Evaluation of Seven Different Atmospheric Reanalysis Products in the Arctic

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Atmospheric reanalyses depend on a mix of observations and model forecasts. In data-sparse regions such as the Arctic the solution will be more dependent on the model structure and assumptions and data assimilation methods than in data-rich regions. State variables that are not directly observed are also expected to show more variability across models than those subject to observation. We present comparative analysis in the Arctic regions of seven different atmospheric reanalysis datasets: NCEP-1, NCEP-2, CFSR, 20CR, MERRA, ERA-Interim, and JRA-25. While basic parameters such as near-surface air temperature and the heights of pressure levels are considered, emphasis is placed on variables not directly observed such as surface fluxes, precipitation, and trends. The monthly averaged surface fluxes are also compared with observed values from a limited number of available shore and drifting stations to see how well the different data sets capture the seasonal cycles. The 30-year period from 1981 to 2010 is analyzed.

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