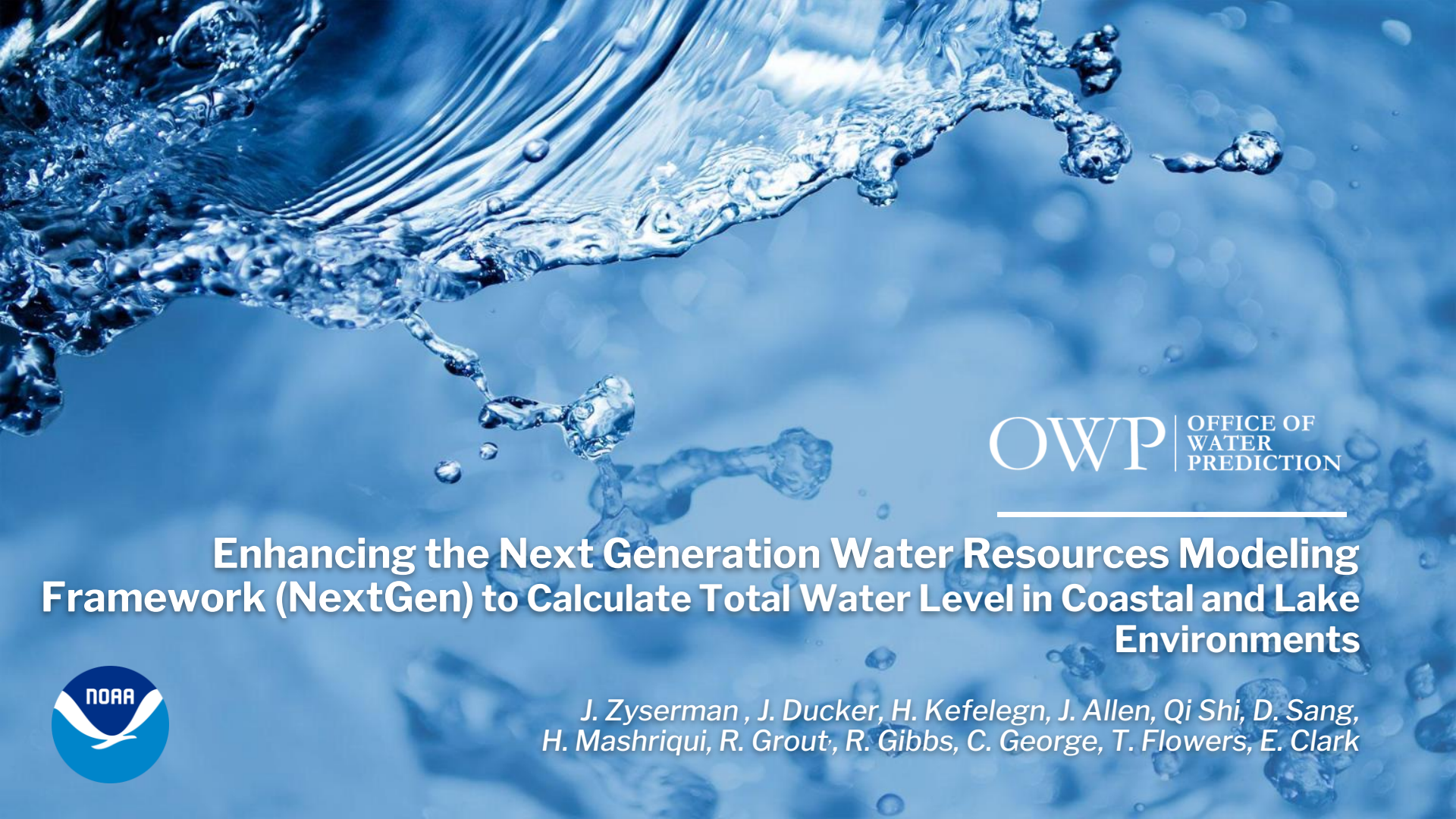


OWP | OFFICE OF WATER PREDICTION

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

J. Zyserman , J. Ducker, H. Kefelegn, J. Allen, Qi Shi, D. Sang, H. Mashriqui, R. Grout, R. Gibbs, C. George, T. Flowers, E. Clark

SCHISM BMI
NOAA Branch

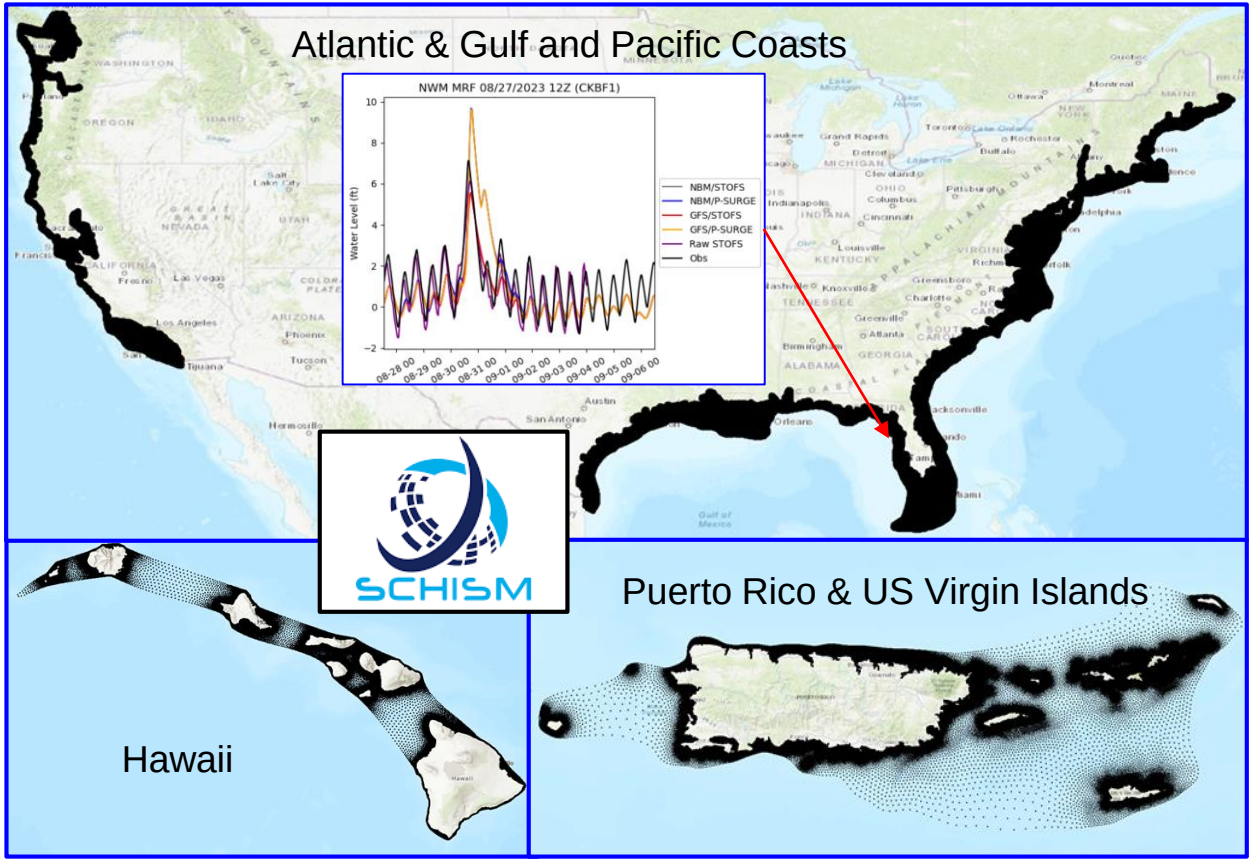
D-Flow FM BMI
NOAA Branch

NOAA

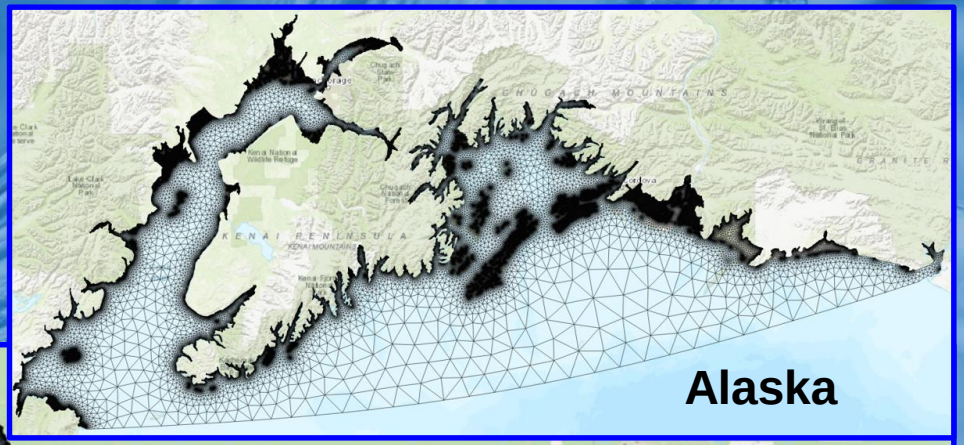
OWP | OFFICE OF WATER PREDICTION

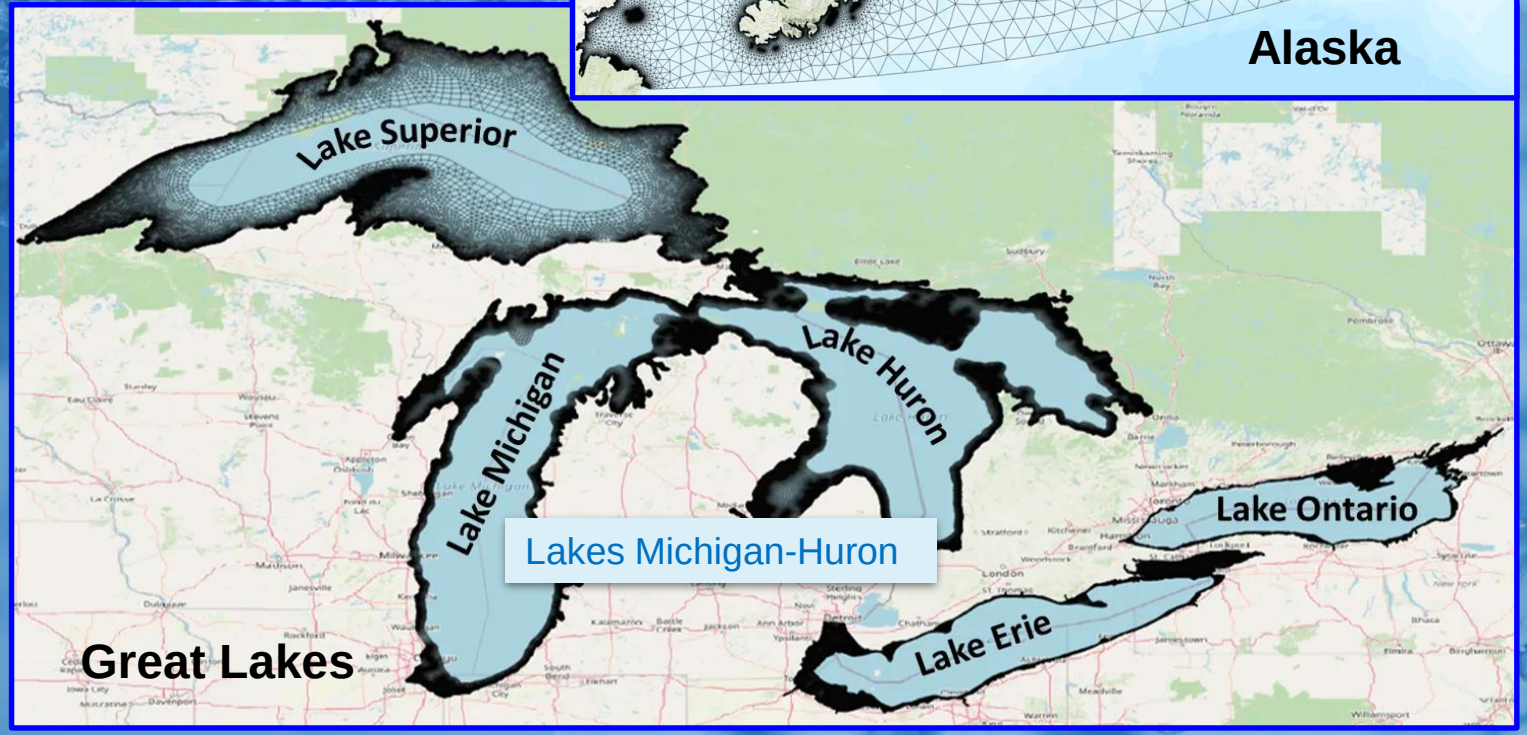
From 4 Domains and 1 Model…

NWMv3.0 TWL Prediction Capability Domains

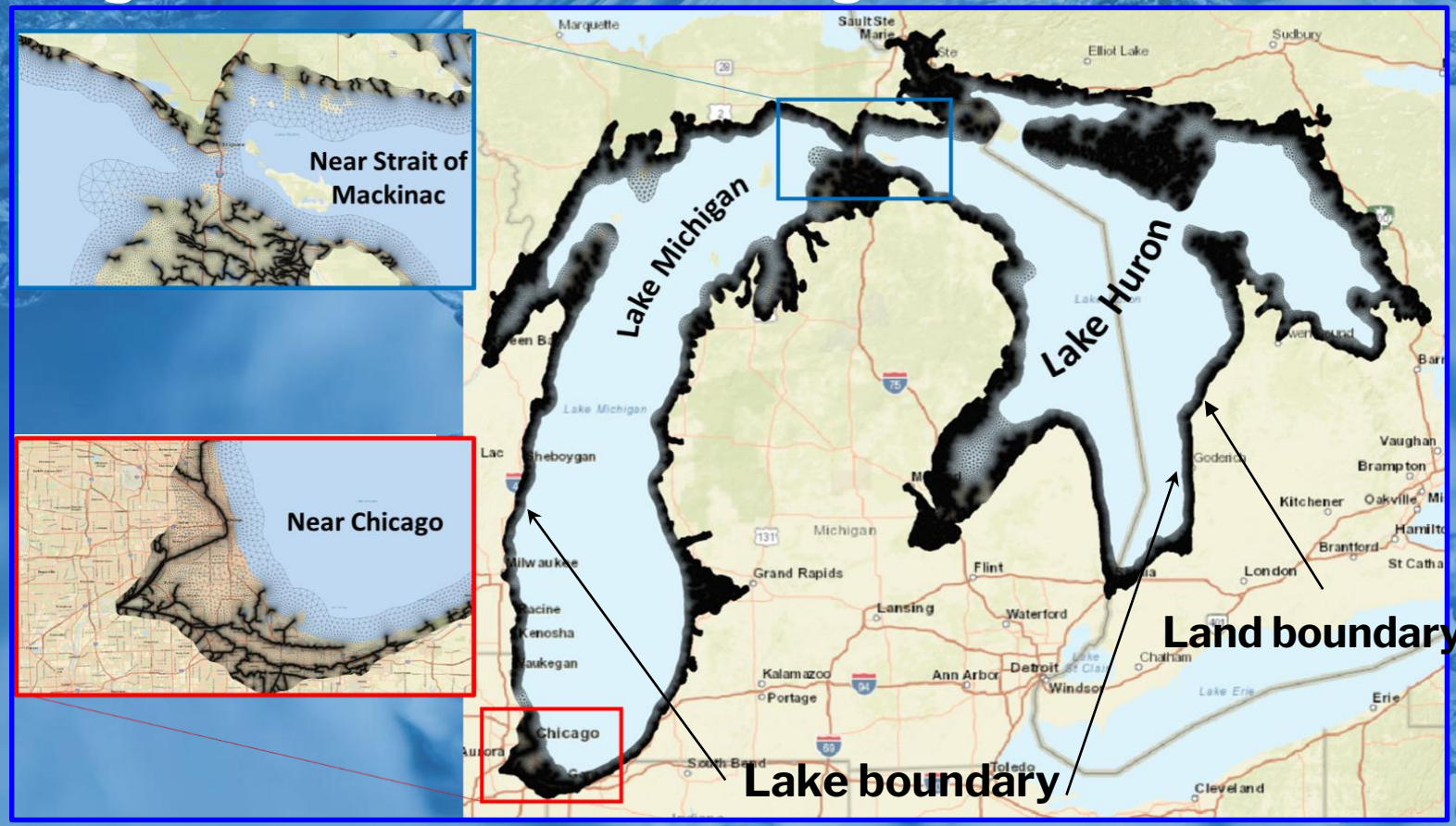


To 7 (10) Domains and 2 Models

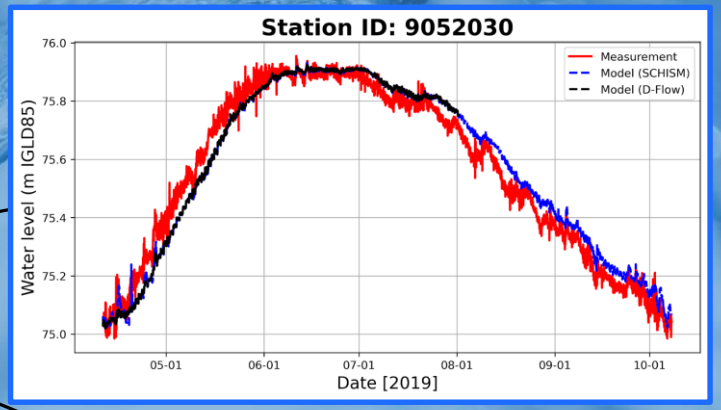


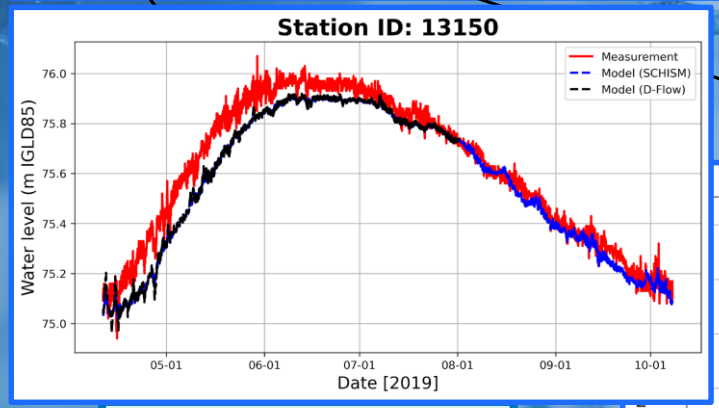


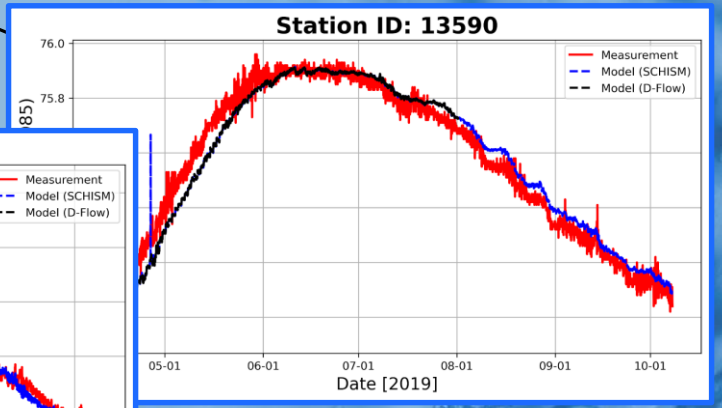
‘Ring model’ mesh of Lakes Michigan and Huron

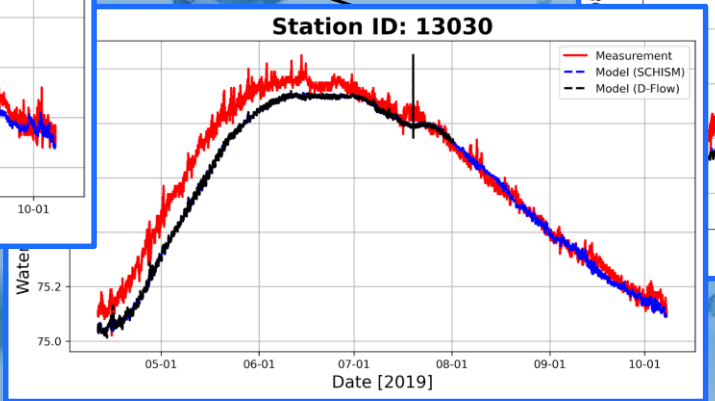


Comparison of Results from Both Models to Measurements



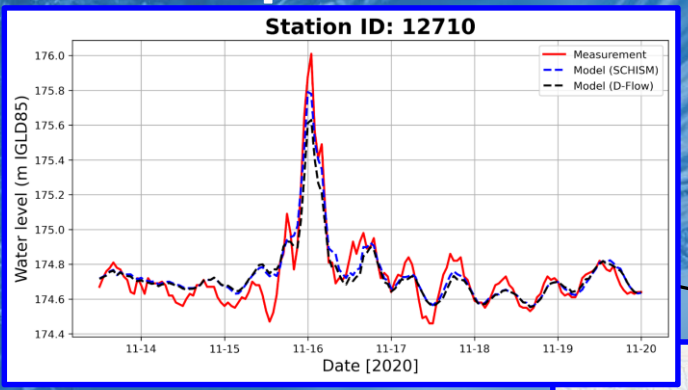


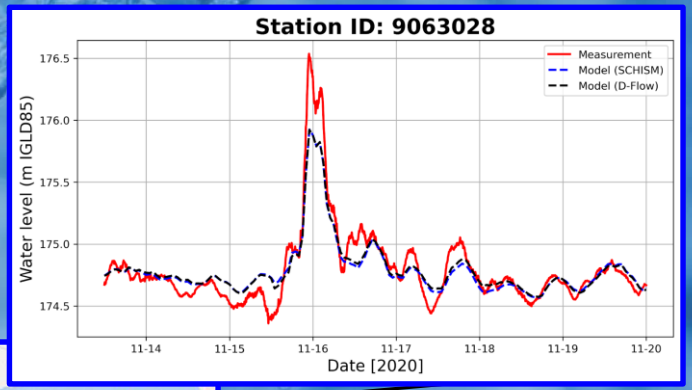


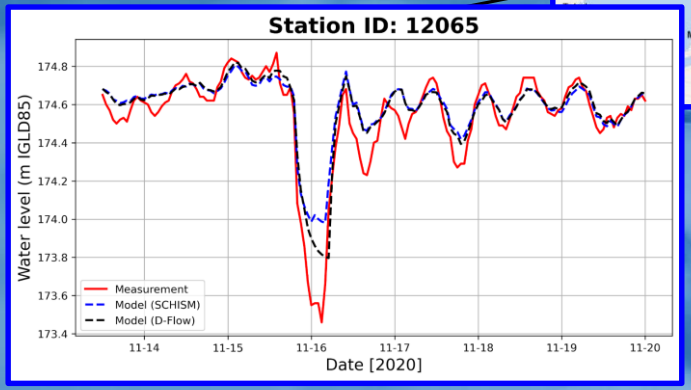


Red: measurements
Blue: SCHISM
Black: D-Flow FM

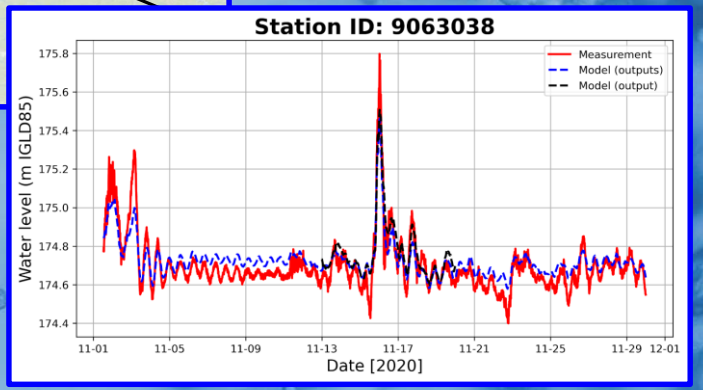
Comparison of Results from Both Models to Measurements Lake Erie



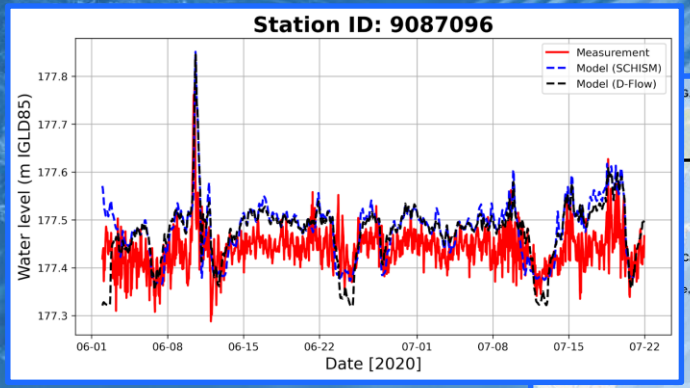


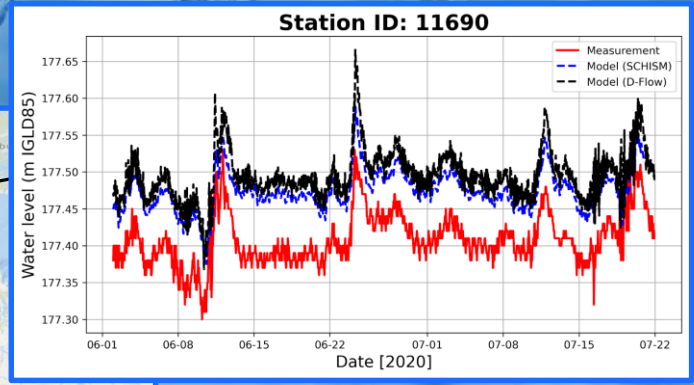


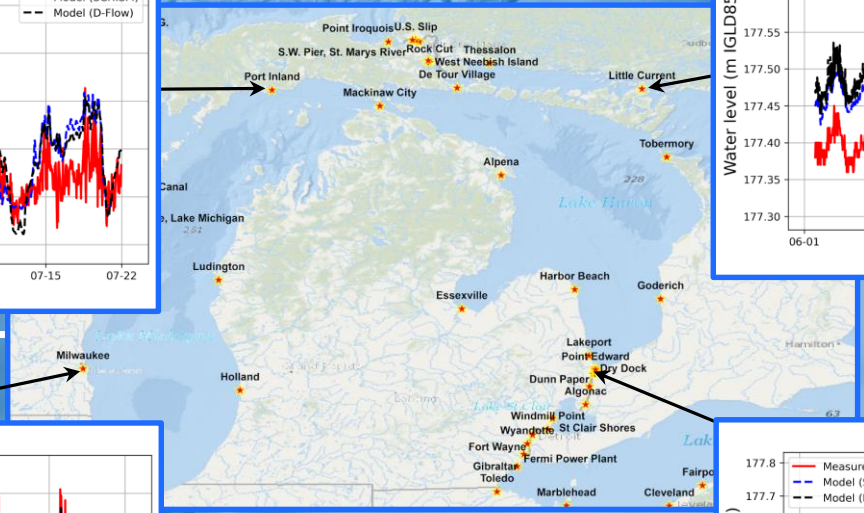
Red: measurements
Blue: SCHISM
Black: D-Flow FM

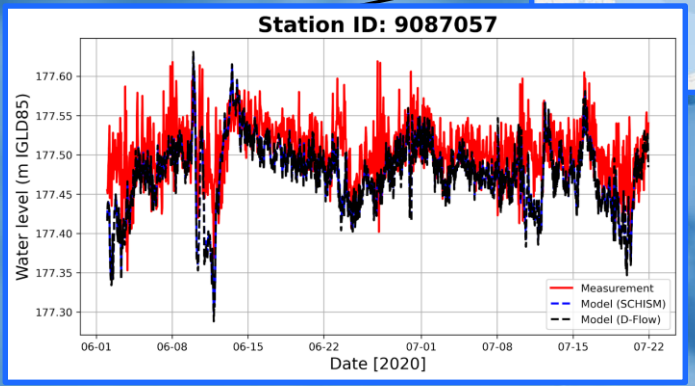


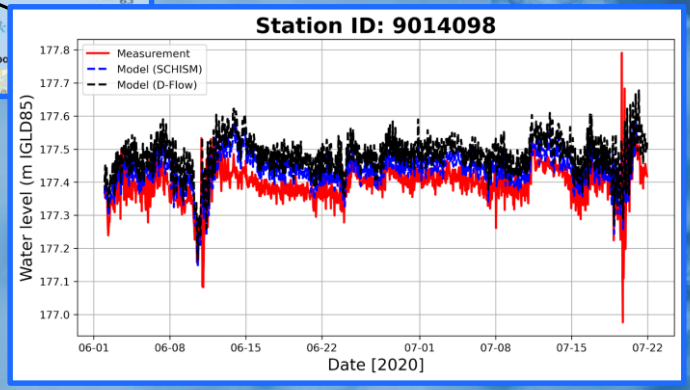
Comparison of Results from Both Models to Measurements
Lake Michigan-Huron



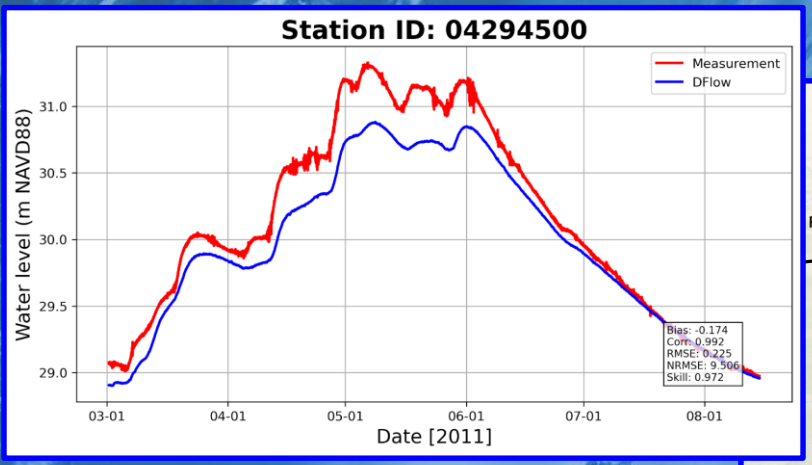


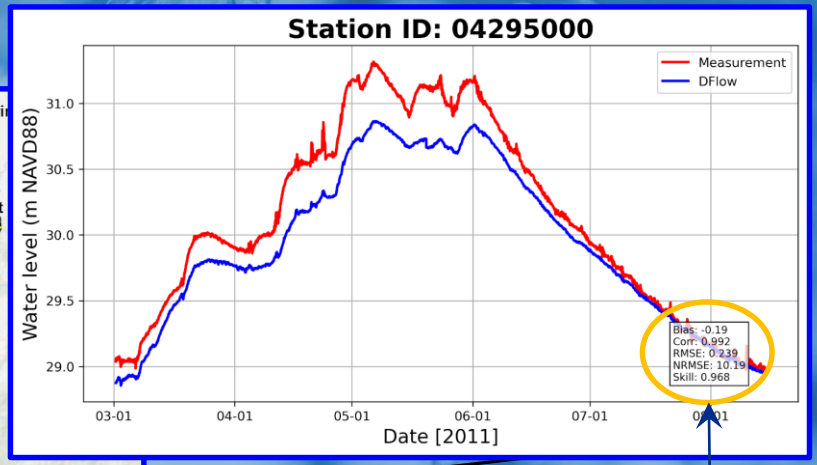


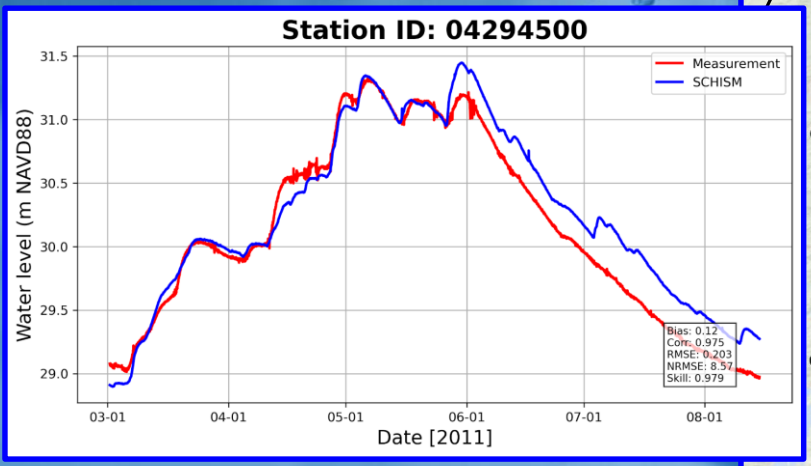


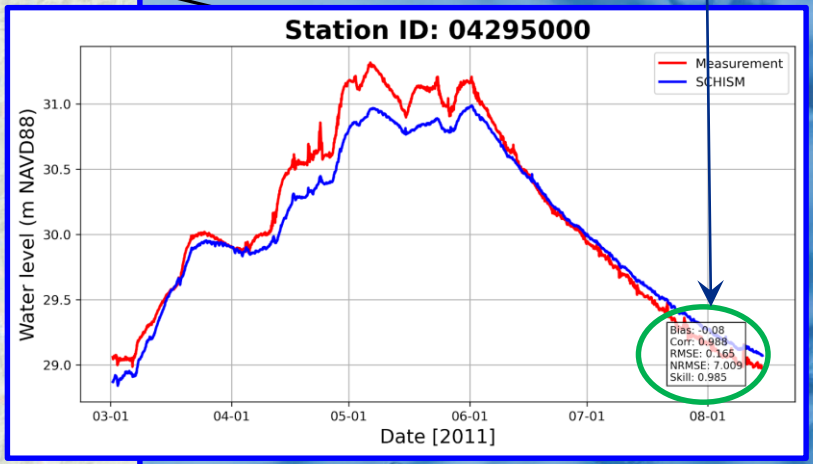


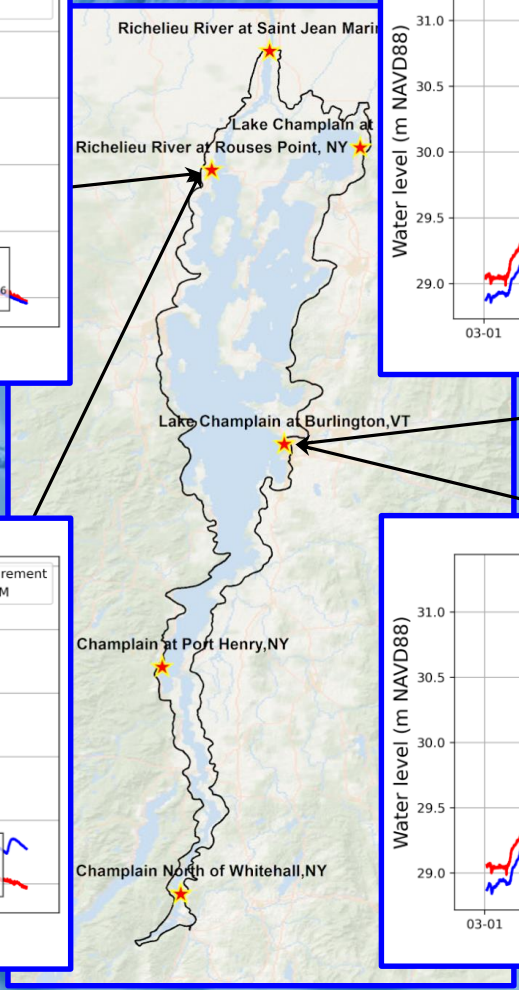
Red: measurements
Blue: SCHISM
Black: D-Flow FM


Station ID: 04294500
Measurement
DFlow
Water level (m NAVD88)
Date [2011]
Bias: -0.174
Corr: 0.992
RMSE: 0.225
NRMSE: 9.506
Skill: 0.972


Station ID: 04295000
Measurement
DFlow
Water level (m NAVD88)
Date [2011]
Bias: -0.19
Corr: 0.992
RMSE: 0.239
NRMSE: 10.19
Skill: 0.968

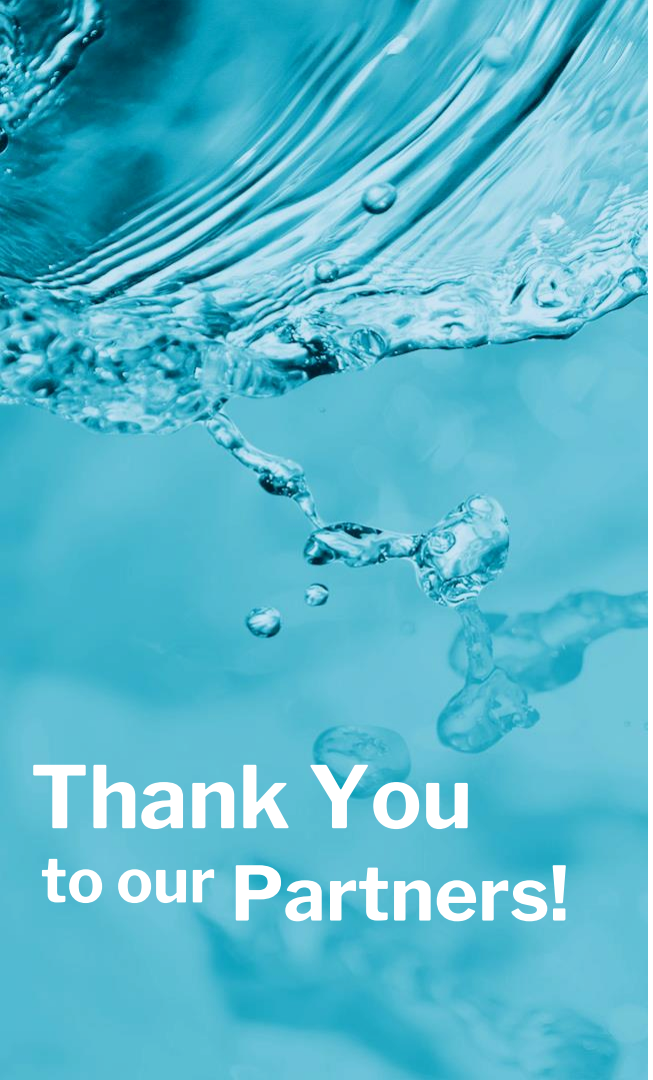

Station ID: 04294500
Measurement
SCHISM
Water level (m NAVD88)
Date [2011]
Bias: 0.12
Corr: 0.975
RMSE: 0.203
NRMSE: 8.57
Skill: 0.979


Station ID: 04295000
Measurement
SCHISM
Water level (m NAVD88)
Date [2011]
Bias: -0.08
Corr: 0.989
RMSE: 0.165
NRMSE: 7.009
Skill: 0.985


Richelieu River at Saint Jean Mari
Lake Champlain at
Richelieu River at Rouses Point, NY
Lake Champlain at Burlington,VT
Champlain at Port Henry,NY
Champlain North of Whitehall,NY

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

CUAHSI

Lynker

USGS
science for a changing world

THE UNIVERSITY OF ALABAMA

OWP | OFFICE OF WATER PREDICTION

Thank You!

Julio A Zyserman

julio.zyserman@noaa.gov

https://water.noaa.gov

NOAA

OWP | OFFICE OF WATER PREDICTION