Enhancing the Next Generation Water Resources Modeling Framework (NextGen) to Calculate Total Water Level in Coastal and Lake Environments



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From 4 Domains and 1 Model...

NWMv3.0 TWL Prediction Capability Domains







'Ring model' mesh of Lakes Michigan and Huron



Comparison of Results from Both Models to Measurements



Station ID: 9063028 Station ID: 12710 Lake Erie 176.0 Measurement Measurement 176 5 -- Model (SCHISM) Model (SCHISM) -- Model (D-Flow) - Model (D-Flow) Mater level (m IGLD85) 175.6 175.4 175.2 175.0 175.0 174.8 (580176.0 176.0 175.5 level Water | 174.6 174.5 174 11-14 11-15 11-16 11-17 11-18 11-19 11-20 11-14 11-15 11-16 11-17 11-18 11-19 11-20 Dry Dock Date [2020] Dunn Papers Mouth of the Black Rive Date [2020] St. Clair State Police Port Stanley St Clair Shores Windmill Point Fort Wayne Erieau Erie, Lake Erie Amhersthur Bar Point Gibraltan Fairport Station ID: 12065 Station ID: 9063038 Marhlehead Cleveland eveland 175.8 Measurement 174.8 Model (outputs) Model (output) 175.6 (580174.4 174.4 174.4 (580175.4 175.4 E 175.2 **Red:** measurements a 175.0 a 174.0 Mater Nater **Blue:** SCHISM 174.8 Nater Black: D-Flow FM 174.6 Measurement 173.6 Model (SCHISM) -- Model (D-Flow) 174.4 173.4 11-14 11-15 11-16 11-17 11-18 11-19 11-20 11-01 11-05 11-09 11-13 11-17 11-21 11-25 11-29 12-01 Date [2020] Date [2020]

Comparison of Results from Both Models to Measurements

Comparison of Results from Both Models to Measurements Lake Michigan-Huron







Summary and Conclusions

- SCHISM and D-Flow FM models for three additional domains extend the TWL prediction capabilities of NextGen beyond those of NWMv3.0
- BMI interfaces developed for both models allow their integration into NextGen framework
- Both coastal models exhibit similar skills when simulating TWL; tools available to guide model selection for a given domain
- Future work focuses on model optimization and further testing under the NextGen framework



Related Presentations

- 3.1 Investigation of Two Methods for Including Precipitation in a 2D Hydrodynamic Model in Coastal and Lake Environments: Direct Rainfall vs. Lateral Discharge by H. Kefelegn et al. Monday, January 29 at 1:45-2:00 PM Room 343
- E75 Extending the NWMv3.0 Forcings Engine Capabilities into the NextGen Water Resources Modeling Framework by J. Ducker et al. Wednesday, January 31 at 3:00-3:40 PM Hall E

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