Processed for gridding purposes daily temperature and total precipitation datasets version 2012 (Processed for gridding daily station T&P v2012)

This dataset contains quality checked and processed daily maximum and minimum temperature and total precipitation data for all viable Canadian stations that report these observations. The processing includes inspection and adjustment using quality control procedures customized for gridding purposes (Hutchinson, 2009), and correction for different definition of climatological day at principal and ordinary climate stations (Hopkinson, 2011). It is used by ANUSPLIN (McKenney, 2011) to produce daily grids and in other applications that involve interpolated data.

Data processing

The processed station dataset for 1950-2012 covers the entire country, with fewer stations located north of the sixty degree latitude. The data is extensively checked and prepared for gridding (Hutchinson et al., 2009). Daily records of precipitation, and maximum and minimum temperature are examined for accuracy in geographic position (latitude, longitude, and elevation), and for the presence of flags indicating uncertainty in the associated data values. Modifications are made to data values to address erroneous and missing values, estimated values, trace precipitation amounts, and precipitation accumulated over multiple days. These efforts substantially increase the number of station days available and improve completeness of the daily dataset for Canada for the period.

In addition, the temperature extremes at principal stations are corrected for a different definition of climatological day as compared to ordinary climate stations (Hopkinson et al., 2011). On 1 July 1961, the climatological day was redefined to end at 0600 UTC at all principal climate stations in Canada, while prior to that, for much of the country, their times of observations were close to those at the ordinary climate stations. In order to ensure spatial compatibility between the two types of stations, daily minimum and maximum temperatures at principal stations are estimated using hourly temperatures and daily precipitation is estimated using synoptic precipitation data for the time of observations that closely match ordinary climate stations.

Data formatting

Daily total precipitation, daily maximum temperature, and daily minimum temperature are organized in text files which can be read by any text editor or imported into newer versions of Excel (2007 or later). Older version can handle only 256 columns whereas newer version can import all 366 days of data plus the climate ID and geographic coordinates.

All stations are grouped in files by year and are listed as follows: climate station identification, year, geographic coordinates (degrees), elevation (metres), 366 days of values: temperature (degrees Celsius), or precipitation (millimetres); missing values as -999.99, including for Feb 29th in non-leap years.

Tx/Tn: A7,1X, I4, 2(1X, F9.4), 1X, 7F.1, 366(1X, F7.2) - ClimateID, Year, Lon, Lat, Elev, 366 values

P: 1X, A7, I4, 2(1X, F9.4), 1X, 7F.1, 366(1X, F7.2) - ClimateID, Year. Lat, Lon, Elev, 366 values

Note: P files have the latitude and longitude switched and an extra space at the start of each line.

References

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Hutchinson, M., McKenney, D.W., Lawrence, K., Pedlar, J.H., Hopkinson, R.F., Milewska, E. and P. Papadopol. 2009: Development and testing of Canada-wide interpolated spatial models of daily minimum/maximum temperature and precipitation for 1961-2003. J. App. Met. and Climatology, 48, 725-741, doi: 10.1175/2008JAMC1979.1

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