



CO₂ – vegetation feedbacks implicated in reducing streamflow in addition to other climate changes

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Changes in the hydrological cycle have a significant impact in water-limited environments. Globally, these regions are experiencing declining precipitation trends, yet are simultaneously becoming greener, partly due to vegetation feedbacks with increasing concentrations of atmospheric CO₂. Reduced precipitation together with increasing rates of actual evapotranspiration when water is available diminishes streamflow especially baseflow, which is a critical freshwater resource during the dry season. Here we assess recent changes in baseflow in Australia from 1981 – 2013 and 1950 – 2013 and separate the contribution of precipitation, potential evapotranspiration and other factors on baseflow trends. Our findings reveal that these other factors influencing the baseflow trends are best explained by an increase in photosynthetic activity. These results provide the first robust observational evidence that increasing atmospheric CO₂, and its associated vegetation feedbacks are reducing freshwater availability in already water-limited regions.