

Welcome to the **DECEMBER** 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.

WHAT'S HAPPENING AT WDFW?

Selected projects, agency resources and initiatives

A recent workshop to introduce the updated Stream Habitat Restoration Guidelines to restoration practitioners included a section on climate change and restoration. Recognizing the importance of addressing current and projected impacts on stream hydrology and plant communities, the updated SHRG manual includes an appendix on how to consider restoration projects in light of climate change (final document available soon). Ingrid Tohver, from the [Climate Impacts Group](#) at the UW, and Tim Beechie from NOAA Fisheries presented an overview of projected impacts and how they will affect salmon. They also shared observations about how to make restoration projects more resilient to climate. Both of their presentations are attached above. For more information about the workshops or the Guidelines, please contact [Michelle Cramer](#).

UPCOMING EVENTS

WEBINAR: Demonstration of the Climate Change Vulnerability Index by Bruce Young of NatureServe January 19, 1 pm EST/10 am PST

The Climate Change Vulnerability Index assesses the relative vulnerability of plant and animal species to the effects of climate change (e.g. range contractions, population reductions) using readily available information about climate predictions and species' natural history, distributions and landscape circumstances. This webinar will describe the concepts used to develop the Index, and the climate data sources it draws upon, and the specific assessment factors. It will also demonstrate the use of the assessment and highlight a variety of ways in which it has been applied. Learn more at www.natureserve.org/prodServices/climatechange/ccvi.jsp. Register for this webinar at <https://www1.gotomeeting.com/register/242109593>.

Climate Refugia in Washington; presentation and discussion of a pilot project to identify and map areas of potential refugia for species and ecological communities.

January 20th -- 1:00-4:00 pm, Room 175 AB in the Natural Resources Building in Olympia.

Please RSVP to Lynn if you plan to attend this event (a reply to this email will work fine!)

WDFW is sponsoring an opportunity for climate scientists from EcoAdapt, *an NGO focused on climate adaptation and natural resource conservation*, to present the results of a pilot project to map climate resilient habitats in Western Washington. The Sierra Club recently funded this project to develop climate-informed conservation "blueprints" for western Washington, with the intent of highlighting areas that have particular ecological value and are predicted to have greater ecological stability or instability under changing climatic conditions. Following the presentation will be a discussion about the relationship of this work to existing products and activities within WDFW. The client for the first phase of work was the Sierra Club, and was intended to inform strategic priorities for that organization. The next phase will focus on testing the methodology on watersheds in Puget Sound, again with the aim of identifying and mapping climate resilient habitats, or potential climate "refugia".

For more information, please contact Lynn Helbrecht, by email, or at 360-902-2238.

Once again, RSVPs are much appreciated!

NEWS AND RESOURCES

[RESEARCH SHOWS COLUMBIA RIVER SOCKEYE ADAPTING TO CLIMATE CHANGE, MIGRATING EARLIER](#)

Sockeye salmon are evolving through natural selection to deal with a warming climate, according to a study by researchers at the National Oceanic and Atmospheric Administration. In recent decades, scientists have observed that salmon in the Columbia River are starting their migration earlier in the year. The fish now migrate upstream an average of 10 days earlier than they did in the 1940s. Researchers knew that the change was associated with warming water temperatures, but an important question remained. Is this a behavioral response in reaction to warmer water, or are the fish evolving modified behavior through mortality and natural selection? Using 60 years of water temperature records and data on salmon mortality during migration, researchers led by Lisa Crozier have determined that the latter has played an important role. According to their model, up to two-thirds of the 10-day advance in spawning is explained by natural selection, with a behavioral response to changes in river flow explaining the rest.

CLIMATE SCIENCE

Northwest Power Planning Council and the Columbia Basin Trust Will Partner on Climate Change Project

The Council agreed to jointly fund, with the Columbia Basin Trust, a [project](#) to compare U.S. and Canadian model projections of hydrologic response to changes in climate in the Canadian portion of the basin. The project stems from the fact that modeling of future runoff conditions in the Pacific Northwest by American climate scientists at the University of Washington's Climate Impacts Group differs to some extent from the modeling of the same conditions by Canadian scientists at the Pacific Climate Impacts Consortium at the University of Victoria in British Columbia. The project will compare the modeling results of a number of different projected impacts in the Canadian portion of the Columbia River Basin including: 1) changes in temperature and precipitation; 2) changes in daily precipitation and temperature extremes; 3) changes in snowpack; 4) changes in annual, monthly, and daily streamflow timing and volume at five to ten specified river locations; and 5) changes in hydrologic extremes such as the 100-year flood or 10-year, seven-day low flows.

POLICY AND MANAGEMENT

[Climate Change Ushers in New Era of Uncertainty for Water Resource Management](#)

Published in the Marten Law newsletter

Scientists are seeing more climate change impacts on water availability – particularly in those areas dependent upon glacial and snow meltwater for agriculture. As water becomes available at different times of the year (or grows more scarce), controversies over water allocation will grow more common. This is particularly true in the arid west, but also in the plains states and many other parts of the country. Water resource agencies will increasingly struggle with how to protect senior water rights, preserve agriculture and other economic activity, manage flood events, and provide instream flows for fish habitat and other ecological purposes. This article details some of the difficult trade-offs that decreased flows will require to be made.

“Moving the Conservation Goalposts”

This literature review provides an interesting perspective on the potential impact of climate change on long-held assumptions and strategies used by resource managers and conservationists. It consists of two major sections. The first is a broad scan of the published literature to identify major trends in the development of the field. This survey was based on queries of the Web of Science, a comprehensive online bibliographic database, and focuses on what can be referred to as self-identified adaptation literature (i.e., the term “adaptation” appears in the article or bibliographic entry). These papers were subsequently reviewed and categorized to provide a quantitative snapshot of the current adaptation literature. The second major section of this literature review focuses on one particular topic of interest to the resource management community: conservation goals in an era of climate change. This section reviews literature relevant to the topic of reconsidering conservation goals in light of a rapidly shifting climate.

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