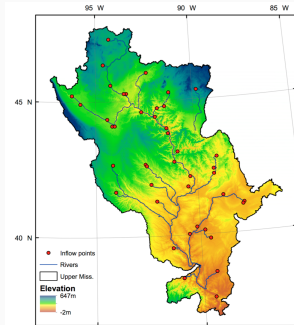


SWOT data assimilation: Upper Mississippi case study

Kostas Andreadis

SWOT Science Team Meeting, 28 June 2017

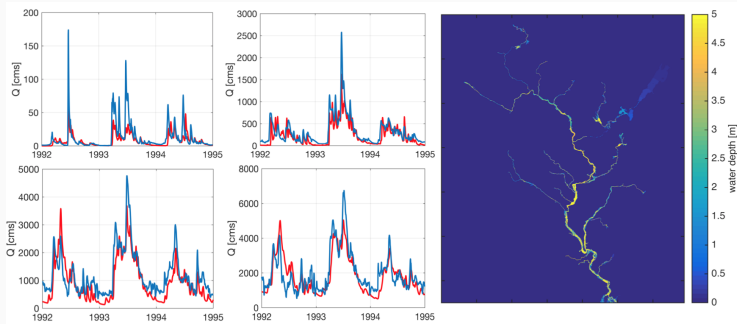
Experimental design



- Coupled VIC and LISFLOOD-FP models
- 1 km resolution simulations
- Identical twin synthetic experiment
 - Benchmark simulation (Truth)
 - Open-loop simulation
- Downscaled Truth-simulated WSE (1 km to 30 m) to run through the Instrument Simulator

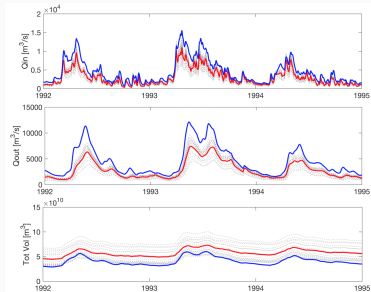
Benchmark simulation

Streamflow comparison between LISFLOOD-FP and USGS measurements

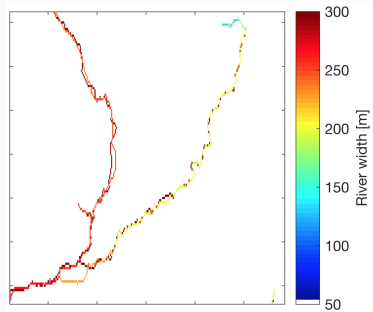


Model errors

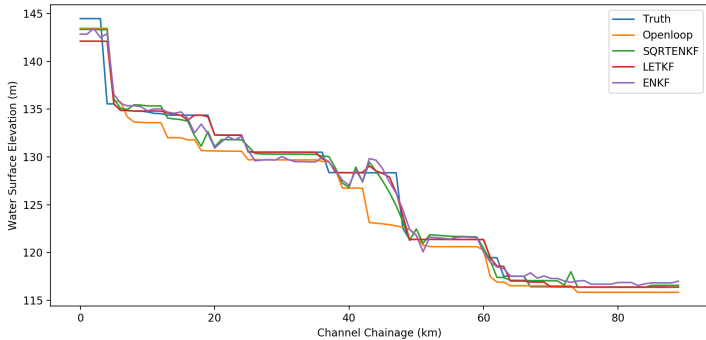
- Errors in inflows, bathymetry, roughness, cross-section shape



- River topology (and channel width) errors



Comparison of Kalman Filter algorithms



Next steps

- Dynamic localization functions within assimilation window
 - Lagrangian coordinates
- Hydraulic geometry as regularization term
- Expand assimilation experiment to Arkansas River basin
- Evaluate sensitivity of estimates to observation errors
 - Layover
 - Wet troposphere
 - Classification
- Explore parallelization techniques for LISFLOOD-FP