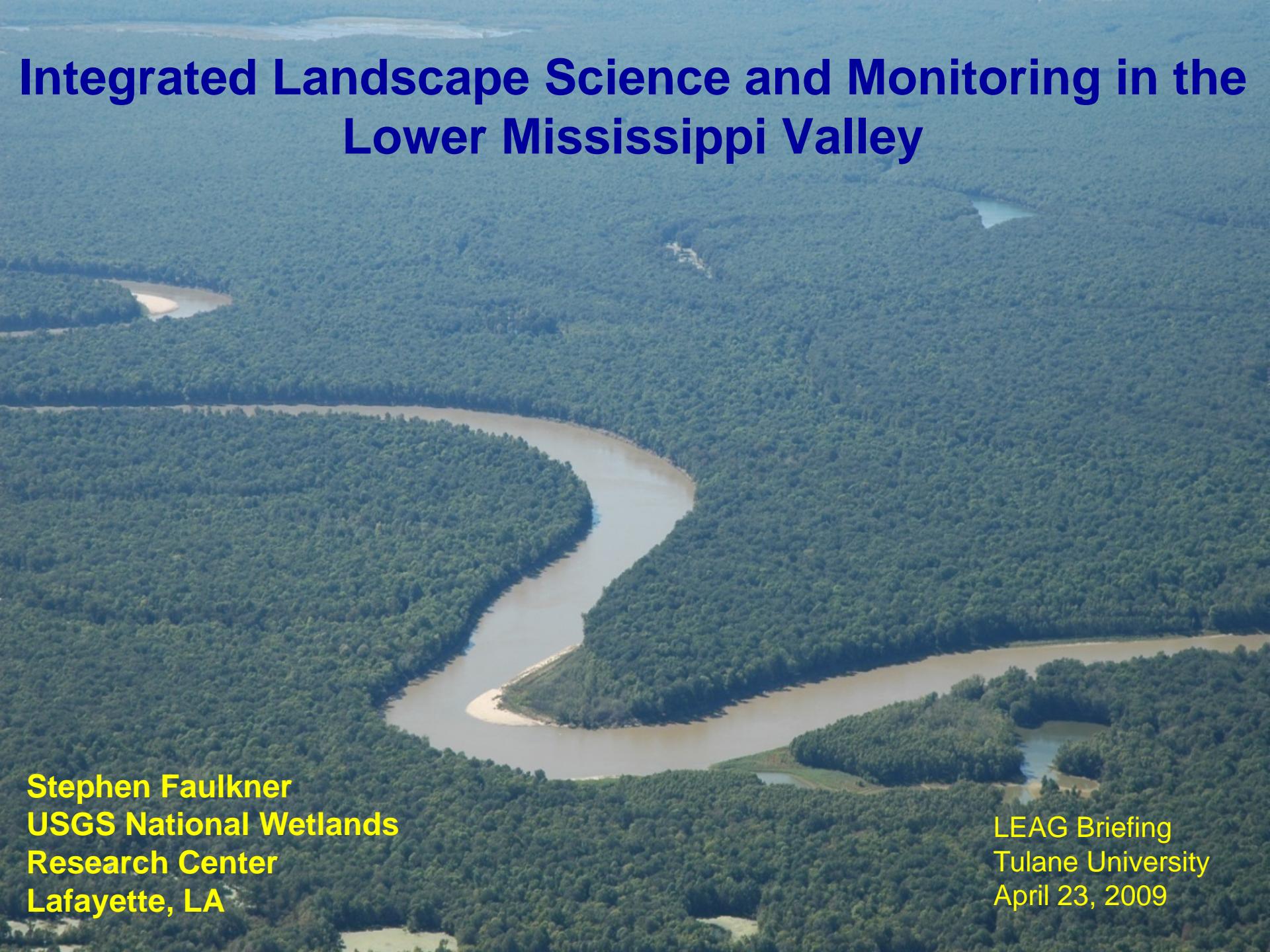


Integrated Landscape Science and Monitoring in the Lower Mississippi Valley



**Stephen Faulkner
USGS National Wetlands
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Lafayette, LA**

LEAG Briefing
Tulane University
April 23, 2009

Integrated Landscape Science and Monitoring in the Lower Mississippi Valley

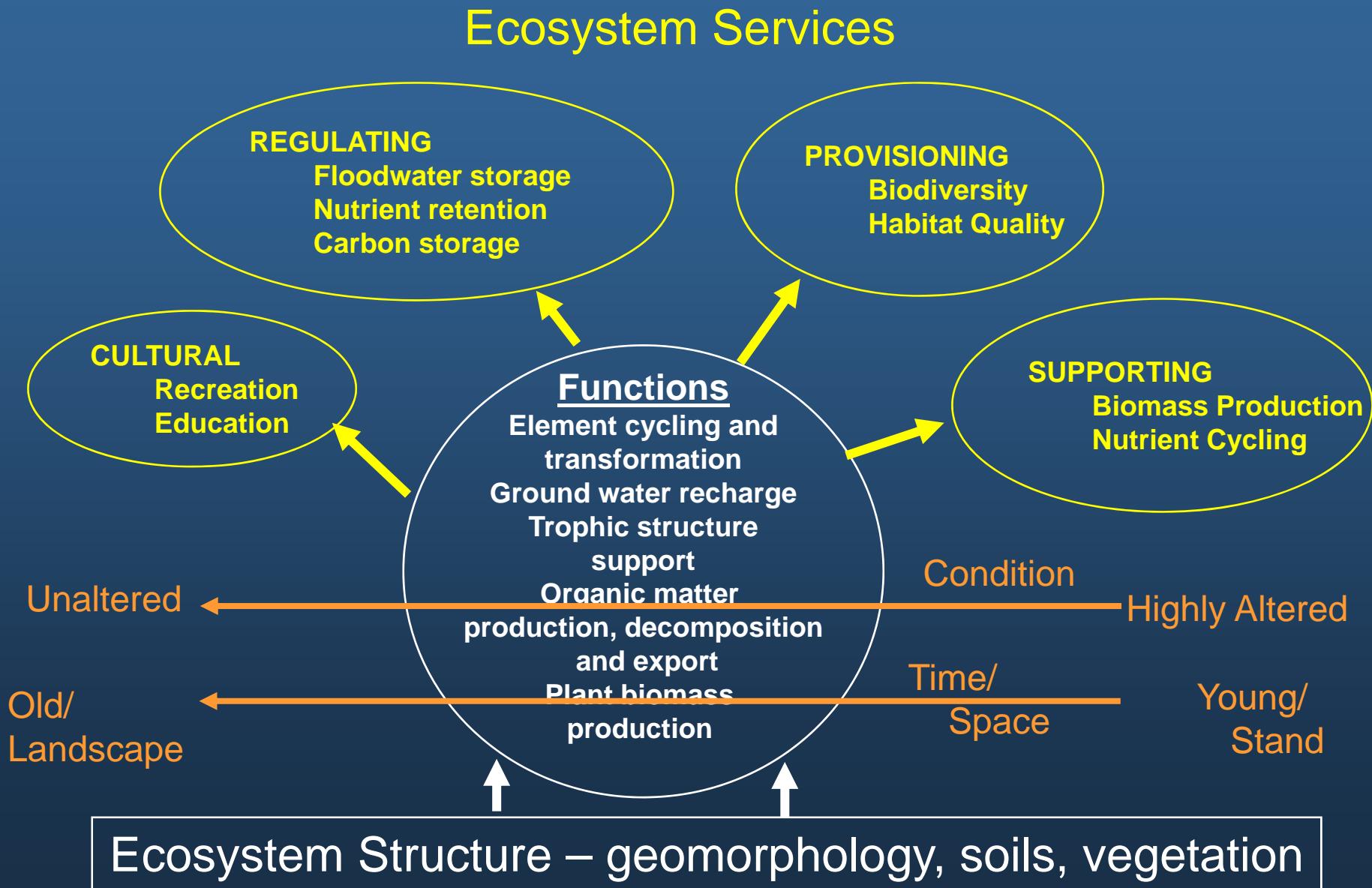
Sustaining And Restoring Ecosystem Services

Climate Change

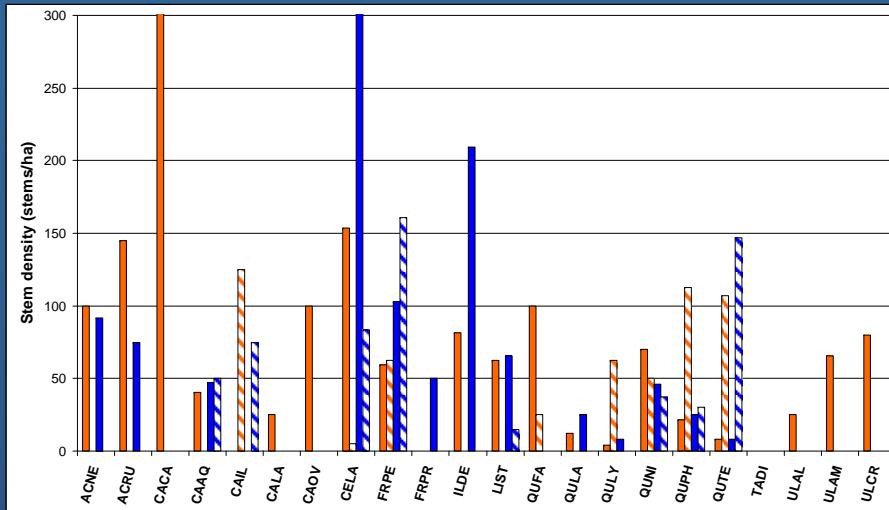
Ecosystem Modeling Frameworks

Enhancing Science Impact in Management and Policy

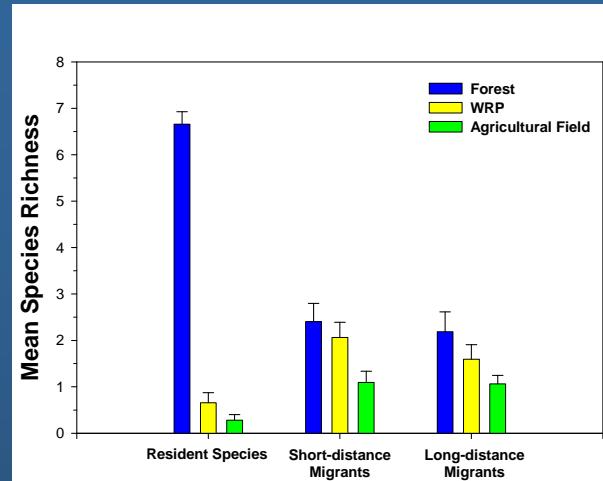
Sustaining And Restoring Ecosystem Services



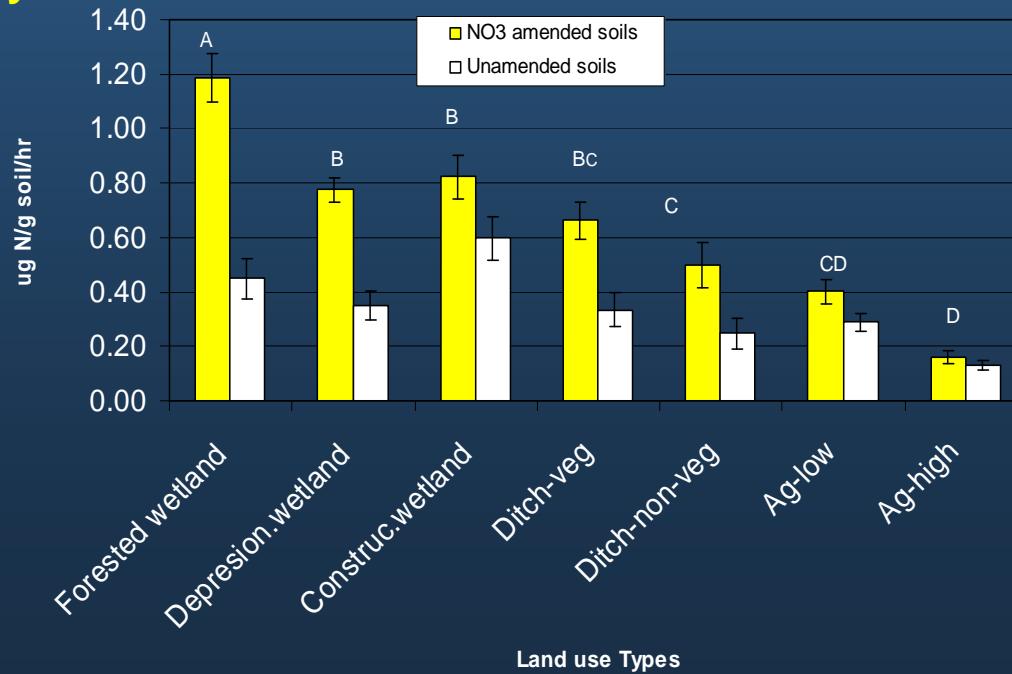
Forest Species Composition



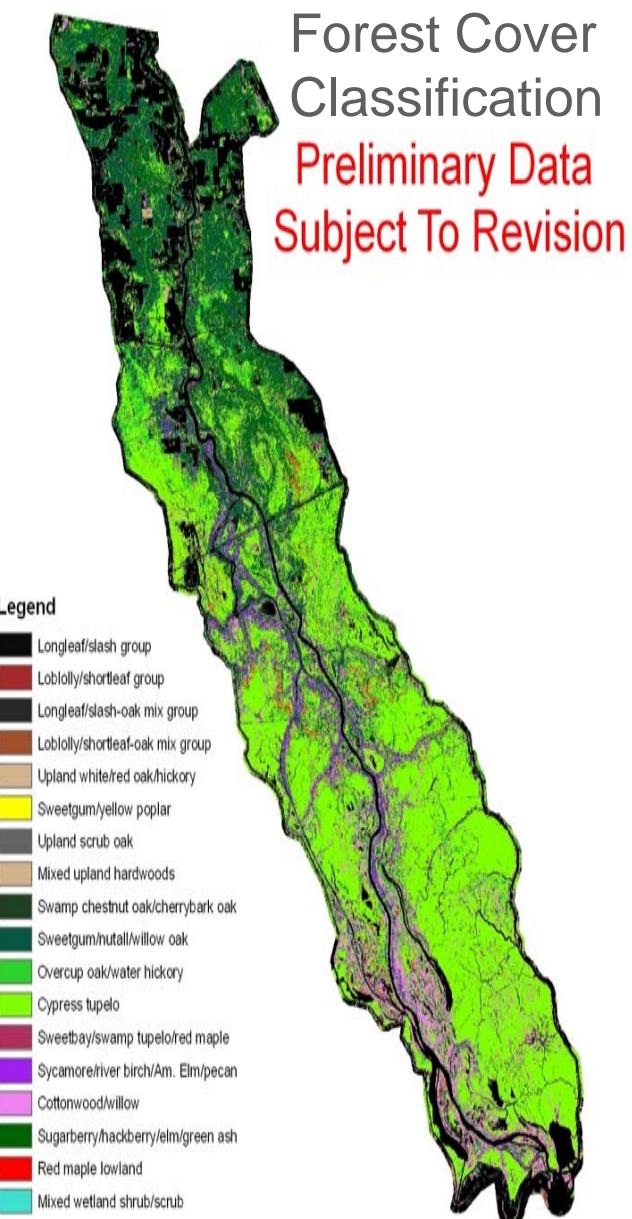
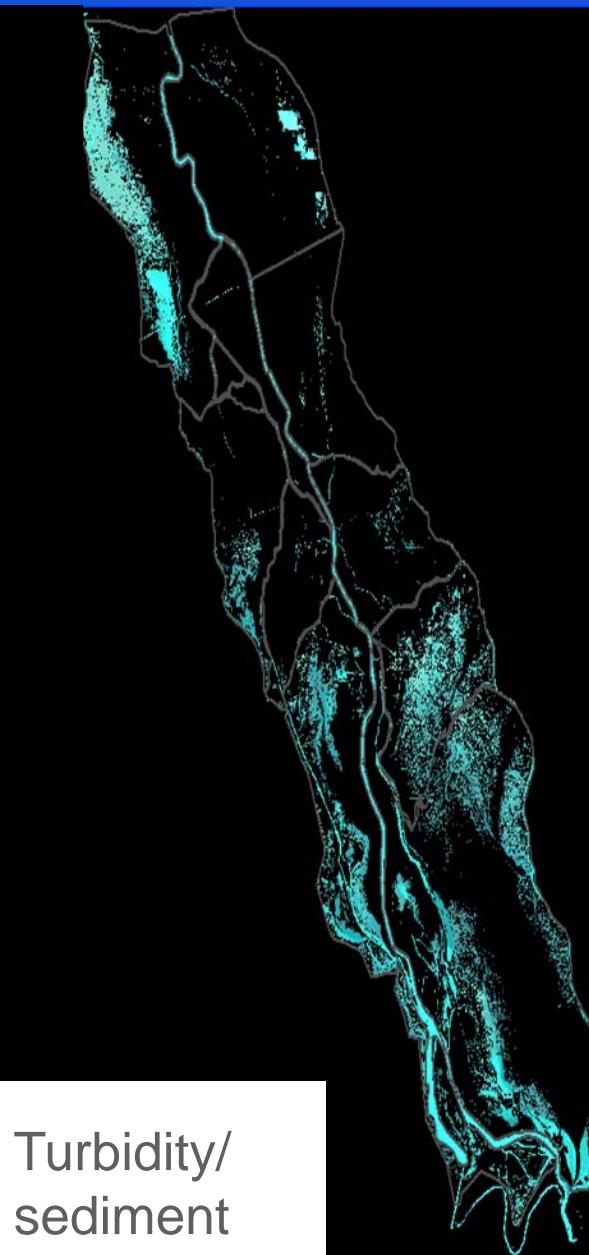
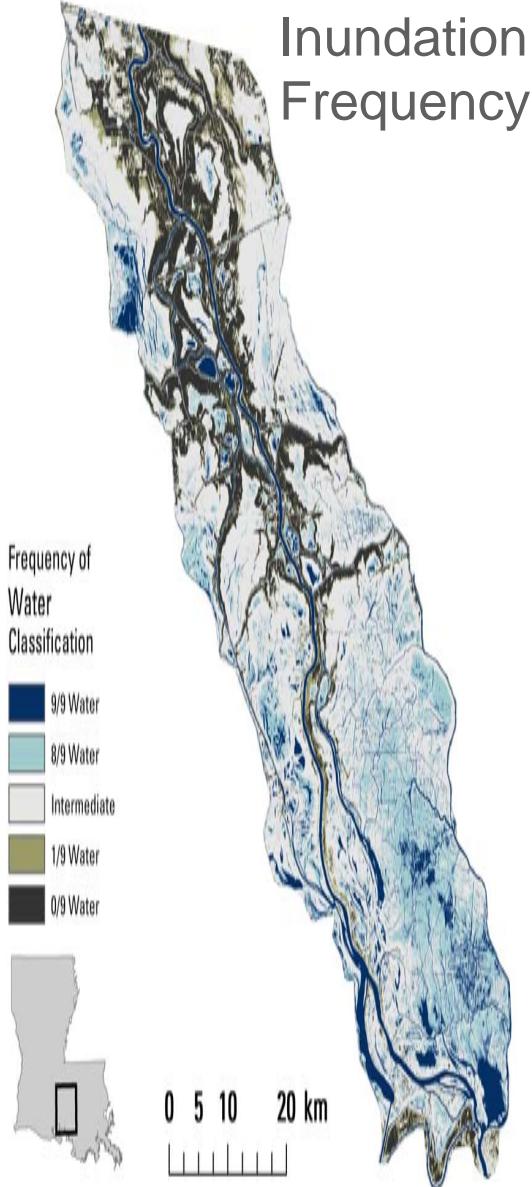
Bird Species Richness



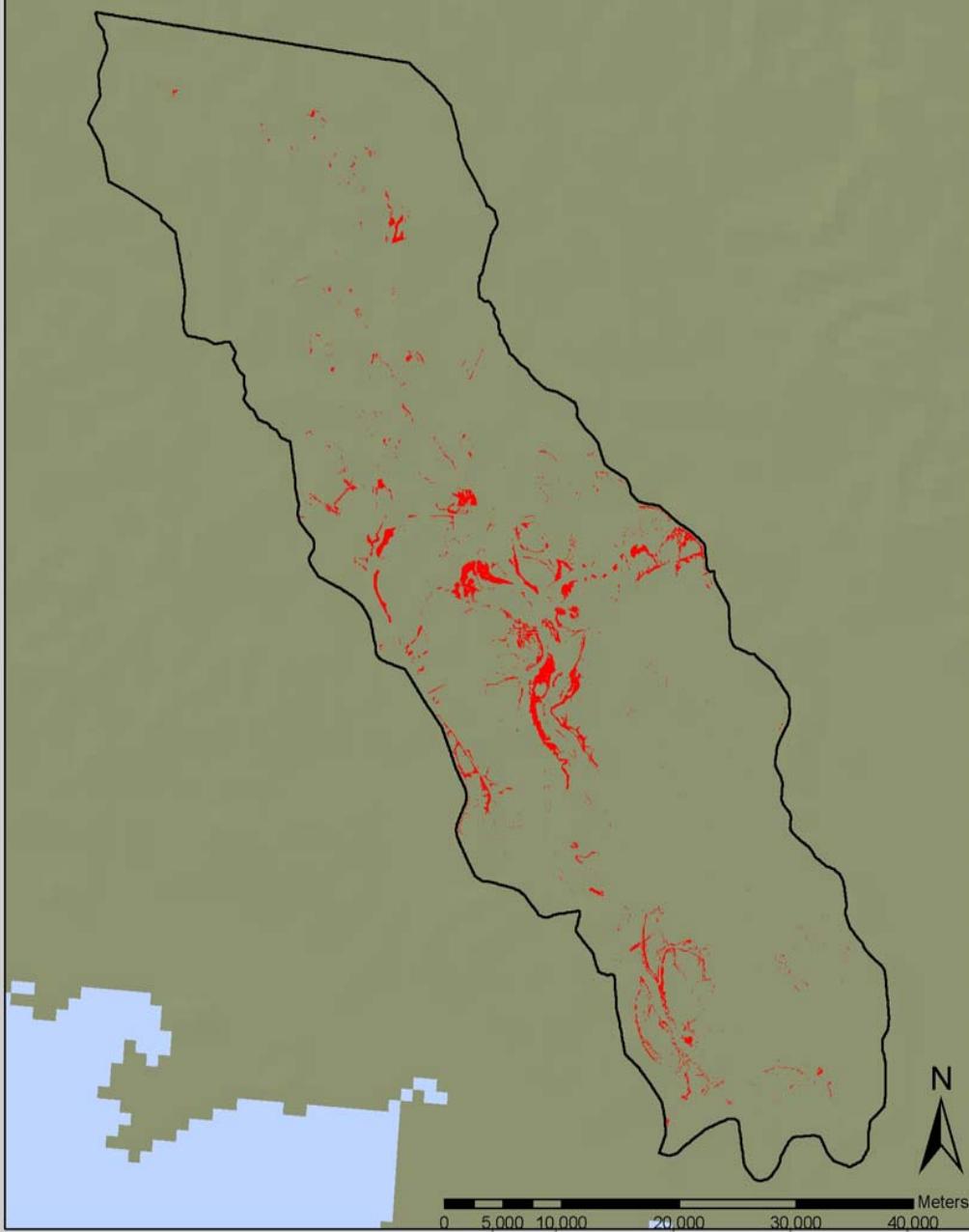
Denitrification Potential By Land-Use



Atchafalaya Basin – Using satellite imagery to develop landscape-scale relationships between hydrology and ecosystem structure-functions-services



Cypress Tupelo forest on land during wet period



Spatial extent of cypress-tupelo forest on land during the wettest period (Class I) - 5,875 ha

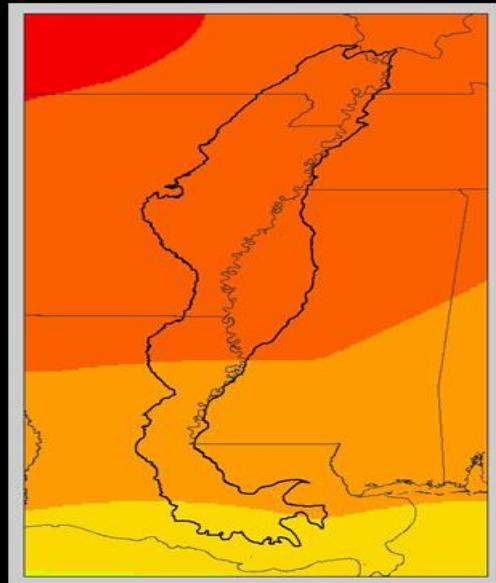
~ 5.6 % of the 104,000 ha of cypress-tupelo forest in the ABFS

Climate Change

- What are the impacts of predicted climate change on ecosystem goods and services in the LMV?
- What are the likely future climate conditions?
- How will they affect functions/processes controlling ecosystem goods and services?

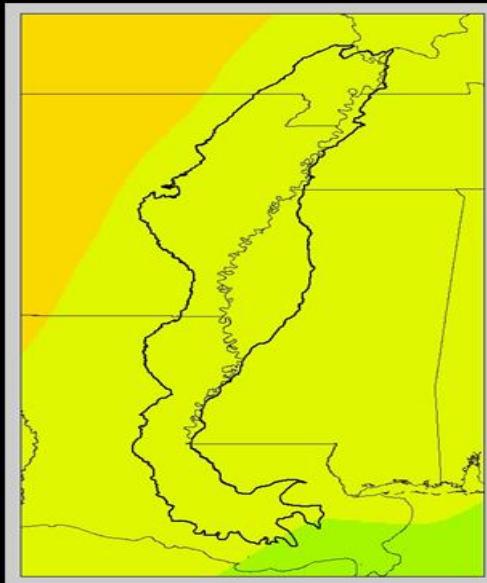
Change in Temperature

Anomalies in June, July, and August (2098/99 Vs 1971-2000)



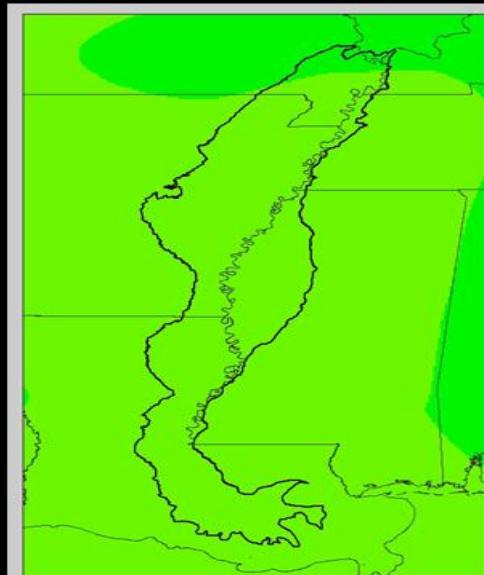
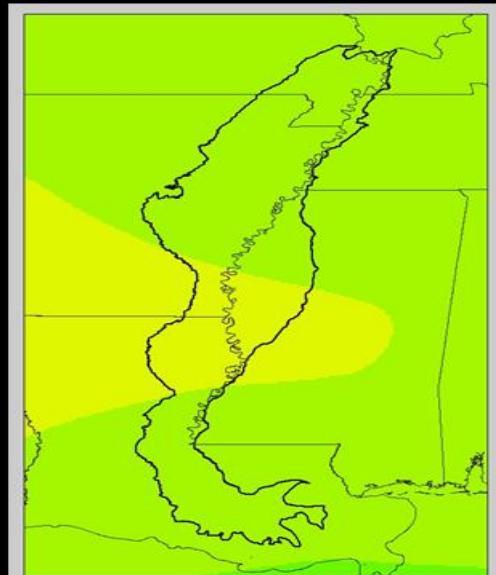
Hadley Model

Above A2, below B1



NCAR Model

Above A2, below B1



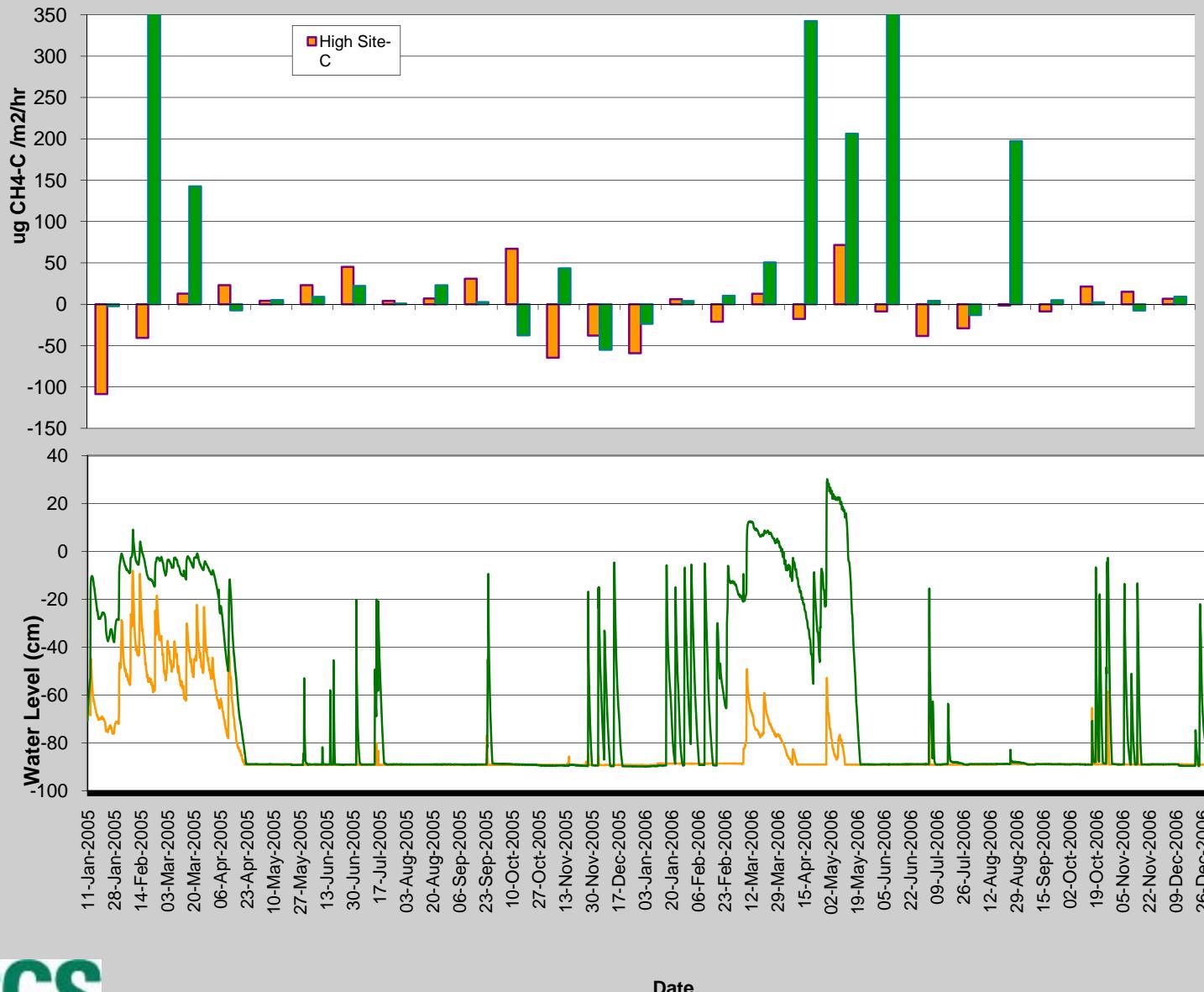
Legend

Difference in Temperature

2098/99 Vs 1971-2000

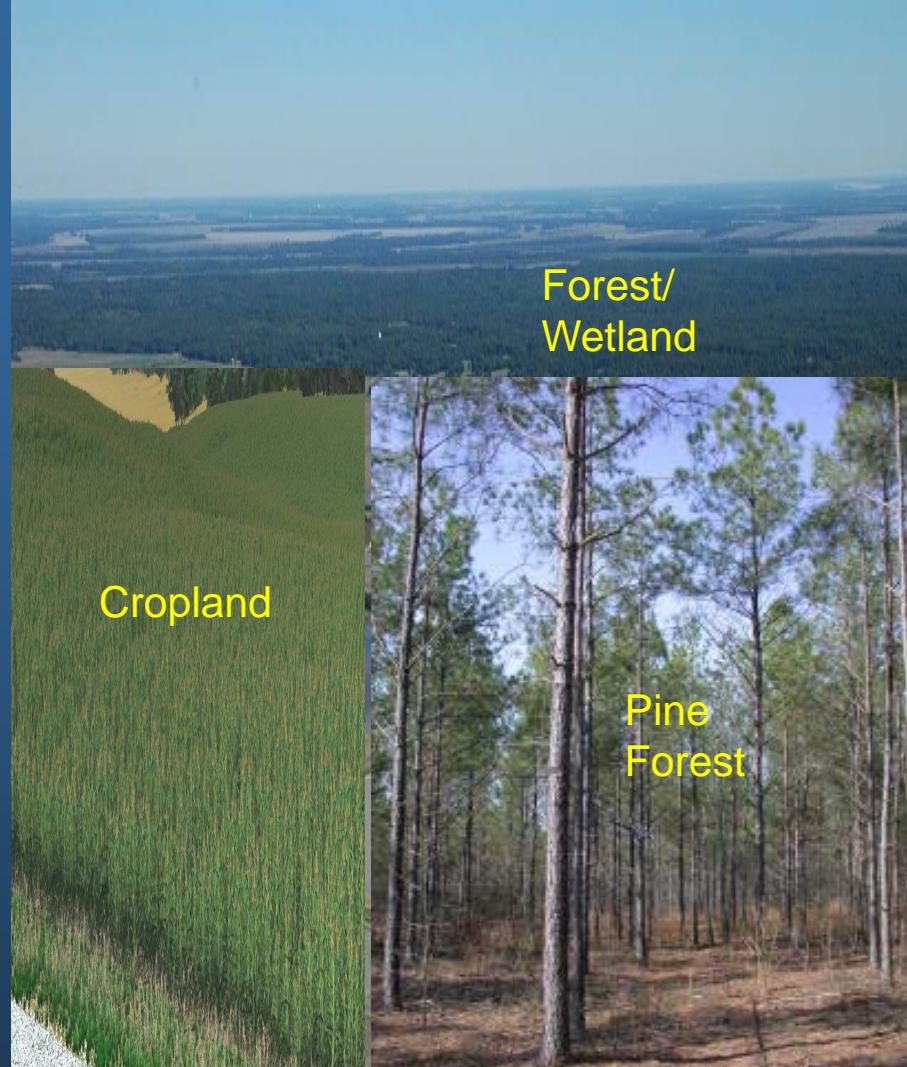
0.45 to 1.0
1.0 to 2.5
2.5 to 4.0
4.0 to 5.5
5.5 to 7.0
7.0 to 8.5
8.5 to 10.0
10.0 to 10.5

CH4 Emissions from High and Low Elevation Plots – Red River





Scenario A: Restore cropland to native forests and wetlands



Scenario B: Climate change shifts land cover types

Forest Vegetation Simulator (FVS)

Young forest stands (FIA data and/or field data) – 100 year simulation

Total stand carbon output (from Fire and Fuel Extension)

<http://www.lmvsci.gov/USDAIntro.aspx>

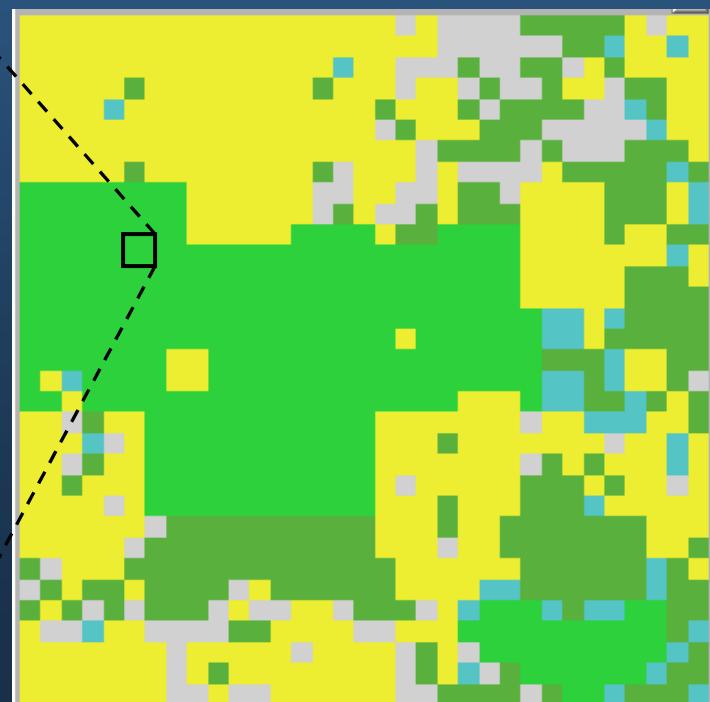
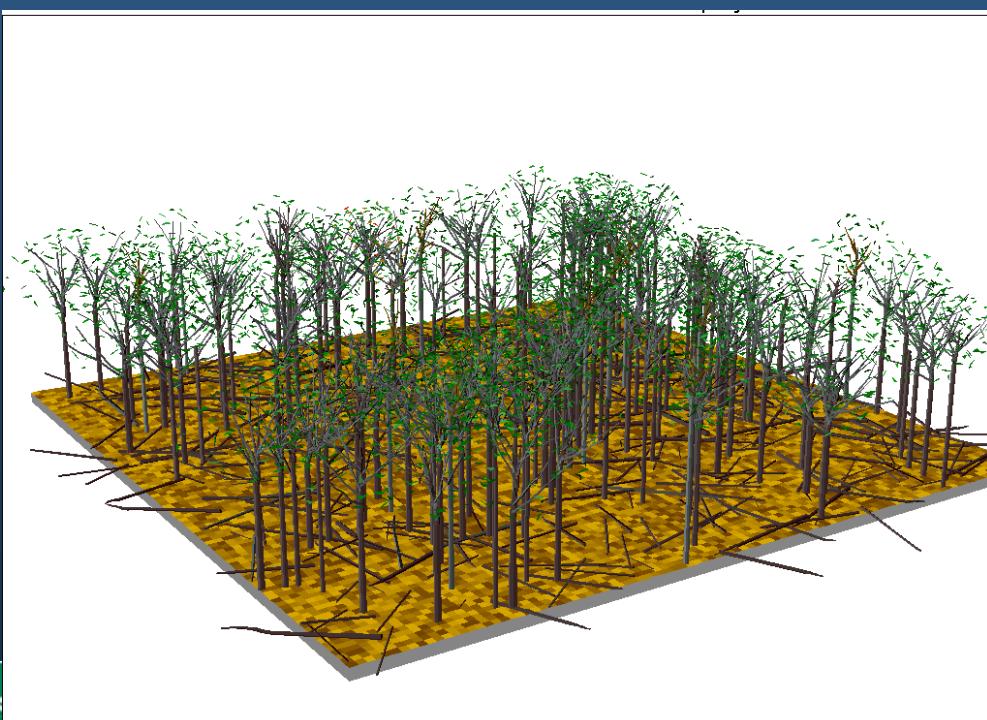
Frame-based landscape model

Wildlife (migratory birds, amphibians)

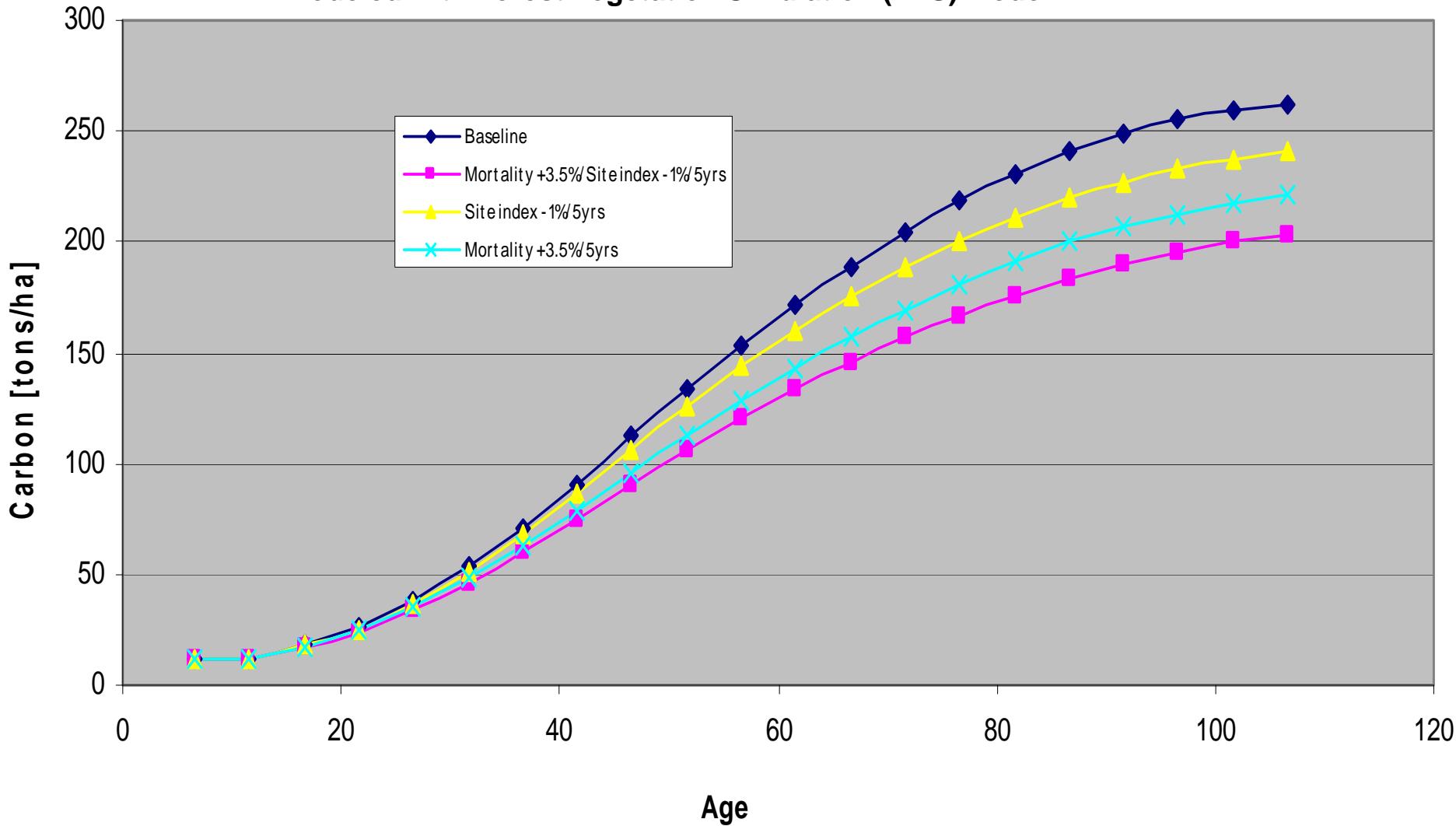
Carbon sequestration

Denitrification

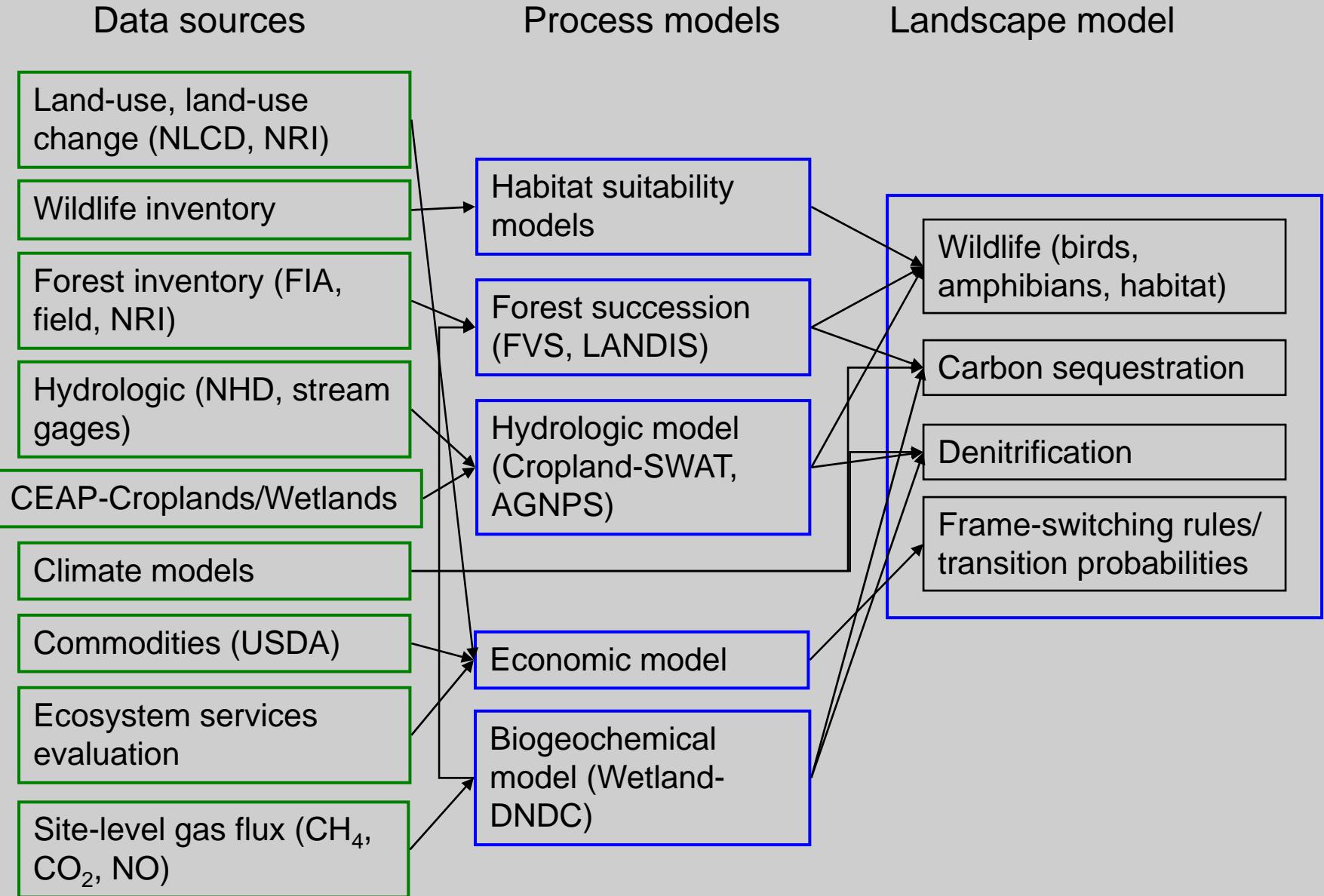
Frame switching rules/
transition probabilities



Comparisons of Forest Carbon Storage – Climate Scenarios Modeled with Forest Vegetation Simulation (FVS) Model



Model – Data Integration



Applied Science . . . to Inform Management

