

**The Drying of the Colorado River Basin:
Lessons from the past 25 years applied to the next 25 years**

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ABSTRACT

Since 2000 the Colorado River has been in unprecedented drought, with flows nearly 20% below the 20th century average. While precipitation declines explain much of the loss, our current best guess is that one-third of this loss (~6%) is due to higher temperatures which cause higher evapotranspiration, evaporation and sublimation from snow. As temperatures continue to warm in the 21st century due to large greenhouse gas emissions, these temperature-induced flow reductions will increase, perhaps reaching 20% of total flow by 2050. While precipitation increases may reduce these losses somewhat, the risk of earlier runoff, extended megadrought, dust on snow, a thirstier atmosphere and northward shifting storm tracks reinforce the overall risk of large Colorado River flow reductions. How are decision makers in the Basin incorporating these projections into their management, and how might science do a better job of providing information to managers to enable effective planning for these challenging future conditions?