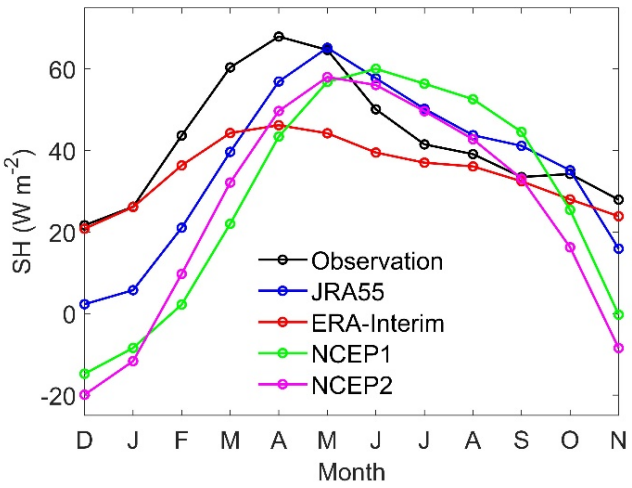
Land-atmosphere coupling over Tibetan Plateau

U.S. Department of Energy
FACETS
Framework for Assessing Climate's Energy-Water-Land Nexus using Targeted Simulations



The mean annual cycle of SH (unit: W m^{-2}) (1980-2015) averaged over all 91 stations in the central-eastern Tibetan Plateau from the observations and reanalysis datasets.

Scientific Achievement

A detailed description of spatiotemporal variability in sensible heat fluxes (SH) over the Tibetan Plateau. This is a region of high atmosphere-surface coupling and profound importance to the climate system. Declines in SH prior to 2000 resulted from changes in wind speeds, with the subsequent recovery in SH being due to increases in both wind speeds and air-surface temperature gradients.

Significance and Impact

The surface energy balance and specifically sensible heat fluxes (SH) over Tibetan Plateau (TP) dictate the seasonal conversion, onset and maintenance of the Asian monsoon and other major components of the climate system. Understanding the spatiotemporal variability and time scale of variability is key to understanding internal climate variability and making more robust climate projections

Research Details

We present an analysis of SH fluxes over the Tibetan Plateau based on multiple reanalyses and in situ data in order to detect and attribute variability in SH.

Chen L., Pryor S.C., Wang H. and Zhang R. (2019): Distribution and variation of the surface sensible heat flux over the central and eastern Tibetan Plateau: Comparison of station observations and multi-reanalysis products. *Journal of Geophysical Research: Atmospheres* **124** 6191-6206 doi: 10.1029/2018JD030069