MAPPING THE GEOSPATIAL COMMUNITY

By

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by

Matias S. Campins

To my best friend and partner Heather Campins.

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MAPPING THE GEOSPATIAL COMMUNITY

By

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Chair: Grant Ian Thrall
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The deployment of Geographic Information Systems (GIS) technology has become virtually spatially ubiquitous within the US during the past decade. However, the GIS production industry is highly concentrated within a few submarkets of the nation. This has national and even global implications as GIS is estimated today to be a multibillion-dollar industry to the US, and even more when global figures are considered.

Where is GIS? Where are the submarkets (geographical regions) of GIS production within the US? What are the major social-economic correlates between those submarkets with high concentrations of GIS firms? What are the characteristics of GIS firms? Can this information be used to guide other submarkets, including submarkets in other nations, to economic opportunities by focusing on the GIS industry?

One of the leading professional publications in the GIS industry is *GeoSpatial Solutions*. That publication has made available to Dr. Grant Thrall its entire 30,000 record subscriber database. This database is used as one source of information to answer the

questions posed above. Every December, *GeoSpatial Solutions* publishes a list of almost every GIS business firm in the US. These databases are used to document and corroborate concentrations of GIS business within a few submarkets. Lastly, social-economic data are drawn from the 2000 census and private data vendors, as well as lifestyle segmentation profiles for those *GeoSpatial Solutions* readers whose publications are delivered to their home addresses.

Included among the beneficiaries of this study are Advanstar Inc., owner of *GeoSpatial Solutions*; the GIS industry, as the results of this work are co-authored with Dr. Grant Thrall and published in *GeoSpatial Solutions* and other GIS publications; and, economic development officers at the local, national, and international scale. The National Chamber of Commerce of Sweden, working with the Swedish Embassy to the US, contacted Dr. Thrall, looking for answers to assist with locating its subscribers and why they locate in specific areas. With this information, it can better understand the characteristics of the market and any correlation that may exist among the European and US markets. Some of the questions which are addressed in this analysis include: where are the submarkets (geographical regions) of GIS production within the US? What are the major social-economic correlates between those submarkets with high concentrations of GIS firms? What are the characteristics of GIS firms? Can this information be used to guide other submarkets, including submarkets in other nations, to economic opportunities by focusing on the GIS industry? The Chamber, along with the editorial staff of *GeoSpatial Solutions,* serve as unofficial outside readers of this thesis.

CHAPTER 1
INTRODUCTION

This thesis incorporates Geographic Information Systems (GIS) principles and business geography Market Analysis practices. This analysis performed on one of the leading professional publications in the GIS industry. The GIS industry is estimated to exceed one billion dollars annual revenue within the US and even more internationally.

> Cambridge, MA, November 12, 2002 - Worldwide GIS software revenue reached $1.1 billion in 2001, an outstanding growth of 14.3% over the previous year, according to a just-published market study by Daratech, Inc., a Cambridge, MA-based market research and technology assessment firm. The largest market for GIS software was the utilities industry, which accounted for 21% of all software revenue, followed closely by state and local governments, the telecommunications industry, and organizations involved in earth resources management.
>
> Moreover, GIS software sales drove more than $7.7 billion in total user spending on software and related hardware and services. Indeed, services contributed a whopping $5.4 billion, including $5 billion from non-core-business vendors-companies that do not develop GIS applications software products. (Daratech, 2002)

Geographic Information Systems Industry

Clearly, this industry has a national and global impact. Beneficiaries of this study include the magazine industry, such as *GeoSpatial Solutions*, and economic development offices at the local, national, and international scales, such as the National Chamber of Commerce of Sweden. This thesis incorporates the advances of business geography and GIS to create a study of the *GeoSpatial Solutions* market. Two industries merged using the technology of Geographic Information Systems (GIS) and the ideas of business geography; “business geography integrates geographic analysis, reasoning and technology for the improvement of the business judgmental decision. Without the

demonstrated ability to improve the business decision, there is no business geography. This differentiates business geography from the traditional descriptive of explanatory objective of economic and urban geography" (Thrall, 2003).

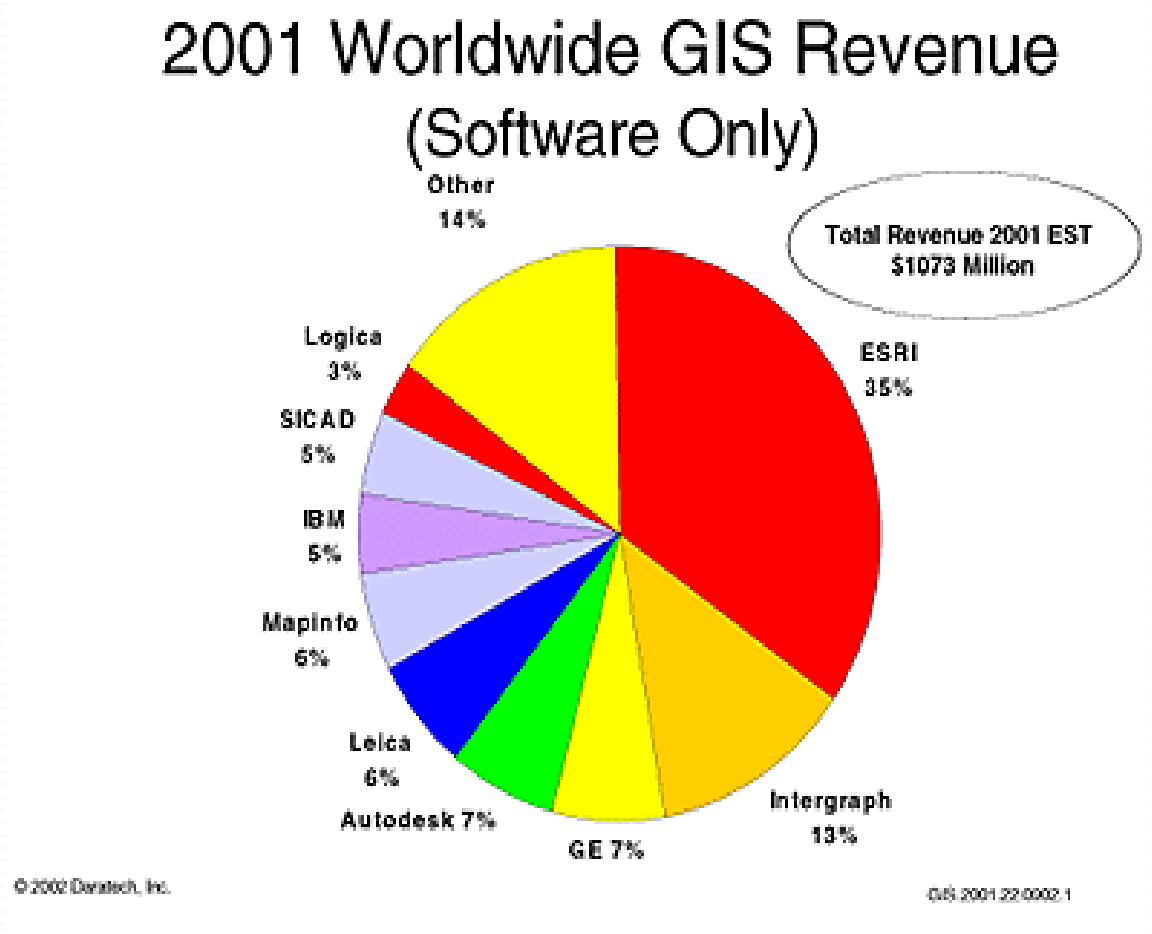


Figure 1. 2001 Worldwide GIS Revenue (Software Only). The figure was compiled in 2002 by Daratech, Inc.

The GIS industry's net worth is estimated today to be a multibillion-dollar industry to the United States, and more when global figures are considered (Figure 1).

The Magazine Industry

The magazine industry has approximate revenue of more than $22 billion (cf: newspapers) (Compaine, 1998). This graph represents where the revenues come for the magazine industry (Figure 2).

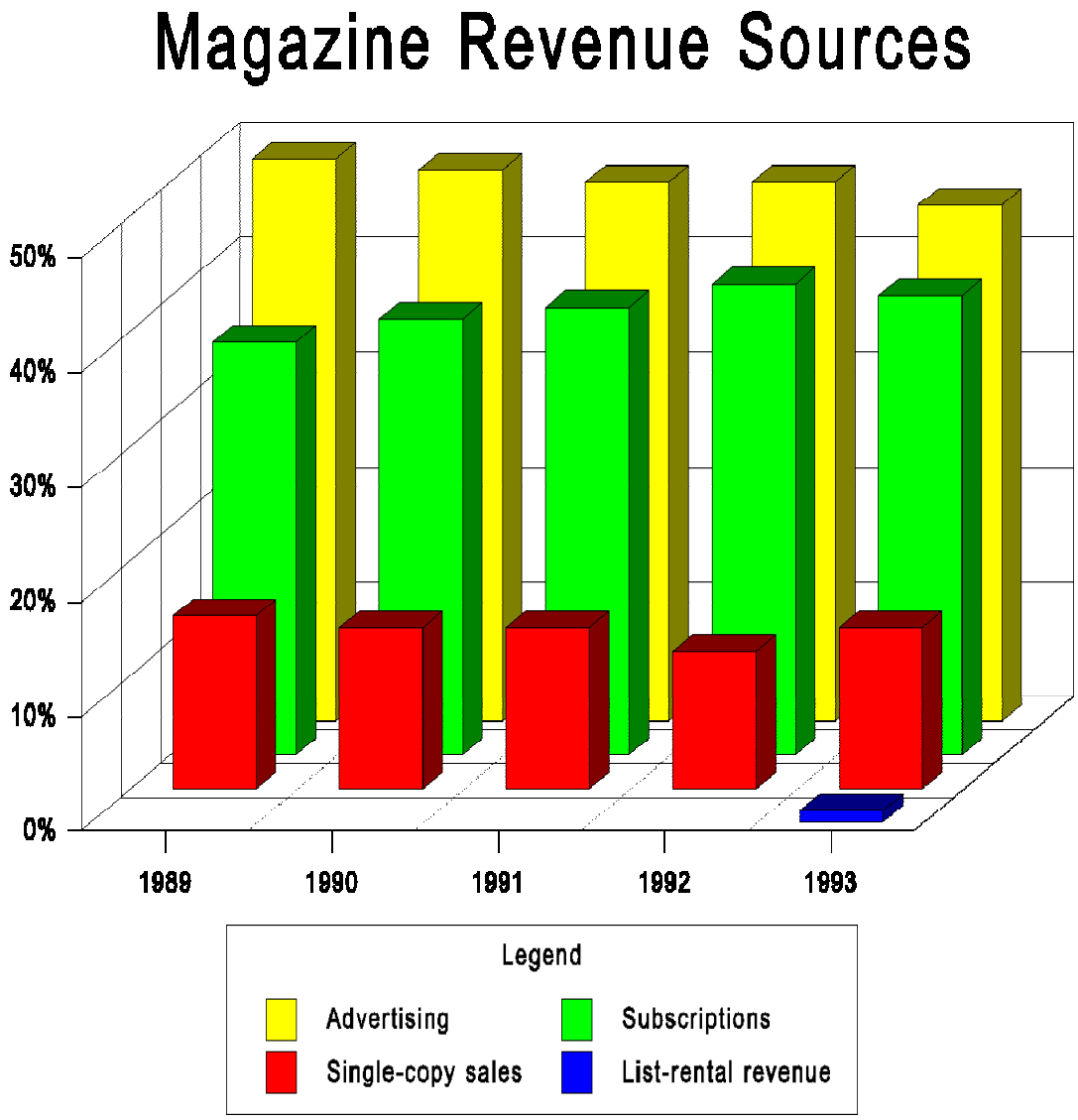


Figure 2. Magazine Revenue Sources. This figure was assembled in 1998 by Compaine.

Business Geography

Business geography is the study and research of a geographic market for various industries, including the retail industry, the hotel industry, the real estate industry, the publishing industry, the development industry, and the government. The Market Analyst or Business Geographer relies on data availability, timeliness, accuracy, and choice of procedures. Business Geographers analyze markets to determine where clients locate and the characteristics of those clients in the market or new market area. Market analysis can

be used for both small and larger market areas. business geography has steadily evolved from the eras of Johann Heinrich Von Thunen and William Applebaum, to the present era of Business Geographer Dr. Grant Thrall. The theories and ideals that make up the study of business geography are constantly changing. One process that was introduced to the field in 1993 was “a four-stage compartmentalization of GIS activity” (Thrall and Elshaw-Thrall 1993). The original four-stage process is as follows:

Stage One: Description

Stage Two: Explanation

Stage Three: Prediction

Stage Four: Judgment

A fifth stage was implicitly added to the earlier stages of evolution (Thrall and Ruiz 1994; Thrall, Bates, and Ruiz 1994):

Stage Five: Implementation and Management

Stage Six: likely to be holistic application of geographic reasoning and technology throughout the enterprise (personal correspondence with Dr. Grant Thrall, 2004)

The evolution of these six stages can be represented chronologically, as shown for the business geography field in Figure 3. The graph represents the evolution of the GIS stages conceding the longevity of the theories and ideals of business geography. Geography theories and ideals have been around since the 1900s, and their stages and principles will continue to evolve well into the future.

An issue of all stage theories is that they do not address "what next" after the last referenced stage. A stage seven added to the time line for business geographic market

analysis would likely, according to Thrall, be an adoption of his stage five and 6 of his general stages of GIS reasoning.

Figure 3. Timeline for business geographic market analysis of retail location decisions after 1996 and 1997 by Thrall and del Valle.

Market analysis is not new, however the evolution of this field has changed with the induction of new technologies (Figure 4). Changes in technology, like the automobile, which changed the shape of cities, and the evolution of the business industry, create a need to understand and analyze traffic flow, social characteristics, social behavior, and people's lifestyle preferences. Also, the advances of computers and the introduction of GIS (Geographic Information Systems) redirected the study and analysis of the market to a more complete and profound understanding of consumers and neighborhood characteristics, which ultimately improves the analysis and data for business geography.

For the analysis of the magazine industry's market, the Lifestyle Segmentation Profile (LSP) is used because the magazine industry also classifies their subscribers by LSP; further, programs like CACI Coder/Plus that are commonly used to geocode the data assigns a specific Lifestyle Segmentation Profile (LSP) to each address.

Being able to classify subscribers in this way can improve understanding of which their customer is, in terms of salary, education level, and occupation, which improves their judgment in decision making for marketing, distribution, and development. Further, these LSPs can be used to evaluate a single market and the LSP of two or more markets (Figure 5). The table listed below outlines the indices used for classifying people into nine categories based on similar characteristics.

TIMELINE OF LOCATION-BASED MARKET ANALYSIS

Stage	Description
1. Pedestrian and sign posting era	The city center offered the best location for marketing high-order retail goods. Other sites may have been chosen, but on a trial-error basis. Some parallels to this approach exist today: for example, some national retail chains consider only a location near the regional mall adjacent to the freeway exit (Thrall et al. 1996)
2. Mapping and cartography	The cumulative body of knowledge about locational analysis goes back at least to the 1920s and the use of gravity models back to the 1850s. Early applied business geography originates with contract work by retail chains to determine the relative value of a site, compared with the relative advantages of other sites. Most important in the development of this stage was the work of Applebaum. The methodologies used in the era before contemporary geographic technologies were mainly subjective in nature (Goldstucker et al. 1978).
3. Sales potential predictive models	Began in the mid-1960s and contributed a number of methodological advancements, particularly in using and manipulating statistical data to arrive at sales potentials

Figure 4. Timeline of location-based market analysis by Thrall (2002).

Stage	Description
	for a total complex of stores in a shopping center (Craig et al. 1984). Most important in the development of this stage of marketing geography were the contributions of Huff (1959, 1963) to the advancement of gravity and spatial interaction models. For discussion, see Haynes and Fotheringham (1984)
4. The rise of the holistic view	Began around 1966 and saw the development of more sophisticated models of retail potential that considered the influence of store size, distance, image factors, merchandise quality, and services of all competitors within the same trade area. During this stage, academic research largely had the objective of measuring retail image and the dimension that underline these perceptions; seldom were these considerations deal with in the professional and academic locational analysis literature prior to the 1960s (Goldstucker et al. 1978). This stage differs from the third stage by the inclusion of nongeographic factors as having equal or even greater importance than location.
5. GIS as an exotic technology	The 1970s and 1980s were the beginning of the use of geographic information systems in retail location analysis. However, the software in this era was very complex, often having been adopted from natural resource applications, or written from scratch by programmers at the retail firm. Data were either very expensive. GIS had a deserved reputation in this era of being an exotic technology that was very expensive and difficult to use. The GIS of this era was dependent on mainframe computers or large workstations.

Figure 4. Continued

Stage	Description
6. GIS as common desktop computer technology, integration of geographic analysis into routine strategic management	Noted for significant advances in desktop computer hardware, including CD-ROMs for the distribution of data: the widespread use of Microsoft Windows operating system that allowed for the standardization of the software user interface: declining computer software programming cost; and the emergence of a business geography technology industry offering a wide array of low-cost data and specialized, highly productive software applications. The future of this stage will include the integration of GIS and management practices, a greater sophistication of the modeling behind the analysis, automation, improved qualitative analysis, and real time information delivered via the Internet.

Figure 4. Continued

ACORN lifestyle segmentation indices

ACORN Category	Description
1. Affluent families	1A Top one percent 1B Wealth seaboard suburbs 1C Upper income empty nesters 1D Successful suburbanites 1E Prosperous baby boomers 1F Semirural Lifestyle
2. Upscale households	2A Urban professional couples 2B Baby boomers with children 2C Thriving immigrants 2D Pacific Heights 2E Older settled married couples
3. Up & coming singles	3A High rise renters 3B Enterprising young singles
4. Retirement styles	4A Retirement communities 4B Active senior singles 4C Prosperous older couples 4D Wealthiest seniors 4E Rural resort dwellers 4F Senior sun seekers

Figure 5. ACORN lifestyle segmentation indices by CACI/Coder Plus.

ACORN Category	Description
5. Young mobile adults	5A Twenty something 5B College campuses 5C Military proximity
6. City dwellers	6A East Cost immigrants 6B Working class families 6C Newly formed households 6D Southwestern families 6E West Cost immigrants 6F Low income young and old
7. Factory and farm communities	7A Middle America 7B Young frequent movers 7C Rural industrial workers 7D Prairie farmers 7E Small town working families 7F Rustbelt neighborhoods 7G Heartland communities
8. Downtown residents	8A Young immigrant families 8B Social security dependents 8C Distressed neighborhoods 8D Hard times 8E Urban working families
9 Nonresidential neighborhoods	9A Business district neighborhoods 9B Institutional populations 9C Unpopulated areas

Figure 5. Continued

This LSP and market analysis improves the judgment (Stage Four) of the company for which the market analysis is done by giving the company a more complete understanding of their market; this also gives the company more insight for better target marketing and creating a more proficient target strategy to increase their audience. Likewise, this enables them to identify specific target markets or increase the subscribers of less saturated markets. This analysis also helps to identify where the strongest and weakest markets are located and what the LSPs are for the specific markets.

This analysis provides companies with a composite of the likes and wants of their markets. This form of analysis, which most companies in the industry do, represents only

one of the four types of consumers' information (Figure 6). However, to get a better understanding of their markets the use of Lifestyle Segmentation Profiles (LSPs) can increase the assessment of each individual (consumer) and, at the same time, better characterize markets and consumers of the publishing company. Of course psycho demographics are important, but Lifestyle Segmentation Profiles (demographics, psychographics, purchase behaviors, and media preferences) with the incorporation of business geography and GIS, shows a more complete analysis and representation of the market characteristics, their subscribers' spatial location, and consumption characteristics. This can be understood also as the cognitive measures that the marketing industry use adding the geographical analysis.

> Consumer researchers who desire to know about their market more than just demographic characteristics may attempt to collect cognitive information; that is, information about consumers' knowledge, attitudes, motivations, and perceptions. Merely observing consumers cannot fully explain why they behave as they do, and questioning often does not provide reliable answers because of consumers' inability or reluctance to reveal true feelings to an interviewer. Thus, researchers attempt to explore intervening variables potentially useful in explaining consumer behavior by utilizing other techniques. (Loudon, Della Bitta, 1979)

This analysis explains and demonstrates the necessity of the publishing companies to incorporate the new technology and ideas of GIS and business geography. Applying the four types of consumers' information from the following Figure 1-6 to the publishing industry helps determine valuable information about their subscribers' demographics (age, income, occupation, location), psychographics (what they think), media preferences (print or broadcast), and purchased behavior (how they spend their money). Using this information, the magazine could decide what kind of advertisements are best suited for inclusion in the magazine, type of advertising to market their magazine, what cost to charge for the magazine, and where to distribute the magazine. These types of decisions

are crucial for the growth and success of any organization. And, any organization can use these business geography ideals to make Better Business Decisions (BBDs).

Chapter 2 presents a literature review of the industry involved in this thesis. Relevant articles have been chosen according to their importance to the GIS, magazine, and business geography industries.

Chapter 3 details how the data acquisition process and steps applied to the data set in order to analyze it. *GeoSpatial Solutions* made this data set available for these analyses.

Chapter 4, using data provided by *GeoSpatial Solutions*, describes where the Geographic Information Systems Market, composed of companies using GIS, is located and who uses GIS in the US. This chapter is broken into three main areas. The analysis then proceeds to explain why the industry is located where it is. First, the geographic regions in the United States is analyzed to identify the primary, secondary, and tertiary submarket regions of *GeoSpatial Solutions'* subscribers in each individual submarket. Second, the location of the GIS producers and their submarkets in the US is identified. And, third, this chapter identifies geographic locations of GIS firms and their submarkets in the US.

Chapter 5 identifies the social-economic influences of submarkets with a high concentration of GIS users for the different markets of the US. This chapter is divided into four sub areas. First, the analysis shows geographic areas with high concentration regions of GIS. Second, the analysis shows the influences of high education to attract the GIS market to the region. Third, the analysis shows the influences of the submarkets to

attract firms to the region. Fourth, this analysis shows the influences of the area for GIS producers to locate in a specific region.

Chapter 7 addresses the relevant questions for use in a global perspective for international market analysis. This analysis assists international markets to increase economic opportunities by focusing on the GIS industry and its characteristics.

Chapter 8 concludes this analysis by explaining where and why GIS locates in particular geographic markets.

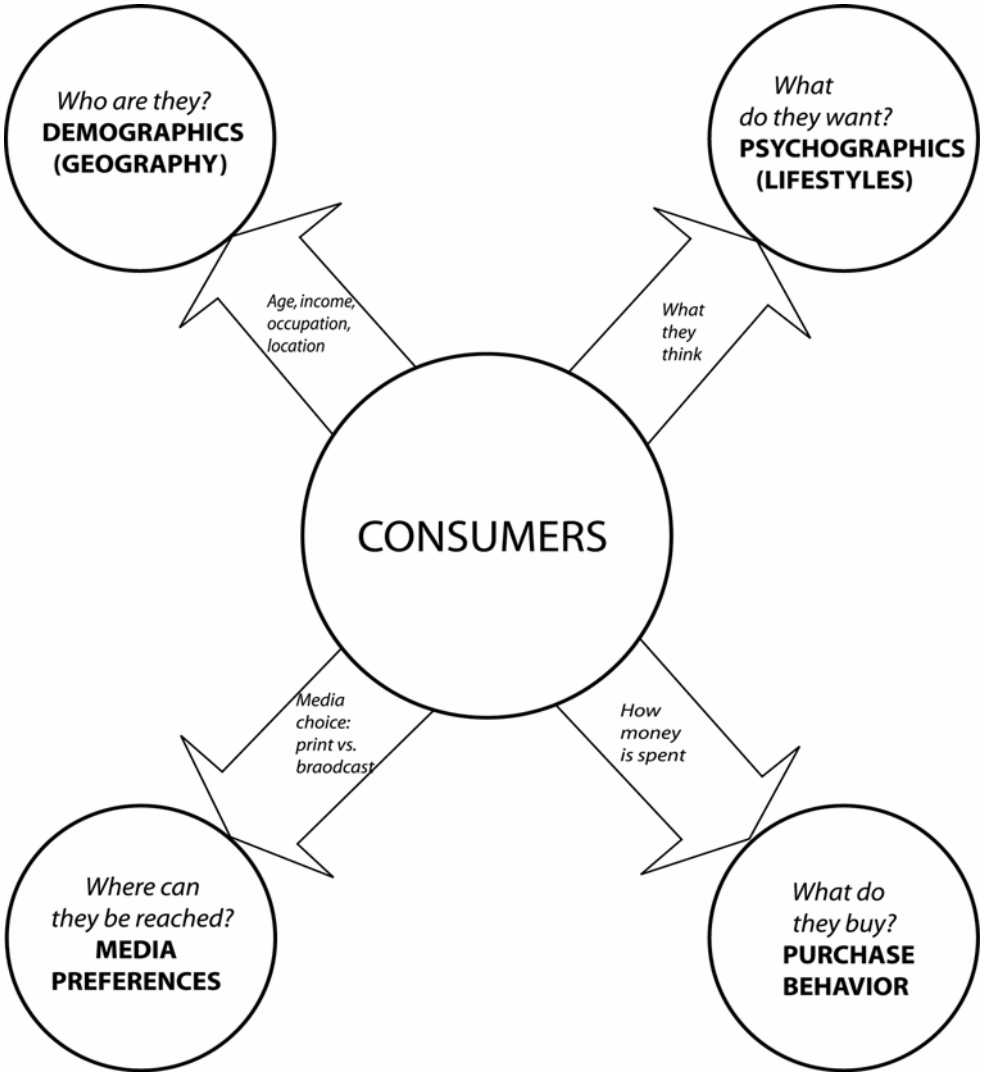


Figure 6. The four types of consumer information. This figure presented in *The Insider's Guide to Demographic Know-How* in 1990.

CHAPTER 2
LITERATURE REVIEW

Business geography literature dates to the early part of the last century however for the purpose of this analysis the focal point of this thesis is on the "New business geography, according to Thrall (2002) is "…the assembly of information on trade areas, demand, and competitive supply for the purpose of improving the judgmental decision."

The goal of a business geographer is to create analysis for a client that enables more informed business decisions to be made. Thrall (2002) has presented the stages that GIS analysts and business geographers in particular, go through in their reasoning. These stages are:

1. Description
2. Explanation
3. Prediction
4. Judgment
5. Management and Implementation

The most important stage to the business geographer is judgment. Judgment is necessary in the final analysis to justify the business geographic analysis. The geographic analysis is expedited using geographic technology, including data and GIS software. This GIS software has great applications of the business geography field. Bill Pinkovitz, N.R. Sumathi and Bill Ryan noted the importance of the data, demography, lifestyle, etc for the Business Geographer. Also, the GIS technology has opened a field in which the data can be represented by mapping demographics. Business geographers use GIS technology to create comprehensive pictures of the subscribers' markets. Piccilli (1999) explains the advantages of mapping demographics and the further analysis possible with the current

technology. The chart in Figure 7 shows six unique characteristics of the advances of technology on the business geography and GIS Analysis field. These methods help the companies to utilize data sets and consumer characteristics to make better decisions.

Media buys:
Once the precise location of your customer base is known, you can make cost-effective media buys that get the right message to the right target. For example, by using the knowledge gained from mapping their customer base, a marketer who wants to place inserts in a local newspaper can target the neighborhoods with the highest level of customers.
Competitive analysis:
Plotting the location of the competition (direct and indirect) on a map is much easier to understand than a list of locations on a report. You can adjust your marketing strategy to fit the number of competitors in the immediate geographic area.
Drive-time analysis:
Mapping your customer drive times is useful for analyzing cannibalization issues, new store placement and competition. By plotting the drive-time area on a map, you clearly see any overlap among various business locations and competitive sites. Barriers such as military bases, airports, parks or college campuses all influence your customer's drive time, but those barriers are not apparent on reports.
Market-entry planning:
Using demographic mapping for market-entry planning clearly identifies sales potential in a region. For market entry, be sure to look at retail sales potential, lifestyle segments, propensity to use or purchase products and services, population, income, age, number of businesses and competition. Using a thematic map, your marketing strategy can be tailored to fit the new market's unique characteristics.
Budgeting:
For comparisons, demographic mapping is invaluable. Analyzing maps for each geographic area enables marketers to determine where to allocate their budgets. Areas with high growth potential or high sales potential are quickly spotted and marketing strategies can be adjusted accordingly.
Lifestyle segmentation:
Used in conjunction with demographic mapping, segmentation is a great tool for identifying quality prospects. Lifestyle segmentation systems use demographic and aggregated consumer demand data to classify every household in the United States into a unique market segment. Each segment consists of households that share similar interests, purchasing patterns, financial behavior and demand for specific products and services.

Figure 7. The advantages of mapping demographics and the further analysis possible by Piccilli 1999.

However, one of the principal problems that the GIS industry encounters is distinguishing itself from other industries. GIS is part of many applications, users, and disciplines. And the GIS industry is comprised of hardware, software, and data (users and

creators). Purvi Rajani (2002) expresses the confusion of this field to identify itself by showing the questions that can separate the industry "Which products and companies should consider GIS and, perhaps more importantly which one shouldn't? Is it fair to compare MapInfo Corp., Troy, N.Y., with Genasys II Inc., Fort Collins? Are these companies really in the same industry?" This is a continuous dilemma that the GIS industry must consider and analyze itself. Valerie L. Hartung (1997) analyze the GIS industry, although the fast growing characteristics of this industry make it difficult to research. Hartung attempts to evaluate the role of the GIS industry and she describes the nature of the industry as a pyramid of functionality, which each layer has to support the previous one.

THE GOAL (Top of the pyramid)

- Is the goal clearly defined, with measurable objectives and time frame?
- Is the goal, as defined, truly of benefit to the organization?
- Is the budget available to accomplish the goal?

USER

- Do the users have enough time available to implement the new system?
- Do the users have adequate training?
- Are the users motivated to make the system work?

DATA

- Is all of the data that is needed available?
- Is the data free from errors?
- Does the data require conversion from another format or medium?

APPLICATION SOFTWARE

- Does the application software truly accomplish the goal or goals desired?
- Is the application software available from a reliable company?
- Does the application software require customization?

NETWORK

- Is the network reliable?
- Does the network have adequate storage and space?
- Is the network security being used?

OPERATING SYSTEM

- Do the operating systems best support the application software?
- Do the operating systems best support the users' needs?

HARDWARE (foundation of the pyramid)

- Is the hardware reliable?
- Does the hardware have all the components to support the layers above?

The dataset that was collected through a survey that Hartung created gave a small, but reliable dataset. However, for a complete statistical analysis of the GIS industry or related firms this is a very small sample size (Figure 8).

	United States	Canada	Total
Sampling Frame Population[2]	874	345	1219
Number of Firms that agreed to participate	504	194	698
Number of Responses	300	84	384
Response Rate	59.5%	43.3%	55.0%

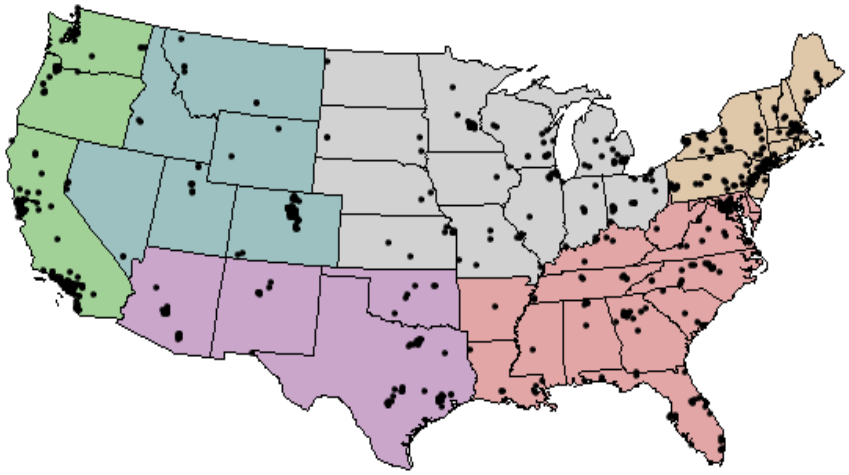
Figure 8. Survey response statistics conducted by Hartung 1997.

Through her study, Hartung then analyses the characteristics of the industry growth. Moreover, Hartung shows statistically that the revenue for this industry is increasing. The

results of her survey revealed many characteristics about the GIS industry, which are listed below:

- GIS firms are young (median year founded 1983, first year GIS revenue 1989), small (median labor force is eleven) and earn on average $1 Million per annum.
- Approximately one-half of the respondents earned export revenues.
- One third of known GIS firms are located in the Colorado Corridor, Washington Beltway, and Los Angeles and its Environs.
- Firms located in one of the three tier one clusters are apt to be more specialized then those firms located elsewhere.
- GIS firms appear to be vertically integrating, offering customers a full-service solution or one-stop shop.
- The largest demand market for GIS technologies is utility companies and all levels of governmental agencies.

Hartung maps the firms to provide a geographic view of the GIS industry.



Thrall (1998) demonstrated the important uses of geocoding software to identify the geographic location of subscribers and their LSP characteristics. CACI Coder/Plus is software that gives the analyst the advantage of analyzing a data set and obtain a comprehensive assignment of geographic information, which includes, latitudes, longitudes, and lifestyle segmentation information. The magazine industry understands

the importance of reaching the right market so lifestyle segmentation is a way to understand who your market is. Cathy Bond (1997) documents customer magazines are using segmentation (lifestyle) as a marketing tool to reach the right people the right message. Some magazine titles are promoting services for the right lifestyle customer, age, or social economic profile. This lifestyle segmentation is important to assess the lifestyle of the US subscribers and dependent upon business geography because to survive it must be oriented to its global market. So in a general way the magazine industry has become more scientific than before and has also become more market oriented. As Sharpf (1989) explains these advances have attracted both advertising market and advertisers that are willing to pay to "fine tune their advertising expenditures to keep waste to a minimum." The market research industry organizations are using their knowledge of lifestyle to increase their analysis proficiency. Sharpf (1989) argues:

> For the publisher, the cost of subscriber's analysis, the trade down risk, and the economic feasibility of segmentation can make for a complex marketing package. It can also mean developing editorials to go with the segmentations; but that again should help the sell.

Further, Dickenson (1998) explains that the magazine industry has advanced to a point in which magazines and brochures can be produced for specific segmentation groups (lifestyles) that the publishing company or magazine wants to target. An example of this is Goldfish, which is a United Kingdom credit card company that produces a guided index of their members' lifestyle segmentation that helps the magazine industry in targeting specific lifestyle segmentations.

The publishing industry is a very competitive industry. As Chepesieuk (1994) explains that specialization and the use of segmentation is essential for magazine in the industry to survive and grow. A good example of this is Winston-Salem Journal (N.C.)

had to specialize to the lifestyle of his market to survive the competition of two new local real estate publications. Niche publishing can be form by the analysis of segmentations like women, men, ethic group, the elderly, tourist, children, professors, etc. Even a high regarded publication like the Chicago Tribune had to target a specific lifestyle segment (elementary and high school) during the 80's to increase their market readership. Thrall (2001) presents a case for (Thrall, 2002) that Lifestyle Segmentation Profile for a good market analysis is today a required part of the analyst's report.

The lifestyle segmentation profile is derived by the combination of census databases and private databases. LSP (lifestyle segmentation profile) is the main characteristic that the magazine industry should take in consideration for use in their market analysis. Pinkovitz (1997) denotes the differences of consumers' lifestyles (psychography), where they live, (geography), and age, income, etc. (demography). On the other hand, the LSP (lifestyle segmentation profile is a more complete way of segmenting the market and the Business Geographer is the person that puts these small groups together and creates a more profound analysis. Hucker-Brown (2003) joins these ideas by combining demographic data or segmentation data with the likely market a better understanding can be done.

The following analysis brings together all of these ideas to create a clear and unique analysis of *GeoSpatial Solutions* magazine and with this data try to understand the social and locational makeup of the GIS industry.

CHAPTER 3
DATA METHODOLOGY

The data used for the analysis was made available by Advanstar Communications for their GIS magazine *GeoSpatial Solutions*. The database includes their entire subscribers list (approximately), a list of GIS business firms in the US, and a list of international GIS companies also from *GeoSpatial Solutions*, which are used to document and corroborate GIS business concentrations within submarkets. Social-economic data from the 2000 US Census, private data vendors, and CACI Coder/Plus (ESRI) are used to understand the social influences of submarkets to attract GIS firms and GIS producers to specific submarkets in the US Analysis is produced using leading GIS technology including CACI Coder/Plus (ESRI), ArcGIS (ESRI), ArcView Business Analyst (ESRI), and Microsoft Excel.

Data Acquisition

To acquire the data from *GeoSpatial Solutions*, a constant communication link was made by Dr. Grant Ian Thrall (University of Florida Professor of business geography), Scottie Barnes (Editor for Advanstar Communications, *GeoSpatial Solutions*) and me. After a few weeks, Advanstar Communications, the publishing company for *GeoSpatial Solutions*, released their subscribers' data lists to Dr. Grant Ian Thrall and me. These data lists included 27,050 subscribers, 647 firms, and 161 international firms. Because of the competitive nature of this market, all the parties involved signed a disclosure agreement to keep their subscribers lists confidential. Also, due to competitive nature of the

magazine publishing industry, any preliminary results of this research were kept confidential until the publication of articles in *GeoSpatial Solutions*.

The 27,050 subscribers' data provided by the GIS magazine *GeoSpatial Solutions* was processed using ESRI's geocoder program CACI Coder/Plus. Executing the CACI program on the list, using data from address fields one and two, assigned a latitude and longitude to each address. The original data set had two different address fields. To have a more complete data set, using Microsoft Excel, the data was analyzed and the two-address fields were consolidated into a single, more complete address field. Afterward, using this complete address field the program CACI Coder/Plus (ESRI) was again used to give each completed address geographical latitude and longitude, and an individual Lifestyle Segmentation Profile (LSP). The results of the CACI Coder/Plus geocoding process were included in the analysis of the program in a Geocoding Match Level Summary at the completion of this analysis. Because the subscribers' data list has multiple address lists, the process of geocoding was processed three separate times.

Geocoding Results

The first address gave only a 4.9% accuracy level. All the addresses from the first address list were kept and the rest of the subscribers were deleted. Then using Microsoft Excel, the addresses that did not have a latitude and/or a longitude were checked for data entry errors, such as extra spacing within the address, or a misspelling in the street name; were edited and the addresses that could not be edited because of data entry errors or non-distinguishable addresses were removed from the list.

Table 1. Geocoding match level summary of 27,050 subscribers' first address field from CACI Coder/Plus.

Number of Records: 27,050

Match Description	Match Code	Number	Percent
Street Match	S	1,330	4.9%
Dominant Tract in ZIP Code	Z	22,809	84.3%
One Tract in ZIP Code	T	1,263	4.7%
No Geocode	X	1,648	6.1%
		27,050	**100.0%**

The second address field (column) gave a 66.2 % accuracy level. The same process as was used for the first address field, using Microsoft Excel, was followed to get a more accurate data set of the address lists.

Table 2. Geocoding match level summary of 27,050 subscribers' second address field from CACI Coder/Plus.

Number of Records: 27,050

Match Description	Match Code	Number	Percent
Street Match	S	17,916	66.2%
Dominant Tract in ZIP Code	Z	6,691	24.7%
One Tract in ZIP Code	T	901	3.3%
No Geocode	X	1,542	5.7%
		27,050	**100.0%**

Final Dataset

After, editing the two address fields, the two data sets were merged together. The final list was also geoprocessed using CACI Coder/Plus by Dr. Grant Thrall. The final result of CACI Coder/Plus was a geocoded match of 73.4%, which is 26,024 subscribers from the original data set. These 26,024 subscribers of *GeoSpatial Solutions* were used to proceed with the analysis.

Table 3. Geocoding match level summary of 26,024 subscribers' final address field from CACI Coder/Plus.

Number of Records: 26,024

Match Description	Match Code	Number	Percent
Street Match	S	19,101	73.4%
Dominant Tract in ZIP Code	Z	5,537	21.3%
One Tract in ZIP Code	T	850	3.3%
No Geocode	X	536	2.1%
		26,024	**100.0%**

The same three-step geocoding process was performed with the firm's data list. Due to a lack of international GIS software, the international firm's data set was geocoded using geospatial proximities to obtain a general overview of *GeoSpatial Solutions*' global market.

CHAPTER 4
MAPPING THE GEOSPATIAL COMMUNITY

This chapter provides a business geographic analysis of *GeoSpatial Solutions*' subscriptions. Using the final data list, Business Analyst (ESRI) and ArcGIS (ESRI), a map of the total subscribers was created. This subscriber's map shows a complete presentation of *Geospatial Solutions*' subscribers nationally. The map corresponds to high concentrations of subscribers located in metropolitan areas. The northeast US shows the largest concentration of *GeoSpatial Solutions* subscribers in the US. These states include New Hampshire, New York, Virginia, and the District of Columbia. From this map, other high concentration geographical market regions can be distinguished (Figure 9).

The map represents a general subscribers' representation of *GeoSpatial Solutions*. The subscribers of each state are represented with colored dots, with each state having its own color. The total count of subscribers by state is located in the legend at the bottom left of the map. To create this map the data set for total subscribers was utilized. After selecting the geoprocessing wizard from the tool icon, the attribute selected was to do a count (dissolve) on each state based on subscribers. The input layer used was the subscriber. After, the specific output (save as) archive was selected; an additional field for ACORN LSP categories was activated. The new layer created also included the total count of subscribers by state. The subscriber's layer and the new subscribers count layer were merged according to their state field. Next, using the properties of subscribers the

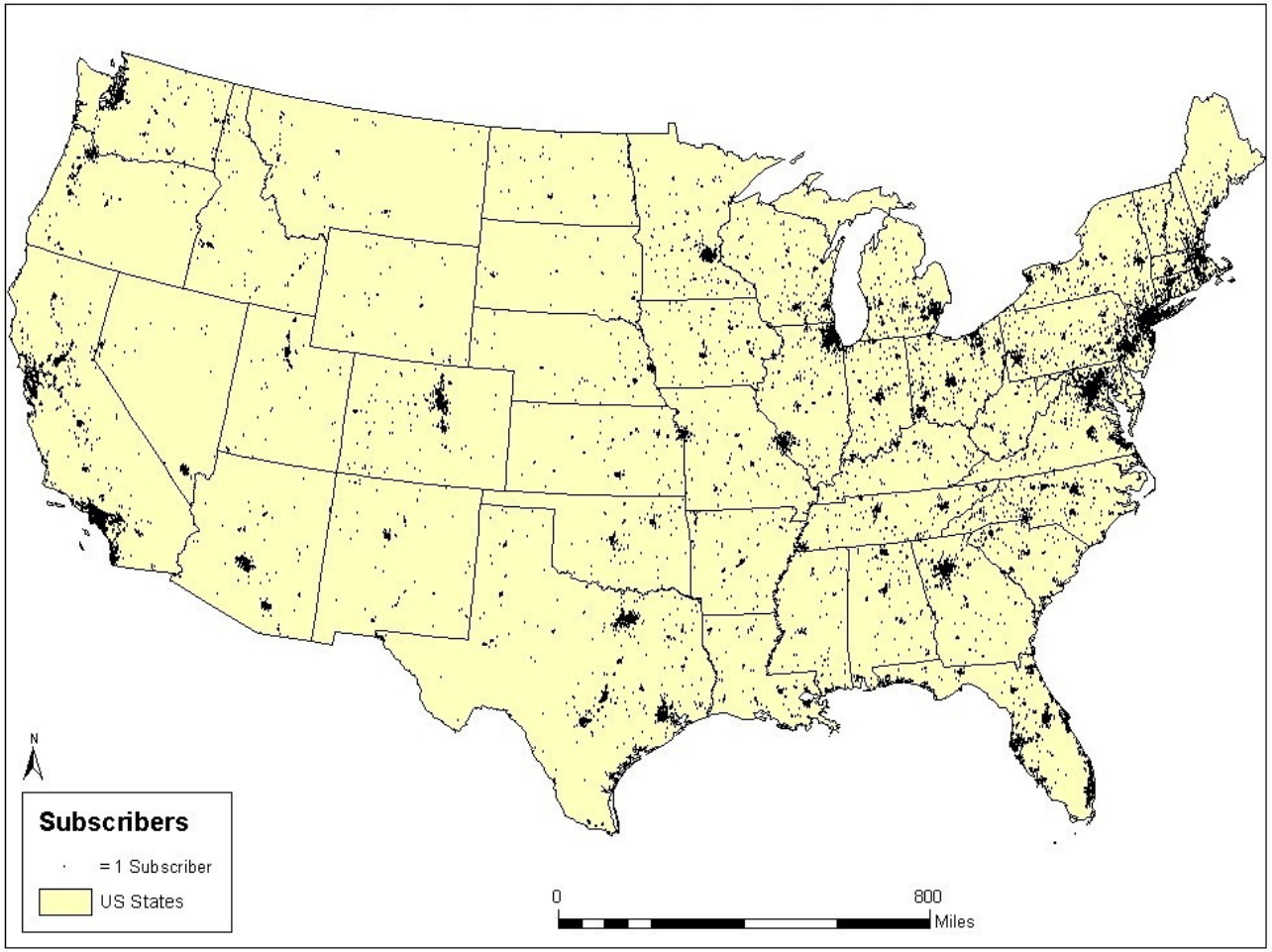


Figure 9. *GeoSpatial Solutions*' US market subscribers processed using ArcMap (ESRI).

symbology tab was selected to activate. From these new windows, the unique values-many fields category was selected. Then, the states and count-states were selected and all the values were added. The legend symbols were edited for better presentation and fit and they were integrated with the new map (Figure 10). The following map represents the percentage rate of the total subscribers for *GeoSpatial Solutions*' data set by state (Figure 11).

Geographic Regions in the US

The market analysis identifies primary, secondary, and tertiary submarket regions of GIS (Subscriber and Companies) in the US.

To create this map, the subscribers' data set was separated into three submarkets to show the states with high, middle, and low representation of the US market. To create these three submarkets, the geocoding match level summary from CACI Coder/Plus (ESRI) was used. The following table outlines the top 20 states by highest number of subscribers per state (Table 4). The corresponding percentage demonstrates the percentage of all subscribers in each state.

Table 4. Geocoding match level summary of top 20 states by number of subscribers from CACI Coder/Plus.

Record	Count	Percent
Top 20 States		
California	3,286	12.6%
Texas	1,564	6.0%
Florida	1,429	5.5%
New York	1,271	4.9%
Virginia	1,179	4.5%
Pennsylvania	955	3.7%
Illinois	872	3.4%
Colorado	869	3.3%
Ohio	832	3.2%
Maryland	772	3.0%
Washington	677	2.6%
New Jersey	661	2.5%
North Carolina	630	2.4%

Michigan	627	2.4%
Georgia	609	2.3%
Massachusetts	599	2.3%
Minnesota	520	2.0%
Wisconsin	512	2.0%
Missouri	504	1.9%
Oregon	487	1.9%
Other States	6,633	25.5%
Non-geocoded Records	536	2.1%

The top 20 states list was used to further divide the data set into the top 3 markets, in terms of percentage of subscribers, for *GeoSpatial Solutions.* A state being classified as primary means that the state contains over 4% of all GeoSpatial Solutions subscribers. A state being classified as secondary submarket means that the state contains 2% to 3.9% of all GeoSpatial Solutions subscribers. And the tertiary submarket means that the state contains 1.9% and below of all GeoSpatial Solutions subscribers. These three submarkets were separated into three individual maps for a more in depth look at the three primary submarkets. These layers show all three leading submarkets for *GeoSpatial Solutions* and by implication the GIS industry in the US. Moreover, it represents the strongest and weakest market saturation areas for *GeoSpatial Solutions* (Figure 12).

Primary Submarket

Figure 13 shows the states that represent the primary submarket of subscribers in the US and their total count. These states were selected based on their percentage classification. The primary submarket is made up of those states with 4% and above subscriber representations by state. The states that comprise the primary submarket are CA with 3,309 subscribers, TX with 1,587 subscribers, FL with 1,473 subscribers, NY with 1,279 subscribers, and VA with a total subscriber list of 1,207 (Figure 13).

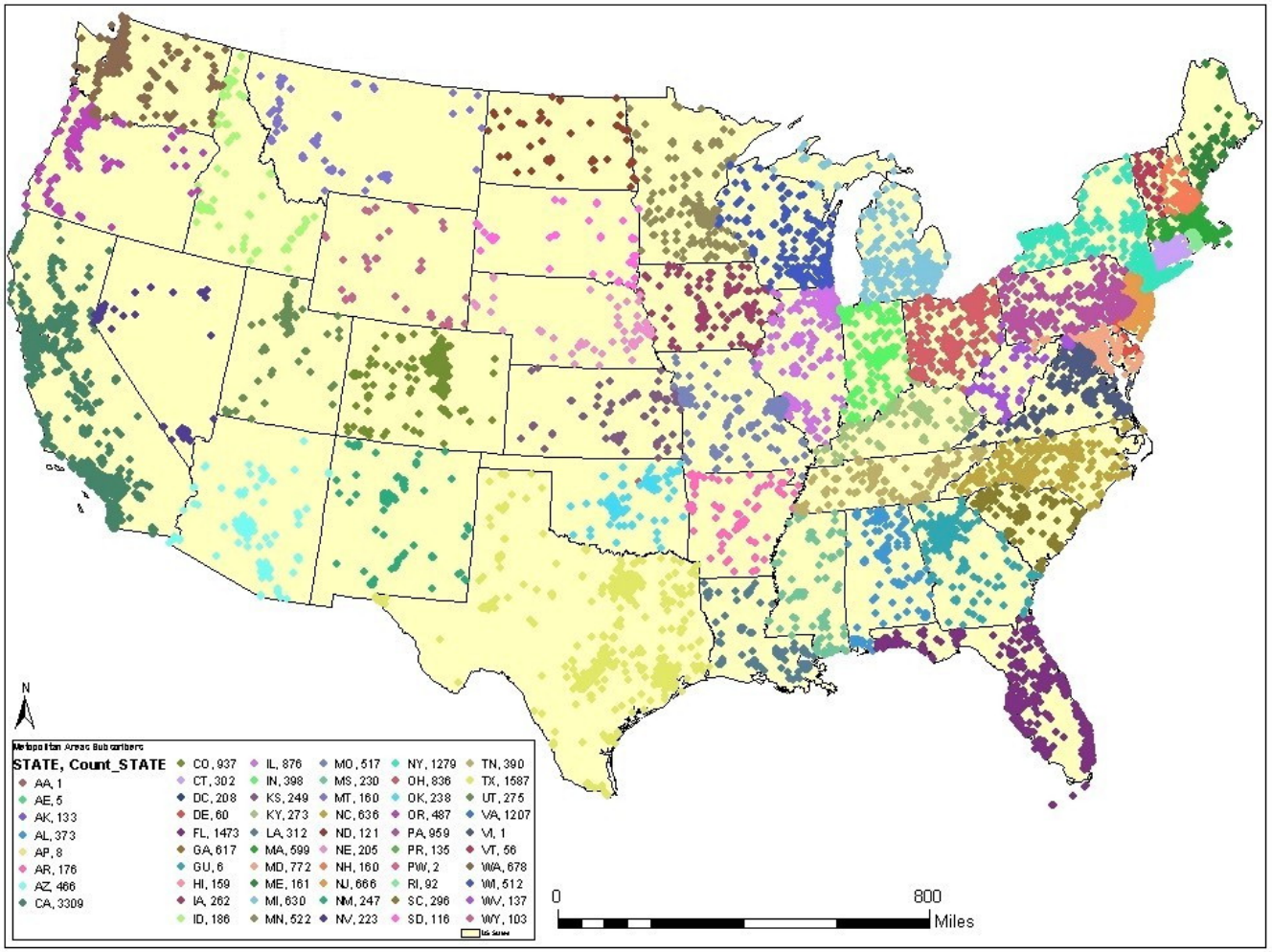


Figure 10. *GeoSpatial Solutions* individual state subscribers color-coded by state counts processed using ArcMap (ESRI).

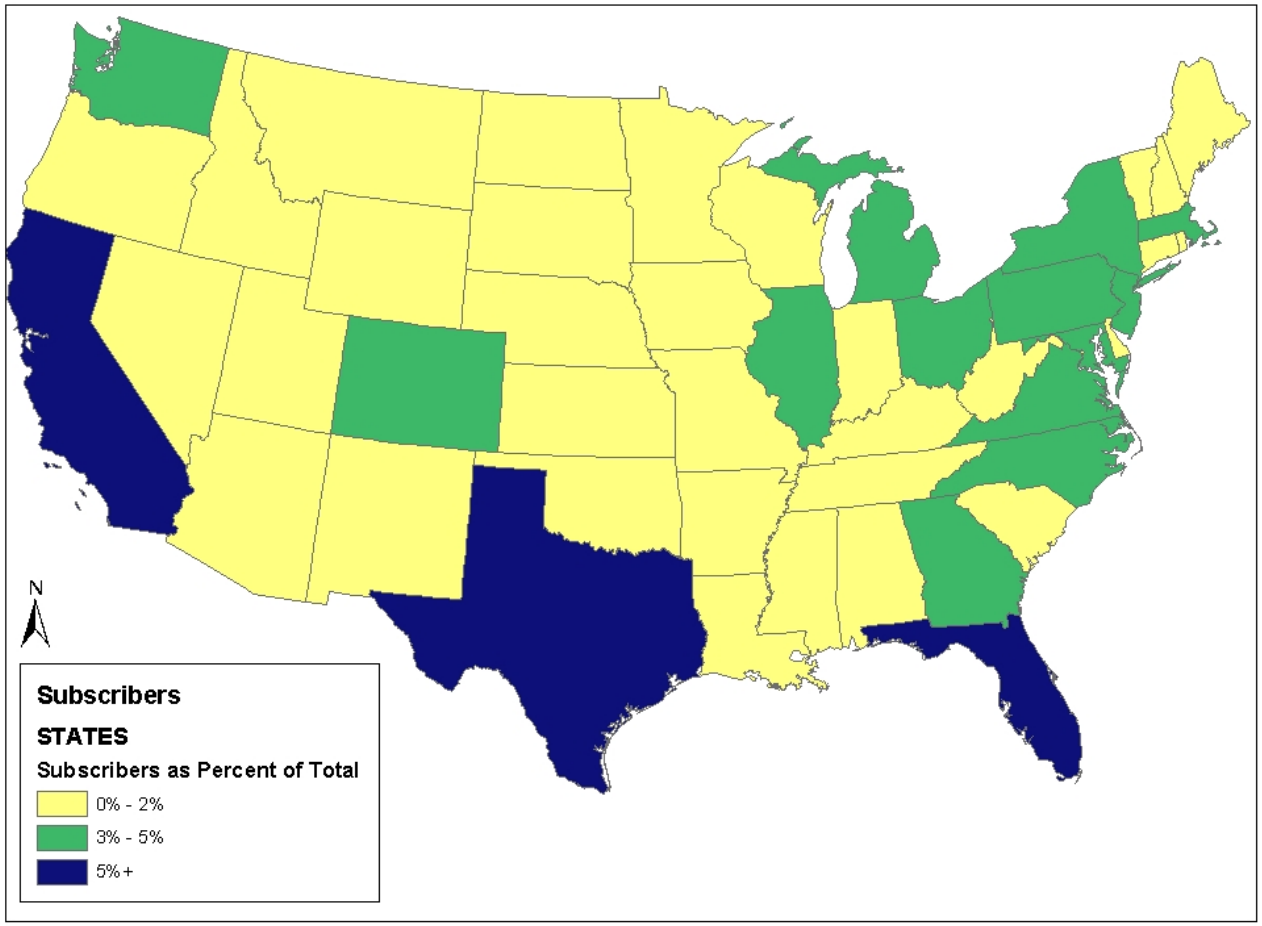


Figure 11. *GeoSpatial Solutions*' US market subscribers percent by State using ArcMap (ESRI).

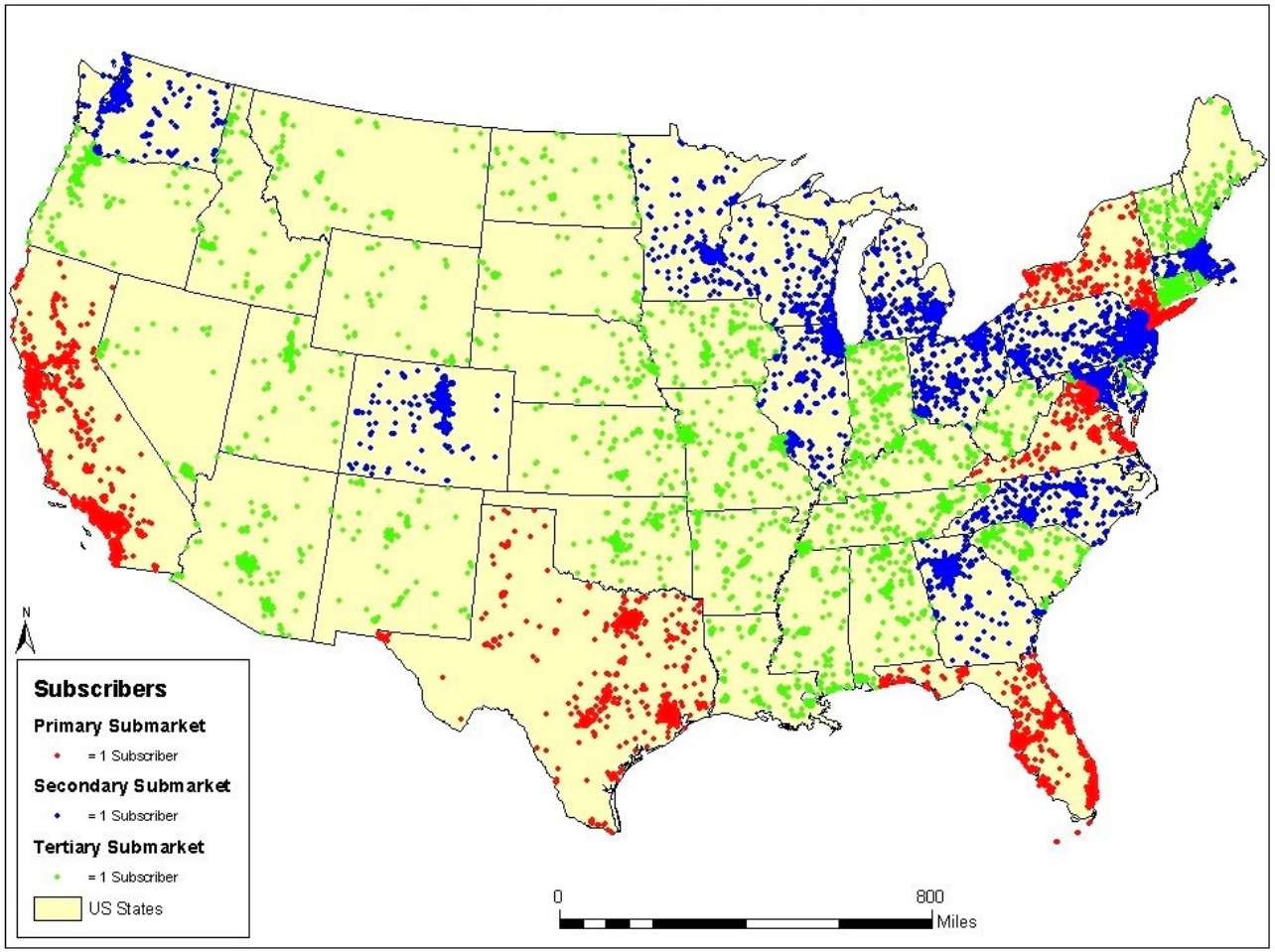


Figure 12. *GeoSpatial Solutions*' three US GIS submarkets processed using ArcMap (ESRI).

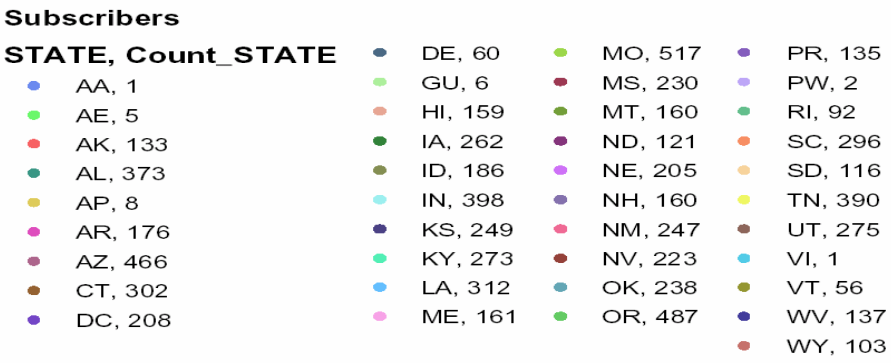
Secondary Submarket

Figure 4-6 is a representation of *GeoSpatial Solutions* subscribers by state that fit the secondary market, which was created, based on the percentage of subscribers by state that CACI Coder/Plus (ESRI) summary released. The secondary submarket represents 2% to 3.9% of subscribers by state. The states that form this submarket include: PA with 959, CO with 937, IL with 876, OH with 835, MD with 772, WA with 678, NJ with 666, NC with 636, MI with 630, GA with 617, MA with 599, MN with 522, and WI with 512 (Figure 14).

Tertiary Submarket

Figure 15 shows the tertiary submarket of subscribers, formed by using the percentage of the top 20 states on the CACI Coder/Plus (ESRI) summary list. All the states that have 1.9% of subscribers or below are included. The states and their individual subscribers counts follow (Figure 15). The state counts for the tertiary submarket were also included in the analysis (Table 5). (Human data entry errors should be considered.)

Table 5. GeoSpatial Solutions' tertiary submarket counts processed using CACI Coder/Plus (ESRI).



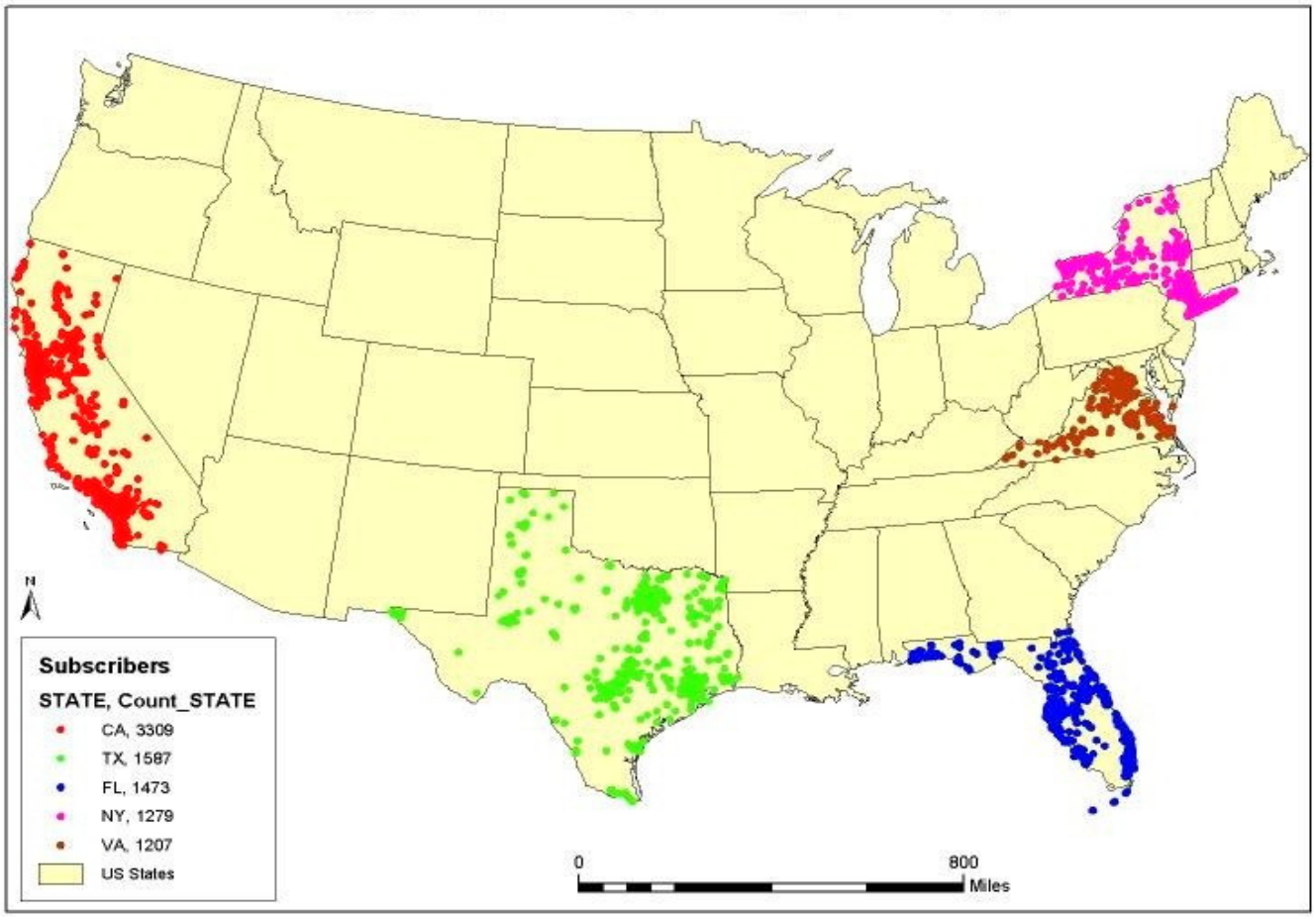


Figure 13. *GeoSpatial Solutions*' primary submarket processed using ArcMap (ESRI).

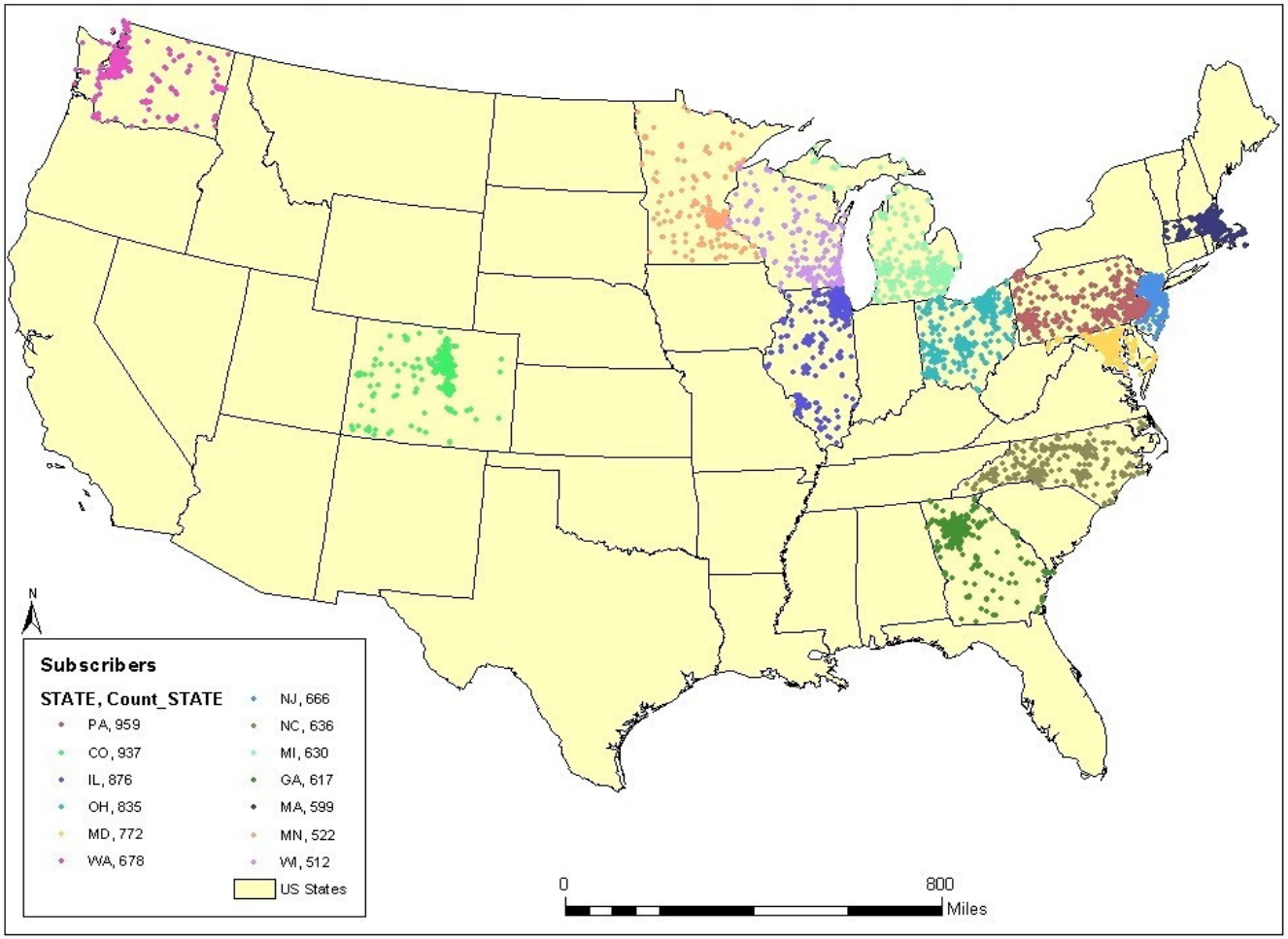


Figure 14. *GeoSpatial Solutions*' secondary submarket processed using ArcMap (ESRI).

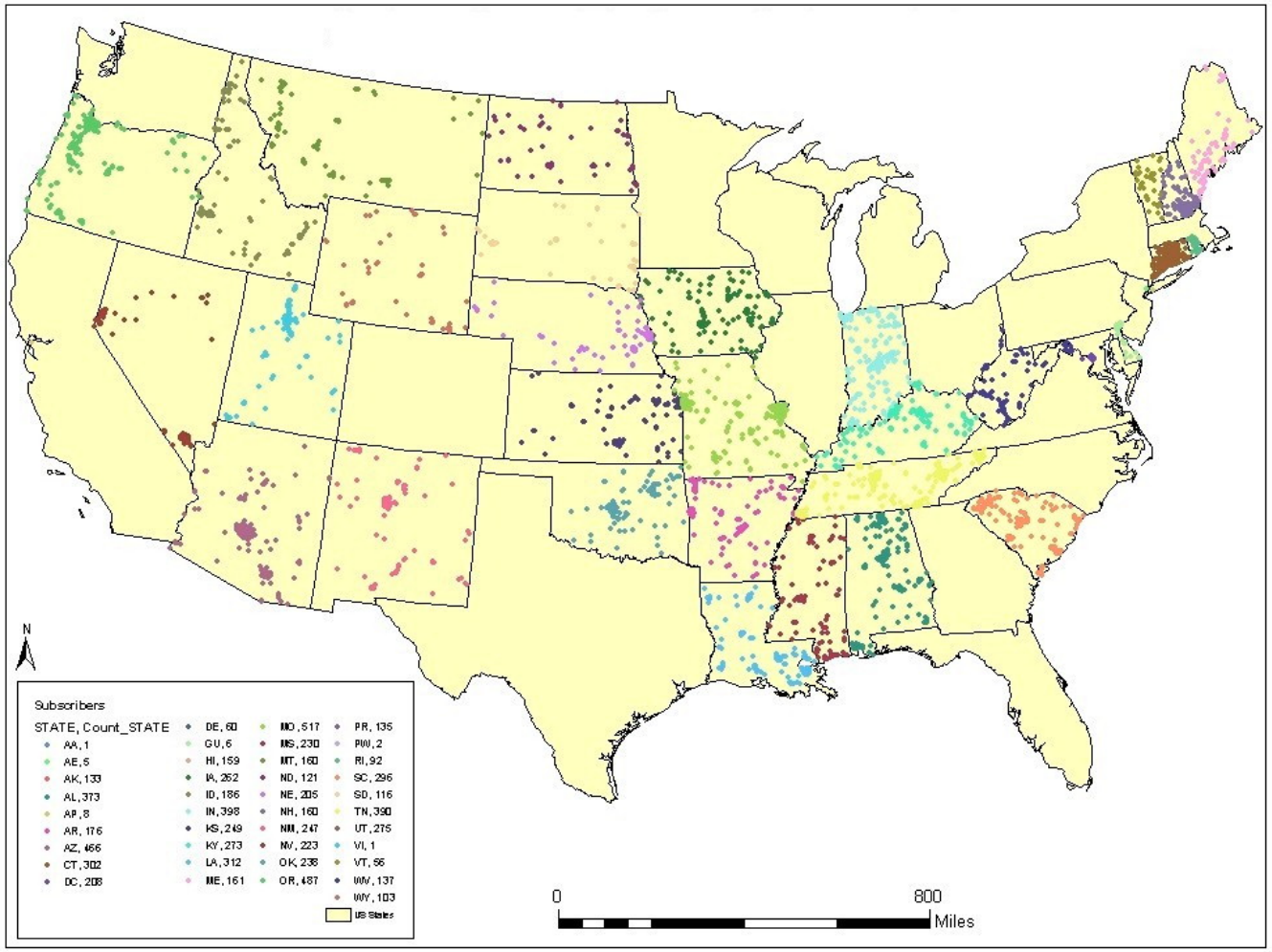


Figure 15. *GeoSpatial Solutions*' tertiary submarket processed using ArcMap (ESRI)

Table 6. *GeoSpatial Solutions*' percentage of subscribers by state using data from the US Census Bureau.

Percentage Rate of Subscriber by State

State	Population 18 years and Over	Subscribers	Subscribers per capita * 100000
Colorado	3,200,466	937	29.28
Wyoming	364,909	103	28.23
North Dakota	481,351	121	25.14
Montana	672,133	160	23.80
Virginia	5,340,253	1207	22.60
South Dakota	552,195	116	21.01
Idaho	924,923	186	20.11
Maryland	3,940,314	772	19.59
Oregon	2,574,873	487	18.91
New Mexico	1,310,472	247	18.85
Utah	1,514,471	275	18.16
New Hampshire	926,224	160	17.27
Maine	973,685	161	16.54
Nebraska	1,261,021	205	16.26
Washington	4,380,278	678	15.48
Nevada	1,486,458	223	15.00
Minnesota	3,632,585	522	14.37
California	24,621,819	3309	13.44
Wisconsin	3,994,919	512	12.82
Kansas	1,975,425	249	12.60
Missouri	4,167,519	517	12.41
Arizona	3,763,685	466	12.38
Massachusetts	4,849,033	599	12.35
Vermont	461,304	56	12.14
Iowa	2,192,686	262	11.95
Florida	12,336,038	1473	11.94
Connecticut	2,563,877	302	11.78
Rhode Island	800,497	92	11.49
Alabama	3,323,678	373	11.22
Mississippi	2,069,471	230	11.11
Texas	14,965,061	1587	10.60
New Jersey	6,326,792	666	10.53
North Carolina	6,085,266	636	10.45
Georgia	6,017,219	617	10.25
Pennsylvania	9,358,833	959	10.25
Delaware	589,013	60	10.19
Ohio	8,464,801	836	9.88
South Carolina	3,002,371	296	9.86
West Virginia	1,405,951	137	9.74
Louisiana	3,249,177	312	9.60
Illinois	9,173,842	876	9.55
Oklahoma	2,558,294	238	9.30
Tennessee	4,290,762	390	9.09

Table 4-3. Continued

State	Population 18 years and Over	Subscribers	Subscribers per capita * 100000
Kentucky	3,046,951	273	8.96
New York	14,286,350	1279	8.95
Indiana	4,506,089	398	8.83
Arkansas	1,993,031	176	8.83
Michigan	7,342,677	630	8.58
District of Columbia	4,570,678	208	4.55
	Source: U.S. Census Bureau		*Public Information Office*

Table 6 is the rate of *GeoSpatial Solutions* subscribers by state (Table 6). To create this chart, data from the 2000 US Census of population 18 years of age and over was used. The formula used to get the percentage rate is:

(Subscriber) / (population) * (100,000)

The chart shows a descending percentage rate of the states with the higher percentage rates to the lower percentage rates. The publishing industry would generally view tables like this as evidence of which states have the greatest potential for expansion. That interpretation might carry over here as well. Florida and California both have large GIS subscriber bases, but not as large as the total population of the state would indicate. The lower-rated states should be considered for as opportunities for market growth in subscriptions for these states (Figure 16).

GIS Producers

Within the *GeoSpatial Solutions* database, subscribers are required to select which industry best represents their use of GIS. This is known as the "Business Code" database.

The business codes map represents a general spatial location of the business codes. The business codes map was created using the data list of subscribers. The list below has a field for Business Codes, Function Codes, and Title Codes (Table 7).

Table 7. *GeoSpatial Solutions*' business code categories using their data set.

Business Codes

Card Code	Description
10	Surveying / Mapping
20	Government Operations
30	Construction / Mining / Civil Engineering
40	Utilities / AM / FM
50	Natural Resources / Environmental Planning
55	Telco (including Cellular / Wireless)
60	Business Services
70	Software Development / Systems Integration
160	Education / Research
85	Healthcare
90	Other

Organizational Affiliation Codes (Function Codes)

Card Code	Description
15	Government/Public Sector
25	Private Business
35	University/College
45	Other

Title Codes (Code 31)

Card Code	Description
Corporate Management	
1	Owner, President, CEO
2	Senior Manager (incl. VP, General Division Manager, etc.)
3	VP/Director/Manager Sales & Marketing
4	Other Corporate Management
Information Technology (MIS/IS)	
5	Senior Manager (incl. CIO, VP, etc.)
6	Manager-Information Technology/Systems (incl. MIT/MIS)
7	Applications Developer
8	In-house User Support Representative
9	Internet/Web Designer/Developer
L	Other IS or IT Staff
Operations	
M	Senior Manager (including COO, VP, etc.)
N	Manager (incl. Coordinator/supervisor/administrator/data processing systems)
O	Engineer
P	GIS Technician

Table 4-4. Continued

Business Codes	
Card Code	Description
Q	Geospatial Professional (incl. Biologist/ geologist/ professor/ cartographer/ surveyor/ mapmaker and all others)
R	Systems Integrator
S	Technician/Analyst/Administrator
T	Other Operations
Other Job Title	
U	Other

These data codes are collected from the subscribers' card codes that are selected when people subscribe to the magazine (Figure 17) and (Figure 18). To perform this analysis, the three codes were analyzed individually and also the Title Codes were separated into three categories (Corporate Management, Information Technology, and Operations).

The map shows all the ten classifications together as a general group. Each individual subscriber selects his or her individual classification on the card codes when they fill out their subscription card.

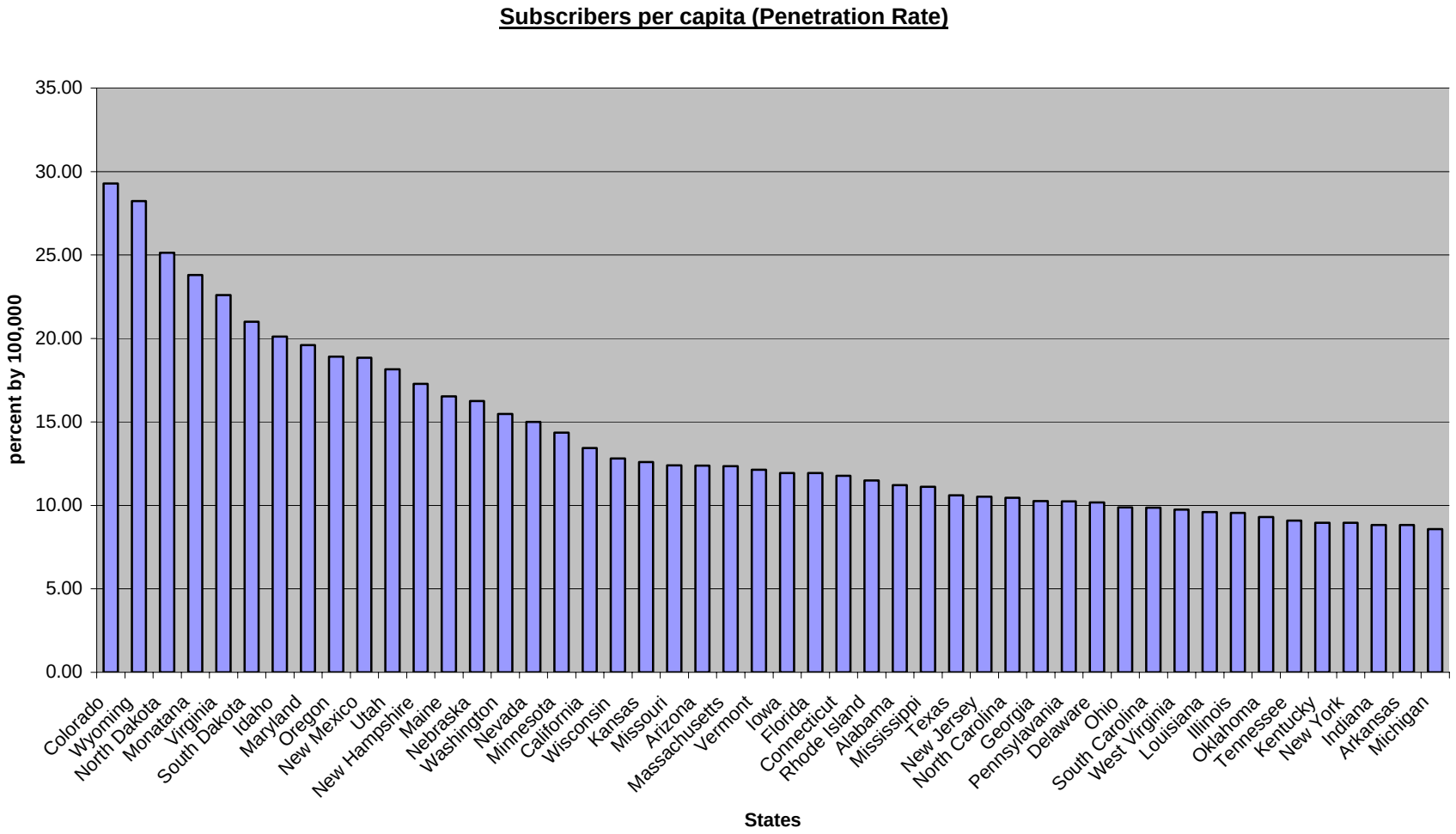


Figure 16. *GeoSpatial Solutions*' percentage rate of subscribers by state using data from the US Census Bureau.

Figure 17. *GeoSpatial Solutions*' subscription card.

Figure 18. *GeoSpatial Solutions*' subscription card.

Business Codes

Figure 19 is the general spatial location of subscribers by business codes. The Business Codes map was also created using the data list of subscribers. The list has a field for Business Codes. This business codes data is collected from the card codes that the subscribers check when subscribing to the magazine (Figure 19). This map represents the percentage of total subscribers in the business codes category of *GeoSpatial Solutions*' database by state (Figure 20).

This map shows each of the ten business codes groups in a different color and lists their individual counts by category. The legend of this map shows:

Table 8. *GeoSpatial Solutions*' ten business codes groups.

Code	Description	Total Subscribers	Percentage
10	Surveying/Mapping	3,574	13.7%
20	Government Operations	5,689	21.9%
30	Construction/Mining Civil Engineering	2,936	11.4%
40	Utilities/AM, FM	1,431	5.5%
50	Natural Resources Environmental Planning	2,245	8.6%
55	Telco	866	3.3%
60	Business Services	3,383	13%
70	Software/Development System Integration	2,556	9.8%

Table 4-5. Continued

Code	Description	Total Subscribers	Percentage
85	Healthcare	644	2.5%
90	Other	60	.2%
160	Education/Research	2,614	10.1%
Total		**2,5998**	**100%**

This map gives an idea of which market groups have high and low subscriber representation by *GeoSpatial Solutions* (Figure 21).

Organizational affiliation

The Organizational Affiliation codes (Function codes) were created to distinguish a geographic perspective where these codes were located in the US. The organizational affiliation is formed by four unique category codes: 15, Government/Public Sector; 25, Private Business; 35, University/College; 45, other. This map represents the total Organizational Affiliation market (Figure 22). The proceeding map illustrates the organizational affiliation code of *GeoSpatial Solutions*' subscribers by state (Figure 23). The second map represents the function codes and respective counts for each category (Figure 24).

Title codes

The Title Codes (Code 31) were too large to analyze as one group, so the group was separated into its three main categories (Table 8). Each category was analyzed independently to better understand its markets. Maps for these categories were created and maps of individual counts for each category were also created.

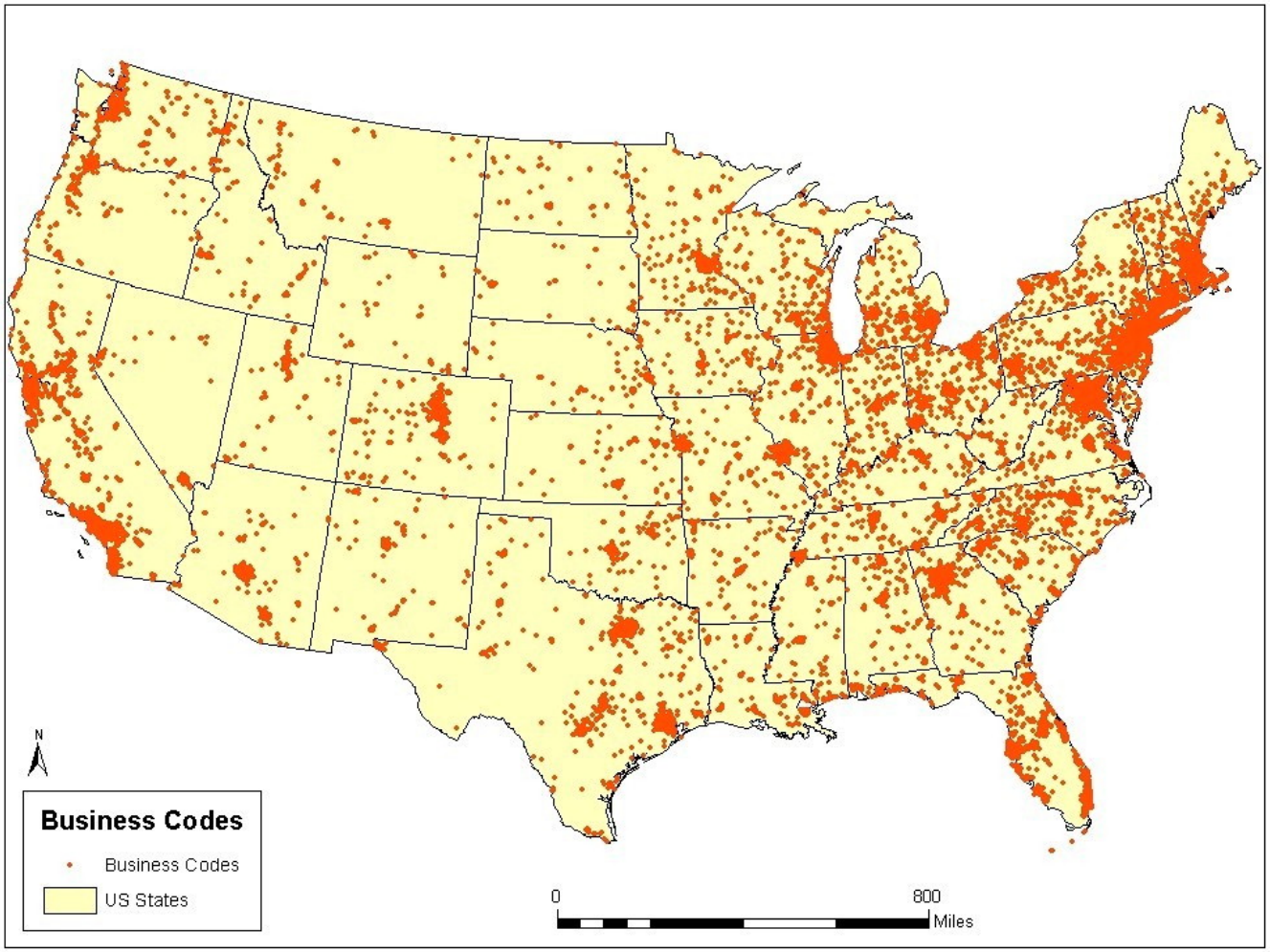


Figure 19. *GeoSpatial Solutions*' combined business codes processed with ArcMap.

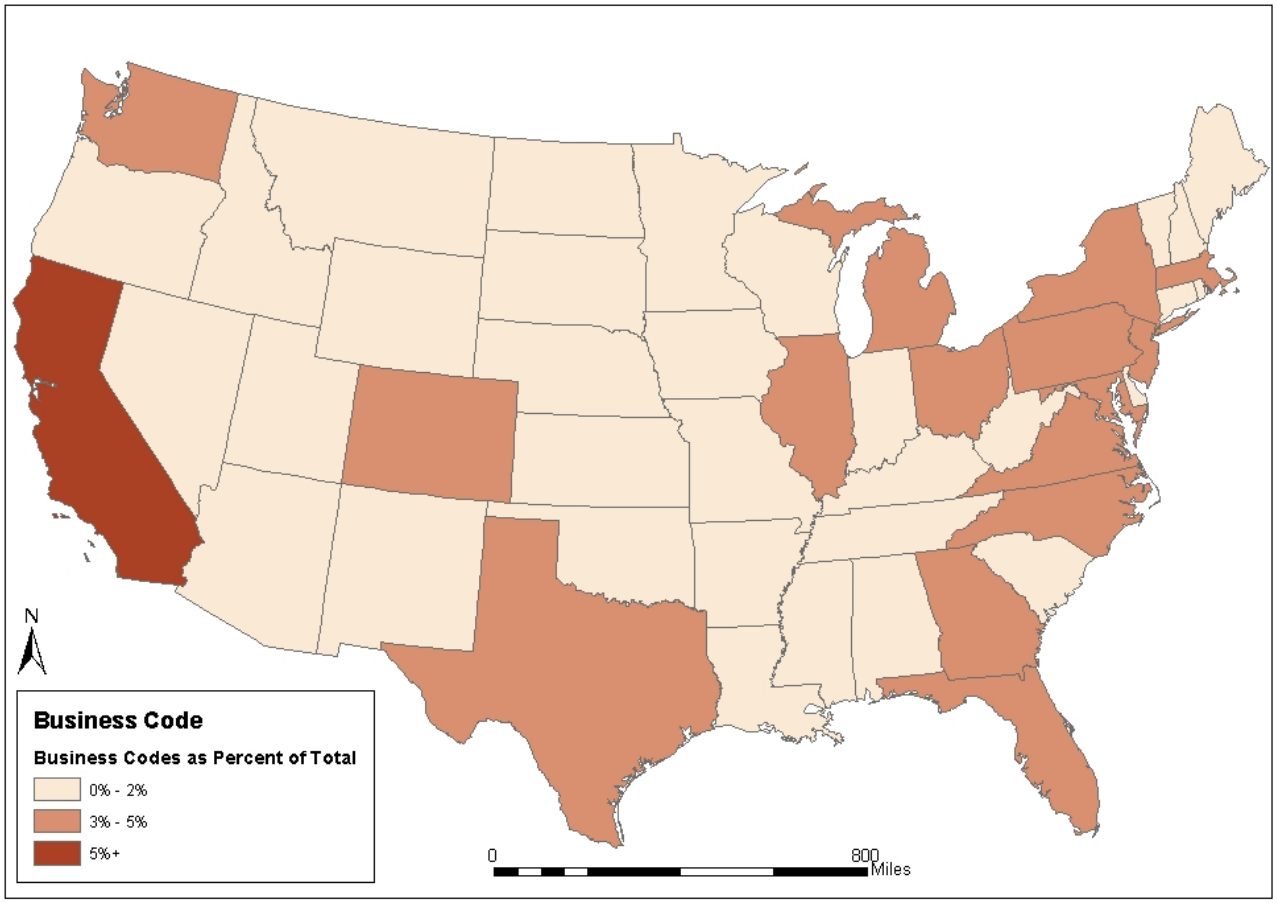


Figure 20. *GeoSpatial Solutions*' combined business codes percent by state processed with ArcMap.

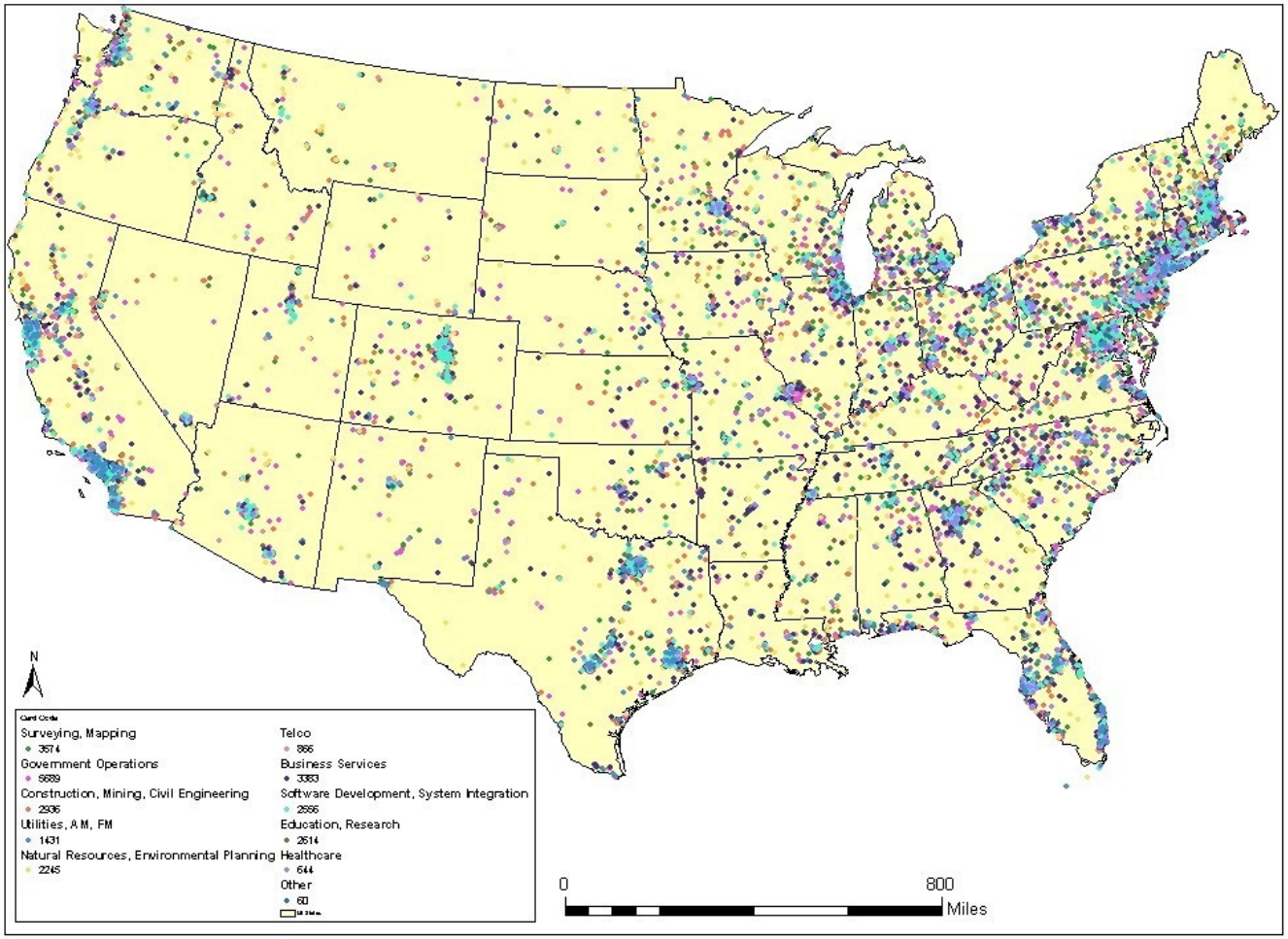


Figure 21. *GeoSpatial Solutions*' individual business codes processed with ArcMap.

Table 9. *GeoSpatial Solutions*' title code categories using their data set.

Title Codes (Code 31)	
Card Code	
Corporate Management	
1	Owner, President, CEO
2	Senior Manager (incl. VP, General Division Manager, etc.)
3	VP/Director/Manager Sales & Marketing
4	Other Corporate Management
Information Technology (MIS/IS)	
5	Senior Manager (incl. CIO, VP, etc.)
6	Manager-Information Technology/Systems (incl. MIT/MIS)
7	Applications Developer
8	In-house User Support Representative
9	Internet/Web Designer/Developer
L	Other IS or IT Staff
Operations	
M	Senior Manager (including COO, VP, etc.)
N	Manager (incl. Coordinator/supervisor/administrator/data processing systems)
O	Engineer
P	GIS Technician
Q	Geospatial Professional (incl. Biologist/ geologist/ professor/ cartographer/ surveyor/ mapmaker and all others)
R	Systems Integrator
S	Technician/Analyst/Administrator
T	Other Operations

Corporate Management:

This map shows the general geographic location of all of the subscribers that fit the category of corporate management from the title code list (Code 31). The data set of subscribers that fit this corporate management category and a new layer was created (Figure 25). The next map shows the percent of total corporate management subscribers of *GeoSpatial Solutions*' dataset by state (Figure 26). This map shows the corporate management category query builder from the subscribers' data set. The corporate management code is divided by *GeoSpatial Solutions* into four different groups. The map shows each of these four groups in a different color and it shows the count of subscribers that fit the categories (Figure 27).

Table 10. *GeoSpatial Solution'* corporate management codes.

Categories	**Total Subscribers**	**Percent of Total**
Owner/President/CEO	4,398	44.8%
Senior Manager	2,524	25.7%
VP/Director/Manager Sales and Marketing	1,456	14.8%
Other Corporate Management	1,438	14.7%
Total	**9,816**	**100%**

Information Technology:

This map shows a general representation of all the subscribers that fit on the Title Code (Code 31) list (the category of information technology). This category is selected from the general subscribers list and an individual layer of these subscribers was created to show their representation in the US (Figure 28). This map represents the percent of information technology subscribers of *GeoSpatial Solutions*' dataset by state (Figure 29).

This map shows a deeper analysis of the Information Technology code. The information technology code is broken into six categories, which were selected by the subscribers when they filled out the card for their subscription. Also, the total count for each of these six categories was produced. The six categories are:

Table 11. *GeoSpatial Solutions'* information technology (MIS/IS).

Code	**Description**	**Total Subscribers**	**Percent of Total**
5	Senior Manager	469	14.1%

Table 11. Continued

Code	Description	Total Subscribers	Percent of Total
6	Manager-Information Technology/Systems	1,216	36.7%
7	Applications Developer	664	20%
8	In-House User Support Representative	386	11.6%
9	Internet/Web Designer/Developer	275	8.3%
L	Other IS or IT Staff	307	9.3%
Total		**3,317**	**100%**

The map shows these categories and their respective total counts (Figure 30).

Operations

This map shows the geographic location of subscribers and their distribution in the United States. The Operations Code is a broad category. This category encompasses many departments and firms. These codes are primarily formed by seven subcategories (Figure 31). The following map represents the percent of total count of operations codes of *GeoSpatial Solutions*' database by state (Figure 32).

In addition the map shows the operations title codes and each individual category count. The operations code is divided into eight individual categories.

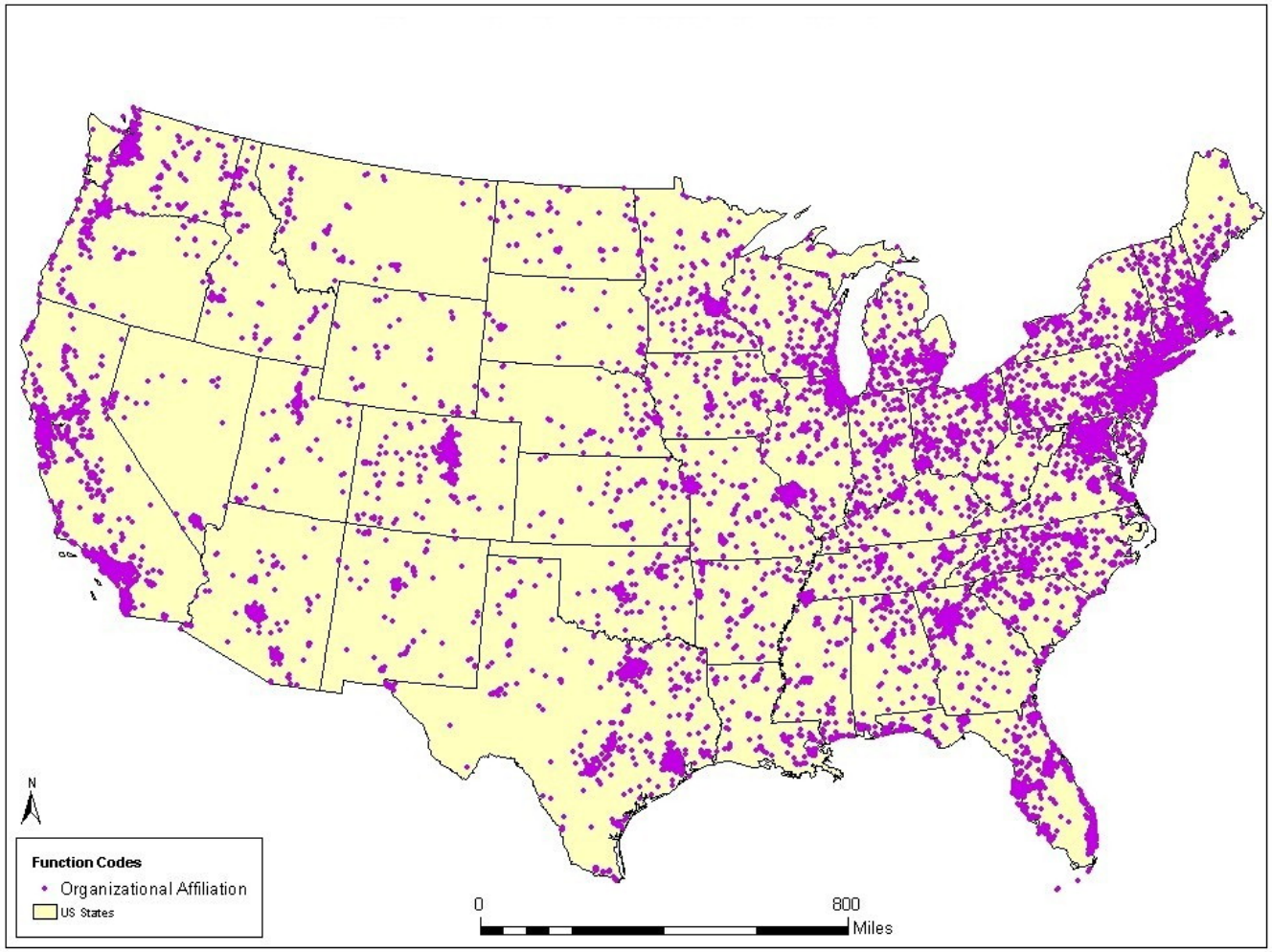


Figure 22. *GeoSpatial Solutions*' combined organizational affiliation codes processed with ArcMap.

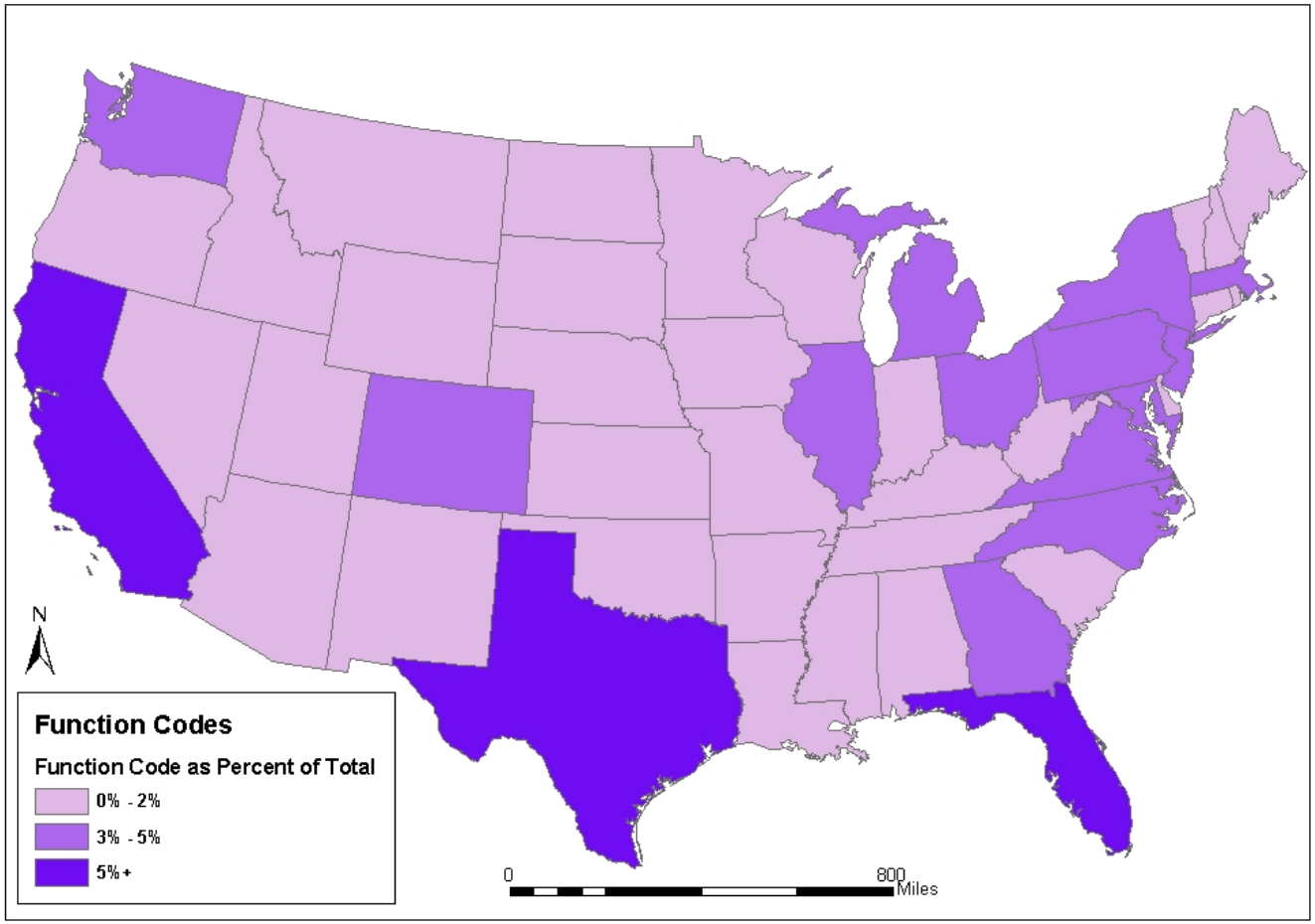


Figure 23. *GeoSpatial Solutions*' combined organizational affiliation codes percent by state processed with ArcMap.

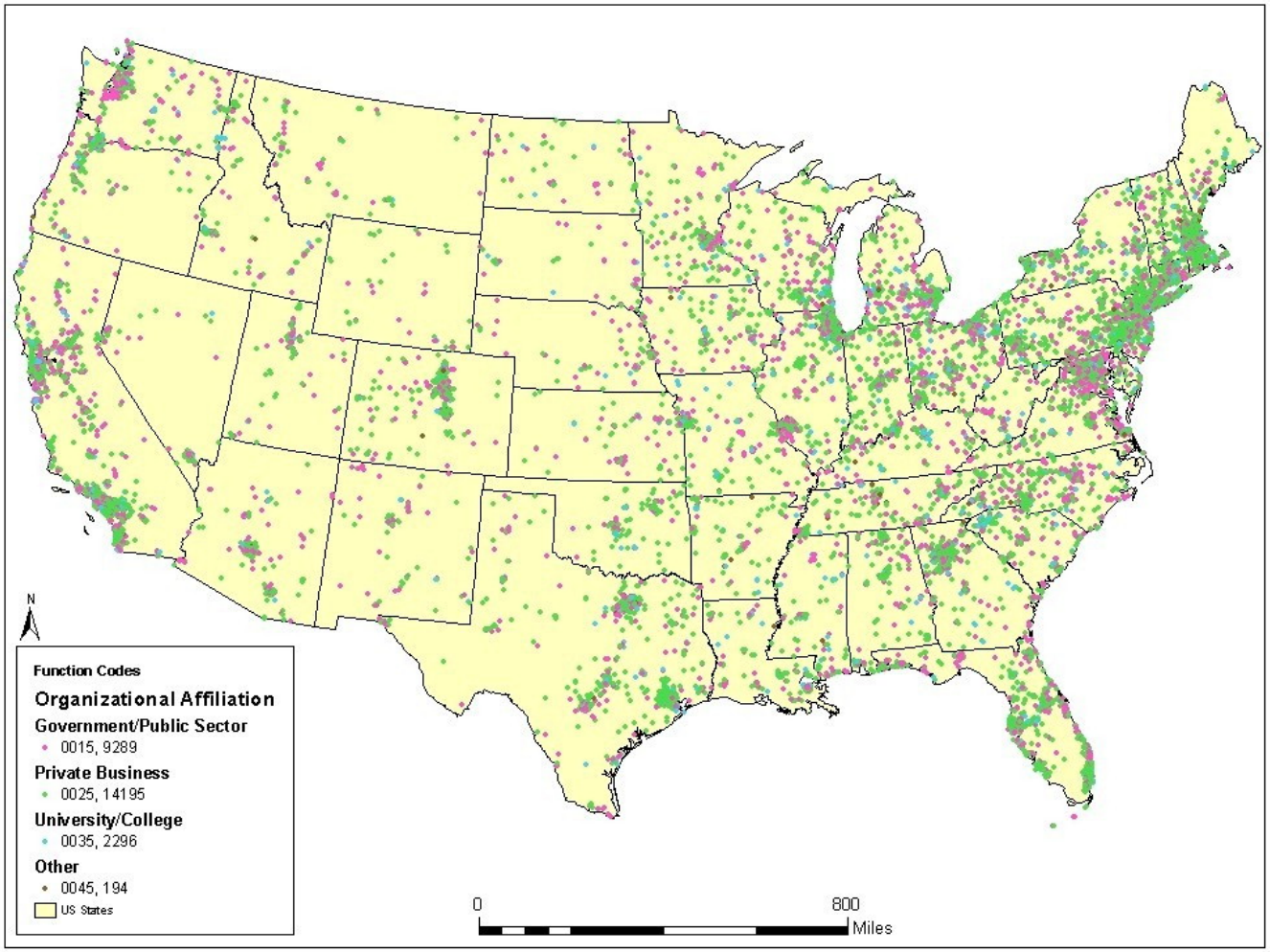


Figure 24. *GeoSpatial Solutions*' individual organizational affiliation codes processed with ArcMap.

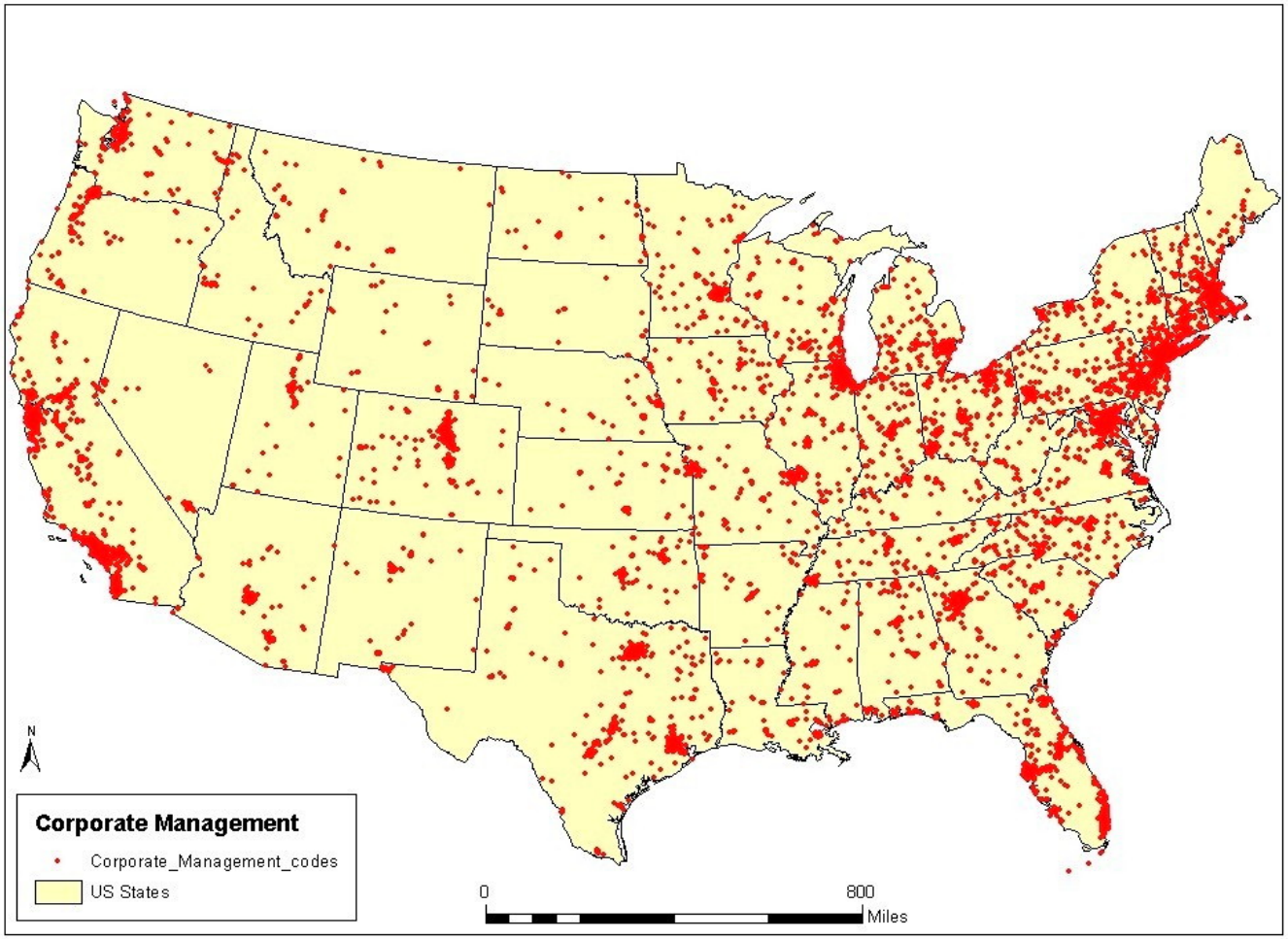


Figure 25. *GeoSpatial Solutions*' combined corporate management codes processed with ArcMap.

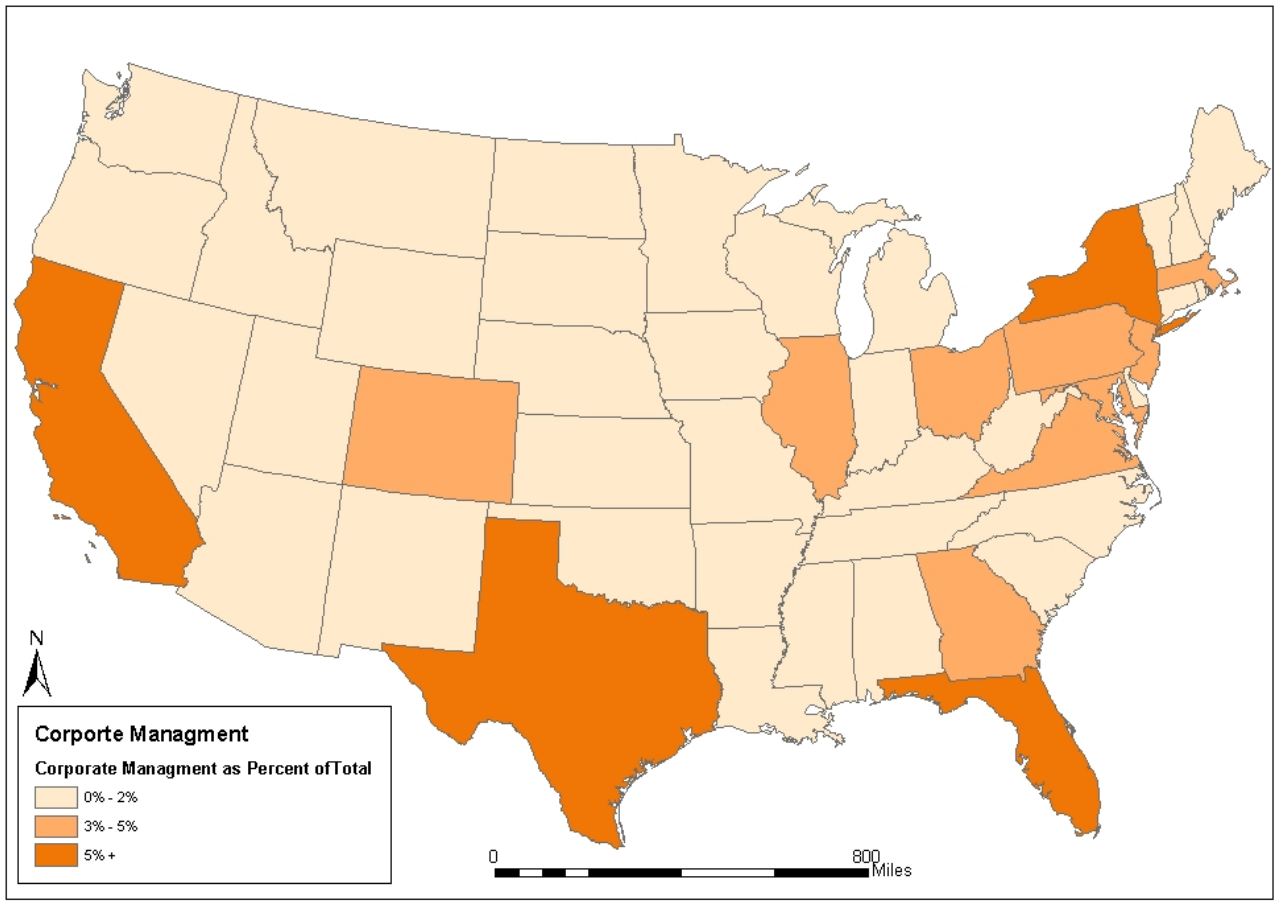


Figure 26. *GeoSpatial Solutions*' combined corporate management codes percent by state processed with ArcMap.

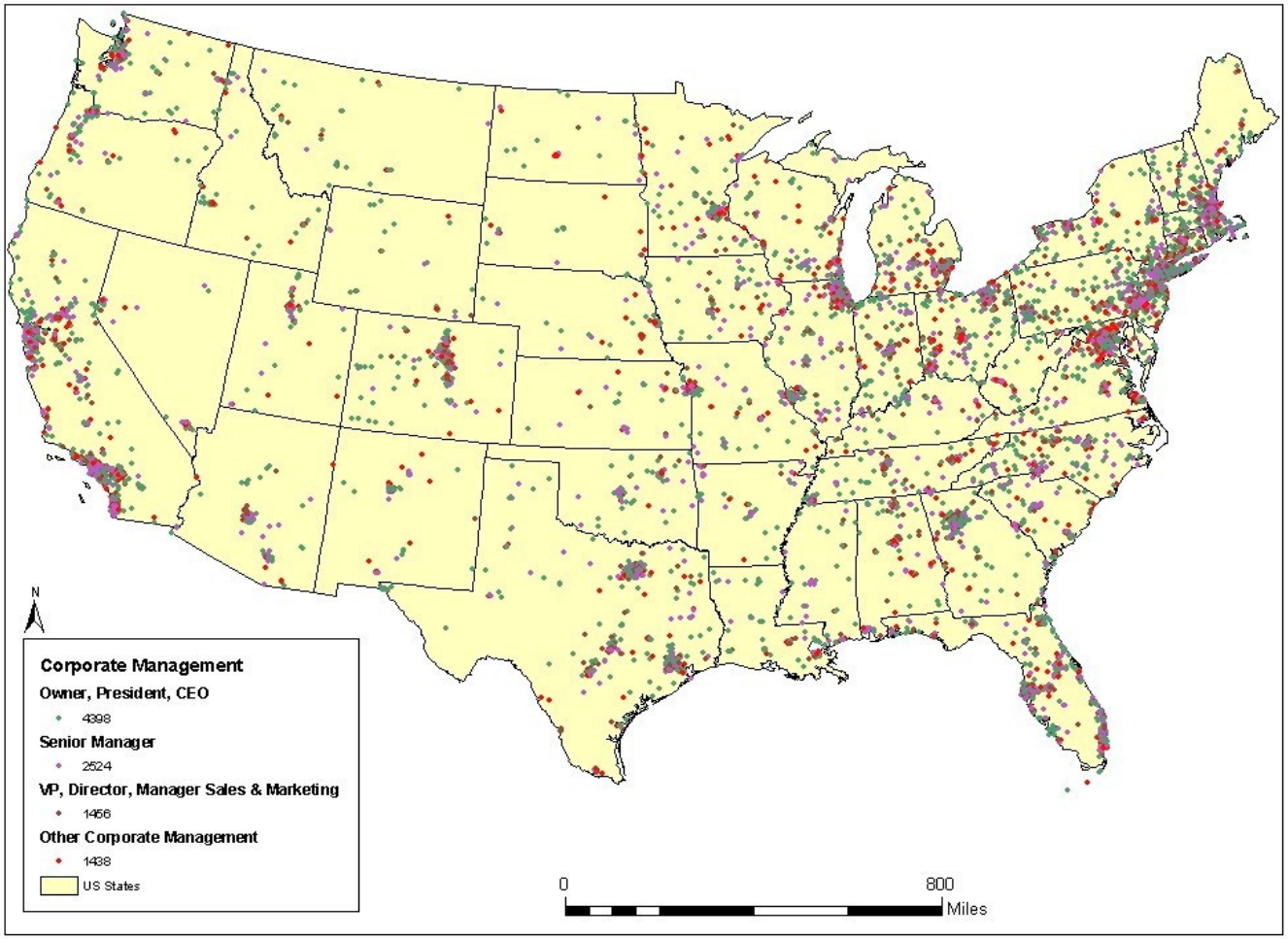


Figure 27. *GeoSpatial Solutions*' individual corporate management codes processed with ArcMap.

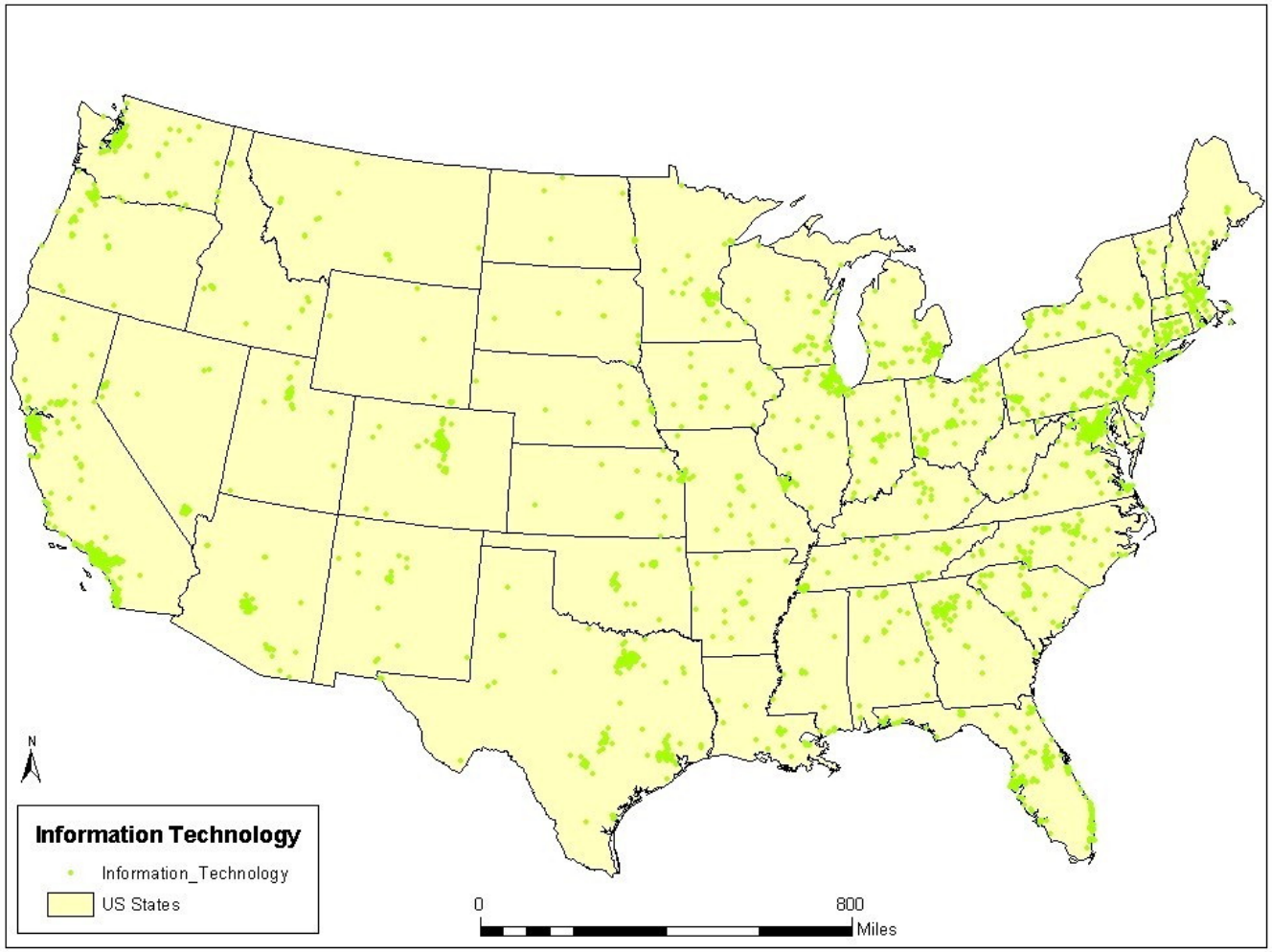


Figure 28. *GeoSpatial Solutions*' combined information technology codes processed with ArcMap.

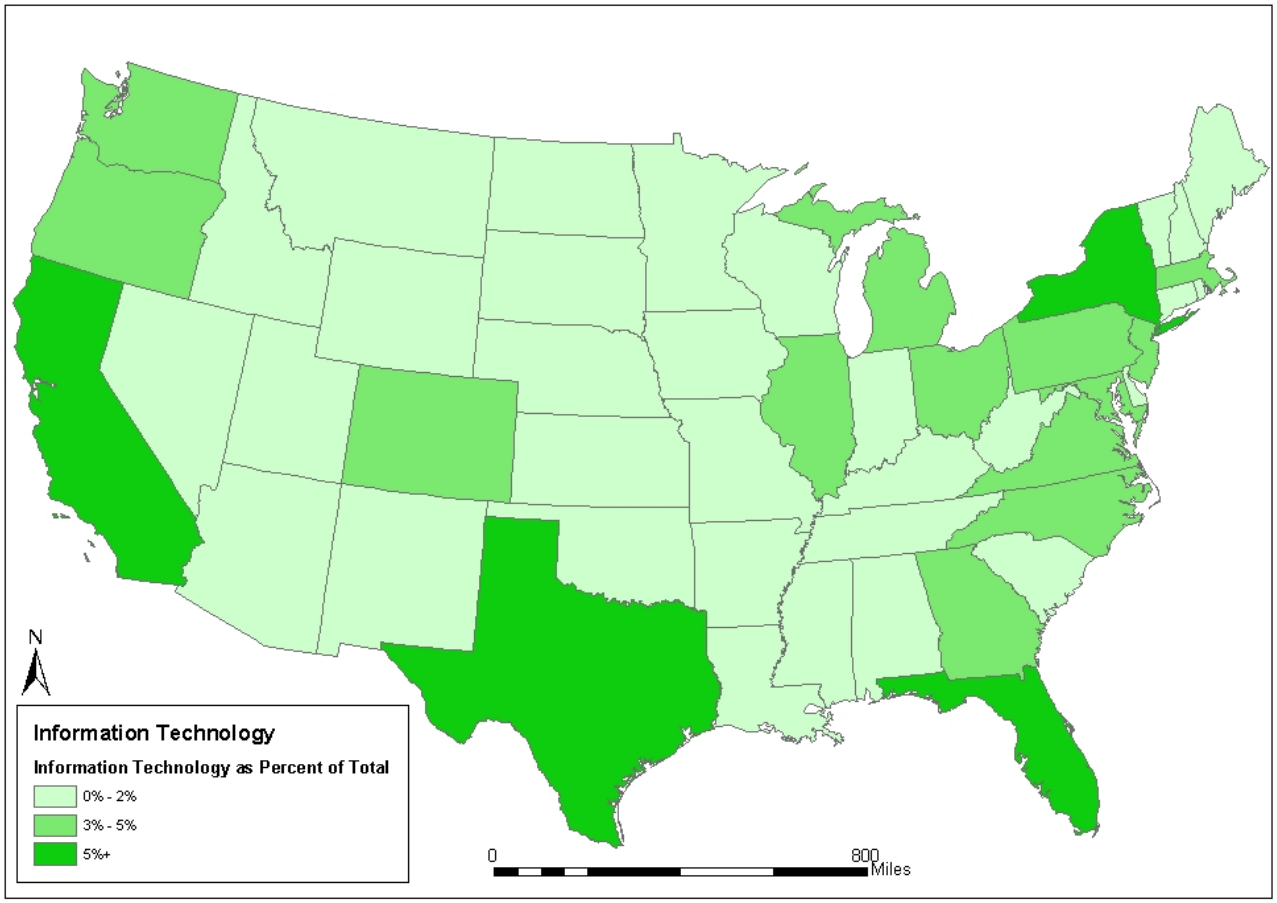


Figure 29. *GeoSpatial Solutions*' combined information technology codes percent by state processed with ArcMap.

These categories and their counts are represented on map (Figure 4-25):

Table 12. *GeoSpatial Solutions'* operations codes.

Code	**Description**	**Total Subscribers**	**Percent of Total**
M	Senior Manager	634	5.7%
N	Manager	2,432	22%
O	Engineer	1,892	17%
P	GIS Technician	1,249	11.2%
Q	Geospatial Professionals	2,962	26.6%
R	Systems Integrator	236	2.1%
S	Technician/Analyst/Administrator	1,453	13.1%
T	Other Operations	260	2.3%
Total		**11,118**	**100%**

GIS Firms

This analysis identifies geographic locations of GIS firms and their submarkets in the US *GeoSpatial Solutions* made available a data set of companies that receive their magazine. Using this 'companies' data set a geographic analysis was done to locate each company by their corresponding latitude and longitude.

This map shows the general representation of the *GeoSpatial Solutions* companies data set and their geographic location. The companies' list was formed of 647 records (Figure 36). This map shows the submarket for these 647 companies.

The three submarkets were created using the summary from the CACI Coder/Plus (ESRI) after geocoding the companies list.

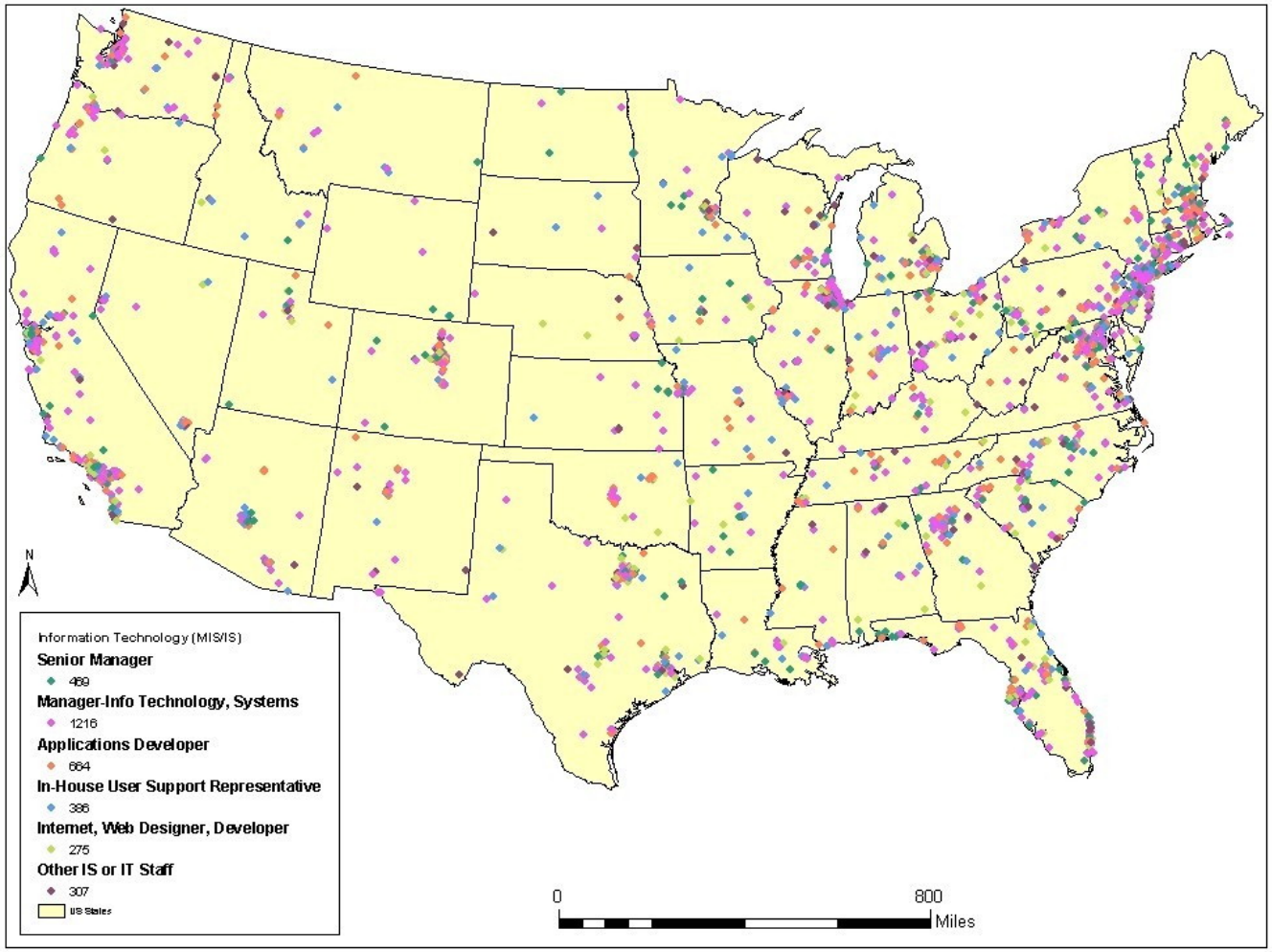


Figure 30. *GeoSpatial Solutions*' individual information technology codes processed with ArcMap

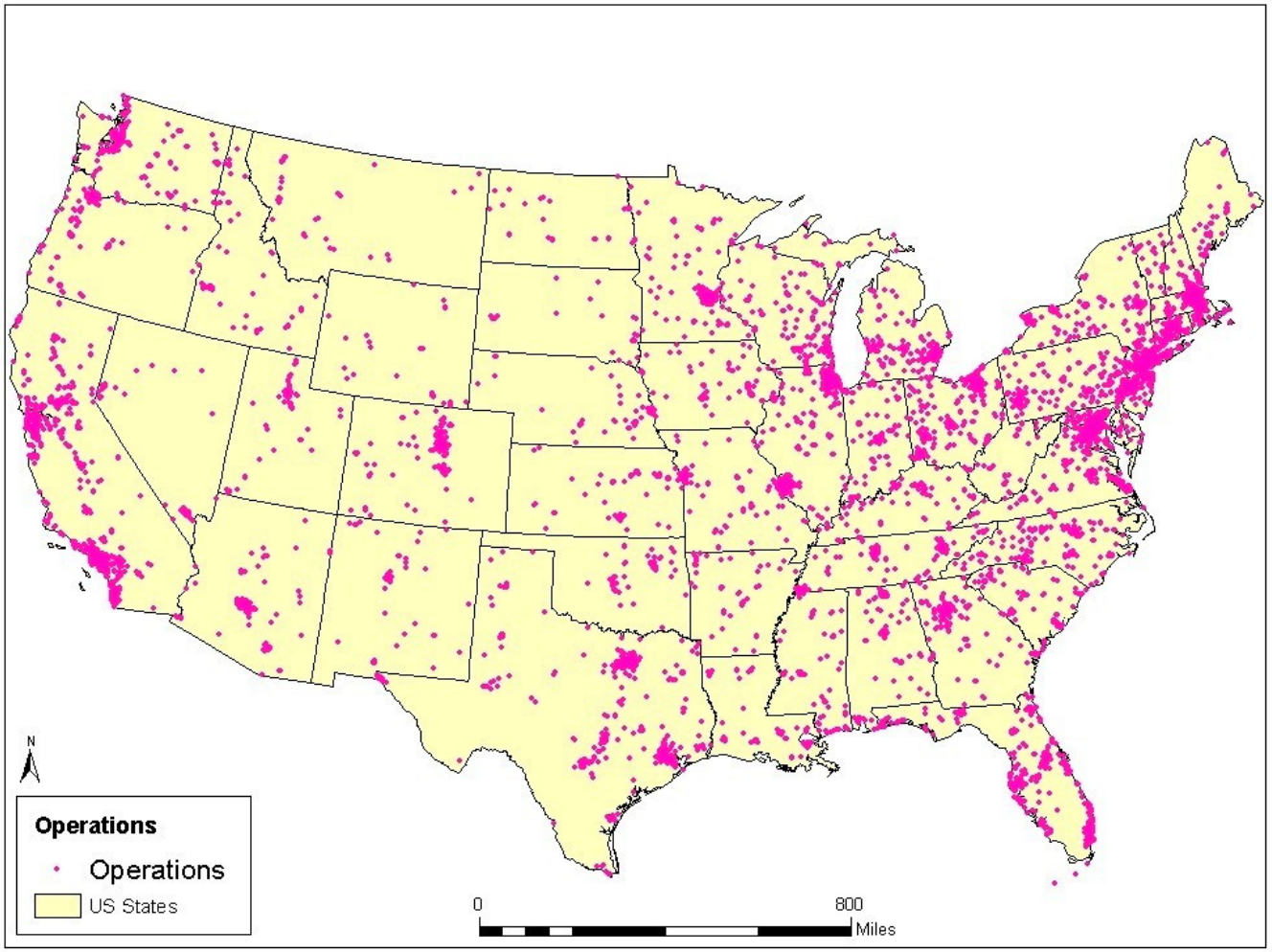


Figure 31. *GeoSpatial Solutions*' combined operations codes processed with ArcMap.

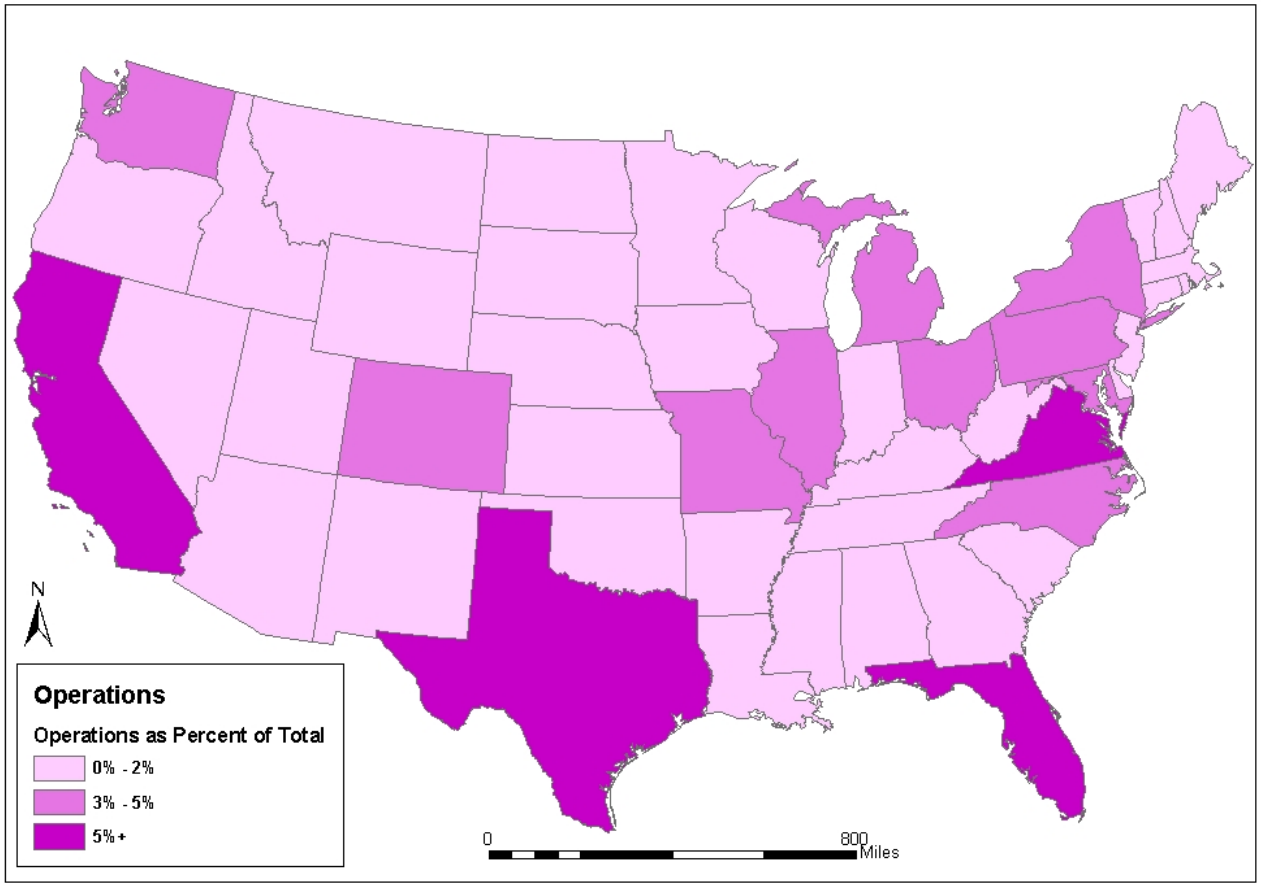


Figure 32. *GeoSpatial Solutions*' combined operations codes percent by state processed with ArcMap.

Figure 33. *GeoSpatial Solutions*' individual operations codes processed with ArcMap.

The submarkets were categorized using the top 20 metro areas; the primary submarket ranging from the 4% and above, the secondary submarket from 2% to 3.9%, and the tertiary submarket from 1.9% and below. Also, figure 33 shows the companies' counts for each market. The tertiary market has the highest count with 321 companies, the secondary submarket has a count of 170 companies, and the primary submarket has a count of 156 companies (Figure 33). The next map illustrates *GeoSpatial Solutions*' companies dataset percent of total by state (Figure 34).

To get a better understanding of the influences of *GeoSpatial Solutions* in each state a percentage rate of firms by state was analyzed. To analyze this data set further, data of Establishments (firms) from US Census Bureau from 2000 was acquired. This new data and the data made available by *GeoSpatial Solutions* was processed through the following formula:

(Firms / Establishment) * 1000 = Rate of Companies

The analysis was executed using Microsoft Excel and a graph of the rates of companies by state was created (Table 9). The result was a high concentration of companies located in Colorado, and a lower concentration in New Mexico, Virginia, Maryland, and lower concentrations in the other states (Figure 35).

Table 13. *GeoSpatial Solutions*' percentage of companies by state using data from the US Census Bureau.

Percentage Rate of Companies by State

Estates	GeoSpatial Solutions Companies	Establishment	Rate of Companies by 1000
Colorado	77	115,893	0.66
New Mexico	10	38,320	0.26
Virginia	36	155,985	0.23
Maryland	23	113,481	0.20
Georgia	34	175,250	0.19

Table 4-10. Continued

Estates	GeoSpatial Solutions Companies	Establishment	Rate of Companies by 1000
New Hampshire	6	33,146	0.18
California	123	693,987	0.18
Massachusetts	27	154,385	0.17
Alabama	14	91,472	0.15
Utah	7	46,473	0.15
Montana	4	27,140	0.15
Oregon	10	88,292	0.11
District of Columbia	2	17,817	0.11
Washington	15	142,653	0.11
Vermont	2	19,097	0.10
Connecticut	8	83,145	0.10
Texas	40	420,139	0.10
Idaho	3	31,991	0.09
Florida	34	372,132	0.09
Minnesota	11	120,668	0.09
Arizona	9	98,834	0.09
Maine	3	33,721	0.09
Kentucky	7	81,935	0.09
Missouri	9	130,269	0.07
Nebraska	3	44,029	0.07
Wisconsin	8	125,600	0.06
Wyoming	1	15,713	0.06
Pennsylvania	16	267,546	0.06
Ohio	14	246,210	0.06
Mississippi	3	54,368	0.06
Iowa	4	73,436	0.05
Louisiana	5	92,092	0.05
New Jersey	11	205,043	0.05
West Virginia	2	37,800	0.05
Nevada	2	40,211	0.05
Delaware	1	20,478	0.05
South Dakota	1	21,037	0.05
South Carolina	4	86,770	0.05
Kansas	3	67,139	0.04
New York	19	429,397	0.04
North Carolina	8	181,306	0.04
Illinois	11	273,421	0.04
Rhode Island	1	25,139	0.04
Oklahoma	3	76,566	0.04
Tennessee	4	119,362	0.03
Michigan	4	210,508	0.02
Arkansas	1	56,235	0.02
Indiana	2	133,226	0.02
North Dakota	0	18,308	0.00
	Source: U.S. Census Bureau		*Public Information Office*

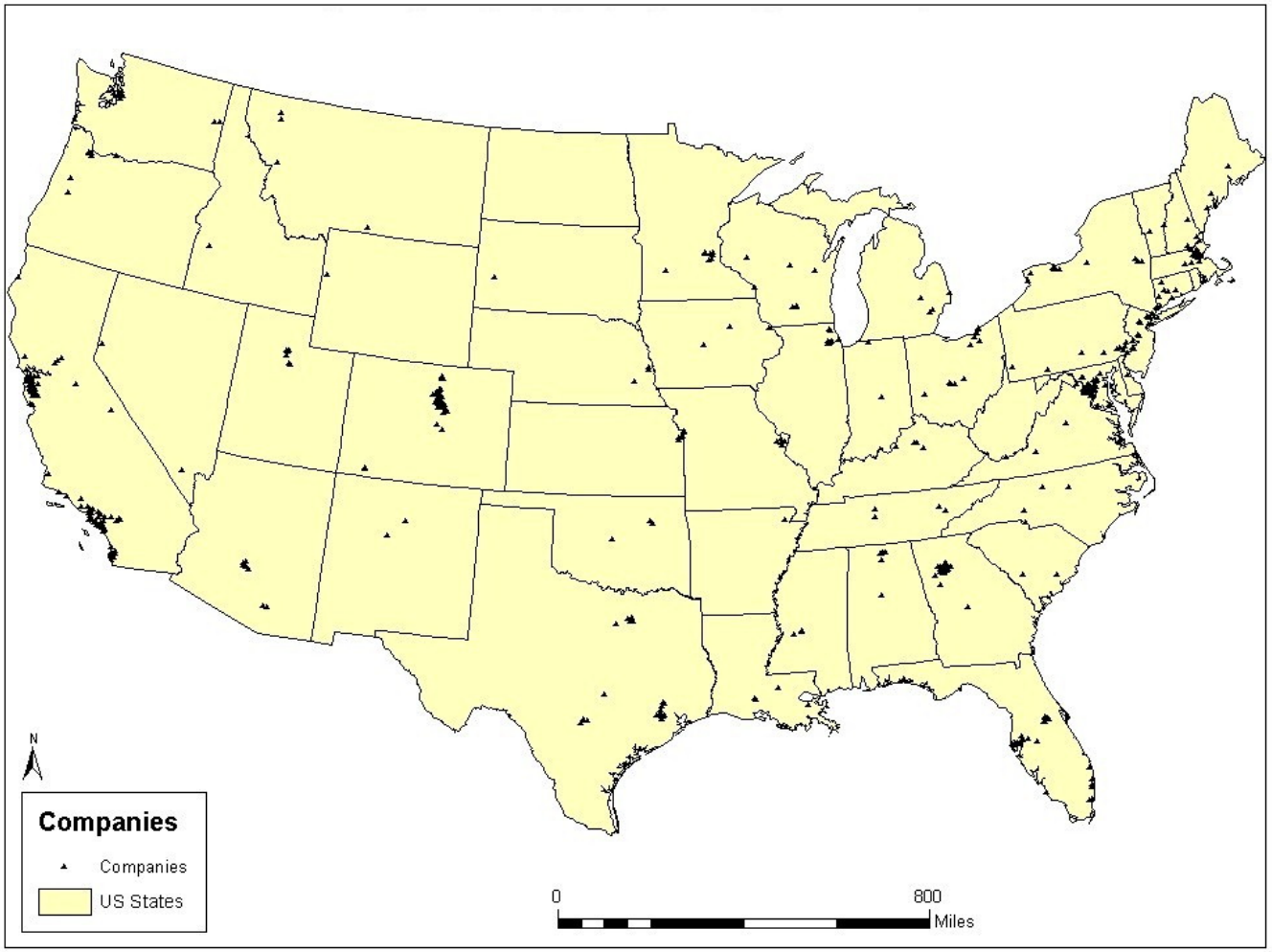


Figure 34. *GeoSpatial Solutions*' US companies data set processed with ArcMap.

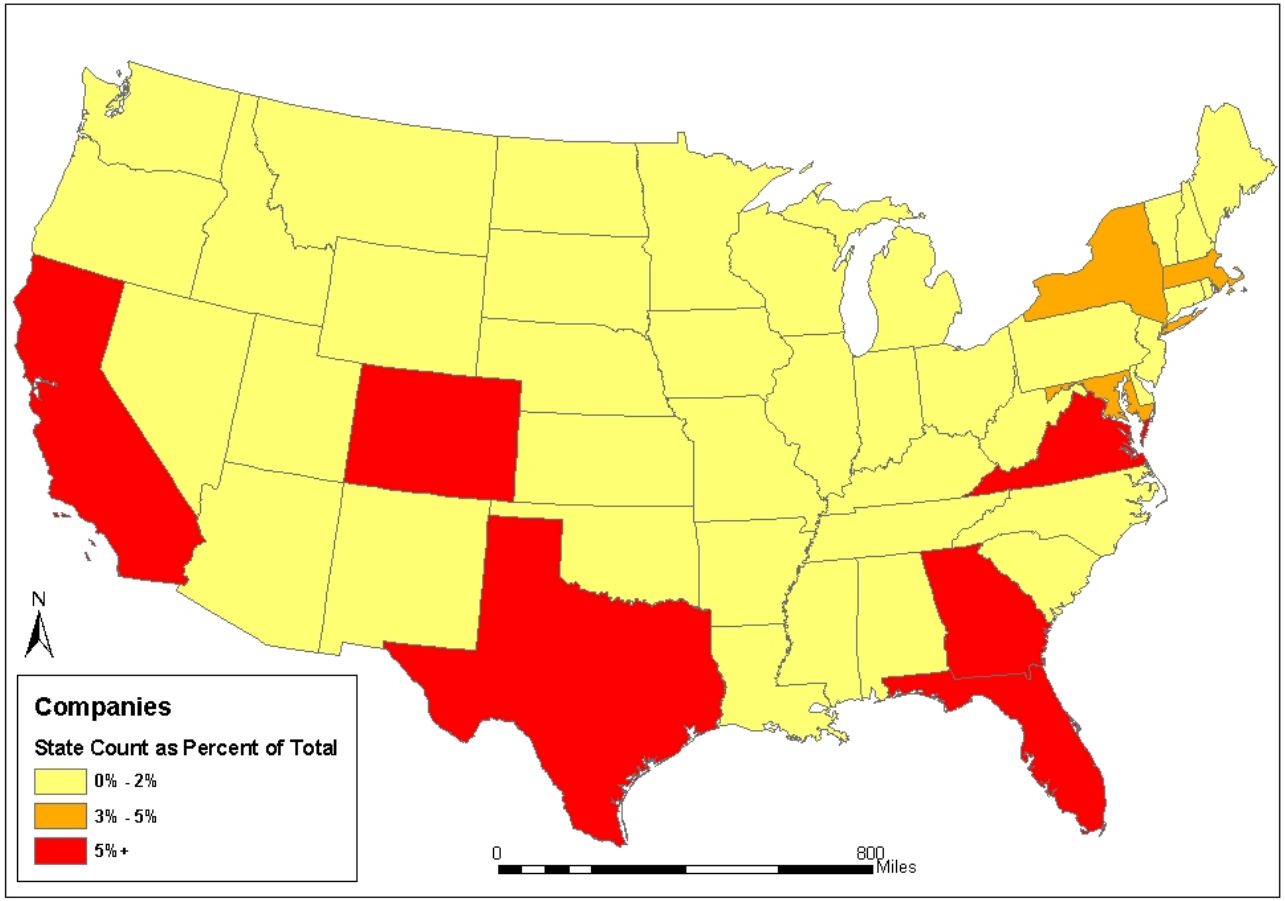


Figure 35. *GeoSpatial Solutions*' US companies data set percent by state processed with ArcMap.

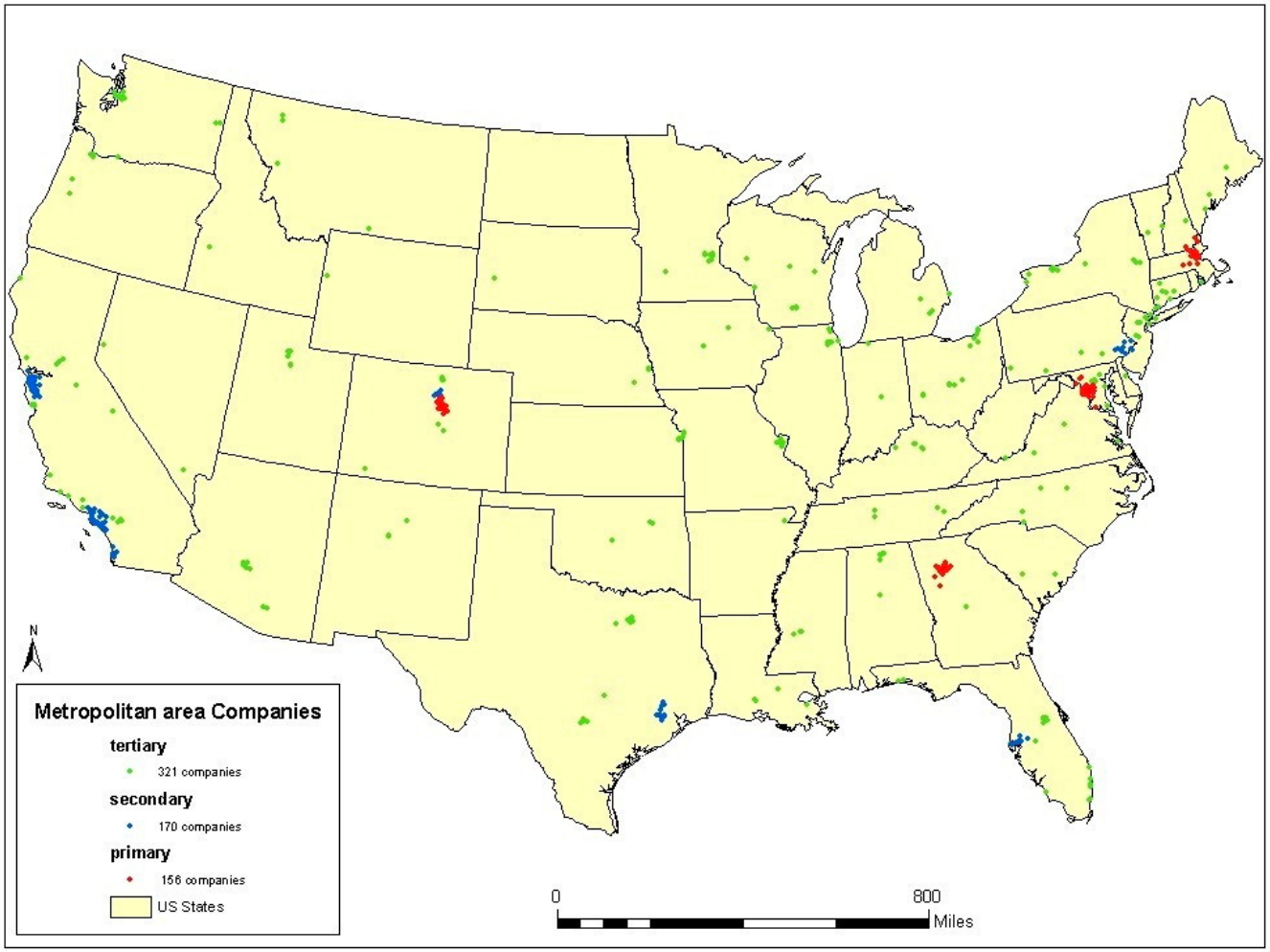


Figure 36. *GeoSpatial Solutions*' percentage of companies by state using data from the US Census Bureau.

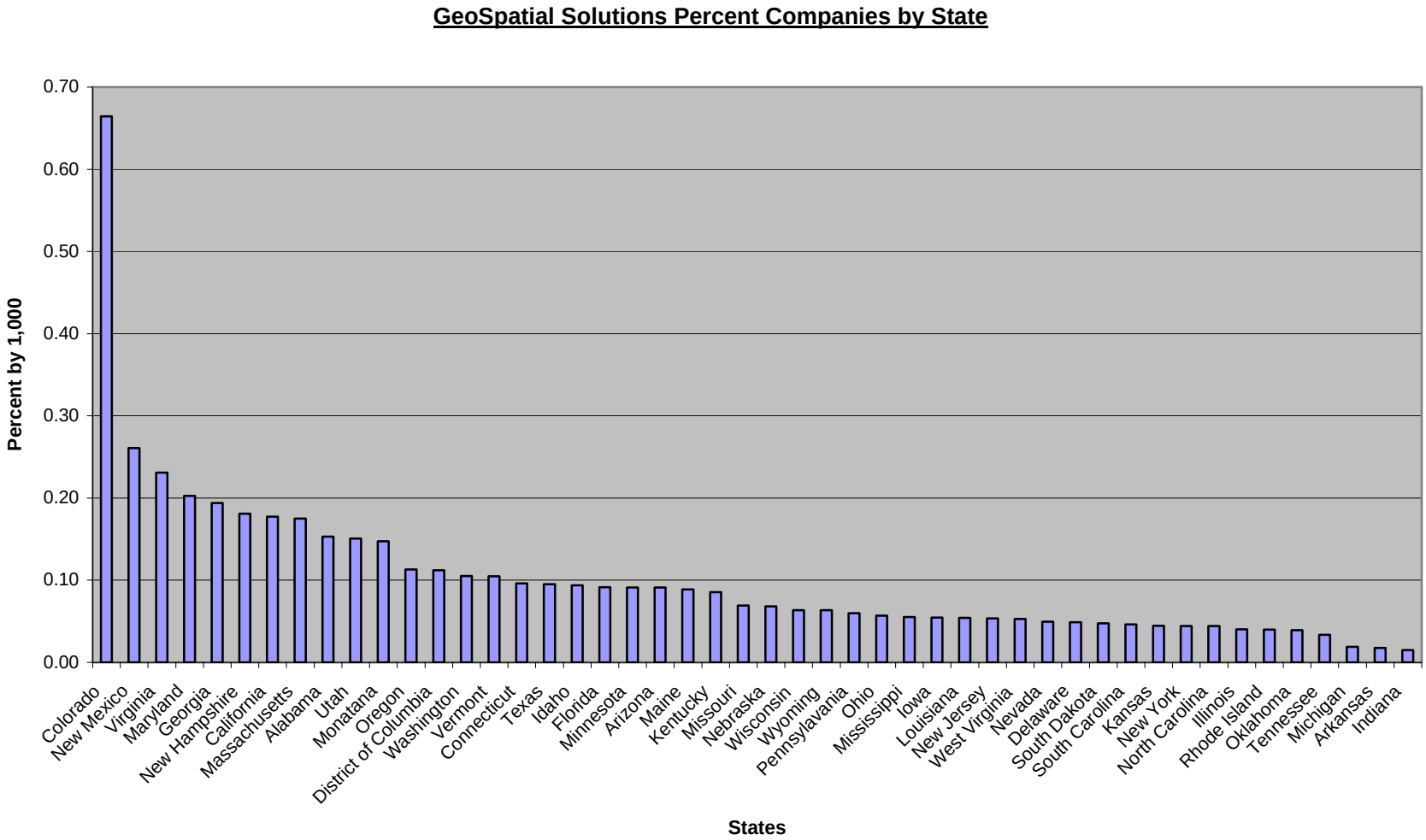


Figure 37. *GeoSpatial Solutions*' percentage rate of companies by state using data from the US Census Bureau.

CHAPTER 5
SOCIAL-ECONOMIC CORRELATIONS

This analysis identifies social-economic (LSP) influences of sub markets with a high concentration of GIS for their location in the US.

The social-economic correlation directly and/or indirectly affects the location of GIS industries in a specific area, city, or state.

High Concentration Regions

The market analysis identifies geographic location areas with high concentration regions of GIS. A further analysis of *GeoSpatial Solutions*' subscribers was performed to better understand and graphically see which metropolitan areas have high concentrations of subscribers in the United States.

To analyze *GeoSpatial Solutions*' market more in depth, the top metropolitan areas were created. Using the summary created by CACI Coder/Plus (ESRI), three sub markets were selected from the Top 20 Metropolitan Statistical Areas (Table 14). Then, based on a percentage count, a map of top metropolitan areas was created.

Table 14. Geocoding match level summary of top 20 metropolitan areas by percentage of subscribers from CACI Coder/Plus.

	Record Count	Percent of Total Subscribers
Top 20 Metropolitan Areas		
Washington, DC (8840)	1,372	5.3%
Los Angeles-L.Beach (4480)	657	2.5%
Boston-Wor-Law-Lw-Br (1123)	576	2.2%
Chicago, IL (1600)	566	2.2%

Table 5-1. Continued

Top 20 Metropolitan Areas		
New York, NY (5600)	486	1.9%
Atlanta, GA (0520)	421	1.6%
Denver, CO (2080)	421	1.6%
San Diego, CA (7320)	387	1.5%
Houston, TX (3360)	383	1.5%
Philadelphia, PA-NJ (6160)	359	1.4%
Minneapolis-St. Paul (5120)	326	1.3%
Seattle-Bellev-Ev'tt (7600)	321	1.2%
Dallas, TX (1920)	304	1.2%
Orange County, CA (5945)	298	1.1%
Baltimore, MD (0720)	295	1.1%
St. Louis, MO-IL (7040)	279	1.1%
Oakland, CA (5775)	259	1.0%
Phoenix-Mesa, AZ (6200)	255	1.0%
Sacramento, CA (6920)	255	1.0%
Riverside-San Bern. (6780)	247	0.9%
Other MAs	13,219	50.8%
Records not in an MA	4,338	16.7%

These submarkets were divided into primary, secondary, and tertiary markets based on the percentage count of subscribers in each metropolitan area (Table 15).

This map also shows the three sub markets and their specific counts for each metropolitan area (Figure 38). These three sub markets were divided according to their percentage levels. The primary market is formed by subscriber count percentages of 4% or higher. The secondary sub market is made up of percentages between 2% and 3.9% of subscribers. The tertiary submarket is comprised of percentages between 1.1% and 1.9% of total subscribers. To create this map from the subscribers' data set, the MSA was

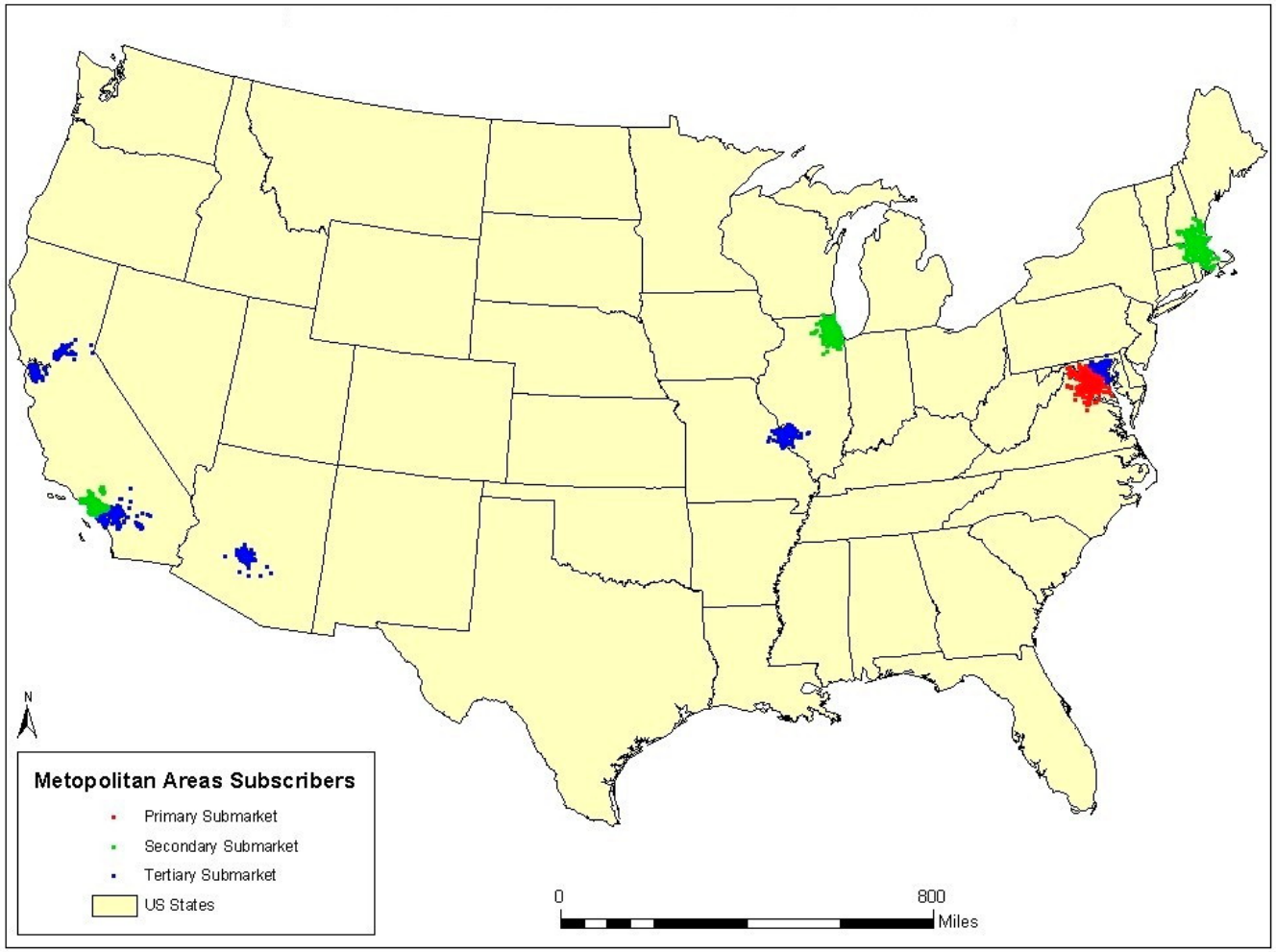
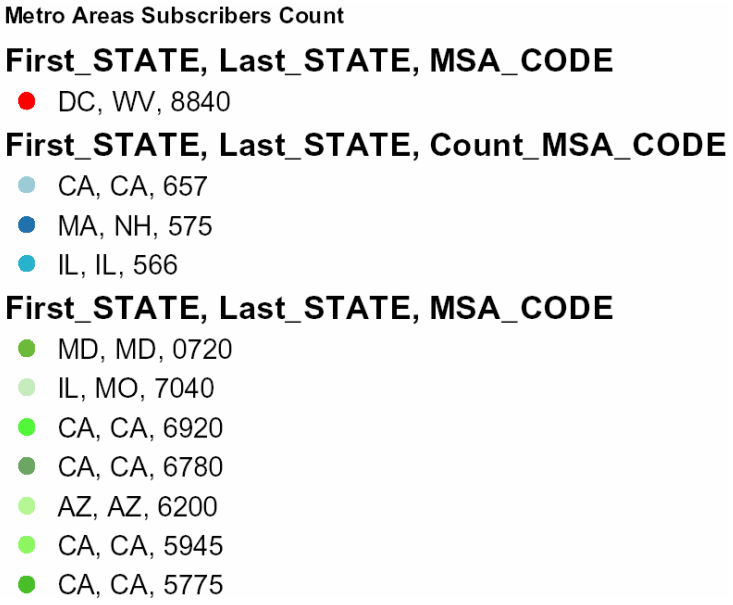


Figure 38. *GeoSpatial Solutions*' top metropolitan areas by subscribers processed with ArcMap.

selected. Metropolitan Statistical Area codes were produced using CACI Coder/Plus (ESRI) produced.

The primary sub market is formed by the MSA code 8840, which corresponds with the Washington, DC area. The secondary sub market is formed by the MSA codes: 4480, the Los Angeles-L Beach area; 1123, the Boston-Wor-Law-Lw-Br area; 1600, and the Chicago, IL area. The tertiary sub market is formed by the MSA codes: 5600, the New York area; 0520, the Atlanta area; 2080, the Denver area; 7320, the San Diego area; 3360, the Houston area; 6160, the Philadelphia, PA-NJ area; 5120, the Minneapolis-St. Paul area; 7600, the Seattle-Bellev-Ev'tt area; 1920, the Dallas area; 5945, the Orange County area; 0720, the Baltimore, MD area; and 7040, the St. Lois, MO-IL area (Figure 39).

Table 15. Identification of metropolitan areas by count of subscribers from CACI Coder/Plus



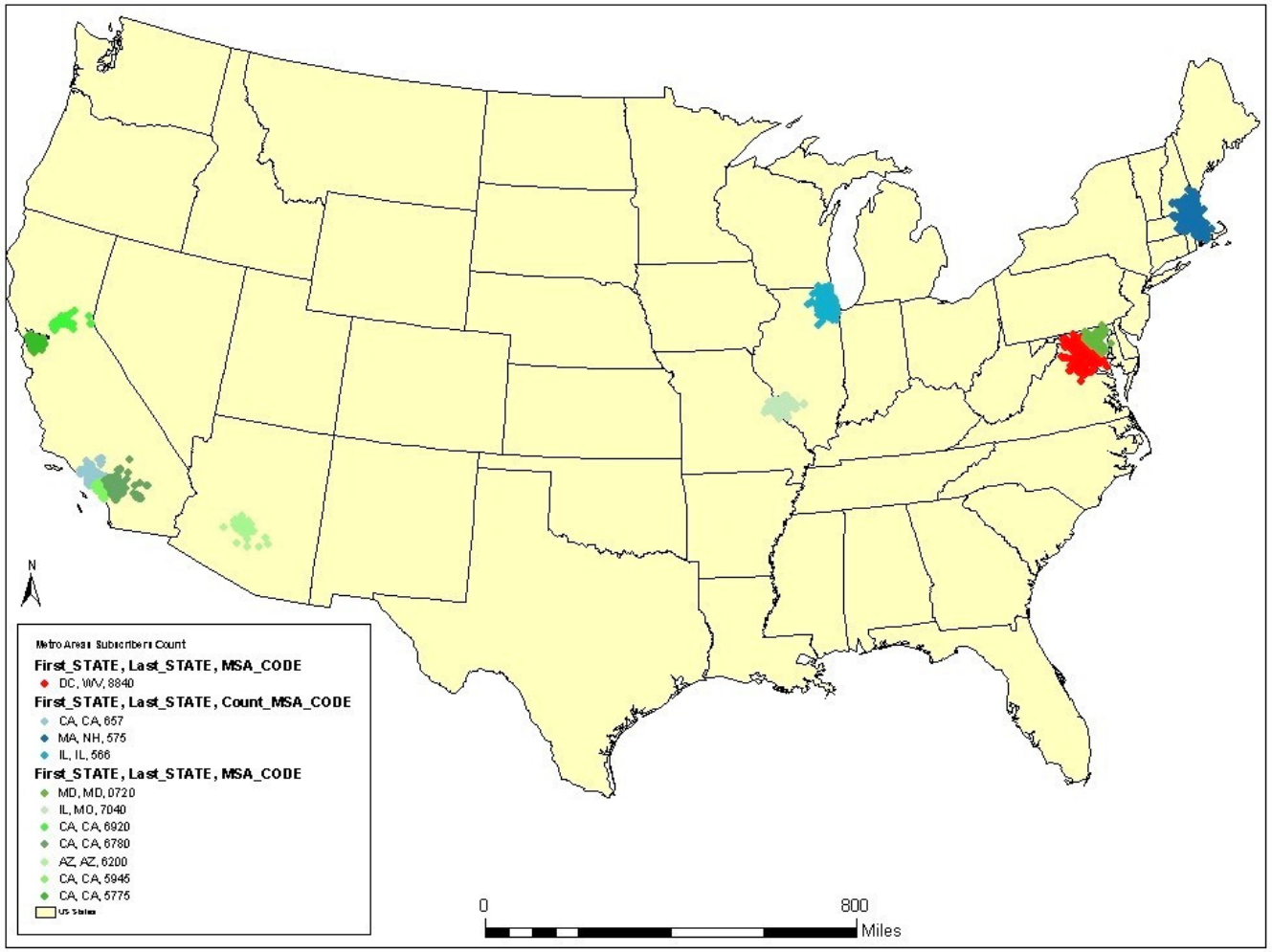


Figure 39. *GeoSpatial Solutions*' top metropolitan areas by count processed with ArcMap.

Also, a geographic representation of the data set of *GeoSpatial Solutions* companies was created to show their geographic location in the United States.

To take the analysis of the metropolitan areas one step further, the primary and secondary MSAs (Metropolitan Statistical Areas) were analyzed individually, and maps for each of the high concentration areas of the metropolitan areas were also included.

Primary Sub Market

Figure 40 shows the metropolitan areas of Maryland, Virginia, and Washington DC. This is the strongest sub market in the US for *GeoSpatial Solutions* subscribers. There is a concentration of subscribers in the Washington, DC area; this could be because of the uses of GIS in the government environment. Also, it may be due to an increase in companies and subscribers in this area because of the recent budget allocations granted to the home land defense agency.

Secondary Sub Market

Figure 41 shows the secondary metropolitan area, Los Angeles, which is a sub market area containing a high concentration of subscribers in the US. This might be because Los Angeles is a high technology industry, which brings a high market for GIS products. This map shows the secondary sub market that locates in the Massachusetts and New Hampshire area. The highest concentration locates in the Suffolk and Middlesex areas (Figure 42). This map shows the secondary sub market that locates in the Illinois area. The highest concentration is in Cook County (Figure 43).

The tertiary sub market was also created using the MSA; however the representation of the first two markets shows a more important characteristic for this analysis. Further analysis of the tertiary sub market can show new and interesting sub

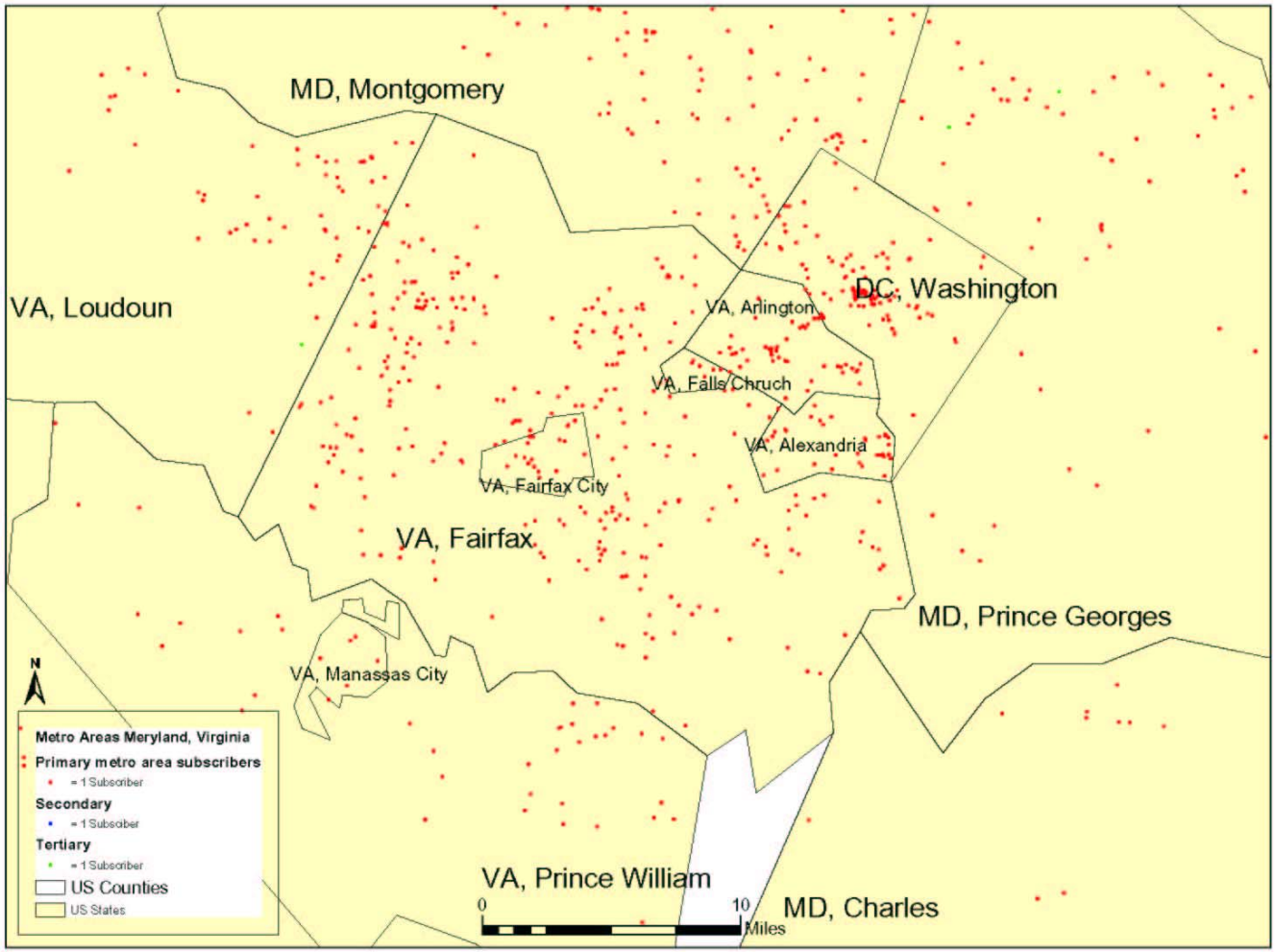


Figure 40. *GeoSpatial Solutions*' high concentration areas in Maryland/Virginia processed with ArcMap.

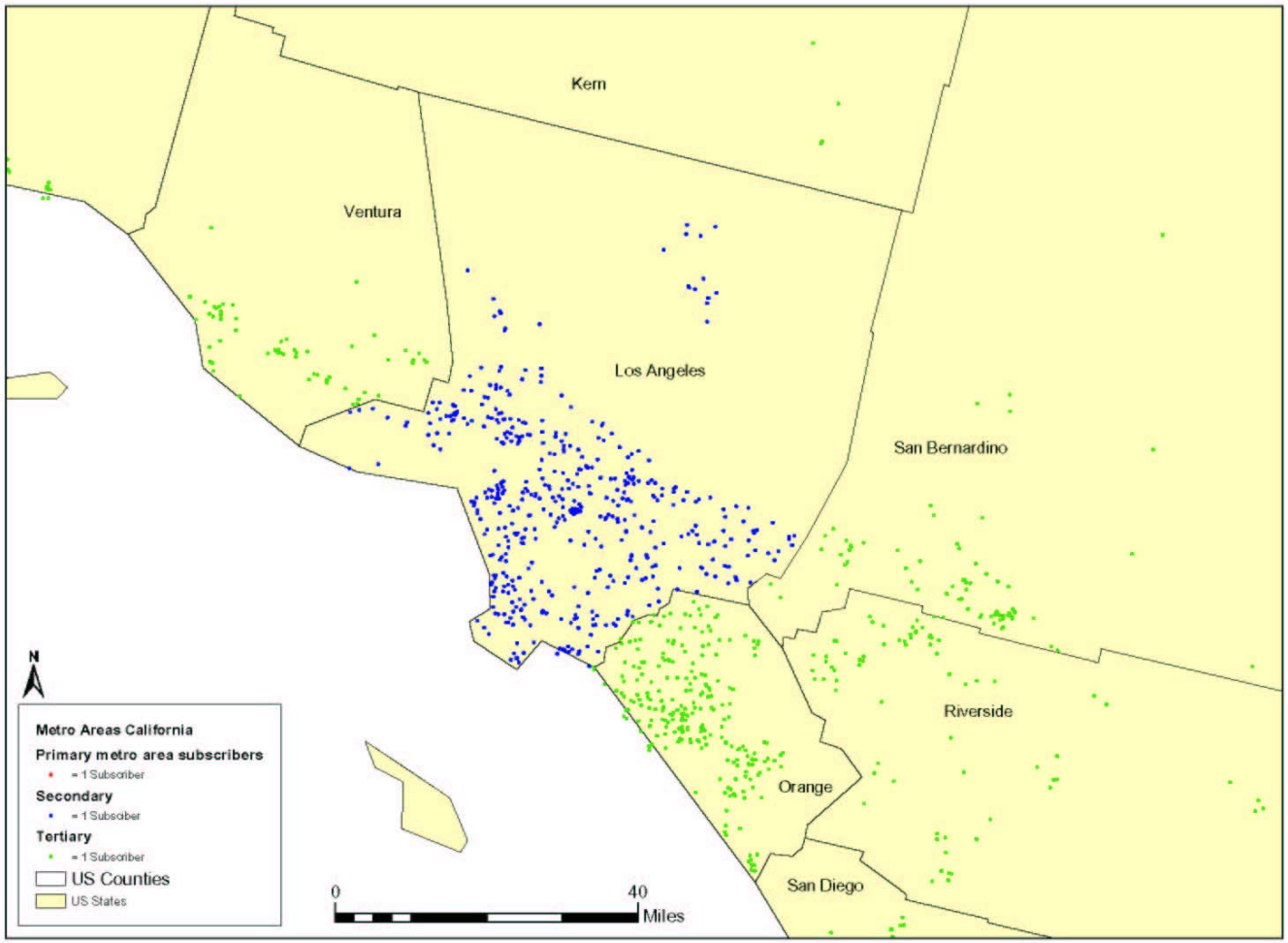


Figure 41. *GeoSpatial Solutions*' high concentration areas in California processed with ArcMap.

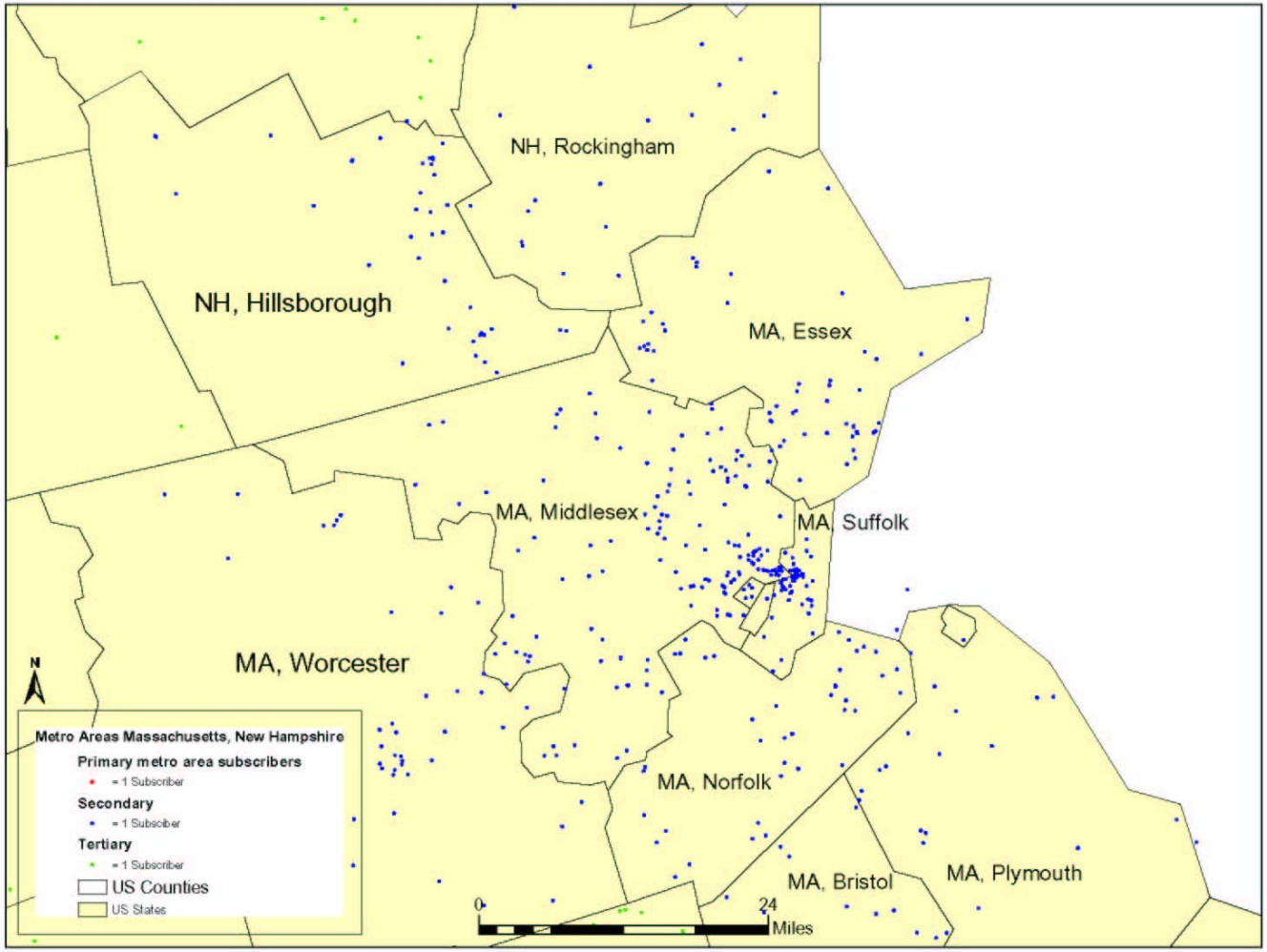


Figure 42. *GeoSpatial Solutions*' high concentration areas in Massachusetts/New Hampshire processed with ArcMap.

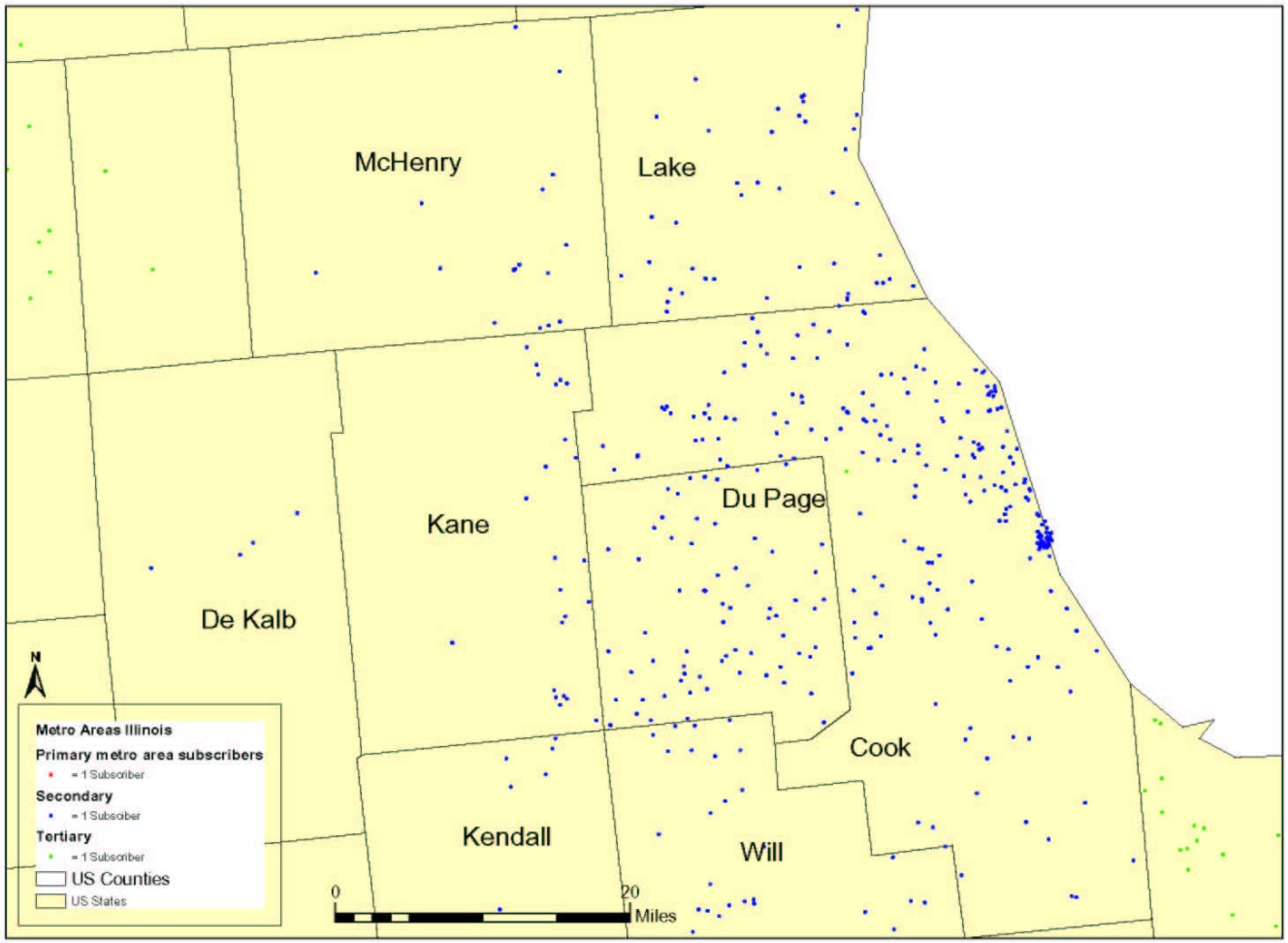


Figure 43. *GeoSpatial Solutions*' high concentration areas in Illinois processed with ArcMap.

markets where *GeoSpatial Solutions* could increase their subscriptions and market area. So further analysis may be an increasing advantage and an important judgment (category 4 of geographic reasoning) for the company.

Education

The following analysis documents the influences of education to attract the GIS market to the region. To do this analysis the map for business code University/College, code 35, was overlain with the GIS business maps. This overlay creates a new layer or map of education and this shows the correlations between the *GeoSpatial Solutions* companies list and the University/Education codes.

Figure 44 shows the total education market in the United States. The data set for this map was extracted from the subscribers list using the organizational affiliate code for University/College, code 35. Using this data a new layer was created which shows the geographic location of universities and colleges in the US.

The result of these layers were buffered (buffering creates a circular area selected within a specified radius of the University/College code data set. Four buffers at varying mile radiuses were formed. These four buffers were established for 10, 12, 15, and 18 miles and applied to the subscriber data to see its characteristics. These buffers show the influence of the educational sector to attract the GIS market to its area. These buffers, of 10, 12, 15, and 18 miles, were selected in order to find the business geography standard of 80% (where 80% of the values locate near a target).

Buffer at 10 Miles

Figure 5-8 shows the geographic location of all the universities and colleges, from *GeoSpatial Solutions*' data code 35, in the US. These locations where buffered to a 10 miles radius. The buffer and the locations were added to the same layer.

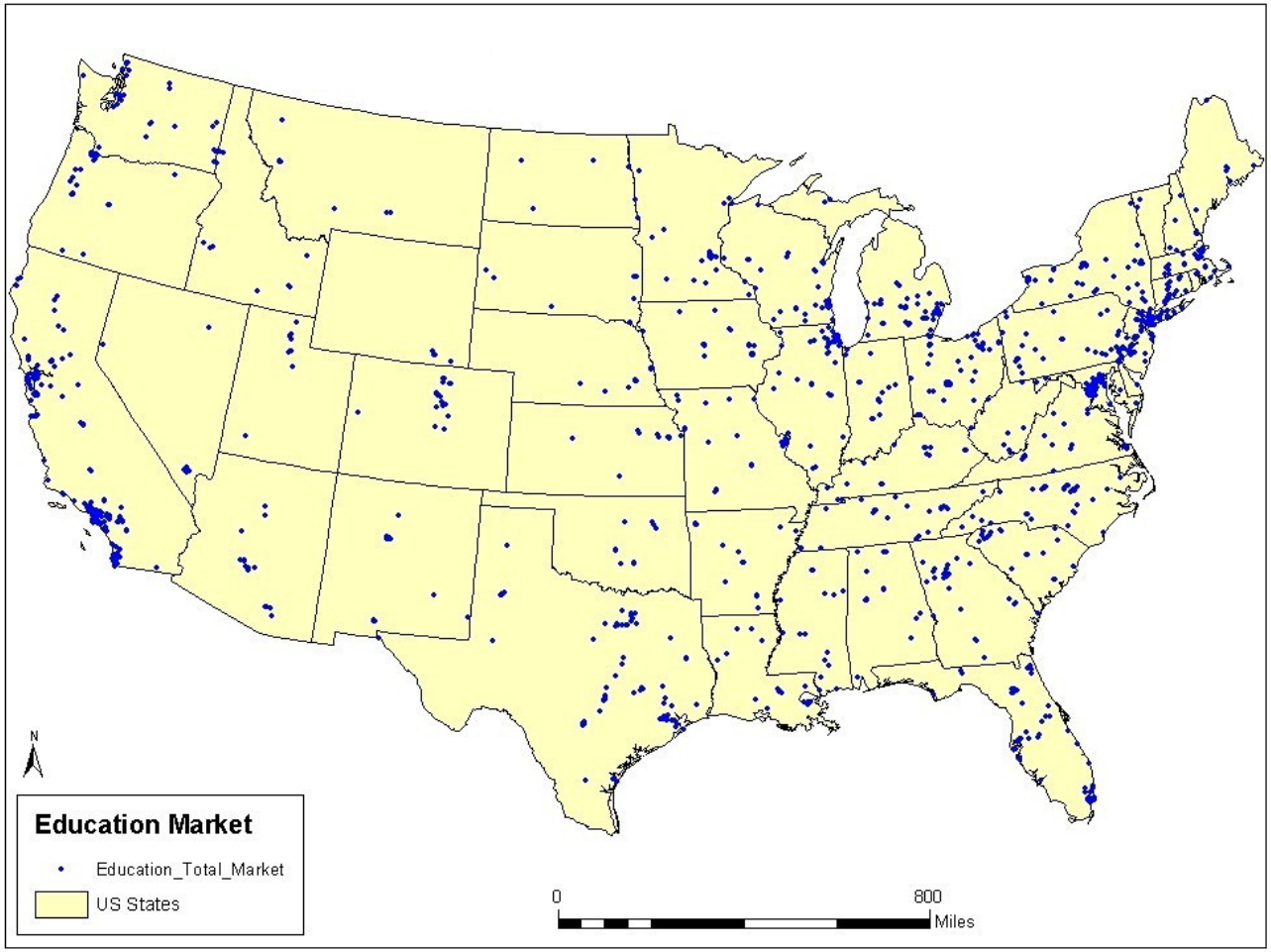


Figure 44. *GeoSpatial Solutions*' education business code US market processed with ArcMap.

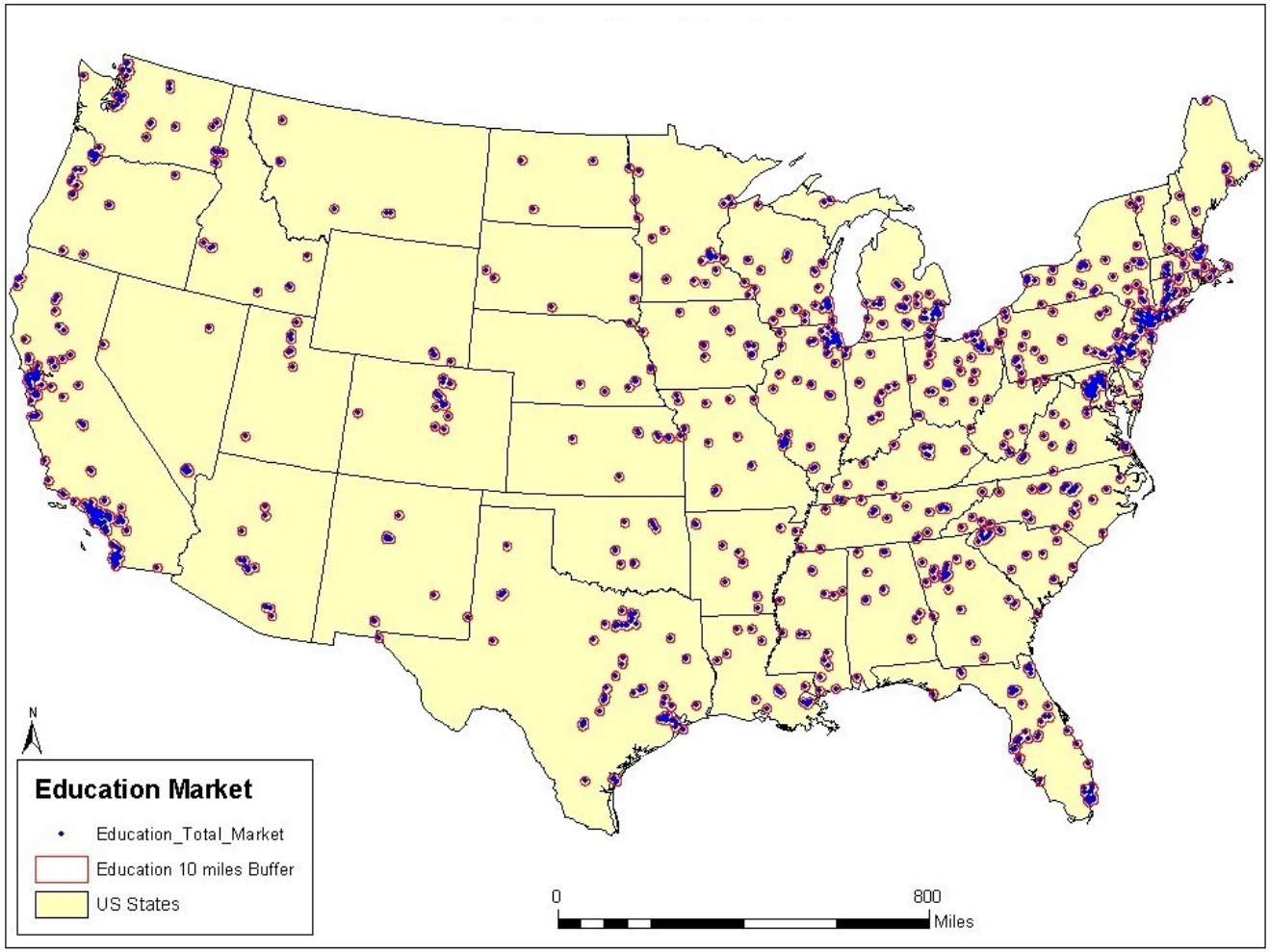


Figure 45. *GeoSpatial Solutions*' US education market with a buffer at 10 miles processed with ArcMap.

Buffer at 12 Miles

Figure 46 shows all the market for the universities and colleges, from *GeoSpatial Solutions*' data code 35, with a geographic location within the 12 miles radius. Then the two layers were overlapped to shows the educational market and the correspondent 12 miles buffer.

Buffer at 15 Miles

Figure 47 shows the geographic location of all the universities and college in the US. Also, it shows a buffer of 15 miles radius from each location.

Buffer at 18 Miles

Figure 48 shows the geographic location of universities and colleges based on their latitude and longitude. The layer of this location was buffered to an 18 miles radius.

Market Attraction

Also, to analyze the influences of the education from the *GeoSpatial Solutions* companies' data set, the company map was used to identify the location of the companies inside the four buffers and indicate the percentages of companies that locate near a university or college for each area.

This map represents the 647 company locations provided by *GeoSpatial Solutions* in the US (Figure 49). The company and the buffer maps were overlapped to form new data and layers. These new layers were created to show the Education Market Attraction for GIS companies to locate near universities and colleges. Table 16 represents the percentage of total companies from the GIS market that fit the 10, 12, 15, and 18 miles buffers from an educational institution.

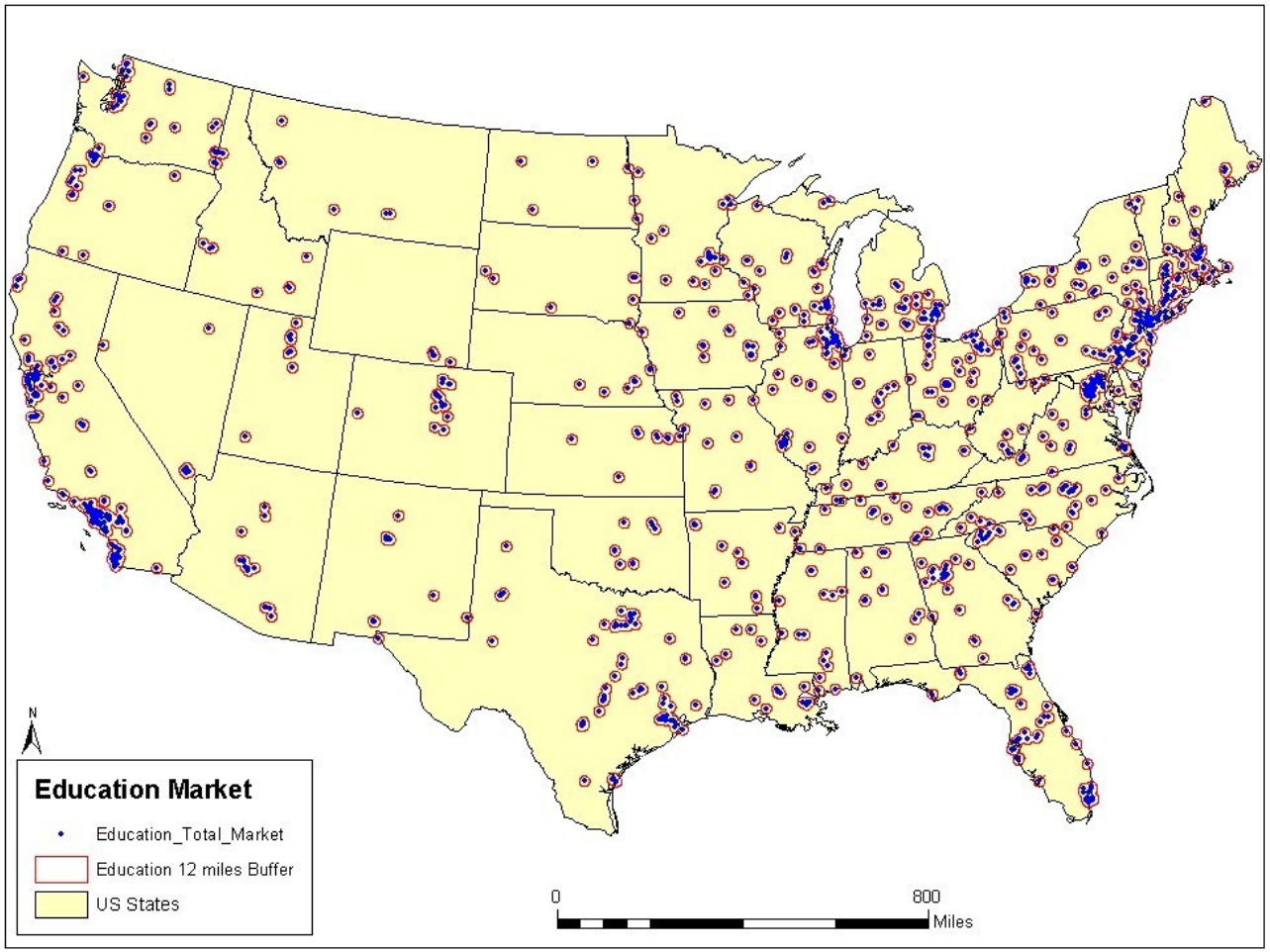


Figure 46. *GeoSpatial Solutions*' US education market with a buffer at 12 miles processed with ArcMap

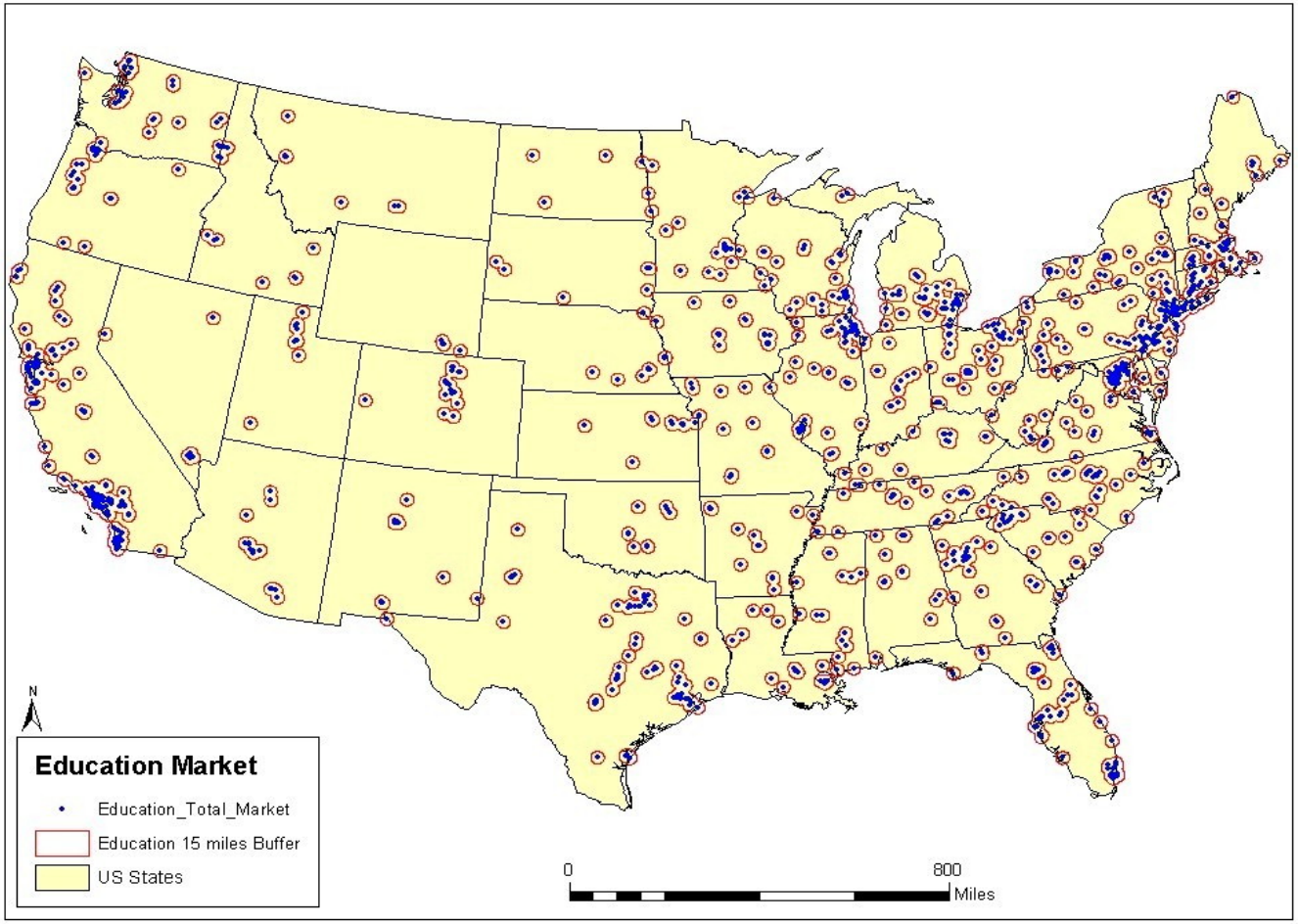


Figure 47. *GeoSpatial Solutions*' US education market with a buffer at 15 miles processed with ArcMap.

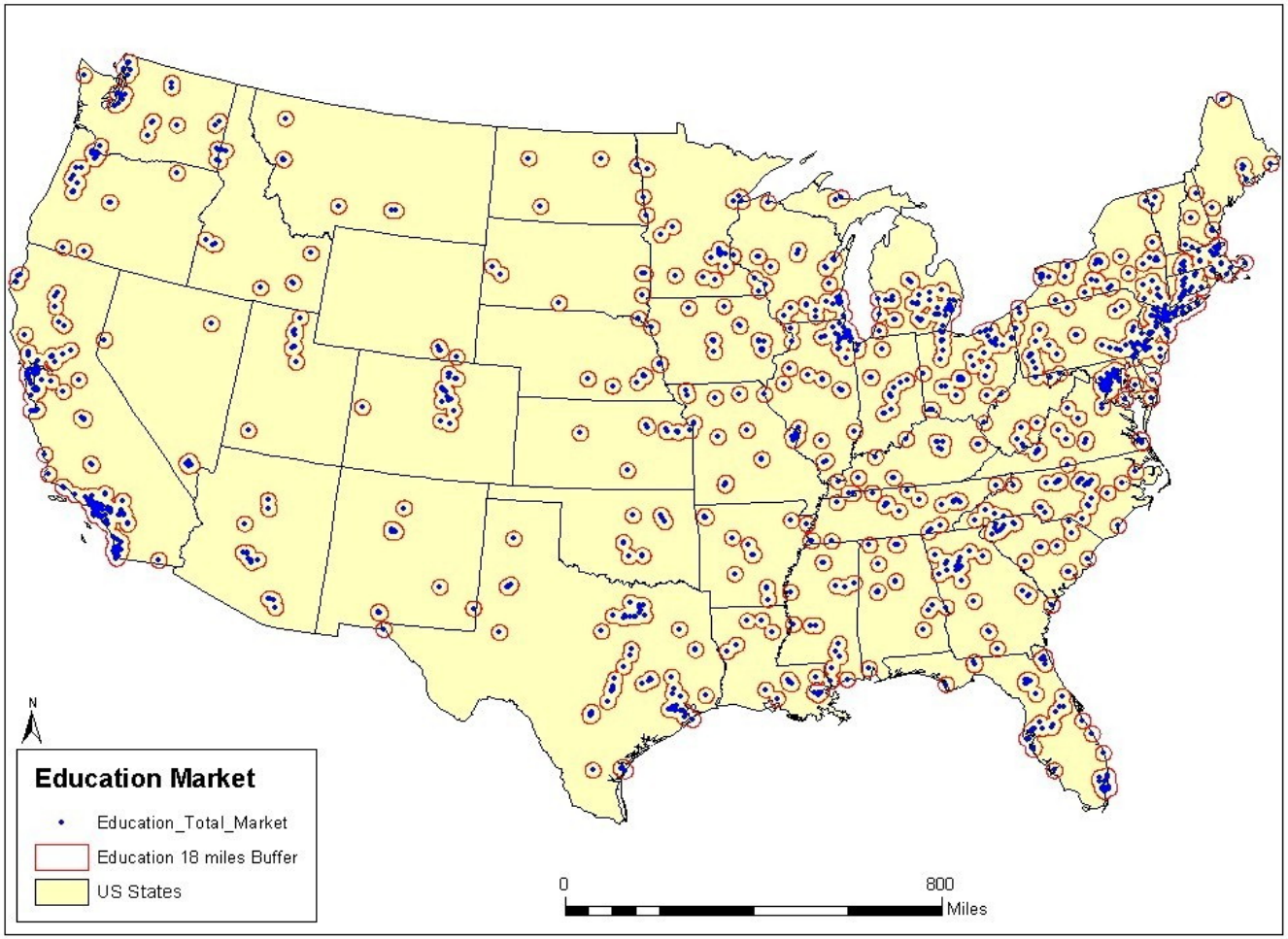


Figure 48. *GeoSpatial Solutions*' US education market with a buffer at 18 miles processed with ArcMap.

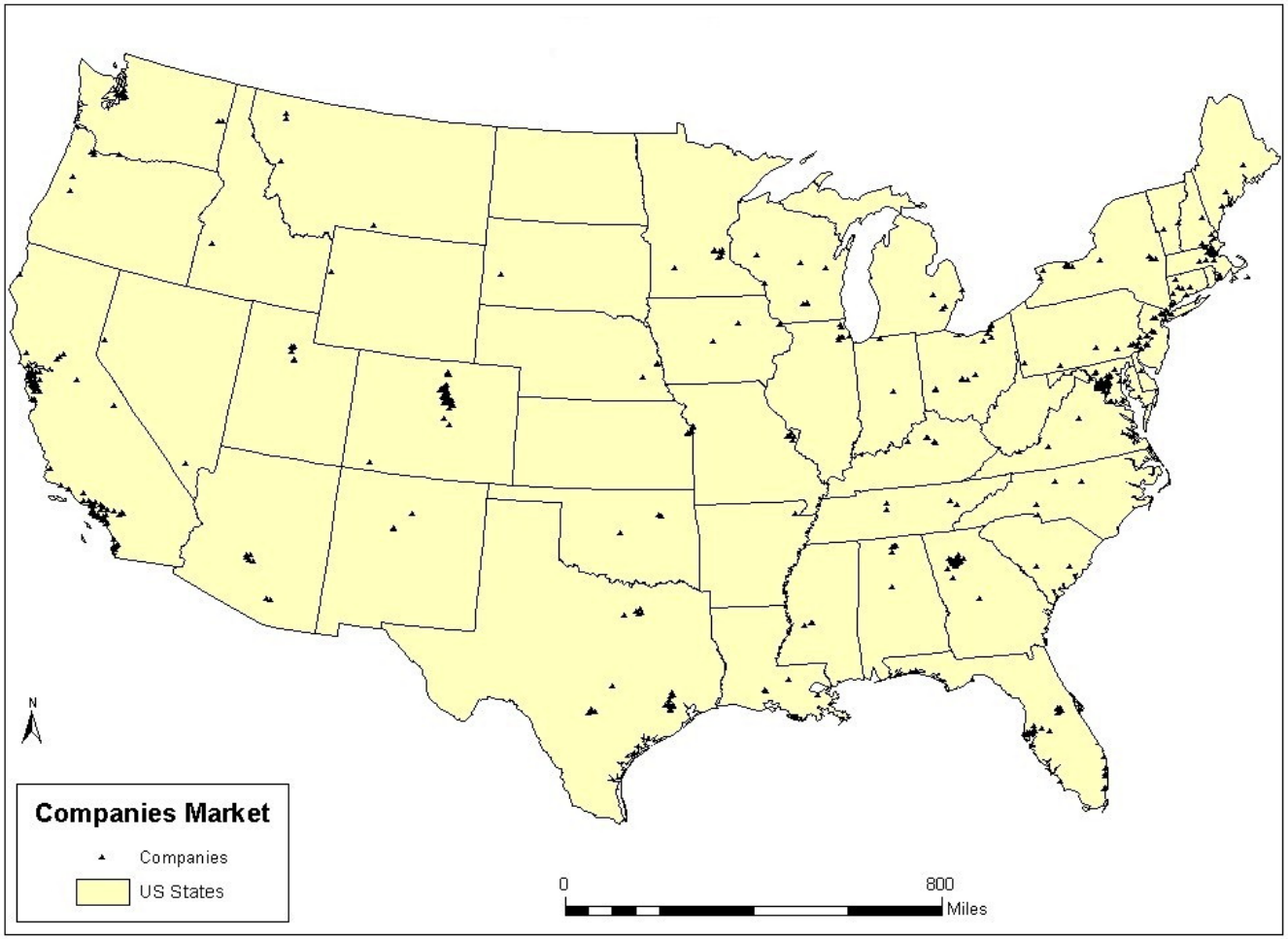


Figure 49. *GeoSpatial Solutions*' US companies dataset processed with ArcMap.

Table 16. GIS market attracted to the education market.

Buffer (miles)	**Total Companies**	**Companies in Buffer**	**Percent of Total Companies**
10	647	466	72.02%
12	647	488	75.43%
15	647	504	77.9%
18	647	520	80.37%

Market Attraction at 10 Miles

To create this map two layers were overlaid together. The map for the 647 companies in the US and the university/college map that was buffered to a 10 miles radius were overlaid. This map shows the relationship between the education and the company sectors. An analysis of the data set showed 466 companies of 647 total companies located inside this 10 miles radius (Figure 50). Correspondingly, this is 72.02% of the total companies in the US subscribed to *GeoSpatial Solutions* (Figure 51).

Market Attraction at 12 Miles

Overlapping the companies layer with the universities/colleges layer that was previously buffered to a 12 miles radius created this map. The map shows all the companies that locate within a 12 miles radius from the educational market. There are 488 companies that locate inside this 12 miles radius (Figure 52). This represents 75.43% of the total companies in the US (Figure 53).

Market Attraction at 15 Miles

This map shows the companies layer and the university/college buffer at a 15 miles radius (Figure 54). After overlaying these two layers the data set shows that there are 504

companies located inside this radius. These 504 companies represent 77.9% of the 647 companies in the US (Figure 55).

Market Attraction at 18 Miles

This map was created using the data set extracted from the subscribers list using the Organizational Affiliation code for the University/College Code 35. Also, the data set that *GeoSpatial Solutions* made available with a total count of 647 companies. The two

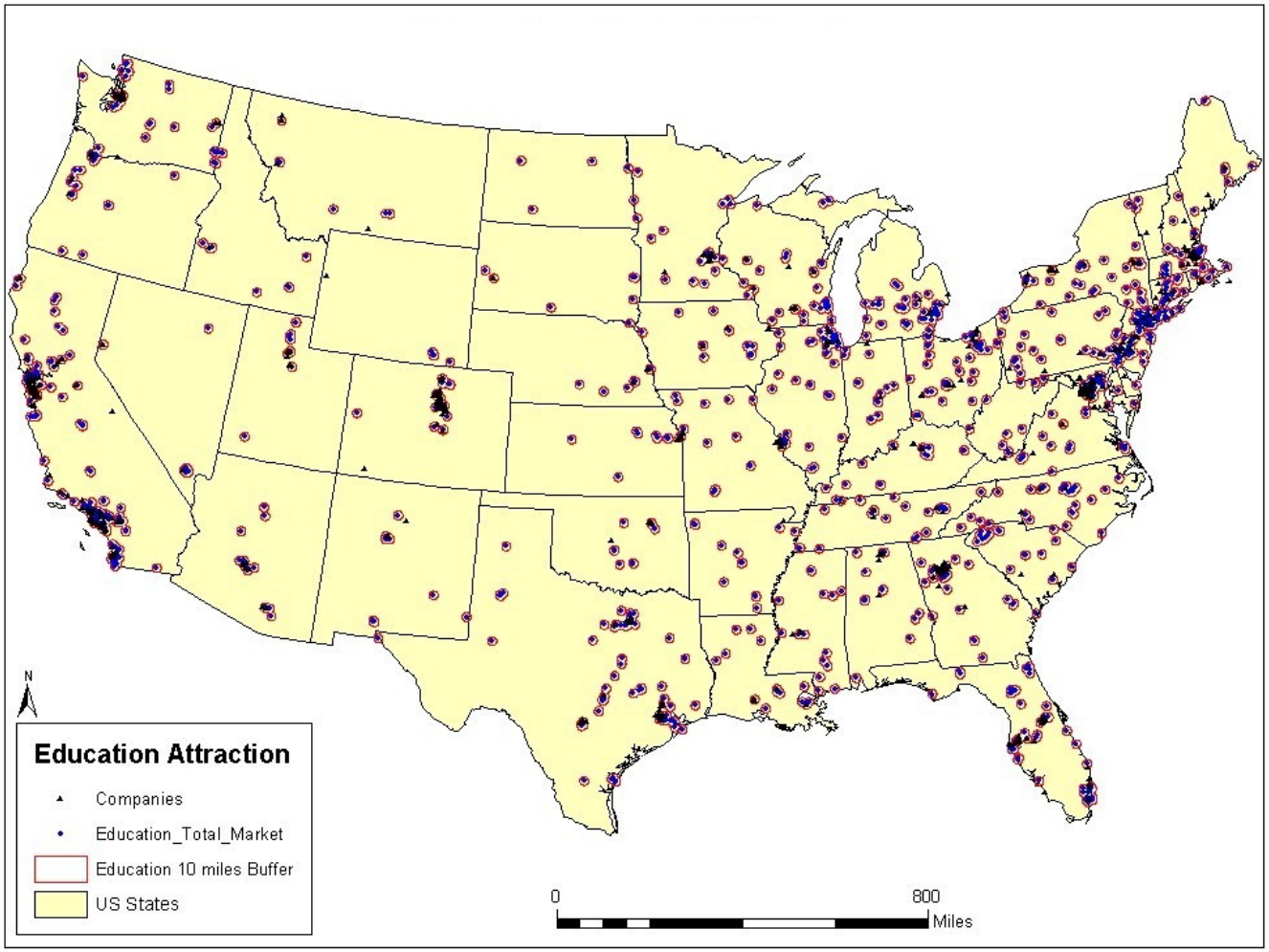


Figure 50. *GeoSpatial Solutions*' US education market attraction at 10 miles radius processed with ArcMap.

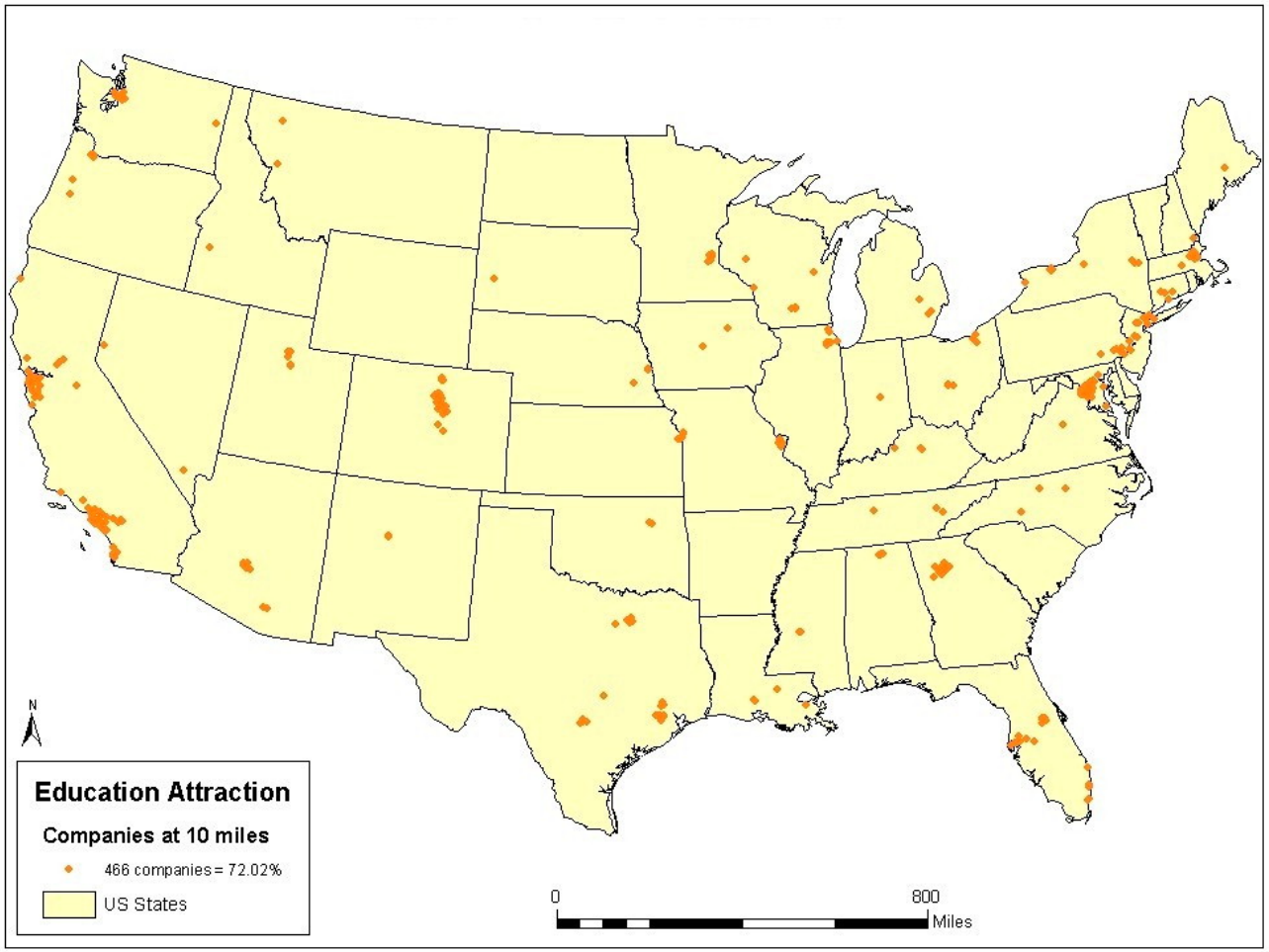


Figure 51. *GeoSpatial Solutions*' US education market attraction percentage at 10 miles radius processed with ArcMap.

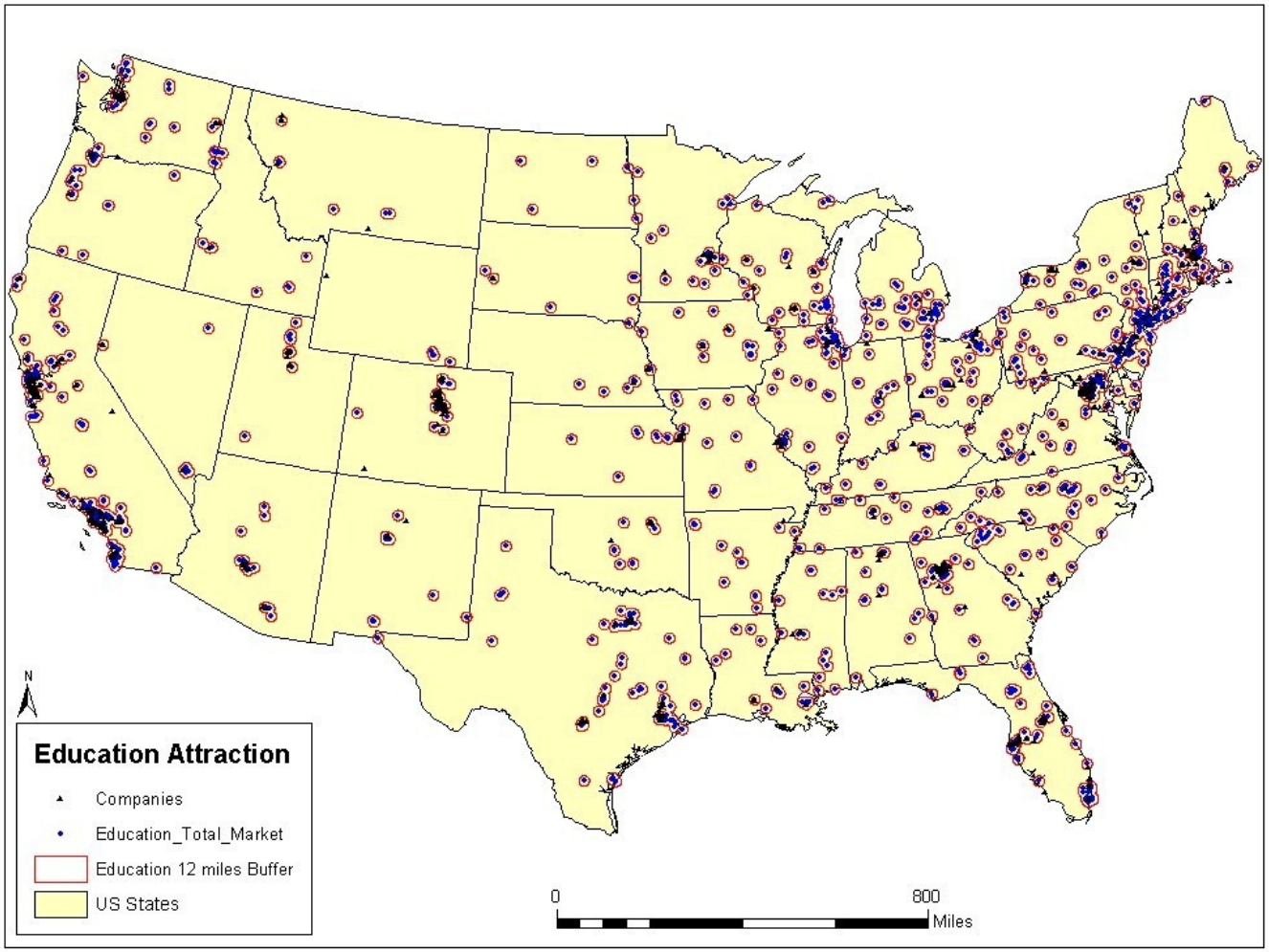


Figure 52. *GeoSpatial Solutions*' US education market attraction at 12 miles radius processed with ArcMap.

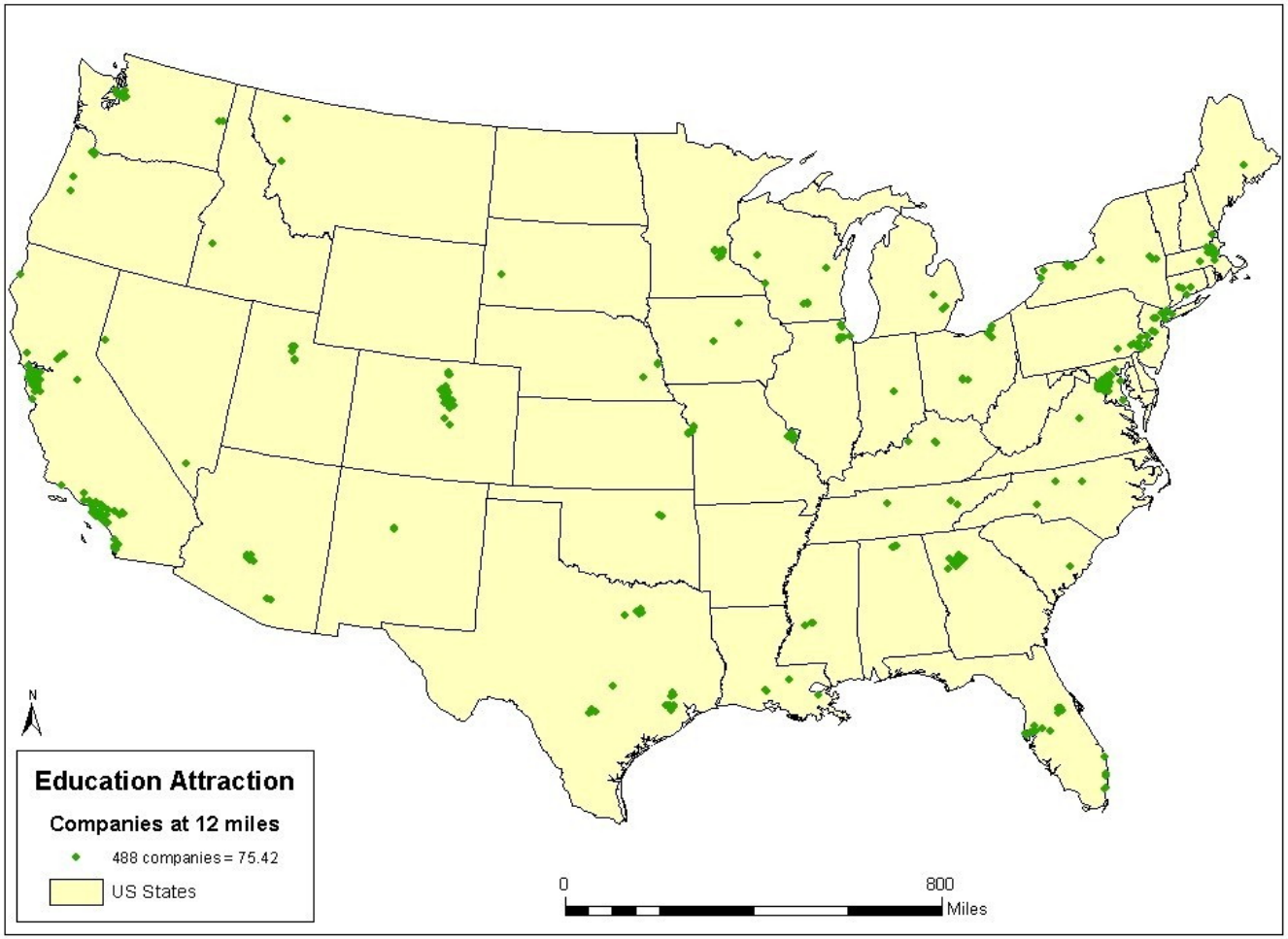


Figure 53. *GeoSpatial Solutions*' US education market attraction percentage at 12 miles radius processed with ArcMap.

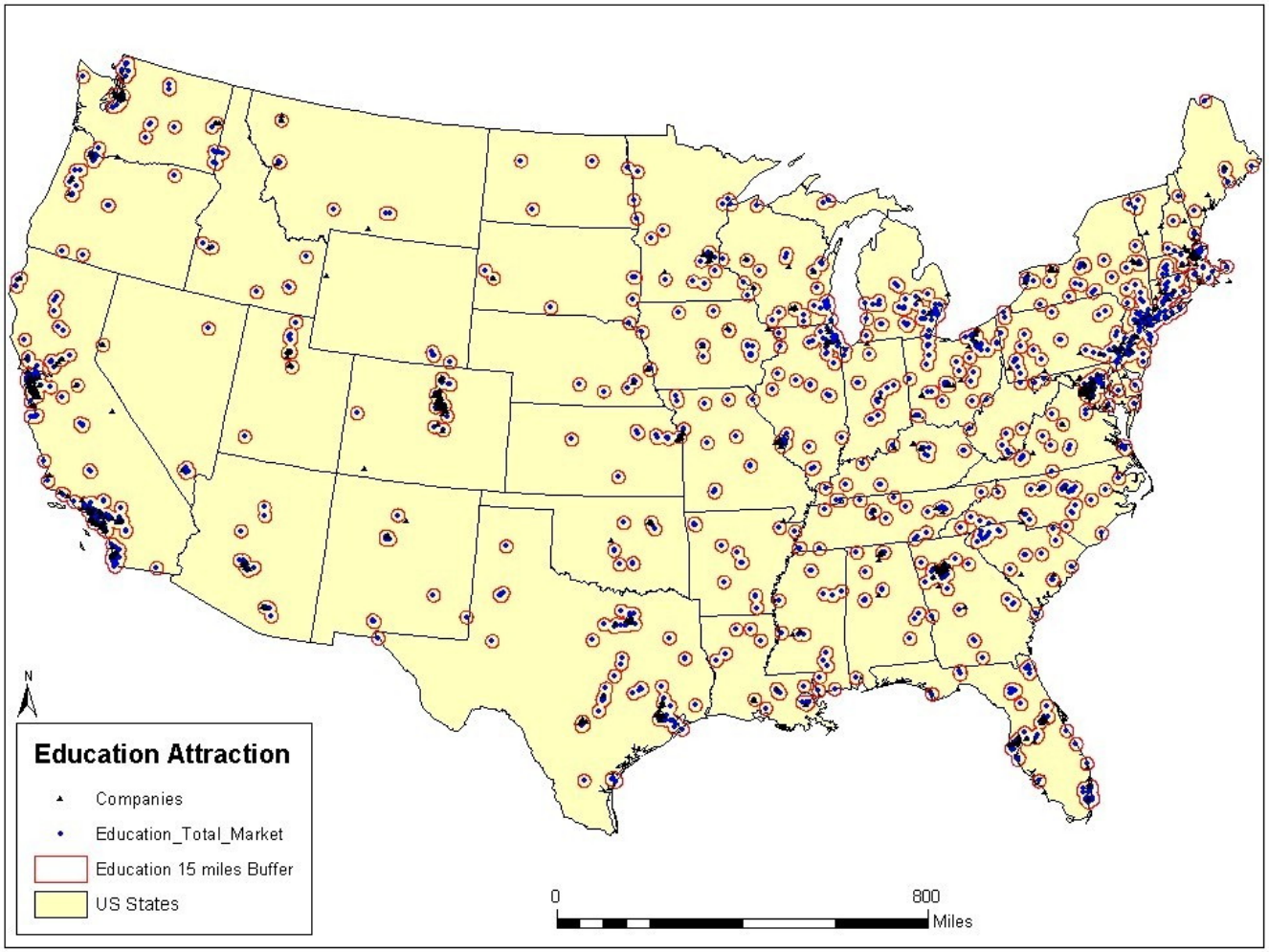


Figure 54. *GeoSpatial Solutions*' US education market attraction at 15 miles radius processed with ArcMap.

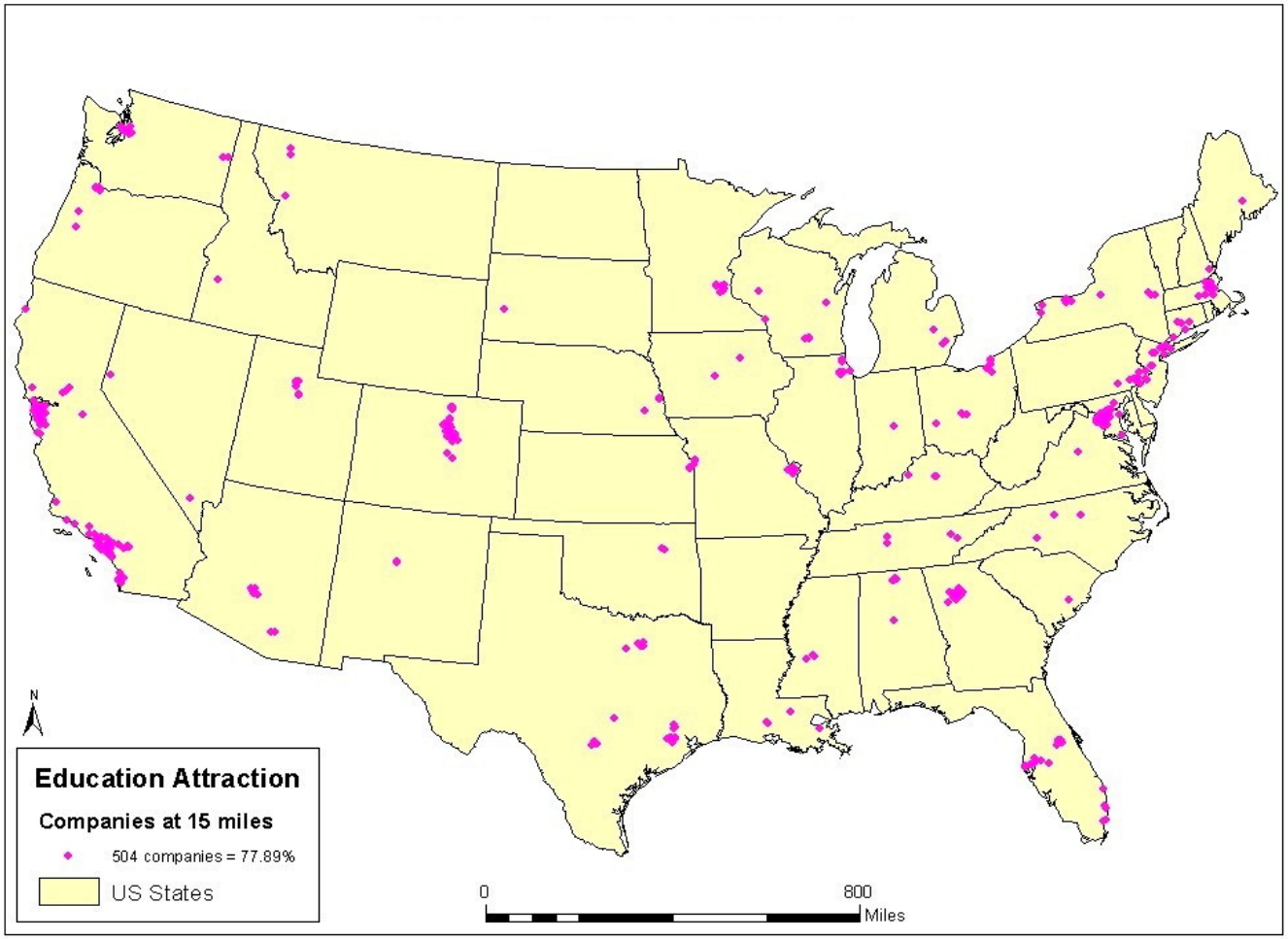


Figure 55. *GeoSpatial Solutions*' US education market attraction percentage at 15 miles radius processed with ArcMap.

layers created with this data were overlapped to understand the attraction of the education industry on the companies subscribed to the magazine. The university/college layer was buffered to an 18 miles radius, which it is not an uncommon distance for a student or an employee to commute to and from their working or studying environment. When buffering was processed and all the companies that located at 18 miles from and college or university a surprising result. The data set shows that 520 companies out of 647 locate at this distance from any university/college category (Figure 56). This is an outstanding 80.37% of the total company list (Figure 57). This is a very important discovery for the GIS and education industries. This finding shows that 8 out of 10 GIS firms locate within 18 miles of a college or university. So, there is a social or economic influence causing companies to locate near the education industry. Maybe these companies located near their market suppliers in order to attract and recruit new graduates from these institutions. Does a spatial attraction for these companies' locations exist? If a spatial attraction is present, who is the beneficiary?

Using the data that the buffer for 18 miles gave, a count of MSAs of the companies that fit this buffer was created. This count was linked to all the main universities and a ranking of these universities was determined. This ranking represents which universities influence the GIS market to locate in their area (Table 17). Further analysis should be done to understand each university's influence to their individual market.

Table 17. University ranking of companies market by count based on MSAs.

University Ranking of Companies Market			
Universities	City	State	Companies Count
CU-Denver	Denver	CO	41
Colorado School of Mines	Golden	CO	41
Univ of Denver	Denver	CO	41

Table 5-4. Continued

Universities	City	State	Companies Count
American Univ	Washington	DC	38
George Mason Univ	Fairfax	VA	38
George Washington Univ	Fairfax	VA	38
Univ of DC	Washington	DC	38
Univ of Maryland	Alexandria	VA	38
Emory	Decatur	GA	29
GeorgiaTech	Atlanta	GA	29
Georgia State Univ	Atlanta	GA	29
Spelman College	Atlanta	GA	29
Univ of West Georgia	Carrollton	GA	29
Babson College	Babson Park	MA	26
Boston Univ	Boston	MA	26
Bridgewater State College	Bridgewater	MA	26
Clark Univ	Worcester	MA	26
MIT	Cambridge	MA	26
Salem State College	Salem	MA	26
Univ New Hampshire	Durham	NH	26
Univ of Massachusetts	Boston	MA	26
Worchester State College	Worcester	MA	26
San Jose State Univ	San Jose	CA	22
Stanford Univ	Stanford	CA	22
Sam Houston State Univ	Spring	TX	21
Univ of Houston	Houston	TX	21
California Poly Pomona	Pomona	CA	17
California State Northridge	West Hills	CA	17
California State Univ	Los Angeles	CA	17
California State Univ	Northridge	CA	17
Univ of California	Los Angeles	CA	17
Univ of California	Valencia	CA	17
Univ of Southern California	Los Angeles	CA	17
San Diego State Univ	San Diego	CA	16
Univ California/San Diego	La Jolla	CA	16
Univ of Colorado	Boulder	CO	16
Univ of California at Berkeley	Berkeley	CA	15
San Francisco State Univ	San Francisco	CA	14
Sonoma State Univ	Belvedere-Tiburo	CA	14
Univ of California	San Francisco	CA	14
California State Univ Long Beach	Westminster	CA	13
Univ of California at Irvine	Irvine	CA	13

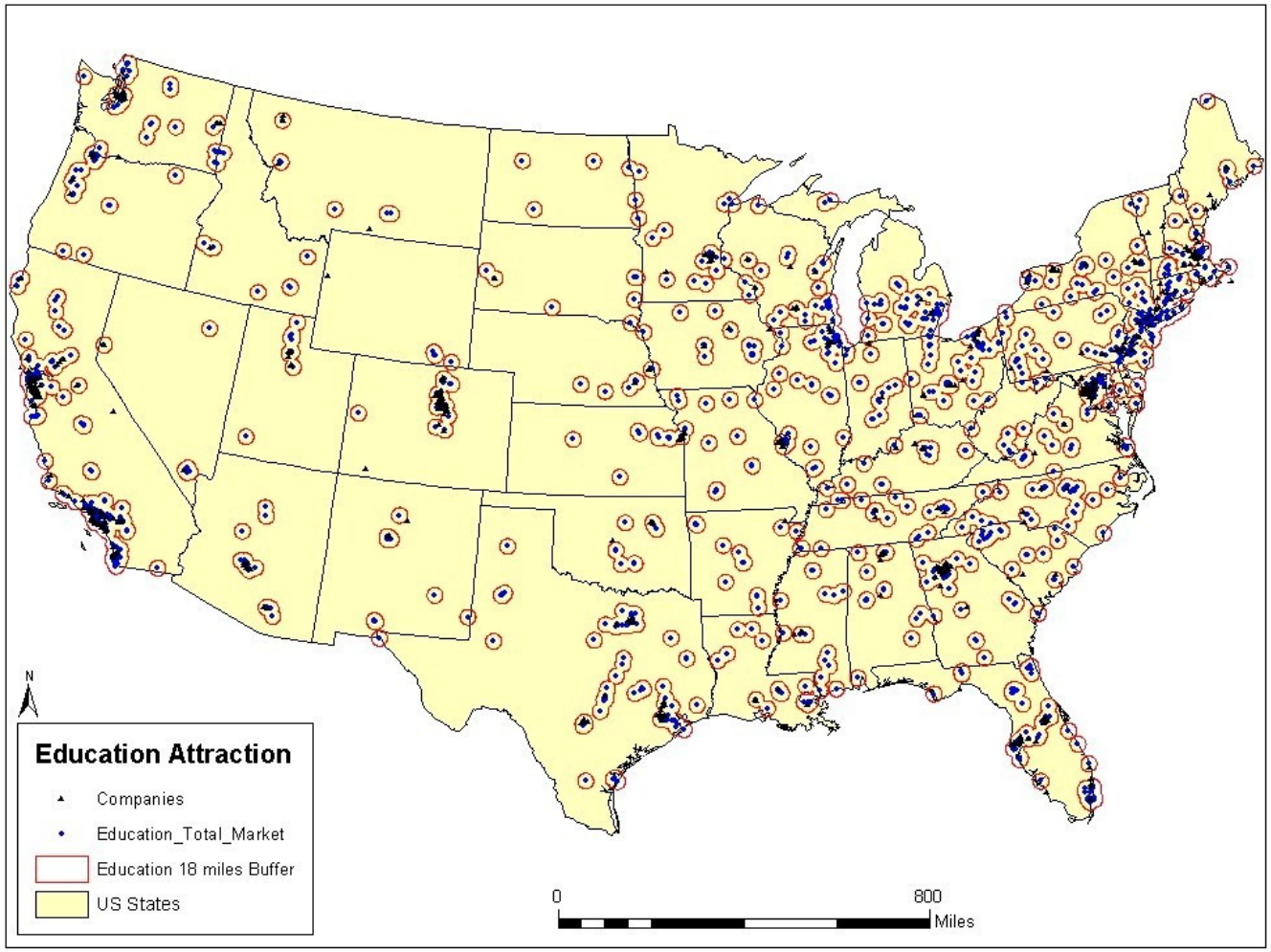


Figure 56. *GeoSpatial Solutions*' US education market attraction at 18 miles radius processed with ArcMap.

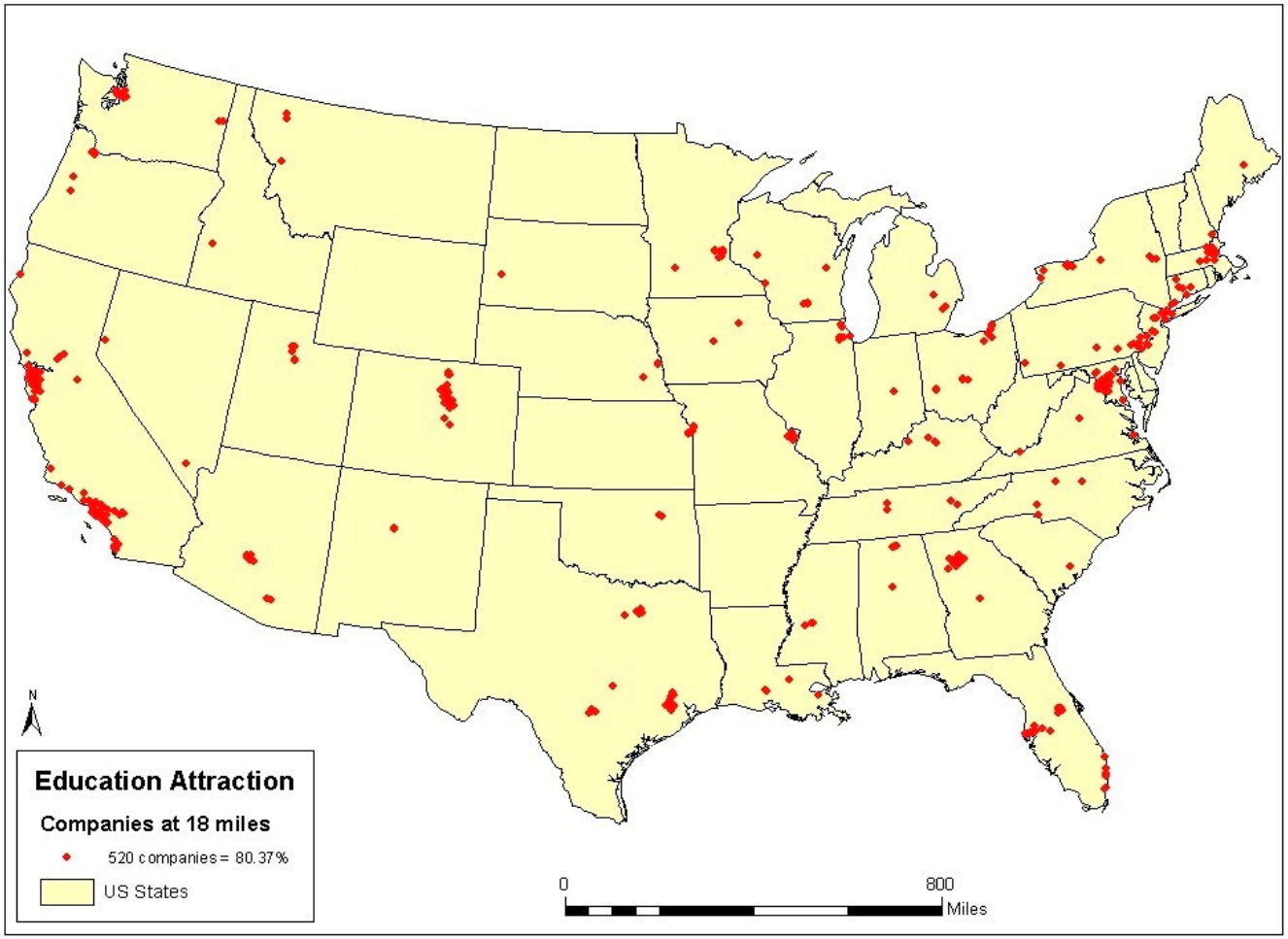


Figure 57. *GeoSpatial Solutions*' US education market attraction percentage at 18 miles radius processed with ArcMap.

Firms

The analysis shows the influences of the sub markets to attract GIS firms to the region. The market was then analyzed by their LSP's (Lifestyle Segmentation Profiles) to see which categories have a higher influence and attraction to the specific geographic areas.

CACI Coder plus produced a table with the specific characteristics of the subscribers Lifestyle Segmentation Profile and their percentage (Table 17) and also CACI Coder plus produced a table for the characteristics of *GeoSpatial Solutions* subscriber firms, represents the percentage of subscribers in each LSP (Table 18).

Table 18. *GeoSpatial Solutions*' subscribers LSP's.

Subscriptions *GeoSpatial Solutions*								
Customer Penetration U.S.								
ACORN Description			Number	%	Per 1000	Number	%	Index
1	Affluent Families	1A Top One Percent	383	1.5	0.31	1,248,861	1.2	125
		1B Wealthy Seaboard Suburbs	714	2.8	0.32	2,220,126	2.1	131
		1C Upper Income Empty Nesters	710	2.7	0.31	2,319,062	2.2	125
		1D Successful Suburbanites	983	3.8	0.38	2,555,230	2.4	157
		1E Prosperous Baby Boomers	1,559	6	0.31	5,000,263	4.7	127
		1F Semirural Lifestyle	1,392	5.4	0.24	5,681,692	5.4	100
2	Upscale Households	2A Urban Professional Couples	1,293	5	0.31	4,212,226	4	125
		2B Baby Boomers With Children	959	3.7	0.23	4,177,326	4	94
		2C Thriving Immigrants	312	1.2	0.19	1,654,879	1.6	77
		2D Pacific Heights	284	1.1	0.35	807,961	0.8	143
		2E Older Settled Married Couples	735	2.8	0.16	4,467,431	4.2	67
3	Up & Coming Singles	3A High Rise Renters	1,124	4.3	0.47	2,395,682	2.3	191
		3B Enterprising Young Singles	1,368	5.3	0.34	4,082,711	3.9	137
4	Retirement Styles	4A Retirement Communities	476	1.8	0.35	1,365,172	1.3	142
		4B Active Senior Singles	704	2.7	0.25	2,866,329	2.7	100
		4C Prosperous Older Couples	715	2.8	0.21	3,463,778	3.3	84
		4D Wealthiest Seniors	231	0.9	0.18	1,295,816	1.2	73
		4E Rural Resort Dwellers	160	0.6	0.16	997,639	0.9	65
		4F Senior Sun Seekers	228	0.9	0.15	1,474,514	1.4	63
5	Young Mobile Adults	5A Twenty-somethings	1,230	4.8	0.59	2,089,363	2	240
		5B College Campuses	1,103	4.3	1.35	819,080	0.8	550
		5C Military Proximity	343	1.3	0.5	687,284	0.7	204
6	City Dwellers	6A East Coast Immigrants	389	1.5	0.15	2,594,144	2.5	61

Table 5-5. Continued

	ACORN Description		Number	%	Per 1000	Number	%	Index
		6B Working Class Families	132	0.5	0.11	1,210,608	1.1	45
			Number	%	Per 1000	Number	%	Index
		6C Newly Formed Households	1,197	4.6	0.23	5,180,760	4.9	94
		6D Southwestern Families	291	1.1	0.14	2,010,329	1.9	59
		6E West Coast Immigrants	168	0.7	0.14	1,218,945	1.2	56
		6F Low Income: Young & Old	474	1.8	0.2	2,319,380	2.2	83
7	Factory & Farm Communities	7A Middle America	1,161	4.5	0.13	8,615,443	8.2	55
		7B Young Frequent Movers	717	2.8	0.19	3,787,725	3.6	77
		7C Rural Industrial Workers	502	1.9	0.09	5,898,450	5.6	35
		7D Prairie Farmers	114	0.4	0.11	1,055,112	1	44
		7E Small Town Working Families	268	1	0.15	1,787,863	1.7	61
		7F Rustbelt Neighborhoods	490	1.9	0.13	3,829,034	3.6	52
		7G Heartland Communities	691	2.7	0.19	3,730,462	3.5	76
	Total		25,843	100	0.25	105,480,101	100	100

Table 19. *GeoSpatial Solutions'* firms LSP's.

Firms *GeoSpatial Solutions*								
		Customer Penetration U.S.						
	ACORN Description		Number	%	Per 1000	Number	%	Index
1	Affluent Families	1A Top One Percent	18	2.8	0.01	1,248,861	1.2	235
		1B Wealthy Seaboard Suburbs	21	3.2	0.01	2,220,126	2.1	154
		1C Upper Income Empty Nesters	17	2.6	0.01	2,319,062	2.2	120
		1D Successful Suburbanites	33	5.1	0.01	2,555,230	2.4	211
		1E Prosperous Baby Boomers	53	8.2	0.01	5,000,263	4.7	173
		1F Semirural Lifestyle	34	5.3	0.01	5,681,692	5.4	98
2	Upscale Households	2A Urban Professional Couples	38	5.9	0.01	4,212,226	4	147
		2B Baby Boomers With Children	25	3.9	0.01	4,177,326	4	98
		2C Thriving Immigrants	15	2.3	0.01	1,654,879	1.6	148
		2D Pacific Heights	5	0.8	0.01	807,961	0.8	101
		2E Older Settled Married Couples	12	1.9	0	4,467,431	4.2	44
3	Up & Coming Singles	3A High Rise Renters	45	7	0.02	2,395,682	2.3	306
		3B Enterprising Young Singles	73	11.3	0.02	4,082,711	3.9	292
4	Retirement Styles	4A Retirement Communities	16	2.5	0.01	1,365,172	1.3	191
		4B Active Senior Singles	17	2.6	0.01	2,866,329	2.7	97
		4C Prosperous Older Couples	19	2.9	0.01	3,463,778	3.3	89
		4D Wealthiest Seniors	2	0.3	0	1,295,816	1.2	25
		4E Rural Resort Dwellers	3	0.5	0	997,639	0.9	49
		4F Senior Sun Seekers	7	1.1	0	1,474,514	1.4	77
5	Young Mobile Adults	5A Twenty-somethings	39	6	0.02	2,089,363	2	304
		5B College Campuses	15	2.3	0.02	819,080	0.8	299
		5C Military Proximity	1	0.2	0	687,284	0.7	24

Table 5-6. Continued

6	City Dwellers	6A East Coast Immigrants	8	1.2	0	2,594,144	2.5	50
	ACORN Description		Number	%	Per 1000	Number	%	Index
		6B Working Class Families	6	0.9	0	1,210,608	1.1	81
		6C Newly Formed Households	18	2.8	0	5,180,760	4.9	57
		6D Southwestern Families	6	0.9	0	2,010,329	1.9	49
		6E West Coast Immigrants	9	1.4	0.01	1,218,945	1.2	120
		6F Low Income: Young & Old	6	0.9	0	2,319,380	2.2	42
7	Factory	7A Middle America	11	1.7	0	8,615,443	8.2	21
	& Farm	7B Young Frequent Movers	13	2	0	3,787,725	3.6	56
	Communities	7C Rural Industrial Workers	4	0.6	0	5,898,450	5.6	11
		7D Prairie Farmers	1	0.2	0	1,055,112	1	15
		7E Small Town Working Families	4	0.6	0	1,787,863	1.7	36
		7F Rustbelt Neighborhoods	4	0.6	0	3,829,034	3.6	17
		7G Heartland Communities	5	0.8	0	3,730,462	3.5	22
8	Downtown	8A Young Immigrant Families	2	0.3	0	1,050,710	1	31
	Residents	8B Social Security Dependents	14	2.2	0.02	881,770	0.8	259
		8C Distressed Neighborhoods	1	0.2	0	949,094	0.9	17
		8D Hard Times	3	0.5	0	1,592,287	1.5	31
		8E Urban Working Families	3	0.5	0	1,635,516	1.6	30
9	Nonresidential	9A Business Districts	7	1.1	0.27	26,243	0	4349
	Neighborhoods	9B Institutional Populations	10	1.5	0.04	223,801	0.2	728
		9C Unpopulated Areas	4	0.6	0	0	0	0
		Total	647	100	0.01	105,480,101	100	100

To see the characteristics of the areas where the companies locate (Figure 58), the total amount of subscribers that locate around the companies was analyzed to understand the companies' market decisions better.

Using a 7 miles and a 20 miles buffer from the companies (these buffers were selected to show different percentage rates, the total amount of subscribers that fit inside of each of these markets were extracted and analyzed. These analyses created two individual maps one for the 7 miles radius and one for the 20 miles radius. These two distances where decided to give a general representation and show the characteristics of the LSP's of subscribers in the proximities of the companies. These buffers of 7 and 20 miles were specifically chosen for the firms code because of the characteristic driving flows within large cities and the proximities to suburban areas. The analysis also gave the

percentage rate of the subscribers of *GeoSpatial Solutions* that located inside of the previous buffers mentioned.

Buffer at 7 Miles

This map was created to show what percentage of *GeoSpatial Solutions* subscribers locate at 7 miles from a company. First, a buffer of 7 miles was created around the companies to find the percentage rate of subscribers. The new buffer layer was overlapped with the layer of total subscribers. Afterward, the subscribers that intersected inside the buffer layer were selected and extracted to create a new layer. The total subscribers remaining that received their subscription in a 7 miles radius from a company, is a total of 8,881, which is equivalent to 34.12% of the total *GeoSpatial Solutions* subscribers in the United States (Figure 59).

Buffer at 20 Miles

This map shows how many subscribers received their magazine subscription around the companies. To create this map, a 20 miles buffer from the companies layer was created. Then, this new layer was overlapped with the total *GeoSpatial Solutions* subscribers layer. A selection of subscribers that intersected inside the 20 miles buffer was done and a new layer with these subscribers was created. The total amount of subscribers that received their subscription for *GeoSpatial Solutions* magazine in the 20 miles radius from a company is 52.43%, an 18.31% increase from the percent of subscribers in the 7 miles radius (see Table 20). This shows that 50% of *GeoSpatial Solutions* market locates within a 20 miles radius from the companies (Figures 60).

To further understand social-economic characteristics of the GIS firms to locate in a specific market, the Lifestyle Segmentation Profile of the subscribers at the 7 miles radius was analyzed. The analyses were done to see the primary categories that locate in

the area. Where the categories of LSPs are high, firm are located in prosperous communities or neighborhoods. If the LSP of this area is low, it shows that the firms are not marketing to a high market. This can demonstrate what kind of market the GIS industry prefers to locate.

Table 20. GeoSpatial Solutions' subscribers at 7 and 20 miles radius from companies.

Buffer (miles)	**Total Subscribers**	**Percent subscribers**
7	8,881	34.12%
20	13,644	52.43%
Total	**14,525**	**86.55%**

LSPs at 7 Miles

This map shows the Lifestyle Segmentation Profile of the subscribers that locate at a 7 miles radius from companies. It also shows the corresponding count for each kind of LSPs in the area. The categories of LSP were summarized into 9 different groups. These groups correspond to the nine ACORN descriptions presented in the Introduction to this thesis (Table 19).

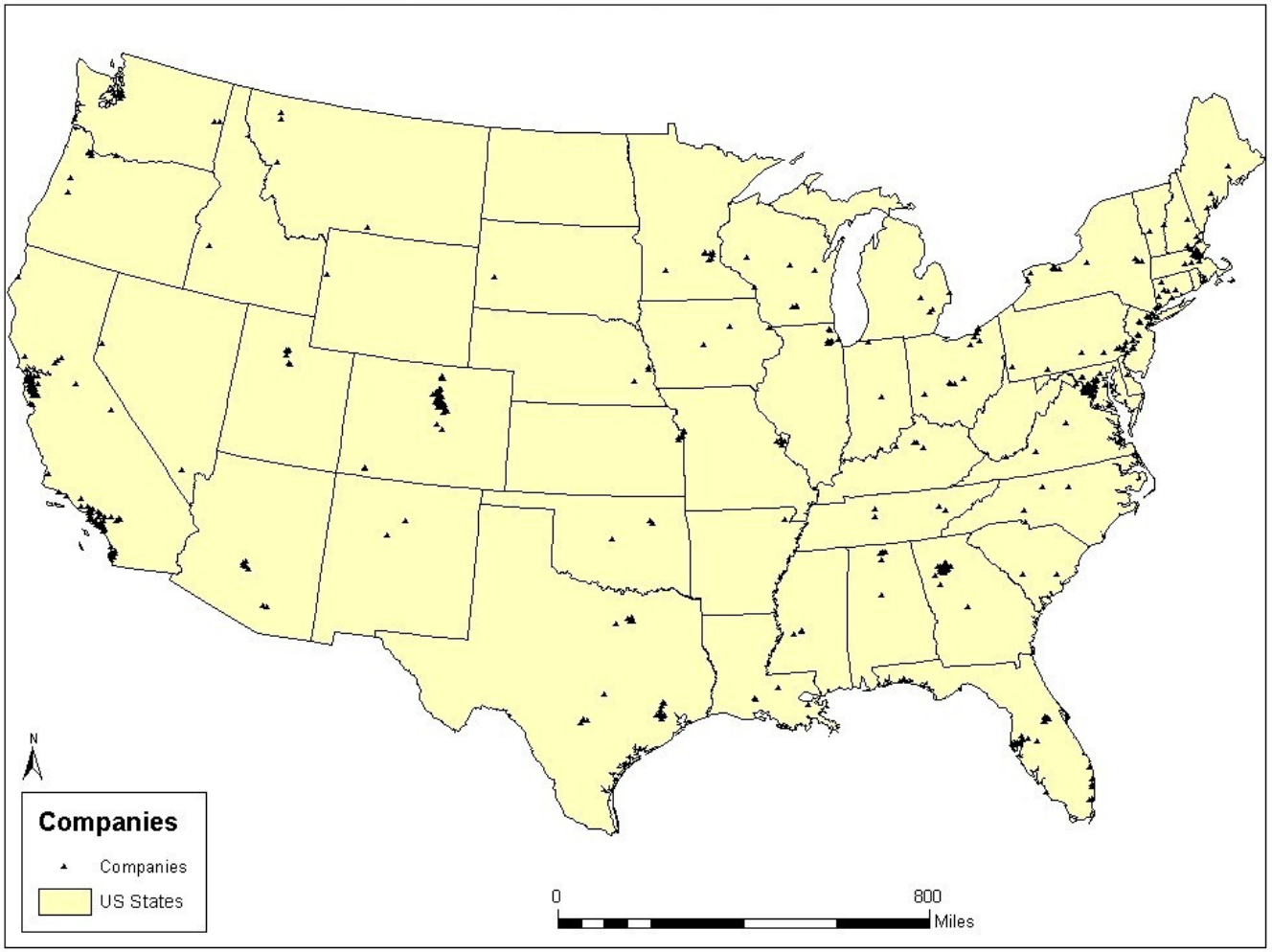


Figure 58. *GeoSpatial Solutions*' US firms dataset processed with ArcMap.

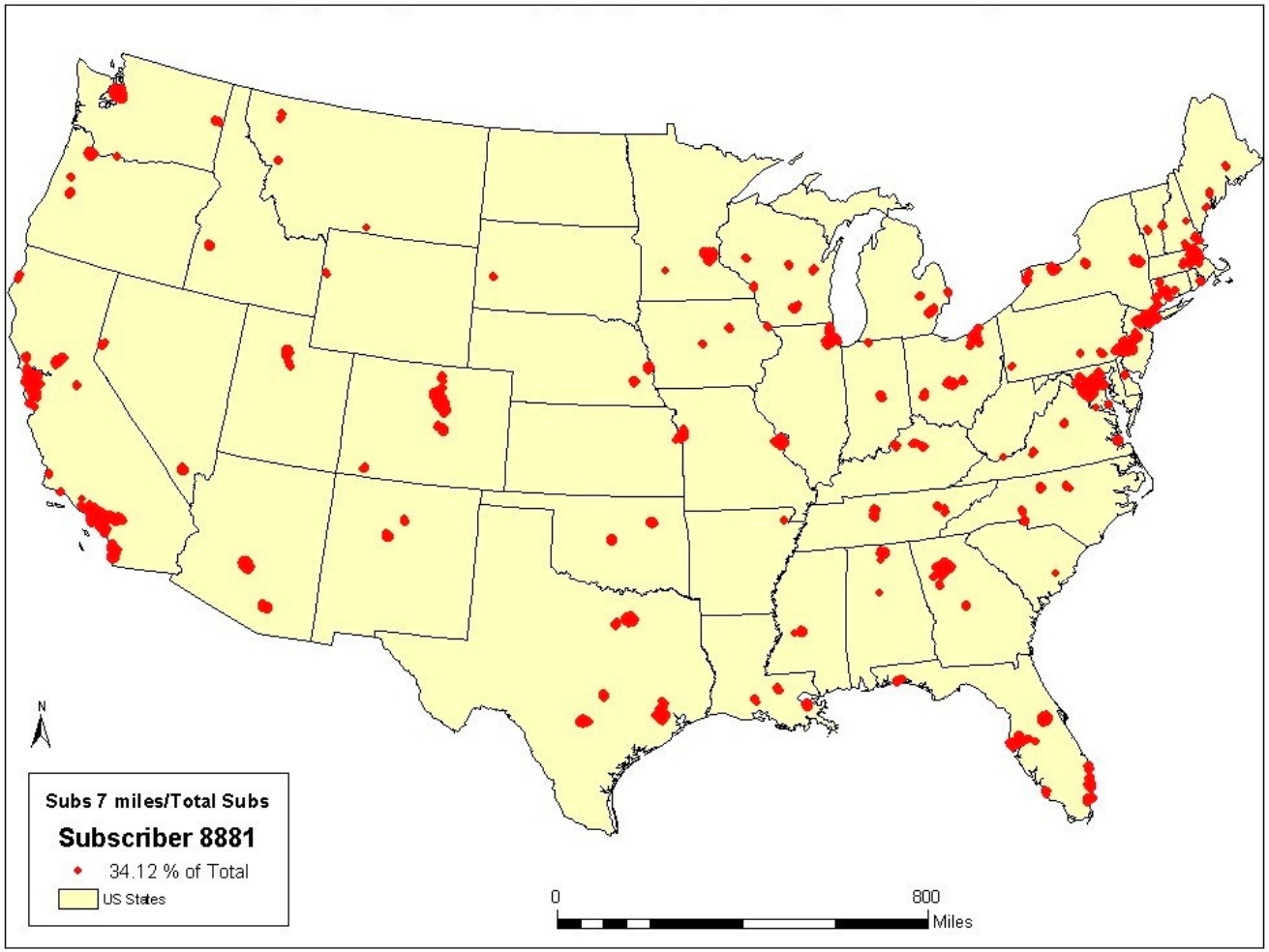


Figure 59. *GeoSpatial Solutions*' subscriber percentage at 7 miles from companies processed with ArcMap

Table 21. GeoSpatial Solutions' subscribers LSP's at 7 miles radius from companies.

ACORN Description		Count
1	Affluent Families	2,398
2	Upscale Households	1,356
3	Up and Coming Singles	1,391
4	Retirement Styles	834
5	Young Mobile Adults	868
6	City Dwellers	811
7	Factory and Farm	309
8	Downtown Residents	463
9	Non Residential Neighborhoods	448

There is a high amount of subscribers that fit into the Affluent Families, Upscale Households, and Up and Coming Singles ACORN descriptions and locate in a 7 miles radius from the companies (Figure 61). This analysis highlights the reasons that some GIS groups locate near the education market. Maybe these locations are chosen for these

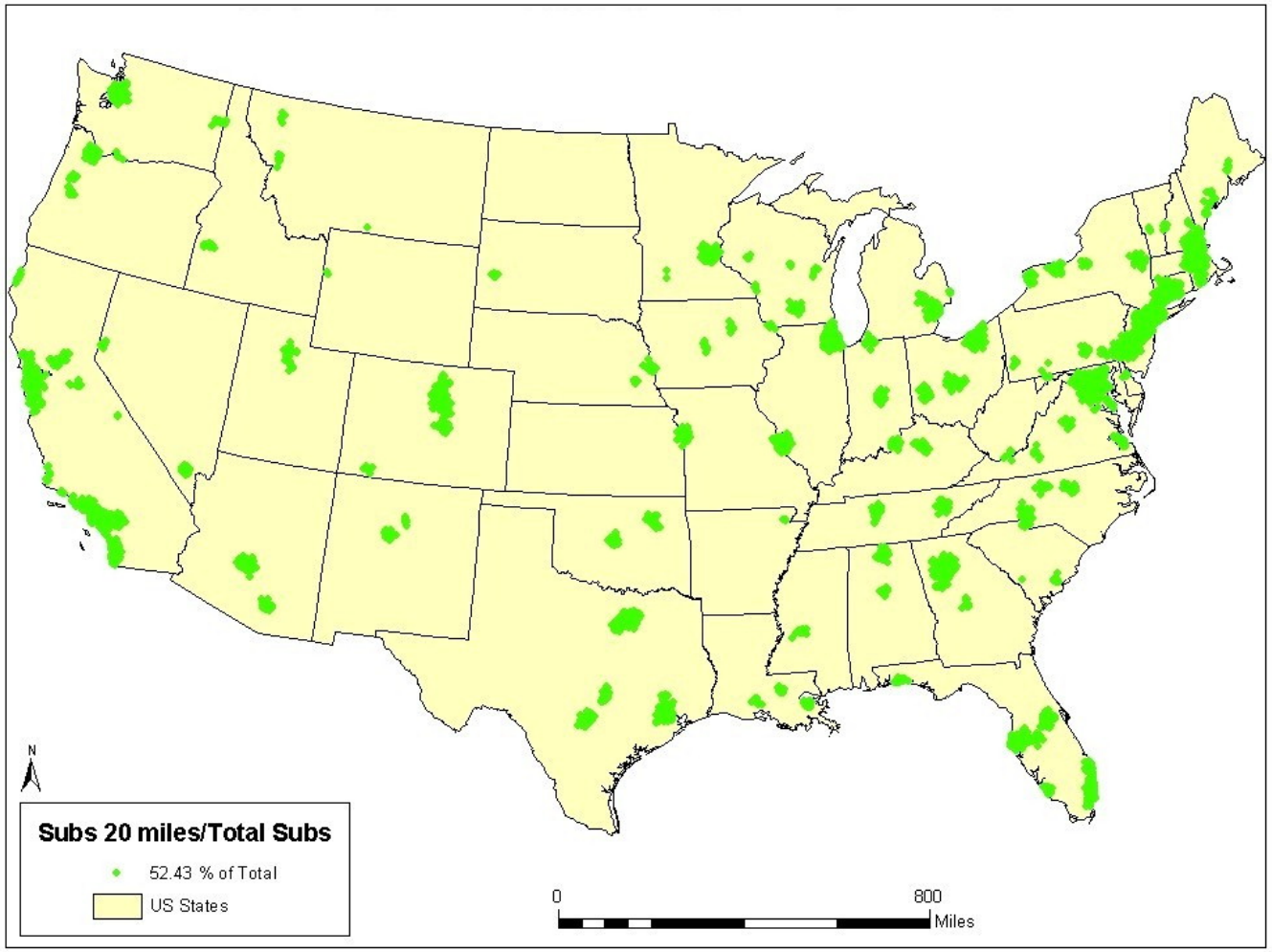


Figure 60. *GeoSpatial Solutions*' subscriber percentage at 20 miles from companies processed with ArcMap.

companies to select graduates with higher education or maybe these companies can use students to do internships. The decision to locate near education also enables employers to select a fresh group of graduates that can bring innovation to the company. As most of the technology market is easy to see bases in the three highest categories of LSPs that surround these companies that the GIS firms like to locate in high-level markets. To understand the reasons for companies to locate in a more economically prosperous area, such as the top 3 ACORN categories previously mentioned, further and more complete analyses should be completed.

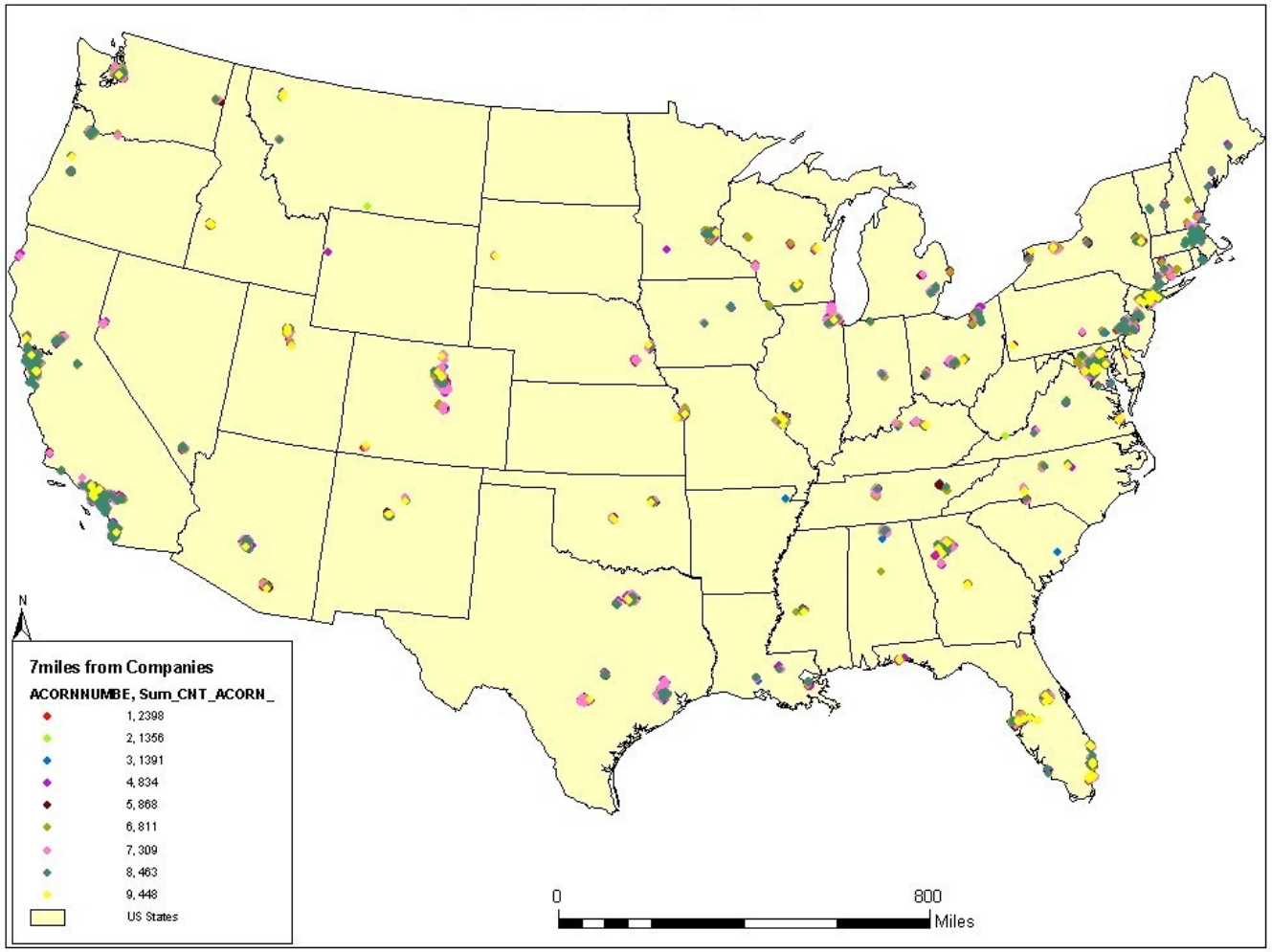


Figure 61. *GeoSpatial Solutions*' subscriber Lifestyle Segmentation Profiles at 7 miles from companies processed with ArcMap.

CHAPTER 6
CORRELATION OF ANALYSIS WITH INTERNATIONAL GEOGRAPHIC REGIONS

Global Analysis

The analysis addresses the relevant questions for use in a global perspective for international market analysis. This assists international markets and increase economic opportunities by focusing on the GIS industry and its characteristics. *GeoSpatial Solutions* made their global market data set available for this analysis. This data set was formed of 167 companies located in different countries. The majority of these companies, however, were located in Canada. This data set shows a general idea of where *GeoSpatial Solutions*' international market is located, and how many subscribers are in each location. This is not a representation of where the GIS market locates in a global perspective, and this analysis should not be used to demonstrate the GIS market forces in other countries as the data set is specifically for the GIS global market of *GeoSpatial Solutions* subscribers.

Global Market

Figure 62 shows the global location of all the companies that are part of *GeoSpatial Solutions'* data set. This global data set includes: Europe, Asia, Australia, Africa, South America, Canada, and the United States. The following table summarizes the number of international companies in the *GeoSpatial Solutions'* firms dataset in addition to the percentage of total companies listed by geographical area (see Table 20).

Table 22. Percent of total companies in each market as defined in international maps.

Global Market	International Companies	Percent
Africa	2	0.3%
Asia	13	1.6%
Australia	5	0.6%
Canada	85	10.5%
Europe	54	6.7%
South America	2	0.3%
United States	648	80%
Total	**809**	**100%**

Europe

Figure 63 of Europe shows part of the data set of *GeoSpatial Solutions*. The map shows companies that are located in the European market and Russia.

Asia & Australia

Figure 64 shows the international markets of Asia and Australia that locates in India, Australia, Japan, Korea, and Pakistan. These companies are part of the *GeoSpatial Solutions* international data set.

Africa

Figure 65 shows the international data for those companies located in Africa. This map was created using the data set provided by *GeoSpatial Solutions*.

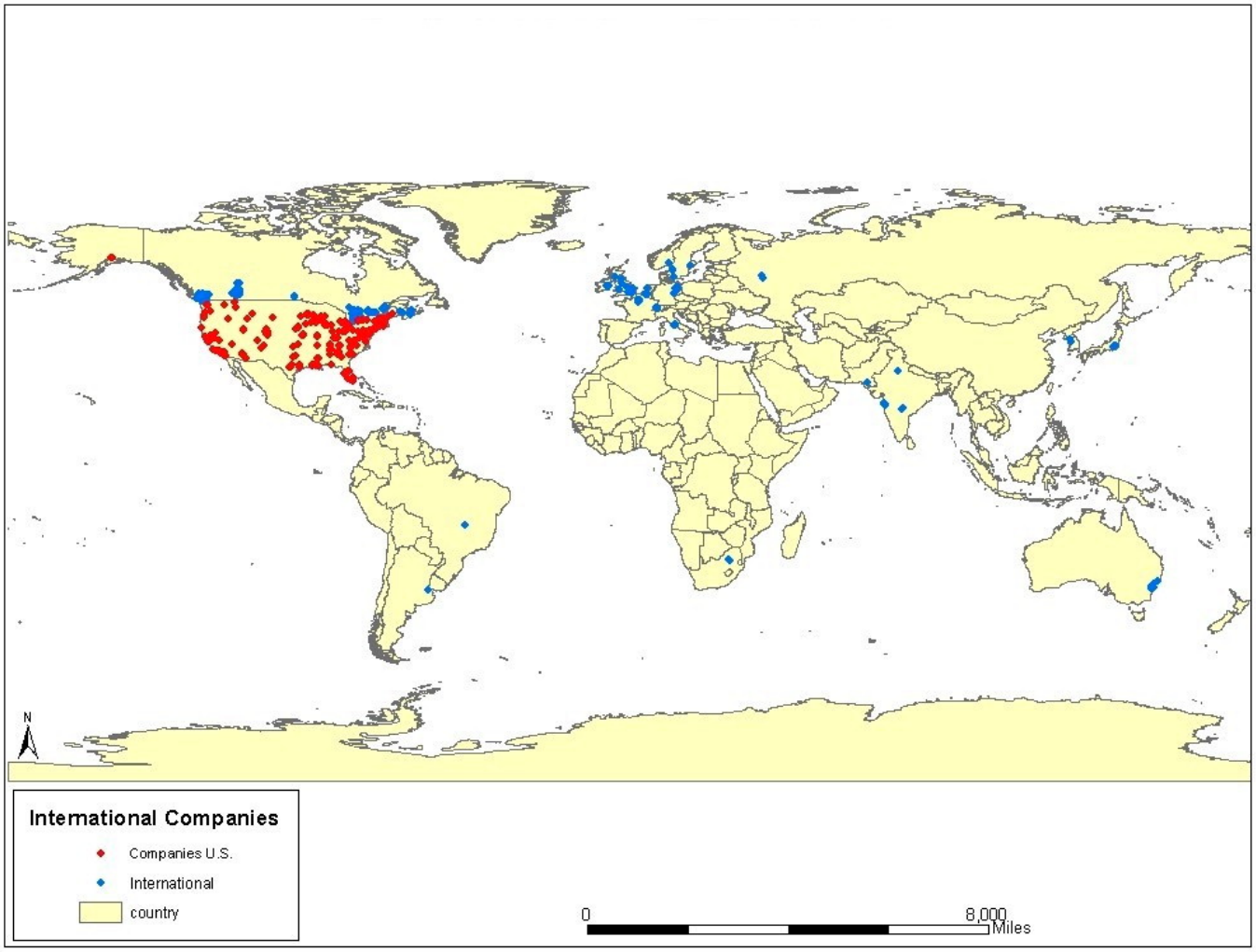


Figure 62. *GeoSpatial Solutions* global market subscribers' processed with ArcMap.

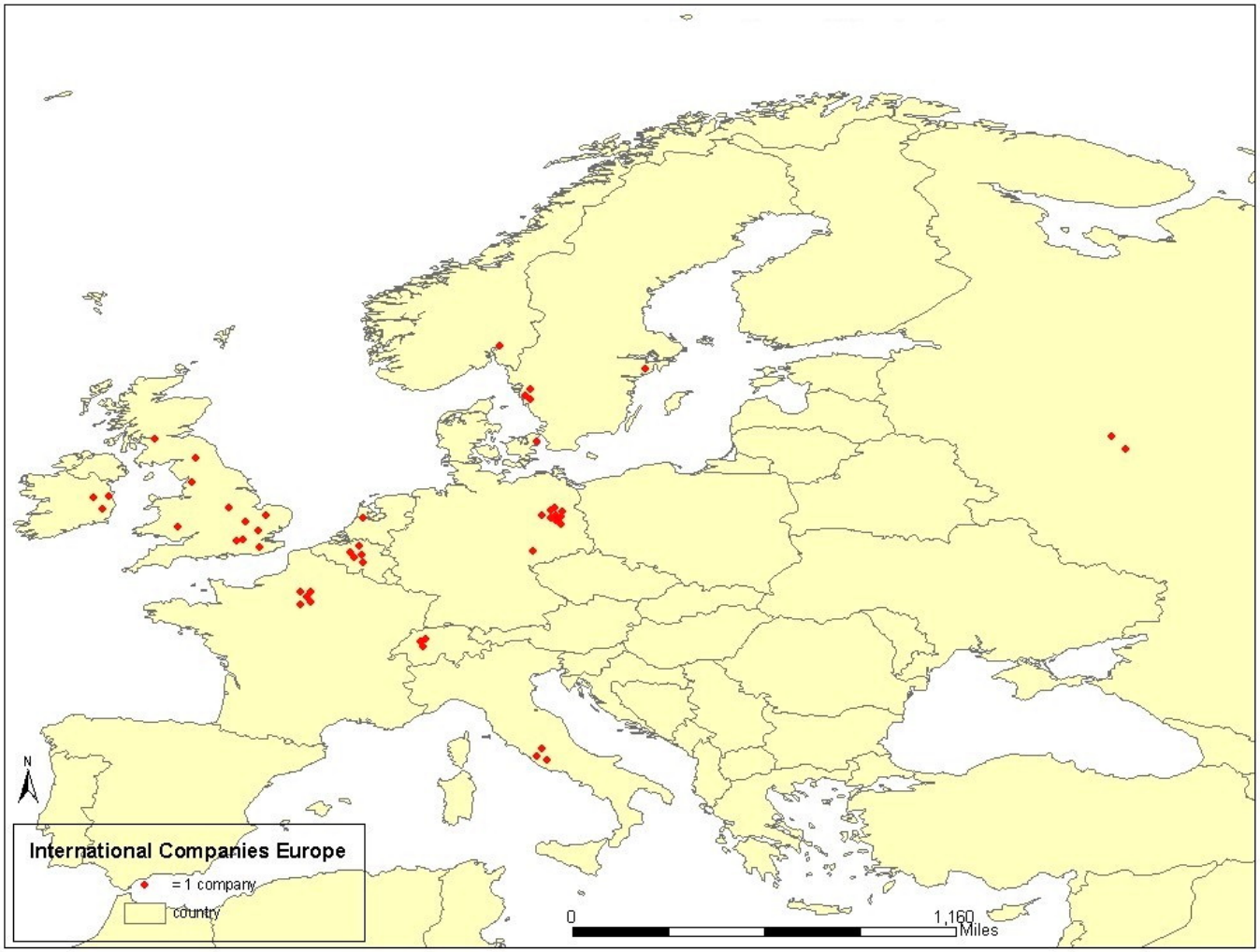


Figure 63. *GeoSpatial Solutions* global market subscribers' Europe processed with ArcMap.

South America

Figure 66 shows the international companies in South America. The international data set of *GeoSpatial Solutions* was used to locate these companies.

Canada

Figure 67 shows the Canadian market. This map was created with the data set of international companies provided by *GeoSpatial Solutions*. The data shows a concentration of companies in major metropolitan areas of Canada. The data shows an even distribution of companies located in the east and west of Canada.

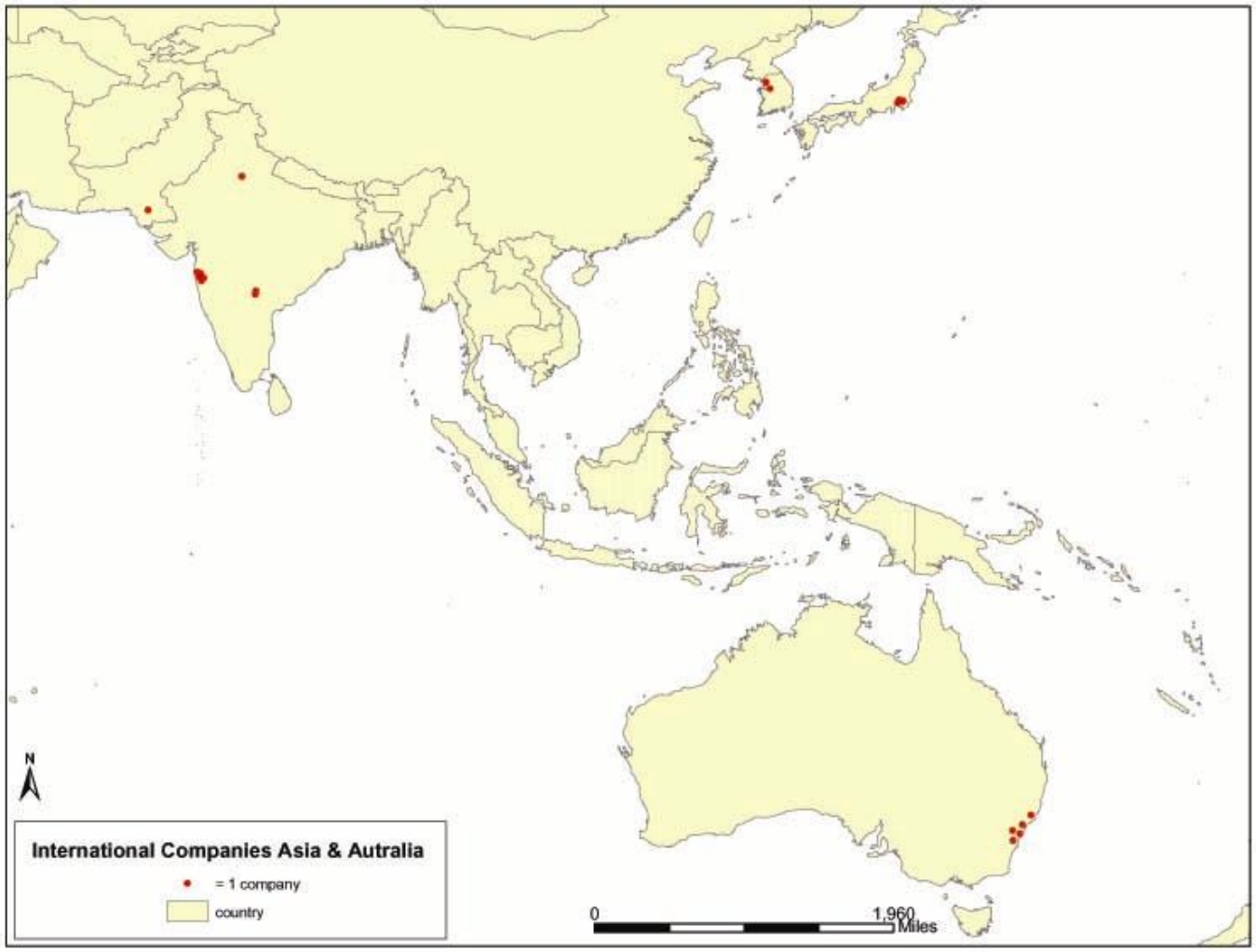


Figure 64. *GeoSpatial Solutions* global market subscribers' Asia and Australia processed with ArcMap.

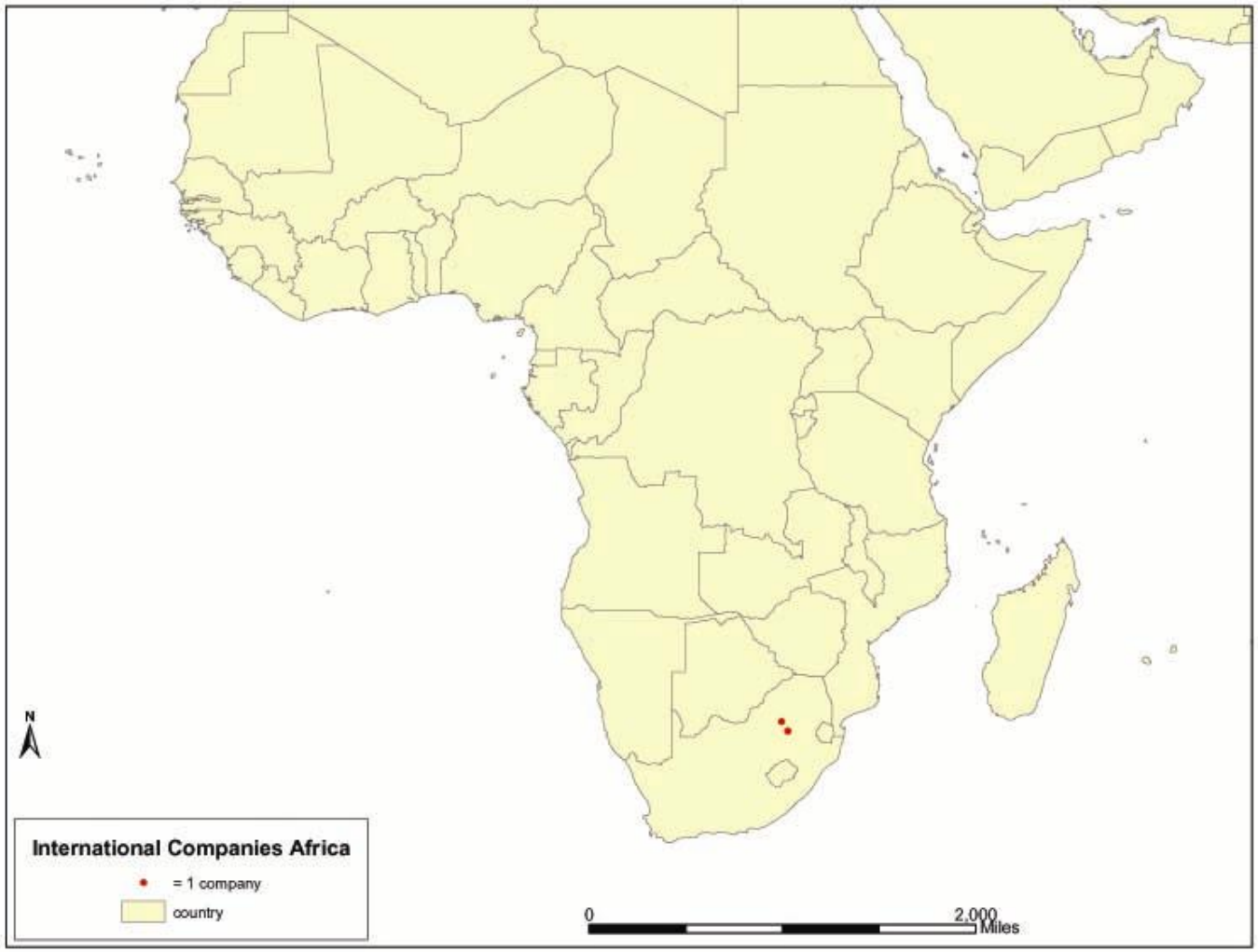


Figure 65. *GeoSpatial Solutions* global market subscribers' Africa processed with ArcMap.

Figure 66. *GeoSpatial Solutions* global market subscribers' South America processed with ArcMap.

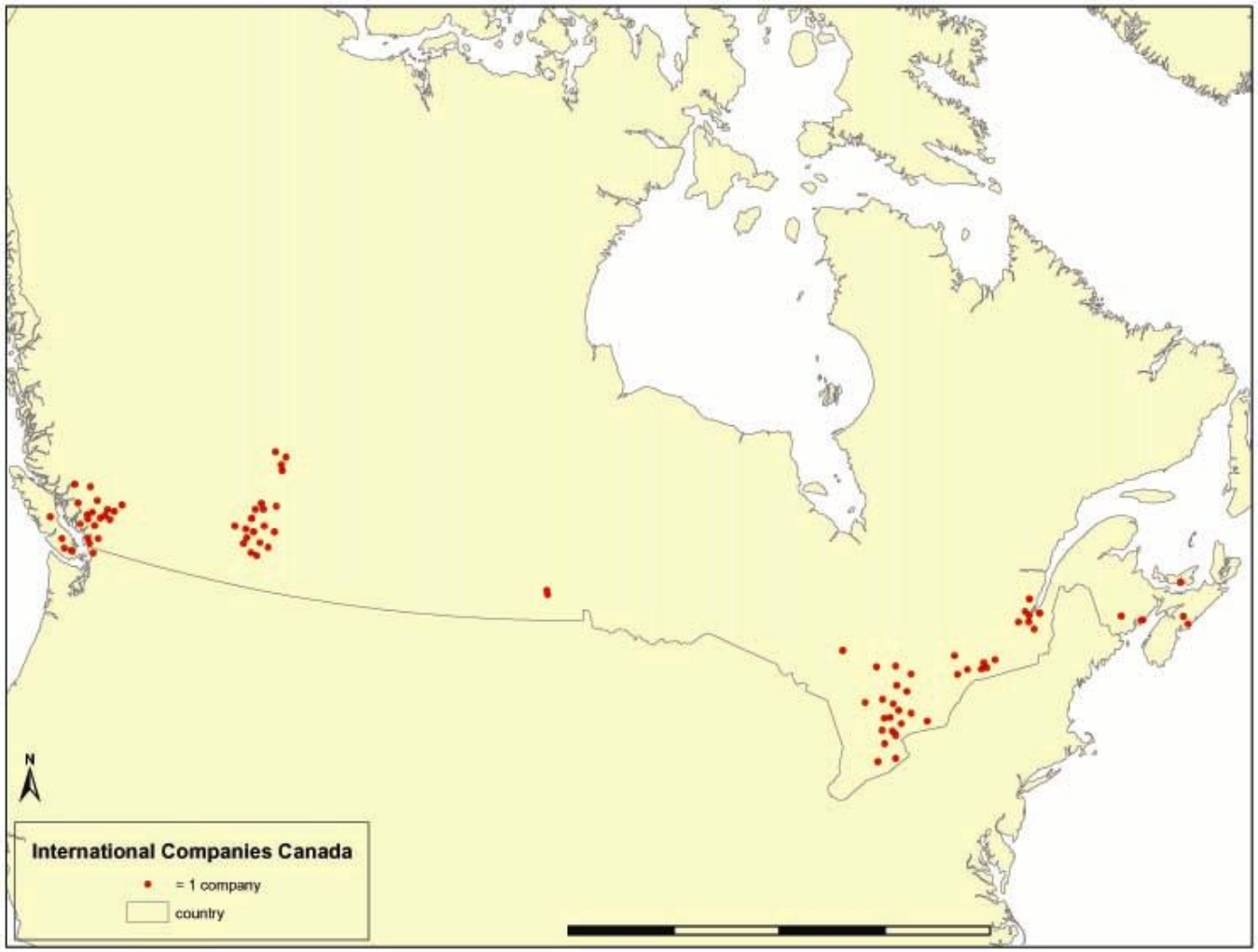


Figure 67. *GeoSpatial Solutions* global market subscribers' Canada processed with ArcMap.

CHAPTER 7
CHARACTERISTICS OF GIS PRODUCERS

This analysis summarizes general characteristics of *GeoSpatial Solutions'* dataset (representative of the GIS industry) for their location in the US and their general reasons for locating in a specific submarket. To explain these characteristics, consideration was taken for the social-economic influences. These social-economic influences were analyzed in Chapter 5 and include high concentration regions, education, firms, and LSP characteristics. All of these characteristics came together to create a thorough and telling analysis of the market for the GIS industry to locate and open new markets based on the *GeoSpatial Solutions* subscribers. Also, the advances of technology, more user-friendliness, and faster Internet access have affected and improved these markets. The increases in the market have encouraged the use of consulting firms to do similar analyses, and the improvements in the industry have provided individuals with the education and knowledge of the industry, giving them more employment options. Also the industry's high growth has created new submarkets for the GIS industry in the US and globally.

While analyzing the data that *GeoSpatial Solutions* made available to use, distinguishable characteristics of geographic locations were made clear. Some of the geographic decisions influencing the GIS industry to locate their enterprises in the US could be explained in the overview of Chapter 5.

Chapter 4 shows the main characteristics of the high concentrations of subscribers in the top metropolitan areas. These high concentrations are not surprising since the areas

correspond to areas of high population are high concentration. In this case, there is a continued correlation between the high metropolitan areas in the US and the high concentration of subscribers of *GeoSpatial Solutions*.

Chapter 5 demonstrates a deeper analysis of the GIS industry characteristics or attraction to specific market areas. The analysis for this part of Chapter 5 was done to see if there were any correlations between the GIS industry and high education areas. During this analysis an outstanding statistic was revealed. The GIS industry has a location bias based on higher education areas. The analysis showed that 72.02% of *GeoSpatial Solutions* GIS firms data set located within a 10 miles buffer from any university or college and 80.37% of the total firms located within an 18 miles radius from any university or college location. This may show that the GIS market is attracted to higher educational areas where they can obtain recent graduates. A chart of the rank of universities that attract most of the GIS market is included in Chapter 5.

The latter part of Chapter 5 was analyzed in a different way; this part of the chapter shows where the subscribers locate from the GIS market and their Lifestyle Segmentation Profiles (LSPs). Knowing the LSPs of their subscribers may show *GeoSpatial Solutions* what kind of market these firms have preferences toward. The analysis showed that 34.12% of the total subscribers locate within 7 miles of any firm, and 52.43% of the total locate within a 20 miles radius from any firm. This analysis shows that half of *GeoSpatial Solutions*' subscribers market localizes within a 20 miles radius from the GIS market. While analyzing the Lifestyle Segmentation Profiles of the subscribers within 7 miles of the firms a surprising 60% of these total subscribers fit on the three higher categories of LSPs. This represents that the GIS markets locates in more expensive markets. This could

be because most of the GIS market is a high technology market. Also, it may be because the GIS market takes advantage of the knowledge spillover from the universities and colleges, and even from other high technology companies; or maybe it is because of the labor market pooling effect in which most high tech companies participate.

These localization characteristics could be further proved with more analysis of each individual market is performed and further characteristics of why the GIS market locates in specific areas could be revealed. Also, these same characteristics of the GIS market may influence the international market to locate where they locate. However, the international market may also be affected by other social-economic influences for each country. To understand the global market analysis, statistical figures should be used and compared to the global picture. The *GeoSpatial Solutions* market, being one of the leading professional publications in the GIS industry, represents a general and complete characteristic of the GIS market in the United States.

To conclude, this analysis has identified the 3 primary market areas of GIS production within the US for *GeoSpatial Solutions.* The primary US submarket includes: California, Texas, Florida, New York, and Virginia. The secondary US submarket includes: Pennsylvania, Colorado, Illinois, Ohio, Maryland, Washington, New Jersey, North Carolina, Michigan, Georgia, Massachusetts, Minnesota, and Wisconsin. And the tertiary submarket includes the remaining US states (see Chapter 4, Table 5 for complete listing). The tertiary market provides the greatest potential of growth for *GeoSpatial Solutions*. Due to the dense population in these geographic areas, it is not surprising that they have been identified as the top 3 markets of GIS production. Further, the major social-economic correlates between these high concentration submarkets have been

pinpointed. Included in these social-economic correlates are: education, firms, and Lifestyle Segmentation Profiles (LSPs) (review Chapter 5, Table 16-17). Moreover, this thesis outlines the characteristics of GIS firms as locating near educational institutions and in high LSP areas (refer to Chapter 5, Table 21). In addition, it has been determined that this information can be used as a guide for other submarkets, including foreign markets, to capitalize on economic opportunities with the use of GIS. As seen in Chapter 6, Table 22 the opportunities for international growth abound. This thesis has provided an analysis of the subscriber base of *GeoSpatial Solutions* to locate GIS users in the US and abroad, the research can be adapted by other publishing companies as well as other industries to determine where their clients are and gain insight on how to better serve the market.

APPENDIX A
GEOGRAPHIC MATCH LEVEL FOR SUBSCRIBERS

In this appendix, a geocoding summary, created with the process of *GeoSpatial Solutions* subscribers' data set and the use of CACI Coder/Plus (ESRI), is outlined. This section supplements the analysis of subscribers found in Chapter 4 and the analysis of Lifestyle Segmentation Profiles found in Chapter 5.

During the analysis of the dataset the top 20 zip codes a correlation between these zip codes and the subscribers was found. A review of specific zip codes reveals a relation between the top zip codes and leading organizations in the geospatial industry. For example, zip code 92373 is located in Redlands, CA—the home of Environmental Systems Research Institute (ESRI); zip 20910 is in Silver Springs, MD the home of the National Oceanic and Atmospheric Administration (NOAA); and zip 21401 in Annapolis, MD is the location of the Environmental Protection Agency (EPA). Further research of the top 20 zip codes can be done to find additional correlations between zips and industry leaders.

Geocoding Match Level Summary

File:
C:\Text\Grant\GeoSpatial_Solutions\subscriptions\geocode\New_add\new_geocode\geomap3_c_xy.dbf
Subscriptions GeoSpatial Solutions

Number of Records: 26,024

Match Description	Match Code	Number	Percent
Street Match	S	19,101	73.4%
Dominant Tract in ZIP Code	Z	5,537	21.3%
One Tract in ZIP Code	T	850	3.3%
No Geocode	X	536	2.1%
		26,024	**100.0%**

Match Description

ESRI BIS assigns your customer records to one of four match levels. The best match level is Street Address or ZIP+4. If a record cannot be matched at the Street Address or ZIP+4 levels, the Geo-Fix option can assign a census tract through a ZIP Code to census tract correspondence. The census tract with the largest population in the ZIP Code is appended to the record. This match is referred to as a Dominant Tract in ZIP Code (Z) match. If the ZIP Code is built from only one census tract, then the match code (T) denotes only one tract in the ZIP Code.

If an address is assigned a "No Geocode", no match was possible below the county level. Post office boxes, rural routes or drops, or incomplete addresses can preclude a match. Addresses outside the U.S. cannot be matched either.

ZIP Code to Census Tract Correspondence Summary

Census tracts, and in nontracted areas, block numbering areas (BNAs), are assigned to residential ZIP Codes by overlaying the centroids of the component blocks on ZIP Code boundaries. Expressed as latitude/longitude coordinates, centroids approximate the geographic centers of blocks. If the centroid of a block falls within the ZIP Code, it is included. Blocks are then aggregated, and the ratio of the block totals to tracts/BNAs is used to create the ZIP Code to census tract correspondence.

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Customer Geographic Summary

File: C:\Text\Grant\GeoSpatial_Solutions\subscriptions\geocode\New_add\new_geocode\geomap3_c_xy.dbf
Subscriptions GeoSpatial Solutions

Number of Records: 26,024

	Record Count	Percent
Top 20 States		
California (06)	3,286	12.6%
Texas (48)	1,564	6.0%
Florida (12)	1,429	5.5%
New York (36)	1,271	4.9%
Virginia (51)	1,179	4.5%
Pennsylvania (42)	955	3.7%
Illinois (17)	872	3.4%
Colorado (08)	869	3.3%
Ohio (39)	832	3.2%
Maryland (24)	772	3.0%
Washington (53)	677	2.6%
New Jersey (34)	661	2.5%
North Carolina (37)	630	2.4%
Michigan (26)	627	2.4%
Georgia (13)	609	2.3%
Massachusetts (25)	599	2.3%
Minnesota (27)	520	2.0%
Wisconsin (55)	512	2.0%
Missouri (29)	504	1.9%
Oregon (41)	487	1.9%
Other States	6,633	25.5%
Non-geocoded Records	536	2.1%
Top 20 Counties		
Los Angeles, CA (06037)	657	2.5%
Fairfax, VA (51059)	430	1.7%
San Diego, CA (06073)	387	1.5%
Cook, IL (17031)	317	1.2%
Harris, TX (48201)	310	1.2%
Orange, CA (06059)	298	1.1%
King, WA (53033)	263	1.0%
Maricopa, AZ (04013)	249	1.0%
Santa Clara, CA (06085)	233	0.9%
Montgomery, MD (24031)	231	0.9%
Dallas, TX (48113)	199	0.8%
Sacramento, CA (06067)	197	0.8%
New York, NY (36061)	195	0.7%
District of Columbia, DC (11001)	187	0.7%
Middlesex, MA (25017)	184	0.7%
Alameda, CA (06001)	173	0.7%
Miami-Dade, FL (12086)	159	0.6%
Travis, TX (48453)	156	0.6%
Franklin, OH (39049)	149	0.6%
San Bernardino, CA (06071)	142	0.5%
Other Counties	20,372	78.3%
Non-geocoded Records	536	2.1%

	Record Count	Percent
Top 20 ZIP Codes		
80225 Denver, CO	62	0.2%
92373 Redlands, CA	55	0.2%
95814 Sacramento, CA	39	0.1%
22030 Fairfax, VA	36	0.1%
63010 Arnold, MO	35	0.1%
65401 Rolla, MO	35	0.1%
20192 Herndon, VA	33	0.1%
20910 Silver Spring, MD	32	0.1%
94025 Menlo Park, CA	32	0.1%
80112 Englewood, CO	31	0.1%
80202 Denver, CO	31	0.1%
21401 Annapolis, MD	30	0.1%
40601 Frankfort, KY	30	0.1%
87109 Albuquerque, NM	29	0.1%
20191 Reston, VA	28	0.1%
22315 Alexandria, VA	27	0.1%
95616 Davis, CA	26	0.1%
20171 Herndon, VA	25	0.1%
20190 Reston, VA	24	0.1%
57198 Garretson, SD	24	0.1%
Other ZIP Codes	25,360	97.4%
Records with no ZIP Code	0	0.0%
Top 20 Metropolitan Areas		
Washington, DC (8840)	1,372	5.3%
Los Angeles-L.Beach (4480)	657	2.5%
Boston-Wor-Law-Lw-Br (1123)	576	2.2%
Chicago, IL (1600)	566	2.2%
New York, NY (5600)	486	1.9%
Atlanta, GA (0520)	421	1.6%
Denver, CO (2080)	421	1.6%
San Diego, CA (7320)	387	1.5%
Houston, TX (3360)	383	1.5%
Philadelphia, PA-NJ (6160)	359	1.4%
Minneapolis-St. Paul (5120)	326	1.3%
Seattle-Bellev-Ev'tt (7600)	321	1.2%
Dallas, TX (1920)	304	1.2%
Orange County, CA (5945)	298	1.1%
Baltimore, MD (0720)	295	1.1%
St. Louis, MO-IL (7040)	279	1.1%
Oakland, CA (5775)	259	1.0%
Phoenix-Mesa, AZ (6200)	255	1.0%
Sacramento, CA (6920)	255	1.0%
Riverside-San Bern. (6780)	247	0.9%
Other MAs	13,219	50.8%
Records not in an MA	4,338	16.7%

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Internet: http://www.esribis.com

Customer ACORN Profile

File:
C:\Text\Grant\GeoSpatial_Solutions\subscriptions\geocode\New_add\new_geocode\geomap3_c_xy.dbf
Subscriptions GeoSpatial Solutions

ACORN Description	**Customers** Number	%	Penetration Per 1000	**U.S.** Number	% Index
1 Affluent Families	5,741	22.2	0.30	19,025,234	18.0123
2 Upscale Households	3,583	13.9	0.23	15,319,823	14.595
3 Up & Coming Singles	2,492	9.6	0.38	6,478,393	6.1157
4 Retirement Styles	2,514	9.7	0.22	11,463,248	10.990
5 Young Mobile Adults	2,676	10.4	0.74	3,595,727	3.4304
6 City Dwellers	2,651	10.3	0.18	14,534,166	13.874
7 Factory & Farm Communities	3,943	15.3	0.14	28,704,089	27.256
8 Downtown Residents	1,383	5.4	0.23	6,109,377	5.8 92
9 Nonresidential Neighborhoods	860	3.3	3.44	250,044	0.21404
Total	25,843	100.0	0.25	105,480,101	100.0100

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Internet: http://www.esribis.com

Customer ACORN Profile

File:
C:\Text\Grant\GeoSpatial_Solutions\subscriptions\geocode\New_add\new_geocode\geomap3_c_xy.dbf
Subscriptions GeoSpatial Solutions

ACORN	Description		Customers Number	%	Penetration Per 1000	Number	%	U.S. Index
1	Affluent Families	1A Top One Percent	383	1.50	.31	1,248,861	1.2	125
		1B Wealthy Seaboard Suburbs	714	2.80	.32	2,220,126	2.1	131
		1C Upper Income Empty Nesters	710	2.70	.31	2,319,062	2.2	125
		1D Successful Suburbanites	983	3.80	.38	2,555,230	2.4	157
		1E Prosperous Baby Boomers	1,559	6.00	.31	5,000,263	4.7	127
		1F Semirural Lifestyle	1,392	5.40	.24	5,681,692	5.4	100
2	Upscale Households	2A Urban Professional Couples	1,293	5.00	.31	4,212,226	4.0	125
		2B Baby Boomers With Children	959	3.70	.23	4,177,326	4.0	94
		2C Thriving Immigrants	312	1.20	.19	1,654,879	1.6	77
		2D Pacific Heights	284	1.10	.35	807,961	0.8	143
		2E Older Settled Married Couples	735	2.80	.16	4,467,431	4.2	67
3	Up & Coming Singles	3A High Rise Renters	1,124	4.30	.47	2,395,682	2.3	191
		3B Enterprising Young Singles	1,368	5.30	.34	4,082,711	3.9	137
4	Retirement Styles	4A Retirement Communities	476	1.80	.35	1,365,172	1.3	142
		4B Active Senior Singles	704	2.70	.25	2,866,329	2.7	100
		4C Prosperous Older Couples	715	2.80	.21	3,463,778	3.3	84
		4D Wealthiest Seniors	231	0.90	.18	1,295,816	1.2	73
		4E Rural Resort Dwellers	160	0.60	.16	997,639	0.9	65
		4F Senior Sun Seekers	228	0.90	.15	1,474,514	1.4	63
5	Young Mobile Adults	5A Twenty-somethings	1,230	4.80	.59	2,089,363	2.0	240
		5B College Campuses	1,103	4.31	.35	819,080	0.8	550
		5C Military Proximity	343	1.30	.50	687,284	0.7	204
6	City Dwellers	6A East Coast Immigrants	389	1.50	.15	2,594,144	2.5	61
		6B Working Class Families	132	0.50	.11	1,210,608	1.1	45
		6C Newly Formed Households	1,197	4.60	.23	5,180,760	4.9	94
		6D Southwestern Families	291	1.10	.14	2,010,329	1.9	59
		6E West Coast Immigrants	168	0.70	.14	1,218,945	1.2	56
		6F Low Income: Young & Old	474	1.80	.20	2,319,380	2.2	83
7	Factory & Farm Communities	7A Middle America	1,161	4.50	.13	8,615,443	8.2	55
		7B Young Frequent Movers	717	2.80	.19	3,787,725	3.6	77
		7C Rural Industrial Workers	502	1.90	.09	5,898,450	5.6	35
		7D Prairie Farmers	114	0.40	.11	1,055,112	1.0	44
		7E Small Town Working Families	268	1.00	.15	1,787,863	1.7	61
		7F Rustbelt Neighborhoods	490	1.90	.13	3,829,034	3.6	52
		7G Heartland Communities	691	2.70	.19	3,730,462	3.5	76
8	Downtown Residents	8A Young Immigrant Families	129	0.5	0.12	1,050,710	1.0	50
		8B Social Security Dependents	746	2.9	0.85	881,770	0.8	345
		8C Distressed Neighborhoods	149	0.6	0.16	949,094	0.9	64
		8D Hard Times	180	0.7	0.11	1,592,287	1.5	46
		8E Urban Working Families	179	0.7	0.11	1,635,516	1.6	45
9	Nonresidential 2240 Neighborhoods	9A Business Districts	144	0.6	5.49	26,243	0.0	
		9B Institutional Populations	474	1.8	2.12	223,801	0.2	864
		9C Unpopulated Areas	242	0.9	0.00	0	0.0	0

	Total	25,843	100.0
0.25	105,480,101	100.0	100

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Subscriptions GeoSpatial Solutions

Rank	ACORN Description	Customers	U.S.	Index
1	1E Prosperous Baby Boomers	6.0%	4.7%	127
2	3B Enterprising Young Singles	5.3%	3.9%	137
3	2A Urban Professional Couples	5.0%	4.0%	125
4	5A Twenty-somethings	4.8%	2.0%	240
5	3A High Rise Renters	4.3%	2.3%	191
	Subtotal	25.4%	16.9%	151
6	5B College Campuses	4.3%	0.8%	550
7	1D Successful Suburbanites	3.8%	2.4%	157
8	8B Social Security Dependents	2.9%	0.8%	345
9	1B Wealthy Seaboard Suburbs	2.8%	2.1%	131
10	1C Upper Income Empty Nesters	2.7%	2.2%	125
	Subtotal	16.5%	8.3%	198
11	4A Retirement Communities	1.8%	1.3%	142
12	9B Institutional Populations	1.8%	0.2%	864
13	1A Top One Percent	1.5%	1.2%	125
14	5C Military Proximity	1.3%	0.7%	204
15	2D Pacific Heights	1.1%	0.8%	143
	Subtotal	7.6%	4.1%	185
16	9A Business Districts	0.6%	0.0%	2240
	Subtotal	0.6%	0.0%	2240
	Total	50.0%	29.3%	171

Note: Only classifications with an index higher than 100 are reported.
Subtotals are shown for every 5 classifications.

Output File Layout

File:
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Subscriptions GeoSpatial Solutions

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ADDRESS_L1
CITY
STATE
F9DIGIT_ZI
COUNTRY
BUSINESS_C
FUNCTION_C
CODE_31
GEOCODE
GEOLEVEL
MSA_CODE
LATITUDE
LONGITUDE
LOC_CODE
ZIP4
ACORN
ACORN_DESC
ACORNLEVEL
GEOCODE
GEOLEVEL
MSA_CODE
LATITUDE
LONGITUDE
ZIP4
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APPENDIX B
GEOGRAPHIC MATCH LEVEL FOR FIRMS

In this appendix, a geocoding summary, created with the process of *GeoSpatial Solutions* firms' data set and the use of CACI Coder/Plus (ESRI), is outlined. This section supplements the analysis of firms found in Chapter 4 and Chapter 5.

Geocoding Match Level Summary

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GIS Companies CONFIDENTIAL

Number of Records: 647

Match Description	Match Code	Number	Percent
Street Match	S	555	85.8%
Dominant Tract in ZIP Code	Z	83	12.8%
One Tract in ZIP Code	T	8	1.2%
No Geocode	X	1	0.2%
		647	**100.0%**

Match Description

ESRI BIS assigns your customer records to one of four match levels. The best match level is Street Address or ZIP+4. If a record cannot be matched at the Street Address or ZIP+4 levels, the Geo-Fix option can assign a census tract through a ZIP Code to census tract correspondence. The census tract with the largest population in the ZIP Code is appended to the record. This match is referred to as a Dominant Tract in ZIP Code (Z) match. If the ZIP Code is built from only one census tract, then the match code (T) denotes only one tract in the ZIP Code.

If an address is assigned a “No Geocode”, no match was possible below the county level. Post office boxes, rural routes or drops, or incomplete addresses can preclude a match. Addresses outside the U.S. cannot be matched either.

ZIP Code to Census Tract Correspondence Summary

Census tracts, and in nontracted areas, block numbering areas (BNAs), are assigned to residential ZIP Codes by overlaying the centroids of the component blocks on ZIP Code boundaries. Expressed as latitude/longitude coordinates, centroids approximate the geographic centers of blocks. If the centroid of a block falls within the ZIP Code, it is included. Blocks are then aggregated, and the ratio of the block totals to tracts/BNAs is used to create the ZIP Code to census tract correspondence.

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Customer Geographic Summary

File:
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Number of Records: 647

	Record Count
Top 20 States	
California (06)	123
Colorado (08)	77
Texas (48)	40
Virginia (51)	36
Florida (12)	34
Georgia (13)	34
Massachusetts (25)	27
Maryland (24)	23
New York (36)	19
Pennsylvania (42)	16
Washington (53)	15
Alabama (01)	14
Ohio (39)	14
Illinois (17)	11
Minnesota (27)	11
New Jersey (34)	11
New Mexico (35)	10
Oregon (41)	10
Arizona (04)	9
Missouri (29)	9
Other States	103
Non-geocoded Records	1

	Record Count	Percent
Top 20 ZIP Codes		
80202 Denver, CO	6	0.9%
92121 San Diego, CA	6	0.9%
20166 Sterling, VA	5	0.8%
77042 Houston, TX	5	0.8%
80112 Englewood, CO	5	0.8%
80301 Boulder, CO	5	0.8%
95050 Santa Clara, CA	5	0.8%
20170 Herndon, VA	4	0.6%
30004 Alpharetta, GA	4	0.6%
80021 Broomfield, CO	4	0.6%
80111 Englewood, CO	4	0.6%
80302 Boulder, CO	4	0.6%
94043 Mountain View, CA	4	0.6%
94612 Oakland, CA	4	0.6%
20151 Chantilly, VA	3	0.5%
30328 Atlanta, GA	3	0.5%
33760 Clearwater, FL	3	0.5%
35758 Madison, AL	3	0.5%
35824 Huntsville, AL	3	0.5%
80026 Lafayette, CO	3	0.5%
Other ZIP Codes	564	87.2%
Records with no ZIP Code	0	0.0%

	Record Count
Top 20 Counties	
Santa Clara, CA (06085)	25
Fairfax, VA (51059)	19
Los Angeles, CA (06037)	17
Boulder, CO (08013)	17
Harris, TX (48201)	17
San Diego, CA (06073)	16
Alameda, CA (06001)	15
Jefferson, CO (08059)	15
Fulton, GA (13121)	15
Middlesex, MA (25017)	15
Denver, CO (08031)	14
Orange, CA (06059)	13
Arapahoe, CO (08005)	11
Madison, AL (01089)	9
Hillsborough, FL (12057)	9
Montgomery, MD (24031)	9
King, WA (53033)	9
San Francisco, CA (06075)	8
Suffolk, MA (25025)	8
Maricopa, AZ (04013)	7
Other Counties	378

	Record Count	Percent
Top 20 Metropolitan Areas		
Denver, CO (2080)	48	7.4%
Washington, DC (8840)	46	7.1%
Atlanta, GA (0520)	32	4.9%
Boston-Wor-Law-Lw-Br (1123)	30	4.6%
San Jose, CA (7400)	25	3.9%
Houston, TX (3360)	23	3.6%
Boulder-Longmont, CO (1125)	17	2.6%
Los Angeles-L.Beach (4480)	17	2.6%
Oakland, CA (5775)	17	2.6%
San Diego, CA (7320)	16	2.5%
Tampa-St.Pete-Clearw (8280)	15	2.3%
San Francisco, CA (7360)	14	2.2%
Orange County, CA (5945)	13	2.0%
Philadelphia, PA-NJ (6160)	13	2.0%
Chicago, IL (1600)	11	1.7%
Baltimore, MD (0720)	10	1.5%
Minneapolis-St. Paul (5120)	10	1.5%
Seattle-Bellev-Ev'tt (7600)	10	1.5%
Huntsville, AL (3440)	9	1.4%
Kansas City, MO-KS (3760)	7	1.1%
Other MAs	227	35.1%
Records not in an MA	37	5.7%

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		Customers		Penetration	**U.S.**
ACORN Description	Number	%	Per 1000	Number %	Index
1 Affluent Families	176	27.2	0.0119,025,234	18.0	151
2 Upscale Households	95	14.7	0.0115,319,823	14.5	101
3 Up & Coming Singles	118	18.2	0.026,478,393	6.1	297
4 Retirement Styles	64	9.9	0.0111,463,248	10.9	91
5 Young Mobile Adults	55	8.5	0.023,595,727	3.4	249
6 City Dwellers	53	8.2	0.0014,534,166	13.8	59
7 Factory & Farm Communities	42	6.5	0.0028,704,089	27.2	24
8 Downtown Residents	23	3.6	0.006,109,377	5.8	61
9 Nonresidential Neighborhoods	21	3.2	0.08250,044	0.2	1369
Total			647 100.0	0.01	105,480,101
100.0			100		

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GIS Companies CONFIDENTIAL

ACORN Description			**Customers** Number	%	Penetration Per 1000	Number	**U.S.** % index
1	Affluent Families	1A Top One Percent	18	2.8	0.01	1,248,861	1.2235
		1B Wealthy Seaboard Suburbs	21	3.2	0.01	2,220,126	2.1154
		1C Upper Income Empty Nesters	17	2.6	0.01	2,319,062	2.2120
		1D Successful Suburbanites	33	5.1	0.01	2,555,230	2.4211
		1E Prosperous Baby Boomers	53	8.2	0.01	5,000,263	4.7173
		1F Semirural Lifestyle	34	5.3	0.01	5,681,692	5.498
2	Upscale Households	2A Urban Professional Couples	38	5.9	0.01	4,212,226	4.0147
		2B Baby Boomers With Children	25	3.9	0.01	4,177,326	4.098
		2C Thriving Immigrants	15	2.3	0.01	1,654,879	1.6148
		2D Pacific Heights	5	0.8	0.01	807,961	0.8101
		2E Older Settled Married Couples	12	1.9	0.00	4,467,431	4.244
3	Up & Coming Singles	3A High Rise Renters	45	7.0	0.02	2,395,682	2.3306
		3B Enterprising Young Singles	73	11.3	0.02	4,082,711	3.9292
4	Retirement Styles	4A Retirement Communities	16	2.5	0.01	1,365,172	1.3191
		4B Active Senior Singles	17	2.6	0.01	2,866,329	2.797
		4C Prosperous Older Couples	19	2.9	0.01	3,463,778	3.389
		4D Wealthiest Seniors	2	0.3	0.00	1,295,816	1.225
		4E Rural Resort Dwellers	3	0.5	0.00	997,639	0.949
		4F Senior Sun Seekers	7	1.1	0.00	1,474,514	1.477
5	Young Mobile Adults	5A Twenty-somethings	39	6.0	0.02	2,089,363	2.0304
		5B College Campuses	15	2.3	0.02	819,080	0.8299
		5C Military Proximity	1	0.2	0.00	687,284	0.724
6	City Dwellers	6A East Coast Immigrants	8	1.2	0.00	2,594,144	2.550
		6B Working Class Families	6	0.9	0.00	1,210,608	1.181
		6C Newly Formed Households	18	2.8	0.00	5,180,760	4.957
		6D Southwestern Families	6	0.9	0.00	2,010,329	1.949
		6E West Coast Immigrants	9	1.4	0.01	1,218,945	1.2120
		6F Low Income: Young & Old	6	0.9	0.00	2,319,380	2.242
7	Factory & Farm Communities	7A Middle America	11	1.7	0.00	8,615,443	8.221
		7B Young Frequent Movers	13	2.0	0.00	3,787,725	3.656
		7C Rural Industrial Workers	4	0.6	0.00	5,898,450	5.611
		7D Prairie Farmers	1	0.2	0.00	1,055,112	1.015
		7E Small Town Working Families	4	0.6	0.00	1,787,863	1.736
		7F Rustbelt Neighborhoods	4	0.6	0.00	3,829,034	3.617
		7G Heartland Communities	5	0.8	0.00	3,730,462	3.522
8	Downtown Residents	8A Young Immigrant Families	2	0.3	0.00	1,050,710	1.031
		8B Social Security Dependents	14	2.2	0.02	881,770	0.8259
		8C Distressed Neighborhoods	1	0.2	0.00	949,094	0.917
		8D Hard Times	3	0.5	0.00	1,592,287	1.531
		8E Urban Working Families	3	0.5	0.00	1,635,516	1.630
9	Nonresidential Neighborhoods	9A Business Districts	7	1.1	0.27	26,243	0.04349
		9B Institutional Populations	10	1.5	0.04	223,801	0.2728
		9C Unpopulated Areas	4	0.6	0.00	0	0.0 0
		Total	647	100.0	0.01	105,480,101	100.0100

Customer ACORN Profile

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GIS Companies CONFIDENTIAL

Rank	ACORN Description	Customers	U.S.	Index
1	3B Enterprising Young Singles	11.3%	3.9%	292
2	1E Prosperous Baby Boomers	8.2%	4.7%	173
3	3A High Rise Renters	7.0%	2.3%	306
4	5A Twenty-somethings	6.0%	2.0%	304
5	2A Urban Professional Couples	5.9%	4.0%	147
	Subtotal	38.3%	16.9%	227
6	1D Successful Suburbanites	5.1%	2.4%	211
7	1B Wealthy Seaboard Suburbs	3.2%	2.1%	154
8	1A Top One Percent	2.8%	1.2%	235
9	1C Upper Income Empty Nesters	2.6%	2.2%	120
10	4A Retirement Communities	2.5%	1.3%	191
	Subtotal	16.2%	9.2%	176
11	5B College Campuses	2.3%	0.8%	299
12	2C Thriving Immigrants	2.3%	1.6%	148
13	8B Social Security Dependents	2.2%	0.8%	259
14	9B Institutional Populations	1.5%	0.2%	728
15	6E West Coast Immigrants	1.4%	1.2%	120
	Subtotal	9.7%	4.5%	214
16	9A Business Districts	1.1%	0.0%	4349
17	2D Pacific Heights	0.8%	0.8%	101
	Subtotal	1.9%	0.8%	235
	Total	66.2%	31.4%	211

Note: Only classifications with an index higher than 100 are reported.
Subtotals are shown for every 5 classifications.

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Field
COMPANY
ADDRESS
ADDRESS_IN
CITY
STATE
ZIP
GEOCODE
GEOLEVEL
MSA_CODE
LATITUDE
LONGITUDE
ZIP4
ACORN
ACORN_DESC
ACORNLEVEL

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APPENDIX C
2000 US CENSUS DATA

In this appendix US States demographic data from the 2000 US. Census was used to supplement the analysis of the percentage rate of subscribers by state in Chapter 4. The data set for Establishment and Employment Changes from Births, Deaths, Expansions, and Contractions from the 2000 US. Census supplements the analysis of the firms' concentration rate by state in Chapter 4.

U.S. States Demographic Data

Geographic area: Alabama
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 4,447,100
Subject Number Percent
18 years and over 3,323,678
Bachelor's degree 351,772
Graduate or professional degree 197,836

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Arizona
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 5,130,632
Subject Number Percent
18 years and over 3,763,685
Bachelor's degree 493,419
Graduate or professional degree 272,793

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Arkansas
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 2,673,400
Subject Number Percent
18 years and over 1,993,031
Bachelor's degree 190,427
Graduate or professional degree 98,001

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: California
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 33,871,648
Subject Number Percent
18 years and over 24,621,819
Bachelor's degree 3,640,157
Graduate or professional degree 2,029,809

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: Colorado
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 4,301,261
Subject Number Percent
18 years and over 3,200,466
Bachelor's degree 599,028
Graduate or professional degree 308,727

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Connecticut
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 3,405,565
Subject Number Percent
18 years and over 2,563,877
Bachelor's degree 416,751
Graduate or professional degree 304,243

Table DP-1. Profile of General Demographic Characteristics: 2000

Geographic area: Delaware
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 783,600
Subject Number Percent
18 years and over 589,013
Bachelor's degree 80,376
Graduate or professional degree 48,541

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: District of Columbia
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 572,059
Subject Number Percent
18 years and over 457,067
Bachelor's degree 69,496
Graduate or professional degree 80,741

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Florida
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 15,982,378 100.0
Subject Number Percent
18 years and over 12,336,038
Bachelor's degree 1,573,121
Graduate or professional degree 889,207

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Georgia
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 8,186,453 100.0
Subject Number Percent
18 years and over 6,017,219
Bachelor's degree 829,873
Graduate or professional degree 430,305

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Idaho
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 1,293,953
Subject Number Percent
18 years and over 924,923
Bachelor's degree 116,901
Graduate or professional degree 53,714

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Illinois
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 12,419,293
Subject Number Percent
18 years and over 9,173,842
Bachelor's degree 1,317,182
Graduate or professional degree 760,867

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: Indiana
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 6,080,485
Subject Number Percent

18 years and over 4,506,089
Bachelor's degree 475,247
Graduate or professional degree 280,366

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: Iowa
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 2,926,324
Subject Number Percent
18 years and over 2,192,686
Bachelor's degree 278,350
Graduate or professional degree 123,740

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Kansas
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 2,688,418
Subject Number Percent
Bachelor's degree 290,271
Graduate or professional degree 148,707

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Kentucky
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 4,041,769
Subject Number Percent
18 years and over 3,046,951
Bachelor's degree 271,418
Graduate or professional degree 182,051

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Louisiana
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 4,468,976
Subject Number Percent
18 years and over 3,249,177
Bachelor's degree 339,711
Graduate or professional degree 180,067

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Maine
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 1,274,923
Subject Number Percent
18 years and over 973,685
Bachelor's degree 129,992
Graduate or professional degree 68,968

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Maryland
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 5,296,486
Subject Number Percent
18 years and over 3,940,314
Bachelor's degree 629,304
Graduate or professional degree 470,056

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Massachusetts

[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 6,349,097
Subject Number Percent
18 years and over 4,849,033
Bachelor's degree 834,554
Graduate or professional degree 583,741

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Michigan
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 9,938,444
Subject Number Percent
18 years and over 7,342,677
Bachelor's degree 878,680
Graduate or professional degree 517,579

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: Minnesota
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 4,919,479
Subject Number Percent
18 years and over 3,632,585
Bachelor's degree 605,210
Graduate or professional degree 262,872

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Mississippi
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 2,844,658
Subject Number Percent
18 years and over 2,069,471
Bachelor's degree 194,325
Graduate or professional degree 102,766

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Missouri
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 5,595,211
Subject Number Percent
18 years and over 4,167,519
Bachelor's degree 507,892
Graduate or professional degree 276,584

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: Montana
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 902,195
Subject Number Percent
18 years and over 672,133
Bachelor's degree 100,758
Graduate or professional degree 42,203

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Nebraska
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 1,711,263
Subject Number Percent
18 years and over 1,261,021
Bachelor's degree 179,181

Graduate or professional degree 78,959

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Nevada
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 1,998,257
Subject Number Percent
18 years and over 1,486,458
Bachelor's degree 158,078
Graduate or professional degree 79,797

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: New Hampshire
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 1,235,786
Subject Number Percent
18 years and over 926,224
Bachelor's degree 153,874
Graduate or professional degree 82,230

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: New Jersey
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 8,414,350
Subject Number Percent
18 years and over 6,326,792
Bachelor's degree 1,063,665
Graduate or professional degree 621,196

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: New Mexico
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 1,819,046
Subject Number Percent
18 years and over 1,310,472
Bachelor's degree 154,372
Graduate or professional degree 111,777

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: New York
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 18,976,457
Subject Number Percent
18 years and over 14,286,350
Bachelor's degree 1,954,242
Graduate or professional degree 1,478,970

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: North Carolina
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 8,049,313
Subject Number Percent
18 years and over 6,085,266
Bachelor's degree 808,070
Graduate or professional degree 378,643

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: North Dakota
[For information on confidentiality protection, nonsampling error, and definitions, see text]

Subject Number Percent
Total population. 642,200
Subject Number Percent
18 years and over 481,351
Bachelor's degree 67,551
Graduate or professional degree 22,292

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: Ohio
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 11,353,140
Subject Number Percent
18 years and over 8,464,801
Bachelor's degree 1,016,256
Graduate or professional degree 547,276

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Oklahoma
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 3,450,654
Subject Number Percent
18 years and over 2,558,294
Bachelor's degree 297,082
Graduate or professional degree 149,689

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: Oregon
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 3,421,399
Subject Number Percent
18 years and over 2,574,873
Bachelor's degree 369,252
Graduate or professional degree 195,314

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Pennsylvania
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 12,281,054
Subject Number Percent
18 years and over 9,358,833
Bachelor's degree 1,153,383
Graduate or professional degree 694,248

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Rhode Island
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 1,048,319
Subject Number Percent
18 years and over 800,497
Bachelor's degree 110,175
Graduate or professional degree 67,642

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: South Carolina
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 4,012,012
Subject Number Percent
18 years and over 3,002,371
Bachelor's degree 351,526
Graduate or professional degree 178,529

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: South Dakota
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 754,844
Subject Number Percent
18 years and over 552,195
Bachelor's degree 73,563
Graduate or professional degree 28,449

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Tennessee
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 5,689,283
Subject Number Percent
18 years and over 4,290,762
Bachelor's degree 478,463
Graduate or professional degree 254,225

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Texas
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 20,851,820
Subject Number Percent
18 years and over 14,965,061
Bachelor's degree 1,996,250
Graduate or professional degree 976,043

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic Area: Utah
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 2,233,169
Subject Number Percent
18 years and over 1,514,471
Bachelor's degree 213,959
Graduate or professional degree 99,004

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Vermont
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 608,827
Subject Number Percent
18 years and over 461,304
Bachelor's degree 74,124
Graduate or professional degree 44,901

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Virginia
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 7,078,515
Subject Number Percent
18 years and over 5,340,253
Bachelor's degree 835,011
Graduate or professional degree 539,977

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Washington
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent

Total population. 5,894,121
Subject Number Percent
18 years and over 4,380,278
Bachelor's degree 704,826
Graduate or professional degree 356,599

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: West Virginia
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 1,808,344
Subject Number Percent
18 years and over 1,405,951
Bachelor's degree 109,651
Graduate or professional degree 73,309

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Wisconsin
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 5,363,675
Subject Number Percent
18 years and over 3,994,919
Bachelor's degree 530,268
Graduate or professional degree 249,005

Table DP-1. Profile of General Demographic Characteristics: 2000
Geographic area: Wyoming
[For information on confidentiality protection, nonsampling error, and definitions, see text]
Subject Number Percent
Total population. 493,782
Subject Number Percent
18 years and over 364,909
Bachelor's degree 47,066
Graduate or professional degree 22,096

Establishment and Employment Changes from Births, Deaths, Expansions, and Contractions

by Employment Size of the Enterprise for the United States and All States, Totals: 1999 – 2000

AREA	CODE	DATA TYPE	Employment Size of the Enterprise
United States	01	Initial year establishments	6,248,411
Alabama	01	Initial year establishments	91,472
Arizona	01	Initial year establishments	98,834
Arkansas	01	Initial year establishments	56,235
California	01	Initial year establishments	692,987
Colorado	01	Initial year establishments	115,893
AREA	CODE	DATA TYPE	Employment Size of the Enterprise
Connecticut	01	Initial year establishments	83,145
Delaware	01	Initial year establishments	20,478
District of Columbia	01	Initial year establishments	17,817

Florida	01	Initial year establishments	372,132
Georgia	01	Initial year establishments	175,250
Idaho	01	Initial year establishments	31,991
Illinois	01	Initial year establishments	273,421
Indiana	01	Initial year establishments	133,226
Iowa	01	Initial year establishments	73,436
Kansas	01	Initial year establishments	67,139
Kentucky	01	Initial year establishments	81,935
Louisiana	01	Initial year establishments	92,092
Maine	01	Initial year establishments	33,721
Maryland	01	Initial year establishments	113,481
Massachusetts	01	Initial year establishments	154,385
Michigan	01	Initial year establishments	210,508
Minnesota	01	Initial year establishments	120,668
Mississippi	01	Initial year establishments	54,368
Missouri	01	Initial year establishments	130,269
Montana	01	Initial year establishments	27,140
Nebraska	01	Initial year establishments	44,029
Nevada	01	Initial year establishments	40,211
New Hampshire	01	Initial year establishments	33,146
New Jersey	01	Initial year establishments	205,043
New Mexico	01	Initial year establishments	38,320
New York	01	Initial year establishments	429,397
North Carolina	01	Initial year establishments	181,306
North Dakota	01	Initial year establishments	18,308
Ohio	01	Initial year establishments	246,210
Oklahoma	01	Initial year establishments	76,566
Oregon	01	Initial year establishments	88,292
Pennsylvania	01	Initial year establishments	267,546
Rhode Island	01	Initial year establishments	25,139
South Carolina	01	Initial year establishments	86,770
South Dakota	01	Initial year establishments	21,037
Tennessee	01	Initial year establishments	119,362
Texas	01	Initial year establishments	420,139
Utah	01	Initial year establishments	46,473
Vermont	01	Initial year establishments	19,097
Virginia	01	Initial year establishments	155,985
Washington	01	Initial year establishments	142,653
AREA	CODE	DATA TYPE	Employment Size of the Enterprise
West Virginia	01	Initial year establishments	37,800
Wisconsin	01	Initial year establishments	125,600
Wyoming	01	Initial year establishments	15,713

LIST OF REFERENCES

Bond C., April 1997, "Divide and Conquer," Haymarket Publishing Ltd, London,.pp. 29.

Campbell R., Martin C., Fabos B., *Media and Culture an Introduction to Mass Communication*, Bedford, New York.

Chepesiuk R., February 1994, "Finding the Right Niche," Editor & Publisher, 127: 14-16.

Cissna K., *Applied Communication in the 21st Century*, Lawrence Erblbam Associate Publishers, Hillsdale, New Jersey 1995.

Craig C., Ghosh A., McLafferty S., 1984, "Models of Retail Location Process: A Review," Journal of Retailing, 49(3): 51-63.

Daratech. *Geographic Information Systems: Markets and Opportunities 2003*. Cambridge, MA: Daratech, 2002.

Davud L, Della Bita A., 1979, *Consumer Behavior: Concepts and Applications*, McGraw-Hill, New York 1979, pp. 50-54.

Dickenson N., "The Brave New World of Segmentation," Campaign, (University of Florida) InfoTrac OneFile, pp. 36, February 6, 1998.

Geller L., "Blazing New Trails Takes Nerve," Philadelphia, September 2003, 26: 9 pp. 20.

Goldstucker J., Bellenger D., Stanley T., Otte R., *New Developments in Retail Trading Area Analysis and Site Selection*, 1978, Atlanta: College of Business Administration, Georgia State University.

Granatstein L., "Talkin' Shop," Mediaweek, New York, September 2003, 13: 33 pp. 37.

Hartung **V**., "An Economic Perspective of the GIS Industry," NCGIA, Buffalo, pp. 1-12.

Haynes K., Fotheringham A., "Gravity and Spatial Interaction Models," Scientific Geography Series, 1984, vol. 2, Thousand Oaks, California: Sage Publications.

Hucker-Brown K., "Estimating the Potential of Your Chosen Market," Direct Response, London, March 2003, pp. 33.

Huff D., "Geographical Aspects of Consumer Behavior," 1959, University of Washington Business Review, 18: 27-37.

Katz M., “You Do the Math: Measure for Measure, Site Selection Process Has Big-Time Sales Potential,” Nation’s Restaurant News, New York, December 2002, 36: 48 pp. 27-28.

Liebeskind K., “Unleashing Data’s Selling Power,” Editor & Publisher, New York, July 1996, 129: 29 pp. 27C.

Maguire D., Goodchild, M., Rhind D., 1991. *Geographical Information Systems: Principles and Applications*. Longman Group, Cambridge, UK.

Martin M., “Man Behind Maxim’s Success Still Isn’t Ready to Take It Easy,” Campaign, August 21, 1998, pp. 19.

Merrick A., “The 2000 Count: Counting on the Census---New Data Will Let Starbucks Plan Store Openings, Help Blockbuster Stock Its Videos,” Wall Street Journal, New York, February 2001, pp. B1.

Mummert H., “Best Practices,” Target Marketing, Philadelphia, September 2003, 26: 9 pp. 34.

Piccillo S., “How Marketers Benefit From Mapping Demos,” Marketing News, June 1999, 33: 13 pp. 15-16.

Piirto R., *Capturing Consumers*, Ithaca, NY: American Demographic Press, 1990.

Saolik M., “Print Media: Placement Strategies for the New Segmentation,” November 1989, Public Relation Journal, 45: 15-16.

Scharpf N., “Target Marketing: Publishers Must Lead,” Folio, February 1989, pp. 168.

Strout E., “The Segmentation Game,” Sales and Marketing Management, New York, August 2003, 155: 8 pp. 11.

Swann M., “Mass Magazine Circulation Patterns in the United States: Regional Variations in Urban and Rural Tastes,” Dept. of Geography, Discussion Paper, Syracuse University, Syracuse, New York, Number 6, June 1975.

Thrall G., “CACI Coder/Plus Version 1,” Geo Info Systems, June 1998, Cleveland, 8: 6 pp. 43-45.

Thrall G., Albury J., *Business Geography and New Real Estate Market Analysis*, Oxford University Press, Inc., New York, NY, 2002.

Thrall G., Casey J., Quintana A., “Mosaic,” GeoSpatial Solutions, Duluth, April 2001, 11: 4 pp. 40-43.

Thrall G., Del Valle J., Amos P., McGurn K., “Measuring the Development Potential of an Historic Downtown”. Geo Info Systems, 1996, 6(4), Cleveland, pp. 44-49.

Van Zuiles A., *The Life Cycle of Magazines*, Graduate Press, Uithoorn 1997.

BIOGRAPHICAL SKETCH

Matias Sebastian Campins is the son of Gabriel Miguel Campins and Raquel Beatriz Campins. Born on October 25, 1975, in Buenos Aires, Argentina, he lived with his family until the age of 21, when the family moved to Orlando, Florida. There, he attended Valencia Community College and received his Associate of Arts degree in 2000. He then moved to Gainesville, Florida, to begin his studies at the University of Florida. In December 2002, he received his Bachelor of Arts degree in geography from the University of Florida. Currently, he is working toward his Master or Arts degree in geography with a specialization in real estate market analysis and a minor in urban and regional planning.