

Applications of regional climate and hydrologic projections in the Western U.S.: Internally consistent projections of future climate for impacts analysis, vulnerability assessment, and resource management

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Several stakeholder-driven projects evolved from the capacity and methods developed for the Climate Impacts Group's Washington Climate Change Impacts Assessment and the Columbia Basin Climate Change Scenarios Project, (<http://www.hydro.washington.edu/2860/>). Here, we describe three "success stories" of partnerships with federal and state level resource managers to incorporate climate information into the decision and planning environment. First, we developed a consistent methodology to create gridded historical and future climate and hydrologic projections over the entire Columbia Basin, Great Basin, Colorado River Basin, and the upper Missouri Basin. This work was funded by a consortium of managers and decision makers from the United States Forest Service (USFS) and the United States Fish and Wildlife Service (USFWS). To date, the results have been used to embed climate variability and extremes into the risk management approaches of USFS regional planning, guide adaptation planning in the USFS and US National Park Service, develop vulnerability assessments for the wolverine and cutthroat trout, and develop projections of future wildfire area burned. A second project involves the River Management Joint Operating Commission (RMJOC) and a partnership between the US Army Corps of Engineers (USACE) and the Climate Impacts Group to develop better projections of hydrologic extremes (flooding and low flows) to provide a better basis for river management decisions. Third, projected changes in local air temperature, precipitation, streamflow, and stream temperature were developed to support Seattle City Light's assessment of climate change impacts on hydroelectric operations, future electricity load, and resident fish populations. A key feature of all these approaches is tailoring the treatment of uncertainty to the needs of and carefully communication with decision makers in order for projected climate impacts to be viewed as credible and used appropriately.