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Temperature trends and extremes from long climatological records at Barrow, Alaska and Tiksi, Russia

Taneil Uttal (1) and Alexander Makshtas (2)
(1) National Oceanic and Atmospheric Administration, (2) Arctic and Antarctic Research Institute

In the International Arctic Systems for Observing the Atmosphere (www.IASOA.org) Barrow Alaska and Tiksi, Russia are sites with two of the longest climatological records dating from 1901 and 1936 respectively. Tiksi and Barrow are also particularly useful sites for comparing Arctic regional variability because they are located at nearly the same latitude (71.325 N and 71.596 N respectively). When making comparison of temperature trends and extremes, this fortunate coincidence allows elimination of the annual variability of incoming solar irradiance as one of the major factors controlling the variability of temperature when considering annual, seasonal, interannual and decadal changes. Although temperature is one of the most basic of environmental parameters measured globally on a routine basis, acquiring temperature records for analysis requires making choices about sources which may apply different quality control and averaging protocols affecting calculations especially of extremes. Records are available from the U.S. NOAA National Climatic Data Center and the Climate Research Unit of the U.K. Met Office. In addition, historical data rescue digitized data sets for Tiksi are available from the Russian Arctic and Antarctic Research Institute. Using these records a detailed analysis and comparison of temperature trends and extremes is performed. The temperature trends are examined using unique method whereby the variation of the trend itself is examined as a function of start year. Differences in statistics of extremes is examined for average, minimum and maximum temperatures. The trends and extremes are then compared between Barrow and Tiksi to determine if it is possible make a first order determination of relationships to larger scale circulation patterns.