

PART III
THE DREDGING PROCESS

Introduction

In this section we review the objectives of dredging, the equipment and methodologies used in dredging and some of the general effects of dredging that can adversely impact the environment.

Dredging Objectives

There are two general and fairly obvious reasons for dredging. First is the removal of quantities of material from an area in which it is regarded as an impediment to one or more particular activities. Examples are dredging of a navigational channel or a marina. In this case, the placement of the material removed is usually of secondary interest to those carrying out the dredging and in the absence of other considerations, the material will be disposed of by the least costly method. The second reason for dredging is to obtain material for some use. In our context, beach nourishment is the more usual example and the quality of the material can be of prime concern. Regardless of the reason for dredging, removal and placement of large quantities of material will obviously cause physical and environmental perturbations in the dredging area and in the area where the material is placed.

Dredging Equipment Methodologies

The two general classes of dredges include mechanical dredges and hydraulic dredges. Mechanical dredges include clam shell dredges (Figure 14) and bucket dredges (Figure 15). Practically all large dredging projects are carried out with hydraulic dredges; therefore, this discussion will be limited to this class.

Within the hydraulic dredge class, there are two general types of dredges, i.e. the pipeline dredge and the hopper dredge. Pipeline dredges move very slowly, excavating to a substantial additional depth before they leave an area, Figure 16. This material is transported as a water-sediment mix or "slurry" through a pipeline to the area desired. Hopper dredges load material into a hull while underway and transport the material as a bulk cargo, Figure 17. The original hopper dredges were designed (as their name implies) to store the