Enhancing Flood Resilience: A Real-time Flood Forecasting Model for the Upper St. Johns River Basin

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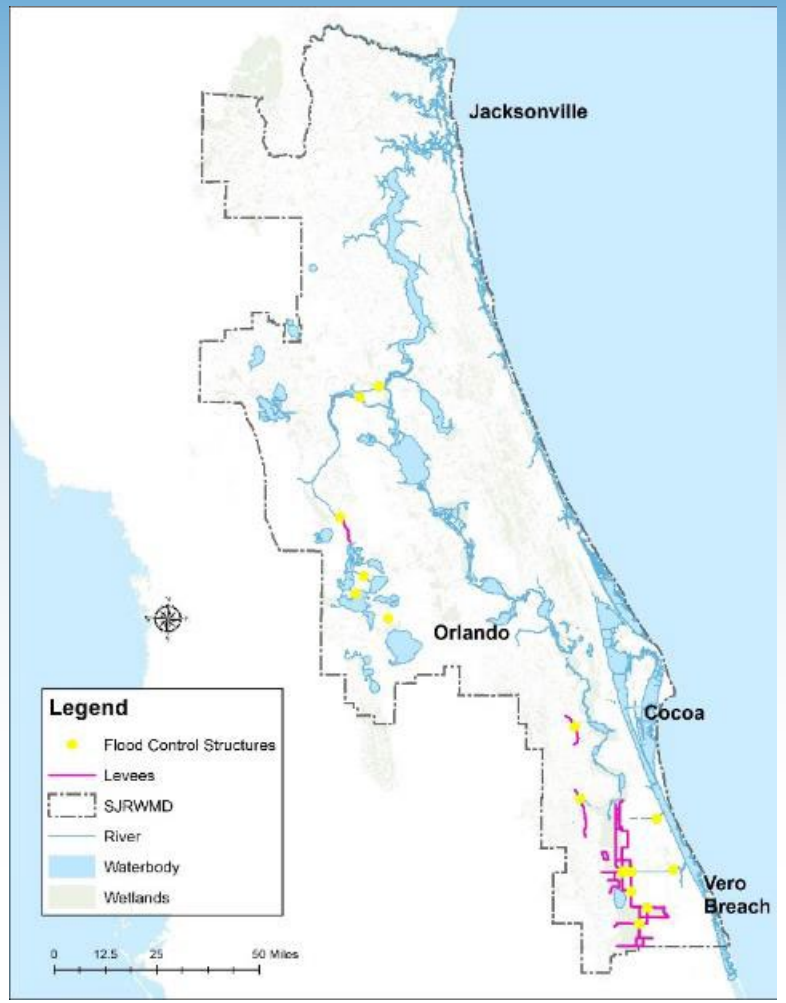
SJRWMD Flood Protection

- Provide flood protection to headwaters and downstream
- Basin-wide flood forecasting model to assess flood risk and improve resiliency
- Support other core missions



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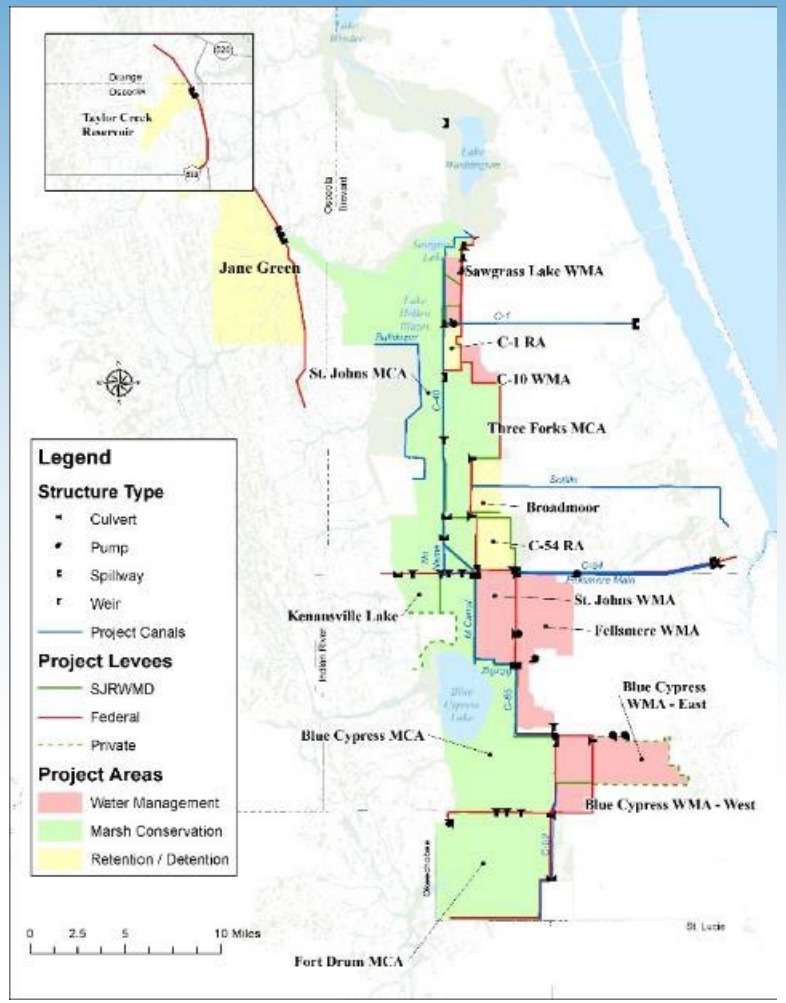
Upper St. Johns River Basin Project

- Project covers 160,000 acres and includes over 100 miles of levees and dozens of water control structures
- Multiple benefits, including flood protection, water quality improvement, wetland enhancement, and reduction of freshwater discharge to the Indian River Lagoon



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Real-Time Flood Forecasting Model

Data Acquisition

- Weather Forecast
- Real-Time Stage
- Real-Time Gate Operations

H&H Model

- Upper St. Johns River Basin ICPR4

User Interface

- Web Portal
- Flood Mapping

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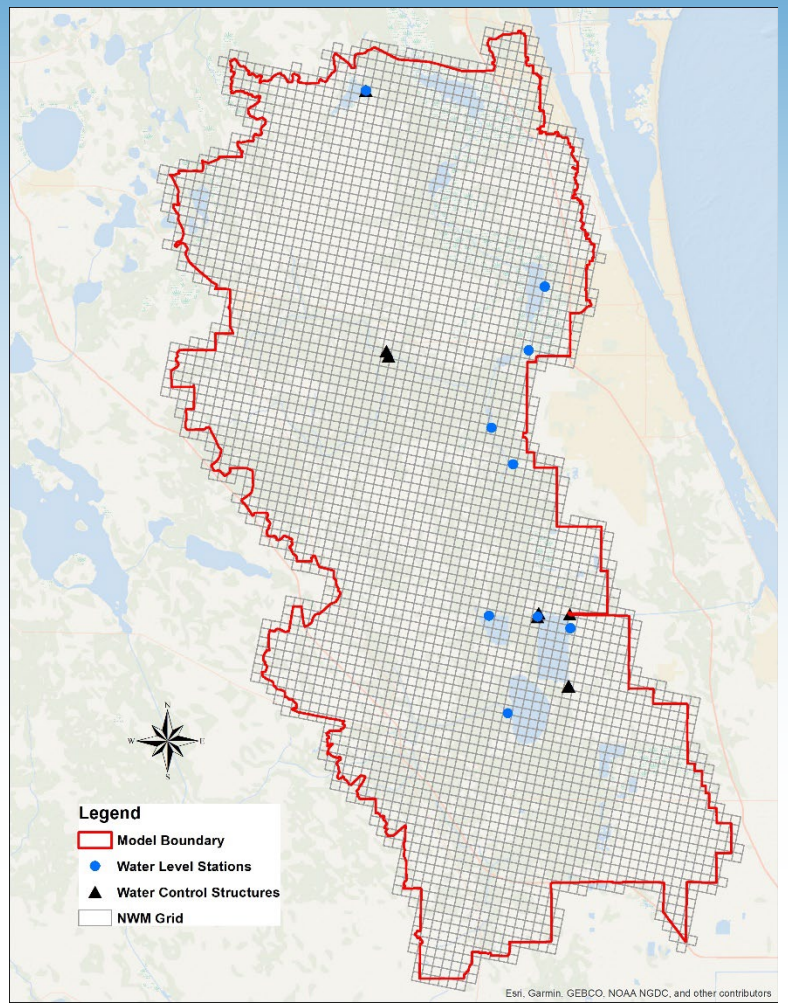
Data Acquisition

- National Water Model rainfall forecast
- USGS and SJRWMD stage data
- SJRWMD water control structure gate operations



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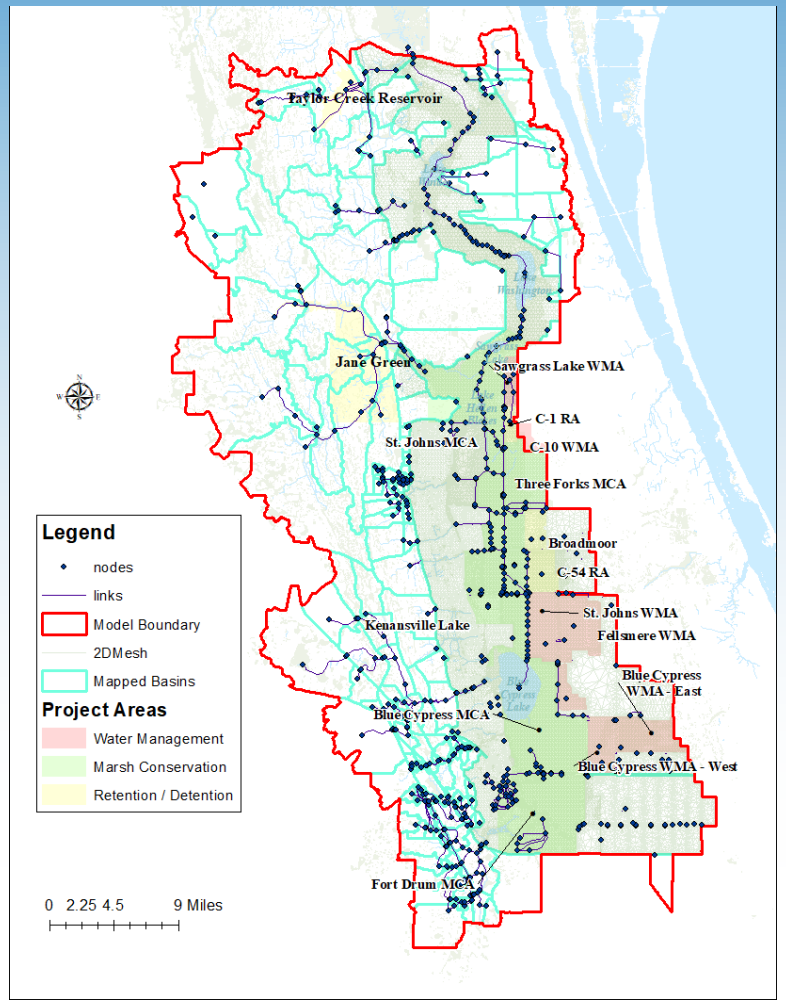
USJR ICPR4 Model

- Combination of 1D/2D overland flow
- Model domain: 1,333 sq. mi.



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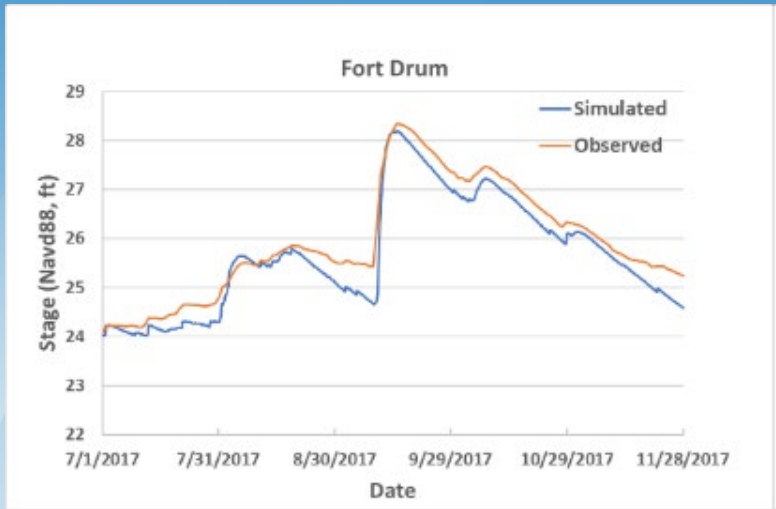
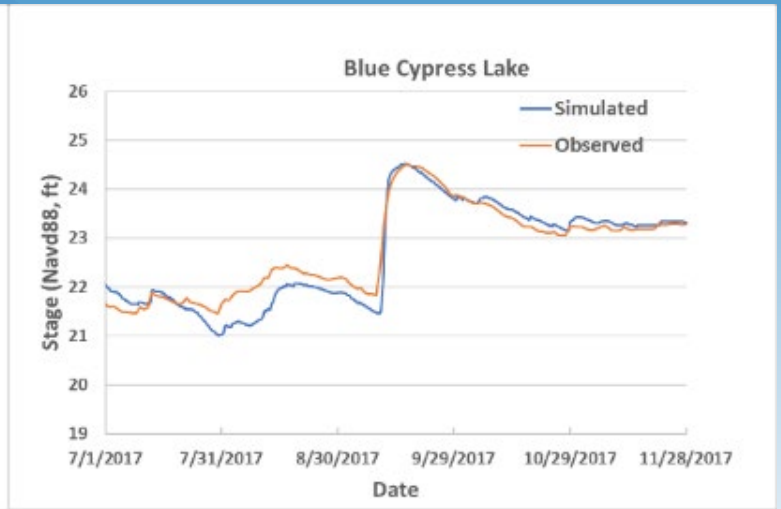
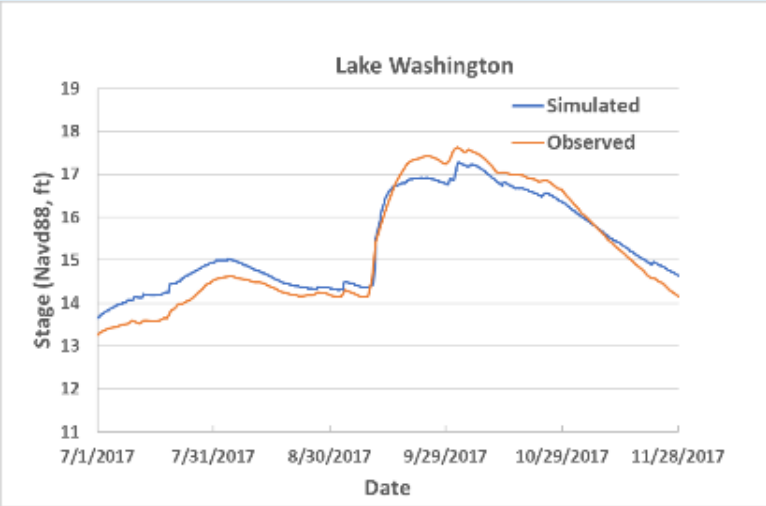
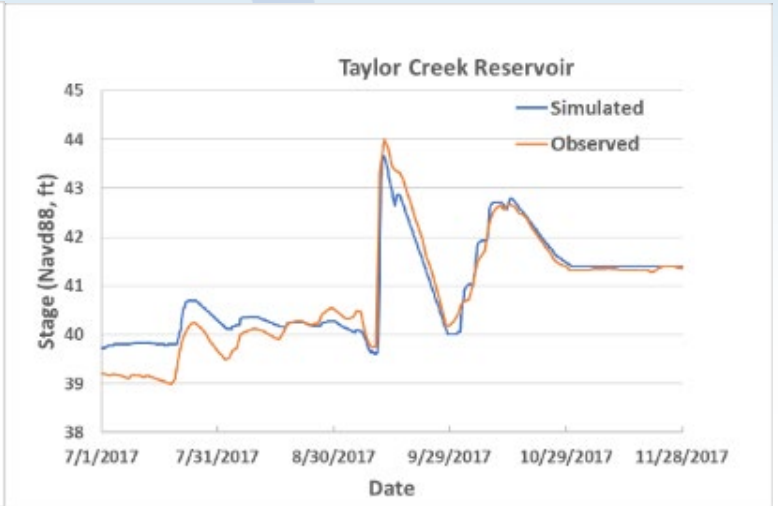
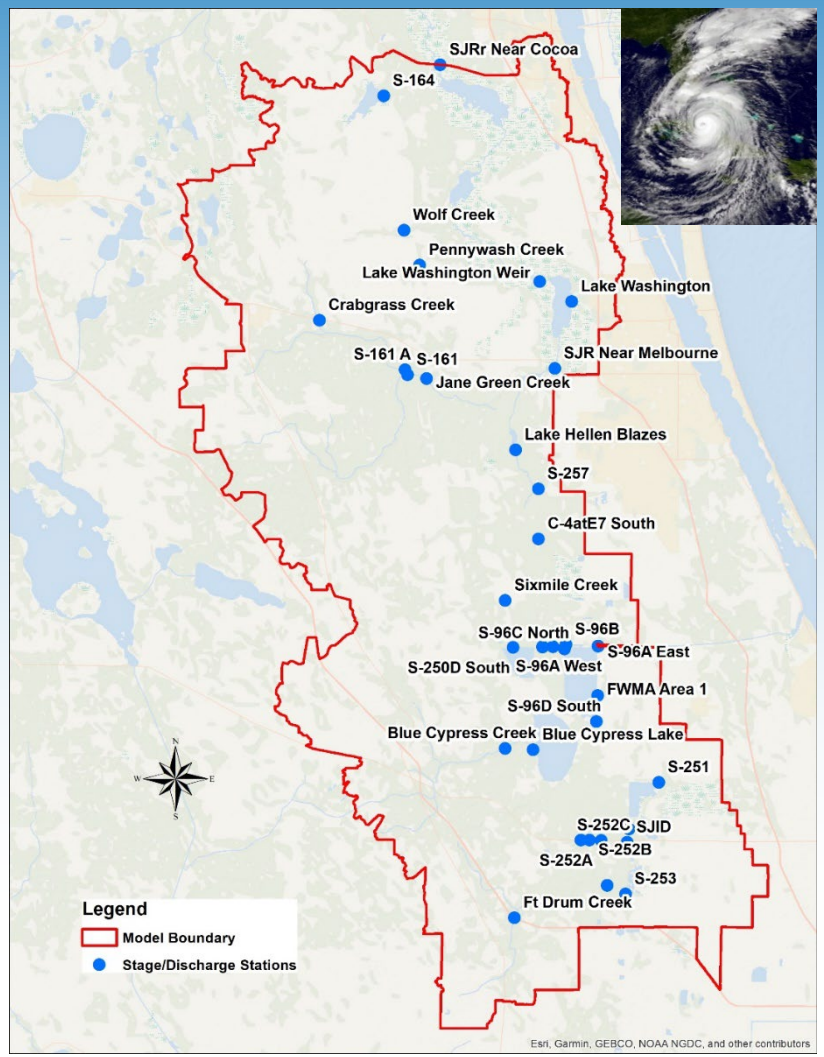
Model Calibration and Validation











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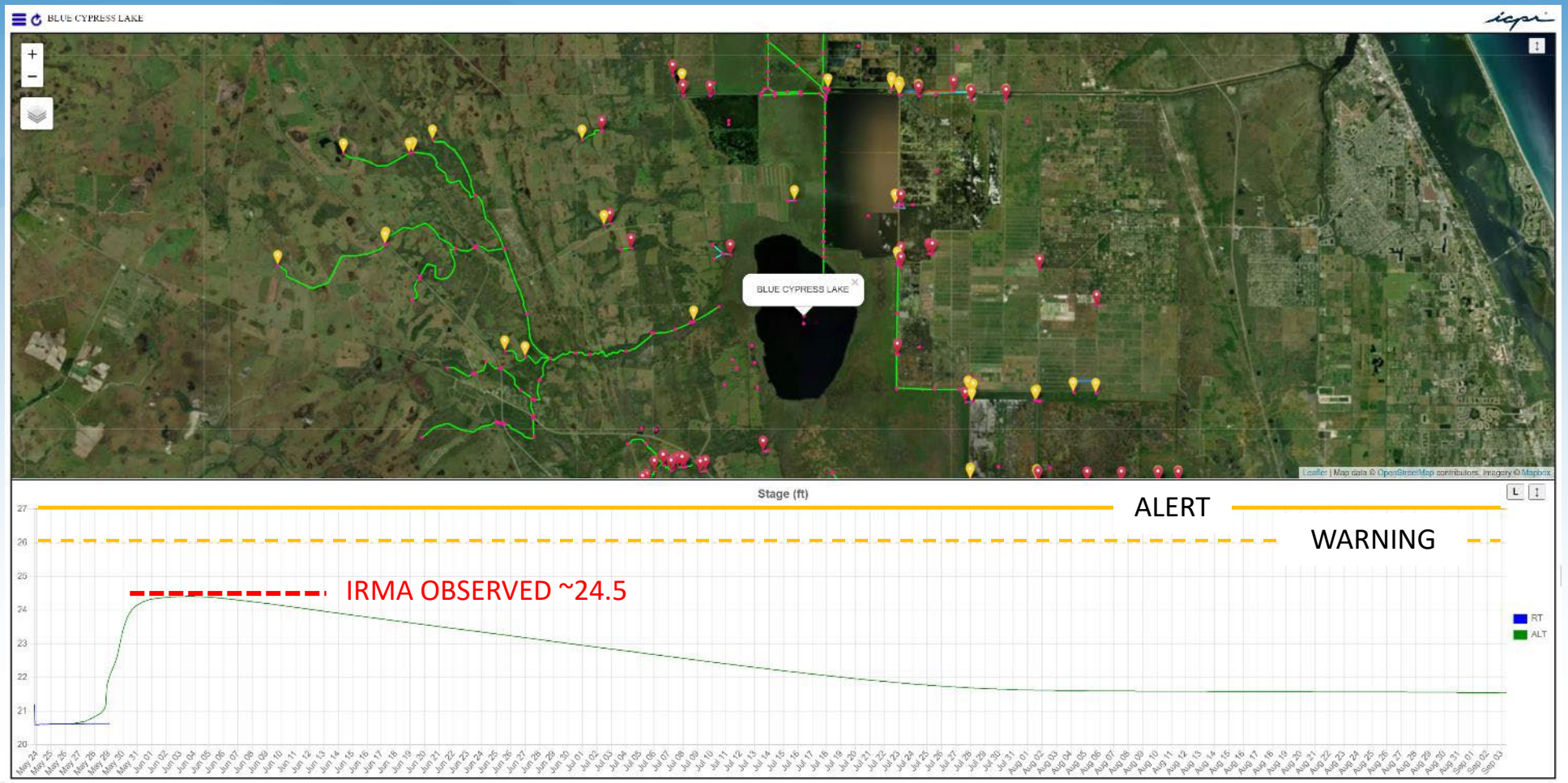
RTFF Web Portal



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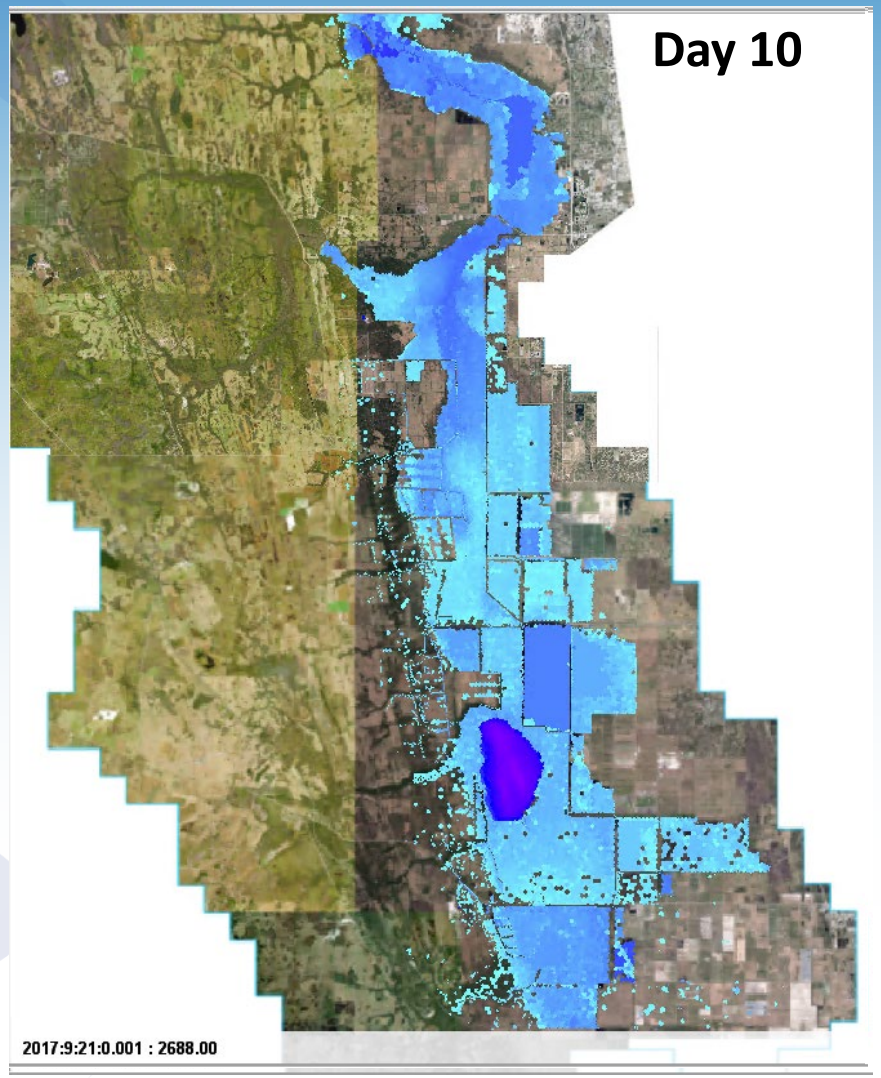
https://live.icpr4.com/?p=sjr

Flood Inundation Maps



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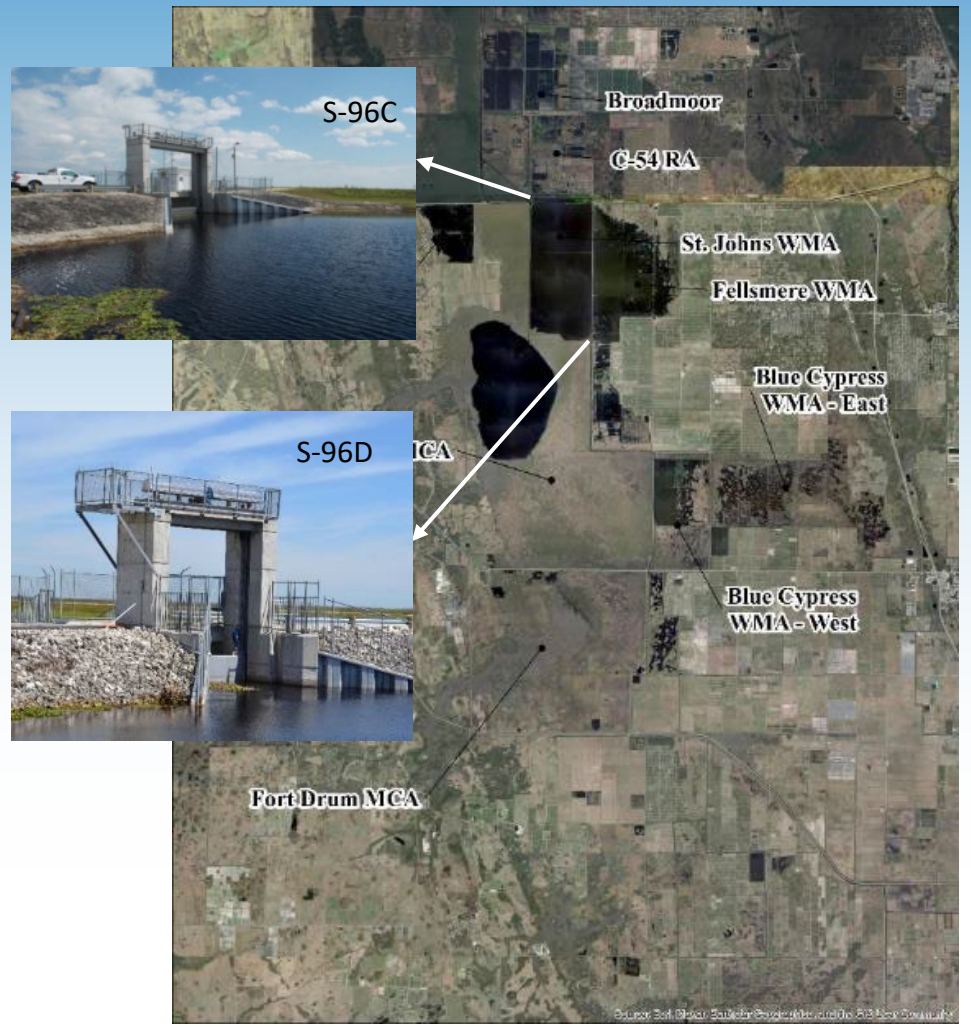
Flood Assessment

- System resiliency from rainfall and operation scenarios
- Conceptual design for flood control and water diversion projects



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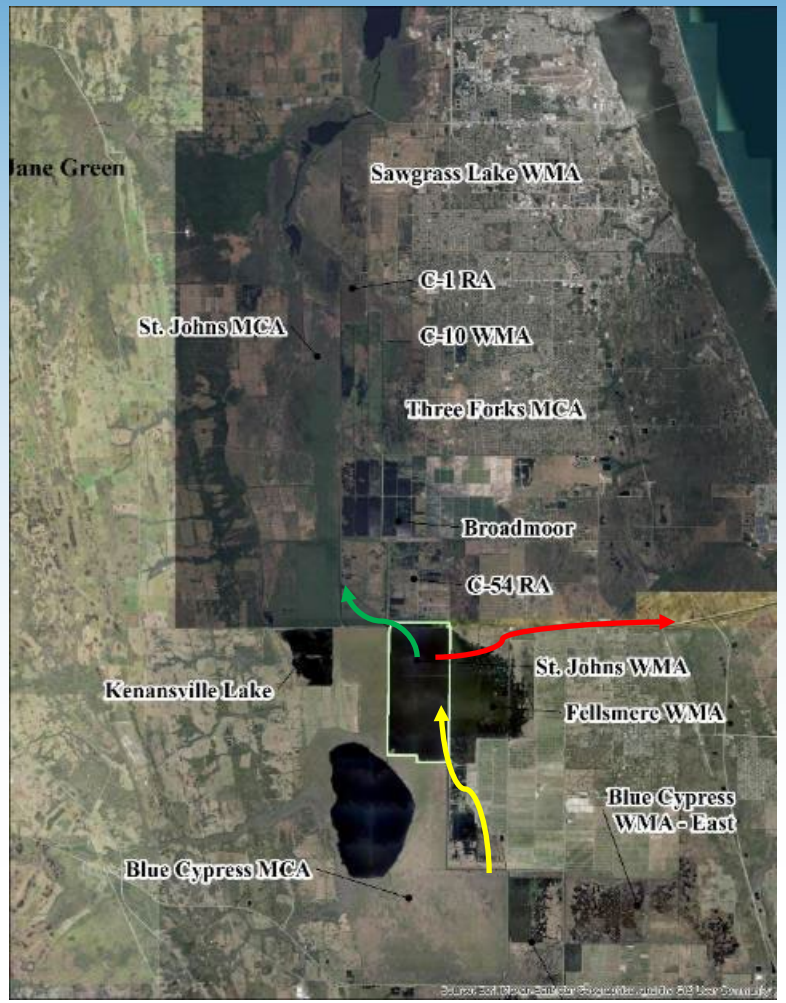
Structure Operations

- Optimize operations for flood mitigation
- Downstream flood protection



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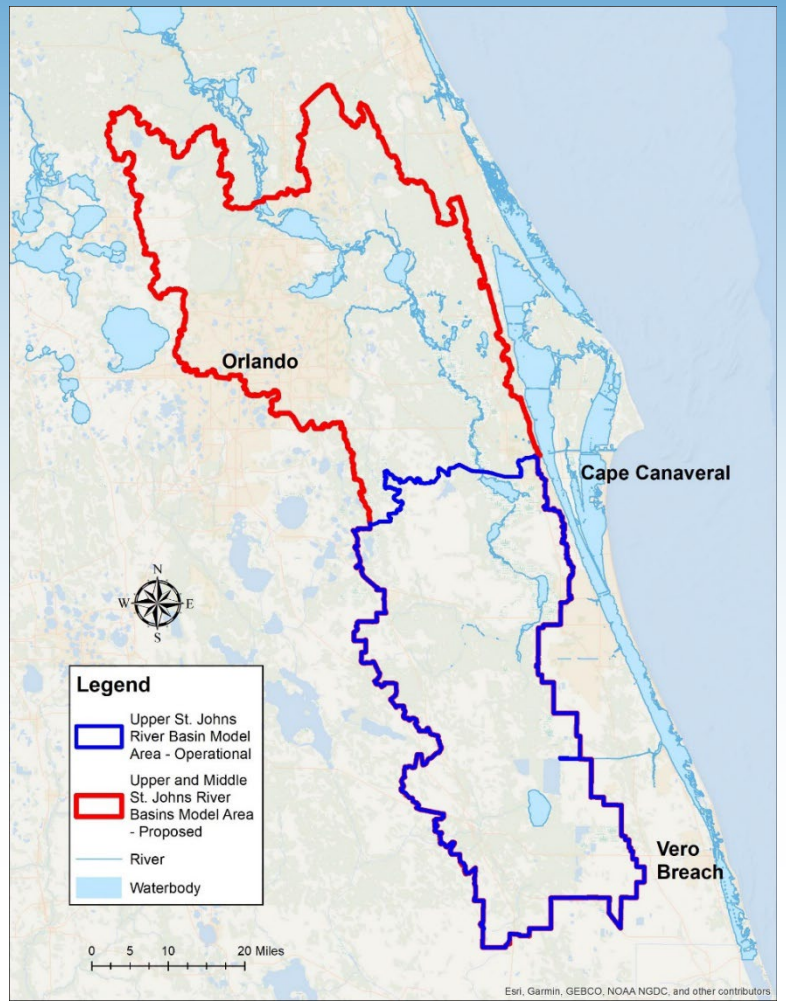
RTFF Model Expansion

- Resilient Florida Grants
- Enhance flood forecasting and resilience across the Upper and Middle St. Johns River basins
- Expected completion 2027



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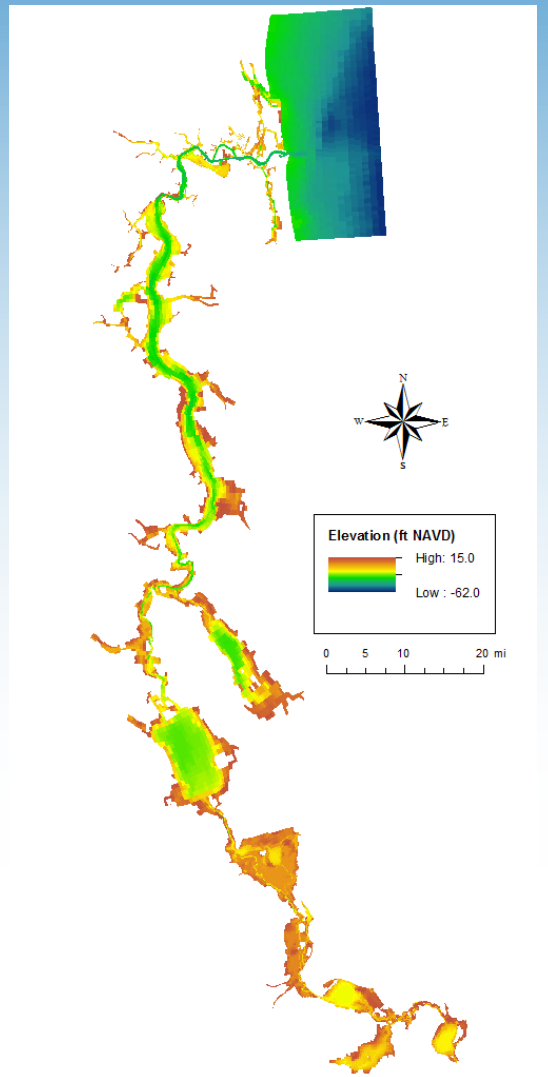
Lower and Middle St. Johns River Flood Forecasting Model

- Predict flow and stage along the mainstem, including nearby floodplain under 15 ft NAVD
- Provide downstream stages for the ICPR4 RTFF model
- Evaluate compound flooding due to rainfall and storm surge
- Expected completion 2027



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