

FY13 RSM IPR

Lake Erie Sediment Budget

Buffalo District

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Buffalo District - Lakes Erie and Ontario

Description/Challenge

- Develop comprehensive sediment budgets for
 - Southern shore of Lake Erie
 - Southern and Eastern shores of Lake Ontario from the Niagara River to Oswego



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BLUF: Creation of system wide sediment budget allows for quicker analysis of proposed shoreline projects, better management of existing projects and easier communication with stakeholders

Regional Sediment Budget Lake Erie

Description/Challenge

- Historically, shoreline dominated by wide beaches
- Today – shoreline is sediment starved
- 28 main river mouths or harbors along U.S. Shore
 - Most modified around protecting navigation interests



Objectives

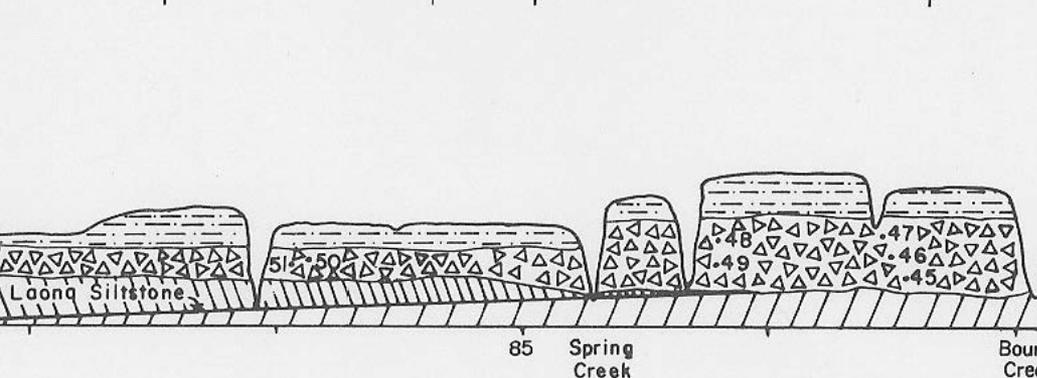
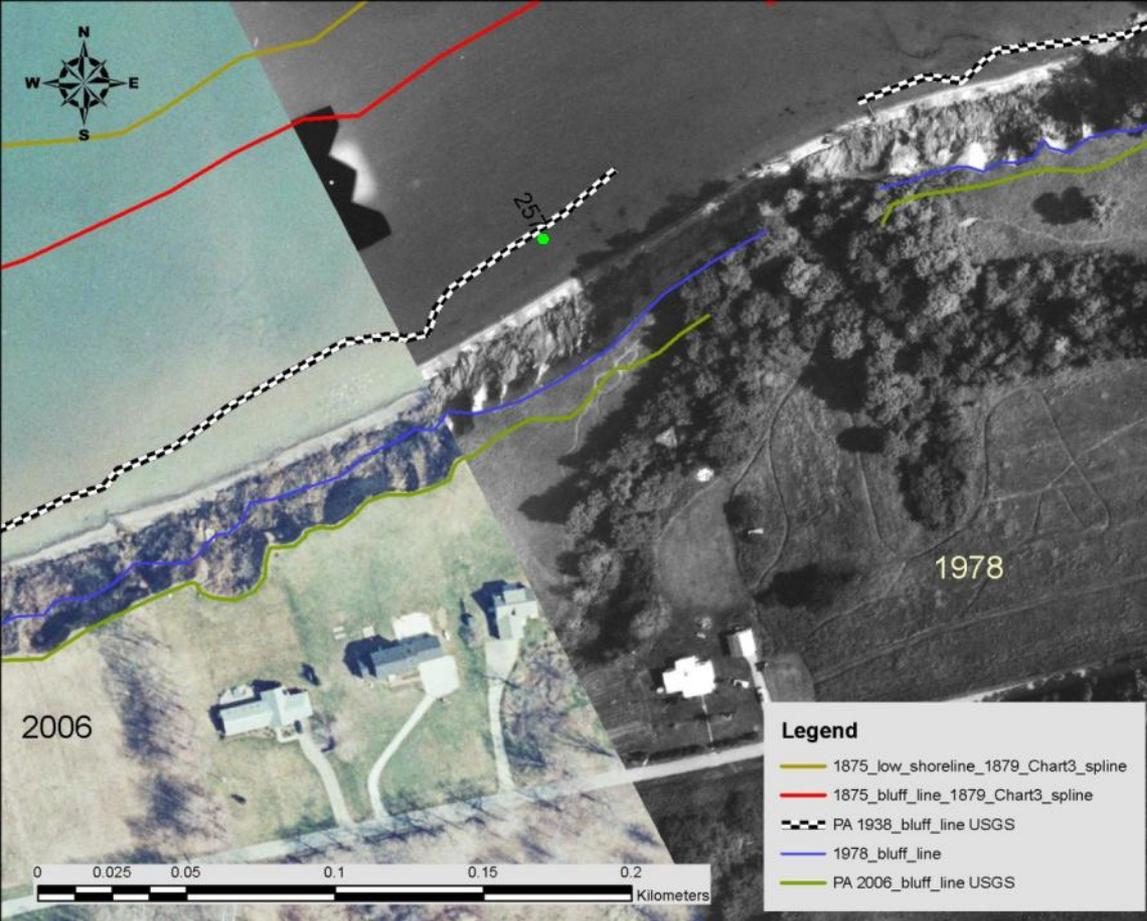
- Determine sediment sources/sinks for three time periods:
 - Undeveloped: 1860's-1930's
 - Mid Century: 1930's-1970's
 - Recent: 1970's - present
- Develop littoral cells/fluxes
- Compute and enter all data into SBAS



Bluff Recession Eastern Lake Erie

Approach

- Bluff line change measured over time
 - NOAA 1870's Coast Charts
 - Aerial imagery – 1930s, 1970s, 2000s
- Stratigraphy acquired to determine bluff height and composition
- Coarse fraction estimated from parent material



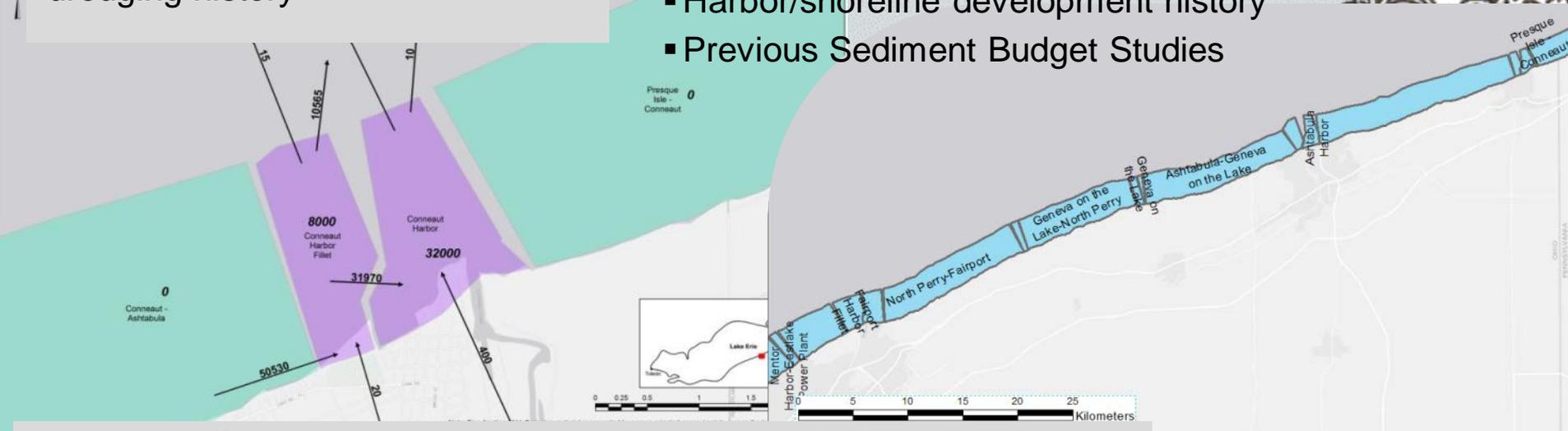
Regional Sediment Budget Lake Erie

Approach

- Sediment input volumes from bluff erosion using historical data
- Fillet growth at major harbors and dredging history

Models, Tools, Databases, etc Used

- ArcGIS
- SBAS
- DSAS
- Harbor/shoreline development history
- Previous Sediment Budget Studies



Benefits to O&M, FRM, Environmental, Regulatory

- Expand beneficial use of dredged materials in littoral system
- Reduce negative impacts of harbor structures on system
- Improve recreation resources and natural habitat
- Rapid analysis of impacts of proposed shoreline development

Utility of Data

- Results and data already being incorporated into district projects
 - ▶ Regulatory permitting and planning for coastal structures
 - ▶ Detailed shale bluff evaluation, New York
 - ▶ Littoral evaluation for Smokes Creek restoration



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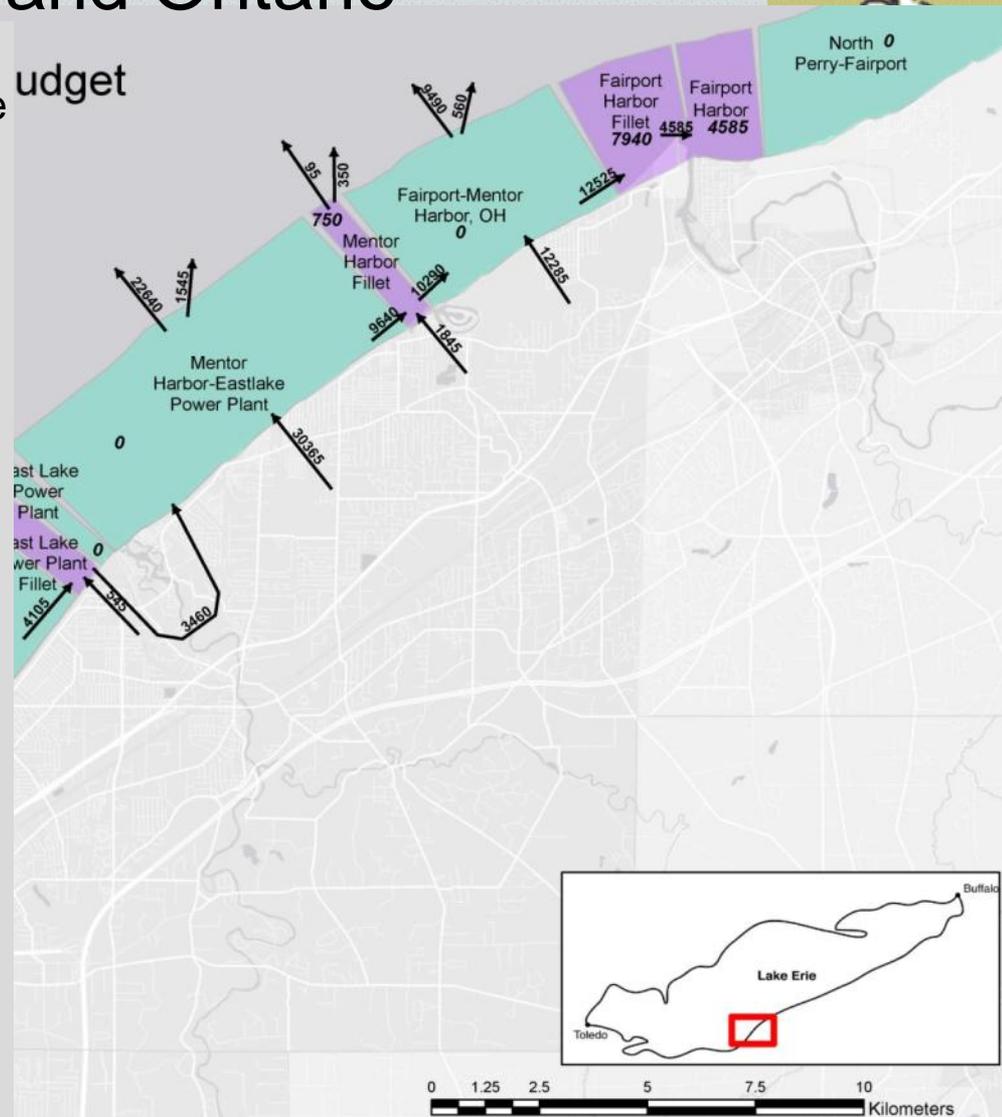
Opportunities to take action:

- Optimization of nourishment at Presque Isle State park
- Continued refinement of computation of harbor sediment accumulation
- Increased Beneficial Use of Dredged Material
 - Studies ongoing at Toledo/Maumee Bay
 - Ashtabula/Cleveland 204
- Need for detailed study regarding Eastern Lake Ontario

Accomplishments

- Lake Erie Sediment Budget complete
 - All data entered into SBAS
 - Final harbor analysis ongoing
 - Project report in review stage
- Baird's Lake Ontario sediment budget reviewed
 - Minor changes made due to harbor structures

udget



Note: Fine fraction of bluff erosion material represented by arrows oriented approximately perpendicular to cells into deep water
Coarse fraction of bluff erosion material lost to deep water represented by arrows oriented obliquely to cells into deep water
All quantities in units of cubic meters per year

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District PDT Members

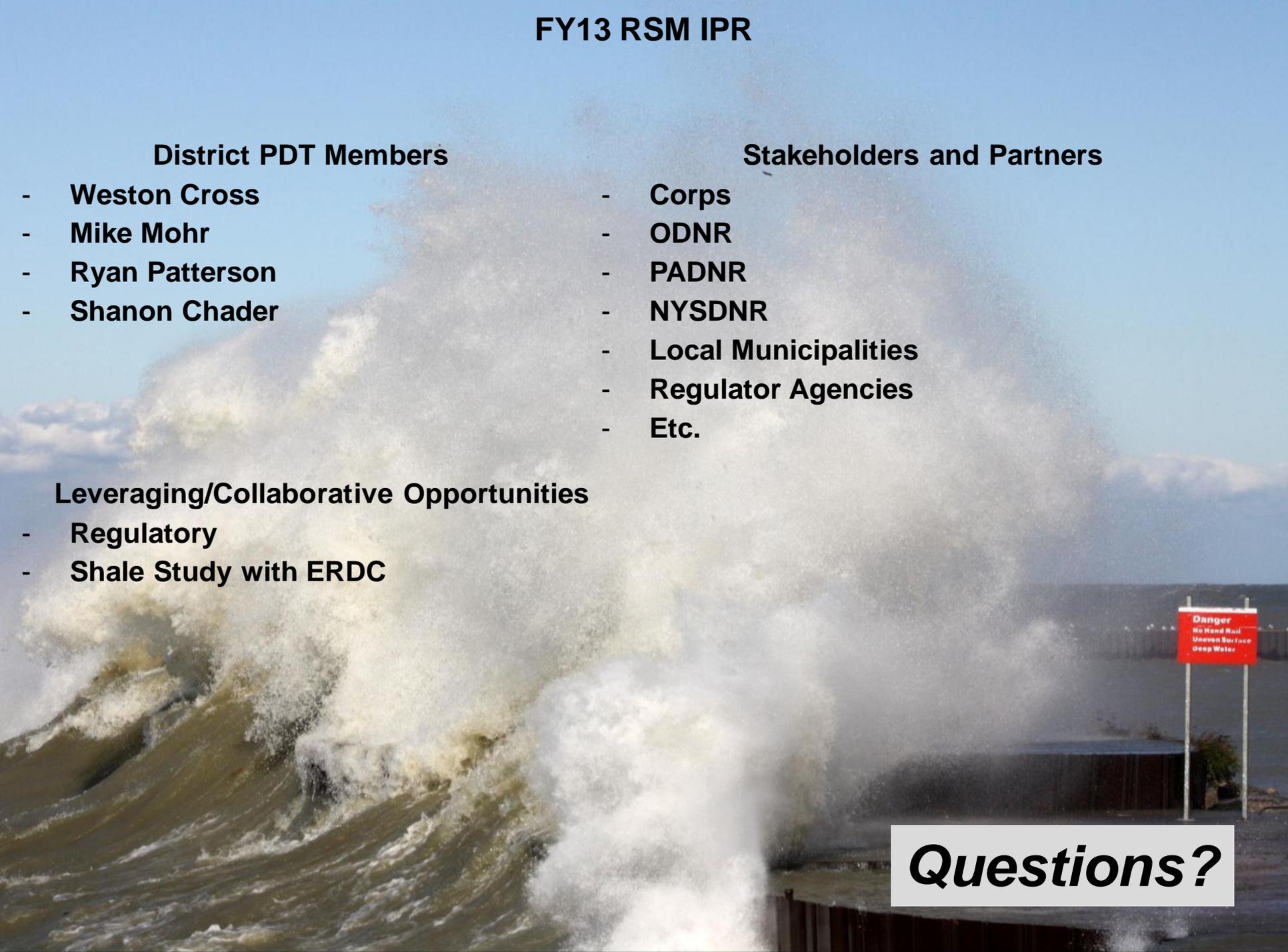
- Weston Cross
- Mike Mohr
- Ryan Patterson
- Shanon Chader

Stakeholders and Partners

- Corps
- ODNR
- PADNR
- NYSDNR
- Local Municipalities
- Regulator Agencies
- Etc.

Leveraging/Collaborative Opportunities

- Regulatory
- Shale Study with ERDC



Questions?