

Climate Change Outreach Project

Final Report

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Project Team

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1.0 Introduction

Climate change is a popular topic. It is widely reported in the media, an issue of policy debate, and a focus of the academic climate-related research. Whether it is the possibility of increased regulation, changes in public policy, or new opportunities or threats for various economic markets, the topic of climate change has touched the lives of Oregonians. Climate change is a challenging endeavor to take on as an outreach project. It is scientifically complex, sensationalized by the media, and value-laden.

Climate change has been characterized as “the ‘perfect problem’ for its uniquely daunting confluence of forces” (Abbasi, 2006: 17). One of those forces, the complex and inaccessible scientific content of climate change has been the focus of a recent Institute for Natural Resources (INR) climate change outreach project in the state of Oregon.

- Complex and inaccessible scientific content
- A substantial (and uncertain) time lag between cause and effect
- Inertia in all the key drivers of the problem, from demographic growth to long-lived energy infrastructure to ingrained daily habits at the household level
- Psychological barriers that complicate apprehension and processing of the issue, due in part to its perceived remoteness in time and place
- Partisan, cultural, and other filters that cause social discounting or obfuscation of the threat
- Motivational obstacles, especially the futility associated with what is perhaps the quintessential “collective action problem” of our time
- Mismatches between the global, cross-sectoral scope of the climate change issue and the jurisdiction, focus, and capacity of existing institutions
- A set of hard-wired incentives, career and otherwise, that inhibit focused attention and action on the issue

(Abbasi, 2006:17)

Figure 1: Forces of the Problem of Climate Change

INR’s mission is to *provide Oregonians with ready access to current, science-based information and methods for better understanding resource management challenges and developing solutions* and after the 2004 release of the Governor’s Advisory Group on Global Warming (GAGGW’s) extensive report, *The Oregon Strategy for GHG Reductions*, INR recognized the need for a grassroots understanding of the issues surrounding climate change in Oregon. INR subsequently was funded to implement Phase I of a three-phased strategy to address the scientific information issue of climate change.

This final report documents the efforts of the INR project team. Section 2 provides the project background, goals, and objectives. Section 3 describes how each of the objectives was achieved and their subsequent impacts. Section 4 highlights some of the overall lessons learned, while Sections 5 and 6 conclude the report by focusing on the project management and the report conclusions.

2.0 Project Background

2.1 Background: Opportunity for Climate Change Outreach in Oregon

In December, 2004, Oregon Governor Ted Kulongoski's Advisory Group on Global Warming (GAGGW) adopted a report – *The Oregon Strategy for Greenhouse Gas Reductions*. The report was published by the Oregon Department of Energy on behalf of the Advisory Group and was forwarded in final form to the Governor in March, 2005. The "Scientific Consensus Statement on the Likely Impacts of Climate Change on the Pacific Northwest," which resulted from a June 2004 meeting, "Impacts of Climate Change on the Pacific Northwest", was included in the strategy report. The report includes approximately 60 recommendations and articulates four broad strategies, including promoting and supporting education, research and technology development.

While Governor Kulongoski accepted the Strategy and embraced its recommendations soon after the Strategy was released, implementation of these recommendations requires support from communities across Oregon. Further, policy-makers need to be informed about what people in key sectors of Oregon's economy can say about the risks and costs of climate change and the opportunity for mitigation in their sectors.

The Institute for Natural Resources (INR) responded to this need by proposing a long-term, three-phased climate change community outreach initiative. In early fall 2005, INR received a grant from the Energy Foundation to design and implement the first phase of the proposed community outreach initiative.

Phase 1 of the initiative was undertaken because broader public understanding and greater public awareness is needed to implement the Advisory Group's recommendations. And, policy-makers need to be informed by what people in key sectors of Oregon's economy can tell us about the risks and costs of climate change and the opportunity for mitigation in their sectors.

2.2 Project Goals and Objectives

The purpose of this outreach project was to work with people throughout Oregon to develop a better understanding of how climate change might affect Oregonians and what might be done about it. The overarching goals of the proposed project were to: (1)

translate the scientific information on the impacts of climate change in the Pacific Northwest into formats, language, and presentations accessible to non-professional audiences; and, (2) engage opinion leaders from various geographic locations and sectors outside the usual organizations involved in climate change issues, who can review the scientific evidence and, if they subsequently decide that climate change is a concern for their areas and/or sector, tell a compelling story to their communities and to the state's leadership about why Oregon should care about climate change. More specifically, the project hoped to:

Objective 1: Develop materials

- Develop outreach materials on the impacts of climate change specific to key sectors of Oregon
- Test the outreach materials with the identified individuals
- Revise the materials in response to the testing

Objective 2: Conduct outreach

- Identify a geographically, socially and economically diverse group of community leaders representing key sectors that will be affected by climate change
- Conduct community climate change meetings

Objective 3: Recruit storytellers

- Enlist 15 of these participants to be "storytellers" about the impacts of climate change in their own communities

The overall project plan was to conduct workshops in various regions of the state to share information and learn from each other about risks and costs of climate change and opportunities for mitigation, including economic development possibilities.

3.0 Project Objectives Described

3.1 Objective 1: Material Development

The objective was to develop a set of materials and guides for interviews, work sessions and focus groups with selected citizens and groups that help them decide whether climate change is a real threat. These materials must be specific enough to various sectors to engage people. At the same time, they must be credible, including recognition of uncertainties and probabilities.

As the project team sorted through climate change materials to present in the community meetings, the filtering procedure (Appendix 1) served as a guide to ensure that we were making scientifically credible choices. There are three specific filters in this

procedure: one based on the *relevance* of the proposed materials and two based on the *source*. Approximately 100 resources (see accompanying CD) were reviewed and vetted with other OSU scientists.

3.1.1 Revising Materials and Process

The materials were tested and revised based on the feedback of the focus group and the subsequent workshops. At the focus group, three poster-sized mock-ups were developed regarding how information could be presented about climate change. The topics of the mock-ups were web resources, sea level rise, and oral history (Appendices 2-4). As these items did not elicit much feedback, the poster mock-ups were put aside for other material development ideas.

PowerPoint Presentations

PowerPoint presentations were used as the primary outreach material for the remaining community outreach events. The project team felt that this was the most efficient way to deliver and then discuss climate change information given the limited time (two and a half hours) for which each event was scheduled. The presentation provided at first workshop in Corvallis differed dramatically from the subsequent meetings in Prineville and Roseburg (see the description in Section 3.2 and the PowerPoint presentations in Appendices 5-7 on the accompanying compact disc).

Handouts

One intention of the materials development component was to not overwhelm the participants with numerous handouts. At the first workshop (Corvallis), written handouts of the scientific information were not provided; instead the team relied solely on the PowerPoint presentation as the main channel of climate change information. Subsequently, based on some of the feedback from the Corvallis participants, the project team later developed two versions a brief XX-page handout for the subsequent meetings (Appendices 8 and 9).

3.2 Objective 2: Community Outreach

Four community outreach events were held over the course of the project period. The first event, held in Newport, Oregon was a focus group, while the next three events – held in the cities of Corvallis, Prineville, and Roseburg – were outreach workshops. The objective of the Newport focus group was to obtain feedback from representative opinion leaders in an affected community (i.e., a coastal city) about how best to relate scientific information about climate change and related issues such as global warming to the lives and livelihoods of ordinary Oregonians, while the objectives of the following workshops were to:

- present what science can tell us about the potential effects of climate change and what might be possible to slow-down climate change and to adapt to it

- discuss what climate change might mean to [the workshop participant] as a citizen and for their professional, business, and other interests.

3.2.1 Community Outreach Locations

Community outreach locations were selected based on geographical location – a coastal community, a community east of the Cascade Mountain Range, a community in the Willamette Valley, and one outside of the Willamette Valley. The exact communities were chosen based on proximity to Corvallis, Oregon – the project team base – due to limited travel funds available in the grant.



Figure 2: Map of Community Outreach Locations

3.2.2 Participant Selection

Staff from the Institute for Natural Resource (INR) at Oregon State University organized and facilitated the focus group and workshops. The project team worked with local Oregon State University Extension agents to identify people representing local industry clusters (timber, agriculture, tourism, “main street” businesses, manufacturing, etc.), community groups (local public officials, faith community, civic organizations, public health, etc.), and the general public in each of the selected communities with whom we could test the preliminary outreach materials and explore why they care (or not) about

climate change, what they understand about its causes and impacts to Oregon, and what they think can be done about it. The Extension agents were also invited to participate.

Invitation letters were sent to the participants via e-mail attachments and U.S. mail. Project team members also made follow-up phone calls to the invitees. Table 1 shows the number of people who participated in the focus group and workshops.

Table 1: Number of Workshop Participants Invited and Attended		
Focus group/Workshops	Invited	Attended
Newport, Oregon (focus group)	25	10
Corvallis, Oregon	34	15
Prineville, Oregon	34	12
Roseburg, Oregon	54	19

3.2.3 Community Outreach Strategies and Activities

The ultimate goal the project was to create an outreach process and outreach materials on climate change in Oregon. Development of the outreach process and outreach materials was based on results and feedback from four community outreach events that held in Newport, Corvallis, Prineville, and Roseburg, Oregon between February and May of 2006. The four events were individually designed; however, all were intended to be flexible enough for each to take on a life of their own during the discussion period, following the direction developed by the interaction of the participants. Differences in workshop design were based on the project team's outreach design process as a whole, feedback received from the prior meetings, and issues specific to each community.

Each of the four events played a role in the team's outreach design process, as the team wanted to involve community members in the process of designing the program. Though the project team knew from the start of the project that each event would have a different design, the eventual product goal was to have a functioning outreach process and outreach materials. The first community outreach event was essentially a focus group. The second and third community meetings were built off of the focus group discussions and outreach materials were added for presentation. The fourth community meeting was essentially a community lecture and discussion about climate change in Oregon – the project team's eventual product goal.

The project team had to be flexible and open to allow for changes in meeting design based on feedback from participants. These differences in meeting design were unknowns to the project team when we started the project. Additionally, each community had distinctive local issues so the team attempted to tailor each workshop to local issues.

At each workshop, participants were provided a project overview (Appendix 10), an agenda (Appendix 11), and the filtering criteria for selecting scientific information (Appendix 1).

3.2.4 Description of Community Meetings

From the beginning of the project, the project team knew that each outreach event would be unique because they would evolve from a strictly community discussion to more of a combined community lecture and discussion. The team also planned to modify each event based on participant responses and our responses from the previous outreach event. Many of the team's responses to each event are reflected in the changes that were made in the material presented and handed out to participants at each event.

Focus Group – Newport, Oregon (22 February 2006, 6:00 – 8:30 PM)

On February 22, 2006, the Project Team convened a focus group in Newport. Newport is located on the central coast of Oregon in Lincoln County and in 2003, had a population of 9,740. The primary industries in the Newport area are timber, fishing, tourism, recreation, and food products manufacturing. The invitees to this climate change outreach meeting included representatives from local government, the fishing industry, scientists, tourism, the port authority, the faith community, local business, coastal management, public health, and the timber industry.

The objective of this meeting was to obtain feedback from representative opinion leaders in an affected community (i.e., a coastal city) about how best to relate scientific information about climate change and related issues such as global warming to the lives and livelihoods of ordinary Oregonians. Participants were not invited based on their knowledge of climate change, but rather their ability to think through issues relevant to public policy and management from the perspective of a particular sector (e.g., commercial fishing, public education, etc.). Specifically, participants were asked to gauge what information about climate change is important and relevant to them and their peers, how they perceive various sources of information from the standpoint of credibility, and how best to present and convey information in future workshops.

- Community discussion facilitated by trained facilitator not part of the project team
- Main point of discussion was to get ideas from participants regarding:
 - What they already knew about climate change and the coast
 - What they wanted to know about climate change in general
 - What they could do, if anything, if they believed climate change was happening
 - Who they trust when it comes to getting “the truth” about climate change
- Four “mock” posters presented for the purpose of sparking conversation about different outreach tactics: oral history, web resources, local examples, and PNW regional examples
- No outreach handouts
- No evaluations

Figure 3: Newport Meeting Approach, Materials, and Expected Outcomes

Ten local citizens attended the meeting, along with Denise Lach, OSU Sociology Professor and facilitator of the focus group, and four members of the Project Team. Denise posed several questions to the group including:

- What changes in climate have you seen in your life?
- Based on what you know now and your own experiences, what do you think will happen on the coast? What are other potential impacts?
- How do you convince residents on the Oregon coast that they should care about climate change impacts?
- If you think climate change was happening, what could you do?
- Who would you trust in your community to provide credible information about climate change?
- What message is being conveyed if we believe there is nothing for them to do about climate change?
- Can we do something by means of adaptation to address impacts of climate change?

Conclusions based on the focus group discussion are that there is broad recognition about climate change and global warming as issues of concern, but little agreement about underlying facts associated with climate change. In addition, there is a diversity of opinions regarding potential impacts to the citizens of Oregon. The lack of recognition of climate change impacts on a day-to-day basis leads to low inclination for many citizens to be advocates for either mitigation or adaptation. However, people truly are interested in having a better understanding of local impacts, along with more large-scale impacts that would have wide-ranging ramifications—if these exist.

**Workshop –Corvallis, Oregon
(18 April 2006, 5:45 – 8:30 PM)**

With a population of 53,165, Corvallis is located in the Willamette Valley, within 90 minutes of the Portland Metropolitan area. The primary industries in Benton County, in which Corvallis is located, are agriculture, lumber, research and development, and education. The invitees to this climate change outreach meeting included representatives from agriculture, local business, civic organizations, faith community, health, local government, manufacturing, recreation, and timber. Fifteen people participated

- Hybrid lecture-discussion, *Climate Change Effects and Discussion*, presented and facilitated by a communications consultant from the project team
- Main point of holding a hybrid lecture-discussion was so that the project team could get reactions about the presentation material from participants. We wanted to specifically get feedback about these aspects of the presentation:
 - How much “hard science” and facts do people want to see in our presentation?
 - Will people trust a non-scientist as a presenter of scientific data?
 - How much time should we spend on effects of climate change vs. drivers/causes of climate change?
 - General feedback about our presentation
- Handout 1: Project overview and workshop agenda
- Handout 2: Filtering Procedure
- Evaluations

Figure 4: Corvallis Meeting Approach, Materials, and Expected Outcomes

As part of the introduction to the workshop, participants were asked to share what it was about climate change, the invitation they received, or the follow-up phone call that made them decide to come to the workshop. For the main portion of the workshop, the project team communications consultant concurrently presented materials and facilitated a discussion. Based on the Corvallis workshop feedback and project team observations, modifications were made for the design of the next workshop to be held in Prineville:

- the objectives of the workshop would be verbally stated in the introduction of the workshop rather than having the participants only refer to project overview
- a discussion would follow a presentation of only material that had been vetted through the filtering procedure
- the presenter of the scientific information and the discussion facilitator would be two different people

- the presenter of scientific information would be a university-based Extension specialist rather than a consultant
- the presenter would create the presentation, which we as a team decided would be based on the science of climate change
- the team would review, vet, and present scientifically credible opposing views
- handouts of important graphs and figures from the presentation would be available to participants

Forty percent of participants at the Corvallis event thought that the workshop was biased and we as a project team agreed that the presentation leaned too much towards advocacy.

Workshop – Prineville, Oregon
(2 May 2006, 6:00 – 8:30 PM)

Prineville, Oregon is located in Crook County in the high desert region of Central Oregon. With a population of 8,500 in 2003, Prineville’s reliance on the primary wood industry has faded in recent decades, but a strong secondary wood industry has been booming. The invitees to this outreach event included representatives from agriculture, local business, civic organizations, faith community, health, local government, manufacturing, public land agencies, recreation, timber, and tourism. Twelve people participated.

- Community lecture with a separate discussion following the lecture. An Extension specialist from the project team presented, *Is it all Hot Air? Climate Change, Global Warming, & the Pacific Northwest*. The following discussion was facilitated by a communications consultant from the project team
- Discussion focused on the following questions:
 - Does climate change matter? (How much does climate change matter?)
 - Why do you feel that way? (What is it about climate change that you think is important? What effects or information led you to feel that way?)
 - What do you think we should be doing about climate change, if anything?
- Handout 1: Project overview
- Handout 2: Filtering Procedure
- Handout 3: Supplemental handout highlighting figures and graphs from the presentation, *Is it all Hot Air? Climate Change, Global Warming, & the Pacific Northwest*
- Evaluations

Figure 5: Prineville Meeting Approach, Materials, and Expected Outcomes

The Prineville workshop began in the same fashion as the Corvallis one, with the exception that the workshop objectives were verbally stated. The project team technical

advisor (a Sea Grant Extension Specialist) presented the scientific information and the following discussion was facilitated by the project team communications consultant. Based on the Corvallis workshop feedback and project team observations, the project team decided to keep the structure generally the same, but change some of the presentation materials. Participants in Prineville seemed particularly interested in the controversies within climate change research and they seemed to want the knowns and the unknowns in climate change research to be better defined.

For the next workshop, to be held in Roseburg, some topics were added to the materials, including: addressing scientific consensus on climate change, changes over climate change research with time, and opposing views in climate change research. Handouts were also modified by adding brief explanatory text to the graphics.

**Workshop – Roseburg, Oregon
(11 May 2006, 6:00 – 8:30 PM)**

The city of Roseburg is located Douglas County along the Interstate-5 corridor. In 2003, Roseburg had a population of 20,480. The primary industries are timber, mining, and agriculture. The invitees to this outreach workshop included representatives from advocacy groups, agriculture, local business, civic organizations, the faith community, public health, state government, local government, education, manufacturing, recreation, timber, and tourism businesses. Nineteen people participated.

- Community lecture with a separate discussion following the lecture. Both were modified from the Prineville lecture and discussion. An Extension specialist from the project team presented, *Is it all Hot Air? Climate Change, Global Warming, & The Pacific Northwest*. The following discussion was facilitated by a communications consultant from the project team
- Discussion focused on the following questions:
 - Does climate change matter? (How much does climate change matter?)
 - Why do you feel that way? (What is it about climate change that you think is important? What effects or information led you to feel that way?)
 - What do you think we should be doing about climate change, if anything?
 - What do you think about one policy option, feebates?
- Handout 1: Project overview
- Handout 2: Filtering Procedure (see Appendix A)
- Handout 3: Supplemental handout highlighting figures, graphs, and main points from the *Is it all Hot Air? Climate Change, Global Warming, & The Pacific Northwest* presentation
- Evaluations

Figure 6: Roseburg Meeting Approach, Materials, and Expected Outcomes

During the discussion, a policy option addressing climate change issues was brought up for discussion and many people were not in favor of the specific action. We speculate that it was a source of confusion, and definitely debate, as most the presentation dealt with the science of climate change and then specific policy options were discussed. This confusion was expressed in the participant evaluations and in observations by the project team. However, one participant commented in a later e-mail:

I want to thank you and your associates for the fine workshop on global warming that you put on Thursday evening. In reflecting on the discussion, I think I reacted too negatively to the "feebate concept". There is a strong anti-Tax sentiment in Douglas County which was expressed by several members of the audience and I guess I got caught up with it (I actually am not anti-tax as long as they are fairly administered). Feebate may be a good approach. Please provide this comment to [the facilitator]...

3.2.5 Impacts

Goals and impacts of the overall outreach objective of the grant – more specifically the workshops – were measured through workshop-specific evaluations. These evaluations were both formal in the form of written responses at the end of each workshop (summary of written responses in Appendices 12, 13, and 14) and informal (discussion points during the workshop) that focused on the immediate impacts of each workshop. This was followed up by random phone calls to workshop participants, four to eight weeks following the workshops.

Summary of Written Evaluations

Participant responses to the outreach events were measured through a participant evaluation form and by observing their behavior at outreach events. Evaluations were not handed out in the Newport workshop as the Newport outreach event was a focus group and we did not ask participants to critique materials as was done at the other three workshops. Identical evaluation forms were given to participants at the Corvallis, Prineville, and Roseburg workshops.

Each evaluation form had five categories: workshop organization, workshop content, presenting, visual aids, and interaction and discussion. Table 2 is a summary of participant responses from each of the five categories for each workshop. As noted in the previous sub-sections describing each workshop, there were different people presenting and different presentations used at each of the events.

Corvallis

Most participants said that the overall workshop organization was "good," yet many participants noted that the objectives of the workshop were not clear. Most participants rated the workshop content as being "commendable" or "good" and many noted that the content was relevant to local issues and concerns. While most participants rated the presentation as "good," 40% thought that the presentation seemed biased. Visual aids

received an overall “good” rating and more than half of the participants said that the visual aids were well-organized. The only “commendable” rating was given Corvallis in the “interaction and discussion” category of the evaluations. Almost all of the participants said that the discussion was well-managed, that it encouraged active participation, and that the participants’ contributions were valued.

Prineville

Most participants said that the overall workshop organization was “good,” objectives were clear, and the workshop implementation matched the workshop objectives. More than half of the participants said that more time was needed. Almost all workshop participants rated the workshop content as being “commendable” or “good” and many noted that the content was relevant to local issues and was appropriately challenging. More than half of all the participants rated the presentation as “commendable,” and almost all of the participants said that the speaker had an engaging speaking style, key ideas were emphasized, and that the whole presentation focused on the science. Most participants said that visual aids were “good.” Particular strengths were that the visual aids were organized well, emphasized key points, and focused on the science of climate change. Most participants rated the interaction and discussion as “commendable” or “good.” Particular strengths were that the interaction and discussion was managed well, encouraged active participation, gave the right amount of interaction for the number of people, and that participant contributions were valued.

Roseburg

Most participants said the overall workshop organization was “good” or “commendable,” yet, more than 40% of participants said that the objectives of the workshop were not clear. Most workshop participants rated the workshop content as being “commendable” or “good” and many noted that the content had good breadth, good depth, was appropriately challenging, and was relevant to local issues. More than half of all participants gave the presentation a “good” overall rating and said that it focused on the science, was easy to understand, and used effective examples. However, 32% of participants said that the presentation seemed biased. The Feebate discussion at may have led to the perceptions that the presentation was biased even though a deliberate strategy had been adopted since Prineville to present facts and refrain from personal commentary. Most participants said that visual aids were “good.” Particular strengths were that the visual aids were organized well, emphasized key points, and focused on the science of climate change. Most participants rated the interaction and discussion as “good.” Particular strengths were that the interaction and discussion was managed well, encouraged active participation, and that participant contributions were valued.

Table 2: Summary of Participant Evaluations from Corvallis, Prineville, and Roseburg (in percentages)												
	Corvallis (15 participants)				Prineville (12 participants)				Roseburg (19 participants)			
	C*	G	OK	NI	C	G	OK	NI	C	G	OK	NI
Workshop Organization	13**	60	20	7	15	62	23	0	37	32	21	10
Workshop Content	20	40	33	7	42	42	16	0	26	32	42	0
Presenting	20	60	20	0	54	46	0	0	28	56	10	6
Visual Aids	7	60	20	13	33	54	0	13	40	53	0	7
Interaction and Discussion	60	33	0	7	39	46	15	0	34	53	0	13
* Abbreviations: C = “commendable”; G = “good”; OK = “okay”; NI = “needs improvement” **All numbers are percentages of the total number of responses for each question. Number of responses for each question can be less than the total number of participants.												

In all three of the workshops, the majority of participants rated all five categories as being either “commendable” or “good.” It is interesting to note that many of the specific strengths identified by participants were the same for all three of the workshops.

So, according to participant responses only, it appears that the project team did “okay” in Corvallis, better in Prineville, and then back “just OK” again in Roseburg. The INR project team goal was to listen to participants’ responses at each workshop, revise the materials, and therefore improve each consecutive workshop.

We can only speculate why the workshop in Roseburg, which was an “improved” version of Prineville’s workshop, had more negative responses. The group in Roseburg was a much different audience than Prineville. We expected in Roseburg that we would have to face a “tougher audience” because the issue of climate change and global warming was already a topic of discussion in this community.

Two weeks prior to our climate change outreach project workshop in Roseburg, a city of Roseburg-based advocacy group held a well-attended open community forum about global warming. The guest speaker was Dr. Jane Lubchenco, one of the co-chairs of the GAGGW. Unlike Corvallis or Prineville, when residents of Roseburg found out about our workshop, people called us asking to be invited. When follow-up calls were made to Roseburg invitees, almost everyone the project team spoke with already had a strong opinion about climate change and global warming. This was not the reaction received to follow-up invitation calls to the Corvallis and Prineville invitees. Climate change and

global warming is a highly politicized issue in Roseburg and we ultimately faced a much different climate there.

This issue accentuates one of the challenges with our project. We wanted to create outreach materials about climate change for Oregonians, but communities across Oregon are different in many aspects. People will inherently respond differently to materials, even if the same materials are presented at every location.

Summary of Follow-up Phone Calls

After the workshops, follow-up phone calls were made to participants for whom there was contact information. The follow-up list was compiled using notes from the workshops to confirm attendance, and then the list of invitations for contact information. For Corvallis, the correspondence between participants identified in the workshop notes and the invitation list was incomplete, so it is possible several participants did not get on the call list. Other than that, an attempt was made to contact all participants. In all cases, at least 6 phone calls were made to reach people; in several cases phone messages were left requesting better contact information. Otherwise, no participant was asked to call back.

In all, 30 of 40 identified participants were interviewed. There were three couples at the workshops. For each couple, only one person was interviewed. Two couples reported having very similar views, while the other two had minor differences of opinion. One person declined to be interviewed without confirmation that the questions had been approved in specific form by OSU. Otherwise all people contacted cooperated eagerly. Interviews ranged in duration from 10 minutes to 55 minutes. Almost uniformly participants complimented and thanked OSU and INR for conducting the workshop.

Table 3: Number of Participants Identified for and Participating in Follow-up Interviews		
Workshop Locations	Number of identified participants	Number of follow-up interviews completed
Corvallis	13	8 <i>(9 including 1 spouse)</i>
Prineville	10 <i>(12 counting spouses)</i>	9 <i>(covered 11 participants through interview of 1 spouse for each couple)</i>
Roseburg	17 <i>(18 including spouse)</i>	13 <i>(covers 14 participants through interview of 1 spouse for one couple)</i>
Totals	40 <i>(44 including spouses)</i>	30 <i>(34 including spouses)</i>

The objectives of the follow-up interviews were to:

- assess effect of the workshops on participants opinions about climate change
- solicit opinions about climate change, including what consequences are of concern and what actions might be supported
- obtain additional information about evaluations of the workshops (in addition to that provided in the evaluation forms), and
- determine interest in possible further participation in the project

The project was not designed as an academic exercise to test pre- and post- workshop opinions. No measures of opinion were obtained prior to the workshops; rather the project team was interested in the self-reported experiences of participants to help refine workshop formats and materials. Participants were able to easily discuss their experiences and respond to questions about whether participation in the workshops did or did not affect their opinions.

Ten people were not interviewed because they could not be reached after at least six attempts over a two week period. Five of these were from the Corvallis workshop, and insufficient information exists from the workshop notes to categorize their views. For the five (5) people not interviewed for whom there is some expression from the workshops, three (3) were just somewhat concerned, one (1) was not concerned, and one (1) was very concerned.

Individual interviews (see Appendix 15 for the interview guide) were coded by number for each workshop. This masks but does not completely hide the identity of participants since they can be traced through identification of sector they represent and comments they made at the workshops which are included at the top of each interview. This was

not done for the Corvallis interviews as the workshop notes are sketchier. Generally the summary statements (see Appendix 16) result from one or two readings of each interview. Where feasible, words close to those used by respondents have been used, but not always. Summary tables were not used for assessing individual interviews.

Other Impacts

This project formed the basis for a Marine Resource Management student project that was produced independently of the INR project report. The student report is available from College of Oceanographic and Atmospheric Sciences at Oregon State University. Additionally, the approach developed and the climate change PowerPoint slides are being used by Sea Grant extension in presentations to community groups.

3.3 Objective 3: Recruiting 15 “Storytellers” from Workshop Participants

One outcome of the proposed project was to establish whether a group of credible Oregonians will, after reviewing the evidence, acknowledge that there is a real problem here; believe the problem is solvable; and agree that Oregonians should be doing their proportionate part to solve it. With much debate, instead, the project team decided to establish who would be interested further in the project and climate change information.

The Institute for Natural Resources was created in 2001 through legislation as part of the law creating the Sustainability Board (Section 12, Chapter 918, Oregon Laws 2001 codified at ORS 352.239), effective January 1, 2002. The Legislature sought to assure that good science is used to measure resource use, environmental health, and costs to determine progress in achieving desired outcomes, as well as establish clear measurable goals and targets to guide state efforts toward sustainability. They also sought a place for citizens to go to access the best scientific information in order to empower citizen involvement in resource policymaking. INR’s fundamental charge *to provide integrated interdisciplinary research, information, and policy services to decision makers and the public*. Underlying this charge is our principle of neutrality – providing the best information, but not advocating a policy direction.

Thus, to adhere to the role of INR in providing access to the best available information to the public and decision-makers, the project team instead sought people who had further interest in the project and climate change information in general, based on their participation in the outreach project. Twelve participants (0 from Corvallis, 4 from Prineville, and 8 from Roseburg) identified themselves as being interested in somehow continuing their participation with the climate change outreach project.

In the follow-up interviews, more participants said they would be willing to participate further in the project:

Would you be willing to participate further in the project?

Table 4: Number of Participants from the Follow-up Interviews Interested in Participating Further in the Project

	Corvallis	Prineville	Roseburg	Total
Yes	4	4	8	16
Maybe		2	3	5
No	3	5	2	10

4.0 Lessons Learned

Climate change is a popular topic in the media, current policy, and within the academic fields related to climate research. Despite the popularity of the issue, this does not necessarily mean, that people have access to accurate information about the science, policy, and advocacy issues involved with climate change. Climate change outreach is its own entity facing unique challenges. Specific challenges include translating climate change science terminology, separating values from facts, and finding appropriate sources for reliable information. The lessons learned (below) are not listed in order of importance; rather they serve as an overall list of issues that the project team came away with regarding climate change outreach.

Have a clear and concise focus of the outreach program

Successful outreach programs would have the following components: (1) a clear purpose, (2) well-organized and effectively handled so all participants can share, learn, and teach, (3) encourage all participants to share, learn, and teach, and (4) when the activity is complete, participants leave with a feeling that they gained something from the experience and have given something to others (Conway, 1997). Outreach is much more effective when there are multiple points of access and it builds on existing partnerships and relationships.

Advocacy versus neutrality

There is a fine line between what is perceived as advocacy and neutrality. With such value-laden topics such as climate change people come in with their own opinions as to its importance and relevance to them, its importance relative to other pressing issues, and the extent to which it is a natural phenomenon or one that is exacerbated by human actions. Most people have established views about climate change and global warming, and there is a lot of confusion surrounding terminology, separating values from facts, and finding appropriate places for reliable information.

Word choice: climate change versus global warming

Climate change is a scientific issue in that we would not be aware of had it not been for the scientific method; yet, the correct words to communicate about climate change have not yet been found, including what to call the phenomenon itself (Abbasi, 2006). Scientists seem to prefer the term *climate change* because it better allows for non-

temperature effects and the patchwork of warming and cooling regions, while public polls have shown that the term *global warming* is more unsettling and attention-grabbing (Abbasi, 2006). Word choices at any time in the outreach and communication of an issue can be interpreted differently based on the perceptions and values the person hearing the message. In our project, participants were much more responsive to the term and science of climate change than the term “global warming”.

Appreciation for having a scientist/technical advisor in the room

When outreach is aimed toward individuals who either have not made up their minds about climate change, or are very skeptical about it, scientific information is seen as much more credible when it is presented by a university faculty member who can explain the intricacies of the information. Many of the participants expressed the appreciation, no matter what their personal beliefs, of having a technical advisor in the room.

Being clear on the sources of information

Being transparent on how information was reviewed, vetted, and selected add to the credibility of the information presented.

Offering alternative points of view

Despite the consensus on climate change, participants were interested in knowing about scientifically credible alternative views. The State Climatologist for Oregon, though not a climate change scientist, was often mentioned as one holding, and public stating, an alternative view. Participants were interested in knowing that what he has said had been considered for the outreach project.

Memories are not short concerning the link between science and policy

Science, for all its authoritativeness, appears to many Americans to be in the realm of perpetual discovery and reversals (Abbasi, 2006). This was iterated in two of the three workshops in relation to the science of 20 years ago which called for the removal of woody debris in streams for salmon habitat (which many landowners took part in due to the science and recommendations) and the reversal of that recommendation, based on science, years later. Participants were skeptical of the application of current climate change science to policy and its potential for reversal.

Ineffectiveness of projections and models

Participants were much more interested in the presentation of historical data and current data, than long-range projections of 40, 60 and 100 years. A list of projected consequences can be used by anyone engaging in climate change outreach and communication including sea-level rise, extreme weather events, droughts and water shortages, agricultural and food risks, infectious disease, ecosystem loss, and species extinction among others. In such an outreach program one should question the balance

between information about currently observable consequences of climate change and the projections of future impact.

Letting people make up their own minds versus “persuasion”

Adults come into learning situations – whether workshops, meetings, or training programs – with their own experiences and points of reference. What might be a “smoking gun” to one may not be at all unsettling to another. As Abbasi (2006) states, “The fact is that there is surprisingly little hard evidence about which of the many climate change-related risks are of greatest concern to the American population” (p. 26).

Building partnerships and use existing services (recommendation – use Extension)

Community members rely on Extension and outreach as a resource for information. Careful selection of information sources by Extension and outreach professionals can “take the chaos” out of the world of information for an audience and deliver focused information effectively

5.0 Conclusions

The Institute for Natural Resources at Oregon State University conducted a pilot outreach project for communities in Oregon in the spring of 2006 to explore critical success factors that could be used in designing climate change community outreach projects for communities across the state of Oregon.

When conducting an outreach program for value-laden issues, such as climate change, a basic question should be whether to communicate about the associated risks or the potential solutions or some combination of the two. What holds great value to increase the understanding of and the ability to communicate local climate change impacts, potential policies, and solutions. Though people might have an interest in the state, regional, national, and international climate change impacts, focusing on local impacts and solutions can provide needed information to what climate change could mean to their livelihoods. The ability to have this local focus, depends in part of the availability of science.

The team was largely successful in disseminating credible scientific information to participants by focusing on the science of climate change in the presentations and outreach materials. The team also suggested ways people could better identify reliable information about climate change by providing handouts that described a filtering procedure. We also felt we were successful in choosing appropriate invitees to participate in the workshops. Each event ended up having a diverse audience that reflected our well thought out invitee list.

This project was *Phase 1* of a three phase project. The project team felt that the *Phase 1* targets were met through the development of materials, the testing and revision of those materials through community outreach events – namely workshops, and that 12 individuals expressed interest in continuing their participation with the climate change outreach project. Real and lasting benefits will come only if *Phases 2* and *3* – continuing and refining outreach activities across the state, collecting personal climate change narratives, and making those narratives accessible to the public – are carried out. The results of *Phase 1* would inform the development and implementation of *Phases 2* and *3* through the application of the lessons learned.

In order to create a successful community outreach program on climate change, outreach specialists need to be vigilant in following established successful Extension and outreach strategies. These strategies include personal coaching, the building of partnerships, service, neutrality, clear objectives, and trust. With a topic like climate change that is politicized and polarized, outreach professionals have the opportunity to help communities make sense of the chaos.

References

Abbasi, Daniel. 2006. *Americans and Climate Change: Closing the Gap between Science and Action*. Yale School of Forestry and Environmental Studies.

Conway, F. D. L. (1997). *Groups That Work: Practical ways of adapting to changes in commercial fishing*. Corvallis, OR: Oregon State University Fishing Families Project.

Appendix 1: Filtering Procedure for Scientific Workshop Materials

Documentation of criteria for choosing materials

INR Climate Change Outreach Project

March 28, 2006

As the Project Team sorts through climate change materials to present in upcoming workshops, this procedure guides us so that we make scientifically credible choices. There are three specific filters in this procedure: one based on the *relevance* of the proposed materials and two based on the *source*.

Filtering processes within these three specific filters (a, b, c,) are in order of most preferred to least preferred. For example, for a *Web-based Source*, it is more preferred to present materials that come from an independent website, such as NASA for example, than to present materials from an advocacy-based website, such as Environmental Defense.

1. *Relevancy*

a. *Local/Regional:*

Climate-related changes in water resources or sea level rise on the north Oregon coast is a local example

b. *National:*

Water resource issues in New Mexico or impacts of sea level rise in Florida are less relevant to Oregon residents than local impacts. However many will have visited these places and will have friends and family there. Also some impacts such as health impacts will affect Oregonians as they travel

c. *Global:*

Retreating glaciers in the Himalayas or coastal flooding in Bangladesh illustrate the impacts of climate change but do not necessarily have immediate resonance with people living and working in Oregon.

2. *Web-based Source*

The Project Team recognizes that information about climate change that (1) *we* seek out to aid in our workshop material development, and that (2) *the public* seeks, is often web-based. When choosing web-based information, we need to specifically answer two questions: (1) *who hosts* the site, and (2) *who funds* the site?

a. *Independent website* (NOAA, NASA, UW's CIG)

- b. *Public Interest/News* (BBC, Oregonian, OPB)
- c. *Advocacy-based* (Union for Concerned Scientists, Physicians for Social Responsibility)

3. All Sources

First, ask the question: *Can we find the reference?* If so, then the reference must be verified:

- a. Is the reference *peer reviewed* from a *reputable journal*?
- b. Is the reference from *grey literature*? If so,
 - ♦ Does the grey literature paper *use a credible scientific method*?
(Possibly redirect question to OSU scientists to make final call)
 - ♦ *What is the source material* for the paper?
Does it reference peer-reviewed publications?
 - ♦ *Who funded* the paper?
Was it funded by an advocacy group or by an independent research initiative?
- c. How recent is the paper. The field of climate change is changing rapidly and information quickly becomes dated. More recent peer reviewed papers on a topic are preferred to older peer reviewed papers on a topic.

Examples

Little scientific credibility

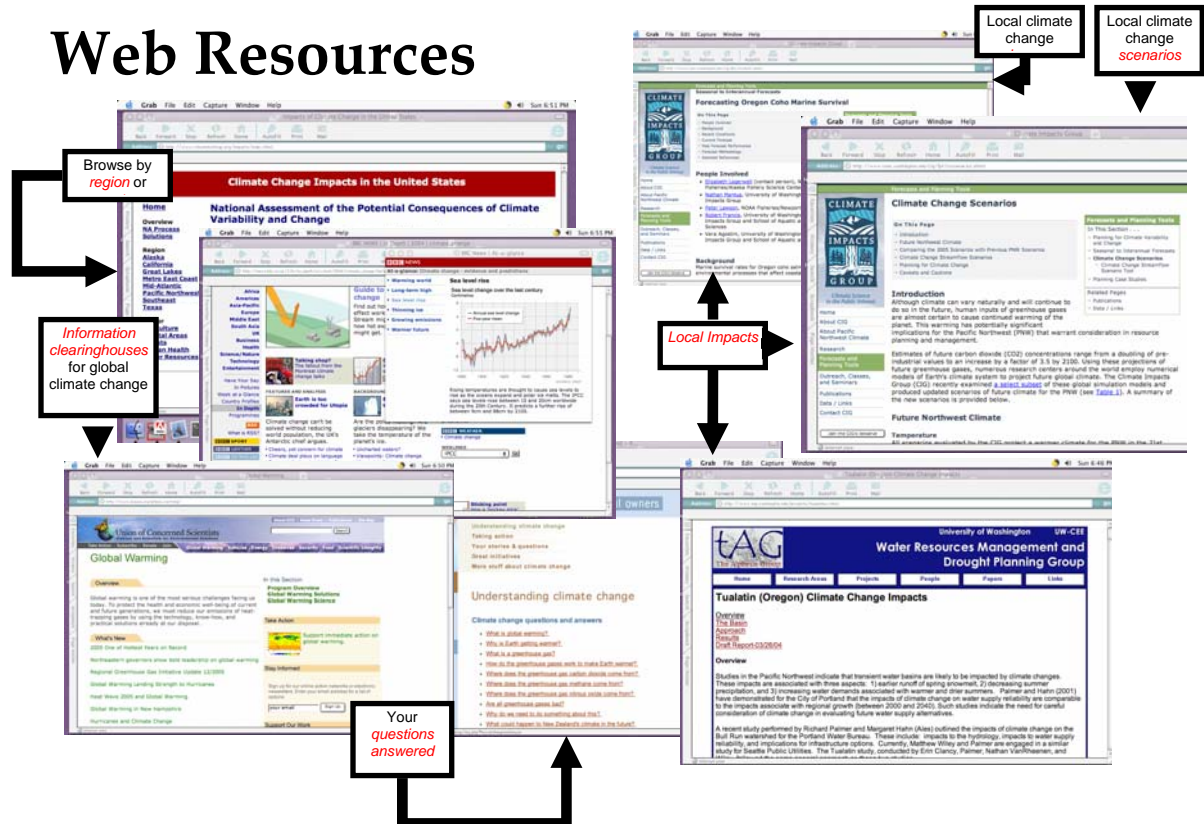
A national or global topic picked off the Greenpeace website with no references. Further research may substantiate such work but it would be the original sources not the Greenpeace site we use. In this case the Greenpeace site is a lead rather than a source.

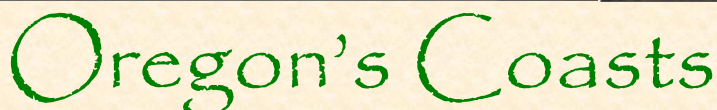
Scientifically credible

Newspaper article in *The Oregonian* that references back to a recent study conducted by OSU researchers. The researchers were subsequently contacted and confirmed that their work, mentioned in the recent media, had been accepted for publication in a peer-reviewed journal.

Appendix 2: Web Resources Information Mock-up

Web Resources



[illegible]

What does climate change mean for coastal Oregon?

Figure 1 is a scatter plot titled "Oregon Coast" showing "Land Movement Relative to Sea Level (mm/year)" on the y-axis (ranging from -4 to 4) versus "Latitude" on the x-axis (ranging from 42 to 46). The plot is divided into two regions by a vertical line at approximately latitude 44.5. To the left of this line, the text "Land is rising faster than eustatic sea level rise" is present. To the right, the text "Land is being submerged by rising sea level" is present. A blue double-headed arrow at the top indicates the "Oregon Coast" region, and a red double-headed arrow indicates the "Predominant Erosion Problem Areas" region. Data points are plotted for various locations: Coos Bay, Gear Beach, Seaside, Cannon Beach, Florence, Newport, Lincoln City, Tillamook, and Astoria. The data points show a general trend of decreasing land movement relative to sea level rise as latitude increases, with a significant drop around latitude 44.5.

Effects of sea level will be greatest on the coast north of Florence. Along the south coast, the coastal land is rising due to uplift.


What could a rise in sea level mean for coastal Oregon?



Coastal erosion, shoreline retreat, landslides are likely to increase.

Coastal erosion, shoreline retreat, and landslides are projected to increase as a result of sea level rise and increased winter precipitation. This rise in sea level will accelerate beach erosion. Increased erosion will affect the very existence of some beach areas and diminish (or eliminate) the value of some coastal properties. In addition, increased wave heights and storm hazards related to rising sea levels can be expected to affect bridges, tide gates, port facilities, and other public infrastructure (Resource Innovations, 2005).

Appendix 4: Oral History Information Mock-up



In their own words...

My mountain is Hikurangi and it was snowing in late October which is unusual for our area. I've seen such changes in the weather over time and believe we must be responsible to ensure our land doesn't run away to the sea or fall down a gully. When it comes right down to it, even though I own my land, I never really do. I am always just a caretaker. Really my children own it, and when they inherit the land then their children will own it. This is why we have to make the right decisions - for our children's future.

-Lance Rickard, agricultural consultant. Lance has spent all his life on a farm in eastern New Zealand where he has already witnessed the effects of climate change in his area, including erosion and changing weather patterns.

My family has been making maple syrup on our Trumbull County farm since just after the civil war, and it is abundantly clear to us that something is dreadfully wrong in the maple woodlots here. This warming may soon impair the ability of the farmers in this state to make a living from what they have been doing for over a hundred years.

-Tony and Joe Logan, northeastern Ohio maple syrup producers, on discovering premature maple tree buds after the warmest January on record.

"All the mountains were covered with glaciers. There isn't any deep snow anymore."

-Elisapee Ishulutaq, 78 year old native Inuit on the loss of ice and permafrost in Baffin Island, Canada. Loss of ice in the winter severely limits hunting and fishing, and thawing permafrost in the summer is creating more erosion.

References:
Lance Rickard <http://www.4million.org.nz/stories/carefulowners.php>
Tony and Joe Logan <http://www.stopglobalwarming.org/learn/read.asp?1101412172006>
Elisapee Ishulutaq <http://www.worldviewofglobalwarming.org/pages/artists.html>

Appendix 5: Corvallis Workshop PowerPoint Presentation

See accompanying CD

Appendix 6: Prineville Workshop PowerPoint Presentation

See accompanying CD

Appendix 7: Roseburg Workshop PowerPoint Presentation

See accompanying CD

Appendix 8: Prineville Workshop Science Information Handout

Is it all Hot Air?

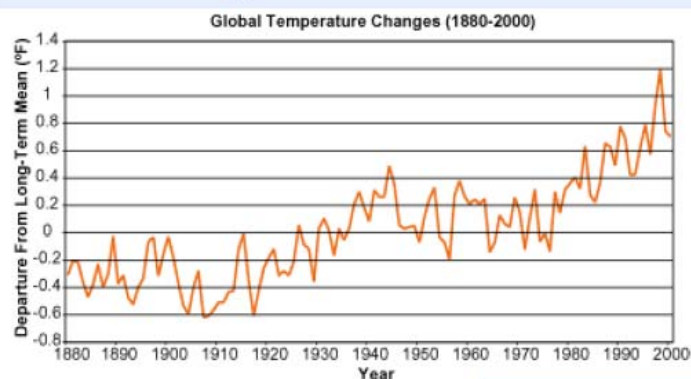
Climate Change, Global Warming & The Pacific Northwest

Oregon State University Institute for Natural Resources Climate Change Workshop May 2, 2006 Prineville, Oregon

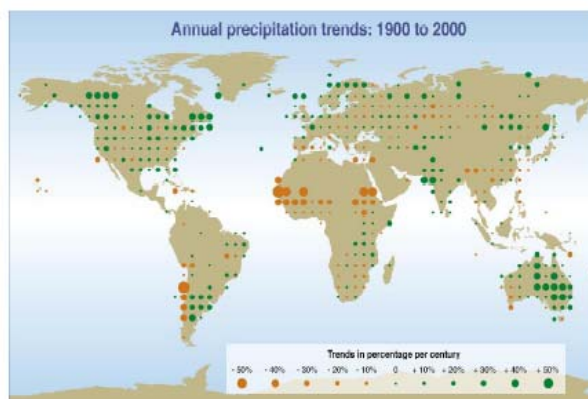
Purpose of this Talk



Global Climate Change Over the Last 100 Yrs

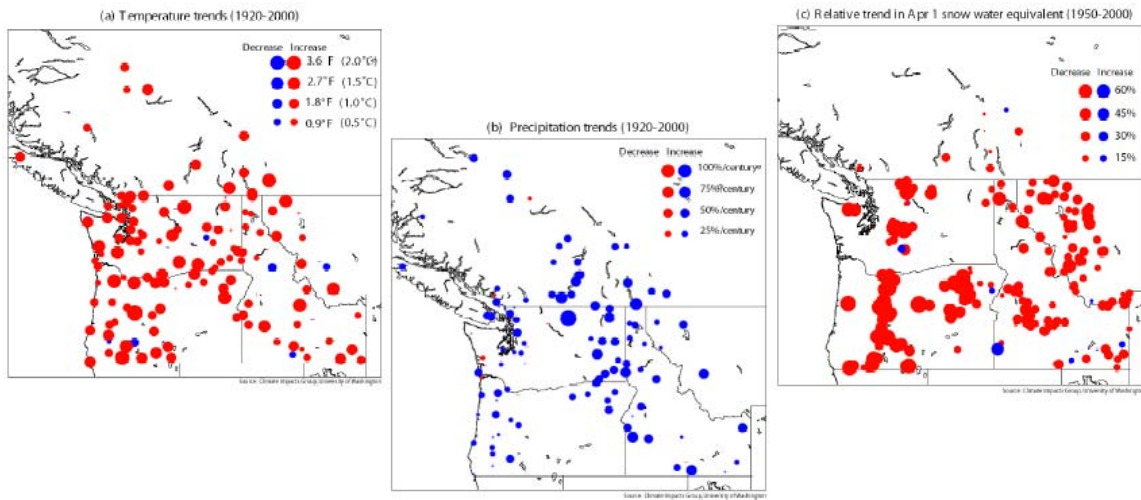


Source: US National Climate Data Center 2001

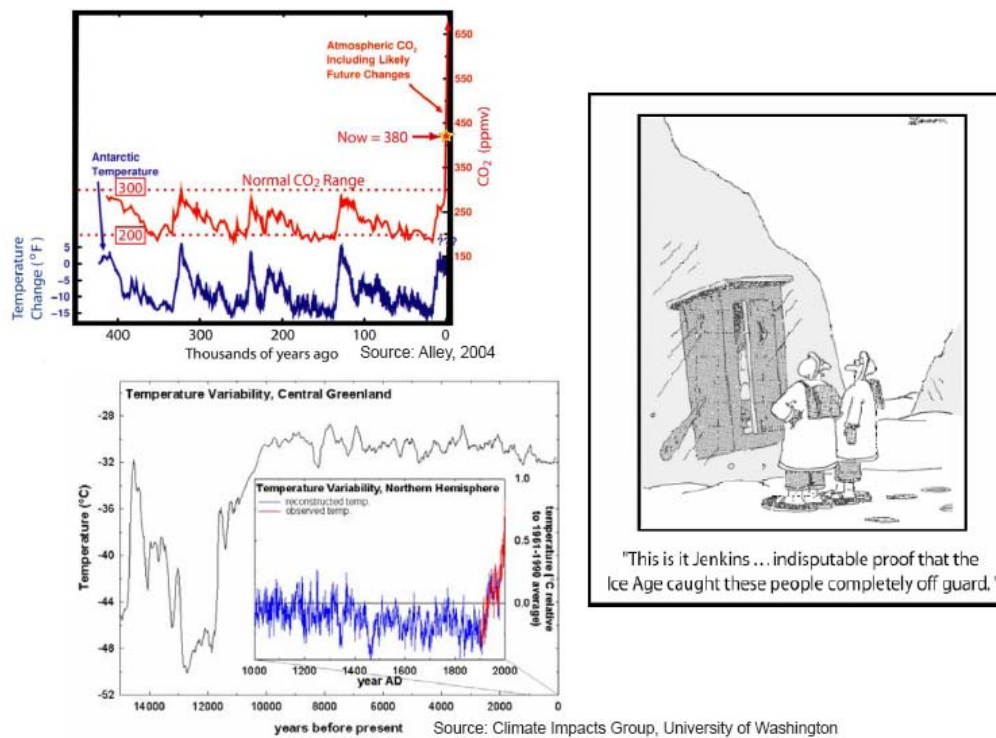


Source: IPCC 2001

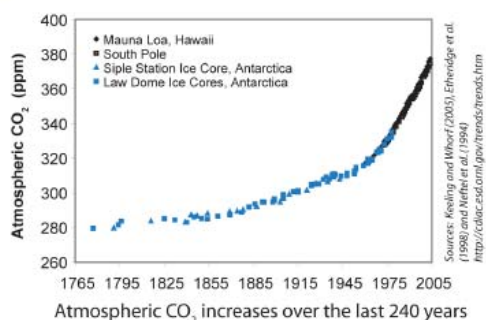
PNW Climate Change Over the Last 100 Yrs



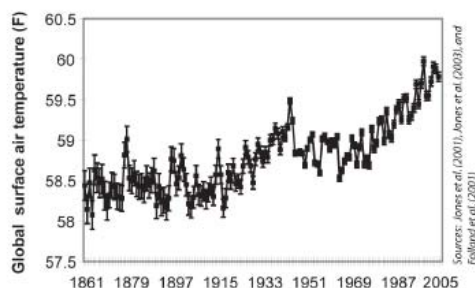
Global Climate Change over 1000s of Yrs



Trends in Emissions and Global Temperature



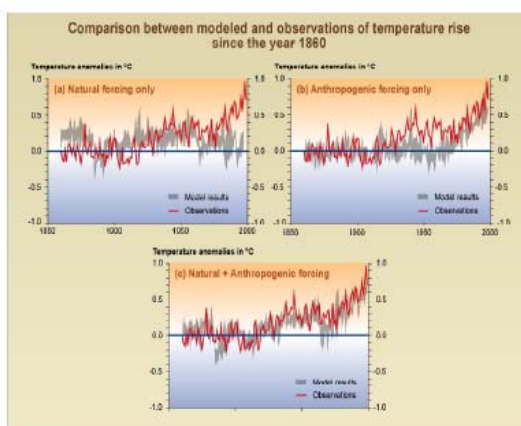
Source: Climate Impacts Group, University of Washington



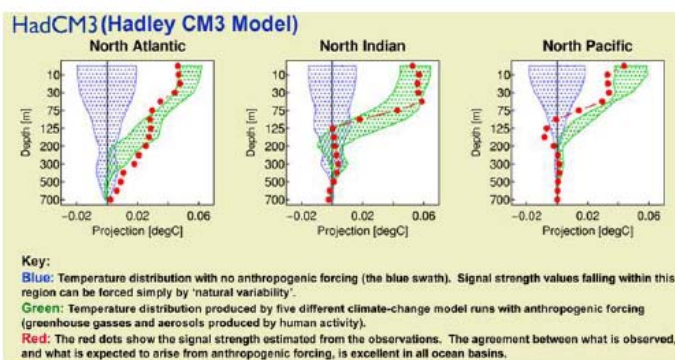
Global surface air temperature increases over the last 144 years

Source: Climate Impacts Group, University of Washington

Are We Causing Global Warming?

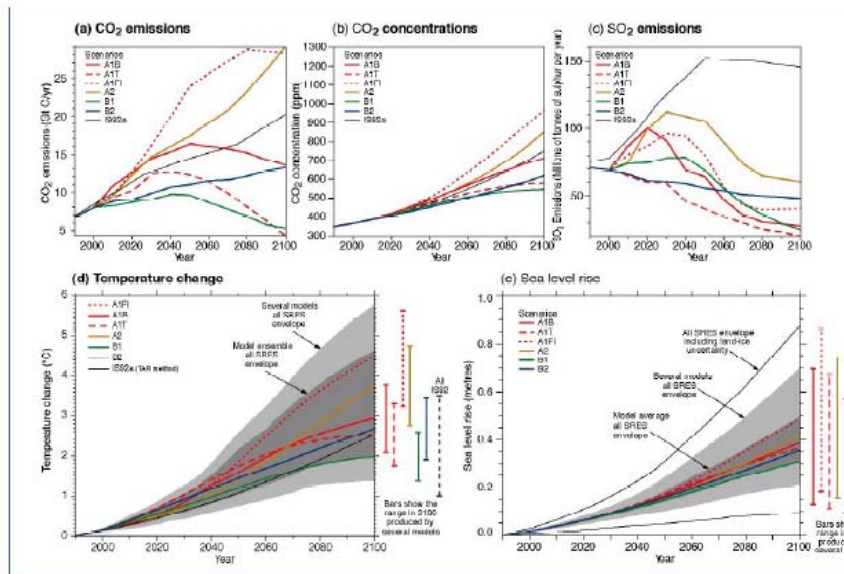


Source: IPCC 2001



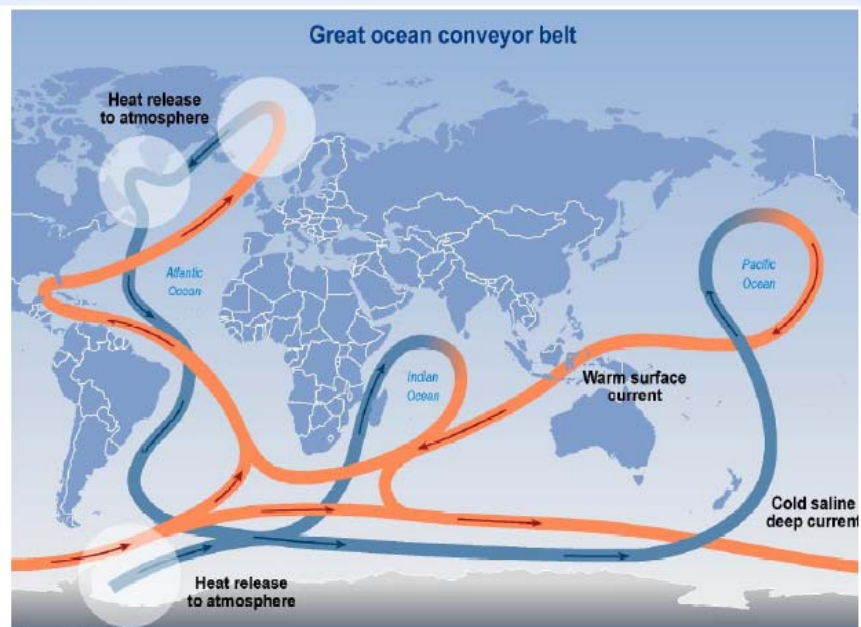
Barnett et al 2005

Global Warming in the 21st Century



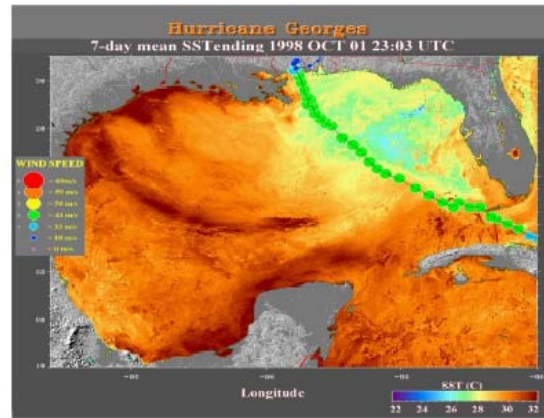
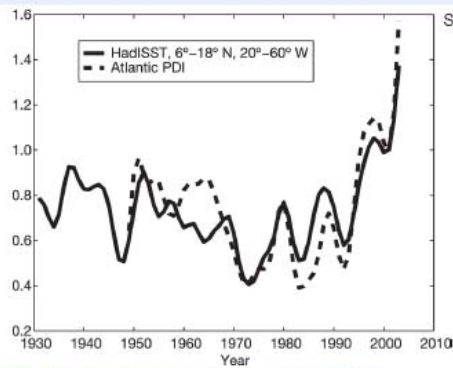
Source: IPCC 2001

Does This Extra Heat Matter?

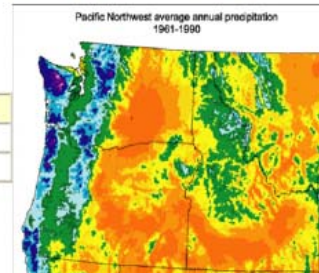
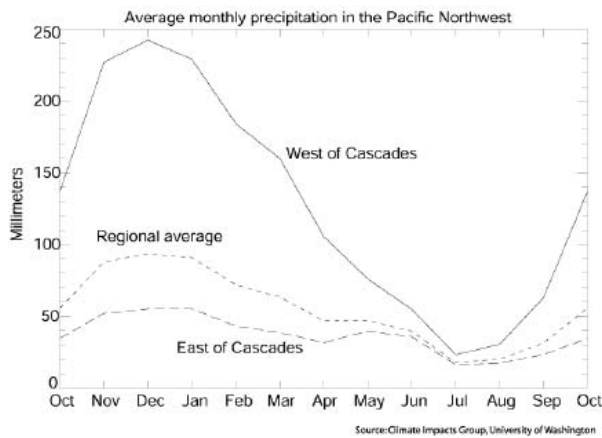


Source: IPCC 2001

Extra Heat and Hurricanes: Is there a link?

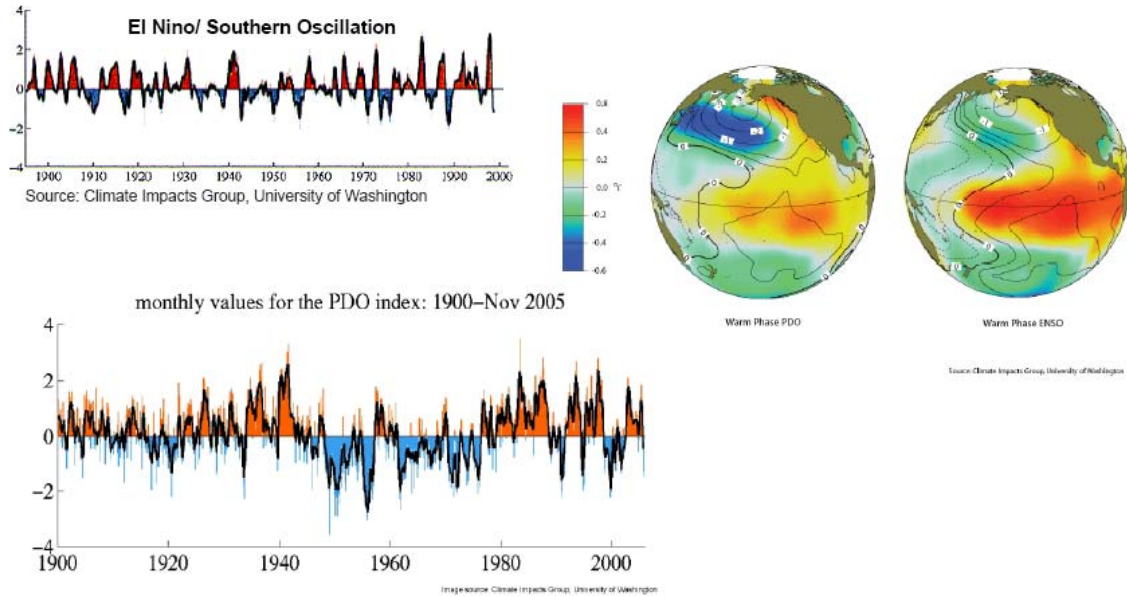


Climate Influences on the PNW: Land



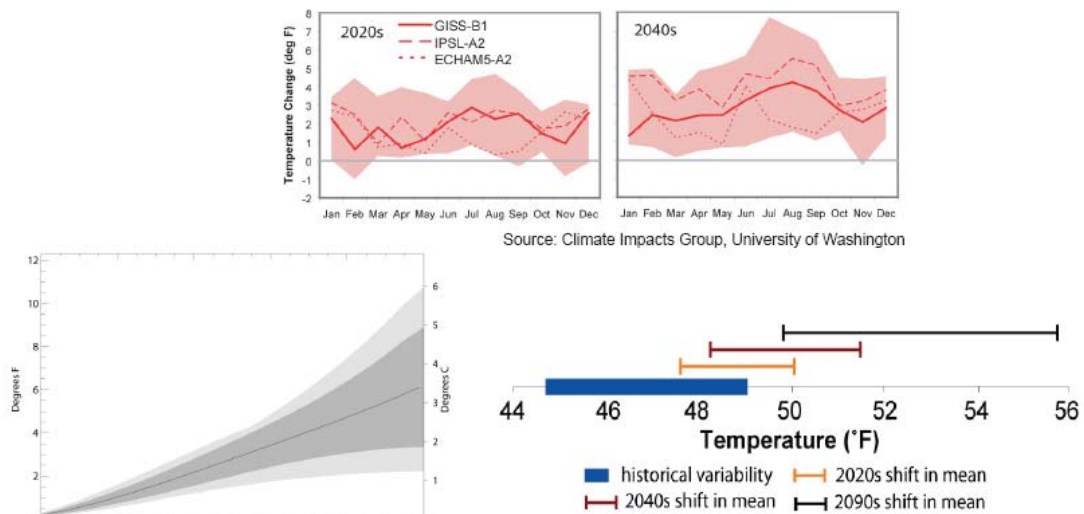
Coastal Sites	Summer High Temp	Interior PNW	Summer High Temp
North Bend, OR	66°F (19°C)	Bend, OR	82°F (28°C)
Long Beach, WA	66°F (19°C)	Richland, WA	90°F (32°C)

Climate Influences on the PNW: Ocean

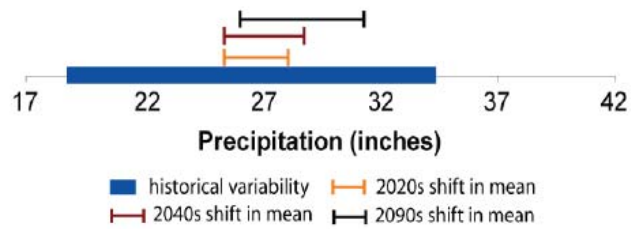


21st Century Changes in PNW Temperature

Temperature Change Compared to 1970-2000 Average



21st Century Changes in PNW Precipitation



2020s	Temperature (°F)	Precipitation (%)
low	0.7	-4
average	1.9	2
high	3.2	6

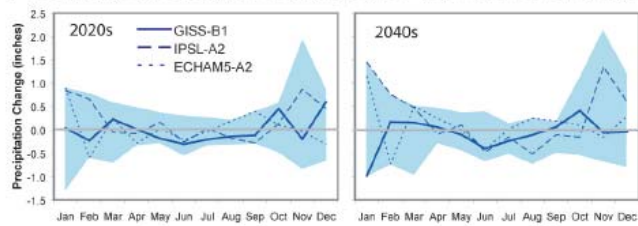
2040s	Temperature (°F)	Precipitation (%)
low	1.4	-4
average	2.9	2
high	4.6	9

2080s	Temperature (°F)	Precipitation (%)
low	2.9	-2
average	5.6	6
high	8.8	18

Projected changes in annual PNW temperature and precipitation

Source: Climate Impacts Group, University of Washington

Precipitation Change Compared to 1970-2000 Average



2001 & 2005 Predictions of PNW Climate

temperature	2020s		2040s	
(°C)	old	new	old	new
lowest	1.4	0.4	1.7	0.8
average	1.7	1.1	2.3	1.6
highest	2.1	1.8	2.9	2.6

Source: Climate Impacts Group, University of Washington

precipitation	2020s		2040s	
%	old	new	old	new
lowest	2	-4	-3	-4
average	6	2	4	2
highest	14	6	9	9

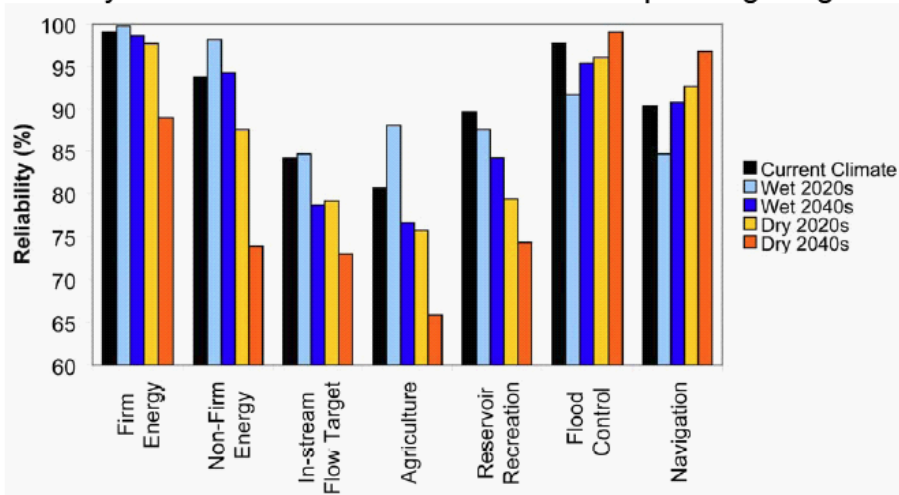
Source: Climate Impacts Group, University of Washington

Climate Impacts in the PNW from Global Warming

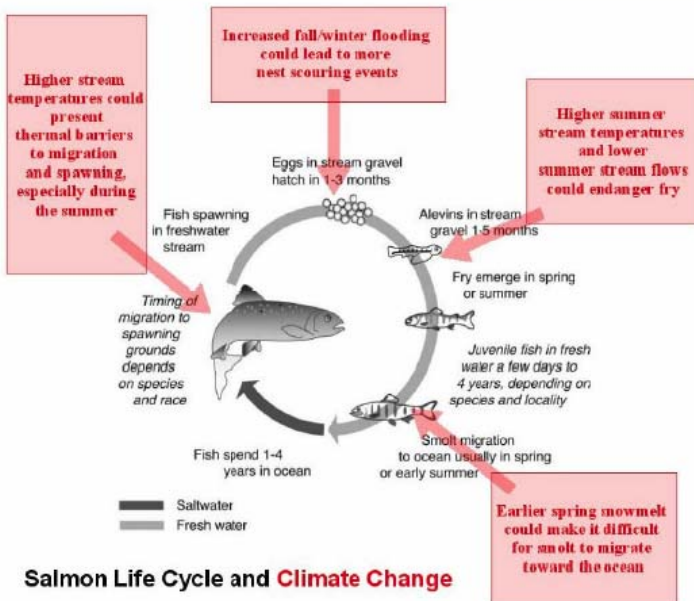


Climate Impacts: PNW Water Resources

Ability of Columbia R Reservoirs to Meet Operating Targets



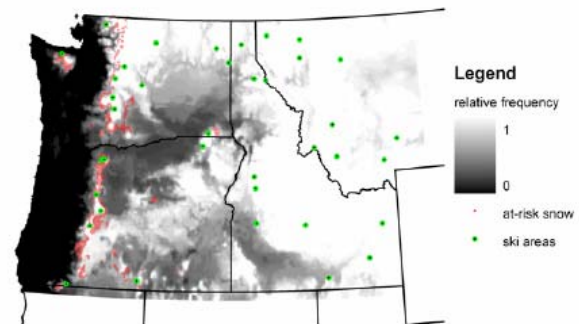
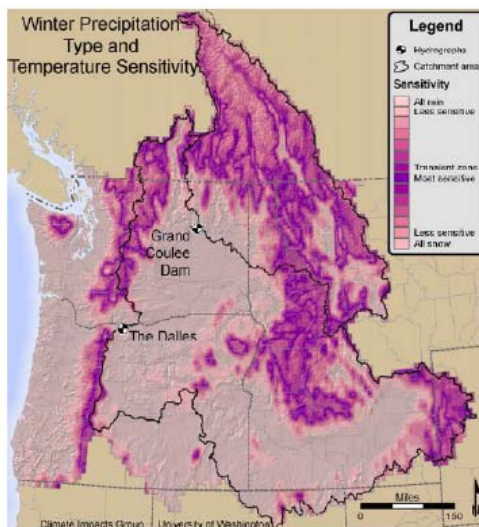
Water Resource Cases: Salmon



Source: Climate Impacts Group, University of Washington

Water Resource Case II: Snow Pack and Skiing

At Risk Snow and Ski Areas



Source: Nolin 2006

Appendix 9: Roseburg Workshop Science Information Handout

Oregon State University Institute for Natural Resources

Climate Change Workshop

Is It All Hot Air?

Climate Change, Global Warming & The Pacific Northwest

Purpose of this Talk

The Oregon State University Institute for Natural Resources is putting together materials to educate the public about climate change. The goal is to provide **reliable** and **relevant** science-based information about climate change and its causes and potential impacts on the Pacific Northwest. Reliable information constitutes sources that are both unbiased and timely. Relevant information is targeted to people's concerns about their own personal and family health and happiness, as well as local, regional, national and international extensions. This information is provided in the hope that it will help the public reach their own conclusions about the implications of climate change and global warming, and how they may choose to act, as an individual, community, state or nation.



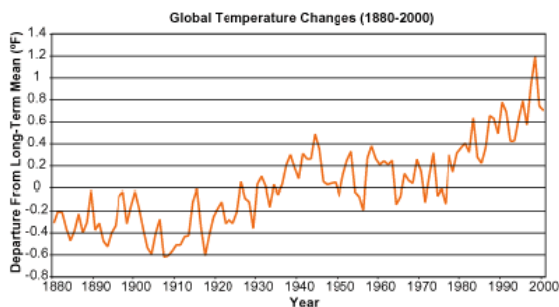
The Story of Climate Change

- Trends, observed global patterns indicating climate change
- Causes, drivers of the observed global trends
- Predictions, the future as speculated through science models
- Impacts, potential consequences to the Pacific Northwest

Trends

Global Climate Change Over the Last Hundred Years

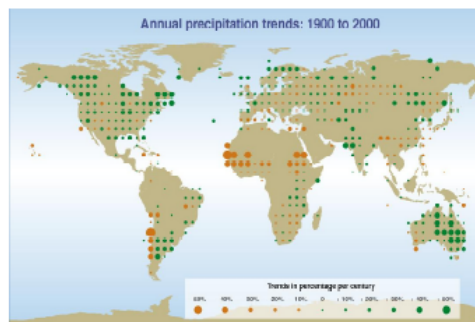
The past 100 years has shown some observable trends in global climate.



Source: US National Climate Data Center 2001

◀ The Earth's surface has warmed 1.1°F since 1900.

Changes in global rainfall patterns ▶
have been observed.

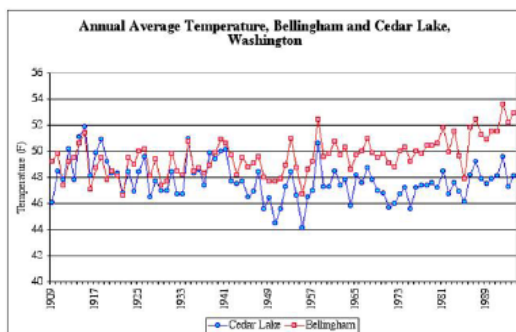


Source: IPCC 2001

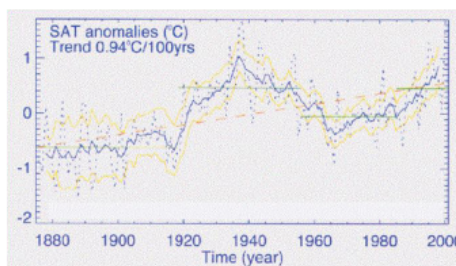
Alternate Views on Trends

Not all observations support the case for climate change.

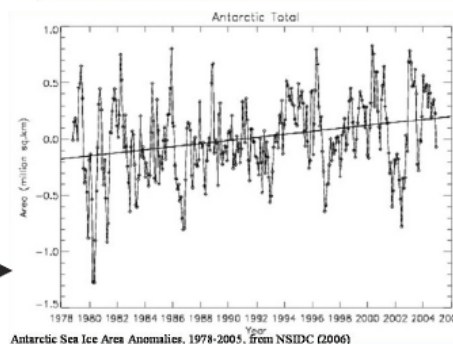
Regional temperatures haven't gone up everywhere



Arctic air temperatures are no higher now than they were in the 1930s and 1940s



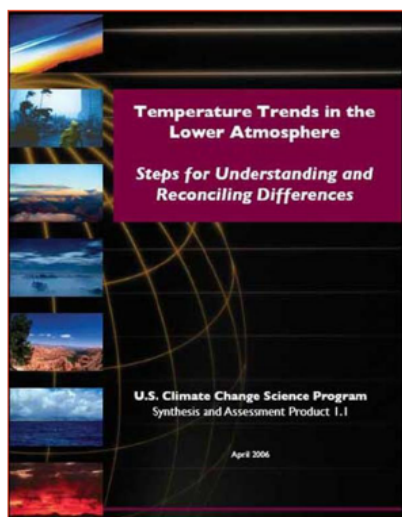
Polyakov, I. et al., 2002, Trends and Variations in Arctic Climate Systems. EOS, Transactions, American Geophysical Union, Vol. 83, 547-548.



Antarctic sea ice has increased in extent from 1978 to 2005

Reconciling Differences

Differences in trends and their interpretation can only be reconciled through debate and synthesis within the science community.



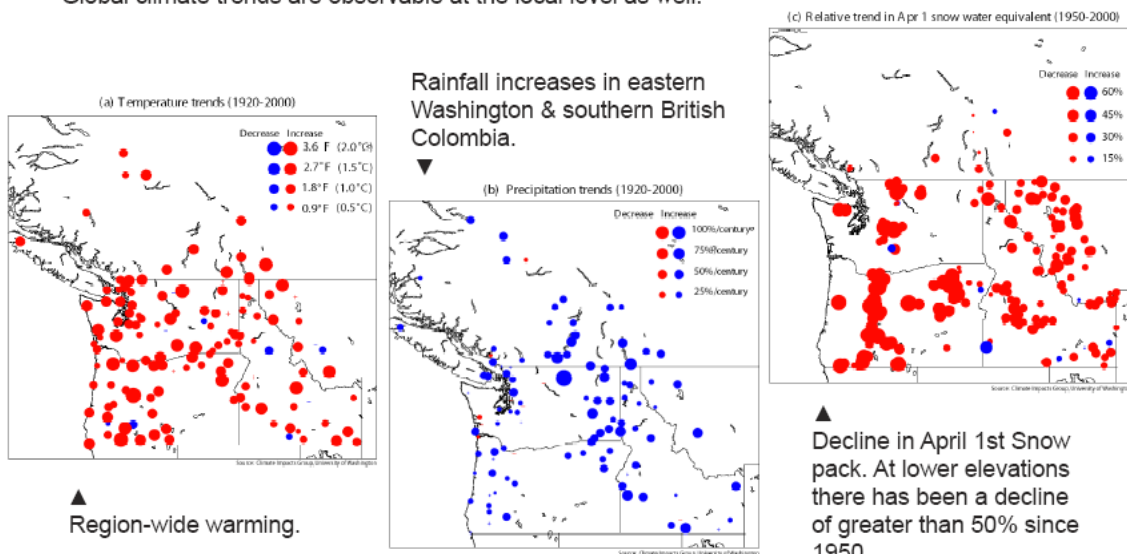
Excerpts:

Previously reported discrepancies between the amount of warming near the surface and higher in the atmosphere have been used to challenge the reliability of climate models and the reality of human-induced global warming. Specifically, surface data showed substantial global-average warming, while early versions of satellite and radiosonde data showed little or no warming above the surface. This significant discrepancy no longer exists because errors in the satellite and radiosonde data have been identified and corrected. New data sets have also been developed that do not show such discrepancies.

- The observed patterns of change over the past 50 years cannot be explained by natural processes alone⁵, nor by the effects of short-lived atmospheric constituents (such as aerosols and tropospheric ozone) alone.

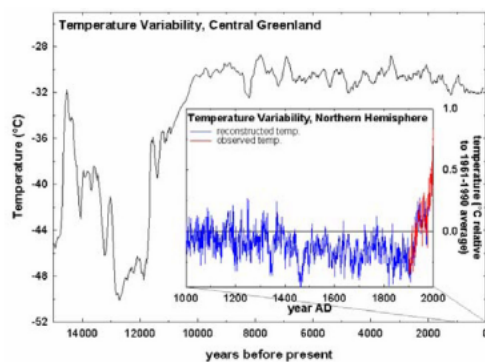
Pacific Northwest Climate Change Over the Last Hundred Years

Global climate trends are observable at the local level as well.



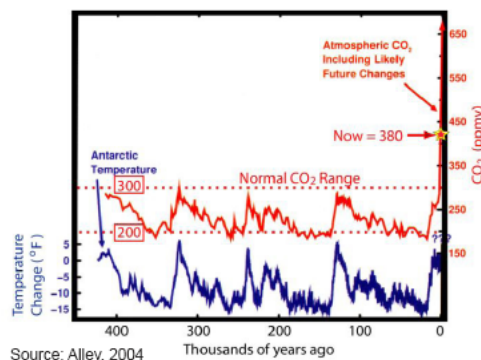
Global Climate Change over Thousands of Years

Global climate varies over time scales of 10,000 to 100,000 years. Even given this variability, the changes observed over the last hundred years, when compared to the climate record of the last 1,000 years, are dramatic.



▲ Northern hemisphere temperature variability is highly variable over geologic timescales.

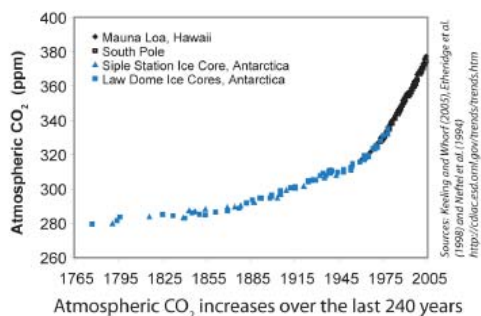
Recent changes in CO₂ and temperature are dramatic.



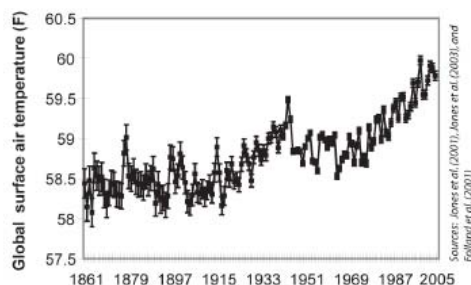
Causes

Trends in Emissions and Global Temperature

Levels of atmospheric CO₂ and global temperature show a similar pattern. Atmospheric CO₂ has increased 34% since 1750, and global temperature has increased 1.1°F in the past 100 years.



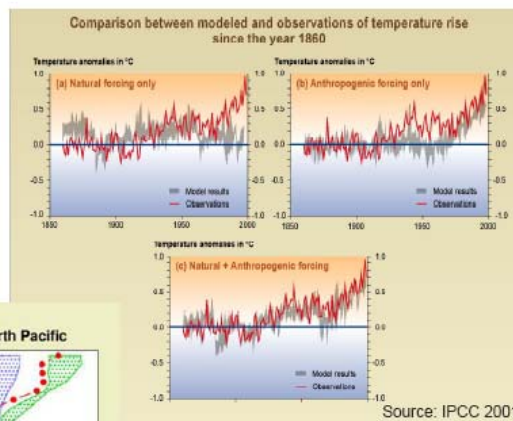
Source: Climate Impacts Group, University of Washington



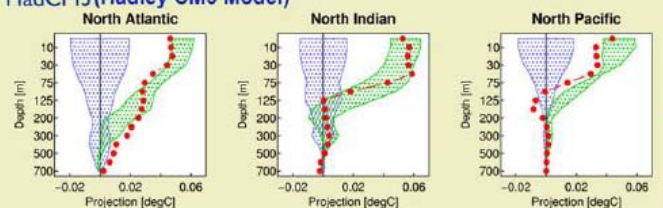
Source: Climate Impacts Group, University of Washington

Are We Causing Global Warming?

Modeling of air temperature and sea temperature shows that observed increases in temperature cannot be explained by natural influences alone. Only once human-sourced CO₂ is added in can we explain observed changes in global temperature.



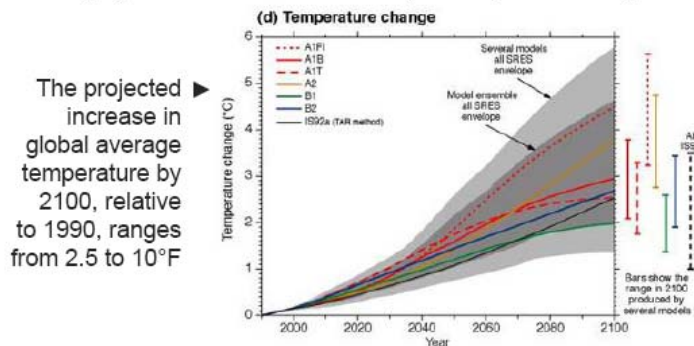
HadCM3 (Hadley CM3 Model)



Global Predictions

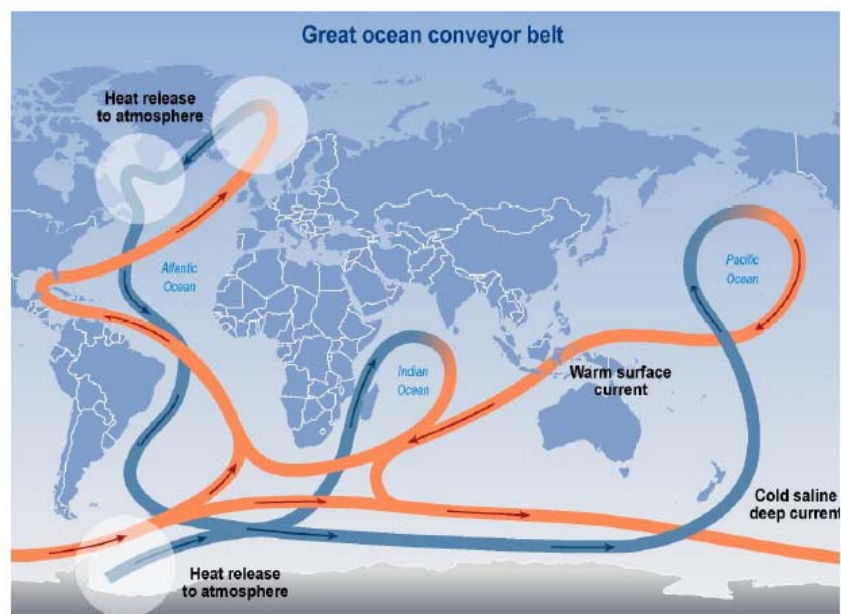
Global Warming in the 21st Century

We know the 21st century will be warmer, but projections of future greenhouse gas concentrations are highly uncertain and this makes precise prediction of global warming difficult.



Does This Extra Heat Matter?

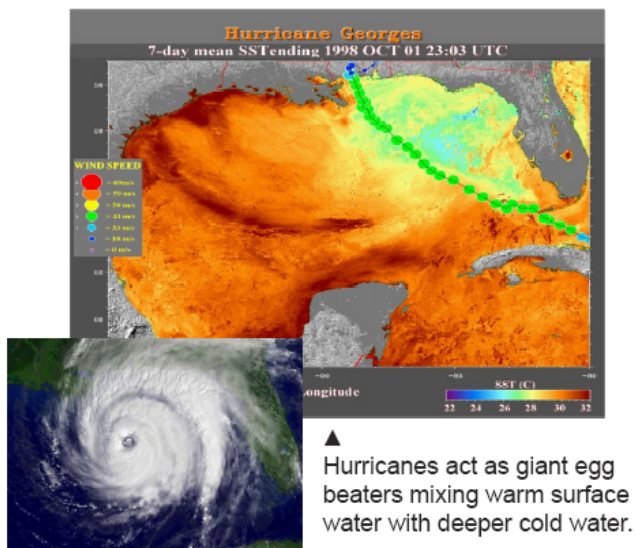
Currents in the Earth's oceans and atmosphere move heat from the tropics to the poles. Without this circulation the tropics would be much hotter and poles much colder. Heat drives this circulation, and therefore changes in the amount of heat available may alter global ocean and atmospheric circulation, affecting regional climates including the Pacific Northwest.



Source: IPCC 2001

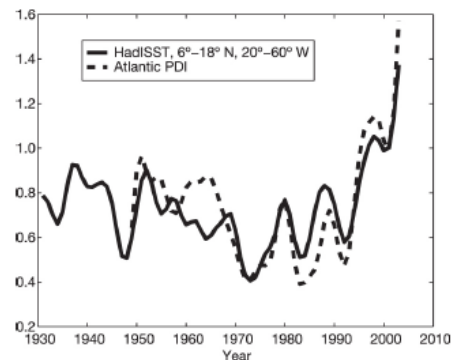
Extra Heat and Hurricanes: Is there a link?

No evidence has been shown to link global warming and hurricane **frequency**. However, a relationship has been observed between sea temperature and hurricane **intensity** (15% increase wind speed) and **duration** (60% increase in life time) since 1970.



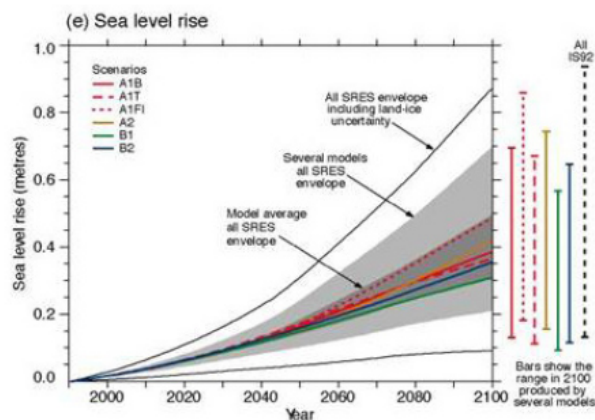
Intensity of North Atlantic hurricanes is increasing.

Total Power Dissipated by North Atlantic Hurricanes



Global Sea Level Rise

Models predict varying degrees of sea level rise through thermal expansion of the oceans and eventually melt water. Local seal level rise will vary due to the influence to local factors such as tectonic uplift and prevailing ocean conditions.



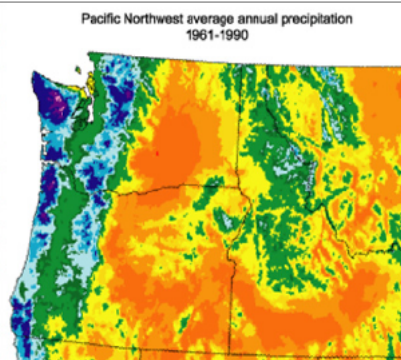
Pacific Northwest Predictions

Climate Influences on the Pacific Northwest: Topography

Regional topographic features, such as the Coastal and Cascade mountain ranges, influence local climate.

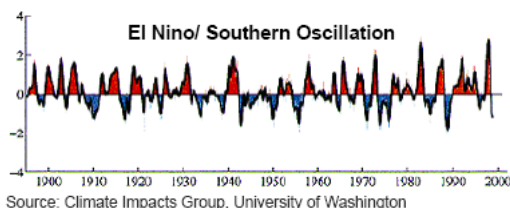


Precipitation patterns follow topography



Climate Influences on the Pacific Northwest: Ocean

The Pacific Northwest has two unique climate patterns that contribute to the variability of the region, the El Niño Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO).



Source: Climate Impacts Group, University of Washington

El Niño winters tend to be warmer and drier than average. La Niña winters tend to be cooler and wetter than average.

Warm phase PDO winters tend to be warmer and drier than average. Cool phase PDO winters tend to be cooler and wetter than average.

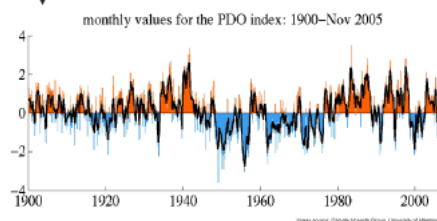
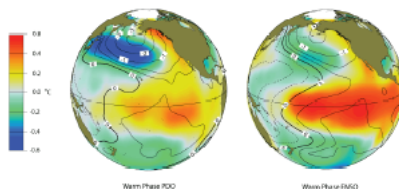


Figure Source: Climate Impacts Group, University of Washington



When the two events are in-phase the potential for temperature and precipitation extremes increases

2001 & 2005 Predictions of Pacific Northwest Climate

In 2005 new and more sophisticated global climate change models were released. The University of Washington used the new models to look at PNW climate predictions. The new models show smaller temperature increases and drier 2020 precipitation projections, as well as greater warming in summer than in winter. The old models showed more warming in winter than summer.

temperature	2020s		2040s	
(°C)	old	new	old	new
lowest	1.4	0.4	1.7	0.8
average	1.7	1.1	2.3	1.6
highest	2.1	1.8	2.9	2.6

Source: Climate Impacts Group, University of Washington

precipitation	2020s		2040s	
%	old	new	old	new
lowest	2	-4	-3	-4
average	6	2	4	2
highest	14	6	9	9

Source: Climate Impacts Group, University of Washington

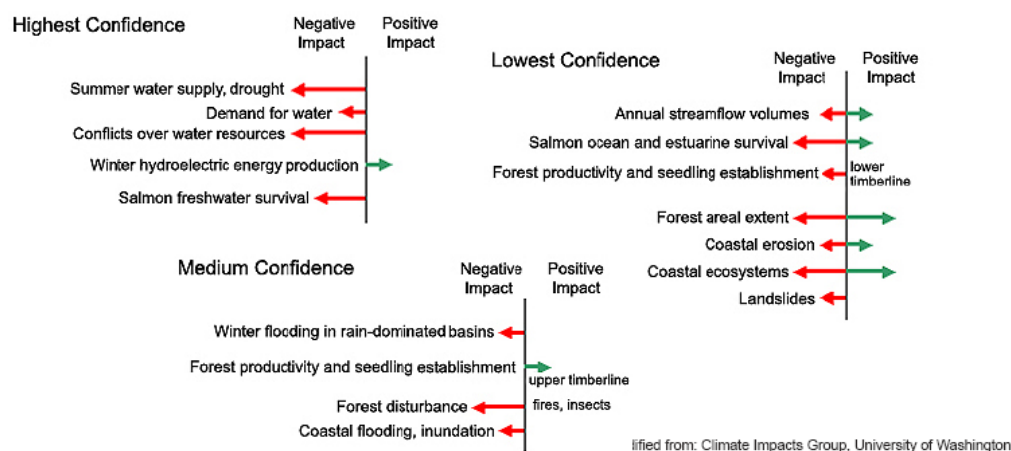
Recent models show new predictions for changes in regional temperature and precipitation, as compared with earlier models.

Pacific Northwest Impacts

Scientific Consensus on Impacts on the Pacific Northwest from Global Warming

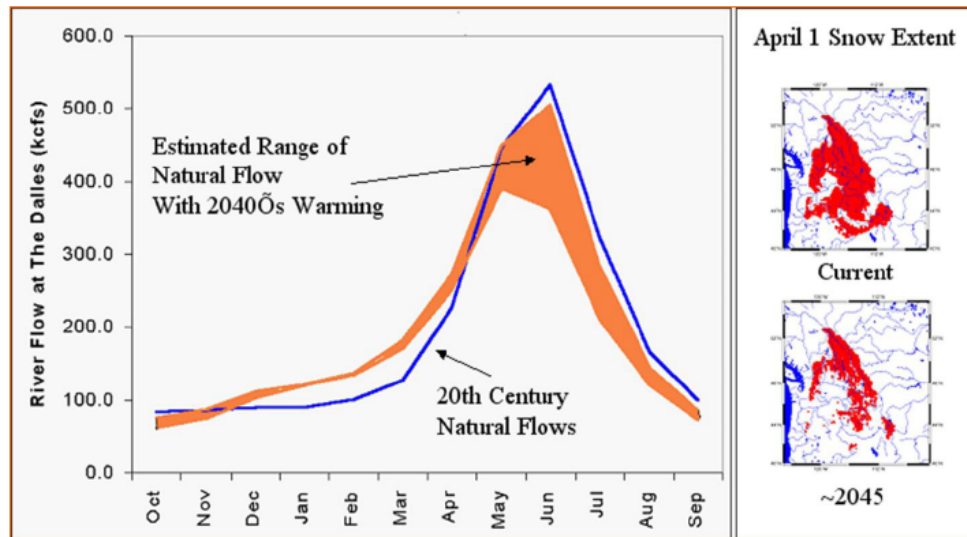
Negative impacts on Pacific Northwest water resources include:

- reduction in snowpack
- stresses on endangered salmon
- impacts on east-side forests with slower growth and more fires from warmer summer
- local population losses of wildlife and plants if climate shifts are faster than ability to migrate
- increased beach erosion and beach loss along the Northern Oregon Coast



Climate Impacts: Pacific Northwest Water Resources

Warmer 21st century temperatures would mean less winter snow accumulation, higher winter stream flows, earlier spring snowmelt, earlier peak spring stream flow, and lower summer stream flows.



Source: Climate Impacts Group, University of Washington

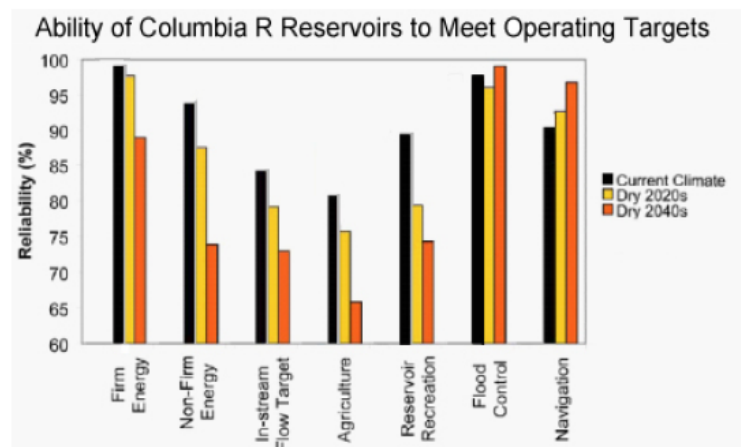
▲ Predicted Columbia River Flows in 2040

Water Resource Case I: Water Allocation Conflicts

Earlier peak river flows, lower summer streamflows, and lengthened summer low flow will heighten competition over water use for:

- Hydropower generation
- Instream flow protection for endangered species
- Irrigation
- Recreation

Issues facing
Columbia River
reservoirs based on
the drier predictions
of new climate
change models.

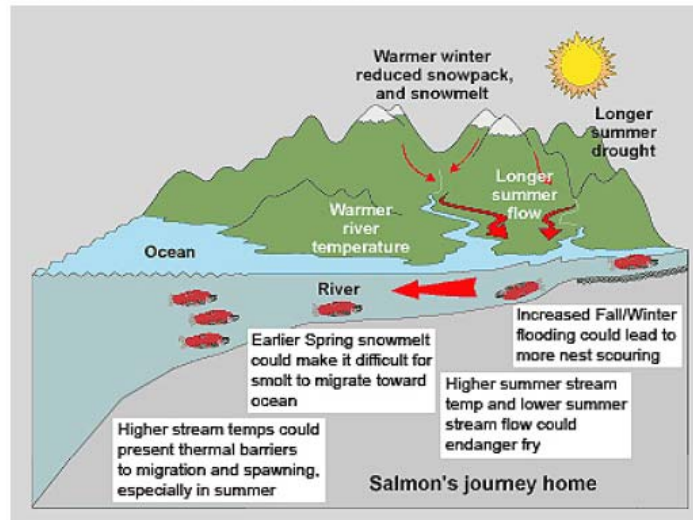


Modified from: Climate Impacts Group, University of Washington

Water Resource Cases: Salmon

Changes in annual patterns of stream flow will be detrimental to salmon rearing, migration and spawning in some transient river systems. Increased water temperatures in summer may exceed the tolerable limits for trout and salmon. There may be Endangered Species Act implications for power generation & irrigation through higher in-stream flow standards.

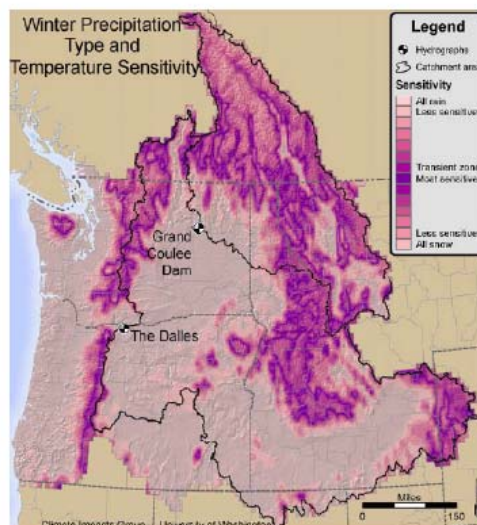
Major impacts of
climate change
on the life cycle
of Salmon



Modified from: Climate Impacts Group, University of Washington

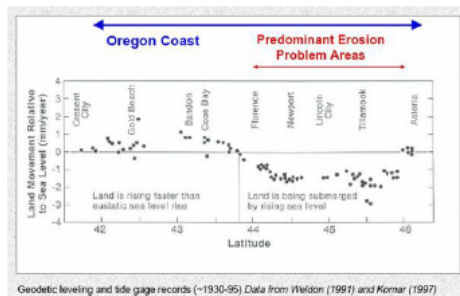
Water Resource Case II: Snow Pack and Skiing

Warmer winter temperatures would mean later opening dates, shorter seasons and more rainy days for ski areas below 5,000'



Sea Level Rise and Coastal Erosion

Predicted sea level rise will increase coastal erosion hazards along the northern Oregon coast. This hazard is most severe occur during El Niño events when local sea level is higher.



▲ Points north of Florence are likely to experience the effects of rising sea level.



Fishing Rock Oregon Coast

Source: Sea Grant

Adapting to and Mitigating Climate Change in the Pacific Northwest

When looking at the issue of climate change in the Pacific Northwest, it is important to recognize that the past is not a reliable guide to the future. Climate change considerations will need to be integrated into planning processes, including an honest appraisal of current policies. Additionally, it is important to monitor regional climate and resources for medium and long-term change. Adaptability in the face of the unexpected will likely be important.

Mitigation strategies that make economic and environmental sense include:

- Green energy generation initiatives
- Fuel and energy efficiency
- Water resource conservation measures

Summary

- Climate change is happening globally and in the Pacific Northwest.
- Humans are contributing to global warming and climate change in a measurable way.
- The quickest and greatest impact in the Pacific Northwest will be on water resources due to more rain and less snow at lower elevations.
- These water resource impacts will cause increased conflict over water for irrigation, instream flows and electricity generation.
- IF we exercise foresight now through sound planning and use of readily available technology, the Pacific Northwest is well placed to deal with climate change and global warming.

Appendix 10: Project Overview Handout

Institute for Natural Resources

Created by the Oregon Legislature with the Oregon Sustainability Act of 2001, the Institute for Natural Resources (INR) works to provide Oregon leaders with ready access to current, science-based information and methods for better understanding our resource management challenges and developing solutions. INR expands OSU's leadership role in coordinating research, supporting policy analysis, and facilitating information-sharing, and actions, by partnering with natural resources agencies, other universities, private businesses, conservation groups, and local to national levels of government.

Climate Change Outreach Project Overview

The Governor's Advisory Group on Global Warming recommended a comprehensive Oregon Strategy for Greenhouse Gas Reductions. The diverse Advisory Group members worked together over many months to understand the nature of climate change and its likely impacts on the Pacific Northwest. Governor Kulongoski has accepted the Strategy and embraced its recommendations.

This initiative is being undertaken because broader public understanding and greater public awareness is needed to implement the Working Group's recommendations. And, policy-makers need to be informed by what people in key sectors of Oregon's economy can tell us about the risks and costs of climate change and the opportunity for mitigation in their sectors. The objectives of the project are to:

- 1) Translate the scientific information on the impacts of climate change in the Pacific Northwest into formats, language and presentations accessible to non-professional audiences; and,
- 2) Engage opinion leaders from various geographic locations and sectors outside the usual organizations involved in climate change issues, who can review the scientific evidence and, if they subsequently decide that climate change is a concern for their areas and/or sector, tell a compelling story to their communities and to the state's leadership about why Oregon should care about climate change.

This project is being organized by the Institute for Natural Resources at Oregon State University, is funded by the Energy Foundation, and is supported by Oregon Sea Grant.

Appendix 11: Workshop Agendas

Climate Change Outreach Project

Tuesday, 18 April 2006

5:45PM – 8:30PM

Valley Library, Room 3622

Oregon State University

Corvallis, Oregon

Draft Agenda

Time	Topic
5:45-6:15	Welcome and Dinner – <i>Lisa Gaines</i>
6:15 -6:30	Workshop Introduction – <i>Welcome/Logistics, About Project, Motivation to Participate, Workshop Objectives, Framing Climate Change for Tonight</i>
6:30-8:15	Climate Change Effects and Discussion – <i>David Yaden</i>
8:15-8:30	Evaluation – <i>Lisa Gaines</i>
8:30	Adjourn

Climate Change Outreach Project

Tuesday, 2 May 2006

5:45PM – 8:30PM

Stafford Inn

Prineville, Oregon

Workshop Objectives

To consider the science of climate change and its effects in the Pacific Northwest

To give you the opportunity to tell us what climate change might mean to you as a citizen and for your professional, business, and other interests

By end of evening we hope to give you enough information and have enough discussion to answer, or give you a good start at answering, the following questions:

1. Does climate change matter? (How much does climate change matter?)
2. Why do you feel that way? (What is it about climate change that you think is important? What effects or information led you to feel that way?)
3. What do you think we should be doing about climate change, if anything?

Draft Agenda

Time	Topic
5:45-6:15	Welcome and Dinner – <i>all</i>
6:15 -6:30	Workshop Introduction – <i>Lisa Gaines, INR</i>
6:30-7:15	Presentation: <i>Is It All Hot Air?</i> – <i>Michael Harte, OSU Sea Grant Extension</i>
7:15-8:15	Facilitated Discussion – <i>David Yaden, consultant</i>
8:15-8:30	Evaluation – <i>Lisa Gaines, INR</i>
8:30	Adjourn

This project is being organized by the Institute for Natural Resources at Oregon State University, is funded by the Energy Foundation, and is supported by Oregon Sea Grant.

Climate Change Outreach Project

Thursday, 11 May 2006

5:30PM – 8:15PM

Holiday Inn

Roseburg, Oregon

Workshop Objectives

To present reliable and relevant science-based information about climate change, its causes and its effects on the Pacific Northwest.

By giving you the opportunity to tell us what climate change might mean to you as a citizen and for your professional, business, and other interests, to identify ways of disseminating this information at the grass root level in Oregon communities so people are better informed about the climate change and global warming issue.

By end of evening we hope to give you enough information and have enough discussion to answer, or give you a good start at answering, the following questions:

1. Does climate change matter? (How much does climate change matter?)
2. Why do you feel that way? (What is it about climate change that you think is important? What effects or information led you to feel that way?)
3. What do you think we should be doing about climate change, if anything?

Draft Agenda

Time	Topic
5:30	Welcome and Dinner – <i>all</i>
5:45 -6:00	Workshop Introduction – <i>Lisa Gaines, INR</i>
6:00-6:45	Presentation: <i>Is It All Hot Air?</i> – <i>Michael Harte, OSU Sea Grant Extension</i>
6:45-7:00	Questions about Presentation – <i>Lisa Gaines, INR</i>
7:00-8:10	Facilitated Discussion – <i>David Yaden, consultant</i>
8:10-8:15	Evaluation – <i>Lisa Gaines, INR</i>
8:15	Adjourn

This project is being organized by the Institute for Natural Resources at Oregon State University, is funded by the Energy Foundation, and is supported by Oregon Sea Grant.

Appendix 12: Corvallis Workshop Participant Evaluation Results

Numbers in **bold** indicate the number of participant responses, participant comments are in *italics*.

Climate Change Outreach Project Evaluation

Corvallis Workshop, 18 April 2006

This evaluation includes items about a variety of aspects of the workshop. Please give an overall rating of each aspect and also check any specific strengths or concerns that match your experience in the workshop. Your input will help us improve future workshops.

Workshop Organization

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
2 commendable 9 good 3 okay 1 needs improvement	14 invitations were sent in a timely manner 2 objectives were clear 7 workshop implementation matched workshop objectives 9 workshop was well-organized <i>Other strengths?</i>	8 objectives were not clear 0 objectives were not met 4 workshop fell behind schedule 6 more time was needed 2 less time was needed <i>Other concerns?</i>

Workshop Content

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
3 commendable 6 good 5 okay 1 needs improvement	5 good breadth 2 good depth 7 relevant to local issues and concerns 0 appropriately challenging <i>Other strengths?</i>	3 assumed too much prior knowledge 2 did not relate to local issues and concerns 2 too narrow <i>Other concerns?</i>

Presenting

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
3 commendable 9 good 4 okay 0 needs improvement	6 stimulated interest 5 engaging speaking style 8 key ideas emphasized 6 focused on science 6 easy to understand 1 effective examples 2 good summaries provided <i>Other strengths?</i>	0 speech was hard to understand 1 unclear explanations 0 talked too fast 4 not enough examples 4 unhelpful examples 6 seemed biased, not objective 3 seemed sensationalized <i>Other concerns?</i>

Visual Aids

Overall Rating (please check one)	Specific Strengths (check all that apply)	Specific Concerns (Check all that apply)
1 commendable 9 good 3 okay 2 needs improvement	8 well-organized 6 emphasized key points 4 appropriately detailed 2 very helpful to my learning 2 well-designed 5 focused on the science of climate change <i>Other strengths?</i>	4 confusing graphics 1 wordy 3 not enough written explanation 1 difficult to understand 1 not used well during presentation <i>Other concerns?</i>

Interaction and Discussion

Overall Rating (please check one)	Specific Strengths (check all that apply)	Specific Concerns (Check all that apply)
9 commendable 5 good 0 okay 1 needs improvement	11 discussion was well managed 8 responded well to questions and comments 13 encouraged active participation 8 right amount of interaction for the number of people 14 participant contributions valued 4 thorough follow-up to questions and concerns <i>Other strengths?</i>	0 not enough interaction 0 too few participants 1 not enough opportunities to participate 0 presenter didn't respond effectively to questions 1 too controlled 0 inequitable distribution of participation 0 participant contributions not acknowledged <i>Other concerns?</i>

Please tell us anything else you think we should know about the workshop so that we can make improvements for future workshops and so that we can improve the project as a whole.

If you would be interested in somehow continuing your participation with the Climate Change Outreach Project, please write your name here.

Thank you for your time!

Appendix 13: Prineville Workshop Participant Evaluation Results

Numbers in **bold** indicate the number of participant responses, participant comments are in *italics*.

Climate Change Outreach Project Evaluation

Prineville Workshop, 2 May 2006

This evaluation includes items about a variety of aspects of the workshop. Please give an overall rating of each aspect and also check any specific strengths or concerns that match your experience in the workshop. Your input will help us shape our outreach materials development and future workshops.

Workshop Organization

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
2 commendable 8 good 3 okay 0 needs improvement	11 invitations were sent in a timely manner 8 objectives were clear 7 workshop implementation matched workshop objectives 8 workshop was well-organized <u>Other strengths?</u> <i>good research, excellent moderator</i> <i>current meeting format is good and it sparked good discussion</i> <i>good food, nice to have some scientists in Prineville</i>	2 objectives were not clear 1 objectives were not met 4 workshop fell behind schedule 7 more time was needed 0 less time was needed <u>Other concerns?</u>

Workshop Content

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
5 commendable 5 good 2 okay 0 needs improvement	5 good breadth 6 good depth 7 relevant to local issues and concerns 9 appropriately challenging <u>Other strengths?</u> <i>very impressed with Mr. Harte's presentation</i>	0 assumed too much prior knowledge 1 did not relate to local issues and concerns 3 too narrow <u>Other concerns?</u> <i>intended to sway opinions, not just provide information – “conviction or manslaughter” infers we ought to agree (jury of peers verse just the presenter)</i> <i>did not have George Taylor's graph of sea temperatures & correlation to salmon runs in PNW vs. Alaska</i>

		<p><i>need more time to get down to local programs and objectives of relevance</i></p> <p><i>100 year time slot for gathering information for support is not long enough time for conclusion of fact</i></p> <p><i>What can you do? It's like talking about religion</i></p>
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Presenting

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
7 commendable 6 good 0 okay 0 needs improvement	7 stimulated interest 9 engaging speaking style 10 key ideas emphasized 11 focused on science – 7 easy to understand 5 effective examples 5 good summaries provided <u>Other strengths?</u>	0 speech was hard to understand 0 unclear explanations 1 talked too fast – a little 1 not enough examples 1 unhelpful examples 2 seemed biased, not objective 0 seemed sensationalized <u>Other concerns?</u> <i>some of the problems with water, fish habitat, etc. are much more complex than just global warming</i> <i>not enough examples – e.g., sea level change impacts, translation of decreased snow pack to <u>available</u> water supply</i>

Visual Aids

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
4 commendable 7 good 0 okay 2 needs improvement	9 well-organized 9 emphasized key points 5 appropriately detailed 5 very helpful to my learning 4 well-designed 7 focused on the science of climate change <u>Other strengths?</u>	3 confusing graphics 1 wordy 1 not enough written explanation 1 difficult to understand (but well explained) 0 not used well during presentation <u>Other concerns?</u> <i>way too much info on slides, just had to assume Mike's conclusions were rational</i> <i>not enough examples – e.g., sea level change impacts, translation of decreased snow pack to <u>available</u> water supply</i>

Interaction and Discussion

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
5 commendable 6 good 2 okay 0 needs improvement	9 discussion was well managed 5 responded well to questions and comments 11 encouraged active participation 9 right amount of interaction for the number of people 8 participant contributions valued 5 thorough follow-up to questions and concerns <u>Other strengths?</u> <i>excellent</i>	1 not enough interaction 0 too few participants 2 not enough opportunities to participate 0 presenter didn't respond effectively to questions 2 too controlled 1 inequitable distribution of participation 0 participant contributions not acknowledged <u>Other concerns?</u> <i>Hard stuff to work through</i> <i>Needed more response from science</i>

Please tell us anything else you think we should know about the workshop so that we can make improvements for future workshops and so that we can improve the project as a whole.

Good discussion – format okay

Interaction was too short and didn't tie in to the objectives well. Don't feel the project was interested in some ideas we presented

I believe the concept is appropriate – be alert not to sensationalize it. We are in such a small pinpoint of time – people do not understand that

Some thought to perception of long-term environmental damage would be useful

If you would be interested in somehow continuing your participation with the Climate Change Outreach Project, please write your name here.

Thank you for your time!

Appendix 14: Roseburg Workshop Participant Evaluation Results

Numbers in **bold** indicate the number of participant responses, participant comments are in *italics*.

Climate Change Outreach Project Evaluation

Roseburg Workshop, 11 May 2006

This evaluation includes items about a variety of aspects of the workshop. Please give an overall rating of each aspect and also check any specific strengths or concerns that match your experience in the workshop. Your input will help us shape our outreach materials development and future workshops.

Workshop Organization

Overall Rating (please check one)	Specific Strengths (check all that apply)	Specific Concerns (Check all that apply)
7 commendable 6 good 4 okay 0 needs improvement	16 invitations were sent in a timely manner 7 objectives were clear 4 workshop implementation matched workshop objectives 13 workshop was well-organized <u>Other strengths?</u> <i>Good job keeping on track</i> <i>Lisa, in particular was good</i> <i>Good scientific presentation</i> <i>Very good technical presentation</i>	8 objectives were not clear 1 objectives were not met 3 workshop fell behind schedule 3 more time was needed 1 less time was needed <u>Other concerns?</u> <i>Too technical</i> <i>Technical presentation too long</i> <i>Should have participant introductions</i> <i>Questions pushed into biasness</i> <i>Tell us who you decided to invite</i>

Workshop Content

Overall Rating (please check one)	Specific Strengths (check all that apply)	Specific Concerns (Check all that apply)
5 commendable 6 good 8 okay 0 needs improvement	10 good breadth 8 good depth 7 relevant to local issues and concerns 9 appropriately challenging <u>Other strengths?</u> <i>Good gathering of diverse people</i>	1 assumed too much prior knowledge 1 did not relate to local issues and concerns 2 too narrow <u>Other concerns?</u> <i>Too bias (3 people said this)</i> <i>Discussion questions presumed that people believed global warming was a problem</i>

		Too heavy on models
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Presenting

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
5 commendable 10 good 0 okay 1 needs improvement	9 stimulated interest 8 engaging speaking style 7 key ideas emphasized 11 focused on science 10 easy to understand 10 effective examples 7 good summaries provided <u>Other strengths?</u>	0 speech was hard to understand 0 unclear explanations 0 talked too fast 2 not enough examples 0 unhelpful examples 6 seemed biased, not objective 1 seemed sensationalized <u>Other concerns?</u> <i>Bias of speakers was apparent</i> <i>Conflicting statements</i> <i>Need more time</i> <i>Seemed presentation got a captive audience in order to force an agenda in the discussion</i>

Visual Aids

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
6 commendable 8 good 0 okay 1 needs improvement	12 well-organized 8 emphasized key points 7 appropriately detailed 5 very helpful to my learning 4 well-designed 10 focused on the science of climate change <u>Other strengths?</u> <i>Nice handouts</i> <i>More needed</i> <i>Nice blown-up images</i>	0 confusing graphics 0 wordy 0 not enough written explanation 0 difficult to understand 0 not used well during presentation <u>Other concerns?</u> Bias

Interaction and Discussion

<u>Overall Rating</u> (please check one)	<u>Specific Strengths</u> (check all that apply)	<u>Specific Concerns</u> (Check all that apply)
5 commendable 8 good 0 okay 2 needs improvement	10 discussion was well managed 7 responded well to questions and comments 12 encouraged active participation 7 right amount of interaction for	0 not enough interaction 0 too few participants 2 not enough opportunities to participate 0 presenter didn't respond

	<p>the number of people</p> <p>11 participant contributions valued</p> <p>6 thorough follow-up to questions and concerns</p> <p><u>Other strengths?</u></p>	<p>effectively to questions</p> <p>0 too controlled</p> <p>1 inequitable distribution of participation</p> <p>1 participant contributions not acknowledged</p> <p><u>Other concerns?</u></p> <p><i>Too many people in room</i></p> <p><i>Need to better control people who rambled</i></p> <p><i>Materials and subsequent questions too leading</i></p>
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Please tell us anything else you think we should know about the workshop so that we can make improvements for future workshops and so that we can improve the project as a whole.

Presenters came across as imposing science into the community

Assumed lower level of ability to understand the issue

Science cannot be done by “consensus”

Pre-workshop materials would be helpful

If you would be interested in somehow continuing your participation with the Climate Change Outreach Project, please write your name here.

Thank you for your time!

Appendix 15: Follow-up Interview Guide

Workshop follow-up questions

It's been some time now, so just wanted to check in with a couple of quick questions.

1. Looking back, how useful was the workshop to you?
2. Compared to the way you felt before the workshop, did the workshop make you feel that climate change is more serious problem, a less serious problem (or did the workshop not change your feelings one way or the other)? [asked both ways]

IF CHANGE, What was it from the workshops that caused you to change your feelings?

3. How would you rate your feelings about climate change today, is it a very serious problem, quite a serious problem, just somewhat a problem, or not much of a problem at all?
4. What is the main thing about climate change that concerns you?
5. What, if anything, do you think we should be doing about climate change now?
6. Is it worth trying to do more workshops around Oregon? What changes would you make?
7. Would you participate further in project?

Appendix 16: Summary Sheet of Follow-up Interviews

Workshop evaluations from follow-up interviews

The evaluations of the workshops given in follow-up interviews add some texture to the evaluations filled out at the workshops. A caution: the interviews are not a complete canvass of participants and it is possible that respondents were a bit more positive over the phone, talking to one of the presenters, although most seemed to have no problem offering candid views and criticisms. In the case of Roseburg, there is some evidence from remarks made at the workshop that two of those who did not respond to repeated calls for an interview were climate change skeptics, one rated climate change as very serious and one was in the middle.

The table is based on open-end responses to the following interview question:

Looking back, how useful was the workshop to you? (number of responses)

How useful (how rate)?	Corvallis	Prineville	Roseburg
Useful (good)	3	2	5
Useful, but...	3	5	4
Not useful	1	2	4

Not too much should be made of this table (coding is quite subjective) other than to note that there were very few mostly negative responses. And, the negative responses uniformly came from those with strongly held views going into the events who saw bias in the presentation. In the case of Roseburg, there were two participants on each side of the issue who thought the presentation was biased.

Respondents were also asked if more workshops should be done around Oregon. To get the full flavor of comments about the workshops, the views of each participant on those two questions are presented in summarized form below, along with their rating of how serious climate change is.

Corvallis

How serious is climate change?	Opinion of workshop	Should do more workshops?
Quite	Good, good info. Some strong anti views chilled discussion.	Yes, but not sure they will change things.
Not	N/A (Not good, info biased.)	No
Somewhat, could get worse but maybe not	Some useful info, good points from audience	Yes, but try different tack. Maybe target opinion leaders; train the trainers
Very serious	Useful, good information and discussion	Yes, try larger forums, other media to get info out
Very serious	Useful, reminded me there are skeptics. Good format.	Yes, hard to convince skeptics, but necessary.

Not convinced human or that we can do anything	Useful for me to give ag view but did not learn anything	Probably not
Very	Useful but too big for discussion	Yes, more time to explore values, more discussion

Prineville

How serious is climate change?	Opinion of workshop	Should do more workshops?
Not problem.	Good. Bias showed.	Don't need, not a problem
Quite serious	Good. Bias showed but warranted	Yes
Very serious, but how much human not certain	Good, could show opposing views	Yes. Show both sides.
Middle	Good to do them but presentation was one scientist's view	Yes.
Very serious (spouse: quite)	Good, more discussion.	Yes, more discussion
Very serious	Good	Yes, not sure how to reach larger audience
Quite serious	Good	Yes. Get info into schools.
Not very serious, worry is \$ spent in reaction	Not useful, science may be OK but media will make scare out of it	No
Quite serious	OK, not sure about doing more	Not sure would do any good, need natural disaster

Roseburg

How serious is climate change?	Opinion of workshop	Should do more workshops?
Very	Counter-producting, gave comfort to skeptics	Yes, but need tell truth, not just point to models
Very	Gave impression GW is less urgent than it is	Not sure, didn't affect people's opinions
Very but not much we can do [quite]	Useful, got good material	Yes
Important	Good.	Yes, maybe small groups
	Good, but soft-pedaled problem	Yes, combine with peak oil; watershed council model; small groups, more discussion
Middle (spouse: very)	Good, but too technical	Yes
Not serious	Not useful, tried to push GW agenda	No, unless just straight info available to public
Middle, conflicting info	Good, got to hear different opinions	Yes, get info out and hear opinions
Not sure who to believe, ns if negative will outweigh positive	Useful to hear from experts. Showed bias against engineering solutions.	If can reach general public, give info, don't need discussion
Very serious, lot not understand but should use precaution principle	Useful, good presentation but discussion too political, not controlled.	Yes, send materials before, limit political speeches.
Not a problem	Not useful. Part of Gov. agenda to push GW.	No.
Very serious	Useful, esp to hear that some	Yes, especially smaller

	still don't believe science	communities; good format
Very/quite	Good, good to hear about research on NW impacts. Good format	Yes, good to keep focus on local impacts.

In terms of both criticisms of the workshop and suggestions for future workshops, no single theme stands out. The perception of bias, as noted above, comes almost exclusively from those with strong views. There is a smattering of calls for more discussion but it was not as consistent as might have been guessed. (This doesn't mean that more discussion is not essential to more productive workshops, just that our participants did not shout out about it in the interviews.)

