

Coastal Modeling System (CMS)

PROBLEM

- The impact of navigation project alternatives on water circulation and sedimentation patterns must be accurately anticipated to make sound engineering decisions.
- Field surveys and physical models can be impractical for the spatial scales of regional dredging, nourishment, and coastal structure projects.

SOLUTION

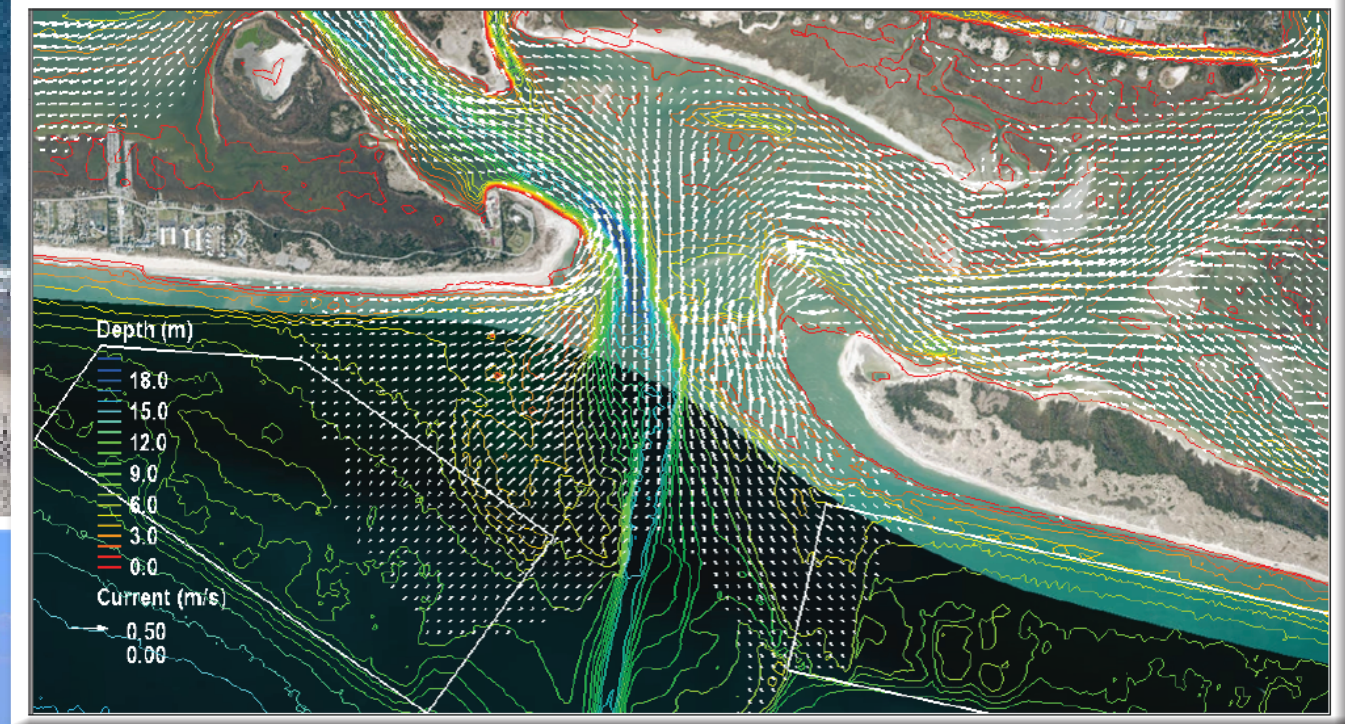
- The numerical Coastal Modeling System (CMS) used by District engineers continues to advance by increasing accuracy in more physically complex environments and improving manipulation of model features by end-users.
- Implementing model standards and testing practices ensures users can quickly access the most up-to-date quality-assured version.

IMPACT

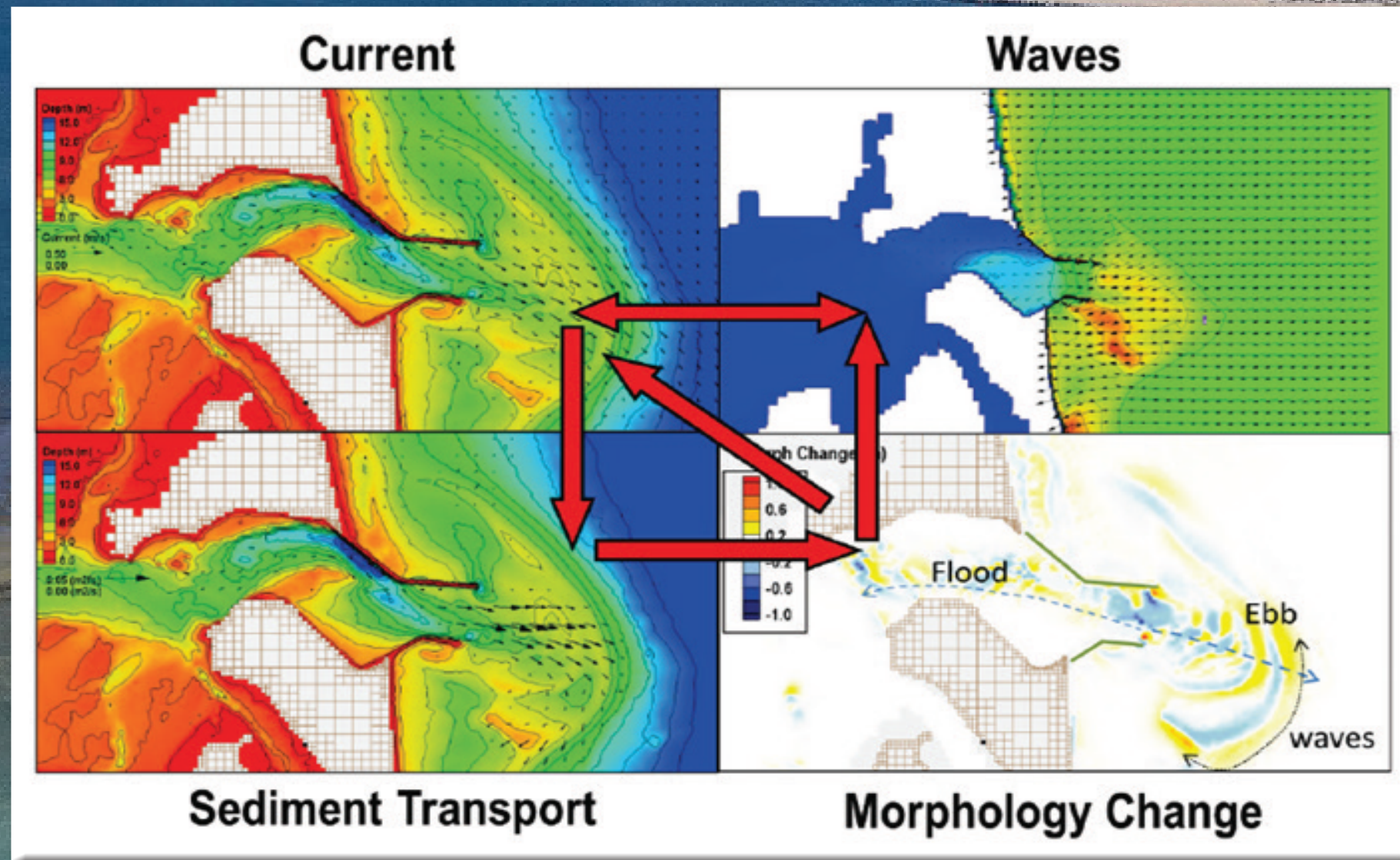
- Increasing model usability decreases the time needed to develop pre-project studies and can allow for more tested project scenarios.
- Continuously tested tools grounded in best-available science and technology support efficient, effective decision-making.



Figure 4-13. Calculated monthly averaged currents for August 2020. Polygons indicate dredged material placement areas.



Coastal Modeling System (CMS)



APPLICATIONS

- Improved accuracy and efficiency of predicted impacts of USACE navigation and flood risk projects nationwide.
- Reduced uncertainties associated with hydrodynamic and sediment transport processes for navigation planning and design, advancing USACE coastal engineering practice.

STATUS

- Ongoing updates to User's Guide and Validation & Verification test cases available on CMS Wiki page: (<https://cirpwiki.info/wiki/CMS>).

BENEFITS

- Reduce the cost of navigation and flood risk planning, design, and maintenance through numerical modeling (\$50K-\$100K) instead of launching data survey programs (\$200K-\$500K) or building physical models (\$500K-\$2M+).

WHAT'S NEXT?

- CMS continues to integrate physical process advancements developed across CHL and by research partners.
- Improving user access will continue to expand, including model manipulation in remote (cloud) environments.



Mitch Brown
Civil Engineering Technician
USACE ERDC CHL

POCs:

Liz Holzenthal
Research Civil Engineer
USACE ERDC CHL

Honghai Li
Research Physical Scientist
USACE ERDC CHL

cirp@usace.army.mil