12th Annual Meteorological Memories
December 11, 2014

Greg Carbin
DOC/NOAA/NWS/NCEP/SPC
12th Annual Meteorological Memories
2014

Greg Carbin
DOC/NOAA/NWS/NCEP/SPC
January Cold and Dixie Woes
January 2014 12 UTC NARR 2m Temperature (F)
January 2014 12 UTC NARR 2m Temperature (F)

<table>
<thead>
<tr>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
<th>Sat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>29</td>
<td>30</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Coldest 5% of January days since 1979:
--2014--
6th   16.6F
7th   15.0F
28th  17.1F
29th  18.5F

Warmest 5% of January days since 1979:
--2014--
11th  36.6F
12 UTC NARR CONUS 2m Temp Extremes by Year (1979-2014)

- Warmest 5% of days
- Coldest 5% of days
12 UTC NARR CONUS 2m Temp Extremes by Year (1979-2014)

- **Warmest 5% of days**
  - 18y from 1979-1996

- **Coldest 5% of days**
  - 18y from 1979-1996
12 UTC NARR CONUS 2m Temp Extremes by Year (1979-2014)

- **Warmest 5% of days**: 20 days in the warmest 5%
- **Coldest 5% of days**: 38 days in the coldest 5%

18 years from 1979-1996
12 UTC NARR CONUS 2m Temp Extremes by Year (1979-2014)

- **Warmest 5% of days**
  - 20 days in warmest 5%
  - 36 days in warmest 5%

- **Coldest 5% of days**
  - 38 days in coldest 5%
  - 18 days in coldest 5%

18 years from 1979-1996
18 years from 1997-2014
Southern U.S. Snowfall from January 27-29, 2014 Winter Storm

Map showing snowfall distribution with color coding:
- Dark blue: 6-12 inches
- Medium blue: 3-6 inches
- Light blue: 1-3 inches
- Lightest blue: Coating 1” isolated 2”
January Cold & Dixie Woes Summary

Midwest & SE Feel Brunt of Coldest Jan. in Many Years

Thousands Stranded by Dixie Winter Storm, 27th-29th

Few Jan. Mornings w/ Record Cold Recent ~2 Decades
California’s Drought Nightmare
Fresno, CA Precipitation January-July

Precipitation (in) to Date for Fresno, CA
Jan 1 through Jul 31. Period of record is 1948 through 2014

NOAA's National Climatic Data Center

1961-2010 Normal underlaid in dark gray
2014 period in NOAA Lite Blue
Fresno, CA Temperature January-July
– California’s Drought Nightmare Summary –

Feb. 2013 - Jan. 2014: Driest 12-months on Record

More of CA in Extreme Drought than Ever (80% by July)

At Least $1 Billion in Agricultural Losses

Hydroelectric Power Generation ~50% of Average

2011 2014
Atlantic Bomb – March 25-26
12 UTC Surface Maps “Ping-pong” Loop for Mar. 24-25-26-27

Surface Weather Map at 7:00 A.M. E.S.T.
Atlantic Bomb, March 25-26 Summary

Rapid Intensification: Pressure Falls > 50 mb/24 h

Expansive Well-forecast Hurricane-Force Wind Field

Central Pressure Comparable to Sandy
Tornadoes Return – Apr 27-28
April 27-30, 2014 Severe Weather Outbreak: Preliminary Tracks* and Tornado Fatalities**

* Tornado tracks are based on preliminary reports and radar data and are only an approximation of actual tornadoes. Total GIS data not yet available.

** Tornado fatalities are preliminary and subject to change. Only direct tornado fatalities are indicated.

Sun. Apr. 27, 2014 estimated tracks/fatalities

Mon. Apr. 28, 2014 estimated tracks/fatalities

Tue. Apr. 29, 2014 estimated tracks


National Weather Service Storm Prediction Center

Rotation track data used in this analysis courtesy of:
National Severe Storms Laboratory (NSSL)
Cooperative Institute for Mesoscale Meteorological Studies (CIMMS)

Updated 9am CDT, Fri., May 2, 2014

Map data ©2014 Google
Little Rock, AR upper-air sounding taken ~ 21 UTC showed 1200 J/kg CAPE, ~600 effective SRH. Storm motion was estimated to be from 235 degrees at 36 knots. A classic supercell tornado thermodynamic and kinematic profile and the best proximity sounding for this event.
Jackson, MS upper-air sounding taken ~ 18 UTC showed 3500 J/kg CAPE, ~155 effective SRH. Storm motion was estimated to be from 230 degrees at 34 knots. A classic supercell tornado thermodynamic and kinematic profile and another great proximity sounding immediately prior to tornado development.
Louisville/Winston County, MS (EF4)

BEFORE

April Tornadoes in Arkansas

Vilonia:
EF4 – 4/2014
EF2 – 4/2011
2x in 12/1982
F2 in 3/1961

Louisville/Winston County, MS (EF4)

AFTER
- Tornadoes Return, April 27-28 Summary -

Two-day event: 70 Tornadoes, 34 Fatalities, 434 Injuries
~$400 Million in Property Damage

With 23 tornadoes, 3rd Largest MS Outbreak on Record

Vilona, AR (EF4), after EF2 in ‘11 & 5th Tor Since ‘50
Gulf Coast Soak – April 30
High PW air (+2") transported across squall line & deeper front.

Strongly diffluent upper jet.
High PW air (+2") transported across squall line & deeper front.

Midnight-2pm Tue-Wed, April 29-30, 2014
Once in a 100-200 Year Event for Florida Panhandle

Pensacola 20”+ (est. two-day amt.)
Gulf Coast Soak, April 30 Summary –

PNS: 5.68” in 1h, New 24h Record of ~16 Inches (1879)

Gulf Shores Swamped with a Foot of Rain in 9 Hours

Mobile, AL; 1 Foot of Rain in 24h, 3rd Greatest (1871)
Nebraska Nasty – June
Radar estimated hail size $\geq 2$ inches in dia.
Two swaths $\sim 150$ miles in length across southeast Nebr.
Next: Northeast Nebraska Tornado Climatology
June 16, 2014 – Add Four More EF4 Tornadoes
June 16, 2014 – Add Four More EF4 Tornadoes
STANTON TORNADO
3:42 - 4:11pm / 12 miles

PILGER TORNADO
4:00 - 4:39pm / 18 miles

PILGER EAST TORNADO
4:13 - 4:32pm / 12 miles

WAKEFIELD TORNADO
4:40 - 5:08pm / 16 miles

Survey map courtesy: NOAA/NWS Omaha, NE

Next: Vel/CC Animation
3:42 pm CDT: Stanton tornado touches down.

0.5 degree Doppler velocity (left) & 0.5 RhoHV (right, 19 seconds behind). RDA is ~65 mi SE.
– Nebraska Nasty, June Summary–

Over $0.5 Billion in Wind-Driven Hail Damage, June 3rd

379 Total Severe Hail Reports Set New Record for June

Four EF4 Tornadoes & $Millions in Damage, June 16th
Cool Summer?
NARR (1979-2013) June-July-August CONUS Daily Grid Avg 2m Temp(F)*
2014 compared to range of daily grid avg values

- Max grid avg on this day
- Median grid avg for day
- Min grid avg on this day

Interquartile range shown in gray.
*North American Regional Reanalysis (NARR)
http://www.emc.ncep.noaa.gov/mmb/reanl/
Analysis and charting in Python by G. Carbin
NARR (1979-2013) June-July-August CONUS Daily Grid Avg 2m Temp(F)*
2014 compared to range of daily grid avg values

Interquartile range shown in gray.
*North American Regional Reanalysis (NARR)
http://www.emc.ncep.noaa.gov/mmb/rreanl/
Analysis and charting in Python by G. Carbin
Summer (JJA) NARR 2m Temperature Difference Between 2014 and 2012
Using daily average temperatures from 3h data, 12-09 UTC, over CONUS domain.

2014-2012 CONUS Mean Difference (F): -1.2
Summer (JJA) NARR 2m Temperature Difference Between 2014 and (1979-2013)
Using daily average temperatures from 3h data, 12-09 UTC, over CONUS domain.
Comparison of Summer 2014 Temps, NARR vs. State Ranks*

– Cool Summer? Summary –

Overall CONUS JJA ’14 Temperatures Were “Normal”

Summer 2014 Much Cooler than 2012, Most of U.S.

West Coast a Sizzling Exception

Western Fire Facts
The onset of the largest western wildfires began with a lightning “bust” across Oregon and Washington on July 14.

Next is a loop of MODIS fire detection imagery displayed on a background map from northern California to Washington.

The onset of the largest western wildfires fires began with a lightning “bust” across Oregon and Washington on July 14.

Loop of MODIS fire detection imagery displayed on a background map from northern California to Washington.

Carlton Complex
nearly 300,000 acres

Buzzard Complex
nearly 400,000 acres

Happy Camp Fire
over 130,000 acres

King Fire
nearly 100,000 acres
Combined, these four western U.S. wildfires equal the size of the state of Rhode Island!
CA, OR, WA Combined Average Fire Size (acres) 2002-2014*

13-year mean: 157 acres

* NFIC Data. 2014 incomplete.
– Western Fire Facts Summary –

Busy Fire Season across West/Northwest

Average Acres Burned 2nd Highest in 13 Years

Poor Air Quality and Visibility a Daily Occurrence
November Cold & Great Lakes Snow!

Super Typhoon Nuri, Nov. 2, 2014
Three (out of 6) solid days of heavy snow!
November Cold and Great Lakes Snow Summary

Teleconnections Bring Arctic Air South Early

2nd Coldest CONUS November in 36 Years

Epic Lake Effect Snow Events (esp. NY)
Memory # 10 for 2014 will be described on Dec. 29, at 8:30 pm CST on:

http://weatherbrains.com/weatherbrains/

Please join us!
2014 Meteorological Memories

1. January Cold and Dixie Woes
2. California’s Drought Nightmare
3. Atlantic Bomb – March 25-26
4. Tornadoes Return – Apr 27-28
5. Gulf Coast Soak – April 30
6. Nebraska Nasty – June
7. Cool Summer?
8. Western Fire Facts
9. November Cold & Great Lakes Snow!
Thank-you!

http://www.facebook.com/NWSSPC

http://twitter.com/NWSSPC

E-mail: Gregory.Carbin@noaa.gov

www.spc.noaa.gov

Will Campbell