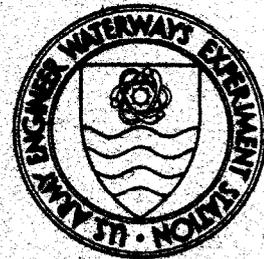


DREDGED MATERIAL RESEARCH PROGRAM



TECHNICAL REPORT D-78-53

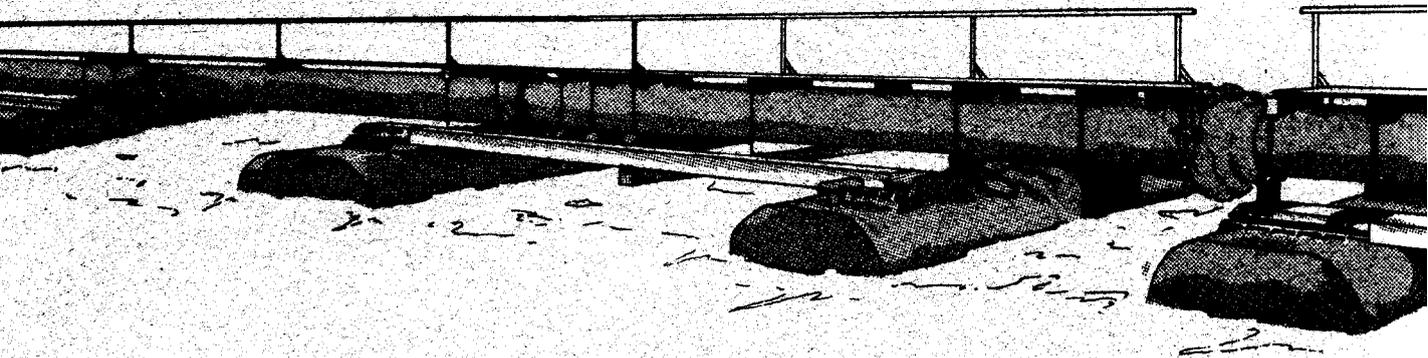
FIELD DEMONSTRATION OF SHRIMP MARICULTURE FEASIBILITY IN DREDGED MATERIAL CONTAINMENT AREAS

by

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SUBJECT: Transmittal of Technical Report D-78-53

TO: All Report Recipients

1. The report transmitted herewith represents the results of one of several research efforts completed as part of Task 4D (Products Development) of the Corps of Engineers' Dredged Material Research Program (DMRP). Task 4D was included as part of the Productive Uses Project of the DMRP, which, among other considerations, included developing concepts for productively using disposal areas or dredged material removed from these areas.

2. There has been a dramatic increase in the last several years in the amount of land disposal of dredged material, necessitated largely as a result of the need for confining dredged material classified as polluted. Land is continuing to become more and more scarce for disposal activities, and the problem becomes more acute with the need for selecting each new disposal area. Many of these areas are acquired for long periods of time, yet are used intermittently when dredging is being accomplished. The remainder of the time, they are nonproductive, unused land and may be both environmentally and aesthetically displeasing. Attention, therefore, can be profitably and justifiably directed towards concepts that can demonstrate that long-term diked disposal sites can serve as a resource to be used for producing income on a continuing basis.

3. DMRP work units under other tasks have developed improved disposal facility operation and management procedures as well as techniques for the reclamation of potentially valuable materials, both of which could increase area life expectancy as well as enhance the aesthetic and environmental characteristics of disposal areas. However, the total picture would be incomplete without considering concepts for developing marketable products from the dredged material itself or from the disposal areas. To this end, the investigation reported herein was directed at demonstrating the feasibility of shrimp mariculture in dredged material disposal sites.

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4. The study was a field investigation verifying results of a previous small-scale study that showed possible feasibility of using containment areas for shrimp mariculture. Seven hundred thousand juvenile shrimp were stocked in a 20-acre section of an existing 158-acre dredged material containment area. Two months later the shrimp were harvested and tested for suitability for human consumption and for bait purposes.

5. The study concludes that shrimp mariculture in dredged material containment areas is technically feasible, although economic feasibility is still somewhat dependent on, among other things, a cheaper system of obtaining the stocking shrimp. The report presents not only a technical analysis but also a complete economic analysis of the project including projections on the probable acreage needed to make future ventures profitable.

6. An additional intent of this study and this report is to promote more widespread interest in and concern over the subsequent use of disposal sites for productive purposes. To this end, it is expected that the basic conceptual design and methodology employed in this study may be of great long-term significance not only to mariculturists but also to persons concerned with land-use planning and management.



JOHN L. CANNON
Colonel, Corps of Engineers
Commander and Director

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Dredging of the nation's waterways results in the production of large volumes of material that must be removed and disposed of. Much of this dredged material is disposed of in diked land disposal sites called dredged material containment areas (dmca). Since dewatering of the disposed sediments takes months or years, these dmca's remain nonproductive over long periods of time. This study was undertaken to determine the potential of shrimp mariculture (Continued)		

20. ABSTRACT (Continued).

in dmca's as a productive use of those sites.

A 158-acre dmca located on the Gulf Intracoastal Waterway near Freeport, Texas was chosen as the demonstration site. A manageable 20-acre pond area was isolated from the main containment area by an internal levee and used as the culture pond. The pond was filled with 50-micron-screened seawater pumped from the Intracoastal Waterway. To kill any predators present in the water, the pond was treated with 3 applications of an ichthyotoxin. Commercial agriculture fertilizer was added to the pond to stimulate a phytoplankton bloom which served directly and indirectly as the sole food supply for the shrimp. No prepared food was provided to the shrimp during the experimental grow-out. The pond was stocked with 30-day-old "hardened" postlarval penaeid shrimp (Penaeus setiferus). Seven weeks later, average survival was estimated to be in the range of 86 to 93 percent and the average size of the shrimp sampled was 5.2 gm. (87 count, heads on). The harvest rate was estimated to average 185 to 200 pounds per acre. Several different harvesting techniques were tested, but unusually early cold weather prevented a complete harvest.

Harvested shrimp were awarded a Certificate of Wholesomeness for human consumption by the U. S. Department of Commerce. No off flavors or other negative qualities were found in organoleptic testing of the shrimp.

It was the conclusion of this study that it is both biologically and economically feasible to culture penaeid shrimp on a commercial scale in dredged material containment areas.

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