

FY15 RSM-EWN IPR – Illinois North Shore

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BLUF: The newly established Illinois Coastal Zone Management (CZM) program is working to develop a comprehensive plan for shoreline management. The development of a regional sediment budget will support the CZM program and provide a valuable tool for Federal, state, and local decision makers.

Problem Statements/Issues

- Coastal management shared by Federal, State of Illinois, local municipalities, and private landowners
- 12 communities as well as significant infrastructure
- In-lake structures created significant littoral barriers
- Barriers trap large volumes of sediment, leaving major sections of coast sand-depleted and vulnerable to erosion via bluff recession and lakebed downcutting
- Most of 32-mile reach exhibits sediment-starved conditions.
- No recent comprehensive quantitative analysis of the littoral processes occurring within the North Shore area.
- Some sediment may have contaminants (asbestos).
- Waukegan Harbor (deep-draft) has experienced increased shoaling over last 5 years.

Summary Approach – Sediment Budget

- Identify sand sources and sinks within coastal system and tally sediment gains and losses within specified cell areas.



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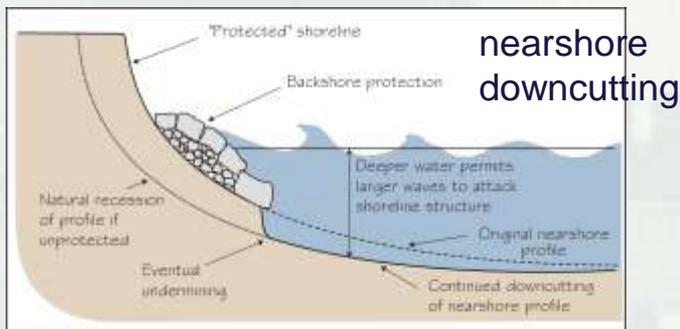
Chicago District, Illinois North Shore

Approach

- Retrieve and digitize historic shoreline/bluff data
- Tabulate dredging data: harbors, marinas, inlet channels
- Measure lakebed erosion around Illinois Beach State Park
- Measure sediment accumulation in Waukegan north fillet
- Measure migration of dredged material south of Waukegan
- Measure nearshore downcutting south of Waukegan
- Determine sediment budget cells
- Construct sediment budget using SBAS software

Deliverables

Coastal sediment budget	summer 2015
Sand Management Workshop w/ CZM, stakeholders, agencies	summer 2015
Technical Report	early 2016



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Accomplishments/Lessons Learned

Completed field inspections

Recovered historic plots and reports from USACE and State archives

Coordinated sediment budget findings with Illinois State Geological Survey and others

Observed:

- More dredging is ongoing at marinas and power stations than previously known
- Major sand being removed from littoral system at Waukegan Power Plant
- Substantial sand inputs from Wisconsin



IL Beach State Park, June 2014



Waukegan Generating Station

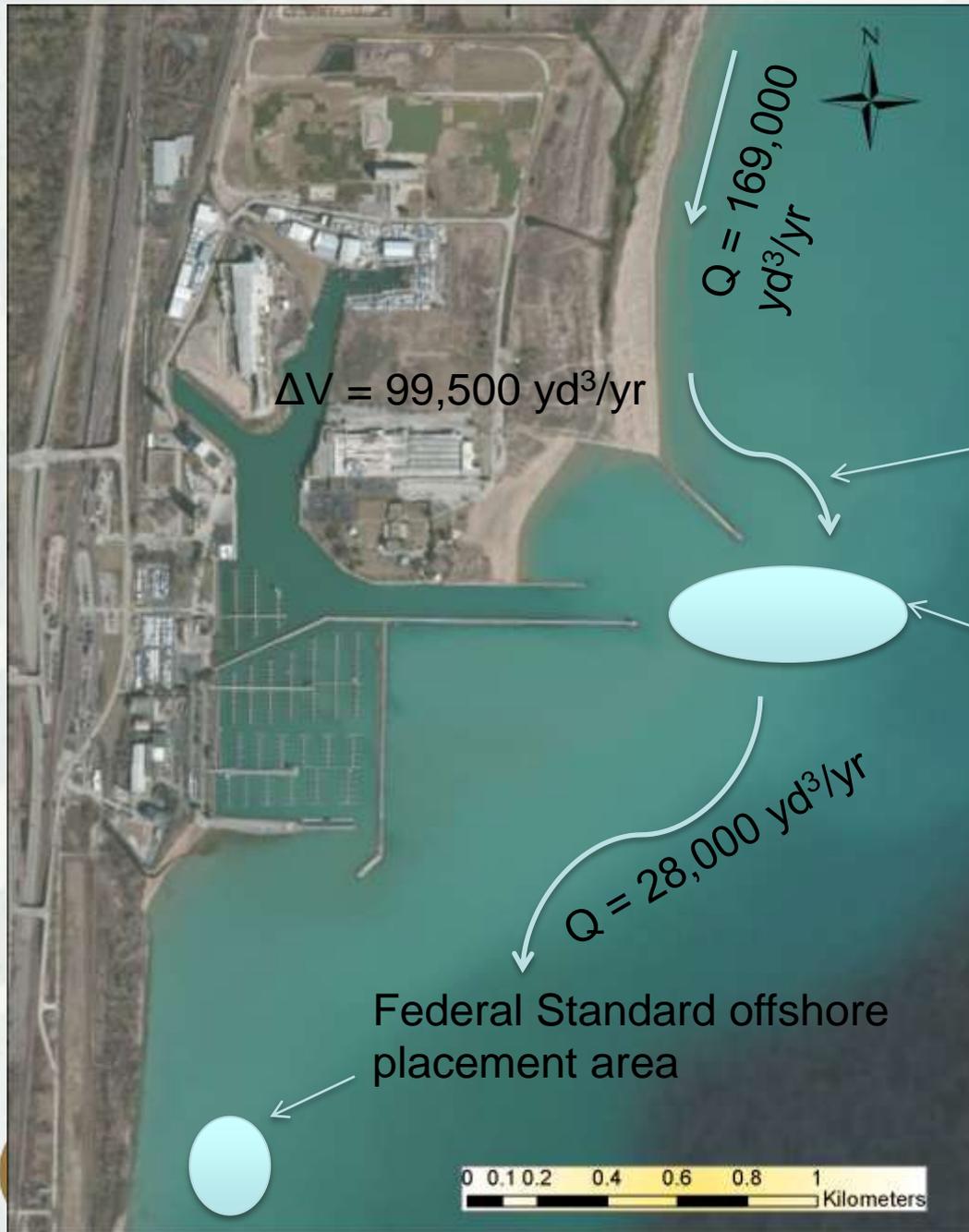
Bypassing, North Point Marina



Vol. of sand mountain \approx 630,000 yd³



Waukegan Harbor Transport



Littoral Transport; $Q = 69,500 \text{ yd}^3/\text{yr}$

Increased Nav. Channel Shoaling
 $R = 41,500 \text{ yd}^3/\text{yr}$, but increasing

Almost 2.5M cy of dredged material
put in deep water from 1889-1982

Over 1.4M cy has been placed in
nearshore area since 1977



Waukegan Harbor

Waukegan N. jetty
Nov. 1946



Waukegan Beach – N. fillet
June 2014

Approx 11M cy of sand
is trapped in fillet beach



1920s

System Responses to Shore Protection

1. Reduces sources of littoral sands
2. Amplifies erosion
3. Causes nearshore downcutting



1975

ACTIVE EROSION



2000

“STABILIZED”



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District PDT Members

David Bucaro, Planning
John Wethington, Planning

ERDC Principal Investigators

Andy Morang, Coastal Hydraulics Laboratory
Ashley Frey, Coastal Hydraulics Laboratory

Active Partners

Diane Tecic, Illinois DNR, Coastal Program Manager
Dan Injerd, Illinois DNR, Chief Lake Michigan Section
Bob Bauer, Illinois State Geological Survey

Stakeholders and Partners

State of Illinois Coastal Zone Management Program
and Dept. of Natural Resources
Waukegan Port District
US Navy
Municipalities: Zion, Waukegan, North Chicago, Lake
Bluff, Lake Forest, Highwood, Highland Park,
Glencoe, Winnetka, Kenilworth, Wilmette

Leveraging/Collaborative Opportunities

Other USACE efforts:

(GI) Illinois Shoreline Erosion, Interim IV
(CG) IBSP 204, Waukegan 107,
Rosewood Park, Zion, Fort Sheridan
(O&M) Continued Maintenance of
Waukegan Harbor

Other Federal efforts:

Maintenance of Naval Station Great
Lakes by US Navy

Illinois DNR:

State of Illinois Coastal Zone
Management (CZM) program; provide
significant technical assistance
Regulatory management and coordination
over Illinois Shoreline
Management and planning of Illinois
Beach State Park

Locally-led Efforts:

Maintenance of shoreline structures,
beaches, parks and harbors



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Positives learned from effort

- Assembled a comprehensive database of existing information
- Identified data gaps and the need for monitoring/field collection plan
- Increased coordination among various stakeholders, including members in newly-formed Illinois Coastal Management Program.
- Identified opportunities for developing a regional sand management plan

Challenges learned from effort

- Major data gaps exist, making portions of sediment budget estimates relatively uncertain
- Need for similar budget study along Wisconsin to properly evaluate updrift sediment inputs
- Communities / industries still managing their sand on site by site basis with minimal coordination



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Potential Value to the Nation

- **Cost Savings**: Better managing sand transport can reduce dredging and nourishment costs for State of Illinois and shoreline owners; better understanding littoral transport and future dredging requirements can reduce USACE costs
- **Value Added**: Ability to make two Federal Harbors more resilient by reducing chances of major shoaling/closures and in turn increasing national and regional economic benefits
- **Leveraging Resources**: Identified potential beach fill sand source at Waukegan Electric Generating if permitting issues can be resolved
- **Environmental Benefits**: Use of sand as a resource at IBSP to restore and protect T&E habitat including piping plover
- **Improved Partnerships**: Provide technical assistance to newly formed Illinois Coastal Program and build trust with area stakeholders; received a request from State to conduct a 729 watershed study of entire Lake Michigan Coast in Illinois

