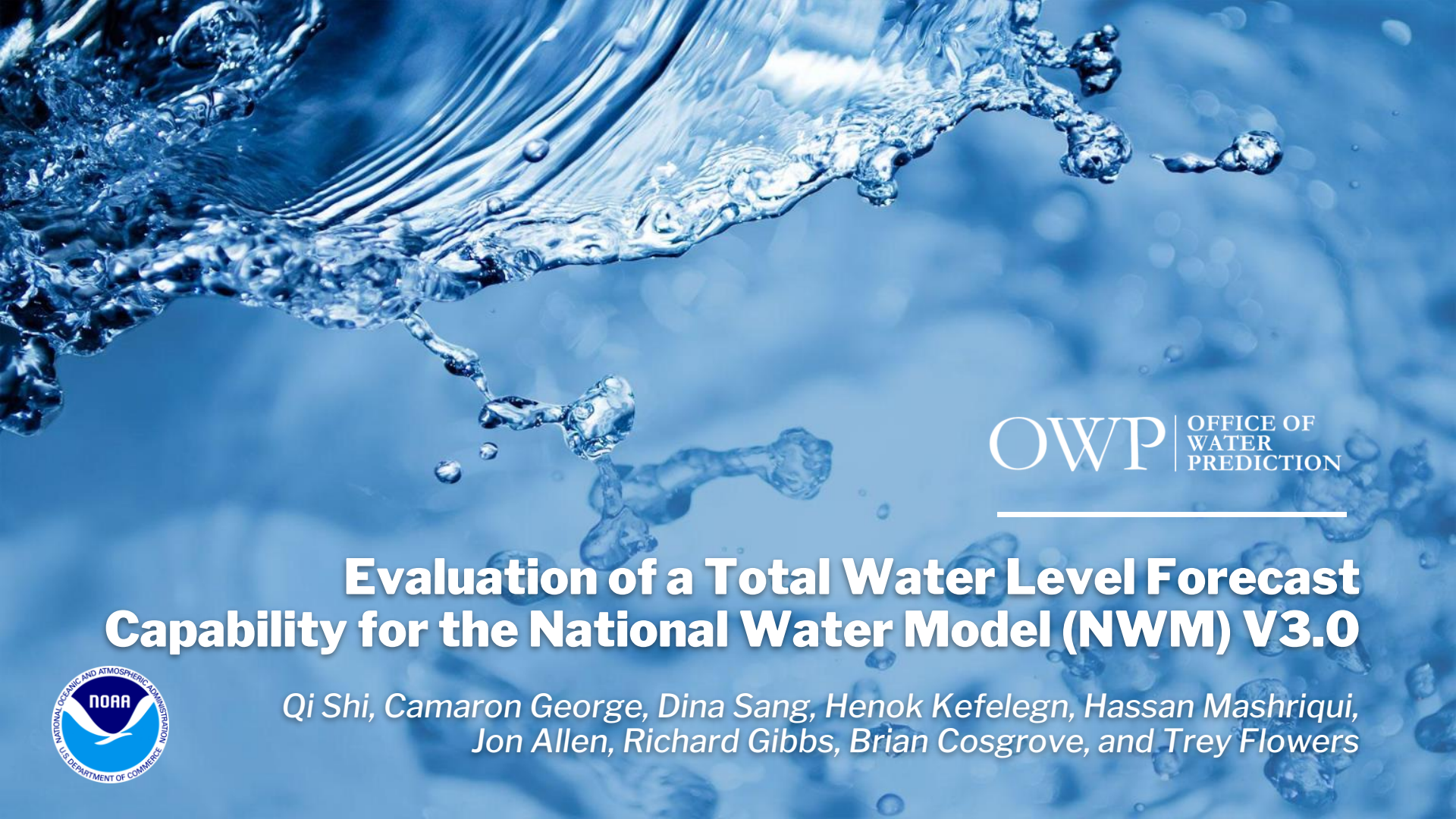

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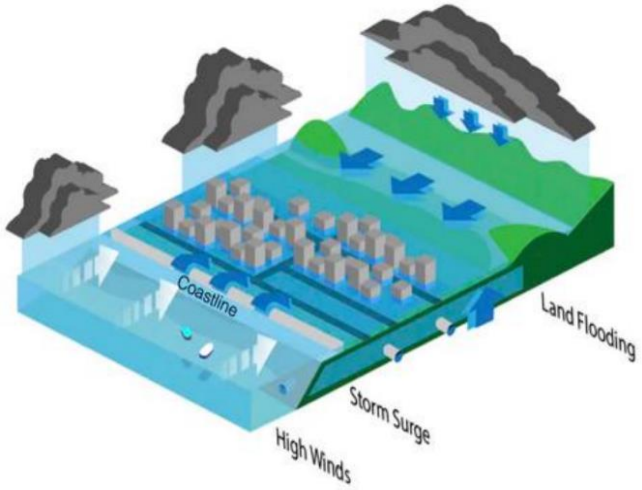
Evaluation of a Total Water Level Forecast Capability for the National Water Model (NWM) V3.0

Qi Shi, Camaron George, Dina Sang, Henok Kefelegn, Hassan Mashriqui, Jon Allen, Richard Gibbs, Brian Cosgrove, and Trey Flowers

OWP is Addressing a Critical Gap in Coastal Forecast Capability

Coastal Compound Flooding

- Storm surge and Tide
- Precipitation
- River discharge



Source: Thomas Wahl (UCF)

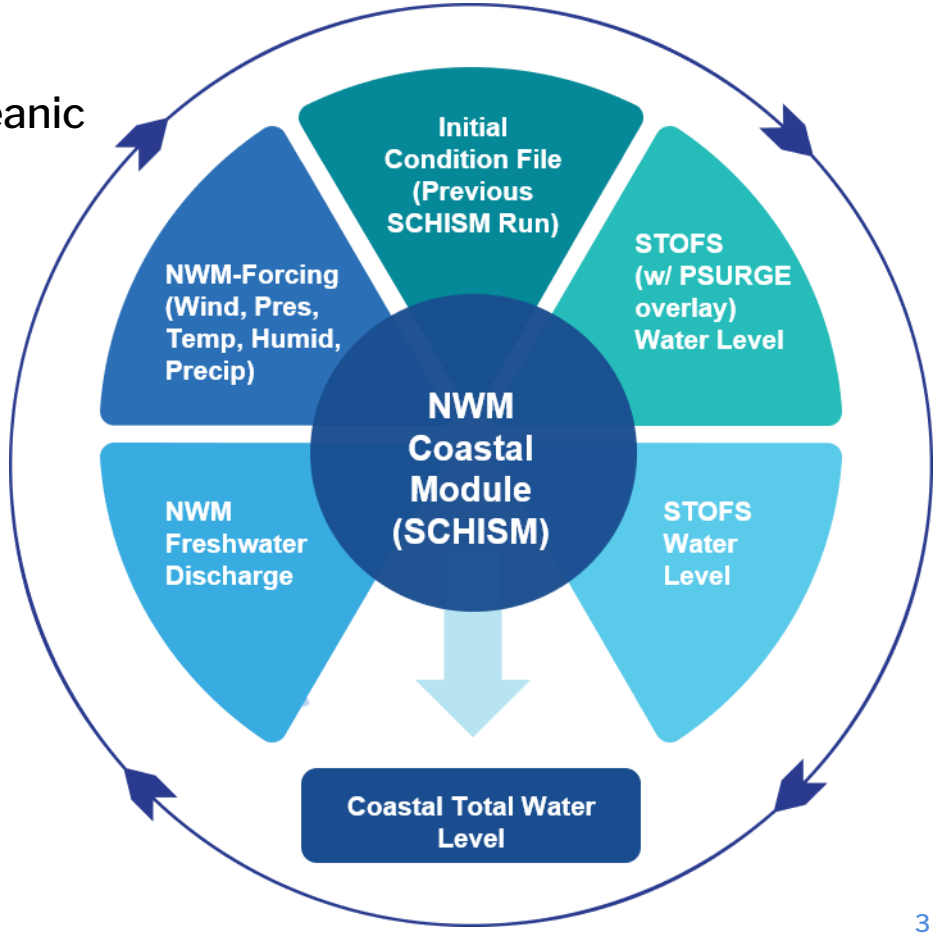
Over 100 million people live near the coast who don't get national total water guidance today

Matlacha, FL one day after Hurricane Ian's landfall

Credit: Matias J. Ocner / Miami Herald

NWM V3.0 (2023) Total Water Level Forecast

- SCHISM acts as a “middleware” to link oceanic processes to upstream rivers/creeks
- NWM river discharge is injected into the SCHISM domain as point sources/sinks
- Ocean boundary forcing comes from:
  - STOFS
  - P-Surge
- Precipitation and other atmospheric forcings come from NWM forcing engine.



SCHISM TWL Domain Coverage

Unstructured meshes generated using a sizing function

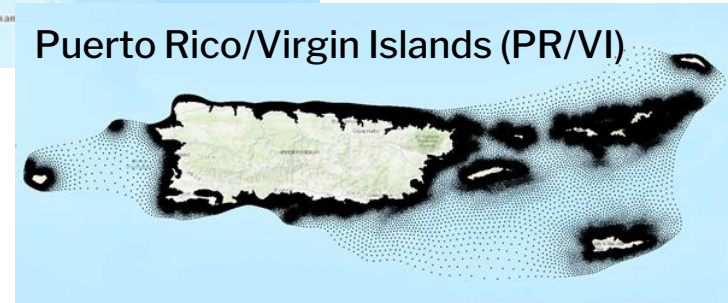
(*Henok's Talk: H53B-07*)

<u>Resolution</u>

East/Gulf: 70 – 100 m

Pacific: 50 m

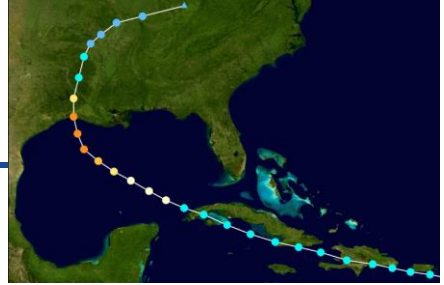
PR/VI & HI: 30 m



Evaluation Runs

Hurricane Maria
PR/U.S. VI

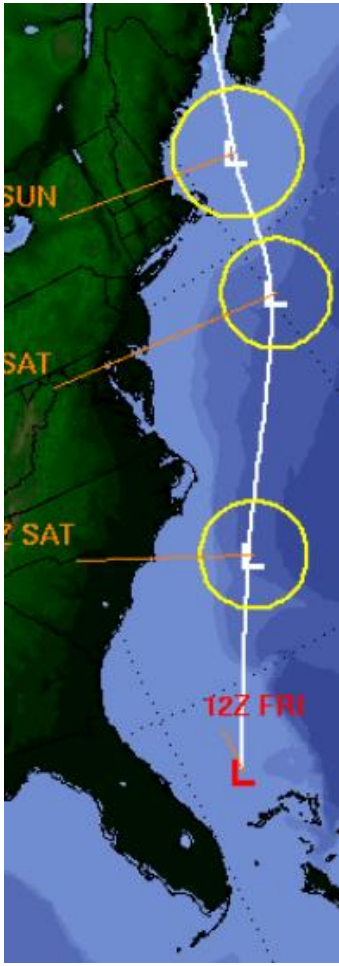
Hurricane Harvey
West Gulf Coast



Hurricane Laura
Mid-Gulf Coast

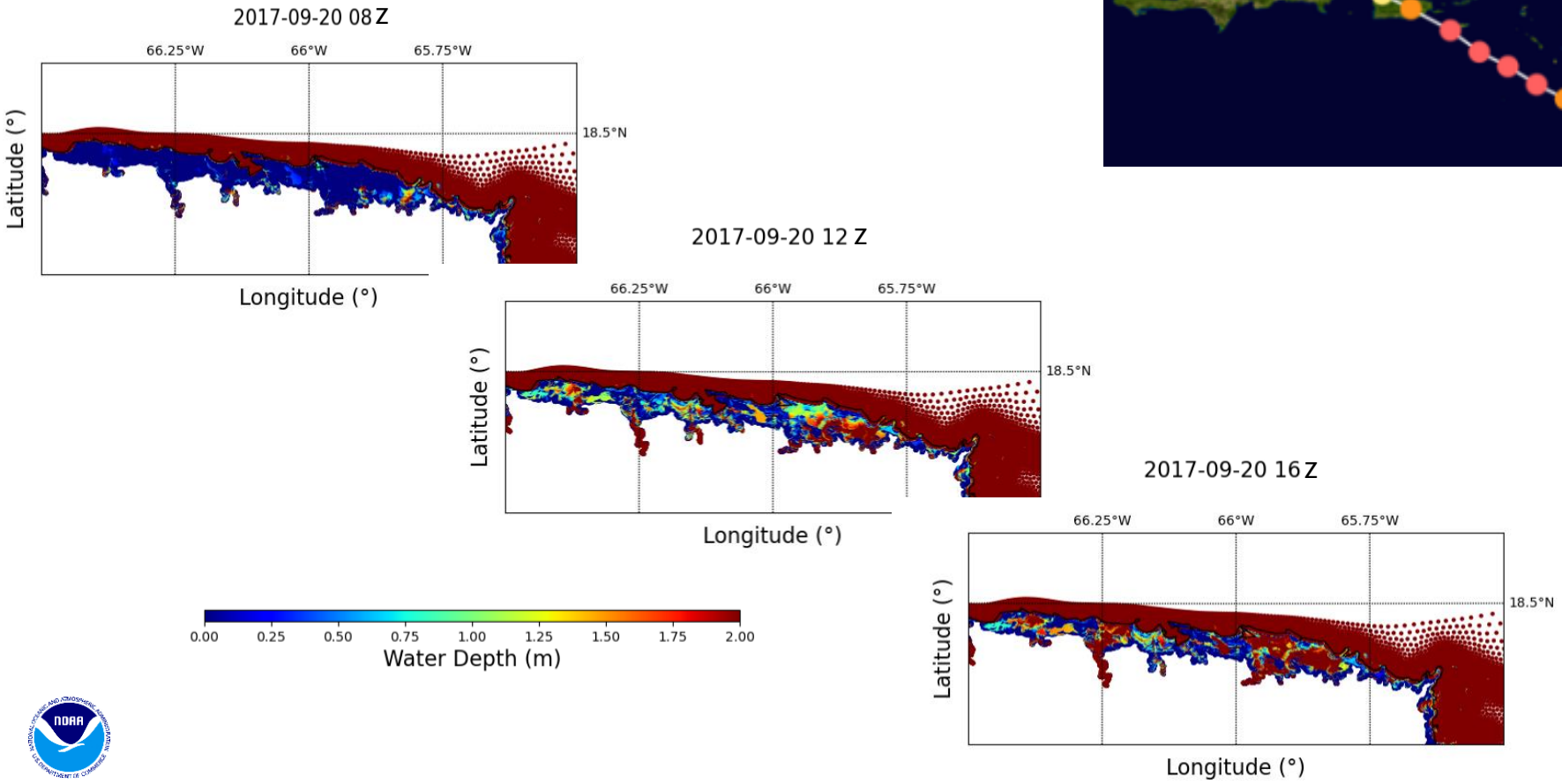
Hurricane Florence
East Coast

Hurricane Isaias
Mid-Gulf Coast

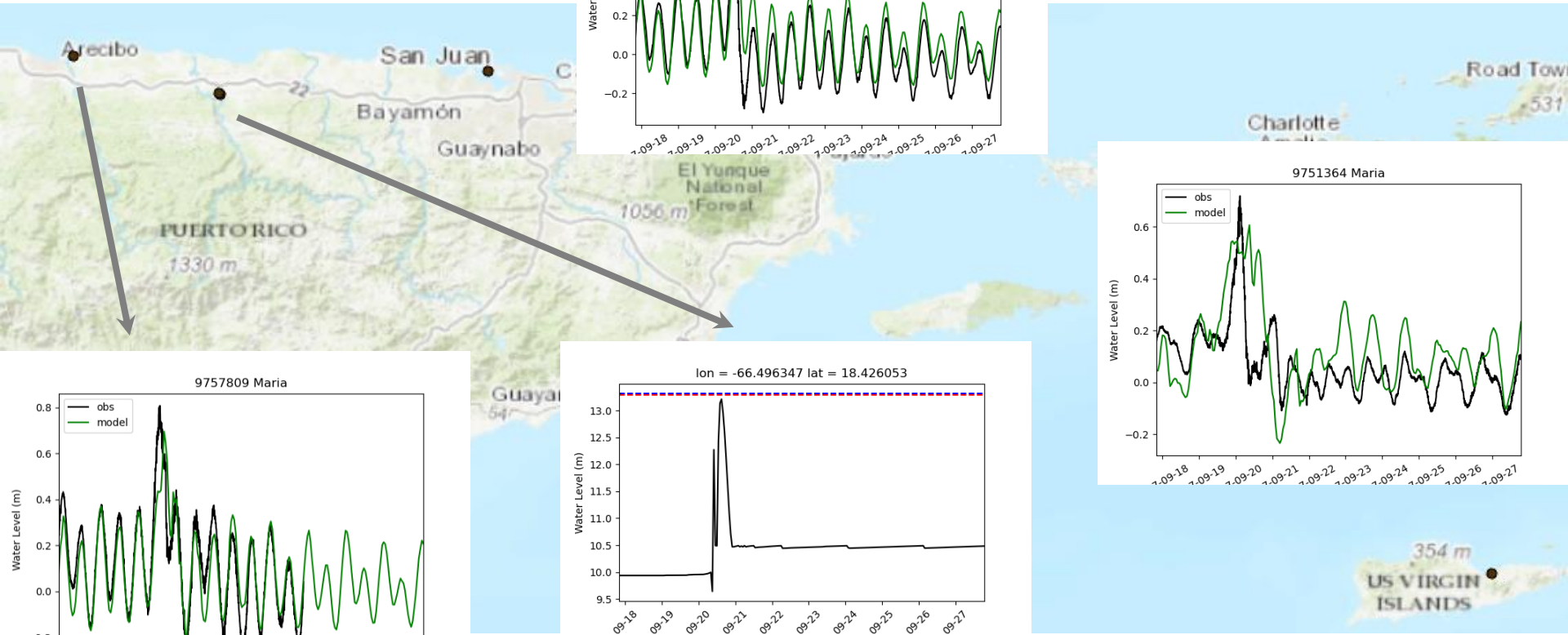


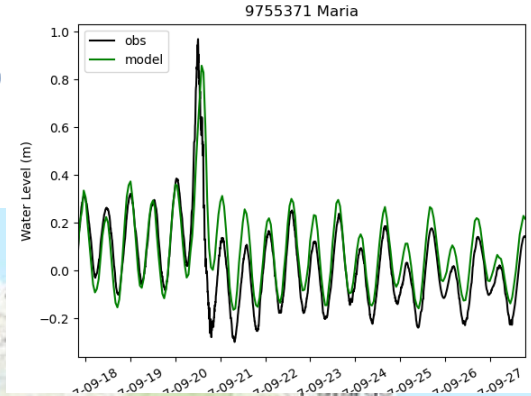
Northeast

Hurricane Maria (2017)

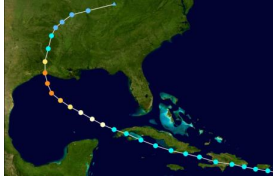


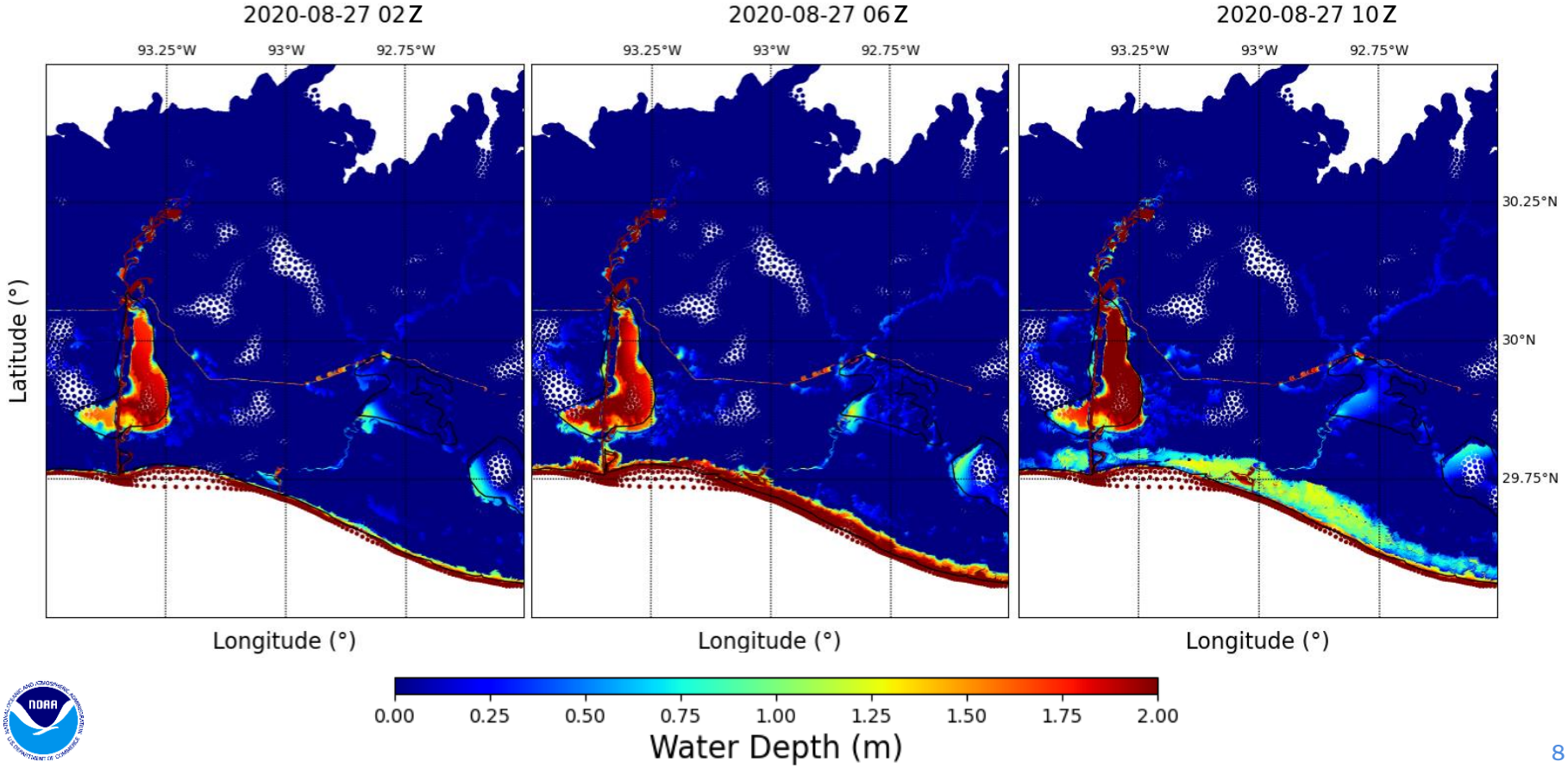
Hurricane Maria (2017)



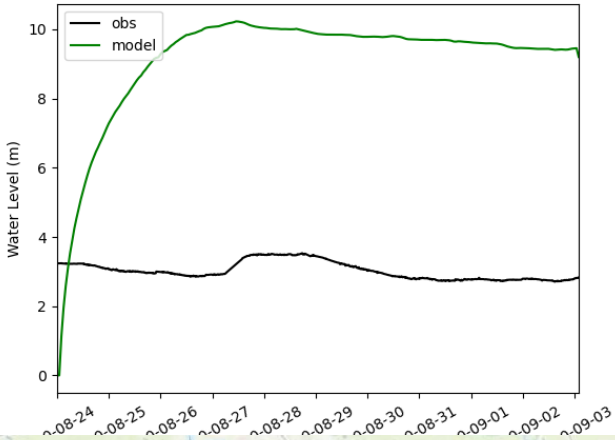


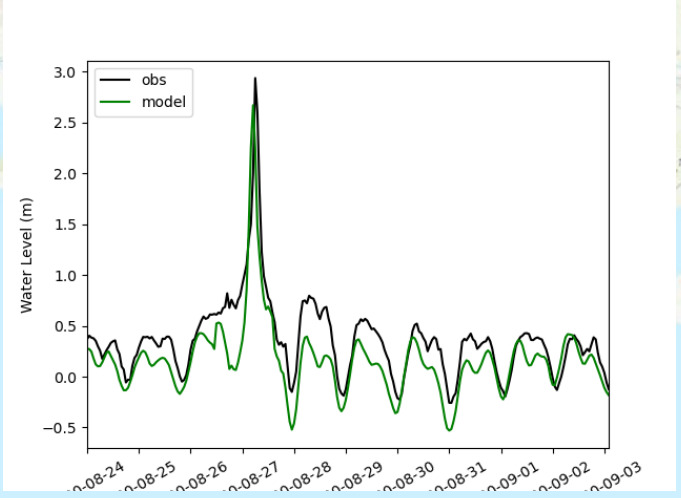
Hurricane Laura (2020)

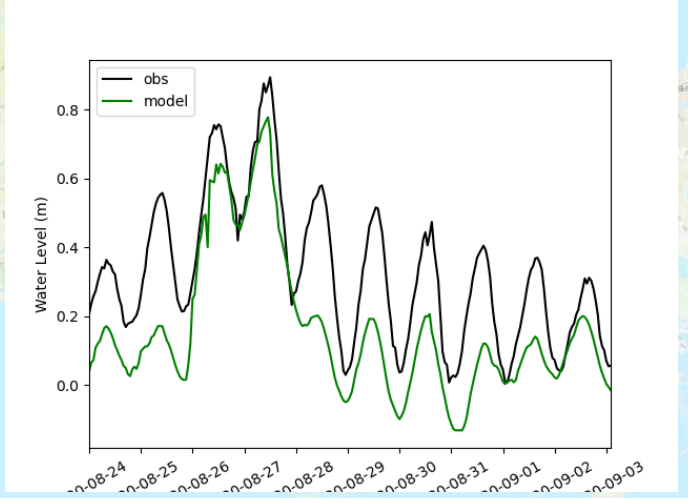




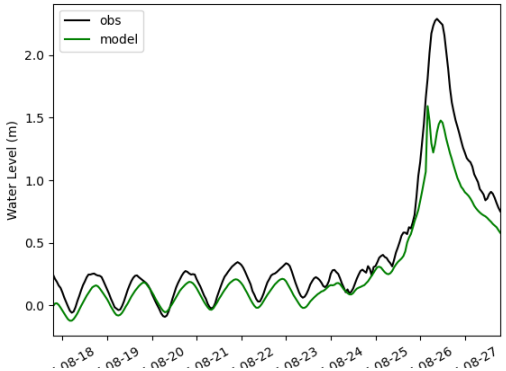
Hurricane Laura (2020)

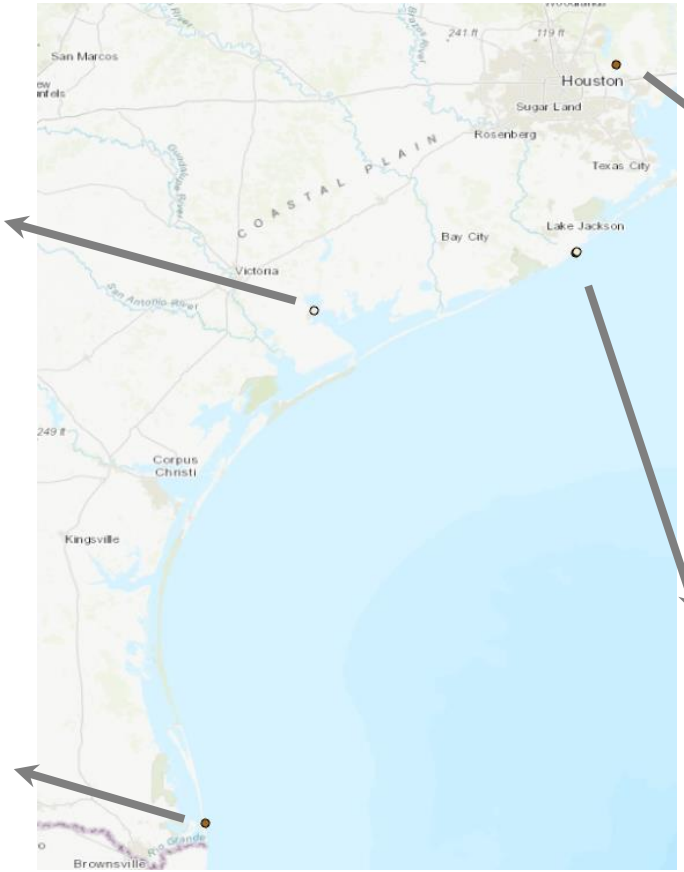


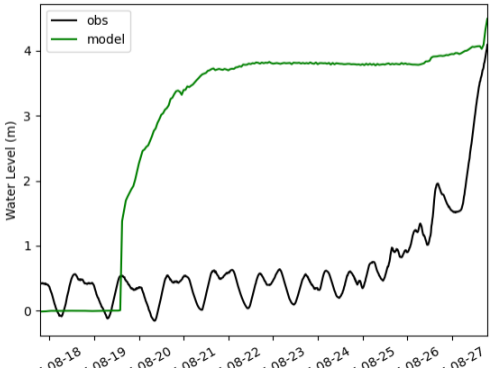


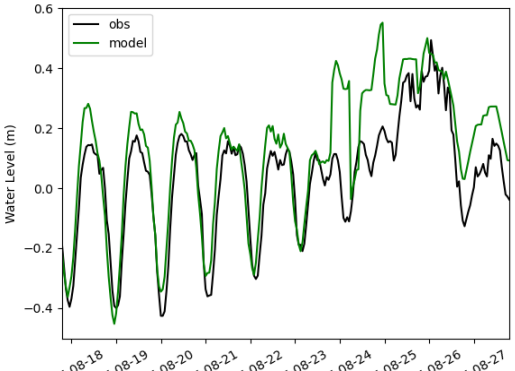


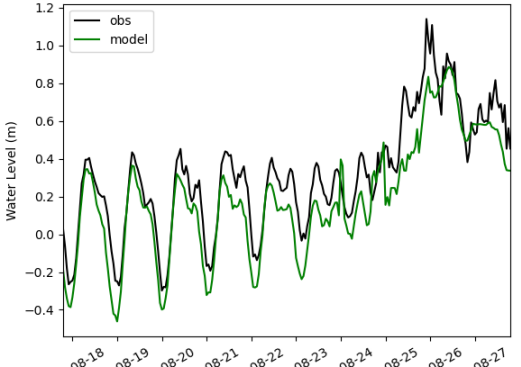
Hurricane Harvey (2017)











Summary

- Addressing a critical forecasting gap, NWM v3.0 will feature the first implementation of a TWL forecast capability
- SCHISM, which resolves processes across multiple spatial and temporal scales, will operate along the East, Gulf and Pacific coasts, in PR/VI, and in HI
- Currently working on improving the accuracy of the results

Thank You!

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