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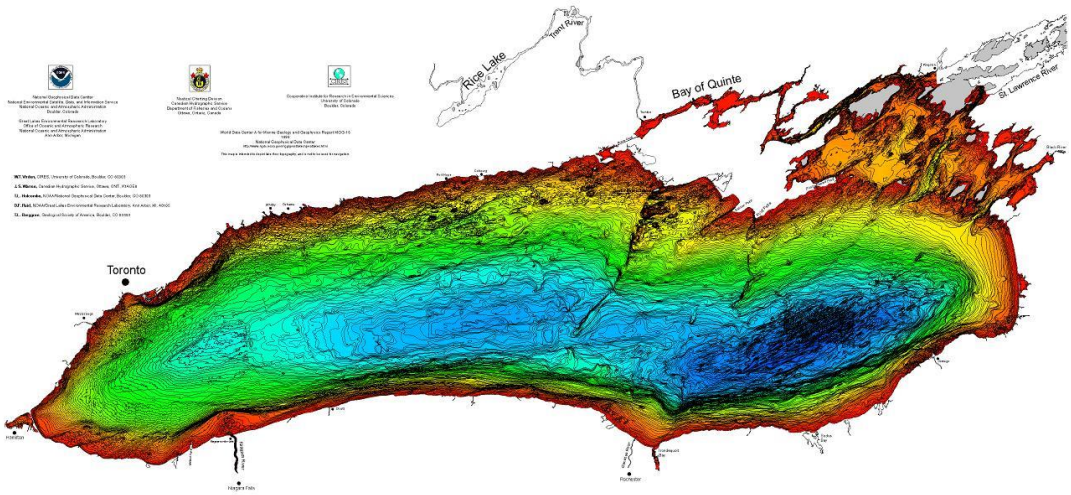
National Regional Sediment Management Program Buffalo District (LRB):

Lake Ontario Sediment Budget Refinement to the Baird (2011) Work

Description

Refinement of the Baird (2011) Sediment Budget to better reflect sediment transport conditions at stick out structures.



Lake Ontario

Issue/Challenge To Address

The comprehensive Lake Ontario Sediment Budget was completed in 2011 by Baird and Associates for the USACE Buffalo District. The work completed by Baird covers the shoreline of Lake Ontario from the Niagara River to 9 Mile Point east of Oswego, NY, a distance of approximately 300 miles. The sediment budget completed by Baird does an excellent job representing sediment inputs into the system and longshore transport rates, however is lacking in data and assessment of littoral processes at large stick out structures, including the 8 Federal harbors that dot the shoreline. The Baird transport volumes assume 100% sediment bypassing around large stick out structures, which results in unrealistically high transport rates moving east through the system. Some work was done on this by the Buffalo District in 2012 and 2013 to model sediment accretion at certain harbors, but additional assessment will better determine realistic transport quantities across the southern shore of the lake. Once reasonable estimations of bypass volumes at district harbors is ascertained, the sediment budget will follow the path of the Lake Erie Sediment Budget and be loaded into the Sediment Budget Analysis System (SBAS) at 1-km resolution, and include approximate recession rates, volumes of sediment entering the nearshore system, sediment properties, and transport quantities entering and leaving each reach. Reception to the 2016 Lake Erie Sediment Budget work from landowners, local, state, and Federal regulators and engineering firms has been overwhelmingly positive. Completion of the sediment budget provided a comprehensive and robust dataset of coastal shoreline erosional and transport properties for the entire 300 mile shoreline from Toledo, OH to Buffalo, NY and includes bluff retreat rates, volume estimates of littoral drift and bluff inputs, and future predictions of sedimentation volumes. This dataset has proven valuable to coastal planners and regulators when examining methods and impacts of shore protection. This proposal would piggy back on the 2018 Lake Erie Sediment Budget proposal to provide an extended dataset publicly available that will allow any interested party to determine the erosion and sediment transport ranges for any reach along the lakeshore.

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Successes Lessons Learned

The completed Lake Erie Sediment Budget has been utilized extensively for coastal planning. The Lake Ontario Sediment budget refinement will follow a similar effort and provide utility to Lake Ontario Landowners and shoreline users

Expected Products

- Updated SBAS Datastructure containing completed Lake Ontario Sediment Budget Data
- RSM-TN to accompany datasets in SBAS
- Stakeholder meetings and presentation to roll dataset availability to end user
- Attendance at the 2018 RSM In Progress Review in May, 2018

Stakeholders/Users

The project initially would work closely with the programmers at the USACE Geospatial Platform to extend the existing SBAS framework to accommodate the expanded datasets, and to provide hosting for the finalized SBAS results. The New York State DEC and the Department of State are integrally involved in coastal project planning decisions, working with the USACE Buffalo District regulatory team to make permitting decisions.

Projected Benefits Value Added

Extending the functionality of the SBAS work allows for all stakeholders from the local property owners through the state level and Federal interests to reference the same high quality high resolution dataset for coastal planning. Presently, project proposals will reference different sources for models, causing large discrepancies between results. Additionally, the resolution of the data allows for USACE regulators to quickly and accurately assess coastal projects for the purposes of permit approval and monitoring plans. The 2017 Lake Ontario Flood Event, which is ongoing, has placed a renewed emphasis on shoreline management, planning, and sediment resources.

Leveraging Opportunities

The existing dataset and sediment budgets are already used for district project and to form engineering determinations and analysis by local, state, and federal entities as well as property owners. The existing dataset has been integrated into USACE coastal projects, and the greater refinement provided by the update will further guide these efforts.

Points of Contact

Weston Cross, CELRB-TD-DC
Coastal Engineering
716 879-4175
Weston.p.cross@usace.army.mil

Participating Partners