US Army Corps of Engineers®
Engineer Research and Development Center

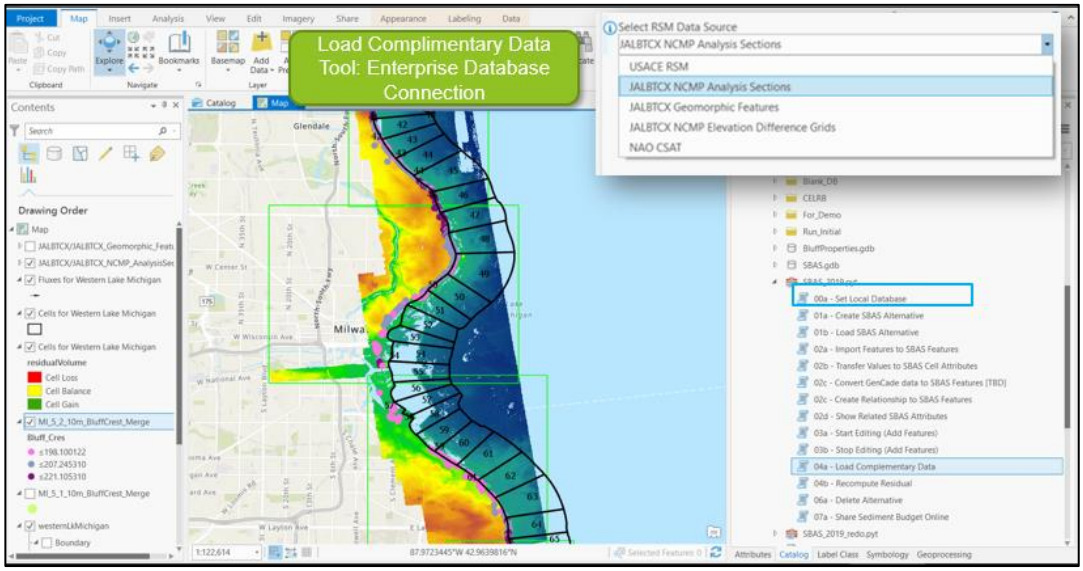
National Regional Sediment Management Program
CEERD-HNC:

Sediment Budget Improvements

to Support the National RSM Strategy

Description

This proposed effort seeks to build upon previous work to improve the primary sediment budget tool used by the USACE; Sediment Budget Analysis System (SBAS). Conversion of SBAS to the ArcPro environment and links to the JALBTCX volume change toolbox as well as the RSM Beneficial Use database have greatly enhanced its functionality. Output from models such as GenCade can provide additional data where these linked datasets are lacking, allowing SBAS to be applied universally along the coast. Updates to the user manual and training materials will make the tool accessible to all users.



SBAS toolbox in the ArcPro environment as it would appear to users. New enterprise database connections can be accessed through the "Load Complimentary Data" tool (inset showing options in this tool). JALBTCX lidar data along with sediment budget cells developed using the JALBTCX toolbox are loaded in the map.

Issue/Challenge To Address

Sediment budgets provide an accounting of sources and sinks within a region and are essential for understanding resources, challenges and requirements for effective planning and design of projects. Recent RSM initiatives brought SBAS into ArcPro, and enabled integration of Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX) volume change output, automatically-extracted coastal features, and the RSM Beneficial Use Database into SBAS. These datasets do not have complete coverage along the coastlines, however, making it necessary to incorporate model results into SBAS. This project seeks to integrate model results from GenCade, a one-line numerical model to predict shoreline change, into SBAS, enabling users to fill in data gaps and making full regional sediment budget assessments possible. A lack of instructional materials and updated user's guide also provides a barrier to use. This will be remedied by developing updated materials this FY.

Successes Lessons Learned

Lessons learned specific to this project will be compiled during the duration of this project.

FY19: SBAS has been updated to be more user-friendly and run in the ArcPro environment. It has been configured to read data from the full JALBTCX volume change database (sediment volume changes, geomorphological features, and difference grids), and

the RSM Beneficial Use database. Additionally, efficiency analyses and improvements have been applied to the JALBTCX volume change and feature extraction methodologies. Initial scoping on how to incorporate GenCade results has begun.

FY18: A workflow for the integration of JALBTCX volume change results was initially developed, including a method to import pre-created polygons as sediment budget cells.

Projected Benefits Cost Savings Value Added

Increased accessibility to other datasets through SBAS, including enterprise databases and model/tool outputs will ensure thorough and streamlined inclusion of all available data in the sediment budget creation process. A more efficient process will greatly benefit district users and improve their results.

These continued improvements to SBAS supports the national RSM plan for optimization by enabling easy creation of conceptual sediment budgets in all regions. Conceptual sediment budgets are essential to understanding sources, sinks and opportunities for additional RSM projects.

Expected Products

- SBAS tool add-on for GenCade
- SBAS ArcPro User's Guide & Training Materials
- Technology transfer through a User's Guide documenting the GenCade feature
- Present at technical conferences and seminars
- Present results at the annual RSM meeting and JALBTCX workshop

Stakeholders/Users

Stakeholders involved in this project include the Great Lakes & Ohio River Division (LRD) through the Great Lakes Restoration Initiative (GLRI) and will continue to include the South Atlantic Division through the SAD Coastal Comprehensive Study and including district representatives from both SAJ (Jacksonville) and SAM (Mobile).

Ultimately all USACE districts as well as ERDC laboratories will be potential stakeholders and users. Sediment budgets are relevant to most districts, and all will be able to utilize the tools created here as well as upload and download datasets to the enterprise database.

Leveraging Opportunities

This project will leverage the GenCade shoreline numerical modelling tool, developed by CIRP.

The Great Lakes Restoration Initiative (GLRI) includes comprehensive sediment budgets in their goals, and the team will actively participate in and leverage this work for case-studies

This project continues to leverage NCMP volume change and feature detection work, as well as experience creating web apps.

The FY 19 RSM project moved the SBAS toolbox into ArcPro and finalized workflows to incorporate volumes and coastal features from the JALBTCX toolbox as well as information from the Beneficial Use database.

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Points of Contact

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