Accessing NOAA Daily Temperature and Precipitation Extremes Based on Combined/Threaded Station Records

Tim Owen¹
Keith Eggleston and Arthur DeGaetano²
Robert Leffler³

¹: NOAA National Climatic Data Center, Asheville, North Carolina
²: Northeast Regional Climate Center, Cornell University, Ithaca, New York
³: NOAA National Weather Service, Climate Services Division, Silver Spring, Maryland

Version 03/20/06
The Issue

• What climatological records should be used as the basis for U.S. daily climate extremes that are reported by the media, NWS, and others?

• Current extreme records reporting are inconsistent, based on varying combinations of multiple observing sites.
For Example, In Chicago…

- Which is the **Official** Record?
- What is available in **Digital** Form?

<table>
<thead>
<tr>
<th>Location</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago Weather Bureau City Office</td>
<td>1872-1970</td>
</tr>
<tr>
<td>University of Chicago</td>
<td>1916-95</td>
</tr>
<tr>
<td>Chicago Midway Airport</td>
<td>1928-Present</td>
</tr>
<tr>
<td>Chicago O’Hare Airport</td>
<td>1958-Present</td>
</tr>
</tbody>
</table>
Digitized Data

• NOAA’s Climate Database Modernization Program (CDMP) has keyed a large amount of pre-1948 data in the past 5 years – data that has not been consistently used before.
ThreadEx Priorities

- Published Local Climatological Stations (~260; Mostly ASOS Sites)
  - Temperature
  - Precipitation
Threading Process

• Starting Point: Current ASOS Site
• Consideration of Historical Precedent
  – 1.) NWS/WB
  – 2.) COOP
• Overlaps: Yield to the More Recent Site
• No Adjustments for Inhomogeneities
  – This data set is informational; NOT meant for research purposes!
• Station Threads Vetted by Partners:
  – Northeast Regional Climate Center (Developer)
  – NWS Field, State Climatologists, Others (Reviewers)
Back to Chicago

Threaded Record

1. Chicago CRB
2. Chicago WB Office
3. University of Chicago
4. Chicago Midway Airport
5. Chicago O’Hare Airport

1871-95
1896-1925
1926-41
1942-58
1958-Present


Unused Portion of Record

Rooftop Station
The Benefit of Threaded Records:

WASHINGTON REAGAN NATIONAL AP (KDCA)
Extremes
Highest Daily Maximum Temperature
Day: January 20; Length of period: 1 day

i.) Years: 1948–2005

<table>
<thead>
<tr>
<th>Rank</th>
<th>Value</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70</td>
<td>1/20/1951</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>1/20/1954</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>1/20/1952</td>
</tr>
<tr>
<td>4</td>
<td>59</td>
<td>1/20/1963</td>
</tr>
</tbody>
</table>

ii.) Years: 1873–2005

<table>
<thead>
<tr>
<th>Rank</th>
<th>Value</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70</td>
<td>1/20/1951</td>
</tr>
<tr>
<td>2</td>
<td>64</td>
<td>1/20/1907</td>
</tr>
<tr>
<td>2</td>
<td>64</td>
<td>1/20/1890</td>
</tr>
<tr>
<td>2</td>
<td>64</td>
<td>1/20/1880</td>
</tr>
</tbody>
</table>
ThreadEx Roll-Out

• Daily Threaded Data: Completed 3/2006
• Data Tables: Available at: http://threadex.rcc-acis.org/
• Data Tables Updates: Annually to Include:
  – Immediate Past Year (e.g., 2006)
  – Addition of Early Data (e.g., Keyed Forts Data)
  – Adjustments to Threads
Data Table Contents

- Daily Top Three Records and Years for:
  - Highest Maximum Temperature
  - Lowest Maximum Temperature
  - Highest Minimum Temperature
  - Lowest Minimum Temperature
  - Greatest Precipitation
ThreadEx on the Web

http://threadex.rcc-acis.org/

Threaded Station Extremes

View records for: - Select location -

Variable: - Select -

Submit

Summary

AZ - Tucson
AZ - Winslow

ThreadEx is a project designed to address the fragmentation of climate information.
Future Plans

- Expanded Locations:
  - Principal COOP Network Sites
  - Key Locations for NWS and Partners
  - Stakeholder Feedback

- Expanded Elements:
  - Snowfall
  - Snow Depth

- Other Statistics (e.g., Consecutive Days, etc.) will be available through NOAA-Sponsored Data Query Tools (xmACIS, CDO, NOWData)
Conclusion

ThreadEx provides…

- Maximized
- Consistent
- Routinely Updated
- Freely Available

Daily Climate Records for Principal Observing Stations in the United States

ThreadEx is for general public use, NOT for research (no homogeneity adjustments)

For More Information Contact: Tim.Owen@noaa.gov