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How well are Arctic precipitation predicted (and observed)?

APPLICATE.eu
Advanced prediction in polar regions and beyond

Norwegian Meteorological Institute

Alertness

The effect of wind induced undercatch of solid precipitation:

skill

Precipitation ETS when wind speed > 4.0m/s

liquid precipitation

solid precipitation
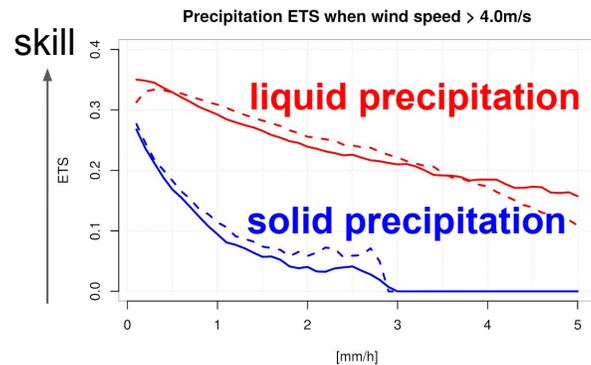
IFS-HRES (dashed), AROME (solid)

Solid precipitation (T < −2C)

123% 122% 100% 138% 141% 137% 138% 197% 206% 155% 177% 169%

MEPS IFS-HRES SA TF1 TF2 TF3 TF4 TF5 TF6 TF7 TF8 TF9

adjusted measurements

forecasts   measured
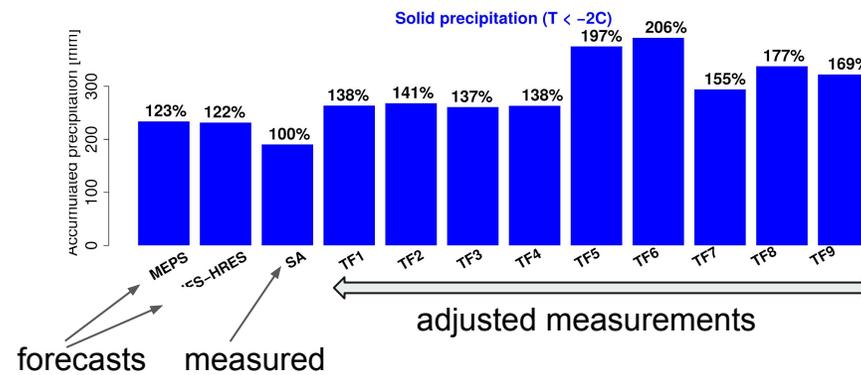
Adjusted precipitation are uncertain, but forecast bias change from positive to negative after adjustment

Haukeliseter test site (DFIR and SA Geonor, WMO SPICE)

All precipitation data sets have limitations, in particular in the harsh Arctic environment.
A sparse surface observation network with representativeness issues (point vs grid, not fully representative for the polar environment) and observational errors in particular for solid precipitation (e.g. undercatch, blowing snow, capping) make it challenging to assess the true quality of precipitation predictions at different time scales.