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## **Adaptive Management: A bridge between science and policy?**

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“Learning from Regions: A Comparative Appraisal of  
Climate, Water, and Human Interactions in the Colorado and  
Columbia River Systems”





# Adaptive Management: A bridge between science and policy?

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# Presentation

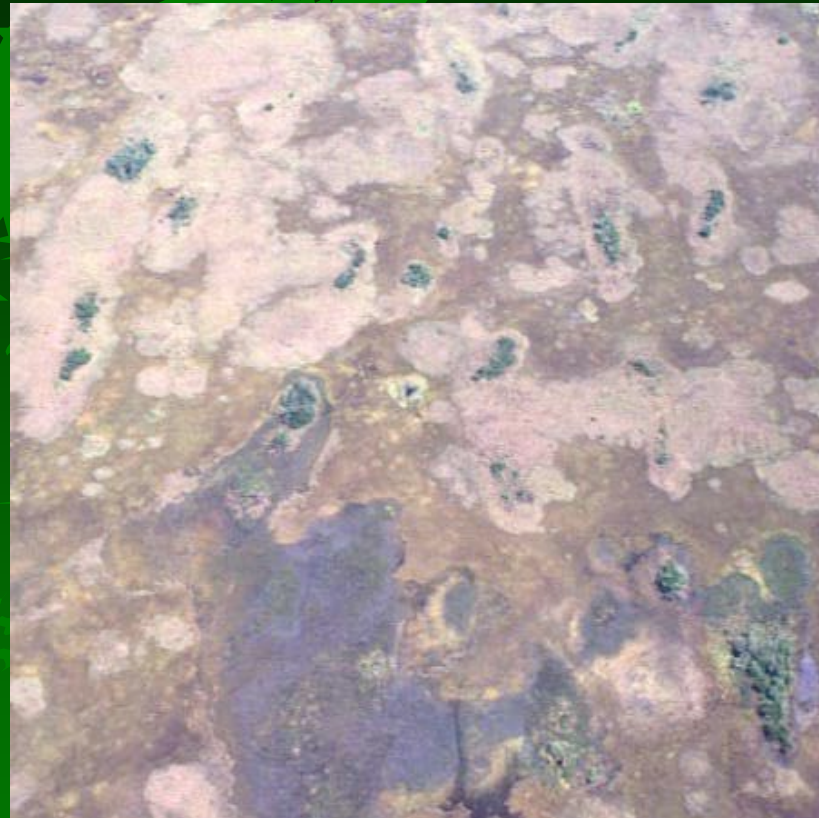


- ✦ Scales of Issues in the Everglades
- ✦ AEA in the Glades
- ✦ AM in the Canyon
- ✦ Managing Uncertainty

# Landscape Scale Issues

## Biotic changes due to:

- Nutrient Enrichment
- Altered Hydrology
- Altered Disturbance Regime



# Subsystem Scale Issues

- Wading Bird Foraging
- Endangered Species  
(Wood Stork, Panther)
- Changes due to  
water management



# Everglades Scale Issues

-1/2 Wetlands Lost

-Water Allocation  
among land uses of  
agriculture, urban and  
conservation





# Regional Scale Issues

-Changes in Wading Bird  
Nesting Patterns

-Changes in Rainfall Patterns



# Adaptive Environmental Assessment and Management

- ✦ Assessment Workshops
  - 3 years, 8 workshops (1989-1992)
  - 60-80 persons involved
  - Transformation of Understanding
  - Led to Restudy Process
- ✦ Avoiding Management Trials



# AEA Workshops

- ✦ Sufficient water resources for experimentation
  - ✦ Resilience identified in key ecosystem components
- 
- ✦ Flexibility among stakeholders?
  - ✦ Room for political negotiations?

# Parallel Planning

## ✦ Technical

- Adaptive Management Design Workshops
- COE Restudy
- Piecemeal Studies

## ✦ Social/Political

- Colloquy- 1992
- Governors Commission
- Federal Task Force



Restoration Act 2000

# Everglades AEAM

- ✦ Successful Adaptive Assessment
- ✦ NO Adaptive Management
  - In spite of statements to the contrary

# Issues in the Grand Canyon

- ✦ Dam Construction
  - Loss of sediment input
  - Lower flows
  - Temperature changes
  - Trophy fishery
- ✦ Endangered species
  - Exotics



# AM in the Canyon

- ◆ Experimental flow regimes
  - 3 tests mid 90's
  - beach habitat building flows
- ◆ Temperature Control Device
  - Planning/evaluation
- ◆ Experimental Harvest
  - Predation on HB chub



# GC- Institutions

GC Research & Monitoring Center

Adaptive Management  
Work Group

Science  
Board





# Keys to Adaptive Management

- ✦ Resilience in Ecosystems
  - Ability to absorb disturbances
- ✦ Social Capital
  - Ingenuity and Creativity
  - Trust among citizens, interests and government
- ✦ Flexibility in Institutions
  - Focus on Learning
  - Facilitating Interactions

# Managing Uncertainty:

Where is the uncertainty?

## -Problem Domain

-science

-organizational

-community

-political

- adequate theory
- multiple hypotheses & congruent management actions.
- tractability (complexity)
- confronting models w/data
- independence/ rigor
- novelty

# Managing Uncertainty:

Where is it?

-Problem Domain

-science

-organizational

-community

-political

- expressions of power
- multiple equilibria  
paths not taken
- NONE are scale invariant
- stability of institutions  
novelty of approaches
- role of epistemic groups
- multiple discourses
- juggling domains