Water availability in Coastal Carolinas (SWAT) and NC SPARROW modeling

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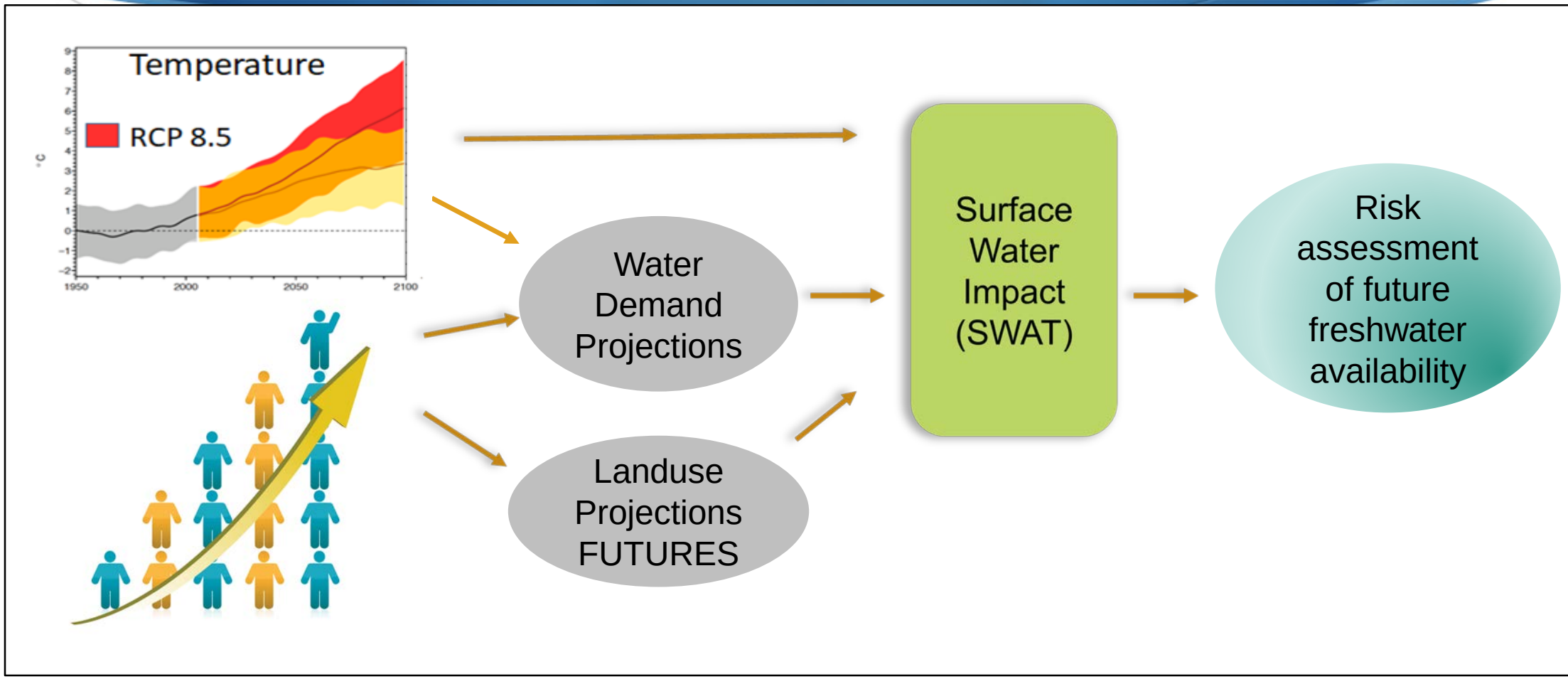
Goals for two USGS Projects

- **Coastal Carolinas Focus Area Study (CC FAS).** The project is funded through the USGS Water Mission Area, Water Census Program
  - We needed a model suited for decision analysis, not an 'operational' model' to quantify streamflow sensitivity to specific projected changes in Water use, Climate change and Urbanization
- **SPARROW Modeling for North Carolina Watersheds.** This project is a collaboration between USGS and North Carolina DEQ – Division of Mitigation Services.
  - The modeling supports needed information and tools that provide a scientific basis for identification of watersheds where targeted restoration efforts will most likely have the greatest benefit.

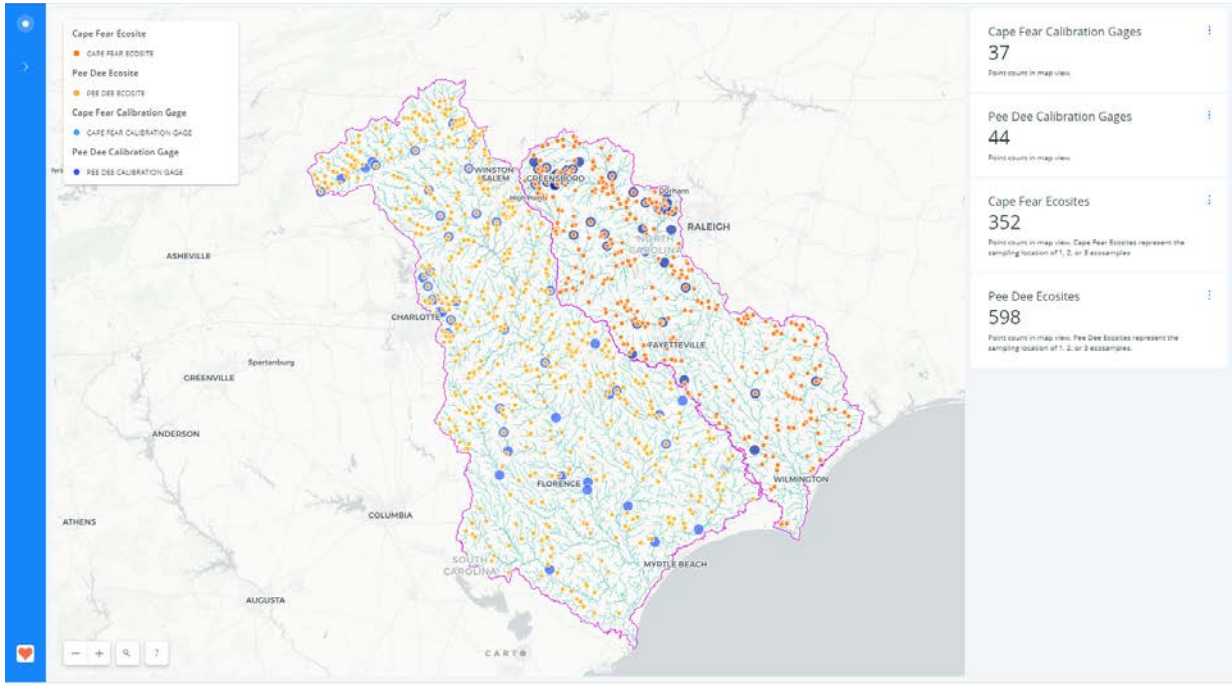
CC FAS: Data and process flow



CC FAS: Scope of products

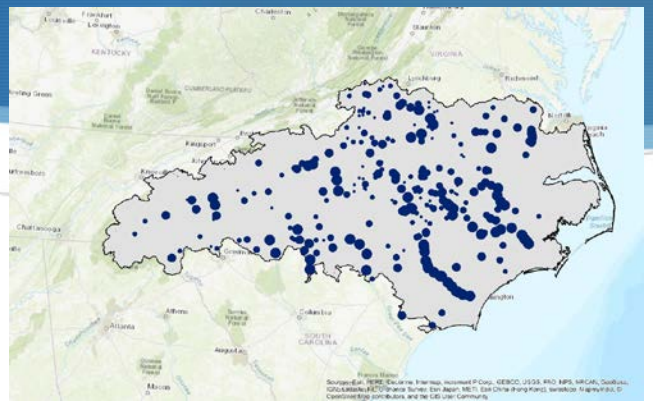
- Models represent roughly 30% of the area of North and South Carolina
  - Two HUC4 scale models -- Cape Fear River basin (9,100 sq mile) Pee Dee River Basin (18,000 miles)
  - Total modeling area extent (27, 000 sq km)
  - 8,606 subbasins (average 2 sq mi)
  - Seven NLCD landuse categories (urban, forest, wetland, agriculture and others)
- Temporal scope

  The models perform hydrology and plant growth simulations at a daily timestep for up to 20 years.
  - Period of calibration 2000 – 2014
  - Period of future simulation 2055 – 2065
  - Period of historic (climate only) simulation 1988 – 2000



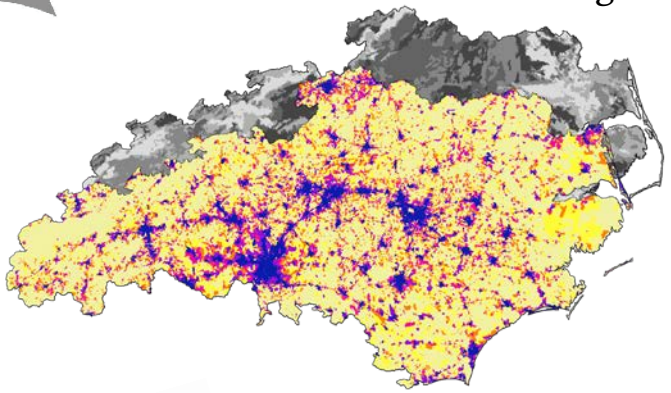
NC SPARROW: Data and process flow

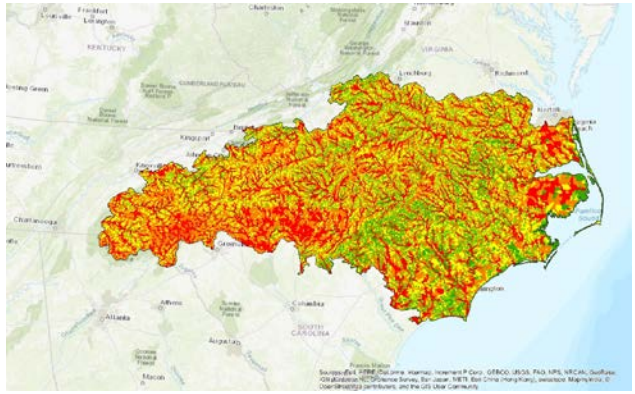
We are applying the USGS SPARROW (SPAtially Referenced Regression On Watershed attributes) to investigate the correlations between water quality and quantity and anthropogenic activities in North Carolina



> 200 water quality stations in North Carolina

Explanatory variables capture the impact of source information such as the intensification of agriculture

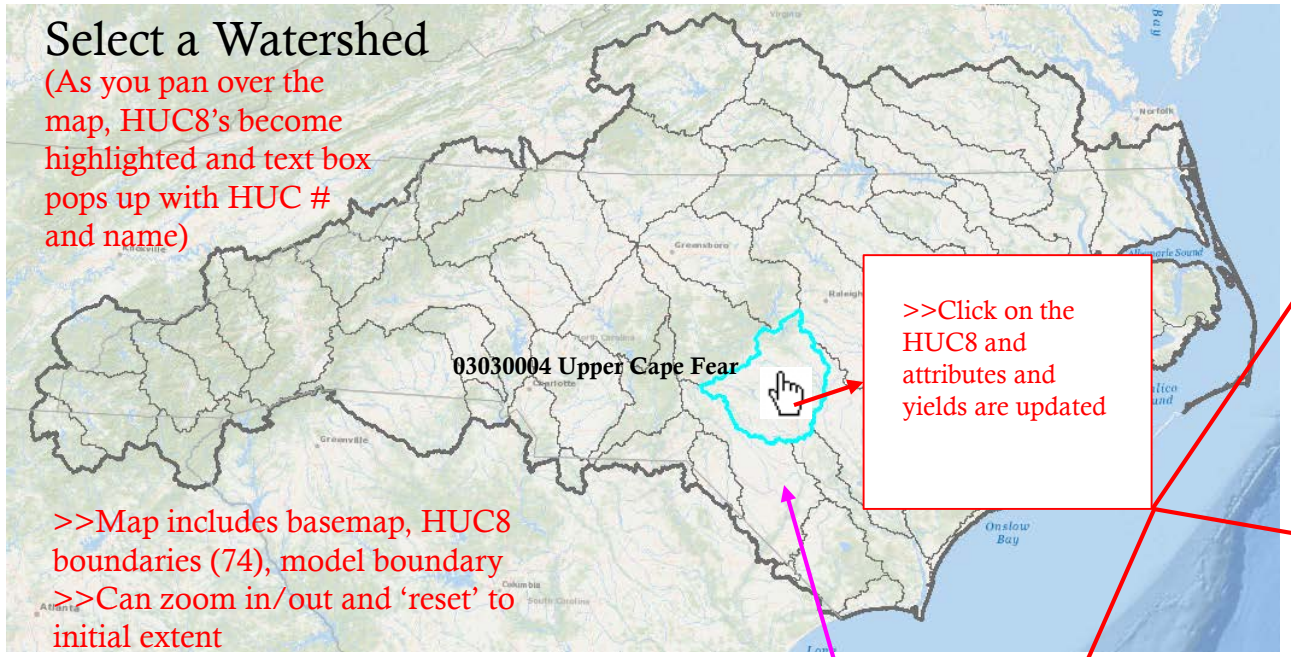




Predictions include projections of the intrinsic variation in contamination potential which can improve targeting and assessment tools for decision makers.

North Carolina SPARROW Dashboard

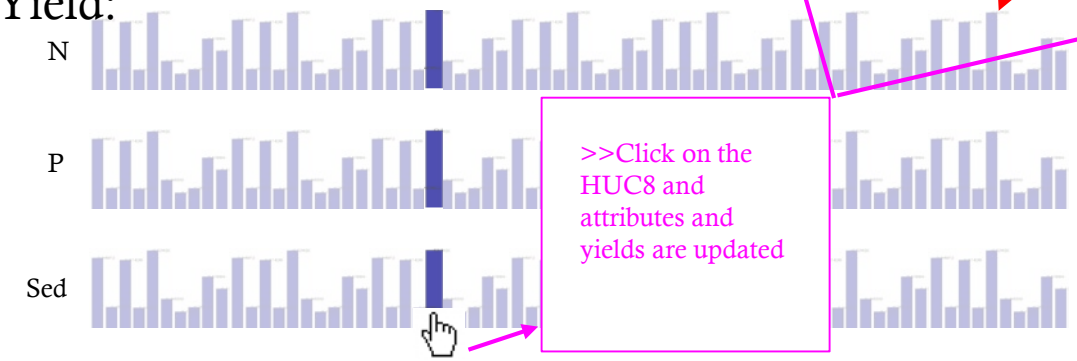
NC/HUC8 Overall Summary

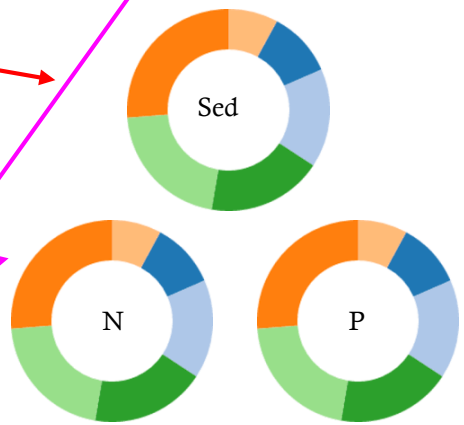


HUC8 Attributes

HUC Name:
HUC Number:
Area:
other?:

Identify Watershed by Yield:





<explanation of colors on donuts>

Conceptualization of NC SPARROW web-based decision support tool

Use and Integration

- All data from both projects will be made available to the public in FY19. This includes the models used to derive predictions.
- To stay informed on upcoming data releases or reports contact USGS (agarcia@usgs.gov)
- Websites
  - CC FAS: https://webapps.usgs.gov/watercensus/coastalcarolinas_fas/index.html
  - NC SPARROW: https://www.usgs.gov/centers/sa-water/science/sparrow-modeling-north-carolina-watersheds?qt-science_center_objects=0#qt-science_center_objects

Available product: Geomorphological features of North Carolina

Rowley, T.H., Hopkins, K.G., and Terziotti, S., 2018, Geomorphological Features of North Carolina: U.S. Geological Survey data release, https://doi.org/10.5066/P9PRAVAQ.

Questions?

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