

**Great Lakes
Commercial and Recreational
Harbor Dredging:
Issues and Recommendations**

Final Report

of

**The Commercial and Recreational
Harbor Dredging Task Force**

to

The Great Lakes Commission

November 1988

Preface

Adequate programs for recreational and commercial harbor dredging in federally authorized Great Lakes harbors are a priority concern of the Great Lakes Commission, given the magnitude of associated economic and environmental implications. This concern has increased in recent years, as lowered water levels, increased recreational boating and commercial shipping activity, dredge disposal issues and sedimentation problems, have combined to present the Great Lakes states with major challenges.

Almost 90 percent of U.S. Army Corps of Engineers expenditures in the Great Lakes region are directed at operations and maintenance functions. Harbor and channel maintenance dredging is a principal activity, taking place on the basis of a needs assessment and prioritization process and contingent upon appropriations.

The dredging of federally authorized commercial harbors for navigation purposes is undertaken through contractual agreement with private operators. Such dredging is typically given a higher priority than dredging related to recreational uses at federally authorized harbors. However, with well over 100 federally authorized harbors that support a multi-billion dollar water-based recreation industry in the Great Lakes, a low priority designation is cause for concern. The record water levels of the mid 1980s allowed maintenance dredging at some low tonnage commercial and recreational harbors to be deferred without adverse consequences. Deferral, however, is no longer a viable option; the Great Lakes states were thus prompted to assess future dredging requirements and funding needs for federally authorized harbors where recreational activities predominate along the Great Lakes and develop appropriate strategies.

The Great Lakes Commission identified this issue area as a priority work item at its 1987 Semi-Annual Meeting. A Task Force was assembled soon thereafter to address the following charges:

- o develop a regional position on the need for and strategy to achieve reauthorization of confined disposal facility (CDF) legislation;
- o define the need for recreational harbor dredging and funding requirements at federally-authorized harbors; and
- o to document and publicize the importance of recreational boating activity to the Great Lakes state's economy and make appropriate recommendations to protect and promote the vitality of this water-based recreation sector.

The Task Force on Great Lakes Commercial and Recreational Harbor Dredging has prepared this report in response to this charge. An Executive Summary presents the Task Force findings and recommendations and is followed by three sections, each addressing one of the three Task Force charges. An Appendix provides valuable reference information generated from a comprehensive state survey of recreational harbor dredging needs.

Acknowledgments

Preparation of this report was the combined effort of a very dedicated Task Force membership and numerous state and federal agencies within the members' jurisdictions. Only through such an effort was it possible to secure an excellent survey response and access to the data needed to shape findings and recommendations. The assistance of all involved is appreciated.

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Executive Summary

Findings and Recommendations

A. CONFINED DISPOSAL FACILITY POLICY

Position Statement

The Great Lakes Commercial and Recreational Harbor Dredging Task Force recognizes the important contribution that confined disposal facilities (CDFs) for dredged material have made to Great Lakes commercial navigation and improving water quality. The Task Force acknowledges a long-term need for commercial harbor dredging in the Great Lakes along with a means to dispose of dredged material in an appropriate manner. The Task Force finds that the existing CDF authorizing legislation (Section 123, P.L. 91-611) needs to be amended in the near term to clarify Corps authority for continued CDF filling and new, replacement legislation is required.

Twenty-six CDFs have been built in the Great Lakes since 1970 and several are under construction or are planned. The prevalence and persistence of contaminated sediments in many Great Lakes commercial harbors coupled with a government policy aimed at protecting water quality and enhancing commercial navigation focuses attention on dredging activities and their impact on the environment.

The Task Force finds that aspects of the Great Lakes CDF program should be evaluated through a General Accounting Office study. Federal navigation cost-share policy may pose a future financial burden for non-federal interests as new CDFs are built and this issue must be addressed.

Recommendations

1. A General Accounting Office Study of the Great Lakes CDF Program should be requested by the Great Lakes Congressional Delegation. The proposed study should:
 - a. assess potential financial burden to non-federal interests of future CDF construction under existing federal cost-share policy and consider the capability of non-federal interests to provide for environmentally safe and publicly acceptable disposal of contaminated material;
 - b. review P.L. 91-611, Section 123 CDF program and evaluate its performance to date.
2. Congress should enact new, replacement legislation for Section 123, P.L. 91-611 that would provide for a system-wide, federal program for disposal of contaminated dredged material from Great Lakes Basin projects and address these issues:
 - o The major element of this program should be continued authority for appropriate disposal of contaminated sediments including construction of confined disposal facilities. Also, the disposal program must provide for state cooperation regarding program implementation.
 - o Disposal of dredged material, including the construction of confined disposal facilities for existing commercial navigation projects, should be considered part of the Corps of Engineers' navigation operation and maintenance program.

- o The Corps of Engineers should give consideration to the full range of disposal methods, including beneficial use or other reuse of dredged material.
- o Any new program must incorporate an overall review process to be completed no later than ten years after date of enactment.
- o The non-federal cost share provisions in Section 101 of P.L. 99-662 as they apply to dredged material disposal areas associated with new navigation construction projects should be reviewed by Congress for the purpose of ensuring an equitable federal/non-federal cost share.

The Great Lakes Commission will work with the Great Lakes Congressional Delegation at the earliest opportunity to assist in the development of an appropriate legislative vehicle consistent with any timetable for a possible GAO Study.

B. RECREATIONAL HARBOR DREDGING NEEDS

Position Statement

The Great Lakes Commission's Task Force on Commercial and Recreational Harbor Dredging finds that maintenance of recreational boating channels - including harbor dredging - is in the best economic and safety interests of both the Great Lakes region and the nation. Nearly ten million recreational boats are registered nationwide with one of every three registered in a Great Lakes state. Well over one million Canadian and U.S. recreational boats have operated annually on the Great Lakes in recent years. Six of the eight Great Lakes states are in the top ten nationally in registered boats; Michigan and Minnesota rank number one and three, respectively.

Travel and tourism is a leading industry in the Great Lakes region. According to the U.S. Travel Data Center, in 1984 an estimated 1.1 million payroll jobs in the region were tied to travel-related business and activities. Furthermore, travel and tourism in 1984 contributed an estimated \$3.4 billion in taxes to state and local governments in the region. This regional impact also translates into substantial federal income and excise tax revenue. For each of the Great Lakes states, tourism and outdoor recreation makes a multi-billion dollar contribution to the state economy. Within the region, the Great Lakes and their coastal zones have become magnets for water-based tourism/recreation and have stimulated revitalized waterfront development. Recreational boating is a key component of the marine recreation sector in the Great Lakes region.

The Task Force therefore recognizes that a continuation and strengthening of the long-standing federal interest in Great Lakes recreational harbor maintenance is critical to the social and economic welfare of the region's and nation's citizenry. Designated in federal law as the nation's "fourth seacoast", the Great Lakes are resources of current and historical national importance for their commercial navigation, national defense and environmental attributes. For many Great Lakes harbors commercial navigation and recreational boating exist side-by-side but for some ports small boat activity is increasing as commercial shipping declines. Current federal budgetary constraints of the U.S. Army Corps of Engineers, coupled with intensified recreational boating activity, growing harbor maintenance needs and lowered Great Lakes water levels have all contributed to elevating the issue of Great Lakes recreational harbor dredging to one of regional importance.

Based on information obtained through its survey of 101 federally authorized commercial and recreational harbors, the Task Force finds that more than \$12 million were expended during the last dredging of 59 of the 101 surveyed harbors with recreational facilities and activities. In addition, more than \$15 million will be required for the next dredging of 66 of the 101 surveyed harbors. Most of this dredging will be required within the next few years; only five of the 66 harbors reported not requiring dredging until 1992 or later.

There will also be a need to dispose of more than 2.1 million cubic yards of material resulting from the next dredging based on projections from 61 of the 101 harbors surveyed.

Also, five harbors reporting cost estimates could not estimate the amount of material to be removed. Therefore, the 2.1 to 2.2 million cubic yards needed to be removed is likely a low estimate.

Based on the above information the Commercial and Recreational Harbor Dredging Task Force finds that the process by which federally authorized harbor dredging priorities are established by the U.S. Army Corps of Engineers should be re-evaluated to emphasize recreation and to consider the total economic impact that recreational activities have on port communities. The Task Force finds that dredging of federally authorized harbors where recreational activities predominate should be given equal priority with the dredging of harbors with commercial orientation.

Based on its survey, the Task Force finds the traditional low dredging priority given to recreational harbors has resulted in deferred maintenance with a need to dredge most of these harbors within the next three years.

The Task Force also finds that federal budget constraints combined with the lowering Great Lakes water levels will require a thorough recreational harbor dredging needs and costs assessment.

Recommendations

1. The Great Lakes Commission recommends that the U.S. Army Corps of Engineers recognize the importance of recreational boating and harbors and that the Corps be directed to dredge federally authorized harbors where recreational activities predominate. The Corps shall be directed to use the same criteria to determine the need and priority for dredging at all authorized harbors, whether predominantly commercial or recreation--degree of shoaling and interference with navigation. To this end, the Commission will present this report to the Secretary of the Army and the Great Lakes Congressional Delegation. Further, the Commission will review and monitor applicable federal laws, policies, procedures, and budgetary actions, and advocate revisions needed to ensure adequate funding for the dredging of federally authorized harbors that are currently used for recreation.

Report presentation and appropriate follow-up activity will be undertaken in November 1988, with policy/legislative review and advocacy undertaken on a continuing basis.

2. Based on survey results and the issues identified during the survey process, the Great Lakes Commission will urge members of the Great Lakes Congressional Delegation to hold a special oversight hearing on the current and future status of the dredging of federally authorized harbors that are principally used for recreation. Objectives will include presentation of funding needs, priority

setting for dredging, review of disposal options and issues; alternative financing; regional equity in funding decisions; and prospective federal policy and legislative changes.

Discussions with Congressional offices and other prospective cooperating organizations will begin in December 1988.

C. FUNDING ALTERNATIVES FOR RECREATIONAL HARBOR DREDGING

Position Statement

The Task Force recognizes that continued and, in some cases expanded, federal funding is required for maintenance dredging at the federally authorized Great Lakes harbors where recreational activities predominate. The Task Force also recognizes, however, that there are hundreds of non-federal harbors in need of maintenance dredging as well. Budget constraints at the state, local and private sector level pose their own threats to the extent and regularity of dredging activity that might take place.

To this end, the Task Force finds that alternative funding options and sources for the dredging of both federal and non-federal recreational harbors must be explored in the interest of augmenting traditional sources.

One alternative is found in the Wallop-Breaux amendment to the Federal Aid in Sport Fish Restoration Act and should be considered when evaluating funding options for recreational harbor dredging. The amendment establishes a trust fund which is funded by the transfer of motorboat fuel taxes and includes a Boating Safety Account administered to the states through the United States Coast Guard for safety and facilities improvements, which can include recreational harbor dredging.

The U.S. Coast Guard lacks full discretionary authority for appropriating and disbursing these funds. The U.S. Congress must provide authority annually to expend monies deposited in the Boating Safety Account. An amendment to the Wallop-Breaux Trust Fund language is needed to authorize the Coast Guard to spend all monies in the account without annual Congressional appropriation; consistent with the permanent indefinite appropriation authority provided to the U.S. Fish and Wildlife Service in administering the Sport Fish Restoration Account established under the Trust Fund.

Less than half (\$21.5 million) of the \$45 million deposited annually was appropriated in fiscal year 1988, limiting the Great Lakes states' access to a funding source for recreational harbor dredging. Funds in the account should be dispersed on an equitable basis, perhaps according to individual state contributions to the Trust Fund.

Recommendations

1. The Great Lakes Commission, in follow-up to its March 1988 correspondence with the Great Lakes Congressional Delegation, should continue its support for full appropriation of monies deposited to the Boating Safety Account, without requiring annual Congressional authorization, as a means to ensure a continuing reliable source of state funding for recreational harbor dredging. The Commission recognizes this measure as being consistent with the permanent indefinite appropriation authority provided to the U.S. Fish & Wildlife Service in administering the Sport Fish Restoration Act also established under the Wallop-Breaux amendment.

The Commission will advocate the above positions via correspondence and testimony/presentation to the House and Senate Appropriations Committees (Subcommittee on Transportation and Related Agencies) beginning in January 1989 and continuing as necessary.

2. Should its member states request, the Great Lakes Commission should serve as an information clearinghouse/referral center on funding alternatives for non-federal recreational harbor dredging in the Great Lakes states. Such a service would entail the receipt and compilation of alternate funding approaches, ideas and case studies for distribution between and among the Great Lakes states. Task Force members would serve as a principal point of contact in providing this service.

D. RECREATIONAL VALUE OF COMMERCIAL HARBORS

Position Statement

The Commercial and Recreational Harbor Dredging Task Force finds that water-based recreation in the Great Lakes is a multi-billion-dollar industry; with the Great Lakes states claiming one of every three registered boats in the U.S., and a sport fishery valued at up to \$4 billion annually. The Great Lakes shorelines, harbors and land-based recreational access to coastal waters provide a significant contribution to regional tourism.

Federal navigation aids have been a social and economic benefit for shoreline communities throughout the Great Lakes. The very character of these communities is shaped by their harbors and channels. Because of this, the Task Force finds that recreation and consideration of recreational benefits be required in Corps of Engineers benefit/cost evaluations for future harbor projects and operation and maintenance projects undertaken by the Corps.

Under the 1899 Rivers and Harbors Act and other specific authorities, the Corps of Engineers has developed harbors and channels to facilitate commercial navigation and flood control. While not constructed specifically to serve recreational interests, the Task Force finds that the breakwaters, revetments and levees have been of tremendous recreational value to boaters, fishers and the sightseeing public. Some states report that these structures are often so altered during maintenance and repair as to eliminate secondary recreational uses that have been established. For instance, a recent Corps of Engineers breakwater rehabilitation project at Holland Harbor, Michigan changed a vertical walled structure to a rubble mound structure. This change in configuration decimated the local sport fishing opportunities and has resulted in annual loss of at least \$250,000 to the local economy. Major losses of recreational opportunities have also been experienced in other areas throughout the region. The loss in such opportunity on these structures is a result of Corps of Engineers Regulation 1130-2-439. The regulation precludes the Corps from maintaining jetties and breakwaters for any usage other than aids to navigation and shoreline protection.

In May 1988, Congressman Robert Davis of Michigan (R-11th District), with Congressmen Upton and Stangeland as cosponsors, introduced legislation (H.R. 4609) to provide for the protection of established recreational uses of water resources projects constructed by the Corps of Engineers to ensure that Corps maintenance, repair, rehabilitation or reconstruction of navigation structures (e.g., piers, breakwaters, revetments) does not adversely affect established recreational uses, such as access to the lakes and sport fishing opportunities.

Recommendations

1. The Great Lakes Commission supports, in principle, legislation to provide the Secretary of the Army the direction needed for protection of established recreational uses of navigation structures.
2. The Great Lakes Commission recommends that recreational boating uses and benefits be recognized and considered as commercial navigation activities in the Corps of Engineers' economic analyses for harbor projects and operation and maintenance projects.

The Commission will advocate the above two positions via correspondence to appropriate House and Senate Committees and Subcommittees beginning in November 1988 and continuing as necessary.

E. RECREATIONAL BOATING

Position Statement

The Great Lakes region is the setting for thousands of lakes and hundreds of miles of navigable rivers. Several major "lake districts" have large numbers of second-homes and are magnets for seasonal waves of vacationers. The Great Lakes form the largest system of freshwater lakes in the world. With 95,000 square miles of navigable water and a resident U.S. and Canadian population of more than 40 million, the Great Lakes Basin anchors an important and growing marine recreation industry. Water-based tourism and recreation in the Great Lakes area makes a major contribution to the regional economy. Diverse opportunities, coupled with high participation levels, contribute to the area's quality of life. Recreational boating is a key component of the marine recreation industry in the Great Lakes region.

The eight Great Lakes states account for more than 3.3 million recreational boats, representing a third of the national total. Based on survey and state registration data, it is estimated that 700,000 U.S. boats, or a fifth of the region's fleet, are used on the Great Lakes each season.

Great Lakes boat use days have been increasing over the last two decades and craft and trip-related expenditures have increased proportionately. It is estimated that total annual Great Lakes recreation boater direct spending is \$1.83 billion.

The recreational boating sector includes a wide array of infrastructure and support components. Marinas, boat manufacturers, retailers and marine business suppliers are characterized by seasonal employment and sales cycles and account for thousands of jobs in the region. Marinas and slip space are integral parts of much new residential waterfront development and are becoming more important in urban waterfront revitalization.

Public policy issues including federal tax policy, shoreland development, sport fishery management and boating safety have a strong connection to the recreational boat sector. Government officials and industry interests will need to develop new partnerships to maintain existing recreational boating opportunities.

Recommendations

- o A fact sheet on the Great Lakes recreational boating industry should be prepared by the Commission to highlight the industry's important regional economic impact. The fact sheet should be directed to the Great Lakes Governors, members of the Great Lakes Congressional Delegation, and other officials and interested persons. It should be completed by Spring of 1989.
- o The Commission should organize a Congressional briefing session that would focus on recreational boating issues and important public policy priorities. National recreational boating organizations should be encouraged to participate. Opportunities should be explored in the Spring of 1989.
- o The Commission should continue to monitor recreational boating issues and identify policy priorities for action by state and federal governments.

F. CONTINUING TASK FORCE ROLE AND POLICY ANALYSIS

Position Statement

Commission oversight of, and support for, implementation activities is required for successful attainment of the preceding recommendations. Further, continuation of the Task Force structure however, is not needed to address additional policy issues raised during discussions to date.

Recommendations

1. The Great Lakes Commission upon receipt and acceptance of this report authorizes the sunset of the Great Lakes Commercial and Recreational Harbor Dredging Task Force, with the understanding that individual Task Force members will, if needed, oversee and assist in the implementation of recommendations.
2. The Great Lakes Commission recommends that followup staff and Commission attention focus on implementation of the recommendations presented in this report.

Section One:

Confined Disposal Facility Policy

Introduction

The appropriate disposal of material dredged from federal commercial navigation projects is a nationwide issue with important implications for the use, management and protection of waters in the Great Lakes Basin. Confinement of dredged material determined to pose an unacceptable risk to the environment is a federal policy and is recognized as important by state and local governments. Growing concern over environmental effects of dredged material and the increasing unavailability of suitable disposal sites have combined to alter traditional disposal practices.

Environmental evaluation of sediment quality and disposal methods is now required by law. In response to such environmental regulation and Army Corps of Engineers' budget constraints and navigation channel maintenance priorities, a management strategy for contaminated dredged material is gradually taking shape. The Great Lakes region pioneered a system-wide confined disposal facility (CDF) program. Now, confined disposal of contaminated dredged material is used throughout the country.

Confined Disposal Facilities in the Great Lakes

Prior to 1970, the cost of dredged material disposal in the Great lakes was the principal criterion for disposal site selection and method of disposal. In 1969, however, a Corps Buffalo District study, Dredging and Water Quality Problems in the Great Lakes launched a new era in the region regarding contaminated dredged material disposal. Although the two-year study did not conclusively demonstrate harmful effects of existing open water disposal practices, a Board of Consultants for the study concluded that "in-lake disposal of heavily polluted dredgings must be considered presumptively undesirable." The study indicated a 10-year program for confined disposal of dredgings was feasible and might be desirable in the interest of pollution abatement. Congress reacted by incorporating a Section 123 in the River and Harbor Act of 1970 (P.L. 91-611) that created a "contained (confined) spoil disposal facilities" program for the Great Lakes. Provisions of P.L. 91-611 require a non-federal entity to provide lands, easements and rights-of-way for necessary construction, operation and maintenance of the facilities and a 25 percent local contribution toward construction costs, subject to specified waivers related to compliance with water quality plans.

The program developed slowly due to site selection delays, difficulties in arranging for local sponsorship and protracted EPA certifications related to delays in water quality plan submissions. As a result of these administrative problems, some proposed CDF projects were dropped and, over time, new facilities were proposed.

Twenty-six CDFs have been built in the Great Lakes under authority of P.L. 91-611 (see Table I). One CDF (Clinton River, MI) is presently under construction. Planning and design of a Green Bay, WI CDF project proposed as an expansion of the existing Renard Isle site is complete, but the project has been held up due to legal challenges. Another CDF (Upper Saginaw, (River) MI) is being planned with final approvals before construction expected in fall 1989. Two-thirds of these CDFs were built as in-water sites. The Great Lakes disposal facilities are usually constructed with graded limestone rock dikes with interior smaller rock and larger "armor" stone intended to protect the structure from wave action. Some dikes are constructed with steel sheet piling. The facilities are designed to permit a gradual release of water, particularly during

Table 1
Great Lakes Confined Disposal Facilities

Table III.1: Confined Disposal Facilities Built by the Corps of Engineers Under Public Law 91-611 Since 1970 (As of May 1985)

Name/Location	Year construction completed	Year filled or expected to be filled to capacity	Percent filled	Life expected to exceed 10 years
Toledo, Toledo, Ohio	1976	1992	65	X
Huron, Huron, Ohio	1975	1990	70	X
Dike #12, Cleveland, Ohio	1974	1979	100	
Dike #14, Cleveland, Ohio	1979	1991	40	X
Erie, Erie, Pa.	1979	1993	40	X
Dike #4, Buffalo, N.Y.	1977	1995	40	X
Lorain, Lorain, Ohio	1977	1990	70	X
Michigan City, Michigan City, Ind.	1978	1989	80	X
Chicago Area, Chicago, Ill.	1984	1995	10	X
Bolles Harbor, Monroe County, Mich.	1977	1990	25	X
Point Mouillee, Monroe County, Mich.	(^a)	1993	38	X
Erie Pier, Duluth, Minn.	1978	1993	50	X
Grand Haven Harbor, Grand Haven, Mich.	1974	1985	100	
Green Bay Harbor, Green Bay, Wis.	1979	1986	97	
Holland Harbor, Holland, Mich.	1977	1988	75	X
Dickinson Island, St. Clair County, Mich.	1976	1990	48	X
Inland Route, Emmet County, Mich.	1982	1992	20	
Kenosha Harbor, Kenosha, Wis.	1975	2007	23	X
Kewaunee Harbor, Kewaunee, Wis.	1982	1992	57	
Manitowoc Harbor, Manitowoc, Wis.	1975	1992	61	X
Milwaukee Harbor, Milwaukee, Wis.	1975	1990	44	X
Monroe Harbor, Monroe, Mich.	1985	1995	0	
Saginaw Bay, Saginaw, Mich.	1978	1990	48	X
Sebewaing Harbor, Village of Sebewaing, Mich.	1979	1989	65	

^aFacility was built in two phases - Phase I completed 1978; Phase II completed 1981.

Note: A confined facility was built at Frankfort Harbor, Michigan, but is not included because the facility is not used for permanent disposal and has been filled-in with gravel.

Source: U.S. Army Corps of Engineers.

active filling. This common dewatering process is intended to retain solids and associated contaminants within the structure. There are two CDFs (Chicago and Duluth-Superior) that were constructed to be relatively impermeable. When or where the dredged material is exposed to the air or submerged at shallow depths, natural vegetative processes take root.

Periodic maintenance dredging is essential to Great Lakes commercial navigation. Natural siltation levels are high for many ports, especially for those that contain river flows. Many of the major commercial ports and all of the connecting channels are maintained at a 27-foot depth. Of the 119 U.S. commercial harbors in the Great Lakes, most are maintained by the Army Corps of Engineers. Some are privately owned and operated. Grain, iron ore, coal, limestone and refined petroleum products, are the principal commodities moved on the Great Lakes/St. Lawrence River system, but a vast array of manufactured and processed goods are also carried by vessel. Commercial traffic with a U.S. Great Lakes port connection has averaged around 150 million tons in recent years. Commercial navigation-related dredging in the U.S. Great Lakes removes an average of 4-5 million cubic yards of material annually. Of this amount, a significant percentage is placed in CDFs. Federal costs for the CDF program have been significant. CDF construction costs range between \$1 and \$5 per cubic meter of capacity but about a quarter of the projects have been over \$10 per cubic meter. Over the last seven fiscal years, Great Lakes CDF appropriations have amounted to over \$122 million ranging from \$11.8 million to \$23.1 million.

Confined Disposal Facility Legislation

Authority for Great Lakes CDF construction based on Section 123, P.L. 91-611 is now 18 years old. This innovative legislation was originally conceived as a short-term solution to the problem of contaminated dredged materials. The basis for this position centered on projected water quality improvements through mandated pollution abatement and therefore future maintenance dredgings would less likely need to be contained. Water quality has improved and CDFs have also played a role, but polluted sediments continue to be a problem.

The following excerpt from Section 123, referencing a ten-year program duration, has spawned controversy and is subject to differing interpretations.

Sec. 123. (a) The Secretary of the Army, acting through the Chief of Engineers, is authorized to construct, operate, and maintain, subject to the provisions of subsection (c), contained spoil disposal facilities of sufficient capacity for a period not to exceed ten years, to meet the requirements of this section.

The apparent ten-year use limit by the Corps of Engineers is not in accord with the Secretary of Army's stated position. The Corps position construes the ten-year period contained in Section 123 to refer to a facility's capacity and not the maximum period of use for such facility. The Corps indicates that the great majority of CDFs will not be completely filled during the ten-year period following construction. The interpretation question came to a head in 1986 when the General Accounting Office issued a report on the matter and concluded that P.L. 91-611 limits the use of disposal facilities to only a ten-year period.

The Department of Army sought in 1987 and again in 1988 a legislative resolution to the controversy. The purpose of the Administration's proposed amendment to Section 123 of P.L. 91-611 is two-fold: to clarify authority of the Secretary of Army to continue to fill CDFs and to sunset authority for construction of such facilities (under the old rules). However, the proposed sunset provision would exempt "any project for which

there is an executed agreement...." The Green Bay CDF project would thus be grandfathered in, but the planned Upper Saginaw CDF project could be jeopardized by the wording change. Budgetary considerations are certainly a factor, especially in light of greater non-federal cost share requirements of the Water Resources Development Act of 1986 (P.L. 99-662). Also, termination of new construction authority could give the Corps more flexibility in site selection for dredged material.

The uncertainty surrounding the continued filling of CDFs raises serious issues. Litigation seeking a legal declaration is possible. A ruling enjoining continued use could result in a major disruption of current maintenance dredging activities for particular dredging projects. If such a legal decision were made in 1988, half of the CDFs would be deactivated because of the lapse of ten years from completion of construction. A legal challenge could come from a municipality or governmental unit seeking alternative use of a CDF site. In fact, the GAO investigation stemmed from the City of Kenosha, WI wanting to explore development options for its waterfront CDF which was only 23 percent full at its tenth year of existence. Another basis for legal challenge could be a claim by an environmental organization or interest group of possible environmental damage from dredging practices or even, by extension, from commercial navigation. A real threat of immediate disruption to maintenance dredging is present as the legal limbo continues.

On April 26, 1988, Senate bill S. 2100, the Water Resources Development Act of 1988, was passed. A CDF continued filling provision was incorporated, but at the urging of Great Lakes interests, the Senate rejected the Administration-backed provision for termination of authority. The Great Lakes Commission's Commercial and Recreational Harbor Dredging Task Force has proposed the following amending language for Section 123 that includes a provision for "cooperation with applicable state and non-federal sponsors"

A BILL

To amend section 123 of the River and Harbor Act of 1970 to clarify the authority of the Secretary of the Army to continue to fill Confined Disposal Facilities.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that section 123 of the River and Harbor Act of 1970 (P.L. 91-611) is amended by adding at the end thereof the following new subsection:

"(j) The Secretary of the Army is authorized to continue to deposit dredged materials into a facility constructed under the provisions of this section until the Secretary of the Army in cooperation with applicable state and non-federal sponsors determines that such facility is no longer needed for such purpose or that such facility is completely full.

S. 2100 does not include the "cooperation" language. In the House of Representatives, H.R. 5247, a counterpart bill, is pending following approval by the Committee on Public Works and Transportation. Section 22 of the House bill is similar to the Senate CDF provision, but goes further by providing for a study and monitoring program. This provision would direct the Secretary of the Army to study the materials disposed of in these facilities for the purpose of determining whether or not toxic pollutants are present. The Corps of Engineers is also "directed to conduct a program to inspect and monitor contained spoiled disposal facilities constructed under the authority of the 1970 Act for the purpose of determining whether or not toxic pollutants are leaking from the facilities."

New Legislation

A major issue concerns long-term dredging requirements, the continued need for confinement disposal of contaminated dredged material, and possible non-federal cost share. As filling progresses, the need for additional sites for particular project areas will arise. In the next several years, the need will increase--over half of the CDFs will be full (original design capacity) by 1993. Current Corps policy indicates that any new CDFs for an existing commercial navigation project will be constructed under prior project authority which in some cases may entail a substantial non-federal cost share. Also, cost share provisions of Section 101 of P.L. 99-662 Water Resources Development Act of 1986 would require 100 percent non-federal funding subject to specified credits for those disposal areas associated with new navigation construction.

With respect to the existing CDF legislation, the Commission task force has identified the need for new, replacement legislation. The objective is to maintain a Great Lakes CDF program and improve legislation and program provisions where necessary.

Another area of concern is CDF efficiency and whether existing facilities have achieved intended containment goals. Facility placement on land, fringe shore areas or in water is a site-specific consideration requiring an assessment of all relevant factors. A decision on a preferred alternative disposal site does not guarantee complete containment. Total segregation of contaminated dredged material may be possible but is not economically justified. For example, most Great Lakes CDFs are designed with a level of permeability to permit dewatering during the filling operation. Many toxic contaminants are bound to the sediment particles and to the degree that particles are retained within the containment structure, a form of pollution is controlled. Other potential environmental problems concern overtopping of CDFs by wave action and/or high water levels and bioaccumulation of pollutants by plants and animals in or near CDFs.

Although Section 123 of P.L. 91-611 is a Great Lakes CDF program, it also authorized the Corps of Engineers to undertake "a comprehensive program of research, study and experimentation relating to dredged spoil" for not only Great Lakes waters but for all U.S. waters. Over the last fifteen years, many local and federal studies have been conducted on the environmental effects of dredging and dredged material disposal. In conjunction with these studies a major effort has been undertaken by the Corps of Engineers to assess hydraulic efficiency of CDFs. From 1973 to 1978 the Dredged Material Research Program resulted in improved procedures for CDF solids retention. A Dredging Operations Technical Support Program (DOTS) managed through the Corps Waterways Experiment Station has been the principal follow-up program. DOTS gives technical guidance to Corps districts in addition to conducting research.

Due to concerns over the effectiveness of Great Lakes CDFs in containing dissolved contaminants, an Interagency CDF Work Group was formed in early 1986, consisting of Representatives from the Corps' North Central Division (including representatives from Buffalo, Chicago and Detroit Districts), the USEPA Region V, and the Twin Cities and Cortland New York Regional Offices of the U.S. Fish and Wildlife Service (including field office representation). A number of studies and monitoring efforts have been conducted by the represented agencies yielding information of use to this work group. The Corps developed a mathematical model for the Saginaw CDF to be used to estimate the efficiency of this CDF in containing PCBs. Review of this model has resulted in the development of a similar model by the USEPA laboratory in Athens, GA. The Corps and USEPA are closely coordinating these efforts. Region V, USEPA conducted a pilot bio-monitoring study at the Saginaw CDF in 1987 to scope a larger biomonitoring study conducted in 1988. This effort is designed to detect whether contaminant loss from the CDF during a dredging operation, though too low to measure in the water, may be accumulated by caged organisms outside the CDF, and magnified to a measurable level. The USFWS has

initiated a study to determine whether contaminants are accumulated by earthworms living in Great Lakes CDFs. Earthworms were collected from a number of CDFs, and are being analyzed for a variety of contaminants. The Corps (Buffalo District) has conducted a number of ecological studies at the Times Beach CDF, Buffalo, NY. Reports have been published, discussing the degree of contamination of plants and animals living in the CDF. The identification of elevated levels of contaminants by the USFWS in fish living in the Saginaw CDF, and in ducks with clipped wings temporarily living in the CDF pond, emphasizes the importance of proper management of CDFs during the years when they are being filled, to minimize any adverse environmental impacts. Reports on many of the identified studies will be available in upcoming months. The results of the various studies will be reviewed and evaluated by the work group.

Great Lakes CDFs are monitored during their filling phase by the Corps but, there has been no specific legislative directive that such monitoring take place. Compliance with existing federal law and adherence to international agreements presumes an acceptable level of water quality with the operation of the CDF program. However, the House Water Resources Development Act of 1988 (H.R. 5247) contains a monitoring provision, but the Senate bill does not. It may be left to a conference committee to iron out the differences.

The Commercial and Recreational Harbor Dredging Task Force supports CDF replacement legislation. The following points are recommended to Congress for use in developing prospective legislation. The task force urges drafting of such legislation during the 101st Congress. The Task Force also supports the need for a General Accounting Office study of the Great Lakes CDF program. The proposed GAO study should be completed before new CDF legislation enactment. However, the task force urges development of such legislation even if for some reason a GAO study is not conducted.

Section Two

Great Lakes Recreational Harbor Dredging

Background

The Great Lakes, as described earlier, are home to a flourishing water-based travel and tourism industry. Recreational harbors along the Great Lakes provide access for thousands of boaters and fishers. In recent years, dredging requirements for these facilities have been minimal due principally to the record high Great Lakes water levels experienced in the mid-1980s. With decreasing lake levels over the past year and a half, the Great Lakes states must anticipate the needs and requirements for recreational harbor dredging and develop a regional strategy to address those needs.

Arrangements for the construction, operation and maintenance of recreational harbors are complex. Nearly 90 percent of the U.S. Army Corps of Engineers expenditures in the Great Lakes are for operations and maintenance activities; the principal function being harbor and channel maintenance dredging.

Dredging of federally authorized harbors, channels and waterways is accomplished by private operators under contract. Dredging of commercial harbors is given a higher priority than recreational harbors. Under the 1965 Federal Water Project Recreation Act, the U.S. Army Corps of Engineers is authorized to include recreation as part of any federally authorized water resources project, if economically feasible. Many recreational harbors in the Great Lakes are adjacent or contiguous to commercial facilities, or have extended into harbors which are commercially authorized but no longer have commercial operations. In these instances, the Corps is responsible for maintaining navigation, and will dredge entrance channels and turning basins, and maintain revetments and breakwaters. While recreational interests often benefit from above mentioned Corps activities, enhancement of recreation is not the intent of these projects.

Federally authorized recreational harbors include those classified as harbors of refuge and harbors where small craft predominate. Authorized depths are usually not more than twelve feet, with varying levels required for dockside and anchorages. Policy issues revolve around maintenance dredging needs, particularly for newer harbors where non-federal interests have more responsibility. Deferred maintenance due to the recent high water levels raises the need for planning and scheduling maintenance dredging activities as water levels become lower. Also, in the absence of Corps of Engineers' involvement in maintenance of recreational harbors, state, local and private interests will incur the additional burden of increased maintenance costs. Strong interest has been expressed by the Great Lakes states in maintaining and strengthening the Corps of Engineers' role in the operation and maintenance of federally authorized recreational harbor facilities in the Great Lakes. Interest has also been expressed in a new policy to require the Corps to consider established recreation uses when undertaking repair and maintenance activities on commercial projects.

To develop a regional approach to these issues, the Great Lakes states recognize the need for compiling and presenting information on harbors where recreational activities predominant to define and prioritize the important issues to be addressed.

Recreational Harbor Dredging Survey

Objectives

One important aspect of the Great Lakes Commission charge to the Commercial and Recreational Harbor Dredging Task Force is the assessment of regional needs and re-

quirements for recreational dredging at federally authorized harbors. To accomplish this, a survey of the individual states was undertaken in late 1987 and early 1988 to: 1) determine the need for recreational harbor dredging; 2) present current and projected cost information; and, 3) outline special issues or requirements to be addressed.

Methodology

In the fall of 1987, the Great Lakes Commission's Commercial and Recreational Harbor Dredging Task Force developed and conducted a state survey to address the objectives identified above. At its initial meeting in early December, the Task Force decided to gather the necessary data in two tiers: the first involving principally qualitative information on recreational dredging policy options and special needs; the second, involving harbor specific quantitative information.

The scope of the Task Force Survey was restricted to federally authorized harbors where recreational activities predominate because of the availability of data and the interest in maintaining and strengthening the federal involvement in recreational harbor dredging activities. A decision was made to exclude large tonnage commercial ports from the survey because the Task Force believes that, with their commercial orientation, large commercial harbors are not representative of the dredging issues affecting recreational harbors and smaller commercial harbors where recreation activities predominate. Large tonnage ports are defined as those with more than one million tons per year of waterborne commerce based on long-term trends and 1985 tonnage figures as reported by Waterborne Commerce of the United States, published by the U.S. Army Corps of Engineers.

Background information on the policy issues and needs assessment was compiled by the Task Force and received by the Commission staff for review in January 1988. This information formed the basis for the Task Force interim report to the Commission at its semi-annual meeting in March 1988.

Individual state, harbor specific data were received by the Commission staff by April 30, 1988 after being compiled by the Task Force members. Requests for information included: harbor name, use, maximum depth, date of last dredging, total cost, amount of material removed and disposal method, for both the most recent dredging and the next anticipated dredging. The information is presented here in the following ways: individual harbor data; state by state summaries and a Basin Summary. The data provide background for the individual Task Force recommendations presented later in this Section.

Following are the state summaries, the Basin Summary and the individual harbor data sheets, included as appendix.

It should be noted that states were not always able to provide complete information on cost of dredge disposal and volume of material removed for both the current and projected periods. Hence, the average costs of disposal (\$ per cubic yard) were calculated only for those harbors where complete information was available. Also, the narrative preceding the state summary sheets briefly describes, where available, the individual state maintenance dredging programs, based on information provided by the Task Force.

ILLINOIS

There is one federally authorized, low tonnage, commercial harbor** (Waukegan) along the Illinois Lake Michigan shoreline. Total costs associated with the most recent dredging for this harbor is \$525,294. Over 100,000 cubic yards of dredge material were removed from this harbor, at a disposal cost of \$5.20 per cubic yard.

For the next required dredging, disposal costs at Waukegan harbor are estimated at \$600,000. Material to be removed at this harbor, total 75,000 cubic yards. The average cost, based on these figures is \$8/cubic yard.

There are no federally authorized harbors maintained solely for recreation in the Lake Michigan waters of Illinois. Maintenance dredging is the sole responsibility of the local or state entity owning and managing the harbor. Dredging and disposal activities require a permit from the Illinois Department of Transportation. There is no specific state cost-sharing program for recreational harbor dredging.

(Data provided by Dept. of Transportation, Division of Water Resources)

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	1	No federally authorized recreational harbors but some recreation occurs at Commercial harbors
2. Disposal Costs - most recent dredging	\$525,294	
3. Material Removed	101,000 cu yds	
4. Average Disposal Cost	\$5.20/cu yd	
B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$600,000	
2. Material to be Removed	75,000 cu yds	
3. Average Disposal Cost	\$8/cu yd	

Harbor Surveyed:
1. Waukegan

**less than one million tons of waterborne commerce per year based on long-term trends and 1985 statistics.

INDIANA

Three federally authorized, low tonnage, commercial navigation harbors** are found on the Indiana shore of Lake Michigan, each with a commercial/recreation component (Michigan City, Trail Creek, and Burns Harbor and Portage/Burns Waterway). All of the navigation-related dredging activities at these harbors are undertaken at 100 percent federal cost. In the case of Trail Creek, the locality provides the land for the CDF facility.

There is no formal maintenance program for dredging for recreational purposes in Indiana. Funding for such projects depends upon local tax revenues appropriated on a year-to-year basis; availability of federal cost-share funds (usually restricted to special projects); and in general, budget constraints at all levels of government due to overall economic conditions. At present, no state funds are available for dredging.

The most recent dredging of these harbors cost \$1.28 million, involving over 220,000 cubic yards of material at an average disposal cost of \$5.79 per cubic yard. First-time dredging costs in future years will total an estimated \$2.45 million, and include the removal of 135,000 cubic yards of material at an average cost of \$18.15/cubic yard.

The changes in projected dredging costs for Michigan City (see following Summary Table) are a result of recent required changes for disposal of dredge material. Rather than dewatering the dredge material (as has been the practice) for beach nourishment and upland disposal, the free liquids will be "tied up" using sawdust or clean fly-ash before transporting the material to a sanitary landfill. The added requirements are expected to increase the total disposal costs five-fold.

(Data Provided by Dept. of Natural Resources,
with assistance from the Port Authority at Michigan City)

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	3	
2. Disposal Costs - most recent dredging	\$1,280,000	
3. Material Removed	221,054 cu yd	
4. Average Disposal Cost	\$5.79/cu yd	
B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$2,450,000	
2. Material to be Removed	135,000 cu yds	
3. Average Disposal Cost	\$18.15/cu yd	

Harbors Surveyed:

1. Burns Small Boat Harbor and Portage/Burns Waterway
2. Michigan City
3. Trail Creek

**less than one million tons of waterborne commerce per year based on long-term trends and 1985 statistics.

MICHIGAN

Fifty-four federally authorized, low tonnage, commercial and recreational harbor facilities** are located along Michigan's Great Lakes shoreline. Data from 38 of the 54 harbors, indicate that over \$6.3 million in disposal costs for the most recent dredging was incurred. Over 1.4 million cubic yards of material were removed at an average cost of \$4.51/cubic yard. (These 38 harbors are identified by an * below).

Projected dredging needs were determined for 30 harbors, (indicated with a # below). First-time dredging costs in the future will total over \$6.6 million to remove nearly one million cubic yards of material at an average cost of \$6.78/cubic yard.

(Data Provided by Dept. of Natural Resources,
with assistance from the Corps of Engineers - Detroit District)

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	54	
2. Disposal Costs - most recent dredging	\$6,371,013	Thirty-eight harbors reporting (see * below)
3. Material Removed	1,414,176 cu yd	Thirty-eight harbors reporting (see * below)
4. Average Disposal Cost	\$4.51/cu yd	Thirty-eight harbor average (see * below)
B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$6,616,750	Thirty harbors reporting (see # below)
2. Material to be Removed	975,800 cu yds	Thirty nine harbors reporting (see # below)
3. Average Disposal Cost	\$6.78/cu yd	Thirty harbor average (see # below)

Harbors Surveyed:

1.**Arcadia	14.**Little Lake	27.**Manistee
2.**Au Sable	15.**New Buffalo	28.**Monroe
3.**Big Bay	16.**Pentwater	29.**Ontonagon
4.**Black River (U.P.)	17.**Port Sanilac	30.**St. Joseph
5.**Bolles	18.**Portage Lake	31. *Eagle
6.**Caseville	19.**Pte. Lookout	32. *Les Cheneaux
7.**Clinton River	20.**Saugatuck	33. *Cheboygan
8.**Grand Traverse	21.**Sebewing	34. *Grand Marais
9.**Harrisville	22.**White Fish Point	35. *Grand River
10.**Inland Route	23.**Charlevoix	36. *Harbor Beach
11.**Lac LaBelle	24.**Frankfort	37. *Marquette
12.**Leland	25.**Holland	38. *Menominee
13.**Lexington	26.**Keweenaw Waterway	

**less than one million tons of waterborne commerce per year based on long-term trends and 1985 statistics.

MINNESOTA

The two federally authorized, low tonnage, commercial and recreational harbors** in the Great Lakes waters of Minnesota are Grand Marais and Knife River. Disposal costs for the most recent dredging totaled almost \$56,000, involving the removal of approximately 3,850 cubic yards of material at an average cost of \$14.52/cubic yard. Next-time dredging needs total an estimated \$70,000, providing for the removal of 4,500 cubic yards of material at an average cost of \$15.56/cubic yard.

(Data Provided by Zenith Dredge Co., Duluth, MN)

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	2	
2. Disposal Costs - most recent dredging	\$55,900	
3. Material Removed	3,850 cu yd	
4. Average Disposal Cost	\$ 14.52/cu yd	
B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$70,000	
2. Material to be Removed	4,500 cu yds	
3. Average Disposal Cost	\$15.56/cu yd	

Harbors Surveyed:

1. Knife River
2. Grand Marais

**less than one million tons of waterborne commerce per year based on long-term trends and 1985 statistics.

NEW YORK

Fifteen federally authorized, low tonnage, commercial and recreational harbors** are found along New York's Great Lakes shoreline. Figures on the most recent disposal costs were unavailable. It was found that the most recent dredging totaled almost 420,000 cubic yards of material for the following seven harbors (Olcott, Oak Orchard, Wilson, Great Sodus, Little Sodus, Barcelona, and Dunkirk).

A total estimated figure of one million dollars for next-time dredging costs was provided for seven harbors (Olcott, Oak Orchard, Wilson, Barcelona, Dunkirk, Rochester, and Oswego). Estimates on material to be removed were available only for two harbors (Rochester and Oswego), and total 230,000 cubic yards, for an average disposal cost of \$3/cubic yard.

(Data Provided by Dept. of Environmental Conservation,
with assistance from the Corps of Engineers - Buffalo District)

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	15	
2. Disposal Costs - most recent dredging	Not available	
3. Material Removed	418,900 cu yd	Seven harbors reporting (see * below)
4. Average Disposal Cost	Not available	
 B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$1,000,000 +	Seven harbors reporting (see # below)
2. Material to be Removed	230,000 cu yds	Two harbors reporting (Rochester and Oswego)
3. Average Disposal Cost	\$3/cu yd	Two harbor average (see # below)

Harbors Surveyed:

- | | |
|------------------|-----------------|
| 1. Cape Vincent | 10. Sacketts |
| 2. Cattaraugus | 11. #*Barcelona |
| 3. #*Olcott | 12. #*Dunkirk |
| 4. Port Ontario | 13. # Rochester |
| 5. #*Oak Orchard | 14. # Oswego |
| 6. Irondequoit | 15. Ogdensburg |
| 7. #*Wilson | |
| 8. *Great Sodus | |
| 9. *Little Sodus | |

**less than one million tons of waterborne commerce per year based on long-term trends and 1985 statistics.

OHIO

There are six federally authorized Great Lakes low tonnage, commercial and recreational harbors** in Ohio. These harbors reported removal of over 141,000 cubic yards of material from their latest dredging activity. Total disposal costs of over \$1.1 million were reported by four of these harbors (see * below), with an average disposal cost of \$7.70/cubic yard.

Four harbors (see # below) report next-time dredging costs of over \$2 million, at an average disposal cost of up to \$9.07/cubic yard.

Ohio reports that the U.S. Army Corps of Engineers annually dredge harbors to commercial depth. Recreational harbors are dredged on the basis of need and when funds are available. Cost-sharing may be involved when nearshore disposal of dredge material removed from the channel is requested.

(Data Provided by Department of Natural Resources,
with assistance from the Corps of Engineers - Buffalo District)

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	6	
2. Disposal Costs - most recent dredging	\$1,139,780	Four harbors reporting (See * below)
3. Material Removed	141,219 cu yd	Three harbors reporting (See * below, but exclude Put-In-Bay)
4. Average Disposal Cost	\$7.70/cu yd	Three harbors average (see * below but exclude Put-In-Bay)
 B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$2,040,000	Four harbors reporting (see # below)
2. Material to be Removed	225,000 cu yds	Four harbors reporting (see # below)
3. Average Disposal Cost	\$9.07/cu yd	Four harbor average (see # below)

Harbors Surveyed:

- | | |
|-------------------|------------------|
| 1. Geneva | 4. #*Rocky River |
| 2. # Port Clinton | 5. #*Vermilion |
| 3. *Put-In-Bay | 6. #*West Harbor |

**less than one million tons of waterborne commerce per year based on long-term trends and 1985 statistics.

PENNSYLVANIA

Presque Isle Bay is the only federally authorized commercial recreational harbor in the Great Lakes waters of Pennsylvania. It meets the low tonnage criterion of less than one million tons of waterborne commerce per year based on 1985 statistics and hence, is included here.

Disposal costs for the most recent dredging activity total \$238,000, with 75,000 cubic yards of material removed at an average cost of \$3.17/cubic yard. Next-time dredging requirements at the site are projected at \$200,000 to remove between 50,000 and 80,000 cubic yards of material.

(Data Provided by Dept. of Environmental Resources, Bureau of Water Resources Management)

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	1	
2. Disposal Costs - most recent dredging	\$238,000	
3. Material Removed	75,000 cu yd	
4. Average Disposal Cost	\$ 3.17/cu yd	
B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$200,000	
2. Material to be Removed	50,000 - 80,000 cu yds	
3. Average Disposal Cost	\$2.50 - 4.00/cu yd	

Harbors Surveyed:

1. Presque Isle

WISCONSIN

There are nineteen federally authorized low tonnage commercial and recreational harbors** in the Great Lakes waters of Wisconsin. Disposal costs for the most recent dredging were available for ten harbors (see * below) and totaled over \$2.6 million. Over 516,000 cubic yards of material were removed from eighteen harbors (see # below) at an average cost of \$7.41/cubic yard for the ten harbors.

Estimated dredging needs were available for eighteen harbors (absent Detroit and Jackson Harbors). Cost estimates were between \$2.2 and \$4.7 million for the removal of up to 439,000 cubic yards of material from the eighteen harbors, with an average disposal cost of up to \$11.37/cubic yard.

The Wisconsin Coastal Management Program has a key role in establishing the state's dredging needs and priorities, coordinating an annual meeting of the Corps of Engineers, U.S. Fish and Wildlife Service and state departments of Natural Resources and Transportation.

The Corps' principal focus is on commercial harbors. Dredging of recreational harbors is not regularly scheduled, but done on an as-needed basis as funds allow.

(Data provided by Depts. of Administration and Natural Resources)

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	19	
2. Disposal Costs - most recent dredging	\$2,636,218	Ten harbors reporting (see * below)
3. Material Removed	516,699 cu yds	Eighteen harbors reporting (see # below)
4. Average Disposal Cost	\$7.41/cu yd	Ten harbor average (see * below)
 B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$2,279,500-4,728,500	All harbors minus: Detroit and Jackson Harbors
2. Material to be Removed	416,000 - 439,000 cu yds	All harbors minus Detroit & Jackson Harbors
3. Average Disposal Cost	\$5.19 - 11.37/cu yd	

Harbors Surveyed:

- | | | |
|-----------------|-----------------------|-------------------------------|
| 1. # Algoma | 7. #*La Pointe | 13. #*Port Wing |
| 2. # Ashland | 8. # Manitowac | 14. #*Saxon |
| 3. # Bayfield | 9. # Marinette | 15. #*Sheboygan |
| 4. #*Cornucopia | 10. # Oconto | 16. #*Sturgeon Bay |
| 5. #*Kenosha | 11. # Pensaukee | 17. # Suamico |
| 6. #*Kewaunee | 12. #*Port Washington | 18. #*Two Rivers |
| | | 19. Detroit & Jackson Harbors |

**less than one million tons of waterborne commerce per year based on long-term trends and 1985 statistics.

GREAT LAKES BASIN SUMMARY

The following summary illustrates the magnitude of dredging activity in the Great Lakes.

Data for 101 federally authorized low tonnage commercial and recreational harbors and waterways along the Great Lakes were provided by the Great Lakes Commission's Commercial and Recreational Harbor Dredging Task Force. Large tonnage commercial harbors, those with waterborne commerce of more than one million tons per year, were excluded. The Task Force believes that due to the commercial orientation of large tonnage harbors they are not representative of smaller commercial and recreational harbor dredging issues and needs.

Determination of which ports were excluded was based on long-term trends and 1985 tonnage figures as reported by Waterborne Commerce of the United States.

Based on the data provided, over 12 million dollars were required to accomplish the most recent dredging at 59 of the 101 harbors where cost figures were available.

Similarly, as much as 17.7 million dollars will be required for the next dredging period. That is, the aggregate amount required to accomplish the next anticipated dredging at 66 of the 101 harbors where projections were made. It should be noted that this is not an annual figure as many of the harbors have not been dredged nor are projected to be dredged on an annual basis.

It is clear that the near-term financial resources required to adequately sustain a maintenance dredging program in the Great Lakes are substantial; only five of the 66 harbors that anticipate needed dredging will require it in 1992 or later, while the vast majority reported needing dredging within the next three years.

Almost 2.9 million cubic yards of material were removed from 73 of the 101 harbors and waterways during the last dredging and at least 2.1 million cubic yards are anticipated to be removed during the next dredging at 61 of the 101 harbors where projections were made. This raises serious questions about disposal requirements and options and the need to plan for disposal of dredge material in the near future.

The current and projected average costs of disposal will rise slightly with a range of \$7.05 - \$8.39 per cubic yard projected for the next dredging as opposed to \$5.27 per cubic yard for the most recent dredging.

A) CURRENT STATUS	TOTAL	NOTES
1. Number of Harbors	101	
3. Disposal Costs - most recent dredging	\$12,246,205	59 harbors reporting
4. Material Removed	2,891,898 cu yds	73 harbors reporting
5. Average Disposal Cost	\$5.27/cu yd	Based on 58 harbor average
 B) PROJECTED STATUS		
1. Disposal Costs - next needed dredging	\$15,256,250 - \$17,715,250	66 harbors reporting
2. Material to be Removed	2,111,300 - 2,164,300 cu yds	61 harbors reporting
3. Average Disposal Cost	\$7.05 - 8.39/cu yd	61 harbor average

Section Three

The Economic Importance of the U.S. Great Lakes

Recreational Boating Industry

Introduction

The Great Lakes Commercial and Recreational Harbor Dredging Task Force recommended to the Commission in its interim report that a briefing paper documenting the economic importance of the Great Lakes recreational boating industry and highlighting related policy and legislative issues be prepared. The briefing paper would provide supplemental information for the recreational harbor dredging recommendations as well as serve broader Commission information purposes.

Background

The Great Lakes form the largest system of freshwater lakes in the world. The Great Lakes region is the setting for thousands of lakes and hundreds of miles of navigable rivers. With 95,000 square miles of navigable water and a resident U.S. and Canadian population of more than 40 million, the Great Lakes Basin anchors an important and growing marine recreation industry. Water-based tourism and recreation in the Great Lakes area makes a major contribution to the regional economy. Diverse opportunities, coupled with high participation levels, contribute to the area's quality of life. Recreational boating is a key component of the marine recreation industry in the Great Lakes.

According to state registration data, the number of recreational boats in the eight Great Lakes states for 1987 is estimated at more than 3.3 million (see Table A). The figure represents a third of all registered watercraft in the country. An exact figure representing boat numbers by jurisdiction is not available because some state data contain inactive or expired registrations and not all categories of watercraft require registration.

The mainland shoreline for the eight Great Lakes states is 3,756 miles and for islands it is 1,194 miles. The region's strong connection to its Great Lakes resources is demonstrated by revitalized waterfront development and increasing interest in water-based recreation. Nation-wide trends in second home ownership, increasing outdoor recreational activity and pursuit of an amenity-rich life style support the region's rediscovery of its water playground. But, improving water quality and a good Great Lakes sport fishery are principal factors behind the thriving recreational boating scene in the Great Lakes.

Great Lakes Recreational Boating Activity

With respect to Great Lakes recreational boat activity, no comprehensive, system-wide data is available. However, registration data for lake-adjacent and near-lake counties and results from several recreational boat/marina studies provide a basis to estimate Great Lakes boat numbers and usage. These studies have also produced reliable profile information on Great Lakes boaters as well as the marina sector. Great Lakes coastal zone counties accounted for 871,069 boat registrations or about a quarter of total region-wide registrations. A 1988 Michigan State University - Department of Park and Recreation Resources study (Tahelm, et al.) based on a statewide survey of 10,089 Michigan registrants, indicated for 1986 that 245,000 boats were used on the Great Lakes or 41 percent of the total active fleet. However, for exclusive Great Lakes boat use, the figure drops to 104,000 or 17.4 percent.

Table A

Recreational Boating in the Great Lakes States: 1986 and 1987

	Total Registered Boats* 1986	% of Total Boats in U.S. and (Rank) 1987	Boats Proximate to the Great Lakes** 1986	Retail Boat and Outboard Motor Sales 1986	Great Lakes Excursion/ Ferry Operations and (vessels) 1987***
Illinois	287,586	2.96 (10)	101,434	\$205,358,000	5 (9)
Indiana	203,275	2.07 (17)	28,414	128,370,000	---
Michigan	716,441	7.49 (1)	245,000	487,368,000	26 (65)
Minnesota	655,389	6.75 (3)	59,473	201,931,000	2 (5)
New York	358,400	3.85 (7)	100,183	536,183,000	13 (25)
Ohio	361,885	3.67 (8)	158,688	268,199,000	12 (21)
Pennsylvania	236,455	2.52 (14)	24,368	141,856,000	1 (1)
Wisconsin	452,481	4.63 (6)	153,569	180,009,000	11 (20)
Great Lakes Region	3,271,912	33.97	871,069	2,149,274,000	70 (146)
United States	9,876,197			6,031,809,000	

* State boat registration data may contain inactive or expired registrations and not all categories of watercraft require registration.

** Boat use data for the Great Lakes was obtained from state agencies responsible for recreational boating programs. The figures for 1986 are based on lake-adjacent and near-lake county boat registrations. For the State of Michigan, the figure represents boat use on the Great Lakes, and was derived from the 1986 Michigan Recreational Boating Survey conducted by the Department of Park and Recreation Resources, Michigan State University.

*** Great Lakes Excursion/Ferry operations are identified as those passenger and passenger/vehicle operations that offer regularly scheduled service. The New York figure includes operations for the St. Lawrence River.

SOURCES: National Marine Manufacturers Association, Boating 1987; State Recreational Boating Offices; United States Coast Guard; Boating Statistics 1987; Great Lakes Commission, Excursion, Cruise, and Passenger Ferry Services on the Great Lakes and St. Lawrence River (1987); 1986 Michigan Recreational Boating Survey.

The best indicator of Great Lakes boating activity is the usage measure of "boat days". For 1986, the Michigan study estimated 28% of all boat days in the state were spent on the Great Lakes. Earlier studies for Michigan have resulted in a similar percentage for the Great Lakes relative share. The Michigan studies also demonstrated the remarkable growth of Great Lakes boat days in recent years: 1974 to 1980 - 63%, and 1980 to 1986 - 41%. Another recent study - University of Wisconsin, Recreational Resources Center (Petersen and Atwood), based on a survey sample of 2,515 boat registrants from selected counties that contribute to Great Lakes boating, indicated Great Lakes boat days were 36 percent of the study area total. The Wisconsin study also confirmed findings of the Michigan studies that the Great Lakes boating market does not extend far inland for trailerable boats and includes a significantly greater relative share of large boat and commercial marina use. Michigan data indicates that for 1986 boats 20 feet or larger make up only 11 percent of the total and that only 14 percent used a marina at some time, nearly half at a Great Lakes location.

On the basis of boat registrations for counties proximate to the Great Lakes a 75 percent estimate of Great Lakes usage for those boats and 50,000 boats from other locations, approximately 700,000 recreational boats are used on the Great Lakes each year. This figure is 21 percent of total region-wide boat registrations which corresponds to selected study findings.

Economic Impact of Great Lakes Boating

The recreational boating industry in the Great Lakes is large and pervasive. This economic sector is represented by boat manufacturers and retailers, marina operators, marine business suppliers and the hundreds of thousands of recreational boaters/anglers.

The following capsulates basic economic impact information and business activity for the Great Lakes recreational boating industry.

o Boat Sales and Trade Shows

One indicator of the economic importance of the recreation boating industry in the Great Lakes region is the volume of new boat and marine accessory sales. Table A shows retail boat and outboard motor sales for the Great Lakes states amounted to \$2.14 billion in 1986, or more than a third of national spending. Annual boat shows play an important part in industry promotion and local economic impact. Great Lakes shows also are a good barometer of consumer interest. Attendance at the major events has been steadily increasing. For example, the Detroit Boat and Fishing Show has doubled its attendance since 1981 and sales volume has grown much more rapidly. In 1988, the Detroit show generated \$61.5 million in sales. The Cleveland Mid-America Boat Show held each January is the nation's largest indoor boat show in terms of attendance and square feet of exhibit space. 188,000 persons attended the 1987 show and 385 U.S. and Canadian companies participated. Cleveland area businesses received ten million dollars of business resulting from the show and total show proceeds amounted to over \$25 million.

o Sector Employment and Number of Business Establishments

According to the U.S. Bureau of Labor Statistics, the eight Great Lakes states accounted for 22,791 marina-related, etc., jobs and 35,769 boat dealer and supplier jobs during the peak boating season in 1987. The number of business establishments reporting payroll positions was 1022 and 1411 respectively for the listed employment categories.

A recent study by Ohio Sea Grant (Lichtkoppler and Hushak) based on a survey of Lake Erie marinas in 1986 profiled the "typical" marina. Such a facility had been in operation for 18 years, grossed \$894,000 in annual sales, (boat sales, repair charges, dockage and launch fees, etc.), and employed 5.5 people on a full time annual basis and a similar level of full-time equivalent employment during the average 6.6 month season. The mean annual payroll for marinas was nearly \$100,000.

o Recreational Boater Spending

Recreational boater spending is usually broken down into two categories: craft-related and trip-related. The recent Michigan study concluded that total direct spending for Michigan boating in 1986 was \$1.5 billion. Of the direct spending, 44 percent or \$678 million was Great Lakes-based. Sixty percent of the amount was categorized as trip-related. A 1982 Michigan State University study (Stynes and Holecek) looked at boating activity spending particularly by craft size and type. Cabin craft and boats larger than 16 feet accounted for half of state boating expenditures. Using the Michigan expenditure rate per Great Lakes boat figure (\$1025/ boat and \$1583/trip-related for 28 boat days) and the 700,000 number for Great Lakes boats in use, an estimated level of total annual Great Lakes recreation boater direct spending is \$1.83 billion. This figure does not include purchases of new and used boats.

o The Fishing Dollar Connection with Great Lakes Recreational Boating

In most studies of Great Lakes recreational boating, fishing is identified as the major activity connected with such boating. The Michigan studies have shown that fishing now accounts for 56 percent of boat days in the Great Lakes, up from 44 percent in 1968. Surprisingly, the Great Lakes percentage is higher than that for boating on inland lakes, rivers, and streams.

According to the Department of Interior's National Survey of Fishing, Hunting and Wildlife - Associated Recreation, Great Lakes fishing in 1985 accounted for 46.4 million angler days by 3.7 million anglers. Eighty-one percent of the anglers were residents of the eight Great Lakes states. The Great Lakes Fishery Commission has estimated the total annual regional economic impact of the Great Lakes fisheries (dominated by sport fishing) at between \$2 and \$4 billion for 1985.

o Demographic and Consumer Expenditure Trends Support High Great Lakes Recreational Boating Economic Impact

Recent studies of waterfront development and marina use trends in the Great Lakes by the Laventhol and Horwath accounting firm show that the high level of economic activity in these sectors should continue for the next several years. For example, the area around the southern Lake Michigan (Kenosha, WI to Muskegon, MI) will generate 850 new shoreside dwelling units and 1,000 boat slips at marinas and residential developments each year.

Increased household income (two-earner families) and maturation of the early baby-boom age category along with continued preferential tax treatment for second homes, and boats with galley and heads (loan interest deductibility) are the principal reasons. However, renewed Congressional scrutiny of tax "loopholes" and a smaller baby-boom bulge may roil future waters. Also, increasing marina congestion for transient boaters, new zoning and other development restrictions on shore home building and marina construction could dampen Great Lakes boating trends.

Recreational Boating Public Policy Issues

The recreational boating industry is in a growth mode. As with any economic sector that is experiencing rapid change, applicable public policy needs to respond appropriately. Recreational boating has strong linkages to publicly managed natural resources and the boating infrastructure represents both private and public facilities. The following listing of selected issues illustrates the range of public policy as it relates to the recreational boating industry.

- o Public Access. Shoreland private development can have a negative impact on boating opportunity.
- o Federal Tax Policy. The loan interest deductibility provision for boats with galleys and heads ("living units") is under scrutiny and if eliminated could reduce boating activity.
- o Waterfront Development. Public/private development initiatives along urban waterfronts has spawned renewed interest in marine recreation as well as helped to revitalize communities.
- o Boating Safety. Coast Guard and local-state boating safety programs and enforcement activities are critical to a growing recreational boating industry.
- o User Fees. Possible implementation of federal recreational boat user fees, especially those that would be directed to the general fund, pose serious policy questions.
- o Sport Fishery Programs. State fish stocking and management programs have proved to be successful and play an important role in stimulating demand for recreational boating opportunities.
- o Recreational Harbor Dredging. Costs of dredging public recreational harbors and governmental responsibility for such activity are long-term issues but are of immediate concern when water levels drop.

Summary

The recreational boating industry is a growing and important part of the Great Lakes regional economy. Boating is a major recreational pursuit and contributes to the quality of life.

The economic and industry information presented here will serve to show the connection between recreational boating activity and relevant public policy.

Section Four

Emerging and Continuing Policy Issues for Great Lakes Commission Review

The following policy issues were raised by the Task Force members during the state survey process. They are presented below both as a means to identify dredging-related concerns and for consideration as future agenda items for Great Lakes Commission attention. The issues identified include:

- a. Need for clarification of the impact of P.L. 99-662 on cost sharing for feasibility studies, planning and engineering, construction, and operation and maintenance of CDFs authorized under Section 123 of P.L. 99-611. Clarification is also needed on whether new CDFs for existing federally authorized commercial harbors will be considered as O&M of the existing project or as new construction.
- b. Need for an established, comprehensive federal-state program for maintenance dredging of recreational harbors. Such a program needs to provide a reliable and stable source of funds, preferably in the form of grants, rather than loans, due to restrictions placed on expenditures of port authority monies.
- c. Cost-sharing provisions of P.L. 99-662 (Water Resources Development Act of 1986) need to be amended for improvements to the Great Lakes connecting channels.
- d. Need to review Corps and EPA policies with regard to the disposal of dredge material.
- e. Concern over the Corps' priority setting process and the fact that it is "essentially abandoning" many federally constructed breakwaters and authorized channels used by recreational boaters, charter and commercial fishermen.
- f. Question as to how Great Lakes states are responding to the establishment of a "federal standard" (Federal Register, Vol. 51, NO. 104, p. 19698). Under the proposed rules, the Corps would require the local sponsor to pay any cost differential between implementing the "federal standard" and implementing state law. Depending on how the proposed rule is implemented, the cost impacts for communities could be significant.
- g. A question of regional equity: Are Great Lakes ports, harbors and waterways with federal authorization maintained by the Corps at least to the same degree as other regions?
- h. Cost sharing: Is some form of recreation user fee or "Great Lakes stamp" a viable means to assist in maintenance of Great Lakes recreational harbors?

APPENDIX

State Harbor Summary Tables

ILLINOIS

HARBOR NAME	WAUKEGAN
Use	<u>Commercial</u>
Maximum Depth (ft.)	<u>22</u>
Date of Last Dredging	<u>1988</u>
Total Cost (\$)	<u>525,294</u>
Amount of Material (Cu. Yd.)	<u>101,000</u>
Disposal Method	<u>Beach nourishment</u>
Date Dredging Needed	<u>1990</u>
Projected Costs (\$)	<u>600,000</u>
Amount of Material (Cu. Yd.)	<u>75,000</u>

INDIANA

<p>HARBOR NAME Use Maximum Depth (ft.) Date of Last Dredging Total Cost (\$) Amount of Material (Cu. Yd.) Disposal Method</p>	<p>BURNS SMALL BOAT HARBOR & PORTAGE/BURNS WATERWAY <u>Harbor_of Refuge</u> <u>10</u> <u>1987</u> <u>377,000</u> <u>129,000</u> <u>Beach Nourishment</u></p>	<p>MICHIGAN CITY <u>Commercial/Fishing/Recreation</u> <u>14</u> <u>1986</u> <u>255,000</u> <u>68,000</u> <u>Beach nourishment</u></p>
<p>Date Dredging Needed Projected Costs (\$) Amount of Material (Cu. Yd.)</p>	<p><u>1990</u> <u>150,000</u> <u>20,000</u></p>	<p><u>1994</u> <u>1,400,000</u> <u>70,000</u></p>

<p>HARBOR NAME Use Maximum Depth (ft.) Date of Last Dredging Total Cost (\$) Amount of Material (Cu. Yd.) Disposal Method</p>	<p>TRAIL CREEK <u>Small_boat_recreation</u> <u>6</u> <u>1987</u> <u>648,000</u> <u>25,054</u> <u>CFD</u></p>
<p>Date Dredging Needed Projected Costs (\$) Amount of Material (Cu. Yd.)</p>	<p><u>1989</u> <u>900,000</u> <u>45,000</u></p>

MICHIGAN

HARBOR NAME **ARCADIA**
Use Recreation
Maximum Depth (ft.) 16
Date of Last Dredging 1985
Total Cost (\$) 42,500
Amount of Material (Cu. Yd.) 7100
Disposal Method Beach_nourishment

Date Dredging Needed 1988
Projected Costs (\$) 63,000
Amount of Material (Cu. Yd.) 10,000

HARBOR NAME **AU SABLE**
Use Recreation
Maximum Depth (ft.) 12
Date of Last Dredging 1975
Total Cost (\$) 36,097
Amount of Material (Cu. Yd.) 9500
Disposal Method Open lake

Date Dredging Needed 1990
Projected Costs (\$) 61,000
Amount of Material (Cu. Yd.) 17,000

HARBOR NAME **BAY PORT**
Use Recreation
Maximum Depth (ft.) 6
Date of Last Dredging No maint. dredging performed
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----

Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME **BELLE RIVER**
Use Recreation
Maximum Depth (ft.) 15
Date of Last Dredging No maint. dredging performed
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----

Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME **BLACK RIVER (P.H.)**

Use Recreation

Maximum Depth (ft.) 17

Date of Last Dredging No maint. dredging performed

Total Cost (\$) -----

Amount of Material (Cu. Yd.) -----

Disposal Method -----

Date Dredging Needed -----

Projected Costs (\$) -----

Amount of Material (Cu. Yd.) -----

HARBOR NAME **BIG BAY**

Use Recreation

Maximum Depth (ft.) 12

Date of Last Dredging 1987

Total Cost (\$) 151,200

Amount of Material (Cu. Yd.) 20,000

Disposal Method Beach Nourishment

Date Dredging Needed 1989

Projected Costs (\$) 66,000

Amount of Material (Cu. Yd.) 8,800

HARBOR NAME **BOLLES**

Use Recreation

Maximum Depth (ft.) 8

Date of Last Dredging 1981

Total Cost (\$) 94,715

Amount of Material (Cu. Yd.) 7221

Disposal Method CDE

Date Dredging Needed 1988

Projected Costs (\$) 670,000

Amount of Material (Cu. Yd.) 65,000

HARBOR NAME **BLACK RIVER (U.P.)**

Use Recreation

Maximum Depth (ft.) 12

Date of Last Dredging 1980

Total Cost (\$) 35,953

Amount of Material (Cu. Yd.) 5147

Disposal Method Open lake

Date Dredging Needed 1988

Projected Costs (\$) 139,000

Amount of Material (Cu. Yd.) 15,000

HARBOR NAME CASEVILLE

Use Recreation
 Maximum Depth (ft.) 10
 Date of Last Dredging 1980
 Total Cost (\$) 138,100
 Amount of Material (Cu. Yd.) 23,350
 Disposal Method Open lake
 Date Dredging Needed 1988
 Projected Costs (\$) 250,000
 Amount of Material (Cu. Yd.) 42,000

HARBOR NAME CHARLEVOIX

Use Commercial/Recreation
 Maximum Depth (ft.) 18
 Date of Last Dredging 1984
 Total Cost (\$) 7,865
 Amount of Material (Cu. Yd.) 900
 Disposal Method Upland
 Date Dredging Needed 1988
 Projected Costs (\$) 41,000
 Amount of Material (Cu. Yd.) 7,800

HARBOR NAME CHEBOYGAN

Use Commercial/Recreation
 Maximum Depth (ft.) 21
 Date of Last Dredging 1976
 Total Cost (\$) 18,247
 Amount of Material (Cu. Yd.) 10,273
 Disposal Method Open lake
 Date Dredging Needed -----
 Projected Costs (\$) -----
 Amount of Material (Cu. Yd.) -----

HARBOR NAME CLINTON RIVER

Use Recreation
 Maximum Depth (ft.) 8
 Date of Last Dredging 1979
 Total Cost (\$) 127,147
 Amount of Material (Cu. Yd.) 13,737
 Disposal Method CDE
 Date Dredging Needed 1990
 Projected Costs (\$) 225,000
 Amount of Material (Cu. Yd.) 25,000

HARBOR NAME

DETOUR

Use Recreation

Maximum Depth (ft.) 10

Date of Last Dredging No maint. dredging performed

Total Cost (\$) -----

Amount of Material (Cu. Yd.) -----

Disposal Method -----

Date Dredging Needed -----

Projected Costs (\$) -----

Amount of Material (Cu. Yd.) -----

HARBOR NAME

EAGLE

Use Recreation

Maximum Depth (ft.) 14

Date of Last Dredging 1973

Total Cost (\$) 11,000

Amount of Material (Cu. Yd.) 4,700

Disposal Method Open lake

Date Dredging Needed -----

Projected Costs (\$) -----

Amount of Material (Cu. Yd.) -----

HARBOR NAME

FRANKFORT

Use Commercial/Recreation

Maximum Depth (ft.) 24

Date of Last Dredging 1982

Total Cost (\$) 176,035

Amount of Material (Cu. Yd.) 37,000

Disposal Method Upland

Date Dredging Needed 1990

Projected Costs (\$) 180,000

Amount of Material (Cu. Yd.) 34,000

HARBOR NAME

GRAND MARAIS

Use Recreation

Maximum Depth (ft.) 20

Date of Last Dredging 1973

Total Cost (\$) 84,297

Amount of Material (Cu. Yd.) 63,094

Disposal Method Open lake

Date Dredging Needed -----

Projected Costs (\$) -----

Amount of Material (Cu. Yd.) -----

HARBOR NAME GRAND RIVER
 Use Commercial/Recreation
 Maximum Depth (ft.) 8
 Date of Last Dredging 1974
 Total Cost (\$) 73,183
 Amount of Material (Cu. Yd.) 45,680
 Disposal Method CDE
 Date Dredging Needed -----
 Projected Costs (\$) -----
 Amount of Material (Cu. Yd.) -----

HARBOR NAME GRAND TRAVERSE
 Use Recreation
 Maximum Depth (ft.) 12
 Date of Last Dredging 1982
 Total Cost (\$) 35,807
 Amount of Material (Cu. Yd.) 4072
 Disposal Method Open Lake
 Date Dredging Needed 1990
 Projected Costs (\$) 76,000
 Amount of Material (Cu. Yd.) 6,400

HARBOR NAME HAMMOND BAY
 Use Recreation
 Maximum Depth (ft.) 12
 Date of Last Dredging No maint. dredging performed
 Total Cost (\$) -----
 Amount of Material (Cu. Yd.) -----
 Disposal Method -----
 Date Dredging Needed -----
 Projected Costs (\$) -----
 Amount of Material (Cu. Yd.) -----

HARBOR NAME HARBOR BEACH
 Use Commercial/Recreation
 Maximum Depth (ft.) 23
 Date of Last Dredging 1986
 Total Cost (\$) 267,000
 Amount of Material (Cu. Yd.) 26,200
 Disposal Method Open Lake
 Date Dredging Needed Unknown
 Projected Costs (\$) -----
 Amount of Material (Cu. Yd.) -----

HARBOR NAME HARRISVILLE

Use Recreation
Maximum Depth (ft.) 12
Date of Last Dredging 1983
Total Cost (\$) 98,225
Amount of Material (Cu. Yd.) 23,300
Disposal Method Open lake
Date Dredging Needed 1988
Projected Costs (\$) 230,000
Amount of Material (Cu. Yd.) 49,000

HARBOR NAME HOLLAND

Use Commercial/Recreation
Maximum Depth (ft.) 23
Date of Last Dredging 1987
Total Cost (\$) est 380,000
Amount of Material (Cu. Yd.) 35,000
Disposal Method Beach nourishment/CDF
Date Dredging Needed 1988
Projected Costs (\$) 460,000
Amount of Material (Cu. Yd.) 40,000

HARBOR NAME INLAND ROUTE

Use Recreation
Maximum Depth (ft.) 5
Date of Last Dredging 1983
Total Cost (\$) 139,810
Amount of Material (Cu. Yd.) 6152
Disposal Method CDF
Date Dredging Needed 1991
Projected Costs (\$) 667,000
Amount of Material (Cu. Yd.) 33,000

HARBOR NAME KEWEENAW WATERWAY

Use Commercial/Recreation
Maximum Depth (ft.) 32
Date of Last Dredging 1976
Total Cost (\$) 623,479
Amount of Material (Cu. Yd.) 164,000
Disposal Method CDF
Date Dredging Needed 1989
Projected Costs (\$) 525,000
Amount of Material (Cu. Yd.) 75,000

HARBOR NAME LAC LABELLE

Use Recreation
Maximum Depth (ft.) 10
Date of Last Dredging 1983
Total Cost (\$) 8,450
Amount of Material (Cu. Yd.) 2750
Disposal Method Open lake
Date Dredging Needed 1989
Projected Costs (\$) 33,000
Amount of Material (Cu. Yd.) 4,200

HARBOR NAME LELAND

Use Recreation
Maximum Depth (ft.) 10
Date of Last Dredging 1987
Total Cost (\$) 58,000
Amount of Material (Cu. Yd.) 15,000
Disposal Method Beach nourishment
Date Dredging Needed 1988
Projected Costs (\$) 60,000
Amount of Material (Cu. Yd.) 15,000

HARBOR NAME LES CHENEAUX

Use Recreation
Maximum Depth (ft.) 7
Date of Last Dredging 1971
Total Cost (\$) 140,421
Amount of Material (Cu. Yd.) 80,388
Disposal Method Open lake
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME LEXINGTON

Use Recreation
Maximum Depth (ft.) 10
Date of Last Dredging 1987
Total Cost (\$) est 130,000
Amount of Material (Cu. Yd.) 30,000
Disposal Method Open lake
Date Dredging Needed 2000
Projected Costs (\$) 200,000
Amount of Material (Cu. Yd.) 30,000

HARBOR NAME	MANISTIQUE	MACKINAC ISLAND
Use	Commercial/Recreation	Recreation
Maximum Depth (ft.)	18	-----
Date of Last Dredging	No maint. dredging performed	No maint. dredging performed
Total Cost (\$)	-----	-----
Amount of Material (Cu. Yd.)	-----	-----
Disposal Method	-----	-----
Date Dredging Needed	-----	-----
Projected Costs (\$)	-----	-----
Amount of Material (Cu. Yd.)	-----	-----

HARBOR NAME	MANISTEE
Use	Commercial/Recreation
Maximum Depth (ft.)	25
Date of Last Dredging	1986
Total Cost (\$)	211,000
Amount of Material (Cu. Yd.)	32,500
Disposal Method	Beach nourishment
Date Dredging Needed	1989
Projected Costs (\$)	230,000
Amount of Material (Cu. Yd.)	32,000

HARBOR NAME	MACKINAW CITY
Use	Recreation
Maximum Depth (ft.)	10
Date of Last Dredging	No maint. dredging performed
Total Cost (\$)	-----
Amount of Material (Cu. Yd.)	-----
Disposal Method	-----
Date Dredging Needed	-----
Projected Costs (\$)	-----
Amount of Material (Cu. Yd.)	-----

HARBOR NAME	MACKINAW CITY
Use	Recreation
Maximum Depth (ft.)	10
Date of Last Dredging	No maint. dredging performed
Total Cost (\$)	-----
Amount of Material (Cu. Yd.)	-----
Disposal Method	-----
Date Dredging Needed	-----
Projected Costs (\$)	-----
Amount of Material (Cu. Yd.)	-----

HARBOR NAME NEW BUFFALO

Use Recreation
Maximum Depth (ft.) 10
Date of Last Dredging 1985
Total Cost (\$) 62,604
Amount of Material (Cu. Yd.) 9797
Disposal Method Beach_nourishment
Date Dredging Needed 1988
Projected Costs (\$) 70,000
Amount of Material (Cu. Yd.) 10,000

HARBOR NAME ONTONAGON

Use Commercial/Recreation
Maximum Depth (ft.) 17
Date of Last Dredging 1987
Total Cost (\$) est 660,000
Amount of Material (Cu. Yd.) 135,000
Disposal Method Beach_nourishment
Date Dredging Needed 1988
Projected Costs (\$) 320,000
Amount of Material (Cu. Yd.) 60,000

HARBOR NAME PENTWATER

Use Recreation
Maximum Depth (ft.) 16
Date of Last Dredging 1986
Total Cost (\$) 95,000
Amount of Material (Cu. Yd.) 20,000
Disposal Method Beach_nourishment
Date Dredging Needed 1988
Projected Costs (\$) 90,000
Amount of Material (Cu. Yd.) 20,000

HARBOR NAME PETOSKEY

Use Recreation
Maximum Depth (ft.) -----
Date of Last Dredging No maint_dredging performed
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME PINE RIVER

Use Recreation
Maximum Depth (ft.) 14
Date of Last Dredging No maint. dredging performed
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME PORTAGE LAKE

Use Recreation
Maximum Depth (ft.) 14
Date of Last Dredging 1981
Total Cost (\$) 49,500
Amount of Material (Cu. Yd.) 8780
Disposal Method Open lake
Date Dredging Needed 1990
Projected Costs (\$) 122,000
Amount of Material (Cu. Yd.) 18,000

HARBOR NAME PORT AUSTIN

Use Recreation
Maximum Depth (ft.) 12
Date of Last Dredging No maint. dredging performed
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME PORT SANILAC

Use Recreation
Maximum Depth (ft.) 12
Date of Last Dredging 1979
Total Cost (\$) 474,295
Amount of Material (Cu. Yd.) 78,000
Disposal Method Beach nourishment
Date Dredging Needed 1988
Projected Costs (\$) 575,000
Amount of Material (Cu. Yd.) 60,000

HARBOR NAME PTE. LOOKOUT

Use Recreation
Maximum Depth (ft.) 12
Date of Last Dredging 1984
Total Cost (\$) 95,107
Amount of Material (Cu. Yd.) 15,407
Disposal Method Open lake
Date Dredging Needed 1988
Projected Costs (\$) 120,000
Amount of Material (Cu. Yd.) 20,000

HARBOR NAME SAUGATUCK

Use Recreation
Maximum Depth (ft.) 12
Date of Last Dredging 1985
Total Cost (\$) 107,495
Amount of Material (Cu. Yd.) 19,880
Disposal Method Beach nourishment
Date Dredging Needed 1989
Projected Costs (\$) 80,750
Amount of Material (Cu. Yd.) 20,600

HARBOR NAME SEBEWAING

Use Recreation
Maximum Depth (ft.) 8
Date of Last Dredging 1981
Total Cost (\$) 145,382
Amount of Material (Cu. Yd.) 43,762
Disposal Method CDE
Date Dredging Needed 1988
Projected Costs (\$) 265,000
Amount of Material (Cu. Yd.) 80,000

HARBOR NAME SOUTH HAVEN

Use Recreation
Maximum Depth (ft.) 21
Date of Last Dredging No maint. dredging performed
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME ST. JAMES

Use Recreation
 Maximum Depth (ft.) 14
 Date of Last Dredging No maint. dredging performed
 Total Cost (\$) -----
 Amount of Material (Cu. Yd.) -----
 Disposal Method -----
 Date Dredging Needed -----
 Projected Costs (\$) -----
 Amount of Material (Cu. Yd.) -----

HARBOR NAME ST. JOSEPH

Use Commercial/Recreation
 Maximum Depth (ft.) 21
 Date of Last Dredging 1987
 Total Cost (\$) est 90,000
 Amount of Material (Cu. Yd.) 15,000
 Disposal Method Beach nourishment (+CDF)
 Date Dredging Needed 1988
 Projected Costs (\$) 315,000
 Amount of Material (Cu. Yd.) 50,000

HARBOR NAME TAWAS BAY

Use Recreation
 Maximum Depth (ft.) 12
 Date of Last Dredging No maint. dredging performed
 Total Cost (\$) -----
 Amount of Material (Cu. Yd.) -----
 Disposal Method -----
 Date Dredging Needed -----
 Projected Costs (\$) -----
 Amount of Material (Cu. Yd.) -----

HARBOR NAME TRAVERSE CITY

Use Recreation/Commercial
 Maximum Depth (ft.) 14
 Date of Last Dredging No maint. dredging performed
 Total Cost (\$) -----
 Amount of Material (Cu. Yd.) -----
 Disposal Method -----
 Date Dredging Needed -----
 Projected Costs (\$) -----
 Amount of Material (Cu. Yd.) -----

HARBOR NAME WHITE FISH POINT

Use Recreation
Maximum Depth (ft.) 12
Date of Last Dredging 1980
Total Cost (\$) 33,914
Amount of Material (Cu. Yd.) 9830
Disposal Method Open Lake
Date Dredging Needed 1992
Projected Costs (\$) 68,000
Amount of Material (Cu. Yd.) 13,000

HARBOR NAME WHITE LAKE

Use Recreation
Maximum Depth (ft.) 16
Date of Last Dredging No maint. dredging performed
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

MINNESOTA

HARBOR NAME	GRAND MARAIS	HARBOR NAME	KNIFE RIVER
Use	Rec./Sport Fish./Light Comm.	Use	Recreation/Sport Fishing
Maximum Depth (ft.)	20	Maximum Depth (ft.)	10
Date of Last Dredging	1975	Date of Last Dredging	1975
Total Cost (\$)	16,300	Total Cost (\$)	39,600
Amount of Material (Cu. Yd.)	1350	Amount of Material (Cu. Yd.)	2500
Disposal Method	Upland	Disposal Method	Upland
Date Dredging Needed	None anticipated	Date Dredging Needed	None anticipated
Projected Costs (\$)	20,000	Projected Costs (\$)	50,000
Amount of Material (Cu. Yd.)	1500	Amount of Material (Cu. Yd.)	3000

NEW YORK

HARBOR NAME BARCELONA

Use Recreation

Maximum Depth (ft.) 8

Date of Last Dredging 1981

Total Cost (\$) -----

Amount of Material (Cu. Yd.) 37,100

Disposal Method Open lake

Date Dredging Needed -----

Projected Costs (\$) 100,000 +

Amount of Material (Cu. Yd.) -----

HARBOR NAME CAPE VINCENT

Use Recreation

Maximum Depth (ft.) 20

Date of Last Dredging Never dredged

Total Cost (\$) -----

Amount of Material (Cu. Yd.) -----

Disposal Method -----

Date Dredging Needed -----

Projected Costs (\$) -----

Amount of Material (Cu. Yd.) -----

HARBOR NAME CATTARAUGUS

Use Recreation

Maximum Depth (ft.) 8

Date of Last Dredging Never - new project

Total Cost (\$) -----

Amount of Material (Cu. Yd.) -----

Disposal Method -----

Date Dredging Needed -----

Projected Costs (\$) -----

Amount of Material (Cu. Yd.) -----

HARBOR NAME DUNKIRK

Use Recreation

Maximum Depth (ft.) 16

Date of Last Dredging 1983

Total Cost (\$) -----

Amount of Material (Cu. Yd.) 11,500

Disposal Method Open lake (+CDF)

Date Dredging Needed 1990

Projected Costs (\$) 50,000 +

Amount of Material (Cu. Yd.) -----

HARBOR NAME GREAT SODUS

Use Recreation
Maximum Depth (ft.) 15
Date of Last Dredging 1975
Total Cost (\$) -----
Amount of Material (Cu. Yd.) 8400
Disposal Method Open lake
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME IRONDEQUOIT

Use Recreation
Maximum Depth (ft.) 8
Date of Last Dredging Never - new project
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME LITTLE SODUS

Use Recreation
Maximum Depth (ft.) 12
Date of Last Dredging 1975
Total Cost (\$) -----
Amount of Material (Cu. Yd.) 1900
Disposal Method Open lake
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME OAK ORCHARD

Use Recreation
Maximum Depth (ft.) 10
Date of Last Dredging 1985
Total Cost (\$) -----
Amount of Material (Cu. Yd.) 9100
Disposal Method Open lake
Date Dredging Needed 1990
Projected Costs (\$) 40,000 +
Amount of Material (Cu. Yd.) -----

HARBOR NAME OGDENSBURG
Use Commercial & Recreation
Maximum Depth (ft.) -----
Date of Last Dredging 1985 Project Completion
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method Upland
Date Dredging Needed 1991 (5-7 year need)
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) Unknown

HARBOR NAME OLCOTT
Use Recreation
Maximum Depth (ft.) 11
Date of Last Dredging 1985
Total Cost (\$) -----
Amount of Material (Cu. Yd.) 5300
Disposal Method Open lake
Date Dredging Needed -----
Projected Costs (\$) 20,000
Amount of Material (Cu. Yd.) -----

HARBOR NAME OSWEGO
Use Commercial & Recreation
Maximum Depth (ft.) -----
Date of Last Dredging 1987
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method Open lake
Date Dredging Needed 1990 (2-3 year need)
Projected Costs (\$) 90,000
Amount of Material (Cu. Yd.) 30,000

HARBOR NAME PORT ONTARIO
Use Recreation
Maximum Depth (ft.) 11
Date of Last Dredging Never - new project
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME ROCHESTER
Use Commercial & Recreation
Maximum Depth (ft.) -----
Date of Last Dredging Annual
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method Open Lake
Date Dredging Needed Annual
Projected Costs (\$) 600,000
Amount of Material (Cu. Yd.) 200,000

HARBOR NAME SACKETTS
Use Recreation
Maximum Depth (ft.) -----
Date of Last Dredging Never dredged
Total Cost (\$) -----
Amount of Material (Cu. Yd.) -----
Disposal Method -----
Date Dredging Needed -----
Projected Costs (\$) -----
Amount of Material (Cu. Yd.) -----

HARBOR NAME WILSON
Use Recreation
Maximum Depth (ft.) 8
Date of Last Dredging 1985
Total Cost (\$) -----
Amount of Material (Cu. Yd.) 25,600
Disposal Method Open Lake
Date Dredging Needed -----
Projected Costs (\$) 100,000 +
Amount of Material (Cu. Yd.) -----

HARBOR NAME WILSON
Use Recreation
Maximum Depth (ft.) 8
Date of Last Dredging 1985
Total Cost (\$) -----
Amount of Material (Cu. Yd.) 25,600
Disposal Method Open Lake
Date Dredging Needed -----
Projected Costs (\$) 100,000 +
Amount of Material (Cu. Yd.) -----

OHIO

HARBOR NAME	GENEVA	HARBOR NAME	PORT CLINTON
Use	<u>Recreation</u>	Use	<u>Recreation/Light Commercial</u>
Maximum Depth (ft.)	<u>8</u>	Maximum Depth (ft.)	<u>10</u>
Date of Last Dredging	<u>1987 - still under construction</u>	Date of Last Dredging	-----
Total Cost (\$)	-----	Total Cost (\$)	-----
Amount of Material (Cu. Yd.)	-----	Amount of Material (Cu. Yd.)	-----
Disposal Method	-----	Disposal Method	<u>Open lake</u>
Date Dredging Needed	-----	Date Dredging Needed	-----
Projected Costs (\$)	-----	Projected Costs (\$)	<u>500,000</u>
Amount of Material (Cu. Yd.)	-----	Amount of Material (Cu. Yd.)	<u>50,000</u>

HARBOR NAME	PUT-IN-BAY	HARBOR NAME	ROCKY RIVER
Use	<u>Recreation/Light Commercial</u>	Use	<u>Recreation</u>
Maximum Depth (ft.)	<u>8</u>	Maximum Depth (ft.)	<u>10</u>
Date of Last Dredging	<u>1939</u>	Date of Last Dredging	<u>1985</u>
Total Cost (\$)	<u>52,000</u>	Total Cost (\$)	<u>308,916</u>
Amount of Material (Cu. Yd.)	-----	Amount of Material (Cu. Yd.)	<u>47,829</u>
Disposal Method	<u>Open lake</u>	Disposal Method	<u>Open lake</u>
Date Dredging Needed	<u>None anticipated</u>	Date Dredging Needed	<u>1991</u>
Projected Costs (\$)	-----	Projected Costs (\$)	<u>340,000</u>
Amount of Material (Cu. Yd.)	-----	Amount of Material (Cu. Yd.)	<u>50,000</u>

HARBOR NAME WEST HARBOR

Use Recreation
Maximum Depth (ft.) 10
Date of Last Dredging 1987
Total Cost (\$) 315,505
Amount of Material (Cu. Yd.) 45,561
Disposal Method Upland
Date Dredging Needed 1989
Projected Costs (\$) 700,000
Amount of Material (Cu. Yd.) 75,000

HARBOR NAME VERMILION

Use Recreation/Light Commercial
Maximum Depth (ft.) 8
Date of Last Dredging 1985
Total Cost (\$) 463,359
Amount of Material (Cu. Yd.) 47,829
Disposal Method Open Lake
Date Dredging Needed 1990
Projected Costs (\$) 500,000
Amount of Material (Cu. Yd.) 50,000

PENNSYLVANIA

HARBOR NAME	PRESQUE ISLE
Use	Commercial/Recreation
Maximum Depth (ft.)	<u>25</u>
Date of Last Dredging	<u>1986</u>
Total Cost (\$)	<u>238,000</u>
Amount of Material (Cu. Yd.)	<u>75,000</u>
Disposal Method	<u>Open Lake and CDE</u>
Date Dredging Needed	<u>1989</u>
Projected Costs (\$)	<u>+200,000</u>
Amount of Material (Cu Yd)	<u>50,000-80,000</u>

WISCONSIN

HARBOR NAME	ALGOMA	HARBOR NAME	ASHLAND
Use	Recreation/Comm. Fishing	Use	Comm. Fishing/Rec./Commercial
Maximum Depth (ft.)	14	Maximum Depth (ft.)	27
Date of Last Dredging	1963	Date of Last Dredging	1981
Total Cost (\$)	Unknown	Total Cost (\$)	Unknown
Amount of Material (Cu. Yd.)	8675	Amount of Material (Cu. Yd.)	38,000
Disposal Method	Unknown	Disposal Method	Upland
Date Dredging Needed	Now, but not scheduled	Date Dredging Needed	1990
Projected Costs (\$)	50,000 - 240,000	Projected Costs (\$)	200,000 - 480,000
Amount of Material (Cu. Yd.)	10,000 - 20,000	Amount of Material (Cu. Yd.)	40,000

HARBOR NAME	BAYFIELD	HARBOR NAME	CORNUCOPIA
Use	Rec./Comm. Fish./Ferry/Refuge	Use	Rec./Comm. Fish./Refuge
Maximum Depth (ft.)	10	Maximum Depth (ft.)	10
Date of Last Dredging	1973	Date of Last Dredging	1985
Total Cost (\$)	Unknown	Total Cost (\$)	77,849
Amount of Material (Cu. Yd.)	1875	Amount of Material (Cu. Yd.)	6564
Disposal Method	Unknown	Disposal Method	Upland
Date Dredging Needed	1990	Date Dredging Needed	1988
Projected Costs (\$)	10,000 - 24,000	Projected Costs (\$)	67,000 - 158,000
Amount of Material	2000	Amount of Material (Cu. Yd.)	11,000

HARBOR NAME DETROIT & JACKSON HARBORS

Use Rec./Comm. Fish./Ferry
 Maximum Depth (ft.) 14
 Date of Last Dredging None since completed
 Total Cost (\$) 0
 Amount of Material (Cu. Yd.) 0
 Disposal Method N/A
 Date Dredging Needed None needed
 Projected Costs (\$) 0
 Amount of Material (Cu. Yd.) N/A

HARBOR NAME KENOSHA

Use Rec./Comm./C.G.
 Maximum Depth (ft.) 27
 Date of Last Dredging 1987
 Total Cost (\$) 414,088
 Amount of Material (Cu. Yd.) 38,200
 Disposal Method CDF
 Date Dredging Needed 1990-91
 Projected Costs (\$) 250,000
 Amount of Material (Cu. Yd.) 50,000

HARBOR NAME KEWAUNEE

Use Rec./Car. Ferry/Commercial
 Maximum Depth (ft.) 20
 Date of Last Dredging 1984
 Total Cost (\$) 85,673
 Amount of Material (Cu. Yd.) 13,863
 Disposal Method Beach nourishment
 Date Dredging Needed 1988
 Projected Costs (\$) 150,000 - 500,000
 Amount of Material (Cu. Yd.) 50,000

HARBOR NAME LA POINTE

Use Ferry
 Maximum Depth (ft.) 10
 Date of Last Dredging 1984
 Total Cost (\$) 3,864
 Amount of Material (Cu. Yd.) 700
 Disposal Method Upland reuse
 Date Dredging Needed 1995
 Projected Costs (\$) 15,000 - 36,000
 Amount of Material (Cu. Yd.) 3000

HARBOR NAME MANITOWOC

Use Comm./Comm. Fish./Rec./Ferry
Maximum Depth (ft.) 25
Date of Last Dredging 1986
Total Cost (\$) Unknown
Amount of Material (Cu. Yd.) 17,223
Disposal Method CDE
Date Dredging Needed 1990
Projected Costs (\$) 75,000
Amount of Material (Cu. Yd.) 15,000 - 20,000

HARBOR NAME MARINETTE

Use Comm./Rec./Comm. Fish./Shipbldg
Maximum Depth (ft.) 26
Date of Last Dredging 1982
Total Cost (\$) Unknown
Amount of Material (Cu. Yd.) 6216
Disposal Method In-water, Michigan
Date Dredging Needed 1992
Projected Costs (\$) 30,000 - 108,000
Amount of Material (Cu. Yd.) 6,000 - 9,000

HARBOR NAME OCONTO

Use Rec./Comm. Fish./Rec. Boat bldg.
Maximum Depth (ft.) 15
Date of Last Dredging 1974
Total Cost (\$) Unknown
Amount of Material (Cu. Yd.) 58,013
Disposal Method Beach nourishment
Date Dredging Needed Needed now but not scheduled
Projected Costs (\$) 300,000 - 720,000
Amount of Material (Cu. Yd.) 60,000

HARBOR NAME PENSAUKEE

Use Commercial Fishing/Recreation
Maximum Depth (ft.) 8
Date of Last Dredging 1965
Total Cost (\$) Unknown
Amount of Material (Cu. Yd.) 8395
Disposal Method In-water
Date Dredging Needed Needed now but not scheduled
Projected Costs (\$) 50,000 - 120,000
Amount of Material (Cu. Yd.) 10,000

HARBOR NAME PORT WASHINGTON
Use Comm./Comm. Fish./Rec.
Maximum Depth (ft.) 21
Date of Last Dredging 1981
Total Cost (\$) 259,940
Amount of Material (Cu. Yd.) 16,400
Disposal Method Upland
Date Dredging Needed 1990
Projected Costs (\$) 75,000 - 180,000
Amount of Material (Cu. Yd.) 15,000

HARBOR NAME PORT WING
Use Rec./Comm. Fish
Maximum Depth (ft.) 15
Date of Last Dredging 1985
Total Cost (\$) 131,285
Amount of Material (Cu. Yd.) 15,500
Disposal Method Upland
Date Dredging Needed 1988
Projected Costs (\$) 100,000 - 280,000
Amount of Material (Cu. Yd.) 20,000

HARBOR NAME SAXON
Use Recreation
Maximum Depth (ft.) 10
Date of Last Dredging 1981
Total Cost (\$) 39,732
Amount of Material (Cu. Yd.) 7700
Disposal Method Upland
Date Dredging Needed 1990-91
Projected Costs (\$) 25,000 - 60,000
Amount of Material (Cu. Yd.) 5000

HARBOR NAME SHEBOYGAN
Use Comm./Comm. Fish./Recreation
Maximum Depth (ft.) 25
Date of Last Dredging 1987
Total Cost (\$) 176,926
Amount of Material (Cu. Yd.) 24,303
Disposal Method Beach
Date Dredging Needed 1988
Projected Costs (\$) 217,500
Amount of Material (Cu. Yd.) 30,000

HARBOR NAME STURGEON BAY
Use Ship Bldg./Rec./Comm.
Maximum Depth (ft.) 23
Date of Last Dredging 1986
Total Cost (\$) 129,138
Amount of Material (Cu. Yd.) 18,036
Disposal Method Upland
Date Dredging Needed 1988-89
Projected Costs (\$) 75,000 - 240,000
Amount of Material (Cu. Yd.) 15,000 - 20,000

HARBOR NAME SUAMICO
Use Recreation/Comm. Fish.
Maximum Depth (ft.) 8
Date of Last Dredging 1965
Total Cost (\$) Unknown
Amount of Material (Cu. Yd.) 12,772
Disposal Method Unknown
Date Dredging Needed 1988
Projected Costs (\$) 440,000
Amount of Material (Cu. Yd.) 44,000

HARBOR NAME TWO RIVERS
Use Comm. Fish./Recreation
Maximum Depth (ft.) 18
Date of Last Dredging 1981
Total Cost (\$) 1,317,723
Amount of Material (Cu. Yd.) 214,264
Disposal Method CDF & Upland Reuse
Date Dredging Needed 1990
Projected Costs (\$) 150,000 - 600,000
Amount of Material (Cu. Yd.) 30,000