

Biological Resources Discipline

Understanding the Nation's Living Resources

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Biological Resources Discipline Vision and Mission

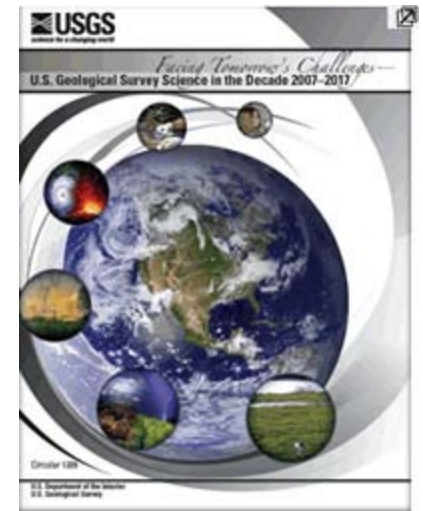
Partnering to Understand, Predict, and Address Complex Biological Change on Landscapes

“The Biological Resources Discipline (BRD) works with others to provide the scientific understanding and technologies needed to support the sound management and conservation of our Nation's biological resources.”



Bureau's Science Strategy

- ✓ Understanding Ecosystems and Predicting Ecosystem Change
- ✓ Climate Variability and Change
- Energy and Minerals for America's Future
- A National Hazards, Risk, and Resilience Assessment Program
- ✓ The Role of Environment and Wildlife in Human Health
- A Water Census of the United States
- ✓ New Methods of Investigation & Discovery



USGS Global Change Science Strategy

- Goals
 - Integrate existing and new observing activities
 - Develop a balanced, coordinated research program
 - Conduct modeling and projection activities that effectively simulate resource response to global change
 - Provide decision support for adaptation and mitigation



USGS Global Change Efforts

- **Climate Effects Network (CEN):** A vision for a National climate early-warning system
- **Carbon Sequestration:** integrated approach towards understanding the GHG fluxes, sequestration and impacts on human and natural systems
- **National Climate Change and Wildlife Science Center:** A vision for a National center for understanding fish and wildlife responses to climate change



Climate Effects Network (CEN)

- National climate early-warning system
- Composed of watershed research sites linked to a national multi-scale monitoring network and information and decision support system
- Partners: NSF (NEON, LTER), USFS (FIA), NOAA
- Will enable cost-effective resource management and policy decision-making regarding CC impacts and effects
- Will contribute to monitoring and ground-truthing for Carbon mitigation; including cap and trade and carbon tax
- Current focus - Yukon River Basin



Carbon Sequestration

- Integrated approach to understanding the physical and biological processes of GHG fluxes, carbon budget, and the ecological impacts of sequestration activities
- Methodology for National geo-sequestration assessment completed
- Need to develop methodology for ecological sequestration
- Outcomes/Applications will provide knowledge of sequestration potential for GHG mitigation strategies



Ecological Carbon Sequestration

- A multi-scale approach: Identify priority ecosystems for GHG flux studies and improve upward linkage of carbon cycle information
- Improve linkage of large-scale models to regional GHG flux information
- Improve our understanding of the effects of land management practices on GHG flux
- Develop risk models for carbon emissions related management actions and events (forestry practices, fires, etc)

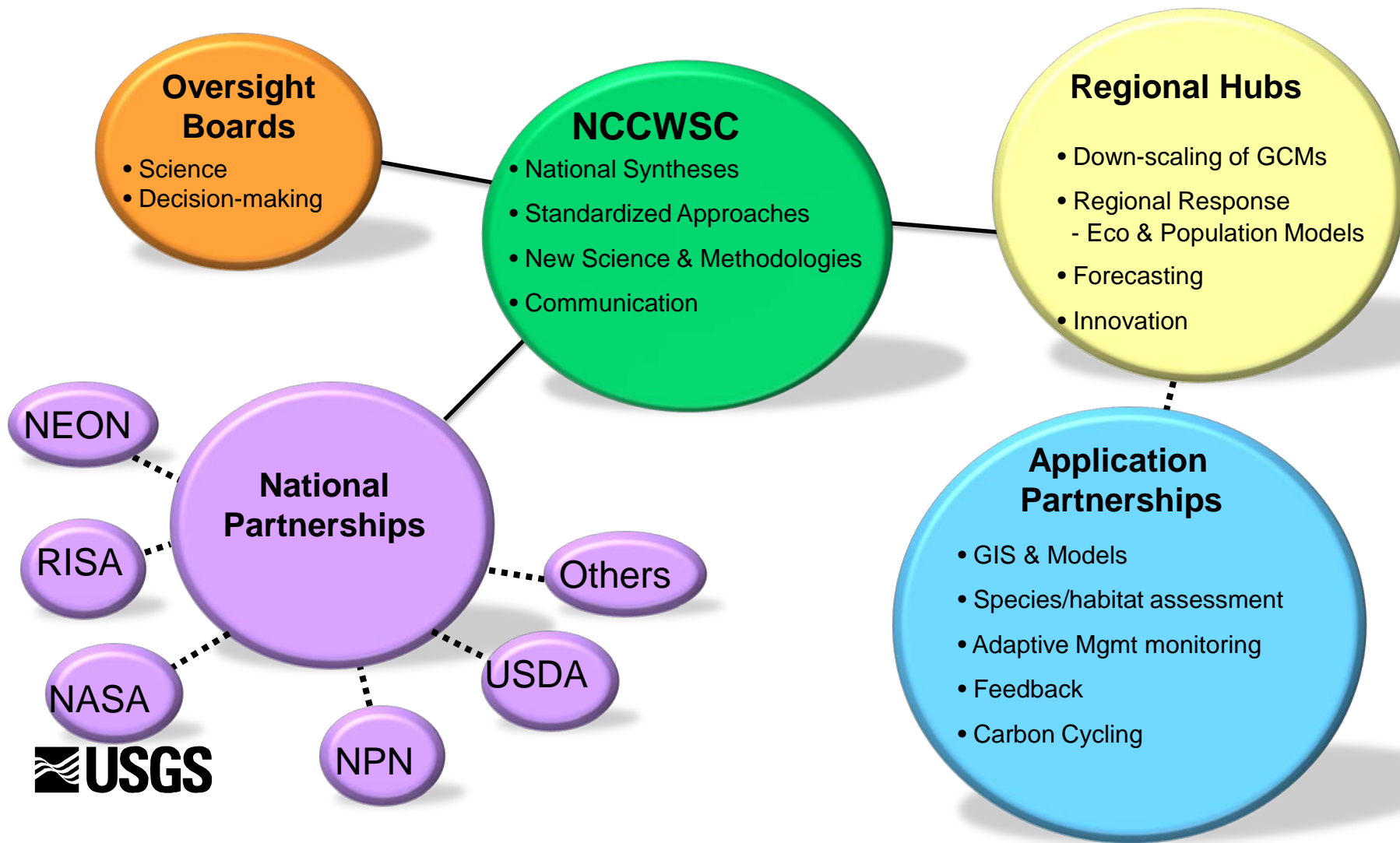


National Climate Change and Wildlife Science Center

- A partnership to sustain fish and wildlife communities
- Provides information on responses of fish, wildlife, and habitat to climate change
- Forecasts change through:
 - Downscaled climate models
 - Integration of ecological and habitat models
 - Defining population and habitat responses at appropriate scales
 - Developing response options in an adaptive framework
- Joint decision-making with Federal, State and NGO communities
- National and regional focus on adaptation



National Climate Change and Wildlife Science Center



Workshop Recommendations

- Focus on top priority science information for biological managers (state and federal) for management of climate adaptation
- System, habitat, species and land use shifts are priority end points
- Integrating public and private land management strategies are key
- Communications & Monitoring (?)



SE Regional Pilot

- Demonstration project: integrates climate change science with habitat and species response models to assess impacts on avian and aquatic species
- Cast predictive models calibrated from data gathered during recent decades
 - NOAA Climate data
 - Remote sensing data
 - USGS - BBS & MAPS data
 - Downscaled climate models
 - Watershed modeling



Next Steps – Regionally & Nationally

- Facilitate additional workshops
- Proposal options for regional hub at universities
- Unite terrestrial and aquatic methodologies
- Develop Regional Hub options
 - Western Region – PNW, Desert SW, Alaska
 - Central Region – Northern Rockies
 - Eastern Region – NE Coastal, Great Lakes
- Staff National Office & Regional Hubs



Closing Thoughts

- Quantitative, probabilistic output
- Outputs comparable to human infrastructure adaptation needs
- Multi-faceted partnerships
- Multi-scaled results
- Information for many societal drivers and options for natural resource management

E Pluribus Unum