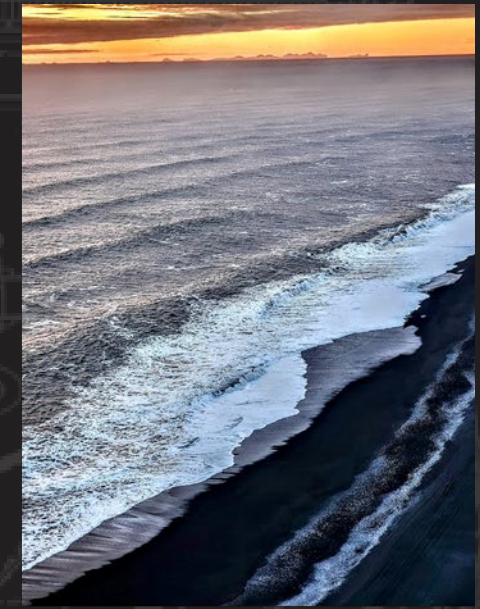
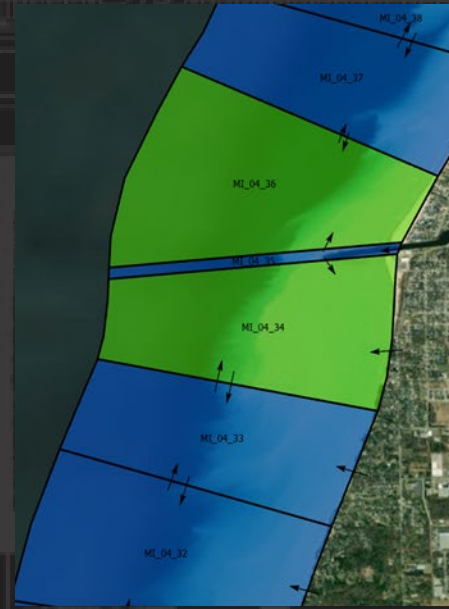


NEW DATA IMPORTATION CAPABILITIES FOR THE SEDIMENT BUDGET ANALYSIS SYSTEM

SEDIMENT BUDGET ANALYSIS SYSTEM (SBAS) TEAM

Sean McGill, Michael Hartman
Peter Tereszkievicz

October 1, 2024



COASTAL INLETS RESEARCH PROGRAM

FY24 IN PROGRESS REVIEW



U.S. ARMY



US Army Corps
of Engineers®



ERDC



CIRP



PROBLEM STATEMENT



Problem: Sediment budgets are an important component of any coastal engineering project, and the Sediment Budget Analysis System (SBAS) is a USACE developed toolbox for creating sediment budgets. Depending on the fidelity of the sediment budget, the time required to collect and process data to quantify budgets can be on the timescale of months to years. Except for GenCade, any volume change or sediment transport rates calculated from field measurements, literature values, or other USACE tools must be manually entered into SBAS.

Solution: Add new tools and capabilities to the SBAS, allowing users to quickly and easily import data from commonly used USACE tools, saving time and money.

Statements of Need

SON 1968: “New volume-change tools to improve sediment management”

SON 1969: “Incorporating shoaling rates into sediment budget creation to improve sediment management”

FY24 was Year 1 of 2

CIRP TD, Aeolian Transportation Script



CAPABILITY AND STRATEGIC IMPACT



Capability

- Create, modify, and publish sediment budgets
- Tool for communicating with clients, sponsors, and partners
- Important for planning/investigating feasibility for projects

Strategic Impact

- Increase ease of use (and therefore increase userbase) of SBAS
- Increase in published sediment budgets
- Help District better monitor BUDM to meet 70% by 2030 goal



CECG

DEPARTMENT OF THE ARMY
HEADQUARTERS, US ARMY CORPS OF ENGINEERS
441 G STREET NORTHWEST
WASHINGTON DC 20314-1000

25 January 2023

Beneficial Use of Dredged Material Command Philosophy Notice

Teammates,

Today I am formally issuing a Beneficial Use of Dredged Material Command Philosophy Notice which outlines my vision for expanding the U.S. Army Corps of Engineers beneficial use of dredged material (BUDM) program. This philosophy notice aligns with two of my four key priorities for the organization, Partnerships and Innovate.

Dredged material is a valued resource that is not to be wasted, but instead used for benefits to the ecosystem, economy, and to deliver the USACE mission more effectively and efficiently across our portfolio of Navigation, Flood Risk Management and Aquatic Ecosystem Restoration projects.

Through a symbiotic relationship with navigation dredging, you are being called to generate If there is a need for USACE to dredge an authorized include beneficial use placement options. Equally, if al to implement a project, beneficial use from dredging considered as a source in the planning and execution rith applicable laws and regulations, including the placement. A proper analysis of the total lifecycle cost fits will result in an accurate determination of the

nts derived from the Navigation mission for beneficial advance the practice of BUDM to 70% by the year

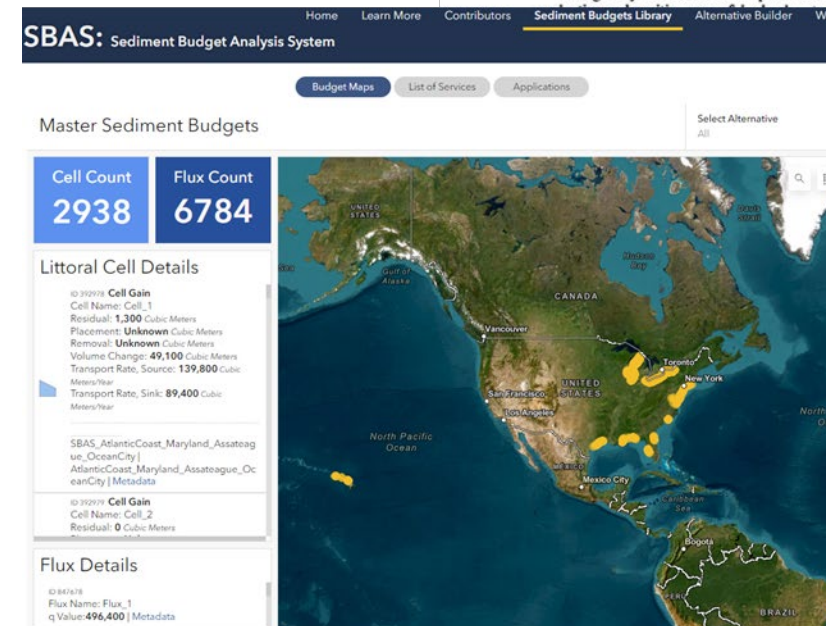
documentation and an innovative pursuit both internally You will need to leverage available solutions, :able while developing and applying new approaches ring challenges.

o participate in supporting this shared vision, provide ultimate success of the BUDM program.

mation on how to get involved, contact Tiffany ie at (202) 761-4474 or by email at

BUILDING STRONG!

Scott A. Spellmon
SCOTT A. SPELLMON
Lieutenant General, US Army
Commanding





SEDIMENT BUDGETS

Size of sediment budgets

Q_{source} = input of sediment into a cell

Q_{sink} = loss of sediment from a cell

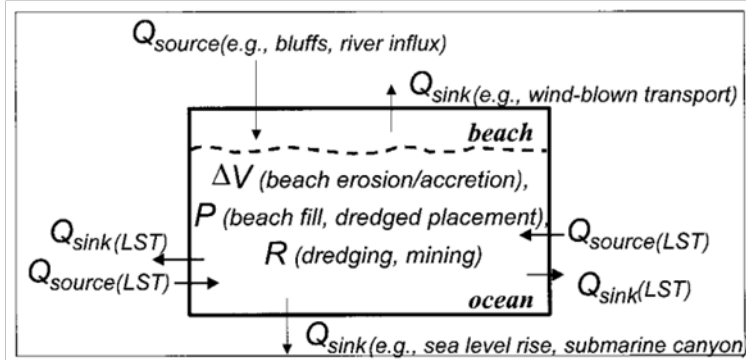
ΔV = volume change within a cell

P = placement into a cell (e.g., beach fill or dredged material)

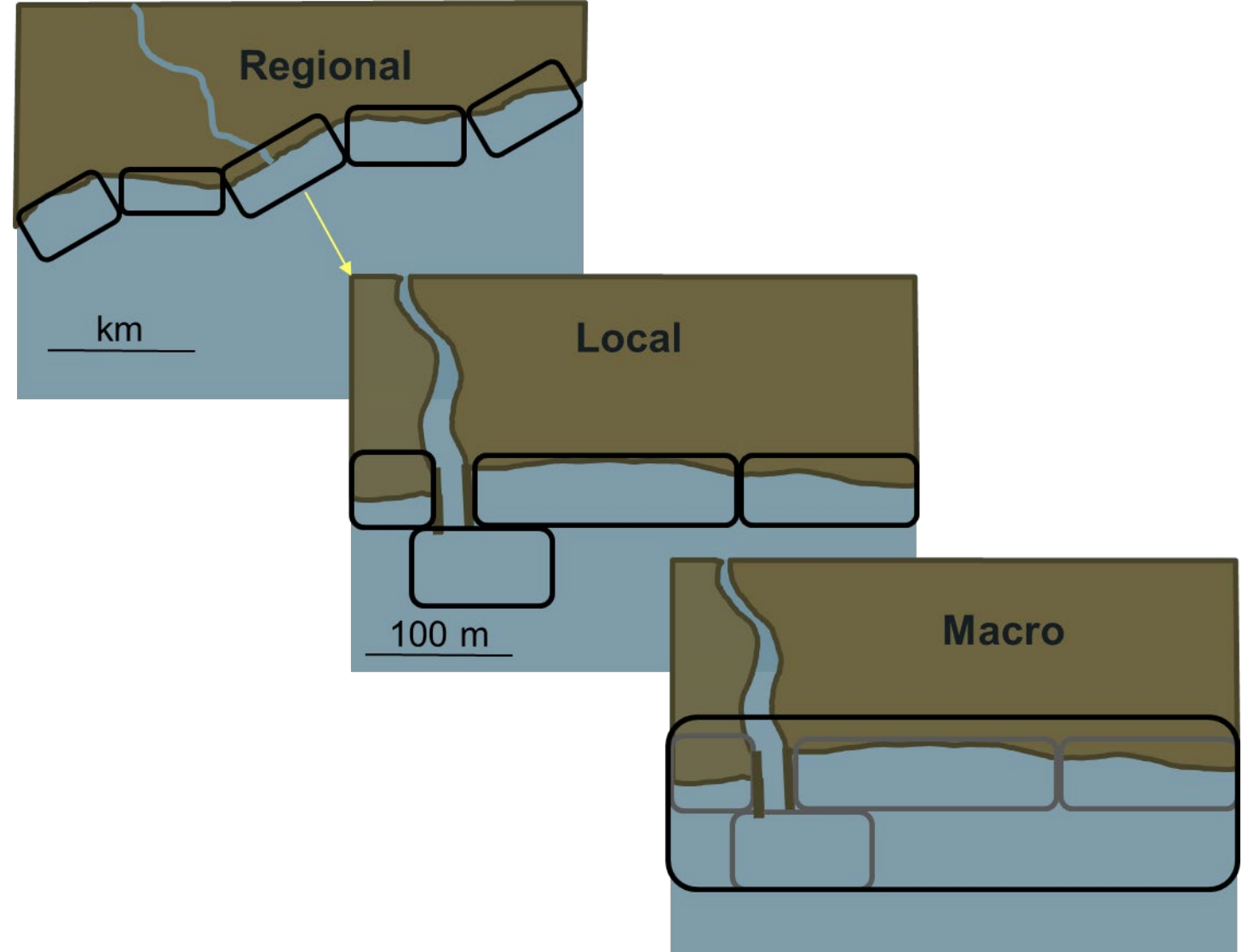
R = removal from a cell (e.g., dredging or mining)

Residual = 0 for a balanced cell

$$\sum Q_{source} - \sum Q_{sink} - \Delta V + P - R = Residual$$



(Rosati, 2005)



THE SEDIMENT BUDGET ANALYSIS SYSTEM



The screenshot displays the SBAS_2020.pyt software interface. The central pane lists the following steps:

- 00 - Set Local Database
- 00a - Pull Live SBAS Database v1.1
- 01a - Create SBAS Alternative
- 01b - Load SBAS Alternative
- 01c - Copy SBAS Alternative
- 02a - Plot GenCade Points
- 02b - Convert GenCade Points to Budget Features**
- 03a - Import GIS Features to SBAS Alternative
- 03b - Transfer Values to SBAS Cell Attributes
- 03c - Create Relationship to SBAS Features
- 03d - Show Related SBAS Attributes
- 04a - Load Complementary Data
- 04b - Load Published Sediment Budgets
- 05a - Start Editing (Add Features)
- 05b - Stop Editing (Add Features)
- 06 - Recompute Residual
- 07 - Delete Alternative
- 08 - Share Sediment Budget Online

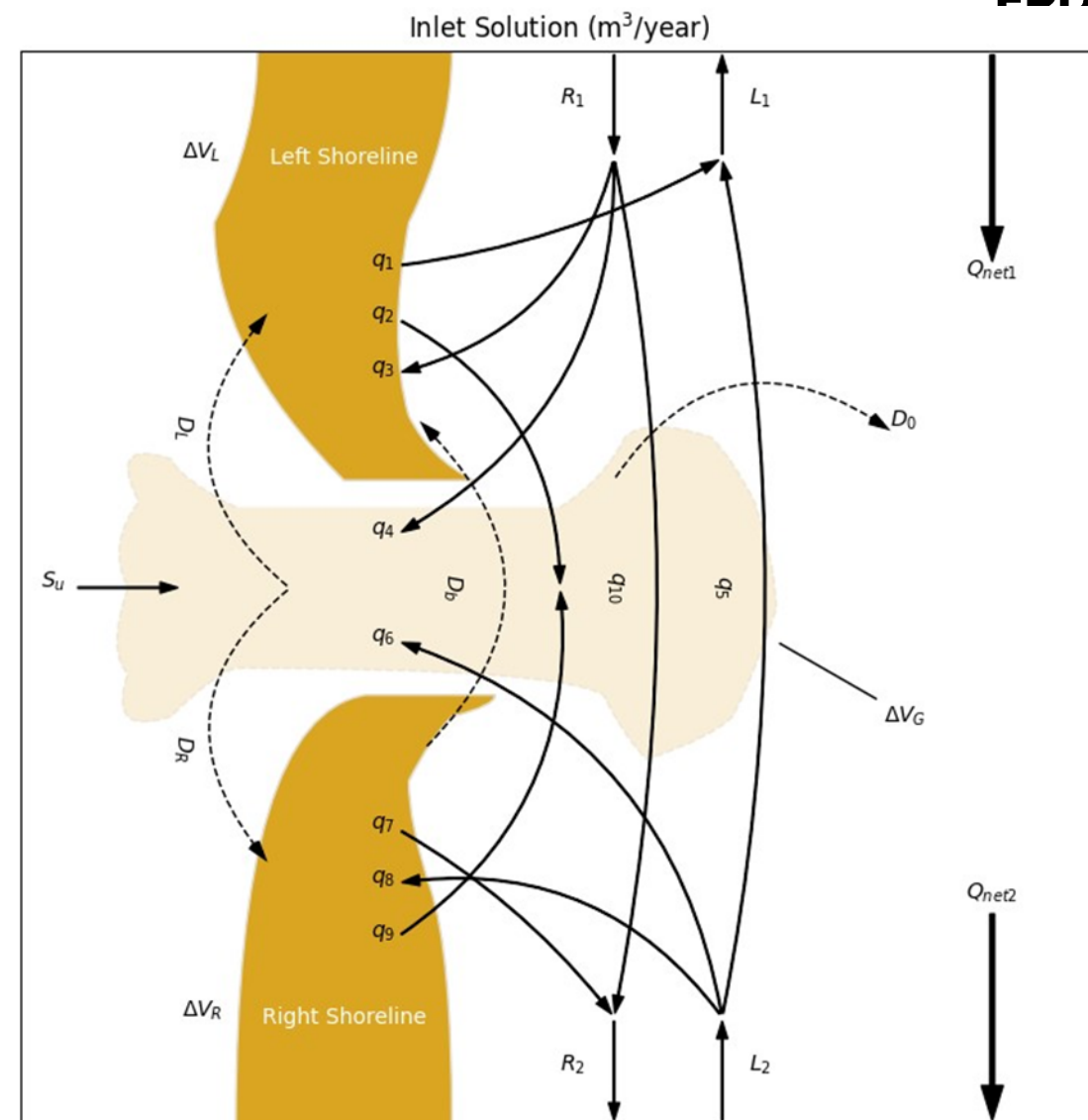
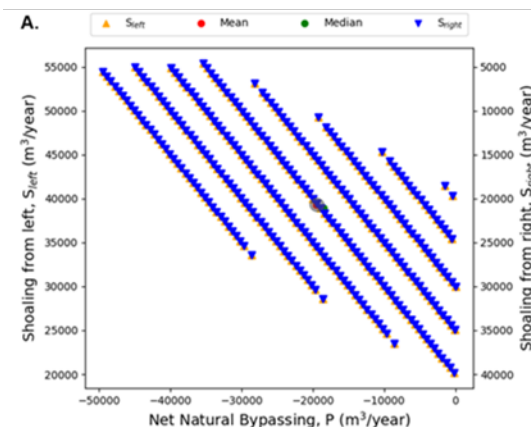
The left pane shows the 'Contents' and 'Drawing Order' sections. The right pane shows the 'Catalog' section with a search bar and a list of project files, including the highlighted step 02b.



SEDIMENT BUDGET CALCULATOR



- Sediment Budget Calculator (Rosati et al. 2013) was developed to calculate a suite of possible sediment transport rates around inlets
- Inputs
 - Volume change on adjacent beaches
 - Longshore transport rates
 - Jetty permeability
- Incorporated into SBAS by converting to Python, validating using JALBTCX data
- Nearshore transport, but no aeolian component

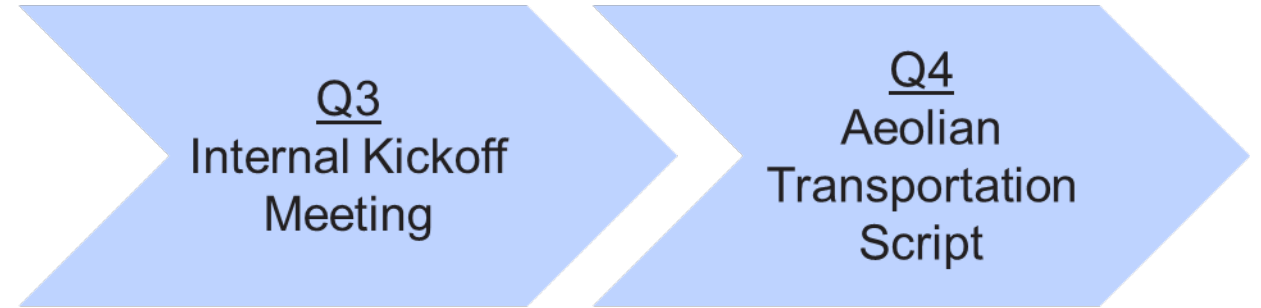




PROJECT ROADMAP...



FY24



FY25



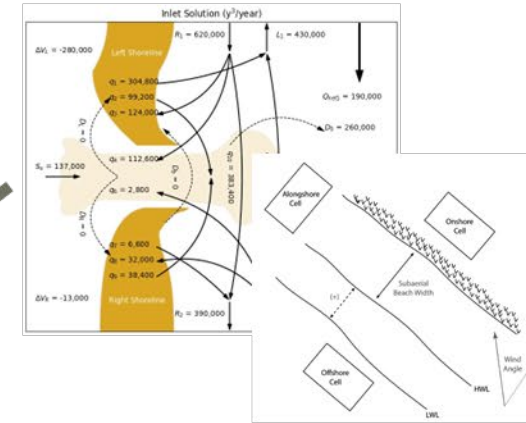


...TO THE FUTURE OF SBAS

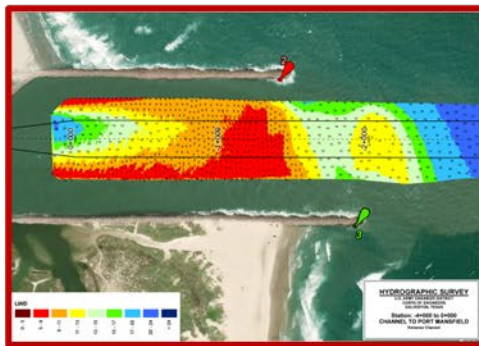
CoastSat



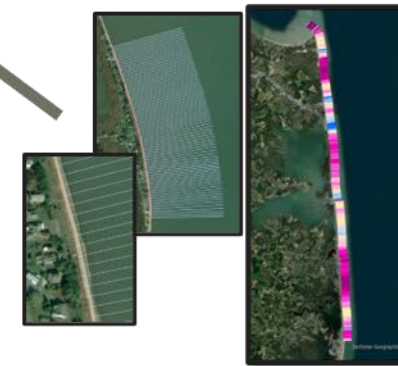
Calculators



CSAT



JALBTCX Volume Change Toolbox





SUMMARY



FY24 Major Advancements in Capability

- Aeolian transportation script written

FY24 Major Products & Collaborations

- Collaboration/leverage across multiple funding lines (RSM, HH&C, DOER, CIRP) and projects

FY25 Products & Advancements

- New Data Importation Capabilities
- New Case Studies and Sediment Budgets
- SBAS 2025 Release
 - SR User Guide
 - Workshop