NW CSC
Northwest Climate Science Center

The Northwest Climate Science Center

Gustavo Bisbal, Director
Nicole DeCrappeo, Research Coordinator

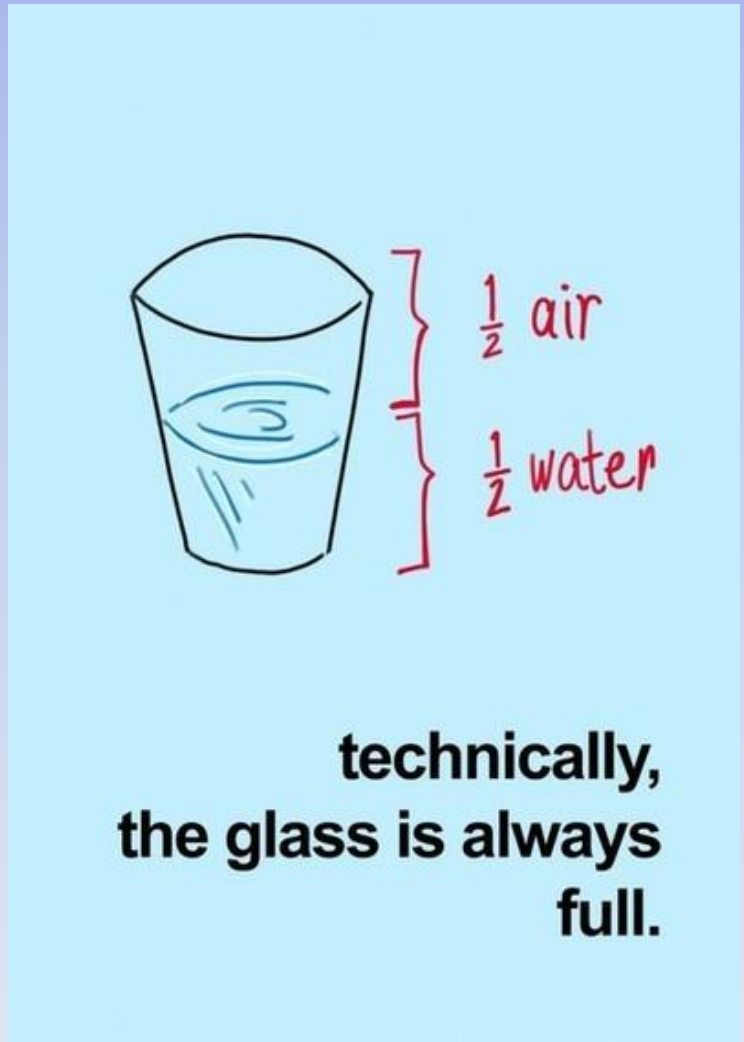
ACCCNRS – Portland, OR – September 17, 2014

Assumptions for today

1. You know little about us
2. How do we work with others?
3. Emphasis on our science

NW CSC
Northwest Climate Science Center

Assumptions for today



NW CSC
Northwest Climate Science Center

Outline

- The government meets the elephant
- NW CSC 101
- The science we want
- Getting a grip on the science

NW CSC
Northwest Climate Science Center

Outline

- **The government meets the elephant**
- NW CSC 101
- The science we want
- Getting a grip on the science

NW CSC
Northwest Climate Science Center

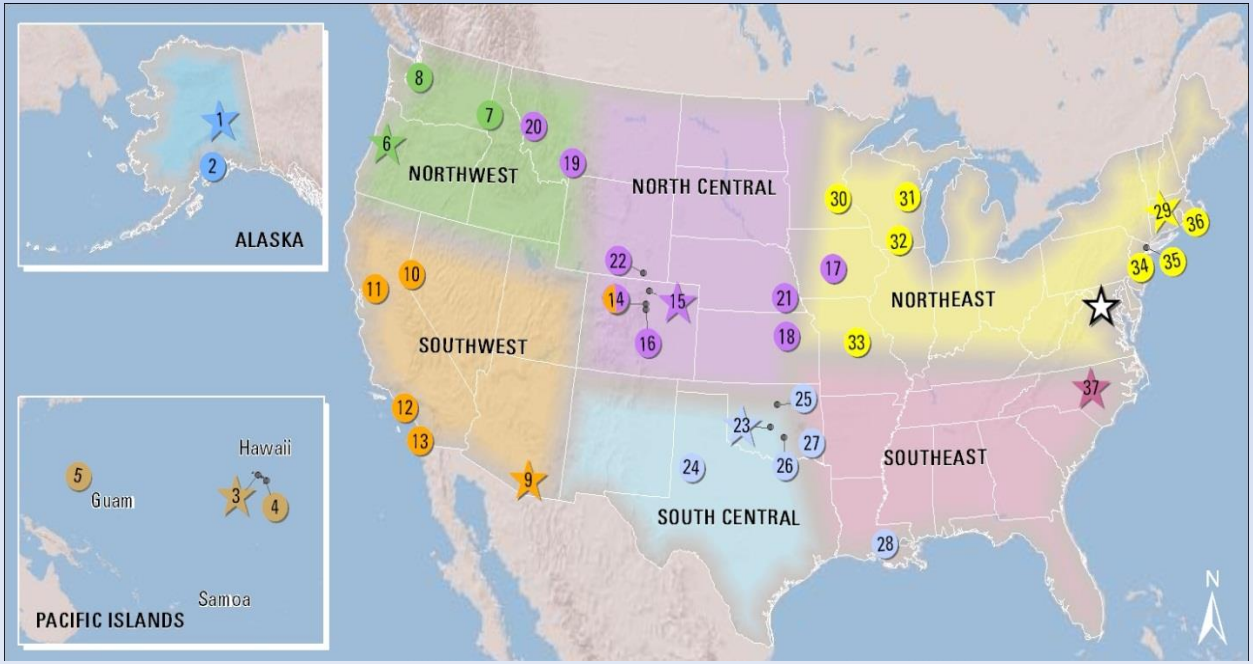
DOI Secretarial Order 3289 (Sep 2009)

- Directs DOI Bureaus to:
  - work together to address CC impacts
  - analyze CC impacts when making major decisions
  - Develop landscape-level strategies to respond to CC impacts

- Establishes DOI approach:
  - Landscape Conservation Cooperatives (22)
  - Climate Science Centers (8)

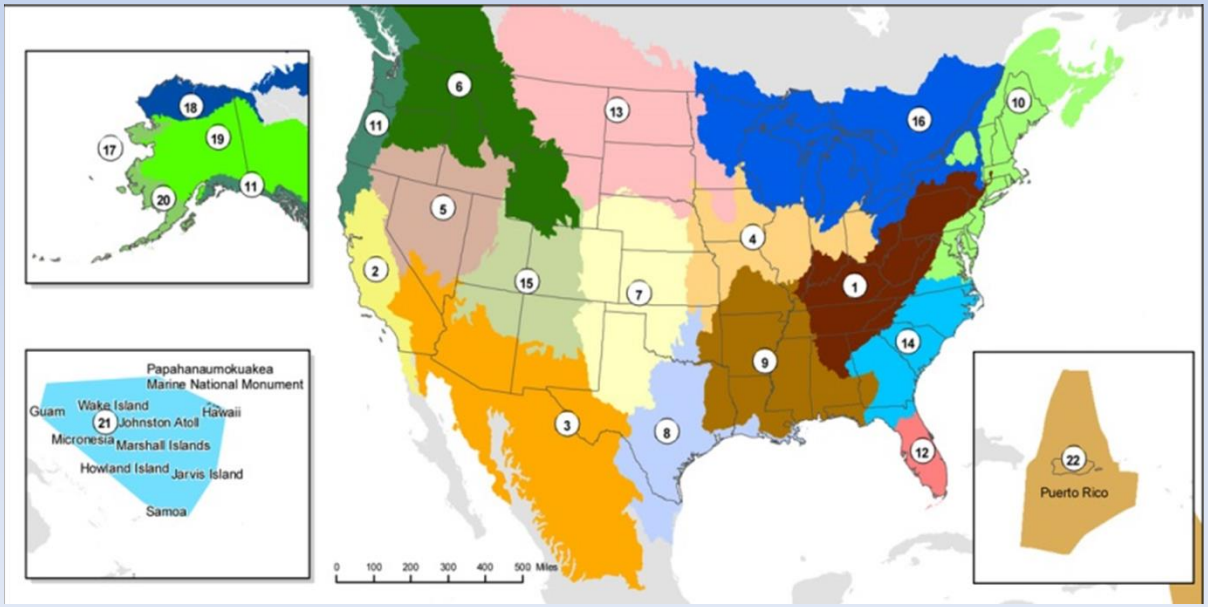
Climate Science Centers

- DOI – USGS
- 8 nationwide
- Support federal-university partnerships that provide managers scientific tools and info to address CC impacts on natural and cultural resources
- Focus: climate science for fish, wildlife, ecosystems, and cultural resources
- Clients: LCCs, federal, state, tribal, local resource managers, NGOs



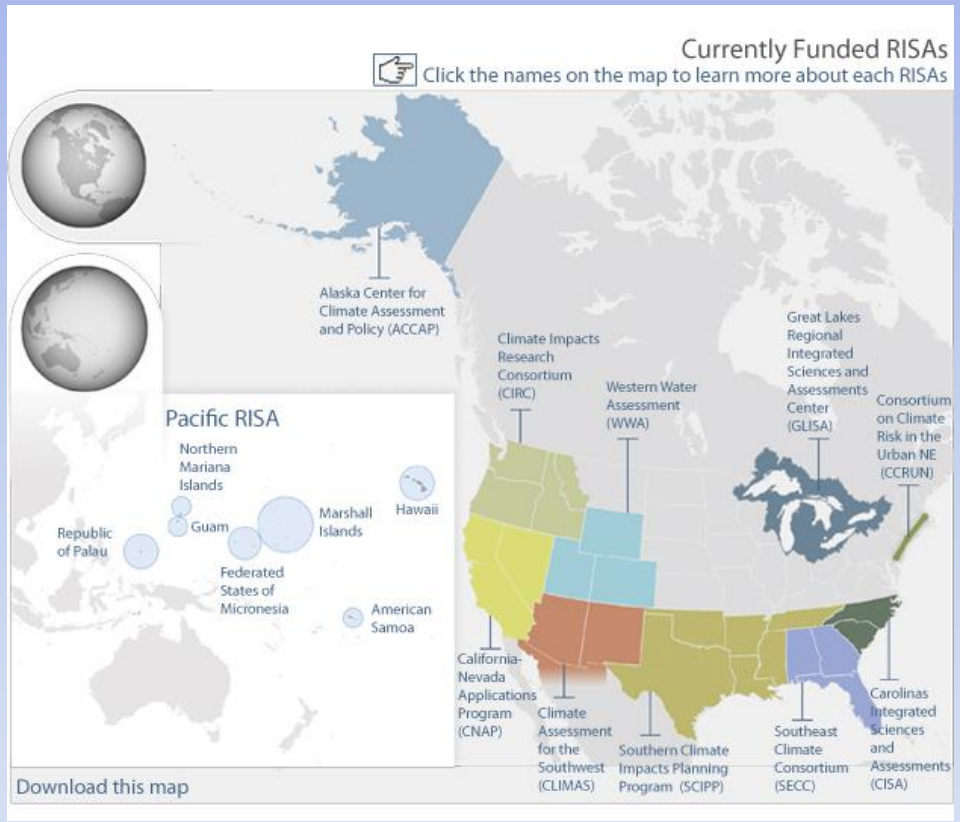
Landscape Conservation Cooperatives

- DOI – USFWS
- 22 nationwide
- Partnerships in which the private, state, tribal and federal community share conservation goals for landscapes capable of sustaining natural and cultural resources for current and future generations
- Focus: conservation actions for land, water, fish, wildlife, plant and cultural resources
- Clients: the partnership



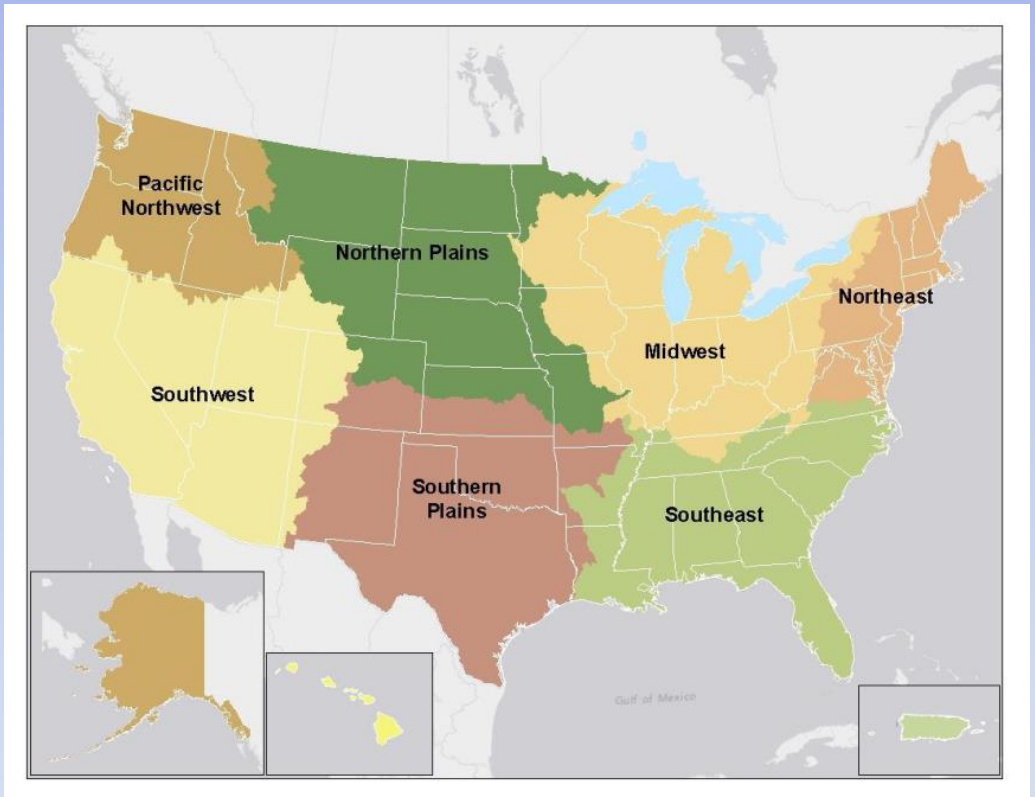
Regional Integrated Sciences & Assessments Programs

- NOAA – Climate Program Office
- 11 nationwide
- Support interdisciplinary network of researchers & technical experts
- Focus: impacts of climate variability & change on natural resources and human communities
- Clients: Local governments, community sectors



Climate Change HUBS

- USDA
- 7 nationwide
- Deliver information and technologies that enable climate-smart decision-making by producers
- Focus: fires, invasive pests, floods, drought
- Clients: farmers, ranchers and forest landowners



Many Mission Statements…

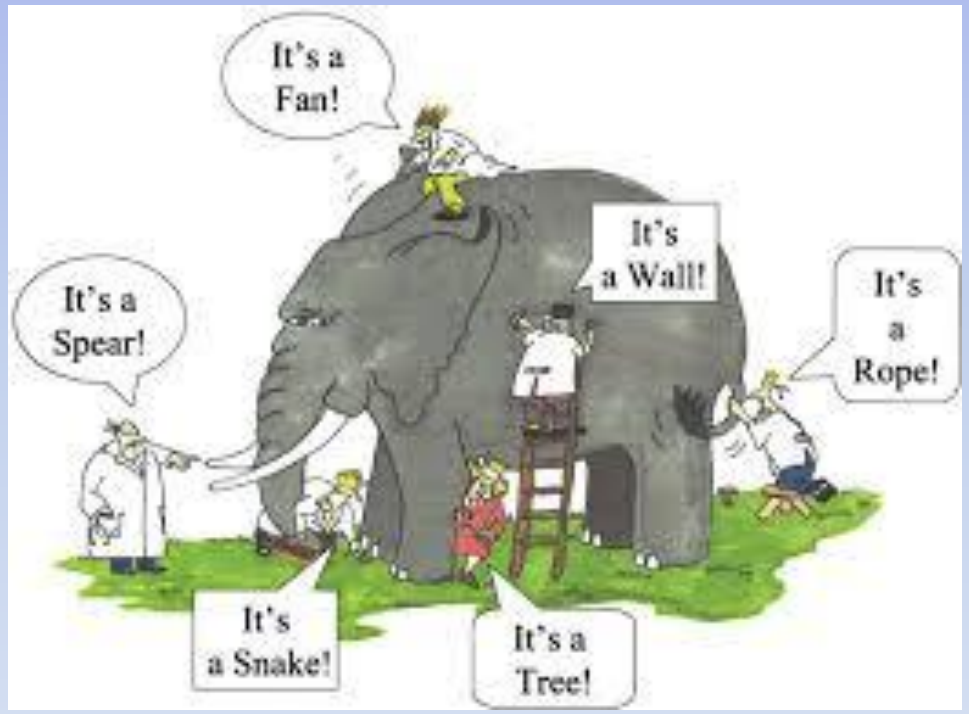
To protect America's natural resources and heritage, honor our cultures and tribal communities, and supply the energy to power our future

To understand and predict changes in climate, weather, oceans, and coasts
To share that knowledge and information with others, and
To conserve and manage coastal and marine ecosystems and resources

To provide leadership on food, agriculture, natural resources, rural development, nutrition, and related issues based on sound public policy, the best available science, and efficient management

… and a shared hope

By using our **many lenses** and knowledge bases together we will **see more** and provide more effective information to resource managers and decision makers **than any of us would on our own**



NW CSC
Northwest Climate Science Center

Questions?

Outline

- The government meets the elephant
- **NW CSC 101**
- The science we want
- Getting a grip on the science

NW CSC
Northwest Climate Science Center

NW CSC Strategic Plan 2012-2016

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

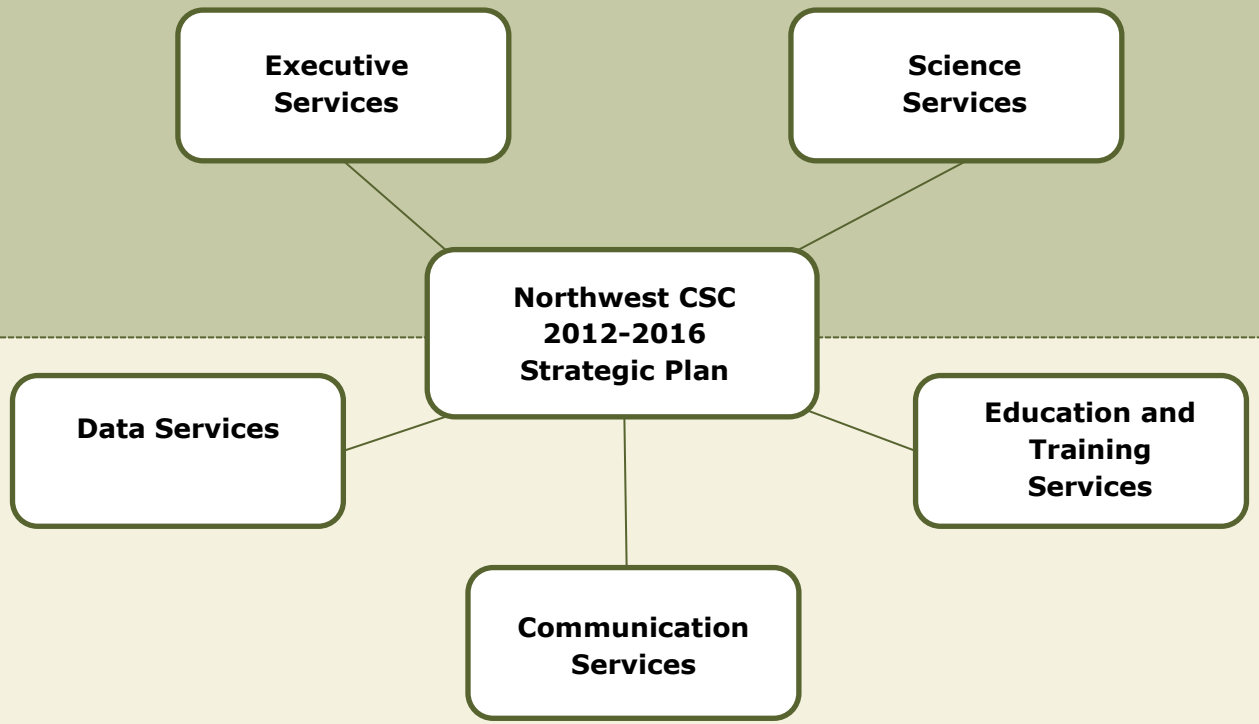
VISION

To become nationally recognized as a best-practice model for the provision of climate science and decision support tools to address conservation and management issues in the Pacific Northwest Region

NW CSC Strategic Plan 2012-2016

GOAL 1

Goal 1: Establish a significant and effective **leadership presence** to strengthen the region's ability to plan and implement a coordinated climate science portfolio



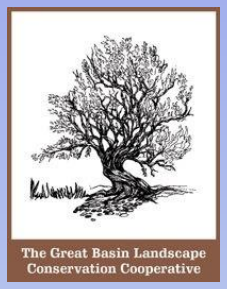
GOAL 2

Goal 2: Develop resources and programs to enhance **climate science literacy**, and give regional audiences the necessary tools and information to promote **climate change awareness**

Executive Services

To provide leadership, guidance, and support for climate-related activities through coordination and engagement with relevant stakeholders

- Establishment/Staffing
- Convening function (ESAC)
  - LCCs
  - States
  - Tribes
- Universities
- Science/Resource Mgmt interface



ESAC

Executive Stakeholder Advisory Committee

23 entities

13 Federal

4 State

3 Tribal (73 tribes)

3 LCCs

NW CSC
Northwest Climate Science Center

Working with

LCCs

Regional LCCs

- Great Northern
- North Pacific
- Great Basin

NPLCC Engagement with NW CSC

Advisory Committee on Climate Change and Natural Resource Science
September 17, 2014

John Mankowski
NPLCC Coordinator

Outline

- LCCs – Quick Review
- North Pacific LCC
  - How we're organized
  - The work we do
  - How we engage with NWCSC

Landscape Conservation Cooperatives

LANDSCAPE CONSERVATION COOPERATIVES

lccnetwork.org

Involvement in the LCCs

250+ Agencies and Organizations

- **All 50 state natural resource agencies**
  - States serve as Chairs (or Vice Chairs) on ~2/3 LCC Steering Committees
- **All major federal resource management and conservation agencies**
  - FWS, BLM, BOR, NPS, USGS, BIA, BOEM
  - USFS, NRCS, FSA, NOAA/NMFS, EPA, USACE, DOE, DOD, TVA
- **Tribes: 20+ individual and consolidated groups**
- **NGOs, Partnerships (JVs, FHPs), Academic: 40+**
- **Climate Science Centers**

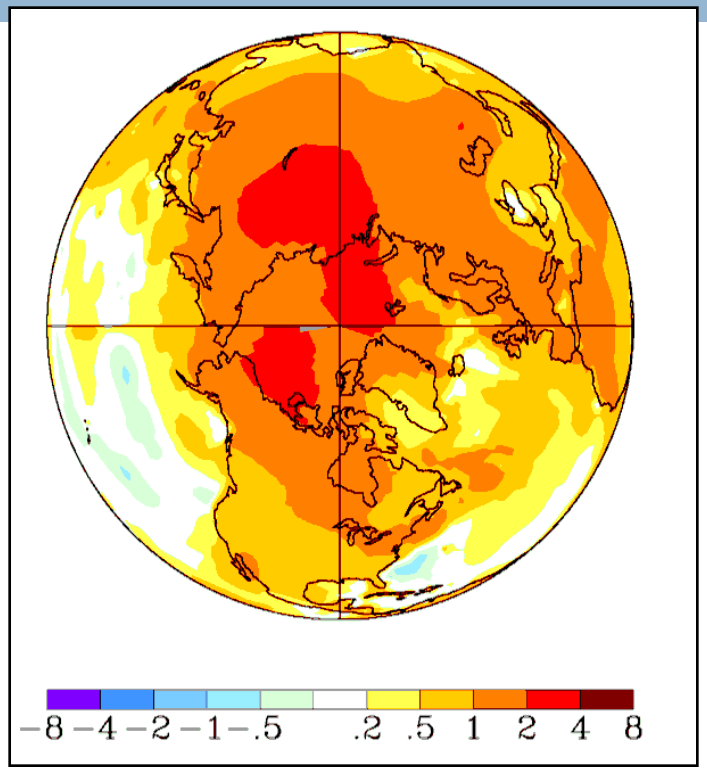
Landscape Conservation Cooperatives
Strategic Goals

- A network of landscapes and seascapes adaptable to global change
- Facilitated alignment of partnership needs
- Conservation of natural and cultural resources guided by collaborative application of science, experience, and cultural and traditional ecological knowledge
- Advance the knowledge of, support for, and engagement in landscape-scale conservation

Our Challenges

LANDSCAPE CONSERVATION COOPERATIVES

- Habitat fragmentation
- Genetic isolation
- Invasive Species
- Water Scarcity
- Energy Development
- Others…



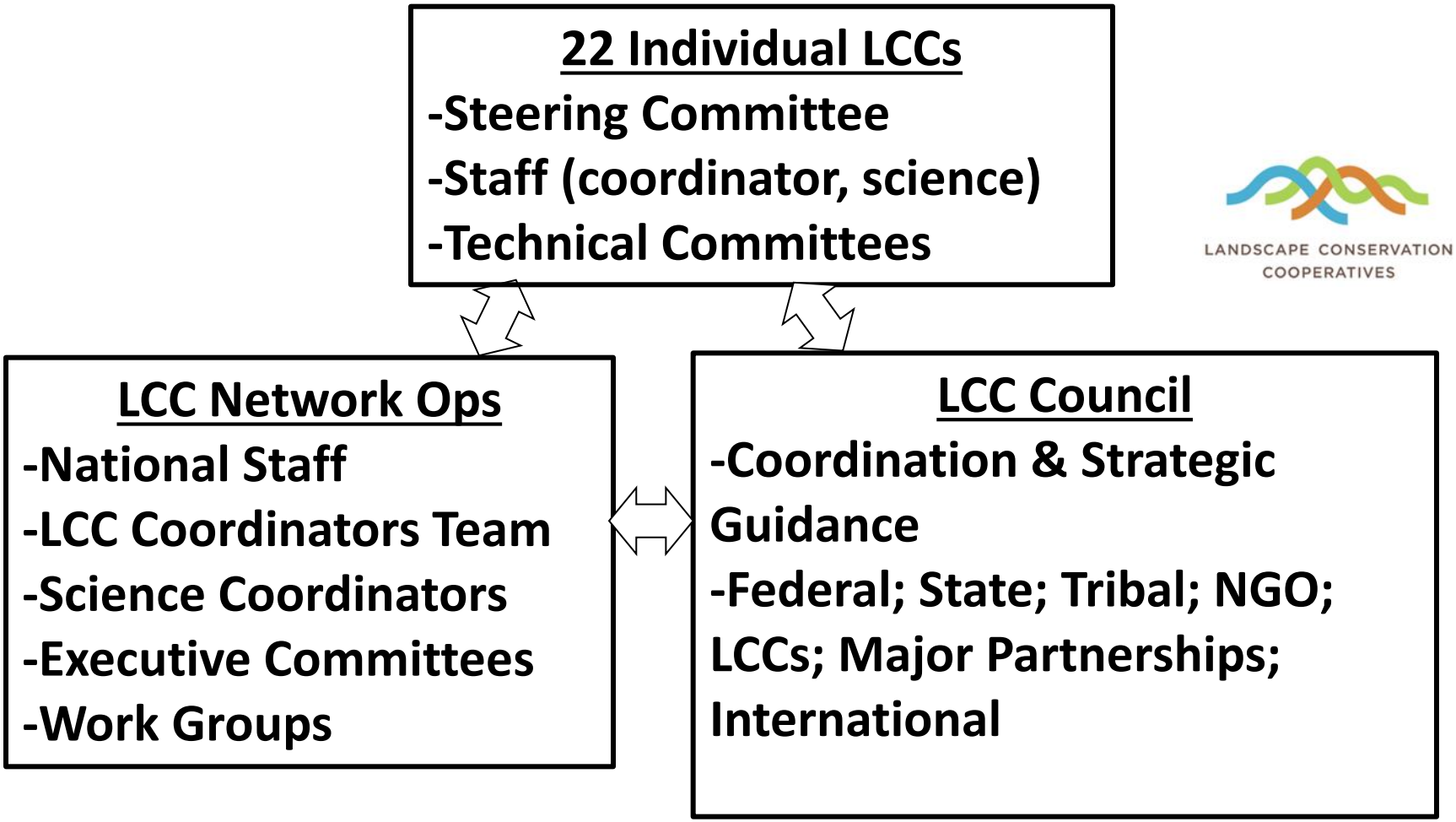
All compounded by a rapidly changing climate

Temperature Change, ° C
1958-2008

NATIONAL *fish, wildlife & plants*
CLIMATE ADAPTATION STRATEGY

Identified the LCC Network as a forum "to *define, design, and deliver sustainable landscapes at a regional scale*" including the development of "*landscape/seascape scale plans capable of sustaining fish, wildlife, and plants*"

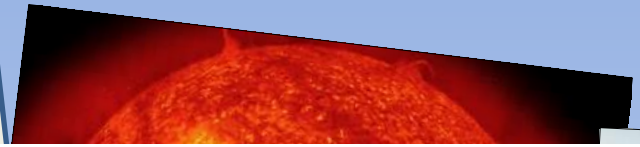
LCC Network Organizational Structure

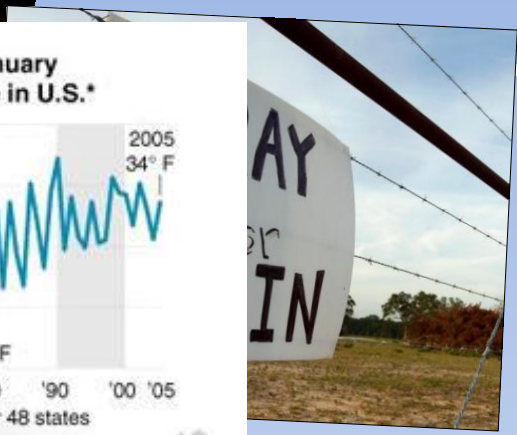


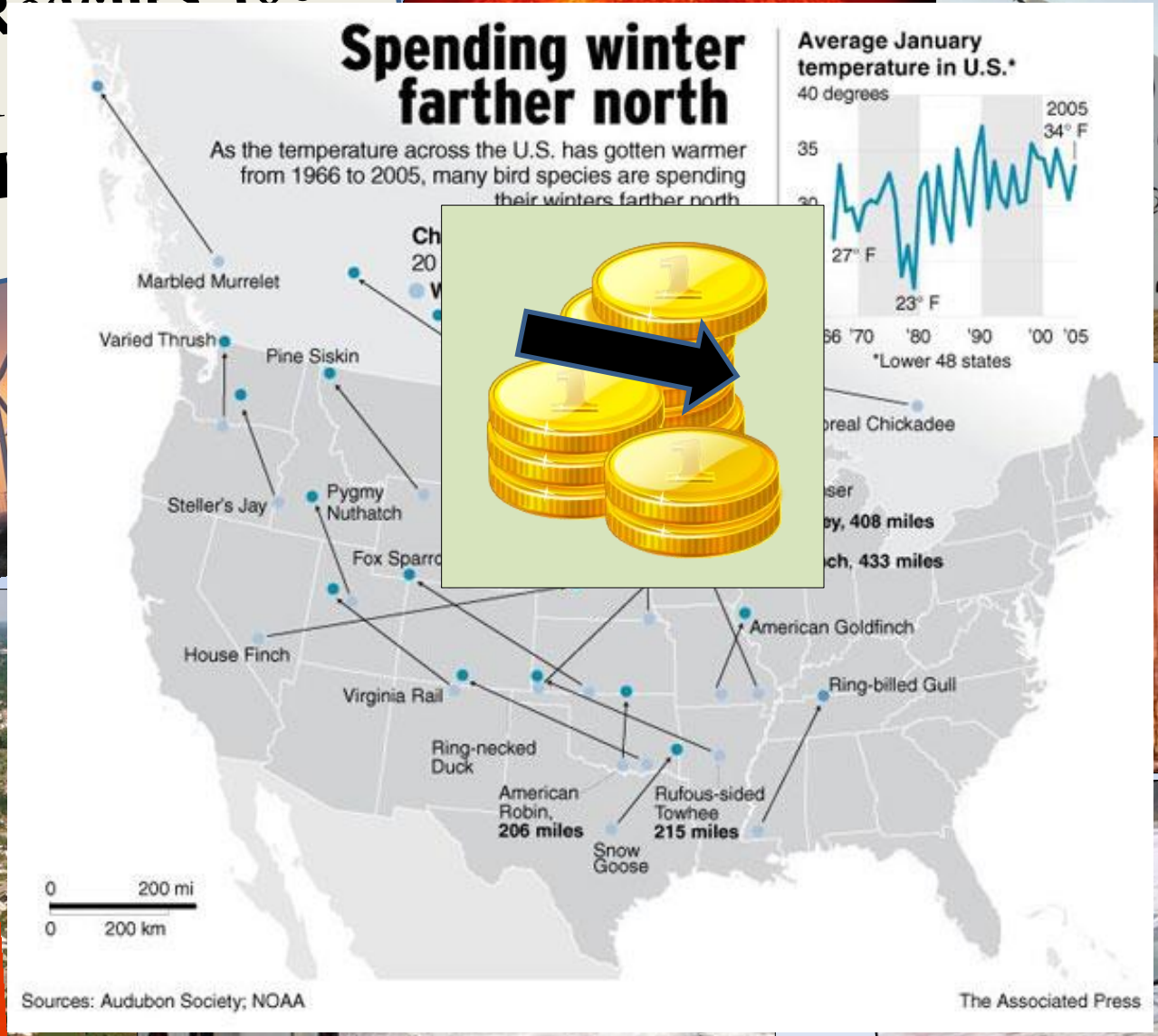
LCC Council - What

- Purpose:
  - assist the LCCs in achieving their goals
  - contribute to building a constituency of partners
  - to help sustain the LCC initiative
- Goal:
  - *add value* to the LCC initiative *in partnership* with the LCCs and contribute to its effectiveness and sustainability

CO2 R[illegible]aches 400
ppm: 1[illegible]
MILLI[illegible]







NORTH PACIFIC LANDSCAPE
CONSERVATION COOPERATIVE

Who?

- ✓ 2 Countries
- ✓ 200+ Tribes and First Nations
- ✓ 4 States, 1 Province, 1 Territory

What?

- ✓ Understand and respond to climate-related large-scale stressors
  Traditional Knowledge and western science
- ✓ Build trans-boundary bridges (international, jurisdictional, geographic)
- ✓ Provide broader context to conservation efforts
- ✓ Share information, experiences, best practices

Where?

- ✓ Entire range of Pacific Coastal Temperate Rainforest
- ✓ Terrestrial & Freshwater Aquatic Ecosystems
- ✓ Adjacent Marine Ecosystems (shorelines, estuaries, nearshore)

Why?

- ✓ Face larger-scale challenges with shrinking fiscal resources
- ✓ Natural & cultural resources know no boundaries,
- ✓ Become a Community of Practice

NPLCC Mission:

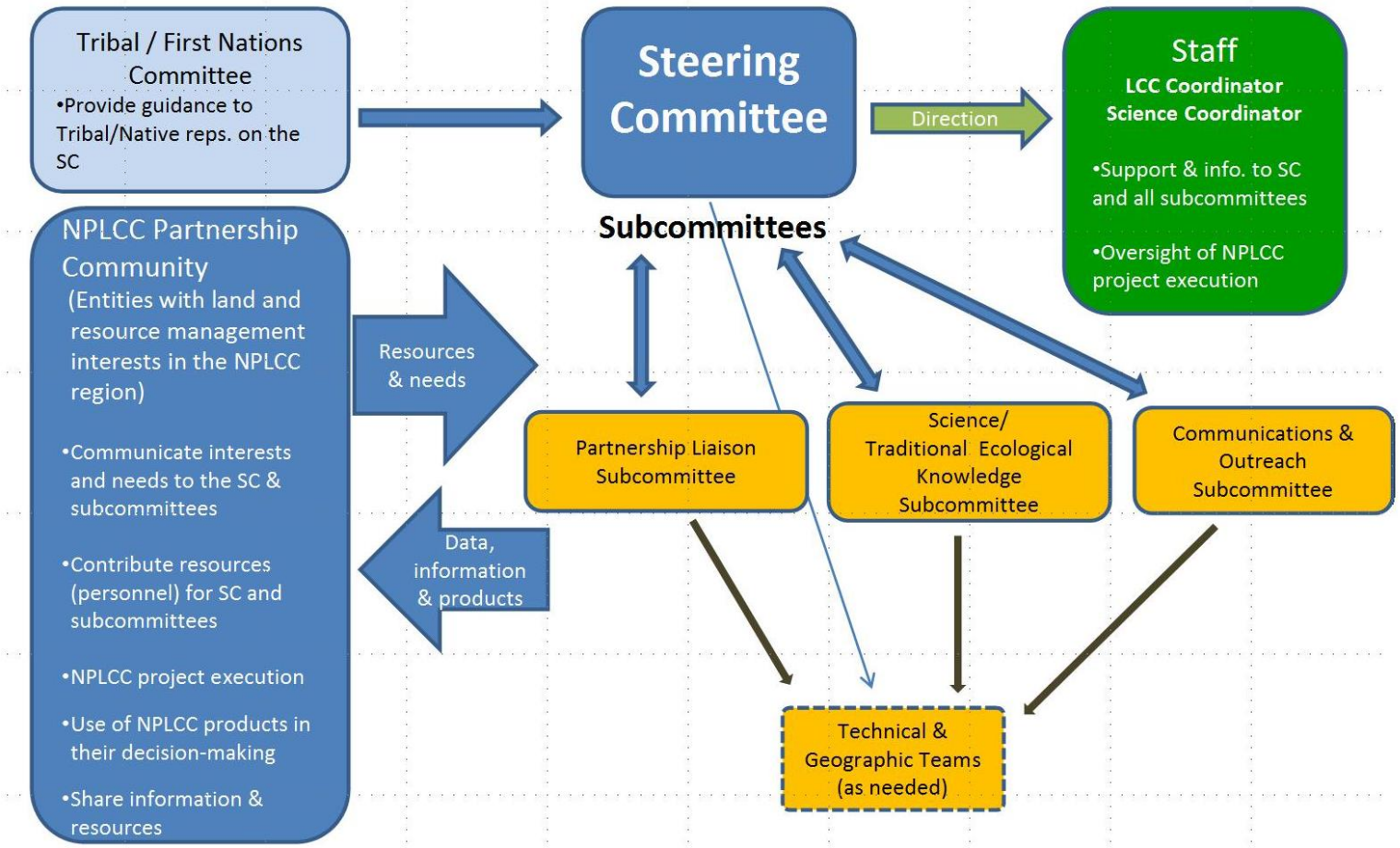
Promote development, coordination & dissemination of science

to inform landscape-level conservation & sustainable resource management

in the face of a changing climate and related stressors.

Organizational Structure

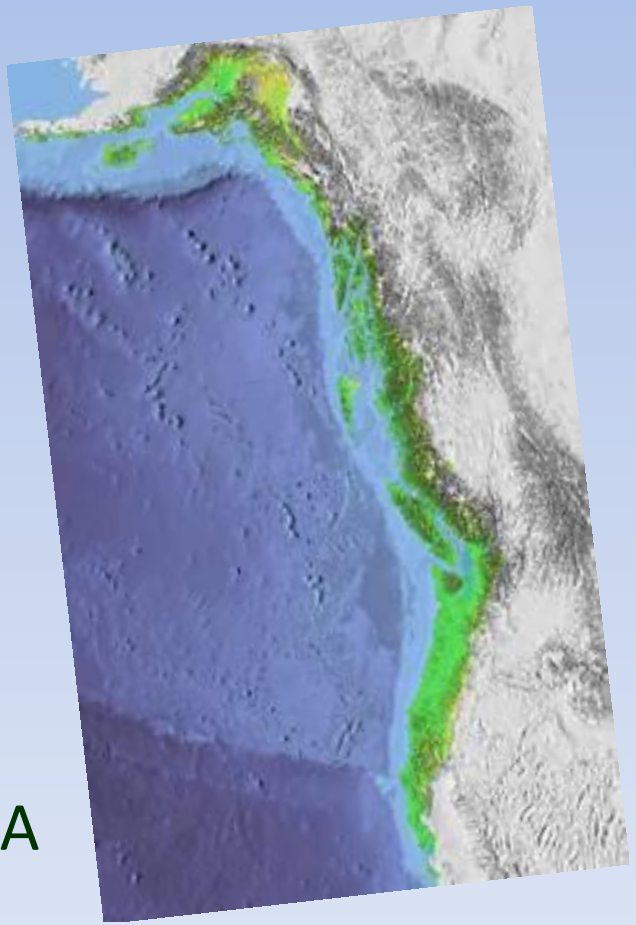
North Pacific Landscape Conservation Cooperative



Steering Committee Entities

5 Tribes & First Nations
AK, BC, WA, OR, CA

Federal
FWS, USFS, BLM, NOAA, NRCS, EPA, NPS, USGS, BIA CWS, DFO



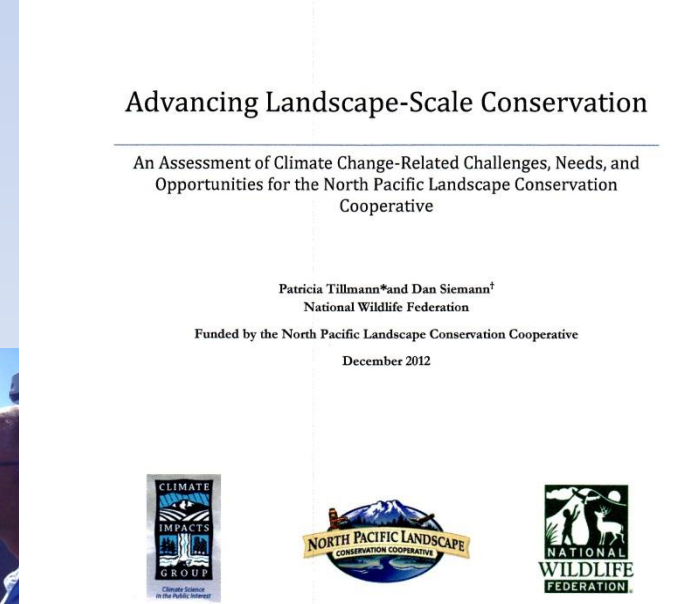
State/Provincial
4 States (AK, WA, OR, CA)
British Columbia

Partnerships:
Pacific Coast J.V.

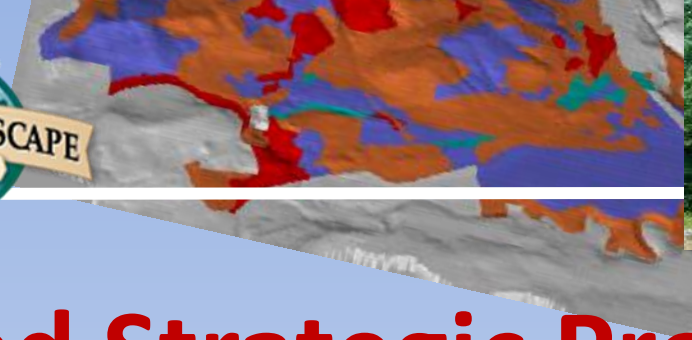
Science Orgs:
CSC (AK, NW, SW)
NOAA RISAs
Pac. Climate Impacts Con.

Convene Partners and Assess Needs

- **Committees & subcommittees**
- Structured needs assessments
- In-person meetings
- Adopt Science Strategy
- Collaborate and leverage with others
  - **CSCs**, HUBs, RISAs, USGS, Tribes, state and federal agencies

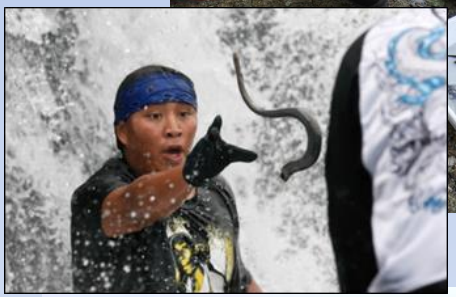


NORTH PACIFIC LANDSCAPE CONSERVATION COOPERATIVE



Fund Strategic Projects

- Population & Habitat Assessments (3)
- Conservation Planning & Design (23)
- **Vulnerability Assessments (16)**
- Decision Support Tools & Data (15)
- Monitoring & Modeling (3)
- Conservation Planning Atlas
- **Traditional ecological knowledge, cultural & subsistence resources (12)**



NPLCC.org/resources

NORTH PACIFIC LANDSCAPE CONSERVATION COOPERATIVE

Build Capacity

- Participation support for Tribes and state/province partners
- Provide training/workshops
- Support conservation planning efforts
  - North Cascadia Partner Forum
  - Willamette Basin
- Seek/leverage resources with partners of common interests
  - PCJV Pacific Flyway
  - Adjacent LCC joint projects
  - Co-fund projects with CSCs

Pacific Institute for Climate Solutions
Knowledge. Insight. Action.

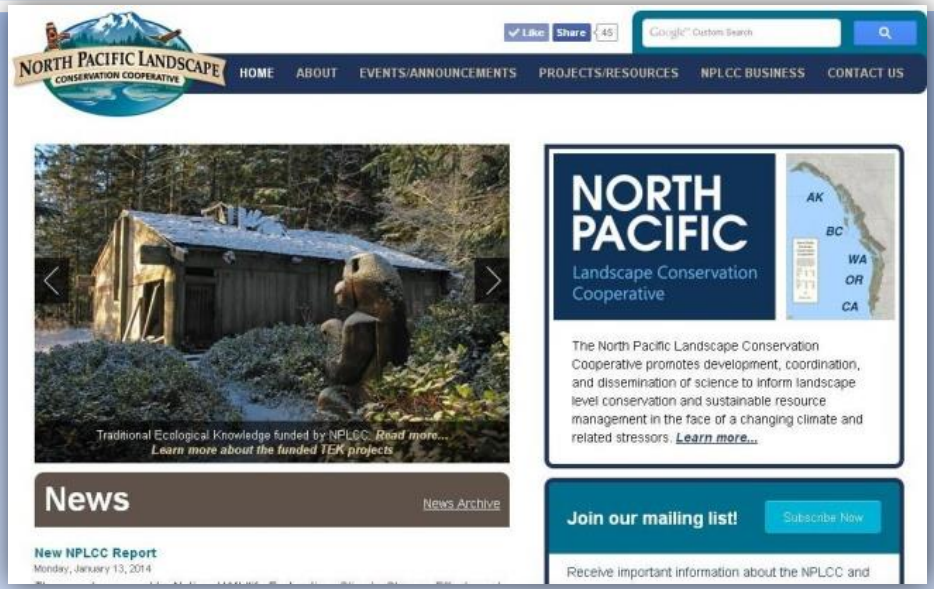
NW CSC
Northwest Climate Science Center

THE YUROK TRIBE

PACIFIC COAST JOINT VENTURE

Communicate & Share Information

- Conservation Planning Atlas
- **Website**
- **Science/Management Webinars**
- Newsletters
  - **Climate Science Digest**
  - **North Pacific Tidings**
- Social Media
  - Facebook, Twitter, YouTube
- **Conferences/workshops**



NorthPacificLcc.org

LANDSCAPE CONSERVATION COOPERATIVES

Summary NPLCC and NW CSC Engagement

- **Organizational Structure – Policy and technical coordination**
  - CSC positions on Steering Committee; LCC on ESAC
  - CSC on S/TEK – align science strategies
  - Project review teams
- **Fund Strategic Projects (separate/unique roles; joint)**
  - CSC – Integrated Scenarios, regional compilation of science research
  - NPLCC – CPA, culvert size, demonstration projects
  - Joint – Regional SLR; Tribe/First Nations TEK, Subsistence resources
- **Communications**
  - Conferences (5th Pacific NW Climate Conf)
  - Newsletters, Climate Science Digest
  - Joint end-of-year climate action report (NW CSC, NPLCC, NOAA RISA)

Take-home messages

- NPLCC works with and relies on 3 CSCs
- Key partners in delivering on the goals of the Secretarial Order
- We are not interchangeable
- We always look to collaborate, share, partner *where it makes sense, and is consistent with our roles/strengths*
- Work *independently* on efforts that suite our unique strengths/roles

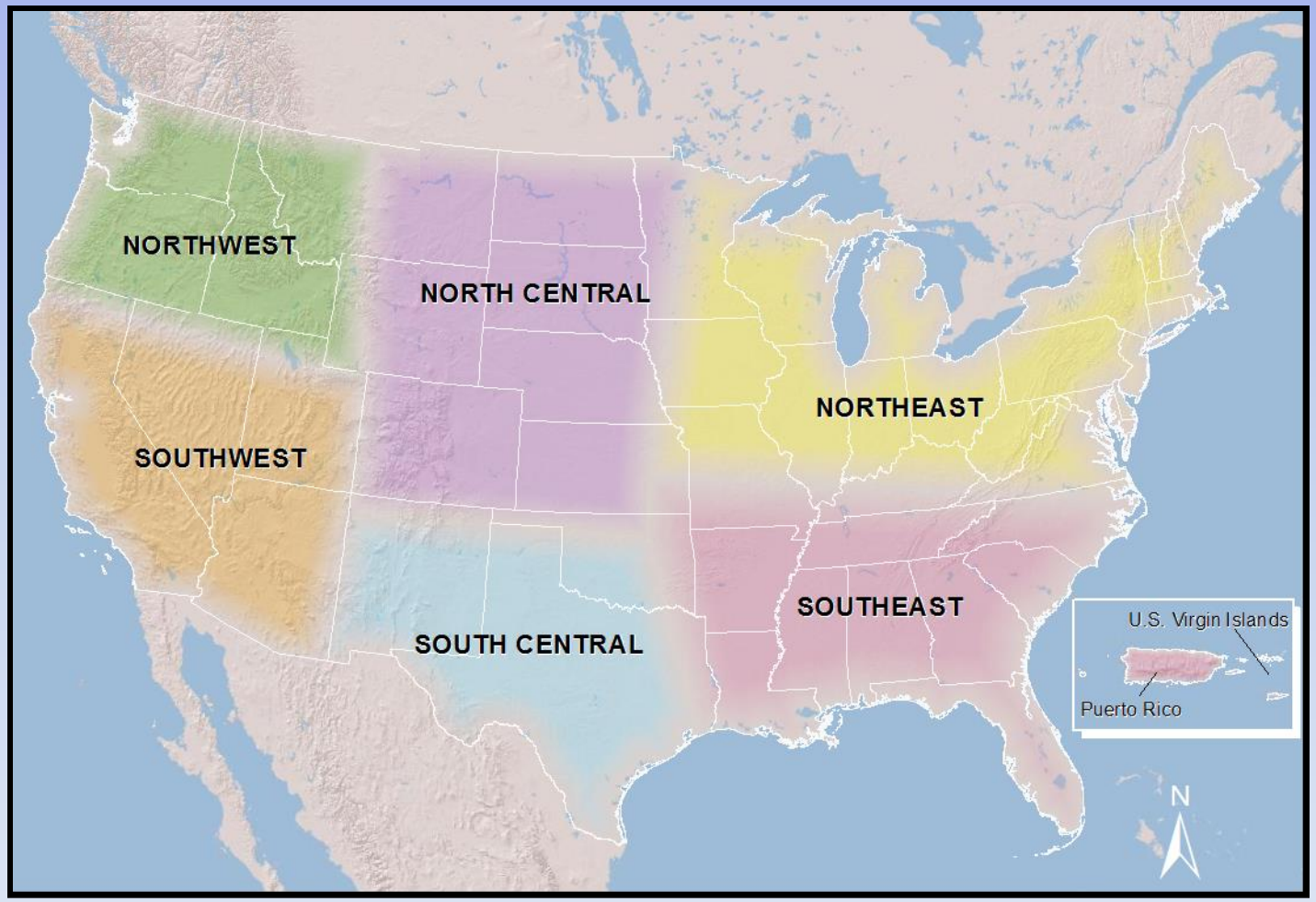
NW CSC
Northwest Climate Science Center

Questions?

NW CSC
Northwest Climate Science Center

Working with States

State Wildlife Action Plans (SWAPs)



State Wildlife Action Plans (SWAPs)

- State F&W agencies may submit proposals for State Wildlife Action Grants if they maintain a current SWAP
- SWAPs assess health of wildlife and habitats; identify stressors; outline conservation actions
- All states developed a SWAP in 2005
- Revision every 10 years, due **Oct 1, 2015**
- NW CSC offered aid in incorporating climate change elements into SWAP revisions

Oregon SWAP

Coordinator: Andrea Hanson
Climate Advisor: Holly Michael

Climate considerations, now and then

2005: Appendix 6 – A Brief Look at Global Warming

2015: To be considered for all target species and habitats

Timeline/Milestones

March 2015: Technical work and web-enabling complete

Spring 2015: Public comment period

Sept. 2015: Final product submission to FWS

NW CSC Involvement

Conversations initiated July 2014

Will serve as SWAP draft reviewers

Washington SWAP

Coordinator: Lynn Helbrecht

Climate considerations, now and then

2005: Not considered in document

2015: To be considered for all target species and habitats?

Timeline/Milestones

Oct 1, 2015: Final product submission to FWS

NW CSC Involvement

Met with SWAP Team in Olympia, Aug. 2014

Will provide datasets from select NW CSC projects

Provided link to regional climate research inventory

Idaho SWAP

Coordinator: Rita Dixon
Climate Advisor: Leona Svancara

Climate considerations, now and then

2005: Not considered in document

2015: Extensive use of climate change sensitivity database for focal species

Timeline/Milestones

Oct 1, 2015: Final product submission to FWS

NW CSC Involvement

Conversations initiated Aug. 2014

Montana SWAP

Coordinator: Lauri Hanauska-Brown
Climate Advisor: Deb O'Neill

DONE

Climate considerations, now and then

2005: Not considered in document

2015: Considered on par with other stressors

Timeline/Milestones

Spring 2014: Revised SWAP submitted to FWS

NW CSC Involvement

No involvement in SWAP revision, but opportunity for future conversations

Quick comment from Lynn Helbrecht?

NW CSC

Northwest Climate Science Center

Working with

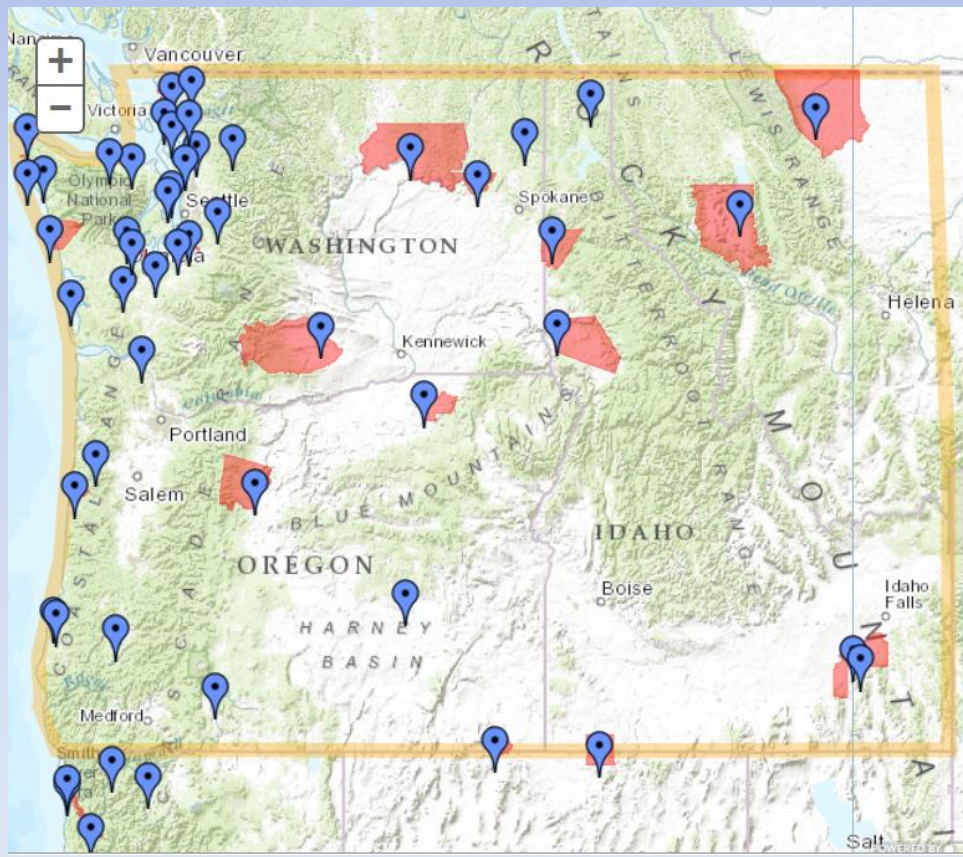
NW Tribes

Working together with NW tribes

"Address the impacts of climate change on American Indians and Alaska Natives, for whom the Department holds trust responsibilities on behalf of the federal government." (Secretarial Order No. 3289)

52 federally recognized tribes

www.doi.gov/csc/northwest/tribal-partners



Nurturing relationships between the NW CSC and NW Tribes

- Focus on regular, meaningful collaboration
- Develop effective, long-term, & culturally sensitive relationship
- Invite tribal input on science priorities for the NW CSC
- Foster active tribal engagement in climate research, assessments, planning and implementation
- Connect tribes with science centers and researchers to promote partnerships and collaboration

Working together with NW tribes

- **Executive Services**
  - Tribal engagement Strategy adopted August 2013
  - ESAC participation
- **Science Services**
  - Science Agenda - RFPs
  - CSC/LCC joint funding
- **Data Management Services**
  - Storage-Access-Safety
  - Sensitivity
- **Communication Services**
  - Tribes are recognized audience
  - Opportunistic meetings/conferences/workshops
- **Education & Training Services**
  - Annual Climate Boot Camp

NW CSC does NOT participate in…

- Rulemaking
- Policy development
- Adoption of regulations
- Establishment of standards
- Distribution of sensitive information
- Management or legislative actions
- Litigation or settlement negotiations
- Imposing compliance costs
- Actions that challenge sovereign rights

We only deliver objective climate science

Tribal Projects funded since FY12

Lead	Title	Months
Swinomish Tribe[1]	Correlation and Climate Sensitivity of Human Health and Environmental Indicators in the Salish Sea	12
Yurok Tribe[1]	Utilizing Yurok Traditional Ecological Knowledge to Inform Climate Change Priorities	12
OSU	Vulnerability of traditional women's foods to climate change on the Olympic Peninsula, WA	12
OSU	Understanding Native American cultural response associated with climate change	12
QVIR[2]	Klamath Basin traditional ecological knowledge and climate change science internship	3
CRITFC[2]	A coupled (ocean and freshwater) assessment of climate change impacts on Pacific lamprey and Pacific eulachon	20
Chilkoot Indian Association[2]	Identifying climate vulnerabilities and prioritizing adaptation strategies for eulachon populations in the Chilkoot and Chilkat Rivers and the application of local monitoring systems	24
Chugachmiut Tribal Consortium[2]	Berry risk mapping and modeling of native and exotic defoliators in Alaska	18
UI and Coeur d'Alene Tribe[3]	Schitsu'umsh Relationships with Their Dynamic Landscapes: Identifying, Managing and Applying Indigenous Knowledge and Praxis	12
Tribal Leadership Forum	Columbia River Basin Tribes Climate Change Capacity Assessment	5

Jointly funded by [1] NW CSC-NPLCC, [2] NW CSC-AK CSC-NPLCC, [3] NW CSC-NCCWSC

NW CSC - Columbia River Basin Tribes Climate Change Capacity Assessment

- **The Institute for Tribal Government (ITG)** is part of the Center for Public Service - Hatfield School of Government at Portland State University in Portland, Oregon. The Tribal Leadership Forum is the non-profit arm of the ITG.

- ITG serves elected tribal governments from across the nation and also provides training to local, state, and federal government agencies and others who are interested in learning about tribal government.

- Even though a trust responsibility exists between the U.S. government and federally recognized tribes, it is vital that tribal governments be able to actively protect their rights themselves. Too often tribes must obtain assistance from non-Indian experts, many of whom know little about a particular tribe's treaty or other legal rights.

- Primary goal of ITG is to assist tribes who want to cultivate the necessary expertise and governance skills from within their own tribe. Similarly, government agencies with trust responsibilities and programs which interface with tribal programs, seek services from ITG.

NW CSC - Columbia River Basin Tribes Climate Change Capacity Assessment

Project Summary: Conduct a Tribal capacity assessment of 15 Columbia Basin Tribes and 3 Inter-Tribal Organizations related to their technical, scientific, policy, and programmatic funding for Climate Change preparedness and adaptation.

The objectives of the project are to:

1. Assess the level of Columbia Basin Tribes awareness of the federal, state, tribal, and local government agencies climate change plans, scientific analysis, policies, and initiatives;

2. Assess each Columbia Basin Tribe's and Inter-Tribal Organization's internal and external technical and policy expertise related to capacity on climate change and identify the capacity of tribal management and policy leaders to effectively implement actions and policies related to climate change impacts;

NW CSC - Columbia River Basin Tribes Climate Change Capacity Assessment

Project objectives (cont'd):

3. Identify existing or planned tribal and Inter-tribal efforts and innovative methods to effectively mitigate and adapt to climate change;

4. Identify opportunities to foster and facilitate cross-tribal, state, and federal agency collaboration on and dissemination of effective and innovative climate change practices;

5. Determine the level of participation in strategic and programmatic operations to address national and regional climate adaptation and mitigation issues; and

6. Identify the policy, technical, scientific, legal, and programmatic needs of Columbia Basin Tribes.

NW CSC - Columbia River Basin Tribes Climate Change Capacity Assessment

The Tribal Leadership Forum will conduct 3 levels of inquiry with each entity:

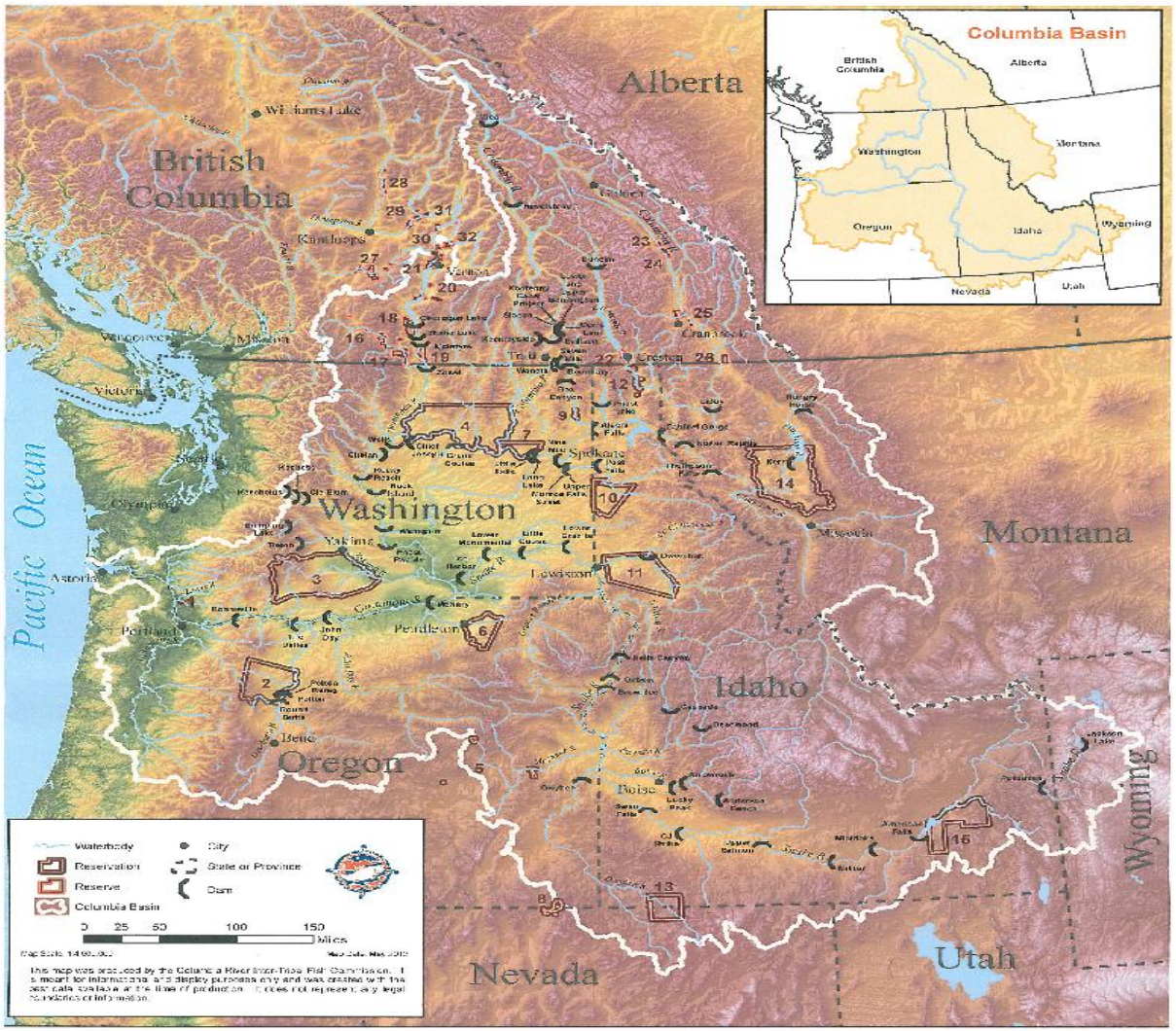
- electronic survey questionnaire,
- phone interviews, and
- on-site meetings and interviews

Project Duration – 5 months

An assessment of Tribal capacity will allow federal agencies, such as the NW CSC, to support climate resilience planning and implementation priorities in tribal communities in the Columbia River Basin.

NW CSC - Columbia River Basin Tribes Climate Change Capacity Assessment – Tribal Partners

Oregon (3)	- **Burns Paiute Tribe (Burns, OR)** - **Confederated Tribes of the Umatilla Indian Reservation (Pendleton, OR)** - **Confederated Tribes of the Warm Springs Reservation (Warm Springs, OR)**
Idaho (4)	- Coeur d'Alene Tribe (Plummer, ID) - Kootenai Tribe (Bonners Ferry, ID) - Nez Perce Tribe (Lapwai, ID) - Shoshone-Bannock Tribes of the Fort Hall Reservation (Fort Hall, ID)
Montana (1)	- Confederated Salish and Kootenai Tribes of the Flathead Nation (MT)
Nevada (2)	- Fort McDermitt Paiute Shoshone Tribes (McDermitt, NV) - Shoshone Paiute Tribe of the Duck Valley Indian Reservation (Owyhee, NV)
Washington (5)	- Tribes of the Colville Reservation (Nespelem, WA) - Confederated Tribes and Bands of the Yakama Nation (Toppenish, WA) - Cowlitz Indian Tribe (Longview, WA) - Kalispel Tribe of Indians (Usk, WA) - Spokane Tribe of Indians (Wellpinit, WA)
Inter-Tribal Organizations (3)	- Columbia River Inter-Tribal Fish Commission (Portland, OR) - Upper Columbia United Tribes (Spokane, WA) - Upper Snake River Tribes (Boise, ID)



Columbia River Treaty

Tribal Nations in the United States *

1 - Cowlitz Indian Tribe
2 - Confederated Tribes of the Warm Springs Reservation of Oregon
3 - Confederated Tribes and Bands of the Yakama Nation
4 - Confederated Tribes of the Colville Reservation
5 - Burns Paiute Tribe
6 - Confederated Tribes of the Umatilla Indian Reservation
7 - Spokane Tribe of Indians
8 - Fort McDermitt Paiute Shoshone Tribes
9 - Kalispel Tribe of Indians
10 - Coeur d'Alene Tribe
11 - Nez Perce Tribe
12 - Kootenai Tribe of Idaho
13 - Shoshone Paiute Tribe of the Duck Valley Indian Reservation
14 - Confederated Salish and Kootenai Tribes of the Flathead Nation
15 - Shoshone-Bannock Tribes of the Fort Hall Reservation

First Nations in Canada

Inside the Columbia Basin

16 - Upper Similkameen Indian Band (Okanagan Nation)
17 - Lower Similkameen Indian Band (Okanagan Nation)
18 - Penticton Indian Band (Okanagan Nation)
19 - Osoyoos Indian Band (Okanagan Nation)
20 - Westbank First Nation (Okanagan Nation)
21 - Sukanaqinx/Okanagan Indian Band (Okanagan Nation)
22 - Lower Kootenay Indian Band (Ktunaxa Nation)
23 - Shuswap Band (Secwepemc Nation)
24 - ?a'kisqnuk First Nation (Ktunaxa Nation)
25 - ?aq'am (Ktunaxa Nation)
26 - Tobacco Plains Indian Band (Ktunaxa Nation)

Outside the Columbia Basin with Asserted Interests

27 - Upper Nicola Indian Band (Okanagan Nation)
28 - Simpcw First Nation (Secwepemc Nation)
29 - Adams Lake Indian Band (Secwepemc Nation)
30 - Neskonlith Indian Band (Secwepemc Nation)
31 - Little Shuswap Indian Band (Secwepemc Nation)
32 - Splatsin First Nation (Secwepemc Nation)

* Management authorities and responsibilities affected by the Columbia River Treaty

NW CSC - Columbia River Basin Tribes Climate Change Capacity Assessment

The Institute for Tribal Government

CONTACT US! WE'RE HERE TO HELP

- Don Sampson, Executive Director
- Peggy Harris, Program Coordinator
  Institute for Tribal Government Portland State University
  PO Box 751, Portland, Oregon 97207
- 503-725-9000 or 541-215-2753
- d.sampson@pdx.edu or Don@Seventhgenerationllc.com
- peggy.harris@pdx.edu or Peggy@Seventhgenerationllc.com

NW CSC
Northwest Climate Science Center

Questions?

NW CSC

Northwest Climate Science Center

Working with Universities

NW CSC Academic Consortium

- 14 institutions
- Lead universities
  - OSU: Program management & host
  - UI: Data management
  - UW: Communications
- Focus
  - Education goals
  - Recruit and train students
  - Conduct climate impacts research

NW CSC Administration
Funded Projects

Life of NW CSC-funded Project

Award | Progress Report | Final Report

Procurement

- Science priorities
- Selection criteria
- RFP announcement
- Assemble PRT
- Conflict of Interest
- SOI review/selection
- Full Proposal review
- Final selection
- Procurement

Project Period of Performance

- Research Coordinator embedded in project team (monitor/guidance/SOPs/science excellence)
- DMP finalization
- Quarterly expense reports
- Quarterly requests for status of project pubs
- Progress/Final Report submissions and review
- Delivery and approval of data products
- Official close-out
- ScienceBase curation

Publicity, Data Access

- Accomplishments
- Project vignettes
- USGS Highlights
- Press releases
- Weblinks to data products/maps/tools
- Webinars
- Social media
- Conf. presentations

Data Services

To collect and secure climate data, while providing timely access, analytical functions, and interpretive services

- Common project data administration & infrastructure (SciBase)
- Uniform data management plans from all CSC PIs
- Project selection criterion: define data/capacity/needs
- Metadata support, tribal, social sciences data

NW CSC

Northwest Climate Science Center

Working with

The Public

NW CSC Activities
Strategic Documents 2012-2016

DOCUMENT	ADOPTION DATE
Strategic Plan	23 JAN 2012
Science Agenda	23 JAN 2012
Communication Strategy	20 MAR 2013
Tribal Engagement Strategy	29 AUG 2013
Education & Training Strategy	15 NOV 2013
Data Management Strategy	~SEP 2014

NW CSC Activities
Planning & Performance

FISCAL YEAR	ANNUAL WORKPLAN	ANNUAL REPORT
2011	NA	20 JAN 2012
2012	17 FEB 2012	16 NOV 2012
2013	29 OCT 2012	20 DEC 2013
2014	31 OCT 2013	~ 15 NOV 2014
2015	~ 30 OCT 2014	~ NOV 2015

Communication Services

To provide professional communication and outreach services that support the exchange of information among regional stakeholders, and effectively raise awareness of climate issues in the PNW

- Communication Strategy adopted March 2013
- Communications Manager hired January 2014
- Logo & brochure …….. Twitter & FB
- Increased web presence
  - Federal site (www.doi.gov/csc/northwest)
  - University site (www.nwclimatescience.org)
- Coordinate communication/outreach with LCCs and others
- Project selection criterion: outreach & knowledge transfer

NW CSC
Northwest Climate Science Center

Working with

Early Career Professionals

Education and Training Services

To promote broad participation and support education of diverse young scientists in the work of the NW CSC

- Education & Training Strategy adopted Nov 2013
- Fellowships at universities
- Student support at courses & conferences
- 5th Annual PNW Climate Science Conference
  Sep 9-10, 2014, Seattle
- Climate Boot Camp: a national model
  Aug 11-15, 2014, Oregon
- Project selection criterion: early career professionals

NW CSC Climate Boot Camp

- Annual week-long interdisciplinary training program for early career professionals, staffed and supported by NW CSC and University partners
- Provides integrative training in climate impacts science, communication of science, and improved understanding of the application of science to resource management decisions
- Students and instructors: wide range of backgrounds and disciplines

Jill Hardiman on Boot Camp

NW CSC
Northwest Climate Science Center

Questions?

Science Services

To develop and implement a comprehensive Science Agenda to address current and emerging climate priorities in the Pacific Northwest

- Science Agenda
- Actionable science
- OGEL
- ASAP

NW CSC
Northwest Climate Science Center

Working with

Scientists & Resource Managers

Outline

- The government meets the elephant
- NW CSC 101
- **The science we want**
- Getting a grip on the science

NW CSC
Northwest Climate Science Center

NW CSC Science Agenda 2012-2016

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

Actionable Science

- Policy relevant – NOT prescriptive
- Directly reflects expressed constituent needs
- Users & producers working together from the start
- Available at needed times/places
- Accessible through media available to user community
- Understandable to users

5th Annual
Pacific Northwest
Climate Science
Conference

September 9-10, 2014

http://pnwclimateconference.org/

Plenary Session

Dancing with the Management Stars:
Science-Management Partnerships that Provide Actionable Science

By Nicole DeCrappeo and Gustavo Bisbal

Message to Resource Managers

Recognize general research themes to pursue

Describe the science products you are looking for

Identify the intended management application

Message to Resource Managers

RESEARCH PRODUCTS scientists thought YOU needed

- 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

Message to Resource Managers

MANAGEMENT APPLICATIONS scientists thought YOU had in mind

- 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

Message to Scientists

Project selection criterion

Identify **relevancy** of expected results to natural/cultural resource managers

Describe plans to **actively engage** with intended users of the scientific output

Some real responses…

Our results will be important for managers anticipating climate change

We plan to share our results with natural resource managers

Insights gained will help managers understand the resources they steward

Understanding the effects of climate change on […] will provide resource managers with information needed to develop adaptive management strategies

We will work with managers to guide mgmt strategies in light of our findings

Message to Scientists

Make your science count
Jump on the time machine!

Quick comment from David Patte?

NW CSC FY11 (non-Tribal) Projects

Lead PI	Affiliation	Title	Themes
Betts, Matthew	OSU	Disentangling the effects of climate and landscape change on bird population trends in the Western U.S. and Canada	Species response to cc Birds
Black, Robert	USGS	Identification and laboratory validation of temperature tolerance for macroinvertebrates	Species response to cc Vulnerability assessment
Connolly, Patrick	USGS	Climate change threats to fish habitat connectivity: Growth and predation	Species response to cc Habitat connectivity
Dunham, Jason	USGS	Rangewide climate vulnerability assessment for threatened bull trout	Habitat connectivity Vulnerability assessment
Knick, Steven	USGS	Contribution of landscape characteristics and vegetation shifts from global climate change to long-term viability of greater sage-grouse	Habitat connectivity Threatened sage grouse
Lettenmaier, Dennis	UW	Toward next generation downscaling for hydrologic prediction in the Pacific Northwest using MACA-VIC	Climate downscaling Hydrologic modeling
Salathe, Eric	UW	Uncertainty and extreme events in future climate and hydrologic projections for the Pacific Northwest	Climate downscaling Hydrologic modeling
Wylie, Bruce	USGS	Modeling effects of climate change on cheatgrass die-off areas in the Northern Great Basin	Invasive species Sagebrush steppe

NW CSC FY11 Project:

Rangewide climate vulnerability assessment for threatened bull trout

PI: Jason Dunham, USGS

Science Objective

Assemble and analyze existing data to conduct a rangewide analysis of threats to bull trout from climate and non-climate factors

Management Application

Inform USFWS Final Bull Trout Recovery Plan (Sept. 2015)

Management-Relevant Products

Map of suitable habitat patches across species range
Map of migratory habitats and their relationship to patches

NW CSC FY12 (non-Tribal) Projects

Lead PI	Affiliation	Title	Themes
Germino, Matt	USGS	Sagebrush ecosystems in a changing climate	Species response to cc Sagebrush steppe
Henderson, Emilie	OSU	Climate, land management and future wildlife habitat in the Pacific Northwest	Vulnerability assessment Sage grouse, spotted owl
Hicke, Jeff	UI	Improving understanding of threats to whitebark pine in the Western US: Quantifying climate change effects on Mountain Pine beetle outbreaks	Invasive species Threatened whitebark pine
Lawler, Josh	UW	Extended monitoring and modeling of climate change effects on Pacific Northwest wetlands	Hydrologic modeling Threatened Cascades frog
Lawler, Josh	UW	Climate-change vulnerability in the Pacific Northwest: A comparison of three approaches	Vulnerability assessment
Mote, Phil	OSU	Integrated scenarios of climate, hydrology, and vegetation for the Northwest (Jointly funded with CIRC)	Climate downscaling Hydrologic modeling
Muhlfeld, Clint	USGS	Predicting climate change impacts on river ecosystems and salmonids across the Pacific Northwest	Species response to cc Native salmonids
Nolin, Anne	OSU	Climate change and peak flows: Knowledge-to-action to help managers address impacts on streamflow dynamics and aquatic habitat	Hydrologic modeling Snow pack
Takekawa, John	USGS	Marshes to mudflats: Climate change effects along a latitudinal gradient in the Pacific Northwest	Sea level rise Habitat connectivity

NW CSC FY12 Project:

Marshes to Mudflats: CC effects along a latitudinal gradient in the PNW

PI: John Takekawa, USGS

Science Objective

Assess vulnerability of nearshore habitats and their dependent wildlife

Management Application

Inform National Wildlife Refuge climate adaptation plans

Management-Relevant Products

Digital elevation model coverages
Continuous annual tidal record
Vegetation profile by elevation

} NWR-specific

NW CSC FY14 (non-Tribal) Projects

Lead PI	Affiliation	Title	Themes
Kolden, Crystal	UI	Disappearing refugia: identifying trends and resilience in unburned islands under climate change	Fire regimes
Kreitler, Jason	USGS	Changes to watershed vulnerability under future climate, fire regimes, and population pressures	Hydrologic modeling Fire regimes
Krosby, Meade	UW	Creating practitioner-driven, science-based plans for connectivity conservation in the Washington-BC transboundary region	Habitat connectivity
Lawler, Josh	UW	Climate change avian vulnerability visualization and analysis tool for land managers	Vulnerability assessment
Lindquist, Eric[1]	BSU	Assessing climate change vulnerability and adaptation in the Great Basin	Vulnerability assessment
Lundquist, Jessica	UW	Forest management tools to maximize snow retention under climate change	Hydrologic modeling
Miewald, Tom[2]	USFWS	Landscape Conservation Design in the Columbia Plateau Ecoregion: Prioritizing, classifying, and assessing resiliency of riverine systems in the Columbia Plateau	Habitat connectivity
Shinneman, Doug Link, Tim	USGS UI	Projecting climate change effects on aspen distribution and productivity in the central and northern Rockies	Species response to cc Fire regimes
Woodward, Andrea	USGS EcoAdapt	Advancing climate change vulnerability assessments and adaptation planning for Idaho and Montana National Forests	Vulnerability assessment

Jointly funded by [1]NW CSC-SW CSC, [2]NW CSC-GNLCC

NW CSC FY14 Project:

Forest management tools to maximize snow retention under CC

PI: Jessica Lundquist, UW

Science Objective

Map how forests affect snow retention across the Northwest

Management Application

Guide water and land managers on where to cut forest gaps

Management-Relevant Products

Google Earth map of where forests enhance vs. diminish snow retention
Database of region-wide forest-snow data
Individual watershed-scale applications

Citizen science

Outline

- The government meets the elephant
- NW CSC 101
- The science we want
- **Getting a grip on the science**

NW CSC
Northwest Climate Science Center

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
7.	Fit into national agenda?	NCCWSC/ACCCNRS

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
7.	Fit into national agenda?	NCCWSC/ACCCNRS

Getting a grip on the science

Contemporary projects

Existing science

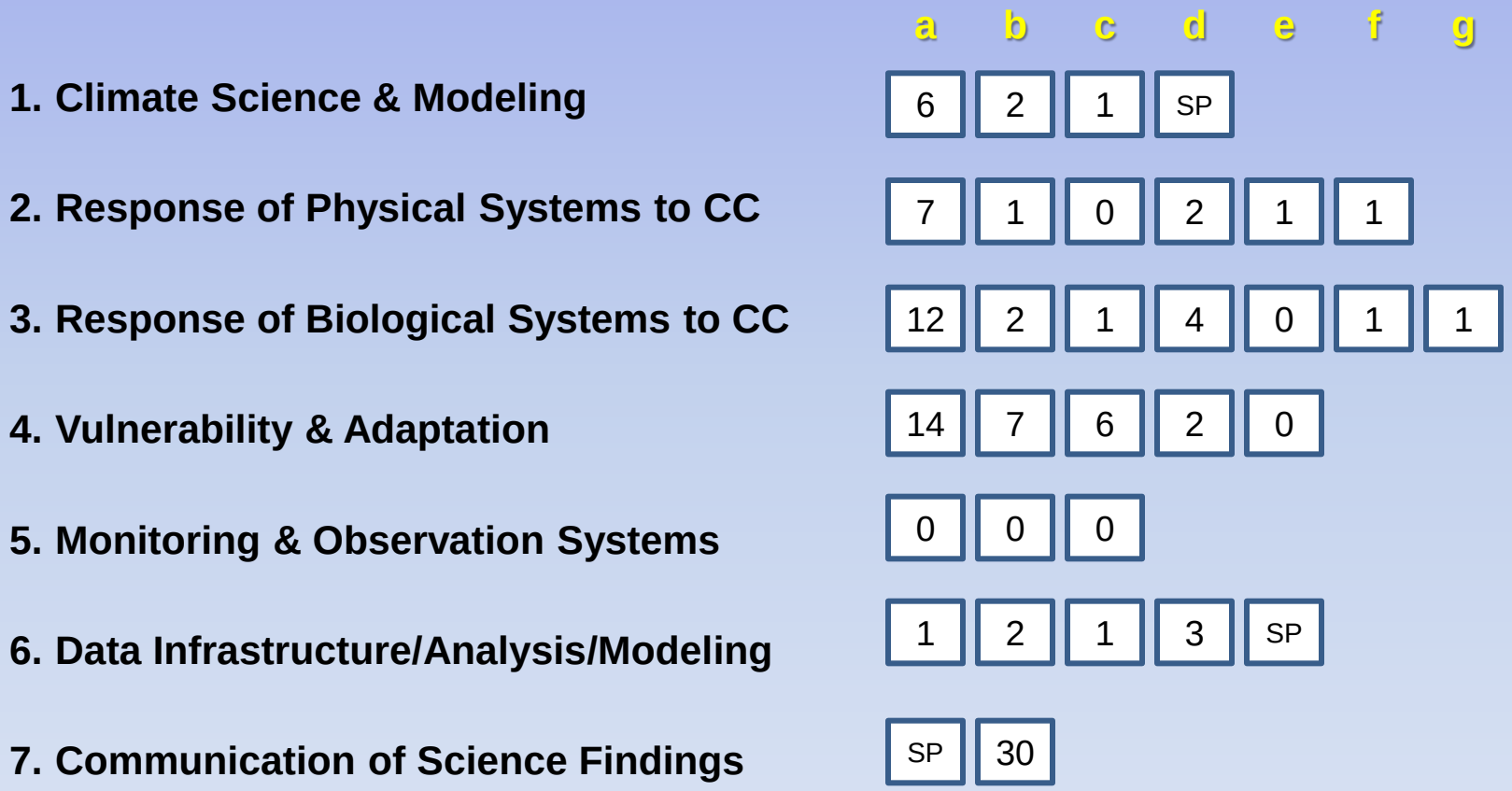
Getting a grip on the science

Contemporary projects

Existing science

The OGEL Challenge

NW CSC Science Agenda Themes Addressed by NW CSC-Funded Projects (30)



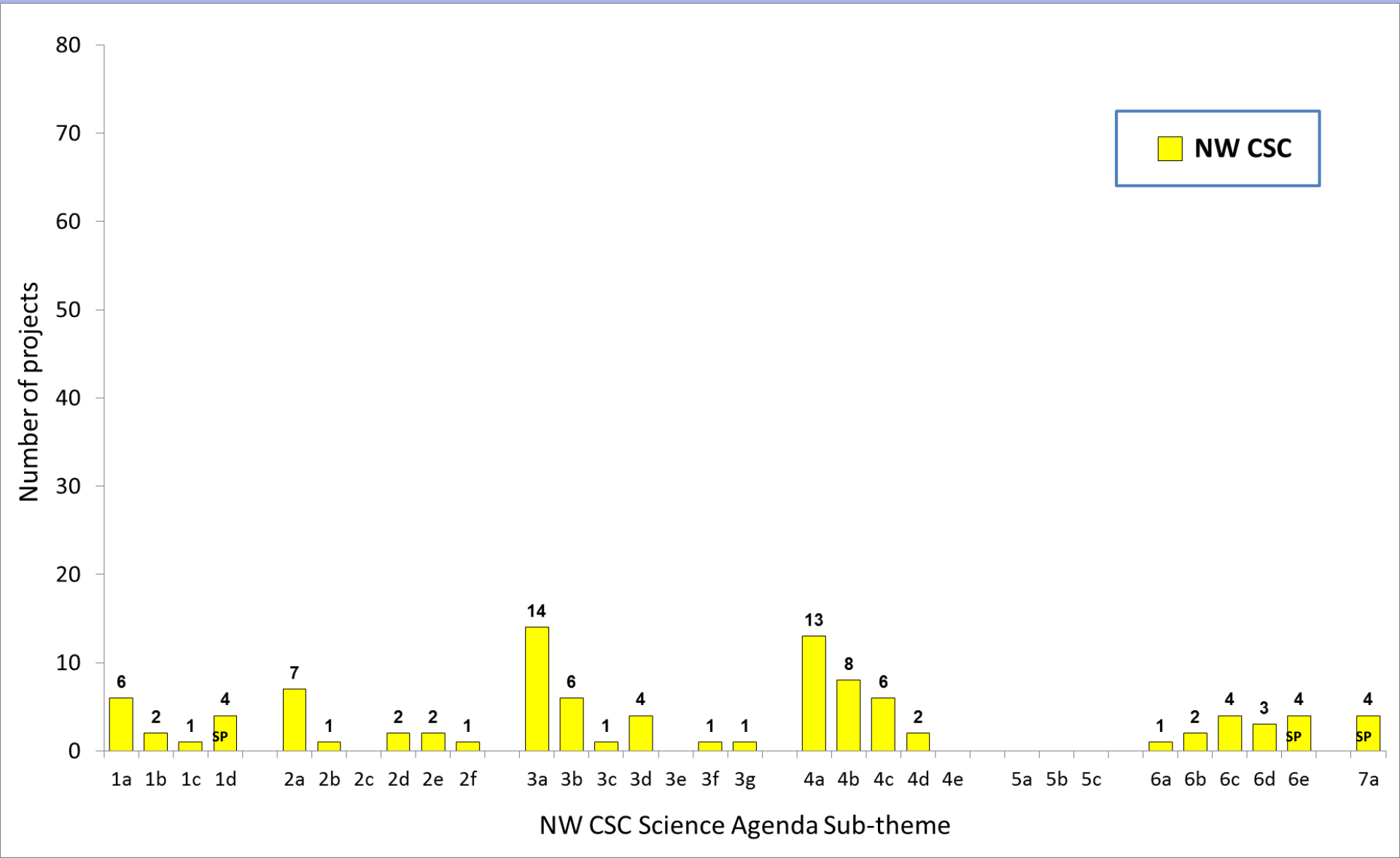
ESAC rises to the challenge

Agency (# of projects contributed):

- ✓ **Bureau of Reclamation (20)**
- ✓ **CRITFC/BPA (4)**
- ✓ **EPA (2)**
- ✓ **Great Northern LCC (22)**
- ✓ **National Park Service CESU (3)**
- ✓ **NOAA Climate Impacts Research Consortium (9)**
- ✓ **North Pacific LCC (17)**
- ✓ **NW Climate Science Center (29)**
- ✓ **U.S. Fish and Wildlife Service (23)**
- ✓ **U.S. Forest Service (98)**
- ✓ **U.S. Geological Survey (14)**

✓ **213 projects in the database and growing…**

Collective NW Climate Research Portfolio 2011-2013



Collective NW Climate Research Portfolio 2011-2013

BOR
BPA/CRITFC
CIRC
EPA
GNLCC
NPLCC
NPS
USFS
USFWS
USGS
NW CSC

Number of projects

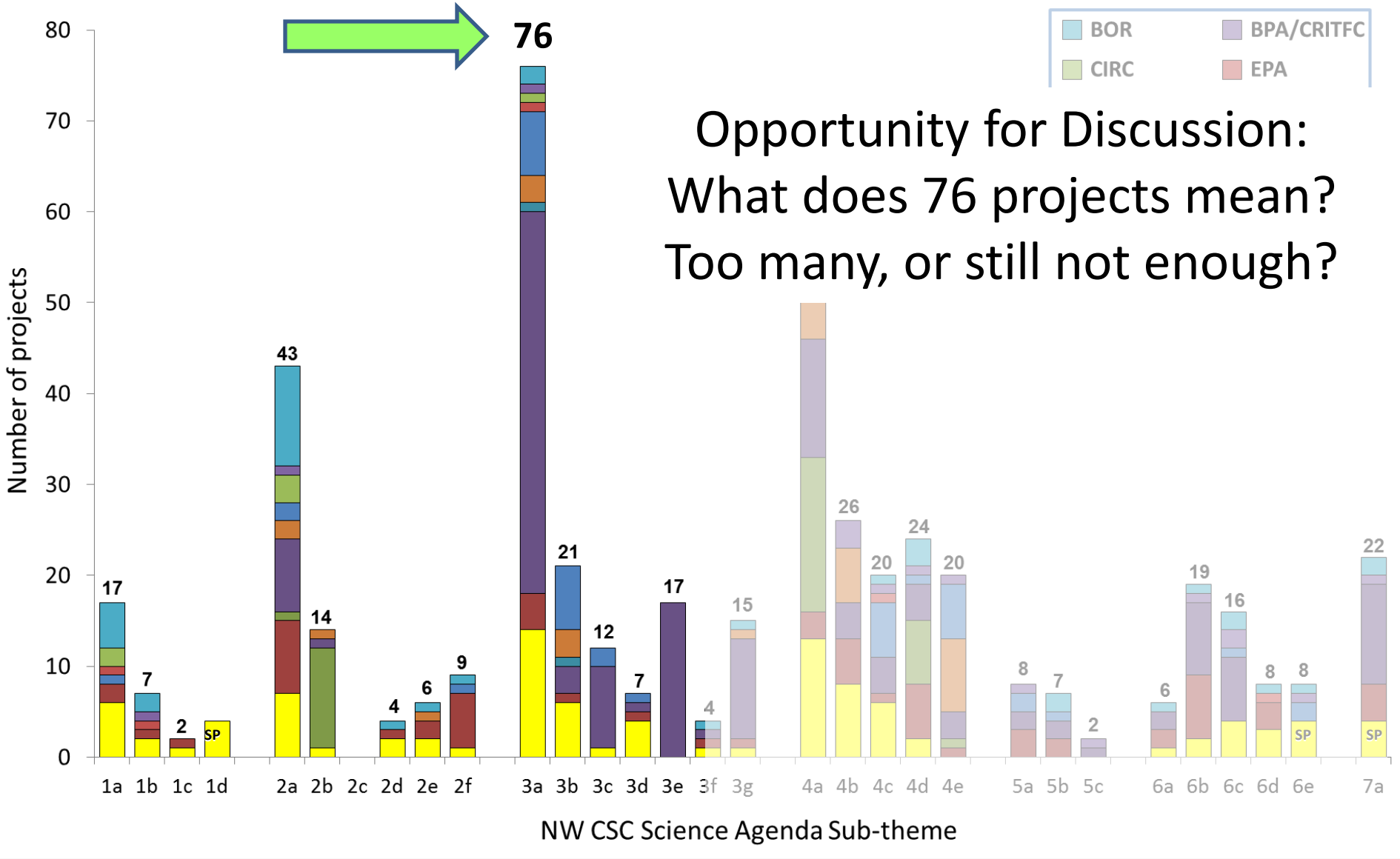
0 10 20 30 40 50 60 70 80

17 7 2 SP 43 14 4 6 9 76 21 12 7 17 4 15 63 26 20 24 20 8 7 2 6 19 16 8 8 SP 22

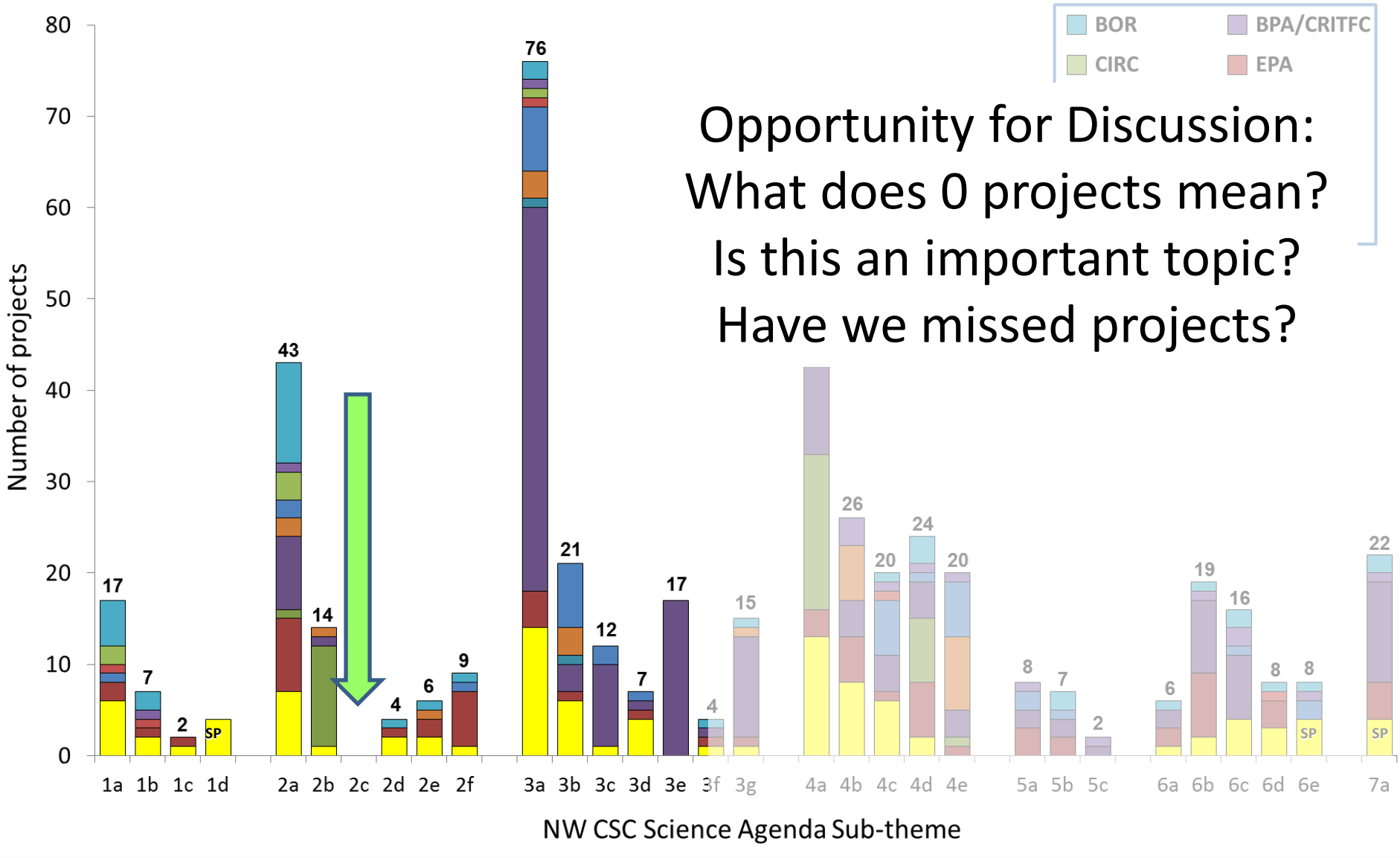
1a 1b 1c 1d 2a 2b 2c 2d 2e 2f 3a 3b 3c 3d 3e 3f 3g 4a 4b 4c 4d 4e 5a 5b 5c 6a 6b 6c 6d 6e 7a

NW CSC Science Agenda Sub-theme

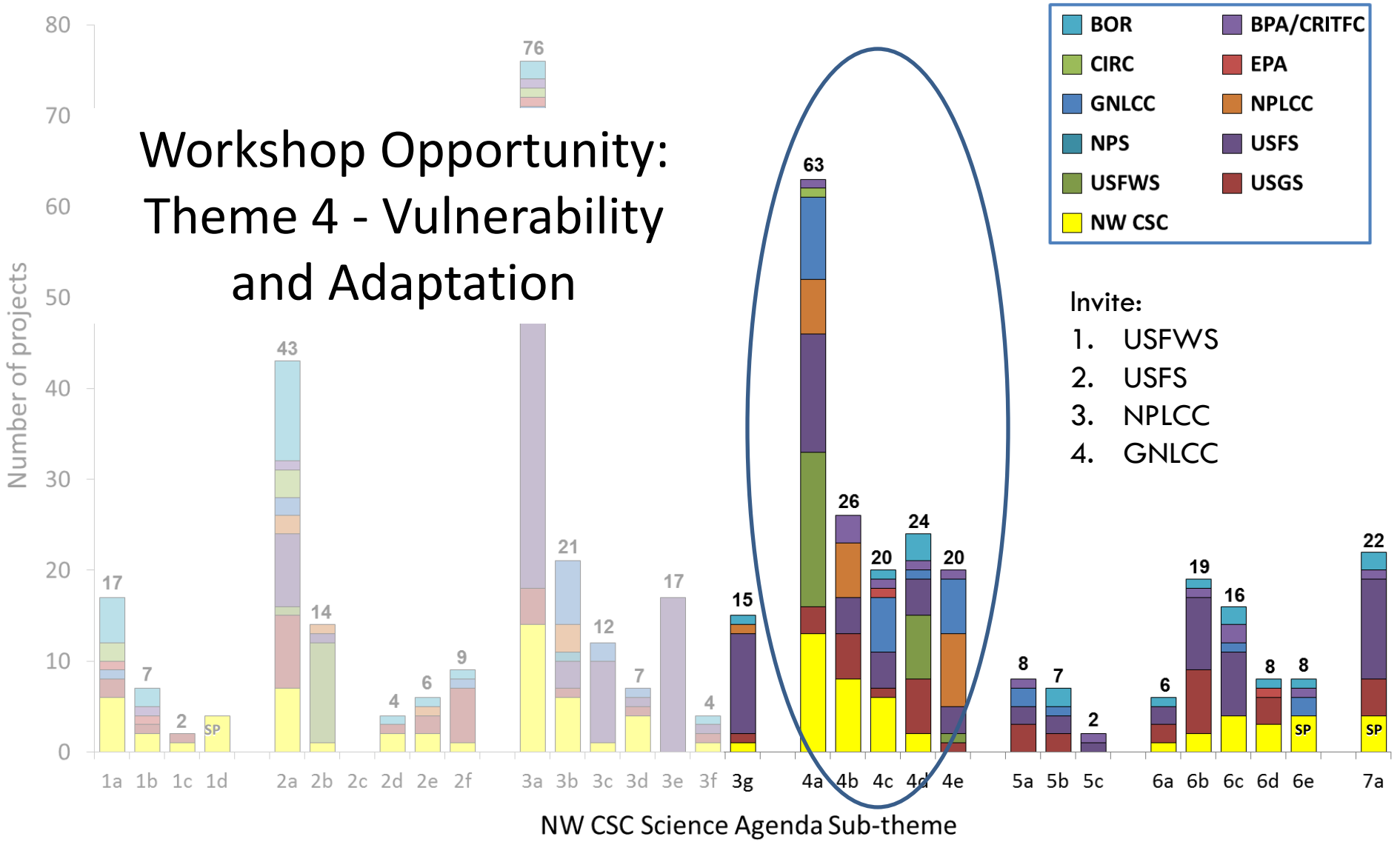
Collective NW Climate Research Portfolio 2011-2013



Collective NW Climate Research Portfolio 2011-2013



Collective NW Climate Research Portfolio 2011-2013



DEPTH web portal

- Web portal for creating, editing, and searching CSC projects in ScienceBase
- Access climate projects contributed by ESAC
- Search projects by specific NW locations
- Open access and freely available to public

https://www.sciencebase.gov/depth

Benefits

Coordination of regional climate research

- ✓ Avoid duplication of efforts, create synergies
- ✓ Identify participants for themed workshops
- ✓ Help decide future research investments

Provides opportunities for discussion

- ✓ Have we answered a particular research question?
- ✓ Too many/few resources focused on a particular problem?
- ✓ Are we missing projects/partners?
- ✓ Guidance for NW CSC Science Agenda revision

DEPTH database and web portal

- ✓ Open access and freely available to public

The alternative…

NW CSC
Northwest Climate Science Center

Questions?

Getting a grip on the science

Contemporary projects

Existing science

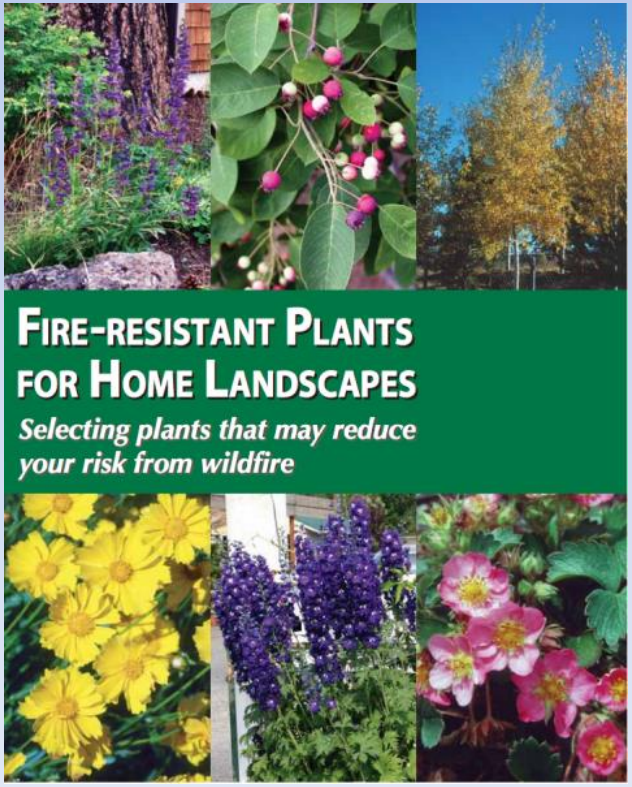
Available Science Assessment Project

Goals

- Identify on-the-ground **Climate Adaptation Actions (CAAs)**
  - CAAs = actions taken to decrease vulnerability or increase resilience to CC
- Summarize and review **existing science** on select CAAs
- Assess **conditions** for using select CAAs in resource management

Example CAAs

Example on-the-ground Climate Adaptation Actions



Available Science Assessment Project

Goals

- Identify on-the-ground **Climate Adaptation Actions (CAAs)**
  - CAAs = actions taken to decrease vulnerability or increase resilience to CC
- Summarize and review **existing science** on select CAAs
- Assess **conditions** for using select CAAs in resource management

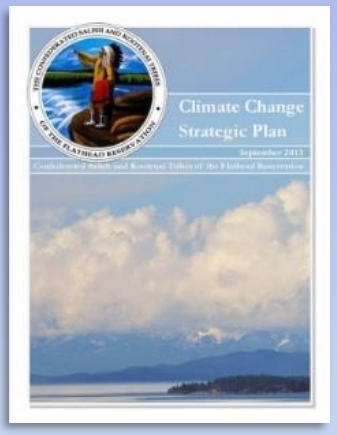
Example CAAs

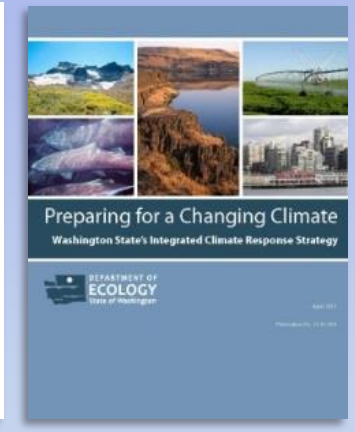
- Upgrade culverts to accommodate changes in peak streamflow
- Plant fire-resistant species to reduce vulnerability to severe fire
- Increase sediment input to tidal habitats in response to SLR

Pilot Project Focus

Develop **process** for review of science on select CAAs

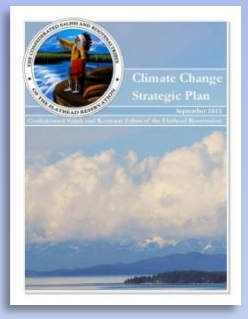
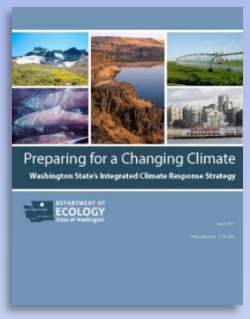
Phase 1: Identify climate stressors from Climate Change Strategy Documents



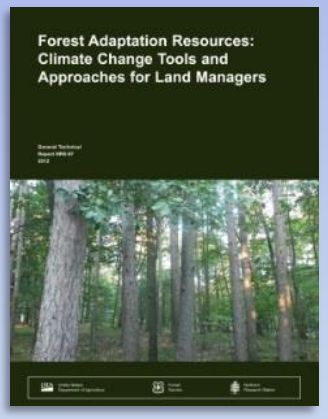


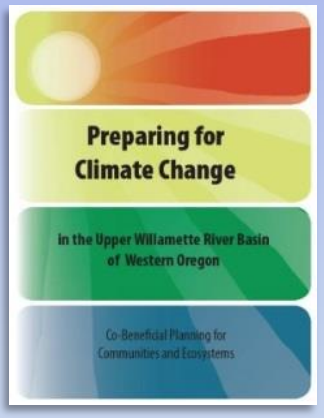
- ✓ Use best available science
- ✓ Adopt integrated approaches
- ✓ Build strong partnerships
- ✓ Use ecosystem-based approaches
- ✓ Incentives and education
- ✓ Effective communication
- ✓ Monitoring and evaluation

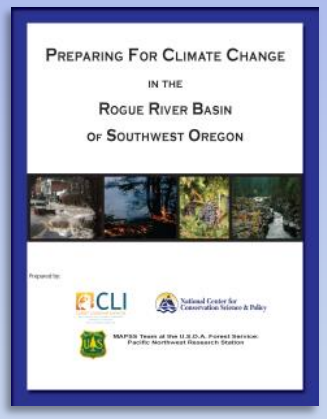
Phase 1: Identify climate stressors from Climate Change Strategy Documents

Climate Stressors			
Increased fire severity	X	X	X
Sea level rise	X		X
Reduced snowpack	X	X	X
Extreme events	X	X	X
Habitat loss	X	X	X
Invasive species spread	X	X	X

Phase 2: Identify CAAs used in response to increased fire severity from CC Adaptation Plans

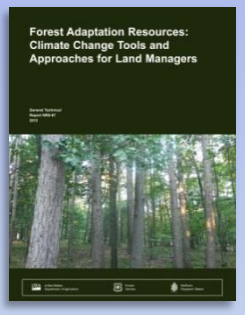
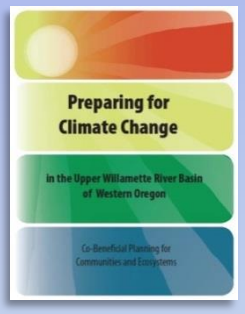
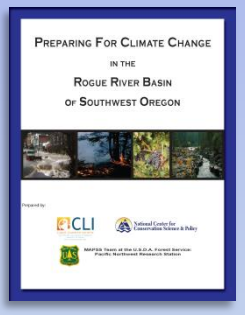






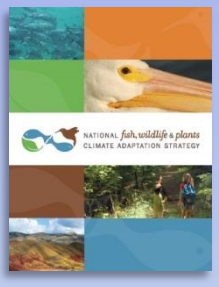
- ✓ Derived from Climate Change Strategy documents
- ✓ Focused on specific climate stressor, resource, or geographic area
- ✓ List specific on-the-ground climate adaptation actions

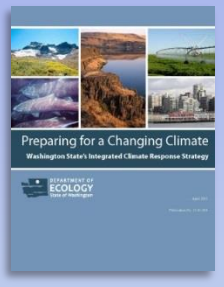
Phase 2: Identify CAAs used in response to increased fire severity from CC Adaptation Plans

CAAs			
Forest thinning	X	X	X
Prescribed burning	X	X	X
Seeding fire-resistant species	X		
Removal of fire-prone species	X		X
Promote diverse tree age classes	X		

ASAP Workflow

Phase 1: Identify climate stressors from CC Strategy Documents

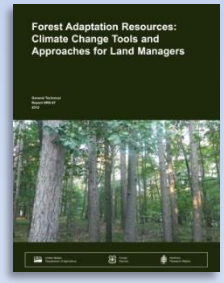


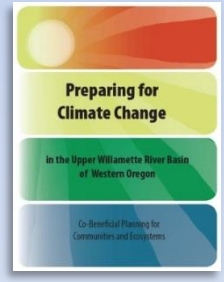


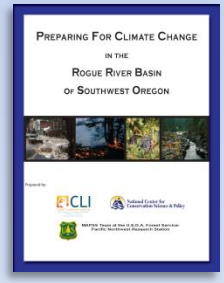
Climate Stressors

- Increased fire severity
- Sea level rise
- Reduced snowpack
- Invasive species spread
- …

Phase 2: Identify CAAs used in response to chosen stressor from CC Adaptation Plans







CAAs used in response to increased fire severity

1. Forest thinning
2. Prescribed burns
3. Seed fire-resistant species
4. Remove fire-prone species
5. …

Most used

Least used

Phase 3: Conduct systematic review of science of the most used CAAs

Phase 3: Systematic review of science on most used CAAs

Framing	• Reviewer **recruitment** • Identify **review question(s)** • Develop **protocol** and **search strategy**
Systematic evaluation of evidence	• Literature **search** and **compilation** • Coarse **filter** of compiled list • **Review** literature • Assess quality and **relevance** of each study • Write narrative **synthesis**
Dissemination of results	• Results workshop, outreach and **engagement**

Phase 4: Evaluate and share results of systematic review and ASAP process

Process Considerations

- What worked, what didn't, lessons learned

Deliverables

- Documentation of methods and process
- Process evaluation report, recommendations for future reviews
- Partial inventory of CC Strategy Documents and Adaption Plans
- Partial inventory of fire-related CAAs
- Systematic review report on fire-related CAAs

The last slide

- Are we meeting constituent needs?
- Is the information reaching the end users?
- Is the information being used?
- Where do we put the next dollar?
- Is the program growing as necessary?
- How do we improve?

THANK YOU FOR RIDING ALONG!

Gustavo Bisbal, Ph.D.

541-750-1020

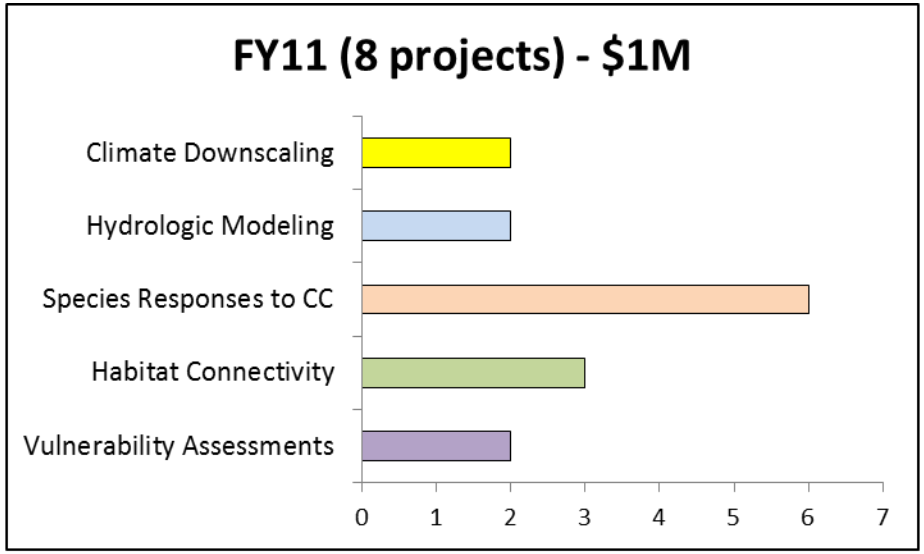
gbisbal@usgs.gov

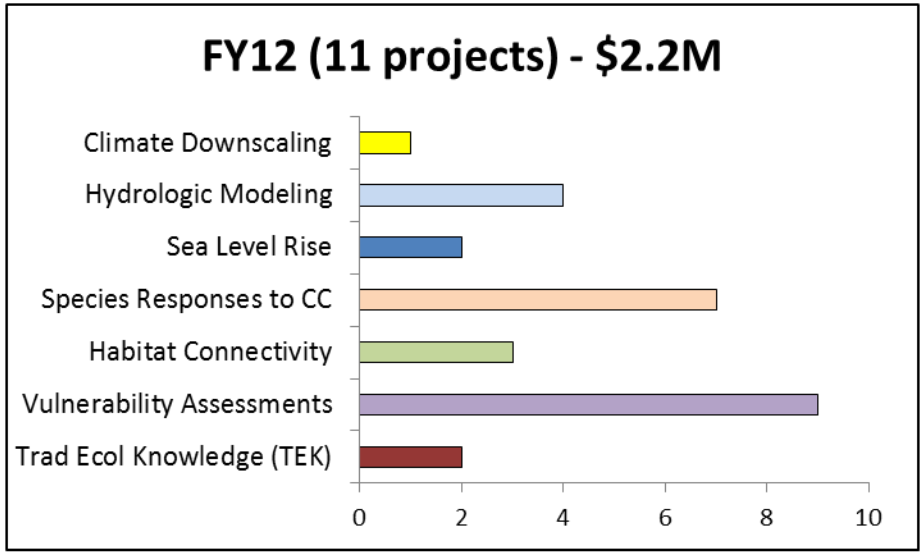
www.doi.gov/csc/northwest

NW CSC
Northwest Climate Science Center

EXTRA SLIDES

Allocated Funding to Climate Science Projects FY11-12*



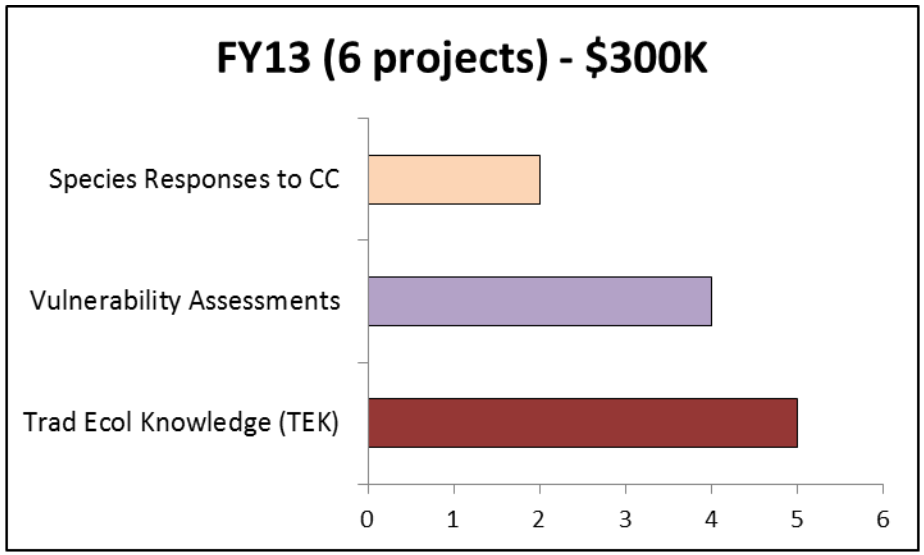


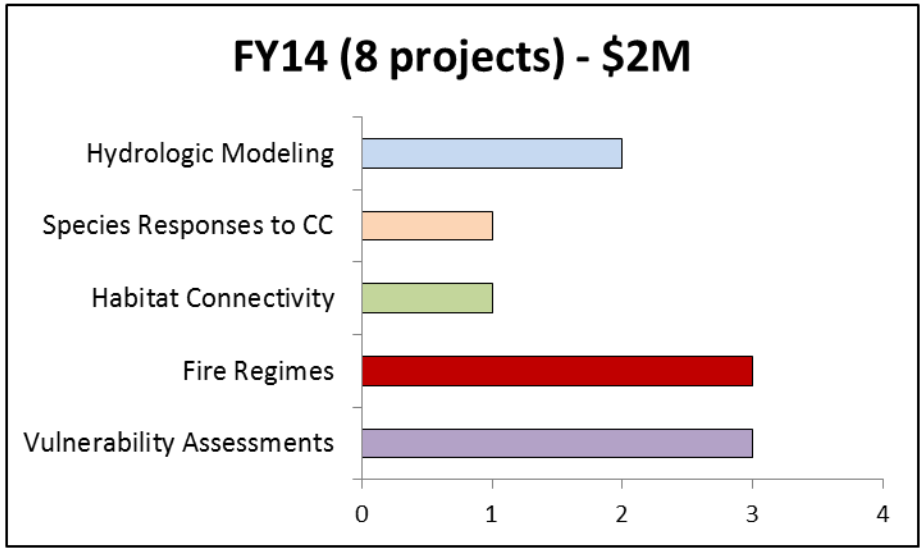
*Most projects address more than one science theme

February 2014

NW CSC
Northwest Climate Science Center

Allocated Funding to Climate Science Projects FY13-14*



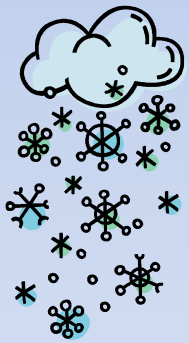


*Most projects address more than one science theme

February 2014

NW CSC
Northwest Climate Science Center

Do climate effects on plants and animals shape elements of tribal culture?

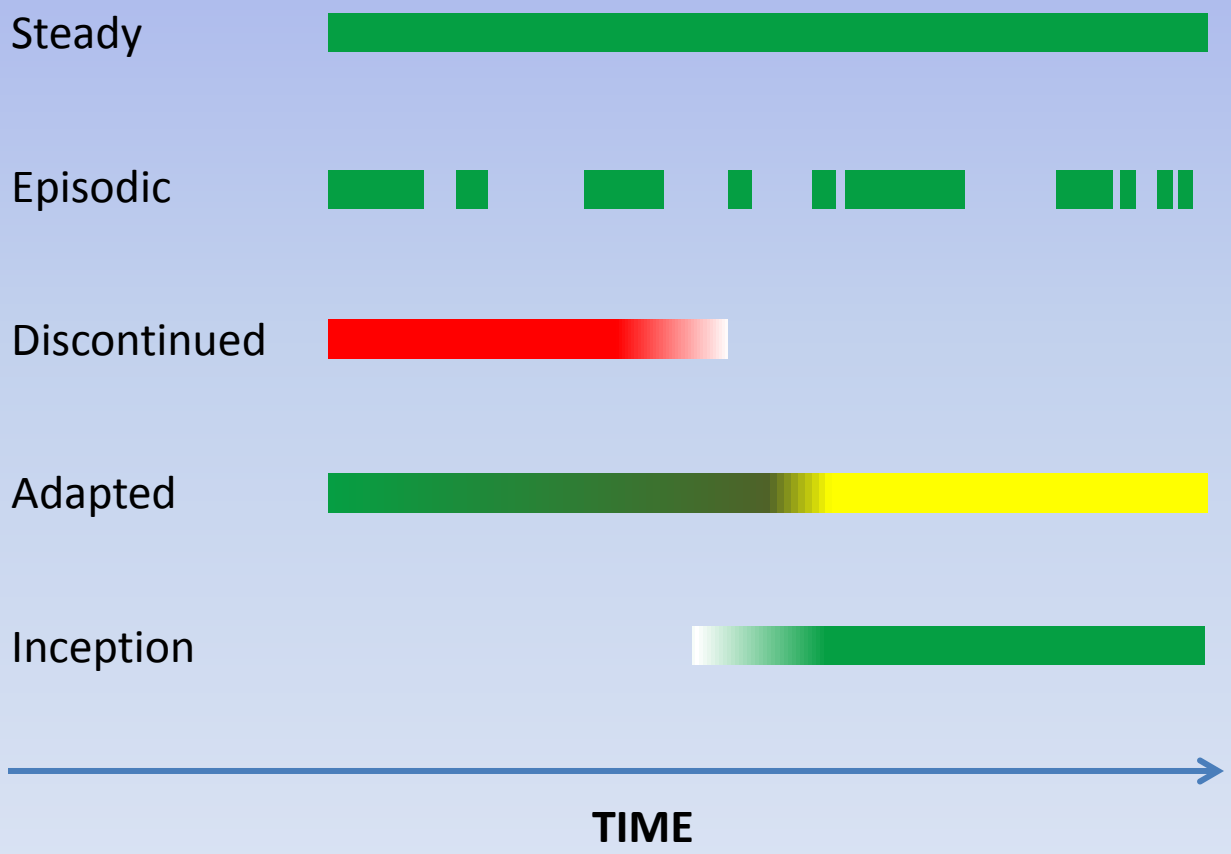


Myths
Legends
Stories
Ceremonies
Symbols
Beliefs
Songs
Rituals
Prayers
Dances

NW CSC
Northwest Climate Science Center

Some anticipated results

1. Steady
2. Episodic
3. Discontinued
4. Adapted
5. Inception



NW CSC
Northwest Climate Science Center

Who wants to be a ~~millionaire~~?climate expert?

~~Chicago~~ ~~Chicago~~ ~~Fire~~ Everywhere

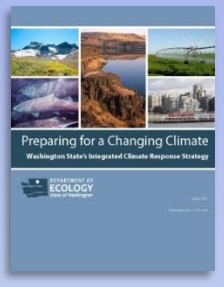
Keeping Up with the Kardashians

Keeping Up with the Changes Around Us

Wheel of ~~Fortune~~ Climate Impacts

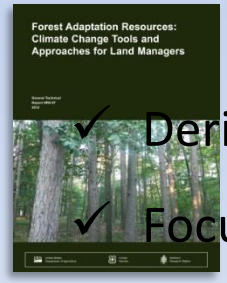

dancing
with the
stars
Management

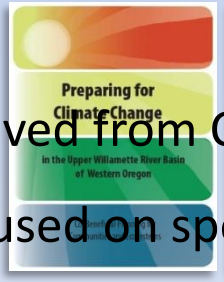
Phase 2: Identify CAAs used in response to increased fire severity from CC Adaptation Plans

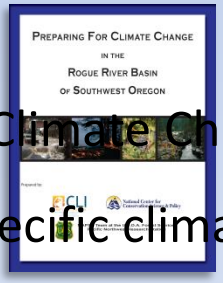


Climate Stressors

- Increased fire severity
- Sea level rise
- Reduced snowpack
- Invasive species spread
- …







CAAs used in response to increased fire severity

1. Forest thinning
2. Prescribed burns
3. Seed fire-resistant species
4. Remove fire-prone species
5. …

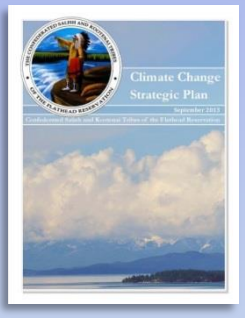
Most used

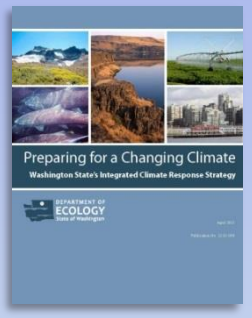
Least used

- ✓ Derived from Climate Change Strategy documents
- ✓ Focused on specific climate stressor, resource, or geographic area
- ✓ List specific on-the-ground climate adaptation actions

USGS

Phase 1: Identify climate stressors from Climate Change Strategy Documents





Agency/Organization	FWS, NOAA, AFWA	Confederated Salish & Kootenai Tribes	Washington Department of Ecology
Document approach	Description of climate stressors and goals to help fish, wildlife, plants & ecosystems cope with impacts of CC	Foundation for developing effective strategies to protect and preserve the local environment	Framework to build capacity to adapt to expected CC
Geography	United States	Western Montana	Washington State
Resources of focus	Plants, animals, ecosystems	Forestry, land, fish, wildlife, water, air, infrastructure, culture	Ecosystems, species, habitats, infrastructure, human health
Terminology	Goals, Strategies, Actions	Vulnerability & Risk, Assessments, Goals & Actions	Key Climate Risks, Priority Response Strategies

LCC Council - Who

The LCC Council consists of twenty-seven participants

- 6 Federal agency directors (including NOAA, USFS, NRCS)
  - DOI - Ed Roberson, Dan Ashe, Jon Jarvis (Ray Sauvajot)
- 3 U.S. participants from Federally-recognized Tribes
- 1 Indigenous participant
- 4 State agency directors
- 4 Non-governmental organization (NGO) participants
- 1 LCC participant
- 2 "Major partnership" participants
- 4 International participants
- 2 "At Large" participants

LCC Council - Who

Council Leadership

- *The L*CC Council is led by two Co-Chairs elected by the Council Membership
  - Marc Miller, Director, Illinois Department of Natural Resources
  - Lynn Scarlett, Managing Director, Public Policy, The Nature Conservancy