

June 10, 2008

Benjamin H. Grumbles
Assistant Administrator
Office of Water
Environmental Protection Agency
1200 Pennsylvania Avenue, NW, Mail Code 4101M
Washington, D.C. 20460

Attention: National Water Program Draft Climate Change Strategy

Dear Mr. Grumbles:

The Rocky Mountain Climate Organization (RMCO), which works to keep the West a special place by reducing climate disruption and its effects here, commends you for taking the initiative to develop a climate change strategy for the EPA Water Program.

The effects of climate change on the West's precious water resources are a primary focus of our work. Our comments are based on three particular sources, each of which we commend to the EPA in considering revisions to the draft Climate Change Strategy (the Strategy). The first is [Hotter and Drier: The West's Changing Climate](#), a recent report by RMCO and Natural Resources Defense Council documenting how climate change is already underway in the American West. The second is [Less Snow, Less Water: Climate Disruption in the West](#), a 2005 report by RMCO and Clear the Air, summarizing how the West's water resources are particularly vulnerable to the predicted effects of climate change. The third is the [water adaptation chapter](#) of the report of the blue-ribbon [Climate Action Panel](#) convened by RMCO. That chapter contains the panel's 14 recommendations for actions that can be taken in Colorado to meet the state's water needs in the face of the coming changes projected by scientists, part of the panel's comprehensive recommendations for actions to reduce Colorado's contributions and vulnerability to climate disruption. The Climate Action Panel was similar to state government-appointed advisory panels in other states, but it was unique in developing water-adaptation recommendations as well as recommendations for state actions to reduce heat-trapping gases. These water-adaptation recommendations were developed by a broadly representative Water Adaptation Policy Work Group, comprised of water providers, university researchers, environmentalists, sportsmen, and others. Of the 14 recommendations, 13 were adopted unanimously by the full Climate Action Panel, and the remaining one was adopted with only one dissent.

The draft Strategy is a good starting point. We offer several comments to improve it further.

particularly relevant is an excerpt from recommendation number twelve on water quality and the environment: "The state government and others, with invited participation by the federal government, should undertake additional data gathering and research on water quality impacts related to climate change, along with reexamination of certain regulatory programs under both the Clean Water Act and the Safe Drinking Water Act."

1. The Strategy should explicitly recognize the particular vulnerability of the West's water resources to the effects of climate change, as done by the Intergovernmental Panel on Climate Change in *Climate Change 2007* and by the U.S. Global Change Research Program in *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity: Synthesis and Assessment Product 4.3* and *Scientific Assessment of the Effects of Global Change on the United States* (both, we recognize, published after the draft Strategy). In particular, RMCO urges EPA to consider incorporating material similar to that in the following sections of *Synthesis and Assessment Product 4.3*:

- Section 4.2, Observed changes in U.S. water resources. This section observes that much more work has been done in evaluating trends in the physical aspects of land surface hydrology than for water quality. In Section 4.2.3., it is observed that while much of the U.S. has been wetter during the last century, there is evidence of increased drought severity and duration in the West. Section 4.2.4.1 points out that the West has generally been more studied than other regions regarding climate-related changes in hydrology and water resources because the West is more water-limited, and any changes in water availability have more immediate and widespread consequences. This section also notes the downward trend in snow water equivalent from 1915-2003 in the West and shifts towards earlier snowmelt, mostly temperature-related rather than precipitation-related. Section 4.2.5, which focuses on water quality, describes a major challenge in attributing altered water quality to climate change: the fact that water quality is very sensitive to other nonstationary human activities, particularly land use practices that alter landscapes and hydrology.
- Section 4.4, Projections of future changes and impacts on water resources. This section observes that models generally project no change or more runoff in the eastern and central U.S., but substantial decrease in the interior West (23 of 24 models do so for the Upper Colorado basin). Section 4.4.2. discusses studies on the vulnerability of salmonids to warming temperatures; the likely increase in algal production, including nuisance species such as bluegreen algae, leading to a decrease in water quality; elevated nutrient loading due to increased storm events; and a decrease in the amount of dissolved oxygen in surface waters and an increase in the concentration of nutrients and toxic chemicals during reduced streamflow conditions. Section 4.4.3. notes that few studies have examined the sensitivity of groundwater systems to a changing climate, and also that reduced precipitation and higher evaporative will likely result in less groundwater recharge. Section 4.5 notes warming climate results in more wildfires (in combination with fire management practices that have encouraged fuel build-up) and encourages insect epidemics.

2. The Strategy should explicitly and forthrightly call for additional research on and upgraded monitoring of the effects of climate change on the nation's water resources. In particular:

- More research is needed on understanding climate change's impacts on water quality. The effects of reduced streamflows, earlier runoff, increased storm events, increased wildfires, and infestation of forests by insects and diseases on warming and nutrient loading of waters should all be covered in a comprehensive research strategy. The studies should build on the extensive physical data on streamflow trends that has already been done in the West. EPA should work closely with the federal agencies that continue to refine the climate models, particularly in efforts to downscale the models to specific watersheds.
- Special attention should be devoted to research on the effects of climate change on groundwater and wetlands, which to date have been far less studied than surface water.
- EPA should devote resources to collaborate with the U.S. Geological Survey and the Natural Resources Conservation Service in modernizing hydrologic observing systems, incorporating water-quality measurement parameters.

- Findings from the above research and data-gathering strategies should be used by EPA to carefully consider how climate-induced hydrologic modifications should be incorporated into its water quality regulatory programs. Essential is close collaboration with state agency and water provider stakeholders prior to regulation change proceedings.

This would be consistent with the U.S. Global Change Research Program's *Synthesis and Assessment Product 4.3*, which points out, in section 4.6 on observing systems, that:

- No aspect of the current hydrologic observing system was designed specifically for purposes of detecting climate change or its effects on the hydrologic cycle.
- The USGS network stream gauges that are vital to studying hydrologic trends are impeded by funding deficiencies, loss of some stations, and the absence of a long-term strategy.
- The Natural Resources Conservation Service SNOTEL network to measure snow water equivalent has suffered from data consistency in shifts from manual to automated readings.

3. The Strategy should more definitively identify the link between climate change's effects on water quantity and on water quality. Such a statement (finally) is made at the beginning of the Water Conservation section:

Water quantity and water quality are inextricably linked. Impacts on water resources due to climate change will make this connection more visible. For example, discharge of treated effluent assumes adequate flow for dilution and low flows require higher treatment to avoid impairments; shortages of precipitation and reduced snow melt result in increased competition between human uses and aquatic uses of in-stream flows; and shortages of surface water drive increases in groundwater pumping, which in turn affect recharge.

RMCO recommends that this statement, or something like it, be prominently featured in the introductory sections at the beginning of the Strategy.

4. The Strategy should place more emphasis on the Clean Water Act's broad goal of restoring and maintaining the biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife recreation in and on the water." The Strategy tends to focus primarily on the CWA goals of chemical and physical integrity of the nation's waters. Biological integrity could be especially threatened in the West due to increased competition for the likely diminished availability of water. Western water law and policy tend to accommodate municipal and commercial uses of water more than ecosystem needs, making particularly important the biological-integrity goal that EPA is charged to meet.

RMCO believes that adoption of these changes would improve the effectiveness of the EPA Water Program Strategy to incorporate the effects of climate change into agency policies and actions. For clarification of any of our comments, please contact me at 303-861-6481 or easley@rockymountainclimate.org.

Sincerely,

/s/
Tom Easley
Director of Programs