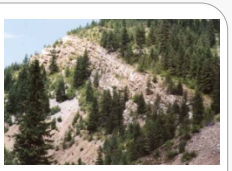

The USGS in the Northwest: Structure and Climate Science

A presentation to the PNW CESU
April 29, 2010

"The USGS serves the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life."

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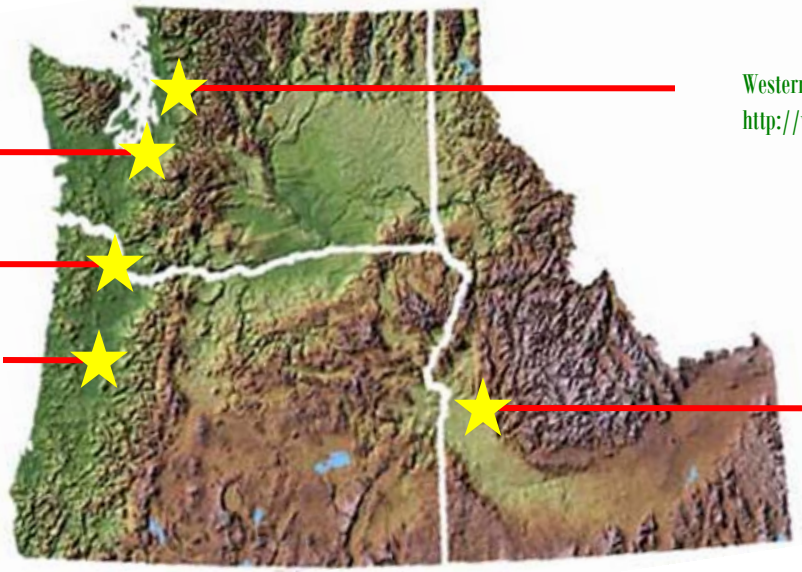
USGS science for a changing world

Presentation Overview

- USGS in the Northwest
- Regional Climate Impacts: Northwest
- DOI Response to Climate Change
- USGS NW CC Infrastructure
- USGS Science
- The Psychology of Climate Change Communication
- C3 (separate handout)
- The PNW CESU and Climate Change Collaboration

The USGS Northwest Area

The USGS NW Area Office coordinates a three state region, linking the USGS field operations of five Science Centers with other components of the organization and the Survey's varied and diverse partners



Western Fisheries Research Center (WFRC)
http://wfrc.usgs.gov/

Washington Water Science Center (WA WSC)
http://wa.water.usgs.gov/

Oregon Water Science Center (OR WSC)
http://or.water.usgs.gov/

Forest and Rangeland Ecosystem Science Center (FRESC)
http://fresc.usgs.gov/

Idaho Water Science Center (ID WSC)
http://id.water.usgs.gov/

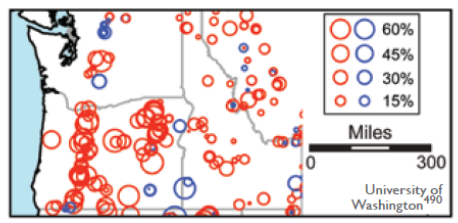
Regional Climate Impacts: Northwest

U.S. Global Change Research Program (USGCRP) Scientific Assessment

"The Northwest's rapidly growing population, as well as its forests, mountains, rivers, and coastlines are already experiencing human-induced climate change and its impacts. Regionally averaged temperature rose about 1.5°F over the past century (with some areas experiencing increases up to 4°F) and is projected to increase another 3 to 10°F during this century"

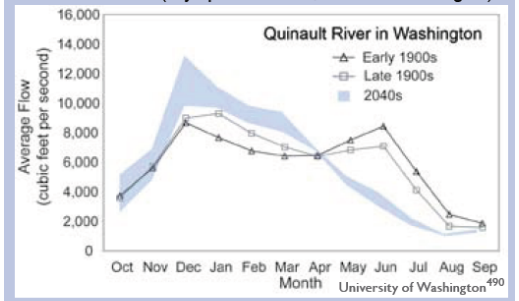
- Increased insect outbreaks, wildfires, and changing species composition in forests will pose challenges for ecosystems and the forest products industry
- Declining springtime snowpack leads to reduced summer streamflows, straining water supplies
- Salmon and other coldwater species will experience additional stresses as a result of rising water temperatures and declining summer streamflows
- Sea-level rise along vulnerable coastlines will result in increased erosion and the loss of land

Trends in April 1 Snow Water Equivalent
1950 to 2002



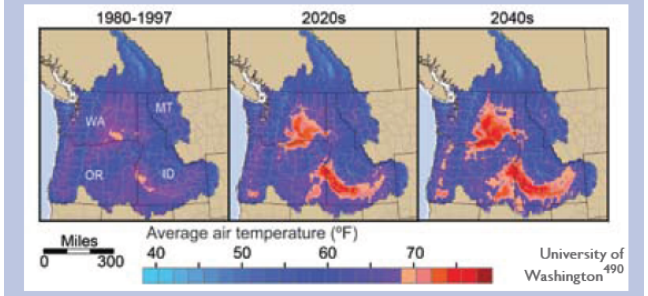
April 1 snowpack (a key indicator of natural water storage available for the warm season) has declined throughout the Northwest. In the Cascade Mountains, April 1 snowpack declined by an average of 25 percent, with some areas experiencing up to 60 percent declines. On the map, decreasing trends are in red and increasing trends are in blue.[491]

Shift to Earlier Peak Streamflow
Quinault River (Olympic Peninsula, northern Washington)



As precipitation continues to shift from snow to rain, by the 2040s, peak flow on the Quinault River is projected to occur in December, and flows in June are projected to be reduced to about half of what they were over the past century. On the graph, the blue swath represents the range of projected streamflows based on an increase in temperature of 3.6 to 5.4°F. The other lines represent streamflows in the early and late 1900s.[487,494]

Decreasing Habitat for Coldwater Fish



Increasing air temperatures lead to rising water temperatures, which increase stress on coldwater fish such as trout, salmon, and steelhead. August average air temperature above 70°F is a threshold above which these fish are severely stressed. Projected temperatures for the 2020s and 2040s under a higher emissions scenario suggest that the habitat for these fish is likely to decrease dramatically.[486,497,568,569]

http://www.globalchange.gov/images/cir/pdf/northwest.pdf

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An Integrated DOI Response to Climate Change

THE SECRETARY OF THE INTERIOR
WASHINGTON

ORDER NO. 3289 (Sept, 2009)
Subject: Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources

- **Coordinated Approach:** Overseen by Office of Secretary's Climate Change Response Council -- consisting of Departmental Leaders and Agency Directors.
- **Objective:** Increase scientific understanding of and development of adaptive management tools to address CC impacts upon natural and cultural resources.
- **Approach:** Must be integrated into long-range planning requirements, priority setting for scientific research, development of management plans and major decisions regarding usage of resources.
- **Regional Climate Change Response Centers:**
- Designed to provide CC impact data and analysis geared toward the needs of F&W managers as they develop adaptation strategies in response to CC.
- Developed in close collaboration with Interior agencies and other federal, state, university, and non-governmental partners.
- **Landscape Conservation Cooperatives:**
- Interior bureaus and agencies, guided by the Climate Response Council, will work to stimulate the development of a network of collaborative Landscape Conservation Cooperatives.
- Cooperatives will work interactively with the relevant DOI RCCRCs and help coordinate adaptation efforts in the region.

An Integrated DOI Response to Climate Change (cont.)

Creation of Energy and Climate Change Council for Oversight and Coordination of Department-wide Response to Climate Change

- Climate Science Centers
- Landscape Conservation Cooperatives
- Data Integration and Management
- Carbon Storage Activities
- Geological Sequestration
- Biological Sequestration

http://www.doi.gov/whatwedo/climate/strategy/index.cfm

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Climate Science Centers (CSCs)

Delivering Fundamental Climate-Impact Science to Resource Managers on a Regional Basis

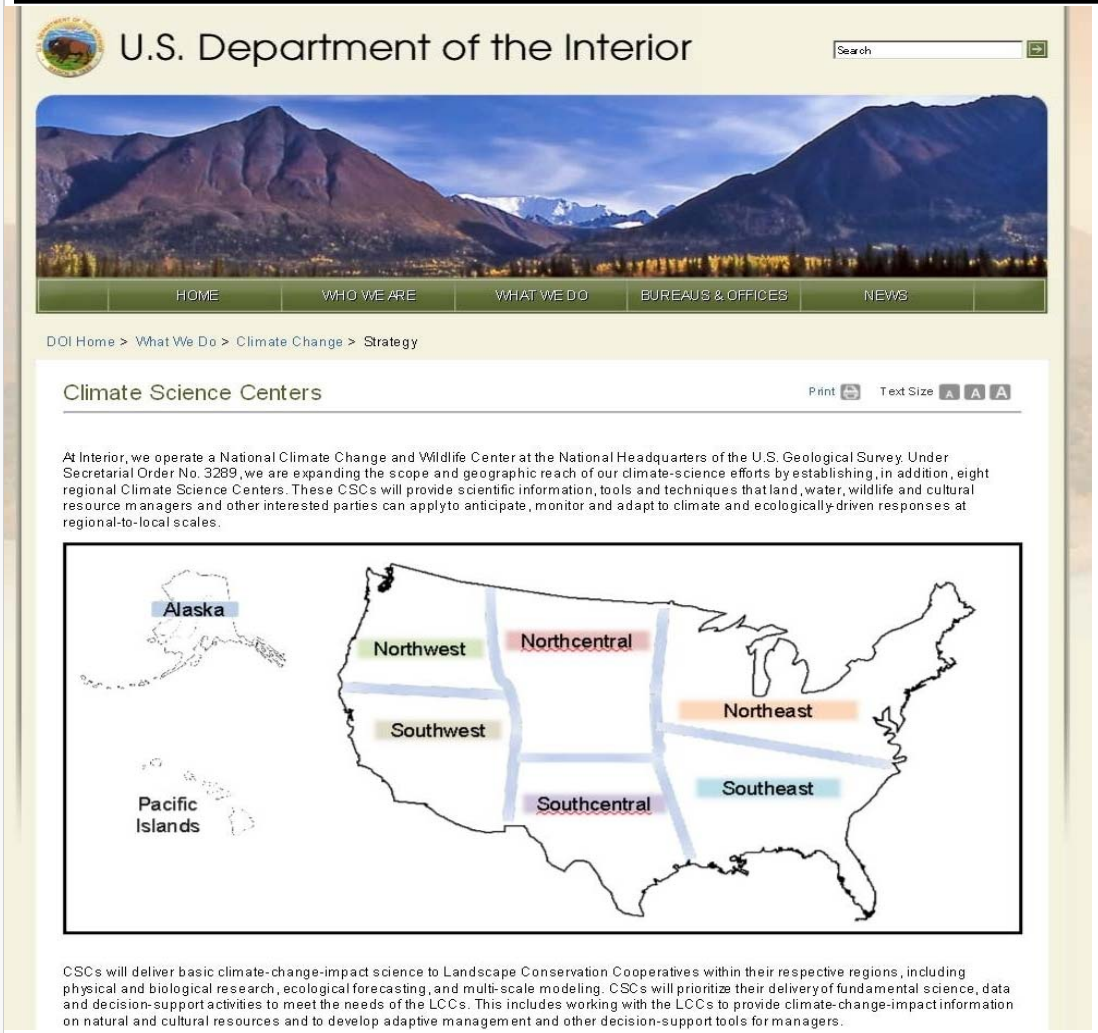
- National Climate Change and Wildlife Center at USGS HQ & Eight regional Climate Science Centers (CSCs)
- Provide scientific information, tools and techniques for land, water, wildlife and cultural resource managers to adapt to climate and ecologically-driven responses at regional-to-local scales.
- Deliver basic climate-change-impact science to Landscape Conservation Cooperatives
- Prioritize fundamental science, data and decision-support activities to meet the needs of the LCCs.
- Work with the LCCs to develop adaptive management and other decision-support tools for managers.

Landscape Conservation Cooperatives (LCCs)

On-the-Ground Applied Science and Adaptive Management

- Twenty-One Nationwide, functioning within a specific landscape as part of a national and international network
- Focus on-the-ground strategic conservation & adaptive management efforts at the landscape level.
- Management-science partnerships that inform integrated resource-management
- Link science and conservation delivery
- LCCs are cooperatives, formed and directed by land, water, wildlife and cultural resource managers and other stakeholders.
- Steering committees will include representatives from governmental entities (federal, state, tribal and local), as well as non-governmental organizations.

Climate Science Centers (CSCs)



http://www.doi.gov/whatwedo/climate/strategy/CSC-Map.cfm

STATUS

- Three in FY2010 - Alaska (Univ of Alaska), Northwest and Southeast
- Individual RCSC budget ~$4m (25% for staff and space; 75% for climate change science)
- The USGS Area RExs will Chair the Steering Committee/Governance Board for their Area's respective CSC.
- USGS will provide an Interim Director prior to the selection (via Program Announcement) of the host institution

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Landscape Conservation Cooperatives (LCCs)

http://www.doi.gov/whatwedo/climate/strategy/LCC-Map.cfm

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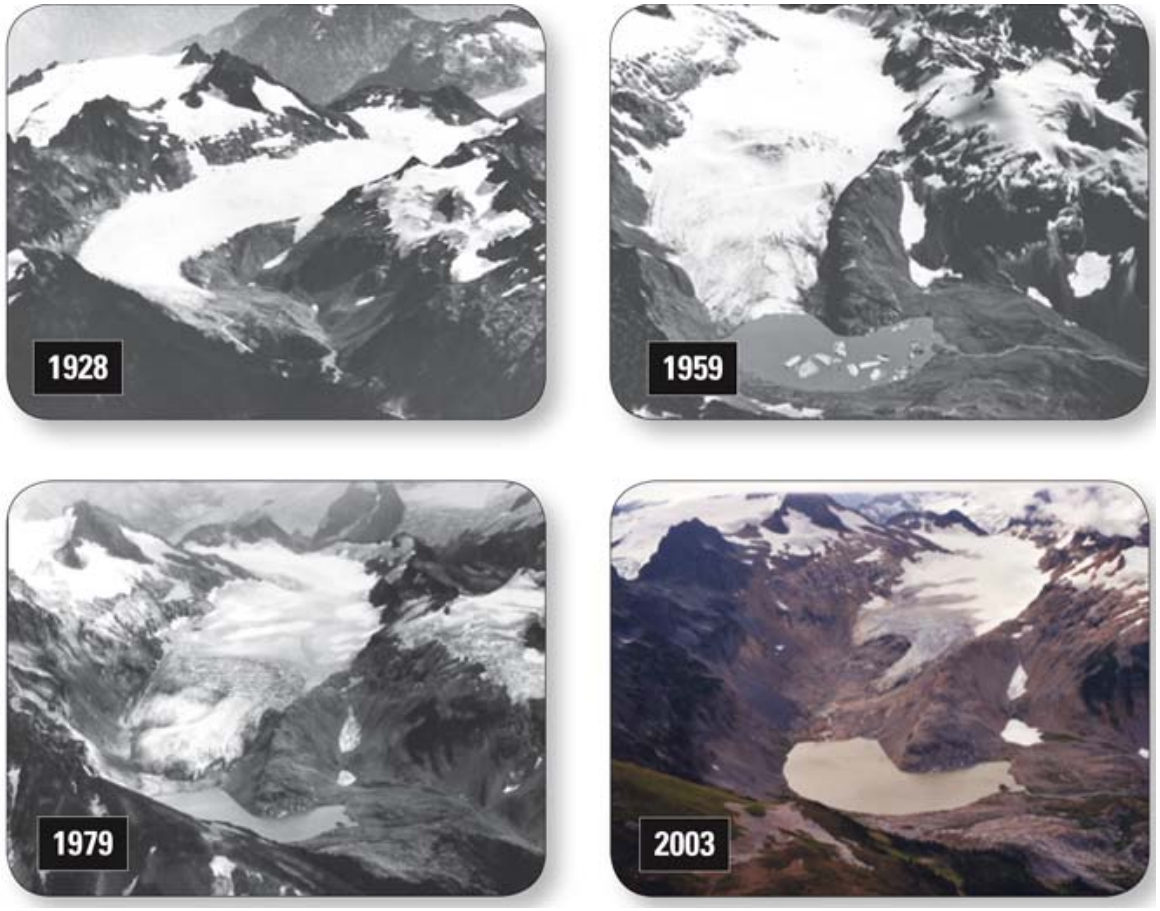
USGS NW CC Infrastructure

- Multiple Science Centers and Field Stations
- NW RCSC (future)
- Annual Science RFPs (Global Change & NCCWSC)
- Funding for LCC Science Capacity
- Climate Effects Networks (future)
- Dedicated program dollars

USGS Science: Glacier Recession as an Indicator of Mountain Protected Area Responses to Climate Change



Retreat of South Cascade Glacier, Washington, during the 20th Century and the beginning of the 21st Century

(Ed Josberger)

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USGS Science : How might future increased temperatures affect hot and cold desert fire regimes?

- Climatic models predict increasing temperatures.
- Conditions in higher elevation and more mesic shrublands may become more conducive to dominance by non-native grasses and the grass/fire cycle (move upslope).
- Start winter growing season sooner that should favor weedy non-native plants.
- Increase the length and aridity of the summer fire season.

(Matt Brooks)

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Brooks and Matchett in review

The Psychology of Climate Change Communication

1) What is their knowledge/beliefs

2) Make the message relevant

3) Translate

4) Understand people's "finite pool of worry"

5) Address uncertainties and consider the interpretation of scientific language (i.e. Uncertainty (range) = not knowing , Positive trend (upward trend) = a good trend)

6) The importance of group affiliation

7) Bring people together

8) Simplify and make change attainable

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C3

Pacific Northwest
Climate Change Collaboration (C^3)

I. Purpose: The Climate Change Collaboration (C^3) is intended to better organize, integrate, and focus the federal community's efforts in addressing the challenges posed by climate change in the Pacific Northwest region. C^3 is a regional forum, designed to complement the framework of the multi-agency U.S. Global Change Research Program (formerly the U.S. Climate Change Science Program). Key to the success of this framework is the pursuit of activities that:

- Are coordinated and avoid duplication of similar national or regional efforts;
- Remain relevant into the future;
- Are sustainable and manageable; and
- Assist federal entities in meeting their current and future needs and responsibilities regarding climate change.

II. C^3 Objectives:

- Serve as a forum to strengthen and enhance federal coordination on climate change related issues;
- Create a regional network of key federal employees working on climate change issues;
- Engage top agency executives and managers to encourage effective alignment of resources and programs that address climate change;
- Share information about regional conferences, workshops, and other activities organized by participating agencies to avoid duplication;
- Share and exchange information on climate change related grants and scientific studies funded and/or managed by federal agencies in the region;
- Exchange and coordinate climate change tools, data and information, best practices and scientific knowledge in the region; and
- Encourage federal coordination with tribal, state, and local, government, NGOs, and private partners.

III. Geographic Scope and Coordination with other Efforts: C^3's efforts are focused in Washington, Oregon and Idaho. C^3 is designed to compliment other Pacific NW regional efforts and related efforts in Alaska, California, Hawaii and the Pacific Islands.

IV. Near Term Focus: C^3 members have formed two interagency teams to focus on:

- Inventorying research, research tools, models, modeled scenarios, monitoring programs/projects and assessments related to climate change in the Pacific Northwest
- Education, outreach and partner engagement

Structured for Opportunities:
The PNW CESU and Climate Change Collaboration

Strengths

- Geographical alignment with the NWCSC and NPLCC, GNLCC and GBLCC
- A structure that allows for the efficient sharing of resources
- An established partnership with national coverage
- A bridge among Federal Agencies and Universities
- A Multi-faceted mission (research, technical assistance, and education)
- Multi-faceted expertise (biological, physical, social, and cultural sciences)

Opportunities

- Participation on/in LCC & RCSC Scoping Teams, Webinars, Workshops
- Connections/Participation with LCC & RCSC Steering/Work Teams
- Working with your Agency Reps on NW Interagency Collaborations (PSFC, CRFC, C3)
- Work with LCCs and RCSCs

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Thank You!