

Impact of snowpack initialization on seasonal forecasts

NCEP Climate Forecast System (CFS) ensemble forecast data were analyzed to assess the impact of uncertainties in snow water equivalent (SWE) versus sea surface temperature (SST) initializations on seasonal forecasts

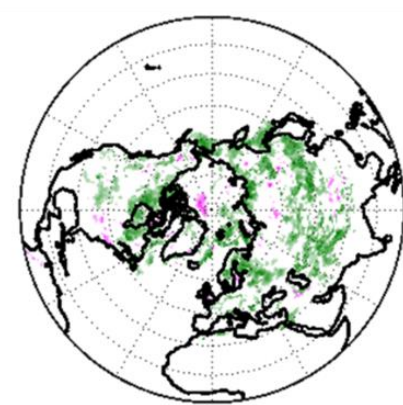
Xubin Zeng's
MAP Project

CFS significantly underestimates SWE in its initialization (figure not shown)

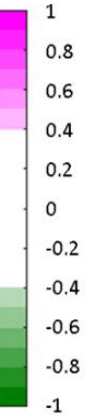
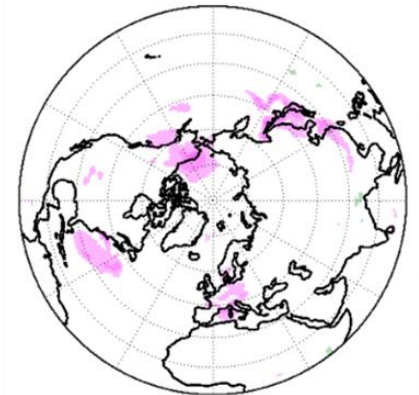
Over Land, SWE initialization uncertainties on 1 April affects the seasonal forecasts of different variables (e.g. T2m) in Apr-Jun more strongly than do SSTs, whose influence is mostly felt on the edges of continents (Figure)

SST interannual variability (ENSO) has a strong impact on various quantities over land, but its initialization uncertainty is small, which is translated into small impacts on (initialized) seasonal forecasting (figure not shown)

There is an urgent need to accurately measure SWE or snow depth globally based on satellite remote sensing.



Temporal correlation (from 1982-2009) of SWE difference on 1 April with Apr-Jun T2m difference (grid-to-grid)



Correlation of Apr-Jun SST difference (over oceans north of 30°N) with Apr-Jun T2m difference

Reference: Broxton, P., X. Zeng, and N. Dawson, 2017: The impact of a low bias in SWE initialization on CFS seasonal forecasts. *J. Climate*, 30, 8657-8671, doi: 10.1175/JCLI-D-17-0072.1.

