



Global Warming and California's Water Supply

California Climate Choices

A Fact Sheet of the Union of Concerned Scientists

ROUGHLY 75 PERCENT OF California's precipitation falls in the winter, north of Sacramento. However, the greatest demand for water comes during the spring and summer from users south of Sacramento. California relies on snowpack in the Sierra Nevada mountains for water supply during these dry months. Rising temperatures, potentially exacerbated by decreased precipitation, could lead to severe reductions in the snowpack and make water shortages more common in the future.

Shrinking Snowpack

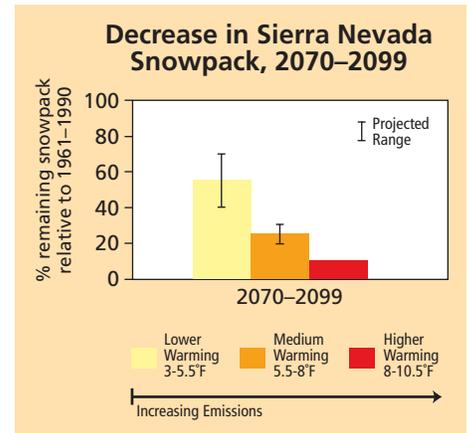
By the end of the century, if global warming emissions continue unabated, statewide annual average temperatures are expected to rise into the higher warming range (8-10.5°F). This temperature rise will lead to more precipitation falling as rain instead of snow, and the snow that does fall will melt earlier, thus decreasing the spring snowpack in the Sierra Nevada by as much as 90 percent. This would pose extreme challenges to water managers, hamper hydropower generation, and nearly eliminate skiing and other snow-related recrea-

tional activities. However, if global warming emissions are significantly curbed and temperature increases are kept in the lower warming range, the losses in snowpack are expected to be only half as great.

Costly Challenges

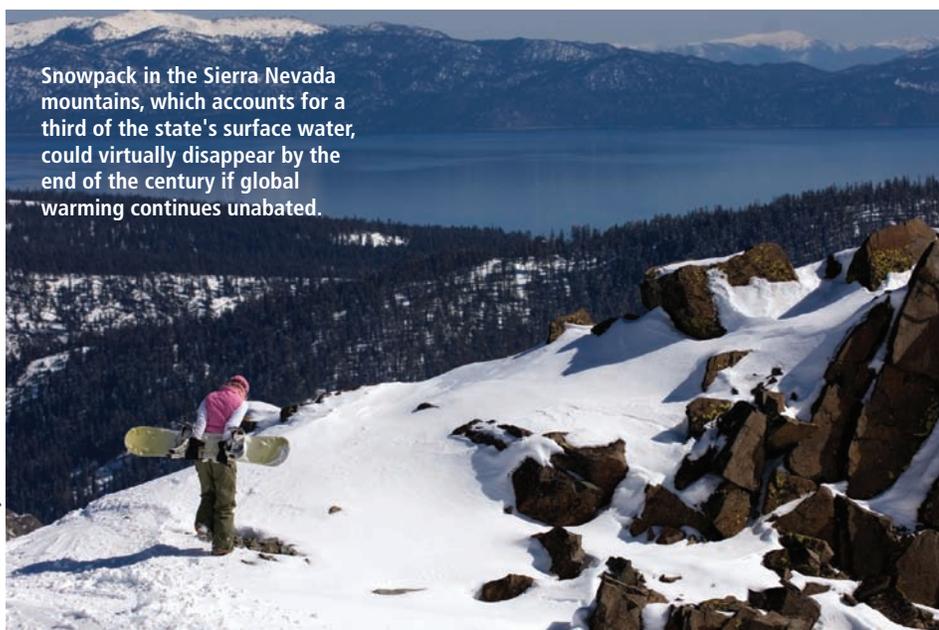
As global warming continues, decreasing snowmelt and spring stream flows, coupled with increasing demand for water resulting from a growing population and a hotter climate, will likely lead to more water shortages. By the end of the century, if temperature increase reaches the medium warming range (5.5 to 8°F) and precipitation decreases, spring streamflow could decline up to 30 percent. Agricultural areas are expected to be hard hit, with farmers able to access about 25 percent less water than they need.

Managing the consequences of global warming will require new infrastructure and major changes in the institutions that govern California water resources. As more winter precipitation falls as rain instead of snow, water managers will have to balance the need to fill constructed reservoirs for



water supply with the need to maintain reservoir space for winter flood control.

Because most global warming emissions remain in the atmosphere for decades or centuries, the choices we make today greatly influence the climate our children and grandchildren inherit. We have the technology to increase energy efficiency and significantly reduce emissions from energy and land use. We must act now to avoid the dangerous consequences of global warming and help ensure a high quality of life for future generations. ■



Snowpack in the Sierra Nevada mountains, which accounts for a third of the state's surface water, could virtually disappear by the end of the century if global warming continues unabated.

Court Level/Gravityhook Productions

SOURCES

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