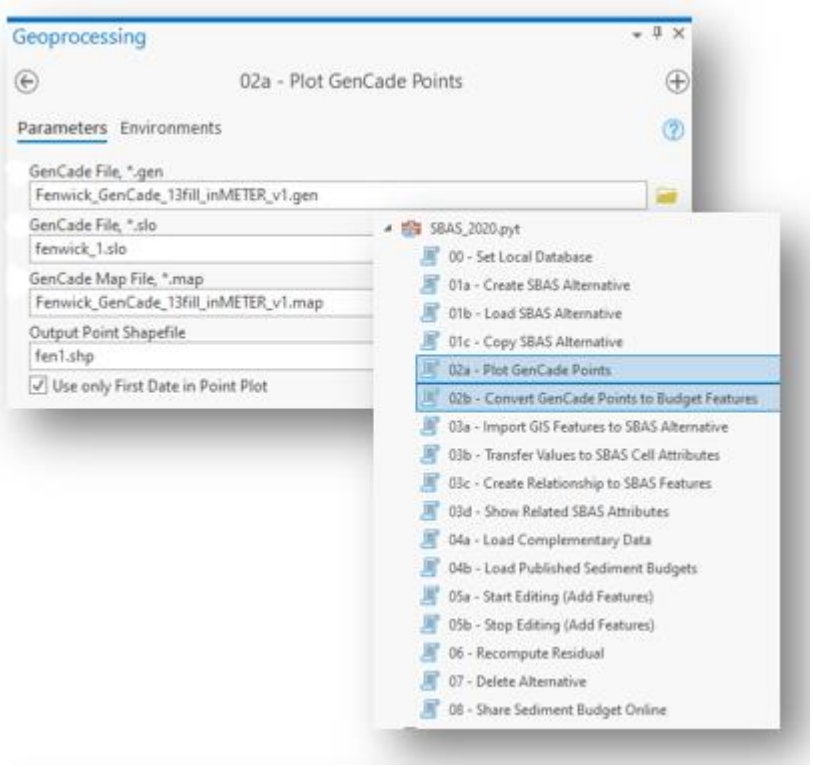
US Army Corps of Engineers®
Engineer Research and Development Center

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, easy incorporation of model output from GenCade, and links to complimentary datasets like JALBTCX volume change toolbox and the RSM Beneficial Use database have greatly enhanced its functionality. This year, in-depth SBAS trainings will be conducted for interested users and previous SBAS users interested in the newest version. In addition, this project will improve online sediment budget sharing capabilities with the creation of a new SBAS ArcGIS Online Hub.



The SBAS 2020 toolbox as viewed in ArcGIS Pro (right). The GenCade compatability tool (left) allows for inclusion of model output cell boundaries, volumes, and fluxes.

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 easy integration of other datasets into sediment budgets, including GenCade model output and lidar volume change results. The challenge now is to ensure SBAS users have the capabilities to share their budgets and access existing budgets. Additionally, availability of trainings, resource documentation, and the tool itself will be addressed this FY.

Successes Lessons Learned

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

FY20: GenCade output compatibility tool was completed for SBAS. SBAS 2020 user's guide documentation, tutorial and training materials were developed. Beta testing for the SBAS 2020 toolbox was completed and used to make final changes.

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 Live Training
- Recorded live training videos and training documents
- SBAS ArcGIS Online Hub
- Technology transfer through a Technical Report documenting the methods and results
- Present at technical conferences

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 leverages 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.

Points of Contact

Principle Investigators (PI):

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

Eve Eisemann (CEERD-HN-C)
Coastal Engineering Branch
228-239-1458
eve.r.eisemann@usace.army.mil

Participating Partners

Joint Airborne Lidar Bathymetry Technical Center of Expertise

Team: Rose Dopsovic, SAM OP-J; Dr. Richard Styles, CEERD-HN-C, Research Oceanographer; Eve Eisemann, CEERD-HN-C, Research Physical Scientist; Lauren Dunkin, CEERD-HN-C, Research Civil Engineer; Jennifer Wozencraft, CEERD-HN-C, Research Physical Scientist; Michael Hartman, CEERD-HN-C, Research Civil Engineer; Marty Durkin, CESAJ; Elizabeth Godsey, CESAM