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"Preliminary Design and Development of a Coupled Water Resources Resiliency Model of the St. Johns River Watershed Florida, USA"

Companion Slides prepared for the 4th International E-Conference on Water Sciences sponsored by MDPI, November 2019

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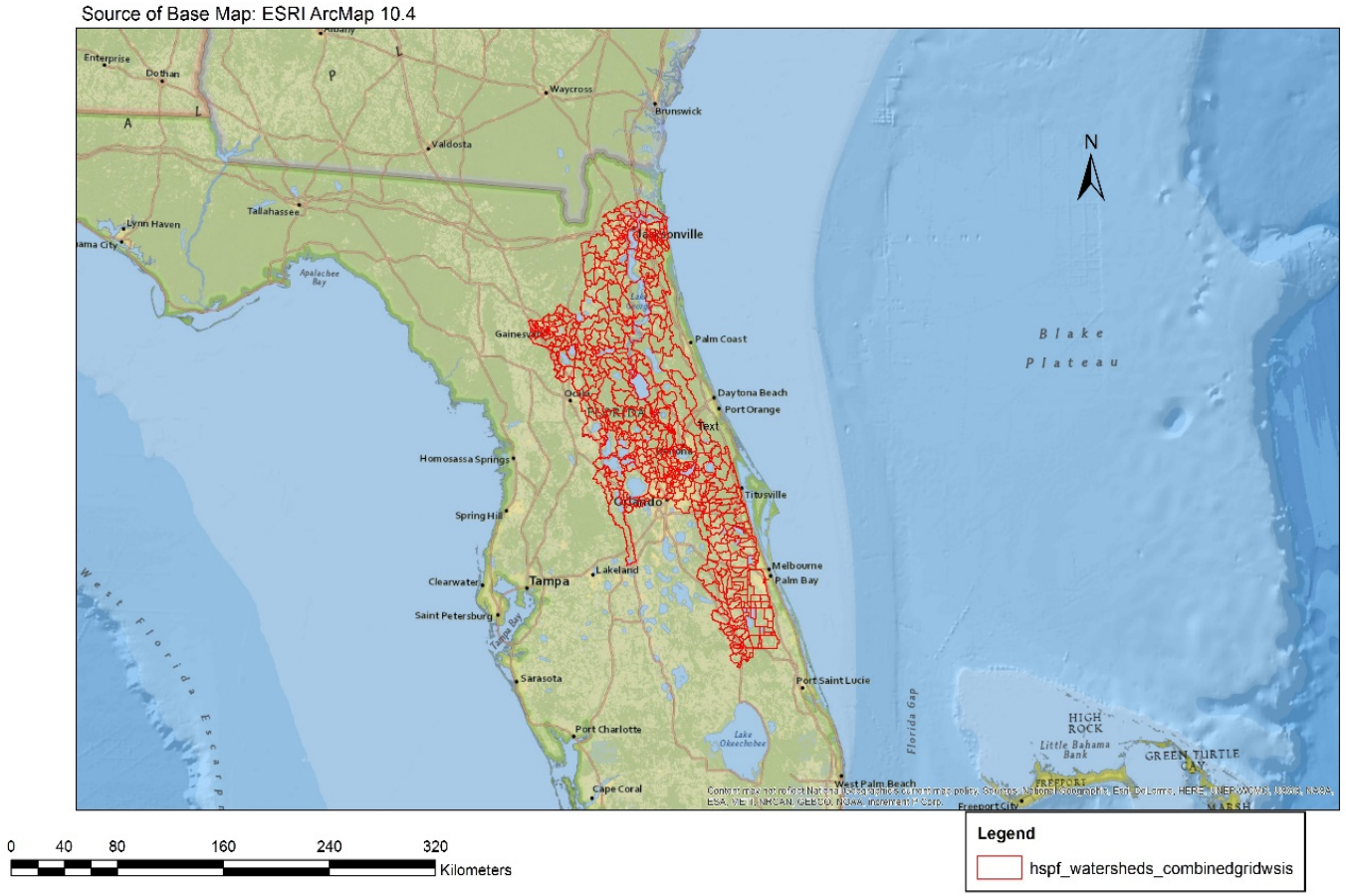
Preliminary Model Development Effort

- A system of models to simulate the entire St. Johns River Watershed.
- This is a companion presentation for paper by Brown et al.
- General conclusion of the study is that for large watershed models the overall size and complexity lends themselves to simulations requiring extensive computational resources, most likely using a Supercomputing Cluster.

Preliminary Model Development Effort

- General project Study Area of the St. Johns River in Florida, USA:



Preliminary Model Development Effort

- General Methods Used:
  - First, the research team developed an ocean and hydrodynamic model using ROMS.
  - Second, the hydrodynamic model was linked to a series of hydrologic models developed using HSPF, HEC-HMS and possibly SWMM.
  - Third, an ADH (2D model) has also been developed in order to consider a smaller ROMS model domain to reduce overall model run-times.

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Preliminary Model Development Effort

- How about some results ?

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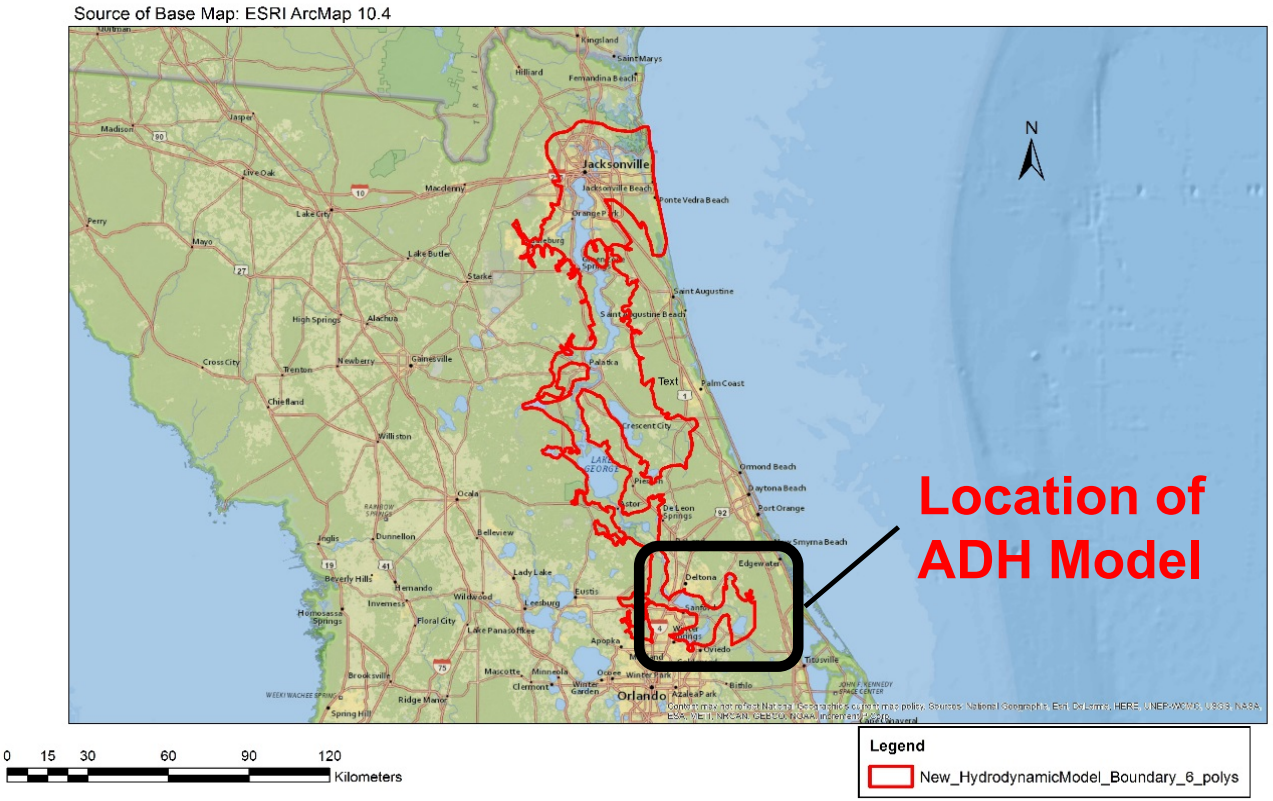
- Initial estimate of hydrodynamic model domain:



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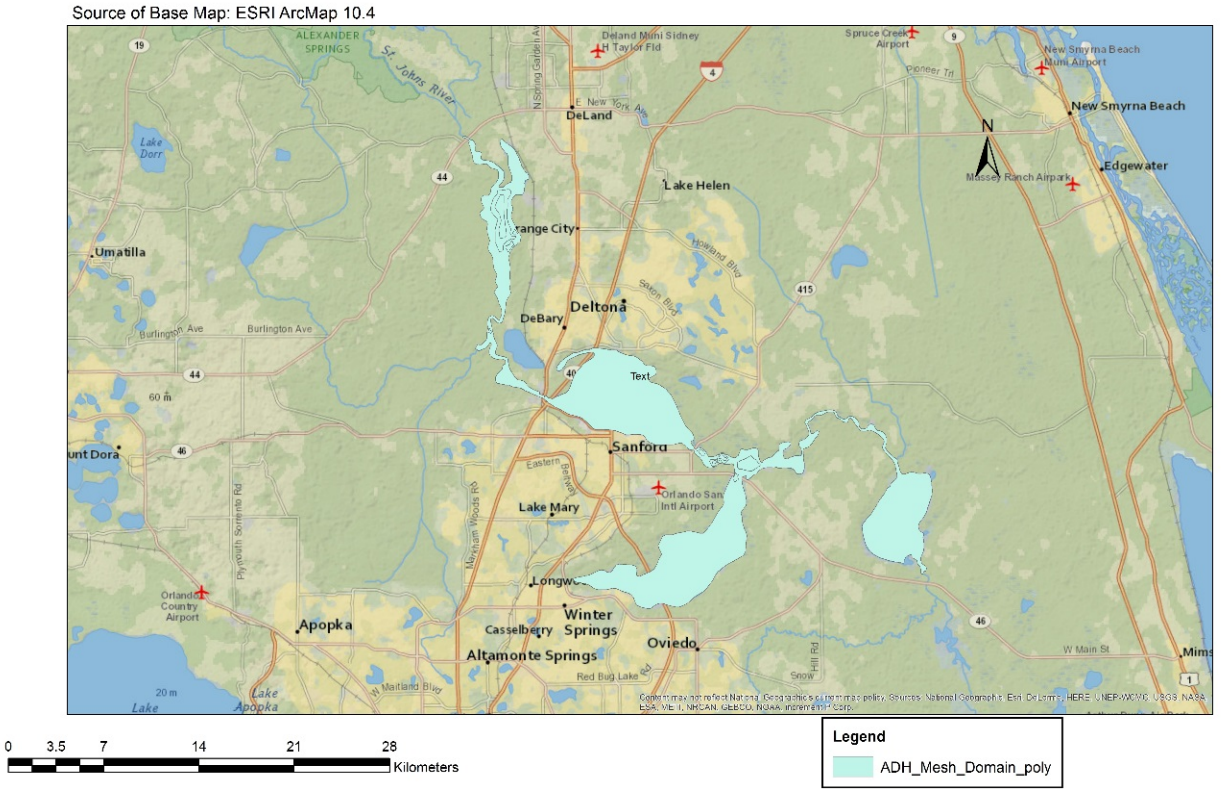
Preliminary Model Development Effort

- Extent of ADH Model Domain (Middle St. Johns River Basin):



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Preliminary Model Development Effort

- Initial Computational Resource Estimates:
  - Ocean and hydrodynamic Model – 2 weeks to 3 months using 256 processor supercomputing cluster;
  - ADH Model – 18 hours to 1 week depending upon simulation model duration and number of processors; and,
  - Hydrologic Models (HSPF, HEC-HMS) – 0.5 hours to 4 hours depending upon simulation model duration and number of processors.

Questions

- Thank you for the opportunity to provide this presentation.

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