

Welcome to the **JUNE 2012** edition of the WDFW Climate News Digest. Here you will find highlights of climate change news, events and resources for WDFW staff. Feedback or suggestions for items to include in future editions are much appreciated – *thanks* to those who have sent links and references and please keep them coming. We are particularly interested in projects or issues you may be involved in which have a climate change component. Many thanks!

WHAT'S HAPPENING AT WDFW?

Selected projects, agency resources and initiatives

ESRP Grant Criteria and Climate Change

The Estuary and Salmon Restoration Program(ESRP) provides funding for nearshore restoration and protection projects in Puget Sound. ESRP is revising their grant evaluation criteria and working to strengthen the program language around climate change. The revised "technical merit" criteria will include an explicit sub-criteria focused on climate change. Points will be awarded to proposals that demonstrate how the impacts of sea level rise and/or how other climate change impacts will affect future functions of the site, and how the proposed project design will minimize those impacts. Sponsors will also be encouraged to describe how the proposed restoration project itself will contribute to overall climate resiliency in the region (for example, through carbon sequestration, increasing sediment transport and deposition or restoring floodplain functions and provide buffering for expected increases in flooding and storm surge). Suggestions or questions about this project, contact Betsy Lyons, ESRP Program Manager.

WDFW Regional Climate Change Workshops

During the month of May, four climate change workshops were held for regional staff – in Ellensburg, Chehalis, Mill Creek and Spokane. The 3-hour workshops provided a brief overview of the climate science and projections for our region, introduced guiding principles for natural resource adaptation, and described the general approach WDFW is taking for its response strategy. Rocky Beach joined Lynn to present some preliminary findings from the PNW Climate Change Vulnerability Assessment, and small groups worked to consider management options for WDFW lands under changing climate conditions. Thanks to all the regional staff who attended and for the valuable feedback on these sessions. We will be working to provide additional resources and educational opportunities over the next months. Suggestions or comments are always welcome – please be in touch.

UPCOMING EVENTS

[Webinar- Thursday, June 28th 9-9:45 am pdt](#)

"Accessing and Utilizing Climate and Impacts Datasets and Tools in Data Basin", presentation by Dr. Dominique Bachelet.

The Conservation Biology Institute is offering free webinars to introduce Data Basin:

<http://databasin.org/>, a web-based platform that integrates science, mapping, and people. In this session, Dr. Dominique Bachelet and members of the Data Basin team will provide an overview of available climate datasets, visualization and analysis tools, and example of how people are better able to use this information to inform climate change adaptation and management of global environmental change. Data Basin is a free, online system that connects users with spatial datasets, tools, and expertise. Individuals and organization can explore and download a vast library of datasets, upload their own data, create and publish analysis, utilize working groups, and produce customized maps that can be easily shared.

RESOURCES

EPA's Main Climate Change Website Gets New Look and Feel

EPA launched a new look and feel for the Agency's main [climate change website](#) last week. The website contains information on the basics and the science of climate change, provides examples of what you can do, and tells what EPA is doing. It also includes a section on climate change impacts and adapting to change by sector and by U.S. climate region. Additional pages focus on indicators of climate change, federal and EPA programs, partnerships, tools for public officials, news, and more.

EPA and the U.S. Geological Survey Publish a Guide for Identifying Cold-Water Refuges to Protect and Restore Thermal Diversity in Riverine Landscapes

EPA has recognized the need for a reference guide to identify cold-water refuges for the protection and restoration of habitat for native salmonids. Many species of salmonids are listed as threatened and endangered under the Endangered Species Act. The [guide](#) includes a detailed description of different types of cold-water refuges in various rivers in the Pacific Northwest. The primary objective of this guide is to assist Pacific Northwest management agencies in implementing the new water quality standard for temperature as laid out by the EPA. Additionally, this guide supports the identification, protection, and restoration of critical cold-water refuges for the protection of salmonids. The guide will help federal, state, and tribal management agencies and local watershed groups involved with salmon conservation. *Note: Page 77 includes a link to a streaming conference on cold water refugia*

CLIMATE SCIENCE NEWS

Forecasting the Impacts of Climate Change in the Columbia River Basin—Implications for Fish Habitat Connectivity

In the Methow River Basin, the USGS and partners have been examining climate change effects on the connectivity of fish habitats and the resultant effects on populations of fish listed under the Endangered Species Act (ESA). In a project with the Bureau of Reclamation, the USGS is studying the fish response to restoration efforts and constructing a model relating stream habitat with fish population dynamics based on empirical data, which include water temperature and flow, fish distribution and abundance, stream productivity (nutrients, macroinvertebrate production), and measures of lateral and longitudinal connectivity of habitat (e.g., side channels, springs). Numerous Pacific Northwest species are listed under the ESA, including five iconic Pacific salmon species and several other non-anadromous salmonids such as the bull trout (*Salvelinus confluentus*) and westslope cutthroat trout (*Oncorhynchus clarkii*). All of these fish need a variety of habitat types that include appropriate water temperatures, flows, refuge from predators, and adequate food. Key to fish using these resources is the connectivity of habitats in which they are found. This connectivity is seriously threatened by changes in flow and temperature predicted with global climate change. Read about this project [here](#). To view a recent webinar on the project, click [here](#).

Paper suggests that seagrasses can store as much carbon as forests

Seagrasses are a vital part of the solution to climate change and, per unit area, seagrass meadows can store up to twice as much carbon as the world's temperate and tropical forests. The paper published in the journal Nature GeoScience, "[Seagrass Ecosystems as a Globally Significant Carbon Stock](#)," is the first global analysis of carbon stored in seagrasses. The results demonstrate that coastal seagrass beds store up to 83,000 metric tons of carbon per square kilometer, mostly in the soils beneath them. The new

results, say the scientists, emphasize that conserving and restoring seagrass meadows may reduce greenhouse gas emissions and increase carbon stores--while delivering important "ecosystem services" to coastal communities. The research is part of the Blue Carbon Initiative, a collaborative effort of Conservation International, the International Union for Conservation of Nature, and the Intergovernmental Oceanographic Commission of UNESCO. The [press release](#) from the National Science Foundation is also available online.

A major new study finds wildfires in the Western U.S. are likely to increase because of climate change (pdf attached).

This study in the journal *Ecosphere* suggests a growing danger for the U.S. It finds that by the end of the century, most of North America and Europe is expected to see increased frequency of fires, according to a summary of the analysis from the University of California-Berkeley. The researchers used satellite-based fire records from past years combined with historical climate data and models of future climate change. "Our study is unique in that we build a forecast for fire based upon consistent projections across 16 different climate models combined with satellite data, which gives a global perspective on recent fire patterns and their relationship to climate," said co-author Katharine Hayhoe, director of the Climate Science Center at Texas Tech University.

Four Major U.S. Heat Records Fall In Recent NOAA Report

The first five months of 2012 were the warmest on record for many locations across the United States. [NOAA's website](#) provides a table which shows, for about 150 long-term stations, how Jan-May 2012 stacks up against normal, and where it ranks among the station's history. In some locations, 2012 temperatures have been so dramatically different that they establish a new "neighborhood" apart from the historical year-to-date temperatures. The unusualness is based upon the number of standard deviations difference between the 2012 value and the station's average.

Are we approaching a Tipping Point?

A new scientific paper out in the journal *Nature* is titled "Approaching a state shift in Earth's biosphere" - pdf attached. The abstract states, "Localized ecological systems are known to shift abruptly and irreversibly from one state to another when they are forced across critical thresholds. This paper reviews evidence that the global ecosystem as a whole can react in the same way and is approaching a planetary-scale critical transition as a result of human influence. As examples of past global state shifts, the authors cite the Cambrian explosion ("a conversion of the global ecosystem from one based almost solely on microbes to one based on complex, multicellular life," which took a comparatively brief 30 million years), the Big Five mass extinctions, and the last glacial-interglacial transition, which started about 14 thousand years ago. The difference today is that human beings are generating "forcings" (influences on biophysical systems) of unprecedented power at an unprecedented rate. These forcings include "human population growth with attendant resource consumption, habitat transformation and fragmentation, energy production and consumption, and climate change." The authors emphasize that all these forcings "far exceed, in both rate and magnitude, the forcings evident at the most recent global-scale state shift, the last glacial-interglacial transition."

POLICY AND MANAGEMENT

Washington's Blue Ribbon Panel on Ocean Acidification.

Check out Ecology's [website](#) for the latest research, state of the science and draft policy recommendations from the Panel. The Panel was convened by Governor Gregoire and charged to document the current state of scientific knowledge, ways to advance our scientific understanding of the effects of ocean acidification, and recommend actions to respond to increasing ocean acidification. *What is ocean acidification? The world's oceans absorb carbon dioxide (CO2) from the atmosphere. As the oceans soak up excess carbon emissions, the chemistry of the seawater changes — both locally and globally. This absorption alters the ocean's natural acid-base balance. This move toward a lower pH value is called ocean acidification. Read more about [why ocean acidification is a problem in Washington](#).*

Cities as Key to Climate Change?

[This presentation](#) suggests that cities are best positioned to address global change. The presentation is by [C40](#), a group of 58 cities that work together to share information and best practices about addressing climate change. Key points from the presentation, quoted directly:

- Almost 50% of cities are already dealing with the effects of climate change, and nearly all are at risk.
- Over 90% of all urban areas are coastal, putting most cities on Earth at risk of flooding from rising sea levels and powerful storms.
- Larger cities have a ravenous appetite for energy, consuming $\frac{2}{3}$ of the world's energy and creating over 70% of global CO2 emissions.
- Today, over 4,700 climate change actions are in effect in the nearly 60 Cities of the C40, with almost 1,500 further actions under active consideration.

New studies suggest inspiration, not climate science, sets the stage for political action.

Researchers are trying to find ways to present the climate issue "as a friend," according to a report http://www.eenews.net/assets/2012/05/29/document_cw_01.pdf by the University of Michigan and the Union of Concerned Scientists. The document summarizes a conference held in January with more than 100 academics, faith leaders, public officials and communications experts. They believe global warming is now "as much a psychological and social issue" as it is a scientific one. That means that burying people in facts about rising temperatures and melting glaciers won't always work; in fact, it could "entrench rather than ease opposition." An article published online this weekend in the journal Nature Climate Change found that the controversy over climate change is unrelated to people's ability to comprehend science. Indeed, as people become more literate in science, they are also likely to become more divided about climate change, if their cultural values conflict with the evidence. "More information can help solve the climate change conflict, but that information has to do more than communicate the scientific evidence,"

Dan Kahan, a professor of law and psychology at Yale Law School and a contributor to the article, said in a statement. "It also has to create a climate of deliberations in which no group perceives that accepting any piece of evidence is akin to betrayal of their cultural group."

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