CCAMMO

Climate

Change

Adaptation and

Mitigation

Management

Options

James M. Vose
Center for Integrated
Forest Science
and Synthesis

CCAMMO…

…uses a common range of future conditions, framework, and definitions

…evaluates potential impacts on threats (fire, insects, invasives) and values (water, timber, etc.) for the southern U.S.

…proposes management options to reduce threats and protect/maintain/enhance values

…uses case studies to show how information can be used to guide decision making

How can forest management enhance the sustainability of southern forest ecosystems and their values under climate change?

Process

Fall 2009 SRS LT Meeting

- Identification of a research need best addressed by a “cross-station”, interdisciplinary approach

CCAMMO Workshop #1 (April 2010)

- Attended by SRS scientists, R8, and participants from state forestry agencies to shape outcomes & approaches and develop the research process and study plan

Process

Study plans, data assembly, GIS support, work begins…

Presentations to SGSF, R8 LT, Southern Leadership Tour

CCAMMO Workshop #2 (March 2011)

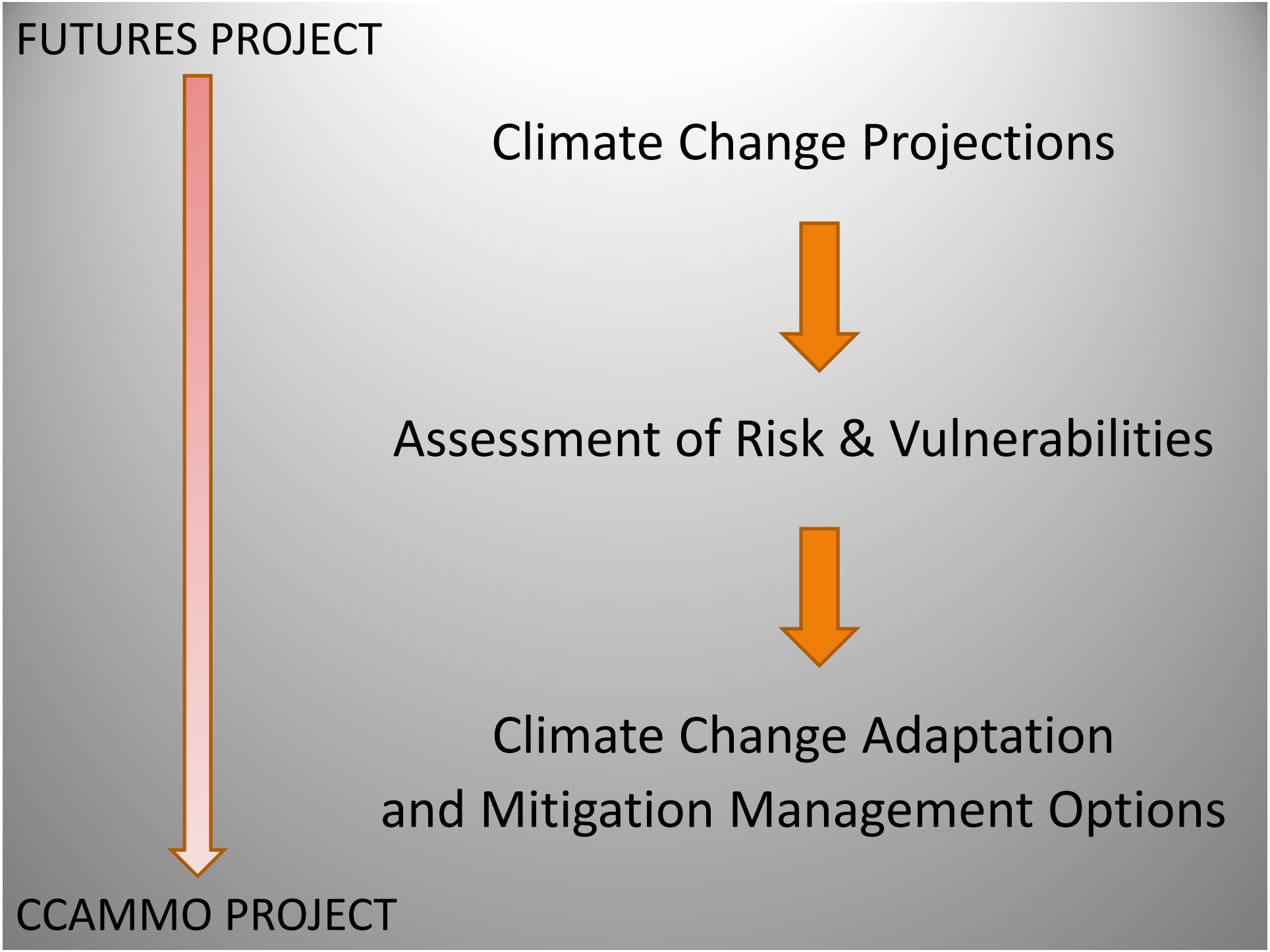
- Attended by CCAMMO participants – update progress, focus work, explore opportunities for integration

Process

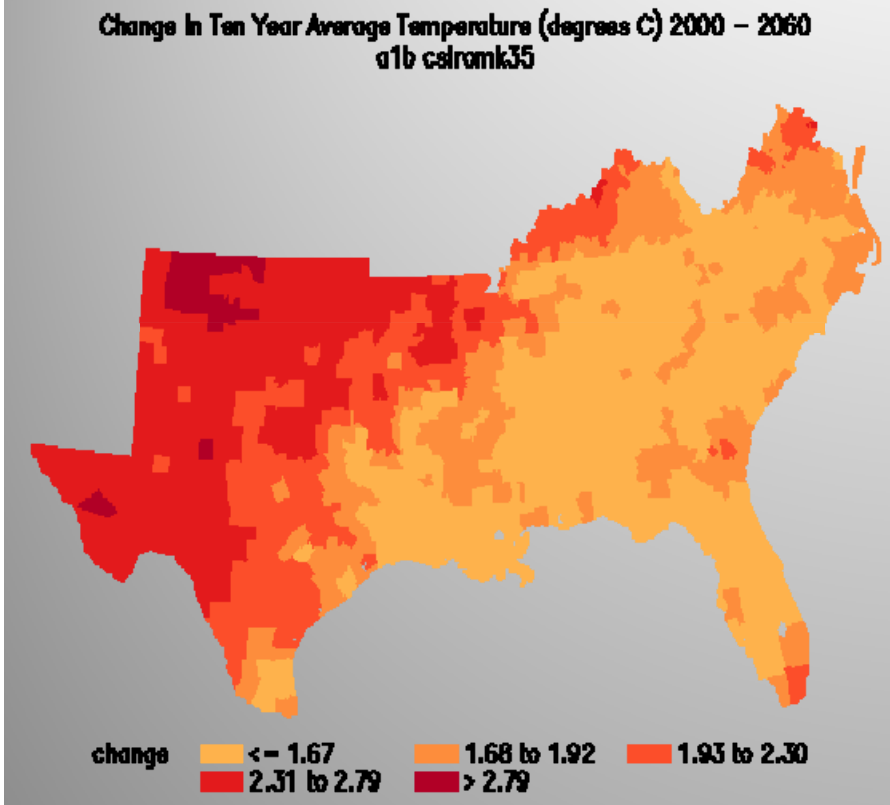
Chapters Completed

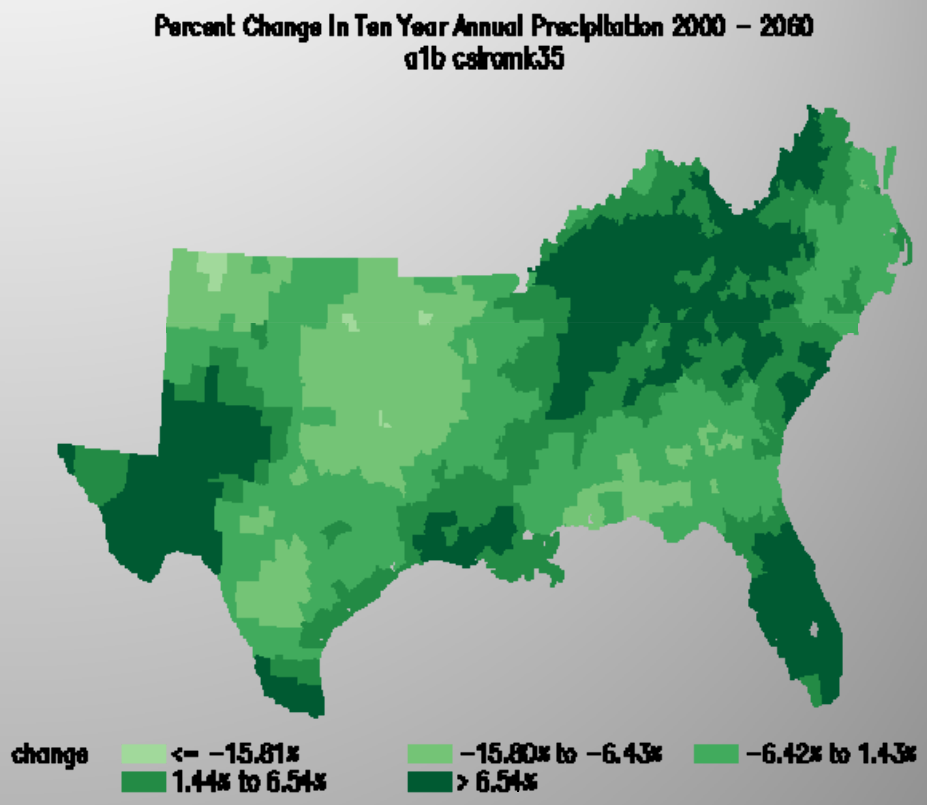
- September 2011-April 2012
- Technical & External Peer Review (ongoing)

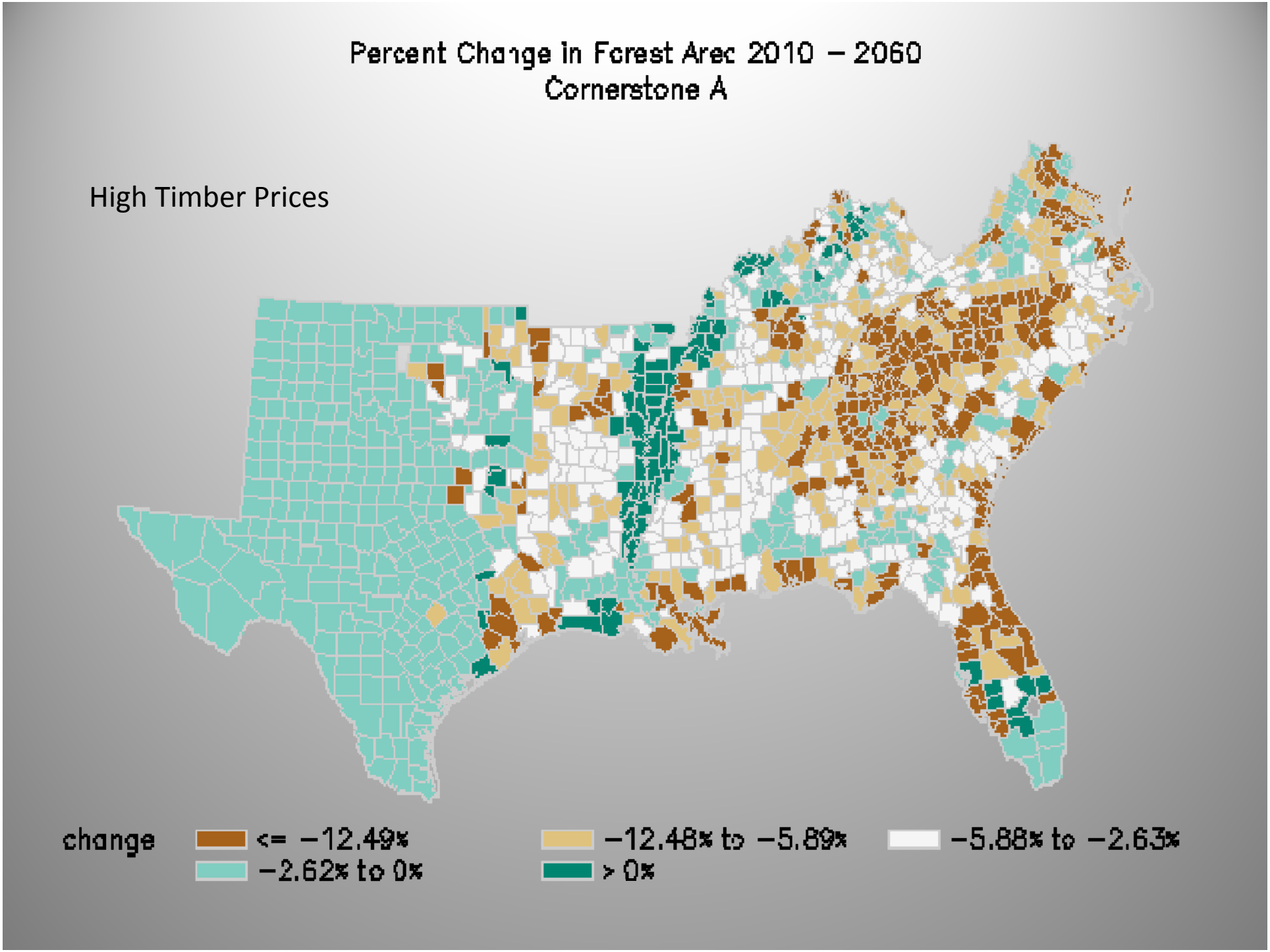
CRC Press Prospectus & External Review


FUTURES PROJECT
Climate Change Projections
Assessment of Risk & Vulnerabilities
Climate Change Adaptation
and Mitigation Management Options
CCAMMO PROJECT

Climate Change Scenarios






Percent Change in Forest Area 2010 – 2060
Cornerstone A
High Timber Prices
change
<= −12.49%
−12.48% to −5.89%
−5.88% to −2.63%
−2.62% to 0%
> 0%

Common definitions and framework

GLOSSARY (Chapter 2: Holmes, McNulty, Vose, Prestemon, Li)

Adaptation: Actions taken to decrease undesirable impacts of climate change, or that increase positive impacts.

Adapative capacity: The ability of an integrated socio-ecological system to generate and test innovations.

Adaptive management: Iterative decision-making based upon experimentation and scientific learning.

Forest condition/state: The structure and function of the assemblage of dominant plant species found at a given location.

Mitigation: Actions taken to reduce the severity of potential climate change, such as sequestering carbon.

Press disturbance: A continuing disturbance, or stress, that slowly alters the state of an ecosystem.

Pulse disturbance: A short term high intensity disturbance, or perturbation, that rapidly alters the state of a system.

Resilience: The length of time required for a disturbed system to return to some initial functional state.

Resistance: The magnitude of disturbance that can be absorbed before an ecosystem state is significantly altered.

Risk: The functional relationship between a range of ecological or economic conditions and their probability.

Sustainable management: Management that maintains the productive capacity of forests so that future generations are able to obtain non-declining levels of well-being from consuming forest goods and services.

Uncertainty: Generally, a lack of knowledge regarding phenomena of interest. In economics, refers to situations under which the scale and probability of outcomes are unknown.

Vulnerability: The sensitivity of a system, subsystem, or system component to damage or harm resulting from exposure to a disturbance.

threats and values

threats

Insects, disease, invasives

Wildfire

values

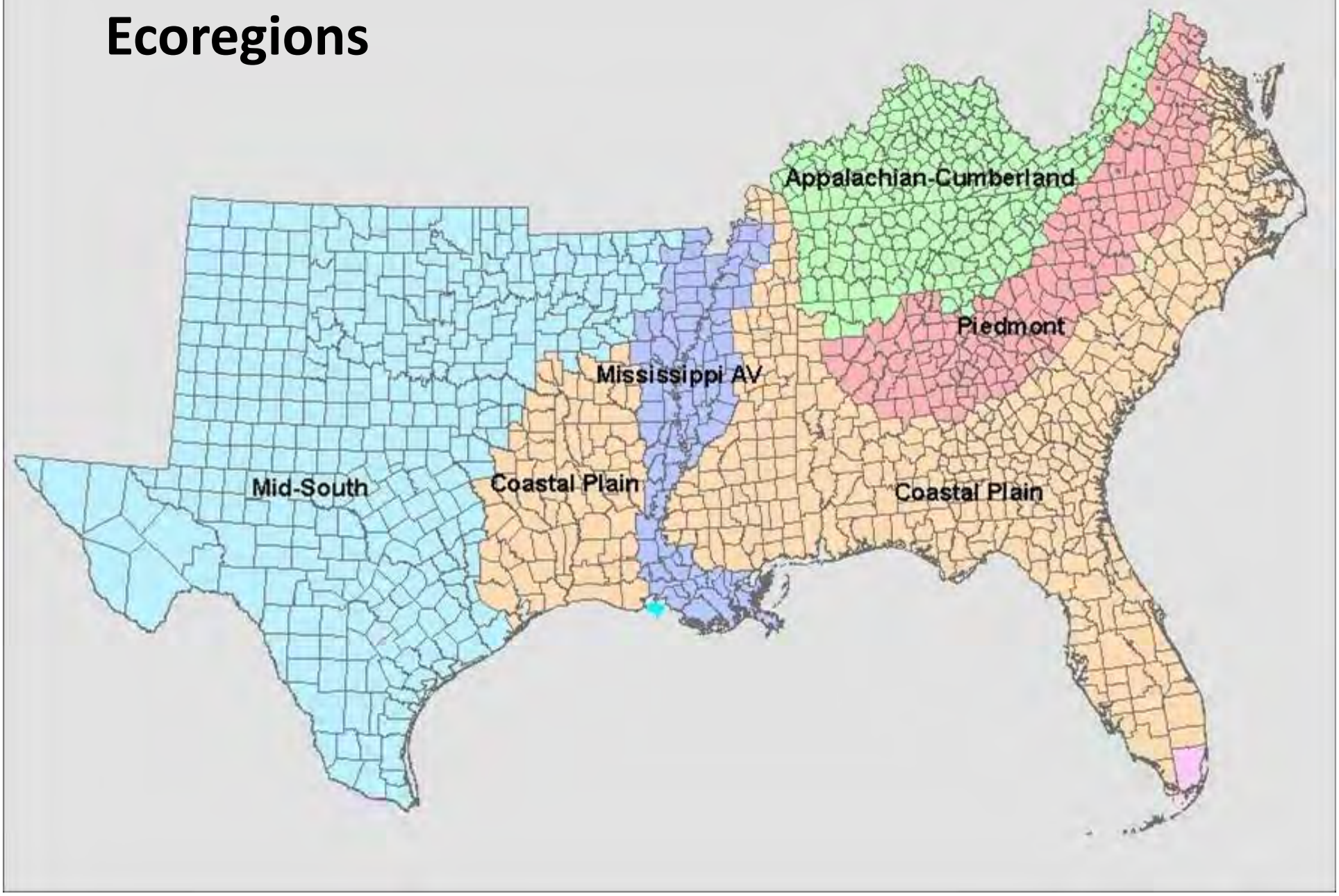
Timber, fiber, carbon

Water quality & quantity

Species and habitats

Recreation

Ecoregions


Appalachian-Cumberland
Piedmont
Mississippi AV
Mid-South
Coastal Plain
Coastal Plain

Framework…..

What do we already know about effects of climate on threat/value?

How have we managed in the face of disturbance climatic variation before?

- What can this tell us about how to manage in the future?
- What can we do now?
- What can/should we do in 10, 20,…50 years?

Where should we implement management practices first (tie-in to risk)?

Case studies to provide specific “stand level” examples

Approaches….

data
models
synthesis
expert knowledge (>60 authors)

case study examples….

Climate Change Adaptation and Mitigation Management Options: A Guide for Natural Resource Managers in Southern Forest Ecosystems

Chapter 1: Introduction - Climate Change Adaptation and Mitigation Management Options

Chapter 2: The Changing Landscape of the Southern United States

Chapter 3: Economic and Ecological Vulnerability: A Conceptual Framework for Managing Forests in Southern U.S. Under Climate Change

Chapter 4: Climate Change, Human Populations, and Social Vulnerability in the South

Chapter 5: Future Wildfire Trends, Impacts, and Mitigation Options Under Climate Change

Chapter 6: Climate Change and Insects, Pathogens, Invasives in the Southern United States: Potential Effects and Management Options

Chapter 7: Silvicultural Tools to Manage Forests Under Climate Change

Climate Change Adaptation and Mitigation Management Options: A Guide for Natural Resource Managers in Southern Forest Ecosystems

Chapter 8: Managing Forest Productivity and Carbon Sequestration Under Climate Change

Chapter 9: Managing Forest Water Quantity and Quality Under Climate Change

Chapter 10: Climate Change and Wildlife in the Southern United States: Potential Effects and Management Options

Chapter 11: Climate Change and Plant Species and Habitats in the Southern United States: Potential Effects and Management Options

Chapter 12: Climate Change and Aquatic Species and Habitats in the Southern United States: Potential Effects and Management Options

Chapter 13: Climate Change and Outdoor Recreation Participation in the South: Projections to 2060

Chapter 14: Conclusions – Integration and Connections

In summary, CCAMMO is….

- *scenario based – builds on Futures*
- *comprehensive*
- *Integrated (especially social science & biological sciences)*
- *backed by data, new analyses, & peer reviewed studies*
- *created by a team of experts*

“This is an exceptionally well-organized and comprehensive book that will not only be timely, but should have an extensive shelf life. There has been relatively less attention to climate change issues in forests of the southern U.S. than in the western U.S., and this volume will help adjust that imbalance. The mixture of public and private lands in the South make the forest resource quite distinct from the West, and the climate change issues and solutions are therefore distinct and typically associated with different spatial and temporal scales.”

“This will be a state-of-science book that will link recent climate change science with a broader range of natural resource issues in the South. To my knowledge, this should be the most effective effort of this type in the U.S. or anywhere else for that reason. The effects of climatic variability and change on natural resources and land management issues are inherently regional and place-based, and this volume addresses that regional focus.”

Next Steps and Timeline

- *Complete technical and peer review*
- *Complete CRC Press publication process*
- *Develop and implement content delivery*
  - *Website*
  - *Integration with other tools & approaches*
  - *Webinars*
- *Develop dynamic process for feedback, update, revision*