An Overview of NCDC’s New Climate Division Dataset

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ηClimDiv Overview

• What is ηClimDiv?
• How does ηClimDiv compare with the DRD divisional dataset?
• What data/products/tools are affected?
• Where do I go for additional information?
• Questions...
What is ηClimDiv?

- ηClimDiv is NCDC’s new divisional dataset which is derived from a gridded instance (5km x 5km) of GHCN-Daily temperature and precipitation (called “ηClimGrid”)

Networks include:

- COOP
- WBAN
- SNOTEL
- RAWS (temp only)
- BUOY (13 stns)
- CIMIS (28 stns)
- CANADA
- MEXICO
What is ηClimDiv?

• ηClimDiv is a monthly divisional dataset which also contains statewide, regional and CONUS data from 1895 to present for the following elements:
  - Temperature (Tavg, for now ➔ Tmax and Tmin coming soon)
  - Precipitation
  - HDD/CDD
  - Drought (PDSI, PMDI, PHDI, Z-Index, SPI)

• As with the DRD divisional dataset, ηClimDiv data will be processed/updated as part of CMB’s routine monthly processing.

• ηClimDiv data will be updated once a month
  - Data within the last 2 calendar years are subject to change
  - POR refreshes will occur with version changes (less frequent)
What is ηClimDiv?

Dataset name history:  GrDD → Version 2 → ηClimDiv

ηClimDiv

HDD, CDD, Drought

Divisional Tavg & Prcp

HDD, CDD, Drought

Statewide Tavg & Prcp

HDD, CDD, Drought

Regional Tavg & Prcp

HDD, CDD, Drought

CONUS Tavg & Prcp

Vose 5km x 5km Gridded Tavg & Prcp Data

“ηClimGrid”
How does $\eta$ClimDiv compare with the DRD divisional dataset?

- $\eta$ClimDiv based on GHCN-Daily data
- New methodologies
  - 5km x 5km grid
  - More stations from pre 1930s era
  - Modern array of quality control algorithms (similar to USHCN)
- $\eta$ClimDiv is wetter and colder in mountainous divisions
- Division-level trends in temperature display greater spatial consistency in $\eta$ClimDiv
- CONUS temperature trends in $\eta$ClimDiv are comparable to those seen in USHCN
- Errors in $\eta$ClimDiv are likely less than 0.5°C for temperature and less than 20 mm for precipitation at the beginning of the record, falling rapidly thereafter.
How does \( \eta \text{ClimDiv} \) compare with the DRD divisional dataset?

- \( \eta \text{ClimDiv} \) more homogenous from 1895-present:
  
  **DRD Climate Division Dataset:**
  
  - **1895-1930**
    - Statewide values were computed directly from stations within each state.
    - Divisional values computed from regression techniques against statewide values
  
  - **1931-Present**
    - Averages of station anomalies within each CD
    - State and Regional (multi-state) values were computed from areally weighted divisions

- \( \eta \text{ClimDiv} \) Dataset:
  - Same 5km x 5km gridding technique used for entire POR
How does nClimDiv compare with the DRD divisional dataset?

Email received by NCDC in early March acknowledged interest in the divisional dataset transition and asked...

“...if this release will serve to correct the longstanding and very large errors in the present dataset?”

Example provided:

<table>
<thead>
<tr>
<th>Location &amp; Element</th>
<th>Date</th>
<th>DRD Value</th>
<th>“Actual” Value</th>
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<tbody>
<tr>
<td>Indiana Temperature</td>
<td>August 1927</td>
<td>78.8°F</td>
<td>66.7°F</td>
</tr>
<tr>
<td>Illinois Temperature</td>
<td>February 1913</td>
<td>35.4°F</td>
<td>25.3°F</td>
</tr>
<tr>
<td>Nebraska Temperature</td>
<td>December 1908</td>
<td>37.7°F</td>
<td>27.7°F</td>
</tr>
<tr>
<td>Nebraska Precipitation</td>
<td>July 1922</td>
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Answer:
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Answer: Yes, this new dataset will indeed correct these values!
What data/products/tools are affected?

- All division-based products including statewide, regional and CONUS analyses for:
  - temperature
  - precipitation
  - hdd/cdd
  - drought products
- ηClimDiv has become the official CONUS temperature dataset (replacing USHCN)
- Monitoring maps
  - all CMB static division-based monitoring maps now have a new look and feel
What data/products/tools are affected?

- **U.S. State of the Climate Reports**
  - All divisional, statewide, regional and CONUS data/ranks are impacted → including percent area products
  - Drought indices and products (all Palmers, Drought Termination & Amelioration, Drought coverage area, percent wet/dry/warm/cold)

- **U.S. Climate at a Glance (USCAG)**
  - All divisional, statewide, regional and CONUS data/ranks are impacted (temp, precip, hdd/cdd, drought). City data values remain stable
What data/products/tools are affected?

- National Temperature Index (NTI)
  - Added ηClimDiv CONUS temperature anomalies to USCRN and USHCN

- U.S. Climate Extremes Index (USCEI)
  - PDSI values changed
  - Monthly Tmax and Tmin indicators will remain USHCN for now, but will likely transition once we begin to use Tmax/Tmin in monthly monitoring reports
What data/products/tools are affected?

- REDTI
- MSI (Moisture Stress Index) – Crop Moisture Index (CMI)
- Weekly Divisional Products (Temp, Prcp, Drought)
What data/products/tools are affected?

CDO Mapping Tool – Climate Indices
What data/products/tools are affected?

CDO Applications – Climate Indices

http://www7.ncdc.noaa.gov/CDO/CDODivisionalSelect.jsp
What data/products/tools are affected?

- CIRS FTP site:
  - DRD divisional data will be updated with final quality controlled data through December 2013.
  - Location of DRD data on CIRS FTP site has changed (on purpose):
  - File names have changed:
    - drd964x.tmp.txt → climdiv-tmpcdv-v1.0.0-YYYYMMDD
    - drd964x.tmpst.txt → climdiv-tmpcst-v1.0.0-YYYYMMDD
  - DRD data will eventually go away as no future data will be added. At that time, customers may access historical climate division data via archive request.
What data/products/tools are affected?

• Station inventories:
  - Inventories for Tmax, Tmin and Prcp are available in 2 ways:
    - POR File: 1895 – present for all months and stations
    - Most recent 2 calendar years


climdiv-prcp-inv-v1.0.0-YYYYMMDD
climdiv-prcp-inv-recent-v1.0.0-YYYYMMMDDD
climdiv-tmax-inv-v1.0.0-YYYYMMDD
climdiv-tmax-inv-recent-v1.0.0-YYYYMMMDDD
climdiv-tmin-inv-v1.0.0-YYYYMMDD
climdiv-tmin-inv-recent-v1.0.0-YYYYMMMDDD
climdiv-inv-readme.txt (inventory readme file)
What data/products/tools are affected?

- Climatological Data (CD) Publication:
  - There will be a disconnect between divisional values published in the CD pub and what CMB produces and puts in the monthly reports and on the CIRS ftp site
  - IAB will continue to produce the publication with the current set of NWS-designated Open and Published COOP and First Order Sites
  - IAB will include a reference note in the January 2014 CD Pub to acknowledge this difference.
Where do I go for additional information?

Climate Division reference page:

Visualization Toolkit:

CIRS ftp site technical status file:

ClimDiv data ascii files on ftp:
Where do I go for additional information?

CONUS temperature transition comparison:
http://www.ncdc.noaa.gov/sotc/national/2014/1/supplemental/page-6/

Russ Vose et al. nClimDiv paper:
http://journals.ametsoc.org/doi/abs/10.1175/JAMC-D-13-0248.1

Fenimore et al. conference paper:

NTI:
http://www.ncdc.noaa.gov/national-temperature-index/background/nti
Thank You!!!

Questions?