

## **Evaluating daily reanalysis temperature and precipitation for Alaska**

Rick T. Lader, Uma S. Bhatt, John E. Walsh, T. Scott Rupp, Igor V. Polyakov

An evaluation of reanalysis data in Alaska is motivated by their increased use in interdisciplinary research (e.g., wildfire, or hydrology). One component of this evaluation is to compare reanalysis with daily observations for 20 first-order weather stations in Alaska. Temperature ( $T_{\max}$  and  $T_{\min}$ ) and precipitation from the NCEP/NCAR, NARR, ERA-Interim, CFSR, and MERRA reanalyses from 1979-2009 are investigated. Fairbanks station data is compared to the nearest interpolated reanalysis grid point (65 °N, 148 °W) to quantify differences in mean, variability, and extreme indices.

For Fairbanks, the NCEP/NCAR reanalysis has a cold and wet bias, with reduced variability for temperature. The annual mean  $T_{\max}/T_{\min}$  is 3.3/-7.7 °C for the station and -1.5/-9.6 °C for the reanalysis. Additionally, reanalysis underestimates temperature variability. NCEP/NCAR had a higher mean daily precipitation (0.22 vs. 0.07 cm/day); however, record precipitation (5.77 cm) was over two times that of NCEP/NCAR.

Climate indices that characterize extremes are consistent with the above findings. Compared to station data, NCEP/NCAR had 37 more icing days per year and nearly twice as many days with 10 mm or greater precipitation, but fewer days than observed with 20 mm or greater. This paper will compare five reanalyses for first-order stations in Alaska.