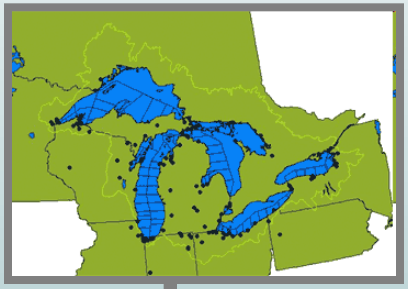
# Rethinking adaptive management as a science-policy bridge:

# How do we engineer the bridge?

**Rachel Pawlitz, *PhD Candidate***
**University of Florida, School of Natural Resources and Environment**

# Water Governance as "Adaptive" and "Ecosystem-Based"

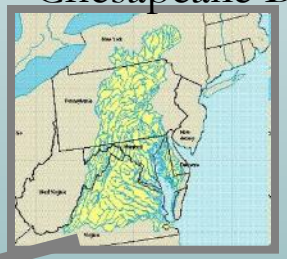
Missouri River

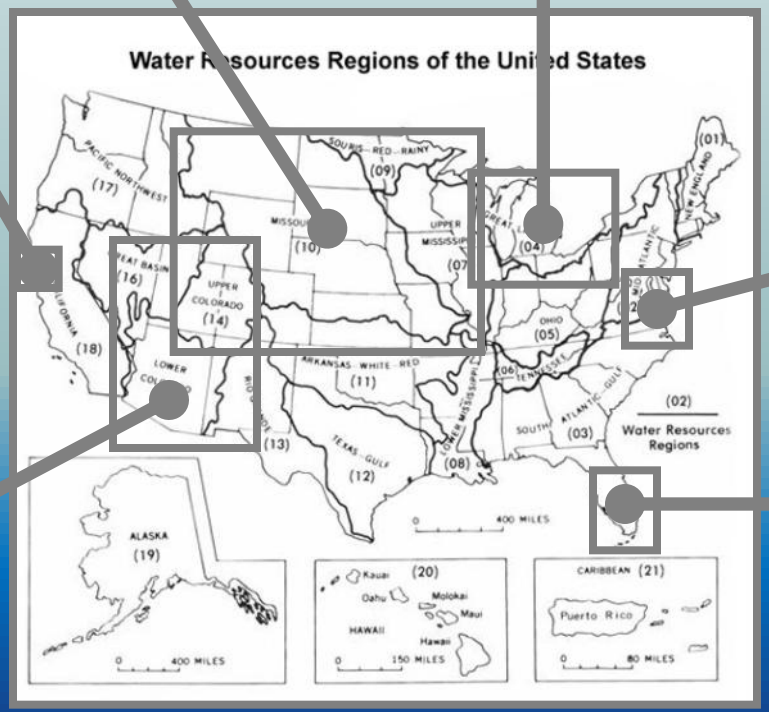


Great Lakes

San Fran Bay

Chesapeake Bay





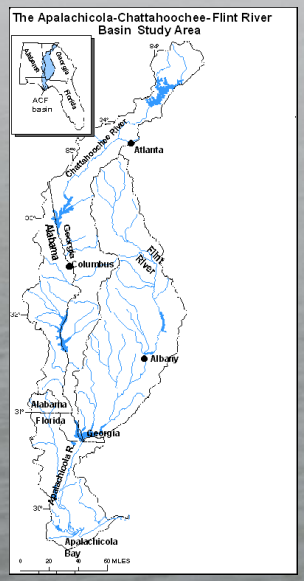

Colorado River

Everglades

# What makes this form of governance different?

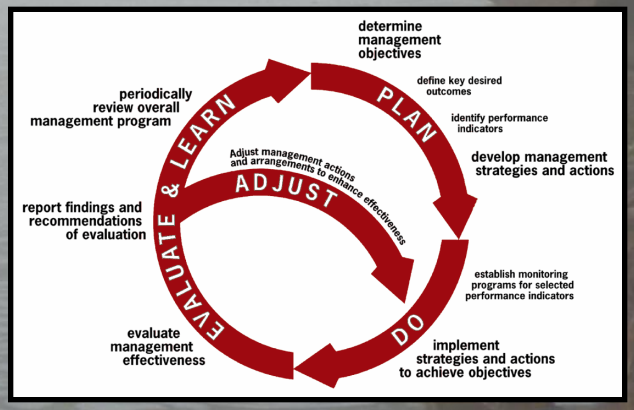
## Decision-making ‘unit’

- Ecosystem-based (watershed)
- Transcends jurisdictions
- Includes stakeholders




## Adaptive approach

- Embracing uncertainty
- Learning by doing
- Iterative cycle of reflection and analysis



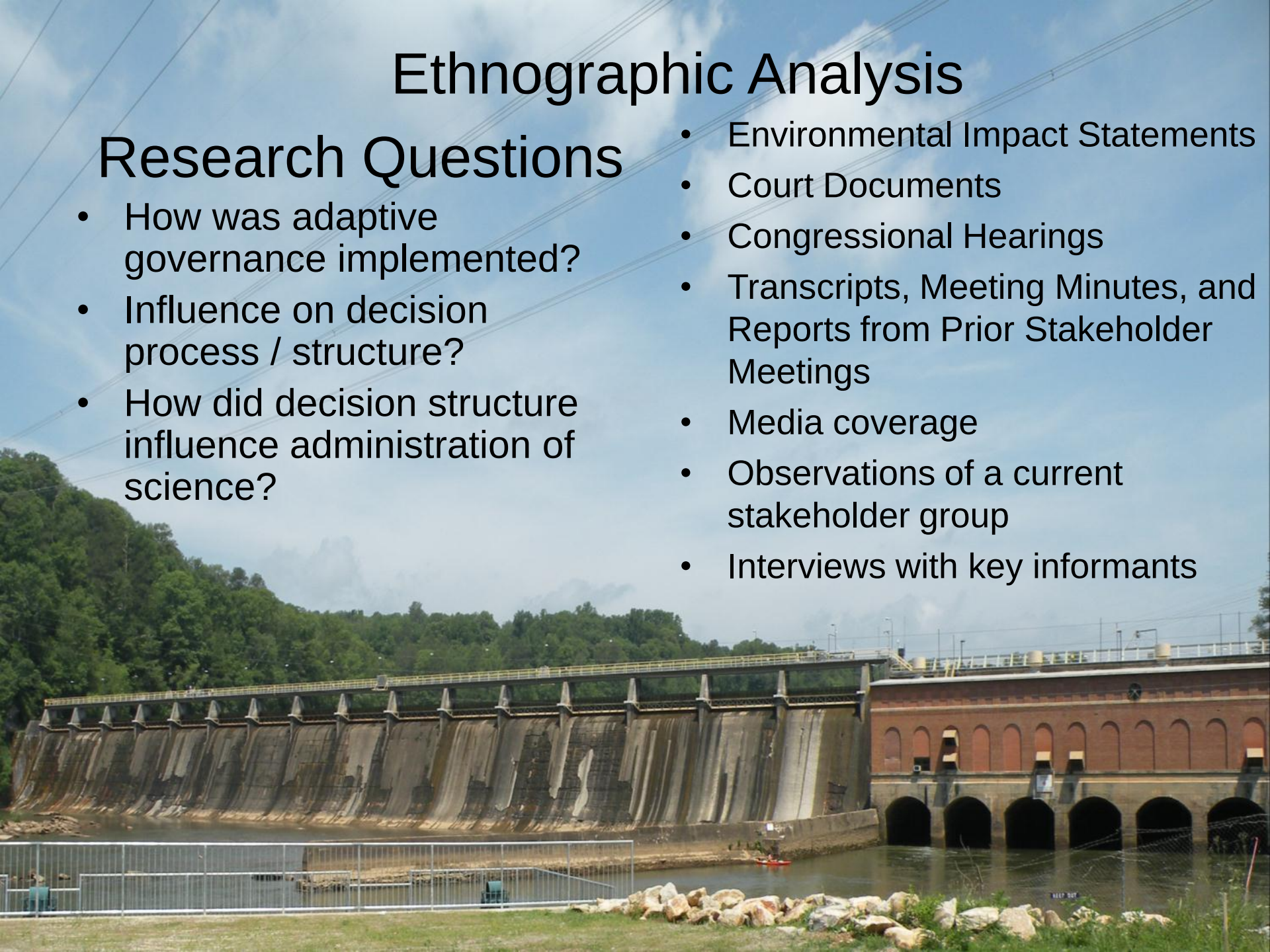

Apalachicola-Chattahoochee-Flint River Basin (ACF)
TN
N.C.
S.C.
N
W
E
S
Chattahoochee River Headwaters
Helen
Dawsonville
Cumming
Buford Dam
Habersham Dam
Gainesville
Morgan Falls Dam
Roswell
Lake Sidney Lanier
Buford
Marietta
Peachtree Creek
Atlanta
Metropolitan North Georgia Water Planning District
Whitesburg (Gauge)
Chattahoochee River Basin
Alabama
Georgia
West Point Lake
Sprewell Bluff State Park
Yellow Jacket Shoals
Flint River Basin
West Point Dam
Lanett, Al
LaGrange, Ga
West Point, Ga
Macon
Langdale Dam
Riverdale Dam
Bartletts Ferry Dam
Auburn, Al
Columbus, Ga
White Water Creek and Dam
Goat Rock Dam
Oliver Dam
N. Highlands Dam
City Mills Dam
Eagle & Phenix Dam
Montgomery
Montezuma (Gauge)
Phenix City, Al
Lake Blackshear
Eufaula, Al
Crisp Co. Dam
Lake Eufaula
Albany
Lake Worth
Albany Dam
Walter F. George Dam
Dothan
Newton (Gauge)
George W. Andrews Dam
Bainbridge
Alabama
Florida
Lake Seminole
Marianna
Jim Woodruff Lock and Dam
Georgia
Florida
Sneads
Chattahoochee (Gauge)
Apalachicola River Basin
Blountstown
Bristol
Tallahassee
Dead Lakes
Wewahitchka
Florida
Eastpoint
Panama City
Carrabelle
Port St. Joe
Alligator Harbor
St. Joseph Bay
Dog Island
Gulf of Mexico
Apalachicola
St. George Island
Apalachicola Bay
Little St. George Island
Indian Pass
St. Vincent Island
0
25
50
miles

# Ethnographic Analysis

## Research Questions

- How was adaptive governance implemented?
- Influence on decision process / structure?
- How did decision structure influence administration of science?

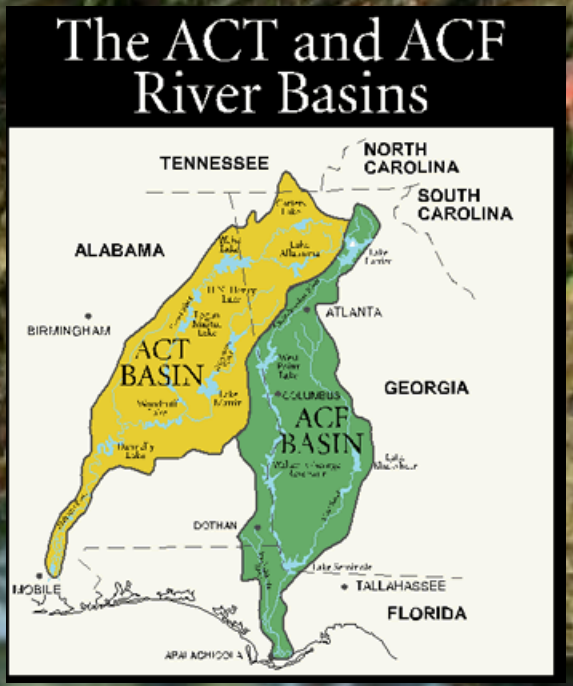
- Environmental Impact Statements
- Court Documents
- Congressional Hearings
- Transcripts, Meeting Minutes, and Reports from Prior Stakeholder Meetings
- Media coverage
- Observations of a current stakeholder group
- Interviews with key informants



# Before Uncertainty

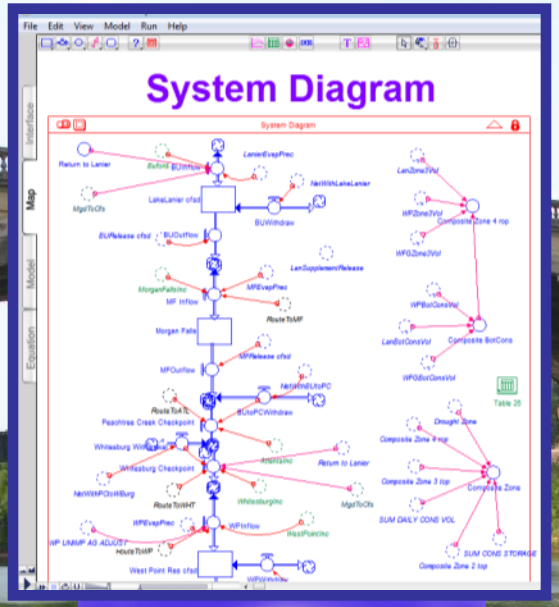
# Development Takes Off


# Conflict Begins




# Phase I: Adaptive Interstate Negotiations

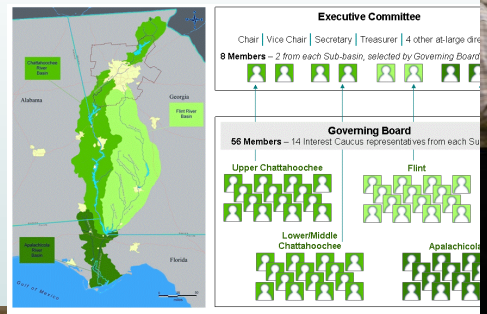
# Phase II:
# Shared Visioning



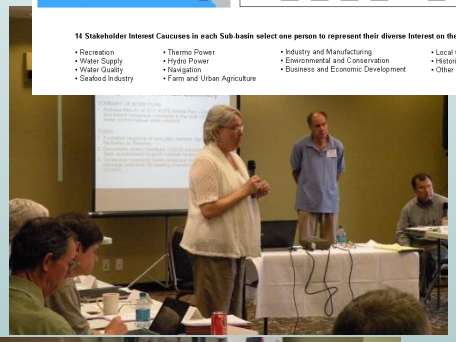

US Army Corps of Engineers®

# Phase III:
# Adaptive Dam Operations

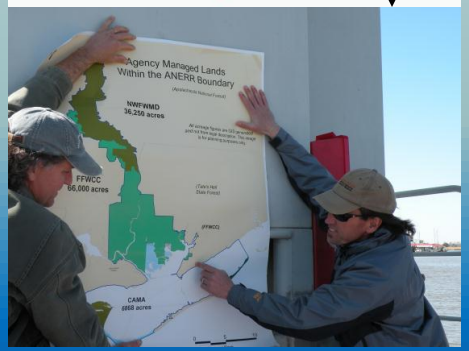
# Phase IV: ACF Stakeholder Organization







Lake Lanier


Apalachicola Bay

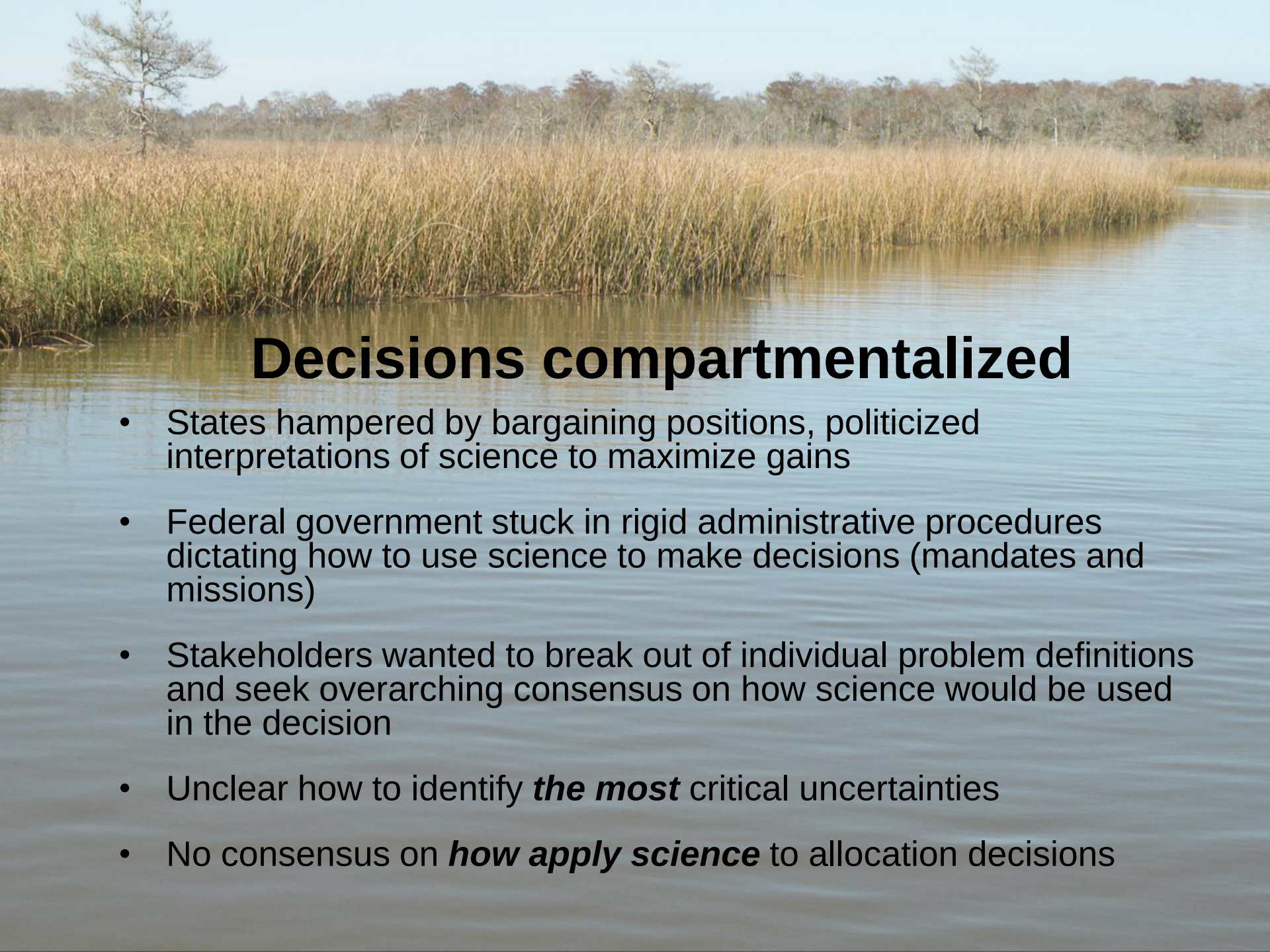
# Theoretical insights:


Phase I (Interstate negotiations)
- Iterative decision-making

Phase II (Shared visioning)
- "Learning from experts"

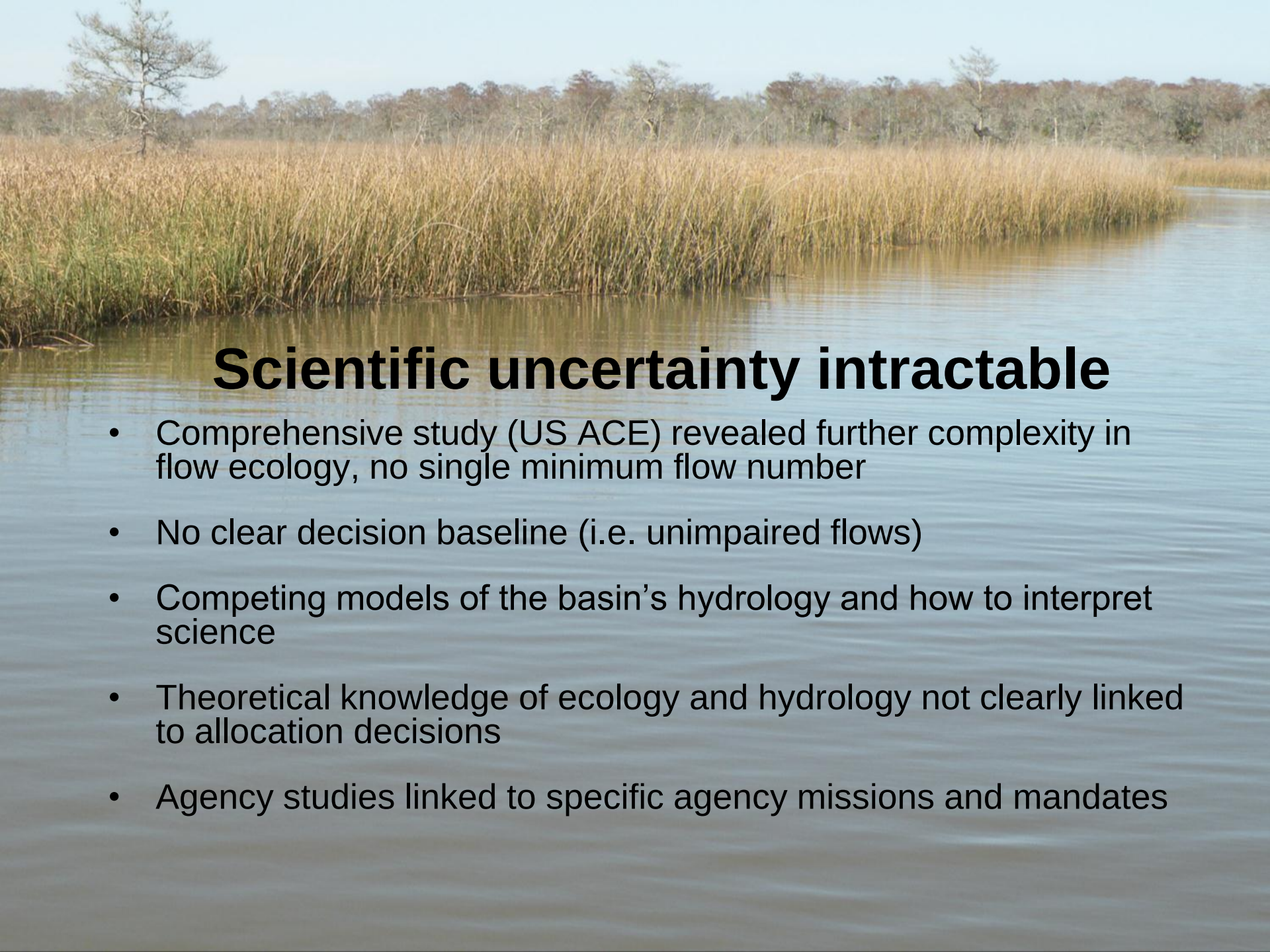
Phase III (Dam operations)
- Rigid administrative interpretations challenged
- Ideological interpretations fueled conflict

Phase IV (Stakeholder group)
- Looked at bigger context
- Redefined the problem
- No power, agencies bound by law



# Decisions compartmentalized

- States hampered by bargaining positions, politicized interpretations of science to maximize gains
- Federal government stuck in rigid administrative procedures dictating how to use science to make decisions (mandates and missions)
- Stakeholders wanted to break out of individual problem definitions and seek overarching consensus on how science would be used in the decision
- Unclear how to identify ***the most*** critical uncertainties
- No consensus on ***how apply science*** to allocation decisions



# Scientific uncertainty intractable

- Comprehensive study (US ACE) revealed further complexity in flow ecology, no single minimum flow number
- No clear decision baseline (i.e. unimpaired flows)
- Competing models of the basin's hydrology and how to interpret science
- Theoretical knowledge of ecology and hydrology not clearly linked to allocation decisions
- Agency studies linked to specific agency missions and mandates

# Recommendations for institutions:

- Use formal partnerships to balance / devolve power in decision-making
- Engage stakeholders in a definition of policy problems; break out of preconceived definitions
- Critically analyze how physical phenomena are linked to policy problems (complexity; connectedness)
- ‘Parameterize’ the overarching problem (tractability)
  - Reduce conflict to key interests to enable collaboration
  - Seek consensus on how science will support decision
  - Reduce scientific uncertainties to key unknowns that are most critical for reaching agreements about allocation
- Develop decision criteria that are viewed as legitimate by stakeholders themselves

# Acknowledgements


- School of Natural Resources and Environment
- Water Institute

ACF stakeholders

ADAPTIVE MANAGEMENT | water, wetlands and watersheds

IGERT Integrative Graduate Education and Research Traineeship