



New estimates of land-based Arctic solid precipitation, 1940-1999

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A new product, the Pan-Arctic Snowfall Reconstruction (PASR) is developed to address the problem of cold season precipitation gauge biases for the 1940-1999 period. The NASA Interannual-to-Seasonal Prediction Project Catchment-based Land Surface Model is used to reconstruct solid precipitation from observed snow depth and surface air temperatures. The method is applied to four stations in the United States and Canada. Reconstructed snowfall at Dease Lake and Barrow is higher than gauge observations. Reconstructed snowfall at Regina and Minot is lower than gauge observations because snow is transported by wind out of the Prairie region and enters the hydrometeorological cycle elsewhere. These results are similar to gauge biases estimated by a water budget approach. Reconstructed snowfall is consistently higher than snowfall from ECMWF Reanalysis-40 but does not have a consistent relationship with snowfall derived from the WMO Solid Precipitation Intercomparison Project correction algorithms.