THE SOCIAL IMPACT OF NAVAL BASE DEVELOPMENT ON A
COASTAL COMMUNITY:
CAMDEN COUNTY, GEORGIA

By
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A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL
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PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA
1982
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by

Mary Margaret Overbey
To the memory of Solon T. Kimball,
who taught me about communities,
and to
the people of Camden County,
who taught me about their community
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Throughout the course of research, a number of agencies and individuals aided me and to them I am forever indebted. The Kings Bay Steering Committee sponsored the study in the county and it is to the members of the committee and other local officials that I hope the results and recommendations prove beneficial. The Camden County Board of Commissioners and associated staff were very helpful in providing me information about themselves and the plans for handling the impact. Mayor Dickey of St. Marys, Mayor Edenfield of Kingsland, and Mayor Clark of Woodbine and their staffs were most helpful in presenting the concerns and expectations of the towns as well as their own impressions of development.

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THE SOCIAL IMPACT OF NAVAL BASE DEVELOPMENT ON A COASTAL COMMUNITY: CAMDEN COUNTY, GEORGIA

By
Mary Margaret Overbey

December 1982

Chairperson: Paul L. Doughty
Major Department: Anthropology

This study is a social impact assessment of the development of a nuclear submarine base on a coastal community. The theoretical approaches of community study, regionalism, development, and ecological anthropology, and the methods of participant observation, interview schedule surveys, institutional inventories, energy modeling, a photographic inventory, oral life histories, and historic research provide the framework and the means of defining the Camden County community within the Barrier Island Region and determining the changes associated with base development.

Three research questions are addressed: (1) What is the impact of base development on the community during the first year of base operation? (2) What is the impact of base development on the commercial fishery? and (3) What is the impact of base development on a
traditional form of community life, the supplementary subsistence activities? Additionally, three hypotheses posited prior to field research are evaluated: (1) base development and the associated population influx will alter community institutions; (2) base development and the associated population influx will result in a changed lifestyle; and (3) base development and the associated population influx will produce conflict between oldtimers and newcomers.

Parallels among the social impacts associated with base development in Camden County, energy boom towns in the western United States, and communities undergoing military installation impacts of base development or withdrawal are presented. The experiences of other communities provide the context for analyzing the impact as well as the basis for recommendations for mitigating the impact.

The impact of base development on the commercial and noncommercial fisheries and related subsistence activities is analyzed within the context of maritime and ecological anthropology literature and the local history of these activities. The maintenance of these economic activities depends upon the productivity of the estuarine and terrestrial environment which is threatened by base development. Through energy modeling, parallels between the historic disruption of the estuary by the local pulp and paper mill and the naval base are examined and predictions for future changes made.
CHAPTER I
INTRODUCTION

The study reported herein examines the social impact of a large military installation on a coastal community in the state of Georgia. The military base has been developed by the United States Navy to accommodate a submarine fleet formerly based in Rota, Spain. The removal of the fleet from Spain by 1980 was a condition of the Treaty of Friendship and Cooperation signed by the United States and Spain. The fleet's relocation site is Kings Bay, located in Camden County, Georgia (see Figure 1).

As of 1979, Camden County was a rural county with a sparse population of 12,500 divided among three small towns and the surrounding county. St. Marys, the largest of these towns and the closest to the base site, had a 1978 population of 3,700 (Kings Bay Steering Committee 1979). The principal means of employment in the county is the pulpwood industry with a local paper company employing 70 percent of the county's workforce. Commercial fishing provides another means of employment for county residents.

Development of the naval base entailed the immediate placement of approximately 4,300 naval personnel and their dependents in Camden County from 1979 to 1981. The original plans specified that only 400 on base housing units would be built. The majority of naval personnel and their dependents are expected to find housing in the community and
Figure 1. Location map of Camden County, Georgia
surrounding area. The Navy assumed that Camden County would become a "base community" and develop the necessary housing and services. Plans further include the development of Kings Bay to accommodate the Trident nuclear submarine complex. Between 1982 and 1998, an additional 25,000 naval personnel are expected to relocate at Kings Bay.

The incoming population of 4,300 naval personnel is greater than any of the existing towns in the county and will increase the original county population by 34 percent. The projected additional population of 25,000 naval personnel will increase the original county population by over 200 percent. Population expansion alone signals a dramatic alteration in the traditional character of the area and its cultural, economic, and political institutions.

As a requirement of the National Environmental Policy Act (NEPA) of 1969, environmental impact assessments were conducted by the Navy in 1976 for the initial base development (Department of the Navy 1977a,b) and in 1979 for expansion for Trident (Department of the Navy 1980a,b). The environmental impact assessments concentrate on the anticipated physical impact of base development on a regional basis but neglect the social consequences of base development on the community.

This research is intended to introduce social and cultural factors into the environmental impact assessment process. To this end, the objectives of the study were an analysis of Camden County life in a cultural and historical context as it existed before base development, and an assessment of the social impact of the first year of base development.
A social impact assessment must be considered in the context of the environmental impact assessment so that the environment, the economy, and the social characteristics of the community are presented as interrelated. Bowles (1981) has suggested that a social impact assessment of communities should consider two concepts: community social vitality and the viability of the local economy.

Patterns of community social life depend on, or are conditioned by, economic activities and environmental conditions. The assessment of social impacts goes beyond the assessment of economic and environmental impacts, but it continues to depend on these two types of analysis. [Bowles 1981: 33]

Thus, changes to the local environment wrought by a development project effect changes in the economy and community life.

The social impact assessment reported here concentrates on two aspects of the community and its economy that are especially susceptible to disruption during the early stages of development: the effects of development on the commercial and noncommercial fisheries and related subsistence activities; and the effects of an influx of outsiders on the traditional institutions and patterns of behavior of original residents.

The ecological orientation of the research is partially an outgrowth of the orientation of Camden County residents to their environment; residents fish, hunt, and garden extensively to supplement the household diet. Indeed the county's major economic activities, commercial fishing, and pulp and paper production, are based on the exploitation of local natural resources, pine trees, and shrimp, crab, and finfish.

The maintenance of these economic activities depends upon the productivity of the terrestrial and estuarine environment. Naval base
development threatens these local natural resources, particularly the estuarine resources on which commercial and noncommercial fishermen depend. An understanding of the ecology and local environment is therefore essential to estimating the impacts of base development on the community.

This dissertation addresses three research questions: (1) what is the impact of naval base development on the community during the first year of base operation, 1979-1980? (2) what is the impact of naval base development on the commercial fishery? (3) what is the impact of naval base development on a traditional form of community life, the supplementary subsistence activities? While the first two research questions were posed prior to field research, the significance of the latter research question became apparent early in the field experience.

Additionally, three predictions posited prior to field research are evaluated: (1) base development and the associated population influx will alter community institutions; (2) base development and the associated population influx will result in a changed lifestyle; (3) base development and the associated population influx will produce conflict between old-timers and newcomers.

This dissertation seeks to enhance the anthropological dimensions of the environmental impact assessment process and thus improve their overall utility. Anthropologists are not always so fortunate to find a research problem with such significant implications. The results of the study were intended from the outset to be of practical application to the problems raised by base development. It is hoped that the study will be
of value to both the community and the governmental agencies responsible for base development, as well as a contribution to the theoretical and methodological framework of social impact assessment.

**Social Impact Assessment**

Social impact assessment (SIA) is a new concept, interdisciplinary in scope, with methods and theory at an early stage of development. Social impact assessment origins can be traced to the National Environmental Policy Act of 1969 (NEPA); NEPA establishes policy, sets goals, and provides the means of meeting those goals in order to protect the environment (Council on Environmental Quality 1978). "Environment" in the language of NEPA is defined as the human and physical environment.

Environmental impact assessments are the vehicle for meeting NEPA requirements by providing a published analysis, an Environmental Impact Statement (EIS), of the projected impacts of development on the environment. The assessment information is then made available to public officials and citizens before decisions are made and actions taken. The usual form of dissemination is a public hearing.

While environmental impact assessments explicitly address the biological, geological, hydrological, and atmospheric impacts, they are also required to address social impacts or impacts on the human environment. Unfortunately most environmental impact assessments are weighted heavily in terms of the natural and physical impacts. If social impacts are addressed, the analysis is typically limited to projected trends in the regional distribution of race, age, sex, income, and other census data.
Social impact assessments are an effort to improve the human dimension of environmental impact assessments. Social impact assessments evaluate the "... human consequences resulting from the implementation of potential projects, plans, and other developments" (West 1975: 429). In examining impacts on demography, institutions, displacement and relocation, economy, community cohesion, and individual lifestyles, SIA attempts to ameliorate the impact of development projects on communities (Shields 1974). Social impact assessments include qualitative and quantitative data in analysis of the project and the development area. Documents and published data such as census statistics as well as direct data gathering such as field observations, interviews, and questionnaire surveys provide the information necessary to conduct an adequate social impact assessment (Finsterbusch 1980: 22).

At present, SIA consists of a growing inventory of case studies specific to the United States, but it has yet to define a common methodology (Finsterbusch and Wolf 1977; Shields 1974). Dixon's (1978) analysis of the effects of the Trans-Alaskan oil pipeline on the community of Fairbanks is an exemplary case study. In this case, the pipeline construction boom attracted a large, transient population, many of whom were unable to secure employment on the pipeline or in Fairbanks. The incoming population increased demands for local services that the community could not provide. Numerous adverse consequences were noted including increased crime, medical needs, and the cost of living. LaPorte (1978) has noted that the construction and operation of large-scale nuclear waste management facilities may produce anxiety and other "unsettling changes" in the communities and regions in which they locate.
A variety of disciplines are concerned with the effects of development on communities, which accounts for the diversity of theoretical approaches and methodology used in SIA. Anthropologists have become increasingly involved in SIA in recent years. Anthropological methodology and theoretical perspectives enable them to address the processual effects of stress and change on community and family life. Applying anthropological methods predictively rather than retrospectively is not only possible but necessary for adequate planning (West 1975) and for advances in theory as well as technique.

To be truly effective, social impact assessments need to be incorporated into the design and implementation of the environmental impact assessment.

Incorporating this schema into planning procedures would have implications for various professional groups. Economists, engineers, and others, traditionally at the centre of planning procedures would be obliged to make room for sociologists and others trained to give prominence to social concerns. Similarly, sociologists and others who might do social impact assessment would have to abandon the sometimes comfortable status of outside specialists brought in to do a quick job and adopt the more demanding role of continuous participants in the "real world" of decision making, with all of the attendant risks. [Bowles 1981: 27]

Social impact assessment, particularly the social impact assessment of communities, is given further consideration in Chapter II.

Theoretical Bases of the Social Impact Assessment of Naval Base Development on Camden County

Due to the holistic nature of social impact assessments and the diversity of disciplines involved, a variety of theoretical approaches are utilized in conducting social impact assessment. For the research
undertaken in Camden County, a series of theoretical approaches proved appropriate. No single theory is espoused as each approach utilized was necessary to fully comprehend the impact of naval base development on the community. The fields of community study, regionalism, development, and ecological anthropology have provided the theoretical framework from which to analyze and present the data on which this dissertation is based.

Community Study

Anthropologists view the community as the microcosm representative of society and culture (Arensberg and Kimball 1972). The community is viewed as an object of study for the researcher in which observations are made and the interrelationships between institutions and members are described (Arensberg and Kimball 1972: 8). The institutions, relationships, and behavior of the community are considered to exemplify those of the larger group and thus, theoretically, by understanding the microcosm, community, one can better understand the macrocosm: the region, society, and culture. Since the inception of the community study approach in the 1930s, many community studies have been conducted in rural settings (Arensberg 1968; Davis and Gardner 1941; Dollard 1937; Doughty 1968; Foster 1967; Kimball and Pearsall 1954; Lewis 1955; West 1945) and in urban settings as well (Gans 1962; Lynd and Lynd 1929; Warner 1961; Whyte 1955).

Many community studies have analyzed the impact of externally controlled events on community social life and as such provide appropriate methods for conducting social impact assessments (Bowles 1981).
Community study can provide the theory and methodology for the social impact assessment of communities.

Community studies as social impact assessment, however, differ from conventional community studies in that social impact assessments are undertaken for the express purpose of guiding decision-making processes whereas conventional community studies are undertaken for "... the more detached purpose of adding to the body of social science literature" (Bowles 1981: 39).

The form of community adopted for the analysis and presentation of data in this dissertation is that suggested by Arensberg and Kimball (1972: 109) for the American South, the county. Aspects of community studies related to "boom towns" and the impact of military installations that are relevant to analyzing the impact of naval base development on Camden County are presented in Chapter II. Further discussion of the Camden County community is also included in Chapter II.

Regionalism

Regionalism is an ideological and heuristic device for delimiting, analyzing, planning, and administering areas defined as "regions": "... homogeneous area[s] with physical and cultural characteristics distinct from those of neighboring areas" (Vance 1968: 377).

The community is part of a region. While many community studies make little attempt to define the region, the concept is implicit. The community as a "representative microcosm" implies the wider context of a region, or macrocosm.
Relating the community to the region and the region to the community is accomplished through micro- and macrolevel analysis. "Comparative community study" and "regional ethnography" are two aspects of the same process and require new techniques for analysis. For the community researcher this entails observation of human living in a new context, the community's relationship to other communities and the macrosystem that impinges on it.

For such data, it will often be necessary to conduct a new kind of fieldwork, one whose intention is to establish a basis for comparison across communities within a context set by the analysis of a larger system or region. [Olsen 1976: 47]

Micro- and macrolevel analysis would define the relationship of the community to other communities and the larger system or region. This in turn would lead to more adequate definitions of regions. Microlevel analysis of communities would "preclude overgeneralization on the entire region" and analysis of the linkages between communities and the larger system would provide insight into the patterns of communication and interaction between groups and the patterns of social cultural change (Hill 1977: 313).

The application of micro- and macrolevel analysis is even more important for social impact assessments. A reliable SIA considers impacts of development projects on the community (microlevel) and the region (macrolevel). In assessing the social impact of a reservoir development project in Texas, Singh (1977) utilized micro- (community) and macro- (region) level analysis and found the two perspectives essential to estimating impacts.
The microlevel analysis provided a definite structural context of community where real impacts and their recipients could be understood and interpreted. . . . studying the project in light of a larger area [macro] we were able to relate the Cooper project to other communities and programs in the region. . . . It seems necessary that the regional analysis of social impacts be supplemented by more intensive community studies. [Singh 1977: 97]

In assessing the impact of naval base development, the environmental impact assessment (Department of the Navy 1977a) defines the region as the Kings Bay region, a seven-county area, economically dependent on the central place of Jacksonville. This definition of region, however, is based on false assumptions. A more useful definition of region, adopted in this dissertation, is referred to as the Barrier Island Region. This definition is based on shared geographical, economic, historical, and social features and is defined in detail in Chapter II.

Development

The effects of planned development on society have been addressed by anthropologists under the topic of technology and social change. The majority of American anthropologists studying the effects of technological developments on the social, cultural, and psychological characteristics of the recipient people or "target groups" as well as the attendant problems associated with implementing the projects of the "innovating organizations" have done so since World War II. A greater awareness of the social, political, and economic problems of the Third World and a desire for creating stable governments have stimulated an increase in development programs (Foster 1969: 22).

Recent case studies of technological development programs by anthropologists include the following examples. Poggie (1972) examines
the impact of the construction of three major factories on a rural area in Mexico and notes the developing contrasts between the life styles and cultural values of locally employed factory workers and the traditional farmers.

Doughty (1972) examines the social repercussions of the construction of a hydroelectric plant in the highlands of Peru and finds unexpected "ripple effects" of increased training, education, and employment of local inhabitants, increased medical services, and lowered infant mortality. The increased training and educational opportunities enhanced social mobility and allowed for successful migration to urban centers.

Sofranko, Fliegel, and Sharma (1977) examine the effects of technical innovation and government supervision of tobacco production on local farmers in Ghana and India. They find that tobacco farmers who practice integrated farm production are satisfied with their careers, apply learned techniques to their other crops, and maintain traditional values.

Gonzalez (1972) notes the widespread support by all segments of society of the proposed construction of a hydroelectric dam in a rural area of the Dominican Republic. The peasants in the construction area perceived the dam to be beneficial to them, but in reality the dam was intended to further existing services to large landholders and urban areas. Cox (1975) also acknowledges differing perceptions or conflicts of interest between the Canadian government and local inhabitants, mostly American Indians, regarding a proposed natural gas pipeline from Alaska to Chicago.
These anthropological case examples attempt to examine the social implications of technological development on nonindustrial societies in order to understand the process of culture change. In each case study, there are implications for social impact assessment, but for the most part, anthropologists have not participated in the planning stages of development nor used their data to mitigate adverse effects of future developments.

In environmental impact assessments, economists and planners view the implementation of development projects as "top-down planning" (Bowles 1981) or "development from above" (Pitts 1976). One of the principles of development revealed through anthropological case studies, however, is that effective planning of development projects entails incorporating the target group into the planning process. This view is represented in "bottom-up planning" (Bowles 1981) or "development from below" (Pitt 1976).

This principle is applicable in analyzing the impact of naval base development on Camden County. The Navy, in taking a "top-down planning" approach, has encountered difficulty in implementing its development project. Results from the research reveal that if "bottom-up planning" had been utilized, the plans for development could have been more readily implemented and adverse impacts on the community minimized.

**Ecological Anthropology**

The development of ecological anthropology is linked to the field of biology and its outgrowth, ecology, the study of the relationship of plant and animal life to the environment. Ecological concepts of
nature have proved appropriate for analyzing human populations. Some of these concepts are the "web of life," the interdependence or symbiosis of plant and animal life, homeostasis as a regulating mechanism for maintaining a balance or equilibrium of nature, and adaptation as the mechanism of change.

The concept of "systems" forms the basis of the ecological approach. A system is a "... set of objects together with relationships between the objects and between their attributes" (Hall and Fagan 1956: 18). The system comprises a complex network of interdependencies between objects and the environment. Implicit in the concept of systems is the recognition of a hierarchy of systems that interrelate to the whole. The systems approach is thus a holistic approach.

The community is viewed as a population of a particular species within a specific environment or econiche whose interactions within and to the niche comprise an ecosystem. The community is a self-maintaining system.

Boundaries on the system can be imposed in order to analyze the components of the system and their interaction processes. Bennett (1976) differentiates systems theory from systems analysis. Systems theory "... attempts to use system as a generalized model for reality" and systems analysis "... is an empirical attempt to discover interdependencies, or energy flows" (Bennett 1976: 85).

Odum's (1971) energetics or energy modeling assumes system theory and is one means of analyzing systems. After initially defining the system boundary and its components by means of an energy model, energy
quantities are assigned to the components, storages, and the inter-
dependencies or flows. While the calculations of storages and flows
reflect the static state of the systems, the model can be analyzed by
computer to provide a picture of the change in these relationships over
time. Thus energy modeling can be used as a predictive technique.

Energy modeling (Odum 1971; Odum and Odum 1976) is utilized in
this dissertation to analyze the historic relationship between the
commercial fishery, the pulp mill, and the environment. Energy modeling
is also employed to analyze the present relationship among the naval
base, the commercial fishery, the pulp mill, and the environment. Further
discussion of the application of this method to Camden County is presented
in Chapter III.

Historical influences on the development of ecological anthropo-
pology within the field of anthropology derive from the work of Julian
Steward and Leslie White. Other contributions to the field derive from
the work of neoevolutionists, represented by Elman Service, Karl Polanyi,
and Morton Fried, and neofunctionalists, represented by Marvin Harris
and the early work of Vayda and Rappaport (Orlove 1980: 236-245).

A processual approach characterizes the current forms of eco-
logical anthropology. As the term implies, processual ecological
anthropology is concerned with the process or interaction of the system
and the mechanisms that regulate it (Orlove 1980). The homeostatic or
equilibrium model that defines the system in other ecological approaches
is replaced by one that emphasizes the system's resilience (Hardesty
The recognition of historical processes, a diachronic viewpoint, and the impact of external events on the system is a distinguishing characteristic of processual ecological anthropology. Processual ecological anthropology incorporates conflict in its models. Finally, processual ecological anthropology attempts precise studies of productive activities and settlement patterns (Orlove 1980: 261). This new approach defines ecological anthropology as

... the study of the relations among the population dynamics, social organization, and culture of human populations and the environments in which they live. It includes comparative research as well as analyses of specific populations from both synchronic and diachronic perspectives. In many cases, systems of production constitute important links among population dynamics, social organization, culture, and environment. [Orlove 1980: 235]

This study incorporates a processual ecological anthropology approach. The focus of analysis is the system and the change in the elements of the system and the interactions resulting from base development. The system is assumed to be resilient and in a state of conflict. The interaction of the system is viewed diachronically. The environmental problems stemming from historical and present development and the adaptive mechanisms invoked are examined.

The Kings Bay Setting: Camden County

Camden County is located on the coastal strand of southeastern Georgia. It is bounded on the east by the Atlantic Ocean, on the west by Charlton and Brantley Counties, on the south by the St. Marys River, and on the north by the Little Satilla River. The county's land area is 657 square miles or 417,920 acres (Department of Commerce 1971: 12-18).
Historically, the land area of Camden County was much larger. In the 1840s, Camden County included 1,125 square miles; however, 468 of the square miles have since been incorporated into Charlton, Wayne, and Brantley Counties (Reddick et al. 1976: 1). Extensive marsh estuaries, rivers, and inlets crosscut the county and comprise 120,375 acres of the county's land area (see Figure 2). Land area alone makes Camden County the ninth largest county in the state of Georgia.

As mentioned earlier, the Camden County population resides among three small towns and the surrounding rural area. Figure 2 illustrates the location of these towns, St. Marys, Kingsland, and Woodbine, as well as the surrounding hamlets and the location of Kings Bay Naval Base.

St. Marys, the oldest existing town in the county, was planned in 1767. The Colonial Council felt that the site, then known as Buttermilk Bluff and granted to Charles and Jermyn Wright, should be laid out as a town (Reddick et al. 1976: 145). This may have been due to the existence of a natural harbor at Buttermilk Bluff. The Wrights agreed to exchange their property at Buttermilk Bluff for land elsewhere.

By 1787, however, the 1,620 acres at Buttermilk Bluff had been granted to and surveyed by Jacob Weed. Plans were made between Weed and 19 other men to lay out a town on the land in 1788. The men each bought four-acre squares from Weed and the remaining acreage became common property (Reddick et al. 1976: 145). The town of St. Marys was officially established by the Georgia State Legislature in 1792, and incorporated in 1802. Figure 3 depicts downtown St. Marys as it appeared in 1980.
Figure 2. Map of Camden County showing the principal towns, Kings Bay Naval Base, and the Cumberland Sound estuary.
Figure 3. View of downtown St. Marys from the waterfront in 1980
The town of Kingsland developed along the tracks of the Florida Central and Peninsular Railroad. Kingsland was originally the site of one of the King plantations, Woodlawn. James King, a wealthy planter and son of John King who had established the Cherry Point plantation near Kings Bay in the 1700s, bought and developed the inland area for Woodlawn. The plantation was later held by John Madison King, a son of James King, as Longwood plantation. William Henry King, son of John King, built his home on the plantation lands (Reddick et al. 1976).

In 1893, the first train came through King's land, and thence comes its name. The town soon developed around the railroad depot and was incorporated in 1908 as Kingsland. When U.S. Highway 17 was constructed in 1927, many of the businesses in Kingsland moved one block east of the railroad tracks situated on the Old Dixie Highway to be located on the new highway (Reddick et al. 1976). Figure 4 depicts downtown Kingsland at the intersection of U.S. Highway 17 and State Road 40 in 1979.

The town of Woodbine, the county seat, developed along the tracks of the Seaboard Railroad. Originally the location of a rice plantation that was established along the south banks of the Satilla River before the 1800s, Woodbine plantation was later developed by J. K. Bedell for pine timber and rice. The plantation flourished due to its location along a main waterway for transporting rice, lumber, and lumber by-products. Bedell permitted the Seaboard Railroad to pass through the plantation if the first community to develop as a result of
Figure 4. View of downtown Kingsland on U.S. Highway 17 in 1979
its presence be named Woodbine in honor of the plantation (Reddick et al. 1976).

The town name was adopted in 1908. When U.S. Highway 17 was constructed one block east of the railroad in 1927, the town and its businesses also moved eastward to be situated along the new transportation nexus—the highway (Reddick et al. 1976). Figure 5 provides a view of downtown Woodbine on U.S. Highway 17 in 1979.

A distinctive ecological feature of Camden County and other coastal counties of the Barrier Island Region is the estuary. "Estuary" by definition refers to "... a semi-enclosed coastal body of water having a free connection with the open sea and within which the sea water is measurably diluted with fresh water deriving from land drainage" (Smith 1974: vii). However, the areas surrounding the estuary are also associated with it. Thus the sounds, salt marsh, intertidal areas, and intruding freshwater habitats are also thought of as being a part of the estuary. By expanding the definition, "estuary" includes the "estuarine zone" and refers to "... an environmental system consisting of the estuary and those transitional areas consistently influenced or affected by water from the estuary" (Smith 1964: vii).

Along the Barrier Island Region, the estuarine zone encompasses that area of waters lying between the barrier islands and the mainland. In this study, "estuary" will refer to the estuarine zone and be termed the Cumberland Sound estuarine complex. The Cumberland Sound estuarine complex is basic to the marine orientation of commercial and noncommercial fishermen in Camden County.
Figure 5. View of downtown Woodbine on U.S. Highway 17 in 1979
Rivers enter the sea through the estuaries and thus one characteristic of estuaries is a mixture of fresh and salt water. Estuaries are fertile, productive systems that support and spawn a chain of marine life.

Their content of organic detritus is continually renewed from inflowing rivers, from the death of freshwater organisms killed by seawater, and marine organisms killed by fresh water, and by the mechanism of the so-called "nutrient trap." Inorganic nutrient salts entering the estuary are trapped by the growth of plants which incorporate them; plankton carried in is greater in volume than that carried out, and both plankton and detritus carried into the estuary are filtered off by many estuarine organisms such as worms and especially filter-feeding molluscs. After digestion, the faeces of these filter feeders, often bound by mucus, further build up the organic content of the estuarine soil. The worms and molluscs are food for many species of fish, and their faeces feed the growth of benthic algae which in turn feed fish such as the grey mullets and many species of prawn. [Hickling 1975: 110]

The chain of marine life consists of producers and consumers. Phytoplankton are the simple plants, or producers, that are consumed by zooplankton, fish larvae, and other estuarine organisms. Benthic invertebrates such as shrimp, crabs, clams, worms, and snails that consume detritus, zooplankton and phytoplankton in turn are consumed by many fish species (Department of the Navy 1977a: 3-148).

The productivity of the estuary is vital to the commercial and noncommercial fisheries. "At least 65 percent of our nation's commercial fish and shellfish and most marine sport species inhabit the estuarine environment during all or part of their life cycle" (Smith 1964: vii).

The estuary maintains a delicate balance which can be upset by dredging, dredge spoil disposal, oil spills, and other pollutants (Georgia Department of Natural Resources 1975). One of the major impacts
of naval base development is the disruption of the Camden County estuarine system. The physical impact of development and its implications for the local economy and community lifestyle are addressed in Chapters III and IV.

The Navy's Plans for Development

The Navy's plans for development are grouped by phases or levels of construction and operation. These phases are termed T-1 and A-1. These refer to the development of the base to accommodate Poseidon submarines (T-1) and the subsequent expansion of the base to accommodate the Trident nuclear submarine (A-1).

The T-1 phase entails the construction of waterfront facilities for the mooring of a 650-foot-long submarine repair ship tender "which serves as a base for a submarine to change crews, take on supplies, and conduct necessary maintenance before returning to patrol" (Department of the Navy 1977a: 1-16). The tender can accommodate four submarines at mid-mooring, i.e., ship's stern to pier, or two submarines lengthwise along each side (Department of the Navy 1977a: 1-18). Also included in T-1 development is a floating dry dock, approximately 535 feet long by 80 feet wide "for necessary maintenance and repairs to the hull of the submarines" (Department of the Navy 1977a: 1-16), submarine service craft, and maintenance and storage facilities (Department of the Navy 1977a: 1-17).

The T-1 development is mobile, essentially a water-based version of permanent, ashore facilities.
The tender and floating dry dock virtually form a floating shipyard with industrial shops, maintenance facilities, supply system, and personnel support accommodations, all providing a wide variety of services. The various shops provide almost all the trade skills of a shipyard, from draftsmen and pattern makers to foundry workers and machinists. Maintenance facilities include machine foundry, instrument, optical, and electronic shops, plus many others. In addition, the tender provides room and board for [submarine] crews during crew turnover. [Department of the Navy 1977a: 1-17]

The Navy maintains a state of readiness which requires rotation of offgoing and oncoming submarine crewmen. As no training facilities are included in T-1 development, offgoing crews return to their home ports of Charleston, South Carolina; New London, Connecticut; or Pearl Harbor, Hawaii; after their duty of patrol (68 days) and refitting (32 days) and are then replaced by an oncoming crew (Department of the Navy 1977a: 1-16).

Development of Kings Bay for T-1, the Poseidon submarine squadron, was scheduled to begin in January 1978 and be completed by early 1982. Further expansion through 1990 has been calculated to meet fleet requirements and provide a refit site for the Trident-1 backfit program (Department of the Navy 1977a: 1-28).

The impact population of naval personnel and dependents associated with the T-1 phase of the development is estimated at 4,247. This includes 1,839 military personnel, 189 civilian personnel, 1,651 military dependents, and 568 civilian dependents (Department of the Navy 1977a: 2-47). Table 1 presents the Navy's estimates of the impact population anticipated in the 1977 environmental impact assessment.
Table 1. Navy estimates of impact population, 1977

<table>
<thead>
<tr>
<th>Proposed Action</th>
<th>One Squadron</th>
<th>Two Squadrons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tender Refit Site:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military</td>
<td>1,839</td>
<td>3,654</td>
</tr>
<tr>
<td>Civilian</td>
<td>189</td>
<td>284</td>
</tr>
<tr>
<td>Military Dependents</td>
<td>1,651</td>
<td>3,285</td>
</tr>
<tr>
<td>Civilian Dependents</td>
<td>568</td>
<td>853</td>
</tr>
<tr>
<td>Total Population Impact</td>
<td>4,247</td>
<td>8,076</td>
</tr>
<tr>
<td><strong>Ashore Refit Facilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military</td>
<td>4,341</td>
<td>7,421</td>
</tr>
<tr>
<td>Civilian</td>
<td>2,790</td>
<td>3,985</td>
</tr>
<tr>
<td>Military Dependents</td>
<td>14,682</td>
<td>14,682</td>
</tr>
<tr>
<td>Civilian Dependents</td>
<td>4,883</td>
<td>6,974</td>
</tr>
<tr>
<td>Total Population Impact</td>
<td>20,339</td>
<td>33,062</td>
</tr>
</tbody>
</table>

Source: Department of the Navy 1977a: Table 2-3
The base support facilities developed for T-1 include "... utilities, public works, base administration, medical and dental, community and family support, family housing, bachelor housing, and the required interconnecting roads and utilities to service each of these" (Department of the Navy 1977a: 1-21). On-base housing completed by 1982 for married and single naval personnel will consist of 400 married housing units and 35 single enlisted quarters. The remaining 562 military households would be expected to secure housing off-base in the surrounding community. According to a housing survey conducted by the Navy, 75 percent of military personnel would prefer to live off-base in Camden County. Civilian personnel employed on the base are expected to reside in Duval County (39 percent), Nassau County (24 percent), Glynn County (17 percent), Camden County (14 percent), and Charlton County (6 percent) (Department of the Navy 1977a: 4-176).

The A-1 phase of base development entails the construction of an ashore refit facility to maintain one Trident submarine squadron of 10 ships (Department of the Navy 1980a: 3-7). This facility would be permanent and replace the tender. The T-1 development would be expanded to include weapons storage and transfer, Trident missile production, off-crew training, administrative personnel support, and additional on-base housing (Department of the Navy 1980b: S-1 - S-2).

Expansion of Kings Bay to accommodate the Trident nuclear submarine complex, the A-1 phase, began in early 1982. The A-1 facility will be completed in 1992 and maximum development and personnel buildup is anticipated by 1998 (Department of the Navy 1980a: 3-20).
The impact of naval personnel and dependents anticipated with A-l development is 22,361. The Navy expects 59 percent, or 13,242, of these new residents to settle in Camden County (Department of the Navy 1980b: S-3). The 1980 EIS does not provide information on the preferred or expected residences of military and civilian personnel comparable to that supplied for the T-l phase.

Table 2 presents the Navy's estimate of the impact population anticipated in the 1980 environmental impact assessment. The primary impact population estimated for 1998 is 18,505, the work force required for Trident II missile production, yet 7,037 additional personnel will be required for Trident I missile handling and storage. Whether these personnel are additional to the A-l figures is unclear.

Base personnel support facilities to be expanded for A-l include the exchange retail store, exchange cafeteria, dining facility, exchange service outlets, family service center, recreation facilities, consolidated club, child care, library, playing courts and fields (Department of the Navy 1980b: 1-9). Medical services will be expanded to provide outpatient care, and hospital care will be provided by the Navy Hospital at the Air Naval Station in Jacksonville, Florida (Department of the Navy 1980b: 1-10). The A-l development will also entail new personnel support facilities. These include a commissary, post office, chapel, and a cafeteria (Department of the Navy 1980b: 1-9).

On-base housing will be increased to include an additional 800 family housing units located near the 400 units of T-l development. Quarters for 1,300 single personnel will be built on-base (Department of the Navy 1980b: 1-29).
Table 2. Navy estimates of impact population, 1980

<table>
<thead>
<tr>
<th>A-1 Facility (1998 Level)</th>
<th>Military</th>
<th>Civilian</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Work Force&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5,274</td>
<td>2,596</td>
<td>7,870</td>
</tr>
<tr>
<td>Dependents</td>
<td>7,902</td>
<td>2,733</td>
<td>10,635</td>
</tr>
<tr>
<td>Primary Impact Population</td>
<td>13,176</td>
<td>5,329</td>
<td>18,505</td>
</tr>
</tbody>
</table>

<sup>a</sup>This work force is required for full Trident II Missile Production Operation. The initial Trident I Missile Handling and Storage function will require the following work force:

<table>
<thead>
<tr>
<th>Military</th>
<th>Civilian</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,256</td>
<td>1,817</td>
<td>7,073</td>
</tr>
</tbody>
</table>

Source: Department of the Navy 1980b: Table 1-1
Both the 1977 and 1980 EIS mention the possibility of further development at Kings Bay to accommodate an additional Poseidon submarine squadron (T-2) or another Trident squadron (A-2). While no estimates of population impact associated with these sequences are presented, it can be assumed that it would require expansion of base facilities, housing and public services, and additional personnel.

Methodology of the Social Impact Assessment of Naval Base Development on Camden County

The research methodology utilized in this study is an amalgam of the traditional anthropological process of participant observation, interview surveys, and the community study approach. Community study methodology entails the use of (1) the natural history method and (2) event analysis. Event analysis involves the observation of specific events and associated human behaviors and interactions in time and space. It represents the synchronic view of the community in process. The natural history method involves observation of the community in process. It represents the diachronic view of the community, its workings through time. Together, these two methods enable the observer to detail social structure and cultural behavior in its historical setting. These methods lead to an understanding of community. Only with such an understanding can social changes be identified, evaluated and possibly predicted.

Analyzing the impact of naval base development on the community required a diverse approach that includes five basic strategies: (1) participant observation of the community; (2) a study of the local associations and institutions; (3) an interview schedule of a sample of community residents and naval personnel; (4) an in-depth study of
representative families and individuals in the community; and (5) historic research of the region and community.

Participant observation provided a means of understanding the composition of the community, the social and cultural context in which change has occurred. The data obtained by living in the community, observing and taking part in local events, facilitated the identification and examination of the nature and extent of social networks in the community through time. Participant observation was essential to the refinement of the formal interview schedule by permitting the identification of appropriate questions. In-depth interviews with key informants, persons in the community who are especially knowledgeable about different aspects of the community, also contributed to the content of the formal interview schedule as well as enhanced the analysis of the schedule results.

The study of local associations and institutions included a survey of the number and distribution of social, economic, and political institutions in the county from 1964 to present. Generally the institutional inventory reveals the presence or absence of government agencies, educational and religious institutions, community services, transportation systems, medical services, communication media, financial or lending firms, industrial and business institutions and recreation facilities.

A photographic inventory of business and residential areas was conducted throughout the research period to document the immediate physical changes. The changes recorded in the institutional and
photographic inventories aid in distinguishing the physical impact of
the naval base from general growth trends.

A formal interview schedule was administered to a systematic
sample of community residents at the beginning of the research period
and again, using the same informants, one year later. The schedule
addressed community patterns of behavior, health standards, and atti-
tudes toward base development. A similar schedule was administered to
a sample of naval personnel in the summer of 1980.

The in-depth study of representative families and individuals
consisted of participant observation and the tape recording of life
histories. The life histories established a history of family patterns
of behavior, health standards, and attitudes as well as varying responses
to the changes accompanying naval base development. One informant in
particular provided extensive information on community lifestyles and
economic pursuits in the early 1900s.

Historic research entailed analysis of community and regional
history through written records and census and vital statistics. Analy-
sis of the commercial fishery was facilitated by Department of Commerce
fishery statistics which provided a complete history of the commercial
fishery when supplemented by interviews of local fishermen. Historic
research combined with oral life histories document traditional community
lifestyle.

The chapters to follow address the three research questions that
form the analytical core of the study. Chapter II examines the community
during the first year of base development. Chapter III presents the
impact of base development on the commercial fishery. Chapter IV addresses the impact of base development on one facet of community lifestyle, the subsistence activities of fishing, hunting, and gardening. Chapter V presents the conclusions drawn from these chapters and also considers recommendations to both the community and the Navy for mitigating the adverse impacts of base development.
CHAPTER II
THE COMMUNITY DURING THE
FIRST YEAR OF BASE DEVELOPMENT

This chapter presents an analysis of the social consequences of the first year of naval base development for Camden County. Literature on boom towns and military impacts provides a framework with which to analyze the impact of base development. Data gathered through field research and historical research are utilized to present an overview of the Camden County community immediately prior to base development. An understanding of the pre-impact community creates a baseline from which to measure future change. Knowledge of historic trends aids in distinguishing impact-related events from the natural course of change.

The results of research intended to identify and measure the changes in the community during the first year are presented. These data include an analysis of interviews with community residents conducted at the beginning of base development and again one year later; an analysis of changes in community institutions over time; a photographic documentation of physical changes in the community; and the researcher's observations of events during the first year of base development.

The community and the Navy are characterized as different social systems. Community residents are contrasted with the incoming population of naval personnel through a comparison of interview schedules administered to a sample of community residents and naval personnel.
Factors affecting the course of the impact are identified in the interpretation of the first year of base development. Political and economic conditions external to the community affected community attitudes and behavior concerning base development. Underlying conflicts among community residents and naval personnel are described and potential sources of conflict are anticipated.

Three scenarios are depicted as alternate futures for the community. One of these, a scenario positing the relative independence of the community, is suggested as the most useful for retaining vitality.

Social Impact Assessments for Communities

Development projects involve the impact of people upon people as well as the impact of people upon the physical environment. Development projects alter the physical and human environment of the community in which they occur. Development connotes progress and economic growth for the human environment and thus is viewed as good for all. As a result, the human element of the host community is often overlooked in the evaluation of the consequences of development. Environmental impact assessments, required by NEPA to evaluate the social and economic consequences of development projects, typically consider the economic consequences more fully than the social consequences.

This results in part from the fact that economic problems are immediately evident, whereas social factors may not be manifest until some time after the impact. Further, economic costs and benefits are quantifiable whereas the associated social consequences are relatively intangible and difficult to address directly (Little 1977: 404-405).
EIS's are a prime example of the tendency to ignore potential social consequences. They typically pay only superficial attention to the social impacts a proposed development might engender. Unlike assessments of the possible impacts upon the natural environment, social impact assessments almost never utilize data collected specifically to answer the questions at hand. Instead, if data is used at all, it is primarily nothing more than demographic information available from federal and state agencies. In fact, the use of available data tends to direct attention away from questions that need to be answered and redirects it towards questions that can be answered. The end result of this practice is that social impact sections of EIS's give the appearance of being afterthoughts, included merely to satisfy the formal requirements of NEPA. [Little 1977: 425, emphasis in original]

Environmental impact assessments conducted by the Navy in advance of base development in Camden County (Department of the Navy 1977a, 1980a) exemplify this tendency. The impact assessments analyze the impacts of base development on a seven-county region rather than address the host community directly, notwithstanding the Navy's expectation that the majority of naval personnel will reside in Camden County. This regional assessment effectively dilutes the actual impact anticipated for Camden County. For example, in considering the demographic impact of the Trident complex, the environmental impact assessment notes that the regional population will increase by only 3 percent. Thus the assessment anticipates "no significant demographic impact" for the region, deemphasizing the fact that the population of Camden County itself will more than double (Department of the Navy 1980a: 6-85).

A neglect of the social consequences of naval base development is clearly illustrated by the manner in which the Navy responded to citizens' questions concerning social impacts. At a public hearing conducted to provide a forum for citizens' reactions to the 1977 impact
assessment, one Camden County resident expressed concern that community attitudes seemed to be excluded from the assessment.

In reference [to] the Kings Bay, GA., TRIDENT base I would suggest that part of your evaluation of the site include a survey of the local residents concerning this project. Other than the merchants and politicians, most of the people with whom I have had contact oppose the selection of the Kings Bay site. [Department of the Navy 1977b: 3-12]

The Navy's response was, "A community attitudinal survey was considered, but was later abandoned because of the difficulties frequently encountered in obtaining impartial results from surveys" (Department of the Navy 1977b: 3-13).

The environmental impact assessment (Department of the Navy 1977a) cited the difficulty of defining the community as justification for neglecting it. The assessment update for Trident (Department of the Navy 1980a) reported that social impacts of base development on Camden County were being addressed by the study reported in this dissertation.

It is difficult to document and accurately assess the impacts of this 1979 growth on community character and cohesion in Camden County because sufficient time has not passed for all impacts to become evident. The University of Florida is in the process of analyzing the impacts of recent growth on community character and the quality of life in Camden County. [Department of the Navy 1980a: 5-133]

Questions concerning social impacts in 1980 were answered with reference to this study and other unspecified studies. The Office of Policy in Human Development Services, Department of Health and Human Services in Washington, D.C., responded to the 1980 environmental impact assessment in a letter recommending the following:

We believe that the mere presence of such a missile system may cause the people of that area to develop anxiety, fear, strain and stress which may cause failing health conditions
requiring clinical and medical treatment and bring about considerable expenditures. We, therefore, recommend that a study of the psychological effects on the people be taken into consideration in addition to the safety and security of this system so that the unique physiological, psychological, social and cultural factors of the ways of life of all people, living in this area, will be protected. [Department of the Navy 1980b: 2-15 - 2-16]

The Navy's response was,

Studies have been undertaken to identify potential effects of the TRIDENT submarine base upon the people in the Kings Bay region. The Draft Supplement to the Environmental Impact Statement presents the findings of these studies and identified strategies for mitigating potentially adverse effects. Furthermore, the University of Florida independently is in the process of analyzing the impacts of recent Navy-related growth upon community character and quality of life in Camden County. [Department of the Navy 1980b: 2-17]

This failure to adequately address the community and social impacts is basically a result of the Navy's failure to deal directly with the people involved. That community residents appreciate consultation was evident in interviews conducted by the author during the summers of 1979 and 1980. Residents were pleased and encouraged that their opinions were sought and that the community would be represented in the study. Consultation was viewed as a sign of cooperation between the host community and the elements of change.

Analysis of social impacts on communities is facilitated by viewing the community as a single social system that produces quality of life conditions for its members (Finsterbusch 1980). "... The communities are the loci for the delivery of most quality-of-life components to individuals and families. They can be considered effective or ineffective to the extent that they are good places to live—that is they provide for a high quality of life...." (Finsterbusch 1980: 25).
A social impact assessment of a community relies on four basic premises:

(1) There is a defined community with more-or-less stable patterns of social behavior, social relationships, and way of life; (2) some identifiable intervention . . . takes place; (3) this intervention has consequences which produce changes in the pattern of activities, the social relationships, and the way of life; and (4) these changes are different from, or in addition to, those which would have occurred as a consequence of processes already operating in the community. [Bowles 1981: 7]

In essence an intervening project or policy disrupts the natural history of a stable community and stimulates new behavioral responses.

Assessing social impacts on a community first entails defining the community and delineating its boundaries. According to Arensberg and Kimball, community is defined as "... systems comprising interactional regularities and cultural behavior in an environmental context" (Arensberg and Kimball 1972: 4). Community refers to a geographic space or settlement pattern; a locality as well as the social interactions and institutions that bind people together.

Delineating community boundaries, particularly in rural areas, can be accomplished by asking residents to identify their community, the community of which they feel a part (Finsterbusch 1980: 79). Community is both a closed and open system, closed by the researcher who defines the boundary of his system and yet open in fact by community members, ties to other communities, institutions, and persons.

Communities must also be considered within a regional context. Assessing the social impacts of one community recognizes that the changes it experiences will eventually affect other connected communities (Bowles 1981: 8-9).
Conducting a community social impact assessment entails an initial literature review of similar impact situations in order to formulate hypotheses about the consequences of the impact. Second, research designed to predict the impact is conducted and the results presented. Finally, the results are used in planning and implementing the impact project (Bowles 1981: 9).

The process of estimating social impacts in a community entails five steps. (1) Baseline data are collected to produce a profile of the physical and social conditions of the pre-impact community. (2) The physical changes in the community resulting from the development are distinguished from those that would occur regardless of development. (3) Social impacts, the changes in the community resulting from the development, are estimated. (4) The significance of the impacts are evaluated in terms of the community's interests and objectives. (5) Proposals for mitigation of adverse impacts of the development on the community are formulated (Christensen 1976).

Collecting baseline data is the most critical and time-consuming step of the social impact assessment. Adequate and reliable baseline data are essential for estimating the social impacts of proposed developments. Methods of collecting community baseline data may include the use of surveys administered to a sample of residents to gather information; direct observations of physical conditions of the community and behavior of community residents in specific settings at specific times; diaries or time activity logs for obtaining detailed information on specific activities; and simulations or graphic displays such as
video tapes, photographs, games and models used as projective tests for identifying residents' preferences (Christensen 1976: 31-42). In the Camden County study, methods of collecting baseline data have included surveys, participant observation, life histories, archival research, a photo inventory and an institutional inventory.

One common means of estimating social impacts is by qualitative inference.

Impacts are estimated by inferring how the changes to the physical environment will affect citizen uses and perceptions. Inference involves judgmental estimates of how satisfaction levels and activities will change when specific neighborhood [and community] places are altered. [Christensen 1976: 26]

The validity of inferences depends upon the quality of the baseline data. The reliability of inference can be checked by monitoring community change after the development is completed in order to test the accuracy of the original predictions. Surveys can be repeated and direct observations conducted. Longitudinal studies that monitor the community changes over time at set intervals can also be undertaken. In the Camden County study, a monitoring process has been initiated. The interview schedule employed in 1979 was administered one year later to the identical sample of local households. Follow-up studies in Camden County are planned to monitor the impact of base development over time.

Social impact assessments are designed to facilitate decision making. While decisions concerning the implementation of the project are usually made by institutions external to the community, this need
not always be the case. Unfortunately, community participation in the environmental impact assessment process is typically confined to the inclusion of citizen comments at public hearings. As will be demonstrated later, the community can be successfully involved in project decision making.

Community Responses to Impacts

Three factors influence a community's response to the impact of development projects: (1) the social vitality of the community; (2) the viability of the local economy; and (3) the internal political efficacy of the community. For example, a vital community social life and a viable local economy are an adaptive characteristic of communities in the Canadian hinterlands that ideally are maintained and planned for in the implementation of major development projects (Bowles 1981: 2). This is most likely to occur if the community has the political efficacy, competence, or internal strength, to bargain with the outside developers.

A vital community is characterized by the following patterns. There are many collective social occasions and events, with a relatively high level of resident participation. Events are usually organized by the residents themselves. Networks relate community members to each other and many services are provided on a contractual basis or through informal network contacts. Individuals or families are supported in times of need, sorrow, or joy by other residents in the community. Members are able to organize collectively in response to imposed events. Most residents perceive impacting events as affecting
the community as a whole as well as themselves personally (Bowles 1981: 49-52).

While formal services and institutions are recognized as important to a community and to individuals' sense of well-being, the informal aspects of the services, i.e., the way in which they are provided, override their formal aspects. For example, "... community residents are not likely to be dismayed by a hospital with a good operating room, but they may be alienated by bureaucratic processing of family members in a community where more personalistic relationships predominate" (Bowles 1981: 53). Little (1977: 422) notes that community division between oldtimers and newcomers in Page, Arizona, a small community undergoing rapid development, was exacerbated when interpersonal processes were replaced by institutional mechanisms.

Viability of the local economy refers to those economic activities that occur within the community and meet local needs. A local economy is defined as "... an institutional system which provides utilities at the local level" (Bowles 1981: 63). The local economy includes commercial and noncommercial activities that contribute to the economic and social well-being of community residents. Examples of viable local economic activities in Camden County include local industry, commercial fishing, and noncommercial fishing, hunting, and gardening practices. Local industrial activities are examined within this chapter. The traditional economic activity of commercial fishing is presented in Chapter III, and the subsistence activities of fishing, hunting, and gardening are presented in Chapter IV.
Political efficacy refers to the ability of the community to organize and mobilize resources in order to act effectively on internal or external problems and to deal with the associated powers or groups that affect the community and its members. A politically effective community is able to define and manage direct and impending impacts of development projects (Bowles 1981: 60).

In contrast, the lack of political efficacy can result in a declining community. Simon and Gagnon (1967) studied three neighboring rural towns in rural southern Indiana that exhibited economic decline following the boom and bust of coal development and an inability to fully redevelop their communities. Their results indicate that the most politically cohesive community, Spiresburg, displayed a greater economic recovery and a more positive attitude about its offerings and future than the other two, politically factionalized, towns. The authors conclude that "... the quality of community leadership—particularly political leadership—is a crucial determinant of the course of development" (Simon and Gagnon 1967: 49).

A community with political efficacy displays "competence," the ability and commitment to act on direct or impending impacts to the good of the community. A competent community is...

... one in which the various component parts of the community: (1) are able to collaborate effectively in identifying the problems and needs of the community; (2) can achieve a working consensus on goals and priorities; (3) can agree on ways and means to implement the agreed-upon goals; and (4) can collaborate effectively in the required actions. It is proposed here that a community that can provide the conditions and generate the capabilities required to meet the above performance tests will be competent to cope with the problems of its collective life. [Cottrell 1977: 548]
Community competence in the face of development projects requires communication skills to deal with outside interests and adaptability to the new circumstances and the wider context in which the community finds itself. This often translates into the ability of the community to learn new skills in order to cope with new problems and to use experts or specialists, such as planners or researchers, without being controlled by them (Bowles 1981: 61; Cottrell 1977: 555).

The value of experts or specialists to a community undergoing development is illustrated by two development projects initiated on a Navajo reservation. During the first project, the Navajo had no access to experts and thus exerted no influence on the development. In the case of further development, however, the Navajo had access to the information and advice of a research facility and were able to make informed decisions and influence the course of development (Robbins 1979).

Experts or specialists are most effective as advisors or consultants that not only provide information but also present recommendations to the community to facilitate decision making. To the mayor of Gillette, Wyoming, a town undergoing energy development in boom proportions, the need for recommendations outweighed the need for information.

They [experts] ask us what our problems are, and a little later they issue a brochure telling us what our problems are. . . . We've got a whole library full of them in our planning department. They're nice to have, and they certainly tell an awful lot about our problems. We have an unusual amount of understanding our problems. What we'd like to have is an unusual amount of understanding our solutions. [Corrigan 1976: 1152]

The community's reliance on experts or specialists can be a source of conflict if the experts are not aware of their delicate
position. Although the temptation sometimes exists to direct the course of development, particularly in factionalized communities that demonstrate little political efficacy or competence, experts function best as advisors or advocates rather than decision makers (Bowles 1981; Lynch 1970; Stafford and Ladner 1977). Lynch (1970) provides an example of a community facing the impact of military base closure that hired a full-time manager to handle the base conversion. The manager became "a scapegoat for community inaction" (Lynch 1970: 234).

As will be discussed later, Camden County residents have expressed resentment over the role of planners in managing the impact of naval base development.

Community involvement in the planning, decision making, and implementation of development projects allows the community to successfully adapt to new circumstances. "When government and business only intervene, or attempt to manipulate analysis and debate, they deny the local community the chance to grow collectively through the process of their own assimilation and their own reformation of change in ways that make sense to them" (Bates 1978: 77). Community participation is thus a means of "bottom-up" planning (Bowles 1981: 59) or "development from below" (Pitt 1976) in which the community and its residents are active in determining the course of changes that will affect their lives.

Bowles (1981) contrasts the response of two French Canadian communities to development. Parish, a rural Quebec community, experienced the impact of several externally controlled textile plants as a passive recipient. The lack of community involvement in the impact resulted in
reduced social vitality, local control and autonomy (Bowles 1981: 37-38). St. Pascal, on the other hand, actively sought new industries and encouraged expansion of old industries and industrialized through local control.

Individuals within St. Pascal, mostly entrepreneurs or sons of entrepreneurs, worked together in previously existing community organizations to mobilize local support for projects which would provide economic benefit to the community. Using contacts which they had with outside agencies, including especially the development-oriented branches of the provincial government, they organized funding for both civic facilities and capitalist enterprises. [Bowles 1981: 38-39]

In this case, the social vitality and economic viability of St. Pascal was not only maintained but increased with locally controlled industrialization (Bowles 1981: 39).

Lynch (1970) notes that communities experiencing military base closures can successfully adapt if they remain independent of the base and actively seek new industry or avenues of development and organize a base closure committee that encourages resident participation and representation in deciding on and carrying out community redevelopment programs (Lynch 1970: 231-236). For example, of the 12 communities cited by Lynch, Presque Isle, Maine, most successfully recovered from base closure. This was accomplished by the community's ready acceptance of the closure decision, its active development of other resources for industry, and its political confidence to work collectively within the community and to garner support from state and federal leaders (Lynch 1970: 48-65).

Communities experiencing base closures are recognized as being solely responsible for development. This is evidenced by the fact that
the federal agency representing communities, the Office of Economic Adjustment, serves only to advise communities that request its assistance (Lynch 1970: 22).

Gilmore (1976) suggests that one means of managing boom growth by local government is through the formation of groups designed specifically to deal with the impact.

In Kitsap County, Washington, local government, assisted by the Department of Defense, set up the Trident Coordination Office to deal with impacts of the developing Trident weapons system. It is financed by the Economic Development Administration, the State Office of Community Development, and some county money. [Gilmore 1976: 540]

Kitsap County like Camden County is being developed as a Trident nuclear submarine base. Camden County has also developed an impact committee, the Kings Bay Steering Committee, and established a Trident Coordination Office to deal with the impact of base development. The role of these agencies in the course of development will be discussed in subsequent sections.

Boom Towns

Boom towns are one manifestation of the impacts of development projects on a rural community. By definition, since boom towns entail economic development and rapid population growth, they do not occur in metropolitan areas where their impacts are more readily assimilated (Little 1977: 402-403).

The term "boom town" is applied to a rural community which experiences a substantial increase in economic activity causing a rapid and disruptive population growth. The major types of new economic activity are (1) mining and resource development; (2) rural industrialization;
(3) military installations; (4) power plants, dams, and other large construction projects; and (5) tourism, recreation, or large retirement housing. [Finsterbusch 1980: 138]

While patterns of population growth may differ according to the type of economic activity, the boom town model is the same. Commonly referred to as a "boom-bust" cycle, the boom town model consists of three stages: construction, operation, and shut-down (Finsterbusch 1980: 138).

The rate of population growth associated with a development project is a major determinant of the extent of the impact for the community. Gilmore and Duff (1975: 2) estimate that a 5 percent annual increase is about as much growth as a small community can absorb. Little (1977) suggests that a small community cannot absorb an annual growth rate in excess of 15 percent and accordingly sets boom town growth rates at 10 to 15 percent annually. Finsterbusch (1980: 138) defines a major boom town as a community that experiences a growth rate of 15 percent for three or more years. Camden County, expected to undergo a 34 percent population increase in the first year of base development, qualifies as a boom town that will experience the problems associated with boom growth.

Recent research in boom towns in the western United States dispells the romantic notion of boom towns in the American West as relatively problem-free places for carrying out entrepreneurial enterprises (Little 1977: 401). In fact, Gilmore (1976) concludes:

The energy boom town in the western United States is apt to be a bad place to live. It's apt to be a bad place to do business. . . . The results of such unmanaged growth are probably the leading source of upsets and conflict that can be seen or anticipated in the process of western energy development. [Gilmore 1976: 535]
The economic problems associated with boom towns are coupled with social problems. While the economic factors are usually considered to be more important than the social factors, the social and economic consequences of boom towns are interrelated (Finsterbusch 1980; Gilmore and Duff 1975; Little 1977). Little (1977: 402) concludes that a community population increase of even 10 percent will result in "severe institutional malfunctioning." The new population increases the demands for housing and community services and signals conflicts between pre-impact community residents (oldtimers) and the newcomers (Finsterbusch 1980: 137).

An example of the social and economic breakdown of a community undergoing boom town growth is Sweetwater County, Wyoming. Sweetwater County, and particularly the towns of Rock Springs and Green River, have experienced a boom-bust-boom cycle. The community was originally dependent on railroading and coal mining during the late 1880s, two economic activities that steadily declined after World War II. Mining operations for trona, a source of industrial soda ash, developed in the county in the 1960s (Gilmore and Duff 1975: 1).

The recent boom in Sweetwater County is related to the development of energy resources, specifically oil, gas, and coal. Increasing demands for soda ash have stimulated expansion of trona mining in Sweetwater County. Accelerated growth in the county began in 1971. The 1970 county population of 18,391 persons increased to 36,900 persons by 1974. The community has experienced a 19 percent annual growth rate with rapid growth rates expected through the 1980s, making Sweetwater County
a boom town with associated boom town problems (Gilmore and Duff 1975: 2-6).

Gilmore and Duff (1975) cite three major problems for Sweetwater County that have resulted from boom expansion. (1) The quality of life has deteriorated. Population growth has exceeded the ability of the community to provide needed services. The health, housing, schooling, retailing, and urban needs of newcomers have not been met. As the population doubled, newcomers were not satisfied with living conditions and were not integrated into the county. (2) Mining productivity declined 25 to 40 percent as a result of labor turnovers and shortages. Construction productivity declined also. Declining productivity was related to the deteriorating quality of life as newcomers, attracted by jobs but dissatisfied by the lack of community services, were discouraged enough by living conditions to consider leaving the county. (3) The local services sector failed to meet the needs of the community for goods and services. Local services and the revenue to develop them did not expand rapidly enough to accommodate the boom situation (Gilmore and Duff 1975: 2).

The problems associated with unmanaged growth in boom towns perpetuate a self-sustaining cycle. Based on the experiences of Sweetwater County, Gilmore and Duff (1975: 23) and Gilmore (1976: 536) refer to the problems of boom towns as "the problem triangle." The impetus to the cycle is rapid population growth which stresses the local services. First, inadequate local services, goods, and other intangibles degrade the quality of life for oldtimers and newcomers. Second,
residents' discontent with the stressed living conditions results in an unstable work force, as they either move out of the community or exhibit high absentee rates. An inadequate labor force results in declining industrial productivity. Finally, the declining industry fails to provide adequate revenues to the community with which to develop the needed local services. And so the problem triangle continues to operate on a downward cycle.

The problem triangle emphasizes the effect or social consequence of boom towns on the success of the development projects. Dixon (1978: 119) asserts that impacts are not merely related to the population increase, but the social structure of the immigrants (newcomers) and the community (oldtimers). For oldtimers and newcomers, the quality of life in the community is most important. Corrigan (1976) records this for Rock Springs in Sweetwater County.

The impact on the community is what has bothered people . . . not the impact on the environment. . . . [Community impacts include] rising crime rates, increases in suicide and alcoholism and divorce cases and other troubles associated with a sense of rootlessness. . . . Newcomers complained about the lack of services. Oldtimers complained about traffic jams. [Corrigan 1976: 1151]

In Rock Springs, inadequate housing, streets, schools, water, sewers, utilities, police and fire protection, medical services, and recreational facilities have been a source of discontent. A trailer court boom has resulted as a means of meeting the housing needs of newcomers. The abnormal behavior patterns that result from stressed living conditions in boom towns has been termed "the Gillette Syndrome," after the boom town Gillette, Wyoming (Corrigan 1976: 1151-1152; Little 1977: 408).
Little (1977) provides an example of the Gillette Syndrome.

A housewife, fighting mud, wind, inadequate water and disposal systems, a crowded mobile home, and muddy children all day, snaps at her husband who returns from a 16-hour shift. He responds by heading back downtown and spending the night at a bar drinking and trading stories with men from similar circumstances. [Little 1977: 408]

The social consequences of boom towns include the following: mental health problems, value conflicts, altered personal interaction patterns, altered institutional interaction patterns, and transiency and increased crime (Little 1977). One, mental health problems increase. In Gillette, Wyoming, divorce, depression, alcoholism, and attempted suicide rates were high among adults. Students exhibited low academic achievement levels and high truancy and delinquency rates. Similar studies in other boom towns demonstrate that "... the social milieu of boom towns is not conducive to good mental health" (Little 1977: 409).

Two, value conflicts arise. Values, abstract standards of behavior shared by groups, are the general principles by which individual and group behaviors are judged. The value conflicts common in boom towns generally result from the differing attitudes and behavior among oldtimers and newcomers (Little 1977: 409-410).

Oldtimers in rural communities are relatively conservative, while newcomers are more liberal in their values (Bates 1978: 76; Little 1977: 410). "[Newcomers] tend to be from urban areas, are younger and better educated, have fewer children, and are better paid than their rural counterparts" (Little 1977: 410). Nellis (1974) compared oldtimers and newcomers in the energy boom town of Hanna, Wyoming, and found differences in age, education, mobility, political affiliation
and awareness, as well as attitudes about development and needs for local services.

Three, personal interaction patterns are altered. Boom town growth may affect friendships and interaction among oldtimers and between oldtimers and newcomers. These changes may be reflected in either a breakdown in personal relationships among community members as disagreements over the development project surface, or in increased solidarity or cohesion of community members as a result of the development project (Little 1977: 410-411).

Personal interaction patterns between oldtimers and newcomers are potentially fraught with conflict. The basis for conflicts is due to the different values and cultural orientations of oldtimers and newcomers. Stereotyping is one means of expressing the conflict and effectively limiting interaction between oldtimers and newcomers. Scapegoating is another expression of conflict between oldtimers and newcomers (Little 1977: 411).

Newcomers are often blamed by oldtimers for the adverse effects of development.

The original rural resident traditionally places a high value on independence and self-reliance, sometimes to the point of expecting or demanding fewer public services than may be needed. The newcomer often has an urban pattern of expectations and demands for services. [Bates 1978: 75]

Oltimers view themselves as bearing the increased costs of services that benefit the newcomers, who are perceived as temporary residents.

Families of the [newcomers] pay only a small proportion of the costs of such improvements; they are in the community a relatively short time, and they typically live in
mobile homes which carry low tax assessments and thus contribute only a small amount toward the upkeep of the community while making use of all its benefits. [Bates 1978: 75]

Four, institutional interaction patterns are altered. Changing personal interaction patterns affect institutional interaction patterns. Disrupted friendship patterns among oldtimers may result in reduced activities in community organizations, while solidified friendships may increase the activity of oldtimers in community organizations. The composition of existing institutions may change if newcomers become integrated into community organizations, or new institutions may arise to accommodate newcomers. Politics in the community may shift, particularly if newcomers become politically active in community affairs (Little 1977: 412-413). Nellis (1974) notes that one result of the boom in Hanna, Wyoming, was that the Democratic majority of oldtimers was overwhelmed by the number of newcomers voting Independent.

Five, transiency and crime increase. Uncertainty pervades boom towns, i.e., concern with the transiency or possible bust of the development project affects many communities. Development project policies are out of the community's hands, a fact which adds to the uncertainty. In areas of energy development in Wyoming, for instance, uncertainty is expressed as follows: "So many energy projects have been proposed, withdrawn, revived and revised that any community would be hard put to prepare for whatever might result" (Corrigan 1976: 1152).

This is particularly true of military installations which are frequently closed in reaction to changing defense needs and political interests (Lynch 1970). The uncertainty factor related to military
installations in general and the consequences for Camden County are examined below.

Communities undergoing boom growth are also concerned about the transiency of the incoming population (Little 1977: 414). Havighurst and Morgan (1963) in their analysis of a military-related boom town, Seneca, Illinois, conclude: "A stable community by its very nature resists a boom-like expansion. It is a place built for and by people who are sedentary in disposition and habit. A boom brings in people who are migratory and restless" (Havighurst and Morgan 1963: xiv). Little (1977: 414) notes that the majority of newcomers to boom towns are transients and that the construction workers, associated with the building phase of the development project, are "notoriously mobile." As will be illustrated later, military personnel are also a transient population.

The transient populations of boom towns are associated with increased crime rates (Little 1977: 414). Boom town studies cite increased crime rates as one of the adverse effects of unmanaged growth (Corrigan 1976; Gilmore and Duff 1975; Little 1977). Gilmore and Duff (1975) report a 60 percent increase in complaints received by police in Rock Springs, Wyoming, during 1972 and 1973. Little (1977) notes that newcomers to Page, Arizona, were highly transient and that the boom town experienced an increase in crime rates. In the first year of construction activities on the Navajo Generating Station from 1970 to 1971, the number of crimes increased 118.7 percent while the population increased 150.4 percent. From 1971 to 1972, however, the
percentage increase in crimes, 63.7 percent, was greater than the population increase, 55.9 percent (Little 1977: 422-423).

In boom towns, the informal social control mechanisms that work so effectively to control crime in the pre-boom community no longer function. Formal controls are installed to handle the increase in crime in the boom town. This may include an increased number of law enforcement officers, and a more elaborate criminal justice system for trying and punishing offenders (Little 1977: 415).

Military Impacts

When military installations are developed in rural communities, the frequent result is boom town growth (Finsterbusch 1980: 138). The magnitude of the impact is a function of the size of the installation relative to the community, the self-sufficiency of the base or installation, and the economic stability and diversity of the community. As illustrated in the preceding section, the impact of Kings Bay naval base on Camden County is of boom town proportions.

There is little published information on the impact of military installations on rural communities. The available case studies indicate that military installations follow the boom-bust cycle of other large economic development projects. The construction and closure of military bases or other defense-related installations are subject to shifts in national defense priorities and political interests.

Two studies that reveal the boom-bust cycle of military installation impacts on rural communities are Breese et al. (1965), The Impact of Large Installations on Nearby Areas, and Havighurst and
Morgan's (1963) *The Social History of a War-Boom Community*. Some of the most valuable information on the social impact of military installations is found in studies examining what happens to host communities when the installation closes. Lynch (1970) reviews the responses of 12 communities to military base closures in the *Local Economic Development after Military Base Closures*.

Breese et al. (1965) present five case studies that analyze the impact of military base and defense-related installations on rural communities. The five case studies exhibit a number of similarities: (1) the five installations were defense related; (2) the military installations were established without consideration of community preferences; (3) an initial construction boom was followed by a smaller operational force; (4) the influx of the boom population, including construction and military personnel, precipitated a housing crisis—community services and facilities were stressed; the communities were also stressed; (5) the establishment and operation of the installations changed the way of life in the nearby communities and with the closure of some installations residents and community-based military support facilities were dislocated (Breese et al. 1965: 3-4).

Two of the case studies involve the impact of military bases on nearby communities. The establishment of Dover Air Force Base Complex in Dover, Delaware, and the Naval and Air Force establishments in Geneva, New York, illustrate the problems for the community that result from military boom-bust cycles.

Dover, originally a quiet, historic town, experienced a military base impact during World War II when an Army airfield and pilot training
center was established. The facility was closed after the war, but reactivated and developed as an Air Force base in 1952 following a Defense Department determination that the site was strategically important (Whelan 1965: 295-296).

Dover Air Force Base was not originally planned to be self-sufficient; the community was expected to provide the necessary housing and local services and facilities. Between 1952 and 1962, Dover experienced a population influx of 20,000 military personnel and dependents. The population increase produced a housing and service demand for which Dover was ill prepared. Trailer parks blossomed to provide inexpensive housing for military personnel. Recognizing that the community would not be able to provide adequate housing and facilities, the base slowly took steps to become self-sufficient. Funds for the construction of family housing on the base were not provided until 1956, four years after base development was initiated, and an on-base school for military dependents did not open until 1960 (Whelan 1965: 295-358).

The base moved slowly toward self-sufficiency, remaining heavily dependent on the community. The community was eventually able to provide most of the necessary housing and services at the cost of maintaining a diverse economy. Dover become economically dependent on the continued existence of the base (Whelan 1965: 359-358).

Sampson training center in Seneca County also underwent two cycles of development. The Navy built the training center in 1940 and closed it in 1942. Between 1946 and 1950, the facility was converted to community use, first as a junior college and later a mental hospital.
In 1950, the Air Force redeveloped the training center for the Korean conflict. The Air Force attempted to make nearby Geneva into a "base community." The population impact on Geneva was mitigated somewhat when the Air Force provided some on-base housing. Geneva responded to base needs by expanding schools, roads, housing, and commerce. In 1956 the Air Force closed the training center and Geneva's economy suffered (Church 1965: 380-429).

Havighurst and Morgan (1963) detail the boom-bust cycle of a naval shipyard on the rural town of Seneca, Illinois. The shipyard, established in 1942 by the U.S. Navy to build the Landing Ship Tank (LST) during World War II, closed down in 1945. During the three years of operation, however, Seneca's population swelled from 1,255 to 9,000 within the first eight months, an increase of 858 percent. The boom population peaked at 10,600 in the summer of 1944 (Havighurst and Morgan 1963: 47).

Providing housing for the incoming population proved to be the most difficult problem for Seneca. Private housing was immediately filled. Trailers were brought in, intended only for temporary use but occupied throughout the boom. The federal government provided public housing for the remainder of the shipyard workers and their families. Public housing projects consisted of dormitory buildings, apartments, row houses, and multiple-family dwellings (Havighurst and Morgan 1963: 62-73).

Despite the influx of newcomers into Seneca, the social structure and institutional make-up of the community changed very little. Relations between oldtimers and newcomers were minimal and strained. The high
degree of transiency among newcomers kept them from becoming involved in the community. Rather than become integrated into existing institutions, the newcomers created new institutions, particularly churches.

After the shipyard closed in 1945, life in Seneca resumed its pre-boom character. The government removed most of the public housing and trailers, leaving only 67 apartments standing. The population returned to pre-boom levels. At the beginning of the school year following the closure, the elementary enrollment was only 30 students higher than pre-impact levels (Havighurst and Morgan 1963: 325).

In a return visit five years after the closure, the authors found that 40 new families had joined the five or six shipyard families that had remained when the facility closed. Thirty new houses had been built and old houses were painted and improved, giving Seneca a new, neat appearance (Havighurst and Morgan 1963: 330).

Havighurst and Morgan (1963) recount a story illustrating the difference between what Seneca hoped for and what it actually got out of the shipyard boom.

The statement had often been heard in Seneca during the boom, a statement usually attributed to Father Preston, that "Seneca needs three things—a community building, the dredging of Rat Run, and a toilet at the Rock Island Depot." Rat Run never was dredged; the community building was authorized but never built. The Rock Island Depot, however, was renovated and a toilet was installed in the spring just before the boom ended. [Havighurst and Morgan 1963: 326-327]

Lynch (1970) analyzes 12 communities' responses to base closures. The case communities involve base withdrawals of over 1,000 persons. Lynch defines community responses to the base bust phase as successful
or less than successful recoveries and, on the basis of these results, offers recommendations for mitigating the impact of base closures. The Lynch study contains some timely lessons for communities undergoing the initial stages of base development. In subsequent sections, some of these lessons are applied to the Camden County situation in a series of scenarios for possible outcomes of naval base development.

The response of Preque Isle, Maine, to the withdrawal of the Presque Isle Air Force Base is listed as the most successful recovery to base closure. The community's heavy dependency on the base was quickly reduced as the community secured other economic development by tapping its available resources. New industry was brought in to exploit lumber and potatoes, and a plan was developed for sugar beet production (Lynch 1970: 56-59).

Through prompt political action and support from state and federal leaders, the community was able to purchase the base facility and secure redevelopment funds. The base facilities were converted for industrial and recreational use (Lynch 1970: 60-65).

The response of Mobile, Alabama, to the closure of Mobile Air Material Area (MOAMA) at Brookley Air Force Base represents a less successful recovery to withdrawal. In this case, the community was unable to purchase the base facility. The base constituted the largest employer in Mobile, employing 12,500 civilians and 1,070 military personnel or 12 percent of those in civilian nonagricultural employment in Mobile (Lynch 1970: 137).

The immediate reaction of Mobile to the closure announcement was to attempt to reverse the withdrawal decision. A "Battle for Brookley"
committee was established by the mayor to politically organize the community against the closure. The move to "Save Brookley" was futile, however, and only served to slow down community redevelopment. The community waited until five months after the closure announcement to contact the Office of Economic Adjustment (OEA) for assistance in recovery. Not until a year after the announcement did the community organize a planning committee to deal with redevelopment (Lynch 1970: 140).

Mobile was slow to attract other industry. The general trend of a declining total employment and manufacturing employment did little to aid community recovery efforts. The growth that did result after the closure was due to an expansion of existing firms (Lynch 1970: 140).

The Camden County Community

The foregoing literature review illustrates the degree to which the host community bears the brunt of the social and economic impacts of large-scale development projects. The nature of the impact and the extent of adverse effects depend to a great extent upon the community's response to the development. Thus in order to predict the outcome of the project and to minimize undue disruptions in community life, analysis must focus on the host community.

The working definition of community adopted for this study is that of the county as the form of community in the South (Arensberg and Kimball 1972). The county formed the focus and physical boundary of the study.
The distinctive community form of the South was and is the county. Dispersed a day's ride in and out around the county seat, that community assembled planter and field- or house-hand from the fat plantations, free poor white or Negro from the lean hills and swamps, for the pageantry and the drama of Saturdays around the courthouse, when the courthouse, the jail, the registry of deeds, and the courthouse square of shops and lawyers' row made a physical center of the far-flung community. This is the American counterpart of the Spanish and Portuguese municipio, the French and German community and Gemeinde, the rural counterpart of the baroque capital which Mumford called the city of the palace and the parade. It is a product of the same age, the age of the rise of the national state, whose community form it represents. [Arensberg and Kimball 1972: 106]

Implicit in this definition is a recognition of different levels of community. Community can be defined as a geographic place or territory, a set of shared institutions, shared cultural values, shared experiences, or a shared sense of identity. Field research underscored the utility of focusing on the country as the research area while at the same time revealing the finer spatial and social distinctions recognized by the residents themselves.

To someone from outside of Camden County, local residents identify themselves as being from Camden County, Georgia. To someone from within Camden County, residents will identify themselves as being from St. Marys, Kingsland, or Woodbine (Figure 2). Rural residents will further specify one of the many settlements surrounding the principal towns, for example, Mush Bluff, Woodsville, Kinlaw, Greensville, Colesburg, Scarlet, Tarboro, Spring Bluff, or Hazards Neck.

The institutional inventory of the three major towns and rural areas reveals their relative size, growth patterns and basic composition from 1964 to present. In 1979, St. Marys, the largest of the three
towns, had the most institutions, 203 total (Figure 6). Woodbine, the smallest town, had the least number of institutions. Very few institutions were found in the rural areas. With the exception of post offices in White Oak and Waverly and the military complex at Kings Bay, institutions in rural areas were commercial rather than governmental.

The basic composition of each town is also revealed in the institutional inventory. The 1979 data identify St. Marys as the industrial and service center of the county. The pulp and paper mill, the only high school, and the only hospital are located in St. Marys. St. Marys has the highest number of industries, health care facilities, and professional and community services in the county. Figure 7 presents a view of downtown St. Marys along the major road, Osborne Street. Kingsland appears to be the transportation and commercial center of the county. Kingsland is located at the intersection of Interstate 95, U.S. Highway 17, and State Road 40, and exhibits the greatest degree of commercial differentiation. Figure 8 depicts a downtown street scene of Kingsland at the intersection of Highway 17 and State Road 40. Woodbine, the county seat, is the administrative and ceremonial center of the county, with the highest concentration of governmental agencies and offices in the county. Figure 9 depicts the Camden County courthouse located in Woodbine.

Each town has experienced a slow growth rate in population and institutions. Table 3 details the change in population since 1900. Figure 6 illustrates the change in the number of institutions from 1964 to 1980. That the physical appearance of the towns has changed
Figure 6. Number of institutions in the principal towns and rural areas, 1964-1980
Figure 7. View of downtown St. Marys along the major road, Osborne Street
Figure 8. Downtown street scene of Kingsland at the intersection of U.S. Highway 17 and State Road 40
Table 3. Camden County population, 1900-1980

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900</td>
<td>7,669</td>
<td>---</td>
</tr>
<tr>
<td>1910</td>
<td>7,690</td>
<td>.3</td>
</tr>
<tr>
<td>1920</td>
<td>6,969</td>
<td>-9.4</td>
</tr>
<tr>
<td>1930</td>
<td>6,338</td>
<td>-9.1</td>
</tr>
<tr>
<td>1940</td>
<td>5,910</td>
<td>-6.8</td>
</tr>
<tr>
<td>1950</td>
<td>7,322</td>
<td>23.9</td>
</tr>
<tr>
<td>1960</td>
<td>9,975</td>
<td>36.2</td>
</tr>
<tr>
<td>1970</td>
<td>11,334</td>
<td>13.6</td>
</tr>
<tr>
<td>1980</td>
<td>13,371</td>
<td>18.0</td>
</tr>
</tbody>
</table>

Source: Department of Commerce, Bureau of the Census
only slightly is obvious from a comparison of Figures 3 and 10, 11 and 12, 8 and 13.

Commuting is a normal part of life in Camden County. Due to the rural nature of the area, many residents drive distances of at least 10 to 40 miles one way for work, shopping, and medical care. Analysis of commuting patterns for shopping, health care, and work recorded in the 1979 survey revealed the pervasive nature of commuting and the orientation of local residents to various areas within and outside the county.

A distinction frequently expressed between the "north end" and the "south end" of the county is reflected in commuting and shopping patterns for specialized goods and professional services. Families in the southern towns of St. Marys and Kingsland routinely travel to Fernandina or Jacksonville for medical and dental care and to shop for clothing and household items. Families in the north end of the county around Woodbine, White Oak, and Waverly are much more likely to travel to Brunswick for specialized goods and professional services. Field research indicates that the north-south boundary extends through Colesburg, south of Woodbine (Overbey 1979).

The Community in a Regional Context

Commuting patterns in and outside of Camden County are diagnostic of residents' outside links to the region. Placing the Camden County community in context requires a definition of its surrounding region. The Environmental Impact Statement (Department of the Navy 1977a) defines the area surrounding Camden County as the "Kings Bay
Figure 9. Camden County Courthouse in the county seat, Woodbine
Figure 10. Aerial view of downtown St. Marys from the waterfront in 1940

Courtesy Georgia Department of Archives and History
Figure 11. Housing on Osborne Street in St. Marys, 1979
Figure 12. Housing on Osborne Street in St. Marys, 1915

Courtesy Georgia Department of Archives and History
Figure 13. Street scene of Kingsland, early 1920s

Courtesy Georgia Department of Archives and History
Region," so designated to reflect the area of the Kings Bay naval base impact. The Kings Bay Region includes seven counties surrounding the Kings Bay base site. This definition is derived from a Florida Department of Commerce report that noted that these seven counties, as well as 17 others, are served by the City of Jacksonville.

... The largest urban center of southeast Georgia and northeast Florida is the City of Jacksonville, Florida. With an estimated 1975 population of 578,347, Jacksonville exerts considerable social and economic influence north of the Florida state line. The Jacksonville Economic Area, as defined by the Department of Commerce ... includes 17 Florida counties and seven Georgia counties (Brantley, Camden, Charlton, Glynn, McIntosh, Pierce, and Ware Counties).

Most of the Georgia counties depend on the Jacksonville newspapers on a daily basis, although there are several smaller newspapers throughout the region. ... Jacksonville's retail trade area ... is regularly patronized by residents of southeast Georgia.

Camden County, the geographic center of the Kings Bay Region, is included in both Jacksonville's retail trade area and its area of dominant influence. ... [Department of the Navy 1977a: 3-159 - 3-160]

The underlying assumption is that Jacksonville is the central place for the seven counties. This assumption disregards the north-south dichotomy in Camden County; residents in the north end of the county are more likely to orient themselves to Brunswick than to Jacksonville.

A more suitable regional definition for the purposes of this study is one based on a common economic base and shared geographical, historical, and social characteristics. This region, termed the Barrier Island Region, includes the coastal area from Fernandina, Florida, to Charleston, South Carolina. The most striking characteristic of the
region is the chain of barrier islands that separate the mainland from the Atlantic Ocean and allow the development of an extensive salt marsh estuary.

The existence of the barrier islands precludes the development of beaches on the mainland, limiting the resort potential of these areas. The barrier islands themselves have historically been controlled by a few large landholders since the late 1700s. Throughout the 1800-1900s, entire islands were owned by wealthy families. Cumberland Island, the barrier island situated off the Camden County mainland, was owned by Nathaniel Greene in the 1800s and then bought by the industrialist Andrew Carnegie in 1881.

In the 20th century, the barrier islands that had been controlled by single-family estates were gradually transferred to state or federal control. There were exceptions to this pattern, for example, St. Simons Island, where the large estates were dismantled during Reconstruction. The island was divided into smaller holdings which were more easily acquired by post-World War II developers.

State and federal governments were determined that the undeveloped islands should remain undeveloped. In the 1960s and 1970s, as large estate owners came under pressure to open up the islands for development, the state and federal governments moved quickly to acquire them. Work at the Georgia State Marine Institute on Sapelo Island beginning in the early 1960s revealed the importance of the salt marsh to the environment and prompted further acquisition and control of the barrier islands by state and federal agencies.
Thus a special relationship between mainland residents and the owners of the barrier islands has always existed. The patronal system of wealthy planters in the 1700-1800s was followed by that of the industrial magnates of the 1900s. This has most recently been replaced by a similar patronal system of state and federal agencies. The mainland areas have, for the most part, remained poor and rural. Fernandina, Brunswick, Savannah, and Charleston are the only significant cities and these are associated with the developed resort islands of Amelia, St. Simons, Jekyll, and Hilton Head.

Diagnostic, too, of the Barrier Island Region is a common economic base. Paper mills and the pulpwood industry dominate the regional economy. In the mainland towns of Fernandina, St. Marys, Brunswick, Savannah, and Charleston, there are one or more paper mills situated on adjacent rivers. The pulpwood and paper mill operations provide the most industrial employment in the barrier island region. For instance, in Camden County Gilman Paper Company employs 70 percent of the county work force (CAPDC 1978: 6).

Pulp and paper companies also own most of the land in the region. As mentioned previously, the low-lying coastal region is marked by an extensive salt marsh system and is cross-cut by rivers, inlets, and estuaries that severely limit development. The sandy flatwoods, however, are well suited for pulp and production. In Camden County, one-half of the total acreage in the county is forestland, and 90% of this forestland is controlled by five major paper companies: Brunswick Pulp and Paper; I.T.T. Rayonnier; Union Camp Corporation; Gilman Paper Company; and St. Regis Paper Company (Kings Bay Steering Committee 1979).
The second largest source of employment in the region is the fishing industry. The primary fisheries are shrimp, crab, and finfish. Fishing firms tend to be family-owned businesses, particularly in the smaller towns. Fishing is pursued by both blacks and whites, and it is the preferred employment by those who like the independence of self-employment. Fishing entails considerable risk, however, as one's livelihood depends upon the yield of catch as well as the current market value of the catch. Both of these factors cannot be predicted and can fluctuate greatly.

For commercial fishermen in the Barrier Island Region, fishing is synonymous with shrimping. The increasing value of shrimp on the market since the 1920s has induced most commercial fishermen to pursue shrimp exclusively. This has resulted in a lack of diversity for coastal fishermen. Present costs of shrimping, fuel, insurance, equipment, as well as dwindling yields threaten the nondiversified fishermen. Attempts to convince fishermen of the necessity to diversify have been made (Carley and Frisbie 1968) but have not substantially altered the commercial fishery.

The fishing industry was established in the Barrier Island Region long before the pulp and paper industry. The first recorded commercial catch for Camden County is 1923 (Department of Commerce 1923). The pulp and paper industry threatens the continued importance of commercial fishing, however, by attracting much of the available labor and disrupting the estuarine resource base. The pulp and paper industry has expanded "... at the expense of the fishing industry, which has
suffered greatly from pollution caused by the paper mills" (Johnson et al. 1974: 10).

The conflict has eased somewhat since the early 1970s when the coastal paper mills were forced to comply with Environmental Protection Agency regulations concerning water pollution and when the Georgia Department of Natural Resources closed the estuarine sounds to commercial fishing. The relationship of pulp mill operations to the commercial fishery in Camden County and its influence on naval base development is examined in Chapter III.

The final basis for distinguishing the Barrier Island Region is historical. This was the "debatable land" contested by Spain and Britain throughout the late 1600s and early 1700s (Bolton and Ross 1968). The strategic significance of the region was evident from the beginning of Spanish and British colonization and continues to the present. The area figured prominently in military campaigns in the American Revolution and the Civil War.

Today the region is the site of U.S. Navy installations at Charleston, St. Marys, and Jacksonville, and a U.S. Army base near Savannah. During the past several decades, other military installations were established in the region including a World War II pilot training base at Harris Neck in McIntosh County, Georgia; a naval air station at Brunswick in the 1960s; and an Army dock facility at Kings Bay during the 1950s.
Social Characteristics of the Community

As indicated in earlier sections, the social characteristics of a community influence its response to development (Bates 1978; Havighurst and Morgan 1963; Little 1977; Nellis 1974). Thus identifying social characteristics of a community is a prerequisite for predicting social impacts.

One means of identifying social characteristics of a community is interviewing residents themselves (Finsterbusch 1980: 79). A survey administered to a representative sample of residents provides adequate and reliable baseline data from which to measure social impacts (Christensen 1976).

Social characteristics of Camden County residents are summarized here through an analysis of the sample survey of households conducted in 1979 during the initial stages of base development. The influence of these social characteristics on the community's response to base development is analyzed in a later section.

A 3 percent systematic sample of Camden County households was drawn from the property owners listed in the tax rolls. The resulting sample is highly representative of the total county population. Table 4 compares some of the social characteristics of the sample with those recorded for the county in the 1970 census. The 1970 census is used for comparison rather than the 1980 census because the latter included a significant proportion of the incoming naval population.

The survey sample encompassed 98 households of which 72 were married couples. The remaining 26 heads of households were unmarried. The sample population involved a total of 170 adult homeowners.
Table 4. Comparison of survey sample to total population

<table>
<thead>
<tr>
<th></th>
<th>Sample</th>
<th>Camden County Population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Marys division</td>
<td>38%</td>
<td>39%</td>
</tr>
<tr>
<td>Kingsland division</td>
<td>24%</td>
<td>28%</td>
</tr>
<tr>
<td>Woodbine division</td>
<td>38%</td>
<td>34%</td>
</tr>
<tr>
<td><strong>State of Birth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>76%</td>
<td>72%</td>
</tr>
<tr>
<td>Other southern state</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>States outside South</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>Abroad, at sea</td>
<td>1%</td>
<td>.4%</td>
</tr>
<tr>
<td>Not reported</td>
<td>---</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>69%</td>
<td>68%</td>
</tr>
<tr>
<td>Black</td>
<td>31%</td>
<td>32%</td>
</tr>
<tr>
<td><strong>Persons per Household</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-29 years</td>
<td>7%</td>
<td>23%</td>
</tr>
<tr>
<td>30-49 years</td>
<td>37%</td>
<td>42%</td>
</tr>
<tr>
<td>50+ years</td>
<td>56%</td>
<td>35%</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>35%</td>
<td>48%</td>
</tr>
<tr>
<td>Female</td>
<td>65%</td>
<td>52%</td>
</tr>
</tbody>
</table>

Source: Camden County population data from Department of Commerce 1971
The sample accords closely with the county population in terms of the geographic distribution of households, the number of persons per household, racial composition, and the state of birth of household members. The individuals interviewed tended to be somewhat older than the mean age reported for the population simply because adult members of the household were interviewed almost exclusively.

A higher proportion of females to males is represented in the survey than that recorded for the population in the census. This discrepancy can be largely accounted for by the fact that a larger number of housewives than working males were available for interviews.

Other social characteristics of the sample provide insight into the community. The average length of residence in the county indicates the settled nature of the population and lack of transience. Forty-one percent of the residents were born and raised in the county, 39 percent have lived in the county for over 20 years, and only 3 percent have lived in the county for less than three years.

Residents' reasons for moving to Camden County included the following. Nineteen percent moved to the county specifically to work for the paper company, 13 percent for a job in general. Seven percent of the residents moved to the county with their parents, while 14 percent had relatives in the county or married someone from the county.

Of the working adults interviewed, 35 percent work at Gilman Paper Company, 4 percent work at Union Carbide, 51 percent work elsewhere in the county, and 14 percent work outside of the county. Of those who work, 19 percent are classified as professionals such as
teachers, doctors, lawyers, or government employees. Forty-seven percent are skilled workers such as industrial workers at the paper company or pesticide plant, 8 percent are unskilled workers such as domestics. Twenty-one percent are employed in commerce as self-employed businessmen or salespersons, and 5 percent are employed in other ventures such as fishing, lumbering, or farming.

The church appears to be the most important social institution in the county. The institutional inventory reveals that the majority of churches in the county are Protestant. Of these, Baptist and Methodist denominations predominate. There is only one Catholic church in the county, located in St. Marys. There are no Jewish synagogues or temples in the county.

Analysis of the inventory from 1964 to 1979 indicates a steady increase in the number of churches in the county relative to the increase in population. Table 5 illustrates the church affiliation and church location of the households in the survey sample. Baptists (44 percent) and Methodists (33 percent) predominate. Only 7 percent of the residents interviewed stated that they did not belong to a church.

In planning for the initial influx of naval personnel, an important objective of church officials and community members was the construction of 40 new churches to accommodate the naval personnel. Camden County residents were particularly encouraged when naval officers and their families began to attend local church services.

While 58 percent of the residents interviewed disclaim any affiliation with community organizations, the remaining 42 percent are actively involved in one or more organizations. Ten percent of these
Table 5. Religious affiliation of survey sample

<table>
<thead>
<tr>
<th>Church Denomination</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baptist</td>
<td>44%</td>
</tr>
<tr>
<td>Methodist</td>
<td>33%</td>
</tr>
<tr>
<td>Episcopal</td>
<td>5%</td>
</tr>
<tr>
<td>Catholic</td>
<td>2%</td>
</tr>
<tr>
<td>Mormon</td>
<td>1%</td>
</tr>
<tr>
<td>Church of God</td>
<td>6%</td>
</tr>
<tr>
<td>Jehovah Witness</td>
<td>2%</td>
</tr>
<tr>
<td>No church</td>
<td>7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Church Location</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Marys</td>
<td>32%</td>
</tr>
<tr>
<td>Kingsland</td>
<td>18%</td>
</tr>
<tr>
<td>Woodbine</td>
<td>12%</td>
</tr>
<tr>
<td>Rural</td>
<td>28%</td>
</tr>
<tr>
<td>Florida</td>
<td>2%</td>
</tr>
<tr>
<td>No church</td>
<td>7%</td>
</tr>
</tbody>
</table>
residents are involved in church-related organizations, 14 percent in political or community service organizations, 2 percent in social organizations, and 15 percent in two or more of these organizations.

Table 6 illustrates the military background of the sample households. Eighty-two percent of the residents had themselves served or had relatives who had served in the military. This accords with the 1970 census finding that 43 percent of civilian men 16 years and over are veterans. The majority of the residents with military experience had served in the Army or Air Force. Only 9 percent served in the Navy or the Coast Guard.

One of the most striking social characteristics of the Camden County community is the orientation to marriage and family. Extensive kinship ties among the residents impart a highly personalistic atmosphere to the community.

Marriage is a major ritual in the life of community residents. Evidence of the social significance of marriage is the manner in which engagement and wedding announcements are presented in the two local newspapers. Prior to and during 1979, engagement announcements warranted a half-page article and photograph while wedding announcements entailed full-page coverage with photograph and wedding details. By the summer of 1980, however, the newspaper coverage of engagement and wedding announcements were each reduced by half. Figure 14, taken in the summer of 1979, depicts a large wedding party posing for photographs at Orange Hall in St. Marys.

Familial ties, common lifestyle, and the attitudes associated with this lifestyle foster a sense of communality among residents. The
Table 6. Military background of survey sample

<table>
<thead>
<tr>
<th>Number of Family Members with Military Service</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>One person</td>
<td>38%</td>
</tr>
<tr>
<td>Two persons</td>
<td>22%</td>
</tr>
<tr>
<td>Three or more persons</td>
<td>20%</td>
</tr>
<tr>
<td>No relations with military service</td>
<td>18%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relationship</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate family</td>
<td>67%</td>
</tr>
<tr>
<td>Collateral relatives</td>
<td>5%</td>
</tr>
<tr>
<td>Immediate family and collateral relatives</td>
<td>9%</td>
</tr>
<tr>
<td>No relations with military service</td>
<td>18%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Branch</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Army/Air Force</td>
<td>49%</td>
</tr>
<tr>
<td>Navy/Coast Guard</td>
<td>9%</td>
</tr>
<tr>
<td>Marines</td>
<td>2%</td>
</tr>
<tr>
<td>Army, Air Force/Marines</td>
<td>3%</td>
</tr>
<tr>
<td>Navy, Coast Guard/Army, Air Force</td>
<td>3%</td>
</tr>
<tr>
<td>Army, Air Force/Navy, Coast Guard/Marines</td>
<td>1%</td>
</tr>
<tr>
<td>Don't know/No relations with military service</td>
<td>20%</td>
</tr>
</tbody>
</table>
Figure 14. Wedding party on steps of Orange Hall in St. Marys, 1979
Camden County community of the early 1900s described by one woman is appropriate for the community of 1979.

... What made it a community was all of the neighbors, the various types of families. And they seemed to band together and they worked for one goal, all of them seemed to work for one goal. And back then, a person's word was their bond. They were truthful and they dealt honest in all the dealings with each other. ... We can attribute a good community to the kind of people we got in it, as to whether or not it is a good community and if we got good people. And I think we did have back then, the majority of them were good Christians, honest, trustworthy people. [Their one goal was] to make life worthwhile. And they looked into the future as a better way of life and they really weren't satisfied with just stoppin'. They wanted to continue on, and they really had a goal to go forward in life and make life a better life and more pleasant in which to live and bring up their children.

It is this sense of community that binds residents to Camden County. Although young residents frequently migrate out of the county to find work, many return to raise a family or retire.

Economic Characteristics of the Community

The present economic base of Camden County resembles that of other coastal counties in the Barrier Island Region. The pulp and paper industry is the major economic activity with Gilman Paper Company employing 70 percent of the total labor force in the county (CAPDC 1978: 6). A Union Carbide pesticide plant is a relatively recent but rapidly growing industry. Commercial fishing constitutes another economic activity that has operated since the early 1900s. Tourism, largely stimulated by Cumberland Island National Seashore, allows some St. Marys residents to derive a small income from hotels and restaurants. Small business and small farming play an important role in the local economy, although somewhat overshadowed by local industry.
Examination of the economic development of Camden County since 1900 reveals a series of boom-bust cycles based on the exploitation of local resources. Table 6 illustrates the change in population from 1900 to present. The decline in population between 1900 and 1940 reflects the instability of the economy prior to the establishment of the paper company.

Lumber was one of the first local resources exploited on a large scale. Sawmills were located throughout the county, and St. Marys was a major port for shipping cypress, cedar, and pine until the lumber was depleted. One resident recalled his job of loading large quantities of lumber aboard schooners from 1912 to 1917, and realizing that the local lumber resources would soon disappear.

I worked in that... board shed [near the dock in St. Marys], me and my brother-in-law. We had 4, 5, 6 grades of boards in here... I seen a million feet of boards in that [shed]... We'd get a vessel, a three-mast vessel, and load them boards. Me and him used to run a race to see which one could load them boards. We'd have a crew, you know, and so we had quite a run. And [Brandon Lumber Company] run till 1917... and then the logs give out.

I used to talk with an old colored fellow, he fired for Brandon and Davis... they had three big boilers... I said, "Jonas, when these logs give out, I wonder what we all are going to do then." He said, "Man, they'll never give out," that's what he said. But they did.

Directly [the lumber company] sold the [saw] mill... and moved the mill above Kingsland and they sawed that timber... and so after that played out... they went to [a town] just this side of Savannah.

Canning plants were established to can small shrimp and vegetables. In 1912 there were three canneries in St. Marys (Reddick et al. 1976: 157). The canneries closed when the small shrimp stocks played out.
The first paper mill in the county was established along the North River in St. Marys by Burdette Loomis of Connecticut. Loomis was experimenting with the production of paper from marsh grass. The plant closed, however, in 1918.

In 1917, the Southern Fertilizer and Chemical Plant was established in St. Marys on the North River for processing menhaden for oil and scrap. The oil and scrap were exported by rail for the manufacture of soap and fertilizer. The plant was a boon to the local economy, employing some 300 people in the processing plant and on the fishing vessels until it closed in 1937.

Small-scale economic activities

During the period 1900-1940, Camden County residents experienced fluctuations in employment and income as a result of local and national economic instability. Residents adapted by maintaining subsistence activities and working at a variety of jobs. In 1900 St. Marys experienced a recession. "... And again times were hard. The people fished and shrimped and gathered oysters or did whatever they could to earn a living" (Reddick et al. 1976: 157).

One elderly resident recalled a number of odd jobs he did as a youngster. His first job at the age of 10 was sweeping out a doctor's office.

And I can remember him [the doctor] getting up on Saturday when I wasn't in school. You know in them days they wore the hat, and had a cane. Most professional men had a cane, a walking stick... He'd light his cigar and he'd come down the steps and stop in the office. He said, "____, sweep my office up." And you know what he give me? Five
cents. I'd sweep his office out, I don't think it got swept all of the week. Just on Saturday morning.

And a year or two later, the same man did other jobs.

... Well, Saturday morning, that's when I got up [to be] a good size boy, I would go to Mrs. _____ and ask on Saturday ... "Do you want your yard raked up?" She'd say, "Yes, yes, you can rake it all up and carry it to the back and burn it." ... I'd do all of that and you know how much she paid me? Fifteen cents ... It took all evening. That was a lot of money then, you know. Fifteen cents. Grown men made a dollar a day then, some of them 50 cents, some of them 75 cents for a whole day's work. Fifteen cents. And I done that and I hoed people's gardens and then I got to working for 10 cents an hour. And people would get me to hoe out their beans and work in their garden and rake their yards and whitewash fences and all that kind of stuff. ... And then the mayor would come to me and you know the weeds would grow up in the streets. Then it was all grass you know, the cows on it, but from some of the weeds used to grow up the sticky bush and bear. Some of 'em were white flowers and yellow flowers and they'd grow up along the fence to the north. And he'd [the mayor] give me 50 cents to cut all them weeds down from one end of town to the other. Now you take like Bryant Street and Weed Street, you'd start there to ... Norris Street, start ... [at Norris Street] and go all the way to the cemetery. Chop all the weeds down and they'd give me 50 cents. And Osborne Street and all them weeds, chop 'em down ... 50 cents.

And then, another trick we used to do [to make money], people all around town here had hogs. And no hogs could come in the city limits, 'cause it'd ruin up the grass and all. Trees, acorns would be all over streets, you know, them hogs would come in and we'd catch 'em and put 'em in the pound. We'd get 25 cents a piece for 'em and sometimes we'd have the pound full. And them poor people out there, you know, they could hardly make a living and have to get up on Monday—sometimes go borrow the money to get their hogs out of the pound. ... I wonder if the Lord will forgive me.

At the age of 14, the resident took a job in a local sawmill.

... When I got about 14 years old, I took a man's place on a sawmill for 50 cents a day. We got about 14 or 15 dollars a month and you had to work all day long on that mill. They didn't have no eight hours. And you got 50
cents. I mean, 50 cents! But that money would buy a lot of stuff. Of course, I didn't realize it then but then when I'd get my pay I thought I was rich, in them days. And man, you'd go to the store and you could buy lard and sugar and all that for about 4 cents a pound. Buy a quarter's worth of sugar, man . . . sometimes it wasn't a granulated sugar, it was what they called sea sugar. . . . It had a little syrupy taste. But it used to have big lumps in it and I can remember it used to come in barrels. And the storekeeper, he bent down and get them lumps, you know, and put 'em in the paper bag. But man, a quarter's worth would do you.

Plantations remained important to the local economy well into the 20th century. Rice was particularly suited to the marshy county and brought a good price through the early 1900s. A farm demonstrator, W. R. Smith, reported on rice production in a letter to the local newspaper in 1918. Of the large rice plantations, Owens Ferry owned by J. O. Dyal yielded 4,500 bushels of rice from 125 planted acres of the 1,100 total acreage. Woodbine plantation owned by J. K. Bedell had 900 rice acres; Refuge and Hopewell plantations yielded 1,000 bushels of rice. Halifax plantation owned by Brandon and Davis produced 700 bushels of rice from 21 of its 50 acres. Old rice fields along the Satilla River totaled over 8,000 acres. Prices paid for rice in 1917 were satisfactory and even the straw sold for up to $20 per ton (Reddick et al. 1976: 59).

Many blacks continued to work on the plantations as wage laborers after the Civil War (Reddick et al. 1976: 68). One elderly black resident recalled working on a rice plantation as a little girl with her mother and father, a former slave.

I lived at home. We had to come there [to the plantation] in the morning on the oxcart, before daylight, to go to work. We had to come from home, from Tarboro, to Clinch's Plantation to work. . . . Oh, Lord, you like rice? They planted rice along then and they had a task. Twenty-one
comforts was a task, long and short, and worked it and had it cut off in tasks. Daddy took his task, Momma took hers, and I took mine. For 25 cents [a day]. . . . Cut grass, you see the row was about this wide [gesturing]. This here is the rice and this was the rice. Then you had to hoe that alley . . . . You had to hoe that alley clean, 21 comforts, long and short, 21 comforts. You had to hoe that space. . . . Well, I worked there longer. I had to work or get a whipping, and I didn't want to get a whipping. And I was always an obedient child. Whether my Momma [or] my Daddy said to go . . . I had to go . . . . I went to school. I'm glad you asked me. I went to school on Monday. Tuesday I had to go to the Plantation. Wednesday I went to school. Thursday I had to go to the Plantation. . . . Friday we had washing. . . . The weekend we had to get in the field. . . . Hard, hard work.

The term "comforts" probably refers to a series of rice rows or other areal measurement comprising a "task," the daily work unit. The task system was originally developed on antebellum plantations (Gibbs et al. 1980).

Land ownership became important to blacks seeking economic mobility. Blacks bought land quickly during the Reconstruction period when plantation owners sold extensive tracts of land for as little as 50 cents an acre (Reddick et al. 1976: 68). One former slave, Pompey Floyd, purchased the deteriorating main house and 100 acres of the Belleview Plantation from the white owner, Samuel Floyd, on May 10, 1877, for $100. The plantation was operated by Pompey until his death. His wife maintained the plantation until October 20, 1927, when she sold it to developer Howard Coffin for $1,000. Coffin used the plantation as a hunting preserve (Young 1979: 11).

Life for black farmers entailed working their own land for subsistence and hiring out for wage work. An elderly black woman recalled her father planting his own rice at home and then going to work on the plantation.
Other blacks worked on turpentine farms. One elderly black man began working on a turpentine farm in middle Georgia when he was nine years old. He followed his aunt who was recruited from South Carolina to work on the turpentine farm. As with other turpentiners, he moved to other turpentine locales and ended up in Camden County, where he has lived for the last fifty years.

I came to Camden County and did the same thing [turpentining]. After a while I switched turpentining and went to the mill, after the mill moved to St. Marys. I quit there [after six months] and went back to turpentines. I chipped boxes for my living . . . you work turpentine by the barrel. . . . I lived on the turpentine farm. They furnished a house where you could stay in. . . . You had a privilege to clean up all the land you want. . . . I have worked for 50 cents a thousand, chip boxes for 50 cents a thousand. . . . That was in [19]32. . . . I cut cross-ties for 15 cents a piece. . . . Part of 1916 and for winter I would cut ties.

One elderly white man spoke of the turpentine still located at Scotchville, a settlement on State Road 40, and the black employees.

Scotchville, they used to call it Scotchville . . . that used to be a turpentine still there and a whole lot of houses were on the road. That's how the railroad come to go by there [for there was timber there, too]. . . . Most of the people that worked at that turpentine still (lived there). . . . They'd get these colored people, see. Well, they didn't pay 'em much wages, these colored people. But you know they had to do something. Well, in them days they'd cut cross-tie for the railroad, and they run turpentine and they fished and farmed. That was the big industry in St. Marys from 1910 on up to 1917.

The paper company

Certainly the greatest boon to Camden County's economy and population was the establishment of Gilman Paper Company along the North River at the former site of the Southern Fertilizer and Chemical Plant in St. Marys in 1939 (Figure 15). Following a decline in population
Figure 15. Gilman Paper Company pulp mill and main offices
from 1920 through 1930, Camden County experienced a 51 percent increase in its population from 1940 through 1950. From 1940 through 1960, a 69 percent increase in the county's population has taken place (Table 3). This increase in population is due almost solely to the expansion and operation of the Gilman Paper Company.

The paper company has had a profound influence on the Camden County community, particularly St. Marys. The social impact of base development cannot be effectively analyzed without considering the role of the paper company in the economic, political, and social life of the community.

Gilman Paper Company is a family-owned company founded in 1884 by Issac Gilman (Gilman Paper Company 1978). The original family mill was established in Gilman, Vermont. Isaac Gilman and his son Charles Gilman, Sr., visited St. Marys in 1939 to consider it as a location for another Gilman plant in a move for southward expansion (Camden County Tribune 1955). The move to St. Marys was not only a sign of company growth but part of a general trend by paper mills in the northeast to move south to take advantage of plentiful pines and cheap labor (Schuck and Wellford 1972). Other factors to be considered were accessibility of resources and transportation of resources and products. For these reasons the Gilmans purchased the St. Marys Railroad along with the 143 acre plant site (Camden County Tribune 1955).

The St. Marys plant, chartered under the name of St. Marys Kraft Corporation, was under construction by 1940. In August 1941, the pulp-making machine was operating and a few months later a kraft paper bag machine operating (Camden County Tribune 1955). In 1949, a pulp drying
machine was installed, and in 1953 a bleach plant was installed for the manufacture of bleached pulp used in the production of white paper products. In 1955, a second paper machine was installed to produce bleached grades of paper and board used in making food and milk cartons, paper cups, and other white paper products (Camden County Tribune 1955). A high-speed paper machine was installed in 1960 to produce more unbleached paper (Reddick et al. 1976: 163). The Kraft Bag Plant, a subsidiary of the Gilman Paper Company located two miles west of the mill, was established in 1950 to manufacture multi-walled paper bags with mill-supplied paper (Camden County Tribune 1955).

Gilman Paper Company sold its Vermont mill in 1967 (Schuck and Wellford 1972: 57), but still operates the mill and bag plant in St. Marys as well as a bag plant near St. Louis (Gilman Paper Company 1978: 13). During its first year of operation, 1941, the mill employed 125 men and produced 125 tons of pulp and paper a day. By 1955, 1,100 men and women were employed in the mill and bag plant (Camden County Tribune 1955).

The Gilman mill operates on a 24-hour basis and has never experienced a shut-down. Even during World War II, when other businesses were suffering, Gilman continued to operate. One resident explained the success of the mill in this way: "They bought at pre-war prices and sold at post-war prices."

The Gilman plant offered employment for local residents, and also brought in outsiders to the county who were looking for work. Many of the new people to enter the county following the mill were mill workers from other paper mill areas, such as Louisiana.
One resident stated that "a lot more people" came in with the paper mill and that area has "kept a growing" since then.

But they brought in a lot of people. Now [my daughter's husband] came from Louisiana, but he'd worked in a paper mill in Louisiana. A lot of these people that first come here, was come from Louisiana, from the paper mills there. . . . Well, they didn't come in here when they was running the . . . pulp mill. They cone in here when they was running the paper mill. And then they built a bag factory.

One couple from Louisiana that moved to Camden County in the 1950s to work with the paper company compared their experiences in St. Marys as newcomers to those of naval personnel in 1979. Old-time residents referred to the new mill workers as "poor white trash." Housing was inadequate as there was no rental housing available and very little in the way of new housing. Figure 16 depicts one of the first mill housing developments in St. Marys. Built in 1954, these houses were located near the mill.

Some of the incoming millworkers quickly took steps to become incorporated into St. Marys. The Louisiana couple felt that they were accepted by the original residents because they became involved in the Methodist church and the local PTA.

The paper company presently employs 2,000 persons in its mill and bag plant and consumes 700,000 cords of pulpwood a year to produce over 500,000 tons of bleached and unbleached kraft papers and paperboard per year. The company owns 250 acres of land in Camden County and an additional 250,000 acres of timberland in Florida and Georgia. The company generates in excess of $150 million in annual sales (Gilman Paper Company 1978: 9). The average earnings of the 1,375 hourly
Figure 16. New housing in St. Marys built to accommodate workers for Gilman Paper Company, 1954

Courtesy of Georgia Department of Archives and History
employees is $6.75 per hour and $19,500 per year for the 321 salaried employees (Kings Bay Steering Committee 1979: 30).

Of the adults employed full-time interviewed in 1979, 34 percent worked for Gilman Paper Company. In 4 percent of the households surveyed, both husband and wife worked for the paper company. The majority of those working for the paper company resided in St. Marys. Nineteen percent of the residents interviewed had moved to Camden County specifically for a job with the paper company.

The pervasive influence of Gilman Paper Company in the economic and social life of Camden County has given St. Marys a reputation as a company town, i.e., a "... community which is owned and controlled by a particular company" (Allen 1966: 6).

The relationship of Gilman Paper Company to St. Marys was first examined in an environmental inquiry into pulp mill-related water pollution along the Georgia coast in 1970. The resulting document, The Water Lords (Fallows 1971) depicts St. Marys as a pulp mill town under the social, economic, and political dominion of a single company.

In 1971, a political controversy occurred in St. Marys that brought the town to national attention. Harper's Magazine (Shuck and Wellford 1972), Newsweek (1972), and the CBS television program "60 Minutes" each depicted St. Marys as a company town whose residents were wholly dependent on the paper company for employment and who comply with the wishes of the company at whatever cost to maintain their jobs. The town government was portrayed as controlled by the company through its employees who were elected officials. The controversy resulted in
criminal indictments and civil suits against mill officials (Keim 1982).

Just as the court cases were disappearing from public view (Merrefield 1975; Phillips 1978), the company town controversy was revived in the St. Marys city elections of 1978. The incumbent mayor, a mill employee who had held office for 10 years, was characterized by opponents as representing only paper company interests (Respess 1978). As some residents stated, "We had a mayor who was sitting in city hall and being paid for full-time work at the mill." The incumbent was defeated by an independent shrimper (Southeast Georgian 1978).

That controversy and national exposure of St. Marys as a company town has affected county residents was evident in the 1979 interviews. One of the questions intended to gauge community expectations of the effect of base development was, "What changes do you think will happen to Gilman Paper Company over the next few years with naval base development?" Many residents misunderstood the intent of the question and reacted defensively to the mention of the company's name. Some residents were guarded in their answers. One woman turned to her husband and asked, "You're not going to get in trouble for this, are you?" One man declined to comment, stating, "I'm afraid to say." Other residents automatically began to defend the company with comments such as, "A lot of people would be without work if it weren't for Gilman. Gilman has been good to this town."

The perception of the paper company as a benefactor is not unfounded. A company publication cites a number of charitable activities.
"Through the Gilman Foundation, funds have been provided to help build a hospital, to restore historic buildings in the neighborhood, to support education and the performing arts, and to construct recreational facilities" (Gilman Paper Company 1978: 32). Residents also praised the company's annual childrens' Christmas party at the Pavilion on the waterfront of St. Marys and the annual Halloween party at the local high school.

A recent event sponsored by the company is the July 4th Firecracker, a 6.5 mile footrace that opens the July 4th festivities in St. Marys. The race was initiated in 1978 and attracts a large number of runners from outside the county. Gilman provides lumber and workers to build the judges' stand and the start/finish line. For a $4.00 entry fee, each runner who finishes the race receives a T-shirt printed with "July 4th Firecracker" on the front and the Gilman logo on the back.

The paper company is not without local detractors, however. Residents living on the north end of the county, away from the influence of the mill, tended to be more critical of Gilman Paper Company and St. Marys. This was particularly true of self-employed residents or those employed outside the county. In response to the questions, "What changes do you think will occur in St. Marys within the next year due to base development?" some residents commented: "I don't know and I don't care. It's a mess down there," and "St Marys is a corrupt city. I don't go down that way much." In response to the Gilman change question, several residents commented, "They'll lose some of their political power."
The image of St. Marys as a company town is changing as base development unfolds. In 1979, the newly elected mayor and city council attempted to collect back taxes from the paper company. When Gilman refused to pay the sum requested, the city council threatened to sue the company. A compromise sum was finally paid by the company. Gilman had paid little or no city tax since the plant was established (Respess 1979). This unprecedented event signals the independence of the city council from paper company interests.

Although Gilman officials foresee little or no impact on commercial operations stemming from base development, it is inevitable that the company will lose some of its influence on the community. How much is unclear. It is certain, however, that the future of the Camden County community will be largely shaped by the relationship that ultimately develops among the community, the naval base, and Gilman Paper Company.

Other Industry

In 1962, the Thiokol Chemical Corporation secured land from Brunswick Pulp and Paper Company situated on Floyd's Creek at Horse Pen Bluff. The plant's property was formerly the site of the Floyd Plantation. Thiokol developed its plant for the construction of solid propellant rocket motors for the United States space program. The plant employed 400 persons in the rocket propellant program, of which 60 were Camden County residents (Davis 1971). Following a shift by NASA to liquid fuel (Davis 1971) and the decline of the space program in general, the 400 employees left Thiokol.
Thiokol diversified, securing a variety of commercial and government contracts for research and development. The plant soon employed 500 persons, most of whom were from Camden County and the surrounding area.

... They ground silicone for a private firm, even ground powder for Revlon's women's leg makeup; they began to develop other commercial products, a nonwood door, preservatives for metals; they expanded into experiments on raising shrimp and fish in fresh water. ... In the interim, contracts were landed with the Army for the manufacture of the CS irritant, riot control gases, and also the trip flares and other pyrotechnic flares for the army. [Davis 1971: 2]

One of these Army projects resulted in a tragic accident in February 1971. A magnesium flare assembly building exploded, killing 27 persons and injuring about 30 others. The explosion was one of the worst tragedies in Camden County history, particularly for the black community. Twenty-one of the dead and all of the injured were black (Davis 1971).

In 1967, Union Carbide contracted with Thiokol to develop a new agricultural pesticide, TEMIK. Union Carbide purchased the entire Thiokol facility in 1976, converting it to Union Carbide operations. The new plant is known as the Woodbine plant and is the primary manufacturing plant for Union Carbide's Agricultural Products Division. The plant covers "... 7,500 acres of land, marshes, waterways, three islands, historic sites, and endless plant and animal life" (Cromer and Holt 1980: 7). Very little of the total acreage is developed, however, and Union Carbide allows employees to fish off the sea walls of Horse Pen Bluff and employee hunt clubs hunt on the undeveloped acreage.

The Woodbine plant is the second largest employer in the county, employing approximately 400 people (Cromer and Holt 1980: 7). The chief
executives commute from their homes on St. Simons Island in Glynn County, but the majority of the plant's employees reside in Camden County. Over one-half of the plant employees, about 201 persons, are hourly-wage employees who average $4.89 per hour (Kings Bay Steering Committee 1979: 31). Of the county residents interviewed in 1979, 4 percent worked for Union Carbide.

Political Characteristics of the Community

Camden County is governed by a county commission consisting of a five-member board of elected officials. Four board members are elected from each of the four districts: St. Marys, Kingsland, Woodbine, and the area north of the Satilla River. Commissioners are required to live in the district that they represent. One commissioner is elected from the county at large, and this commissioner may live anywhere in the county. The commissioners select a chairman from among themselves.

The position of county commissioner is not a full-time, salaried position. In 1979, the commissioners were either self-employed or employed in local industry. The commission administers such county agencies as the Health Department, the Sheriff's Department, the Revenue Department, the Tax Commission, the Probate Court, and the Roads and Bridges Department. County commissioners receive $25.00 a day for attending county commission meetings and related meetings, and are reimbursed $0.18 per mile for mileage accrued during their commission work. A commissioner can be paid a maximum of $400.00 per month, although most commissioners have never made that amount.
One commissioner stated that he has made between $75.00-$300.00 per month. Another commissioner said that he made $3,200 in 1979 from county commission work, but that he lost twice that amount in income due to the amount of time that county commission work took from his regular job.

In 1979, the position of county administrator was established. This full-time, salaried position was created as a means of alleviating the county commission of the increasing demands associated with naval base development. The present county administrator is a planner with a B.A. degree in urban design and ten years experience as a planner, engineer, and building inspector for local governments. He formerly worked with the Coastal Area Planning Development Commission (CAPDC) in Brunswick and worked with planners in Camden County.

The three incorporated towns of St. Marys, Kingsland, and Woodbine are each governed by a city council and mayor who are elected for two-year terms. Like the county commissioners, the positions of mayor and city councilman are not full-time, salaried positions. The mayor of Woodbine is paid $75.00 per month, the mayor of Kingsland receives $50.00 per month, and the mayor in St. Marys receives $100.00 per month. The mayors and city council members are either self-employed or employed elsewhere. The mayor and city council administer the city departments and agencies within the city limits.

In 1978, the St. Marys mayor and city council agreed to hire a city manager to alleviate the burden of the city business generated by naval base development. This position was filled by a planner with an
M.A. in urban geography who had formerly worked for the consulting firm that conducted the 1977 Environmental Impact assessment.

Woodbine hired a full-time, salaried city manager in 1980 to aid the mayor and city council in impact planning. The new city manager is a planner who formerly worked with the Coastal Area Planning and Development Commission. Kingsland also hired a full-time, salaried city engineer in 1980. The city engineer formerly worked with a contracting agency for the City of Kingsland.

Like Kitsap County, Washington, undergoing Trident base development (Gilmore 1976), Camden County has formed the Kings Bay Steering Committee to handle the impact of naval base development. The Committee was initiated in 1977 by the local Coastal Area Planning and Development Commission planning office. The Committee initially consisted of the county commissioners, the three mayors, and some local citizens. At the request of the Navy, naval representatives were admitted to the steering committee in 1979.

The most striking accomplishment of the Kings Bay Steering Committee is the degree of competence and coordination achieved by its members. Local officials have united to handle the impact of base development on the county. Since the earliest meetings, local officials have become increasingly sophisticated in the complex issues surrounding base development, acquiring the bureaucratic skills needed to operate among the myriad of government and private agencies involved in the impact of Kings Bay.

Much of the success of the Steering Committee is due to the endeavors of the Coastal Area Planning and Development Commission. The
county contracted with the CAPDC office in Brunswick to assist in planning for the Kings Bay base. A local planning office was set up in a trailer on State Road 40 one mile east of Interstate 95 in 1977. Local planners commuted from Brunswick or St. Simons in Glynn County to Camden County each day to work.

A number of the potential problems associated with incorporating outside planners into community development efforts cited by Bowles (1981) and Lynch (1970) were evident in Camden County. From the beginning, the planners were viewed with some suspicion and resentment by local residents and officials. At one Steering Committee meeting, the final business of the agenda was the presentation of the branch CAPDC office work program and budget for endorsement by the Steering Committee. After the presentation, the chairman of the Committee requested a motion to endorse, but no motion was offered. The CAPDC Director stated, "Either this, or we close the office down," after which a motion was finally made that the budget and program be accepted. After a voice vote in which two or three of the 13 committee members said "Aye," the program and budget were passed. One official later complained, "These planners come in from the outside and tell us what we need. But they drive from Brunswick. We live here and know our needs. There's a movement to abolish local government and replace it with CAPDC."

Yet at the same time, the Steering Committee has depended upon the planners to write the proposals for grants from government agencies to handle the impact of Kings Bay. The recognition of planners as persons with valuable bureaucratic skills undoubtedly prompted the County
Commission and St. Marys city government to hire planners as knowledgeable outsiders to act as county administrator and city manager.

The Impact of Base Development on the Community

As noted earlier, the anticipated effects of base development on Camden County are similar in many respects to other boom development situations resulting from intensive energy exploitation or industrial development in areas of low ambient population. The problems, however, are not directly transferable since Camden County is not as remote as the energy boom towns out West. In addition, Camden County is experiencing the impacts peculiar to communities suddenly compelled to absorb a military population, with its unique social and institutional characteristics. Thus many of the problems reported for both boom towns and base communities may be applicable for Camden County. This section assesses the impact of naval base development on the Camden County community during the first year of base operation.

Before field research was initiated, three predictions were advanced as to the effects of base development on the community. These predictions were (1) base development and the associated population influx will alter community institutions; (2) base development and the associated population influx will alter community lifestyle; and (3) base development and the associated population influx will result in conflict between community residents and newcomers.

The first of these, alteration of community institutions, will fully evolve over a longer period of time than the one year encompassed by this study; thus the institutional survey data collected at the beginning of fieldwork is viewed as a first step in a long-range
monitoring of the change in commercial and industrial differentiation, governmental, civic, and religious entities, as well as formal and informal voluntary associations. Some institutional change did occur within the first year, although, for reasons outlined below, not to the degree expected.

Manifestations of the latter two predictions were apparent in the first year. Evidence of change in aspects of the rural lifestyle is presented in Chapter IV. The issue of conflict between residents and newcomers is examined in the sections to follow.

The nature of the impact of base development on the community during the first year varied from the expectations of the environmental impact assessment (Department of the Navy 1977a,b) and from the expectations of community residents as recorded in 1979. Events within and external to the community acted to delay the Navy's original schedule for settling a substantial portion of the incoming population within the local community. The Navy altered its plans for base development accordingly, changing its original goal of making Camden County a "base community" (Department of the Navy 1977a,b) to one of the base becoming more self-sufficient (Department of the Navy 1980a,b). In response to the slow pace of development, local residents' expectations for community change in 1980 were more conservative than their projections recorded in 1979.

The Navy community is a population of newcomers who differ markedly from Camden County oldtimers in their perceptions and expectations of base development as well as their perceptions of each other.
Stereotyping and scapegoating are utilized by both community residents and naval personnel to distinguish themselves from each other. Conflicting attitudes between oldtimers and newcomers and conflicting goals between the community and the Navy are potential sources of tension.

The Costs and Benefits of Base Development

That "development" brings progress and economic benefits to a rural community is a common assumption. The benefits of development projects are presumed to outweigh their costs to the community. However, studies in boom towns and communities experiencing military impacts reveal that development projects often entail more costs than benefits.

In boom towns, the rapid population growth demands more community services than the local tax revenue can supply. Unless the incoming industry initially provides the needed revenue, the economic burden falls on local property owners. According to Finsterbusch,

... although population growth brings additional taxpayers, their taxes almost never compensate for the increase in public expenditures which they require. Newcomers generally rent or live in trailers and contribute little additional revenues for the community. [Finsterbusch 1980: 139]

The costs borne by communities undergoing the development of military installations are similar. "Base communities," particularly, are expected to provide housing and services for the incoming personnel unless the base is intended to be self-sufficient. For community residents, this translates into an increased tax burden. The highly transient military population usually contributes little to local tax revenues (Breese et al. 1965).
Both the 1977 and 1980 environmental impact assessments focus on the effects of naval base development on the seven counties that comprise the Kings Bay Region. The costs and benefits for the immediate environment of the base, i.e., Camden County, receive less attention. Adverse effects on the physical environment are addressed in Chapters III and IV. Adverse effects on the social and economic environment are purportedly outweighed by the potential benefits resulting from increased population expenditures. An analysis of the costs and benefits of T-1 and A-1 development reveals that the costs of naval base development outweigh the benefits to the community.

The costs of T-1 development recognized by the environmental impact assessment are limited to the loss of Blue Star Shipping Co., termination of the Army operation at MOTKI, "partial disruption" of local shrimping and fishing activities (Department of the Navy 1977a: 4-193), displacement of three households and an egg ranch located at Kings Bay, and displacement of an unknown number of low-income county residents due to economic stress stemming from base development (Department of the Navy 1977a: 1-50).

The Blue Star Shipping Co. operated from Kings Bay and employed approximately 13 full-time and up to 30 part-time employees (Department of the Navy 1977a: 4-178). Blue Star generated $1.4 million per year and disbursed $195,000 per year in payrolls and $93,600 in local contracts. Regional contracts netted $1.1 million per year (Department of the Navy 1977b: 1-49).

The Army operation at MOTKI consisted of 16 public works personnel who acted as caretakers for the base; MOTKI generated $260,000 in
operating expenses annually, $23,000 of which went to contracts with vendors (Department of the Navy 1977b: 1-49).

The three households and the egg ranch at Kings Bay were bought by the government and relocated elsewhere. The egg ranch netted $30,000 per year (Department of the Navy 1977b: 1-50). The displacement of low-income households is expected to result from increased rents and competition for housing (Department of the Navy 1977a: 4-193).

The environmental impact assessment insists, however, that the "economic advantages" of T-1 development "... more than outweigh the loss of jobs and income which may occur" (Department of the Navy 1977a: 4-193). These advantages are expected to flow from the $19 million that will be generated annually by the normal operation of the base. The military payroll will be $12 million per year supplemented by an estimated $900,000 income earned by dependents and "moonlighters" (Department of the Navy 1977a: 4-190).

While much of this income would be spent within the Kings Bay Region, the proportion destined for Camden County is unknown. As stated in the environmental impact assessment,

Camden County would inevitably experience increased business, although some retail sectors would benefit more than others. ... The proportion of military payroll which would be spent in Camden County will depend largely upon the enterprise of local citizens. [Department of the Navy 1977a: 4-192]

The types of expenditures by military personnel expected for Camden County are those for housing, entertainment, recreation, and transportation (Department of the Navy 1977a: 4-192). Of these, only transportation is presently developed in Camden County. While there is no mass
transit, automobile dealerships, gas stations, and parts and service establishments are well represented due to the rural nature of the county and the resulting high mobility of the residents.

A good deal of military income will be spent on the base or outside Camden County. Military personnel are expected to buy necessary food and clothing at the commissary and naval exchange on base. Medical, personal, and special purchases will be made largely in Jacksonville and Brunswick (Department of the Navy 1977a: 4-192 - 4-193).

A further economic benefit of T-l development predicted in the environmental impact assessment is diversification of the county's economy. The T-l development will create 129 base civilian jobs (Department of the Navy 1977a: 4-193), but these will probably be filled by "immigrant labor" because they require educated and skilled labor not available in the county (Department of the Navy 1977a: 2-76). The T-l development will also generate 600 secondary jobs, presumably service positions "... in the region as a whole" (Department of the Navy 1977a: 4-193). The number of these jobs that will be created in Camden County is unknown. These employment opportunities, along with the jobs created by Union Carbide's planned expansion, are expected to "... lessen the county's dependence on the pulp and paper industry" (Department of the Navy 1977a: 4-193 - 4-194).

In contrast to T-l, the costs of A-l development appear to outweigh the benefits for Camden County. The same local enterprises that were to benefit from T-l development are now expected to suffer. Local
businesses may lose some of their labor to construction contractors involved in base construction (Department of the Navy 1980a: 6-89). Local merchants and small businesses may lose out to the competition from larger retail operations.

Local merchants may encounter pressure to change their style of doing business, such as updating procedures, adopting modern advertising, competing with the new businesses, merchandising, and refinancing. Small enterprises may not be able to compete with the buying power of larger firms and may subsequently be replaced or edged-out by fast-food chains, supermarkets, or new retail establishments. [Department of the Navy 1980A: 6-89 - 6-90]

Another cost resulting from A-l development is the increased cost of living "associated with property assessment increases and the general decline in purchasing power" (Department of the Navy 1980a: 6-90). This would particularly hurt low-income residents and those on fixed incomes, such as the elderly (Department of the Navy 1980a: 6-90). These residents will probably be displaced from their homes and possibly from the county itself.

The predicted benefits of A-l development are an increase in construction jobs resulting from construction of base facilities and off-base housing, an increase in commercial development leading to competitively priced goods and services, and employment openings in the "government sector" (Department of the Navy 1980a: 6-90). The payroll associated with A-l operations will be $159 million annually, of which $65 million will go to military and civilian personnel living in Camden County (Department of the Navy 1980a: 6-89).

Presumably the income will be spent on a regional, rather than a local, basis unless Camden County develops the housing, entertainment,
recreation and transportation facilities necessary to meet the A-l population needs.

Approximately $239.2 million [in the 20-year period] in general fund expenditures will be required to meet the needs of the 1998 population, of which up to $73.5 million can be attributed to serving the A-l related population. Revenues generated by the A-l related population will amount to $18.0 million over the 20-year period, obviously placing a strain on the county general fund budget. [Department of the Navy 1980a: 6-109]

The means of providing the revenue to meet the service demands of the A-l population is expected to be through increased taxes and grants-in-aid from the federal and state governments. The availability of the latter is increasingly doubtful in view of reduced federal expenditures.

Community residents frequently perceive themselves as bearing the costs of development to benefit transient newcomers (Bates 1978). Many Camden County residents were skeptical of the benefits of naval base development. One resident remarked, "The Navy won't bring in jobs except in construction and related small food and other chains. The population will come and go." Another resident assessed the situation this way:

People wouldn't believe me. I said, "It [the naval base] isn't going to help St. Marys, Woodbine, or Kingsland. All it's going to do is ruin our town." And they kind of got mad at me. And next time I seen 'em, two or three months later, their tune had changed. Our taxes went up. 'Cause really, it's not helping St. Mary's, Woodbine, or Kingsland. Maybe if somebody's got something to rent it may. But usually when they [the Navy] move out, they're going to have lots left standing. But as far as buying groceries, you know they're not going to buy groceries [in town]. They're going to go to the PX. The can get 'em so much cheaper. And their clothes and all.
As discussed above, the inability of the community to provide the needed goods and services for the incoming population associated with boom development results in a deteriorated quality of life for both oldtimers and newcomers and decreased productivity for the development project (Gilmore 1976; Gilmore and Duff 1975). Those inherent costs of development have led some authors to suggest that the developing industry bear the costs of development (Bates 1978; Gilmore 1976; Gilmore and Duff 1975). This was indeed the conclusion of the Camden County Board of Commissioners. Concern over the ability of the county to handle the economic demands of base development prompted the Commission to make the following statement at the Trident complex public hearing:

Of primary concern to the Camden County Commission is the impact that a Trident base construction and operation will have off base. More specifically, we are concerned with the proposed action's effect on local government finances. . . .

Such staggering public sector costs cannot be borne by the local taxpayers. Nor can they be adequately addressed by normal state and federal grant programs. Rather, special Department of Defense monies must be made available to Camden County's local governments to fund these projects and to avoid budget deficits. . . .

In closing, we support the Navy's plans to construct and operate the proposed submarine support base provided that adequate funds are available to avoid local government deficits and increases in local tax burdens. One way we could do this is payment in lieu of taxes. [Department of the Navy, Department of the Army 1980: 44-46]

The Navy Community

The incoming naval population comprises a community significantly different than the Camden County community. Naval personnel differ from community residents in the formality of their relationships, their
focus on the group rather than the individual, their degree of mobility, their participation in churches as well as their attitudes and expectations concerning base development. The latter two differences will be examined in sections to follow.

There is little published information on the social characteristics and lifestyle of naval personnel. A particularly useful source is The Sailor's Wife (Ebbert 1977), a Navy handbook designed to assist Navy wives in making the transition from civilian to military society.

The Navy community is a transient population composed of members whose activities are regulated by the Navy. The Navy is a complex organization, hierarchically ordered, that must deal with people as groups and not as individuals in order to function. "It is only by the skill and initiative of people working together as a disciplined command unit that the Navy can properly function" (Ebbert 1977: 4; emphasis in original). Thus, relationships among naval personnel are ordered and formalized.

Order and discipline, enhanced by the chain of command and regulated working conditions, characterize Navy life. This is evident in the old Navy saying, "A taut ship is a happy ship."

"Taut" in this connection means closely meshed and under firm control, while "happy: means the conviction of every crew member that he and his work are respected. The saying reflects centuries of experience by seagoing men everywhere that good order and discipline are absolutely indispensable to the crew's health, morale, and competence. [Ebbert 1977: 3]

The disadvantages of Navy life are offset by a number of privileges and benefits accompanying military service. These benefits
include a higher degree of job security than most civilian occupations; mobility within the Navy with increased training, promotions, and pay; shopping privileges in commissaries and exchanges; medical benefits; recreational opportunities; travel opportunities; and retirement benefits (Ebbert 1977: 6).

The shared working and social conditions of naval personnel tend to keep them together, set off from the civilian population in the host community. Throughout The Sailor's Wife, naval personnel are distinguished from "civilians."

Wherever Navy people are stationed, they generally tend to form a community of friends and neighbors with each other. As a community they share many things and find ways of pursuing various interests, like schools, a library, car pools, and meeting common problems. In some ways this Navy community is something like a hometown. You could call such a community "Hometown, USN." [Ebbert 1977: 111]

The Kings Bay Navy community also differs from the host community. These differences, however, are not addressed by the environmental impact assessments. Other than projections of the numbers of incoming naval personnel, the environmental impact assessments (Department of the Navy 1977a, 1980a) do not provide any information on the social makeup of the naval base population, but instead create the impression of a faceless mass. An understanding of the social parameters of the incoming base population, however, allows prediction of the social impacts as well as a means of identifying potential conflicts.

In an effort to gain some insight into the "other side" of base development, a small sample of 27 Kings Bay naval personnel were interviewed in the summer of 1980 with the permission and cooperation of the
base command. The personnel interviewed included those who worked both on the base proper and on the submarine tender.

With the request for interviews, the commanding officers selected a sample of naval personnel on the base and the tender. Exactly how the individuals were selected is not clear, but while some individuals were given the option of participating, others apparently were "volunteered" for the interview. The officers stated that they attempted to explicitly select individuals that had already settled in the community because they thought that this group would provide a "better view" of the base community. There is no way to determine the degree to which this sample of naval personnel is representative of the total population.

A modified version of the interview schedule administered to Camden County residents was administered in person to the sample of naval personnel. Of the 27 naval personnel interviewed, 25 were male and 2 were female. Thirty-six respondents of the sample were under 30 years of age, and 64 percent were between 30 and 50 years of age. No one interviewed was over 50 years old. Thus, the sample population was significantly younger than the sample of Camden County residents.

Eighty-nine percent of the respondents were white and 11 percent were black. Fifty percent of the naval personnel were married and 75 percent of those married had one or more children.

Nineteen percent of the respondents were officers, both commissioned and warrant; 30 percent were chief petty officers; and 52 percent were petty officers or seamen. The sample is thus composed primarily of relatively older, career-oriented naval personnel. The
proportion of officers to enlisted men is probably higher than normal for base personnel. The high proportion of officers to enlisted men also may reflect the fact that more officers than enlisted men are settled in Camden County.

The majority of the respondents, 61 percent, were from the South, 18 percent from the North, 7 percent from the Midwest, and 5 percent from the West and Southwest. Forty-three percent reported having been raised in an urban environment, 36 percent in a rural environment, and 18 percent in a suburban environment.

Sixty-four percent of the personnel resided off-base in Camden County at the time of the interview. Eleven percent lived on-base. The remainder lived in Jacksonville, Fernandina, or Brunswick. Sixty-one percent had been stationed at Kings Bay for a year or more.

The formality of naval personnel relations differs from the personalistic orientation of Camden County residents. Camden County residents are tied to each other through extensive kin relations. Relations between naval personnel are formalized, as exemplified by the customary forms of address. Naval personnel are addressed by their title, particularly when the addressee is an officer. Personal names are used only if a personal relationship exists between the individuals. As the Navy advises sailors' wives,

"Anytime you're addressing any chief, you can't go wrong by addressing him the same way your husband does. Naturally, if the chief becomes a personal friend, then you call him by his first name, just as you do all your other friends.

Much the same is true for commissioned officers. Professional courtesy requires that enlisted and commissioned members do not ever address each other by their first names"
while in uniform and on duty—although they may occasionally do so off duty. . . . When you're speaking to an officer, it's considered polite to address him by his rank, although as a civilian you're not bound by the rules of professional courtesy as your husband is. It's rather that in most situations you'll feel more comfortable using his rank, until you and he, like the chief, become friends on a first-name basis. [Ebbert 1977: 130]

The group orientation of the Navy community differs from the individual orientation of the Camden County community. The notion of self-sufficiency and the self-made man are popular ethics among community residents. The Navy, however, depends on groups of people in order to function. The focus of community residents on the individual was regarded by one naval officer as an outmoded ideal that would hinder residents' eventual assimilation into base life. "People are short-sighted. The attitudes of 'I'm a self-made man and independent' is antiquated. Mayor ______ is classic. . . . We are pioneers . . . bringing Camden County to the 20th century."

The transience of the Navy community differs significantly from the stability of residence of Camden County residents. Eighty percent of the community residents interviewed had lived in Camden County for over 20 years. In contrast, naval personnel can expect to be transferred every two years.

Most tours of duty—that is, the length of time a person is assigned to a specific command—last three to four years, but some are shorter and some longer. For instance, a man may be ordered to a school for a course of instruction lasting 12 to 18 months. Or, after a tour of duty on a ship sailing in and out of a particular home port, he may receive orders to a job ashore at the same port, or vice versa, and in these cases he would not have to move his family in order to carry out the new orders.
So, while three or four years is the normal amount of time between moves, a Navy family may move as often as twice within two years, or as seldom as once in eight years. [Ebbert 1977: 69-70, emphasis in original]

The incoming civilian populations associated with boom developments and military impacts are also transient (Finsterbusch 1980: 141; Little 1977: 418-421). Military personnel can maintain a stable form of residence, a "home of record." The home of record is usually the city and state where they entered the service. One naval officer stated that most naval personnel do not become involved in local politics, typically voting in their home of record by absentee ballot, and usually voting only in national elections. Naval personnel also pay their taxes in their home of record.

Every person who joins the Navy is already a legal resident of one of the states of the United States, and he does not lose this residence—with its privileges and obligations—by joining the service. Your legal state of residence is where you vote and also where you pay state income tax. [Ebbert 1977: 34]

Like the transient populations associated with boom towns, one would expect the naval personnel to maintain a more liberal outlook than the more conservative community residents (Bates 1978; Finsterbusch 1980; Nellis 1974). For naval personnel the opportunities for travel abroad exposes them to a variety of lifestyles. "Travel, besides being fun, is valuable, because as you live in different places with different climates and customs you'll be encouraged to grow and develop your own potential to become a better-informed and more capable person" (Ebbert 1977: 6).

Church participation differs significantly between naval personnel and Camden County residents. Fifty percent of the naval personnel
interviewed did not belong to a church. This is in stark contrast to Camden residents, of which only 7 percent of those interviewed did not belong to a church. Of those naval personnel that do belong to a church, 14 percent are Catholic, 11 percent are Baptist, 4 percent are Methodist, 4 percent are Episcopalian, 4 percent belong to an unspecified Christian church.

Finally, the naval population views itself as different from the Camden County community. As in other boom situations (Bates 1978; Havighurst and Morgan 1963), naval personnel perceive themselves as outsiders, a concept congruent with the community's perception of the Navy. As one enlisted man stated, "I'm from Georgia, so people talk to me. But people still call the military and just about anybody connected with the base 'outsiders.' If you weren't born here, you are an outsider."

Attitudes and expectations of naval personnel also differ significantly from those of Camden County residents. These differences will be discussed in later sections.

Community Impressions of Development in 1979

In the summer of 1979, when the first major installment of naval personnel arrived, Camden County residents when interviewed acknowledged that changes resulting from naval base development had already occurred. Twenty-eight percent of the residents reported an increase in housing—homes, apartments, and mobile homes. Twenty-eight percent were aware of roads being expanded, particularly the four-lane widening of SR 40, added traffic, and traffic accidents, and the dredging of waterways.
Sixteen percent had noticed increased commercial development. Thirteen percent had noticed more strangers in town. Only 2 percent mentioned more bars in operation.

Many Camden County residents have a present-day orientation and find it difficult to predict future developments. This became evident while administering the interview schedule during 1979. When residents were asked to visualize and describe the changes anticipated over the next one or two years in the three principal towns, along State Route 40, and in the areas of employment, the schools, Gilman Paper Company, Union Carbide, and the National Park Service, the majority of answers were vaguely stated as "growth," "more build-up," or "expansion." Most respondents answered in terms of physical changes. A few residents were able to visualize specific changes such as a street light at a busy intersection in St. Marys, or a McDonald's or Pizza Hut on SR 40. Predictions were expressed in terms of "I hope that . . ." or "I hear that. . . ." A few residents could not make any predictions at all, for example, the woman who could only respond "Only God knows" to each of the predictive questions.

The major expectation, expressed by 68 percent of the sample, was that housing and commercial establishments would be developed locally. Twelve percent expected that roads in the county would be expanded and paved, and that traffic congestion and traffic accidents would increase along major routes.

On the whole, the towns of St. Marys, Kingsland, and Woodbine were expected to experience growth in housing and commercial development. Eleven percent, however, felt that St. Marys would not change appreciably
as its physical potential for growth was limited. Eight percent felt that Kingsland would not experience any noticeable change. Twenty-eight percent felt that Woodbine would not change as a result of base development.

In the area of employment, 55 percent of the residents interviewed in 1979 felt that it would improve as more jobs became available. Twenty-five percent felt that employment would get worse for Camden residents because outsiders would be competing for jobs. Others were pessimistic about even outsiders finding jobs. Six percent predicted no change in the employment situation.

In the area of education, 61 percent of the sample predicted that schools would expand and improve in order to handle the increased population. The majority of these respondents predicted that more schools would be built. Some specifically mentioned the addition of a middle school and second high school. Fifteen percent doubted the ability of the schools to handle the impact and predicted a decline in education quality due to overcrowding. Eight percent foresaw only a moderate increase in school enrollments and felt the schools were prepared to handle the impact. Four percent predicted an improvement in the quality of teachers hired as result of the influx.

When asked about the possible effects of base development on Gilman Paper Company, 38 percent of the sample predicted no major changes in the company's operations, predicting continued, stable growth. Twenty-four percent felt that Gilman would expand further as a consequence of base development. Seven percent predicted that Gilman will
face competition for labor and will lose some of its political power in the community. Five percent predicted that Gilman will decline and eventually leave Camden County.

A large percentage of county residents were unaware of the operations of the Union Carbide plant. Many residents still associate the plant site with the Thiokol plant and do not recognize Union Carbide by name. Forty-four percent of the sample were unable to make any predictions about the effects of development on its operation. Forty percent of the residents did, however, predict that Union Carbide would expand. Ten percent stated that Union Carbide would experience no change other than stable growth. Five percent viewed Union Carbide as a "sleeper" that will grow rapidly and soon employ more people than Gilman Paper Company.

For Cumberland Island, 29 percent of the sample predicted growth as the island would attract more visitors, expand its operation and employ more local residents. Eighteen percent felt that the National Park Service would expand the facilities on the island, possibly adding a bridge or other means of access other than the present ferry, eventually becoming as commercialized as Jekyll Island. Nine percent foresaw no change, and 7 percent stated that they hoped it wouldn't change. Seven percent of the residents expressed resentment of National Park Service policies concerning Cumberland Island.

The First Year of Base Development

Actual developments during the period June 1979 to July 1980 were somewhat different than predicted by either the planners or the
community. The boom of development and the associated influx of naval personnel failed to materialize to the extent expected, allaying the fears of many community residents.

Like the military installations in Dover, Delaware (Whelan 1965), Geneva, New York (Church 1965), and Seneca, Illinois (Havighurst and Morgan 1963), Kings Bay was not planned to be a self-sufficient base. The Navy anticipated that Camden County would become a "base community" that would provide the housing, goods, and services needed by the base and naval personnel. The Navy assumed that local residents and outside developers would develop the housing necessary to accommodate naval personnel and initially planned only 400 on-base housing units (Department of the Navy 1977a).

When off-base development failed to keep up with the needs of the base, the Navy, like the Air Force in Dover (Whelan 1965) altered its plans and slowly moved to make the base self-sufficient. Base development plans were revised and on-base housing and base facilities were expanded (Department of the Navy 1980a).

Economic constraints, community uncertainty regarding the Navy's commitment, and local traditions of housing and land use combined to inhibit base-related development during the first year. This section describes what actually happened and why it differed from the anticipated course of events.

**Housing and commercial growth**

Case studies of boom towns and military impacts indicate that the demand for housing and services usually exceeds the ability of the
local community to provide these needs (Breese et al. 1965; Dixon 1978; Finsterbusch 1980; Gilmore 1976; Gilmore and Duff 1975; Havighurst and Morgan 1963). Housing shortages are the most apparent because the incoming population must first find a place to live. A trailer boom is the frequent result when the local housing supply is inadequate to meet the needs of newcomers (Corrigan 1976; Havighurst and Morgan 1963; Whelan 1965).

In Camden County the need for housing among naval personnel has been their most critical concern since the first arrival of naval personnel in July 1979. Naval personnel are accustomed to housing dilemmas to some extent. As the Navy advises naval wives,

> **Finding a home that's adequate, convenient to work, shopping, and schools, and that you can afford, is no easy chore. For Navy people, because of Navy orders which may move the husband from one duty station to another every few years, it's a recurring chore.**

[Ebbert 1977: 46]

In the summer of 1979, the housing industry was hit hard by a national recession. In Camden County, as elsewhere in the United States, developers found it difficult to initiate new construction. The predominant form of housing in Camden County has always been single-family dwellings owned and often built by the occupant. Home ownership reflects the ethos of self-sufficiency. Most of the building is done by the owner or with the help of friends or relatives. One resident, for example, added rooms and a second floor onto his existing home, converted a one-story garage into a two-story apartment, and helped his son build his own home nearby. Although the father and son both worked full-time, the son's home was completed in six months. Another resident who
also worked full-time added on a family room to the garage apartment he built behind his house.

There is no tradition of rental property or multi-family dwellings in Camden County. As one attorney acknowledged, "People here don't want apartments. They are not used to them. Probably the locals confuse 'public' with 'low-rent' housing here—that is, welfare. They have never had apartments here before, so they aren't used to them. People here fear congestion."

Thus initial housing developed in Camden County conformed to local norms—single-family dwellings suitable for naval officers and their families but priced out of the reach of most enlisted men. By mid-December 1979, only a small number of multi-family dwellings were completed. The costs of homes in 1979 had nearly doubled. An $18,000 home in 1978 became a $30,000 home in 1979. The opportunity to secure home financing was diminished as the nearest savings and loan was located outside of Camden County in Waycross, Georgia. Commercial banks in Camden County as of 1979 only provided short-term loans and did not handle home financing (Department of the Navy 1980a: 5-138).

Because housing costs tend to be the largest item in naval personnel's budget, the Navy offers one of two benefits to alleviate their burden: on-base housing or "quarters"; or a Basic Allowance for Quarters (BAQ) (Ebbert 1977: 46). Most naval personnel prefer "quarters," government-owned housing units. While in quarters, naval personnel pay no rent, property taxes or utilities, except for the telephone. Maintenance and repairs for quarters are also provided at no cost.
The big drawback to quarters is that there aren't enough of them to go around. Even though eligibility is limited to men in paygrade E-4 and above with at least two years in service, and even though the Navy builds them as fast as it gets the money to do so, there are still more people wanting to live in quarters than there are quarters available. Therefore, at most duty stations there is a waiting list for them. [Ebbert 1977: 47]

The Basic Allowance for Quarters (BAQ) entails a monthly stipend to help defray the costs of private housing for naval personnel who are ineligible for quarters. The drawback to private housing for naval personnel is the cost. "The sad truth about most private housing is that it is fearfully expensive, and what we prefer we can't afford, while what we can afford we don't prefer. This is what makes house hunting such a frustrating task" (Ebbert 1977: 87). The amount of the BAQ varies with the naval personnel's paygrade and whether or not there are dependents; BAQ monthly allotments for a married E-4 as of October 1976 was $147.90, for a married E-8, $212.40 (Ebbert 1977: 46).

In Camden County where the majority of naval personnel have had to find private housing with only a BAQ to help meet the inflated costs, many naval personnel, particularly enlisted men, have been unable to buy a house. Rental units, particularly apartment complexes, located near the base are considered by many naval personnel as the preferred type of temporary housing. Yet very few of these are available.

As a result, the majority of naval personnel in 1979-1980 lived on the submarine tender or lived outside the county and commuted to the base. Figure 17 depicts a billboard near the base advertising a housing development in Jacksonville. Mobile homes were a popular housing
Figure 17. Billboard on State Road 40 advertising housing in Jacksonville
alternative for some naval personnel. Figure 18 depicts mobile home sales along State Road 40.

Due to the lack of the type of housing needed to meet naval personnel's needs, the majority of naval personnel, particularly enlisted men, were not very visible in the county. Significantly, the naval personnel who were most visible were the commissioned officers and their families who moved into single-family dwellings in the community, joined community organizations and local churches. Thus, in 1980 when the vast influx of naval personnel had failed to materialize, local residents no longer felt that the housing situation was critical. Whereas 56 percent thought the housing supply was inadequate in 1979, only 27 percent felt so in 1980. Respondents felt there was adequate housing available, albeit costly, to meet the Navy's needs.

Ninety-seven percent of the naval personnel interviewed in 1980, however, felt that housing was inadequate. Many sailors blamed the lack of housing, especially rental housing, on the reluctance of local residents to invest in support facilities for the Navy.

Of the naval personnel interviewed in the summer of 1980, 46 percent were renting and 52 percent had bought a home. The larger percentage of home owners is no doubt due to the high proportion of officers in the sample. Thirty percent stated that they would like to buy a home but did not due to the high costs of housing and the brief duty tour expected at Kings Bay. Twenty-two percent stated they would prefer to rent housing.
Figure 18. Mobile home sales on State Road 40
Changes in the housing situation are indicated. Of the plans being made in December 1979 for housing, 52 percent were multi-family dwellings and 48 percent were single-family dwellings (Department of the Navy 1980a: 5-138). As more apartments are added, and more quarters are provided on the base, the housing shortage may be alleviated.

That commercial development did not occur in Camden County as anticipated is indicated in Figure 6 (p. 68). In comparing the number of institutions from 1964-1980 in St. Marys, Kingsland, Woodbine, and the rural areas, the growth rates between 1978 and 1980 are not great except for the rural area. Between 1979 and 1980, St. Marys experienced only a 5 percent growth rate, Kingsland a 12 percent growth rate, Woodbine zero percent growth, and the rural area a 32 percent growth rate. The relatively high commercial growth in the rural area is concentrated in the area around Kings Bay and is directly related to base development.

One major area of commercial growth was State Road 40, the main highway that leads to the base and St. Marys. Land along this major artery was cleared for mobile home sales, automobile sales, bars, and other businesses. Figures 18 through 20 illustrate some of the commercial growth that occurred along State Road 40 during the first year of development.

Factors inhibiting development

Two major factors have discouraged Camden County residents from developing the housing and commercial services needed by naval personnel: land ownership patterns and uncertainty as to whether or not
Figure 19. Newly built bar constructed at the "flowing well," a local landmark, on State Road 40
Figure 20. Law offices and mobile home sales on State Road 40
the base would be developed. Since the majority of Camden County land is externally controlled, development depends largely upon the ability and willingness of local residents to develop their own acreage.

Existing patterns of land use and ownership have limited development in the county during the first year of base development. Only 15 percent of the land area in the county is developed, and the high proportion of undeveloped land evokes the notion that the county is ripe for development. Further analysis of soils and land ownership, however, reveals that wetlands unsuitable for development constitute 29 percent of the total land area, and the remaining 56 percent is controlled by private industry and state and federal agencies. Figure 21 depicts the extent of this outside control of the county's land area.

Of the total land area of 417,920 acres, 204,800 acres is forestland of which 90 percent is controlled by five major pulp and paper companies. Most of this land is planted in pine trees for pulp and paper production (Figure 21). The remaining 10 percent of forestland is privately owned (Kings Bay Steering Committee 1979: 73).

The federal government through the Department of Defense, Department of the Navy, and the Department of the Interior, National Park Service, also controls a large portion of the land in the county (Figure 21). The amount of land owned by the Navy in 1979 was 14,247 acres, and an additional 1,800 acres will be acquired for future development of Kings Bay. The National Park Service controls 22,500 acres of land on Cumberland Island (Kings Bay Steering Committee 1979: 18).
Figure 21. Land ownership map indicating the limited extent of land available for immediate development. Not illustrated is the amount of freshwater swamps. Adapted from Kings Bay Steering Committee (1979: Map 5)
State-owned lands include 500 acres at the Crooked River State Park located directly north of Kings Bay and 60 acres at Santa Maria State Park, known as the Spalding Sugar Mill site (Kings Bay Steering Committee 1979: 18). The Sugar Mill site is located directly across the naval base entrance on Crooked River Road and serves as a recreation area for many naval personnel.

Similar land ownership patterns are evident in other counties of the Barrier Island Region. The patronal system of wealthy planters from the late 1700s to the 1900s was replaced by a similar patronal system in the 1960s and 1970s of state and federal agencies and pulp and paper companies. The mainland areas of the region, for the most part, have remained rural in character.

Thus, in Camden County the majority of the undeveloped land is presently controlled by private industry and state and federal agencies. The five pulp and paper companies control 44 percent of the land area, and the federal and state governments control 12 percent of the land area in the county. As a result, the residents of Camden County have little control over local land use and are limited in their ability to initiate commercial development.

Boom developments are fraught with uncertainty, particularly in the early stages. Development plans are proposed, withdrawn, revived, and revised so frequently, the host communities find it difficult to prepare (Corrigan 1976: 1152). The fact that the ultimate decision to locate the project in the community depends largely on factors beyond the control of the residents adds to the uncertainty surrounding developments. With little in the way of tangible financial commitments, the
community must base its actions on intangible, verbal assurances. Concern frequently arises in host communities over the ephemeral nature of boom developments. Dixon (1978) noted the uncertainty of potential investors in Fairbanks concerning the development of housing and services needed by the influx of newcomers associated with the oil pipeline.

In 1970 it appeared that the pipeline construction boom was imminent and many forward-thinking business persons in Fairbanks expanded their inventories and operations to accommodate the anticipated increased demands. Due to the delay in pipeline construction, their investments were not profitable and many sustained heavy losses. The businessmen felt they had been "burned" by planning ahead. These recent experiences, coupled with the long boom/bust history of Fairbanks, led many to believe that it was more realistic to view the pipeline period as a temporary boom and more responsible to react accordingly by limiting their investments...

To business and community leaders, it seemed more responsible to "only bet on a sure thing." [As one official stated] "Because of lack of commitment by the oil industry... it was difficult for people here to justify spending money, either their own or the public's, on preparation for the boom, that might never come."... Given their experiences and the advice of others, the local businessmen and leaders opted for the more conservative wait-and-see approach. [Dixon 1978: 134-135]

In Camden County, residents have been discouraged from committing themselves to development by considerable uncertainty surrounding the Navy's plans for base development. When the MOTKI Army terminal was first constructed in the 1950s, a development boom was expected, but failed to materialize. Camden County residents felt that the same thing might happen with Kings Bay. A number of residents in 1979 stated, "I really don't think they'll build it." For instance, while the Navy stated as early as 1977 that Kings Bay was their preferred site for the Trident complex, the final decision for funding rested with Congress and was not announced until November 1980.
Expansion of Kings Bay was jeopardized by the Reagan administration's budget cuts. In the fall of 1981, the Navy announced plans to reduce funding at Kings Bay which would delay completion of base construction for three years. This move met with opposition from the original proponents of base development: Senator Sam Nunn (D-Georgia), on the Senate Armed Services Seapower Subcommittee, Senator Mack Mattingly (R-Georgia), new member of the Military Construction Appropriations Subcommittee, and Representative Bo Ginn, Chairman of the Military Construction Appropriations Subcommittee in the House (Woolner 1981). The Navy rescinded its decision and restored the funding.

Developing housing and services for the base in 1979-1980 entailed too much financial risk for the majority of county residents.

**The presence of the Navy in community life**

The slow development of housing and businesses affected the visibility of naval personnel in Camden County during the first year. Because the majority of enlisted men lived on the tender or commuted from Jacksonville, Fernandina, or Brunswick to the base, their presence in the community was not noticeable. Naval officers, who were able to move into homes in the community, were visible.

Many naval officers joined community organizations and local churches, and their wives became active in community affairs. Of the naval personnel interviewed in June 1980, 36 percent had joined community organizations. These included Kiwanis and Rotary, sports clubs, social clubs, the Veterans of Foreign Wars (VFW), the Camden County Historical Society, volunteer fire departments, the Kings Bay Steering Committee, Scouts, and the PTA.
Three men in the sample reported that their wives were ombudsmen, individuals selected by the commanding officer of the base to serve as liaisons between the military and the community. The Navy encourages naval personnel and their wives, particularly officers, to become involved in community and volunteer work.

... In our Navy community it's hard to say where social life ends and volunteer work begins. ... The Navy community often exists within or adjacent to a civilian community. Over the years many, many Navy wives and their husbands have contributed greatly to the civilian volunteer work force ... [as] Scout leaders, PTA members, church supporters, fund-raisers, Little League coaches. ... Volunteer work in the civilian community has its own special rewards. One of them is the realization that as a volunteer you're also sort of a good will ambassador for the Navy (sorry, no pay or diplomatic immunity comes with this appointment). That is, your contributions as a volunteer speak well of the Navy and help build support for it. [Ebbert 1977: 123-125]

Officers and their wives who have moved into homes in the community and joined organizations have been readily accepted by community residents. Some residents decided after meeting these officers and their families in church that "They're regular people like you or me."

The tendency of this "upper class" to become incorporated into the community has often been noted in the military and other large institutions (Breese et al. 1965; Dixon 1978; Havighurst and Morgan 1963). Interaction between newcomers and the community is often limited to these individuals. During the first year of base development, the interaction between naval personnel and community residents was essentially confined to officers and their families.

The Navy has made its presence known to the community by participating in local events, even initiating new social events. Shortly
after the arrival of the first naval personnel in July 1979, the Navy participated in the July 4th parade and exhibits in St. Marys. Figure 22 depicts a Navy color guard marching with representatives of the local chapter of the Veterans of Foreign Wars (VFW).

Also during that summer, the Navy sponsored an "open house," a tour of the submarine tender and a Poseiden submarine for interested civilians. Figure 23 depicts the tender and submarine.

In 1980, the Navy instituted Memorial Day services in cooperation with the VFW to commemorate Camden County residents killed in action from the American Revolution to the Vietnam war. The ceremony at Oak Grove cemetery in St. Marys involved naval officers, VFW officials, and county and state leaders. Figure 24 depicts the opening of these Memorial Day services.

On July 4th, 1980, the Navy again participated in the parade in St. Marys, to a somewhat greater degree than the year before. Uniformed naval personnel were more visible in the 1980 parade. Figure 25 depicts one of the Navy "floats."

Expectations for Development in 1980: The Community vs. the Navy

Differences between the community and the Navy are also discernible in their expectations for future development as recorded in 1980. Residents' expectations of community change were conservative, tempered by a year of little visible growth. In contrast, naval personnel predicted, on the basis of their familiarity with other base communities, substantial demographic and social impacts.
Figure 22. Navy Color Guard in St. Marys' July 4th parade, 1979
Figure 23. The Simon Lake tender and U.S.S. James Monroe Poseidon submarine, Kings Bay Naval Base open house, 1979
Figure 24. Memorial Day services at Oak Grove Cemetery in St. Marys, 1980
Figure 25. A Navy "float" in St. Marys' July 4th parade, 1980
After one year of base development, Camden residents' predictions for change were not radically different from their 1979 responses, not surprising considering that the respondents were the same. One year projections of development in the principal towns, changes in employment, industry, and education were largely unchanged. If anything, respondents anticipated less change in their physical environment than they had the year before. After a conspicuous start, new home and business construction had slowed.

Significantly, the expectations for housing and commercial growth in St. Marys, Kingsland, Woodbine, and along State Road 40 were not as great as in 1979. Fifty-eight percent of the residents expected further housing and commercial development along State Road 40, 64 percent in St. Marys, 69 percent in Kingsland, and 45 percent in Woodbine. Just as fewer residents in 1980 predicted housing and commercial growth in these areas, more residents felt that these areas could grow no further. Nine percent expected no further growth along State Road 40, 14 percent in St. Marys, 13 percent in Kingsland, and 40 percent in Woodbine. Another significant change in the 1980 interviews is that the number of residents predicting increased traffic and accidents along State Road 40 doubled, from 12 percent to 21 percent.

In terms of employment, 65 percent of the sample felt that employment will improve as a result of more jobs becoming available. Twenty-two percent, however, stated that the employment situation would worsen. When asked about education in 1980, fewer residents (24 percent) believed that the county would build more schools. Other residents
(24 percent) feared that the school system was not prepared for an increased enrollment of naval dependents and would therefore decline in quality.

A few more residents (32 percent) expected Gilman Paper Company to expand. More residents (54 percent) also expected Union Carbide to expand.

Predictions of the future of Cumberland Island were not dramatically different from 1979, except in one category: unsolicited expressions of resentment regarding National Park Service policies rose sharply. In 1980, following the National Park Service's public hearing on further land acquisitions, 16 percent of the residents expressed anger and resentment, up from 7 percent in 1979. Local attitudes concerning the National Park Service appear to be related to aspects of the social impact of base development, a relationship examined in a subsequent section.

Naval personnel interviewed in the summer of 1980 were also asked what they expected to occur in various areas of the county over the next year. Unlike local residents, the naval personnel were comfortable making specific predictions of community change over the next several years. Their projections are based on experience in similar military communities and may provide a more valid picture of the impact of military installations on rural communities.

Along State Road 40, where most community residents predicted an equal amount of commercial and housing development, 53 percent of the naval personnel predicted only commercial growth. Only 21 percent
predicted housing development along the highway. Eighteen percent mentioned expanded roads, increased traffic and accidents.

For St. Marys, Kingsland, and Woodbine, naval personnel predicted more housing than commercial growth. Forty-five percent of the sample expected more housing to develop in St. Marys; only 24 percent predicted a growth of commercial establishments. Fifty-one percent anticipated increased housing development in Kingsland; only 17 percent predicted commercial development. Twenty-one percent predicted increased housing development for Woodbine and only 6 percent expected commercial growth.

Naval personnel were more positive than residents about the effects of base development on employment, education, industry, and tourism. Eighty-three percent anticipated an improved employment situation. Sixty-four percent expected the schools to expand and improve in quality.

Although naval personnel's knowledge of Gilman Paper Company and Union Carbide were limited, 29 percent expressed confidence that Gilman would suffer no adverse effects from base development and 19 percent offered the same assessment of Union Carbide. In both instances naval personnel foresaw uninterrupted growth for Gilman and Union Carbide; however, two responses concerning Gilman were that the company would lose some of its political power (11 percent) and be pressured to clean up its pollution (11 percent). "Pollution" referred to the air effluent discharged by the mill which many naval personnel found offensive.

Twenty-six percent of the naval personnel anticipated no significant change for Cumberland Island. Twenty-five percent mentioned
that the island would attract more visitors. Eighteen percent were unfamiliar with Cumberland Island and could not respond.

Projections by naval personnel for Camden County within five years revealed expectations for commercial growth. Forty-two percent anticipated a vast increase in the amount of goods and services. Thirty-six percent expected a vast increase in population. Only 20 percent expected a significant increase in housing facilities in the county within five years.

The Impact of Attitudes on Development

The influence of attitudes on the outcome of development has been demonstrated by many researchers. Among old and new residents in a coal-mining town in Wyoming, Nellis (1974) noted that differences in attitudes about development are marked. In analyzing the impact of construction of the Alaskan pipeline on Fairbanks, Dixon (1978) found that local residents' attitudes toward the different types of newcomers determined acceptance or rejection of pipeline personnel.

Little (1977) perceives conflicts between oldtimers and newcomers as common in boom situations, resulting from the different values and cultural orientations of each group. Stereotyping and scapegoating are two manifestations of this conflict. Bates (1978) relates conflict between oldtimers and newcomers in boom towns to the stress of overcrowding, a changing environment, and social and psychological climate.

In communities undergoing military impacts, differences in attitudes between oldtimers and newcomers act as a barrier to incorporating newcomers into the community. Breese et al. (1965) noted that
attempts to incorporate military personnel into the community were not successful. Havighurst and Morgan (1963) concluded that, despite the magnitude of the impact associated with the naval shipyard in Seneca, Illinois, newcomers were not incorporated into the community and that in fact Seneca maintained its pre-impact institutions and behavior patterns.

In Camden County, the environmental impact assessment (Department of the Navy 1980c) dismisses the significance of conflicting attitudes and values of Camden County residents and the incoming naval personnel in a single sentence.

While friction between old and new value systems may exist, it has not been documented. [Department of the Navy 1980c: C-205]

Contrasting attitudes and conflicting values were, however, immediately apparent in interviews with both groups.

The attitudes of naval personnel

The attitudes of naval personnel about Camden County, its residents and base development are reflected in the results of the interviews with the sample of naval personnel in June 1980. When asked to describe what Camden County was like when they first arrived, 58 percent described the county in neutral terms: "rural," "undeveloped—like it is now," or "quiet." Twenty-eight percent described the county in more negative terms: "Backwards," "desolate," with "nothing to do," and a "company town." Sixteen percent described the county in positive terms: as a "pretty, nice place" with "friendly people."
When asked how they might describe the county to their best friend, more markedly positive or negative opinions were expressed. Thirty-eight percent of the responses were negative: along with the comments "desolate," "nothing to do," and "backwards" were added "like Mayberry" (referring to the television series depicting small town life), "the people are racist and redneck," "the air stinks," "there are too many bugs," and "a swamp." Thirty-three percent of the responses were positive: a "nice and pretty place" with "friendly people," and also "it reminds me of my home town." Thirty-six percent of the respondents were neutral: "small towns" and "rural."

The naval personnel largely view the Camden County community as "backwards." Many are quick to mention that people in Camden County are friendly, a fact exemplified by one officer as "everybody waves at everyone else." This impression, however, is mixed with negative perceptions of the county and its residents. The description of Camden County as "backwards," "desolate," and "rural" is often applied to the residents as well. One officer noted that people in Camden County were "living in 1930." Another officer felt that naval base development "will bring the 20th century to Camden County." An enlisted man recognized residents as having a "different lifestyle, not up with the times yet."

Another description of the county with negative connotations for residents is that of "small town." In this instance "small town" refers to small town values. One officer described St. Marys as a "Peyton Place. Everyone knows everybody else's business." An enlisted
man felt that this was manifest in residents' gossip. "None of my neighbors pay much attention. They rely on rumors [for information]. For example, all crime is blamed on sailors."

Many naval personnel also perceive Camden County residents as racist or "redneck." Of those interviewed, this perception was only noted among white naval personnel. One officer when asked how he would describe the county to his best friend said, "Watch out for the rednecks." Another officer described the county as exhibiting "considerable racism."

For one enlisted man racism was expressed in an incident at his home in the county. The enlisted man stated that one of his neighbors did not like his black friends visiting his home so one day the neighbor dumped black paint on the enlisted man's white car to demonstrate his displeasure. The enlisted man stated that his neighbor and some of his friends had told him that they were upset over his black visitors because "We work with them. We don't want them living with us or coming by where we live." Another enlisted man noted that racism among local residents could produce problems between the Navy and the community if "there's real civil rights or housing problems for black people in the service."

Behavioral and spacing differences among blacks and whites in Camden County do exist, but direct racial conflict is minimal to nonexistent. Blacks and whites cooperate at work, in politics, and in organized team sports, but generally do not live in the same areas or socialize together.
Black and white housing is generally segregated. Blacks, particularly in the rural areas of the county, tend to live in extended family groupings on contiguous tracts of land.

Although local schools are integrated, some white residents expressed concern that the quality of education was getting worse due to an increase in the number of black students. One white professional stated that the school situation would improve with naval base development "... because of more whites coming in to raise the educational standards ... [there are] fewer blacks in the Navy."

Although local blacks and whites work together, they do not socialize together except for those situations where a personal friendship exists. The churches that tend to be the social binders of the community appear to be segregated with the exception of the Mormon, Jehovah's Witness, and Catholic churches. One white community resident remarked that although she and her husband would invite his black co-workers to their house for parties, the blacks would never come. When asked why, she responded, "I guess they're afraid to. It's just not done here."

The lack of fraternity is most evident in the few recreation areas of the county. In St. Marys, for instance, a baseball field next to the elementary school, utilized by black and white children during recess, becomes the playing field for black children and teens after school hours. In the summer of 1979, however, some white sailors began using the baseball field. One white resident remarked, "It's pretty funny. Those sailors use that baseball field to throw frisbee or play ball and don't realize that it's the blacks' field."
Blacks are, however, involved in community leadership. The high school principal is black and one St. Marys city councilman is black. The first black county commissioner was elected in 1978.

Blacks and whites also play together in organized sports. At a high school basketball game, considered the major game of the season, Camden County and Ware County high schools played before a capacity audience. About 350 people, half black and half white, ranging in age from pre-school to retired, filled the Camden County high school gym. The intensity of the rivalry was due to racial factors. As one white resident explained, "Look at the skin tones." The Ware County team had only one black player on the floor, and all of the Ware County cheerleaders were white. The Camden County team had only one white player on the floor, and a mixture of black and white cheerleaders. The Camden County team won the game that night to the cheers of white and black Camden residents.

The perception of St. Marys as a "company town" evokes negative feelings among naval personnel. One officer described St. Marys as "... a company town. Everyone works for Gilman." Another officer characterized the county as "politically polarized" with "nondiversified industry." The assertion that "the air stinks" refers to the pulp mill emissions which the majority of naval personnel found offensive.

The perception of the county as dependent on the paper company justifies many naval personnel's view of the Navy as the community's salvation. One enlisted man stated that the residents he had met seemed pleased that the Navy came to Camden County because now "the grip
of the paper mill is broken." A number of naval personnel felt that the Navy would pressure the paper company to clean up its pollution. An officer noted that the residents he had met welcomed the base because it "creates competition with Gilman."

Interviews with naval personnel also revealed mixed feelings in the reactions of community residents toward base development. When asked, "What feelings about naval base development have local residents expressed to you?" 30 percent stated that the feelings were mixed, 30 percent positive, and 15 percent negative. Fifteen percent of the community reactions were classified as neutral and 11 percent of the naval personnel had experienced no contact with local residents.

Mixed feelings were described as "People want the change that will bring in business but they still want to keep the old home town." As one community resident stated, "I don't want the base, but I'll try to accept it as long as it doesn't affect my home and lifestyle."

Naval personnel consider base development to be good for the community because it weakens the grip of the paper company, yet they expect the Navy to take over the community in much the same manner. This change from "company town" to "base town" is considered beneficial. As one enlisted man stated, "The Navy will one day own the county, in terms of the mayor and other political offices." An officer noted, "I really feel that the military will take over the community. I think this is good. We've already infiltrated Kiwanis and other organizations." Another officer stated that "Navy-related people will bring pressure on the county politicians to spend money, and if they don't, they'll be replaced by Navy-related people."
The attitudes of community residents

While the impact of large-scale development projects on rural communities are typically frustrating for both oldtimers and newcomers, it is usually more painful for the oldtimers who experience the erosion of their way of life (Finsterbusch 1980: 140). The resentment expressed by oldtimers is a reflection of the disorienting changes they are experiencing (Bates 1978: 77).

In Camden County, the young, single enlisted men have a particularly bad image, one that will probably persist regardless of their actual behavior. One resident characterized the lifestyle of sailors as antithetical to community life. "There's too much drinking, partying... not ordinary living. Bars are more crowded than the grocery and churches." Another resident stated, "The Navy people coming in may be less than honest. They're not aristocracy." One couple expressed their impressions this way:

We [live in the country and] have never seen a sailor yet. At night time, they've said, that's when they [sailors] go out. ... They stay out there on the waterfront [in St. Marys] all night... [and] they just like to get and ride these back roads and find out where people live. ... [One friend of ours said] some sailors was riding on the [private] road and they found his trailer. They would have to be riding the road to come across his trailer and really they was trespassing. I think [the driving is] a result of boredom.

You can't hardly blame them coming off on leave and they get a few beers and they get in a car and all they want to do is ride around and drink their beer and just see what's going on.

But sometimes you wonder if they're on something else other than beer. You can never tell about that. That's what kind of worries me.

A resident explained his concern for the type of people associated with the Navy.
The only trouble is if we can keep a good kind of people. But now, when a lot of people come in, you don't know one another. You don't know, you don't know what. Now there's good people in the Navy out there, but I've always wondered one thing. You represent the United States government when you're in the Navy in a foreign country. So why do the foreigners hate us so?

In the Navy, there's stealing. They come here [to Camden County] and they're stealing. But now, all Navy boys ain't like that. There's a crowd of fishing people in the Navy out there. But it seems like that these boys that got into this dope business are in the Navy. How they got in the Navy I don't know.

Another resident had the following impression of sailors:

Well, I, you know, I was all enthused over it [the Navy] coming. I wanted something done with Kings Bay. Since we got it, I'm disappointed in some of the people that's come in...

We got the mushroom seekers and the cow rustlers that trespass. They just walk in and take over. They all came out of this Navy bunch.

Conflict, tension, and mixed feelings were expressed by residents in both the 1979 and 1980 interviews. Underlying these mixed feelings is an element of patriotism and a desire for cooperation tempered by a concern for maintaining community life. The patriotic sentiments of Camden County residents are evident in their positive responses to base development communicated to naval personnel. As one enlisted man stated, "Most people are 'flag-wavin' patriots that are glad to have us."

Traditionally, the South has been pro-military, a sentiment reinforced by the number of military bases located in Southern states. As mentioned earlier, in 82 percent of the Camden County families interviewed, at least one member had served in the military. Patriotic sentiments have been fostered by Navy actions, such as initiating Memorial Day Services and organizing a Navy League Chapter in Camden County to develop community-based support of national defense policy.
International developments in 1979-1980 and increased concern for national security enhanced these feelings of patriotism and "softened" local residents' attitudes toward the presence of the naval base. The seizure of the American Embassy in Iran on November 4, 1979, and especially the Soviet invasion of Afghanistan on December 26, 1979, crystallized a feeling of duress in the county and the country as a whole. As noted by Havighurst and Morgan (1963) and Breese et al. (1965), local communities are more supportive of military presence when external threats are manifest.

In Camden County this support was reflected in residents' responses to the interview schedule. In 1979, 5 percent were concerned about the "danger of a nuclear accident or being a strategic target in the event of war," yet only 1 percent expressed this concern in 1980. Similarly, while no one mentioned "better national security" as a positive outcome of base development in 1979, 2 percent mentioned it in 1980. Sentiments of support were usually expressed as, "I'd really prefer the base not to be here, but I realize we have to have it." One resident interviewed shortly after the Soviet Union invaded Afghanistan felt that people in Camden County now recognized the base as important to national security. "We know it's essential in the national defense, but it's dangerous."

Expressions of patriotism were most evident at the public hearing conducted by the Navy at the Camden High School auditorium in June 1980. Positive sentiments and support for the naval base were expressed by local residents, particularly county and local officials. The public
hearing was widely perceived not as a formality, but as a symbol of the Navy's cooperation with the community. As one resident commented at the hearing,

The cooperation between the City of St. Marys and Camden County and the Navy up to this point, I think, has been exemplary. I think we have been good neighbors. We have had cooperation from the Navy and we have tried to give our cooperation as citizens. I think most people in this community are for a strong military. I also think that most people in this community are willing to make sacrifices to insure that our military remains strong...

I have been in places where a hearing like this would be absolutely unheard of... And I am glad that you, the Navy, are helping to preserve the right of us to make these comments to you tonight. [Department of the Navy, Department of the Army 1980: 52-53]

Statements of opposition to nuclear power presented by individuals from outside Camden County were not well received by some local residents. The speakers were characterized as "outsiders," "unpatriotic," and possibly "communist." One county resident responded emotionally,

My red American blood is beginning to rise. I cannot sit back there idly as I see groups coming from outside of the area into our community; I have been a resident here for approximately 28 years and my foreparents for a hundred years. Let me tell you right now we are not afraid of what might come; I'd rather be dead than red. [Department of the Navy, Department of the Army 1980: 90]

Much of the residents' concern over base development is subsumed in a general uneasiness concerning the increasing role of the federal government in their lives. The Kings Bay base is often lumped together with the National Park Service as "the government." The government is seen as rapidly monopolizing the land and resources of Camden County.

Community resentment concerning the National Park Service's operation of Cumberland Island National Seashore intensified in March
1980 when the National Park Service moved to acquire substantial areas of Cumberland Island that had remained in private and state ownership.

The public hearing for the land acquisition was held on Cumberland Island from 1 to 4 p.m. on Friday, March 21. The very location of the hearing made it suspect to local residents. The National Park Service stated that it arranged the hearing on the island "because we thought the only ones interested would be Cumberland Island land owners" and only expected to use a small work boat to transport mainland residents to the hearing (Respess 1980a).

A number of residents felt that the National Park Service chose the island as the locale for the hearings in order to insure a low turnout and thus no opposition. One resident complained, "If this thing would have been held in St. Marys or the courthouse in Woodbine, you'd have 2- or 3,000 people" (Pierce 1980). The day and time of the hearing were inconvenient for working residents.

About 90 residents attended the public hearing and voiced opposition to the acquisition of beaches, marsh, and tidal creeks on the grounds that it would hinder fishing, boating, and other recreational activities as well as commercial shrimping (Pierce 1980). The National Park Service stated, however, that local access to the waterways would not be affected because "we have recommended that the creeks not be closed . . . but what happens after this is up to Congress" (Pierce 1980).

The Camden County Commission and the cities of St. Marys and Kingsland presented resolutions conveying their opposition to the acquisition plan at the hearing (Pierce 1980). One commissioner stated
that he preferred the waterways to stay in state hands rather than go to the federal government: "I certainly trust the state more than the federal government" (Respess 1980a). One St. Mary's city councilman stated, "It's frightening. . . . They took the island, they're coming this way fast. What's next? . . . We have created a federal monster" (Respess 1980b). Another councilman concurred: "Here the U.S. comes and attacks us with the sub base. And now, they took the whole danged island. I ain't never seen such a bunch of hogwash as is going on over there" (Respess 1980b). A third councilman was also against the acquisition: "We need to continue the stand against anything that is going to corrupt our community. We are really approaching communism if we continue to let the government step over us" (Respess 1980b).

Although the acquisition of state lands has been temporarily postponed, the public hearing created negative, residual feelings about the National Park Service. The grievances with the National Park Service are long-standing and began with the initial take-over of the island in 1972. Seven percent of the residents interviewed in the summer of 1979 expressed resentment of the National Park Service when questioned about the possible effects of base development on Cumberland Island.

Following the public hearing controversy, unsolicited expressions of resentment concerning the National Park Service were recorded among 16 percent of the survey sample, a 9 percent increase in such comments over 1979. The operations of the National Park Service and the development of the Kings Bay Naval Base are related in the minds of many residents concerned about increasing federal control of Camden County land. As a city attorney stated at the public hearing,
I have found the National Park Service to be the most arrogant people on earth. The [original] bill does not mandate the government buy all the land on Cumberland Island. They've accomplished their purpose. I'm afraid, with the Navy condemning land, that we are going to wake up and find the government owns all of Camden County. [McDonald 1980]

Adverse shifts in attitudes are common among community residents during the course of large-scale development. Community residents are generally "... favorable toward projects before they occur, but their attitude worsens when the project gets underway" (Finsterbusch 1980: 140). Gilmore (1976: 536) cites four common phases of attitudes associated with boom development: (1) enthusiasm with anticipation of economic growth that will revitalize the small town and keep the young people from migrating out of the community for employment; (2) uncertainty, particularly among elected officials, as to the community's ability to meet the new growth needs; (3) near panic over the gap between revenue available and expenditures demanded by the new growth; and (4) a problem-solving attitude to deal with the problems associated with development.

Camden County residents and local officials during the 1979-1980 period have experienced the first two and to some degree the third of these attitude phases. Despite a guarded optimism that Camden County will not undergo immediate disruption as a result of a sudden population influx, the attitudes of community residents concerning the ultimate effects of naval base development have become increasingly pessimistic.

When the Camden County households that were interviewed in the summer of 1979 were interviewed again a year later, several changes were
evident in their responses. While no one had mentioned drug problems or crime associated with base development in 1979, 17 percent did so in 1980. Seventeen percent mentioned that there were more strangers in town as opposed to only 7 percent reporting that observation in 1979. The percentage of respondents noticing an increase in commercial development rose from 16 percent to 27 percent. Four percent attributed changes in local government to base development, up from 1 percent in 1979.

Only 12 percent reported an increase in housing construction in 1980 as opposed to 28 percent in 1979, reflecting the housing slump. The work on roads had also decreased as only 7 percent noted new road construction, whereas 21 percent mentioned it in 1979. Increases in taxes and rising prices appeared to have slowed as well, with only 6 percent mentioning these as consequences of base development, compared to 13 percent in 1979.

The primary concern of Camden County residents regarding naval base development expressed in the 1979 interviews was overcrowding and the potential loss of small-town atmosphere. The slow development and the low visibility of sailors in the community soon alleviated these fears. Some local residents perceived the slow development as controlled growth. The high visibility of naval officers and their families who conformed to community standards of behavior had reassured many community residents that the influx of naval personnel would not drastically alter their way of life.

An increase in crime had made a profound impression on county residents. In the 1980 interviews 34 percent expected more crime with
base development whereas only 22 percent had expressed this concern in 1979. A rash of break-ins, drug-related incidents, and two highly publicized child molestation cases were universally attributed to naval personnel.

When asked, "What good things will occur in Camden County with naval base development?" 11 percent in 1979 and 15 percent in 1980 could not foresee anything good occurring as a result of base development. In comparison, when asked, "What bad things will occur to Camden County with naval base development?" 14 percent responded "Nothing bad" in 1979; only 9 percent so responded in 1980.

One resident, who in 1979 foresaw no bad effects had changed his mind in 1980. "I don't like it a bit. I liked the town small. I don't care for the big influx of people." Another resident concurred: 
"[We] settled and moved to a small town because [we] wanted to live in a small town. [It's] getting too big. I'm biased because that's my choice. [I] would prefer it to stay that way." One resident reported crime and overcrowding as a result of base development. "We're moving out into the country to stay away from it all." Another couple expressed a similar view.

[With all of this development] around here it's just going to be a city or suburbs. I'm not used to that. I've got to go to the woods somewhere. . . . I'm not going to leave Camden County. . . . I like people but I would prefer to live [in the country]. We're not city. We live in the country. I've got to be out there with my cows.

One resident felt that "criminals, not only sailors but other people coming in because of the Navy" were a definite threat to the community. "Crime and the types of crimes such as child molesting now
were never happening before." Other residents cited "honky tonks," "hoochie koochie," prostitution, and drug use and abuse as "bad things" associated with base development.

A shift in community attitudes is most evident in a year to year comparison of the changes in the community attributed by residents to base development. When residents were asked in 1980, "What changes in Camden County can you identify at present which you feel are related to the development of the Kings Bay Naval Base?" significantly more negative responses were recorded than in 1979. Negative responses included increased crime or drug problems, higher cost of living, an increase in traffic accidents, and more strangers in town. Correspondingly, the proportion of positive or neutral responses, for example, increased housing and road construction or commercial development, was lower in 1979.

In order to determine if this change in the proportion of negative to positive or neutral responses is statistically significant and not attributable to random change, the 1979 and 1980 responses were analyzed by the McNemar Test for Correlated Proportions (Mendenhall, Ott, and Larson 1974: 337-339). The McNemar test is a variation of the chi-square test designed specifically for panel surveys. Because the same households interviewed in 1979 were interviewed again in 1980, the responses recorded in the two surveys are not independent; the respondents' attitudes in the second survey are logically influenced by the attitudes they held the year before. The McNemar test assesses the significance of change between such dependent variables (Mendenhall, Ott, and Larson 1974: 337-339; Thomas 1976: 298-301).
The null hypothesis subjected to analysis was that an increase in positive or neutral responses was just as likely after one year of base development as an increase in negative responses. The test result allows rejection of the null hypothesis at a probability level of .05, indicating a significant, nonrandom increase in negative attitudes toward base development by the end of the first year.

The role of attitudes in the future of Camden County

Base-related development in Camden County is still proceeding slowly, beset by many of the problems evident during the 1979-1980 field research. Indications of conflict and tension among residents that were manifest during the first year of base development may intensify as the implications of base development are realized.

Underlying the attitudes of the community and Navy towards each other is the problem of stereotyping. As in many development situations, attitudes and behavior of the ingroup are influenced by commonly held stereotypes of the outgroup.

Havighurst and Morgan (1963) provide a striking example from war boom development in Illinois during World War II. The local residents referred to the newcomers as "all those Southerners" and "that poor white trash from the South" despite the fact that the majority of newcomers were also Midwesterners. Seventy percent were actually from Illinois; only 15 percent of the newcomers were actually from the South (Havighurst and Morgan 1963: 89). This stereotype, however, succeeded in separating oldtimers and newcomers during the four-year boom and contributed to the community's resistance to change.
That contact between naval personnel and community residents has been limited is demonstrated by a common reliance on stereotypes. Hopefully as interaction between the community and the Navy increases, these stereotypes will yield to more realistic attitudes. If not, the situation could become much worse as more naval personnel enter the community.

The Navy's revised plans of developing the base as self-sustaining, in response to the slow growth of housing and services in the community, has been intended to lessen the demands on the community. Yet the move has incurred some resentment on the part of community residents.

The revised plans for base development include 1,200 on-base housing units for naval officers, enlisted men and their dependents, quarters for 1,300 single naval personnel, and medical, shopping, recreation, and entertainment facilities (Department of the Navy 1980a). Base facilities offer goods and services at reduced or no cost and are benefits that service people are entitled to as part of their total compensation. Their use by civilians or by naval personnel for civilians is illegal (Ebbert 1977).

Local residents have perceived the Navy's plans to make the base self-sustaining as unwillingness to cooperate with the community. Some residents have expressed resentment at the thought of naval personnel having better support facilities on the base than residents enjoy in the county. They view the base as supported by tax money and wonder why they shouldn't be able to reap the benefits of these facilities. In both 1979 and 1980, the "good things" expected to occur in the county
as a result of naval base development were an increase in competitively priced goods and services. A self-sustaining base, however, decreases the probability of commercial development envisioned by local residents.

A final area of potential conflict is between the community leaders and the professionals brought in from outside the county to help manage the change. These include planners, particularly those at the Kings Bay Impact Coordinating Office (formerly the CAPDC) and newly appointed city and county administrators. Tension among these groups was first noticed during field research in 1979. Several established political leaders privately expressed resentment at the influence of professional planners from outside the community and perceived them to be a threat to local government. These tensions recently culminated in November 1981 with the firing of the county administrator, a professional planner hired in 1979 to coordinate development plans (Schneider 1982: 28).

Robbins (1979) and Bowles (1981) have stressed the importance of outside experts in advisory or advocate roles to communities undergoing impacts. Lynch (1970) emphasizes their importance in community revitalization after military bases withdraw. Yet conflicts may result where planners overstep their bounds as advisors and become decision makers (Bowles 1981).

The planners in Camden County have been important in providing community leaders with information and recommendations to make decisions about the impact of base development. Conflicts, however, have developed when planners have left their advisory roles as consultants in
the community to assume the political roles of county administrator, city manager, or city administrator.

If planners confine their roles to advisor and keep from becoming involved in local politics, some of the conflict will subside. As the community leadership becomes more politically effective the perceived threat of outside experts will further subside.

The Future of the Community: Three Scenarios

Based on the results of this research and similar case studies, a number of scenarios can be postulated concerning the ultimate outcome of base development. Scenarios are a useful forecasting technique. Their real value, however, lies in their ability to influence the everyday decisions that determine the course of growth.

A scenario then is a synoptic view of developments that appear relevant to a particular situation or setting; it is an imaginative narrative of possible alternative futures based upon assumptions and analyses regarding trends and events. By examining a number of alternative scenarios one can seek to identify significant future consequences that may affect current decisions to proceed or not with a given public project. [Vlachos 1977: 211]

The officials and administrators involved in the planning process in Camden County can influence the outcome of development through their decisions. The scenarios presented below recognize that the change process is not unidirectional and that Camden County has an opportunity to control and shape its growth.

The three scenarios posed are (1) Independence; (2) Dependency; and (3) Displacement. The Independence scenario views the community and Navy as separate but equal. In this case, the community would
become more cohesive, maintaining many of its original institutions and managing to conserve much of its former lifestyle. The community would refrain from becoming economically dependent upon the base. The Navy in turn would develop its own support facilities on base and naval personnel would maintain a low level of influence on the political and social life of the community. The Independency scenario is possible only in a situation of gradual growth, thus allowing the community time to control the growth to some extent.

There are signs of an Independency scenario developing in Camden County. The growth to date has been gradual. The community has become more cohesive. The Camden County Historical Society has become increasingly active since the base was first proposed. The downtown area of St. Marys has been zoned an historic district, effectively limiting the development that can occur there. The organization of a Historical Society and the zoning of an historic district are two means of preserving community identity and lifestyle. The move by the Navy to become self-sustaining is a further step toward achieving the Independency scenario.

Many residents in Camden County prefer the idea of maintaining a separation between themselves and the incoming population. Intensification of voluntary associations and community traditions is one way of accomplishing this purpose. Some residents, in fact, noted that one of the good things resulting from naval base development was that it had brought residents closer together. As one woman stated, "There's strength in unity. I think the Navy will keep to themselves."

When faced with a war time boom, the residents of Seneca, Illinois, maintained a distinct, viable community in much the same manner
(Havighurst and Morgan 1963). Despite nearly a 900 percent increase in population, the town managed to maintain its identity. In this case, however, the duration of shipyard operations was brief, only four years. Presque Isle, Maine (Lynch 1970), a community economically dependent on a nearby Air Force base, successfully adapted to base closure by asserting its independence. Securing the base facility for industrial and recreational use and developing its available resources to attract new industry assured the rapid recovery of the community.

The second scenario, Dependency, would be most likely to occur in a situation of rapid change where the population influx is so great that the community is overwhelmed. This scenario depends upon the ready availability of housing and institutions to service the Navy. Naval personnel would become incorporated into local life and within a short time dominate the community. The former identity of the community would be lost and a new identity forged. The community might, in this instance, maintain a symbol of its former identity through rituals.

The obvious changes associated with the Dependency scenario are that the community will expand economically, politically, and socially. The community would become more cosmopolitan in outlook and lifestyle. For old-time residents, however, these changes would be disruptive.

The Dependency scenario is the most common response to military base development (Breese et al. 1965; Lynch 1970). Even with a self-sustaining base, the community must develop the housing, entertainment, recreation, and transportation facilities necessary to service the incoming population. Herein lies the danger of the community becoming
economically dependent on the base and failing to diversify its economy.

Adverse effects would result should the Navy decide to close the base or cut back funds. Base closings are relatively common. A base closure in a community that has established a dependency relationship would leave an economic vacuum.

The Dependency scenario is illustrated in Seneca County, New York, where the Air Force established a training center (Breese et al. 1965). Seneca County concentrated its developments on the housing, commercial, and public services for the military population despite the expressed concern of military and civilians that the county develop other sources of revenue. As a result commerce in the area suffered when the base eventually closed because the county failed to diversify its economy.

Of the 12 communities undergoing base closures cited by Lynch (1970: 231), only two attempted to diversify their economies before the base closed. The other communities had developed an economic dependency on the base which only frustrated their efforts at economic recovery when the base withdrew.

Evidence of a Dependency scenario is found in the Navy's original plans for development. The Navy initially anticipated that Camden County become a base community just as the Air Force expected for Seneca County. Camden County would provide the housing and services for the incoming naval personnel. A number of economic and political constraints postponed this process, at least in the first year of development.
The third scenario is one of Displacement. In this scenario, the population influx and change process are rapid. The cost of living skyrockets. The community has little or no control over the growth, and institutions cannot handle the demands for services. Uncontrolled growth depletes the natural resources that are exploited locally. In Camden County, these resources are the fish, game, fruits, and vegetables that are produced and procured through fishing, hunting, and gardening. The self-sufficient lifestyle of local residents is replaced by the economic constraints of a market economy.

The result of the Displacement scenario is that many local residents either cannot afford or do not wish to continue living in the developing community. These residents either seek familiar surroundings in an undeveloped area of the community or relocate in a community similar to their own.

There have been signs of a Displacement scenario in Camden County as increased taxes force some of the elderly and poor out of their homes and off their land. Remarks by other residents indicate their desire to escape the developing areas. Development in the county will transform the country into the city. These residents want to preserve their self-sufficient way of life even if it requires relocation.

It is strongly recommended that Camden County pursue economic and political self-sufficiency as depicted in the Independency scenario. Given the propensity of military bases to eventually withdraw and the adverse impacts of such closures, particularly in rural communities, maintaining community independence is a logical course of action. The
means of attaining community independence and other general recommendations are presented in Chapter V.

Summary and Conclusions

Camden County is a rural community undergoing the impact of a military development of boom town proportions. As such the course of change and some of the problems associated with boom towns are predictable. However, others are unpredictable. According to Finsterbusch (1980: 160), "... be prepared for surprises."

The surprise in Camden County was the fact that the boom of development did not occur in the first year to the extent expected. The surprise was not anticipated by the environmental impact assessment (Department of the Navy 1977a,b), the planners, or the community but it is explained through the results of this social impact assessment for Camden County. Recognizing that an adequate social impact assessment of the community requires specific baseline information, a baseline for Camden County was prepared through literature and field research.

Naval base development initially depended on the Camden County community to develop the housing and services of the incoming population. Housing and commercial development did not occur to the extent needed to meet demands. The depressed construction industry and housing market, land ownership patterns, and uncertainty surrounding base development largely precluded community residents from investing in development. As a result of the slow growth in 1979, community residents in 1980 tempered their expectations of development to accord with the
experiences in 1979. Naval personnel, however, perceived the magnitude of the impact as just beginning to unfold.

The Navy constitutes a community of newcomers that differs significantly from the Camden County community. The research documents manifestations of one hypothesis of change: that base development will result in conflict between oldtimers and newcomers.

Attitudes of naval personnel and community residents are quite different as their perceptions of each other are fraught with stereotypes. Stereotypes result from the limited contact between naval personnel and community residents. While the naval officers are highly visible in the community and accepted by community residents, the invisible enlisted men are viewed with fear and distrust.

Potential conflicts between the Navy and the community may erupt from these commonly held stereotypes. An adverse shift in community attitudes toward base development has been demonstrated here. Caught in between are other outsiders, planners, and county and city administrators and the National Park Service who serve as scapegoats for community dissatisfaction and frustration.

As this chapter has illustrated, development projects involve the impact of people upon people. As such the human environment deserves as much attention in the environmental impact assessment process as the physical environment. Social impact assessments require the theoretical and methodological approach of the social scientist, particularly field observation and survey research.

Through direct personal contact with the developer and the host community the researcher can see both sides of the situation and begin
to understand the lifestyle and attitudes that distinguish the host community from the incoming population. Only with this understanding can the researcher gauge the magnitude of the development project's impact on the community and its members. Furthermore, this perspective can enable the researcher to identify potential problems that might develop and suggest ways of remedying conflicts that will be satisfactory to both parties.

A social impact assessment that represents people in its findings allows the community to have input into the development project. This makes local residents feel more in control of their destiny and not pawns of a system that operates above them. Community input can better direct the course of development. This viewpoint stresses the importance of planning "development from below" (Pitt 1974). Besides, the stated goal of environmental impact assessments is to identify the populations to be affected by the development project, to predict the range of consequences on those populations that will result from the various courses of action, and to suggest ways to mitigate adverse effects of these consequences. What better way to do this than to consult those parties directly involved in the proposed action: the developers and the community.
CHAPTER III
THE IMPACT OF DEVELOPMENT OF THE COMMERCIAL FISHERY

Fishing in the Camden County area has been an activity of major importance since prehistoric times. Developments in the 20th century, however, have adversely affected marine resources and fishing activities. Two major impacts, the pulp mill and now the naval base, have relegated fishing in Camden County to a minor role.

This chapter analyzes the impact of naval base development on one aspect of Camden County's local economy: the commercial fishery. Commercial fishing is a viable and persistent part of Camden County's economy, having provided a livelihood for many residents for over 70 years. Commercial fishing in Camden County fits Baks and Postel-Coster's (1977: 24) category of a small-scale fishing activity: work units are small; boats are less than 80 feet; fishing is usually pursued in inshore waters and trips last less than a week; harbors are small; boats are owned individually or jointly; fishermen feel attached to their community; and much of the fishing venture is based on family relations or personal ties.

The significance of the commercial fishery to the local economy is somewhat overshadowed by the pulp and paper industry. In considering the impact of base development on local industry, the environmental impact assessment and county planners' reports emphasize the pulp and paper industry and, to a lesser extent, the chemical and pesticide
industry. The environmental impact assessment simply concludes that the commercial fishery will decline as a result of the disruption of the Cumberland Sound estuarine complex (Department of the Navy 1977a).

The historical development of commercial fishing and its present significance in Camden County is presented through oral histories of elderly residents and retired fishermen, interviews with the present manager-owners of the three shrimping firms who are shrimpers themselves, and fishery statistics compiled by the Department of Commerce. Parallels are drawn with aspects of other modern fisheries recorded in the maritime anthropological literature.

Essential to the operation of the commercial fishery, the pulp mill, and the naval base is the estuary. Commercial shrimps and finfish exploited by Camden County fishermen depend upon the estuary for at least part of their life cycle. The productivity of the fishery is dependent upon the integrity of the estuary. Fishing is a "capturing or gathering" activity (Hewes 1948) that is relatively nonpolluting. The operation of the pulp mill and naval base also rely on the estuary, but their concentrated effects pollute or otherwise adversely affect the productivity of the estuary which in turn affects commercially valuable estuarine resources. Thus the biological impact of the pulp mill and the naval base is examined here as well as the biological cycle of estuarine resources, particularly menhaden and the commercial shrimps. These sections illustrate the fragility of the estuary and the marine species that depend upon the estuary.

An important aspect of the history of commercial fishing in Camden County is the relationship of the fishery to the pulp and paper
company. The analysis of the impact of the pulp mill on the commercial fishery provides a basis from which to analyze the impact of naval base development. The establishment of the Gilman Paper Company mill in 1940 created an economic boon similar in many respects to that expected to accompany base development. The operation of the mill, however, adversely affected estuarine resources, with resultant changes in the commercial fishery. The relationship between the pulp mill and the commercial fishery is further illustrated by the analytical and predictive technique of energy modeling. Comparing the results of the energy model based on historic production data with the actual production rates illustrates the utility of this technique.

The effect of base development on the commercial fishery will be similar in many respects to that of the pulp mill. The naval base will provide an economic boon to Camden County greater than that of the pulp and paper company. Its operation also requires use of the estuary and signals adverse impacts on estuarine resources, with implications for the commercial fishery.

**Anthropological Approaches to Commercial Fishing**

Anthropological approaches to commercial fishing have traditionally focused on the means of fishing rather than the community in which it occurs.

... The significant contributions of the anthropology of fishing have stemmed from studies focusing on the way that human beings have adapted to earning a living in the marine environment. Most of the contributions of this field have been made by anthropologists studying what happens on board ships and in the fishing industry—not by shore-based studies of fishing communities. [Acheson 1981: 275-276]
Lack of concern with the community context of fisheries probably stems from the common assumption that fishermen are marginal natives, "a denigrated if not despised segment" of the community population (Smith 1977: 8). Due to the periodicity of their occupation, it is thought that fishermen are not active participants in community politics or religion (Smith 1977: 8; Acheson 1981: 277).

The typical perception of fishermen as a denigrated and despised segment of the community, "rough and ready spendthrifts" (Pollnac, Gerunsy, and Poggie 1975) with little or no social and economic mobility and little interaction in community affairs is inappropriate for the commercial fishermen in Camden County. Camden County fishermen are happily tied to their community; some, in fact, are community leaders and elected officials. Commercial fishing actually affords considerable economic and social mobility.

In a comparison of fishermen and millworkers in New England, Pollnac, Gerunsy, and Poggie (1975) conclude that fishermen can defer gratification more readily in order to accumulate the capital to buy a boat or other means of production which insure their success as fishermen, are more positive in their outlook, and perceive more control over their future than land-based millworkers. So, too, for fishermen in Camden County is this more positive viewpoint appropriate.

Anthropological studies of fisheries applicable to analyzing the impact of naval base development on the commercial fishery in Camden County include those that examine the impacts of technology, industrial development, and modernization on fisheries (Alexander 1976,

The fishing described is small-scale and "traditional" in that

... private ownership of boats and personal ties in business relations prevail. The fisherman is no wage worker; his income and his success in life depend directly on his individual performance, technical as well as social. For skippers, in particular, great emphasis is laid on their personal skills as fishermen, as leaders of the crew, and on their commercial ability. Part of the traditional background sketched above has maintained itself in spite of changing circumstances. [Baks and Postel-Coster 1977: 30-31]

Development of the oil industry along the Scottish east coast, begun in the 1960s and 1970s with the encouragement of the government, was expected to bring employment and wealth to Scotland directly and to stimulate further economic growth with its operational demands for secondary service industries. The fishing industry was expected to decline as fishermen sought jobs with the oil companies. This prediction proved erroneous, however, as the fishermen continued to fish.

The predictions seem to have been based on naive assumptions concerning the temptation of high-paying jobs and to have overlooked noneconomic factors such as the social consequences of contractual relations and the loss of a feeling of
independence. In other villages there was no mass participation either. Profits in the fishing industry reinforced social motives; a fisherman can earn a good amount of money these days. [Baks and Postel-Coster 1977: 34]

The operation and expansion of the oil industry has produced concern among fishermen. Access to developed fishing harbors, congested by oil tankers, may be restricted for the smaller fishing boats. Offshore drilling debris left on the sea floor can damage fishing nets. Pollution resulting from oil spills or other operational accidents can endanger the fishing grounds (Baks and Postel-Coster 1977: 34).

Befu (1980) reports a similar situation for the fishing villages along the Inland Sea of Japan. Originally the Inland Sea coast was a string of fishing communities, a "maritime treasure . . . as well as the most scenic area of Japan" (Befu 1980: 334-335). Extensive industrial development of the Inland Sea since World War II has disrupted the fishing habitats, restricted the fishing territory of local fishermen, and polluted the waters, rendering the fish inedible (Befu 1980: 336).

Governmental regulation of coastal activities often promotes industry at the expense of commercial fisheries. Befu's (1980) study demonstrates that government plans to encourage industrial development can result in irreparable harm to fishing communities. Government neglect of fishery interests in this case was apparent in the support of land-fill programs that reduced fishing territory, the practice of buying fishing rights from fishermen where industrial growth was planned, and the enactment of laws granting navigational priorities to larger commercial vessels and restricted fishing boats from certain navigation
courses. Fishermen had no input in government decisions and thus had no control over the impact on their livelihood (Befu 1980: 336-345).

Fishing interests are most often neglected because fishermen pose no cohesive, political threat. Fishing is an independent pursuit that attracts independent followers. As one fisheries scientist and administrator stated,

The fishing industry of the United States . . . consists of many small more or less independent segments, few of which are of dominant importance locally. Therefore, when urban or industrial development impinges upon fishery interests, the fisheries often suffer. [Warren 1971: 7]

Governmental attempts to benefit commercial fisheries have produced mixed results. Fisheries in industrial nations are regulated by marine policy designed to reduce competition between fisheries and conserve fishing resources. The need for fisheries management is based on the premise that, because fish are "common property," fish stocks can be easily depleted by overzealous fishermen who tend to overexploit fish resources (Acheson 1981: 301; McCay 1978: 398).

Fisheries throughout the world are characterized by a persistent and, in some cases, disastrous tendency toward overexploitation. The most important and widely accepted cause is the common property or "open access" nature of legal rights in the marine environment. In the absence of ownership, fishermen have no incentives to curtail fishing activities in response to declines in catches or increases in costs, because no property right guarantees that fish not taken today will be available in large quantity or at greater weight in the future. What one fisherman does not catch today simply goes to the other fishermen. [Acheson 1975: 183]

Overexploitation thus results in a "tragedy of commons" (Hardin 1968) in which fishermen deplete the very resources on which they depend. Since fishermen are presumed incapable of regulating their
behavior in order to conserve marine resources (McCay 1978), the
government feels compelled to intervene and regulate the fishery

Anthropologists concerned with marine policy have questioned
these assumptions. Oceans and marine resources are not universally
viewed as common property and fishermen are known to regulate their
fishing behavior in order to maintain their resource base. Forman
(1967) maintains that Brazilian raft fishermen practice secrecy to
establish property rights and prevent their fishing grounds from being
overfished. Acheson (1975) notes that lobstermen in Maine establish
property rights and that "perimeter-defended" lobster territories are
highly self-regulated, a practice which conserves lobster resources.
Indicative of successful self-regulation and conservation is the fact
that the number of lobsters as well as the size of lobsters increases in
perimeter-defended territories.

The involvement of anthropologists in marine policy has increased
since the passage of the Fisheries Conservation and Management Act of
rights for American fisheries in that the United States assumed juris-
diction over fisheries extending 200 miles from shore (Acheson 1981;
Mangone 1977). Permits for foreign vessels to fish within this zone
must be approved by the Secretary of Commerce (Mangone 1977: 158).

The Fisheries Conservation and Management Act also established
eight regional councils among the coastal states, which draw up the
fishery management plans subject to the approval of the Secretary of
Commerce. Fishing within the United States three-mile territorial sea is not affected by the Act but is regulated by the individual states.

[The regional councils] are required to seek "optimum yields" in their conservation and management efforts, manage each stock as a unit over its range, promote efficient use of resources, and seek to minimize costs. The councils were expected not only to describe the fishery, but assess its present use and future condition, with its maximum sustainable yield and optimum yield, and to judge to what extent American fishermen might harvest the fishery and what portion of the optimum yield might be left for foreign fishermen. [Mangone 1977: 157]

The difficulty in fisheries management lies in defining the optimum sustainable yield and enforcing a quota law. Acheson maintains that the regional councils frame their plans in terms of maximum sustainable yields rather than optimum sustainable yields, thus disappointing both fishermen and biologists (Acheson 1981: 304).

How do fishermen react to government regulation, and how effective are government management plans? McCay (1981) analyzes the results of a 1920 New Jersey law that forbids the use of purse seines, otter trawls, and similar commercial gear for catching "food fish" within 4.8 kilometers of the coast. Although originally designed to conserve diminishing fish stocks, the law actually favored affluent sports anglers over commercial fishermen.

Like most restrictive legislation, it was initiated at a time of resource decline and hence done in the name of conservation. However, it was passed by the legislature because of sports-anglers' interests in reducing competition for fish and fishing space. It has remained on the books because of these interests, despite increasing recognition of its tenuous relationship to fisheries conservation. [McCay 1981: 373-374]
The reaction of fishermen to the legislation was to ignore the law and continue their fishing activities illegally. The state's attempts at enforcement further antagonized the fishermen. Today, distrust and animosity characterize the relationship between the state and fishermen and make it difficult for the state to develop and enforce other fisheries management plans (McCay 1981: 374).

Löfgren (1972) reviews the impact of government regulations on inshore fisheries in Sweden. When government restrictions on inshore trawling were removed during World War II, large trawlers invaded the shallow waters and displaced local seiners (Löfgren 1972: 89).

Miller and Van Maanen (1979) examine the results of an enforced "optimum yield" law in Gloucester. Many fishermen ignored the law and exceeded the quota. Attempts to enforce the law produced conflict among fishermen and the government regulatory agents.

**Commercial Fishing in Camden County**

The economic development of Camden County is related to the nearby coastal communities of Nassau, Glynn, McIntosh, Liberty, Bryan, and Chatham Counties in many respects. These coastal communities have characteristically supported two basic yet competing industries: the fishing industry and the pulp and paper industry. The productivity of marine resources has fostered the development of a commercial fishing industry based primarily on the exploitation of a single genus—shrimp. The low-lying, sandy soils of the mainland were uniquely suited to the extensive development of the pulp and paper industry.
The competition between these two industries stems from the reliance of each upon the water resources of the estuarine system as well as the community labor resources. The paper mills, which require tremendous quantities of water for paper production and waste disposal, are located along rivers within the estuarine system. To the fishing industry, the estuary was initially the principal source of shrimp. Since then, the fishing industry has relied on the productivity of the estuary to complete the life cycle of commercial shrimp and ultimately produce adult shrimp for the catching.

Commercial fishing was the first industry to develop in the Barrier Island Region. St. Marys and Fernandina were economically tied in this respect. Commercial shrimping which first began in Fernandina encompassed St. Marys. Even today, some Fernandina shrimpers are employed on St. Marys-based boats and vice versa. St. Marys and Fernandina shrimpers share a single inlet, the St. Marys Entrance, for access to their respective ports. St. Marys and Fernandina shrimpers "fish the same grounds" according to one shrimper.

The majority of the coastal towns of the Barrier Island Region now contain paper mills. Fernandina, once the locus of a major shrimping industry, now has two paper mills that front the water. The pulp and paper industry has expanded at the expense of the fishing industry (Johnson et al. 1974). The highly visible paper industry has overshadowed commercial shrimping in many coastal towns. One St. Marys shrimper expressed this in his assessment of Fernandina.

"... It's still a big shrimping industry, but since then this paper mill came, you know. That was the next biggest thing in the history there. ... In fact, they have two
mills over there and that just boomed, boomed, boomed right on up. And that ended the shrimping business [in Fernandina].

Examination of the history of the fishing industry through analysis of statistical data, historical documents and interviews with fishermen and local historians reveals two commercial fishing ventures in Camden County: menhaden fishing and shrimping. Menhaden fishing is an "industrial fishery," producing nonfood products. In addition to shrimp, commercial shrimping includes a number of other edible species: various finfish, crab, and, most recently, scallops.

**Menhaden Fishing**

Menhaden fishing accompanied the development of a Savannah-based fertilizer and chemical plant on the North River in St. Marys in 1917. The plant processed menhaden for oil which was used for the manufacture of soap. The scrap was used to make fertilizer. The plant was a major development in St. Marys' economy, employing 300 people in the processing plant on the fishing vessels.

Menhaden, genus *Brevoortia*, comprise the largest commercial fishery in terms of pounds of fish landed in North America (Reintjes and Pacheco 1964). The North American menhaden fishery includes basically two species: the Atlantic menhaden, *Brevoortia tyrannus*; and the Gulf menhaden, *Brevoortia patronus*. Atlantic menhaden, *B. tyrannus*, range from the Gulf of Mexico to Central Florida. Gulf menhaden, *B. patronus*, range from southern Florida to the Mexican border and are particularly abundant from Apalachicola, Florida, to Galveston, Texas. A third species, *Brevoortia smithi* or yellowfin menhaden, are limited in
their range from Sapelo Island, Georgia, to Tampa Bay, Florida. A fourth species, Brevoortia gunteri, the fine-scale menhaden, is found in the Gulf of Mexico (Reintjes and Pacheco 1964: 50).

Since the menhaden fishing in Camden County was pursued off the Georgia coast, the menhaden caught were probably Atlantic menhaden, B. tyrannus, yellowfin menhaden, B. smithi, or a combination of both species. Local residents and fishermen in the country refer to menhaden as "pogy," not to be confused with the more familiar "porgy" of the family Sparidae.

Atlantic menhaden spawn in the ocean along the continental shelf. In the South Atlantic states, spawning is from November through March (Reintjes and Pacheco 1964: 51). Menhaden eggs hatch in the ocean. The larvae begin their development in the ocean but soon migrate to the estuaries. On the South Atlantic coast, larvae enter the estuaries between December and May (Reintjes and Pacheco 1964: 51).

Estuaries are critical to the life cycle of menhaden. The larvae grow into young menhaden in the estuarine nursery grounds. Menhaden remain in the estuary for most of their first year of life before returning to the open ocean.

Fishing for menhaden entailed the use of two vessels, the "captain boat" and the "mate boat," along with an accessory "scout boat," all oar-powered. The vessels were relatively large, 100 to 125 feet long and 25 to 30 feet wide, for open ocean fishing and to accumulate a large catch. The crew numbered 12 to 14 men on each vessel. Some experienced menhaden crews came to St. Marys from Nova Scotia and Virginia with their captains.
One fisherman recalled his early involvement in menhaden or "pogy" fishing as well as the means of harvesting the catch.

Well, I was 15 years old [when] I was a pilot on a pogy boat. . . . About the first of April the pogy fishing would start. . . . We'd go on a boat named the "Cumberland" and pogy-fished for four or five months during the summer. . . .

You ought to have seen one of them boats. They were big boats. Some of them 100 to 125 foot long. Now they are up to 200 or 300 foot; they are big boats. And they load those things down with all they can get on sometimes. . . . We have even loaded them till we have to put bend boards on . . . each side of the boat. We'd pile it [menhaden or pogy] on as long as it will stay afloat.

. . . They had a seine . . . in two boats. Half would be in one boat and half in the other. And one boat would be "captain" and the other would be its "mate." And the little, tiny boat [no more than 12 feet long], they'd call it the "drive" [or "scout"] boat.

They'd be on the crow's nest on the pogy boat and looking out and see this school of fish that would be on top of the water just flipping purple-looking colors—dark blue. And they'd send the drive boat out there to keep track of them, 'cause sometimes the fish would take a notion and outrun us. . . . At that time when I was pogy fishing [in the late 1920s and early '30s] they used paddles. And now [since the early 1950s] . . . they've usually got an engine. . . .

[The captain and mate boats would] start in a circle and go around the school of fish [letting out each half of the seine] and come together . . . and in that circle would be that school of fish . . . trapped in the seine. . . . I seen them take a set one time and there were so many fish in there. And when they found out that they been caught they'd get panicked. And then they'd all try to get out at the same time. There would be so many fish hitting the webbing it'd look like a balloon—just like it, the webbing, was going to get up out of the water. Like they were going to fly away with it. They call that a "blow-out," a "strike." That means you got a real good set.

. . . They had to pull the nets [by hand]. That's the reason they had so many crew men on the boats. When you went around in circles they all had to get hold and pull that webbing in by hand. Now they have a power block [to pull in the webbing].
Initially, pogy fishermen were paid a monthly salary and board during the menhaden season. For many fishermen, particularly young single men, menhaden fishing provided a good living. One fisherman recalled those times:

When I got big enough that I could go pogy fishing . . . they paid $60 and $65 a month. That's what we got. And board. . . . Now, you talk about food! A big old table, they line it up with all kind of food and you'd get all you'd want to eat . . . because see, if you're out there [pogy fishing], you couldn't afford to cook and eat. You'd have to be fed 'cause sometimes we'd stay the night, you know, go long distances and stay all night. We'd come back the next day.

But that's what they paid. . . . I never got the $60. I got $65 my first month 'cause I learned how to splice rope, make bobbers, mend nets. . . . So I was a "rigger" which . . . was like if anything would break, a line would break, we had to splice it together. . . . And the net, when . . . a shark or something would cut the net, I didn't have to help web the netting. I just sit there and they'd pass it out and I'd sew up the holes so it'd be able to be back on the next set. . . . So they finally raised it [my pay] to $100 a month and we was making money then!

The Southern Fertilizer and Chemical Company operated a commissary to provide the menhaden crews with board and to sell to local residents and plant employees. One St. Marys resident described the commissary:

They run a commissary out there. They boarded the men at the plant and on the boats. . . . We got the first [commissary food by steamboat and then] . . . by rail. You know, we bought our beef and stuff from Armour and Company. They had hams, pork chops, eggs, and beef. I mean the finest beef and all. . . . [We sold to] the people that worked there. [And that was] everybody.

. . . Now when I run that commissary, I stayed in that commissary sometimes until 2 and 3 o'clock in the morning and I'd walk that road home and then have to go back to the job at 7 [a.m.]. And sometimes I'd put in 16 or 18 hours for the day. I sure worked.

Menhaden were unloaded from the boats to the factory for processing by the night crew. Dippers on a chain scooped up the fish and
these were quickly transferred to an elevator. One resident, who
operated the elevator, recalled with horror the problems of handling
a big catch of menhaden.

I run the fish elevator [in 1917]. . . . They had a
big elevator there. . . . [One day], it was on a Saturday
and they had two boats [that] went out and caught what we call
"a hold full of fish," over 1,000 barrels of fish, pogy fish.
And I was running the elevator. . . . The plant in Fernandina
broke down and the plant at Mayport broke down and all them
boats, them steamers, came in here with them pogy. And I
was in the elevator from Friday till Sunday morning. How I
stood it, I don't know. And they all unloaded them [pogy]
and I went crazy and stayed up in that elevator. . . . They
was bringing me coffee, the nightwatchman and all, . . . to
keep [me] awake. You see, if I would have went to sleep,
their fish was coming, see, they'd have buried me right in
them [pogy]. . . . That elevator dumps three and a half
barrels at one dump. When they got four, I pulled it and it
dumps them. And the next one comes up. . . . One fella did
go to sleep there [working the elevator] one time and the fish
come running down the stairs.

The graph (see Figure 26) illustrates Camden County landings of
finfish and shellfish. The volume of finfish from 1923 through 1940
represents essentially one species: menhaden. In 1928 alone, over 30
million pounds of menhaden were landed and processed in St. Marys. One
fisherman recalled the largest catch he made one day.

We made one set one morning, I think it was about
6 o'clock when we loaded the boat in the water in the summer-
time . . . and we filled the boat up, loaded on that one set,
just one set! Well, it was about 1,142 barrels. But that's
what we caught. That was the biggest catch that I ever made
at one time, or helped make, on the boat.

Despite the amount of menhaden landed, however, the value of the
catch was minimal, less than 1/2¢ per pound. One fisherman concurred:

Pogy wasn't that valuable. The only thing it probably
was valuable for was fertilizer . . . the the oil that you'd
get out of it was used in soaps and paints. . . . Certain
Figure 26. Camden County landings of finfish and shellfish, 1923-1979. Compiled from Department of Commerce fishery statistics
times of the year the fish were worth more than any other because there was more oil in the fish at one time than there was the other. . . . I think the latter part of the season there would be more oil in the fish. . . . Proctor and Gamble bought most of [the oil] . . . for soaps and things. . . . [The scrap was shipped] to Savannah and then they would process them—mix other kinds of fertilizer with it. . . .

A day crew at the plant loaded the fish scrap in box cars and the oil in drums. One resident remarked, "When them things [fish scrap in boxcars] would go through town, it was a pretty good smell." The scrap and oil was shipped from St. Marys during the day to Kingsland where it would sit until transferred. The remark of one St. Marys resident, "We get the money and you all[Kingsland] get the smell," provoked a complaint by Kingsland. The shipment schedule was then changed so that scrap and oil were shipped out at night.

The Southern Chemical and Fertilizer Company began to experience financial difficulties, as evidenced by a change in the wages of menhaden fishermen. The plant began to pay fishermen on a percentage or share basis. Fishermen were paid a percentage of the value on the pounds of fish caught. The volume of fish determined the fishermens' wages. One fisherman recalled the change:

And finally they started working on shares, pay so much percentage of the fishing. That would encourage the fisherman more, you know, when you get shares like that because they'd be eager to get a lot of fish. Other than that, they wouldn't care if they'd ride on all day and didn't catch no fish. Now they'd have bad days when we'd drive all day long and wouldn't see a fish. Bad weather or something. Sometimes a northeaster'd [these hard northeastern September blowings] blow for weeks. Sometime, we'd stay tied up to the dock for two weeks . . . and that would hurt us after we [were paid] on shares.
Another fisherman agreed that payment by shares was not very lucrative: "The more you caught, the more you got paid. If you didn't catch anything, you just didn't make any money."

The seasonality of menhaden fishing, rising processing costs, declining catch and values for menhaden, as well as a growing and competitive shrimping industry resulted in the closing of the Southern Fertilizer and Chemical plant in 1937. The plant was sold to Gilman Paper Company in 1939.

**Commercial Shrimping**

Today, commercial fishing along the Georgia coast is so dominated by the pursuit of shrimp that the fishery is often referred to as commercial shrimping. While commercial shrimping includes the harvesting of blue crab, *Callinectes sapidus*, and finfish such as shad, whiting, flounder, grouper, spot, seabass, seatrout, red snapper, and croaker, these species are considered as supplemental to the shrimp fishery. Commercial landings of fish and shellfish in Georgia during 1978 totaled 17.5 million pounds valued at $14.6 million (Department of Commerce 1978). While shrimp landings in 1978 were 5.7 million pounds or 33 percent of the total pounds landed, the value of shrimp was $11.9 million which accounted for 81 percent of the total value of fish and shellfish landed (Department of Commerce 1978).

Landings of blue crab in Georgia in 1978 were 10.6 million pounds, accounting for $1.9 million or only 13 percent of the total value. Although blue crabs are taken in greater number than any other commercial species, they derive only a small percentage of the monetary
value of the catch due to their low value (Carley and Frisbie 1968). In Georgia there are two principal methods for harvesting crabs commercially: traps or pots and otter trawls (Palmer 1974). For many commercial shrimpers, crabs are taken by otter trawls along with shrimp and other bottom-dwelling fish. However, crabs caught by otter trawls are valued less than trap-caught crabs because they are usually smaller and can be damaged by trawl nets (Palmer 1974: 5).

Landings of finfish in Georgia have averaged only about 5 percent of the total quantity and value of all fish and shellfish (Johnson et al. 1974: 102). The American shad accounts for the greatest poundage and value and is pursued by many shrimpers for a supplemental income during the off season, from January until April, when the adult shad migrate up the rivers (Johnson et al. 1974: 102). Other finfish such as whiting and flounder are caught as incidental to shrimping in the otter trawls.

In Camden County, commercial fishing refers to commercial shrimping. One shrimper, for instance, referred to finfish and some crabs that are brought up with the shrimp in the nets as "trash fish," edible species that are considered simply incidental to shrimping. These trash fish include small croaker, small weakfish, and some crabs which are all pushed back overboard. Another shrimper noted that he catches some bottom fish such as flounder in his trawls, but that he doesn't sell these fish. He divides them among his crew. A third shrimper freezes and sells the few whiting and flounder that are caught in his nets.
Landings of shrimp in Camden County in 1979 totaled 794,900 pounds, accounting for only 36 percent of the total pounds of fish and shellfish landed. However, the value of shrimp in 1979 was $2,003,148, accounting for 86 percent of the total value of the year's catch. Landings of blue crab in 1979 totaled 1,323,000 pounds, accounting for 60 percent of the total poundage but crab yielded $238,140 or 10 percent of the total value. Finfish landed in 1979 amounted to 70,300 pounds or 3 percent of the total pounds and yielded $48,507 or only 2 percent of the value of fish and shellfish landings. A catch of scallops by one shrimper was also recorded in 1979 and amounted to 32,800 pounds, or 1 percent of the total poundage, and netted $45,264 or 2 percent of the value (Department of Commerce 1979).

The fishing industry in Camden County is relatively small. Three family-based firms with docking and packaging facilities are located on the St. Marys River in downtown St. Marys. Figure 27 depicts part of one firm's fleet on the St. Marys waterfront. Together the three firms own a total of 22 boats and employ 66 persons. The number of registered shrimping boats is 47 and the number of crew is 134 in the county (Department of Commerce 1979). This indicates that over half of the shrimping is done by independent shrimpers, those who own their own boats. Independent shrimpers often dock and unload with the three firms who buy their catch, package, and market it.

Commercial shrimping has a definite appeal to a number of Camden County residents. Fishermen are proud of their independence and self-sufficiency. They are self-made men who succeed as a result of their own initiative.
Figure 27. Locally owned shrimp boats docked on the St. Marys' waterfront
The biology of shrimp

Three species of shrimp, genus *Penaeus*, comprise the commercial shrimping industry: the white shrimp, *Penaeus setiferus* (Linn.); the brown shrimp, *Penaeus aztecs* (Ives); and the pink shrimp, *Penaeus duorarum* (Burkenroad). White shrimp, *P. setiferus*, were the first shrimp exploited. *Penaeus setiferus* range from Fire Island, New York, to Cape Canaveral, Florida, along the Atlantic coast and from Pensacola, Florida, to Campeche, Mexico, in the Gulf of Mexico, and prefer mud bottoms (Williams 1965: 18). The grooved shrimps, brown, *P. aztecs*, and pink, *P. duorarum*, were later discovered. Brown shrimp range from New Jersey to the Gulf of Mexico and prefer a mud bottom in which to burrow (Williams 1965: 26). Pink shrimp were first discovered off the Tortugas (Joyce and Eldred 1966) but range from the Chesapeake Bay through the Gulf of Mexico and prefer sand, shell-sand, or coral mud bottoms (Williams 1965: 22-23).

*Penaeus setiferus*, *P. aztecs*, and *P. duorarum* share certain characteristics. All spawn in the ocean and their larvae migrate, carried by the tides, to inshore nursery grounds. Along the Georgia coast, these nursery grounds are the sound, estuary, salt marsh, rivers, and creeks. The shrimp develop in the estuary and within two to six months, depending upon the species, they migrate out to the open ocean to spawn.

White shrimp, *P. setiferus*, spawn between April and June about 20 to 80 feet offshore (Joyce and Eldred 1966). Larval white shrimp have reached the nursery grounds by late June, develop quickly, and
migrate out to the open ocean between mid-August and the end of November. Of the three commercial species, white shrimp can tolerate the least salinity. Individuals have been found as far inland as 100 miles up in the St. Johns River (Joyce and Eldred 1966: 11).

Brown shrimp, *P. aztecs*, spawn in November or December. The larval brown shrimp arrive in the nursery grounds by late February or March and depart by August or September. Pink shrimp, *P. duorarum*, spawn and migrate at varying times according to geographical location. The highest rate of spawning extends from April through July (Williams 1965: 23). The pink larval shrimp migrate to the nursery grounds and depart for the ocean in May and June (Williams 1965: 24).

The estuary is essential to the life cycle of commercial shrimps. *Penaeus setiferus*, *P. aztecs*, and *P. duorarum* spend an appreciable period of time in developing from larval to adult form in the estuary. The movement of larval shrimp from their hatching offshore is still unknown (Kutkuhn 1964: 20), but once in the estuary, the postlarvae develop to adults of commercial size over a two- to four-month period.

One of the important characteristics of estuaries affecting commercial shrimps is the tidal currents or water circulation. Currents regulate the interchange of fresh water from the mainland and salt water from the sea as well as affect the estuarine chemical composition, salinity, temperature, turbidity, nutrient levels, and biological populations (Kutkuhn 1964: 22).

Shrimp are also affected by temperature. Spawning occurs prior to or during the warmer months (Kutkuhn 1964: 23). Growth rates are
related to temperature with growth at its highest level in the warmer summer months and at its lowest in the colder winter months (Joyce 1965: 177; Kutkuhn 1964: 23; Williams 1965). Extremes in temperature can result in death for commercial shrimp. In laboratory experiments with grooved shrimp, *P. duorarum* and *P. aztecu*, none of the shrimp survived above 43°C, a temperature that may be reached in very shallow nursery areas, or below 3°C (Joyce 1965: 177). The temperature, the rate of decline in temperature, the length of time that temperatures are low, and the salinity of the water combine to determine the survival of commercial shrimp.

Salinity, another important characteristic of the estuary, also affects commercial shrimp. Penaeid shrimps are capable of enduring a wide range of variation in salinity. Salinity tolerance is governed by size and species. Small shrimp tend to be more abundant in lower salinities and large shrimp tend to be more abundant in higher salinities (Joyce 1965: 179). The small shrimp, for example, are found in the estuary, a low-salinity environment, and the adult or large shrimp are found offshore in the high-salinity sea.

Salinity tolerance differs with the commercial shrimp species. *Penaeus setiferus* can tolerate the lowest level of salinity in water less than 1.0 o/oo. White shrimp have been found to migrate over 100 miles up the St. Johns River from salinities of 1.0 o/oo to as low as .26 o/oo (Joyce 1965: 179; Joyce and Eldred 1966: 11). *Penaeus aztecu* have also been found migrating in the St. Johns River, but the distance traveled and the time spent there is shorter than that of the white shrimp (Joyce
minimum salinity that brown shrimp can tolerate is .46 o/oo (Joyce 1965: 179). *Penaeus duorarum* is the least tolerant of low salinity. Although a few pink shrimp have been found 50 miles up the St. Johns River (Joyce and Eldred 1966: 13), the majority remain in high-salinity areas. The minimum salinity tolerated by *P. duorarum* is .64 o/oo (Joyce 1965: 179).

The turbidity and fertility of the estuary is controlled by the exchange and content of waters from the sea and the land. Some turbidity in the estuary is considered beneficial to the development of commercial shrimp.

No successful studies have been conducted to relate turbidity with shrimp occurrence and density, but gross observation suggests that those bays which are consistently the most roily generally harbor per unit area and in season the largest concentrations of young shrimp. Whether this reflects more the nutritive potential of the detrital material in suspension, or protection of transient shrimp from predation by fishes, birds, and other animals, remains a moot question. [Kutkuhn 1964: 24-25]

Excessive turbidity, however, can suppress algal production and indirectly inhibit the development of shrimp (Kutkuhn 1964: 25).

The vegetation and suspended material that characterize the estuary affect the development of commercial shrimp.

It is such areas—the shoreline zone and transitional marsh, typically vegetated with mangroves or with rushes, reeds, cane, and various grasses, particularly *Spartina* and *Distichlis*—that are sought by the young of most penaeid shrimps during the earliest stages of their estuarine existence, presumably for protection and food. Significantly, it is also the same areas which, through reduction of their vegetative cover . . . would very likely be subject to gradual, widespread deterioration. . . . [Kutkuhn 1964: 25]
A final environmental characteristic of the estuary that affects the development of shrimp is the bottom structure or substratum. Laboratory experiments reveal that pink shrimp, *P. duorarum*, prefer a comparatively hard substrate of mixed shell and sand; the brown and white shrimps, *P. aztecs* and *P. setiferus*, select softer bottoms of mud, peat, or sand for protection rather than food content (Kutkuhn 1964: 25).

From this limited information one may reasonably conceive that a gross change in substrate composition, arising, for example, from an increased silt load or a reversal in circulation pattern, with attendant changes in scouring action and rate of sediment deposition could alter estuarine carrying capacity [of shrimp]. [Kutkuhn 1964: 25]

Obviously, change in the estuarine substrate produced by dredging could have the same effect.

**The history of shrimping**

Originally shrimp were a by-product of fish seining and only later became an end-product of fishing activities (Joyce 1965). Shrimp were exploited on a very small scale by residents in coastal communities for home consumption and also to sell for extra income. St. Marys' residents were consuming shrimp prior to the development of the shrimping industry. One author has stated, "During the early years, the consumption of shrimp was confined mostly to lower-income classes, as they were considered inferior as human food. At least this was true in Apalachicola" (Joyce 1965: 7). While one may question the evaluation of shrimp as "inferior" human food, fish and shellfish have traditionally been a less expensive form of protein. In 1880 in Charleston, South
Carolina, for instance, the demand for fish increased because of its low cost and a local market was created to further cut the costs of fish.

The demand for fish has greatly increased, for many of the Negroes who cannot afford the luxury of a meat dinner, live largely on the cheaper grades of fish as giving the greatest bulk for the least money. New markets . . . have also been opened up, and Charleston is now supplying many of the villages of North and South Carolina and Georgia with their fish, while a few are sent to the markets of the north. The result of the change above mentioned is that Charleston is no longer dependent upon the northern fishermen, but is supplied chiefly by her own citizens. . . . [Earl 1887a: 507]

Shrimp have also been traditionally preferred as bait for hook-and-line fishing. The bait shrimping of Charleston, South Carolina, is one of the earliest described.

Shrimp are taken in any of the rivers and creeks from the 1st of April till the middle of November. In April they seem to occur only in particular localities, and six seines, with crews of six men each, are employed in their capture during the two or three hours of low water at night. . . . Early in May, when the shrimp become more plenty, the seines are laid aside, and their owners, with many others, provide themselves with cast nets and engage regularly in the business. The fishing soon reaches its height, when it is said that 120 men and boys, with 60 boats, are regularly employed in the capture of the species. During June and July the daily catch often exceeds 100 plates, of about one quart each, to the boat, and the average for the season is not less than 60 to 75 plates per day.

All of the shrimp taken during the first of the season find a ready sale at about 50 cents a plate to the hook-and-line fishermen of the city, who use them as bait in the shore fisheries. During seasons of scarcity they sometimes sell as high as 2 cents each, or nearly $1 per plate. The fishermen prefer shrimp to any other bait, and think them almost indispensable to their success. Each man buys from one to two plates daily, according to the fishing that he expects. [Earl 1887a: 509]
Bait shrimping has now become a major commercial venture. The term "bait shrimping" as used today encompasses home consumption as well as sale of bait. "... Bait shrimping refers to the shrimping done in the inshore waters. Most of the catch may be broken down into live and dead bait although a large portion undoubtedly ends up on the dinner table" (Joyce 1965: 168).

In St. Marys, residents used cast nets to procure shrimp for home consumption and for sale. One elderly resident recalled catching shrimp from river banks as a boy in the 1880s and early 1890s.

When I was a boy we used to make [cast] nets by hand. I made many a one by hand. ... Four foot nets and we'd go at night and catch these, what they called "prawn" then. They called the shrimp "prawn," the big shrimps. ... When we was casting into them they'd just go "Shoooooo," you know. Just like sand. And at night you can see the reflection in the water. You could just see them shrimp, big shrimp. ... And we'd sell them shrimp 10¢ for a quart, or three quarts for a quarter.

Commercial shrimping activity is first recorded in 1880 in Savannah, Georgia, and Fernandina, Florida. The shrimp were boiled and dried and then either sold in a local market or shipped to northern markets. In Savannah, the commercial shrimping is described as such:

... During the height of the season, twenty to twenty-five men go to Saint Catherine and Osabaw Sounds, where they camp for several weeks for the purpose of engaging in the fishery. They carry a complete outfit, including seines, cast-nets, boats, and kettles for cooking the shrimp. After cooking and drying the catch of the day, one boat is detailed to carry it to market. The price paid by the Savannah dealers varies from $5 to $1.50 per bushel according to circumstances, $2.50 being a fair average. During the summer of 1879 about 1,400 bushels, valued at $2,500, were landed. ... Of those taken part are sold locally, others go to the interior cities, and the remainder are packed in crates and sent to the Northern markets. [Earll 1887a: 516]
In Fernandina, the shrimping was on a much smaller scale; however, the beginnings of commercial export were evident.

According to Capt. T. E. Fisher, shrimp and prawn are abundant in the harbor directly opposite the city during the entire year, and a man can readily secure 3 or 4 bushels with a small cast-net on any pleasant night. The catch, which is not less than 450 bushels, is boiled and dried for shipment to New York, Philadelphia, and Savannah. [Earll 1887b: 525]

The beginning of commercial shrimping in Fernandina as well as St. Marys is generally attributed to Sollecito Salvador, a Sicilian immigrant (Joyce 1965; Joyce and Eldred 1966). Salvador used seines to catch shrimp and probably started as a buyer who processed the shrimp he caught as well as the shrimp that others caught to sell for export. One St. Mary's resident recalled Salvador's entry into St. Marys to buy shrimp from community fishermen, an act which catalyzed the development of commercial shrimping in St. Marys:

We . . . , we'd catch them shrimp and there was a fella, I don't know if he was a Portuguese or Italian or what, but his name was Salvador . . . [and another one] Mitchell. Salvador and Mitchell [two sellers that came to Fernandina]. Well, they'd buy these shrimp by the bushel and they'd boil 'em and dry them. Then they'd ship 'em in boxes, little boxes, all over the country. That was the first of these shrimp. . . . They caught 'em by seines and cast nets . . . . They shipped them all over the country by express. Boiled shrimp . . . They'd get orders all over the country. They'd ship them a lot. . . . And they got rich at it.

By 1902, Salvador had instituted the power driven boat to pull a haul seine in deeper waters for shrimp (Joyce 1965; Joyce and Eldred 1966: 14). In 1906, Salvador founded his own company in Fernandina. An elderly St. Marys resident remembers these first shrimp boats in the area:
They took small boats and they didn't have but a five-horse engine. [They were] what they call "yawls" boats [with] an engine in it. A fella done that and made a little net and he went out there. . . . Right off of Cumberland, he just loaded that boat with so many shrimp. Plenty of shrimp. Let me see if I can get about the year that was. I imagine that was about 1906 or 1907. . . .

The shrimping industry began to expand. Around 1912, two brothers-in-law of Salvador, S. Versaggi and Anthony Poli, came to Fernandina from Sicily to start their own shrimping operations (Joyce 1965: 7). Between 1912 and 1915 the first otter trawl was designed by Capt. Billy Corkum and first used by S. Versaggi (Joyce 1965: 7). This net has two large doors that bounce along the bottom and keep the net open. As the net is pulled or dragged behind the boat, shrimp and other bottom dwellers are swept into a closed bag at the end of the net (Joyce and Eldred 1966: 14).

Developments in commercial shrimping in Fernandina spurred advances in St. Marys. By the time the menhaden plant was built in St. Marys, commercial shrimping was well established as shrimp canneries developed to handle the market of shrimp. Campbell's Soup Company operated a canning factory nearby and bought shrimp from local fishermen to put in soup. One resident explained, "Well, now, the Campbell Soup Company, they had a canning factory on St. Simons Island. They bought these small shrimp for soup, to put in soup. They'd buy from here [St. Marys] and all around."

Canneries were developed in St. Marys to accommodate the shrimp catches. One of these canneries was started by the Hardee Brothers of Fernandina. Another one was built by Brandon and Davis. Probably the
largest shrimping operation and cannery was the St. Mary's Canning Company, owned by C. A. Taylor. In 1930, Taylor owned 25 to 30 shrimp boats and employed 50 to 60 men on the boats. In the cannery, Taylor employed almost 100 black and white men and women. The business was situated on the St. Marys Rivers at the end of town. The canning process included heading the shrimp and peeling the hull; cooking the shrimp; and canning the shrimp. One shrimper explained:

... Those shrimp would have to be headed and peeled and there'd be sometimes 50 headers in the peeling room. They would mostly be colored people, too. And the canning [room] where they canned them inside ... there'd be maybe 30 or 40 [people] in there. They'd be picking the hulls that the other people didn't get off ... put them in cans and weigh them.

Another shrimper remembered the boiler shed where they cooked the shrimp prior to canning it. Canning was the primary mode of packaging shrimp for sale. As one shrimper stated, "They didn't hardly sell any shrimp fresh; it was all canned [at the] St. Marys Canning Company."

Shrimping was initially pursued in inshore waters—in the sounds, rivers, and nearby beaches. Lengthy shrimping trips were impractical in the small boats. Shrimp caught in the sounds and rivers were small because they were the post-larval, juvenile shrimp developing to adult size in the protected and productive waters of the estuary. One resident felt that the canneries "destroyed the shrimp" because they canned only small shrimp, thus depleting future populations.

... We was catching those shrimp in the sound and followed them all the way up North River. In May you'd find the little shrimp. They was so small you could hardly catch 'em in the net ... And in June they'd be all down the river there ... And them things would grow. In August, they'd be good eating size [but not canning size].
As commercial shrimping in Camden County expanded, shrimp boats became larger. One shrimper described the shrimp boats of the 1930s.

I guess the boats would be about 20 or 25 feet long. . . . They built them with a pilot house on them and a bunk where they could stay aboard the boat, sleep aboard the boats. But they had the deck there. But they still threwed the nets by hand, you know, fold 'em by hand. It took two people and it [the net] was hard to fold.

Early shrimp boat crews included only two persons: the captain and the striker. The captain was the skilled shrimper and the striker was the helper and apprentice. To learn shrimping, one would hire on as a striker. Once established as a skilled shrimper, one would be hired as a captain to run a boat for someone else. Ideally, captains would eventually be able to buy their own boats and become manager-owners. In fact, many of the early shrimpers in Camden County learned their shrimping skills as strikers from the Fernandina captains.

This step up the ladder of success was possible for both blacks and whites. One white shrimper recalled that, although no blacks were captains or owners of shrimp boats in the 1930s, blacks were strikers at the time and later became captains.

... It wasn't long before they [blacks] was strikers. That's the way you learn [shrimping], see? No matter whether you're black or white, you get on there [as a striker] and learn. . . . Pretty soon . . . they was hired on as captains. One right behind the other started getting to be captains.

One black shrimper concurred:

... By [working] as a striker on a shrimp boat . . . I got familiar with the shrimping. And finally I got a chance to run a boat . . . The captain would get, you know, a little more [money]. But when we was striking, we didn't get nothing.
The pay involved for captains and strikers differed and the means of payment has changed over time. When working as a striker in the 1930s and '40s, a black shrimper was paid 10¢ a bushel for the amount of shrimp caught, enough to provide a living at the time. "Everything was cheap. Groceries . . . clothes. . . . [If] you made $20.00 a week then you could live." As a captain, shrimpers made more money. Payment was on a percentage basis with the captain and crew receiving 60 percent of the shrimp value and the owner receiving 40 percent of the value. The owners later reduced the percentage to a 50-50 basis, with both captain and crew receiving 50 percent of the value and the owners 50 percent. The owner was responsible for the operating and maintenance expenses of the boats.

During the period that the menhaden plant was operating, most fishermen took advantage of both pogy fishing and shrimping to make a living throughout the year as menhaden fishing and shrimping are seasonal occupations. The pogy fishing started about the first of April and ended by the first of October. The seasonality of menhaden is related to its life cycle. At the point in the life cycle when schools of developed menhaden leave the estuaries for the continental shelf to spawn, the fishery harvests them.

Shrimping has also been a seasonal activity related to their life cycle. Although all three species of shrimp are found on the South Atlantic coast, the number of pink shrimp, *P. duorarum*, recorded in shrimp catches for this area is negligible due to the difficulty of distinguishing pink from brown shrimp, *P. aztecus*, both of which are
grooved shrimp. Commercial fishermen tend to group pink shrimp in with brown shrimp (Joyce and Eldred 1966: 16). Pink and brown shrimp are nocturnal and are best caught at night. The brown/pink shrimp season lasts from June 1 through August 31 (Joyce and Eldred 1966). White shrimp, *P. setiferus*, are better caught in the daylight. The white shrimp season is from late August until December or January. White shrimp constitute the biggest money crop for the northeast coast of Florida and the Georgia coast (Joyce and Eldred 1966: 16). The best months for catching white shrimp are October, November, December, and sometimes January. It is at this time of year that the commercial shrimper may earn enough money to offset the expenses accrued during the "off season."

The off season for commercial shrimpers lasts from January through May or June along the South Atlantic states when the white shrimp season has ended and before the beginning of the brown/pink shrimp season (Joyce and Eldred 1966: 16). The off season is a time when shrimp catches are so minimal that for many shrimpers it is not worth the investment of time and money to find them. The commercial shrimper at this time may accrue debts which are either met through the assets accrued during the previous season, through successful shrimping for other shrimp species such as royal reds, or fishing for other fish such as snapper or shad (Joyce and Eldred 1966: 16-18), or finding some other means of employment. Other means of adapting to the off season are shrimping for spawning white shrimp outside the three-mile zone and shrimping for pink shrimp at night along the Gulf Coast states. The off
season for most shrimpers is also a time to repair boats and nets to ready them for the coming season.

Very early shrimping in the South Atlantic states was confined to white shrimp, *P. setiferus*, because of its daylight habits and probable abundance. One shrimper in Camden County described the seasonal nature of shrimping in the 1930s:

... Didn't hardly anybody fish at night in those days and times 'cause you couldn't catch any shrimp at night-time. ... [Furthermore] the first of the season would usually start the first of August. That's when the canning season [began]. ... Most of the fishing at that time was in the sounds especially [due to] those small boats. The only time they would go into the ocean was when the weather was real good. [The season] would last ... right on through ... the first of January. ... You could fish right on if the shrimp was there. But usually ... in the winter months they'd go out in the ocean ... and there wouldn't be nothing to catch.

The diurnal nature as well as the duration of the season indicate that the species exploited then was the white shrimp.

With the presence of the menhaden plant in St. Marys and the seasonal nature of menhaden, many fishermen were able to fish for menhaden in the "summertime," actually the spring and summer months of April through August, and shrimp in the "wintertime," actually the fall months of August through December. One black shrimper recalled that black fishermen would "switch around" between pogy fishing and striking on a shrimp boat. "Fishery switching" is a common adaptive strategy used by fishermen to cope with uncertainty (Acheson 1981: 291). Switching allows for year-round employment and continual income.

Fishery switching can also facilitate a permanent change from one fishery to another (Acheson 1981: 292). For fishermen in Camden
County, switching was a means of making a permanent change from menhaden fishing to shrimping. Switching allowed menhaden fishermen the opportunity to learn shrimping. Once a shrimper was hired on as a captain of a boat, the movement between pogy fishing and shrimping was no longer lucrative. A captain of a shrimp boat could make more money shrimping than pogy fishing. This was exemplified by one black shrimper who alternated between pogy fishing and striking: "... After I learned to run a [shrimp] boat [as captain], then I didn't [pogy] fish because I could make more [money] running the [shrimp] boat."

The growth of commercial shrimping in Camden County probably produced competition for labor between it and the menhaden fishery. The menhaden fishery which employed mostly blacks began to lose those fishermen to commercial shrimping as they began to be hired as captains of shrimp boats. This along with the seasonal nature of menhaden fishing and declining catches probably resulted in the closing of the Southern Fertilizer and Chemical Plant in St. Marys in 1937. One shrimper spoke of the reasons for the decline of the menhaden fishery: "It wasn't bringing much [money]. And ... the pogies were gone. ... It was something like farming, some seasons would be real good and some would be bad. So there had been a couple of bad seasons so they thought they'd phase it out."

Technological changes in shrimping

Although the basic method of shrimping with otter trawls remains the same, the technology associated with shrimping has changed somewhat since its inception. The change in boat size has had a definite impact
on the range of shrimping ventures. In the beginning, small boat size limited shrimping to the sounds—inshore areas. Only in good weather would a boat venture offshore because of the small craft's vulnerability to bad weather conditions. The small boat size also limited the amount of time that the shrimper could stay out, as the amount of ice brought along to store the shrimp was limited.

Even when boats became larger, 25 to 30 feet in length, shrimpers confined their activities to daily runs along the coast and returned to port by dark. Figure 28 depicts early shrimp boats in Camden County. Shrimpers would go no more than three miles offshore in their small craft, but they would go 25 to 30 miles north or south of the St. Marys Entrance. Shrimpers would leave the dock before daylight in order to get the maximum number of daylight hours for shrimping.

In the early days of shrimping there were no mechanical hoists. The captain and striker would pull in the net by hand. There would be up to 300 feet of tow line and to this was added the depth of the water, the weight of the net's doors, and the size of the catch. As one shrimper complained, "By the time you got to [pulling] the door up on the deck you were given completely out . . . and then you would . . . [have to] pull the weight of the net and whatever was in it up on deck. And boy I tell you that was tremendous work." Today, shrimp boats are equipped with a hoist on deck and most of the lifting of nets is done mechanically.

Early shrimp boats had no automatic pilot to aid in steering the boat, and no fathom meters or radar to read the depth and makeup of the bottom. Shrimpers relied on the use of a sounding lead to measure the
Figure 28. Shrimp boats docked on St. Marys' waterfront in the early 1900s

Courtesy Georgia Department of Archives and History
fathoms (depth) and structure of the bottom. The sounding lead was a five-pound piece of lead with a hole in the bottom of it. A piece of soap was placed inside the cavity. A length of rope with knots and marks at six-foot, or one-fathom, intervals was attached to the sounding lead. The sounding lead was thrown into the water until it hit the bottom. The soap in the cavity would pick up mud or sand at the bottom, allowing the shrimper to determine the consistency of the bottom; the knots or marks on the rope at the water's surface would allow the shrimper to measure the depth.

Successful shrimping in the early days required skill plus an element of luck or providence. The decision to go north or south of the St. Marys Entrance as well as how far in either direction was part of "shrimper's luck," according to one early shrimper. To another shrimper, it was God's will. One shrimper recalled an early experience of shrimping in the fog, a situation in which he relied on his skill and knowledge of the Georgia coast.

I recall one time I went out in the fog. It was real thick that morning and I timed myself from the bar that's in the jetty and north towards Brunswick. I run an hour and a half... I sounded first... I was in the right depth of water... [I] pulled a "try net" and had a good little old trial. [A try net] was a little sampler you pulled on as you go along to see what you are catching. And I put me a flag buoy out. Then I towed for 45 minutes due north and from where I put that flag and all during the time I was catching shrimp. And when I run out of shrimp I put me another flag up there on that [the north] end. And I fished all day, back and forth between those two flags...

It was so foggy, you couldn't see hardly 100 feet in front of you. [I] caught 40 bushels of shrimp that day. Made two drags and went back in... I had to feel my way in [on the return trip to St. Marys] a little bit at a time. I had a bad time of it. It was a scary time... I had to be careful not to run onto the
jetty rocks on the bank. And I'm telling you, that fog—you'd 
see sea gulls sitting out on the water and it would look like 
a big shrimp boat out there. Everything looks different 
in the fog.

... [I] caught a good day's catch. But see, I had to 
go by my skill and time rather than depend on that radar and 
fathom meter. I had to use my natural sense of doing it.
It paid off. I caught shrimp. . . .

Today, the shrimper's skill is augmented by a variety of elec-
tronic and navigational devices. The boats have increased in length 
from 25 to 30 feet to over 60 feet and have more conveniences on board. 
Compare the 1930s shrimp boats in Figure 28 with their modern counter-
parts in Figure 29.

Hazards and satisfaction of shrimping

Certainly shrimping entails hazards. The mortality rates of 
commercial fishermen in general is twice that of coalminers, and for 
fishermen on trawlers, including shrimpers, the mortality rate is 
probably higher (Moore 1969a). In examining mortality and morbidity 
among trawlermen in Grimsby, England, in one year, Moore determined the 
mortality rate to be twice that of fishermen in the United Kingdom, four 
times that of miners, and 40 times that for employees in manufacturing 
industries (Moore 1969b: 25).

Forty-three percent of the deaths recorded by Moore for that 
year were accidental, half were drownings. Drownings occurred in both 
good and bad weather, usually resulting from a sudden lurch of the boat 
or entangling fishing gear. Fifty-seven percent of the deaths were the 
result of natural causes; over half of these were cardiac arrest (Moore 
1969b: 30-31).
Figure 29. Modern shrimp boat docked on the St. Marys' waterfront, 1980
Common injuries that incapacitated over half of the fishermen included contusions, infected lesions, sprains and strains, lacerations, and fractures. Most of the injuries occurred in the winter months, the fewest occurred in the summer months (Moore 1969b: 38). Incapacitating illnesses for over half of the fishermen were gastrointestinal, respiratory, and skin diseases. Gastrointestinal, cardiac, psychiatric, and respiratory illnesses were the most debilitating for fishermen (Moore 1969b: 25).

Fatigue appears to be an indirect cause of most accidents. Fishermen work long hours at heavy manual labor in a confined space under constant motion. The method of payment, by the number of fish caught, encourages fishermen to stay out fishing longer and to continue working despite injury or illness (Moore 1969a: 20). Schilling (1971) recorded the following schedule for near-water trawlermen that would probably apply to shrimpers of Camden County:

During a voyage on a near-water trawler I estimated that the deck crew had about six hours' broken rest in 24 but seldom more than two hours at a stretch. The deck crew of a side trawler are exposed to all weathers, to the constant vibrations of the engines, and to working on a pitching, rolling deck. All these factors are conducive to fatigue. In a crew which had fished continuously for five days and nights, I became aware of the ashen-grey pallor of their faces, their slower movements, irritability, and chain-smoking, which reminded me of what I had seen among soldiers during the retreat to Dunkirk in 1940. [Schilling 1971: 33]

Fishermen can become even more fatigued on returning to shore if they overextend themselves in catching up on family or social life. In this case, a fisherman returns to his ship even more tired than when he entered port (Schilling 1971: 34).
Shrimpers working in Camden County during the early days recall hair-raising incidents and the loss of fellow shrimpers at sea. Shrimp boats are vulnerable to the weather at sea and must therefore be maintained as seaworthy vessels. One shrimper recalled one long night near St. Andrews Sound when he was stranded on a shrimp boat with the hole in its bottom the size of a fist. He and the striker stayed awake through the night pumping the water out of the boat until they were towed into port by another shrimp boat the next day. Being knocked off the boat alone or entangled in the net or ropes by a wave often results in drownings. One shrimper stated that he "fished out" the bodies of five shrimpers who drowned. He felt that drowning was the worst possible death. "It looked like that was more dreadful to me—to be drowned . . . 'cause sometimes you come back and sometimes you never [come back]. . . . No one can give account of you. . . . You can't even say where he's [buried] or nothing."

Certain occupational health hazards may also be associated with commercial shrimping. Shrimpers may be prone to ulcers and arthritis. The ulcers may result in part from the uncertainty inherent in shrimping. One never knows if the season's income will cover the costs incurred during the off season. The lack of regular meals and the constant vigilance for potential hazards while on the boat may also add to a proclivity for ulcers. One shrimper stated that he retired due to ulcer troubles: " . . . [Shrimpers] never have their meals the same like you would on a shore job. You eat when you can sometimes. . . . You have to be on your toes all the time. On your guard."
Arthritis, this shrimper feels, eventually afflicts most shrimpers and is due in part to the strenuous work of shrimping in the cold and damp wintertime.


For fishermen in Camden County, the satisfactions derived from shrimping outweigh the hazards. One shrimper felt that being in the outdoors was one attraction, while another attraction was the curiosity aroused by wondering what one might catch. "There is something about it that you never forget. It's not having any idea what you are going to haul in in your net. You dump it out on the deck and you see so many different things. And it's just something that you will always love."

Satisfaction is also derived from the independent nature of shrimping. The shrimper pits his skills and fortune against the odds of uncertainty. The shrimper derives much satisfaction from a successful run and season. Shrimping is actually an entrepreneurial venture. There is social and economic mobility inherent in the independent system of striker, captain, owner, manager-owner. And this mobility is open to blacks and whites. The Protestant ethic that hard work enhances one's chances for success runs strong among shrimpers. For many
individuals in Camden County the lure of stable employment onshore, primarily at the paper company, cannot compare to the life of shrimping.

**Community integration of shrimpers**

Shrimpers in Camden County maintain close ties to the community. Although shrimpers will leave the county for long periods at a time to shrimp the Gulf Coast states and the north and south Atlantic Coast states, they all claim St. Marys as their home port and prefer to return to St. Marys as soon as possible. One manager-owner who established a second port in South Carolina and brought his boats and shrimpers with him to shrimp three or four months of the year found that the shrimpers did not like to be away from St. Marys that long. So, despite good catches in South Carolina, the manager-owner abandoned the second port and settled for having the shrimpers make short runs to South Carolina and back. "... It got to where the fishermen didn't like to go up there and fish much [three to four months of the year]... Now they go ... up there and make a four- or five-day trip and [stay] on the boat and come back to St. Marys. Or they can go in a port up there and unload."

Even when the two shrimping firms established ports on the Gulf of Mexico to take advantage of the newly found pink shrimp, *P. duorarum*, in Campeche, Mexico, in the 1950s, both firms maintained their home port as St. Marys. One manager-owner had his father-in-law maintain the business in St. Marys while he was at the port on the Gulf Coast. The two firms' manager-owners and their shrimpers would return to St. Marys to shrimp from June through August or "six months at most." While in
St. Marys, one manager-owner would drive eight to ten hours to his Gulf Coast port to unload boats from Campeche. Another shrimping firm presently maintains a port in Key West as well as the home port in St. Marys. Although this manager-owner states that business at the Key West port has been much better than the home port, the firm continues to keep the St. Marys port open because "it is home."

Shrimpers' close ties to the community are evident in their preference for short-term shrimping trips. Because of this, freezer boats are not commonly found in St. Marys. Although one firm recently purchased a freezer boat, the majority of shrimpers only take on enough ice to keep the shrimp catch a limited amount of time. This insures a limited run. Freezer boats, on the other hand, are specifically designed for long-term shrimping trips. Thus, one of the problems with operating freezer boats in St. Marys is finding the crew to man them. According to one manager-owner, "Once you get the freezer on the boats, you've got to get a crew that will go out and stay, sometimes two or three months at a time. And there aren't many people that want to be gone away from home that long." This manager-owner uses ice on his boats and will only send his boats out a week to ten days at a time.

Perhaps the ties of shrimpers to their community, or home port, can best be illustrated by their perception of shrimpers from other areas or home ports. When the Georgia coast was experiencing a good shrimp season in the spring of 1980, the Camden County manager-owners expressed concern over the arrival of Gulf Coast fleets taking advantage of the good conditions and avoiding Gulf Coast fishing grounds disrupted
by an oil spill. The manager-owners in St. Marys perceived the Gulf Coast shrimpers as "outsiders" who might overfish their shores and thus deplete shrimp stocks. One shrimper initially referred to the Gulf Coast shrimpers as "poachers," but then corrected himself. "They're not 'poachers,' but 'foreigners.' . . . 'Course we can go down there when we want to."

Shrimpers in Camden County are well integrated into the community, and are not the marginal element depicted by many maritime studies (Smith 1977). They participate in political and religious activities. One black shrimper was also a pastor of the Church of God. Another shrimper was elected city councilman in St. Marys, and his son, also a shrimper, was elected mayor of St. Marys.

A reason for the relatively high standing of shrimpers in the community is that they exemplify community ideals of independence, hard work, and self-sufficiency. The level of community integration among fishermen in general obviously differs according to the local situation. Studies of fisheries, therefore, cannot afford to ignore the community context of commercial fishing.

The Impact of the Pulp and Paper Company on the Commercial Fishery

Gilman Paper Company began construction on its paper mill along the North River in 1939, on the site of the former menhaden plant. Paper production began in 1941. The shrimping industry was well established by this time, with 157 commercial fishermen employed on 31 vessels and boats. In 1940, fishermen had landed 1,681,000 pounds of
shrimp, menhaden, crab, and shad which yielded $43,933. Of the total catch, shrimp—Penaeus—comprised 1,209,500 pounds in weight and $36,285 in value (Department of Commerce 1940). The C. A. Taylor shrimp dock and cannery on the St. Marys waterfront was thriving.

The effect of Gilman Paper Company on the commercial fishery in Camden County is immediately obvious. The paper mill drew upon the local labor and natural resources upon which the commercial fishery relied.

The Effects on Labor Resources

In its first year of production, the mill employed 125 men (Camden County Tribune 1955). The mill rapidly absorbed a large portion of Camden County residents as well as attracting a new population of millworkers from Vermont, Louisiana, and elsewhere.

Among the local employees were commercial fishermen who chose steady, full-time, onshore employment over the uncertainty of shrimping. By 1945, there were only 89 commercial fishermen employed on 24 vessels and boats (Department of Commerce 1945), 43 percent fewer fishermen than in 1940 (Figure 30). C. A. Taylor sold his canning plant, dock, and boats in 1947 as his business began to decline. According to one shrimper, Taylor's competitors were not selling him fresh shrimp for canning and the dock was in bad need of repair.

While part of this decrease in the number of commercial fishermen may be attributed to the disruptive effects of World War II and the closing of the menhaden plant, it also reflects the influence of the mill on the local labor force. The mill continued to operate at the 1941
Figure 30. Number of Camden County commercial fishermen, 1923-1979. Compiled from Department of Commerce fishery statistics.
level with a daily production rate of 125 tons of pulp and paper until 1945. The paper company began to expand after World War II, and by 1950 was producing 400 tons of pulp and paper a day (Camden County Tribune 1955), and employing approximately 500 persons in the mill and the newly constructed kraft-bag plant. By contrast, the fishing industry in 1950 employed 62 fishermen on 14 vessels and boats (Department of Commerce 1950). This represents a 61 percent decrease in the number of fishermen and a 45 percent decrease in the number of boats over the ten-year period. By 1955, the paper company employed 1,100 persons in the mill and bag plant along with 400 construction workers employed in expanding the operation (Camden County Tribune 1955).

The Effects of Pulp Mill Wastes on the Estuary and Estuarine Resources

The growth and development of Gilman Paper Company also affected the productivity of the commercial fishery catch by polluting its source, the estuary. Construction of the mill marked the beginning of a major industry in Camden County and its by-product, industrial waste and pollution. This situation was not peculiar to Camden County but symptomatic of the spread of industrial development throughout the United States following the Industrial Revolution. Industries tended to locate along rivers in order to easily and cheaply process their goods and to dispose of the wastes of processing (Warren 1971).

Disposal of industrial wastes can pose a significant problem for estuaries, the organisms within them, and the commercial fisheries that rely upon their productivity. The decline of fisheries in the northeast United States are in part a result of industrial growth.
The great Atlantic Coast fisheries on anadromous and estuarine species from New England to Chesapeake Bay declined drastically after about 1800. The Atlantic salmon (Salmo salar) and then the American shad (Alosa sapidissima) all but disappeared. Poor fisheries management, dams across rivers and streams, and pollution were responsible for this. The once-fabulous clam and oyster fisheries of the Atlantic Coast have in large part been rendered useless since the turn of the century. [Warren 1971: 6]

Other forms of pollution associated with the growth and development of our civilization can and do damage estuaries. Sewage wastes, pesticides, dredge spoil, fossil fuel, phosphate, petrochemical, and nuclear wastes threaten the world's water resources (Odum, Copeland, and McMahon 1974).

The pulp and paper mill waste associated with Gilman Paper Company is of particular concern in Camden County because it is the major source of pollution in the county's ecological system (Copeland and Odum 1974: 109). A potential source of chemical and pesticide pollution is the Union Carbide plant situated on Floyd's Creek. The plant is recent, however, and has operated under federal and state environmental protection measures since its inception (Union Carbide 1978: 19). Data on the past and present effects of its operation on the estuary is incomplete.

Gilman Paper Company uses one of two major pulping techniques: the kraft (sulphate) method. The kraft method involves the use of an alkaline cooking liquor to break down the pulp (Wilkes and Copeland 1974). The other pulping technique, the sulfite process, utilizes an acid liquor, spent sulfite liquor (SSL). The cooking liquor produced in the kraft process is more easily recovered than SSL.

The liquor produced in the kraft process contains turpentine and tall oil, "... two by-products that were once routinely pumped into
the [North] river . . . [but are now sold and] account for a solid percentage of Gilman sales" (Gilman Paper Company 1978: 17). Although the kraft process "usually produces lower organic waste loadings than SSL," its waste can be more toxic because toxic substances such as "hydrogen sulfide, mercaptans, resin acids and soaps are usually present in higher concentrations" (Wilkes and Copeland 1974: 215).

Pulp mill wastes produced by the kraft and sulfite processes have direct and indirect effects on the coastal environment. Direct effects include (1) an increased oxygen demand on the water in which the effluent flows—the BOD (biological oxygen demand) of the sugars depletes the oxygen in the water. Spent sulfide liquor, which contains more concentrated organic material, exerts a greater BOD than does the kraft process; (2) a change in the pH of the water that receives the waste as a result of the kraft process (alkalinity) or the SSL (acidity); (3) turbidity which affects the photosynthesis in the water; (4) a temperature change resulting from heated waste introduced into the water; and (5) toxicity of the effluent waste to the organisms in the water (Wilkes and Copeland 1974: 215-216). The indirect effects of pulp mill wastes include (1) the "settling out" of waste materials on bottom sediments which can deplete the oxygen and adversely affect the growth and development of marine organisms; (2) increased foaming on the surface water; and (3) long-term but subtle changes in the growth, reproduction, and metabolism of the marine flora and fauna (Wilkes and Copeland 1974: 216).

In essence, pulp mill wastes stress the ecological system of coastal waters by utilizing its energy, normally used to support marine

Copeland and Odum (1974: 109) have studied a pulp mill located in St. Joseph Bay, Florida, that shares a similar marine environment and pulp processing method with Gilman Paper Company. The St. Joseph Bay environment is defined as a "medium-salinity, plankton-based system." The medium salinity results from the mixing of fresh and salt waters. Analysis of the effects of the pulp waste from the St. Joseph Bay mill revealed that the wastes became thoroughly mixed with the bay water a short distance from its origin. Pulp mill wastes were detectable one mile away from their origin (Wilkes and Copeland 1974: 226). Significant for fisheries, however, is that the species diversity in the bay correlated with distance from the mill. At the point of waste origin, there were only six species of zooplankton per 1,000 individuals. This increased to 18 species of zooplankton per 1,000 individuals four miles out into the bay (Wilkes and Copeland 1974: 239).

Pulp mill wastes can have particularly detrimental effects on sessile marine organisms that are unable to escape the environment. In laboratory and field studies of oysters, it has been found that pulp mill wastes, particularly SSL, can cause mortality of oysters and inhibit their ability to spawn. Sulphate wastes can inhibit carbohydrate metabolism, reduce the number of hours that the oyster remains open
to feed, and in strong concentrations can kill oysters by atrophy of the adductor muscle which allows the oyster to keep its shell closed (Wilkes and Copeland 1974: 234-237).

Pulp mill wastes can affect "migrating subsystems," marine organisms that make seasonal use of the estuarine systems for spawning of eggs and/or growth and development of larvae to adults. The remainder of their life cycle is spent in the ocean. Many of the commercial fishes and crustaceans in the United States spend part of their life cycle in the estuarine system. These include penaeid shrimp, pandalid shrimp, Atlantic salmon, Pacific salmon, American salmon, striped bass, herring-like fishes such as herring, alewives, anchovies, sardines, and menhaden, and blue crab (Copeland, Odum, and Moseley 1974).

Migrating species enter the estuaries in the spring or early autumn when the productivity of the estuary is at maximum. River flow into the estuary increases in the spring and summer bringing with its flushing activity nutrients, organic compounds, and lowered salinity that enhance photosynthesis (Copeland, Odum, and Moseley 1974: 447). Waste disposal that inhibits the productivity of the estuaries inhibits the growth and productivity of these species and the productivity of commercial fishing that relies upon these species. Industry and development in coastal areas or along inland rivers that drain into coastal areas have taken their toll. "The popular impression that a general decline in the population of migrating organisms has occurred over the past several years is by and large correct" (Copeland, Odum, and Moseley 1974: 447).
Kutkuhn (1964: 31) foresees only adverse effects on shrimp from industrial pollution as the associated "change in water chemistry; presence of toxic or suffocating compounds" would result in "decreased shrimp survival and productivity." Studies on the effects of pulp mill wastes on shrimp are lacking, however.

Kraft mill wastes can have a toxic effect on salmon, like shrimp, a migrating organism. A 50 percent mortality rate of young Pacific salmon can be induced with a 10 percent concentration of kraft mill waste (Wilkes and Copeland 1974: 230-232). At very low concentrations, fish can survive the effects of kraft mill waste, but their physiology will undergo changes (Wilkes and Copeland 1974: 232). Rather than tolerate polluted estuaries, even those in which they could survive and reproduce, fish are more likely to avoid them since they can detect concentrations of many harmful substances (Warren 1971: 62).

The Adaptation of Commercial Fishermen to Estuarine Pollution

Adverse effects of the operation of Gilman Paper Company on the estuarine resources prior to the completion of a filtering system in 1972 are corroborated by local residents and commercial fishermen. Commercial fishermen who were fishing before and during the establishment of the paper company stated that the pulp mill's pollution hurt the commercial shrimping. One fisherman stated:

Years ago you couldn't catch any fish in North River on account of fish couldn't live in there when they [Gilman] dumped all the waste in the river. . . . See they used to dump all of the waste in the North River and on flood tide it would . . . go up the river and [at] ebb tide it would drift back out in the St. Marys River and go around polluting everywhere. . . .
Another fisherman stated that "pollution from Gilman affected everything! Shrimp, fish." A third fisherman noted, "You couldn't hardly eat the fish until four or five years ago. Tasted like turpentine. In the North River, there was no life."

Public concern over an apparent decrease in shrimp on the northeast Florida coast prompted an investigation by the Florida Board of Conservation. In Nassau County, the study notes "local fishermen have told of fish and shrimp taken in the inshore waters that smelled of turpentine. This is probably correctly blamed on the pulp mills . . ." (Joyce 1965: 11).

In St. Marys, a Georgia Public Health Department inquiry was held in 1955 to investigate complaints of Gilman's pollution of North River, St. Marys River, and the Cumberland Sound (Fallow 1971: 102). The Health Department report included one shrimper's claim that his fishing business had been completely destroyed by the pollution of the mill. He could not catch shrimp in the area, and the fish caught from the Cumberland Sound, St. Marys River, and nearby areas had a "kerosene" or "turpentine" flavor which made them useless for selling or eating. The shrimper stated that his business survived the previous year because of shrimp caught in the Gulf of Mexico (Fallow 1971: 103).

Comparing this complaint with those of other commercial fishermen, production rates of Gilman, and fishery statistics of Camden County landings and labor reveals that the mill was adversely affecting commercial shrimping by disrupting the original pattern of shrimping in the sounds. The shrimpers adapted to this situation by going further out
for their catch. Adaptation was completed with the discovery of new shrimping grounds in the Tortugas in 1949 and Campeche, Mexico, in 1950 (Joyce and Eldred 1966: 15, 23) as well as technological innovations in the commercial shrimping industry.

The increase in Gilman's production rates from 125 to 400 tons of pulp and paper a day between 1941 and 1950 was probably beginning to have a cumulative effect on the commercial fishing. Fishery statistics indicate that the landings of shellfish (shrimp and crab) in 1950 were at their lowest level since the beginning of commercial fishing in Camden County (see Figure 26, p. 199). The number of fishermen recorded in 1950 is also at its lowest level (see Figure 30, p. 232).

It appears that shrimping was being pursued outside the sound along the Atlantic coast. One shrimper stated that he didn't fish off the Camden coast during this time. Another shrimper purchased a dock in partnership on the South Carolina coast in 1948 for landing the catch of his boats. South Carolina is a 12-hour run from St. Marys. Boats shrimp the South Carolina coast in the summer because sometimes, according to one shrimper, "... the shrimp will maybe start running [there] ... before they do down here."

Probably the critical point in Gilman's expansion for the commercial fishery was the addition of a bleach plant in 1953. The bleach plant produces high brightness white paper. The 1955 Public Health report stated that the bleaching process increased foaming and added an acid effluent to waters. Kerosene was added to the bleaching process to reduce the foaming.
The amount of kerosene used varies from 1/2 to 1 gallon per ton of pulp or paper produced. At the upper figure of 1 gallon per ton, this would mean that 465 gallons would be used per day at peak production... an unnamed operator from the plant informs me that the pump used to transfer the acid effluent to the river must have parts replaced every three days because of the action of the acid. This, if true, indicates a much stronger acid condition of the effluent than indicated by [the mill]... [Fallows 1971: 102-103]

As late as 1970, one shrimper is quoted as saying, "You take a crab, and you throw him in the [North] river. . . . You know what he'll do? Number one, he'll crawl right out of the water. And number two, he'll die" (Fallows 1971: 102).

Shrimpers adapted to the new environmental constraints by merely doing what they had always done—i.e., following the shrimp. Following the shrimp took them further up and down the Atlantic coast and out to the Gulf of Mexico. Particularly profitable was the shrimping in Campeche, Mexico. The run to Campeche was 72 hours. In the beginning, in the early 1950s, boats would carry enough ice and fuel to last 15 days. The time was soon expanded to 30 days on a round trip. One shrimper who had leased a dock in Tampa, Florida, made one run to Campeche that lasted 33 days. He recalled the experience as quite different than the daily daylight runs from St. Marys.

Well, it was bad weather over there when we got there and the first night one crew member got pulled off the deck of a boat out of Fernandina and drowned. And that scared me to death. . . . One morning, when I was pulling up the anchor, the anchor rope slipped out of a shot and hit me and knocked me against the pilot house and like to broke my legs. I thought they was broken, and for about 10 days I was hobbiling around and putting liniment on my knee . . . having to work the boat, too. . . . There wasn't nobody but just me and one man on the boat at that time and that
was one of those big boats, too [probably a 65-foot boat]. And it was more than we could handle. We fished over there 33 days and I caught 70 boxes of shrimp. That's 7,000 pounds. . . . And some of them at that length of time were catching maybe 100 boxes. But the weather was so bad, we didn't get a chance to fish too much. It'd be so nice when we were fishing and get so rough we would have to quit. You would run into shore . . . called the "flats" and it would be very rough and we'd anchor and lay there and rest till the weather got smooth again. And we'd go back out. All that fishing over there was in the nighttime and I didn't like that. I was used to fishing at daytime. I never could get accustomed to fishing in the nighttime. I like daytime fishing.

This shrimper, like others, would also shrimp from Key West to Texas and unload the catch and refuel at the nearest port. "We would land in the nearest port, see. It was too far to haul them back . . . and forth [to St. Marys]." Camden County shrimpers had adopted a new pattern of long-distance shrimping along the Gulf Coast for part of the year and along the Atlantic Coast for the remainder.

Gilman Paper Company began to construct a clarifying and aeration basin in 1967 to comply with federal and state environmental protection standards. The basin, designed to treat effluent water in several stages over a six-day period, was completed in 1972. The water treatment facility allows the mill to pump 40 million gallons of treated water into the North River each day (Gilman Paper Company 1978: 31).

Treating the mill's effluent waters produced better conditions for the estuary. One shrimper said that the water treatment by the mill made a difference in the fishery, that the estuarine waters cleared up in a couple of years. Another shrimper concurred: "... Since they started putting it [effluent] out in that lake and purifying it,
people have been going up in there [North River] and catching good, many fish. So they have licked that problem."

Illustrating and Predicting the Impact of the Pulp Mill on the Commercial Fishery through Energy Modeling

Energy modeling provides a technique for illustrating and predicting the impact of the pulp and paper company on the commercial fishery in Camden County. Energetics or energy circuit modeling as developed by Howard T. Odum (1971) is a means of quantitatively analyzing systems. The methodology is based on general systems theory. While a systems or holistic view of the world sees the whole as consisting of related and interacting parts, energetics views the whole, or system, and its parts as being composed of energy. The relationships and interactions between the parts are based on flows of energy (Alexander, Alexander, and Sipe 1980). "Energy is a measure of everything. It measures the amount of stored capability for future processes and the rate at which processes go. The total amount of an accomplished process is measured by the energy used" (Odum and Odum 1976: 25).

Three principles of energy apply to systems modeling: (1) the law of conservation of energy, which states that energy entering a system is either stored or flowing out—energy is neither created nor destroyed; (2) the law of degradation of energy, which states that in all processes, some of the energy loses its ability to work and is degraded in quality—in energy models this principle is illustrated by the heat sink (see Figure 31); (3) the maximum power principle, which states that those systems survive that are able to harness the most
Figure 31. Energy model symbols used in the energy models for Camden County

Energy Source: A source of energy from outside the system
Energy Storage Tank: A storage of energy within the system
Heat Sink: The loss of degraded energy
Interaction: The interaction of two or more types of energy required for a process
Production: The processes, interactions, and storages involved in producing high-quality energy from a dilute source
Self-Maintaining Unit: A unit of storages and feedback interactions which maintain it

Adapted from Odum and Odum (1976: 20-22; 44)
energy and effectively compete with other systems (Odum and Odum 1976: 37-41; Sipe 1978).

Measurements in energy modeling are usually based on heat and calculated in terms of kilocalories. "Because all forms of energy can be converted into heat, energy can be defined and measured as the ability to generate heat. The unit of measure ... is the calorie" (Odum and Odum 1976: 27).

The process of energy modeling entails (1) defining the boundaries of a system for analysis; (2) identifying its interacting parts; (3) calculating and assigning comparable values in kilocalories to the parts and their interactions; and (4) calculating the rates of change in the system, its parts, and interactions over time. With the aid of a Dynamo Simulation program, this final step is quickly accomplished by the computer and will produce a printed simulation or graph of the energy quantities within the system over time. The resulting graph indicates the growth, decline, or steady state of a system or its parts.

Energy modeling requires simplification of the defined system into a modular diagram for analysis. Models can incorporate such complicated systems as the world or relatively simple ones like a farm. Models are arranged such that less concentrated energy sources are at the left of the diagram and more concentrated energy sources or flows are at the right.

Expressing the system in the model is done through the use of symbols. The symbols were established by Howard T. Odum (1971) as part of the energy circuit language. The symbols used in the energy model of Camden County are explained in Figure 31.
Figure 32 is the simplified energy model for analyzing the relationship between the pulp mill and the commercial fishery within the boundary of Camden County. Both the commercial fishery and the pulp mill rely on the productivity of the natural environment in the county for terrestrial and estuarine resources that maintain their operation. The commercial fishery utilizes fish resources; the pulp mill utilizes timber and water resources. The natural environment within the county relies on outside sources of energy such as the sun to encourage its productivity. The commercial fishery also procures fish resources from fishing grounds located outside the county while the pulp mill secures timber resources from company-owned land situated outside the county. The storages within the system are defined in Table 7.

The various connecting lines, kn, indicate the pathways of energy within the system. Inflowing energy is either stored, or it flows out to produce other energy in a feedback loop, or it is degraded as waste heat. The flows within the system are defined in Table 8.

The significant pathway in the model is k11 (see Figure 32), which designates the impact of pulp mill pollution on the estuarine resources on which the commercial fishery relies; k11 acts as a drain on k7, the flow of resources to the commercial fishery.

Figure 33 presents the simplified model of Figure 32 with its calculated storages and flows. The values assigned to the storages and flows within the system refer to kilocalories per year and are expressed in terms of $10^9$. Appendix III provides the complete
Figure 32. Simplified energy model of the relationship between the commercial fishery and the pulp mill in Camden County
Table 7. Description of energy storages

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Energy Storages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Stored Natural Energy Assets</td>
</tr>
<tr>
<td>NA</td>
<td>Natural System Assets</td>
</tr>
<tr>
<td>F</td>
<td>Commercial Fishery Assets</td>
</tr>
<tr>
<td>P</td>
<td>Paper Mill Assets</td>
</tr>
<tr>
<td>L</td>
<td>Paper Mill Assets Outside of the County</td>
</tr>
<tr>
<td>FS</td>
<td>Commercial Fishery Assets Outside of the County</td>
</tr>
</tbody>
</table>
Table 8. Description of energy flows

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Energy Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>k0</td>
<td>Flow of Natural Energy</td>
</tr>
<tr>
<td>k1</td>
<td>Depreciation of the Storage of Natural Energy</td>
</tr>
<tr>
<td>k2</td>
<td>Flow of Natural Energy into the Natural System</td>
</tr>
<tr>
<td>k3</td>
<td>Productivity of the Natural System</td>
</tr>
<tr>
<td>k4</td>
<td>Feedback of Natural Assets into Natural Production</td>
</tr>
<tr>
<td>k5</td>
<td>Depreciation of the Natural Assets</td>
</tr>
<tr>
<td>k6</td>
<td>Flow of Natural Assets to Commercial Fishery</td>
</tr>
<tr>
<td>k7</td>
<td>Flow of Natural Assets to Paper Mill</td>
</tr>
<tr>
<td>k8</td>
<td>Productivity of the Paper Mill</td>
</tr>
<tr>
<td>k9</td>
<td>Feedback of Paper Mill Assets into Mill Production</td>
</tr>
<tr>
<td>k10</td>
<td>Depreciation of the Paper Mill Assets</td>
</tr>
<tr>
<td>k11</td>
<td>Feedback of Mill Assets Negatively Affecting the Flow of k7</td>
</tr>
<tr>
<td>k12</td>
<td>Flow of Wood into Paper Production from Land outside of the County</td>
</tr>
<tr>
<td>k13</td>
<td>Productivity of the Commercial Fishery</td>
</tr>
<tr>
<td>k14</td>
<td>Feedback of Commercial Fishery Assets</td>
</tr>
<tr>
<td>k15</td>
<td>Depreciation of Commercial Fishery Assets</td>
</tr>
<tr>
<td>k16</td>
<td>Flow of Shrimp into the Commercial Fishery from Water Resources outside of the County</td>
</tr>
</tbody>
</table>
Figure 33. Simplified energy model of the relationship between the commercial fishery and the pulp mill in 1940 with the calculated storages and flows
calculations for storages and flows in the model. The calculations are based partly on historic production data for the commercial fishery and the pulp mill, others reflect productivity rates of natural energy sources (see Helmut and Whittaker 1975).

With the aid of the Dynamo Simulation program, the system is plotted over time, in this case nearly 200 years. Appendix IV presents the Dynamo program utilized to simulate the model. The results of simulation are exhibited in Figure 34 and Figure 35. In both Figures 34 and 35, the productivity of the pulp mill (P) increases and eventually declines, the productivity of the natural system (N) decreases and reaches a steady state, the stored natural energy (A) increases and reaches a steady state, and the commercial fishery (F) declines.

In Figure 34, the operation of the pulp mill produces pollution that adversely affects the estuarine resources (i.e., k11 acts as a drain on k7), and ultimately the commercial fishery. In Figure 35, as the mill installs pollution controls (i.e., the drain, k11 is turned off), its operation continues to adversely affect the commercial fishery.

The relationship between the pulp mill and the commercial fishery from the years 1940 to 2010 is characterized as one of "competitive exclusion" in which one system experiences expanded growth at the expense of another system.

The principle of competitive exclusion is well established in such situations as microbial cultures, competitions of weeds, and perhaps the economic competition of businesses. During periods of rapid growth, when sources of energy are relatively unlimited, and when no other controls are provided, one system accelerates its growth faster than the other. The effect accumulates until one unit drives the other out of
Figure 34. Simulation of the 1940 energy model of the commercial fishery (F) and the pulp mill (P) with drain, k11, turned on: natural system (N), natural energy (A)
Figure 35. Simulation of the 1940 energy model of the commercial fishery (F) and the pulp mill (P) with drain, k11, turned off: natural system (N), natural energy (A)
business; one survives and the other does not. The survivor, by means of its accelerating growth, manages to capture resources for energy flows from the other. [Odum and Odum 1976: 70-71]

The declining productivity of the natural system (N), however, eventually affects the pulp mill as it, too, ultimately declines.

Energy modeling is used here to illustrate the relationship between the pulp mill and the commercial fishery described earlier in this chapter. The results of the model simulations accurately reflect the results of historical analysis and thus support the utility of this technique as a predictive device in systems analysis.

The Impact of Base Development on the Commercial Fishery

This section analyzes the impact of naval base development on the commercial fishery. The results of research indicate a number of adverse impacts associated with the development. Adverse effects resulting from construction of the base include disruption of the estuary by channel dredging and the disposal of dredge spoil. In addition, operational impacts which include maintenance dredging, submarine traffic, and petroleum, chemical, and radioactive pollutants will further disrupt the estuary.

The impact of base development cannot be considered without reference to the effects of the pulp mill upon the commercial fishery. Faced with severe disruption of the estuary caused by the early operation of the mill, Camden County fishermen adapted through innovations in fishing strategy aided by technological advances. The ability of the fishermen to accommodate the effects of base development, however,
is hindered by current economic conditions as well as government regulatory actions.

The implementation of pollution control measures has mitigated the effect of the pulp mill on the estuary in recent years; however, the cumulative effects of mill operations and naval base development are potentially devastating to the fishery. An energy model illustrating and predicting the relationships among the naval base, the pulp mill, and the commercial fishery is presented.

The Effects of Dredging and Dredge Disposal

The major impact of the naval base on the fishery will result from the dredging of the channels and disposal of the dredged materials (spoil) to allow submarines and other naval craft ocean access and maneuverability. Kings Bay Naval Base is located approximately eight miles up the Cumberland Sound from the St. Marys Entrance, the main access point to the Atlantic Ocean.

The channels to be dredged are the St. Marys Entrance, interior channels located between the entrance and Cumberland Sound, and Cumberland Sound. Prior to dredging, the channels were 34 feet deep and the St. Marys Entrance and interior channels were 400 feet wide. The Cumberland Sound was originally 200 feet wide at bottom (Department of the Navy 1977b: 1-22).

A Poseidon submarine draws 33 feet of water when underway (Department of the Navy 1977a: 4-162). For T-1 dredging, therefore, the St. Marys Entrance was dredge cut to 44 feet below mean low water, the interior channel was dredge cut to 40 feet below mean low water,
and the Cumberland Sound dredge cut to 40 feet below mean low water and widened to 300 feet on the bottom (Department of the Navy 1977b: 1-22).

The Trident submarine is considerably larger than the Poseiden, approximately the length of two football fields. Thus A-1 development for Trident will require further enlargement of the channels. The St. Marys Entrance will be dredge cut to 45 feet below mean low water and widened to 500 feet on the bottom. The area of the Entrance that leads out to sea will be dredge cut to 47 feet below mean low water. The interior channels will be dredge cut to 44 feet below mean low water and widened to 500 feet, while the Cumberland Sound will be dredge cut to 44 feet below mean low water and widened to 500 feet (Department of the Navy 1980b: 1-15 - 1-17).

The Kings Bay basin also averaged 34 feet deep prior to naval base development; T-1 dredging required deepening the basin to 41 feet below mean low water. The area for the floating dry dock was to be cut to 56 feet below mean low water, and the area between it and the shore maintained at 23 feet below mean low water (Department of the Navy 1977b: 1-19).

Expansion for Trident submarines, however, requires that the entire Kings Bay basin be dredge cut to 44 feet below mean low water. A magnetic silencing facility (MSF) installed with A-1 development will require a 600-foot radius turning basin. The approach to the MSF will require a 500-foot width. An upper and lower turning basin will require a 600-foot radius for each and the channel connecting the turning basins
will be widened on the bottom to 500 feet (Department of the Navy 1980b: 1-14 - 1-16).

To date, T-1 dredging in the St. Marys Entrance has affected 326 acres of sandy and clay-like bottom and produced 2.6 million cubic yards of dredged materials or spoil. Dredging in the interior channels has affected 199 acres of bottom and produced 700,000 cubic yards of sand. Dredging in Cumberland Sound has affected 291 acres of bottom and produced 2 million cubic yards of spoil. Basin dredging in Kings Bay has affected 287 acres of bottom and removed 6.7 acres of marsh producing 8.2 million cubic yards of spoil (Department of the Navy 1977b: 1-22 - 1-23).

The A-1 dredging of the Kings Bay basin, St. Marys Entrance, interior channels, and Cumberland Sound will disrupt 333 acres of bottom and will also disrupt 49 acres of tidal wetlands consisting of 12 acres of salt marsh and 37 acres of intertidal mudflats or sand bars (Department of the Navy 1980b: 1-24). A total of 20.5 million cubic yards of dredged materials will be produced by A-1 dredging. Of this total, 10.3 million cubic yards will be removed from the basin of Kings Bay; 5.8 million cubic yards will be removed from the Cumberland Sound and interior channels and 4.4 million cubic yards will be removed from the St. Mary's Entrance (Department of the Navy 1980b: 1-14 - 1-17).

Further, T-1 and A-1 development of Kings Bay require maintenance dredging due to the high sedimentation rates of the basin and channels (Department of the Navy 1977a, 1980a). Although no estimates are given for the amount of bottom to be affected by T-1 maintenance
dredging, the amount estimated for A-1 is 500,000 cubic yards per year (Department of the Navy 1980b: 1-17). Maintenance dredging will be necessary to keep the channels and basin clear for submarine traffic.

The dredge spoil from T-1 development has been deposited in three areas: diked upland areas located on the naval base, along beaches, and in open water offshore. The upland areas include 620 acres of Crab Island, a diked disposal area; 375 acres of pine plantations and wetlands; 250 acres of pine and hardwood plantation; and 190 acres of pine plantation. Beach "nourishment" programs along the shoreline of Ft. Clinch State Park and a 23,000 foot section of Fernandina Beach, Florida, is another means of distributing dredge spoil. The ocean dump site, temporarily approved by the Environmental Protection Agency (EPA), is located six miles southeast of the St. Marys Entrance (Department of the Navy 1977b: 1-23 - 1-25).

The dredge spoil from A-1 development will be deposited in the upland areas and at the ocean dumping site. The upland areas on the naval base will be expanded to include 400 acres in addition to the already impacted 650 acres and all of the spoil acreage will be diked to a new elevation of 35 feet above mean low water (Department of the Navy 1980b: 1-21). Upland disposal will handle the initial and maintenance dredge spoil from the Kings Bay basin and Cumberland Sound. The ocean dumping site will receive dredge spoil from the St. Marys Entrance and part of the interior channel. If the interim EPA ocean dump site is not available, the Navy will seek other EPA-approved ocean disposal sites (Department of the Navy 1980b: 1-18). While utilizing A-1 level
and maintenance dredge for beach nourishment is recommended as an approved alternative means of disposal by the Navy, the Navy cannot assume financial responsibility for transporting the dredge spoil to nourishment areas. Thus beach nourishment is not planned for A-1 level and maintenance dredging.

The dredging and disposal of spoil produced by naval base development will diminish the productivity of the Cumberland Sound estuarine complex and disrupt the habitat and life cycle of species upon which the commercial and noncommercial fisheries depend. The shrimp, crab, and shad that comprise the commercial fishery are all dependent on the estuary. While limited dredging can release nutrients and stimulate productivity of the estuary, the nature of dredging associated with construction and operation of Kings Bay Naval Base will not have this beneficial effect.

In Kings Bay, the effects of dredge-related nutrient releases will be substantially reduced because (1) a hydraulic dredge tends to prevent sediment dispersion and thus does not provide significant increases in nutrient concentrations; (2) physical processes (adsorption, flocculation, and sedimentation) tend to remove nutrients rapidly from estuarine waters; and (3) high ambient water color reduces light transmission, thereby reducing the ability of phytoplankton to utilize available nutrients. [Department of the Navy 1977a: 4-151]

Dredging of navigation channels increases the amount of sea water entering the estuary, affects circulation patterns and exchange rates of ocean, estuarine and fresh waters, and changes the estuarine temperature (Kutkuhn 1964: 30). Dredging can interrupt the normal pathways of energy flow. Channeling of tidal currents changes the mechanism whereby incoming food sources from the ocean and outgoing food
sources from fresh water streams and rivers are transported in the estuary (Copeland and Dickens 1974: 151).

The construction dredging associated with Kings Bay Naval Base changes the bottom sediments (substrate) to a soft texture, destroys marine plant and animal life within the dredged area, creates turbidity and siltation, releases toxic substances (particularly pulp mill pollutants) from disturbed sediments, and produces a low dissolved oxygen level in the estuary (Department of the Navy 1977a). These disturbances destroy the habitat for marine plant and animal life, particularly those species such as shrimp, crab, and finfish that commercial and noncommercial fishermen exploit. While the estuarine plant and animal life would normally reestablish itself once the construction dredging was completed and the bottom sediments resettled thus mitigating these adverse effects, the continued maintenance dredging and submarine traffic in the navigation channel and basin will continuously disturb the bottom rendering the area uninhabitable for marine life on a long-term basis.

Submarine traffic would effectively "redredge" the navigation channels and basin with each passage. Poseidon submarines at T-1 depths, for instance, have only 3 feet of water between the hull and bottom sediments. The passage of Poseidon subs as well as tug boat prop wash churn up bottom sediments and redeposit them up and down the estuary (Department of the Navy 1977a: 4-162). Trident submarine passage would similarly scour the bottom and resuspend bottom sediments. Although the level of submarine traffic for T-1 and A-1 levels is not
indicated, the frequency of submarine traffic associated with Trident development will increase 80 percent over T-1 since twice as many submarines will be stationed at Kings Bay Naval Base (Department of the Navy 1980a: 6-63).

The highly technical analysis presented in the environmental impact assessment somewhat obscures the magnitude of adverse impacts on the shrimp, crab, and finfish so vital to the local economy. The economic significance of the affected species is obfuscated by the use of terms such as "benthic macro-invertebrates," "benthic invertebrates," and "benthic organisms" to refer to shrimp, crab, clams, and oysters (Department of the Navy 1977a: 3-148; 1977b: 1-33). Fish affected are "bottom-feeding fish populations." For example, the environmental impact assessment concludes:

Frequent maintenance dredging may prevent bottom-living aquatic populations from reestablishing themselves. This repeated process would also alter substrate composition, resulting in sediments which are not conducive to benthic invertebrate colonization. . . . Bottom-feeding fish populations which prey upon benthic organisms will decrease due to the diminished food supply. This group includes commercially valuable species such as spot and weakfish. [Department of the Navy 1980a: 6-77]

These conclusions are then condensed in the abstract to read, "Dredging and additional submarine traffic are expected to disrupt and/or eliminate populations of benthic organisms in the more northern navigation channels and in the operating basins" (Department of the Navy 1980a: 1-2).

The dredge spoil deposited in the diked upland areas is susceptible to erosion and runoff which can result in dredge spoil effluent. Spoil effluent increases oxygen demand and may produce fish
kills in Kings Bay, particularly during the summer "when dissolved oxygen concentrations in deep waters are lowest" (Department of the Navy 1977a: 4-157).

Toxic materials such as heavy metals and pulp mill pollutants that are present in the bottom sediments of Kings Bay may reenter the bay as part of dredge spoil effluent and affect the chain of marine life by first being absorbed by phytoplankton and zooplankton and then concentrated in the tissues of fish, shrimp, crabs, oysters, and fish that consume them (Department of the Navy 1977a: 4-157).

With Trident development the amount of dredge spoil effluent will increase as the dredging activities increase, therefore the potential for contaminating the estuarine organisms increases.

The amount of dredge spoil effluent produced would significantly increase as a result of additional dredging activities. An increased quantity of nutrients and possibly some heavy metals may be liberated from dredged sediments and enter the estuary through this effluent. Introduction of heavy metals can contaminate the aquatic food web and render fish and other food species unfit for human consumption. [Department of the Navy 1980a: 6-77 - 6-78]

The severity of the adverse effects of spoil effluent on estuarine life would be governed by tidal level and circulation patterns in Kings Bay (Department of the Navy 1977a: 4-157 - 4-158; 1980a: 6-72).

Disposal of dredge spoil at the ocean dumping site directly affects marine life by burying benthic invertebrates such as shrimp and crabs and their larval forms. Ocean dumping of dredge spoil also increases turbidity and lowers the dissolved oxygen level (Department of the Navy 1977a: 4-159 - 4-160). Increased ocean disposal of dredge
spoil with Trident development will result in sediment buildup that will aide repopulation of the site by marine organisms (Department of the Navy 1980a: 6-77).

Other Base Related Impacts

Other aspects of naval base development affecting the estuary and commercially significant species are the potential for oil spills and other pollutants, nuclear contamination, and restricted access. Oil contamination is regarded as an inevitable consequence of the restricted channel and increased submarine traffic.

Associated with this increase [of the number of ships moving into and out of Kings Bay] is the possibility of oil pollution through accidental leakage or spillage. Possible sources of oil pollution are bilge discharges, collisions, groundings, structural failures, rammings, fires, explosions, breakdowns, and human error. [Department of the Navy 1977a: 4-166]

Trident development increases the probability of an oil spill accident (Department of the Navy 1980a: 6-32). While the Navy maintains an emergency plan for controlling oil spills, the severity of the spill will be governed by the location of the spill, the amount and type of oil involved, and the tidal level.

In the event of an oil spill, the effects on estuarine plant and animal life and the associated fishery would be detrimental.

Once introduced into an aquatic environment, [petroleum] effects can persist almost indefinitely. This is particularly so when they coat rocks, sands, and silts of the benthic environment and render them unsuitable for life. Oily films on water surfaces are displeasing and interfere with recreational uses. . . . To the [estuarine] plants and animals . . . their light and oxygen become restricted, and their body surfaces may become coated. . . . Objectionable odors . . . can impair the flavor of aquatic animals man uses for food. [Warren 1971: 62]
The environmental impact assessment acknowledges that, when exposed to sublethal concentrations of oil, shrimp, and crab larvae die and fish take on a kerosene-tainted taste (Department of the Navy 1977a: 4-169 - 4-170).

Other estuarine pollutants resulting from naval base operation include increased oil, grease and metals from stormwater runoff in the base support area (Department of the Navy 1980a: 6-10); copper used in paints and other toxic substances from waterfront operations (Department of the Navy 1977a: 4-166); and pesticides for the control of mosquitoes and other biting insects from runoff or drift (Department of the Navy 1980a: 6-14). Pesticides entering the estuary can destroy plant and animal life and become concentrated in surviving species, posing a threat to human consumers (Gray 1974, Wilber 1969). The Navy hopes to minimize the adverse effects of pesticide pollution by using nonpersistent pesticides and monitoring their application (Department of the Navy 1980a: 6-14).

The environmental impact assessment does not discuss any adverse environmental aspects of nuclear-powered submarines carrying nuclear missiles. In fact, the term "nuclear" does not appear in the Key Word Index to the 1977 Draft Environmental Impact Statement and is only briefly addressed under the topic of "Operational Impacts" (Department of the Navy 1977a: 4-16 - 4-22). There are three potential sources of radiation: shipboard reactors, nuclear warheads, and nuclear waste. Although nuclear warheads emit low-level radiation, emissions are confined by shielding during storage, handling, and while aboard the
submarine (Department of the Navy 1977b: 1-69). Radioactive materials could be released from the nuclear missiles only if the warhead ruptured, an accident which the Navy considers virtually impossible due to the construction and design of the missiles and the safety precautions practiced by naval personnel (Department of the Navy 1977b: 1-70).

Naval nuclear-powered ships have been prohibited from disposing solid radioactive waste at sea since 1970, and land facilities are prohibited from burying solid radioactive waste on their own sites (Department of the Navy 1977b: A-13). Solid radioactive wastes are collected, packaged in tight containers, shielded, and shipped to burial sites licensed by the U.S. Nuclear Regulatory Commission. Because refueling of nuclear-powered ships is infrequent, the amount of spent fuel produced is low enough to require few waste shipments. Expended fuel is shipped for processing to U.S. Energy Research and Development Administration facilities in containers designed to prevent release of radioactive waste in the case of accidents (Department of the Navy 1977b: A-13).

Nuclear-powered submarines and surface ships emit low amounts of radiation in the operation of shipboard reactors. The radioisotopes released by nuclear-powered ships are of the same kind as those released by land-based nuclear power reactors (Wolfe 1974: 372).

In the shipboard reactors, pressurized water circulating through the reactor core picks up the heat of nuclear reaction. Reactor cooling water circulates through a closed piping system to heat exchangers which transfer the heat to water in a secondary steam system isolated from the primary cooling water. The steam is then used as the source of power... Releases from the shipboard reactors occur primarily when reactor coolant water expands as a result of being heated to operating temperature; this
coolant passes through a purification system ion exchange resin bed prior to being transferred from the ship. The principal source of radioactivity in liquid wastes [produced in this operation] is from trace amounts of corrosion on wear products from reactor plant metal surfaces in contact with reactor cooling water. [Department of the Navy 1977b: A-7]

These radioactive liquid wastes are released at sea (Department of the Navy 1977b: A-11) and in harbors and seas within 12 miles from shore (Department of the Navy 1977b: A-8), under strict controls designed to minimize the amount of nuclear waste released (Department of the Navy 1977b: A-7).

The Navy conducts environmental monitoring and notes that the total amount of nuclear radiation released into harbors and seas within 12 miles of shore at which nuclear submarines and ships visited, ported, and based from 1972 to 1976 has been less than 0.002 curie each year (Department of the Navy 1977b: A-8). The effects of low releases of radiation from nuclear submarines and ships on the marine plants and animals is largely unknown. While the Navy considers the effects so negligible so as not to warrant discussion, other authorities argue that very low levels of radiation can have subtle effects on marine life, indicating continued surveillance and research (Wolfe 1974: 397; Rice and Baptist 1974; Wilber 1969).

The introduction of radioactive wastes into estuaries could alter the environment in four ways: "(1) somatic damage (including death) of estuarine biota; (2) increase in genetic mutation rates of populations; (3) increase in growth rate and maximum size of organisms; [and] (4) reorientation of human uses of estuaries" (Wolfe 1974: 395-396).
Regulations controlling radioactive waste disposals reduce the probability of bodily damage such as death, tumors, and other physical abnormalities to estuarine organisms. However, the early stages of marine animal life, particularly from zygote through larval forms, are more susceptible to radiation damage than adult forms (Wolfe 1974: 396). Larval forms of shrimp, which migrate to the Cumberland Sound estuary, could, therefore, be affected by low-level radiation emissions from the nuclear submarines.

Genetic changes in estuarine organisms are more likely than somatic damage from low-level radiation because genes are highly sensitive to ionizing radiation (Wolfe 1974: 396); however, the nature of genetic changes makes them difficult to detect until a mutation is well established in the population. Further, information on the genetic variation of marine plants and animals is incomplete (Wolfe 1974: 396).

Controlled experiments with low-level doses of radiation have resulted in increased growth rates and sizes of organisms (Wolfe 1974: 396). These results may occur in a natural estuarine setting when marine plant and animal life are exposed to low levels of radiation, but their occurrence in vivo has not been demonstrated.

Low levels of radiation may disrupt human use of the estuary, particularly fishing and recreational activities such as swimming, boating, water skiing (Rice and Baptist 1974; Wilber 1969). Potential sources of human exposure in Camden County include consumption of contaminated fish and shellfish, fishing, swimming, or skiing in the Cumberland Sound estuary. Although residents living near the nuclear fuel
production plant at Richland, Washington, on the Columbia River continue to drink river water and fish and swim in the river, people in the area are receiving some radiation and the area is frequently monitored to make sure that no danger to the local population exists (Wolfe 1974: 397).

The concern for human use of an area receiving radiation governs the levels of nuclear waste disposal.

Limits on the environment are now based on the expectancy that the receiving water will be used as a source of drinking water for people and/or that people will consume large quantities of fish, shellfish, or other aquatic or marine foodstuffs produced in the vicinity of the plant discharge. The calculations that lead to the specification of release rates (or maximum permissible concentrations of radionuclides in the effluent) are based on conservative estimates of the behavior of the radionuclides by aquatic and marine food organisms, and on the accumulation and retention of the nuclides in man. [Wolfe 1974: 397]

Sources of radiation may disrupt human exploitation of the estuary out of proportion to the actual levels of contamination if the local population perceives a health hazard. One Camden County resident who fished locally in 1979 stated a year later that he now only fishes outside of the county. The resident, a Navy veteran, expressed concern about possible nuclear contamination: "I hope the Navy doesn't poison the area with nuclear waste."

Obviously the greatest disruption to the Cumberland Sound estuarine complex would occur with a nuclear accident. "... A near-shore accident involving a nuclear vessel could be serious [to the estuary]—if the integrity of the reactor itself was extensively damaged" (Wolfe 1974: 372). The Navy, however, states that the design
of nuclear submarines and ship reactors minimize hazards "even under the most severe casualty conditions." The design of the reactor core makes it "impossible" to explode like a bomb; the reactor fuel elements are corrosion resistant (Department of the Navy 1977b: A-12). Radioactive materials could only be released by the reactor "... if the fuel elements were actually to melt and in addition the high-strength, all-welded reactor system were to rupture" (Department of the Navy 1977b: A-12). Protective devices and self-regulating features of the reactor prevent melting of the fuel elements (Department of the Navy 1977b: A-12).

The impossibility of a nuclear accident is used by the Navy as justification for omitting an analysis of the effects of such an event in the environmental impact assessments. Yet the possibility of a nuclear accident is of concern to many people in Camden County and the surrounding area. In view of this concern, these impacts should have been addressed by the Navy and warrant further attention.

The possibility of restricted access to the St. Marys Entrance poses a threat to the commercial fisheries of Camden and Nassau Counties. While commercial fishermen in St. Marys foresee no problems with access, the Navy does. In the environmental impact assessments for the Poseidon submarines of T-l development (Department of the Navy 1977a: 4-55) and Trident submarines of A-l development (Department of the Navy 1980a), the possibility of boat traffic control is considered.

Traffic frequency is another navigational consideration. Submarine and support vessel traffic in Cumberland Sound could interfere with existing barge and shrimp boat traffic. Although experience to date has not revealed a
problem, control measures will be needed when major vessels are in transit to eliminate the potential for collision or grounding while passing in the confined channel. [Department of the Navy 1980a: 6-64]

The St. Marys Entrance is the main access channel for port of entry available to St. Marys and Fernandina shrimpers. Figure 36 illustrates the width of the channel. This channel presently is shared with Poseidon submarines and other naval craft. The frequency of Poseidon submarine passage has not interfered with shrimp boat access. As one shrimper stated,

That Entrance out there ... there's plenty of room there. Two big ships could probably come in. The deepest ships, well they draw too much water; they're probably pulling 25 foot depth. Shrimp boat only draws anywhere from 4 to maybe 8 or 9 feet. They can go right up to the shore where a ship would have to be strictly in the middle of the channel, the 40-foot channel.

However, the larger size of Trident submarines and their anticipated increased traffic may prompt the Navy to limit private access to the channel. Further, it is reasonable to assume that in an increased state of military readiness or a national emergency commercial access could be limited or prohibited entirely.

Future Adaptations of Shrimpers Tempered by Limitations

As discussed earlier in this chapter, Camden County shrimpers successfully adapted to disruption of the Cumberland Sound estuary that accompanied the operation of Gilman Paper Company by extending their range of fishing and establishing additional temporary ports. Shrimpers in Camden County were able to pursue their livelihood despite the changed conditions. Adaptation, however, was facilitated by technological advances in shrimping.
Figure 36. Shrimp boat passing through the St. Marys' entrance from the Atlantic—going home. The view, from Fort Clinch in Fernandina, Florida, illustrates the width of the channel to be shared by shrimp boats and submarines. Cumberland Island, Georgia, is in the background.
Can shrimpers adapt to the changes wrought by naval base development? Shrimpers are flexible and could adapt in two different ways: (1) by abandoning St. Marys as their home port and moving elsewhere, or (2) by remaining in St. Marys but concentrating on long-distance shrimping. Abandoning St. Marys would be most disruptive for the shrimpers because it would sever their ties to the community. As demonstrated earlier, shrimpers have maintained St. Marys as their home port even in the most adverse conditions because it is "home." Shrimpers are well integrated into the community and retain historical family ties. The alternative of abandoning St. Marys would likely be the last resort.

Shrimpers would most likely remain in St. Marys and extend the range of their shrimping. This would continue the pattern of shrimping adopted in the 1950s. If the local situation was particularly difficult, shrimpers would again establish temporary ports from which to operate. The difficulties inherent in this approach are predictable, stemming from problems already familiar to shrimpers. The costs of shrimping have so increased as to make long-distance shrimping practically infeasible. The high costs of fuel, boats, equipment, and taxes incurred in shrimping are already affecting the volume of shrimping which in turn increases the cost of shrimp.

One shrimper detailed the inflationary costs of shrimp relative to the costs of shrimping.

[In 1955] that 26-30 [size shrimp], that's considered a big shrimp. Not the jumbo, but the next largest... 50 cents a pound... In 1954... 31-35 is 36 cents a pound. It's about $3.00 [a pound] now... We get about $5.00 a pound now for the 21-25. But oh, the supplies...
so high now. A net is about $1,300 each now, when you used to get them for about $200. . . . [The doors on the net] they're about 5 or $600 a set. That's 2 doors to each side. . . . [In] '54 and '55 . . . we was getting fuel for 11 cents a gallon at that time. Now I think it's about 85-90 cents a gallon for fuel. So even though you're getting a high price for shrimp now, it doesn't mean you're making any money out of it. The expenses of operation has gone up relative to the price of shrimp.

Shrimp boats cost between $150,000 and $250,000. A standard 73 foot Fiberglas shrimp boat without rigging in 1980 cost $200,000 to $225,000 and boat payments would run about $2,500 a month (Litrico 1980).

One Camden County shrimper stated that his last shrimp boat purchased in 1975 cost nearly $100,000. Boat payments on his two most recent boats run $1,600 a month. Another shrimper whom he knew recently purchased a shrimp boat with a freezer for $250,000. Insurance on the first shrimper's two recent boats is $6,400 a year. Licensing from the Department of Natural Resources costs about $100 a year.

Electronic equipment on a shrimp boat adds $20,000 to $30,000 to its total cost; block, tackle, ropes, and tow cables cost an additional $7,000 to $10,000. Shrimpboats usually can take on 3,000 to 6,000 gallons of diesel fuel which as of 1980 cost $1.00 per gallon. Shrimpboats usually burn between 18 and 20 gallons of fuel per hour. The 15 to 25 tons of ice carried on the boat to preserve shrimp costs $60 to $125 (Litrico 1980).

The increasing costs of shrimping, the unpredictable yield, and the fluctuating price of shrimp has prompted a change in the form of payment to crew members from fixed to relative. One shrimper explained,
Ever since about 1955 or '56, we've been paying 'em a third of the market price. ... We got together with the crew and we decided on [it]. ... That way when the price [of shrimp] was up they get the advantage up and when the price went down, why they'd have to take a cut on it. ... After you take the expense of packing out of it, they get a third. And a lot of them [owners] pay as much as 40% of the price, too. ... But while you're paying for a boat you can't pay them 40%.

In Camden County, city and county taxes are levied on shrimp boats. One shrimper's wife complained:

[We pay] city and county taxes. [The county] kind of made me mad 'cause they charge us about $700 county tax and I went up there [to the county courthouse] and asked them why they was charging us county tax anyway. I said, "Have you ever seen one of them shrimp boats ride down the highway?" And I said another thing, "If one of them was to get on fire and we called anybody to help, I know what you all would do. You all would come down there with an axe and chop the rope loose for them to drift on out." They didn't say a word. But that's awful to pay city and county tax when there is no upkeep to the city or the county.

The costs of shrimping make it difficult to break even, much less make a profit. While shrimpers may continue to shrimp an extended range, decisions to do so are now tempered by these operating costs. Fuel costs alone can render it impractical to operate a shrimp boat if the catch cannot meet the expenses. This is particularly true of the three or four months in the off-season. As one shrimper explained, "... If you don't make a profit ... no need to even letting them operate."

Increasing costs of shrimping will require the shrimper to remain closer to home port. There are limitations to shrimping nearby, however. As of 1978, Georgia's Department of Natural Resources has temporarily closed the Sounds to commercial shrimping with the hope of increasing the yield in the ocean by allowing a maximum number to develop in the Sounds. One
shrimper's perception of the move was that the closing would probably be permanent. "They're supposed to try it for a couple of years and if it turns out that shrimping is better in the ocean they will probably never open [the Sounds] again."

Prior to this move, commercial shrimping was restricted in the Sounds by season and the size of shrimp. "Commercial shrimping in Cumberland Sound is allowed only when the size of the shrimp is such that 45 shrimp or less weigh 1 pound, usually between July and December. At other times of the year, commercial shrimping in this area is illegal" (Department of the Navy 1977a: 3-149). Many shrimpers miss even restricted access to the Sounds. As one stated, "Well, the thing is, if you can't shrimp in the Sound, you lose a lot of shrimp." The closing of the Sounds has been particularly disadvantageous to shrimpers with boats under 60 feet that cannot handle open-ocean conditions.

The action of closing the Sounds has also intensified a rivalry between commercial shrimpers and bait shrimpers. Bait shrimping is legal in the Sounds. Commercial shrimpers, however, perceive bait shrimping as a means of taking "illegal shrimp" and selling them door to door. These bait shrimpers, some licensed and others not, are referred to as "peddler boats." One commercial shrimper explained how "peddler boats" operate.

... See, it's legal to pull a 10-foot net to get your bait ... one quart and not more than two for one boat. ... That doesn't mean that they can go out and catch all the shrimp they want. ... They can't take any home [for food]. ... Just enough to fish with for bait purposes. So they go and catch maybe a couple of bushels or a hundred or two [hundred] pounds and peddle them from one door to the other. ...
Illegal bait shrimping and peddling is one of the reasons that one shrimper gave for not operating a retail outlet from his business. Illegal peddlers were able to sell their shrimp for $1.00 a pound, undercutting his retail price of $3.00 a pound.

Competition between commercial shrimpers and bait shrimpers is not peculiar to Camden County. Bait shrimping is a profitable venture important to the sports fishing industry. The increasing popularity of sports fishing and tourism since World War II has encouraged the growth of the bait shrimping industry (DeSylva 1954; Joyce and Eldred 1966; Woodburn et al. 1957). In Nassau and Duval Counties, Florida, the practice of harvesting shrimp above and beyond the legal limit by bait fishermen for home consumption and/or sale in restaurants or grocery stores is also considered a problem (Joyce 1965: 168-169).

In Duval County, the 100-pound limit imposed on bait shrimpers can be circumvented.

It is possible for the bait shrimpers to bring their shrimp in so they never have more than 100 pounds on the boat should they be checked by a Conservation Officer. By using this method during the season, it is possible to take 500 to 1,000 pounds of shrimp a day. It is obvious that the 100-pound limit is unenforceable unless there are as many Conservation Officers as there are shrimpers. [Joyce 1965: 168]

Included within the category of "illegal shrimp" caught by bait shrimpers in Duval and Nassau Counties are shrimp "castnetted in excess of the families' needs" that are sold to restaurants or "perhaps even given to friends or relatives" (Joyce 1965: 168-169).

Illegal shrimping activities generate animosity among commercial fishermen who fear the depletion of shrimp in the estuaries.
Commercial shrimpers have complained bitterly in the past that bait shrimping [and illegal harvesting and selling of shrimp], especially shrimping for dead bait, is extremely deleterious to their welfare. They state that the number of shrimp in one pound of bait shrimp taken in July and sold for 35-50¢ would equal 2-3 pounds by late September and would bring 70-85¢ per pound. . . . According to the commercial shrimper, such a practice not only harvests shrimp before they have reached maturity but also undercuts both their market and their prices. [Joyce and Eldred 1966: 34-35]

Thus, the state closure of the Georgia coast Sounds, although designed to benefit commercial fishermen, is widely perceived as more directly beneficial to bait shrimpers and local resident fishermen.

Another factor limiting the ability of commercial fishermen to shrimp locally is a restriction on beach trawling intended to protect spawning shrimp. Presently shrimpers can trawl the beaches of the Georgia barrier islands only during the on-season, approximately June through December. At other times of the year, trawling within one mile of the beaches is illegal. Throughout the year, shrimpers can trawl only as close to shore as three miles.

Camden County and Fernandina shrimpers rely heavily on the on-season trawling along Cumberland Island. A move by the National Park Service, however, threatens to close this local shrimping ground. The National Park Service has proposed the acquisition of additional land on and around Cumberland Island, including 4,000 acres of private land, 700 acres of federally owned land, and 14,000 acres of marsh land owned by the state of Georgia (Southeast Georgian 1980). Of concern to local residents and commercial shrimpers is the acquisition of the state-owned marsh land which includes beach, marsh, and tidal creeks (Respess 1980a).
Local opposition to this move is strong because residents fear the loss of rights to utilize these areas for fishing, boating, and recreation. The concern of residents for the beaches was voiced by one city councilman: "The only thing I care about that island is Pelican Point and seine fishing. I was with a group of guys seining when a park ranger came up and tried to run us off. We knew we were where we were supposed to be" (Respess 1980b). One commercial shrimper was extremely concerned over the proposal because it would further limit the areas open to commercial shrimping.

Our best shrimping grounds is underneath that piece round of Cumberland and if they stop us from shrimping there it is going to hurt the shrimping tremendously 'cause they're good shrimping grounds and there is no need to protect it. That's where they're coming in and they spawning after all. They are raised there, too, and after they get mature they go out into the Atlantic and come back into other beaches and offshore.

[National Park Service] wanted to stop the [shrimpers] at least a mile from coming in on the beaches . . . that's what I heard . . . I think they ought to let the shrimpers, since it is such a short season anyhow, they ought to let the shrimpers anywhere they can.

An Energy Model for the Impact of Base Development on the Commercial Fishery

In a previous section an energy model was developed to illustrate and predict the relationship between the commercial fishery and the pulp mill. The model is modified in this section to reflect the establishment of the naval base. Figure 37 is a simplified energy model for analyzing and predicting the relationship among the naval base (NB), the commercial fishery (C), and the pulp and paper company (P). The explanation of energy modeling and its symbols appears earlier in this chapter in the
Figure 37. Simplified energy model of the relationships among the naval base, the commercial fishery, and the pulp mill in Camden County, 1979
section "Illustrating and Predicting the Impact of the Pulp Mill on the Commercial Fishery through Energy Modeling."

An energy model of the present relationships among the naval base, the commercial fishery, and the pulp mill (Figure 37) is basically the same as the historic model (Figure 32, p. 248) with one exception: the naval base now adversely affects the estuarine resources on which the commercial fishery relies. This relationship is symbolized by the intersection of k12 with k8; k12 refers to the impact of naval base dredging, dredge spoil, and other pollutants on the commercially valuable estuarine resources, k8; k12 acts as a drain on k8.

The pulp mill no longer adversely affects the commercial fishery because of the installation and operation of water pollution controls. There is also no adverse impact of naval base operations on the natural resources utilized by the pulp mill.

While the present energy model is not simulated by the Dynamo program due to the unknown quantity of similar production values for the naval base, the outcome of a simulation can be posited. This is accomplished by simulating the relationship between the pulp mill and the commercial fishery in 1978 and then superimposing the naval base given the knowledge of naval base impacts.

The simplified energy model of the relationship between the pulp mill (P) and the commercial fishery (C) in 1978 is the same as that of the historic energy model (see Figure 32, Tables 7 and 8—pp. 248-250). The difference lies in the fact that the mill wastes, k11, are now treated and no longer adversely affect the commercial fishery resources. In essence, k11 equals zero.
Figure 38 presents the calculated values of the 1978 production rates for the pulp mill and the commercial fishery. While the amount of waste produced, kill or 40, is calculated, its treatment reduces its effect to zero for simulation. Appendix V provides the complete calculations for the 1978 energy model.

Figure 39 presents the Dynamo simulation of the 1978 energy model. Appendix VI presents the Dynamo program utilized to simulate the model. The 1978 energy model simulation, Figure 39, differs significantly from its historic counterparts, Figures 34 and 35 (pp. 253-254). Expansion of the pulp mill (P) has not occurred at the expense of the commercial fishery (F). Rather, the increase in pulp mill production from the years 1978 to approximately 2000 quickly declines with that of the commercial fishery. The natural resources (N) in the county decline to a steady state, while the stored natural energy assets (A) increase to maintain a steady state.

Superimposing the naval base (NB) on the 1978 energy model would produce a simulation similar to that depicted in Figure 39. Although hypothetical, the simulation takes into account the Navy's plans for development as well as predicted impacts of base development on the county's natural environment, the commercial fishery, and the pulp and paper company.

The naval base (NB) in Figure 40 expands at the expense of the natural environment (N) and the commercial fishery (F). The pulp mill (P) declines as depicted in Figure 39, but is otherwise not affected by the naval base. Exponential growth of the naval base until the year
Figure 38. Simplified energy model of the relationship between the commercial fishery and the pulp mill in 1978 with the calculated storages and flows.
Figure 39. Simulation of the 1978 energy model of the commercial fishery (F) and the pulp mill (P): natural system (N), natural energy (A)
Figure 40. Hypothetical simulation of the 1979 energy model of the relationships among the naval base (NB), the commercial fishery (F), and the pulp mill (P): natural system (N), natural energy (A)
2000 reflects the Navy's schedule that the base be fully operational by the year 1998. From this point, the naval base maintains a steady state of operation without decline because its operation is not dependent upon the productivity of natural resources. The naval base is not affected by the decline of the natural environment in the county (N) because its operation does not depend upon the quality of natural resources, i.e., the productivity of land and water, but only a sufficient amount of land and water to accommodate naval traffic.

Like the historic relationship between the pulp mill and the commercial fishery, the relationship between the naval base and the commercial fishery is characterized as competitive exclusion. The naval base experiences accelerated growth at the expense of the commercial fishery. The naval base survives; the commercial fishery does not.

Energy modeling has been used to illustrate and predict the impact of a naval base development on the commercial fishery. A hypothetical simulation of the model is based upon the predicted impacts described by the Navy in the environmental impact assessments (Department of the Navy 1977a, 1980a). When actual and comparable values of the naval base are determined, more accurate assessment of the impact of base development on the commercial fishery can be derived from the energy model simulation.

Summary and Conclusions

Fishing has constituted a major economic activity in the Camden County area since prehistoric times. Industrial developments in the
20th century have diminished the productivity of the estuary and reduced the importance of the fishery.

Commercial fishing in Camden County is a viable economic activity that has persisted for over 70 years. Unlike the commercial fishermen who are depicted in maritime anthropological studies as marginal to the community, Camden County fishermen are closely tied to and well integrated into their community. Some commercial fishermen are even community leaders.

Historically, commercial fishing has centered on the exploitation of menhaden and shrimp, two commercially valuable species that rely on the estuary for part of their life cycle. The biological relationship of menhaden and shrimp to the estuary has been examined to illustrate the fragility of the estuarine system and that the productivity of the commercial fishery is dependent upon the productivity of the estuary.

The impact of naval base development on the commercial fishery cannot be considered without addressing the impact of the pulp and paper company on the commercial fishery. The estuary was subjected to severe disruption with the establishment and operation of the pulp and paper company. The repercussions of this impact were experienced by commercial fishermen who adapted by adopting technological innovations and new fishing strategies.

The historic relationship of the pulp mill to the commercial fishery has been examined through energy modeling. Simulation of the model reveals that the pulp mill has expanded at the expense of the commercial fishery, a situation that can be characterized as competitive
exclusion. The congruence of the energy model simulation with historic trends demonstrates its utility as a technique for analyzing systems and predicting change over time.

The impact of naval base development on the commercial fishery is analogous to that of the pulp mill in terms of its disruptive effect on the estuary. The effects of dredging, dredge spoil, submarine traffic, and oil, pesticide, and nuclear pollutants will adversely affect the economically valuable estuarine resources on which the commercial fishery relies. Factors likely to limit the ability of commercial fishermen to adapt to this disruption are the potential for restricted access, increasing costs of fishing operations, and government regulations.

The impact of naval base development on the commercial fishery has also been analyzed through an energy model. A hypothetical simulation is based on a pre-Navy 1978 model of the relationship between the pulp mill and the commercial fishery, the Navy's schedule for development, and the naval base impact predictions. Simulation reveals that the naval base, like the pulp mill in the past, will expand at the expense of the commercial fishery creating a situation of competitive exclusion.
CHAPTER IV
THE IMPACT OF BASE DEVELOPMENT ON SUPPLEMENTARY SUBSISTENCE ACTIVITIES

This chapter will examine the impact of naval base development on a traditional aspect of community life, the supplementary subsistence activities of fishing, hunting, and gardening. The significance of fishing, hunting, and gardening to the local economy of Camden County is presented through historic and interview data. Participation in these activities by naval personnel is contrasted with that of local residents and is characterized as recreation.

Fishing, Hunting, and Gardening as Subsistence

Fishing, hunting, and gardening are another aspect of a viable local economy. These activities can be categorized as "subsistence activities" pursued to produce a noncash income for consumption or exchange within the local group (Bowles 1981: 64). Subsistence thus refers to fishing, hunting, and gardening not done commercially, for sale in a market. Examples of subsistence activities include

... growing vegetables for consumption, hunting, and fishing for food and clothing, wood cutting for fuel, labour invested to build or repair houses, the home manufacture of clothing, tools, and other useful items. At the community level noncash exchanges of such goods, services, and labour for the purpose of meeting economic needs in the area can also be considered subsistence activities. [Bowles 1981: 64]

Subsistence activities entail local populations exploiting a diversity of local resources in order to supply a variety of foodstuffs.
Subsistence is distinguished from "recreation" in that the primary motivation is need rather than desire or pleasure. The goal of subsistence is the end product; the goal of recreation is the activity itself. Subsistence and recreation differ in their intensity, the techniques employed and, particularly, in what is done with the product of the activity. Obviously it is possible to derive both pleasure from subsistence activities and supplemental foodstuffs from recreational activities; therefore, the relationship between the two reflects a continuum. Further research in a variety of contexts may define the parameters of subsistence and recreation activities.

Anthropologists have typically observed and recorded subsistence activities in nonindustrial societies. In nonindustrial societies with economies based on reciprocity or redistribution, fishing, hunting, and gardening can be an individual or group activity. Foodstuffs derived from subsistence activities are exchanged among households along lines of kinship. In market economies, exemplified by industrial societies, fishing, hunting, and gardening may be an organized commercial venture with resources constituting a commodity. Where tribal economies are replaced by market economies, subsistence and commercial needs often conflict if the same natural resources are sought by each. Competition for scarce and diminishing resources increases and disrupts the social relations and institutions that regulate the production and distribution of natural resources upon which the community relies.

An example of these disruptive effects may be seen in the Miskito Indians of Nicaragua, whose subsistence is based on hunting, fishing,
and slash-and-burn agriculture (Nietschmann 1972). Hunting and fishing form the core of village life as meat is a highly valued part of the local diet. Sixty-five percent of the men concentrate on turtle fishing, 15 percent on hunting, and 20 percent on hunting and fishing (Nietschmann 1972: 43). Outside market demands for subsistence-based resources, particularly sea turtles and jaguar and ocelot skins, have induced the Miskito to intensify their hunting and fishing and concentrate their efforts on exploiting their subsistence resources for commercial gain. This in turn has changed the Miskito economic pattern from a subsistence-based, generalized reciprocity to a monetary exchange system (Nietschmann 1972: 49).

Intensive hunting and fishing based on a narrow range of species has begun to deplete the Miskito's natural resources (Nietschmann 1972: 56). Subsistence agriculture has been disrupted as villagers focus their time and efforts on market hunting and fishing. Social relationships have been disrupted as meat is no longer given to others on the basis of kinship obligations but sold to fellow villagers, turtle companies or other outside buyers. With less meat available, protein intake has declined in Miskito villages (Nietschmann 1972: 65-66).

Dewey (1981) provides an example of peasant farmers in Mexico who are shifting from subsistence to commercial agriculture as a result of large-scale agricultural development projects. Subsistence agriculture is based on crop diversity and self-sufficiency in food whereas commercial agriculture is based on intensive production of cash crops. The change from subsistence to commercial agriculture has resulted in
decreased crop diversity and increased dependency on purchased food (Dewey 1981: 151). Children of subsistence farmers appear to be "better off nutritionally" than those of commercial farmers because self-sufficient farm families have a more diverse and better quality diet and consume less sugar than commercial farming families (Dewey 1981: 185-186).

Less attention has been focused on the role of subsistence activities in communities integrated to a greater degree into an industrialized, market economy. Andersen and Wadel (1972) have noted that individuals in rural maritime communities of Newfoundland, Norway, Shetland, and Sweden have little communication with the outside world, are self-sufficient and highly adapted to their environment. They pursue a variety of seasonal economic pursuits—fishing, gardening or farming, and animal husbandry (Andersen and Wadel 1972: 3). Parallels can be found in many rural communities in the United States (Schensul, Paredes, and Pelto 1968) and Canadian hinterland communities (Bowles 1981) where subsistence fishing, hunting, and gardening are important economic pursuits that contribute to a distinctive way of life. In this case, subsistence activities can coexist with wage employment outside the household.

The very nature of subsistence activities in contemporary society makes them difficult to discern and measure. Subsistence activities are usually overshadowed by industry and commercial activities and can only be recognized and analyzed through field research. With little or no cash flow or marketplace involved, conventional economic analyses such as cost-benefit and input-output cannot be easily applied to measure the value of subsistence activities to a community's economy (Bowles 1981: 72).
Research in Canadian hinterland communities indicate that subsistence activities contribute to the economic and social well-being of the community and are clearly important to the maintenance of a community's social vitality (Bowles 1981: 72-73). Development projects in the Canadian hinterland communities have a negative impact on subsistence activities when they interfere with the pattern of these activities and/or adversely affect the natural resources upon which these activities rely (Bowles 1981: 75).

Development of new industry in the hinterland communities can easily disrupt the resources, time, and motivation required for subsistence activities; however, industry can be compatible with the maintenance of subsistence activities by taking these requirements into account (Bowles 1981: 75-77). Indeed a goal of development in the Canadian hinterland communities is the maintenance of subsistence activities to enhance community social vitality.

Perhaps the most important step is to develop a strategy which facilitates the use of wage income to upgrade the potential of traditional economies. This can be accomplished only if the value of local renewable resources is recognized by planners and if a commitment is made to avoid destruction of local economic viability. [Bowles 1981: 104]

Fishing, Hunting, and Gardening in Camden County

The lifestyle of local residents reflects the rural nature of Camden County. Common outdoor activities include fishing, hunting, and gardening. Field investigation revealed the significance of these activities to residents. The pervasiveness of these activities was first indicated by the presence of freezers in almost every household for
storing fruits, vegetables, fish, and meat. Interviews with residents in the 1979 sample survey revealed the nature and extent of fishing, hunting, and gardening.

Fishing, hunting, and gardening are not immediately classified by residents as recreation. In fact when residents were asked, "What do you do for recreation or entertainment?" many laughed at the question and responded, "Nothing." When pressed for an answer, 42 percent responded that they entertained themselves at home by watching TV, sewing, gardening, and reading. Thirty percent stated that they engaged in outdoor recreation as well, including hunting, fishing, swimming, boating, or camping. Fifty-eight percent pursued their recreation or entertainment solely in Camden County.

From this research, a working definition of "subsistence" has been adopted in order to distinguish it from "recreation." Fishing, hunting, and gardening are pursued for the purpose of obtaining food for home consumption. Excess foodstuffs are shared with other households so that there is little waste. Since fishing, hunting, and gardening do not usually constitute the sole source of a household's income, they are actually "supplemental subsistence" activities in that they supplement the income and diet needs of the household.

**Historic Precedent for Subsistence Activities**

There is an historic precedent for subsistence activities throughout Camden County. One elderly St. Marys resident recalled that traditionally each household in town raised its own vegetables, kept its own chickens for meat and eggs, cows for milk, and pigs for pork. When the
economy was depressed, households would exchange items or sell excess foodstuffs.

You see when the [saw] mills finally went dead, and there was no shipping going out here at all, why then it wasn't but there's two things you could do in St. Marys then was fish or farm. But the people here used to do a lot of planting all over town. They raised chickens and I'll tell you about the eggs. My mother used to have what they called "dominickers" then. ... They're speckled, you know. They're beautiful things, great big things, you know. Well, they used to feed all out in the street, see? And the rooster, he'd have his hens and another rooster'd get in his territory, they'd have a big fight, a rooster fight, see? So, one whips the other and one would walk off and that one would jump up on the fence and crow. Well, my mother used to give us eggs for breakfast, see? At 10 cents a dozen, when they was 10 cents a dozen. Now just think of eggs, big eggs, 10 cents a dozen. And [then] they was 15 cents a dozen. The highest they ever went was 20 cents. And when they got 20 cents, she'd tell us children, "I can't give you no eggs to eat now, they're too high, 20 cents." And she'd sell her eggs for 20 cents a dozen. Well, we didn't get no eggs till they went down. And when we wanted a chicken, we went out in the yard, and mostly they'd coop them, what they called "cooping them up," and they'd feed 'em cracked corn. And then say you wanted a chicken for dinner Sunday, they'd go out there and chop his head off and have chicken for dinner. Well, them chickens, great big old chickens. ... And a fellar would come along and say, "Will you sell me a fryer?" "Yeah, 25 cents." Now if he wanted an old hen, 50 cents. Them hens would make a pot¬ful, boy. 50 cents! ... And then we would make vegetables. All kind of vegetables. ... Now they put up tomatoes, snap beans, butter beans, okra, and like that. They'd not can them, they'd jar them. They knew how to process them. My mother knew just how to put them up. Now you couldn't go in the store and buy all that stuff. It wasn't in there. ... [We had our] own garden, yeah. And they had sage and they had all kind of pepper and they had thyme. Now I don't see thyme or any in cans now but you used to see it growing all over St. Marys. Sage, I seen sage. You know, you grow sage in the shade, mostly on the north side of the house and I've seen it up this high. You pick the leaves and dry 'em and then what you call "roll it" and they make it just like a powder, see. Well, you used to use that in fresh sausage and pepper. Now black pepper, we bought that, but it was in black pepper seeds and we had little mills. We'd grind that black pepper. ...
In the early 1900s, this resident contributed to the family's income by harvesting and selling oysters.

I got out of school at 14. My daddy was getting old and all. We had tough living, you know. Now I went and got oysters and opened 'em and sold them for 10 cents a quart, either 5 or 6 cents a pint. A whole lot of people took a pint. Well, it'd scrap up a dollar or two a week and that ain't gonna buy groceries. And I tell you, it was hard living.

This resident also fished, first learning how to make his own cast nets to catch shrimp, or "prawns" as local residents called them. These were also sold for additional income.

Now, when I was a little boy, they caught 'em [shrimp] with cast nets. I made many and many of the cast nets. I used to knit 'em and make 'em and even bore this bullet and everything and hang 'em in. I made 'em and used to get a dollar a foot. Well, we used to take them cast nets and this time of the year [February], it seemed to me it wasn't this cold . . . it was warm, as warm as could be, and we'd catch these prawns all the way down the river, North River, and all of them with the cast nets. And we'd sell them shrimp 10 cents for a quart, or three quarts for a quarter. Well, there wasn't much sale there, there wasn't no big population, see?

As an adult, the resident supplemented his income by selling fish to the Carnegies who lived on Cumberland Island. The Carnegies would buy hundreds of pounds of fish each week to feed family and guests on the island.

We used to catch fish and they'd [the Carnegies] give us so much a pound for it. They wanted 5 or 600 pounds of fish a week, twice a week. And me and him would go fishing and catch these fish and they'd give us 6 or 7 cents a pound for 'em which was good money in them days.

The same tradition carried on through the elderly resident's lifetime as illustrated in his description of the economic life of St. Marys during World War II.
Well, it was tough, but everybody lived. They had a little something to do. You had to create jobs, a lot of people created jobs. You see, you'd go oyster hunting, that's one that helps us, the oysters and fish and crabs, shrimp. And then we raised vegetables. I had two cows myself. We had 'em up till this paper mill come here. Then they didn't want the cows on the street. . . . The geese, we had geese and those geese were quite amusing. . . . We used to have pigs in the pen, raise pigs, you know, and have our own meat. And I had two milk cows and we made our own, we had our own clabber and we made our own butter and we had our own buttermilk and we had our own chickens and eggs, you know, right here. . . . Well, Camden County had open range, what they called a "no-fence open range."

Figure 41, a St. Marys street scene taken in 1905, depicts cows and chickens ranging freely as described above. In rural areas, many residents lived on farms. One woman recalled life on a farm located on an island in the county. There was a barn for horses and cows. All of the children worked on the farm. The farm produced vegetables, fruit, and meat for the family as well as a surplus that her father exchanged in Fernandina, traveling by sailboat.

. . . He carried the stuff over there for the people to sell and they'd send by him to get stuff, horse feed and stuff like that or groceries or whatever they had to have. You know, then they bought stuff in the barrel, barrel of flour, barrel of grits, barrel of meal, barrel of sugar.

Another woman recalled life on a farm in the rural area in the early 1900s. Her father, however, not only farmed but did "public work."

. . . . My mother told me that he [father] would go and work in the timber woods all day and then after he came home and got his supper, then he would go and build him up a fire and pick up the roots and all out there, and build him a fire. And she said that he took in two-thirds of that big farm, and it must be 100 acres or more then, two-thirds of that farm with that grub hoe, at night. She said he would work until 10 and 12 o'clock at night. And that's the way that he took the farm in. He didn't have modern tractors and all to clear it up like they do today. So that's the way they did it, all by hand.
Figure 41. Cows and chickens ranging freely on Ready Street in St. Marys, 1905

Courtesy Georgia Department of Archives and History
The farm produced nearly all of the family's needs.

Well, now, we grew anything that you could name just about.... We even had sour oranges, sweet oranges, grapefruit, figs, two different kinds of pomegranates, three or four different kind of peaches. We had orchards, there was only two things I can't remember that we grew. ... It's apples and lemons, we did not grow them. All the others we grew. And then we had pecans, a lot of them ... and we had our own cattle, my father had big herds of cows, as many as 300 head of cattle. And then we had three or four good milk cows and among them we made all of our butter, had all of our milk, made our grits, our meal, cured all of our pork. And if we wanted a beef, they butchered a beef, and we made sausage. And we had our own smokehouse; we cured all of our own meat. People cured their own meat then. We had meat year 'round. If we wanted any more pork, fresh pork or fresh beef, they went out and killed one 'cause they had it. So, it was really a good living. It was a beautiful living and we just wanted for nothing.... Some years we canned as much as 1,000 quarts of vegetables of different kind and ... we had the stuff there on the farm to make the ones, you know, that we didn't have, all except the flour. We would have to buy flour and salt and things like that.

Her father would exchange surplus food for bulk items at the store in town.

... My father, he generally did the shopping. Mother'd make him a memorandum and send him to town while she stayed and kept care of the kids. He generally went on Friday afternoon or Saturdays. ... And back then ... we didn't buy our groceries each week like we do now. But the most, that is most of the groceries, like the flour and the cornmeal and stuff like that, the bulk stuff, they bought it by the month. A month's supply, see, like a barrel of flour or a 100-pound bag of cornmeal, I mean rice, and sugar and stuff like that, you know. They would buy it in the large amounts. And then there was a lot of that stuff that we grew on the farm. We made our own grits and our own cornmeal. Carried it to a grist mill. ... Well, now, there was no real market like a curb market then. ... The only way that they did this was to take it to your grocer where you bought your groceries and exchanged it, more or less, because there was no curb market. ...

One man recalled his childhood, living in a rural part of the county during the Depression, as "the best years of my life."
... When times got real hard, we moved out in the woods to another house that Daddy had access to. ... It was a shanty. ... It was the old type where you could feed the chickens through the floor, and see the stars through the [roof]. And we lived there for about four or five years, all during the worst part of the Depression. And I would think that was my best years, too. I think about that all the time. ... We had a garden and goats and cows, wild hogs, well, we had two tame hogs. We had chickens, everything running around the yard. We hunted all the time ... and [fished]. ... The mullet out of the small creek fed two or three of my generation. ... But we had plenty to eat. ... [The men in the family would] go down and catch probably a barrel of mullet, and they'd salt 'em down, smoke 'em. We used to salt 'em down in a barrel. Then you could eat out of them a good while.

Present Subsistence Practices

Many of these traditional activities are still important to the present residents of Camden County. Analysis of the interview data from the 1979 survey reveals that 68 percent of the residents fish, 26 percent hunt, and 54 percent raise a garden. Of the 68 percent of fishermen in the county, 96 percent fish in salt water, 57 percent in fresh water, and 53 percent in both salt and fresh water. As expected in an estuarine system, the distinction between salt water fishing and fresh water fishing is somewhat blurred. Thus the fresh and salt water category was a common response.

Species most commonly caught include mullet, shrimp, and crab. The most common techniques of catching these species are gill nets, cast nets, and crab nets or traps. Some species such as sea trout are caught by hook and line.

Ninety-four percent of the fishermen fish within the county. Popular fishing areas include the Satilla, Crooked, and St. Marys Rivers,
Cumberland Sound, and the south jetties of Cumberland Island. Kings Bay, now closed to fishing for local residents, was formerly a favorite fishing spot.

The majority of respondents fish for home consumption. Ninety-seven percent of the fishermen eat the fish or shellfish they catch or share it with others. Surplus fish are distributed directly to relatives, friends, and "those in need." Large catches are often shared with friends through fish fries.

The intensity of fishing by residents is revealed by the amount of time expended in its pursuit. Forty-one percent of the fishermen fish at least every two weeks or more often. Twenty-four percent fish once a month, and 27 percent fish between once a year and four times a year.

Hunting provides additional protein for over a quarter of the sample. Eighty-nine percent of the hunters in Camden County hunt on their own land, relatives' or friends' land, on company land, or as members of a hunt club or cooperative on leased land. Forty-six percent of the hunters hunt a combination of deer, hog, fowl, and small game, while 38 percent are strictly deer hunters.

Hunters are more avid in their pursuit of game than fishermen, with 58 percent of them hunting at least every two weeks or more often during the hunting season. Eighty-nine percent of the hunters eat the meat they procure and share it with others.

Hunting is sometimes couched in terms of "varmint" or "pest" control. While for some residents this refers to shooting small animals such as squirrels or rats, for others it can justify poaching. As one
respondent explained, he didn't hunt anymore, he only shot varmints that got into his garden. These varmints turned out to be deer that he shot out of season to supplement food from his garden. Figure 42 illustrates one of the rituals associated with deer hunting.

Vegetable and fruit gardens contribute substantially to the family's diet as well. Although 42 percent of the gardens are small and contribute less than 10 percent to the family's diet, some 35 percent of the gardens are large enough to contribute over 50 percent of the vegetable and fruit foodstuffs to the household. Gardening is done in all areas of the county. Gardens, however, tend to be smaller and thus contribute less to the diet of households in St. Marys, Kingsland, and Woodbine proper. Even in town, however, lot size allows for the growth of gardens. In the towns, the average density is one house per one-third acre. In the rural areas, the average density is one house per three-quarter acre (Kings Bay Steering Committee 1979: 70). Fifty-five percent of the gardeners share the fruits of their labor with others.

Some residents, particularly the elderly and infirm, do not raise their own gardens, but rather receive fruits and vegetables from others. One couple found that with each of them working it was easier and cheaper to buy fruits and vegetables in bulk from a local farmer and can or freeze them.

The pervasiveness of freezers or canning sheds in most homes indicates that, while not everyone in the county may fish, hunt, or raise a garden, residents nonetheless have access to foodstuffs procured by others. Sharing food with others is a regular occurrence, a sign of friendship that strengthens community ties.
Figure 42. The bloodying ceremony of a youth's killing his first deer, Camden County, 1969

Courtesy Georgia Department of Archives and History
Fishing, hunting, and gardening prove to be major attractions to many residents. Some residents have retired to Camden County for the express purpose of engaging in these activities. One resident stated that he moved to Camden County from Florida because "I wanted to hunt and fish. Camden is one of the best deer hunting places."

John exemplifies a resident who has migrated out of Camden County only to return again. John was born and raised in the north end of the county. He left for college and after graduation joined a federal government agency. His work required relocation to a metropolitan area in a northern state. He eventually tired of his job and, feeling that the city was no place to raise a family, he returned to Camden County to enjoy the small town atmosphere and rural lifestyle.

John took a job at the paper company upon returning to the county. The demands of his job are not as great and he now enjoys hunting and fishing. He was amazed when he bagged a deer the first time he went hunting after returning to Camden County. Of his fishing he states, "You know what my wife and I do some evenings? Around 2 a.m., we pack a light breakfast and take the boat out to go shrimping." These outdoor pursuits and quiet lifestyle are the attractions that brought him back to the county.

A county official stated that he liked the outdoors and "the underdeveloped areas of the county. It depends on what an individual likes. Clean is an attraction in itself." A poem written by a local resident epitomizes the lure of hunting and fishing in a rural county. Although the poem refers specifically to Harriet's Bluff, it could well apply to the county as a whole.
Give me green acres around me,
And a blue sky overhead;
A book for entertainment,
And a hammock for a bed.
A river flowing gently,
Out front for all to see,
A catch of fish for supper,
And that's the life for me.

Give me a wide marsh view before me,
Aged live-oak trees nearby;
All peace and quiet around me,
White clouds floating across an azure sky;
A few friends in the evening;
Some steaks on a charcoal grill;
It may not appeal to others,
To me it's quite a thrill.

You can have your crowded cities,
With their streets so big and wide;
I'll take the open country
Where the wild deer run and hide.
I'll have a little longer
With my heart and care set free,
At my cabin at the Bluff
For that's the place for me.
[Reddick et al. 1976: 43]

The ability to produce one's own food enhances a sense of self-sufficiency, a value that is highly regarded among county residents. One of the pleasures of hunting, fishing, and gardening is knowing that these activities could sustain a family in times of economic stress as they did during the Depression. Successful gardening, hunting, and fishing impart a feeling of security and self-sufficiency. Although one couple stated that they fish, hunt, and garden "strictly for pleasure," the husband admitted, "We used to have a garden for necessity . . . [and] if I didn't draw another paycheck, I could live. Wouldn't like it, but I could do it."

One young family epitomizes the economic self-sufficiency that hunting, fishing, and gardening provide. The family produces everything
but meat from their garden. All family members hunt on land leased by their hunting club. The parents instill in their children the credo, "If you kill it, you eat it." The son is the only one in the family who fishes. The family also raises beetaloes with another family to provide them with their beef. The family owns a freezer for putting up vegetables, fruit, game, fish, and beef. The only items that the family must buy from the market are paper and soap products.

As noted above, there is a degree of overlap between hunting, fishing, and gardening practiced as supplemental subsistence and as recreation. For the purposes of this study, subsistence practices can be distinguished by their intensity, the frequency with which they are pursued, and their productivity, the degree to which they contribute to household diet. These residents who fish every two weeks or more often for home consumption, 41 percent of all those who fish, are considered subsistence fishermen. Similarly, subsistence hunters are those who hunt every two weeks or more often for home consumption, 58 percent of residents that hunt. Gardening that produces over 50 percent of the household diet is considered a subsistence activity.

A striking characteristic of subsistence activities is that there is little waste of foodstuffs. Fish, meat, fruits, and vegetables are consumed by the producing household or shared with other households. Not one of the respondents threw back fish after catching them, failed to dress out game they killed, or threw out fruits and vegetables. Nor did any of the respondents sell their catch or produce. The preferred mode of handling excess foodstuffs is to share it with other households.
Sharing food may promote the independence of lower-income households in an area where the ideal of self-sufficiency runs high. The idea of "welfare" holds bad connotations to many residents. This fact is illustrated by the difficulty of establishing a "human services" program in Camden County to aid in handling social needs arising with the impact of naval base development. Many residents perceived "human services" to be "welfare" and were reluctant to support the program.

In the 1970 census, 16.9 percent of Camden County residents are defined as living below the poverty level. Supplemental subsistence activities and exchange networks may ameliorate low income. Families in the county tend to help each other out. One resident blamed the extent of welfare dependency in the South on the taxes levied on poor but self-sufficient households during the Depression.

Well, these old colored people then, now they blame them for being on welfare, see. They wouldn't have been on welfare if they'd have left their farms alone. Their taxes wouldn't have amounted to nothing if they had left them there. They'd have still had to raise their families. They were making a living. They had their cattle, their hogs, and their chickens and they'd plant their sweet potatoes. They'd make their syrup, cane and all. They was living. But they sold their land for taxes. They had no way to pay taxes. Then they had to put 'em on what they called "relief." That's what this is now [welfare], it's gotten to be a racket with the politicians.

Another resident recalled relief lines during the Depression, but that his family was too proud to take help, relying instead upon subsistence activities.

We hunted all the time. ... We'd fish, too. ... My parents wouldn't, at this particular time [Depression], they had, I think, the Salvation Army, or somebody, anyway, they was handing out food. My family was too proud to take it. They wouldn't line up for no food, so he'd [Father]
do without before he'd go in to get in line to get the handouts in the WPA days, you know.

Schensul, Paredes, and Pelto (1968) note that extensive fishing, hunting, and gardening activities combined with exchange networks for sharing foods contribute to the income of households in rural Minnesota. Although the income of these families places them well below the national poverty index, the yield from subsistence activities substantially raises their standard of living.

Similarly, in Camden County, the contribution of fishing, hunting, and gardening and the exchange networks operating to distribute these foodstuffs is evidently substantial. While the median income of residents in 1970 was $8,390, a little above the state average (Department of Commerce 1971), the actual standard of living is substantially higher. It was apparent during the survey interviews that few people in Camden County consider themselves poor.

The Impact of Base Development on Subsistence Activities

Fishing, hunting, and gardening are not included in local economic activities addressed by the environmental impact assessments (Department of the Navy 1977a, 1980a). Fishing and hunting are considered purely recreational and the only anticipated impacts for recreation are increased participation (Department of the Navy 1977a: 5-104). By not recognizing fishing, hunting, and gardening as economic activities, the environmental impact assessments ignore a major impact of naval base development with repercussions on community residents' income, lifestyle, and social relations.
While there are indications that these supplemental subsistence activities are increasing in other parts of the country to mitigate the effects of inflation and unemployment (Gainesville Sun 1982), for Camden County residents, fishing, hunting, and gardening will decline with naval base development. Physical impacts of base development and the population influx will severely limit the productivity of the county's estuarine and terrestrial habitats. The recreational activities of the incoming population indicated by interviews with naval personnel suggest increasing competition for scarce and diminishing resources of fish and shellfish, game, and land.

Change in Community Subsistence Activities: 1979-80

As indicated in Chapter II, many of the social impacts expected to accompany the population influx and associated commercial impact did not occur during the first year. However, the physical impacts of base development, dredging, land clearing, etc., were extensive. Social impacts relating to alteration of the physical environment were among the first to be manifest.

The proportion of respondents that fish declined from 68 percent in 1979 to 56 percent in 1980. This change in fishing practices was analyzed with the McNemar Test for Correlated Proportions to determine the probability of such a decline occurring by chance alone. The result is significant at a probability level of .01, indicating that a significant, nonrandom decrease in subsistence fishing occurred during the first year of base development.
The intensity of fishing and the consumption patterns remained about the same, with 44 percent of the fishermen fishing every two weeks or more often, and 92 percent sharing their catch with others. One woman complained that the fishing was worse in 1980 now that more residents are posting their property. This concern over trespassers and the posting of land is a recent phenomenon that appears to be related to the influx of naval personnel.

The impact on hunting was quickly evident. Development of Kings Bay, once a prime hunting spot, and associated development in the south end of the county have driven the deer north. While hunters in the south end complained about the decline of game, hunters in the north end stated that the hunting had improved.

The proportion of hunters recorded in the 1980 sample was 26 percent, approximately the same as in 1979. The time they expended in hunting increased with 74 percent of the hunters going out every two weeks or more often. This represents an increase in hunting intensity of 16 percent between 1979 and 1980, although a McNemar test of hunters interviewed both years produced a probability level of .90. While 44 percent of the hunters still hunt a combination of deer, hog, fowl, or small game, the number of specialized deer hunters increased to 56 percent. This represents an increase of 18 percent between 1979 and 1980, producing a McNemar statistic with a probability level greater than .05 but less than .10. The same proportion of hunters still hunt within the county, 87 percent, and share their meat with others, 92 percent.
Gardening activities in 1980 included 48 percent of residents as gardeners, down from 54 percent in 1979, with 32 percent of them deriving over one-fourth of their diet needs from the garden. Despite the smaller yield from gardens in 1980, the number of gardeners that share fruits and vegetables increased to 85 percent. Thus the decline in the yield of gardens between 1979 and 1980, 7 percent, was offset by an increase of 30 percent in sharing activities. The increase in sharing produced a McNemar statistic with a probability level greater than .05 but less than .10.

Fishing, Hunting, and Gardening among Naval Personnel

Of the naval personnel interviewed in 1980, 66 percent fish and, of these fishermen, 67 percent fish within the county. Fifty-two percent fish every two weeks or more often. While 83 percent of the naval personnel who fish eat their catch, 17 percent throw back the fish they catch. None of the naval personnel give away or share their catch with others.

Among naval personnel, fishing is pursued mainly for recreation. Fish are either consumed or thrown back in the water. Camden County residents do not throw back their catch. Furthermore, the fact that naval personnel do not share the fish they catch indicates that the extensive exchange networks that exist among local residents is absent among naval personnel.

Only 22 percent of the naval personnel hunt. Of these, 50 percent hunt within the county. One resident complained that naval personnel were bringing in dogs to hunt on the base, while he and other residents could no longer hunt on the base.
The gardening activity of naval personnel interviewed is negligible, only 19 percent raise a garden and, further, the size of the garden is limited. Only one garden reported contributed over 10 percent of the household diet. The ability of naval personnel to raise gardens will be limited by lot size, and the type of housing accommodations.

**Anticipated Impacts of Development**

The impacts of naval base development on the Cumberland Sound estuarine complex were addressed in Chapter III. The Navy's construction, maintenance dredging, and submarine traffic will disturb the bottom of the sound and disrupt the growth and productivity of the estuarine life chain. Additional pollutants from base operations will further affect the estuary. Local noncommercial fishermen, more directly dependent on the productivity of the estuary than far-ranging commercial fishermen, will suffer the greatest impact.

Local competition for estuarine resources already exists between noncommercial and commercial fishermen. The situation will be exacerbated by diminished estuarine resources and the addition of a new faction, those noncommercial fishermen in the incoming population. Among these are naval personnel.

Heavy participation of naval personnel in fishing activities suggests potential conflicts for the scarce and diminishing estuarine resources in the future, particularly if the level of fishing evident in the sample is representative of the incoming population. Sixty-six percent of the 25,000 additional naval personnel practicing recreational
Fishing signals dire consequences for the commercial and noncommercial fishery.

Naval base development will also adversely affect hunting activities in Camden County. Development of the base itself as well as related housing and commercial development will result in increased urbanization and diminished wildlife habitat. The loss of local wildlife and wildlife habitat with T-1 development warrants only slight mention in the environmental impact assessment (Department of the Navy 1977a: 5-147). Significant impacts on wildlife are anticipated, however, with A-1 Trident development.

Most wildlife may leave the immediate vicinity of construction as human activities increase. The clearing process will destroy resident "nonimportant" wildlife populations. ... Some of the more mobile species of wildlife (i.e., opossum, raccoon, and deer) will leave the area. Those wildlife that are displaced will either move into adjoining, less suitable habitats or they will migrate to an area similar to that from which they have been displaced. Since most lands are at or near carrying capacity for wildlife, the net result ... will be to reduce wildlife population in the region in proportion to the reduced habitat area. In general, the significance of this wildlife habitat loss is not great, because of the commonness of most species involved. ... These impacts are irreversible and are a long-term loss of natural wildlife resources to the site and the area. [Department of the Navy 1980a: 6-68]

While the environmental impact assessment dismisses the loss of wildlife as insignificant due to the "commonness" of the species affected, the significance of these animals to the local economy is ignored.

Again, the potential for conflict between local residents and naval personnel for scarce and diminishing game exists, particularly if the hunting activities of the sample of naval personnel are representative of the incoming population. Twenty-two percent of the additional
naval personnel and dependents of the Trident complex could add 5,500 more hunters to Camden County.

Gardening activities will also decline with naval base development as the county becomes more urbanized. Lot size of residences will become smaller and gardens will decrease in size or disappear as land becomes more valuable and the taxes on land increase. One resident in the rural area complained that increased taxes on buildings had forced him to tear down his barn, a building essential to operating his farm. An elderly woman complained that increased taxes on her home and acre lot on which she grows all her vegetables may force her to move into a rental unit, a move she prefers not to make.

Summary and Conclusions

Fishing, hunting, and gardening are local economic activities that contribute significantly to the health and welfare of Camden County residents. The pervasiveness, intensity, and history of these activities suggest that they are more than mere recreational pursuits but subsistence activities that enhance residents' economic and social well-being. These activities are definitely threatened by naval base development. Not only will the productivity of natural resources diminish, but increased competition for these resources may result in conflict between community residents and naval personnel.

One might be tempted to dismiss the significance of fishing, hunting, and gardening activities by saying, "So what? There will be commercial developments to make up for the yield of fishing, hunting, and gardening. Life will be more convenient because everyone will be
able to buy those things. This sub base will bring Camden County to the 20th century." This attitude, however, ignores the fact that local residents enjoy their rural lifestyle. Some residents have moved to Camden County because of this lifestyle and they prefer the county undeveloped, an area where they can hunt, fish, and garden. Local residents pride themselves on their economic self-sufficiency, continuing a traditional way of life. Furthermore, this response ignores the fact that some residents depend upon these activities to make ends meet. This segment of the population includes the "elderly and minority groups" that the environmental impact assessments (Department of the Navy 1977a, 1980a) conclude may be displaced or otherwise adversely affected by the increased cost of living, increased taxes, and increased competition for employment associated with naval base development.
CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

Camden County is a rural community undergoing the impact of a military installation with boom town proportions. Analysis of the social impact of naval base development on the community has indicated three areas that are especially susceptible to disruption during the early stages of development and operation: the "human impact" resulting from the sudden influx of outsiders; the commercial fishery; and subsistence activities of fishing, hunting, and gardening associated with the rural lifestyle of community residents.

Human impacts resulting from the influx of naval personnel into the community were less than anticipated in the first year of development due largely to unforeseen factors. The Navy initially expected the community and outside developers to provide the housing and necessary services for naval personnel. Camden County was expected to become a "base community." A decline in the housing industry, patterns of land ownership and initial uncertainty surrounding the base development discouraged the development of housing and commercial establishments.

The lack of housing, particularly rental units, forced many enlisted naval personnel to remain quartered on the tender or to secure housing in Jacksonville, Fernandina, or Brunswick. Naval officers and their families, on the other hand, were more likely to purchase single-family dwellings in Camden County and become active in community affairs.
The resulting low visibility of enlisted personnel and the high visibility of officers belied the magnitude of the incoming naval population and calmed many of the fears initially expressed by residents concerning the loss of small town atmosphere and their traditional way of life. Residents began to perceive the slow rate of community change experienced during the first year of development as "controlled growth."

As is often the case in boom developments, naval personnel and community residents possess conflicting attitudes and expectations for development. Commonly held stereotypes are one manifestation of conflict that has resulted from limited contact between oldtimers and newcomers. That oldtimers' attitudes toward development worsen over time in other boom situations (Finsterbusch 1980: 140) is evident in Camden County. A McNemar Test for Correlated Proportions demonstrates a significant adverse shift in community attitudes over the first year of base development. Many residents that in 1979 were positive or neutral in their attitudes toward base development expressed negative attitudes in 1980.

Assessing the impact of naval base development on the fishery and community during the first year of base operation was the second research objective. The environmental impact assessment dismisses the importance of the commercial fishery in Camden County and simply predicts its decline due to the dredging of Kings Bay and Cumberland Sound. Historical research, however, reveals that the commercial fishery is a viable element of Camden County's economy. The commercial fishery is highly adaptive and survived a similar threat when Gilman Paper Company's expanding operations disrupted the Cumberland Sound Estuary. Commercial
fishermen adapted to these adverse conditions by extending their range to new fishing grounds along the Atlantic and Gulf coasts while maintaining their home port in Camden County.

Maintenance dredging and submarine traffic will continue to affect the productivity of the estuary, which may in turn harm the commercial fishing industry. While fishermen may attempt to adapt to local disruption of the estuary as they did with the paper company, their ability to do so is limited by the escalating costs of fishing, particularly fuel costs. At a time when commercial fishermen find it necessary to confine their pursuits to local or nearby fishing grounds, the environmental disruption and restricted access imposed by naval base development may prove disastrous for the commercial fishery of Camden County.

Significant aspects of community life not recognized by the environmental impact assessment are the supplementary subsistence activities of hunting, fishing, and gardening. The community study reveals the extensive practice of fishing, hunting, and gardening among residents. The long history of these practices, their productivity, and the extensive informal exchange networks that have developed around them suggest that these activities represent more than mere recreational pursuits. These activities help to defray the costs of living and allow many households a higher standard of living than would be possible otherwise. Particularly for elderly and lower-income residents, fishing, hunting, and gardening alleviate economic hardship.

Fishing, hunting, and gardening activities are threatened by naval base development. As the productivity of the estuary declines and the catch decreases, competition for estuarine resources will increase.
Exacerbating the situation is the threat of competition for fishing resources posed by naval personnel. A large percentage of naval personnel interviewed engage in recreational fishing. The cumulative effect of intensive recreational fishing by naval personnel could be devastating to subsistence fishermen in Camden County. A McNemar Test for Correlated Proportions demonstrates that fishing behavior among community residents changed during the first year of base development. There was a significant decline in the number of fishermen in 1980 among those that fished in 1979.

Hunting and gardening are threatened by the increasing development of local land. Residents report that game animals, particularly deer, have been displaced from the south end of the county by the development of Kings Bay and the associated land clearing for housing and commercial development. As development continues throughout the county, game will decrease. Gardening is also threatened by urbanism. As land increases in value and the tax rates rise, rural and semi-rural residents are induced to sell their land or divide their holdings into smaller lots for development, thus decreasing the land available for gardening. This process was evident as early as 1979.

Three predictions concerning the impact of base development on the community were posited prior to field research: (1) that base development and the associated population influx will alter community institutions; (2) that base development and the associated population influx will alter community lifestyle; and (3) that base development and the associated population influx will result in conflict between oldtimers
and newcomers. Manifestations of the latter two predictions, an altered lifestyle and conflict, were evident within the first year of base development.

The degree to which the first prediction, altered community institutions, is fulfilled depends upon the course of development adopted by both the community and the Navy. If the Navy continues to develop Kings Bay as a self-sufficient base, and the community successfully maintains social, political, and economic autonomy, base development can proceed with little long-term effect on community institutions. In such a situation, the boom is ephemeral. When the shipyard closed in Seneca, Illinois, community life continued essentially unchanged (Havighurst and Morgan 1963).

Recommendations: The Independency Scenario

Three scenarios of the possible outcome of base development, labeled Independency, Dependency, and Displacement, are presented in Chapter II. The Independency scenario was suggested as the best possible outcome for both the community and the Navy. The Independency scenario seems most appropriate considering the background and needs of the community and the Navy. The Independency scenario is the safest alternative for a community undergoing military base development as there are no guarantees of the permanence of base operations. According to Finsterbusch (1980: 190), "When busts are expected, actions such as building less permanent facilities reduce its negative impacts." Therefore, in military development situations, the host community should prepare for eventual
closure and maintain the important aspects of its identity while remaining open to change in other areas.

Independence would provide for two coexisting and autonomous systems while guaranteeing economic stability for the community. Most importantly, the local economic base must not become completely dependent on the military. The boom-bust cycle of most military installations is well documented. The lesson to be learned from communities that have experienced base closure is that Camden County must act to diversify its economic base. One potential source of economic self-sufficiency is the tourist industry.

The tourist industry could be based upon assets that the community already possesses: its bountiful natural resources, historic background, and small town charm. St. Marys has begun to develop its tourist potential through the renovation of Orange Hall and business district facades, rebuilding the waterfront pavilion, and developing stores and restaurants catering to tourists. To preserve the historic quality of the town, the downtown area was zoned an historic district. Zoning in this case allows St. Marys to maintain an attractive semblance of its former traditional identity. Woodbine and Kingsland should follow this example.

Rome, New York, exemplifies a community that adapted to base closure by developing its tourist potential (Lynch 1970). The immediate response of the community to the base closure was a futile "save the base" campaign which only served to retard community redevelopment. The community finally decided to develop its historical and tourist potential. A tourism committee was formed to develop local resources, concentrating on
an historic military fort site. The committee garnered support from the National Park Service to restore the fort as a national park. Archaeological excavations were initiated, increasing tourist attendance by 51 percent.

In order to maintain some semblance of traditional local lifestyles, the community should strive to preserve the natural resources valued by so many residents. This can be accomplished through land use planning and zoning practices that recognize the pervasive influence of natural resources in community life. Every possible measure should be taken to maintain water quality and the productivity of the estuary.

The Independency scenario promotes a recognition of and respect for differences between the Navy and the community. While some tensions and conflicts will inevitably result, they need not present a barrier to successful adaptation. Conflicts and tensions can be expressed more openly in an Independency situation and are more likely to be repressed in a Dependency or Displacement scenario.

Community independence allows the Navy and the community to work together on an equal basis. Negotiations between the two will encourage mutually beneficial solutions to the problems of development. Community input into the development project makes local residents feel more responsible for their destiny, rather than pawns of a system that operates above them.

Specific Recommendations

In addition to the general suggestions contained in the Independency scenario, a number of specific recommendations are presented
here. First, the community should become cohesive, particularly politically cohesive. The evidence from boom towns and base communities suggests that community leadership is an important factor in determining the community's ability to cope with the impact of development or to recover from the withdrawal of the facility. Finsterbusch (1980: 194) notes that "... quality community leadership and development goals are ... catalysts of growth. ..." Simon and Gagnon (1967) conclude that the "quality of community leadership, particularly political leadership" was the crucial factor in determining the course of economic development for three rural towns recovering from energy resource depletion.

Hughes (1971) and Gold (1975) provide contrasting examples of the extent to which communities can control development. The rural Quebec community that underwent development of externally controlled textile plants as a passive recipient lost its political, economic, and social autonomy (Hughes 1971). Economic development in St. Pascal, on the other hand, was actively sought by community residents, became internally controlled and resulted in community autonomy and vitality (Gold 1975).

The nature of boom town impacts can result in cohesion or dissension (Little 1977: 410-412). Differences between oldtimers and newcomers can precipitate cohesion or dissension. In Seneca, Illinois, the influx of newcomers outnumbered the oldtimers four to one, yet the community maintained its stability through enhanced community cohesion. According to Havighurst and Morgan (1963: 102), "... oldtimers in Seneca tended to forget their own social differences when they faced the horde of strangers moving in upon them."
In Camden County, the formation of the Kings Bay Steering Committee, the activity of the Camden County Historical Society, and the zoning of downtown St. Marys as an historic district are evidence of enhanced community cohesion resulting from the impact of naval base development. Internal political dissension between local officials and outside experts must be overcome, however, if the community is to become politically cohesive.

Bowles (1981) stresses that politically competent communities can direct the course of change associated with development. "To actively influence or control events the community as a collective must have or develop the internal competence to manage local resources and bargain with external organizations" (Bowles 1981: 57).

Developing this political competence may entail the use of experts or specialists such as planners as consultants or advocates who provide the community with information or development plans from which to make decisions (Bowles 1981: 61-62). Robbbins (1979) has demonstrated that the use of experts as advisors helped the Navajo influence the course of resource development on their reservation.

Lynch (1970) cites the importance of political cohesion in the recovery efforts following base closures. Internal dissension in Mobile, Alabama, delayed community redevelopment efforts a full year after the closure of Brookley Air Force Base. Internal dissension resulted largely because planning was confined to political and business leaders who did not represent the community as a whole (Lynch 1970: 138). Presque Isle, Maine, on the other hand, acted cohesively to develop and implement
a successful recovery plan. By securing support from Congressional leaders and forming a delegation of community residents to approach the General Services Administration office in Boston, Presque Isle was able to procure the Air Force Base facility at low cost and develop it for industrial and recreational use (Lynch 1970: 53-65).

Second, the community must implement comprehensive planning for development. While the plans may be suggested by experts or specialists, the community leadership must interpret and implement them. Planning should be undertaken with long-range goals in mind. Long-range planning rather than a series of short-term plans enables the community to better visualize its future, determine cohesive goals, make effective investment decisions, and develop the leadership to achieve those goals (Dixon 1978: 297-298).

Comprehensive planning requires accurate information: knowledge of the development plans as well as an understanding of the community itself (Dixon 1978; Nellis 1974). The community must know the Navy's plans for development and any changes in development plans that may occur well ahead of time. Knowledge of the number, composition, and expectations of newcomers associated with the development aids the community in planning for housing and local services. Accurate information concerning the development project and the impact population is necessary for the community to plan and respond. "Wrong, or deliberately conservative or exaggerated, estimates about workforce, resource needs, and costs are detrimental to any efforts communities may make to address

The second source of information necessary for comprehensive planning is an understanding of the community itself (Dixon 1978: 299). Lynch (1970) cites community understanding and an awareness of local resources as the basis of community confidence which influences recovery from base closures. Knowledge of community values and desires can determine the course of development adopted by community leadership as satisfactory to residents.

Gilmore (1976) notes that the final attitude phase of communities undergoing boom town development, the problem-solving phase, is possible only to the extent of the information available. "The more information that is available on the prospective change, the sooner the fourth phase comes" (Gilmore 1976: 536). The media, particularly the local and regional newspapers, can serve as effective sources of information concerning development (Gilmore 1976: 540).

Gilmore (1976: 537) suggests that "growth management" be adopted as the basis for comprehensive planning in boom towns. Growth management involves cooperation among the "parties-at-interest" in the development. These include the developing industry, state and federal governments, local government, commercial interests, and residents. Growth management entails four basic functions: (1) balancing capital investments; (2) determining resource use and conservation; (3) developing a labor force; and (4) accommodating and retaining the population of oldtimers and newcomers (Gilmore 1976: 538).
Third, the community should proceed upon the premise that the base will eventually withdraw. The lessons learned by Dover, Delaware (Whelan 1965), Seneca County, New York (Church 1965), and the 12 communities undergoing base closures (Lynch 1970) distill to a simple maxim: plan for base closure. The community should resist becoming economically dependent on the naval base and should seek to diversify its economy by developing other local resources.

Fourth, the community needs tangible assurances by the Navy that the costs of base development impacts will be shared. Tangible assurances are couched in terms of financial assistance. According to Gilmore (1976: 540), "... [the developing industry] should commit themselves to community preservation and development and carry the community costs precipitated by their development." Nellis (1974: 237) suggests that an impact tax be added to a severance tax and be paid to impacted communities. Dixon (1978: 298) recommends financial assistance for local governments through federal bond guarantee programs and assistance to local businesses through federal or industry loan guarantees or contract agreements. Increased social services costs that occur as a result of development should also be borne by the developing industry (Bates 1978: 75-76; Nellis 1974: 237).

Fifth, the impact of base development should be limited so as to preserve areas suitable for fishing, hunting, and gardening. The orientation of community residents to the outdoors and these activities warrants that consideration be given to the continuity of these practices. The land area involved may be donated by the Navy. "Declining
natural resources" are one factor responsible for declining towns (Finsterbusch 1980: 194), and community planning for a diversified economy may entail preserving natural resources in Camden County.

Sixth, in order to maintain a productive estuary, the Navy should monitor the estuary for pollutants; if the estuary is destroyed the Navy should be held responsible. The estuary is essential to the survival of the commercial and noncommercial fisheries in Camden County. The development and operation of the base will adversely affect the estuary. The responsibility of the costs involved should, therefore, be borne by the Navy which is benefiting from its use. The federal Water Pollution Control Act Amendments of 1972 and the Georgia Coastal Marshlands Protection Act of 1970 (Georgia Department of Natural Resources 1975) should be rigorously enforced.

Seventh, the fishermen of Camden County should become politically organized to protect their interests. Commercial fishery interests are generally not represented politically due to the low visibility of commercial fishermen. The Camden County fishermen should take advantage of their integration in the community and political representation at the local level to further the continuity of their livelihood. The Georgia Fishermen's Co-op, formed in 1974 (Georgia Department of Natural Resources 1975: 33-34), is one means of realizing this political clout at the state level, much like the Organized Fishermen of Florida (OFF).

Analyzing the impact of base development on Camden County reveals that an understanding of the community that is to be impacted immediately by development is essential to the success of the project. The community
should thus be addressed in the environmental impact assessment and accurate information about the community is best reflected in field data such as community interview schedules. The community should also be included early in the development project plans and in the decision-making processes throughout.

To the extent possible, the community should have a voice in the policies and decisions that have implications for community life. It is vitally important that a concrete and unambiguous development schedule be made available to the community as soon as possible. The developer's commitment to the development plans should be reinforced by financial assurances. Dixon (1978: 297) suggests a waiting period of at least a year before development plans are enacted.

Breese et al. (1965) recognize three sources of stress in communities undergoing the impact of military installations: communication, coordination, and finance. If both the Navy and community cooperate with particular attention to these areas and an appreciation for the social consequences of their plans and policies, the disruptive effects of base development can be minimized.
APPENDICES
APPENDIX I
COMMUNITY INTERVIEW SCHEDULE

DATE
CODED

1. Age group:
   ____ 1) adult under 30 yrs. 2) adult between 30-50 yrs. 3) 50+ yrs.

2. Sex:
   ____ 1) female 2) male

3. Race:
   ____ 1) white 2) black 3) other

4. Residence: write name of residence or indicate town they
associate themselves with:

5. Place of birth:

6. Number of children: specify by age and sex:
   ____ total no.  female and ages:  male and ages:

7. Number of children still at home: (list no.)

8. When did you come to Camden County?

9. Why did you move to Camden County?

10. Do you work?
    ____ 1) yes 2) no 3) NA/DK

11. Where do you work? (list place)

12. Do you have another job at another place?
    ____ 1) yes 2) no 3) NA/DK
    list place:

13. Does your spouse work?
    ____ 1) works full-time 2) works part-time 3) does not work
    4) no spouse 5) NA/DK (list place)
14. Does your spouse work anywhere else?
   _____ 1) yes  2) no  3) NA/DK (list place) __________________________

15. Have any members of your family served in the military?
   _____ 1) yes  2) no  3) NA/DK
   list relationship: __________________________________________

16. What branch of the service did they serve in?
   1) __________  Army  3) __________  Marines
   2) __________  Navy  4) __________  Coast Guard
   5) __________  Air Force

17. Where do you shop for:
   _____ clothing?
   _____ household items or furnishings?
   _____ groceries?
   __________________________

   ANSWER CODE:  1) Jacksonville  2) Brunswick  3) St. Marys
                  4) Kingsland  5) Woodbine  6) other
                  7) combination (list areas)  8) NA/DK

18. What do you do for recreation or entertainment? __________________________

19. Where do you go for recreation or entertainment?
   _____ 1) Jacksonville  2) Brunswick  3) St. Marys  4) Kingsland
   5) Woodbine  6) other  7) combination (list areas)  8) NA/DK

20. What effect has the gasoline shortage had on you, your job, and/or
    your recreation/entertainment? __________________________

21. What future effects of gasoline shortage do you foresee on you
    and your lifestyle? __________________________

22. Do you fish, and if so, in what kind of water?
   _____ 1) yes, salt water  2) yes, fresh water  3) yes, fresh and salt
   water  4) does not fish  5) NA/DK

23. Where do you fish in Camden County? __________________________

24. What do you do with the fish you catch? __________________________

25. If you give away fish, to whom do you give them away? __________________________

26. How often do you fish?
   _____ 1) once a year  2) 4 times a year  3) once a month
   4) every 2 weeks  5) more often than (4)  6) NA/DK
27. Is the fishing better or worse than it was a year ago?
   ______ SALT: 1) better 2) worse 3) no change 4) NA/DK
   ______ FRESH: 1) better 2) worse 3) no change 4) NA/DK

28. Do you hunt?
   ______ 1) yes 2) no 3) NA/DK

29. What kind of hunting do you do?
   ______ 1) deer 2) hog 3) fowl 4) small game 5) other (list)
       ______ 6) combination (list) 7) NA/DK

30. Where do you hunt in Camden County (or outside it)?

31. What do you do with the meat you get from hunting?

32. If you give away meat from hunting, to whom do you give it?

33. How often do you hunt during the hunting season?
   ______ 1) once 2) once a month 3) every 2 weeks
       ______ 4) every weekend 5) NA/DK

34. Is the hunting better or worse than it was a year ago?
   ______ 1) better 2) worse 3) no change 4) NA/DK
       ______ 5) have not been hunting as yet this year

35. What do you think is the reason or reasons for the changes in fishing or hunting over the past year?

36. Do you have a garden for family use?
   ______ 1) yes 2) no 3) NA/DK

37. What percentage of your food comes from your garden during the year?
   ______ 1) 0-10% 2) 11-25% 3) 26-50% 4) over 50%
       ______ 5) all except meat 6) NA/DK

38. To whom do you give away any vegetables/fruits you raise?

39. Where do you go to see a doctor?
   ______ 1) Jacksonville 2) Brunswick 3) St. Marys 4) Kingsland
       ______ 5) Woodbine 6) other (specify) 7) does not have one
       ______ 8) NA/DK
40. Where do you go to see a dentist?
   1) Jacksonville  2) Brunswick  3) St. Marys  4) Kingsland
   5) Woodbine  6) other (specify)  7) does not have one
   8) NA/DK

41. If you need to go to a hospital, where do you go?
   1) Jacksonville  2) Brunswick  3) St. Marys  4) other (specify)
   5) NA/DK

42. How many times did you miss work this year (June 1978–present)
    due to illness?
   1) none  2) 1-3  3) 4-6  4) 7-10  5) over 10  6) NA/DK

43. What kinds of illnesses [referred to in question (42)] were these
    and how long did each one last?

<table>
<thead>
<tr>
<th>TYPE</th>
<th>LENGTH</th>
</tr>
</thead>
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</tbody>
</table>

44. Do you have any chronic (continuing) health problems, such as
    headaches, backaches, respiratory illnesses, stomach problems,
    etc.? If so, list these:
   1) yes, has some  2) has none  3) NA/DK

   TYPES:

45. Have you had any acute (immediate emergency) health problems,
    such as appendicitis, tooth problems, etc.? If so, list these:
   1) yes, has had some  2) had none  3) NA/DK

   TYPES:

46. What do you think is going to happen to Camden County a year
    from now:
   A. Along State Rd. 40 from Kingsland to St. Marys:
   B. In St. Marys:
47. What do you think is going to happen to the following over the next few years:

A. The employment situation in Camden County?
B. The schools in Camden County?
C. Gilman Paper Company?
D. Union Carbide Company?
E. Cumberland National Seashore?

48. What changes in Camden County can you identify at present which you feel are related to the development of the Kings Bay Naval Base?

49. What good things do you foresee happening in Camden County as a result of the naval base development?

50. What bad things do you foresee happening in Camden County as a result of the naval base development?

51. What do you think about the present housing situation in Camden County?

52. What church do you go to, and where is it located?

CHURCH: ____________________________
LOCATION: __________________________

53. What community organizations, service or social clubs do you belong to, and where are they located?
APPENDIX II
INSTITUTIONAL SURVEY FORM

PLACE NAME ________________________ DATE ____________

ITEM

GOVERNMENT

County Seat
City Hall
Post Office
  Separate Building
  Contract
Municipal Police
Local Jail
County Sheriff Office
Fire Department
  Volunteer
  Professional
Welfare/Food Stamp Office
County Agency—name and no.
Courts—list types
State Agency—name and no.
Federal Agency—name and no.
Armed Services Offices—Type and no.

EDUCATION

High School
Middle School/Primary
Day Care/Nursery
Vocational

RELIGIOUS ORGANIZATION

Protestant—name and no.
Catholic
Jewish
Other—name and no.
COMMUNITY SERVICE

Library
Local Parks/Playgrounds
Municipal Water
Municipal Sewer
Municipal Garbage Collection
Museum/Gallery
Cemetery
Public Utility Office
  Gas
  Utility Electric
  Telephone
Community Center—describe facilities
Community Tennis Courts
Community Swimming Pool
State Park
Federal Park
United Fund Agency—name and no.
Service/Social Clubs—name and no.
Country Clubs
Social Service Organization

TRANSPORTATION

Bus Service
  Local
  Intercity (within County)
  Long Distance
Railroads—name and no.
  Passenger
  Freight
Airports
  General
  Commercial
Municipal Parking Lots
Taxi/Rental Car Only
Shipping—specify commercial/passenger

HEALTH SERVICES

Hospital
Clinics
  Physical Health
  Mental Health
EMT
Doctors
Dentist
Veterinarian
Vet Clinic
Visiting Health Professionals—name and no.
Nursing home
MASS MEDIA

Daily Newspaper
Weekly Newspaper
Weekly/Bimonthly Magazine
TV Station
Radio
Cable TV

CREDIT STRUCTURE

Bank
Credit/Loan
Savings and Loan

INDUSTRIAL STRUCTURE

Electronics Plant
Construction Firm
Forestry Firm (timber production)
Pulpwood firm—name and no.
Fishing firm—name and no.
Manufacturing Firm
Crafts Production Firm
Processing Firm
Clothing Firm
Metallurgical Plant
Pharmaceutical Firm
Chemical Plant
Tourism
Dirt Hauling
Food Processing Firm

COMMERCIAL DIFFERENTIATION

Flea and Farmers market
General Retail
Groceries
Pharmacy
Bakery
Hardware
Auto Parts/Service/Garage
Auto Dealer, New or Used Cars
Building Supplies
Gas Stations
Department Store
Clothing Store
Large Appliances—sales and service
Rental Equipment
Hotel/Motel
Furniture
Laundromat
Dry Cleaner
Carpet Cleaning
Mobile Home Sales/Service
Welding/Machine/General Repair
Radio/TV Sales and Repair
Nursery
Barber
Beautician
Antiques
Photographic
Printing
Bookstore
Music Store
Office Supply
Florist
Landscaper
Agricultural
Gift Shop
Jewelry
Pecan Candy
Funeral Home
Exterminator
Seafood Market
Sporting Goods
Bait and Tackle
Animal Grooming and Care
Water Conditioner Service
Wrecker Service
Boat Sales and Service
Restaurants
Locally Owned
Franchises
Combined—specify
Bars/Liquor Store

PROFESSIONAL SERVICES

Insurance
Lawyer
Accountant/Bookkeeper
Chamber of Commerce
Real Estate
Business Brokerage
Well Drilling
Painting Contractor
Electrician
Plumber
Maintenance/Janitorial
Justice of the Peace
Job Placement Service
Engineer
Architect
Planners
Combined—specify
Shopping Center

COMMERCIAL RECREATION

Indoor Theatre
Drive-in Theater
Legitimate Theater
Concert Band or Orchestra
Indoor Recreation—bowling, billiards, amusement
Fish Camps
Sports Leagues
Campground
Marina
## APPENDIX III
ENERGY MODEL CALCULATIONS—1940

### ENERGY STORAGES

<table>
<thead>
<tr>
<th>Storage</th>
<th>Description and Calculation</th>
</tr>
</thead>
</table>
| A       | Stored Natural Energy Assets for purposes of the model, this is calculated as 16% depreciation of the original storage of natural energy (k0) and thus equals k1.  
\[(2,133,400 \times 10^9) \times (0.16)\]  
\[= 341,340 \times 10^9\] |
| NA      | Natural System Assets  
Acreage of evergreen, agriculture, wet, barren, and marsh, continental shelf in the county  
x 4,046 m²/acre x the mean kg/m² for each of the above areas (Helmut and Whittaker, 1975) x 4.25 cal/g  
= biomass of evergreen + agriculture + wet, barren, and marsh + continental shelf  
\[= 123,000 \times 10^9 + 16 \times 10^9 + 37,023 \times 10^9\]  
\[+ 68 \times 10^9\]  
\[= 160,108 \times 10^9\] |
| F       | Commercial Fishery Assets  
Estimated as 10% of the net production (k13).  
\[(7 \times 10^9) \times (0.10)\]  
\[= 70 \times 10^9\] |
| P       | Paper Mill Assets  
Estimated as 10% of the net production (k8).  
\[(191 \times 10^9) \times (0.10)\]  
\[= 1,910 \times 10^9\] |
| L       | Paper Mill Assets Outside of the County (248,000 acres in Florida)  
Acres x 4,046 m²/acre x 35 kg/m² (evergreen biomass, from Helmut and Whittaker, 1975)  
x 1,000 kg/g x 4.25 cal/g.  
\[= 248,000 \times 4,046 \times 35 \times 1,000 \times 4.25\]  
\[= 149,200 \times 10^9\] |
Commercial Fishery Assets outside of the County
8,000 kilometers of coastline x 70 kilometers of continental shelf (Thurman 1975) = 560,000 km²
x 1,000 m/km = 560 x 10 m²
m² x .001 kg/m² (Helmut and Whittaker 1975)
x 1,000 g/kg x 4.25 cal/g
= (560 x 10) x .001 x 1,000 x 4.25
= 2.4 x 10⁹

ENERGY FLOWS

Flow Description and Calculation

k₀
Flow of Natural Energy
Energy of the sun in cal/m²/year x total m² (acreage and water) in the county.
= (2,555 x 10³/year) x (829,615,000 m² land
+ 4,856,000 m² water)
= (2,555 x 10³) x (835 x 10⁶)
= 2,133,400 x 10⁹

k₁
Depreciation of the Storage of Natural Energy
Calculated at 16%
(2,133,400 x 10⁹) x (.16)
= 341,340 x 10⁹

k₂
Flow of Natural Energy into the Natural System
(k₀ - k₁)
= (2,133,400 x 10⁹) - (341,340 x 10⁹)
= 1,792,100 x 10⁹

k₃
Productivity of the Natural System
Net Production = mean net production g/m²/yr x m²
x 4.25 cal/g
Net Production of evergreen + agriculture
+ wet, barren, and marsh + continental shelf
in the county
= (4,585,750 x 10⁹) + (10,520 x 10⁹)
+ (7,420,500 x 10⁹) + (7,438 x 10⁹)
= 25,050 x 10⁹

k₄
Feedback of Natural Assets into Natural Production
This is estimated as 1/2 of the net production.
(1/2 x k₃)
= (1/2) x (25,050 x 10⁹)
= 12,025 x 10⁹
Depreciation of the Natural Assets
\[ k5 = k3 - k4 - k6 - k7 + 0.01 \ (\text{NA}) \]
\[ k5 = (24,050 \times 10^9) - (12,025 \times 10^9) - (7 \times 10^9) \]
\[ - (8 \times 10^9) + 0.01 (160,108 \times 10^9) \]
\[ = 13,556 \times 10^9 \]

Flow of Natural Assets to Commercial Fishery
Heads-on shrimp caught for the year 1940.
Estimated as 7 times that of k6 for 1980.
\[ (7) \times (1 \times 10^9) \]
\[ = 7 \times 10^9 \]

Flow of Natural Assets to Paper Mill
These figures are extrapolated from the 1936 figures quoted by Fallows (1971) for initial production of a paper mill in Savannah, Georgia.
Of the total 77,000 cords of wood produced on 250,000 acres owned by the paper mill, 700 cords of wood come from the 2,000 acres in the county.
\[ \text{cords of wood/yr} \times 3.62 \text{ m}^3/\text{cord} \times 1,000,000 \]
\[ \text{cm}^3/\text{m}^3 \times 0.75 \text{ g/cm}^3 \times 4.25 \text{ cal/g} \]
\[ = 700 \times 3.62 \times 1,000,000 \times 0.75 \times 4.25 \]
\[ = 8 \times 10^9 \]

Productivity of the Paper Mill
Total paper produced from flows (k6 + k12) tons of paper/yr \times 1,016 \text{ kg/ton} \times 1,000 \text{ g/kg} \times 4.25 \text{ cal/g}
\[ = 44,000 \times 1,016 \times 1,000 \times 4.25 \]
\[ = 191 \times 10^9 \]

Feedback of Paper Mill Assets into Mill Production
Estimated as 30\% of net production (k8)
\[ (191 \times 10^9) \times (0.30) \]
\[ = 57 \times 10^9 \]

Depreciation of the Paper Mill Assets
Estimated at a rate of 5\%/yr
\[ P \times 0.05 - k9 - k11 \]
\[ = (1,910 \times 10^9) \times (0.05) - 57 - 5 \]
\[ = 34 \times 10^9 \]

Feedback of Mill Assets negatively affecting the flow of k7
Estimated as 5 \times 10^9
Flow of Wood into Paper Production from land outside of the county
Of the total 77,000 cords/year produced on the 250,000 acres owned by the paper mill, 76,300 cords come from the 248,000 acres outside the county.

\[
\text{cords/year} \times 3.62 \text{ m}^3/\text{cord} \times 1,000,000 \text{ cm}^3/\text{m}^3 \times 0.75 \text{ g/cm}^3 \times 4.25 \text{ cal/g} \\
= 76,300 \times 3.62 \times 1,000,000 \times .75 \times 4.25 \\
= 881 \times 10^9
\]

Productivity of the Commercial Fishery
Total heads-off shrimp produced from flows (k7 + k16). Heads-off = 85% of heads-on. Estimated as \(7 \times 10^9\)

Feedback of Commercial Fishery Assets
Estimated as \(2 \times 10^9\)

Depreciation of Commercial Fishery Assets
Estimated at a rate of 5%

\[
F (0.05) - k14 \\
= (70 \times 10^9) (0.05) - 2 \\
= 1.5 \times 10^9
\]

Flow of Shrimp into the Commercial Fishery from Water Resources outside of the county
Estimated as \(2 \times 10^9\)
* CC 1940
N TIME=1940
*
ALBEDO
L A.K=A.J+DT*(R0.JK-R1.JK-R2.JK)
N A=AI
C AI=341340
R R0.KL=2133400
R R1.KL=K1.K*A.K
A K1.K=R1N/AI
C R1N=341340
R R2.KL=K2.K*B.K
A B.K=A.K*NA.K
A BC.K=AI*NAI
A K2.K=R2N/BC.K
C R2N=1792100
*
NATURAL SYSTEM
N NA=NAI
C NAI=160108
R R3.KL=K3.K*B.K
A K3.K=R3N/BC.K
C R3N=24050
R R4.KL=K4.K*B.K
A K4.K=R4N/BC.K
C R4N=12025
R R5.KL=K5.K*NA.K
A K5.K=R5N/NAI
C R5N=13556
A D.K=L.K*P.K*NA.K
A DC.K=LI*PI*NAI
A K6.K=R6N/DC.K
C R6N=8
R R7.KL=K7.K*C.K
A K7.K=R7N/CC.K
A C.K=NA.K*F.K*FS.K-P.K
A CC.K=NAI*FI*FSI.K-PI
C R7N=7
* PAPER MILL
N P=PI
C PI=1910
R R8.KL=K8.K*D.K
A K8.K=R8N/DC.K
C R8N=191
A K9.K=R9N/DC.K
C R9N=57
R R10.KL=K10.K*P.K
A K10.K=R10N/PI
C R10N=34
R R11.KL=K11.K*C.K
A K11.K=R11N/CC.K
C R11N=5
* LAND OUTSIDE
L L.K=L.J+DT*(-R12.JK)
N L=LI
C LI=149200
R R12.KL=K12.K*D.K
A K12.K=R12N/DC.K
C R12N=881
* COMMERCIAL FISH
N F=FI
C FI=70
A K13.K=R13N/CC.K
C R13N=7
A K14.K=R14N/CC.K
C R14N=2
R  R15KL=K15.K*F.K
A  K15.K=R15N/FI
C  R15N=1.5
*  FISH OUTSIDE
L  FS.K=FS.J+DT*(-R16.JK)
N  FS=FSI
C  FSI=2.4
C  R16N=2
PRINT  N,NA,P,F,FS,L,RO
PRINT  R1,R2,R3,R4,R5,R6,R7
PRINT  R8,R9,R10,R11,R12,R13
PRINT  R14,R15,R16
PLOT  A=A/NA=N/P=P/F=F
SPEC  DT=.1/LENGTH=200/PRTPER=5/PLTPER=1
RUN
C  R11N=0
RUN
APPENDIX V
ENERGY MODEL CALCULATIONS—1978

ENERGY STORAGES

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<tr>
<th>Storage</th>
<th>Description and Calculation</th>
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<td>A</td>
<td>See A, 1940 (same)</td>
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<tr>
<td>NA</td>
<td>See NA, 1940 (same)</td>
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<tr>
<td>F</td>
<td>Commercial Fishery Assets</td>
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<tr>
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<td>Estimated as 10% of the net</td>
</tr>
<tr>
<td></td>
<td>production (k13)</td>
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<tr>
<td></td>
<td>[(1.5 \times 10^9) \times (0.10)]</td>
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<tr>
<td></td>
<td>[= 15 \times 10^9]</td>
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<tr>
<td>P</td>
<td>Paper Mill Assets</td>
</tr>
<tr>
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<td>Estimated as 10% of the net</td>
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<tr>
<td></td>
<td>production (k8)</td>
</tr>
<tr>
<td></td>
<td>[(1,727 \times 10^9) \times (0.10)]</td>
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<tr>
<td></td>
<td>[= 17,270 \times 10^9]</td>
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<td>L</td>
<td>See L, 1940 (same)</td>
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<td>FS</td>
<td>See FS, 1940 (same)</td>
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ENERGY FLOWS

<table>
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<th>Description and Calculation</th>
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<tr>
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<td>k4</td>
<td>See k4, 1940</td>
</tr>
<tr>
<td>k5</td>
<td>See k5, 1940</td>
</tr>
</tbody>
</table>
**Flow of Natural Assets to Commercial Fishery**

Heads-on catch of shrimp for 1980—the flow of k₁₆.

\[
(\text{kgww/year} \times 1,000 \text{ gwc/kgww} \times 0.5 \text{ gdw/ww} \times 4.25 \text{ cal/g}) - \text{k₁₆} = (1,500,000 \times 1,000 \times 0.5 \times 4.25) - (2 \times 10^9) = (3 \times 10^9) - (2 \times 10^9) = 1 \times 10^9
\]

**Flow of Natural Assets to Paper Mill**

700,000 cords/year, 6,000 cords come from the 2,000 acres in the county (estimate: 3 cords/acre/year).

\[
\text{cords/yr} \times 3.62 \text{ m}^3/\text{cord} \times 1,000,000 \text{ cm}^3/\text{m}^3 \times 0.75 \text{ g/cm}^3 \times 4.25 \text{ cal/g} = 6,000 \times 3.62 \times 1,000,000 \times 0.75 \times 4.25 = 69 \times 10^9
\]

**Productivity of the Paper Mill**

Total paper produced from flows (k₆ + k₁₂).

\[
400,000 \text{ tons of paper/yr} \times 1,016 \text{ kg/ton} \times 1,000 \text{ g/kg} \times 4.25 \text{ cal/g} = 1,727 \times 10^9
\]

**Feedback of Paper Mill Assets into Mill Production**

Estimated as 30% of net production (k₈)

\[
(1,727 \times 10^9) \times (0.30) = 518 \times 10^9
\]

**Depreciation of the Paper Mill Assets**

Estimated at a rate of 5%/year

\[
P(0.05) - \text{k₉ - k₁₁} = (1,727 \times 10^9) \times (0.05) - 517 - 40 = 306
\]

**Feedback of Mill Assets negatively affecting the flow of k₇**

Estimated as 40 \times 10^9

**Flow of Wood into Paper Production from land outside of the county**

Of 700,000 total cords produced on 250,000 acres, 694,400 cords come from the 248,000 acres outside the county.

\[
\text{cords/year} \times 3.62 \text{ m}^3/\text{cord} \times 1,000,000 \text{ cm}^3/\text{m}^3 \times 0.75 \text{ g/cm}^3 \times 4.25 \text{ cal/g} = 694,400 \times 3.62 \times 1,000,000 \times 0.75 \times 4.25 = 8,008 \times 10^9
\]

**Productivity of the Commercial Fishery**

Total heads-off shrimp/year produced from flows k₇ + k₁₆

Estimated as 1.5 \times 10^9
Feedback of Commercial Fishery Assets
Estimated as \(0.45 \times 10^9\)

Depreciation of Commercial Fishery Assets
Estimated at a rate of 5%\[F (.05) - k_{14} (15 \times 10^9) \times (.05) - .45 = .3 \times 10^9\]

Flow of Shrimp into the Commercial Fishery
from water resources outside the county
Estimated as \(2 \times 10^9\)
* CC1978
N TIME=1978
* ALBEDO
L A.K=A.J+DT*(R0.JK-R1.JK-R2.JK)
N A=AI
C AI=341340
R R0.KL=2133400
R R1.KL=K1.K*A.K
A K1.K+R1N/AI
C R1N=341340
R R2.KL=K2.K*B.K
A B.K=A.K*NA.K
A BC.K=AI*NAI
A K2.K=R2N/BC.K
C R2N=1792100
* NATURAL SYSTEM
N NA=NAI
C NAI=160108
R R3.KL=K3.K*B.K
A K3.K=R3N/BC.K

353
C R3N=24050
R R4.KL=K4.K*B.K
A K4.K=R4N/BC.K
C R4N=12025
R R5.KL=K5.K*NA.K
A K5.K=R5N/NAI
C R5N=13556
A D.K=L.K*P.K*NA.K
A DC.K=LI*PI*NAI
A K6.K=R6N/DC.K
C R6N=69
R R7.KL=K7.K*C.K
A K7.K=R7N/CC.K
A C.K=NA.K*F.K*FS.K-P.K
A CC.K=NAI*FI*FSI.K-PI
C R7N=1
* PAPER MILL
N P=PI
C PI=17270
R R8.KL=K8.K*D.K
A K8.K=R8N/DC.K
C R8N=1727
A K9.K=R9N/DC.K
C R9N=518
R R10.KL=K10.K*P.K
A K10.K=R10N/PI
C R10N=306
R R11.KL=K11.K*C.K
A K11.K=R11N/CC.K
C R11N=0
* LAND OUTSIDE
L L.K=L.J+DT*(-R12.JK)
N L=LI
C LI=149200
R R12.KL=K12.K*D.K
A K12.K=R12N/DC.K
C R12N=8008
N F=FI
C FI=15
A K13.K=R13N/CC.K
C R13N=1.5
A K14.K=R14N/CC.K
C R14N=.45
R R15.KL=K15.K*F.K
A K15.K=R15N/FI
C R15N=.3
* FISH OUTSIDE
L FS.K=FS.J+DT*(-R16.JK)
N FS=FSI
C FSI=2.4
C R16N=2
PRINT A,NA,P,F,FS,L,R0
PRINT R1,R2,R3,R4,R5,R6,R7
PRINT R8,R9,R10,R11,R12,R13
PRINT R14,R15,R16
PLOT A=A/NA=N/P=P/F=F
SPEC DT=.1/LENGTH=200/PRTPER=5/PLTPER=1
RUN
REFERENCES CITED

Acheson, James M.


Alexander, John F., Jr., Marjorie J. Alexander, and Neil G. Sipe

Alexander, Paul


Allen, James B.

Andersen, Raoul, and Cato Wadel, eds.

Arensberg, Conrad

Arensburg, Conrad M., and Solon T. Kimball
1972 Culture and Community. Gloucester, Massachusetts: Peter Smith.

Baks, Chris, and Els Postel-Coster
Bates, V. Edward

Befu, Harumi

Bennett, John W.

Blake, B. A.

Bolton, Herbert E., and Mary Ross.

Bowles, Roy T.

Breese, G., R. Klingmeir, Jr., H. Cahill, Jr., J. Whelan, A. Church, Jr., and D. Whiteman, Eds.

Camden County Tribune

CAPDC
1978 Community Impacts Resulting from the Kings Bay Buildup. Coastal Area Planning and Development Commission (CAPDC). Brunswick, Georgia.

Carley, D. H., and C. M. Frisbie

Christensen, James B.
Christensen, Kathleen

Church, Archer E.

Copeland, B. J., and Frances Dickens

Copeland, B. J., and H. T. Odum

Copeland, B. J., H. T. Odum, and Frank N. Moseley

Corrigan, Richard

Cottrell, Leonard S.

Council on Environmental Quality

Cox, Bruce

Cromer, Karen, and Dennis Holt
Davis, Allison, and Burleigh Gardner

Davis, Howard H.
1971 As We See and Hear. Southeast Georgian. February 11. p. 2.
Kingsland, Georgia.

Department of Commerce
1923-1979 Camden County Landings and Fishermen on Boats. Fishery
Administration. Compiled through the District Office in Brunswick,
Georgia; the Statistics Division in St. Petersburg, Florida; and the
Statistics Division in Washington, D.C. (Cited 1923, 1940, 1945,

Department of Commerce
1971 General Population Characteristics: Georgia. Bureau of the

Department of the Navy
1977a Draft Environmental Impact Statement for Preferred Alternative
Location for a Fleet Ballistic Missile (FBM) Submarine Support

1977b Final Environmental Impact Statement for Preferred Alternative
Location for a Fleet Ballistic Missile Submarine Support Base, Kings

1980a Draft Supplement to the Environmental Impact Statement for
Preferred Alternative Location for a Fleet Ballistic Missile Sub-
marine Support Base at Kings Bay, Georgia. Washington, D.C.: Depart-
mment of the Navy.

1980b Final Supplement to the Environmental Impact Statement for
Preferred Alternative Location for a Fleet Ballistic Missile Sub-
marine Support Base at Kings Bay, Georgia. Washington, D.C.: De-
partment of the Navy.

1980c Appendices to the Draft Supplement to the Environmental Impact
Statement for Preferred Alternative Location for a Fleet Ballistic
Missile Submarine Support Base at Kings Bay, Georgia. Washington,
D.C.: Department of the Navy.

Department of the Navy, Department of the Army
1980 Record of Public Hearing. Draft Supplement to the Environmental
Impact Statement for Preferred Alternative Location for a Fleet
Ballistic Missile Submarine Support Base at Kings Bay, Georgia.
Washington, D.C.: Department of the Navy, Department of the Army.
DeSylva, Donald P.

Dewey, Kathryn G.

Dixon, Mim

Dollard, John
1937 Caste and Class in a Southern Town. New Haven: Yale University Press.

Doughty, Paul L.


Earll, R. Edward


Ebbert, Jean

Epple, George M.
Fallows, James M.

Finsterbusch, Kurt

Finsterbusch, Kurt, and C. P. Wolf

Ford, Thomas R., ed.

Foster, George M.


Gainesville Sun

Gans, Herbert

Georgia Department of Natural Resources
1975 Activities in Georgia's Coastal Waters: Past Trends and Future Prospects. Atlanta: Georgia Department of Natural Resources, Resource Planning Section.

Gibbs, Tyson, Kathleen Cargill, L. S. Lieberman, and Elizabeth Reitz

Gilman Paper Company

Gilmore, John S.

Gilmore, John S., and Mary K. Duff.

Gold, Gerald L.
Gonzalez, Nancy

Goodlad, C. Alexander

Gray, I. E.

Hall, A. D., and R. E. Fagan

Hardesty, Donald L.

Hardin, G.

Havighurst, Robert J., and H. Gerthon Morgan

Helmut, Leith, and Robert H. Whittaker

Hewes, Gordon W.

Hickling, C. F.

Hill, Carole E.

Hughes, Everett C.

Johnson, A. Sydney, Hilburn O. Hillestad, Sheryl Fanning Stanholtzer, and G. Frederick Stanholtzer
Joyce, Edwin A.  

Joyce, Edwin A., and Bonnie Eldred  

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Lynd, Robert S., and Helen Lynd

Mangone, Gerard J.

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McDonald, Tim

Mendenhall, William, Lyman Ott, and Richard F. Larson

Merrefield, David

Middleton, DeWight R.

Miller, Marc L., and John Van Maanen

Moore, S. R. W.

Munch, Peter A.  

Nellis, Lee  

Newsweek  

Nietschmann, Bernard  

Odum, Howard T.  

Odum, H. T., B. J. Copeland, and E. A. McMahan, eds.  

Odum, Howard T., and Elisabeth C. Odum  

Olsen, Stephen M.  

Orlove, Benjamin S.  

Overbey, Mary Margaret  
1979 Florida Sea Grant Preliminary Report: The Impact of Naval Base Development on a Coastal Community: Kings Bay, Georgia. Submitted to Florida Sea Grant, University of Florida, Gainesville, Florida.

Palmer, Bobby A.  
1974 Studies on the Blue Crab (Callinectes sapidus) in Georgia. Coastal Fisheries Office Contribution 29. Game and Fish Division, Georgia Department of Natural Resources.

Phillips, Jenny  
Pierce, David  

Pi-Sunyer, Oriol  

Pitt, David C.  

Poggie, John J.  

Pollnac, Richard B., Carl Gersuny, and John J. Poggie, Jr.  

Reddick, Margueritte, Eloise Bailey, and Virginia Proctor  

Redfield, Robert  

Reintjes, John W., and Anthony L. Pacheco  

Respess, Susan P.  


Rice, T. R., and J. P. Baptist  

Robbins, Lynn Arnold  

Sabella, James Carmen  

Scheider, Keith  


Schilling, R. S. F.  

Schuck, Peter, and Hanson Wellford  

Shields, Mark A.  

Simon, William, and John H. Gagnon  
1967 The Decline and Fall of the Small Town. Trans-action 4: 42-51.

Singh, Raghu N.  

Sipe, Neil Gavin  

Smith, M. Estelli, ed.  

Smith, Roland F.  
Sofranko, Andrew J., Frederick C. Fliegel, and Navin C. Sharma

Southeast Georgian


Stafford, Walter W., and Joyce Ladner

Stiles, Geoffrey

Thomas, David Hurst

Thurman, Harold V.
1975 Introductory Oceanography. Columbus, Ohio: Charles E. Merrill.

Union Carbide

Vance, Rupert B.

Vlachos, Evan

Warner, W. Lloyd

Warren, Charles E.
1971 Biology and Water Pollution Control. Philadelphia: W. B. Saunders.

West, James
West, Stanley A.

Whelan, Lt. James E.

Whyte, William C.

Wilber, Charles G.

Wilkes, Frank G., and B. J. Copeland

Williams, Austin B.

Wolfe, Douglas A.

Woodburn, Kenneth D., Bonnie Eldred, Eugenie Clark, Robert F. Hutton, and Robert M. Ingle

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Mary Margaret Overbey was born on June 5, 1950, in Louisville, Kentucky, and grew up in St. Petersburg, Florida. The author received the B.A. degree in anthropology at the University of South Florida. She began graduate studies at the Universidad de las Americas in Cholula, Mexico, and completed the M.A. degree in anthropology at Florida State University. After graduation, the author worked for the Division of Archives, History, and Records Management, Department of State, in Tallahassee.

The author entered the graduate program in anthropology at the University of Wisconsin-Madison to prepare for ethnographic field research in Latin America. During this time, she became interested in anthropological approaches to contemporary problems, particularly in the United States.

The author heard of "applied anthropologists" at the University of Florida doing fascinating kinds of research in rural health care and the anthropology of bureaucracies, for example. Her first contact with one such anthropologist, Dr. Carol Taylor in the College of Nursing at the J. Hillis Miller Health Center, convinced her that this was the kind of anthropology she wanted to practice: a practical, problem-solving anthropology concerned with contemporary issues.

The author entered the Ph.D. program in anthropology at the University of Florida in January of 1977. She worked as an editorial
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Paul L. Doughty, Chairperson
Professor of Anthropology

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John F. Alexander, Jr.
Professor of Urban and Regional Planning

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Elizabeth M. Eddy
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Otto von Mering
Professor of Anthropology

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This dissertation was submitted to the Graduate Faculty of the Department of Anthropology in the College of Liberal Arts and Sciences and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Dean for Graduate Studies and Research