

Oregon Regional Sediment Model: Port Orford, Oregon USACE Portland District

Presenters:

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2013 RSM & EWN Workshop and
RSM In-Progress-Review

Engineer Research and Development Center

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Portland District, Oregon Sediment Model, Rod Moritz and Kate Groth

Description/Challenges

- Maintain a federal navigation channel at the Port of Port Orford
- Low use harbor not funded since 2010
- Evaluate alternative breakwater configurations to reduce dredging needs
- Determine long term solution other than annual dredging maintenance

Objectives

- Define littoral sediment transport pathways that affect shoaling at Port Orford, Oregon
- Evaluate alternatives to reduce recurring shoaling/dredging costs
- Build on the MMR completed in 2011
- Propose a long term solution to shoaling



•**BLUF:** Dredging needs at low-use ports in Oregon are not being met in the current budgetary climate. Determining sediment pathways and looking at alternative solutions to dredging may be a way to meet stakeholders needs without regular maintenance dredging



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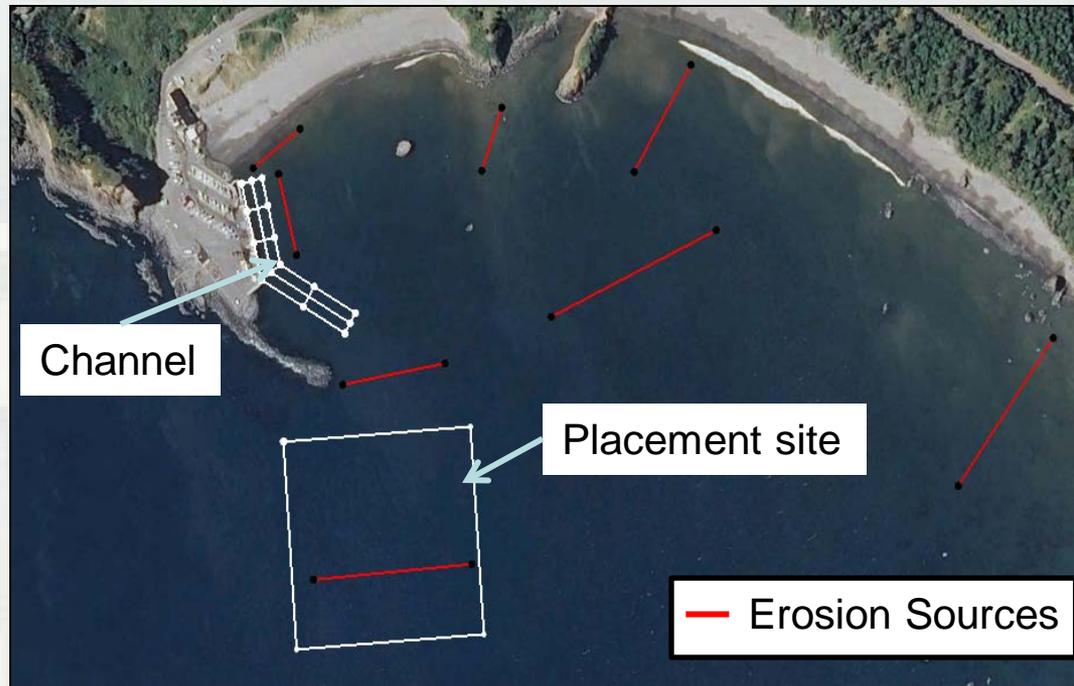
Portland District, Oregon Sediment Model, Rod Moritz and Kate Groth

Approach:

- Two representative hydrodynamic periods (November/December, June)
- Three Configurations: Midway Notch, Modified Breakwater, & Remove Breakwater
- Hydrodynamic Modeling:
 - Conform MIKE 21 data to CMS model framework
 - Apply CMS and Bouss-2D models
- Sediment Transport: The Particle Tracking Modeling (PTM)
 - Entrainment Probability Parameterization

Deliverables:

- Interim Progress Reports (3)
Dec 2012-Sept 2013
- Sediment Transport Pathway Report
Aug 2013
- Lessons Learned Technical Note
Sept 2013
- RSM IPR, Aug 2013



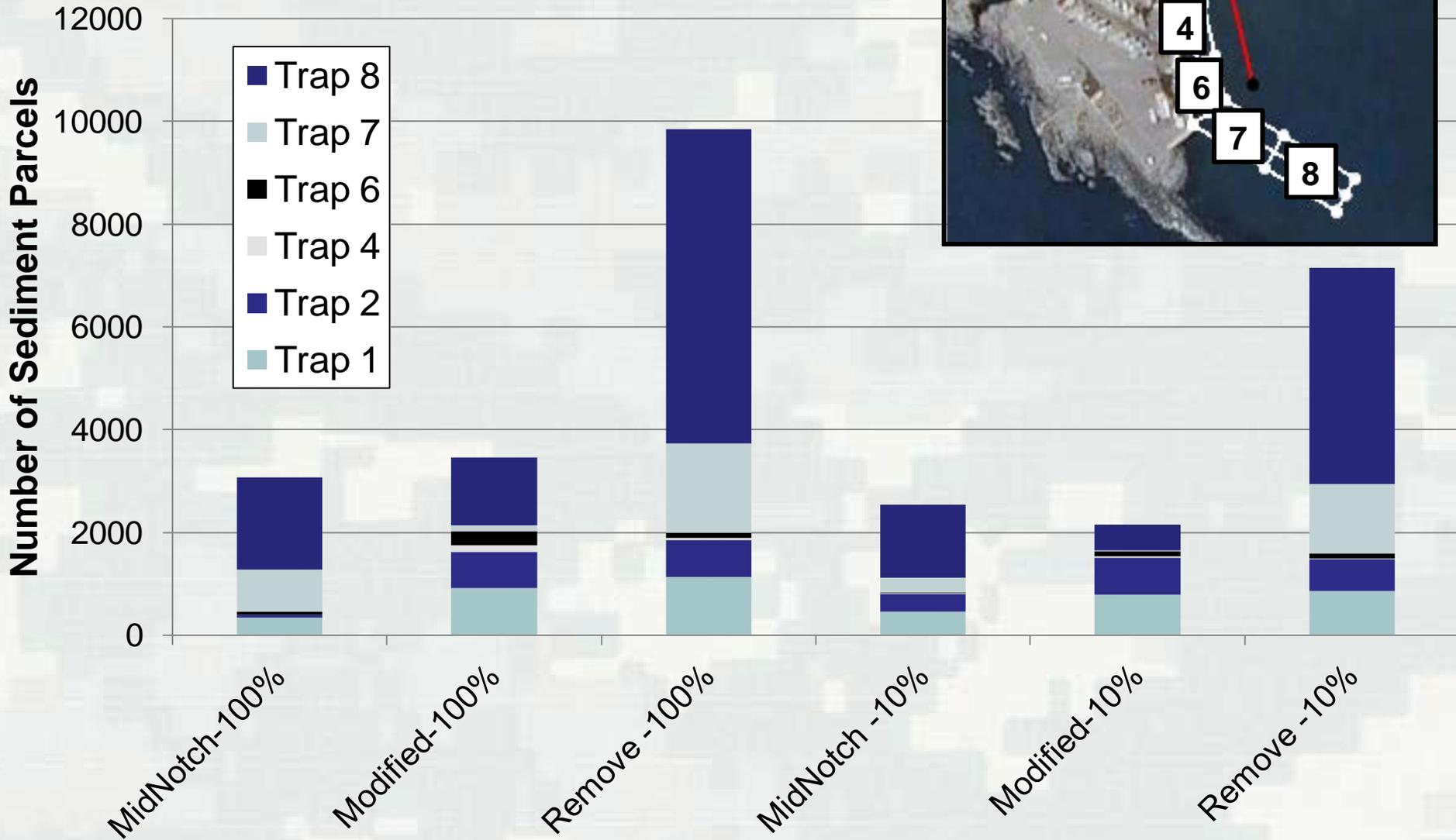
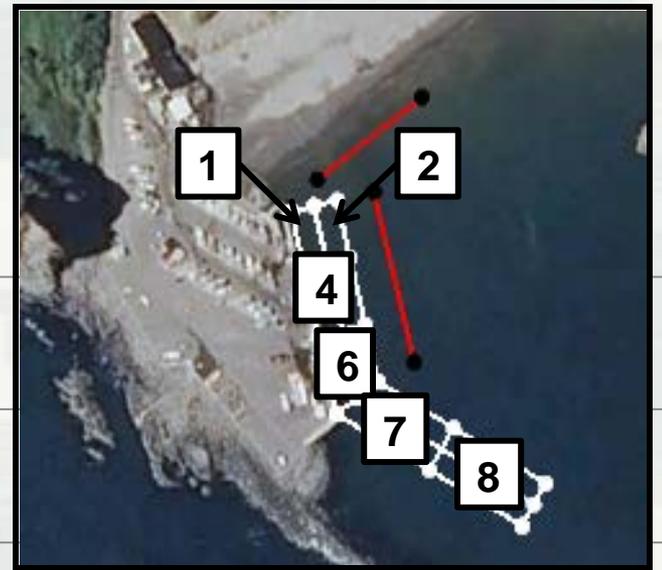
Sediment Transport Animation

Modified Breakwater, Nov/Dec 2007

(particles are color coded based on initial position)



Breakwater Configuration Comparison of Channel Infill



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Accomplishments/Benefits/Lessons Learned

- Compare PTM model for three alternative breakwater configurations under two seasonal conditions.
- PTM Model shows sediment pathway trapped between dock, breakwater and eastern headland.
- Section 404 disposal site NOT contributing to shoaling issues.
- Bracketed probability of entrainment due to unknowns
- Reduce Risk of Unknowns for preferred alternative from MMR

Opportunities to take action

2011 MMR life cycle costs:

- No action \$23.5M
- Cross Sect mod \$22.5M, with \$7.1M construction
- Mid Section Notch \$17M, with \$3.8M construction
- Remove BW \$15.9M with \$8.3M construction

District PDT Members

- Rod Moritz, Technical lead
- Jarod Norton, RSM PM
- Kate Groth, PM
- Mike Ott, Chief Waterways Maintenance

Stakeholders and Partners

- Tanya Beck, ERDC-CHL-MS
- Honghai Li, ERDC-CHL-MS
- Tahirih Lackey, ERDC-CHL-MS
- Port of Port Orford

- With low use harbors not funded, opportunity to alter breakwater to reduce long term dredging need. May meet customer needs with initial upfront costs, but save on life cycle costs of dredging.

