

The Estuary Partnership's fifth annual Science to Policy Summit focused on Climate Change. A panel of leading experts presented scientific research addressing impacts of climate change on the lower Columbia River and estuary. Community leaders, natural resource professionals and scientists discussed factors that limit our response to climate change. The summit concluded with a discussion about how the Estuary Partnership can support adaptation efforts in the region. Oregon State Senator Jackie Dingfelder and Washington State Senator Craig Pridemore served as honorary co-hosts.

The Problem

Estuaries and coastal areas are particularly vulnerable to the effects of climate change. Sea level rise, changes in water temperatures, hypoxia, acidification and other climate change impacts are changing the lower Columbia River ecosystem.

This year, the Estuary Partnership is updating the Comprehensive Conservation and Management Plan to incorporate climate change adaptations. We are working to identify actions that support and augment regional efforts. The Board of Directors will take stakeholders' input expressed through the summit and other forums, assess existing resources, consider the science and develop a series of actions.

The Science

Dr. Philip W. Mote presented predictions and observations related to climate change including sea level rise, warmer annual temperatures, erosion potential and increased flood risks. To illustrate impacts, Dr. Mote cited increases in frequency of extreme weather events, such as the occurrence of two large floods in Chehalis, Washington in three years (2007 and 2009) that would normally happen on average once every 100 years.

Today, uncertainty regarding climate change is not whether impacts will happen, but rather the range of possible impacts. Human actions and decisions can impact the rate of sea level rise or temperature change. Immediate actions, including efforts to reduce greenhouse gases, may slow the rate of climate change. Dr. Mote provided an overview of the Climate Science Center, the Oregon Climate Change Research Institute and other regional resources on climate changes.

Dr. Robert E. Bilby presented research from the region's Independent Science Advisory Board on impacts of climate change to fish and wildlife in the Columbia Basin. Recent climate simulations from the University of Washington Climate Impacts Group indicate increasing temperatures in the Pacific Northwest and decreases in precipitation and snowpack.

Dr. Bilby cited current impacts to hydrosystems in sub-basins with historic winter temperatures near freezing. Current impacts in these subbasins include altered hydrology, increased water temperatures, sedimentation and degraded water quality. These effects impact aquatic habitat and organisms including salmon and steelhead. For example, hard winter freezes historically have held mountain pine beetle populations in British Columbia forests in balance. Warmer winter temperatures have allowed more pine beetles to live through the winter. Increased beetle populations are killing the lodge pole pine forests resulting in severe erosion.

Dr. Bilby also showed that increased frequency of wild fires in the Columbia River Basin from 1960 to 2003 have resulted in denuded landscapes and increased erosion. The Science Advisory Board has developed recommendations for addressing climate change impacts in the estuary and ocean.



Dr. Richard A. Feely discussed ocean acidification, links with hypoxia and the effects on the estuary and the Columbia River plume. The ocean acts as huge “sink” and absorbs the carbon dioxide from the atmosphere. Increases in atmospheric carbon dioxide reduce ocean pH, a condition called ocean acidification. Acidification can reduce calcium carbonate levels, a critical building block for skeletons and shells in marine organisms, and could negatively affect clams, oysters, crabs and shrimp populations.

Current natural processes, such as coastal upwelling, could accelerate acidification off the coast. Dr. Feely submitted that by the year 2100 ocean acidification might be as high as 150% of current levels. NOAA’s PMEL Carbon Program is conducting further research.

Dr. Curtis Roegner presented information on changes to the food web in the estuary and plume caused by hypoxia and intrusion of salt-water. Dr. Roegner covered data collection and the effects of wind and tides on salinity and dissolved oxygen in the estuary and the variations of these levels related to upwelling and downwelling. As sea level rises, ocean-water intrudes farther into freshwater and affects habitats for marine species. Since species have different requirements for oxygen and fresh water, they are susceptible to hypoxia or salinity at different levels and respond to these conditions in very different ways. Using salmon and crabs as examples, Dr. Roegner illustrated the consequences of hypoxic tides entering the estuary. Crabs, tolerant of low-oxygen conditions, may seek refuge below the tide in the mud at the river bottom and remove themselves from the estuarine food chain. Salmon, with their high-oxygen requirement, avoid the tide by swimming above it and become more vulnerable to predation by birds. Predictions suggest that climate change could cause significant impacts to these populations.

The Discussion

Following presentations by the panel, participants met in small groups to consider two questions. While the discussions varied between groups, common themes emerged. Participants represented tribes, academic and applied science, agriculture, transportation, fisheries, recreation, elected officials, and local, regional, state and federal government agencies.



What We Heard

What can the region do to adapt to, mitigate or abate climate change?

Communicate and Educate: Discussions about climate change need to be part of the public discourse, not just a dialogue in the science or environmental communities. Information delivered in the context of everyday life is easier to relate to for citizens. Illustrating the impacts of extreme weather events (floods, hurricanes, etc.) can inform and help galvanize the public. Better basic science helps the public understand; the schools are good place to start. Showing how individual actions make a difference is critical.



Strengthen Leadership: Elected officials, the business community and the scientific community need to show leadership on many issues in order to tackle a problem of such broad scale. They can help develop more cross-jurisdictional land use planning, increase public transportation and access to mass transit, specify actions for individuals and create tax incentives to support those actions, and acquire land in the areas likely to be most affected by sea level rise. Agencies need to collaborate and incorporate sea level rise and population projections into all planning efforts.

Reduce Greenhouse Gas Emissions: There are many approaches to reducing greenhouse gas emissions. Generating more electricity from hydro, wind and solar power reduces use of fossil fuels. The region needs to use incentives to reduce vehicle miles traveled, increase public transportation options, and encourage developments that increase density, access to local markets, and walking.

Encourage Innovation: Regulations need to be more adaptive and allow for innovative solutions. Current land use regulations often zone by use, creating the need for more roads and more driving thus more stormwater runoff and carbon dioxide emissions. Encouraging multi-use zones that allow business, schools, churches and housing clusters is a climate friendly option.

Restore Ecosystems: We need to take a more holistic approach to ecosystem restoration. Instead of focusing on habitat for one or two endangered species, focus on an “endangered ecosystem.” Examples include preserving, protecting, acquiring and restoring habitat such as floodplains, uplands, and wetlands, through a variety of measures; coordinating the needs of different users, such as agriculture, recreation and wildlife; and, taking more aggressive action to maintain or improve ecosystem health such as focusing on contaminate reduction. Consider habitats for ‘First Foods’ like pacific salmon and huckleberries, iconic staples for native populations and recognize humans are part of the ecosystem, not separate.

What is preventing us from taking action?

Complex Problem: Climate change is an enormous global scale problem that can be overwhelming for many people. We often compartmentalize problems or work in silos. This issue is complex. The impacts, the possible solutions and adaptations are daunting and highly integrated. The challenge is to motivate us to change how we live, grow food, drive, shop, vacation, etc. How do we balance the perspectives and needs of all ages and cultures, the politicization of climate change, and the forces behind consumption that are detrimental and advancing climate change?

Data: Sustained long term monitoring is necessary to evaluate and direct climate change adaptation actions. We must collect data to determine current status and track trends, even though such data can be subject to different extrapolations. Having a comprehensive range of expertise and unbiased advice even with different viewpoints can help build confidence in the information. Presenting data in plain language makes it more accessible to more people.

Costs: Inadequate financial resources limit the ability to study or plan for the future. Governments work in ‘budget crisis mode’. There is not enough money to address an immediate crisis such as earthquakes or hurricanes and addressing the long-term need is not seen as a necessity.

Disbelief/Distrust: Many people resist the idea of climate change regardless of the truth. It has become a political debate rather than a scientific discussion. Discussion should focus on the direct impact and immediacy of climate change to people’s lives. Many people simply avoid “the debate” altogether while the some seek an unreachable level of scientific certainty. Waiting for definitive answers and social inertia keep us from moving forward to address either the causes or impacts of climate change.

Jurisdictional Barriers: Land fragmented across multiple owners and jurisdictions hinders the flexibility we need to adapt easily to change. Natural boundaries often differ from political boundaries so regulatory requirements and protections may differ within a single ecosystem. Regulations to address conditions are often developed in silos. We need to move forward based on what works across boundaries, adopt a holistic view. For example, we must identify large areas of vacant land where levy breaches might help accommodate future floods and mitigate climate change impacts.

Blame - No Blame Approach: It is difficult to address climate change without identifying the causes, but people avoid the issue to avoid participating in a polarizing discussion or the blame game. Pointing fingers is no more productive than holding others blameless.

Political Will and Leadership: Partners and leaders need to step up, take political risk and address climate change. The “resist - retreat - restore” approach will not work over the long term. Simply building a higher seawall is not enough. Grants to move houses out of floodplains are a start but a more aggressive ‘we will not rebuild in floodplains’ policy is needed. We need long-term thinking because climate change adaptation does not align with election-cycle thinking.



What is Next?

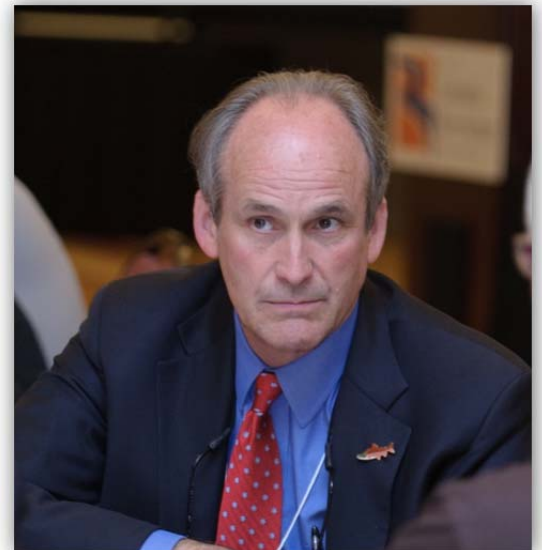
Recommendations for the Estuary Partnership.

- Keep the conversation going.
 - Host meetings like this to keep us current on the science, climate change impacts and regional responses.
 - Take the climate change discussion to local communities.
 - Continue connecting decision makers with scientists.
 - Bring new partners to the table for this discussion, such as ecumenical ministries, community groups, FEMA, non-profits.
- Continue to focus on large-scale habitat projects to restore full ecosystem function for the benefit of multiple resources, including ourselves.
- Develop maps of climate change effects or projections; develop ‘vulnerability assessment’ for the region.
- Continue pursuing funding for monitoring on the Columbia.
- Coordinate a climate change observation network for the lower river and estuary.
- Provide cohesion for inter-agency activities in the region.
- Incorporate climate change into education activities for all ages, from the youngest students to the oldest.



A few specifics for the Estuary Partnership:

- Help establish regional goals for river health and recovery of species before we set out to achieve them. Keep the focus on the ecosystem and the regional context.
- Expand baseline/trend data to help guide our decisions.
- Metrics need to be kept broad enough to meet future needs for knowledge and be adaptive and show how the goals of a project translate into changes in the river.
- Focus is needed on toxics reduction and monitoring. This helps measure trends that will encourage success.



A Closing Thought

Bill Bradbury gave the group a final – and probably most important – challenge. He encouraged participants to move beyond the words “climate change” and instead address the behaviors and policies contributing to and being impacted by changes in our climate. The term is almost irrelevant; it has become polarizing and too often stops the conversation.

What matters are the facts and the facts are clear: the planet climate is changing at a faster rate than any time in its past. The cause of the changes is less important than what the changes are and the actions we can take to mitigate them. He urged us to focus more on the science, policies, and actions needed – and their societal benefits and to do so outside of the climate change context.

As a member of the Inconvenient Truth team, Mr. Bradbury gave talks to over 250 groups in Oregon. He is currently a member of the Northwest Power and Conservation Council and former Oregon Secretary of State.

Full presentations are available at: www.lcrep.org



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