

# QUANTIFYING HUMAN-INDUCED TEMPERATURE IMPACTS ON THE 2018 UNITED STATES FOUR CORNERS HYDROLOGIC AND AGRO-PASTORAL DROUGHT

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This document is a supplement to “Quantifying Human-Induced Temperature Impacts on the 2018 United States Four Corners Hydrologic and Agro-Pastoral Drought,” by Emily Williams, Chris Funk, Shraddhanand Shukla, and Daniel McEvoy (*Bull. Amer. Meteor. Soc.*, **101**, S11–S16) • ©2020 American Meteorological Society • *Corresponding author*: Emily Williams, ewilliams@ucsb.edu • DOI:10.1175/BAMS-D-19-0187.2

The bias correction for CESM1 LENS was based on the CMIP5 CESM1experiment. Values of  $T_{\max}$  and  $T_{\min}$  from the LENS simulations were obtained from the Earth Systems Research Laboratory Facility for Climate Assessments (ESRL FACTS), and  $T_{\max}$  and  $T_{\min}$  from the Coupled Model Intercomparison Project version 5 (CMIP5) simulations were obtained from the Climate Explorer (<https://climexp.knmi.nl/>). The seasonal 1920–49 Four Corners  $T_{\max}$  and  $T_{\min}$  averages from the three available CMIP5 simulations, and 40 available LENS simulations, were compared

to PRISM  $T_{\max}$  and  $T_{\min}$ . The CMIP5 data were found to more closely align with PRISM than the LENS; generally, LENS provided more extreme estimates for both  $T_{\max}$  and  $T_{\min}$ . The monthly (climatological) difference between CMIP5 (from KNMI) and LENS (from FACTS) was taken, providing a climatological estimate of the difference between the model outputs; these scaling factors were the basis of our bias correction. The scaling factors were added to the CESM1 LENS, allowing us to compare the LENS ensemble with the CMIP5 PI time series.

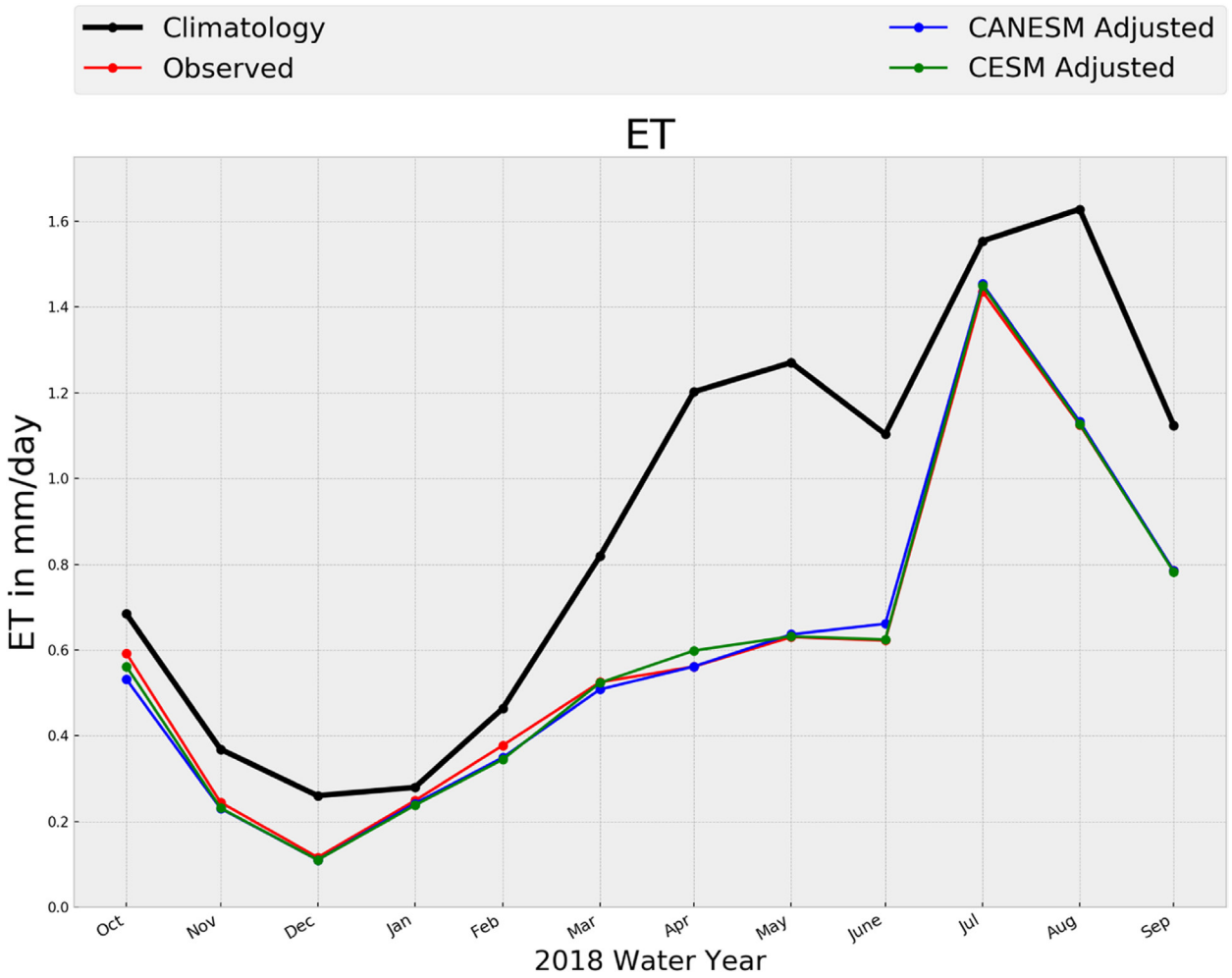


FIG. ES1. VIC model-simulated ET climatological average (1920–2017) with “observed” and CanESM2 and CESM1 adjusted temperature-based values for WY2018.

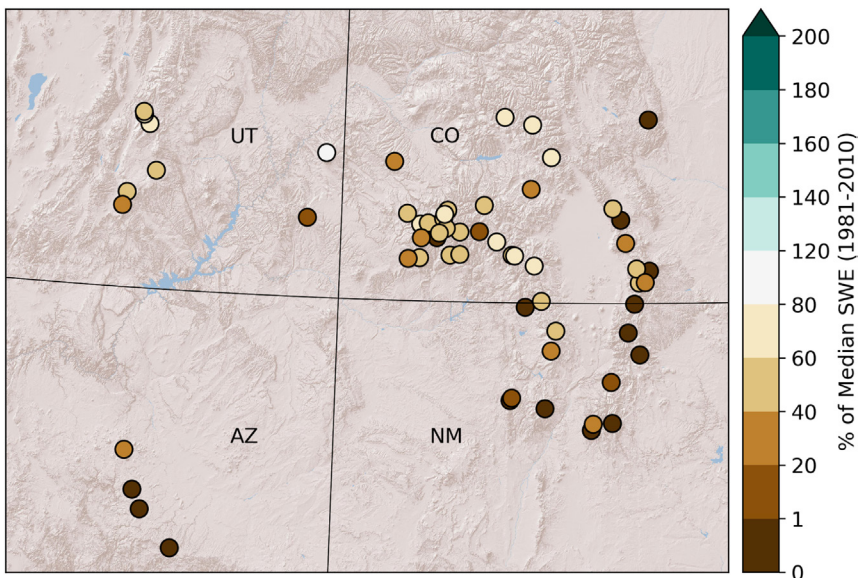


FIG. ES2. 1 Apr 2018 SWE percent of 1981–2010 median at SNOTEL stations within the study region. All stations shown in dark brown reported zero SWE for 1 April.