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## New Report Documents Climate Change Impacts on Water and Snow Resources in Headwaters Region

The Northwest Colorado Council of Governments and the Rocky Mountain Climate Organization today released a report documenting how climate change may affect the water and snow resources in the headwaters region of the Colorado River.

[Climate Change in the Headwaters: Water and Snow Impacts](#), prepared by RMCO for NWCCOG, summarizes existing information on how climate change puts at risk water and snow resources and the many economic and social values that depend on them in six Colorado counties—Eagle, Grand, Gunnison, Pitkin, Routt, and Summit counties.

Rachel Richards, Pitkin County commissioner and chair of the NWCCOG Water Quality/Quantity Committee, said, “The headwaters of the Colorado River has some of the most important water and snow resources not just in Colorado but across the entire nation, and it’s essential that we understand how climate change puts these resources at risk, along with our local economies, recreation opportunities, and the quality of life here.”

Stephen Saunders, the RMCO president and the lead author of the report, said, “Future climate change will be determined by future levels of heat-trapping emissions. If emissions keep increasing unchecked, the science says there will be major disruptions of the snow and water resources of this headwaters region.”

The report details the impacts of climate change that have already happened, and those that could happen, including:

- **Temperature.** In Colorado, in all but one of the last 40 years, statewide temperatures have been hotter than the 20th century average and this century has had seven of the state’s ten hottest years on record. Mid-century temperatures are projected to average 1.5° Fahrenheit to 6.5° hotter than in 1971–2000, and late-century temperatures 1.5° to 9.5° hotter, depending on future levels of heat-trapping emissions.
- **Precipitation.** To offset the impacts of higher temperatures on snow and water resources, there would need to be large increases in total precipitation and snowfall. But only the wettest 10 percent of climate projections suggest that Colorado precipitation amounts could increase by even six to nine percent.

- **Water and snow resources.** Across the West, less winter precipitation is falling as snow and more as rain, snowpacks are declining, and snowmelt is occurring earlier. The flows of the Colorado River, fed mostly by mountain snow, have recently been the lowest in the past century—driven in large part by the evaporative effects of higher temperatures. Projections are that these changes will become more pronounced, with mountain snowfall being reduced to less than half of the precipitation in winter, snowpacks being cut by about one quarter, and river flows being reduced more than anywhere else in the West. Water restrictions and curtailments could become more likely, including an increased possibility of water restrictions under the Colorado River Compact.
- **Impacts on winter recreation and tourism.** If Colorado snowfall and snowpacks decline as projected, skiing, snowboarding, and other snow-dependent winter recreation could suffer. This could have economic consequences throughout the state, as the skiing/snowboarding industry alone contributes about \$5 billion to the state's economy and supports 46,000 jobs. The changes would hit harder in the headwaters than elsewhere, as the six headwaters counties have the largest concentration of skiing in the nation, with 16 downhill ski resorts, including seven of the 10 most-visited resorts in the nation.
- **Impacts on warm-season recreation and tourism.** If climate change projections materialize, fishing, boating, rafting, and other warm-season, water-dependent outdoor recreation could be adversely affected by hot temperatures, low water levels, and other manifestations of climate change. Colorado's outdoor recreation across all four seasons, generates \$28 billion in consumer spending and supports 229,000 direct jobs. Much of this occurs in the headwaters region, which includes Rocky Mountain National Park, the most visited national forest in the nation (White River National Forest), half of Colorado's wilderness areas, and other special places that support outdoor recreation.
- **Impacts on water quality.** Climate change may lead to decreases in water quality, including violations of water quality standards that specify maximum stream temperatures to protect fish and other resources. Further, climate change is projected to lead to major increases in wildfires, including potentially a several-fold increase in area burned, which in turn can increase flooding and sediment flows from burned areas.

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