

Implementing a Range for NCDC Daily Normal Temperatures in North Carolina



Adrienne M. Wootten, Ryan P. Boyles and Mark S. Brooks
 State Climate Office of North Carolina
 Centennial Campus Box 7236, N.C. State University, Raleigh, NC 27695-7236

Introduction

Every ten years the National Climatic Data Center (NCDC) calculates monthly and daily normal temperatures from thirty years of observed data for NWS Cooperative (COOP) Observing Network Stations around the country. However, daily and weekly temperature variations rarely follow the smooth curve of the daily normals. Nearly every day will be somewhat warmer or cooler than the daily normal for that day. This can be misleading for many people and leads to the question of what is "normal"?

The goal of this project was to develop a product using the range of daily normal temperatures to describe typical temperatures for stations in North Carolina.

Method

- Created a temperature range for every COOP station with daily normal temperatures in North Carolina proposed by Holder et al. (2006)
- Daily Normal Temperatures (Maximum, Minimum, Mean) 1971-2000
- Daily Temperatures 1971-2000

$$(L_i, U_i) = N_i \pm 0.6745 \cdot \sigma_i$$

Where N is the daily normal temperature for day i , σ is the standard deviation of the daily temperatures recorded for day i , and L and U are the lower and upper range of the normal temperature respectively.

References:

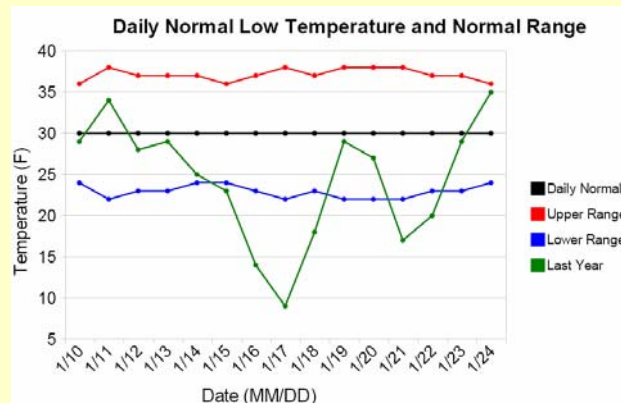
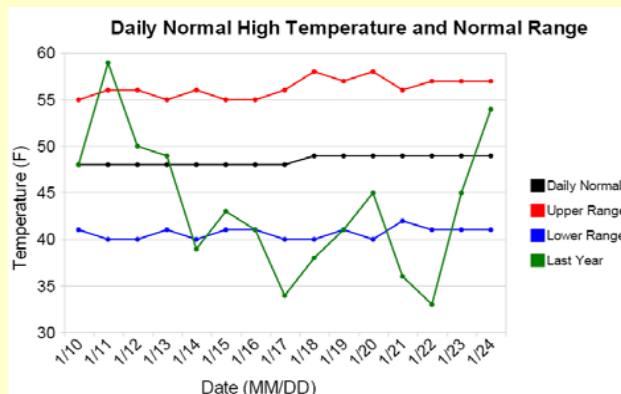
Holder, C., R. Boyles, P. Robinson, S. Raman, and G. Fishel (2006). Calculating a Daily Normal Temperature Range that Reflects Daily Temperature Variability. Bulletin of the American Meteorological Society, Vol. 87, pp 769-774.

The Daily Normal Temperatures Tool

The resulting normal ranges were built into a tool which displays the normal temperatures, normal range and the daily temperatures from last year for any location in North Carolina.

<http://www.nc-climate.ncsu.edu/normalstool.html>

Raleigh, NC in this example.

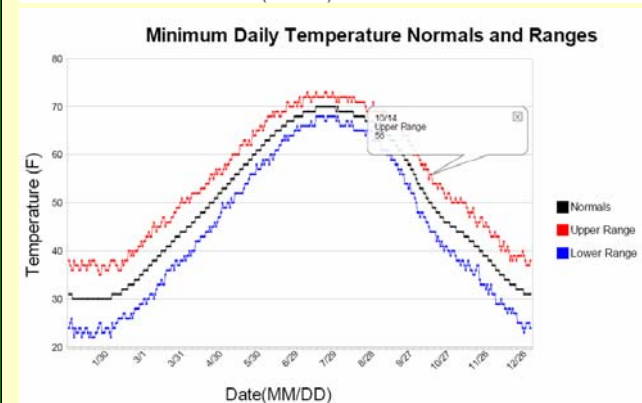
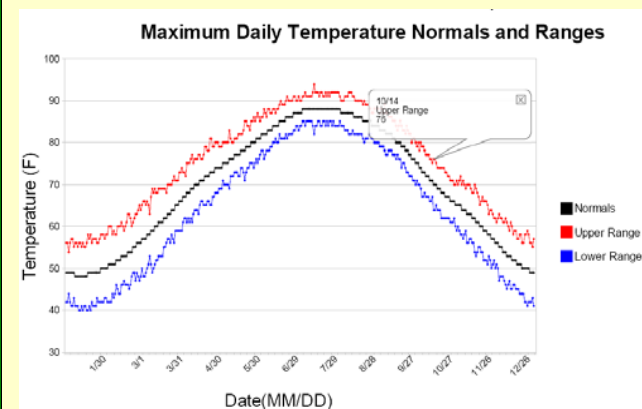


Climate Normals 1971-2000

The normal ranges were also implemented as part of the Climate Normals webpage for the State Climate Office of North Carolina

<http://www.nc-climate.ncsu.edu/cronos/normals.php>

Raleigh, NC in this example



Future Work

- Expand the Daily Normal Temperatures tool to states across the Southeast U.S.
- Explore the variation in the normal range across the U.S.
- Provide graphics and typical temperatures for broadcasters in North Carolina
- Re-calculate the normal range using the 1981-2010 daily normal temperatures.

