The Headwaters

Climate Change, Water, and National Forests in the West

A Carpe Diem Project Policy Brief - July 2009

The **Carpe Diem - Western Water & Climate Change** project brings together people from diverse backgrounds to understand the impacts of climate change on western water resources and to explore innovative policy responses to address them. Our operating premise is that recent changes in elected leadership (nationally and across the West), better climate change science, evolving work on ecosystem services valuation, and growing awareness among both water managers and wilderness advocates, are leading to a "tipping point"—an important opportunity for fundamental shifts in water policy and public land resource management.

This Carpe Diem project policy brief outlines key issues and opportunities arising from the impacts of climate change on the western National Forests—and on the millions of users who depend on water that comes from those headwaters.

National Forest Lands and Water

National Forest lands are the largest single supplier of water in the nation, providing reliable water for 66 million Americans. A 2008 Forest Service study found that national forests and grasslands contribute 51 percent of the water used in the eleven western states—although this contribution is much higher in parts of the West. For example, the Rocky Mountain Region's eleven National Forests supply over half of Wyoming's water yield, more than two-thirds of Colorado's water yield, and over 70 percent of the water used in Colorado's public water systems.

Forested lands capture and hold snow in the winter. Their soils soak up water from melting snow like enormous sponges, providing a natural cleansing filter, replenishing aquifers, and moderating floods and high flows as the water moves downhill toward the many uses to which it is put. Water flowing through National Forests also supports ecologically valuable wetlands, meadows, riparian corridors, in addition to lakes and streams that provide both habitat and recreational opportunities.

Climate Change Impacts

Projected impacts of climate change on the nation's forested watersheds in the West include:

- Higher-elevation snowlines, with more precipitation falling as rain rather than snow, leading to earlier peak runoff;
- More frequent high runoff events associated with flooding and erosion, causing murkier rivers, damaging riparian habitat, and endangering human lives and property;
- More frequent low streamflows during the hottest months of the summer and early fall, causing increased competition among water users and impacts such as fish kills and water quality declines; and
- Drier forest conditions leading to larger and more frequent fires and more insect infestations (e.g. mountain bark beetle); these conditions will in turn magnify the impacts listed above.

Much could be done to strengthen and support the capacity of the Forest Service to understand and address the impacts of climate change on National Forest lands. We are encouraged that Forest Service Chief Abigail Kimball (retired last month) named "climate change" and "water" as two of the three emerging emphasis areas that challenge resource managers to use "knowledge of cross-cutting issues at the broadest scale to better care for the land and serve people." This cannot be accomplished by continuing traditional practices with a nod toward additional environmental impacts, but will require new kinds of partnerships, shared learning, innovative management initiatives and revised land management practices.

Moving forward

In our conversations over the past year with diverse stakeholders and managers, we have heard a consistent message about the importance of addressing water from its source to its final use. There is a great deal of interest in linking the health of the watersheds to those who depend on them through such means as:

- Education and shared learning about watershed health and restoration, with aggressive work to identify critical components whose protection or restoration should be of the highest priority on both public and private lands. This relates to both jobs in riparian restoration projects and ecological conservation such as promoting the role of beavers in improving ecosystem resilience;

- Monitoring and sharing information on changing conditions in national forest watersheds related to climate change and other factors, using a wide range of information sources ranging from academic researchers to community-based stewardship groups;
- Economic research to quantify the value of increased flow and improved water quality generated by upstream restoration and new management practices, along with an examination of the costs of action versus inaction by water managers.
- Enhanced funding to support partnerships aimed at restoring and improving watershed health, including implementation of federal stimulus programs and the Forest Landscape Restoration Act of 2009 (Title IV of H.R. 146), as well as incentive-based funding of innovative pilot projects to encourage timely local projects in key areas; and
- Resource planning and management policies that incorporate the latest knowledge about climate change adaptation strategies and encourage initiatives to address projected impacts though collaboration with other agencies, climate scientists, water users dependent on water produced in National Forests, and conservation groups.

Over the next six months, the Carpe Diem project will be further incubating the "tipping point" opportunity for development of potential new water policy and public land management mandates.

About the Carpe Diem Project

The **Carpe Diem - Western Water & Climate Change** project is network of experts and decision makers addressing the unprecedented challenge of climate change impacts on water resources in the western United States. By linking leaders and incorporating state-of-the-art climate change science with the needs of diverse stakeholders, the Project incubates new initiatives and promotes sustainable management practices and policies that provide water security for people, ecosystems, industry and food production.

Project support comes from foundations, western water and public agencies, individuals and corporations. Launched in Fall 2007, the Project is housed at Exloco, a nonprofit organization that incubates new solutions to sustainability challenges in the western United States.

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