

## Chicago District (LRC), Evaluation of Nearshore Placement in Southern Lake Michigan

David Bucaro & Erin Maloney (LRC); Brian McFall, Katie Brutsché & Honghai Li (ERDC-CHL)

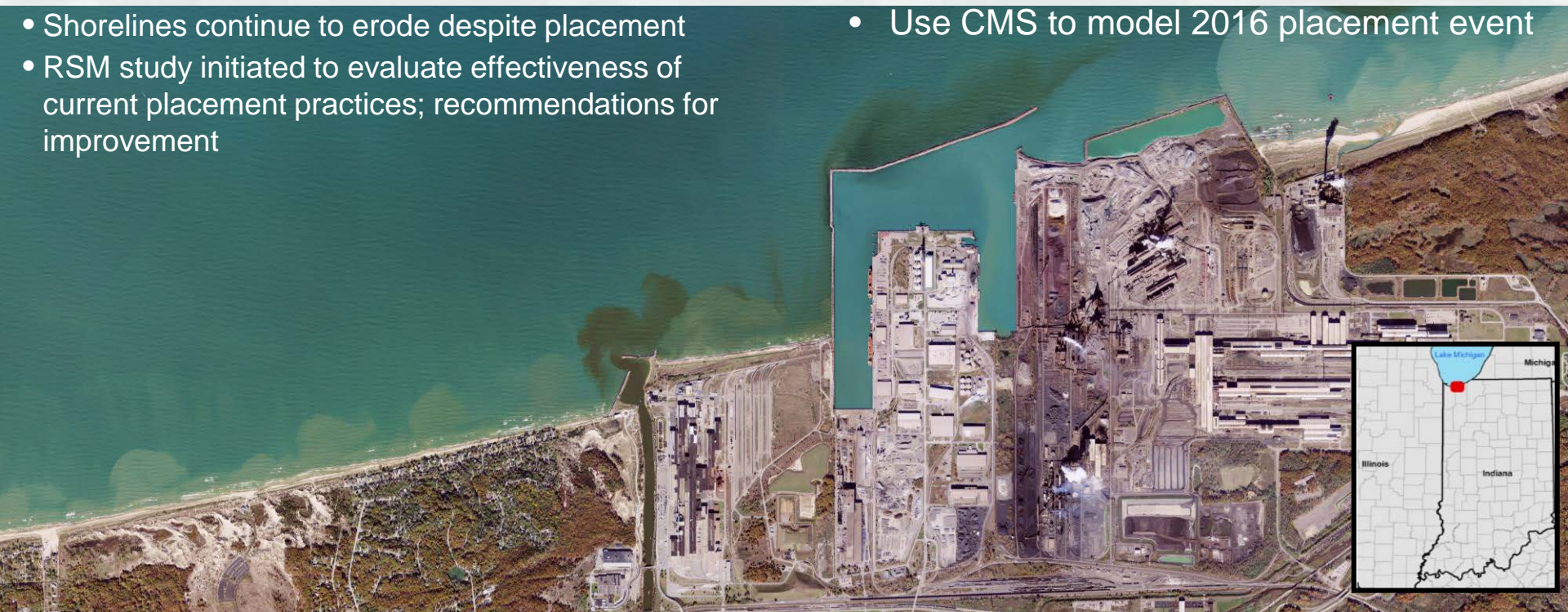
**BLUF:** Evaluation of wave, bathymetric and topographic survey data to determine the effectiveness of nearshore placement at Ogden Dunes, Indiana in Southern Lake Michigan

### Challenge/Objectives

- Harbor structures block natural transport of sand at many locations across the Great Lakes
- Dredged sediment is routinely placed in the nearshore area
- Current placement practices are designed with the goal of minimizing costs, and effectiveness has not been monitored or modeled
- Shorelines continue to erode despite placement
- RSM study initiated to evaluate effectiveness of current placement practices; recommendations for improvement

### Approach

- Study historical shoreline change and placement practices
- Use SMT to determine the potential for on-shore movement
- Collect survey data pre and post placement to inform model
- Use CMS to model 2016 placement event



# FY17 RSM IPR

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### District/Other USACE PDT Members

#### Chicago District

David Bucaro, Chief, Economic Formulation & Analysis Section (PI)

Erin Maloney, Planner

#### ERDC-CHL

Brian McFall, Research Civil Engineer (Co-PI)

Katie Brutsché, Research Physical Scientist

Honghai Li, Research Physical Oceanographer

### Leveraging/Collaborative Opportunities

- USGS survey funded through *Survey of Northern Boundary Waters* Program
- Great Lakes Coastal Resiliency Study
- Great Lakes Coastal Mapping Summit
- NPS Indiana Dunes National Lakeshore Shoreline Management Plan/ EIS

### Stakeholders and Partners

Indiana DNR – Coastal Management Program  
National Park Service (Indiana Dunes National Lakeshore)

Town of Ogden Dunes, Indiana

USGS – Indiana, Illinois, & Kentucky Water Science Centers



Great Lakes Coastal Mapping Summit – April 2017





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## Chicago District (LRC), Evaluation of Nearshore Placement in Southern Lake Michigan Accomplishments/Deliverables



### Bathymetry Surveys Completed:

June 2: 1<sup>st</sup> **ADCP** Survey

July 20: 2<sup>nd</sup> **ADCP** Survey

July 25: 1<sup>st</sup> **MBES** Survey

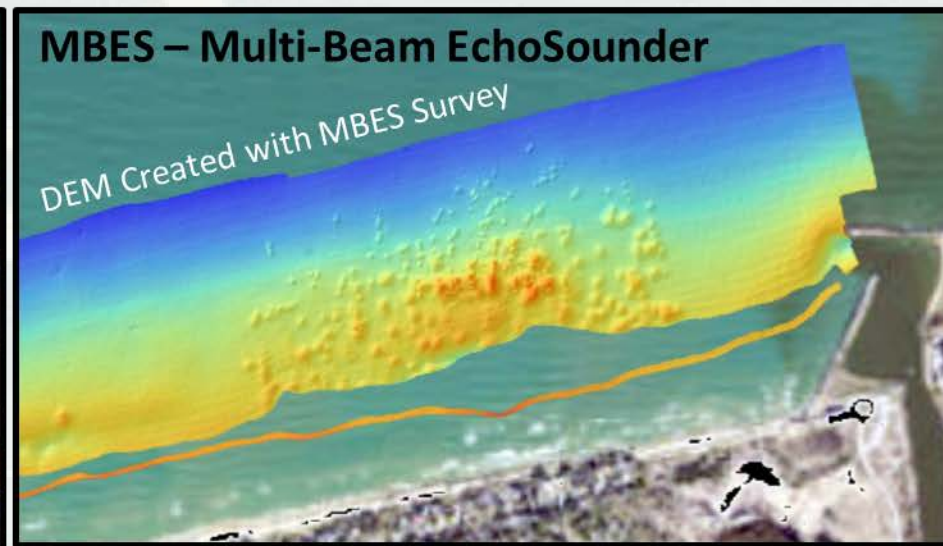
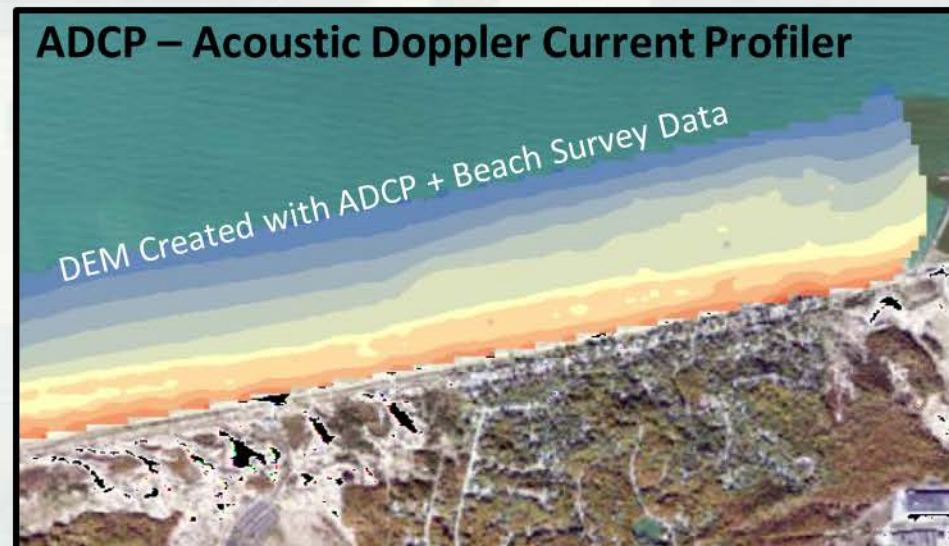
Aug 9: Beach Survey

Sept 8: 3<sup>rd</sup> **ADCP** Survey,  
2<sup>nd</sup> **MBES** Survey

Oct 11-12: 4<sup>th</sup> **ADCP**+ Beach Survey

Nov 15: 5<sup>th</sup> **ADCP** Survey

*RSM Deliverable: Report summarizing analysis of field data. September, 2017*



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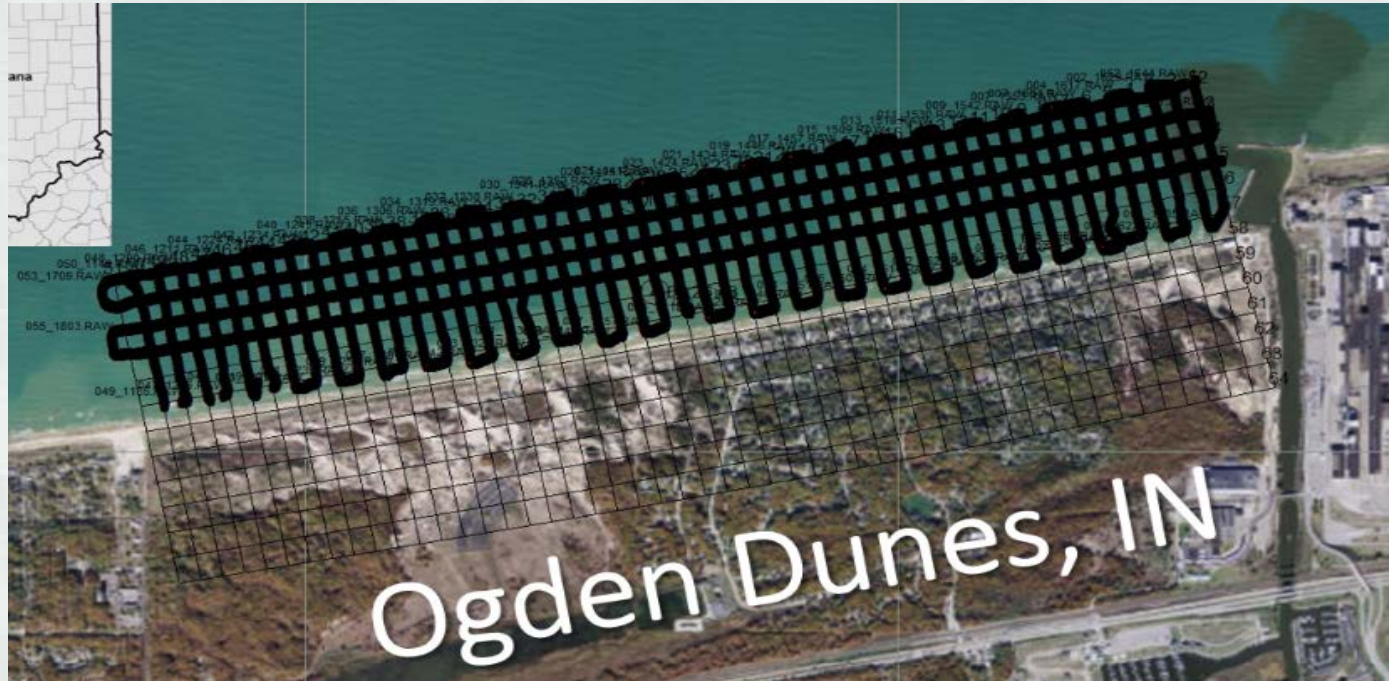
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#### What is working? Ups? Success?

- Leveraged other funds to complete survey
- Significant interest from a variety of stakeholders including internally to USACE
- Recommendations can apply to other harbors across the Great Lakes

#### What is not working? Downs? Issues?

- Unexpected nearshore placement by NIPSCO during study necessitated an additional survey and buried one of the uplooking ADCPs
- Lessons learned related to bathymetric and topographic survey techniques
- Difficulty in measuring nearshore bathymetric changes given survey errors





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### Value to the Nation

- Support more sustainable shoreline management practices and effective use of dredge material
  - Beneficial use of dredge material from navigation projects
- Currently nearshore placement techniques are used to nourish shorelines across the Great Lakes with varied success
  - This effort will aid Detroit and Buffalo Districts and local entities in developing more effective nearshore placement and monitoring plans
  - May lead to more efficiency/effectiveness across the entire Great Lakes Region (better results and/ or reduced costs)
- Protection and reestablishment of valuable and rare Great Lakes dune shoreline ecosystems
- Improved partnerships with various stakeholders

