Multidisciplinary Climate Change Research in the Yakima and Methow River Basins

Alec Maule[1], Matthew Mesa[1], Jill Hardiman[1], James Hatten[1], Mark Mastin[2], Frank Voss[2], Jessica Montag[3], Lynne Koontz[3], Karen Jenni[4], Tim Nieman[5] and David Graves[6]

[1]WFRC, Columbia River Research Laboratory, Cook, WA
amaule@usgs.gov, 509-538-2299 x 239
[2]Washington Water Science Center, Tacoma, WA,
[3]Ft Collins Science Center, Ft Collins, CO,
[4]Insight Decisions, LLC, Denver, Colorado,
[5]Decision Applications, St. Helena, CA,
[6]Columbia River Inter-Tribal Fish Commission, Portland, OR

In 2009 we initiated a series of studies on the impacts of climate change in the Yakima River Basin (YRB) with a four-day stakeholder workshop designed to learn about local concerns and interests and to build an integrated conceptual model of climate change and climate change impacts in the YRB. The conceptual model development highlighted areas of uncertainty that limit the understanding of the potential impacts of climate change and decision alternatives by those who will be most directly affected by those changes, and pointed to areas where both additional study and additional engagement of stakeholders would be beneficial. As a result, we altered our original design to address several areas suggested by the stakeholders, including modeling water temperatures in the lower Yakima River and two lower tributaries, and using bioenergetics modeling to examine climate change effects on growth of steelhead and Chinook salmon. The integrated conceptual model highlighted the importance of numerous different outcomes to stakeholders in the basin, and suggests that appropriate evaluation of the impacts of climate change and of water management strategies must consider all of these factors and the tradeoffs between them. Because of the unique relationship between Yakama Tribal members and the waters and lands from which they gain ceremonial and subsistence foods, we also worked with tribal members to develop a conceptual model of the possible impacts of climate change on tribal well-being. We have recently extended our climate change studies to the Methow River Basin.