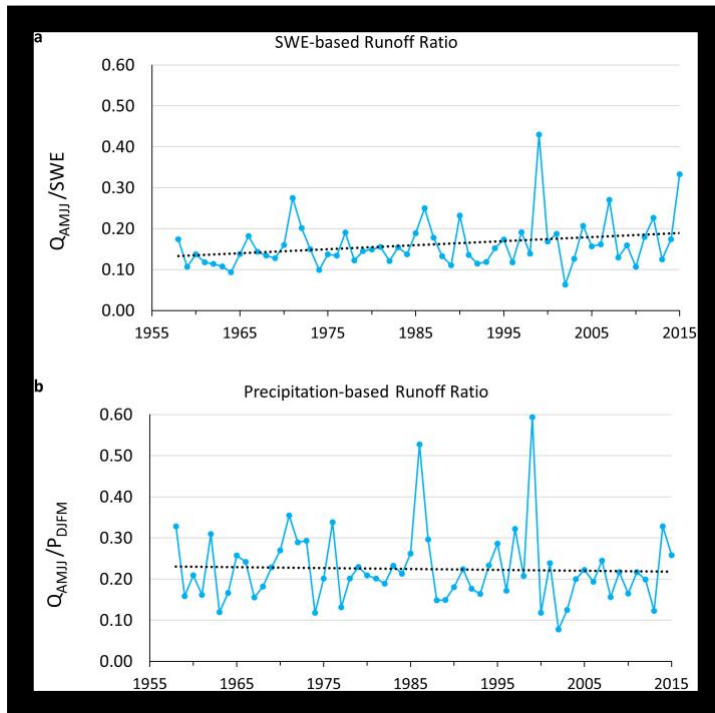


Observed Changes in Climate and Streamflow in the Upper Rio Grande Basin

June 2018



The Rio Grande Basin is a vital source of water for many in the southwest. To explore the potential impacts of climate change, observations of streamflow and climate data were collected and analyzed to see if current trends align with model-based projections of the 21st century streamflow in the basin.

Monthly and annual changes in streamflow and climate variables between 1958 and 2015 were assessed for the Upper Rio Grande. This basin's headwaters are in southern Colorado and its streamflow is fueled by snowmelt, so changes in the climate can directly impact streamflow.

Figure 1 Annual values of runoff ratio at the DN gage, defined as (a) (total spring streamflow) / (April 1 SWE) and (b) (total spring streamflow)/(winter precipitation)

The findings show that winter and spring season temperatures in the basin have significantly increased, while April 1 snow water equivalent (SWE) has decreased by ~25%. Streamflow has slightly decreased from April to July, which is the snowmelt runoff season. However, slight increases in precipitation have reduced the impacts of declining snowpack in streamflow. These observed changes provide confirmation that observations of streamflow are consistent with model projections for decreasing runoff and changes in snowpack. In addition, there appears to be a decreasing ability to predict streamflow based on snowpack alone.

For more information, click [here](#).