USGS National Climate Change and Wildlife Science Center and DOI Climate Science Centers

Science to Support Adaptation

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

Agenda

- Who we are
- Two ways of looking at our science

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National Climate Change & Wildlife Science Center

- **Mission**

  Provide **natural resource managers** with the **tools and information** they need **to develop and execute management strategies** that address the impacts of climate change on **fish, wildlife, and their habitats**

- **Focus on climate change <u>adaption & impacts</u>**

- **<u>Actionable science</u>**

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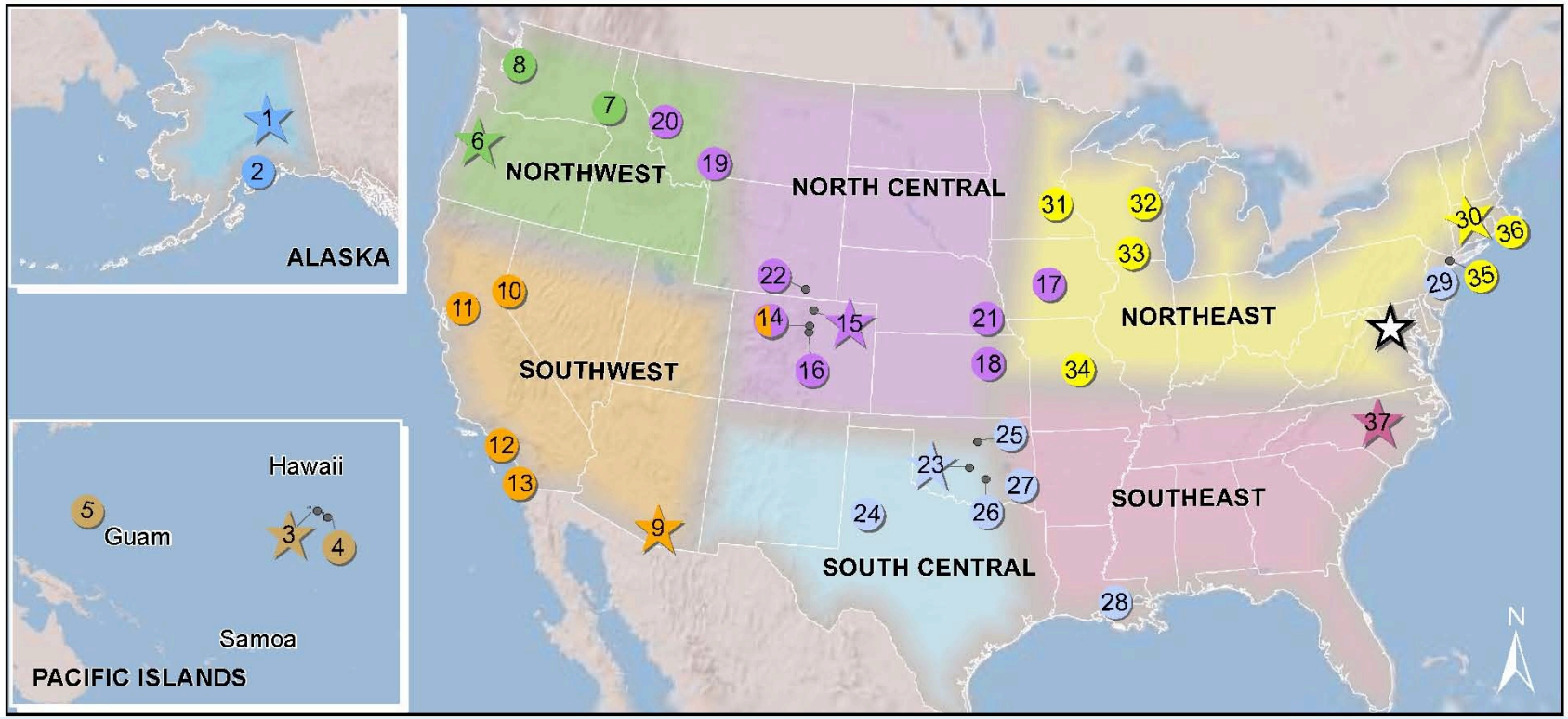
ALASKA
PACIFIC ISLANDS
Hawaii
Guam
Samoa
NORTHWEST
NORTH CENTRAL
NORTHEAST
SOUTHWEST
SOUTHEAST
SOUTH CENTRAL
N

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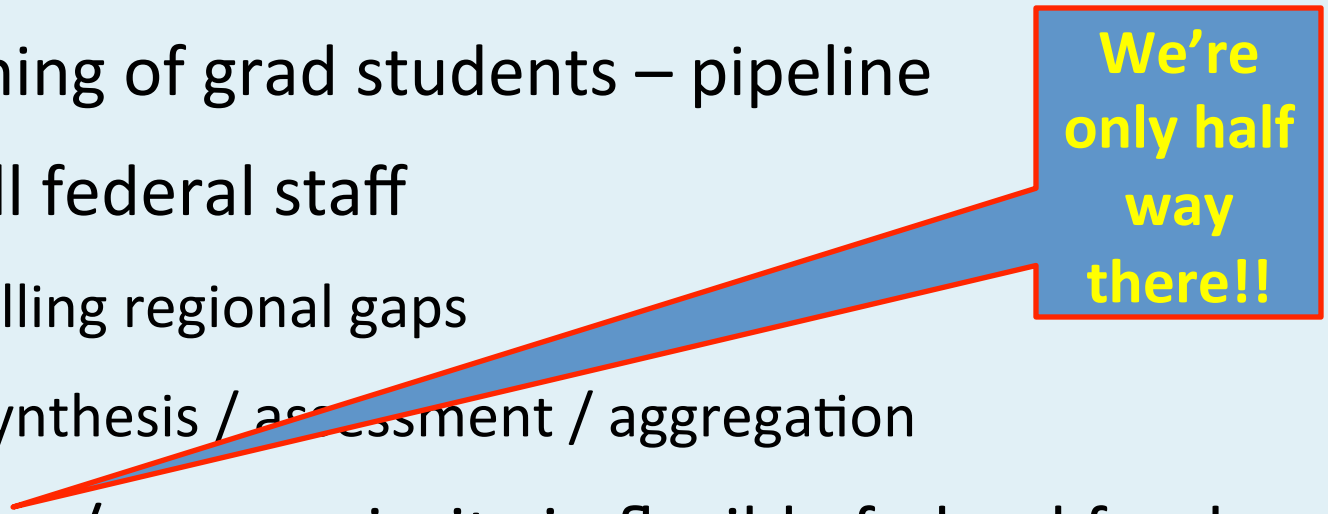
Key CSC Characteristics

- University/federal joint venture – access capabilities feds don't have
- Training of grad students – pipeline
- Small federal staff
  - Filling regional gaps
  - Synthesis / assessment / aggregation
- $4-5 m/year, majority in flexible federal funds
- Will build significant cyber infrastructure network
- **Guided by management-driven questions**



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Executive Stakeholder Advisory Committee NW CSC

Co-Chair-- US Geological Survey
Co-Chair—Affiliated Tribes of Northwest Indians (ATNI);
Swinomish Indian Tribal Community;
Columbia River Intertribal Fish Commission
Environmental Protection Agency
US Bureau of Reclamation
US Forest Service – National Forest System, R&D
State of Montana
State of Oregon
State of Washington
National Park Service
Natural Resource Conservation Service
Bureau of Land Management
US Forest Service
US Army Corps of Engineers – Witt Anderson / Rebecca Weiss
Bonneville Power Administration
National Oceanic and Atmospheric Administration
Fish and Wildlife Service
Federal Highway Administration
Great Basin Landscape Conservation Cooperative
North Pacific Landscape Conservation Cooperative
Great Northern Landscape Conservation Cooperative

NOTE: NO NGO or private parties

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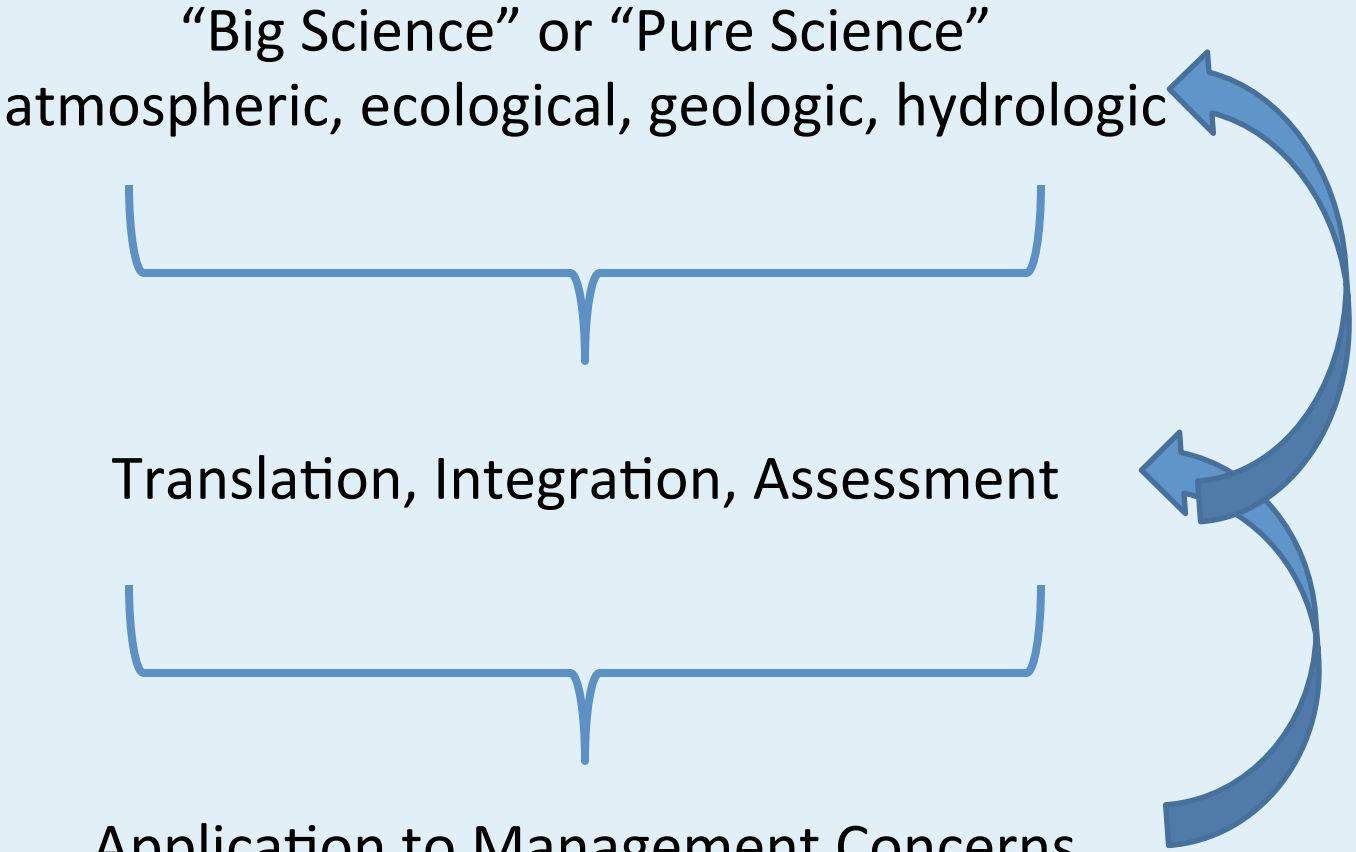

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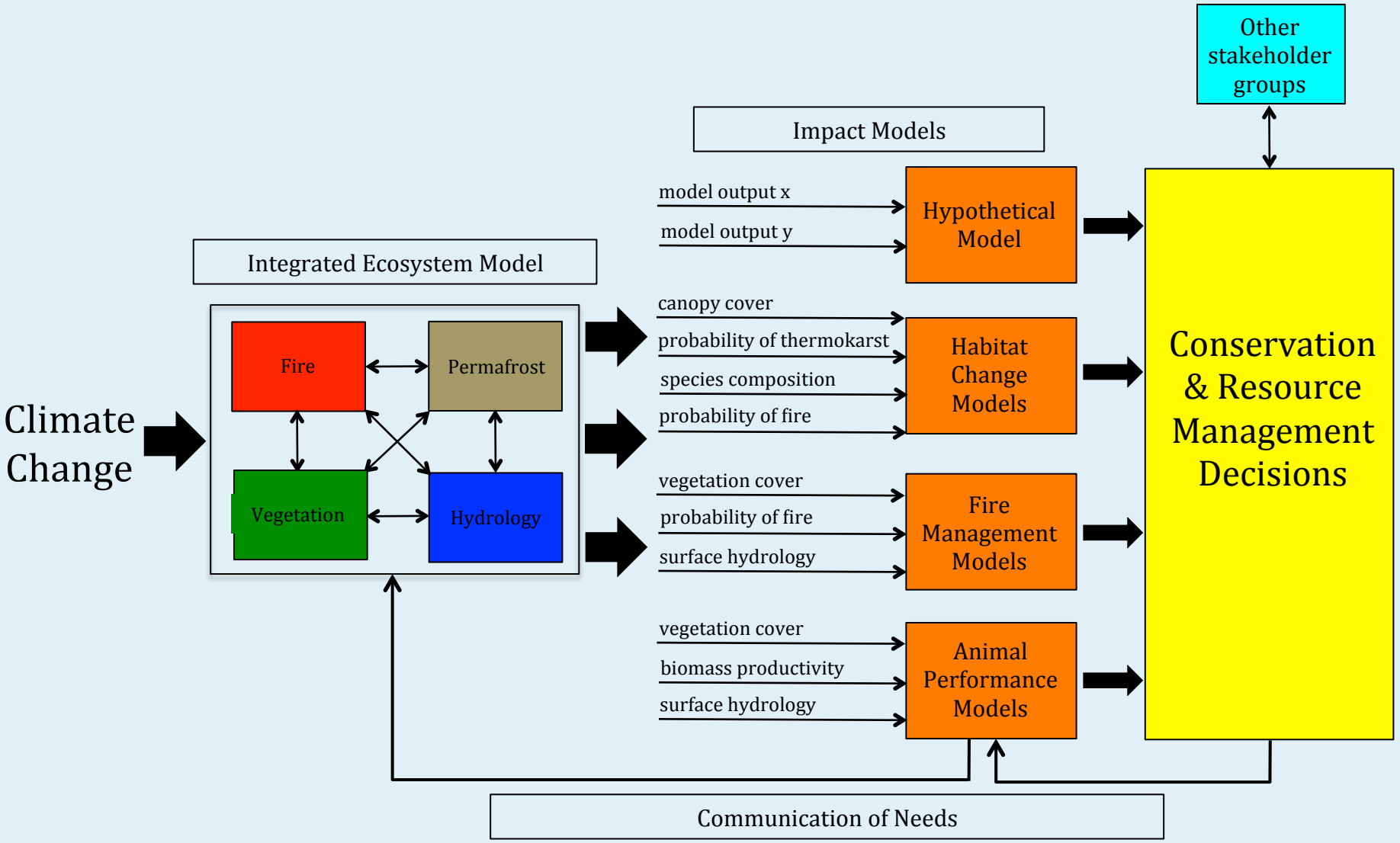
IEM for Alaska Conceptual Framework



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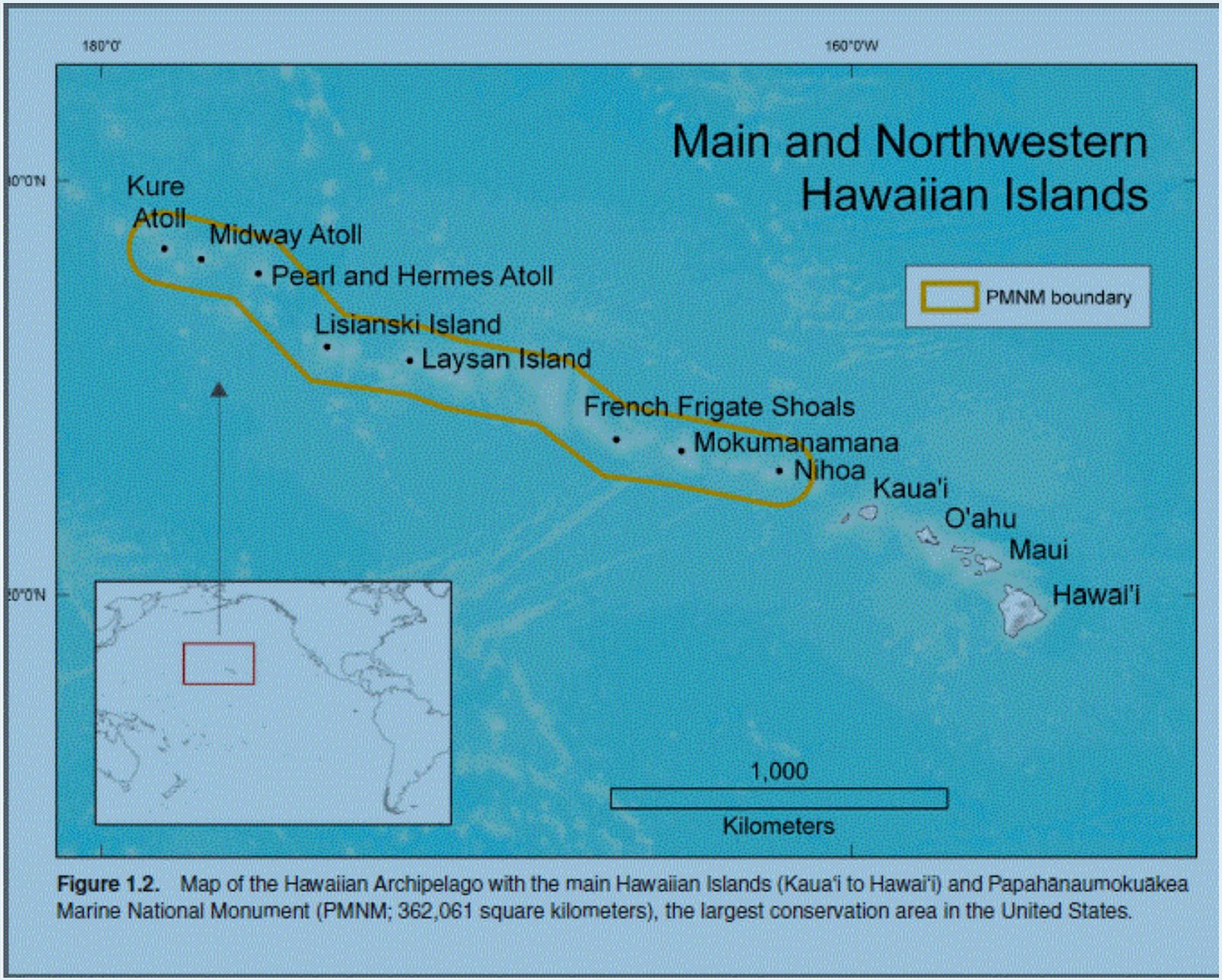

Figure 1.2. Map of the Hawaiian Archipelago with the main Hawaiian Islands (Kaua'i to Hawai'i) and Papahānaumokuākea Marine National Monument (PMNM; 362,061 square kilometers), the largest conservation area in the United States.

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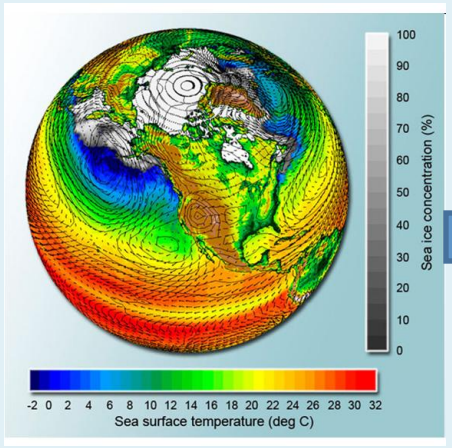

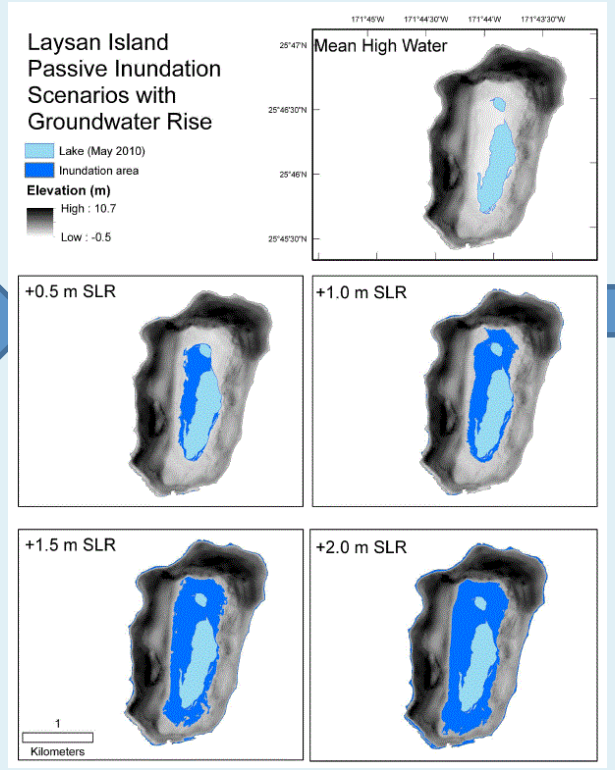

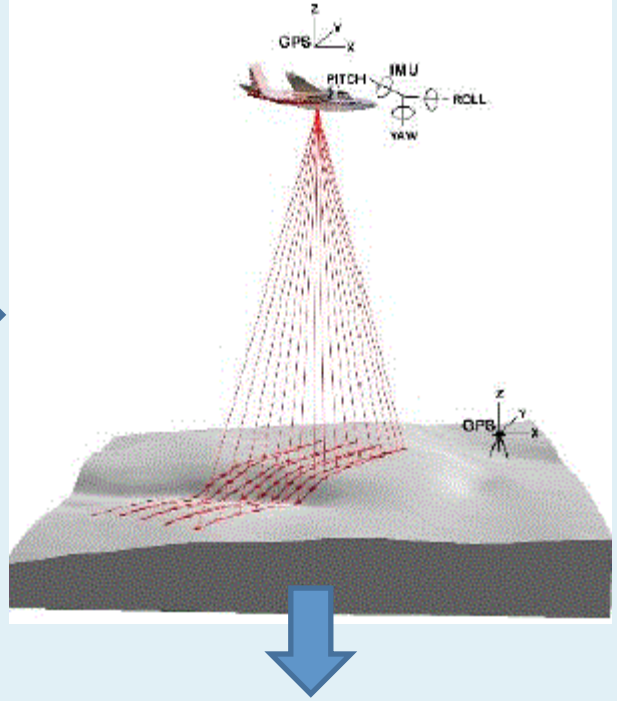

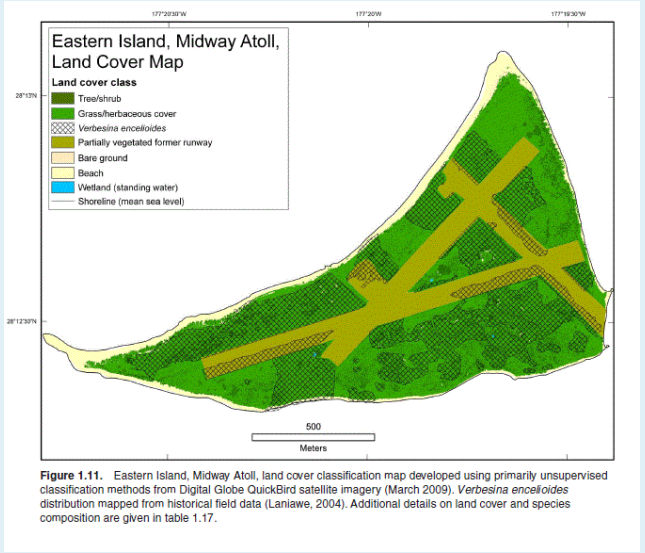

Figure 1.11. Eastern Island, Midway Atoll, land cover classification map developed using primarily unsupervised classification methods from Digital Globe QuickBird satellite imagery (March 2009). *Verbesina enceliodes* distribution mapped from historical field data (Laniawe, 2004). Additional details on land cover and species composition are given in table 1.17.

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Images, clockwise from upper left: Roy Spencer, PhD; USGS/Reynolds (3 images), U-Washington, Encyclopedia Brittanica

Usable Science

U.S. Global Change Research Program:

- Provide "***usable*** *information on which to base policy decisions*…"
- Knowledge that could be "*readily usable by policymakers attempting to formulate effective strategies for preventing, mitigating, and adapting to the effects of global change*"

(U.S. Congress, 1990)

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Usable Science

A function of…

Desired Research Themes

Description of Research Products

Intended Management Application

Q1: What RESEARCH THEMES did you want to pursue?

ESAC DECISIONS FOR FY14

- 2a: response of hydrologic systems to future climate; ecological drought
- 3b: threats to habitat connectivity and potential fragmentation
- 3c: changes in fire regimes
- 3f: changes in phenology and related monitoring needs
- 4a: assess vulnerabilities of ecosystems to CC stressors

Q2: Did you describe the RESEARCH PRODUCTS you need?

A: Not really…

DANGER!

Someone else may answer for you

Scientists thought that the RESEARCH PRODUCTS YOU needed were:

- Workshops
- Technical reports
- Peer-reviewed publications
- Inventories
- Maps
- Time series animations
- Presentations
- Re-analyses
- Analyses
- Simulations
- Evaluations
- Assessments
- Probability distributions
- Models
- Interpretive fact-sheets
- Web applications
- Aerial photos
- Satellite remote sensing
- Videos
- University courses
- Conceptual frameworks
- Web portals
- GIS layers
- Datasets

Q3: What is the MANAGEMENT APPLICATION
for the anticipated science products?

A: You never said…

DANGER!

Someone else may answer for you

Science Needs	"Silent" Management Applications
1. Assess the effects of hydrologic regime changes on salmon	1a. **Provide adequate salmon habitat** 1b. Use hatcheries to restore salmon runs
2. Assess the effects of projected SLR on coastal marshes	2a. **Protect bird colonies** 2b. Establishment of building zoning codes
3. Understand the interactions between future fire and pests	3a. **Protect whitebark pine forests from mountain pine beetles** 3b. Apply treatments to reduce fuel loads


Thank you
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NW CSC science themes 2012-2015

1. Climate science and modeling
2. Response of physical systems to CC
3. Response of biological systems to CC
4. Vulnerability and adaptation
5. Monitoring and observation systems
6. Data infrastructure, analysis, and modeling
7. Communication of science findings

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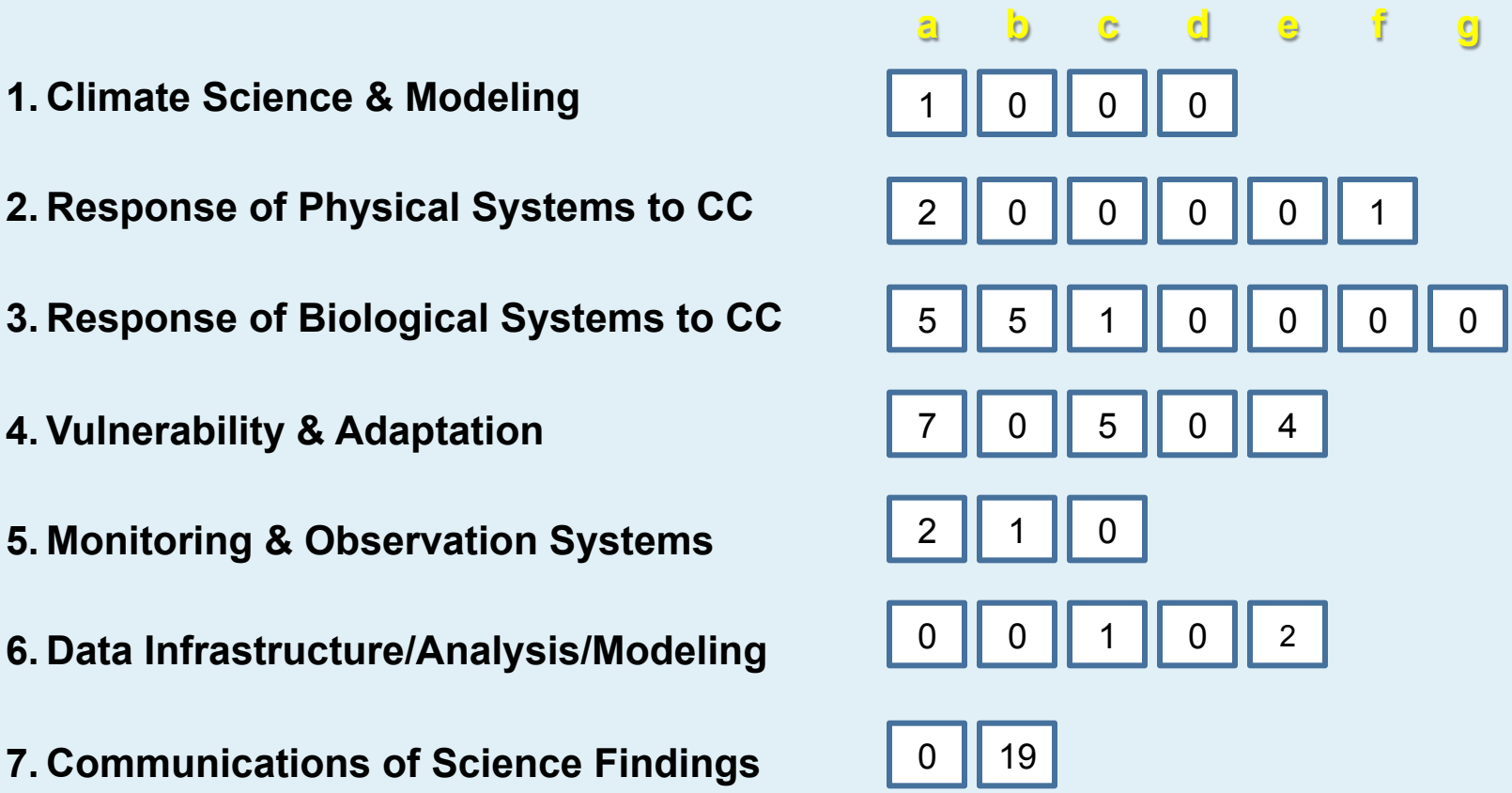
NW CSC Science Agenda Themes Addressed by GNLCC-Funded Projects (19)



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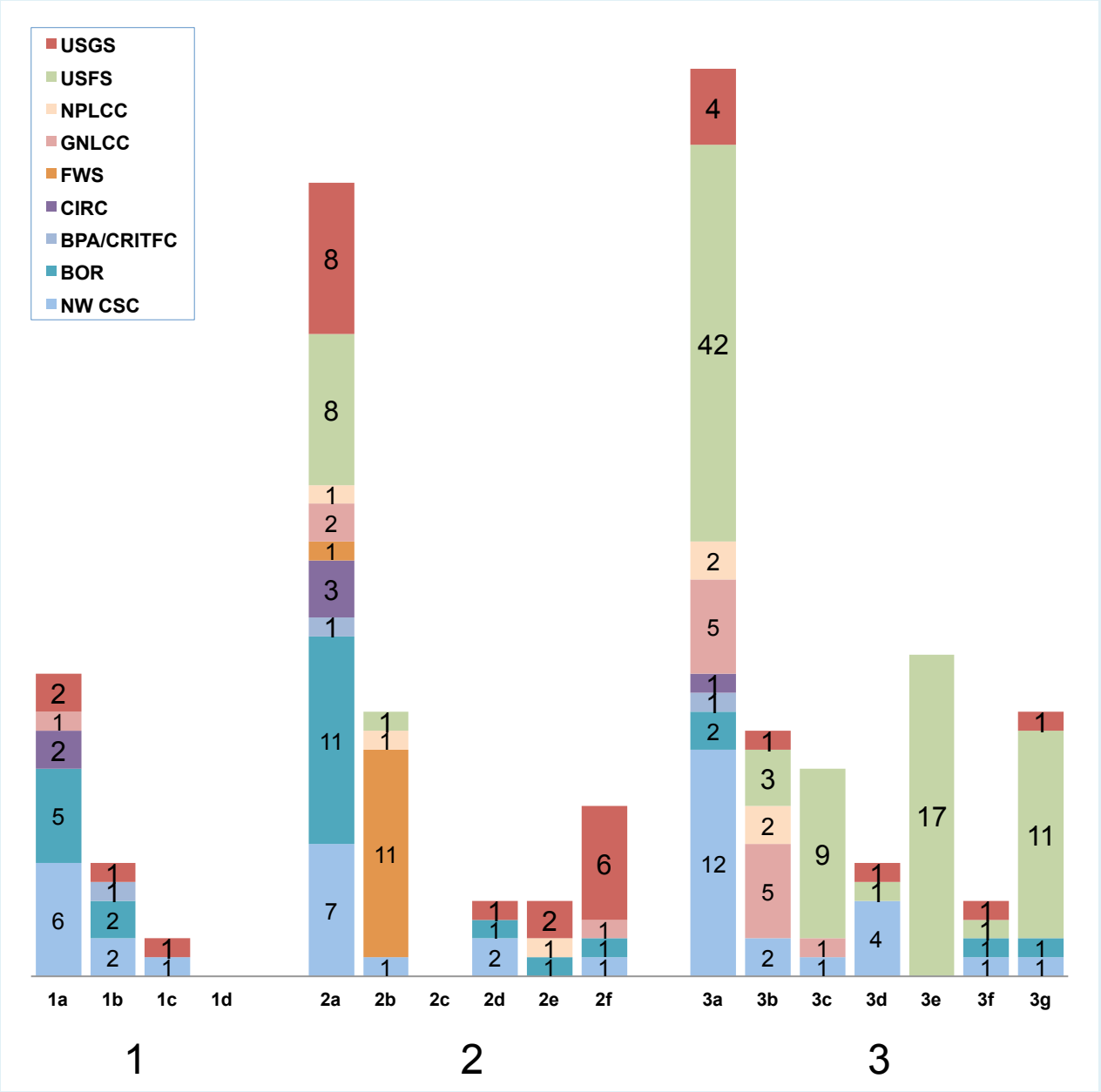
NW CSC Science Agenda Themes: FY10-12 Summary



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Q2: Did you describe the RESEARCH PRODUCTS you need?

A: Not really…

DANGER!

Someone else may answer for you

Scientists thought that YOUR intended MANAGEMENT APPLICATIONS were:

- Human health
- Land use patterns
- Post-fire rehabilitation
- Education opportunities
- Land acquisition
- Forest management
- Prescribed fires
- Species protection
- Reintroduction programs
- Timber harvest
- Monitoring design
- Tribal services
- Cultural practices
- Habitat conservation
- Population preservation
- Assisted fish migrations
- Harvest restrictions
- Hydropower generation
- Restoration priorities
- Landscape design
- Conservation needs
- Treatment strategies
- Water use management
- Socioeconomic considerations
- ESA listings
- Critical habitat designation
- Adaptation strategies
- Reservoir management
- Flood control
- Recreation
- Irrigation allocation
- Public safety
- Connectivity maintenance
- Insurance liability value