Evaluation of Greenland near surface air temperature datasets

Surface air temperature (T2m) measurements (~1400 station-years, starting in 19th century) are used to comprehensively assess reanalysis, gridded temperature, satellite and regional climate model products.

Xubin Zeng's MAP Project

Reanalysis and observation-based gridded datasets differ in mean values and trends: this has impact on estimation of ice sheet mass balance (figure)

NASA MERRA2 is the best product over the satellite era; MERRA2 combined with NASA GISTEMP is best over 20th century (figure not shown)

Choice of observational dataset strongly affects evaluations of CMIP5 models (figure)

University of Arizona released a news article on this work. Jack won "Outstanding Poster award" for student presentations from the AMS Climate Conference in January 2018
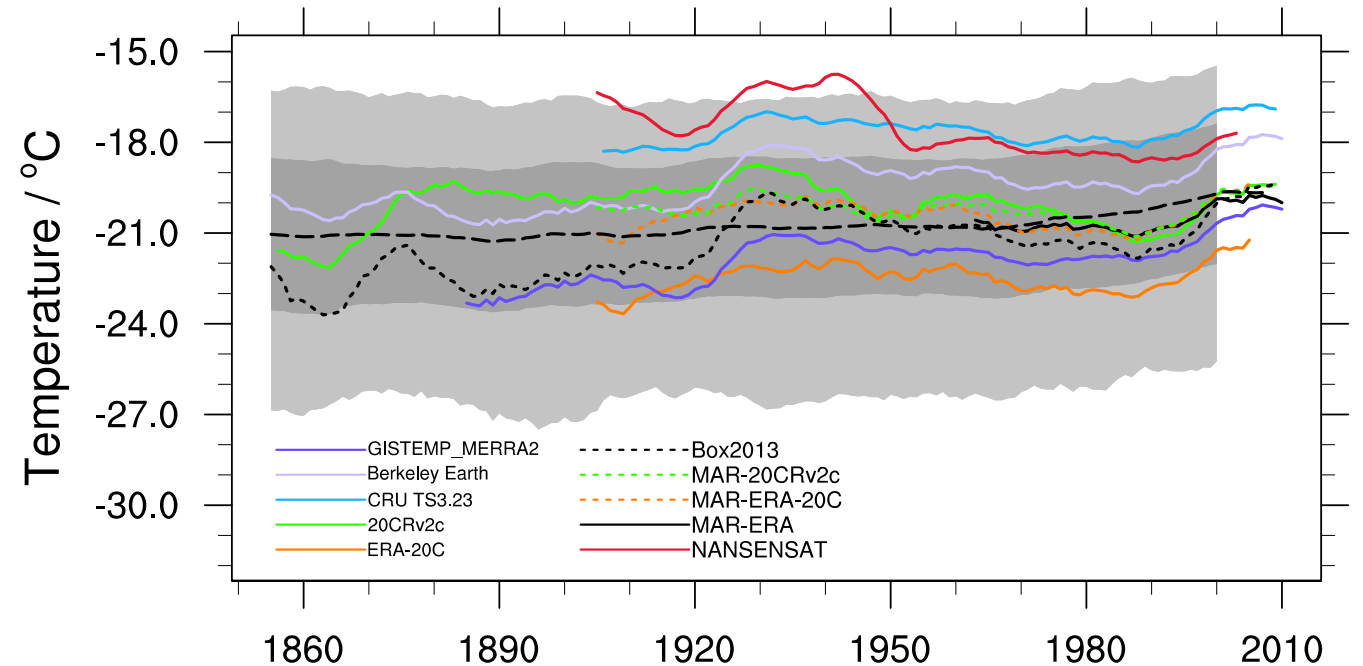
Ice sheet areal average annual T2m for selected observation-based datasets (colored lines) and CMIP5 climate models (ensemble mean in dashed black line; +/- 1 standard deviation in dark grey shading; maxima/minima in light grey shading).

Reference: Reeves Eyre, J. E. J. and Zeng, X., 2017: Evaluation of Greenland near surface air temperature datasets, The Cryosphere, 11, 1591-1605, doi: 10.5194/tc-11-1591-2017. [Part of special issue, "Mass balance of the Greenland Ice Sheet".]