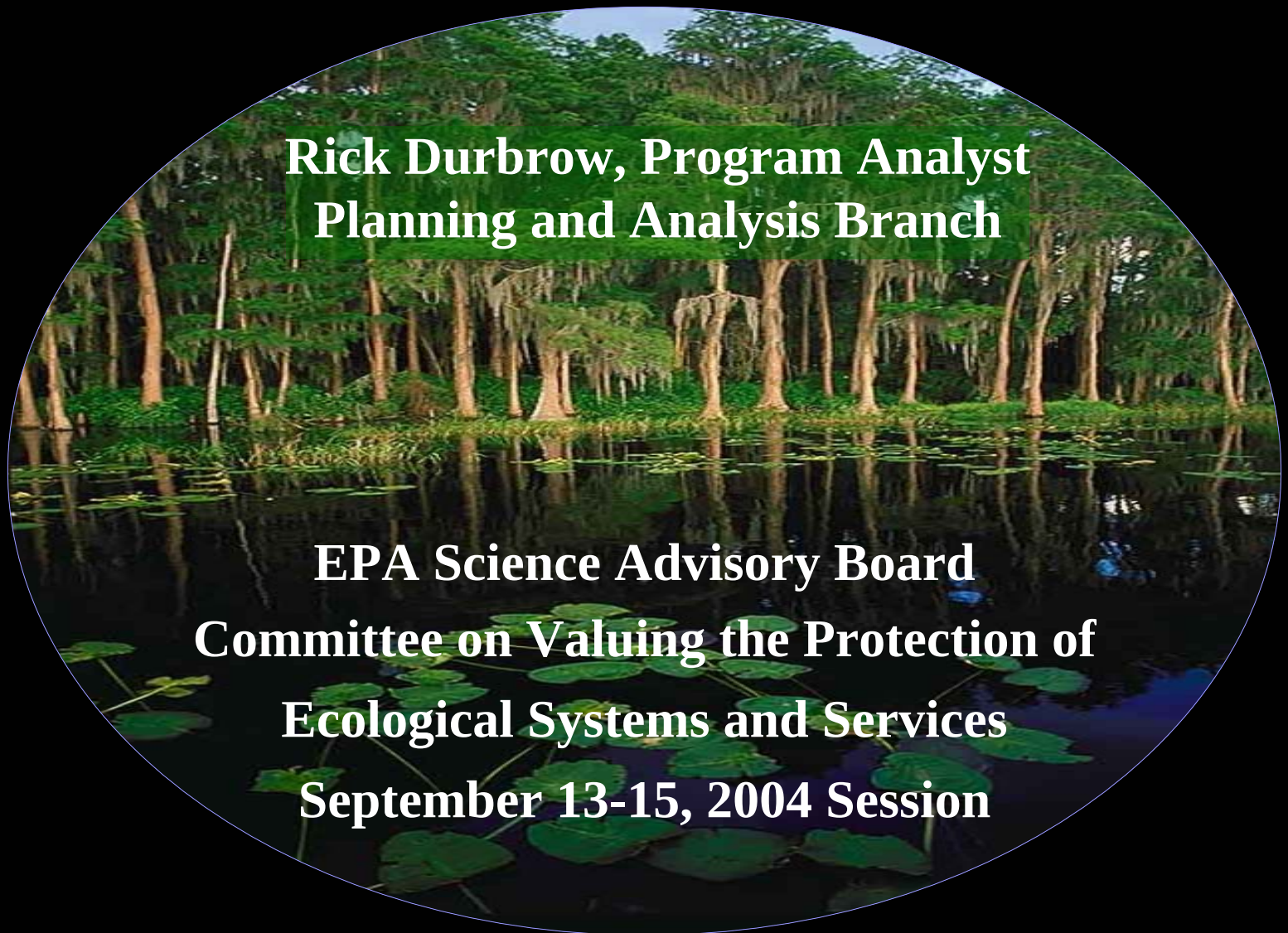
Economic Valuation of Land Cover Characteristics: Supporting Critical Ecosystem Protection through EPA Program & Community Land Use Decision Making

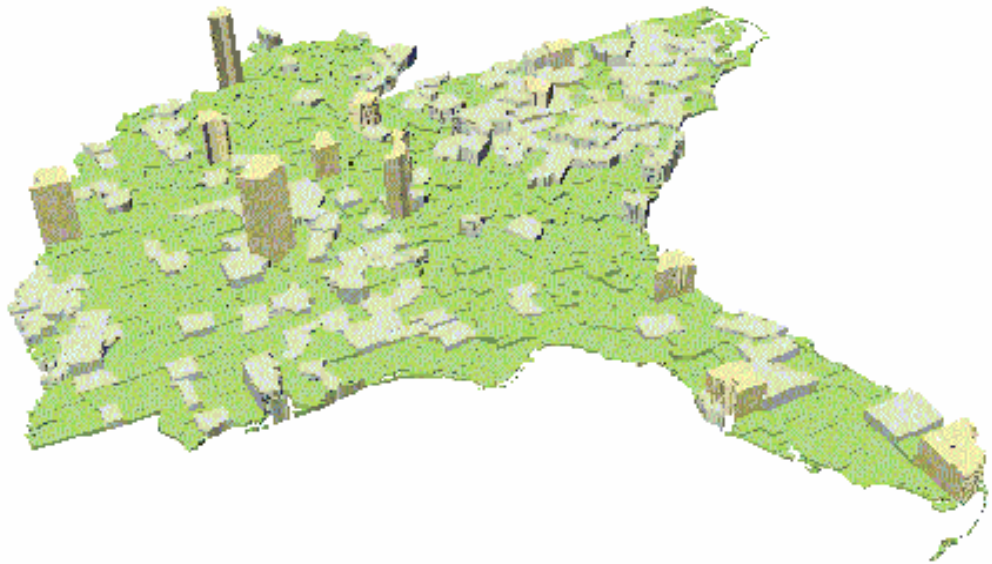


Rick Durbrow, Program Analyst
Planning and Analysis Branch

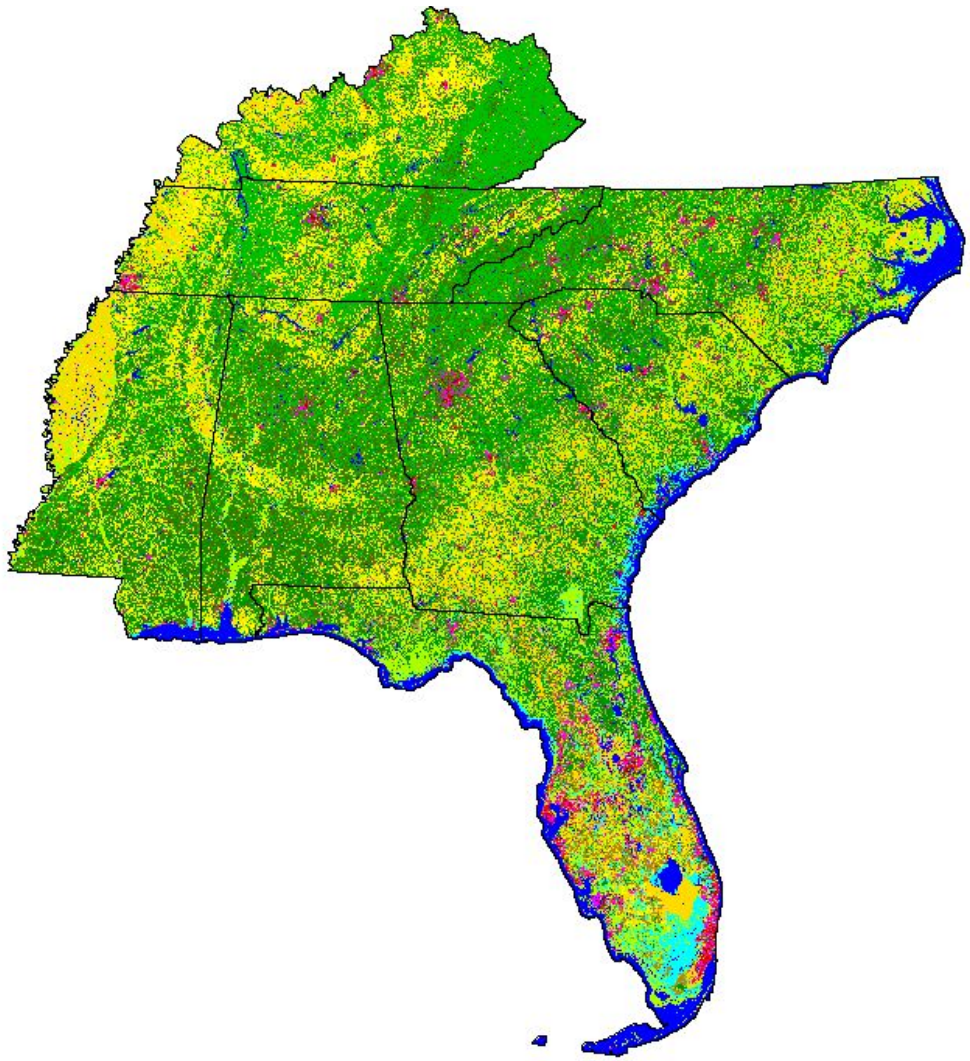
EPA Science Advisory Board
Committee on Valuing the Protection of
Ecological Systems and Services
September 13-15, 2004 Session

And Away We Grow…

1930

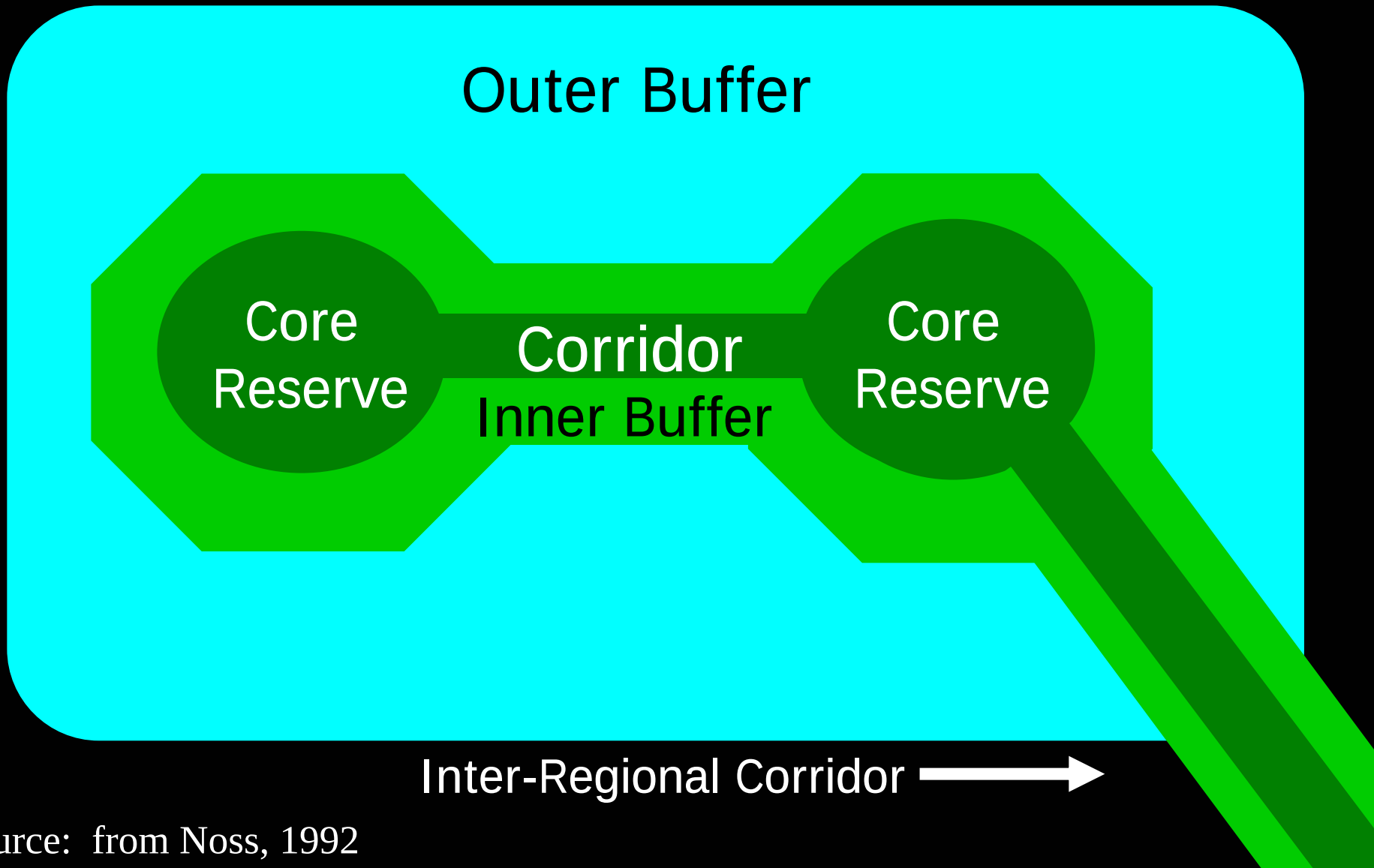


National Land Cover Data



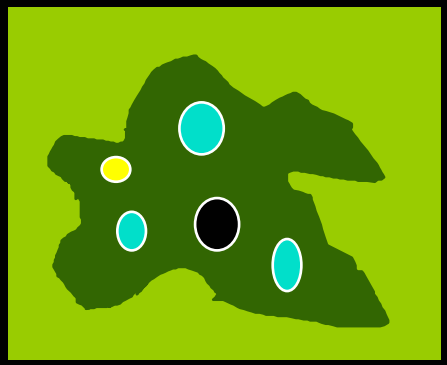
- water
- low intensity residential
- high intensity residential
- high intensity commercial
- bare rock/soil
- quarries/mines
- transitional/clearcuts
- deciduous forest
- evergreen forest
- mixed forest
- deciduous shrubland
- orchard
- grassland
- pasture/hay
- row crops
- small grains
- other grasses
- woody wetlands
- herbaceous wetlands

An Ecosystem Protection Model

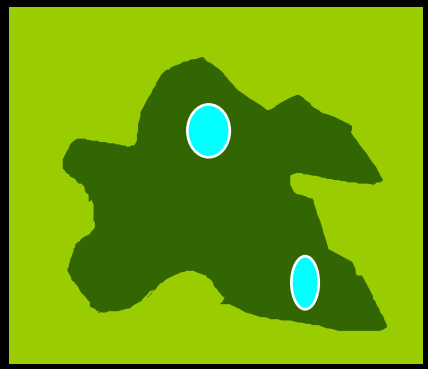


Source: from Noss, 1992

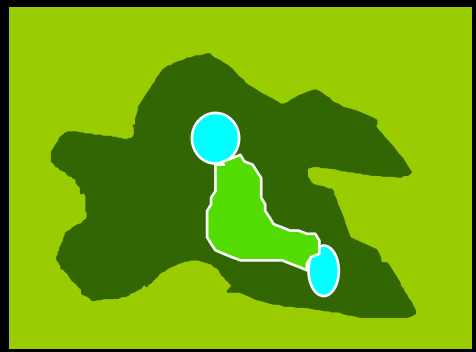
Hub/Corridor Modeling Steps



Step 1 - Identify:
Areas of Ecological Significance



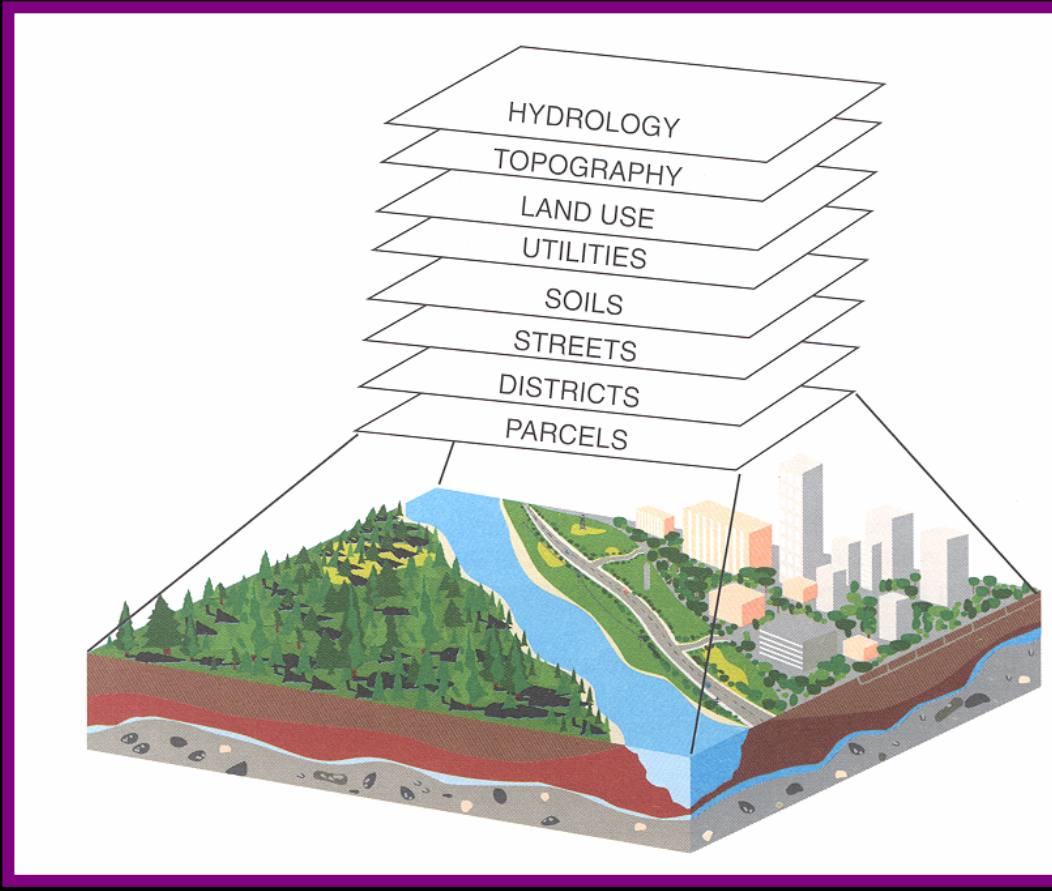
Step 2 - Select:
Ecological Hubs



Step 3 - Delineate:
Landscape Linkages

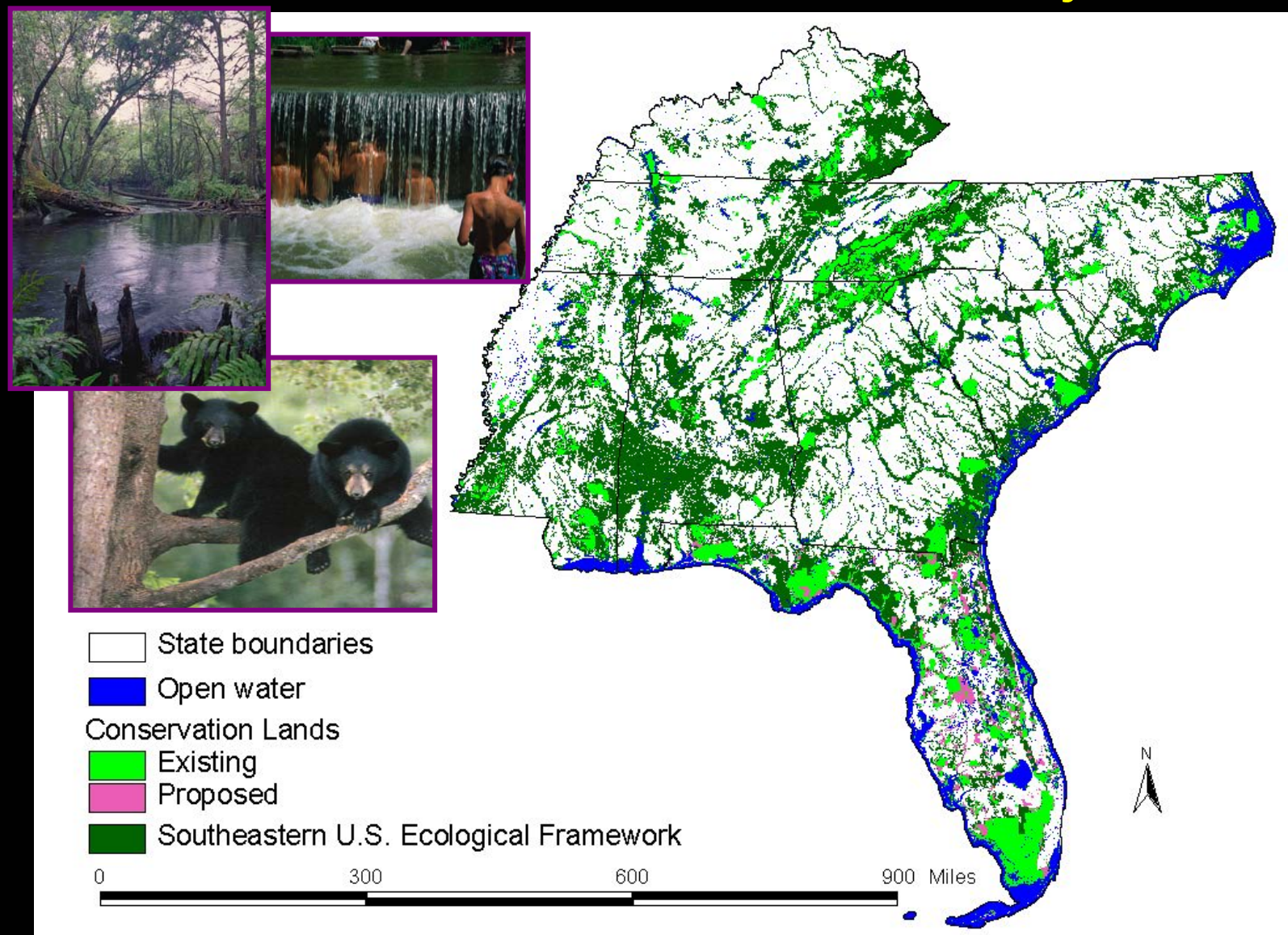
Priority Ecological Area Data Layers

- Roadless areas >5,000 acres
- Potential flood areas
- Old growth forest areas
- Biodiversity hotspots
- Shellfish Areas
- Conservation areas
- High stream reach density



- Areas with significant natural edge habitat or habitat diversity

Incorporate critical ecosystem protection into decision making to ensure ecosystem functionality for the long-term health of communities and ecosystems.

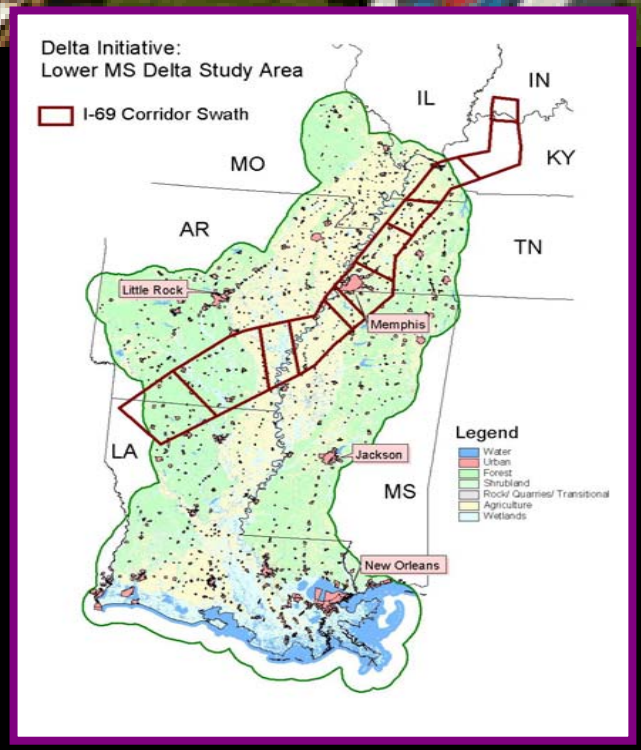


The Value to EPA Regional Program Decision-Making

- National Environmental Policy Act
- Wetlands Protection
- Surface Water Protection
- Well Head Protection
- National Pollutant Discharge Elimination System Permitting
- Total Maximum Daily Load
- Supplemental Environmental Projects

Potential NEPA Applications

- Streamline NEPA process
- Corridor and Alignment Review
- Identify Critical Ecological Areas
- Target Mitigation Areas
- Cumulative Impact Valuation



Supporting Decision-Making through Partnerships

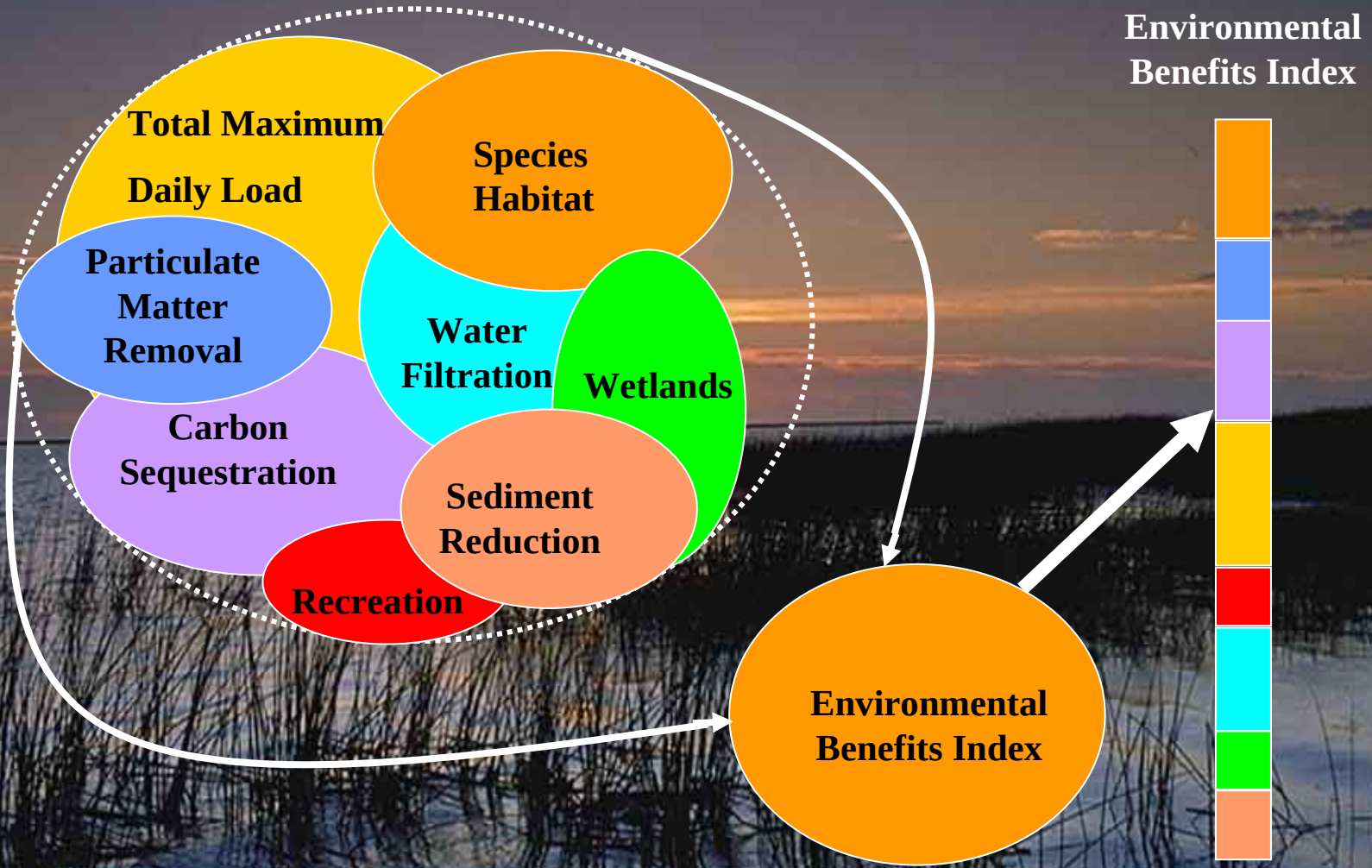
- Internal and Across Agency
  - Strategic Plan Goals and Objectives
  - Regional Ecosystem Protection Network
- Federal Partnerships
  - Leverage Resources
  - Target Activities
- State Partnerships
  - Natural Resources Leadership Council of the States
  - North Carolina Million Acre Initiative
- Local/Nonprofit Partnerships
  - Bartow County Greenspace Program
  - Land Trust Alliance

Every geographic area provides some environmental services. A given land cover type or land characteristic is associated with each geographic area. So, can an index of economic value be identified for any geographic area?

Prototype Matrix for Valuing the Protection of Ecological Systems and Services

Ecological Services	Riparian Buffer	Wetlands	Trees	Connectivity
Drinking Water Supply	X	X	X	X
Sedimentation Reduction	X	X		X
Waste Water Treatment	X	X	X	
Cloud Formation			X	
Aquifer Recharge	X	X	X	X
Water Retention or Storage	X	X	X	X
Flooding/Storm Protection	X	X		X
Urban Heat Island Mitigation			X	X
Particulate Matter Removal			X	
Carbon Sequestration	X	X	X	
Value of Species		X		X
Migratory Birds		X	X	X
Fish Populations	X	X		X
Game Species		X	X	X
Disturbance Regime Recovery	X	X		X
Recreational Value	X	X	X	X
Timber			X	
Agricultural Pollination				X
Land Values	X	X	X	X
Hunting/Fishing	X	X	X	X

Scientific Advice on Valuing the Protection of Ecological Systems and Services that Would be Useful to Regions



Can the Committee provide a fair value for any specified natural area based on the existing land cover characteristics?