



Impacts of Water Level Fluctuations On Great Lakes Navigation

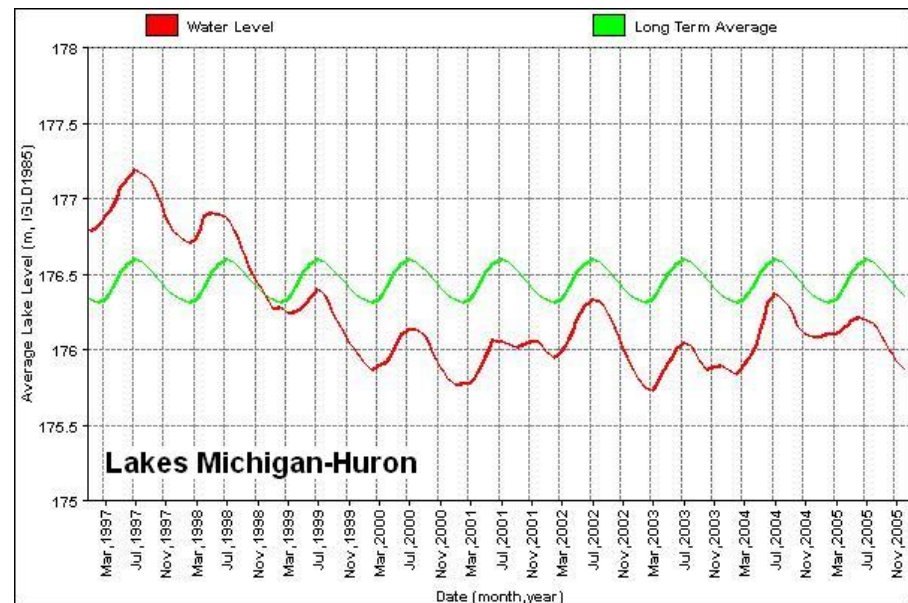
**2007 Great Lakes Commission
Annual Meeting**

**Colonel Jack Drolet
Commander, Chicago District**

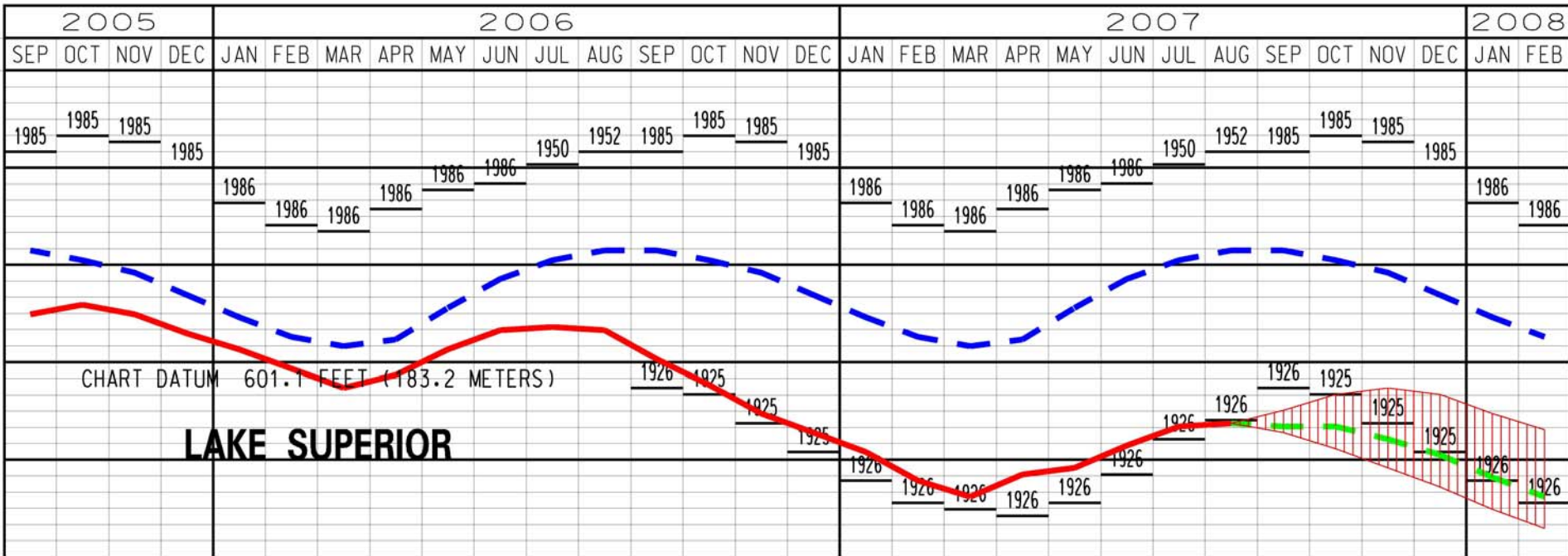
1 October 2007

Water Management System

- Monthly, semi-monthly and weekly forecasting of water levels
- Aid regulation activities in support to IJC Boards of Control
- Collect daily water level and precipitation data from U.S. and Canadian stations
- Maintain historic databases on water level, flow, precipitation, and basin supply



LAKE SUPERIOR WATER LEVELS – SEPTEMBER 2007





Great Lakes Navigation System

Impacts of Lake Level Fluctuations

- Commercial navigation system
- Recreational harbors
- Coastal infrastructure

Great Lakes Navigation System

- ✓ A non-linear navigation system with 63 federal commercial harbors interdependent on each other for the efficiency and the health of the GLNS
- ✓ 25 of the Nation's top 100 harbors (by tonnage) linked in trade with each other, the system's smaller harbors, Canada and the rest of the world



✓ Many of the major rail and highway hubs of the mid-continent are also Great Lakes Port Cities

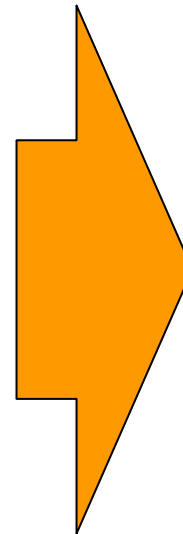


Great Lakes Navigation System

Vital to the Nation's Economy and Security

- ✓ Annually **170 million tons** are transported on the Great Lakes
- ✓ **44,000 Jobs** are directly related to maritime transport (ports, shippers, longshoremen, etc.)
- ✓ **138,000 Steel Industry Jobs** are dependent on the GLNS
- ✓ **54,400 Mining Jobs** are dependent on the GLNS

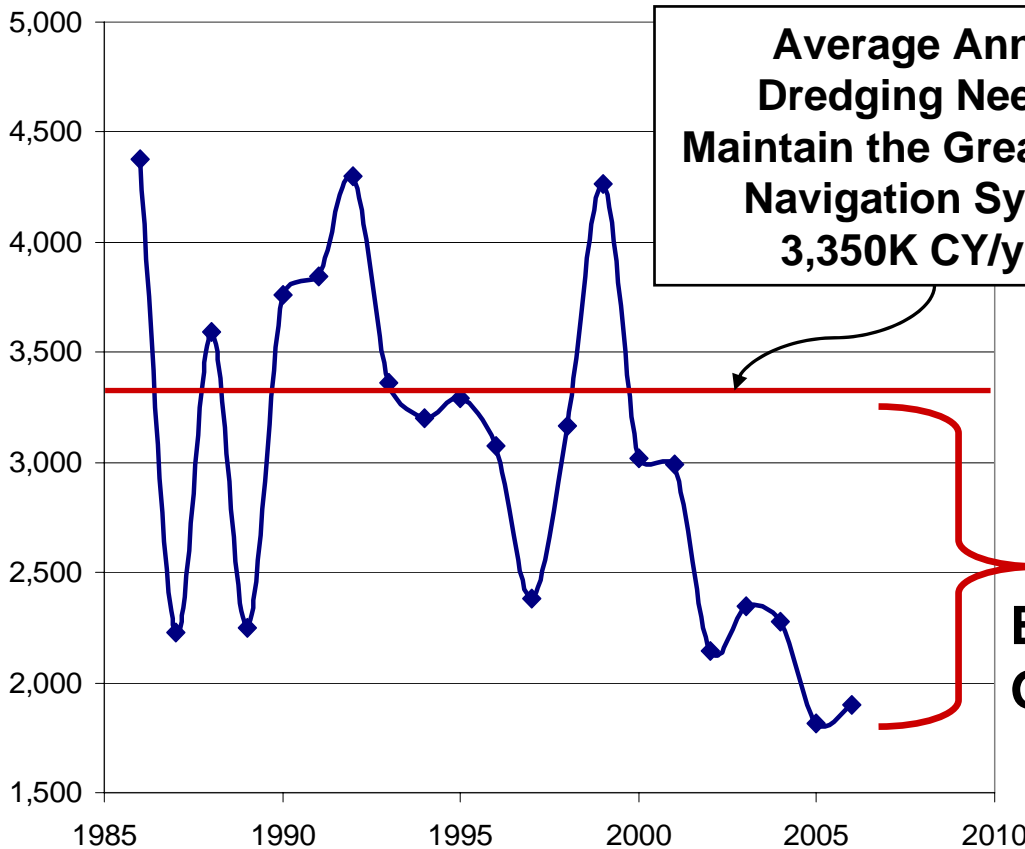
Iron Ore/Steel products (68.2 M tons)
Coal (41.4 M tons)
Petro. Products & Crude (45.9 M tons)
Aggregates (50.3 M tons)
Other Ores (8.9 M tons)
Grain (4.9 M tons)
Chemicals (4.0 M tons)
Other Commodities (12 M tons)



Drives
The Nation's Primary
Steel Production
The Region's Electrical
Power
Regional Manufacturing
Construction
Farming
Coal and Ore Mining

Great Lakes Navigation System Dredging Trends (1986-2006)

Cubic Yards Dredged (x1000)



**Average Annual
Dredging Need to
Maintain the Great Lakes
Navigation System
3,350K CY/year**

**Backlog
Growth**







| Great Lake | Annually Required (x1000) |
|---------------------|----------------------------|
| Superior | 250 CY |
| Michigan | 900 CY |
| Huron | 235 CY |
| Erie | 1,650 CY |
| Ontario | 45 CY |
| Connecting Channels | 270 CY |
| Total | 3,350 CY |

| Funding |
|--|
| System wide average \$12 per cubic yard Annual Need: |
| <u>\$40,200K</u> |

- ✓ Based on a multi-year running average. Not all harbors are dredged annually
- ✓ \$12 per yard cost estimate is in FY09 dollars

Great Lakes Navigation System

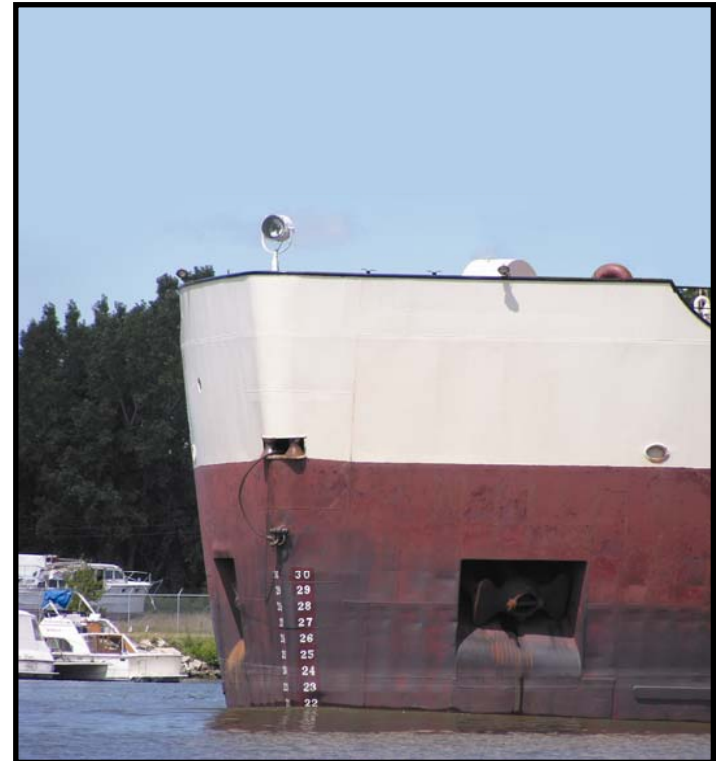
Effects of 1 inch Water Level

| Major Great Lakes Vessel Classes | Vessel Length (feet) | Per-Trip Carrying Capacity (tons) | Capacity Per Inch Of Draft* |
|---|----------------------|-----------------------------------|-----------------------------|
|  | 1,000 | 69,664 | 267 |
|  | 806 | 34,720 | 146 |
|  | 767 | 28,336 | 127 |
|  | 730 | 27,558 | 115 |
|  | 635 | 22,064 | 107 |
|  | 501 | 13,776 | 71 |

*Capacity per inch of draft reflects the incremental tonnage carried at normal loaded draft

Great Lakes Navigation System Status and Impacts

- Operation & Maintenance has not been funded at levels needed to keep up with sediment accumulation
- Dredging backlog at commercial harbors continues to grow
- Light loading
- Vessel groundings
- Increased costs = less competitive



Great Lakes Navigation System Actions

- 5-year plan for Great Lakes navigation system developed in cooperation with ports, carriers and maritime interests
- Systematic approach for prioritizing use of available dredging funds
- Strategy for eliminating dredging backlog in 5-years

Great Lakes Navigation System

Recreational Harbors

- Of the 138 federal harbors in the Great Lakes, 75 do not currently support commercial navigation traffic
- Includes recreational harbors and channels authorized at shallow depths (< 18 feet)
- Also harbors or channels that were authorized as deep-draft but have not experienced commercial traffic in recent years and have not been dredged to authorized depths

Recreational Harbors



✓ Recreational harbors support local and regional recreation and tourism businesses

Great Lakes Navigation System Status and Impacts

- Recreational harbors have been a low Budget priority for several Administrations
- Only projects with named funding are dredged
- Shallow-draft channels more vulnerable to lake level fluctuations
- Some channels are currently impassable





Great Lakes Navigation System Actions

- Federal funding situation not likely to change
- Corps holding workshops to inform states, local governments and harbor users of conditions at harbors, costs for dredging, and options for locally-funded actions

Great Lakes Navigation System

Coastal Infrastructure

- Over 100 miles of breakwaters and coastal structures at Great Lakes harbors
- Protect navigation infrastructure and vessels from wave action



- They also provide protection from ice flows

Great Lakes Navigation System

Coastal Infrastructure

- Although not originally built for this purpose, breakwaters are providing storm protection for critical infrastructure along urban waterfronts

- Roads
- Water supply
- Wastewater treatment
- Power generation
- Parks



Great Lakes Navigation System

Coastal Infrastructure

- Most Great Lakes breakwaters built 50-100 years ago, and are in need of repair
- Low lake levels have hastened deterioration of timber-cribs beneath many older breakwaters
- Repairs have been deferred to provide funds for critical dredging
- Breakwater failures have occurred



Great Lakes Navigation System Actions

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- Repairs to breakwaters critical to commercial navigation included in 5-year plan
 - Repairs at recreational harbors have not been an Administration budget priority
 - Corps collaborating with Great Lakes Commission and Sea Grant to raise awareness of risks and reliabilities of coastal infrastructure
 - October 10-11 Workshop in Duluth



Great Lakes Navigation System SUMMARY

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- Corps is collaborating with states, cities, and users of Great Lakes navigation infrastructure to develop 5-year plan that employs a systematic approach for federal navigation funding priorities
 - We are reaching out to states, cities and users of non-commercial harbors to understand the lack of federal priority for these harbors and develop plans for non-federal maintenance and repair