NW CSC
Northwest Climate Science Center

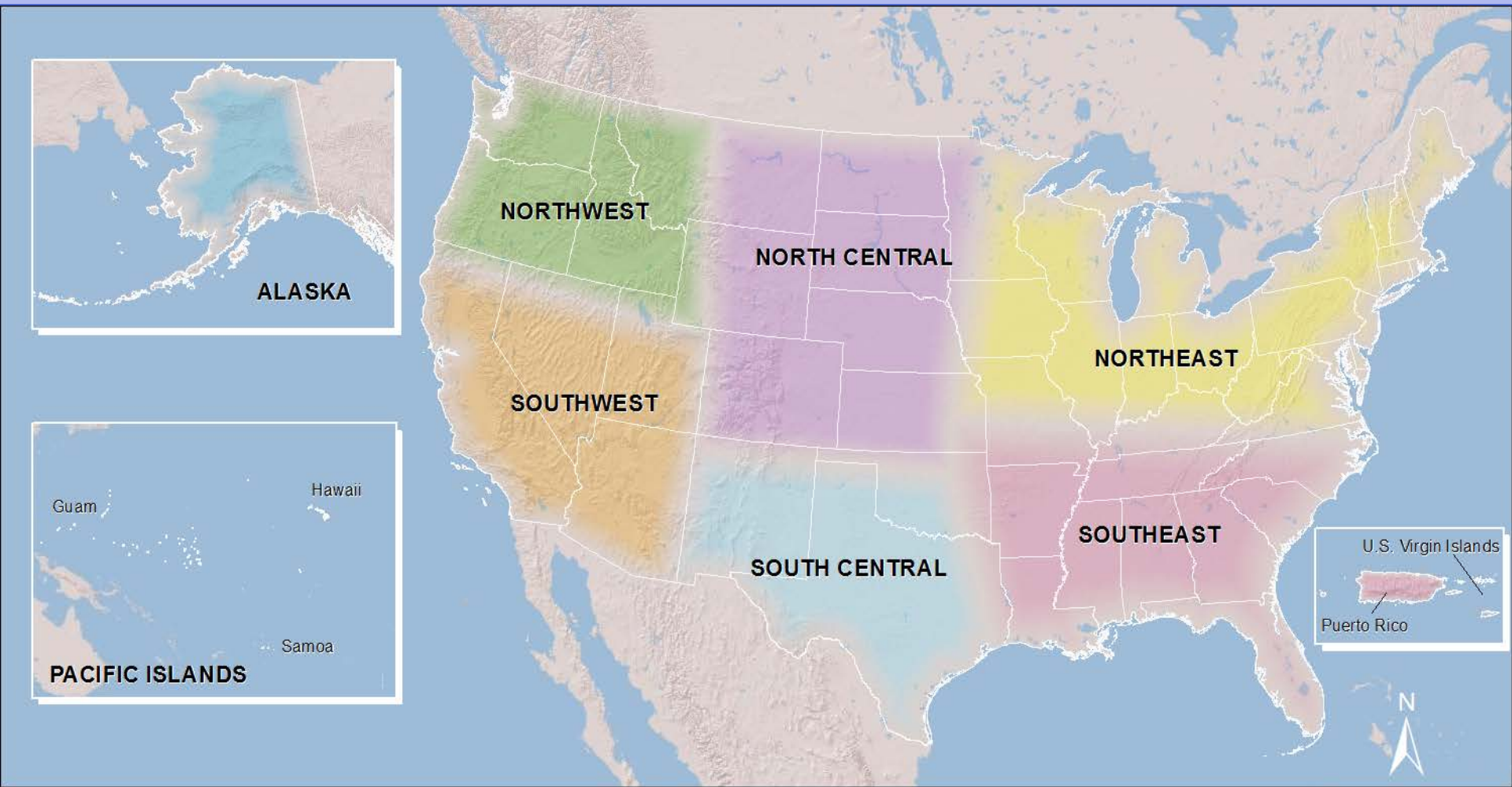
Moving beyond vulnerability assessments: Are we ready to scientifically evaluate climate adaptation actions?

Nicole DeCrappeo and Gustavo Bisbal
DOI Northwest Climate Science Center
Corvallis, OR

USGS

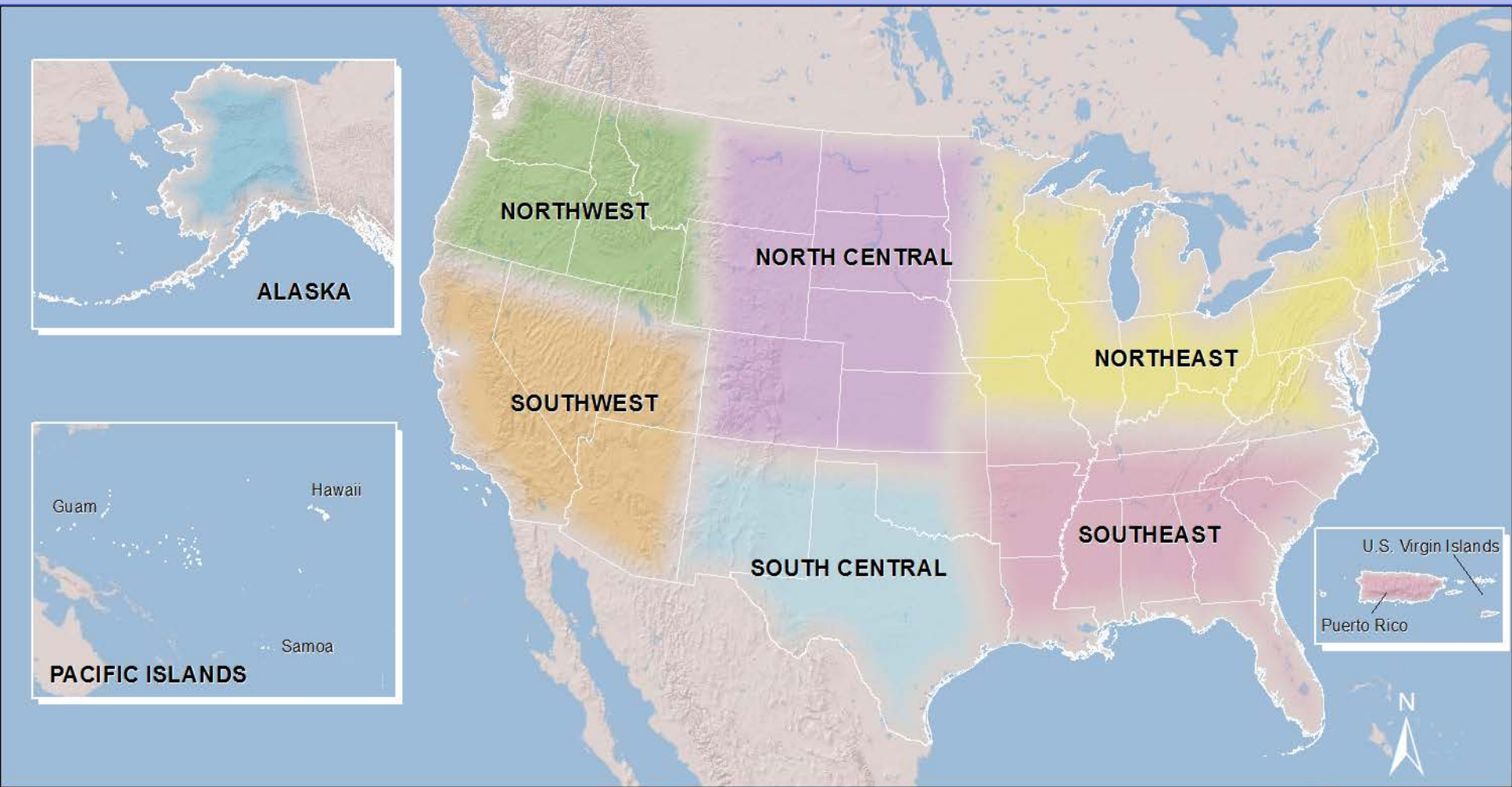
Secretarial Order No. 3289

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



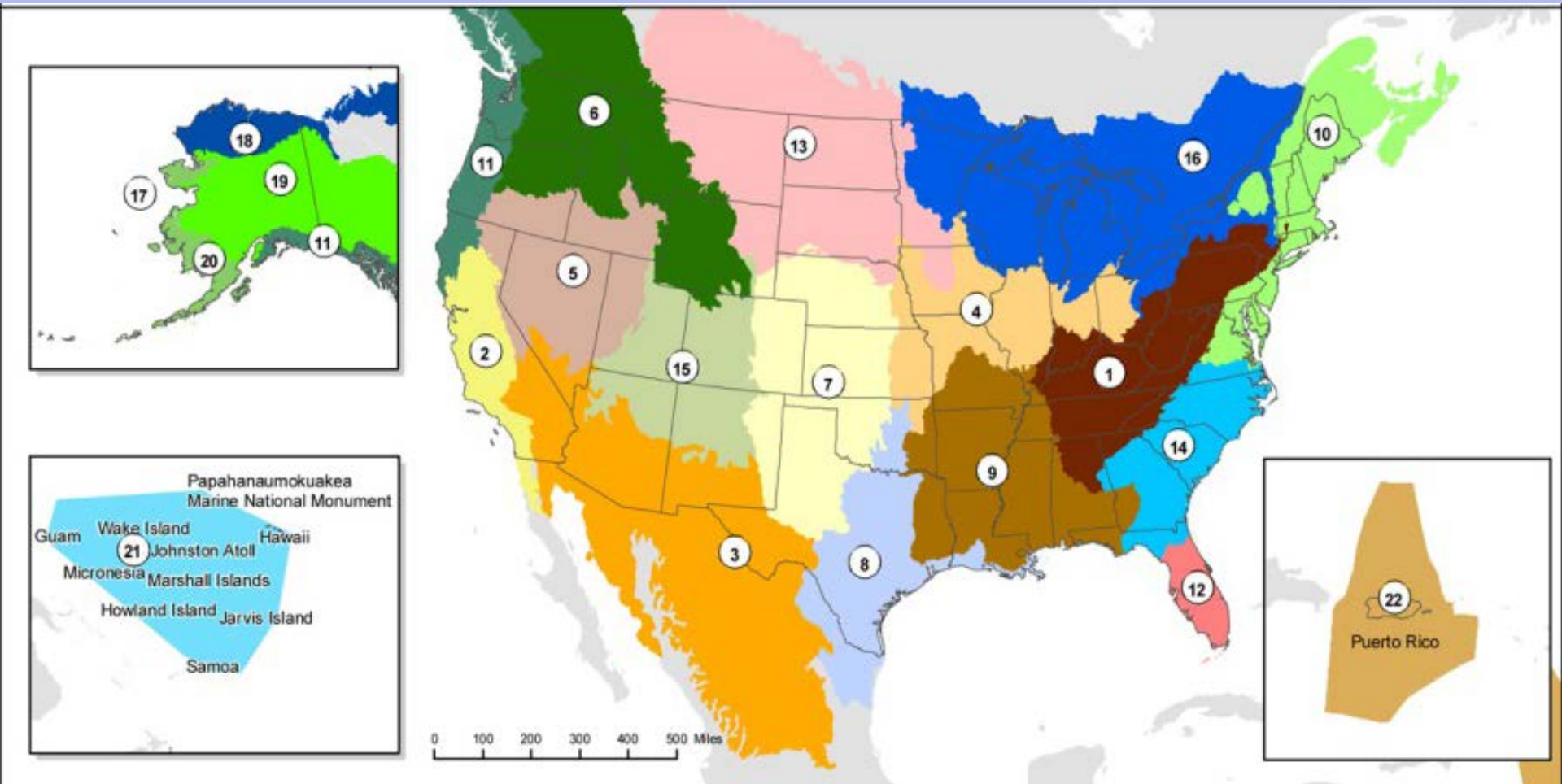
Secretarial Order No. 3289

The Department of the Interior established eight regional Climate Science Centers (CSCs)…



Secretarial Order No. 3289

…and 22 Landscape Conservation Cooperatives (LCCs) to better integrate science and management to address climate change and other landscape scale issues.



Regional LCCs

Great Northern

North Pacific

Great Basin

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The NW CSC Mission

To coordinate the expertise of federal and university scientists to provide scientific information and tools that may help address federal, state, and tribal resource managers' priorities in response to a changing climate.

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NW CSC Academic Consortium

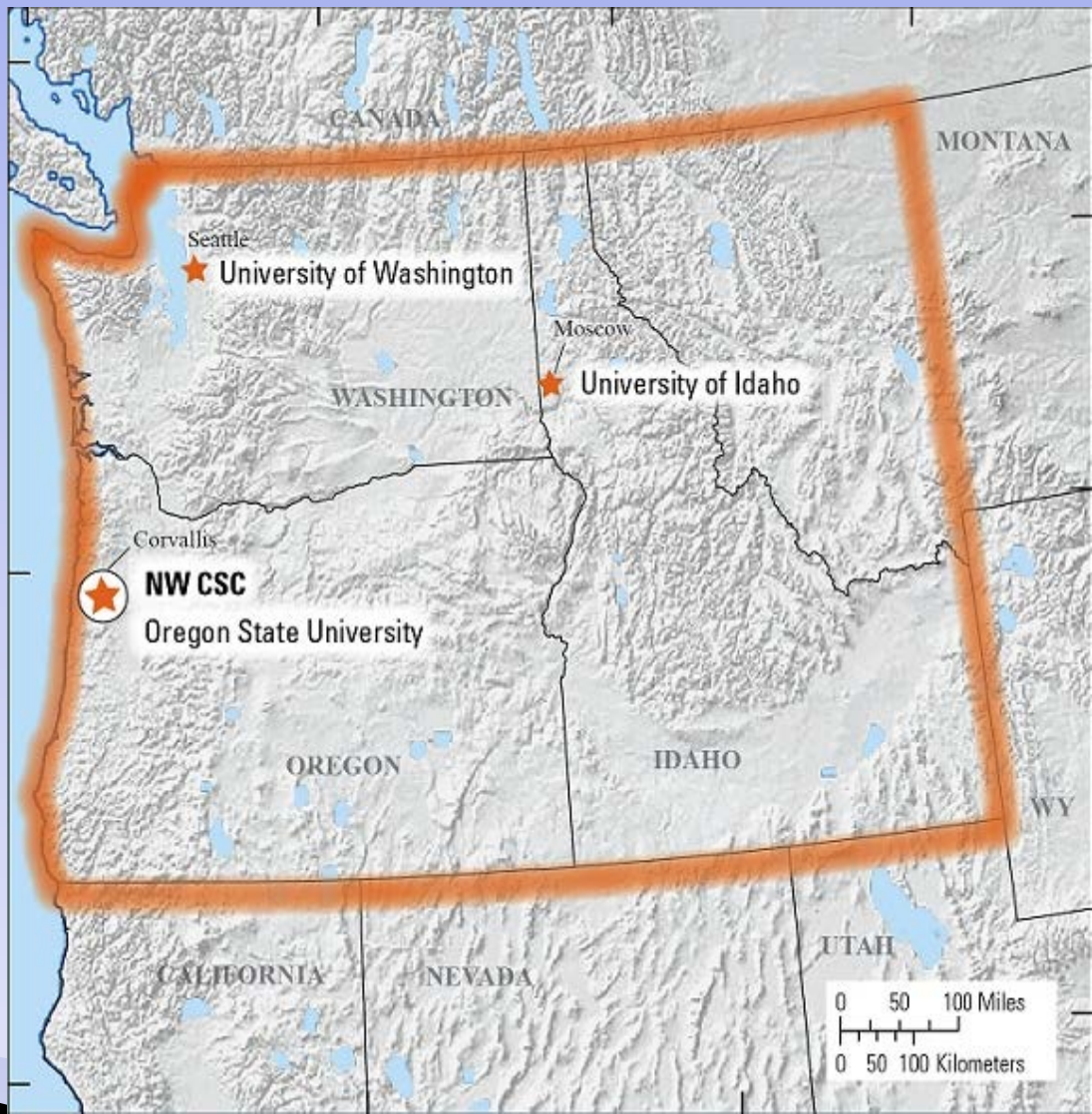
14 Institutions

<u>Lead Universities</u>

Oregon State Univ.

Univ. of Idaho

Univ. of Washington



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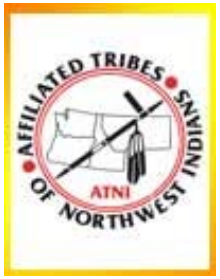

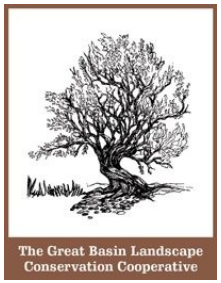

ESAC

Executive Stakeholder Advisory Committee

22 entities

13 Federal

3 State

3 Tribal (73 tribes)

3 LCCs

NW CSC Science Agenda 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

NW CSC Science Agenda 2012-2015

1. **Climate science and modeling**
2. **Response of physical systems to CC**

Integrated Scenarios of Climate, Hydrology, and Vegetation for the Northwest

Principal Investigator:
Phil Mote, Oregon State University

USGS

NW CSC Science Agenda 2012-2015

1. Climate science and modeling
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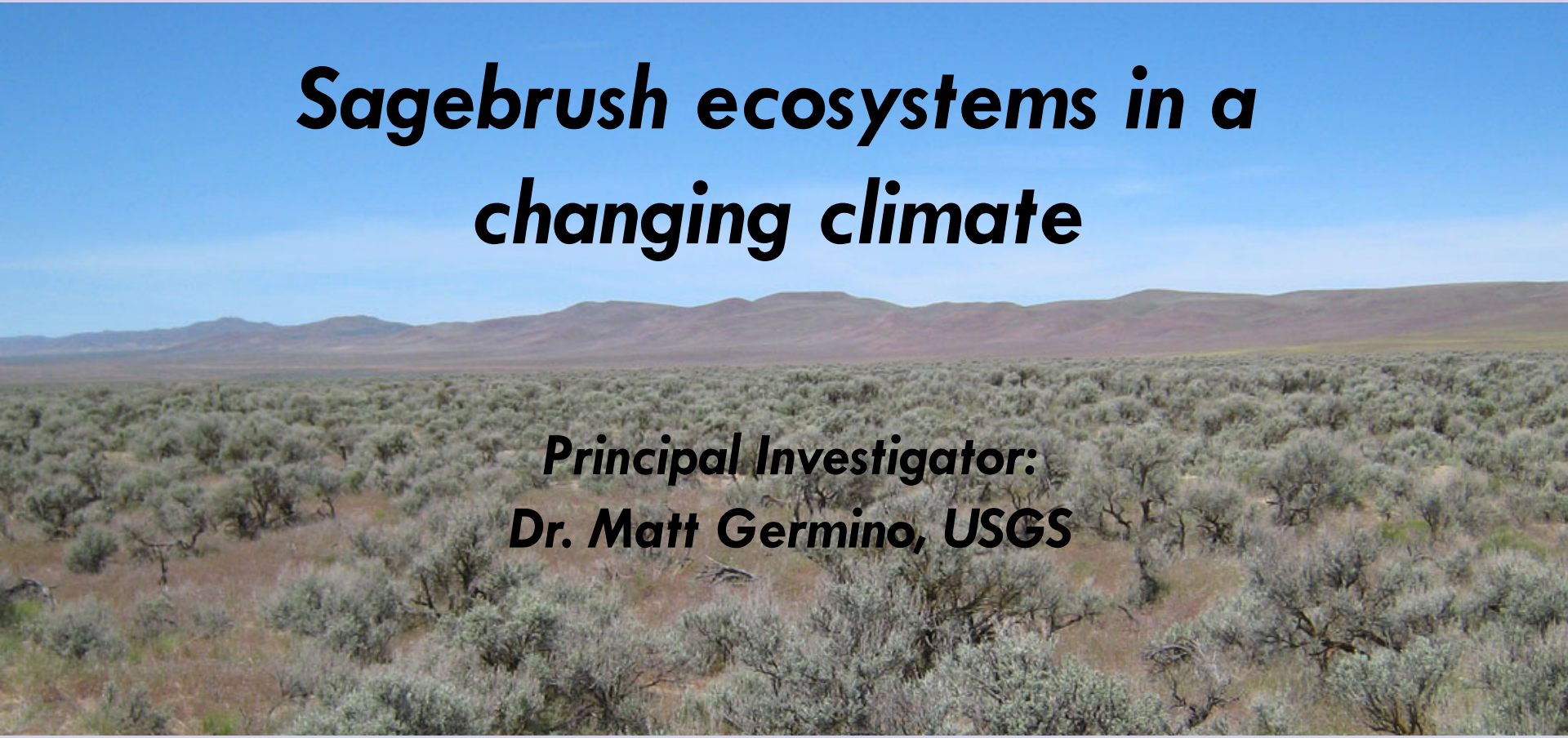
NW CSC Science Agenda 2012-2015

3. Response of biological systems to CC
4. Vulnerability and adaptation

The Floristic Great Basin

NW CSC–Funded Research Project

Sagebrush ecosystems in a changing climate



Principal Investigator:
Dr. Matt Germino, USGS

Goal: To gain an understanding of climate and weather responses of sagebrush, particularly as it varies among subspecies and within subspecies

M.Heck

Sagebrush ecosystems in a changing climate

Research questions:

1. How have big sagebrush populations resisted or changed in response to climate shifts?

1. How have sagebrush planting efforts been affected by post-seeding weather, and by selection of seed source?

Sagebrush ecosystems in a changing climate

Experiments:

1.Idaho National Lab Ecohydrology study – manipulating precip

2.Snake River Plains Warming study – manipulating temperature

Basic measurements across all experiments:

•Sagebrush cover, # plants, height, crown & canopy volume, survivorship, seed production, seed germination or emergence, plant community cover, soil water/temperature

Climate, land management and future wildlife habitat in the Pacific Northwest

Principal Investigator:
Emilie Henderson
Institute for Natural Resources

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Overarching project question

How might land **management** and **climate change** interact to shape future **wildlife habitat** in Oregon and Washington?

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Scenarios

Management

Current Management | Restoration | Natural Resources Economy

Climate (Integrated Scenarios Project)

Hadley (Hot/Dry)

CSIRO (Warm/Moist)

What are the futures that we might have to face?

How can we influence them?

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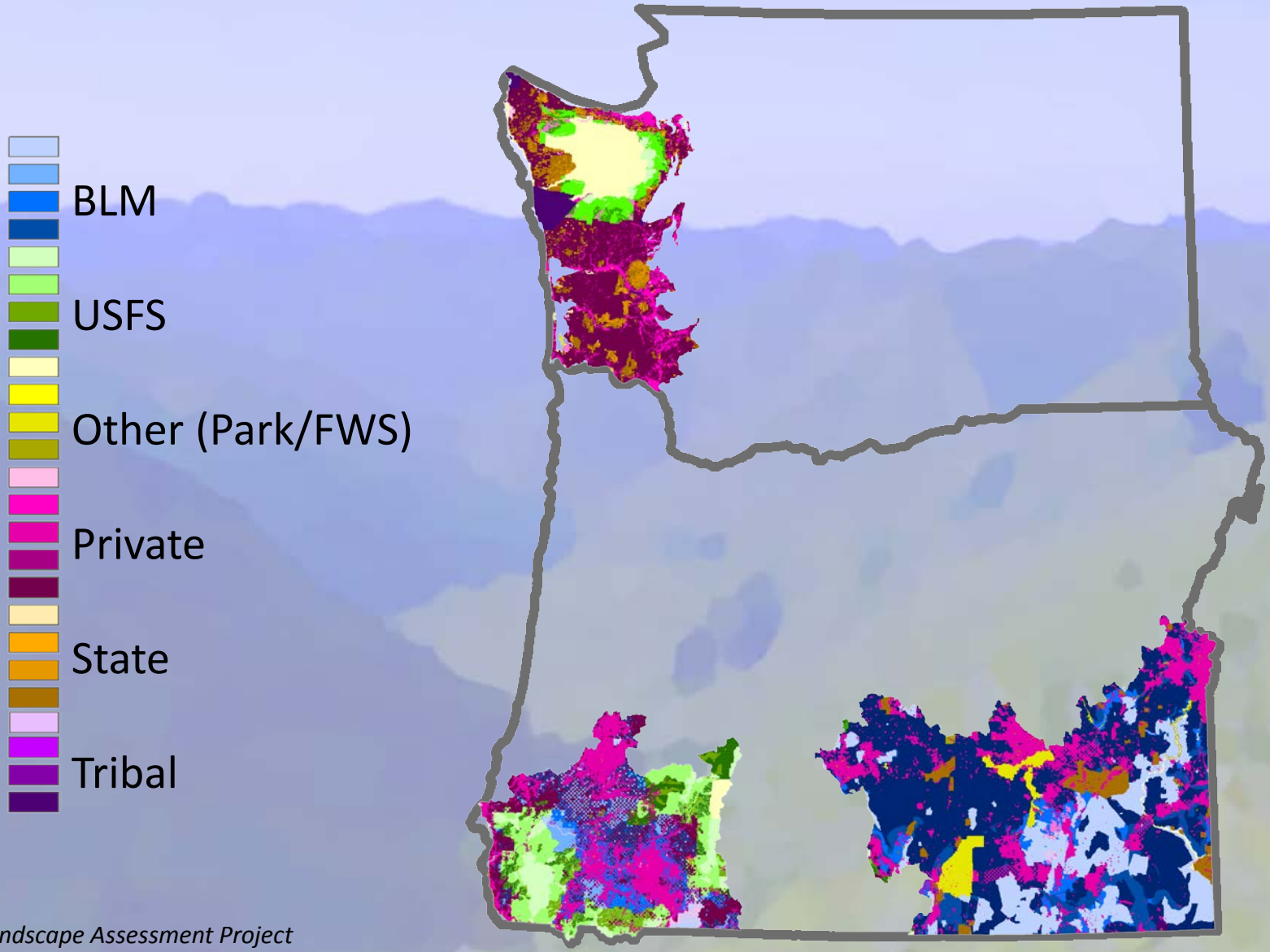
Who manages the land?



Source: Integrated Landscape Assessment Project

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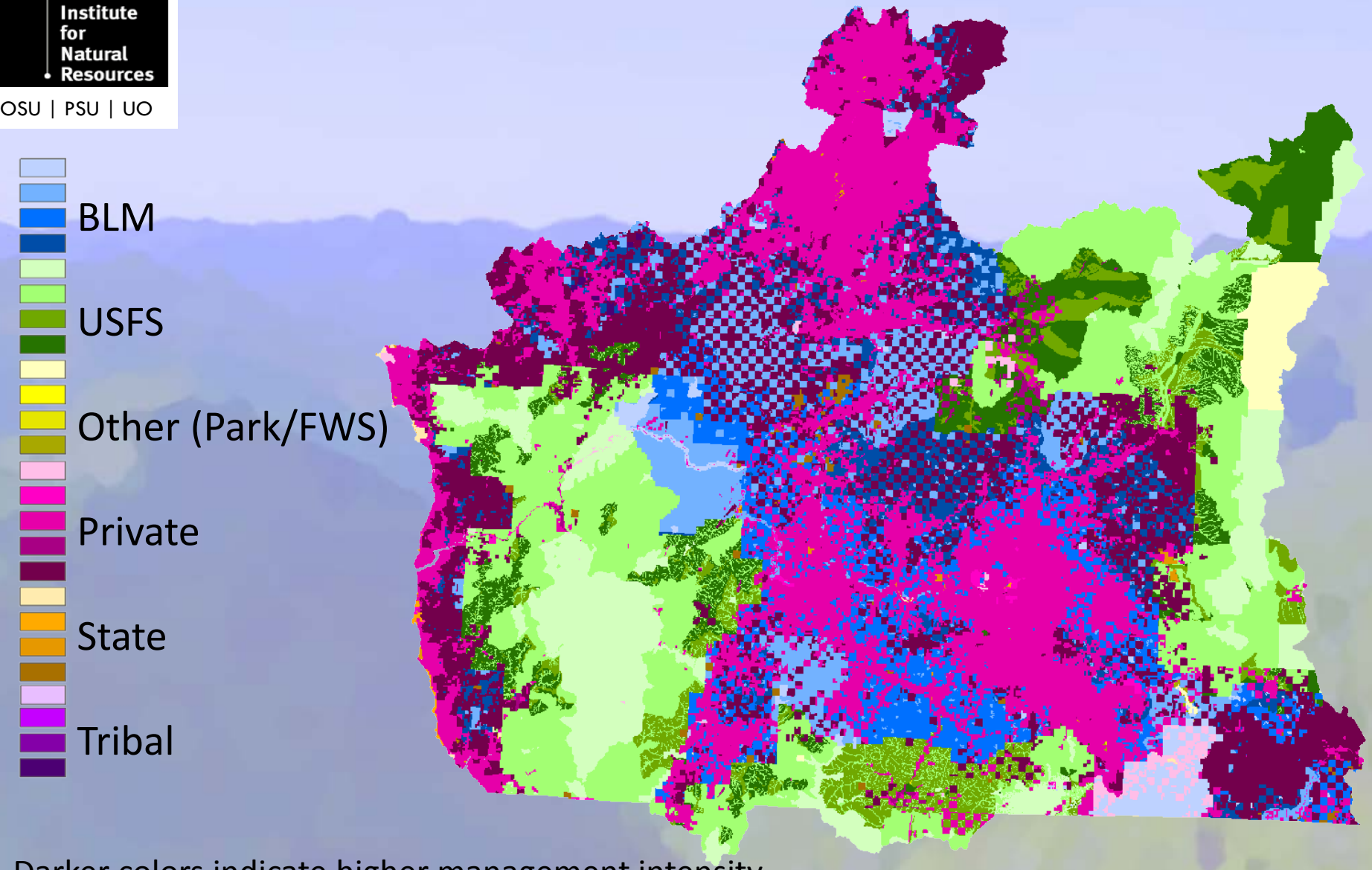
Who manages the land?



Darker colors indicate higher management intensity

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Stakeholders who have been involved

- US Forest Service
- Bureau of Land Management
- Natural Resource Conservation Service
- National Park Service
- US Geological Survey
- US Fish and Wildlife Service
- Oregon Dept. of Forestry
- WA Dept. of Natural Resources
- WA Dept. of Fish and Wildlife
- Private forest industry
- The Nature Conservancy
- Small woodlands association and landowners
- Local governments
- Local collaboratives

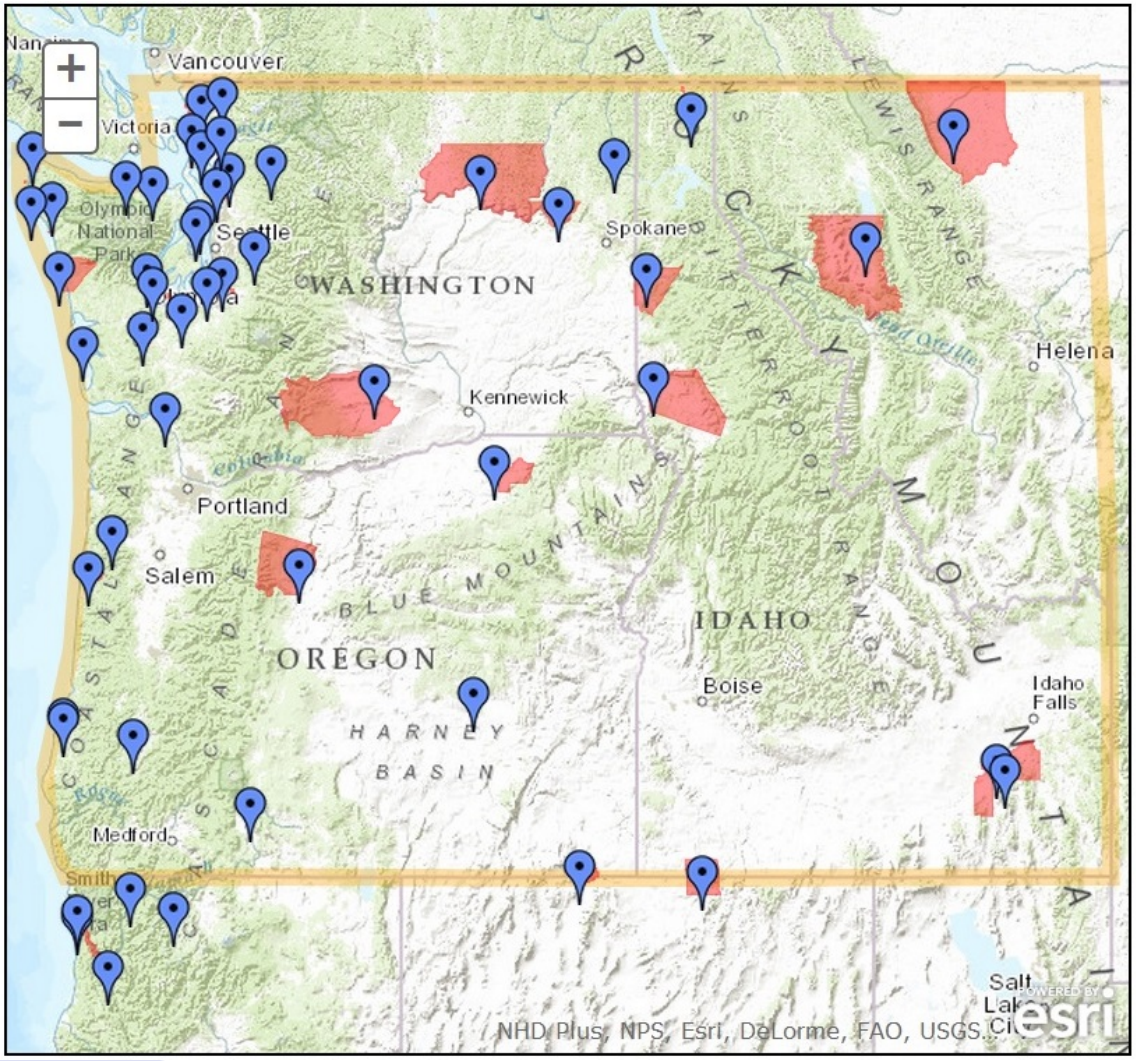
A total of 60 people attended project kick-off meetings. More have become involved since.

Nurturing relationships between the NW CSC and NW Tribes

52 federally recognized Native American tribes within NW CSC geographic area

Invite tribal input on research priorities

Foster active tribal engagement in climate research, VAs, and adaptation planning



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Correlation and Climate Sensitivity of Human Health and Environmental Indicators in the Salish Sea

- **Project goal: Develop overlapping conceptual models of environmental and community health indicators in reference to climate forecasts.**
- **Cross-walk the sensitivity of species and habitats to climate with indigenous health indicators to demonstrate how indigenous knowledge can be used in conjunction with landscape-level conservation indicators to identify resource management priorities.**

Correlation and Climate Sensitivity of Human Health and Environmental Indicators in the Salish Sea

Environmental indicators

- Shellfish beds
- Shoreline armoring

Indigenous Health Indicators

- Community Connection – participation in community functions
- Natural Resources Security – local resources support healthy community
- Cultural Use – ability to carry forth cultural traditions
- Education – knowledge & values are passed from elders to youth
- Self-determination – developing their own restoration programs
- Well-being – maintain connection to homeland

Building Structure

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Some questions to chew on

1.	How do others address this agenda?	Partners
2.	Products & mgmt applications?	ESAC/Partners
3.	Do projects complement one another?	Sci Coords or SAT?
4.	Are project products being used?	ESAC/Partners
5.	When are we done?	ESAC/Partners
6.	Relative priority among items	ESAC/Annual WP
7.	Fit into national agenda?	NCCWSC/ACCCNRS

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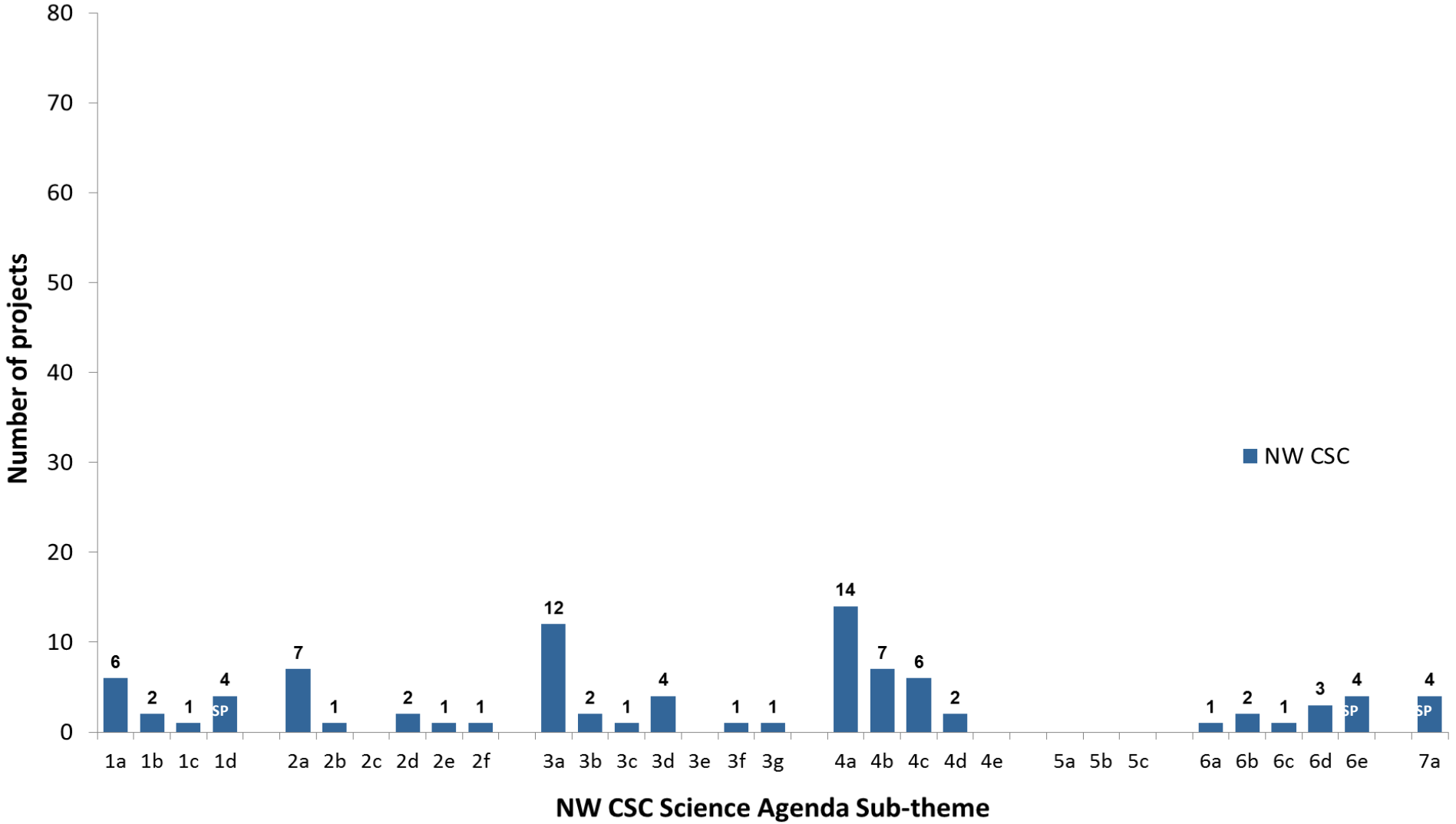
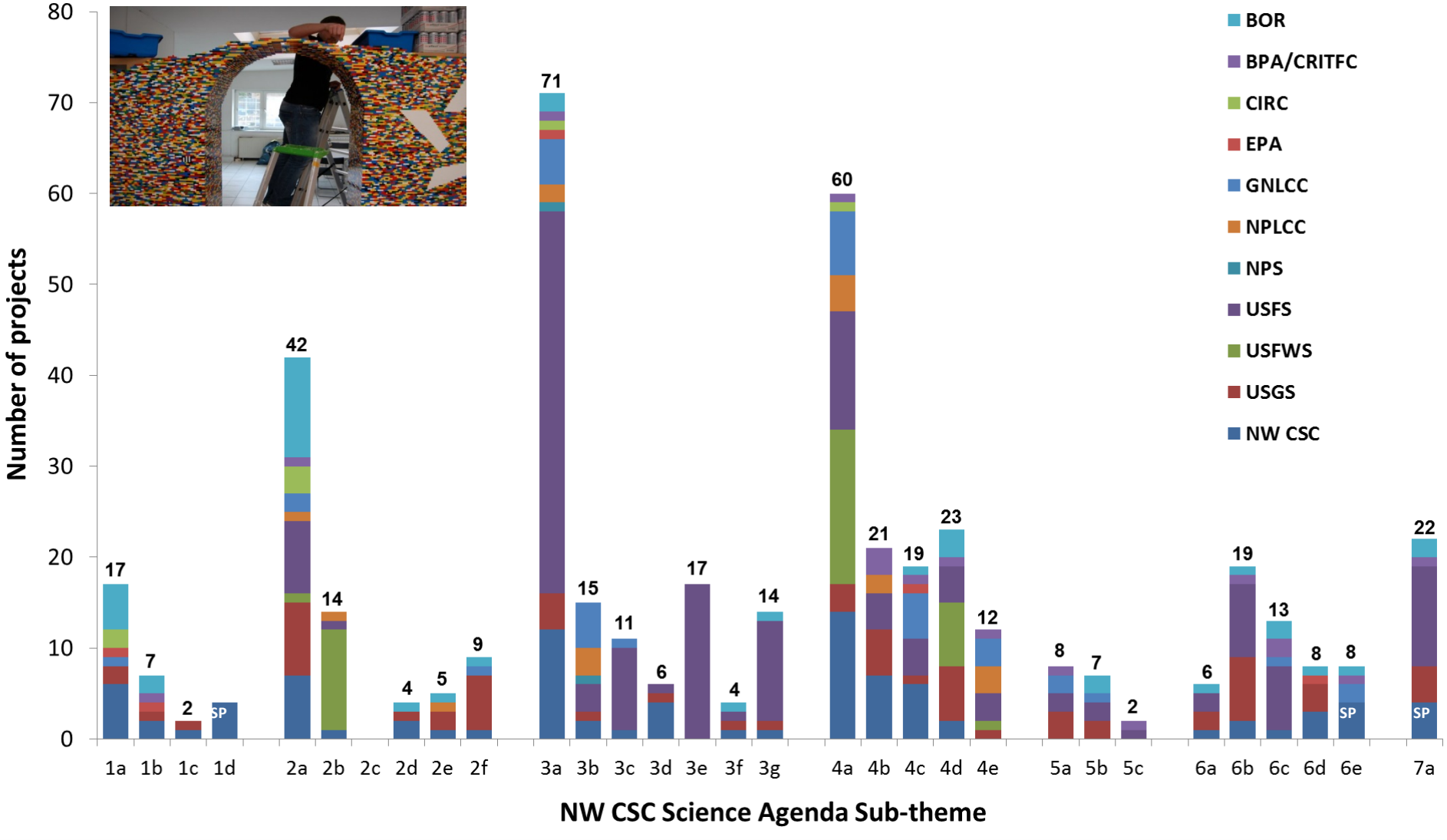
Collective NW Climate Research Portfolio



Collective NW Climate Research Portfolio



Some questions to chew on

1.	How do others address this agenda?	Partners
2.	Expected products & mgmt application?	ESAC/Partners
3.	**Do projects complement one another?**	**Sci Coords or SAT?**
4.	Are project products being used?	ESAC/Partners
5.	When are we done?	ESAC/Partners
6.	Relative priority among items	ESAC/Annual WP
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Do projects complement one another?

Contemporary projects

Existing science

Goal: Develop a **PROCESS** to synthesize the existing science relevant to specific, high-priority management questions or climate adaptation actions

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Do projects complement one another?

Existing science

Goal: Develop a **PROCESS** to synthesize the existing science relevant to specific, high-priority management questions.

1. Identify questions that are strictly management-relevant
2. Vet questions with scientists/subject experts
3. Present questions to ESAC for discussion and approval
4. Assemble panel of experts to synthesize relevant science
5. Final product = white paper/recommendations

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Adaptation Strategies

- Use best available science
- Adopt integrated approaches
- Build strong partnerships
- Apply ecosystem-based approaches
- Incentives and Education
- Effective Communication
- Monitoring and Evaluation

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Climate Adaptation Actions

- Administrative
  - ❖ Legal
  - ❖ Regulatory
  - ❖ Institutional
  - ❖ Decision-making processes

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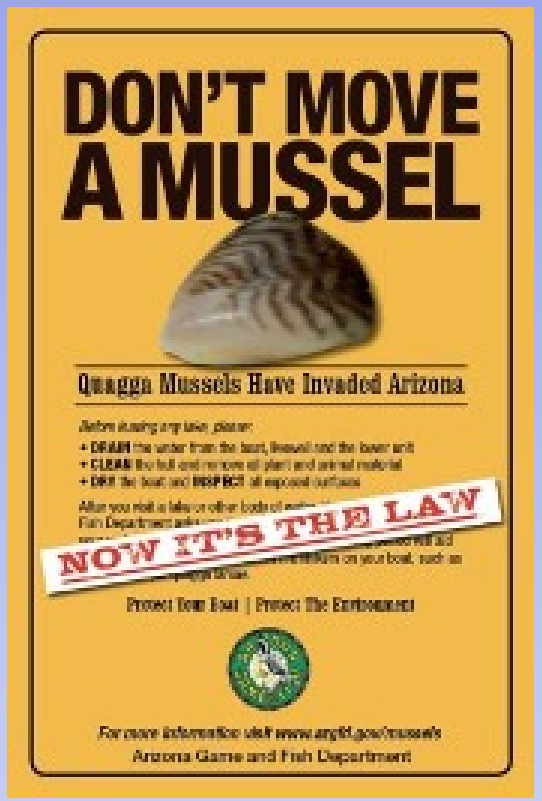
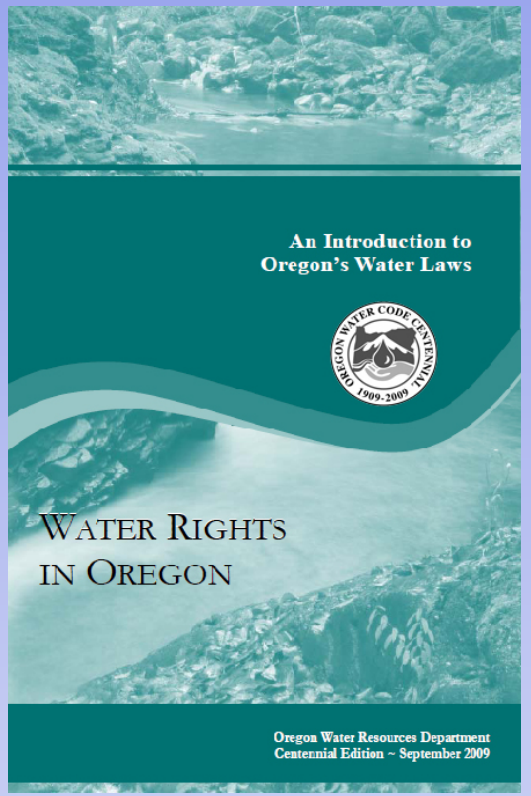

DON'T MOVE A MUSSEL
Quagga Mussels Have Invaded Arizona
NOW IT'S THE LAW
Arizona Game and Fish Department


NO FISHING


An Introduction to Oregon's Water Laws
WATER RIGHTS IN OREGON
Oregon Water Resources Department
Centennial Edition ~ September 2009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Climate Adaptation Actions

- Administrative
  - ❖ Legal
  - ❖ Regulatory
  - ❖ Institutional
  - ❖ Decision-making processes
- On-the-ground

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Captive beaver released into holding facility

On-the-ground climate adaptation actions

Systematic Reviews

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Informing natural resource decision making through integrated knowledge and information.

Lisa Gaines, Director

Systematic Reviews

A review of a clearly formulated question (or action) that uses systematic and explicit methods to identify, select and critically appraise existing relevant research, and to collect and analyze data from the studies that are included within the review.

Contested Science for Policy

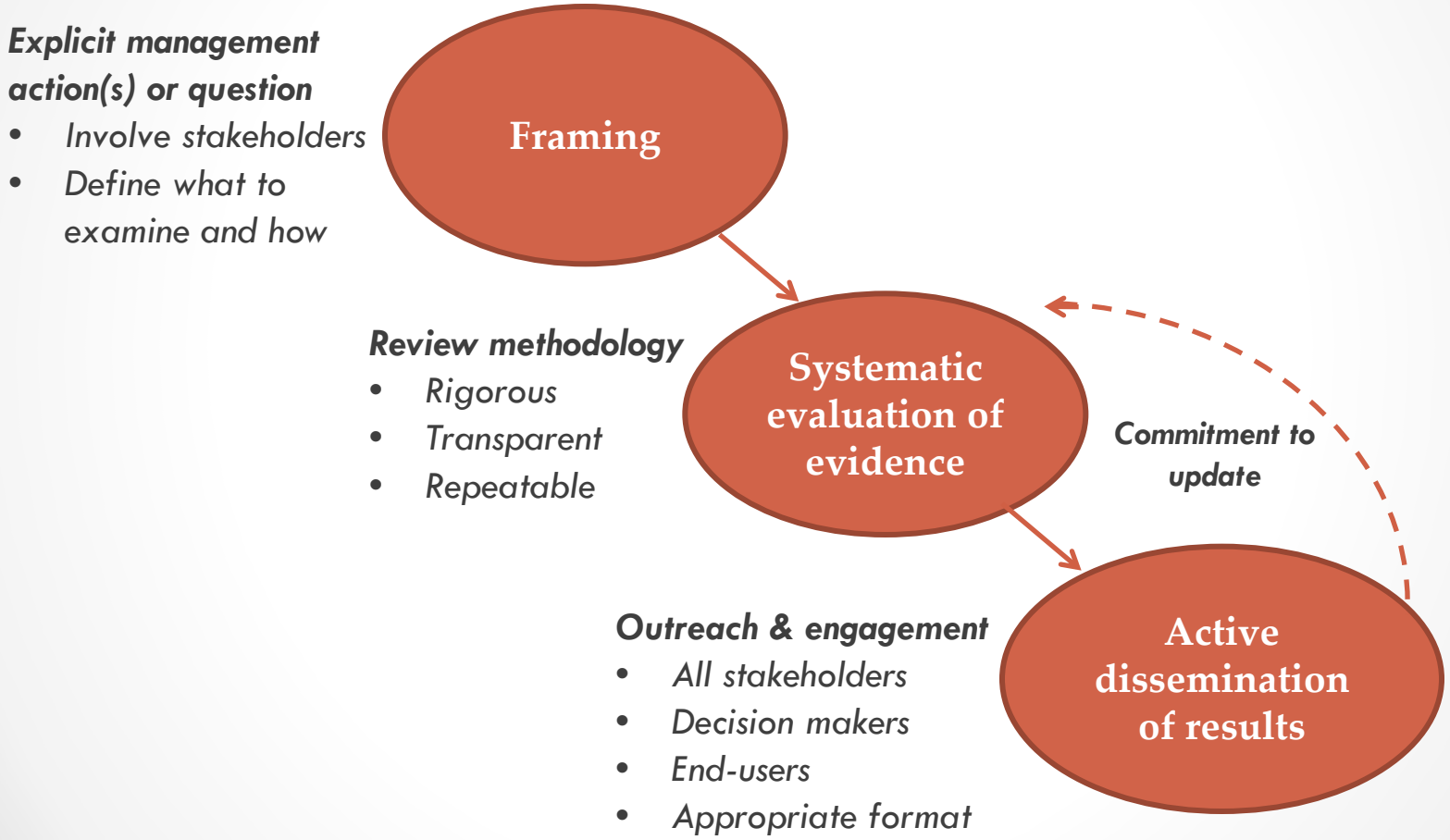
Evidence base supporting position A

Evidence base supporting position B

?

Weighing scientific evidence

Systematic Review Framework




Does wood placement in Pacific northwestern North American streams affect salmonid abundance, growth, survival, or habitat complexity?

Steps of the Review Process

- Reviewer **recruitment** **reviewers, research librarian**
- Question **/management action*** **reviewers, managers**
- The **protocol** and search strategy* **document everything**
- Literature **search and compilation** **457 articles**
- "Coarse" **filter** **80**
- **Review** literature **33**
- Assess quality and **relevance** of each study **quality…difficult**
- Write narrative **synthesis** **external review**
- Results workshop and further outreach and **engagement***

- "…surprisingly **little evidence** was **available to support the efficacy of LW placement** for increasing the abundance, survival, or growth of any salmonid species."
- "Thus, much **less than definitive science** is available to inform decisions about whether to implement and how to design in-stream wood placement projects."

The Value of Systematic Reviews

Researchers: Setting research priorities

Operations and decision makers: Guiding practice, policy, and investment decisions

Funders: Guiding decisions to invest in new research

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Do we have enough on-the-ground climate adaptation actions to systematically evaluate?

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