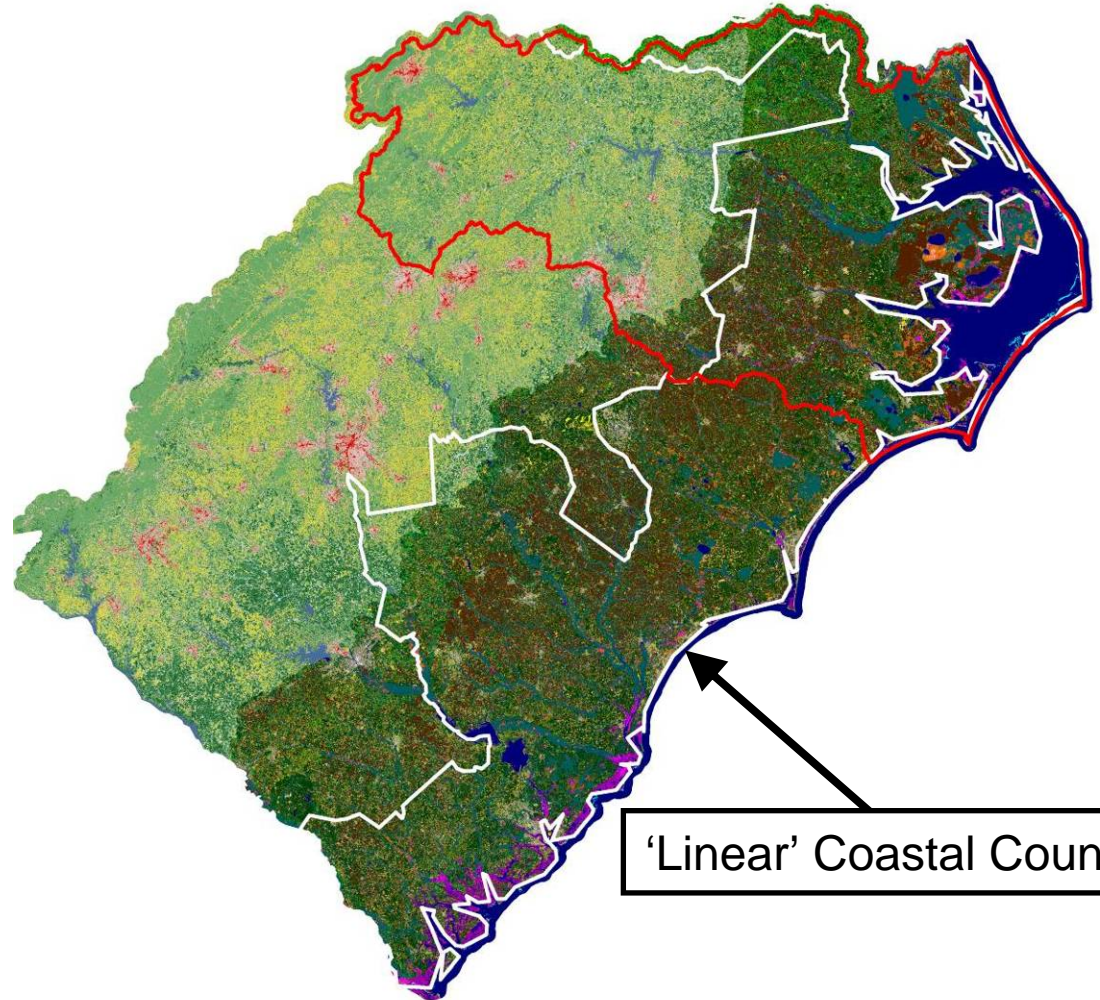


The EPA/ORD Ecological Research Program
Coastal Carolinas
Ecosystems Services Initiative
Planning Workshop
July 9th, 2008

Dorsey Worthy
EPA/ORD
Lead for Coastal Carolinas

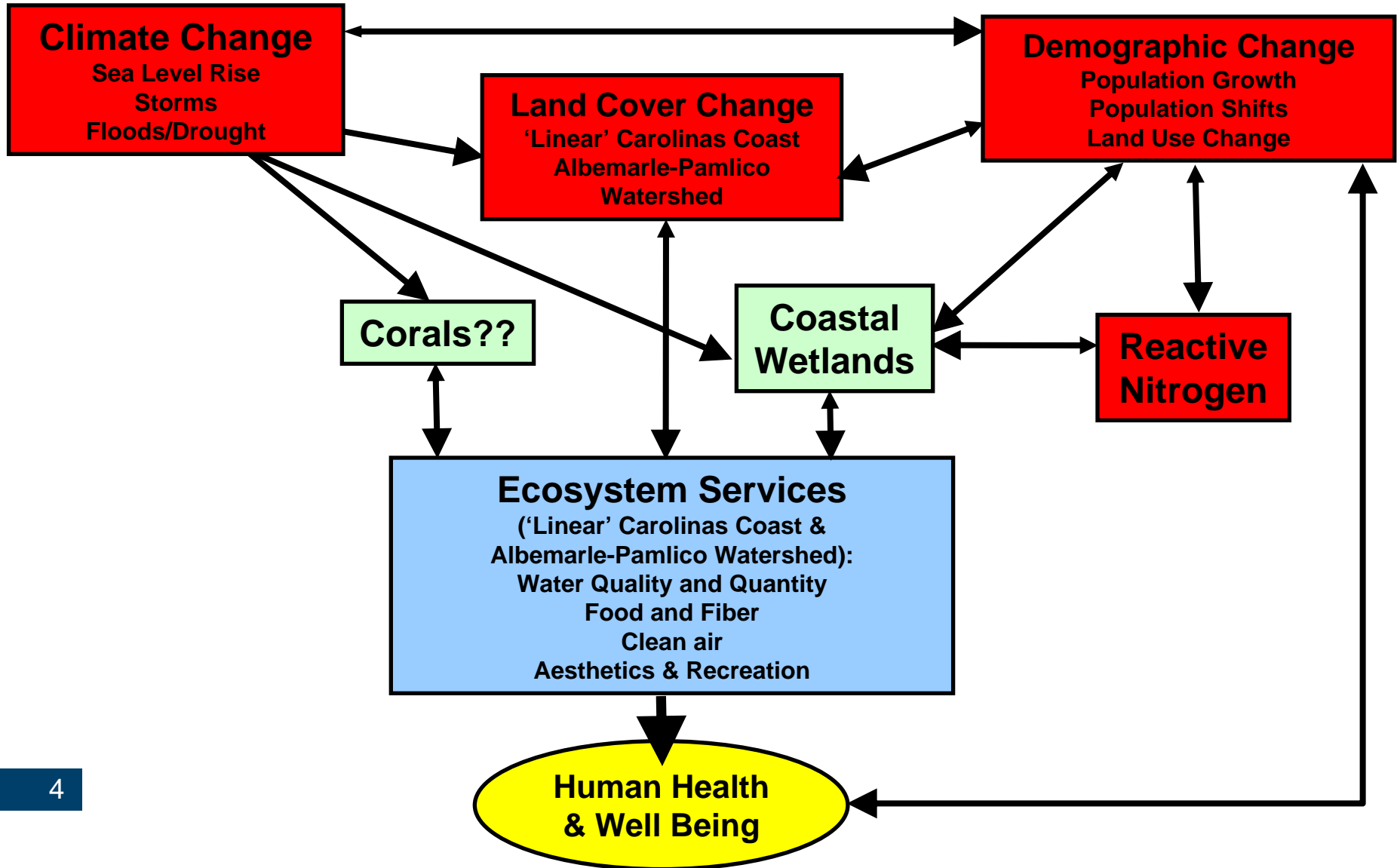
The Coastal Carolinas Research Area (Albemarle-Pamlico Estuary Watershed in red)



'Linear' Coastal Counties

WHAT Do We Propose To Do?

- **Account for the type, location, extent, and quality of the goods and services provided by North and South Carolina coastal ecosystems**
- **Establish the links between ecosystem condition, the drivers of change in condition, including human activities and changes in global climate, and the quality and quantity of the services provided**
- **Develop links for both the immediate ‘linear’ coast of North and South Carolina, and the effects on coastal areas from upstream portions of the Albemarle-Pamlico Estuary watershed**
- **Develop scenarios of future coastal ecosystem condition and associated services under a variety of possible climate change and human land uses**
- **Incorporate this information and these linkages into a decision-support system to fully account for the impact of land use choices and other changes on the services we receive from coastal ecosystems.**



Albemarle-Pamlico Watershed (MODIS) Regional Scale Landcover Analysis – Fine-scale change detection

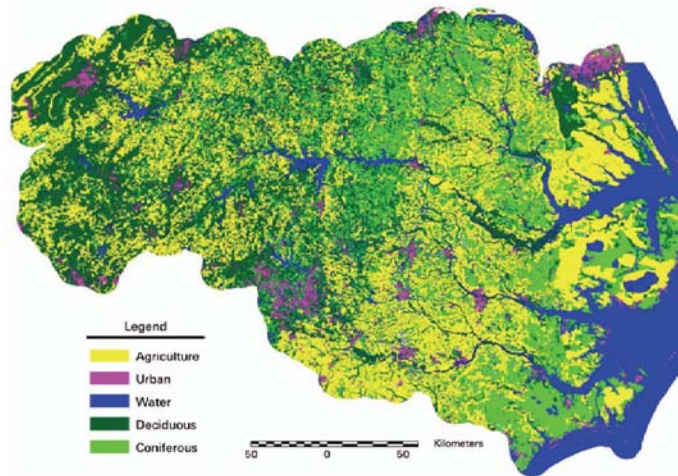
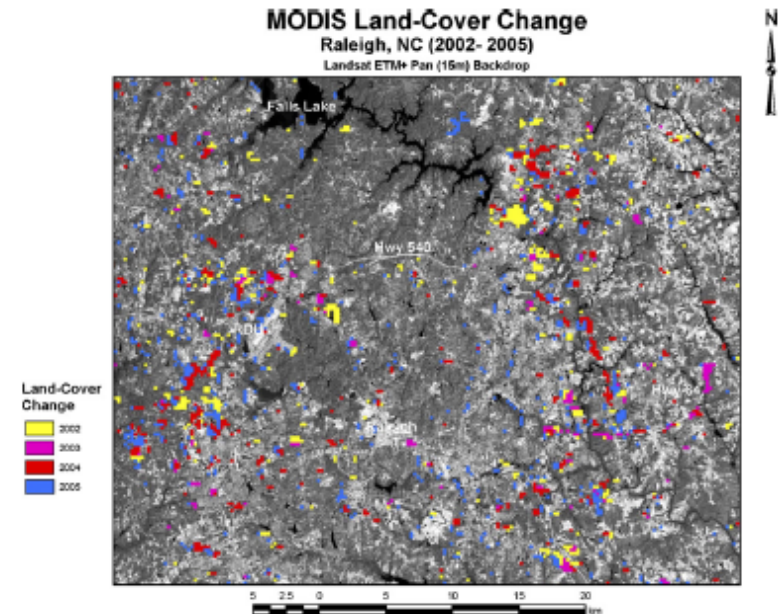
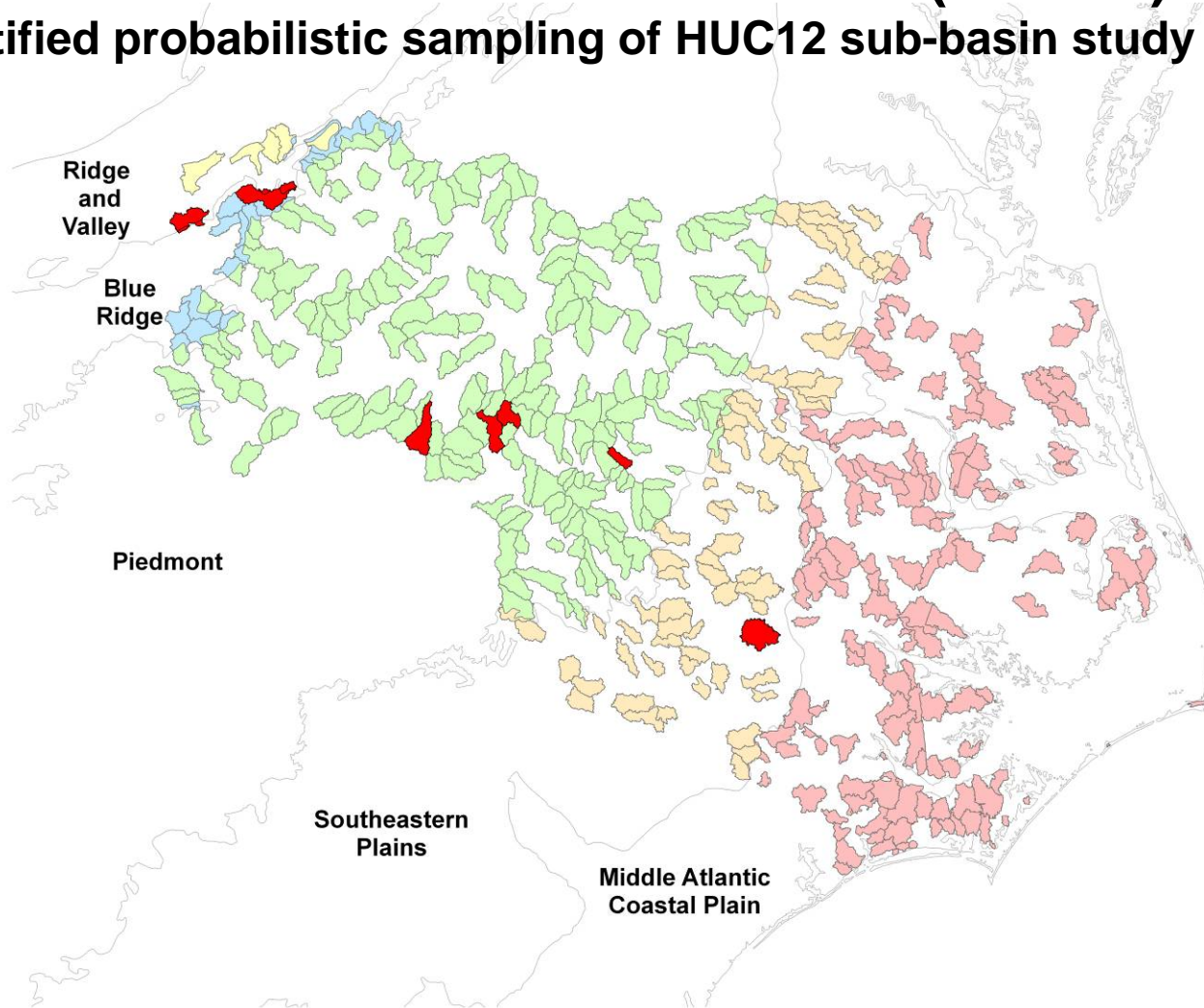


Fig. 7. The final APES land cover classification.



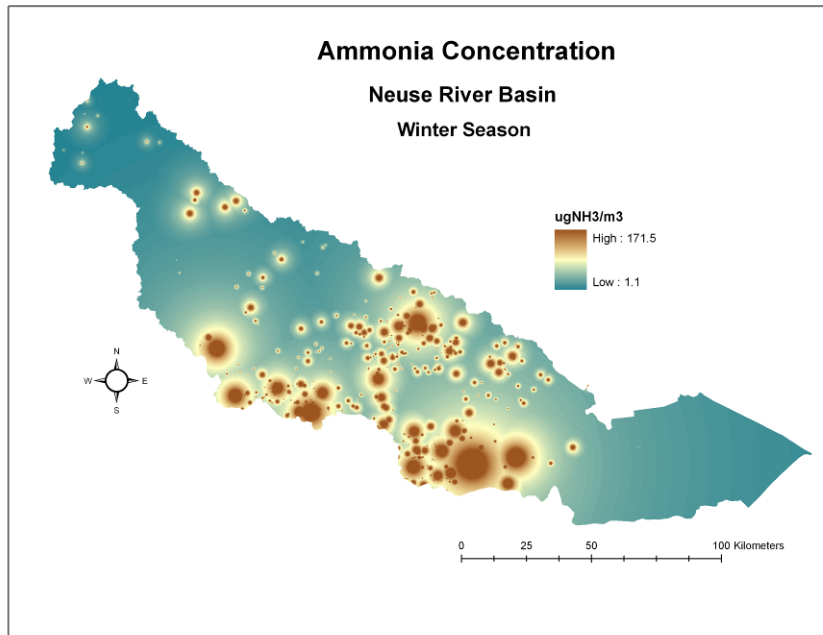
APES Headwater Watersheds (HUC12)

Stratified probabilistic sampling of HUC12 sub-basin study sites



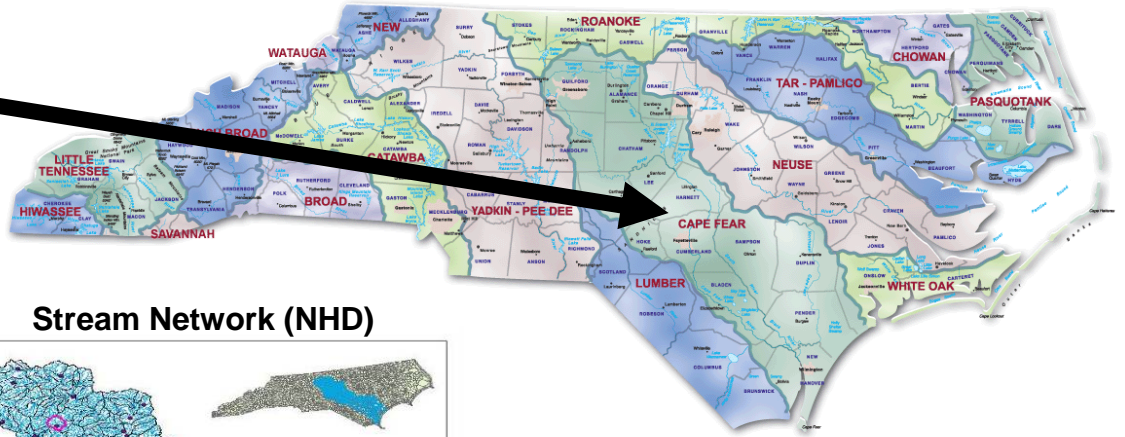
Nitrogen – NH₃ Exchange

Preliminary results – Do Not Cite

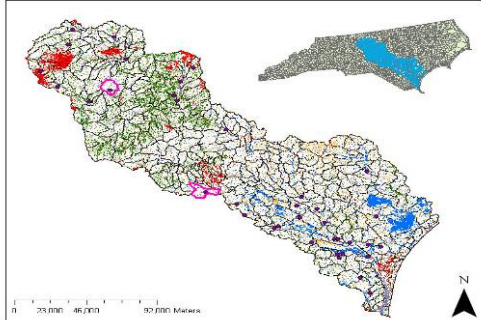


- NRMRL/APPCD
- GIS-based Ground level NH₃ emission/ deposition model
- Concentrated animal operations
- Integration with CMAQ

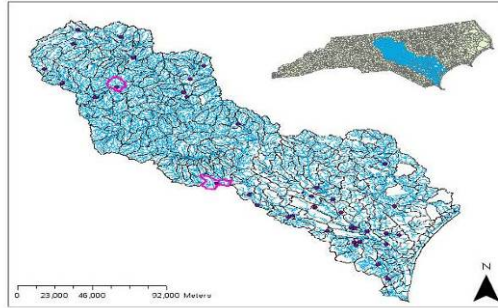
Cape Fear River Basin Modeling Project



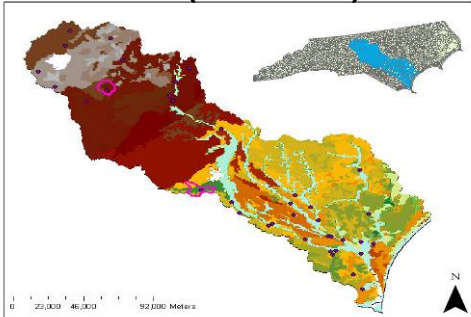
Land Cover (NLCD 2001)



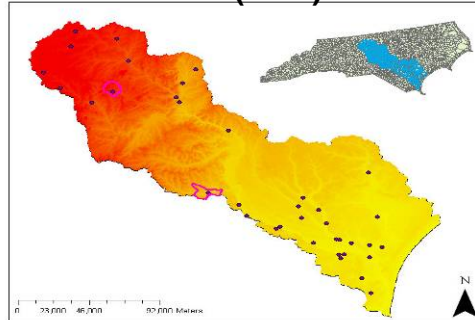
Stream Network (NHD)



Soils (STATSGO)



DEM (NED)



Part of Coastal Carolinas Ecosystem

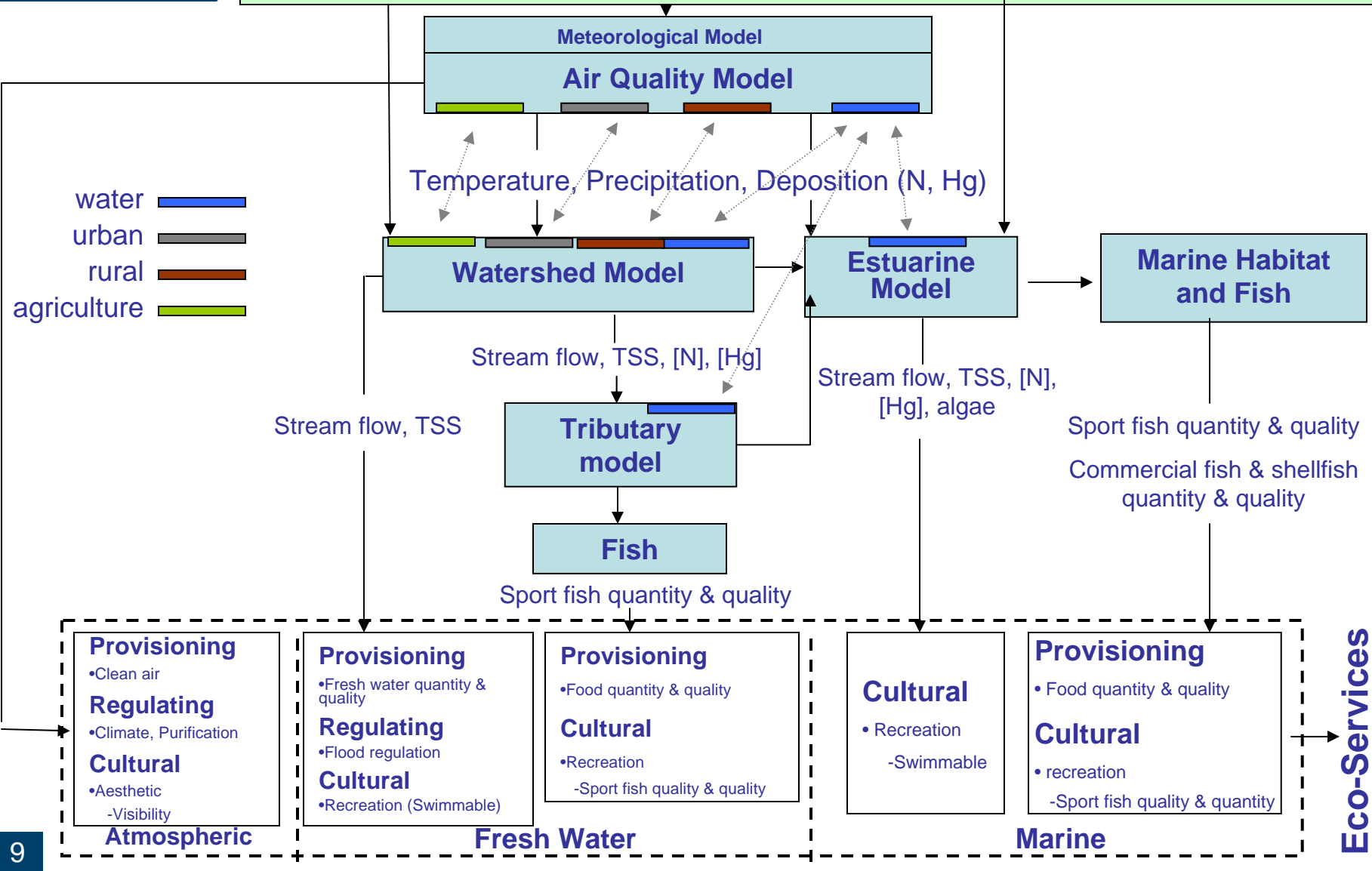
Request by FWS - evaluate importance of historical Hg deposition on Cape Fear River fish tissue [Hg]



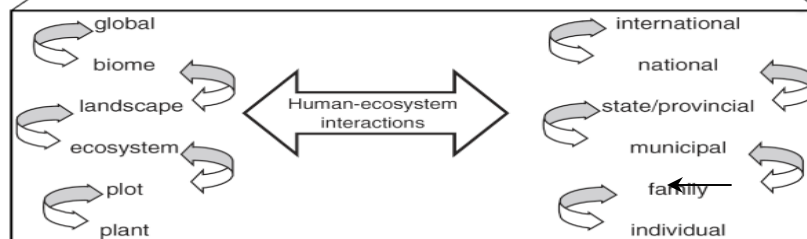
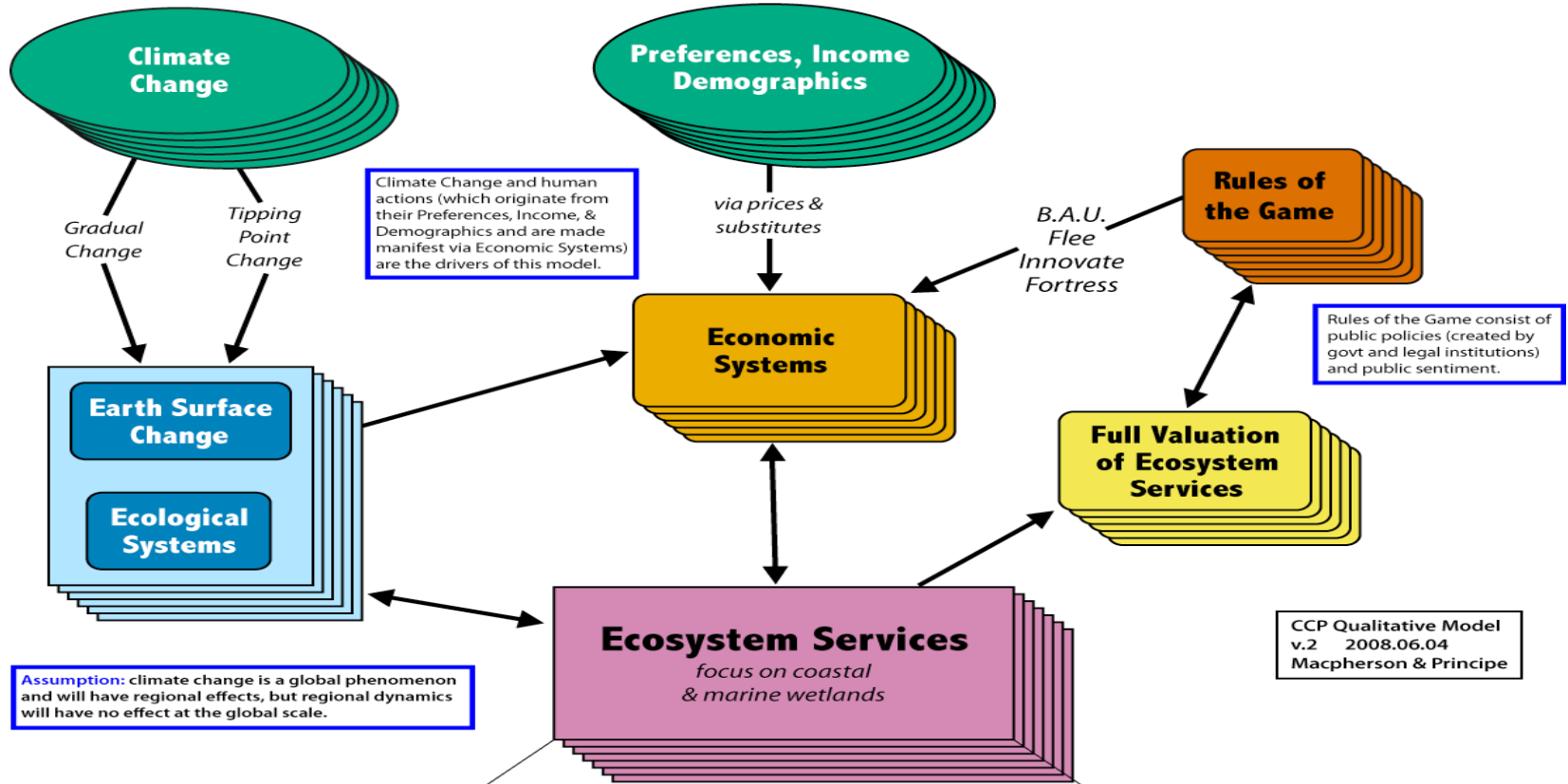
Cape Fear Watershed Stressor Scenarios

Land Use Change
Policy (emissions) Change

Climate Change & Variability (e.g., flood, drought)



Coastal Carolinas Qualitative Model Simplistic First Diagram



ERP Long Term Goals in Coastal Carolinas

LTG1 - Effective Decision Support

Build on ReVA Region-4 Decision Support Tool

Add functionality of FRAMES/3MRA open source multimedia

- Valuation
- Human Health and Well Being
- Outreach and Education

LTG2 - Landscape Characterization

NLCD land cover and associated data

C-CAP land cover change and enhanced wetlands data

LIDAR – fine-scale wetlands mapping

MODIS land cover

- Monitoring

MODIS Land Cover Change data – annual change detection

Aerial Sensor application – wetland condition/function

- Modeling

MEERT, FRAMES/3MRA, SPARROW

LTG3 - Nitrogen Assessment

Neuse Watershed study

Cape Fear Watershed study

CMAQ Nitrogen deposition

LTG4 - Ecosystem Type Assessmentst

Wetlands – including submerged aquatic vegetation

LTG5 - Place based Demonstration Projects

'Linear' coastal counties of North and South Carolina

Albemarle-Pamlico Estuary Watershed (north Carolina and Virginia)



ECOLOGICAL RESEARCH PROGRAM

BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS

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U.S. Environmental Protection Agency
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