

**Name:** Taylor Nicolaisen  
**Affiliation:** Meteorologist at NWS Omaha  
**Address:**  
6707 North 288th Street  
Valley, NE 68064-9443  
**Phone Number:** 402-359-5166  
**Email Address:** [taylor.nicolaisen@noaa.gov](mailto:taylor.nicolaisen@noaa.gov)

### **Replacing Missing Temperature Data and Its Effects on Monthly Rankings**

Author: Taylor Nicolaisen, National Weather Service - Omaha/Valley, NE

Ranking annual and monthly temperatures relative to historical records yields more scrutiny than most weather data. This work identifies and evaluates best practices for when missing data should disqualify a month or year from being ranked in climatological reference. Using Applied Climate Information System (ACIS) for high temperatures and days of missing data, multiple examples were evaluated, one of which was the comparison of the current annual average temperature at KOFK in 1931 which has a single missing low temperature. Multiple missing data replacement methods were evaluated, including replacement with the climatological average for the date, the record warm low for the date, the record cold low for the date, and an average of the three nearest observed station values from the same date. These five methods changed the annual record only slightly, varying only by 0.076 degrees Fahrenheit at most in this example.

World Meteorological Organization guidance allows up to five non-consecutive dates over the course of a month to be vacated without affecting the monthly records. This Norfolk example and several others were evaluated to illustrate how this data absence would compare to various data replacement methods, and the results are presented herein.