DOI Climate Adaptation Science

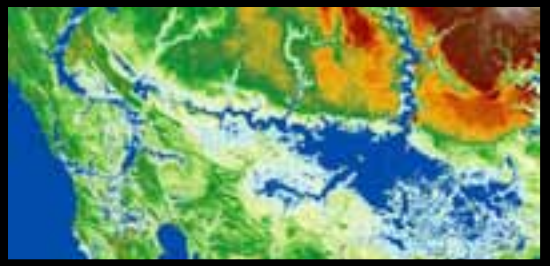
Update USGS Activities

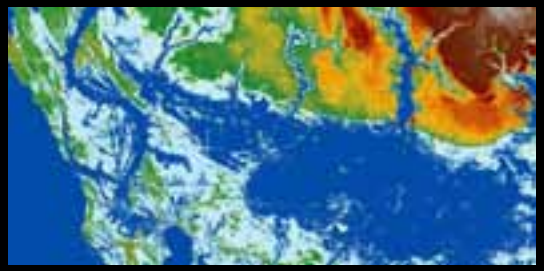
U.S. Department of the Interior
U.S. Geological Survey

USGS Global Change Program

Climate Change Science:

Exploring the Past, Observing the Present, Forecasting the Future





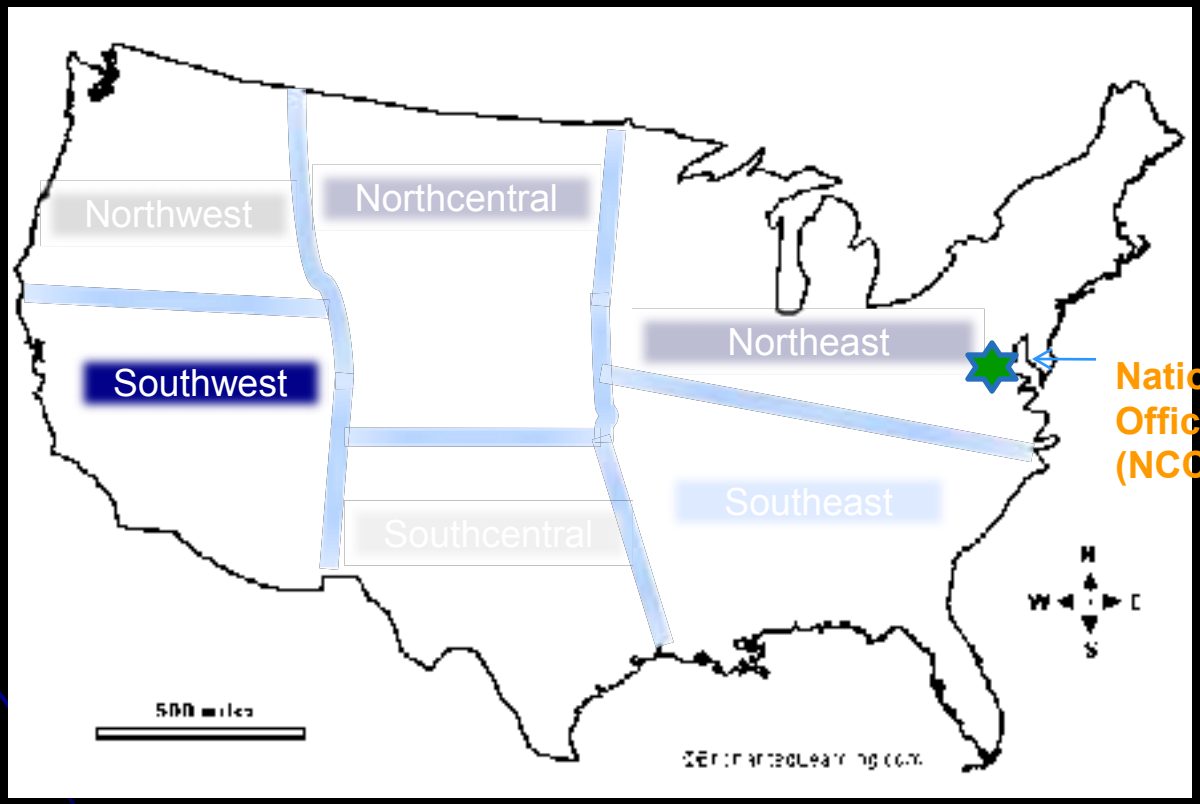
Secretarial Order 3289

Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources *(9/14/09)*

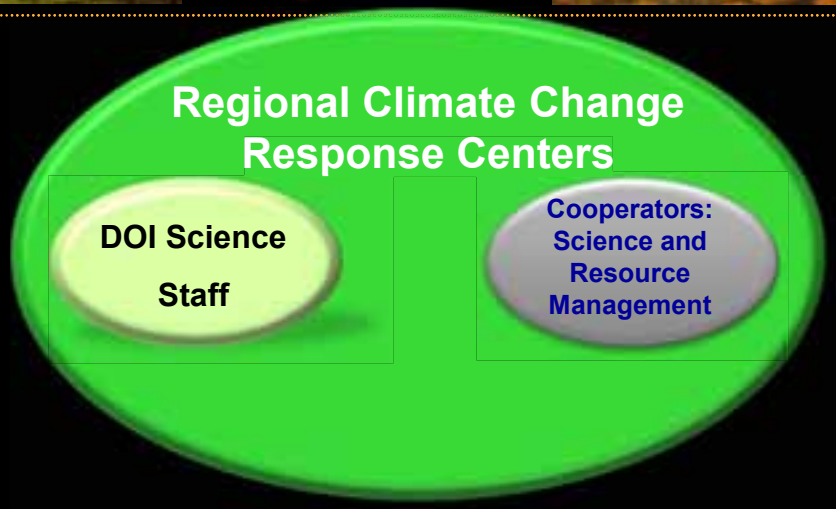
The United States Geological Survey (USGS) has been developing regional science centers … currently known as "regional hubs“ of the National Climate Change and Wildlife Science Center…

The Climate Change Response Council will work with USGS and other Department bureaus to rename these regional science centers as Regional Climate Change Response Centers and broaden their mandate …

Regional Climate Change Response Centers



"Fuzzy Boundaries"



- University Based
- Competitive Process
- 3+ RCCRC Funded in FY 2010
- Program Announcement in Early 2010
- Staffing – Director/Coordinator, Ecologists, Modelers, Climate Scientists, Population Biologists (?), Hydrologists (?), Sociologists (?)

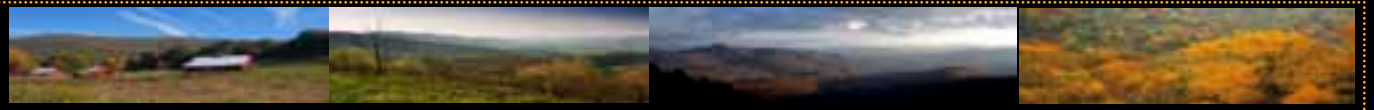
Ongoing Research at NCCWSC

- SE Regional Pilot ($1.7 Million)

- Research Emphases ($5.2 Million)

  - Fisheries & Fish Habitat - $1.8 Million
  - Arctic & Arctic Species - $0.8 Million
  - Estuaries & Coasts - $0.7 Million
  - Avian Conservation - $0.5 Million
  - Wildlife & Terrestrial Species - $1.4 Million

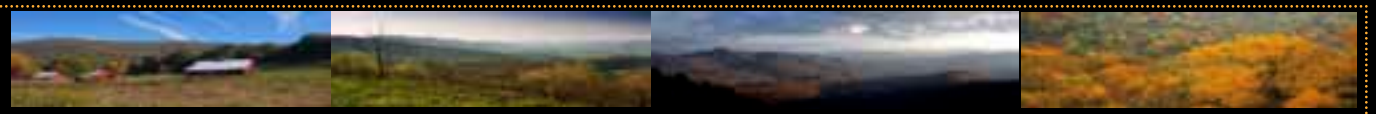
- Partnerships ($1.4 Million)
  - Climate Monitoring (NASA, FWS, NSF, Smithsonian, NPS)
  - Landscape Conservation Cooperatives



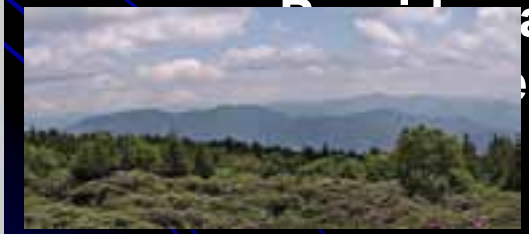
Appalachian Mountains

Appalachia

A 200,000 square mile area containing 400 counties in 13 states, stretching across three weather and two time zones and is home to approximately 96 million people.

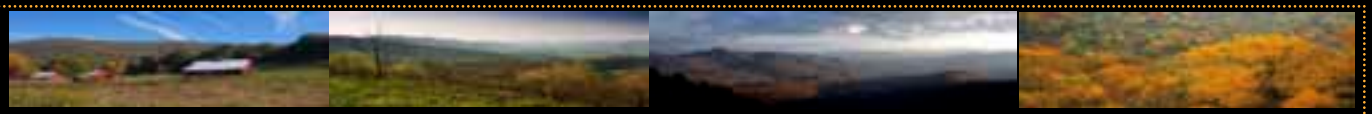


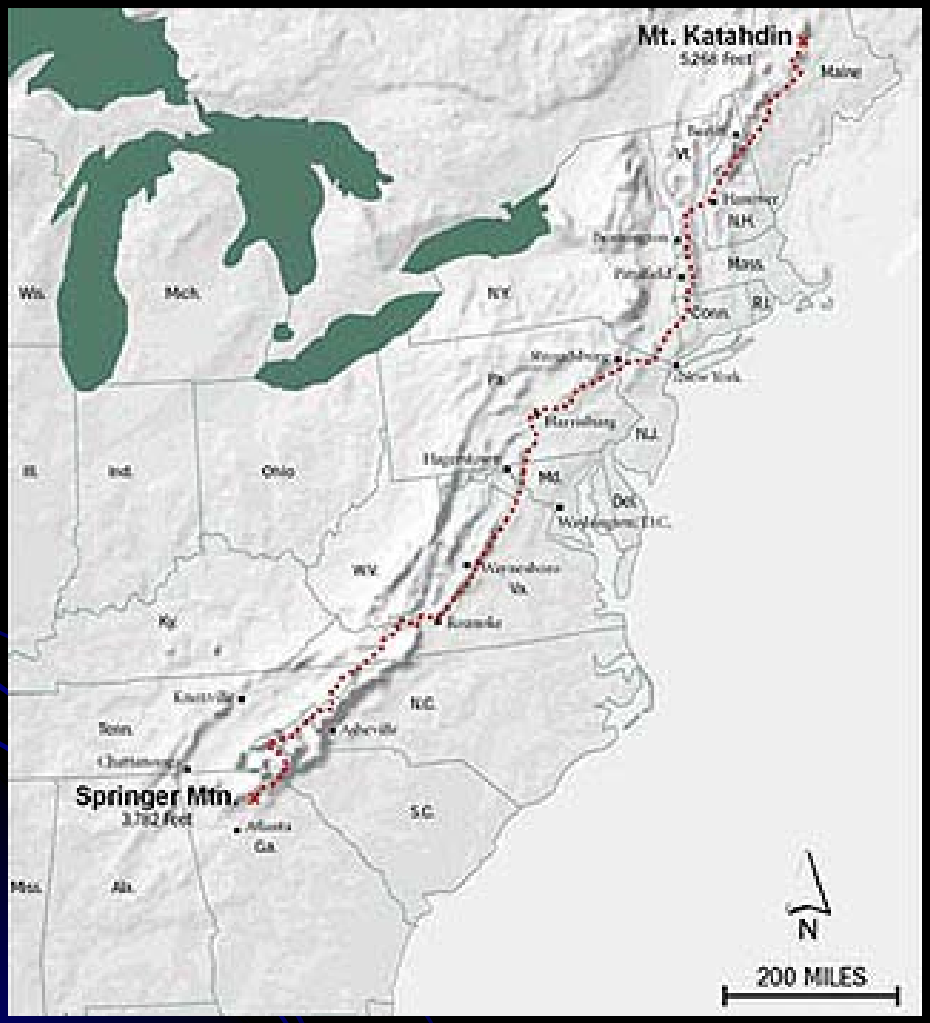
Why the Appalachians?



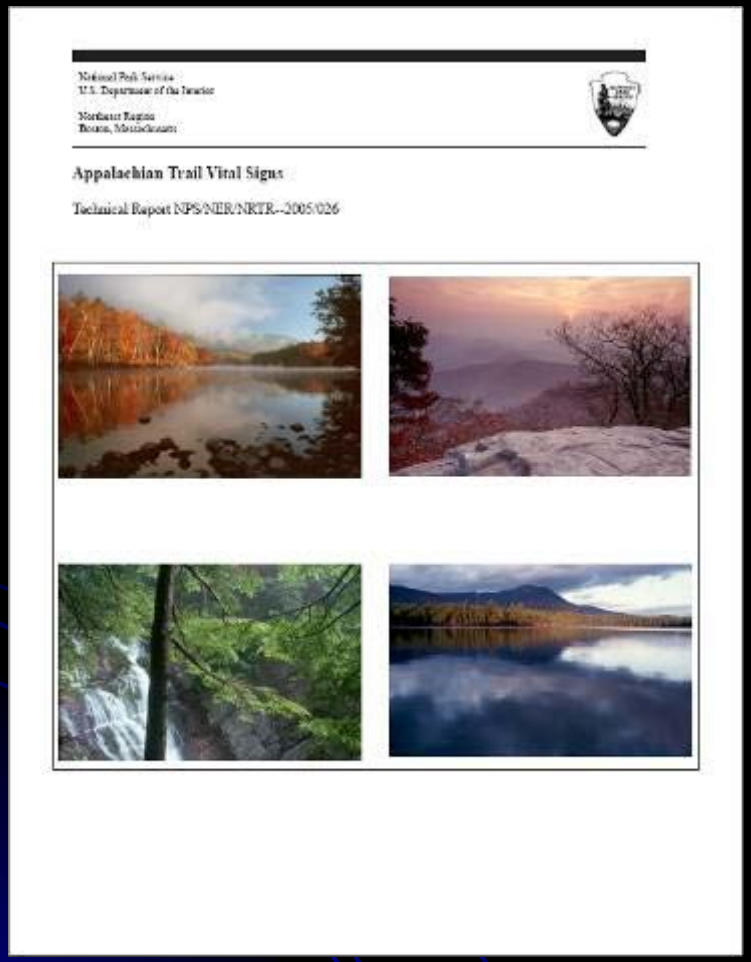
- Large concentration of Federally protected lands
- Extensive areas of minimally disturbed ecosystems that harbor extraordinary biodiversity and species richness
- Globally renowned temperate biome-designated as an international biosphere reserve
- Critical issues surrounding future habitat degradation
- Provides an excellent opportunity to expand our

Contains the headwaters for the Chesapeake Bay Watershed





Appalachian Trail Mega-Transect



National Park Service
U.S. Department of the Interior

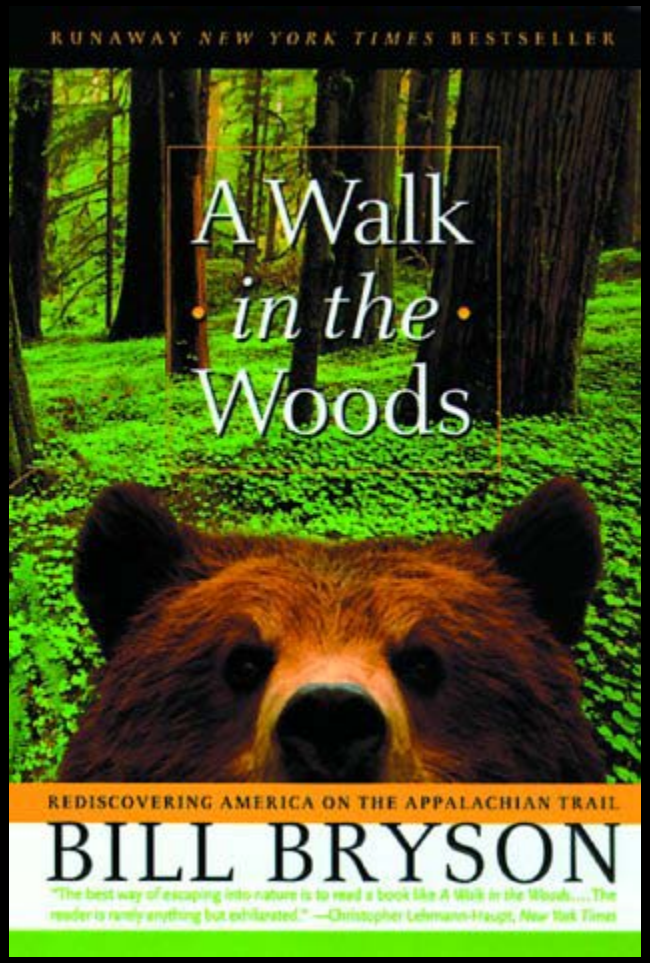
Northeast Region
Boston, Massachusetts

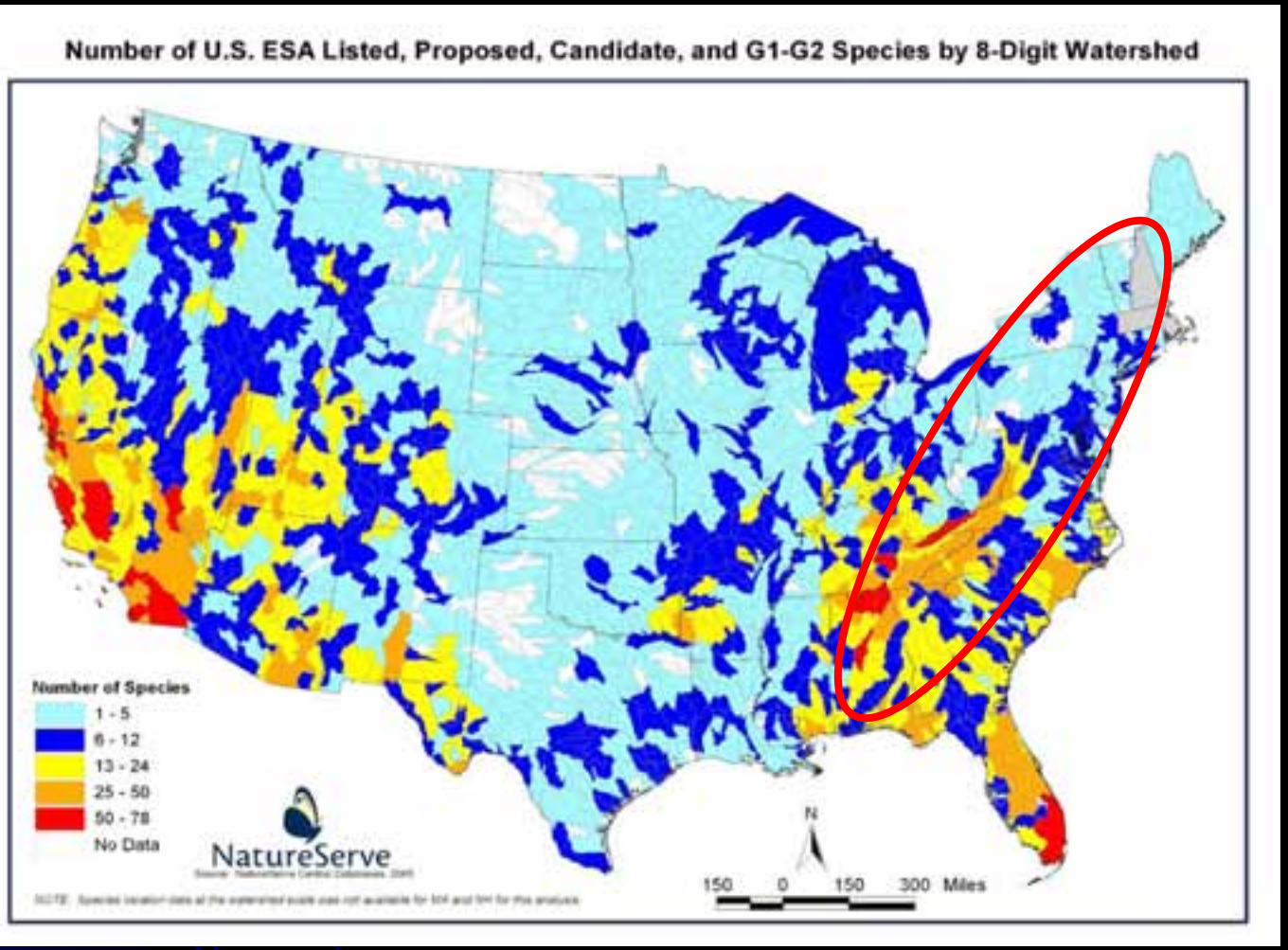
Appalachian Trail Vital Signs

Technical Report NPS/NER/NRTR--2005/026

Vital Signs are defined as a subset of physical, chemical, and biological elements and processes of park ecosystems that are selected to represent the overall health or condition of park resources, known or hypothesized effects of stressors, or elements that have important human values

Appalachian Trail Movie




Number of U.S. ESA Listed, Proposed, Candidate, and G1-G2 Species by 8-Digit Watershed
Number of Species
1 - 5
6 - 12
13 - 24
25 - 50
50 - 78
No Data
NatureServe
N
150 0 150 300 Miles

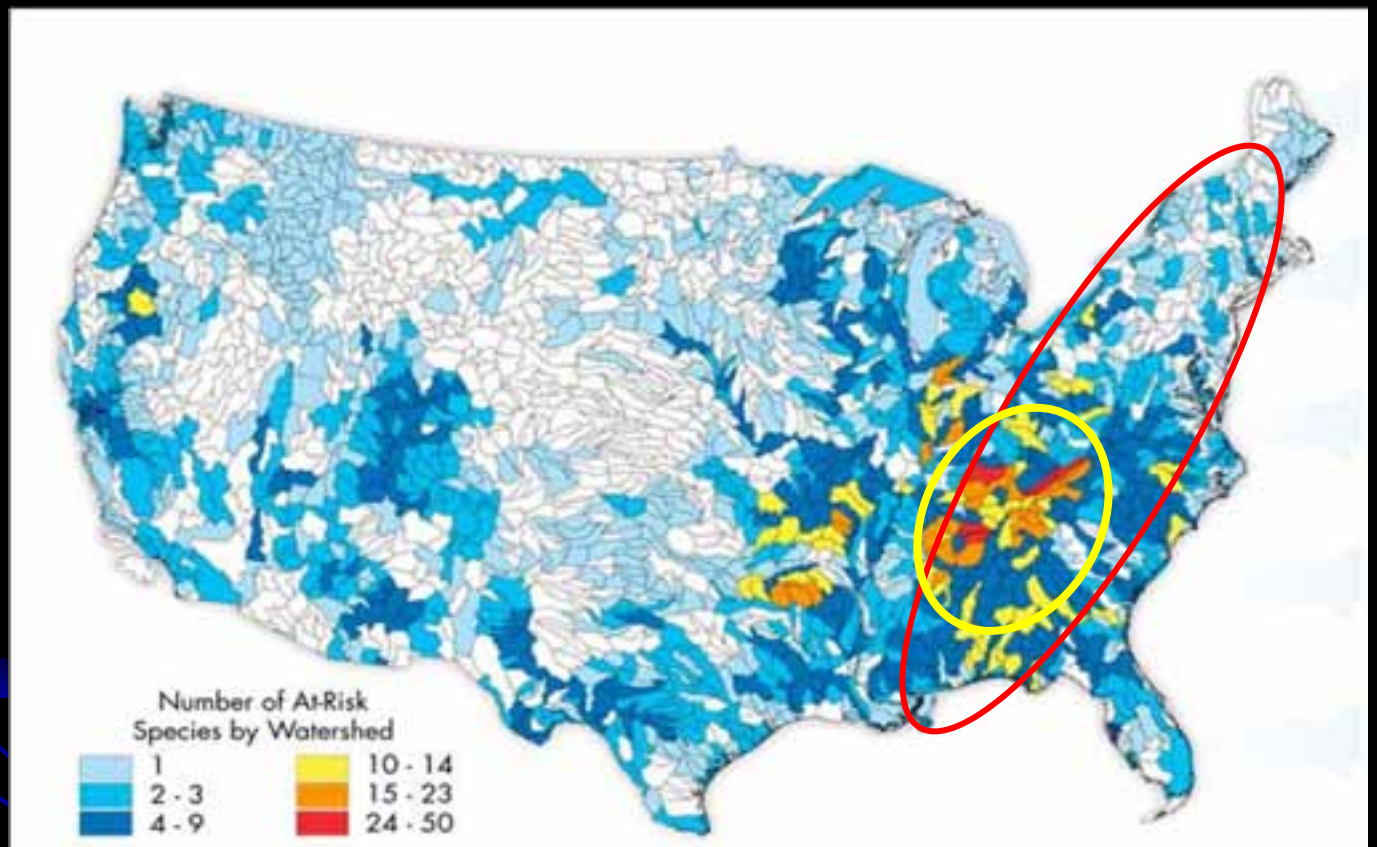
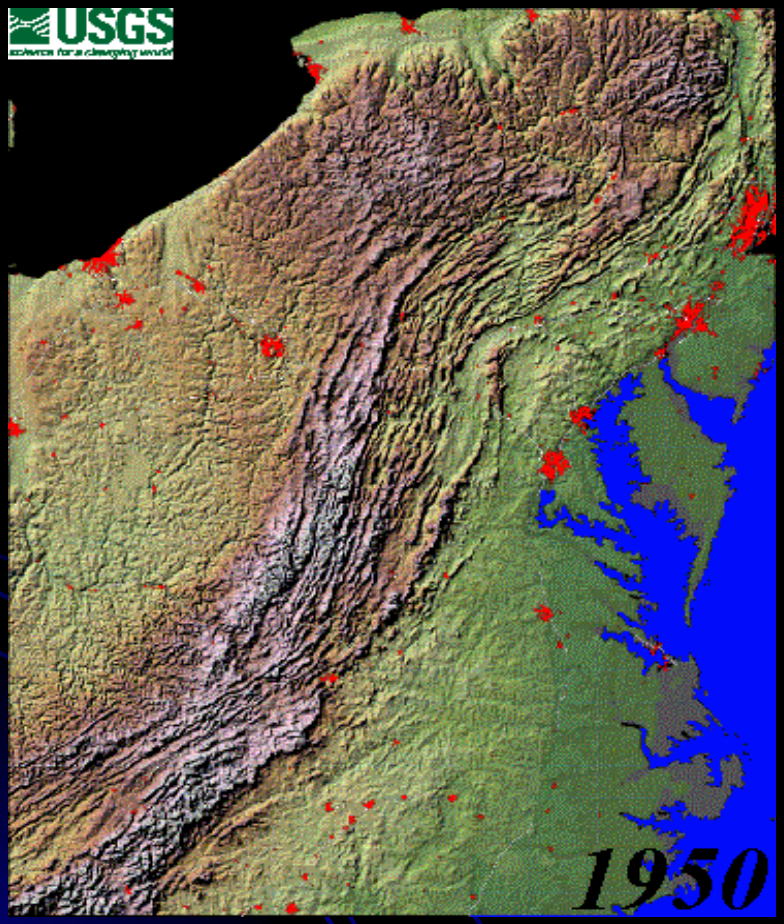


Figure 5. Hot Spots for At-Risk Fish and Mussel Species

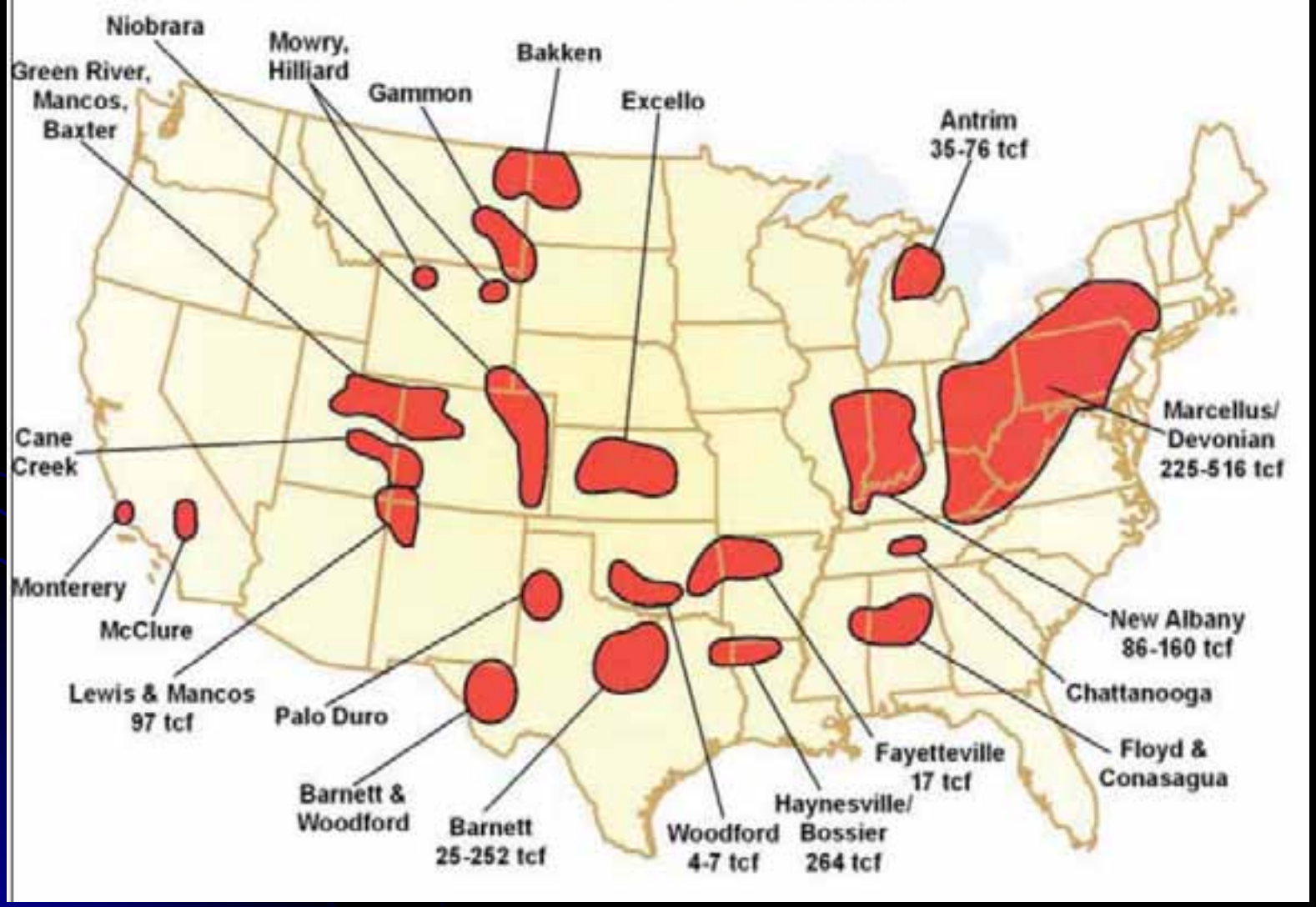
Watersheds with 10 or more at-risk fish and mussel species are concentrated in the Southeast, reflecting the extraordinary species diversity of rivers and streams in this region.



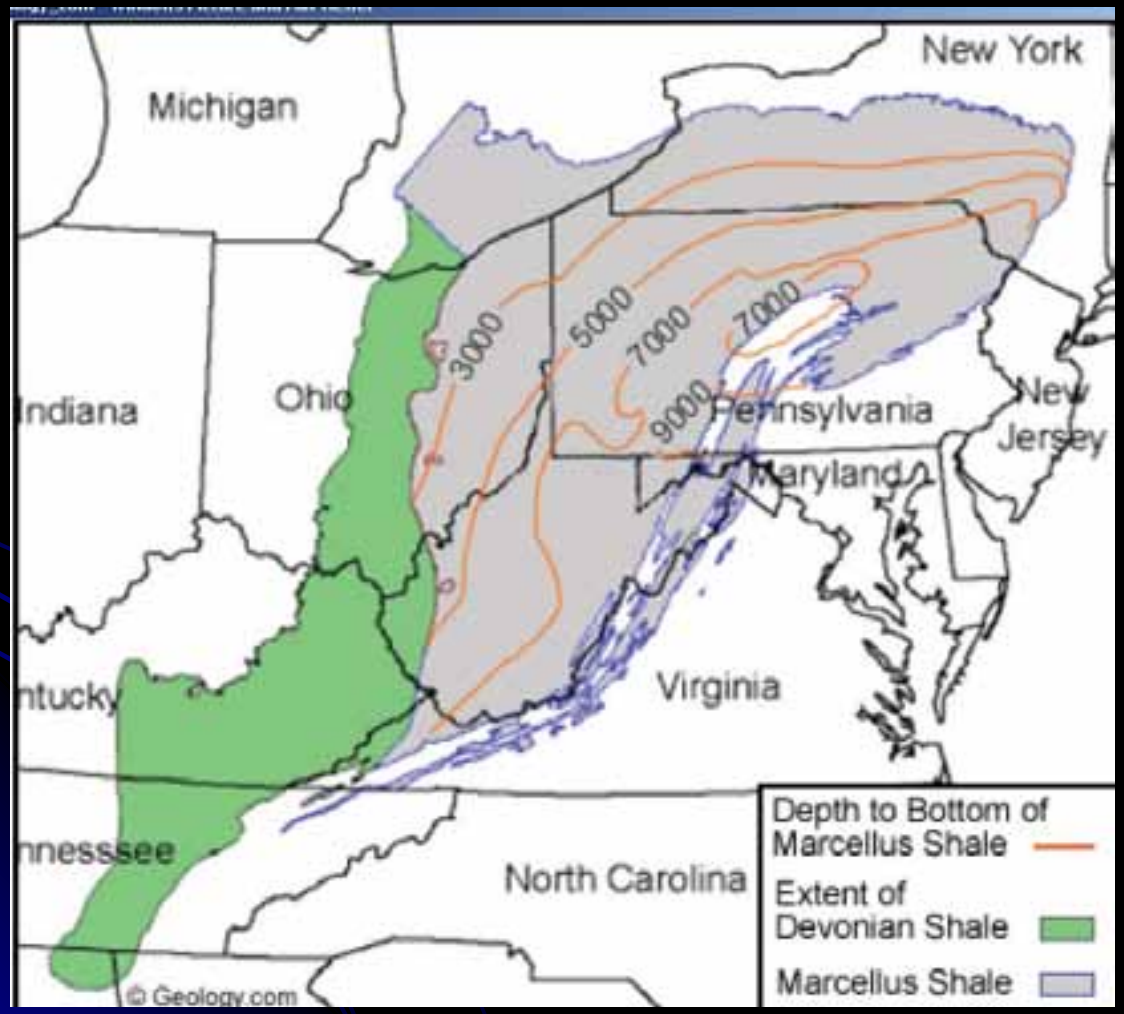
East coast is experiencing unprecedented urban growth

Appalachians are in glide path of East coast urban sprawl

Figure 1: Gas Shale Basins of the United States



Marcellus Play



Bill Kappel
US Geological Survey
Phone: 607-266-0217 ext.-3013
30 Brown Road
Ithaca, NY 14850-1573
wkappel@usgs.gov

Climate Change

- Species existence & distribution
- Increased Wildlife & forest related disease
- Phenology
- Water availability
- Climate Effects Network (CEN)

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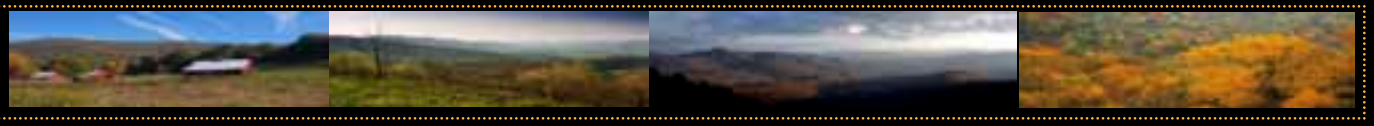
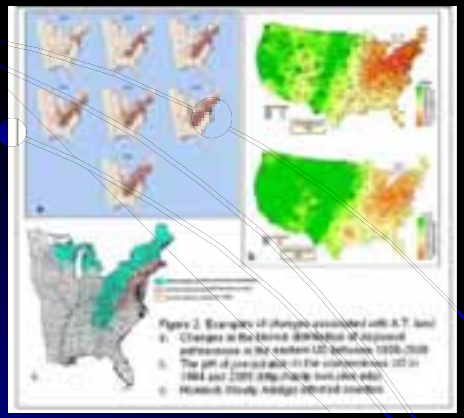
science for a changing world



A Decision Support System for Monitoring, Reporting and Forecasting the Ecological Conditions of the Appalachian Trail MEGA-Transect



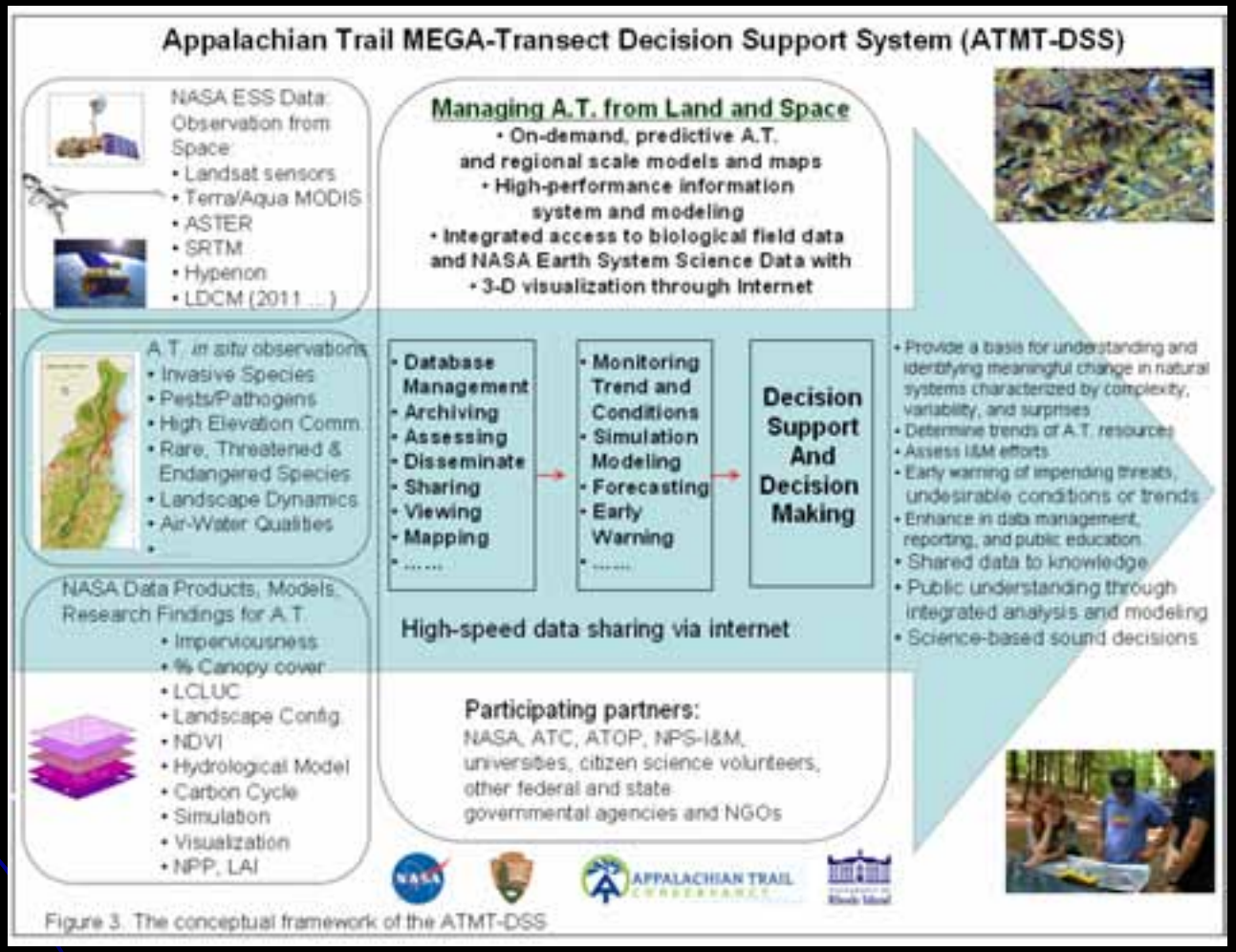
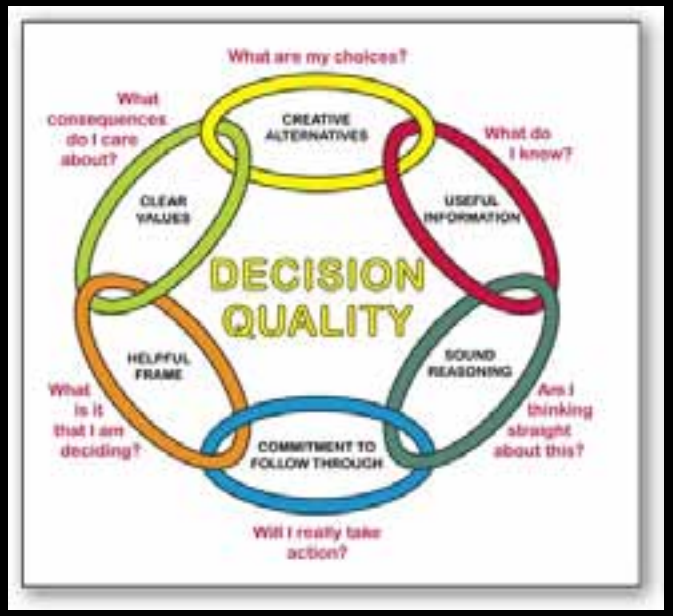


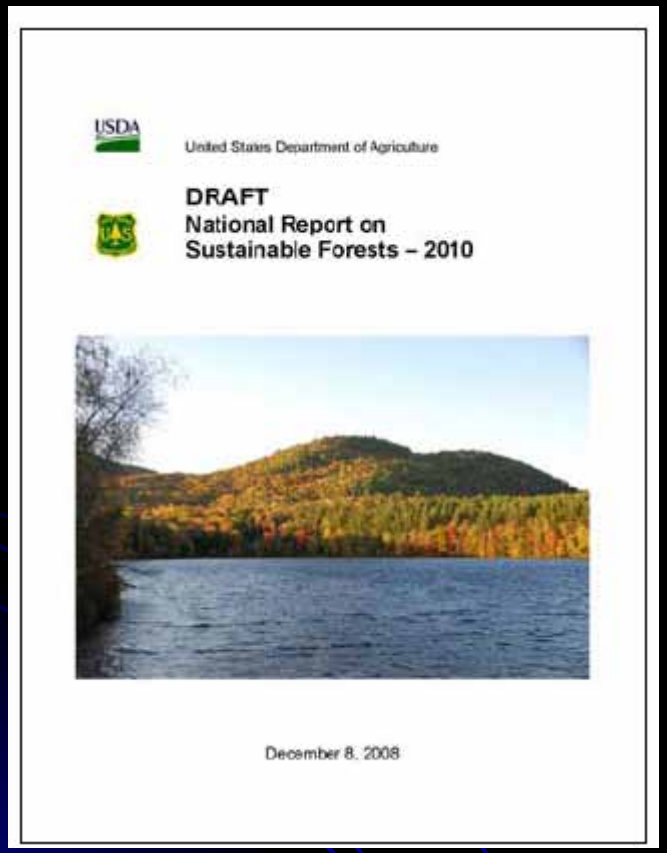
Figure 3. The conceptual framework of the ATMT-DSS

DA Workshop Structure & Steps

- Workshop focus is on the first three elements of ensuring decision quality
  - Framing the questions
  - Understanding decision-maker and stakeholder objectives for land management decisions
    - Including metrics that will connect data to achievement of objectives
  - Defining the management alternatives and scenarios relevant to decision-makers



- The DSS tool itself addresses the remaining elements
- The DA/SDM module of the DSS provides the connection between the “decision frame” and the technical data and models embedded in the DSS



Roundtable on Sustainable Forests

A Partnership for the Future

In December 2008, the US Forest Service released the draft *National Report on Sustainable Forests – 2010* for review and comment over a 120-day period. This draft is the second report in a series that began in 2003, and gauges the sustainability of our nation's forests using the Montréal Process Criteria and Indicators (MP C&I) as an organizing framework.

This report reflects the work of a team of almost 30 Forest Service scientists and staff, and reports on conditions and trends in our nation's forests using the 7 criteria and 64 indicators of the Montreal Process, showing current conditions and recent trends. It also contains analyses of significant conditions, highlights important issues, and describes recent activities at local, State, and regional levels for improving sustainable forest management.

The Draft *National Report on Sustainable Forests - 2010* informs dialogue about contemporary forest issues. Climate change, increasing bio-energy and bio-fuels production, and the loss of forests and the ecosystem services they provide are three of the most important issues that will affect the sustainability of forests in the United States of America in the coming years.

Appalachian Mountain Joint Venture

The AMJV's mission is " *To provide a forum for partners to coordinate and improve the effectiveness of bird conservation planning and implementation in the Appalachian Mountains Bird Conservation Region in order to restore and sustain viable populations of native birds and their habitats* "

The forested landscapes of the Appalachian Mountains Joint Venture offer tremendous opportunity for projects that would improve migratory bird habitat and store large quantities of carbon. Active coal mines and old mine lands fragment forests, leading to decreased productivity of forest birds. Partners are strategically pursuing mine land reforestation projects on previously mined areas, while also encouraging the mining industry to use a “forest reclamation approach” on current and future mines. Old mine lands throughout the Appalachian Mountains could be reforested. *Patrick Angel, DOI/OSM*

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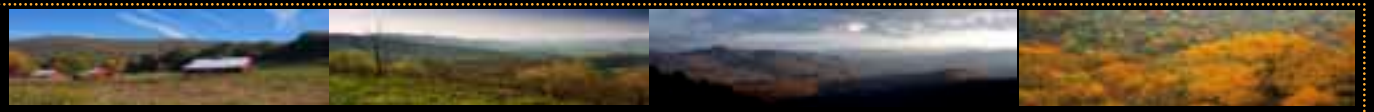
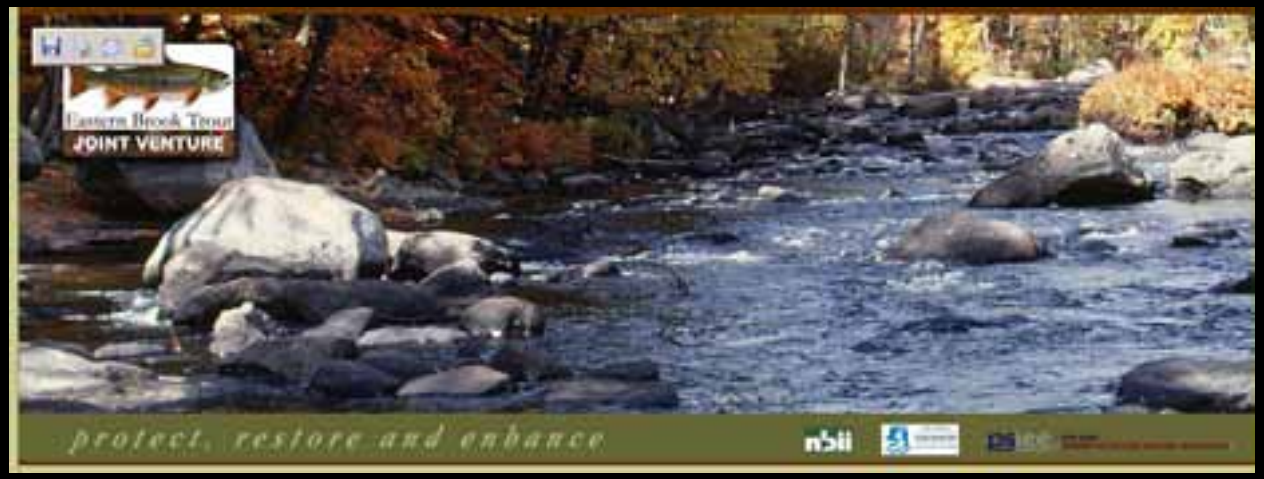
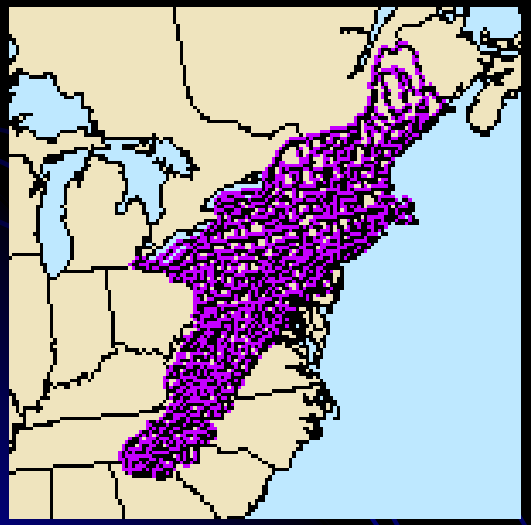


Eastern Brook Trout
JOINT VENTURE



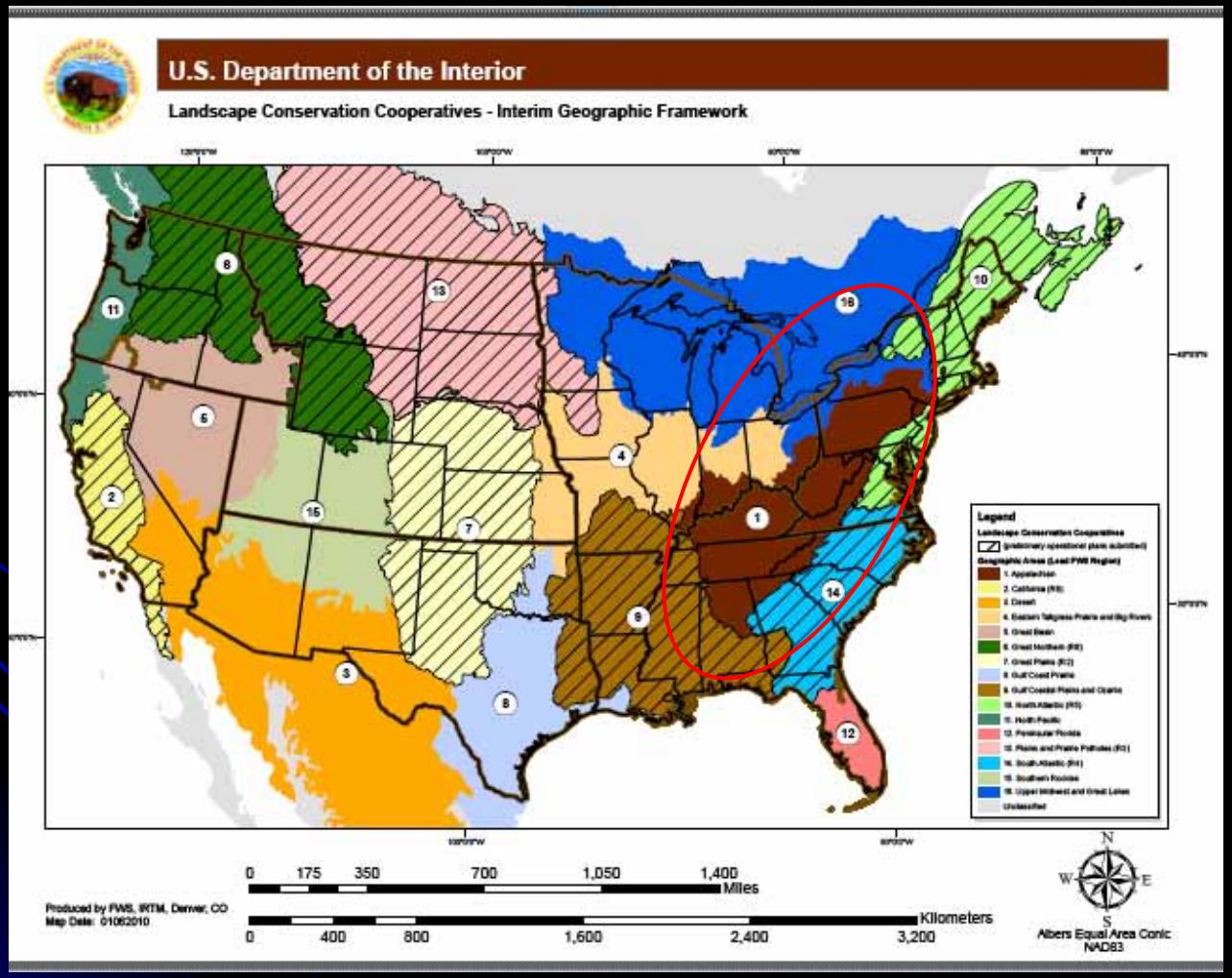


The Eastern Brook Trout Joint Venture

The Eastern Brook Trout Joint Venture (EBTJV) is a unique partnership between state and federal agencies, regional and local governments, businesses, conservation organizations, academia, scientific societies, and private citizens. The nation's first pilot project under the National Fish Habitat Initiative (NFHI), EBTJV is a geographically focused, locally driven, and scientifically based effort to protect, restore and enhance aquatic habitat throughout the range of the Eastern brook trout.

- Assess native Eastern brook trout populations from Georgia to Maine: status, trends, current vs. historical distribution
- Identify data, threats, and potential solutions for species conservation and management strategies

Fish & Wildlife Service Landscape Conservation Cooperatives (LCC'S)



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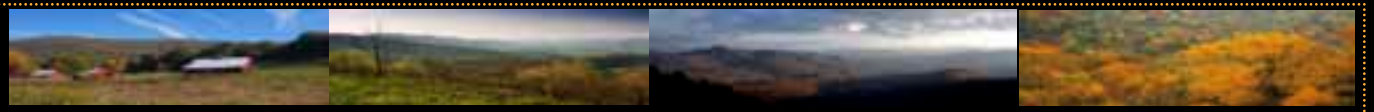


SOUTHEAST AQUATIC RESOURCES PARTNERSHIP
SARP

Activities by State

Quicklinks

Home

See Past Project Sites in Google Maps

New Aquatic Habitat Restoration Projects Funded

SFN Workshop 2009 Presentations

NATIONAL FISH HABITAT ACTION PLAN

Partnership | Programs | Focus | News | Opportunities | Documents

SARP

Southeast Aquatic Resources Partnership

The Southeast Aquatic Resources Partnership (SARP) is a regional collaboration of natural resource and science agencies, conservation organizations and private interests developed to strengthen the management and conservation of aquatic resources in the southeastern United States.

SARP's approach:

- Support and facilitation of on-the-ground and in-the-water science-based action to improve and protect aquatic habitats and resources.
- Focused habitat assessments, restoration actions, monitoring and evaluation of some of the nation's most economically and socially significant aquatic habitats.

SARP's mission:

SARP will, with partners, protect, conserve and restore aquatic resources including habitats throughout the Southeast for the continuing benefit, use and enjoyment of the American people.

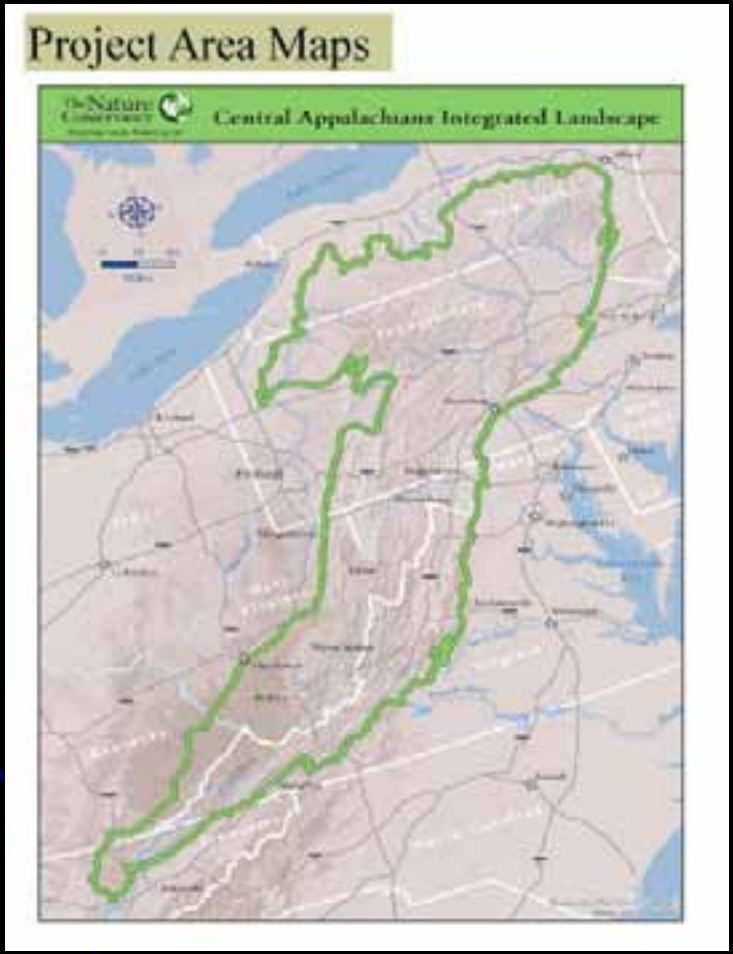
Search the Site: map | Search

The Partnership

Natural resource managers and professionals, both inland and coastal, from government agencies and non-governmental organizations contribute expertise, time, and funding to achieve the SARP mission. SARP welcomes all who wish to participate.

Read more about the Partnership

The Nature Conservancy Central Appalachians Intitiative



View From Glenn's World

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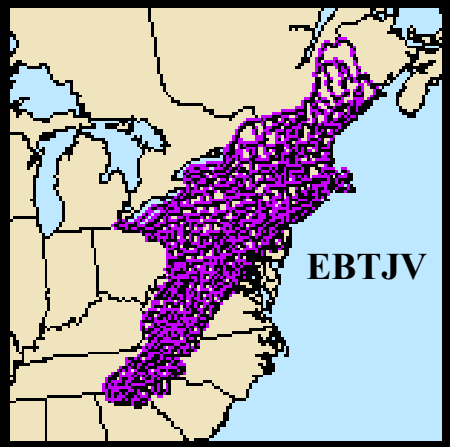
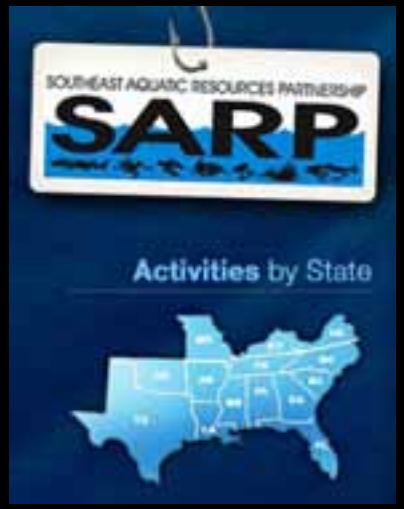




Biology

Species & Habitat Requirements

Hydrology

Ground Water/Surface Water/Ecological Needs

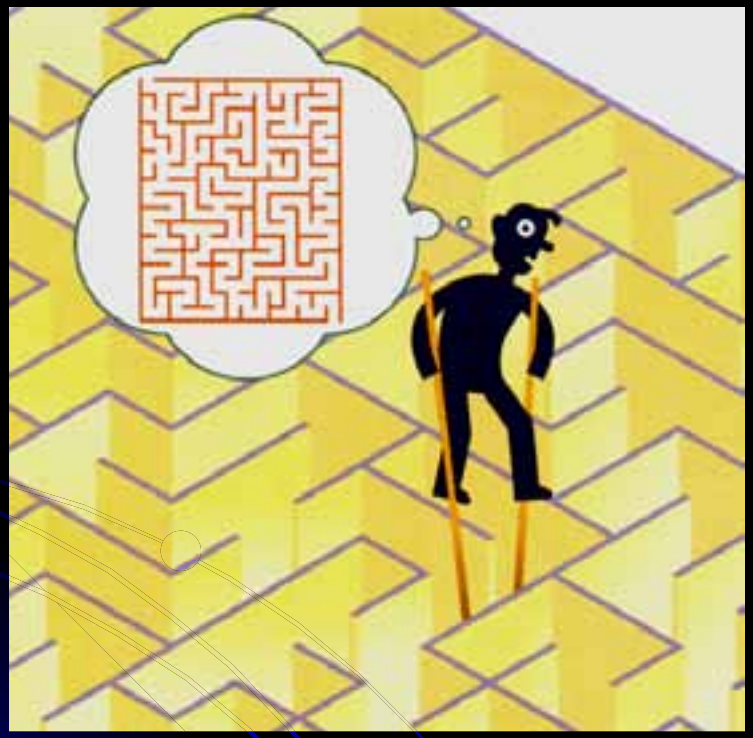
Geology & Land Cover

Surface/Subsurface & Land Use

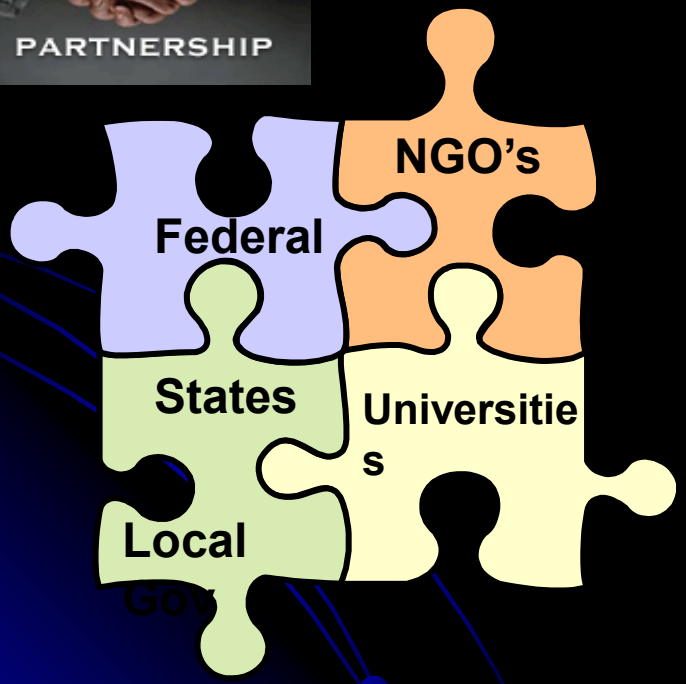
National Parks

National Wildlife Refuges

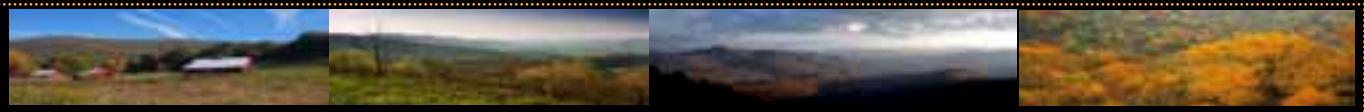
Species by Species



Need Holistic or "Systems" Approach to Make Better Management Decisions



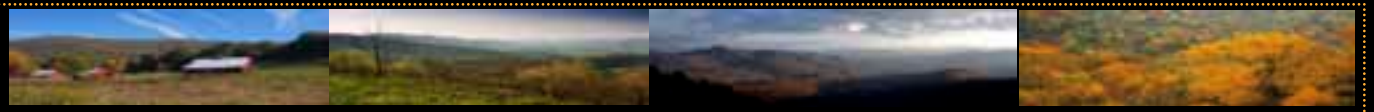
- Form an alliance with Federal Agencies, State and local governments, NGO's and Universities to develop and implement a "Science Strategy" for the entire Appalachian Region



Appalachian Mountains Science Strategy

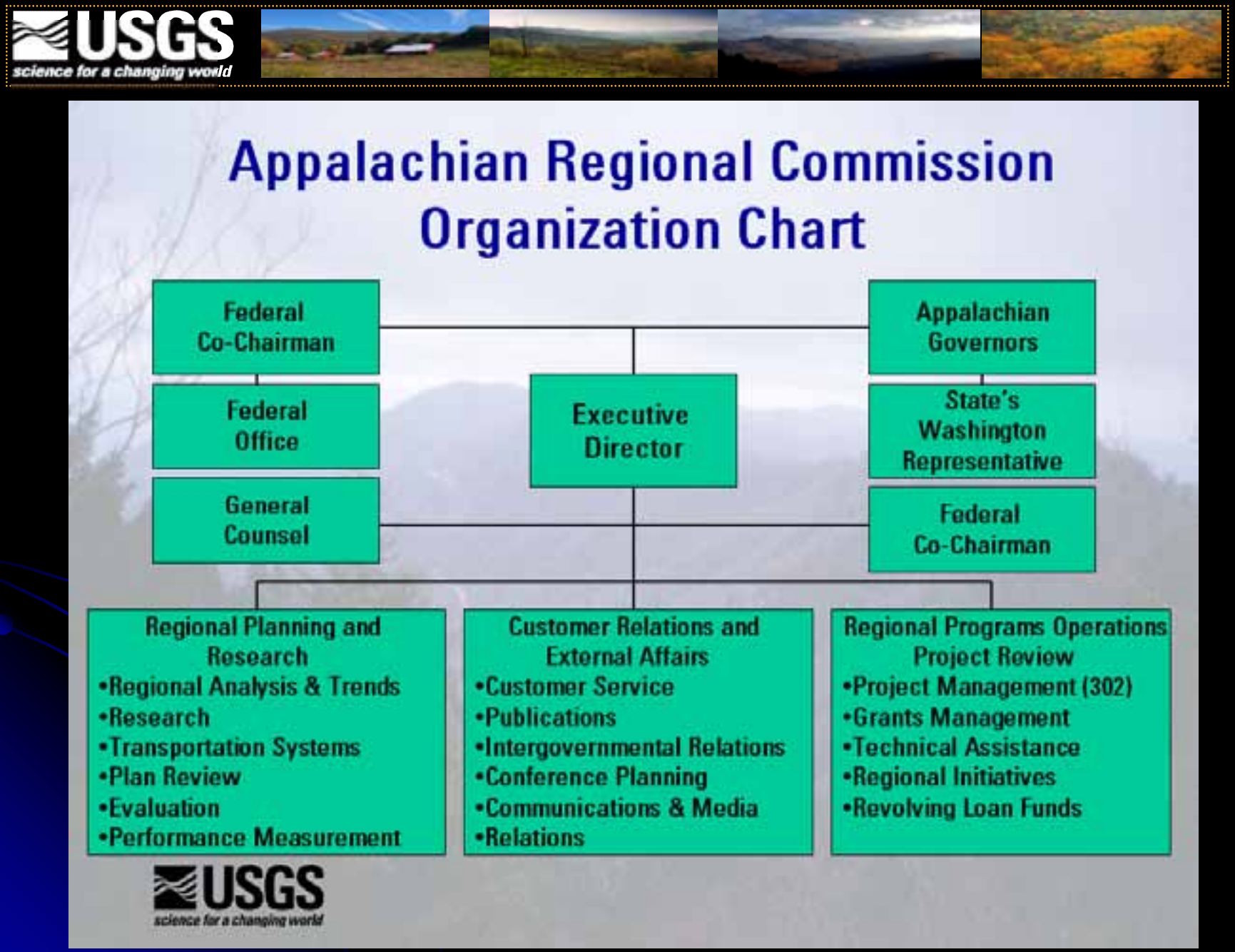
Develop a "Science Strategy" for the entire Appalachian Region

- NPS Vital Signs Report & Park Management Plans
- FWS SHC
- OSM Mine Reclamation
- USGS Science Plan
- State WMP's
- TNC Conservation Action Plan
- USFS Forest Management Plans
- JV & NGO Plans



Partnership Opportunities:

- FWS – Strategic Habitat Conservation (SHC)
- NPS – Centennial Challenge
- OSM – Restoration of Mountaintop Mining Sites
- Appalachian Mountain Joint Venture (AMJV)
- Eastern Brook Trout Joint Venture (EBTJV)
- Southeast Aquatic Resources Partnership (SARP)
- The Roundtable on Sustainable Forests
- The Nature Conservancy (TNC)
- Southern Appalachian Man and the Biosphere (SAMAB)
- Canaan Valley Institute (CVI)
- Appalachian Region Commission (ARC)


USGS
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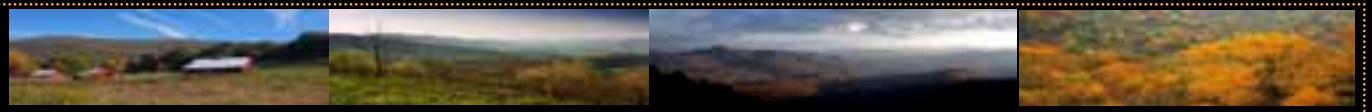
Appalachian Regional Commission
Organization Chart
Federal Co-Chairman
Federal Office
General Counsel
Executive Director
Appalachian Governors
State's Washington Representative
Federal Co-Chairman
Regional Planning and Research
•Regional Analysis & Trends
•Research
•Transportation Systems
•Plan Review
•Evaluation
•Performance Measurement
Customer Relations and External Affairs
•Customer Service
•Publications
•Intergovernmental Relations
•Conference Planning
•Communications & Media
•Relations
Regional Programs Operations Project Review
•Project Management (302)
•Grants Management
•Technical Assistance
•Regional Initiatives
•Revolving Loan Funds
USGS
science for a changing world

FWS/NPS/MMS/USGS MOU

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE EASTERN REGIONS OF THE
U.S. FISH AND WILDLIFE SERVICE/NATIONAL PARK SERVICE/
MINERALS MANAGEMENT SERVICE HEADQUARTERS/
NORTHEAST AREA OF THE U.S. GEOLOGICAL SURVEY
TO STRENGTHEN THEIR RELATIONSHIP
IN THE CONSERVATION OF NATURAL RESOURCES

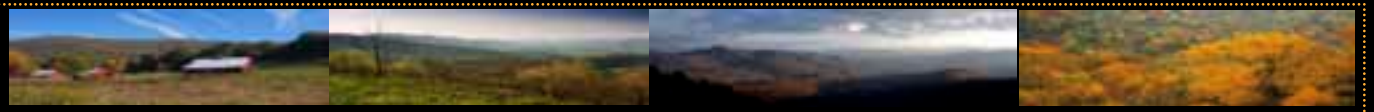
I. PURPOSE: The Regional Executives of the Northeast Region of U.S. Fish and Wildlife Service (FWS), the Northeast Region of the National Park Service (NPS), the Associate Director, Offshore Minerals Management, of the Minerals Management Service (MMS), and the Regional Executive of the Northeast Area of the U.S. Geological Survey (USGS), hereafter referred to as "Executives," are committed to establishing and maintaining a working relationship among the Department of the Interior bureaus to promote conservation of and assessments of impacts to living and geologic resources. Through this cooperative effort, the bureaus will foster a culture for conducting field research operations to cooperate on planning and implementing multi-bureau, landscape-based initiatives, enhancing the ability of the bureaus to meet their responsibilities for science-based stewardship in the northeastern United States. This agreement will not preempt each bureau's authorizing laws and policies, but should serve as a cornerstone for fostering a culture of conservation and assessment in the Northeast and empowering field staff and other personnel to share information and resources.

II. AUTHORITY: Signing this memorandum of understanding (MOU) reflects the intent of the Executives of the four participating bureaus to: (1) formalize, sustain and expand those working relationships and activities that have developed over time, (2) promote throughout their shared geography those relationships and activities that integrate the broad range of FWS/NPS trust responsibilities and MMS regulatory authorities with the full spectrum of USGS science disciplines, and (3) stimulate broader consideration of the FWS/NPS/MMS/USGS science and management relationship nationally in relation to large, synergistic activities of the four bureaus, including strategic terrestrial and aquatic habitat conservation



Appalachians: What do we have going for us?

- We are still in front of what's coming (for the most part)
- Large areas of minimally disturbed ecosystems
- Extraordinary biodiversity
- Designated as an international biosphere reserve
- Established partnerships made of passionate people with broad capabilities and capacities
- Excellent laboratory for studying impacts of climate change
- Established monitoring sites and networks
- Appalachian Trail
- ARC
- DSS for forecasting change
- Climate Effects Network
- Climate Response Centers
- FWS LCC



Collaboration Opportunities:

- Utilize Mega-Transect as a laboratory for developing GIS tools and models to better understand ecosystem change and its consequences
- Coordinate data collection, management plans, and distribution of information and analysis to support decision-making
- Coordinate project & planning efforts– create efficiencies
- Explore multi-scale problems
- Develop a Science Plan that incorporates a “systems” approach to planning – gets everyone on the same page!
- Outreach & In-reach Communication Plan

Vin Day '08 · LAS VEGAS REVIEW-JOURNAL
OK, KIDS, WE'VE GOT TRAVEL VIDEOS OF MOUNT RUSHMORE AND THE GRAND CANYON—WHICH DO YOU WANT TO VISIT NEXT!?
SUMMER VACATION 2008

USGS
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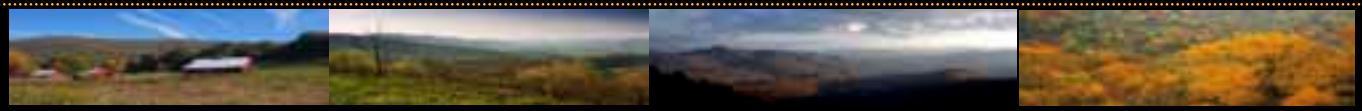
The Appalachians

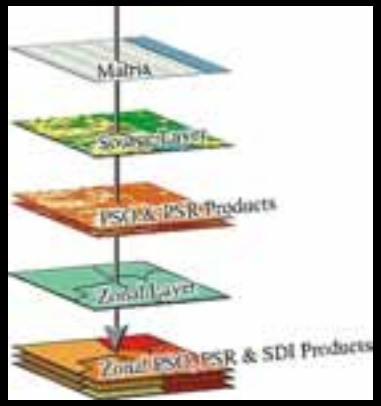
We'll leave the light "off" for you!

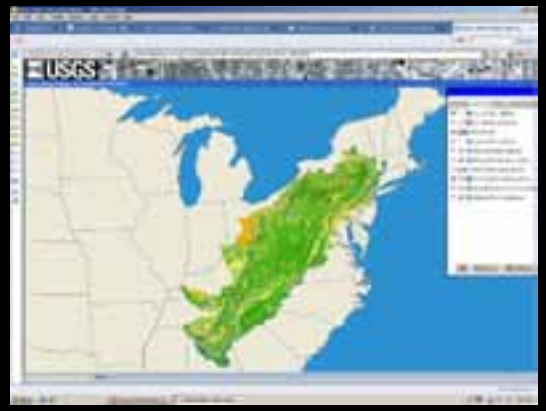
The End

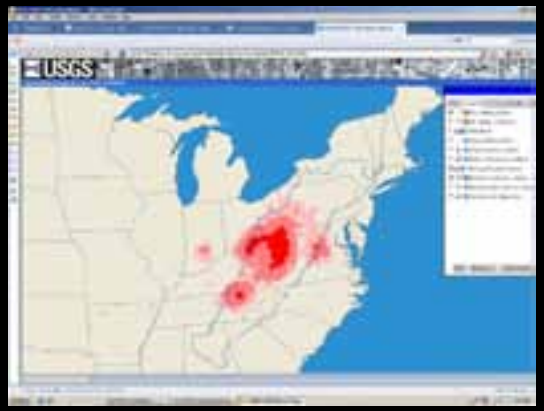


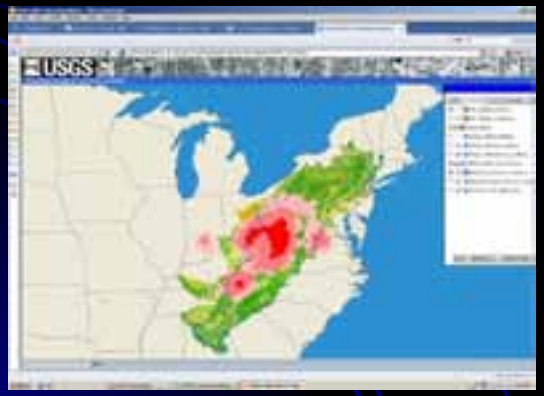
Projects:

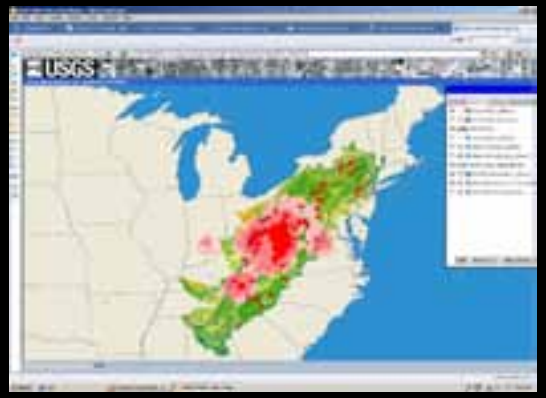
Habitat Restoration & Prioritization Tool for the Appalachian Mountains

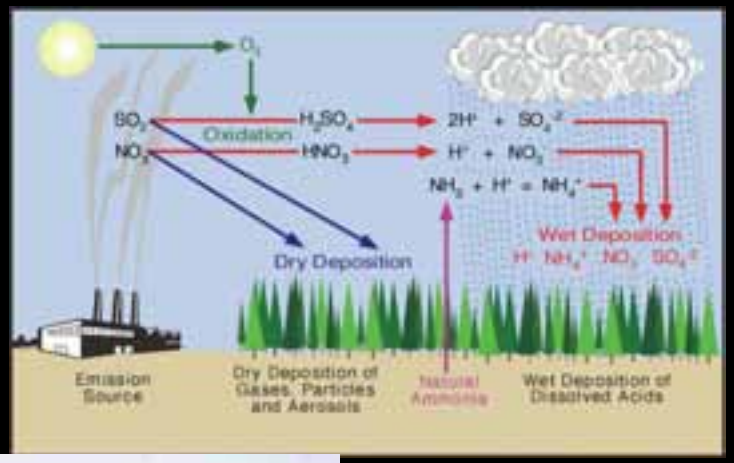












Appalachian Trail MEGA-transect Deposition Effects Project

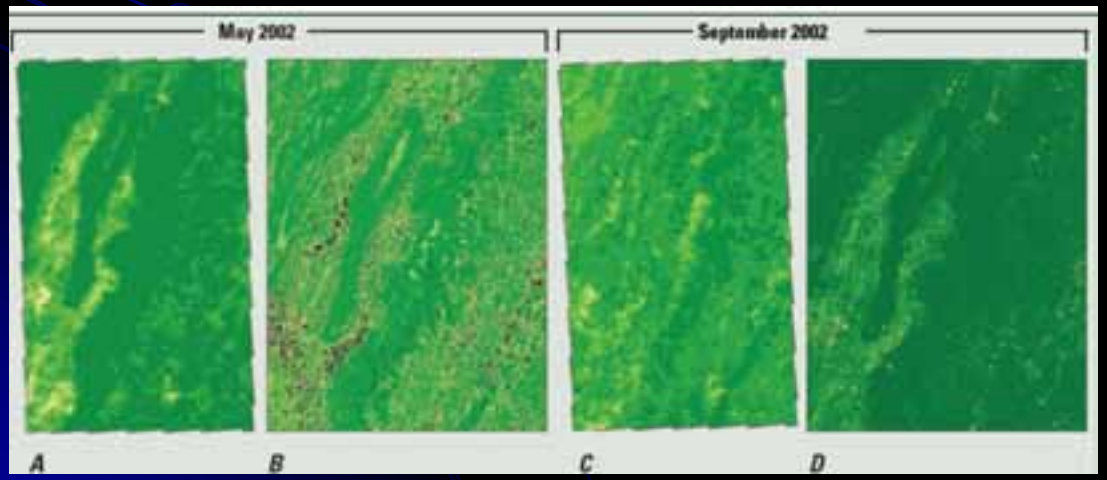
Assess the condition of forest ecosystems along the entire AT corridor, which is largely comprised of ridge tops, a landscape feature typically most sensitive to environmental stresses such as atmospheric deposition and climate change

Appalachian Bird Migration Project

Jack Mountain, Highland Co, VA

Portable Radar Sampling

Paired with sound recording at 3 sites in Spring & Fall 2006

- Detects ‘all’ targets passing, including bats
- Samples larger volume--out to 1.85 km, altitudinal distribution up to 1400 m above radar level

Shenandoah Phenology Project