

PROBLEM

- Natural and Nature Based Features (NNBFs) are becoming more prevalent in Coastal resiliency and protection design, however there is no streamlined or standardized process for numerically modeling the hydrodynamic effect NNBF have on a coastal or estuarine environments.

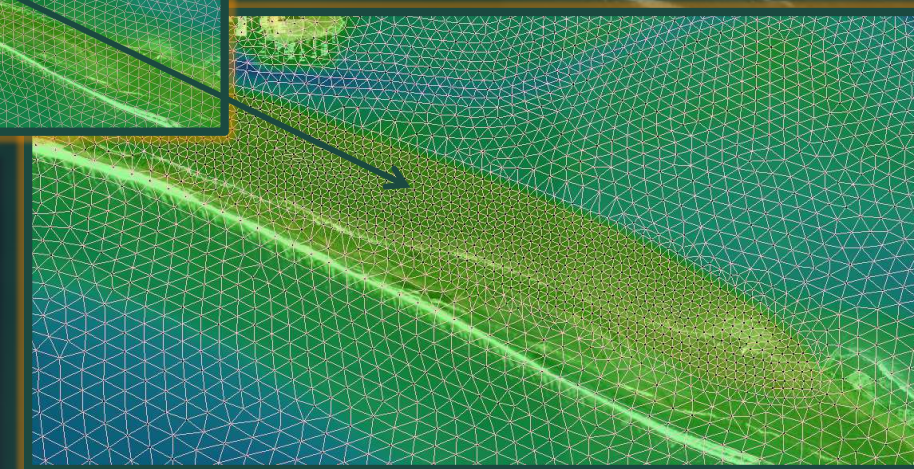
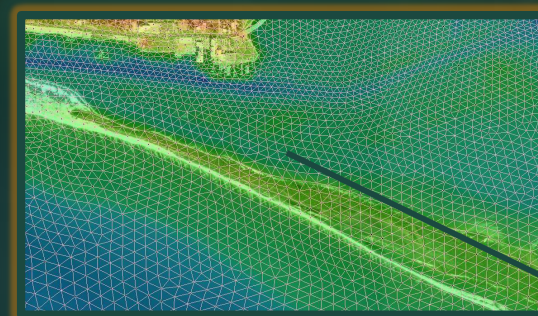
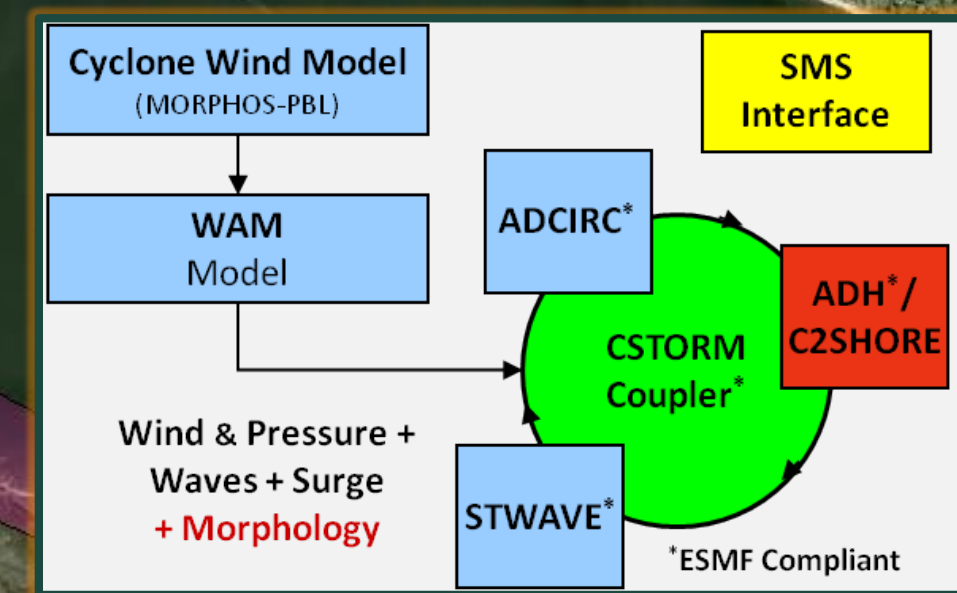
SOLUTION

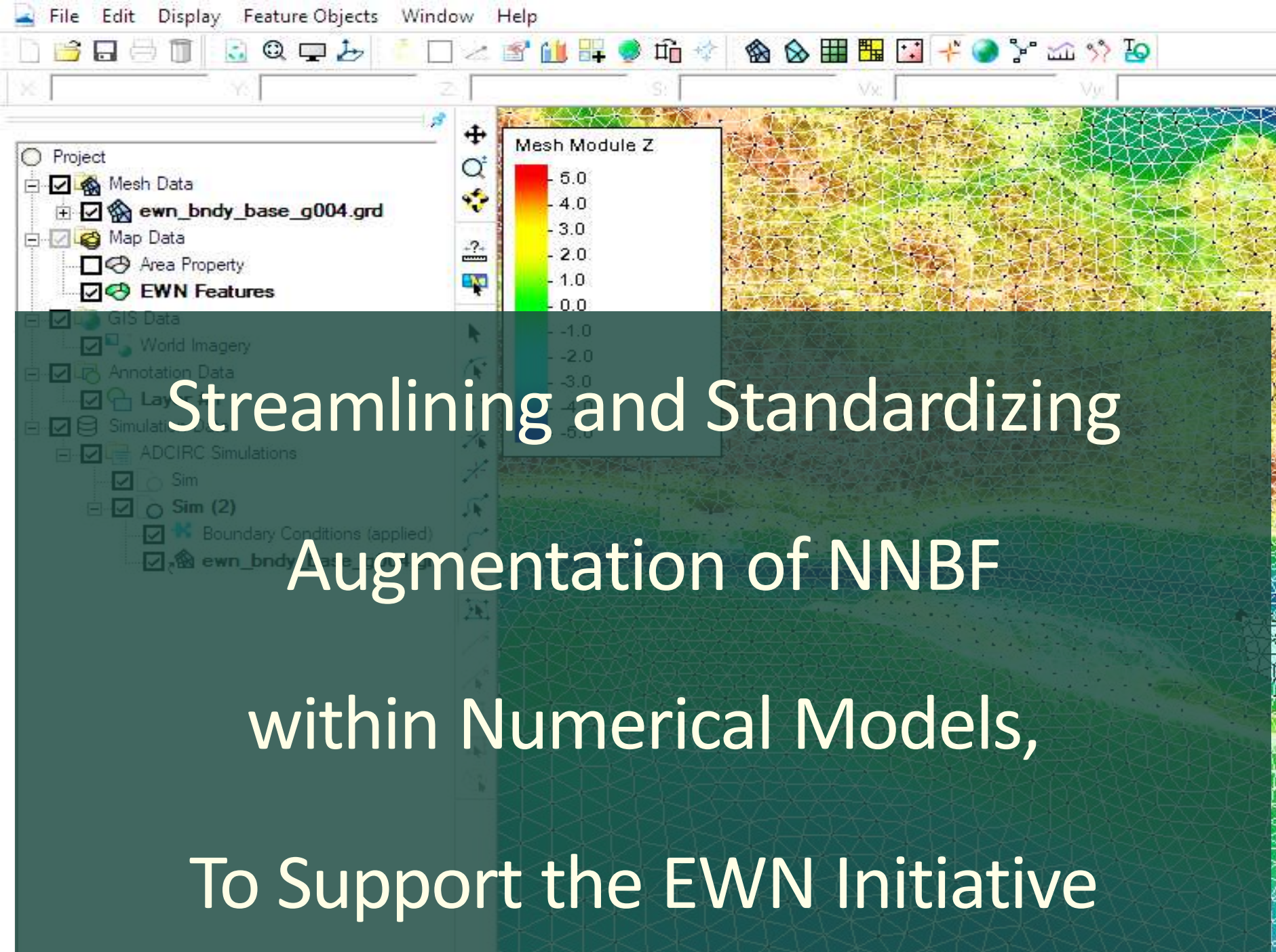
- Develop a workflow for digitizing EWN features for representation within existing hydrodynamic models.
- Provide a GUI which includes this workflow and allows for rapid representation of EWN features in numerical models.

IMPACT

- Reduce computational and personnel resources associated with integrating NNBF into hydrodynamic numerical modeling analysis. Saves \$1000's per design.
- Develop tools to support the evaluation of NNBF design, thus leading to increased innovation in coastal resiliency design work.

Engineering With Nature[®] Toolkit for ERDC's Coastal Storm Modeling System





Streamlining and Standardizing Augmentation of NNBF within Numerical Models, To Support the EWN Initiative

WHAT'S NEXT

Explore additional modeling techniques to support lower computational and temporal cost of including NNBF in numerical modeling. **Develop Use Guidance.**

APPLICATIONS

- Augmentation of state-of-the-art NNBF design techniques from the EWN initiative can be applied within numerical modeling tools for flood risk reduction design.
- Toolkit planned for use in on-going EWN proving ground FY22 projects.

STATUS

- One tested GUI software, with accompanying manual
- One drafted Journal Article, prepped for publication
- Two planned ERDC Tech Notes
- Subdomain Modeling Efforts underway to reduce computational demand while using the toolkit
- Model resolution case studies on way to provide guidance to users

BENEFITS

- Standardized implementation of EWN features into hydrodynamic models and reduced modeling skill levels required – Nationwide consistency of applications and faster review of plans
- Approximately 40% time reduction needed by design engineers to implement NNBF in models – Savings of 10's of \$1000's per project design

