# Contextualizing Impacting Weather and Climate Information via GIS


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**AMS Annual Conference, Jan 2016, New Orleans, LA**

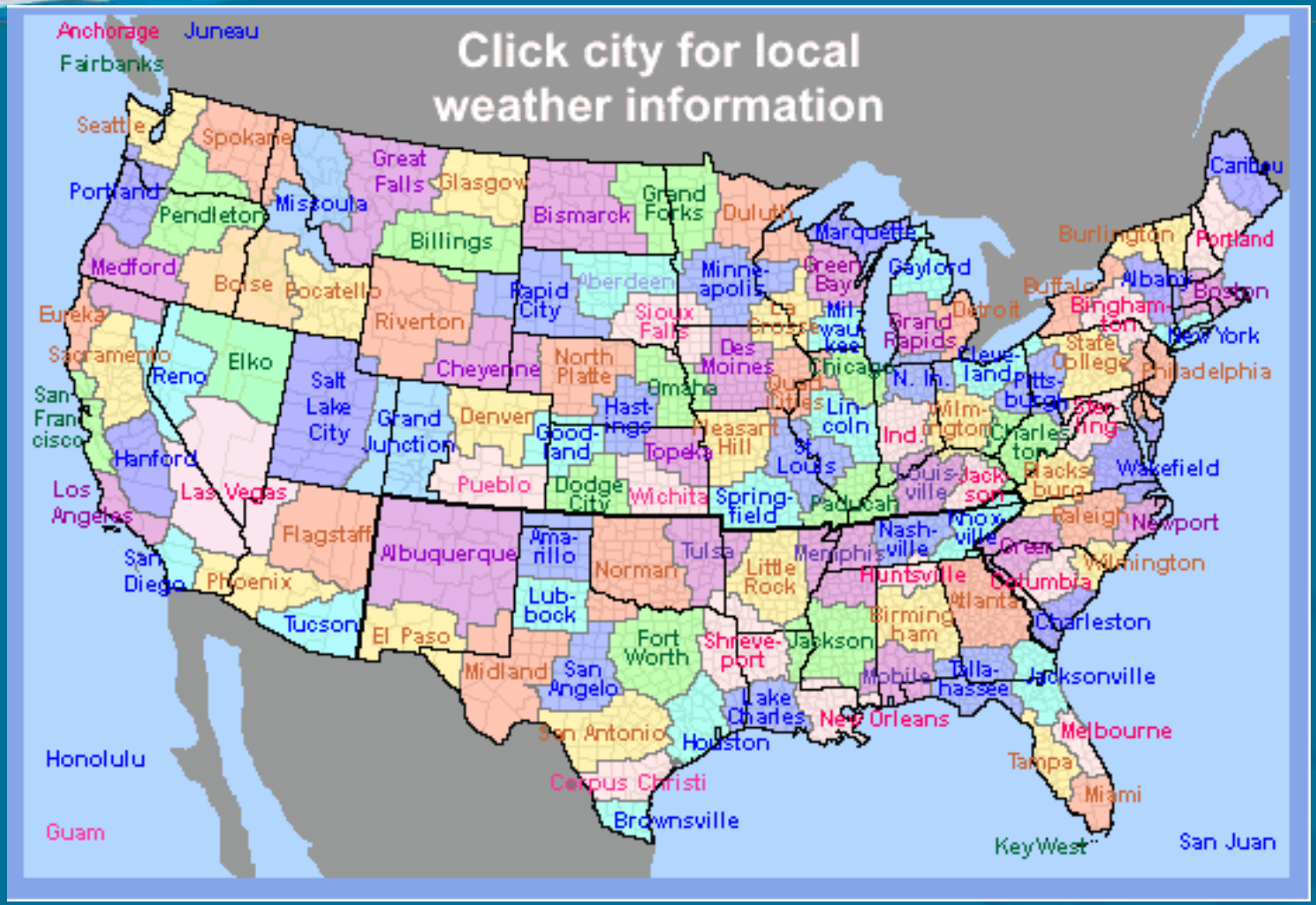
# Outline

- NWS Mission tie (lessen life/property losses, enable efficient commerce)
- Contextualizing vs Conveying Impacts
- Visual Context Examples (Past→Present→Future)
- Methodology (How)

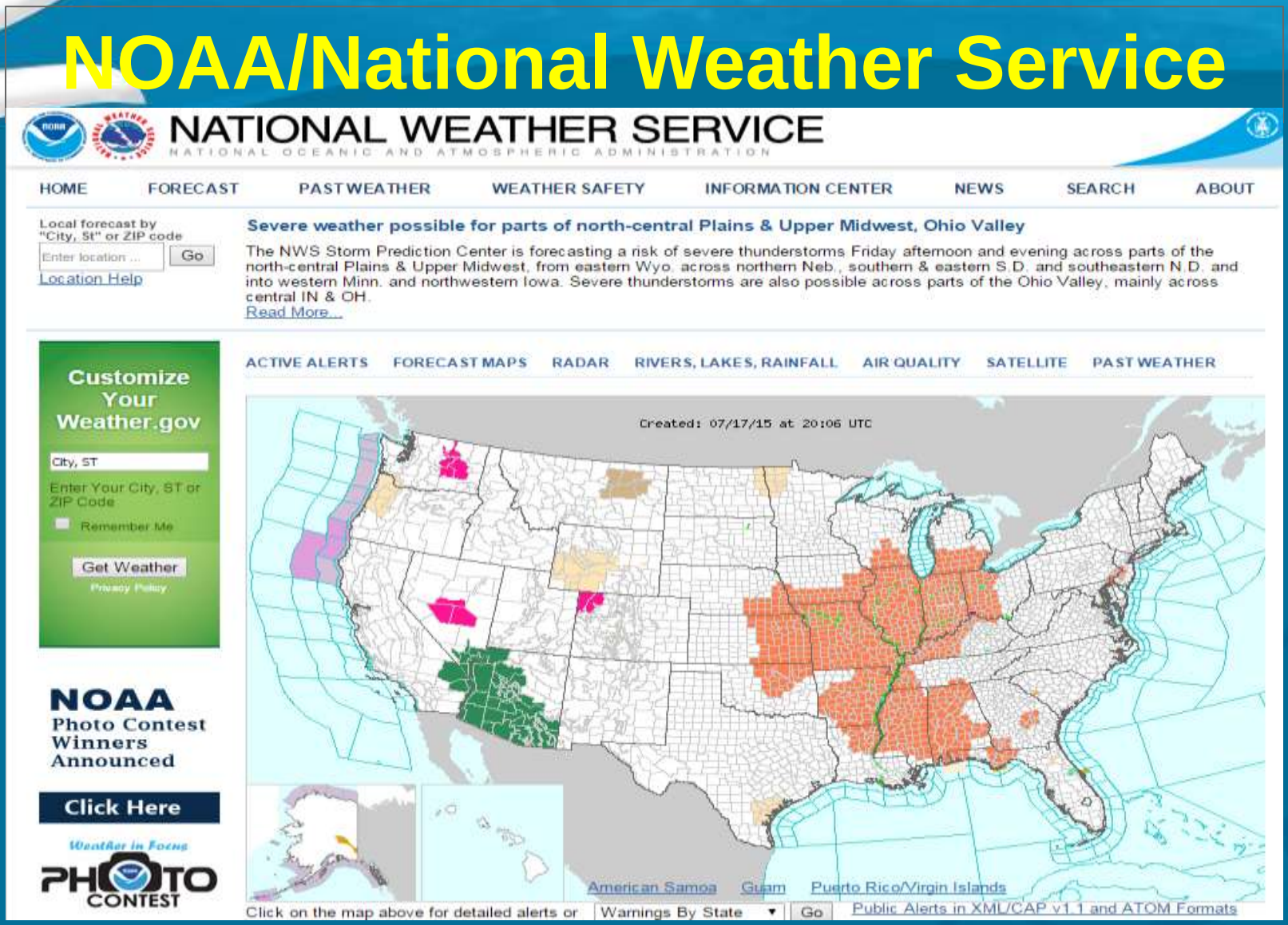
# NWS—Our (common) Mission

- Protect life and property from losses
- Facilitate efficient and productive commerce
- Through Impact-based Decision Support Services (IDSS) for a Weather-Ready Nation (WRN)

# NOAA/National Weather Service



# NOAA/National Weather Service



# Convey vs Contextualize

**Convey**: (verb) To communicate or make known; impart (e.g. a message/information)

**Contextualize**: (verb)
to state the social, grammatical, or other context of

## Word Cloud

Perceive, Communicate, Sensory Analysis, Concepts, Impacts, Connote (CONAN), socialize

Impacts, Risks, Threat--Personal

**NWS: Impact-based Decision Support Services (IDSS), Weather-Ready Nation (WRN)**

# Examples

# GFS MOS MEX Bulletin

GFSX MOS FORECASTS

KDFW GFSX MOS GUIDANCE 7/02/2015 1200 UTC

| FHR | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FRI | 03 | SAT | 04 | SUN | 05 | MON | 06 | TUE | 07 | WED | 08 | THU | 09 | FRI | CLIMO | |
| N/X | 76 | 91 | 75 | 92 | 75 | 93 | 75 | 95 | 76 | 93 | 75 | 94 | 77 | 97 | 77 | 73 | 94 |
| TMP | 77 | 87 | 76 | 88 | 76 | 89 | 76 | 92 | 77 | 89 | 76 | 91 | 78 | 93 | 78 | | |
| DPT | 69 | 68 | 71 | 67 | 71 | 69 | 72 | 67 | 73 | 68 | 69 | 68 | 72 | 66 | 71 | | |
| CLD | OV | OV | OV | PC | PC | PC | PC | PC | CL | PC | CL | CL | CL | CL | CL | | |
| WND | 16 | 14 | 10 | 9 | 13 | 16 | 16 | 18 | 17 | 17 | 17 | 16 | 15 | 15 | 15 | | |
| P12 | 34 | 22 | 30 | 23 | 25 | 8 | 16 | 5 | 8 | 12 | 9 | 6 | 9 | 9 | 8 | 12 | 12 |
| P24 | | 36 | | 50 | | 25 | | 16 | | 12 | | 11 | | 11 | | | 19 |
| Q12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Q24 | | 0 | | 2 | | 0 | | 0 | | 0 | | 0 | | | | | |
| T12 | 27 | 27 | 34 | 43 | 23 | 23 | 16 | 17 | 10 | 24 | 9 | 18 | 8 | 20 | 13 | | |
| T24 | | | 53 | | 50 | | 27 | | 24 | | 24 | | 24 | | 25 | | |

# GFS MOS MEX Bulletin

GFSX MOS FORECASTS

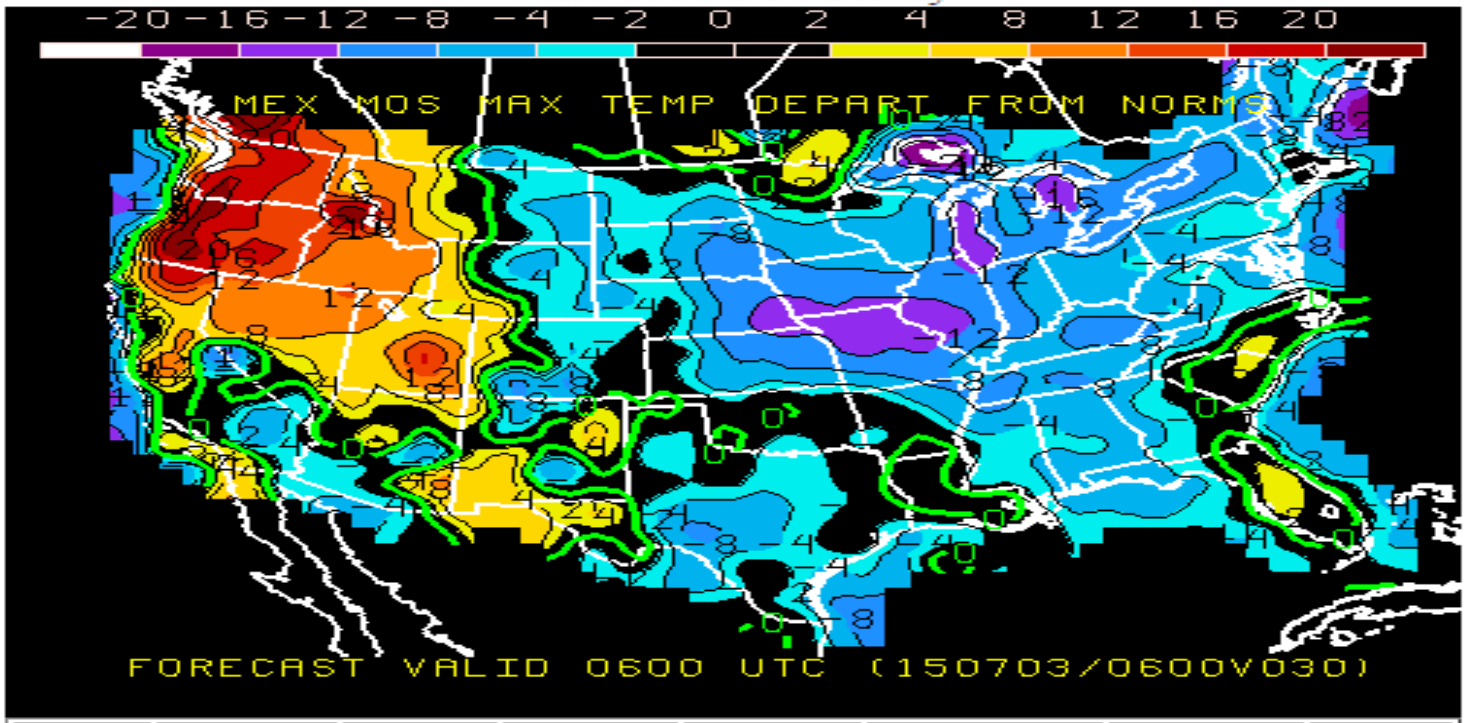
KDFW GFSX MOS GUIDANCE 7/02/2015 1200 UTC

| FHR | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FRI | 03 | SAT | 04 | SUN | 05 | MON | 06 | TUE | 07 | WED | 08 | THU | 09 | FRI | CLIMO |
| N/X | 76 | 91 | 75 | 92 | 75 | 93 | 75 | 95 | 76 | 93 | 75 | 94 | 77 | 97 | 77 | 73 94 |
| TMP | 77 | 87 | 76 | 88 | 76 | 89 | 76 | 92 | 77 | 89 | 76 | 91 | 78 | 93 | 78 | |
| DPT | 69 | 68 | 71 | 67 | 71 | 69 | 72 | 67 | 73 | 68 | 69 | 68 | 72 | 66 | 71 | |
| CLD | OV | OV | OV | PC | PC | PC | PC | PC | CL | PC | CL | CL | CL | CL | CL | |
| WND | 16 | 14 | 10 | 9 | 13 | 16 | 16 | 18 | 17 | 17 | 17 | 16 | 15 | 15 | 15 | |
| P12 | 34 | 22 | 30 | 23 | 25 | 8 | 16 | 5 | 8 | 12 | 9 | 6 | 9 | 9 | 8 | 12 12 |
| P24 | | 36 | | 50 | | 25 | | 16 | | 12 | | 11 | | 11 | | 19 |
| Q12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Q24 | | 0 | | 2 | | 0 | | 0 | | 0 | | 0 | | | | |
| T12 | 27 | 27 | 34 | 43 | 23 | 23 | 16 | 17 | 10 | 24 | 9 | 18 | 8 | 20 | 13 | |
| T24 | | | 53 | | 50 | | 27 | | 24 | | 24 | | 24 | | 25 | |

# Early MOS Display

MEX MOS DEPARTURE FROM NORMAL MAXIMUM (F)

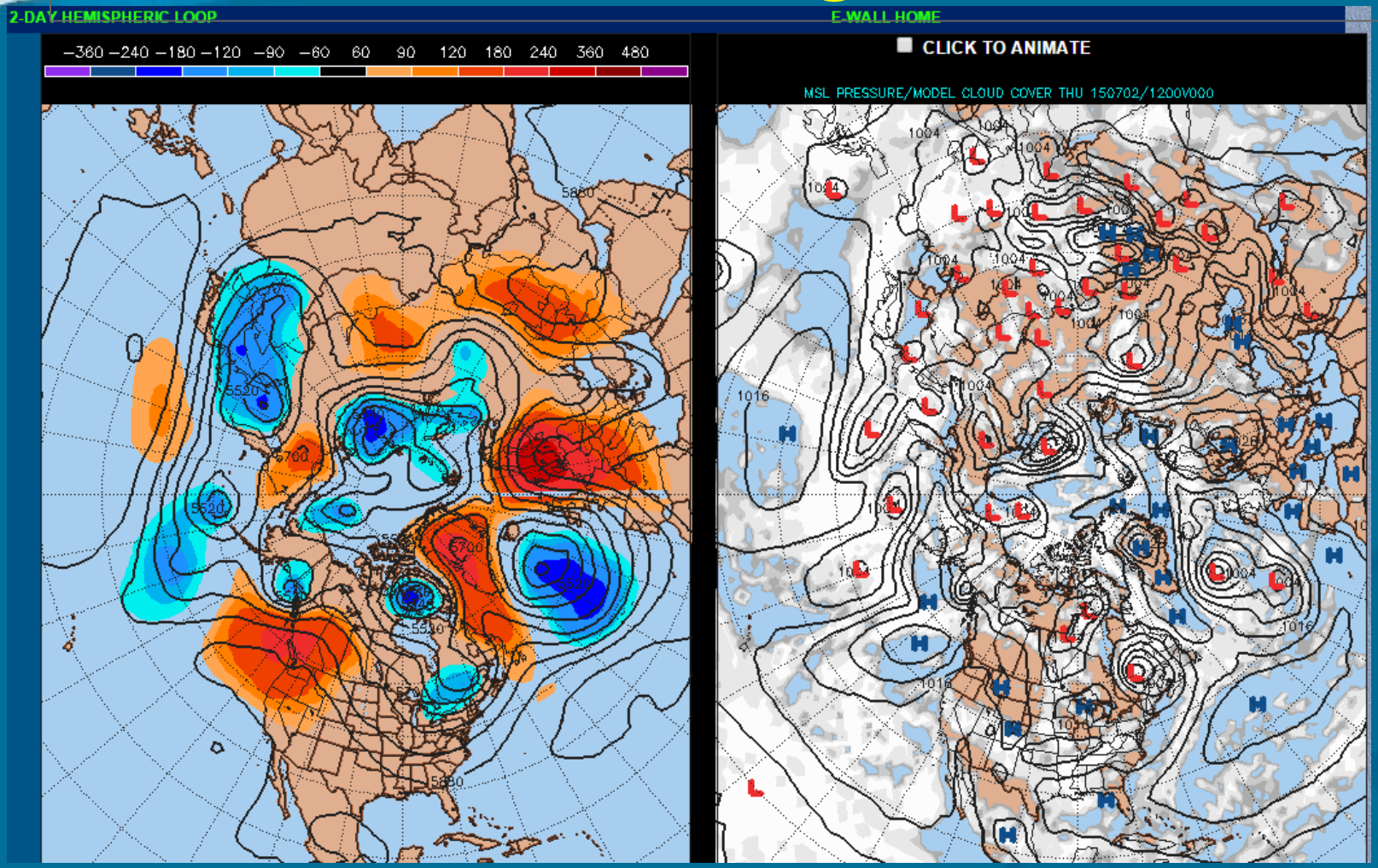
Valid 0600 UTC Friday



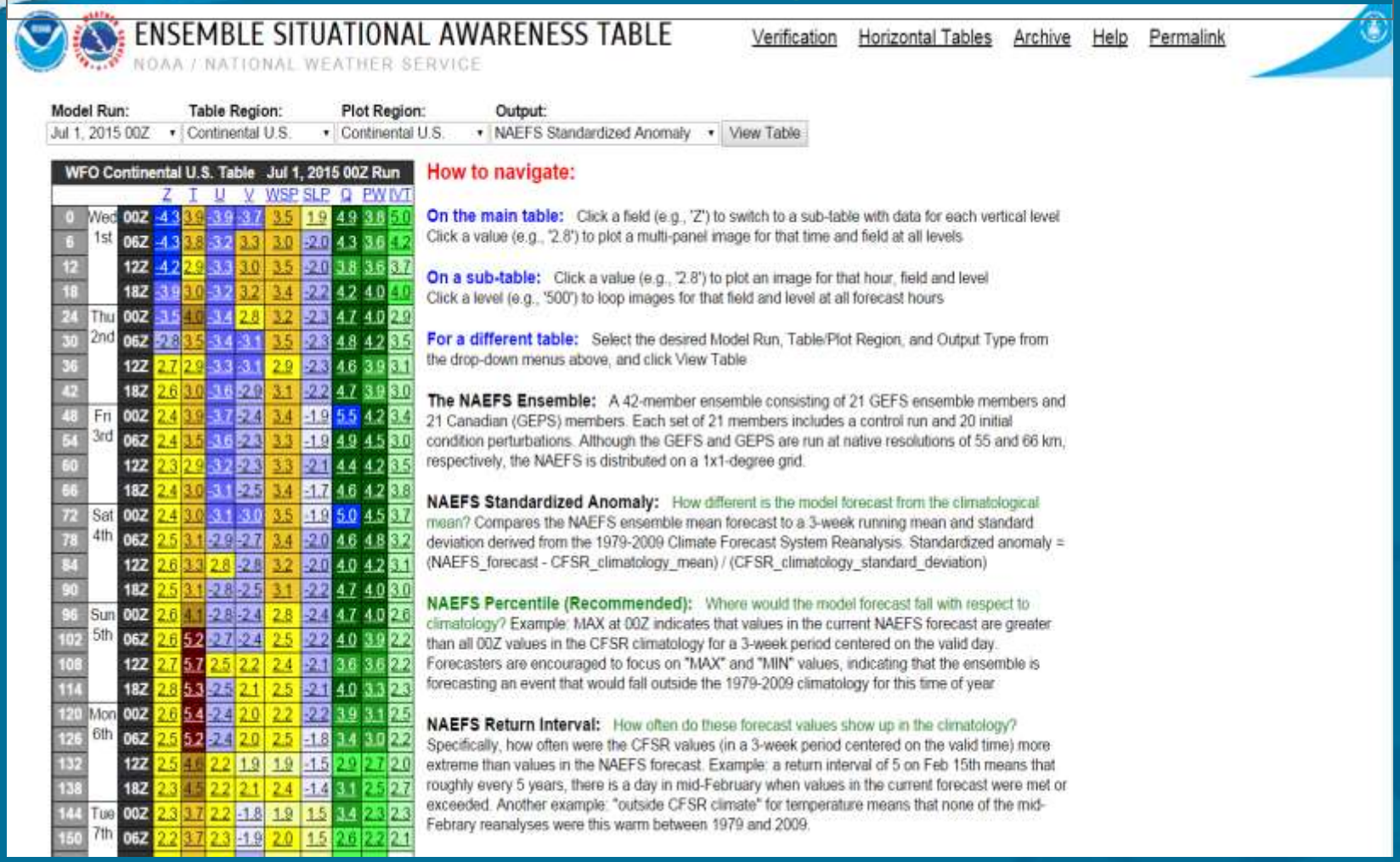

| Friday | Saturday | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|---|---|
| 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 |

**DEPARTURE FROM NORMAL MAXIMUM:** The difference, in degrees Fahrenheit, between the forecast daytime maximum temperature and the normal daytime maximum temperature.

# PSU 500mb Height SA Table



# NWS Western Region SA Table



ENSEMBLE SITUATIONAL AWARENESS TABLE

NOAA / NATIONAL WEATHER SERVICE

Verification | Horizontal Tables | Archive | Help | Permalink

Model Run: Jul 1, 2015 00Z | Table Region: Continental U.S. | Plot Region: Continental U.S. | Output: NAEFS Standardized Anomaly | View Table

**WFO Continental U.S. Table Jul 1, 2015 00Z Run**

| | | | Z | T | U | V | WSP | SLP | Q | PW | IVT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Wed 1st | 00Z | -4.3 | 3.9 | -3.9 | -3.7 | 3.5 | 1.9 | 4.9 | 3.6 | 5.0 |
| 6 | | 06Z | -4.3 | 3.8 | -3.2 | 3.3 | 3.0 | -2.0 | 4.3 | 3.6 | 4.2 |
| 12 | | 12Z | -4.2 | 2.9 | -3.3 | 3.0 | 3.5 | -2.0 | 3.8 | 3.6 | 3.7 |
| 18 | | 18Z | -3.9 | 3.0 | -3.2 | 3.2 | 3.4 | -2.2 | 4.2 | 4.0 | 4.0 |
| 24 | Thu 2nd | 00Z | -3.5 | 4.0 | -3.4 | 2.8 | 3.2 | -2.3 | 4.7 | 4.0 | 2.9 |
| 30 | | 06Z | -2.8 | 3.5 | -3.4 | -3.1 | 3.5 | -2.3 | 4.8 | 4.2 | 3.5 |
| 36 | | 12Z | 2.7 | 2.9 | -3.3 | -3.1 | 2.9 | -2.3 | 4.6 | 3.9 | 3.1 |
| 42 | | 18Z | 2.6 | 3.0 | -3.6 | -2.9 | 3.1 | -2.2 | 4.7 | 3.9 | 3.0 |
| 48 | Fri 3rd | 00Z | 2.4 | 3.9 | -3.7 | -2.4 | 3.4 | -1.9 | 5.5 | 4.2 | 3.4 |
| 54 | | 06Z | 2.4 | 3.5 | -3.6 | -2.3 | 3.3 | -1.9 | 4.9 | 4.5 | 3.0 |
| 60 | | 12Z | 2.3 | 2.9 | -3.2 | -2.3 | 3.3 | -2.1 | 4.4 | 4.2 | 3.5 |
| 66 | | 18Z | 2.4 | 3.0 | -3.1 | -2.5 | 3.4 | -1.7 | 4.6 | 4.2 | 3.8 |
| 72 | Sat 4th | 00Z | 2.4 | 3.0 | -3.1 | -3.0 | 3.5 | -1.9 | 5.0 | 4.5 | 3.7 |
| 78 | | 06Z | 2.5 | 3.1 | -2.9 | -2.7 | 3.4 | -2.0 | 4.6 | 4.8 | 3.2 |
| 84 | | 12Z | 2.6 | 3.3 | 2.8 | -2.8 | 3.2 | -2.0 | 4.0 | 4.2 | 3.1 |
| 90 | | 18Z | 2.5 | 3.1 | -2.8 | -2.5 | 3.1 | -2.2 | 4.7 | 4.0 | 3.0 |
| 96 | Sun 5th | 00Z | 2.6 | 4.1 | -2.8 | -2.4 | 2.8 | -2.4 | 4.7 | 4.0 | 2.6 |
| 102 | | 06Z | 2.6 | 5.2 | -2.7 | -2.4 | 2.5 | -2.2 | 4.0 | 3.9 | 2.2 |
| 108 | | 12Z | 2.7 | 5.7 | 2.5 | 2.2 | 2.4 | -2.1 | 3.6 | 3.6 | 2.2 |
| 114 | | 18Z | 2.8 | 5.3 | -2.5 | 2.1 | 2.5 | -2.1 | 4.0 | 3.3 | 2.3 |
| 120 | Mon 6th | 00Z | 2.6 | 5.4 | -2.4 | 2.0 | 2.2 | -2.2 | 3.9 | 3.1 | 2.5 |
| 126 | | 06Z | 2.5 | 5.2 | -2.4 | 2.0 | 2.5 | -1.8 | 3.4 | 3.0 | 2.2 |
| 132 | | 12Z | 2.5 | 4.6 | 2.2 | 1.9 | 1.9 | -1.5 | 2.9 | 2.7 | 2.0 |
| 138 | | 18Z | 2.3 | 4.5 | 2.2 | 2.1 | 2.4 | -1.4 | 3.1 | 2.5 | 2.7 |
| 144 | Tue 7th | 00Z | 2.3 | 3.7 | 2.2 | -1.8 | 1.9 | 1.5 | 3.4 | 2.3 | 2.3 |
| 150 | | 06Z | 2.2 | 3.7 | 2.3 | -1.9 | 2.0 | 1.5 | 2.6 | 2.2 | 2.1 |

**How to navigate:**

**On the main table:** Click a field (e.g., 'Z') to switch to a sub-table with data for each vertical level
Click a value (e.g., '2.8') to plot a multi-panel image for that time and field at all levels

**On a sub-table:** Click a value (e.g., '2.8') to plot an image for that hour, field and level
Click a level (e.g., '500') to loop images for that field and level at all forecast hours

**For a different table:** Select the desired Model Run, Table/Plot Region, and Output Type from the drop-down menus above, and click View Table

**The NAEFS Ensemble:** A 42-member ensemble consisting of 21 GEFS ensemble members and 21 Canadian (GEPS) members. Each set of 21 members includes a control run and 20 initial condition perturbations. Although the GEFS and GEPS are run at native resolutions of 55 and 66 km, respectively, the NAEFS is distributed on a 1x1-degree grid.

**NAEFS Standardized Anomaly:** How different is the model forecast from the climatological mean? Compares the NAEFS ensemble mean forecast to a 3-week running mean and standard deviation derived from the 1979-2009 Climate Forecast System Reanalysis. Standardized anomaly = (NAEFS_forecast - CFSR_climatology_mean) / (CFSR_climatology_standard_deviation)

**NAEFS Percentile (Recommended):** Where would the model forecast fall with respect to climatology? Example: MAX at 00Z indicates that values in the current NAEFS forecast are greater than all 00Z values in the CFSR climatology for a 3-week period centered on the valid day. Forecasters are encouraged to focus on "MAX" and "MIN" values, indicating that the ensemble is forecasting an event that would fall outside the 1979-2009 climatology for this time of year

**NAEFS Return Interval:** How often do these forecast values show up in the climatology? Specifically, how often were the CFSR values (in a 3-week period centered on the valid time) more extreme than values in the NAEFS forecast. Example: a return interval of 5 on Feb 15th means that roughly every 5 years, there is a day in mid-February when values in the current forecast were met or exceeded. Another example: "outside CFSR climate" for temperature means that none of the mid-Febrary reanalyses were this warm between 1979 and 2009.

# Variables---->>>>

T
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M
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V

**Model Run:** Jul 2, 2015 00Z ▼ | **Table Region:** Continental U.S. ▼ | **Plot Regior** Continental

**WFO Continental U.S. Table Jul 2, 2015 00Z Run**

| | | | Z | T | U | V | WSP | SLP | Q | PW | IVT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Thu 2nd | 00Z | -3.5 | -3.7 | -4.5 | 3.9 | 5.1 | -2.3 | 4.7 | 5.0 | 3.9 |
| 6 | | 06Z | -2.7 | 4.2 | -3.9 | -3.5 | 4.2 | -2.5 | 4.8 | 4.0 | 4.7 |
| 12 | | 12Z | 2.7 | 3.4 | -3.6 | -3.5 | 3.4 | -2.6 | 4.6 | 4.0 | 3.5 |
| 18 | | 18Z | 2.7 | 3.5 | -3.5 | -3.3 | 3.6 | -2.3 | 4.4 | 4.1 | 3.5 |
| 24 | Fri 3rd | 00Z | 2.5 | 4.3 | -3.8 | -2.5 | 4.1 | -2.0 | 4.9 | 4.3 | 3.9 |
| 30 | | 06Z | 2.4 | 4.0 | -3.9 | -2.3 | 4.0 | -1.9 | 4.6 | 4.8 | 3.4 |
| 36 | | 12Z | 2.3 | 2.8 | 3.4 | -2.7 | 3.7 | -1.9 | 4.5 | 4.7 | 3.6 |
| 42 | | 18Z | 2.3 | 2.9 | -3.2 | -2.8 | 3.3 | -1.6 | 4.3 | 4.6 | 3.3 |
| 48 | Sat 4th | 00Z | 2.4 | 3.0 | -3.1 | -3.0 | 3.3 | -1.8 | 4.9 | 4.4 | 3.4 |
| 54 | | 06Z | 2.6 | 3.3 | 3.0 | -2.6 | 3.2 | -1.9 | 4.7 | 3.8 | 3.0 |
| 60 | | 12Z | 2.5 | 3.2 | 2.8 | -2.7 | 3.1 | -2.1 | 4.2 | 3.5 | 2.8 |
| 66 | | 18Z | 2.5 | 3.3 | -2.7 | -2.5 | 3.1 | -2.0 | 4.5 | 3.5 | 2.7 |
| 72 | Sun 5th | 00Z | 2.5 | 3.8 | -2.7 | -2.4 | 2.9 | -2.3 | 4.5 | 3.5 | 2.5 |
| 78 | | 06Z | 2.6 | 5.1 | -2.7 | -2.5 | 2.7 | -2.2 | 4.2 | 3.8 | 2.1 |
| 84 | | 12Z | 2.8 | 5.7 | -2.6 | -2.5 | 2.4 | -2.0 | 3.5 | 3.5 | 1.9 |

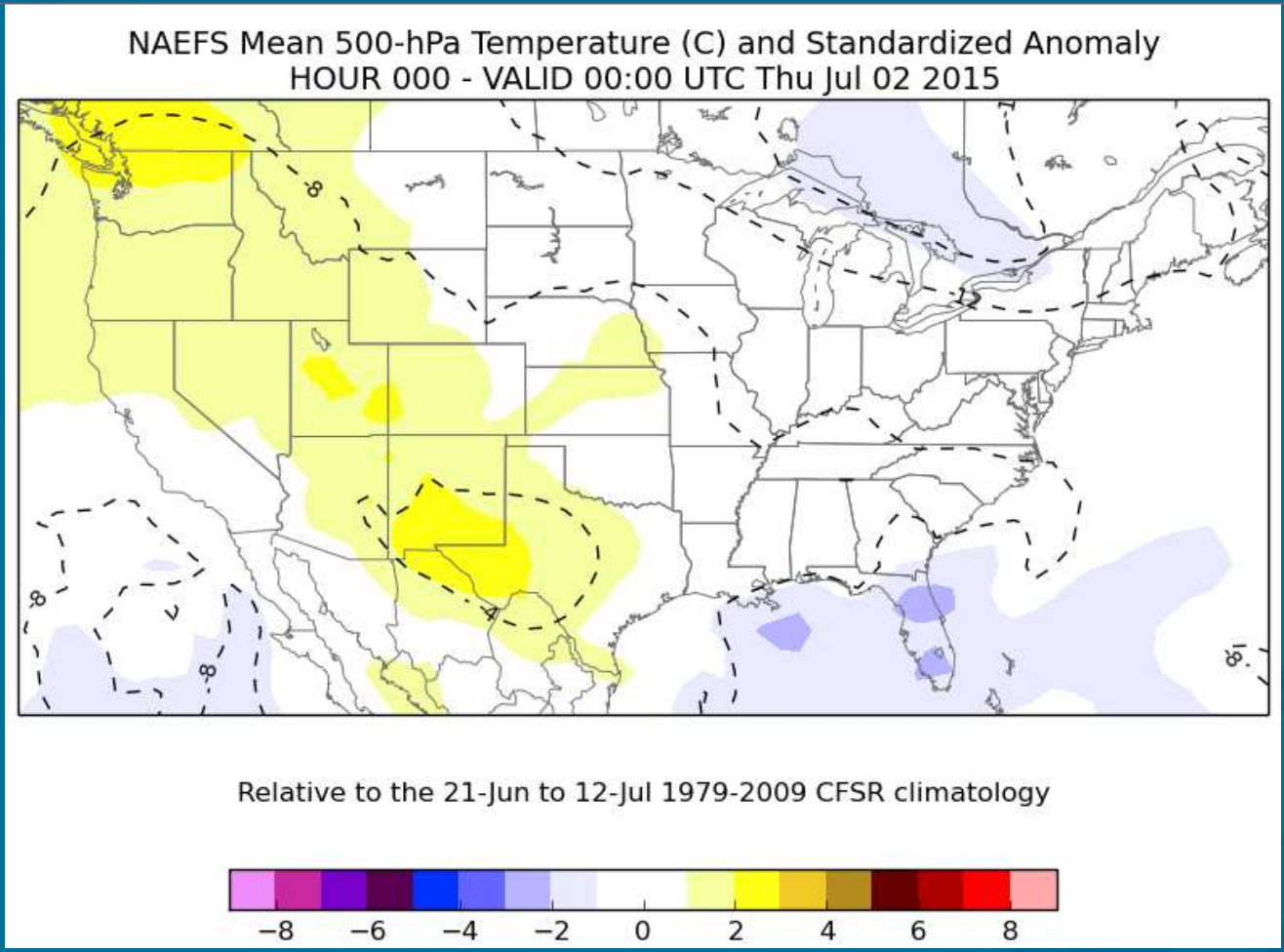
# Variable Per Atmos Level

Model Run: Jul 2, 2015 00Z ▼ | Table Region: Continental U.S. ▼ | Plot Regic Continenta

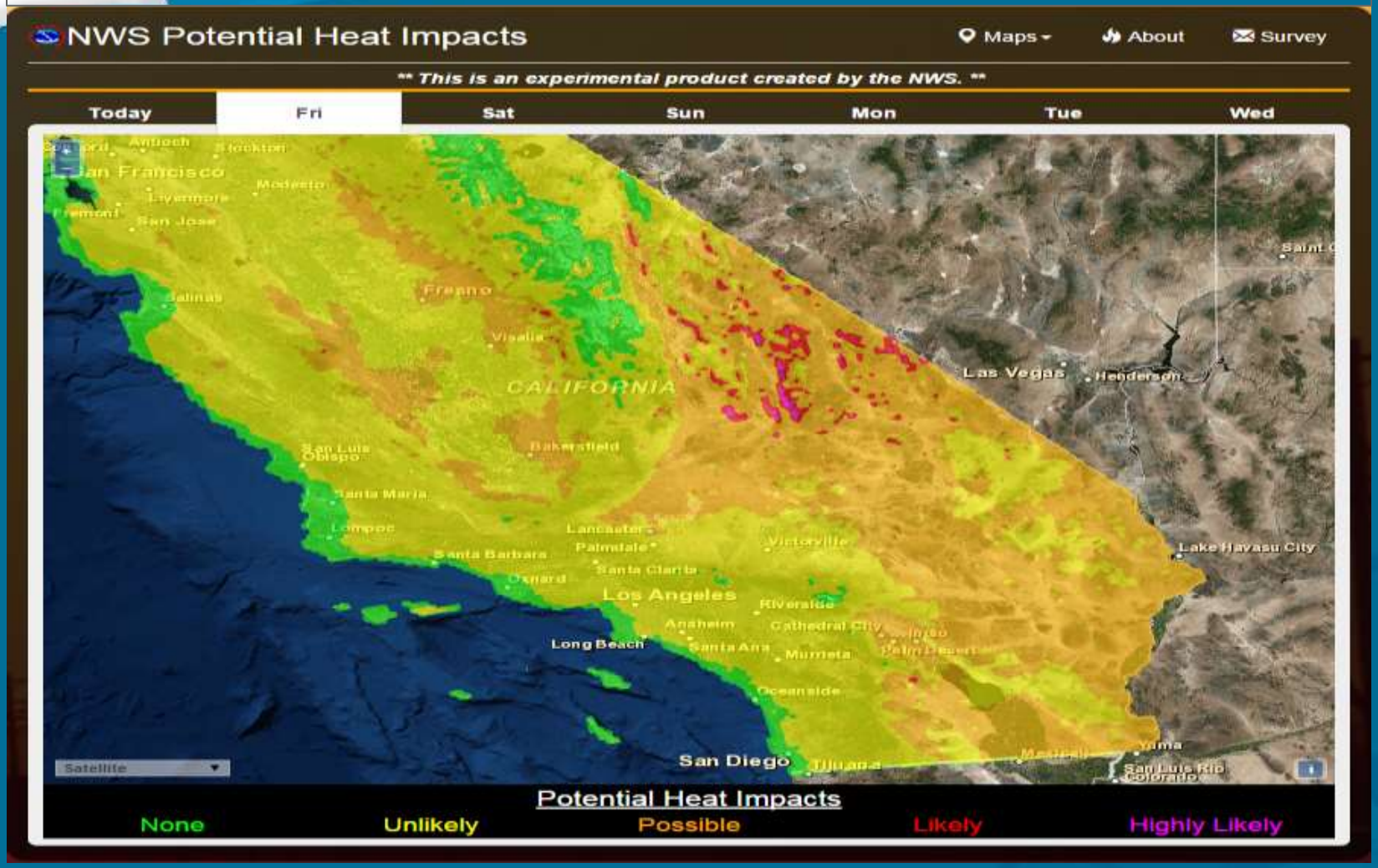
**WFO Continental U.S. Table Jul 2, 2015 00Z Run**

| Back | | T | 200 | 500 | 700 | 850 | 1000 |
|---|---|---|---|---|---|---|---|
| 0 | Thu 2nd | 00Z | 2.3 | 2.9 | 2.6 | 3.0 | -3.7 |
| 6 | | 06Z | -2.0 | 2.4 | 2.6 | 2.7 | 4.2 |
| 12 | | 12Z | 2.3 | 2.3 | 2.6 | 2.8 | 3.4 |
| 18 | | 18Z | 2.1 | 2.4 | 2.7 | 3.0 | 3.5 |
| 24 | Fri 3rd | 00Z | 2.0 | 2.4 | 2.8 | 2.8 | 4.3 |
| 30 | | 06Z | 2.2 | 2.3 | 2.6 | 2.8 | 4.0 |
| 36 | | 12Z | 2.1 | 2.2 | 2.6 | 2.8 | 2.7 |
| 42 | | 18Z | 1.7 | 2.2 | 2.6 | 2.9 | 2.9 |
| 48 | Sat | 00Z | 1.9 | 2.2 | 2.9 | 3.0 | 2.7 |

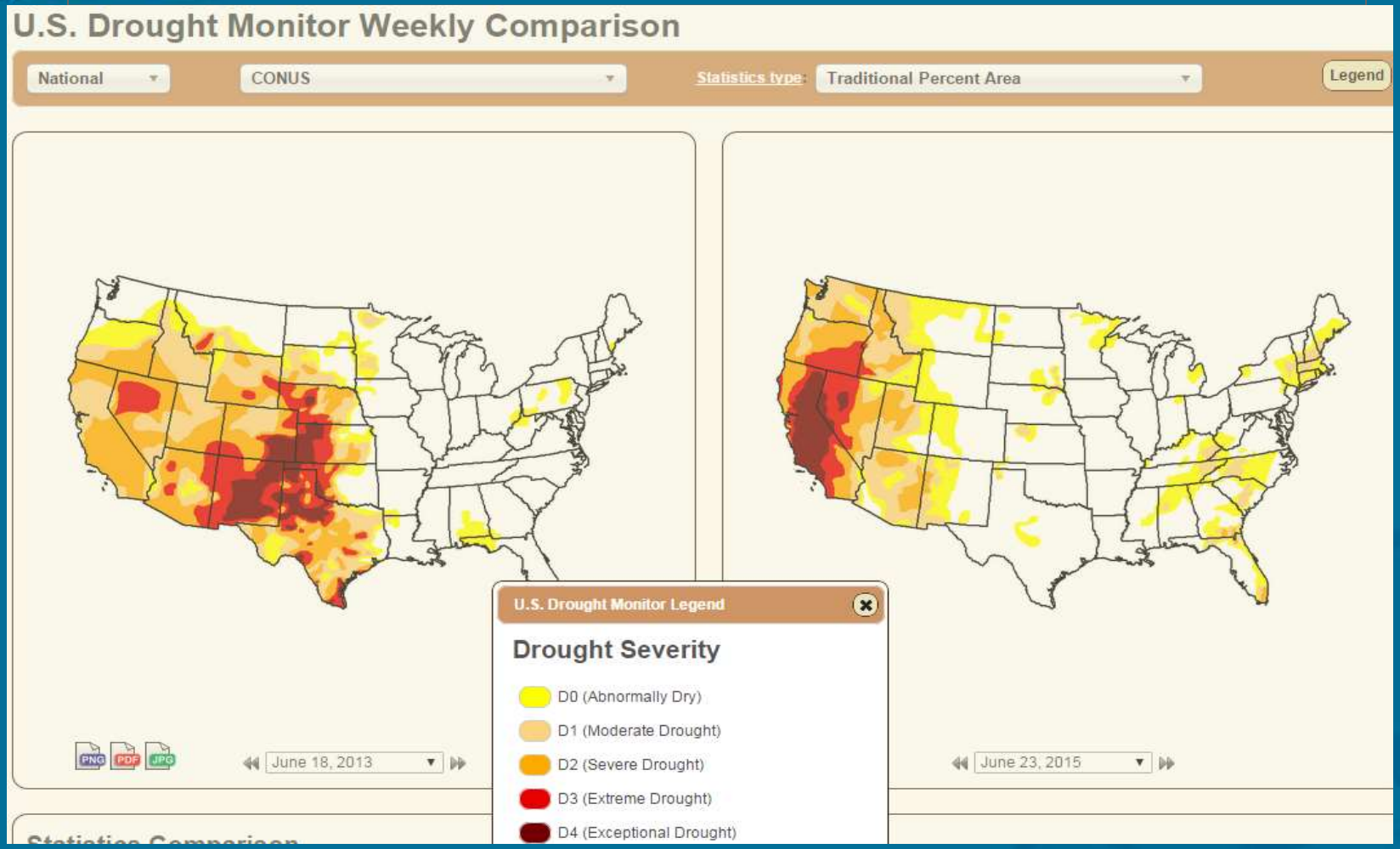
# NWS Western Region SA Table



# Conveying/Contextualizing Heat Impacts



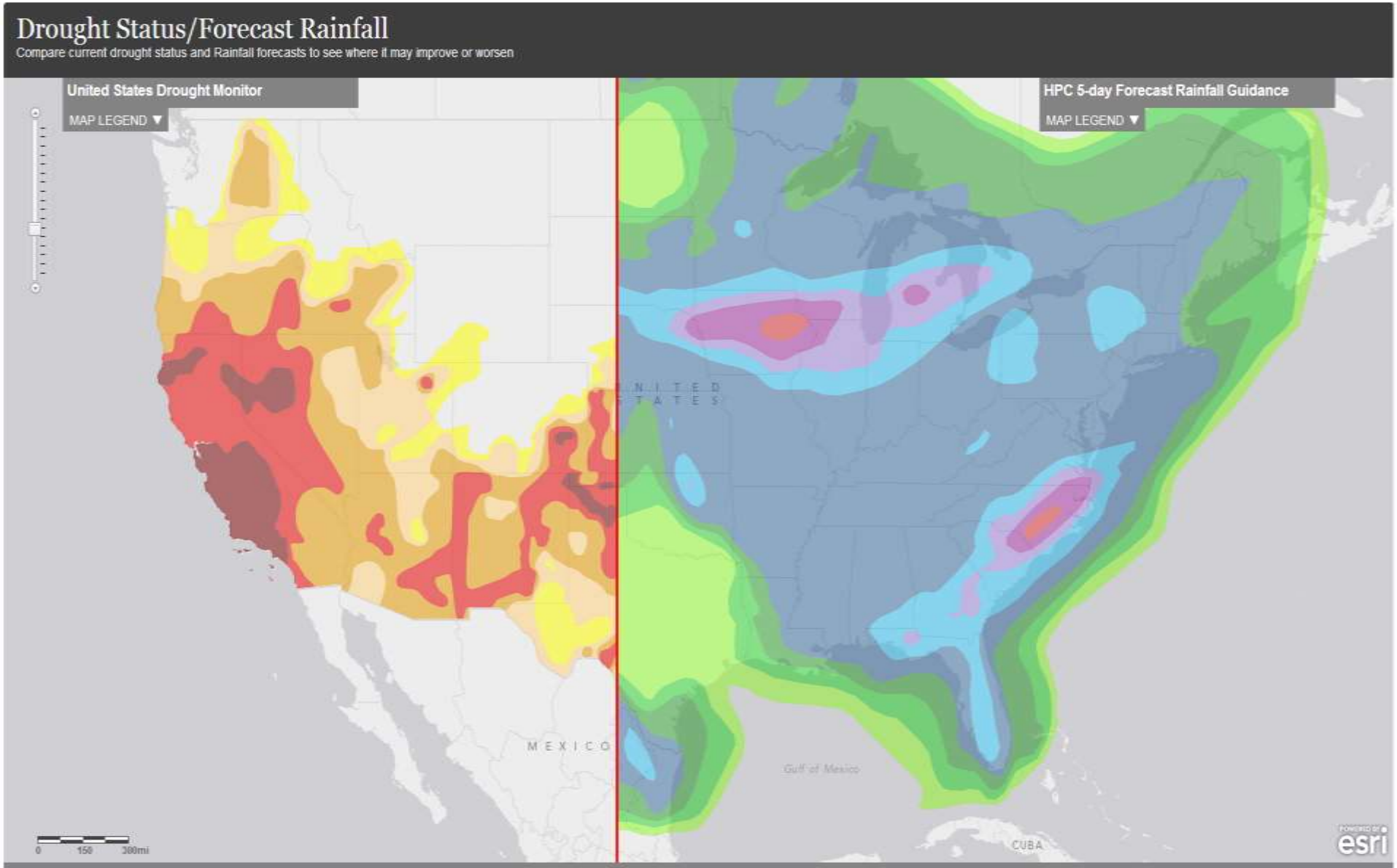
# USDM: June—2013 vs 2015



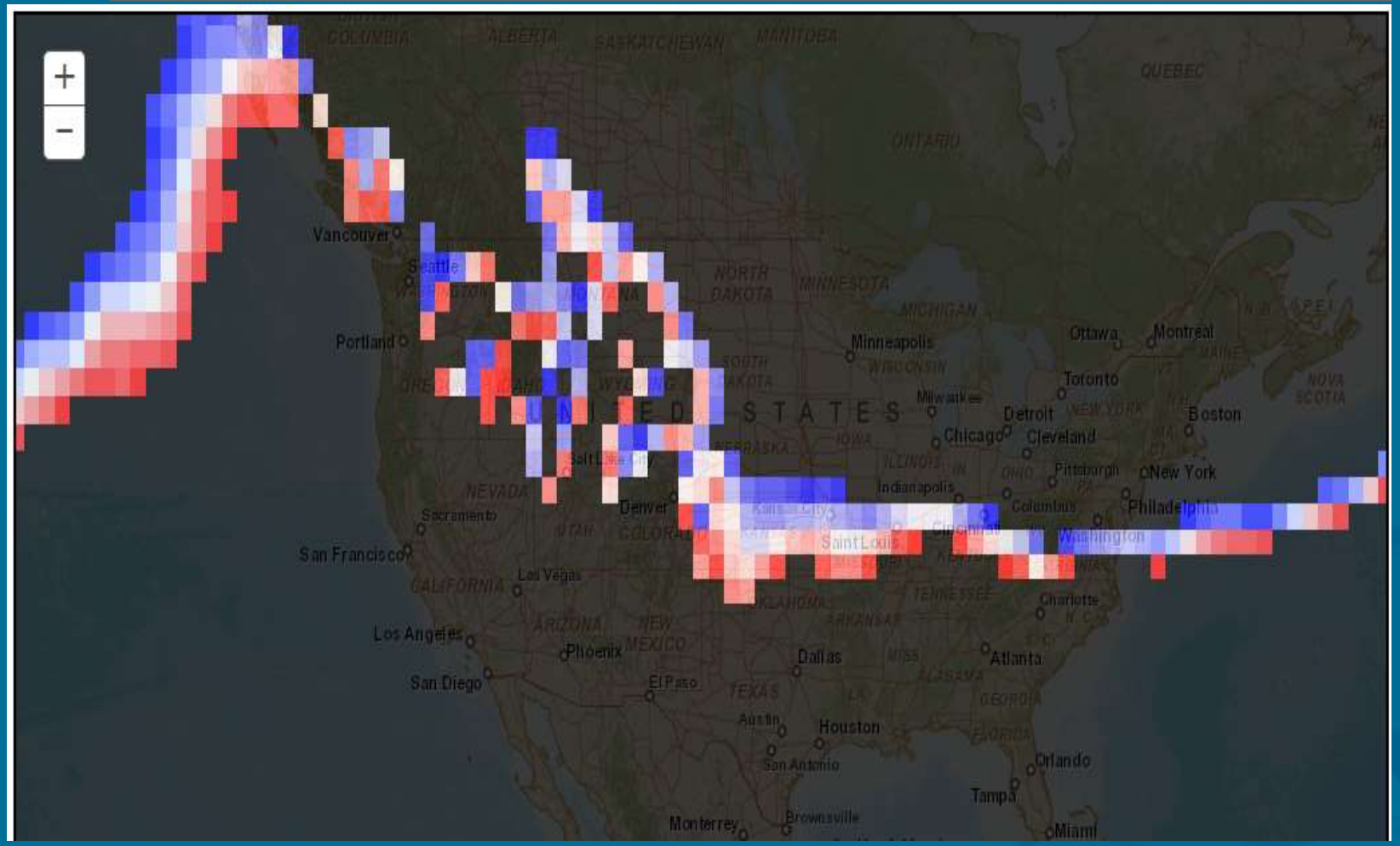
# NOAA-wide ESRI Enterprise License Agreement (ELA)


- Software
- Training
- ArcGIS Online (AGOL) for Orgs
- EEAP (extra exploration, IDP build-out)

# Drought/Rainfall Compare (From 2014?)



# 850mb Temp 0 degC “line”



# Impetus

# SE RCC Perspectives—Dec 25-31 2015 MinT

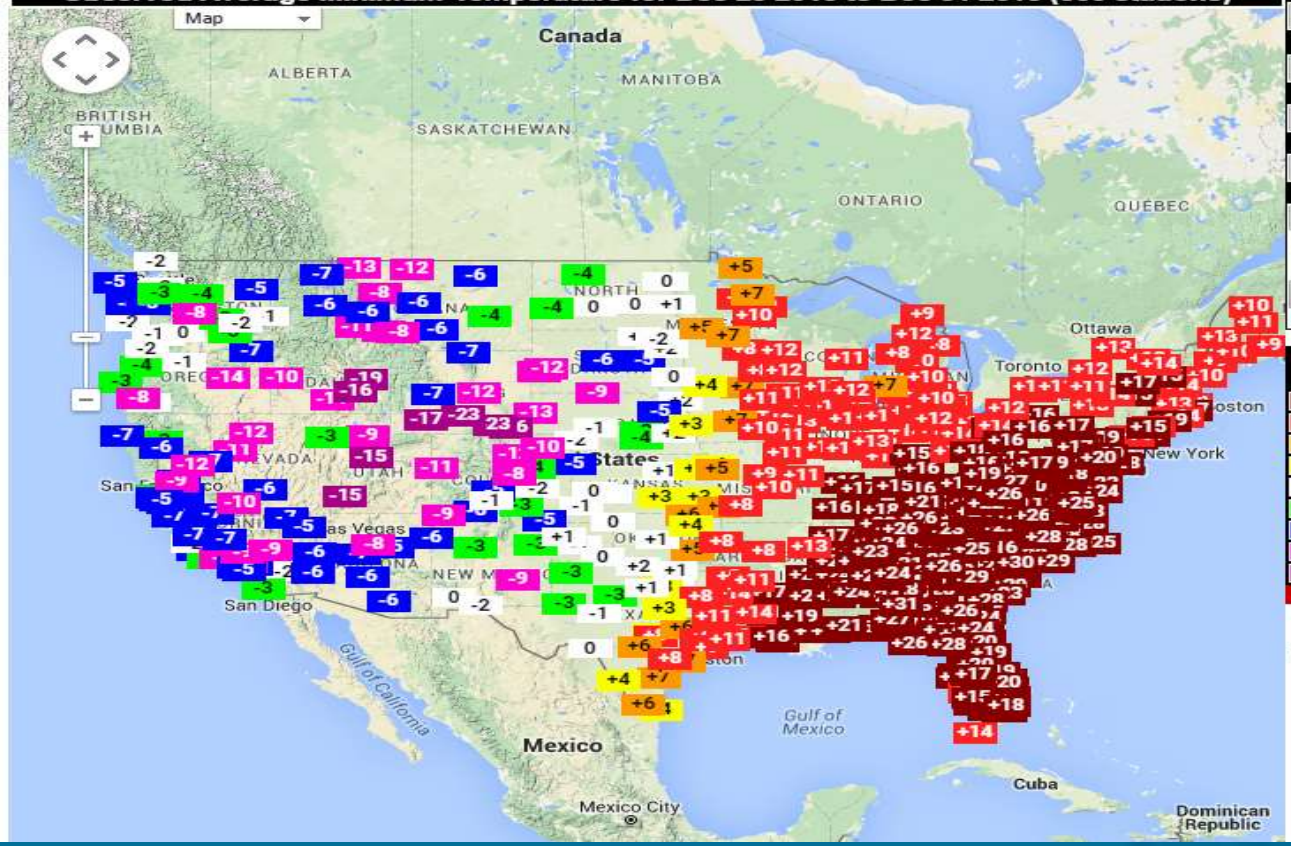
## Southeast Climate Perspectives Map

For any problems, comments or suggestions, please drop us a line.

This tool places recent conditions in both a historical and geographical perspective. About This Product & Video Tutorial

Station Perspectives | Regional Map Perspectives | Streaks & Thresholds Perspectives

**Observed Average Minimum Temperature for Dec 25 2015 to Dec 31 2015 (560 stations)**




**Variable**: Minimum Temp

**Values**: Average

**Date**: Thu 12/31/2015

**Period**: Past Week

**Station Display**: Dep. From Normal

Show ThreadEx [?]

Show Perspectives

Export as CSV

**Legend**
**Dep. From Normal (°F)**

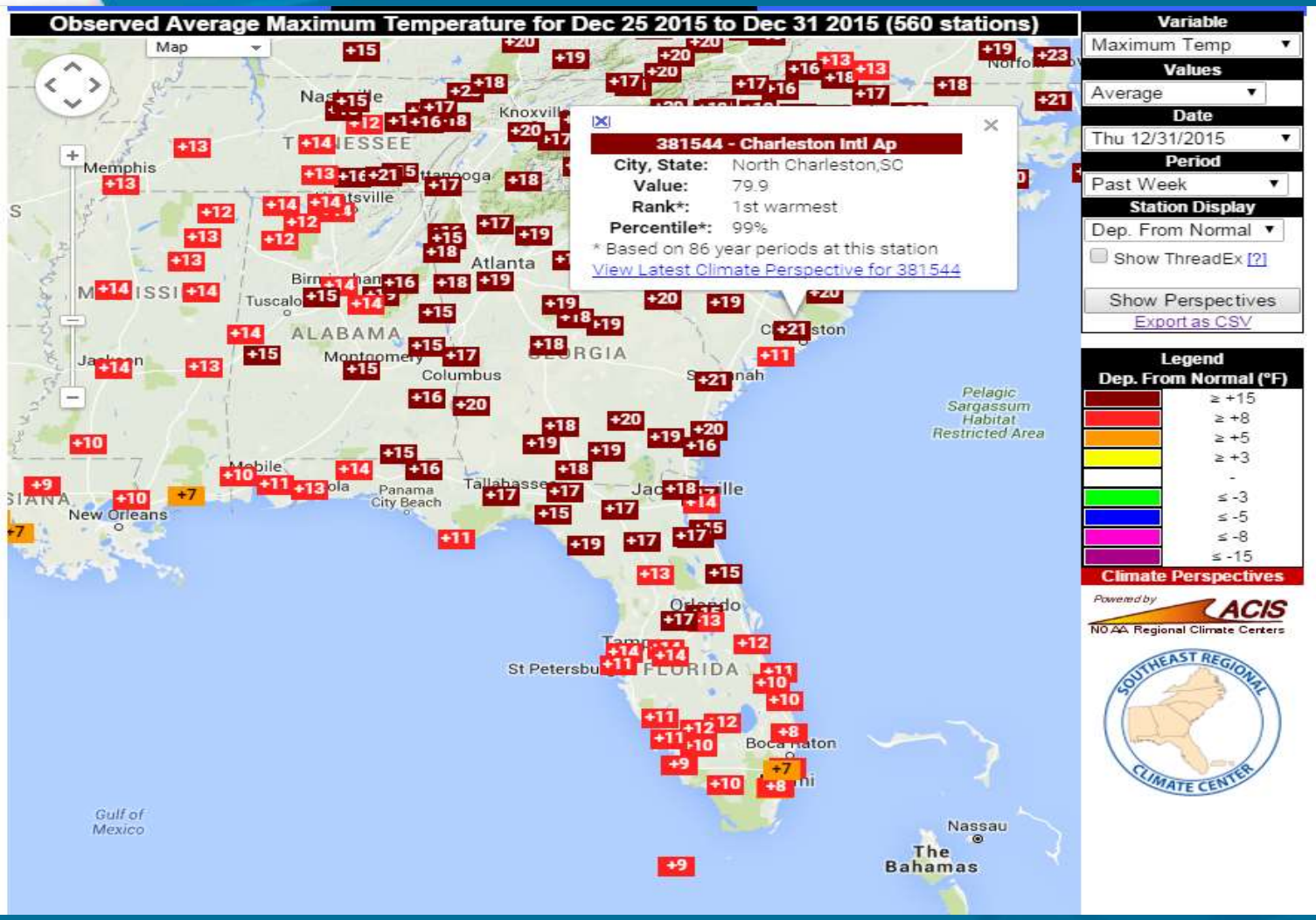
| |
|---|
| ≥ +15 |
| ≥ +8 |
| ≥ +5 |
| ≥ +3 |
| - |
| ≤ -3 |
| ≤ -5 |
| ≤ -8 |
| ≤ -15 |

Climate Perspectives

Powered by ACIS
NOAA Regional Climate Centers

SOUTHEAST REGIONAL CLIMATE CENTER

# SE RCC Perspectives—Pop-Up



# Methodology

# SE RCC Perspectives—CSV

```
Station_ID,Station_Name,Station_Lat_N,Station_Lon_E,City,State,Start_Date,End_Date,Year_Count,Variable,

Value_F,DFN_Station_ID,DFN_Value_F,Abs_Rank_Type,Abs_Rank,Abs_Rank_Tied,Abs_Percentile,Rel_Rank_Type,Rel_Rank,Rel_Rank_Tied,Rel_Percentile

457473,Seattle Tacoma Ap,47.44444,-122.31389,Seattle,WA,2-Jul-15,2-Jul-15,68,maxt,

93.0,457473,19.7,warmest,1,False,99,warmest,1,False,99
```

http://www.sercc.com/climper/climpermap_csv.php?validdate=2015-07-07&var=maxt&thresh=climper&period=1_DAY&map_display=value&showthrdx=true&accessed=2015070814&domain=srcc

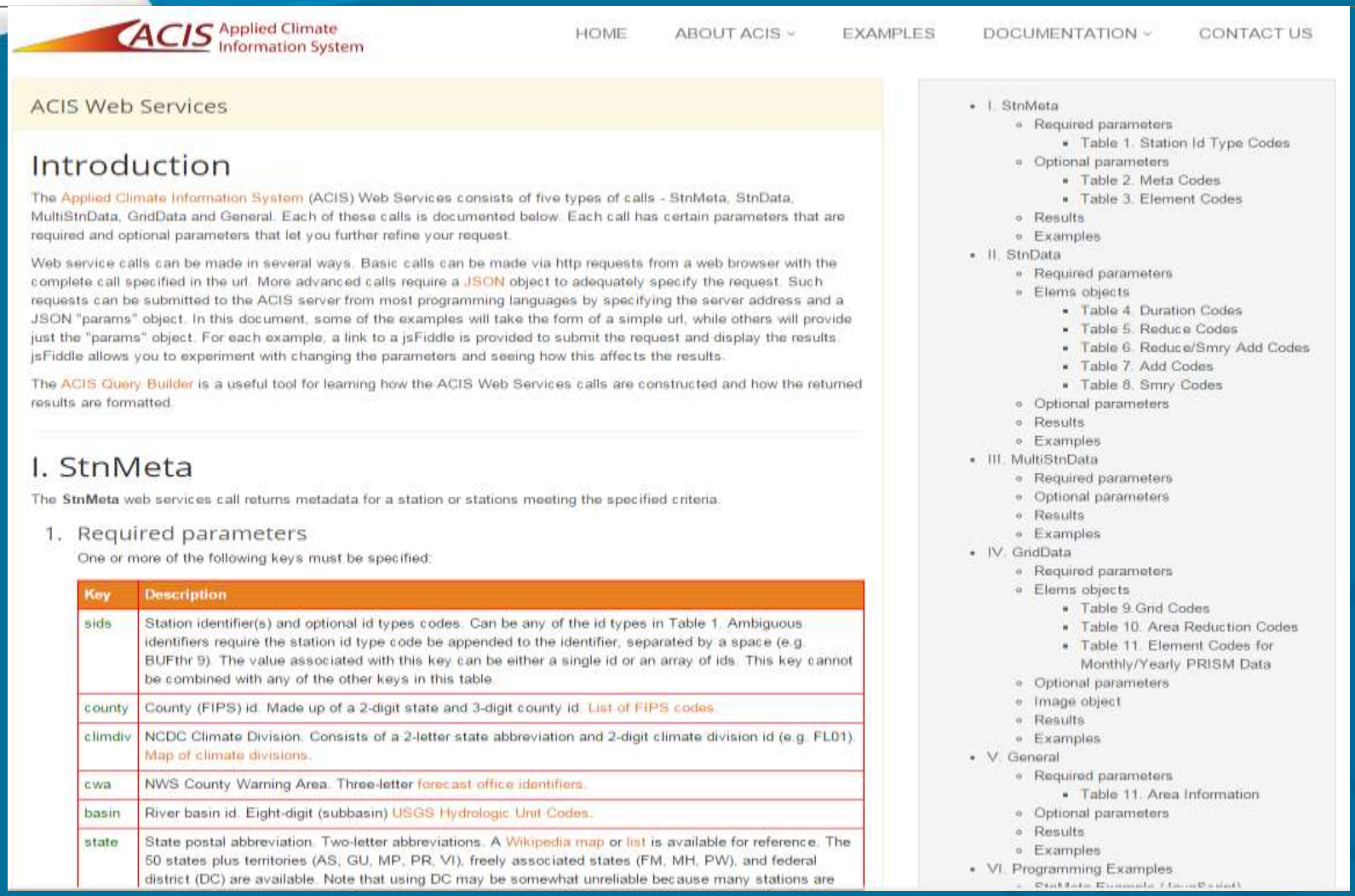
# Observed Jul 2, 2015 MaxT

# Jul 2, 2015 Record MaxT Anomalies

# Jul 2, 2015 Record MaxT Pop-Up

| | |
|---|---|
| Station_ID | SEAthr |
| Station_Name | Seattle Area |
| Station_Lat_N | 47.44 |
| Station_Lon_E | -122.31 |
| City | Seattle |
| State | WA |
| Start_Date | 2-Jul-15 |
| End_Date | 2-Jul-15 |
| Year_Count | 68 |
| Variable | maxt |
| Value_F | 93.00 |
| DFN_Station_ID | 457473 |
| DFN_Value_F | 19.70 |
| Abs_Rank_Type | warmest |
| Abs_Rank | 1 |
| Abs_Rank_Tied | False |
| Abs_Percentile | 99 |
| Rel_Rank_Type | warmest |
| Rel_Rank | 1 |
| Rel_Rank_Tied | False |
| Rel_Percentile | 99 |

# Applied Climate Information System (ACIS)



ACIS Applied Climate Information System

HOME ABOUT ACIS EXAMPLES DOCUMENTATION CONTACT US

ACIS Web Services

## Introduction

The Applied Climate Information System (ACIS) Web Services consists of five types of calls - StnMeta, StnData, MultiStnData, GridData and General. Each of these calls is documented below. Each call has certain parameters that are required and optional parameters that let you further refine your request.

Web service calls can be made in several ways. Basic calls can be made via http requests from a web browser with the complete call specified in the url. More advanced calls require a JSON object to adequately specify the request. Such requests can be submitted to the ACIS server from most programming languages by specifying the server address and a JSON "params" object. In this document, some of the examples will take the form of a simple url, while others will provide just the "params" object. For each example, a link to a jsFiddle is provided to submit the request and display the results. jsFiddle allows you to experiment with changing the parameters and seeing how this affects the results.

The ACIS Query Builder is a useful tool for learning how the ACIS Web Services calls are constructed and how the returned results are formatted.

## I. StnMeta

The **StnMeta** web services call returns metadata for a station or stations meeting the specified criteria.

### 1. Required parameters

One or more of the following keys must be specified:

| Key | Description |
|---|---|
| sids | Station identifier(s) and optional id types codes. Can be any of the id types in Table 1. Ambiguous identifiers require the station id type code be appended to the identifier, separated by a space (e.g. BUFthr 9). The value associated with this key can be either a single id or an array of ids. This key cannot be combined with any of the other keys in this table. |
| county | County (FIPS) id. Made up of a 2-digit state and 3-digit county id. List of FIPS codes. |
| climdiv | NCDC Climate Division. Consists of a 2-letter state abbreviation and 2-digit climate division id (e.g. FL01). Map of climate divisions. |
| cwa | NWS County Warning Area. Three-letter forecast office identifiers. |
| basin | River basin id. Eight-digit (subbasin) USGS Hydrologic Unit Codes. |
| state | State postal abbreviation. Two-letter abbreviations. A Wikipedia map or list is available for reference. The 50 states plus territories (AS, GU, MP, PR, VI), freely associated states (FM, MH, PW), and federal district (DC) are available. Note that using DC may be somewhat unreliable because many stations are |

# Big Data!!

# NDFD or other model data

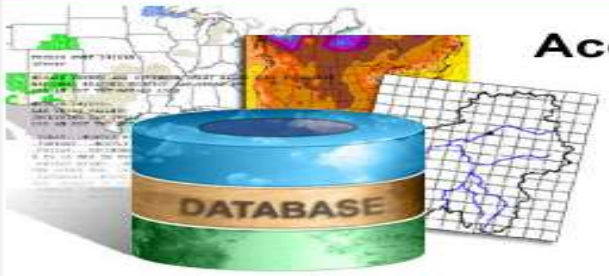
National Weather Service

National Digital Forecast Database

Home | News

- Home
- Status of NDFD Elements as of Nov 5, 2013
- Access Data
- Development Status
- Customer Support
- FAQ
- Background Information
- Presentations
- NDGD

USA.gov




## Access Data

**NDFD**
NWS National Digital Forecast Database

You can access NDFD elements via file transfer protocol (ftp), http, eXtensible Markup Language (XML), or web browser. Links to the data, supporting information and software are listed below:

- Request grids in Gridded Binary (GRIB2) format via:
  - Anonymous ftp over the Internet
    - For the coterminous U.S. (CONUS), Puerto Rico/the Virgin Islands, Hawaii, Guam, and/or 16 pre-defined CONUS subsectors
    - For a user-defined geographic area(s)
      - Service Description Document for retrieving user-defined GRIB2 files
  - Need faster, more reliable ftp access to GRIB2 files? Subscribe to Server Access Service of the Family of Services (ftp via dedicated line–cost-recovery fee)
  - http over the Internet
  - Supporting documentation:
    - NDFD GRIB2 Encoding: how NDFD products are encoded
    - Data Formats and free GRIB2 decoding software (DeGRIB)
    - Tutorial: NDFD DeGRIB, Data Download, and Image Generation (pdf), courtesy of NOAA's Coastal Services Center
- NDFD Elements via XML Web Service
- NDFD Elements via Web Feature Service
- Using NDFD in a Geographic Information Systems (GIS) Environment (Shapefiles and Floating Point Grids), courtesy of NOAA's Coastal Services Center
- NDFD Graphics via web browser

# NOAA's Weather and Climate Toolkit (Data)

Raw data files on disk or remote location (URL, THREDDS, OPeNDAP, etc…)

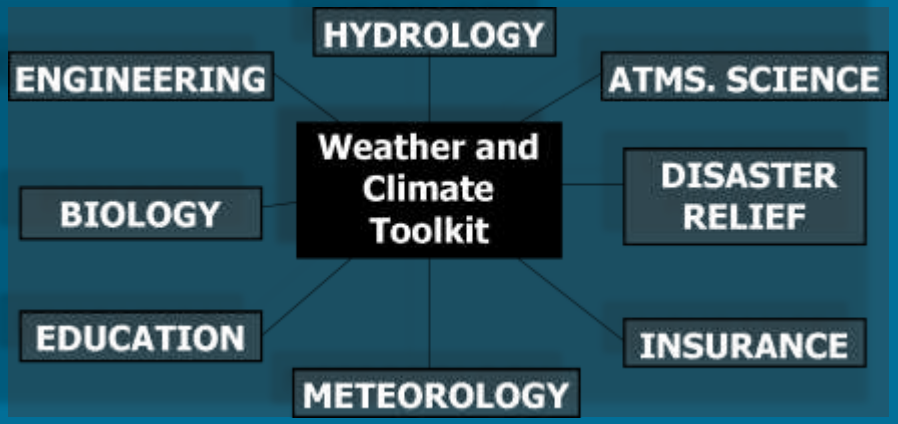
NetCDF, GRIB, GINI, HDF and more via Unidata Common Data Model (CDM):

- Feature types of Grid, Swath, Radial (Time Series, Point, coming soon)

Supports:

- NEXRAD, GOES, Model Data, and much more.

# Data Export

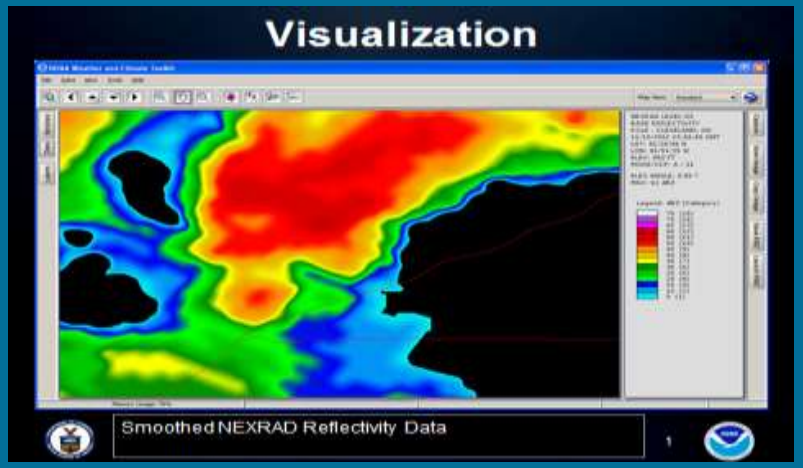


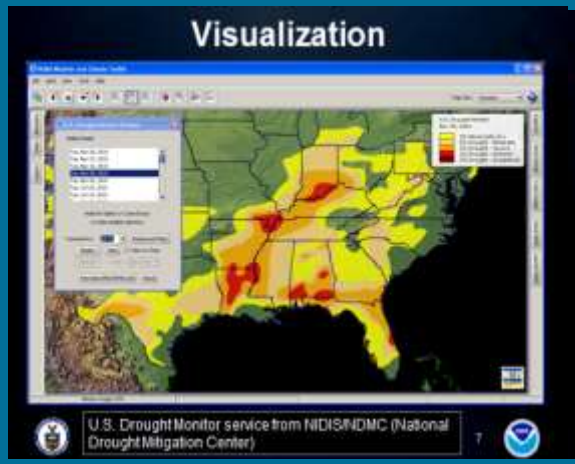

"Bridge" between raw Weather and Climate data and multiple scientific user communities

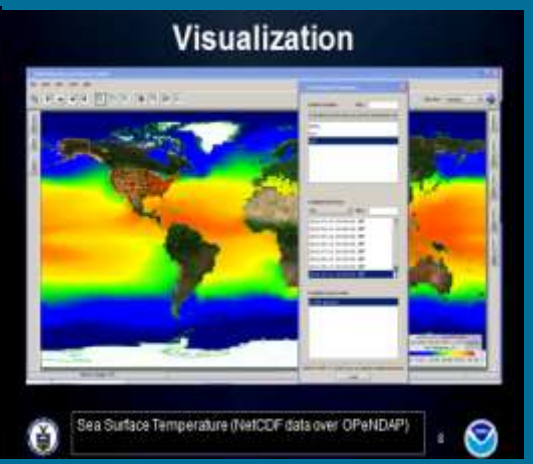
Export Data to:

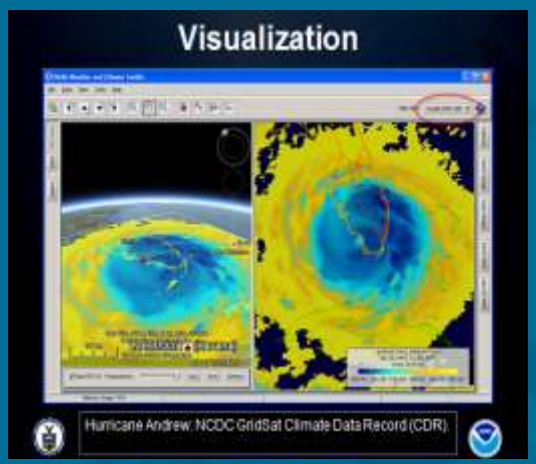
Shapefile, Well-Known Text, Arc/Info ASCII GRID, Gridded and Raw NetCDF, GeoTIFF and KMZ (Google Earth)

# NOAA's W&CT VISUALIZATION

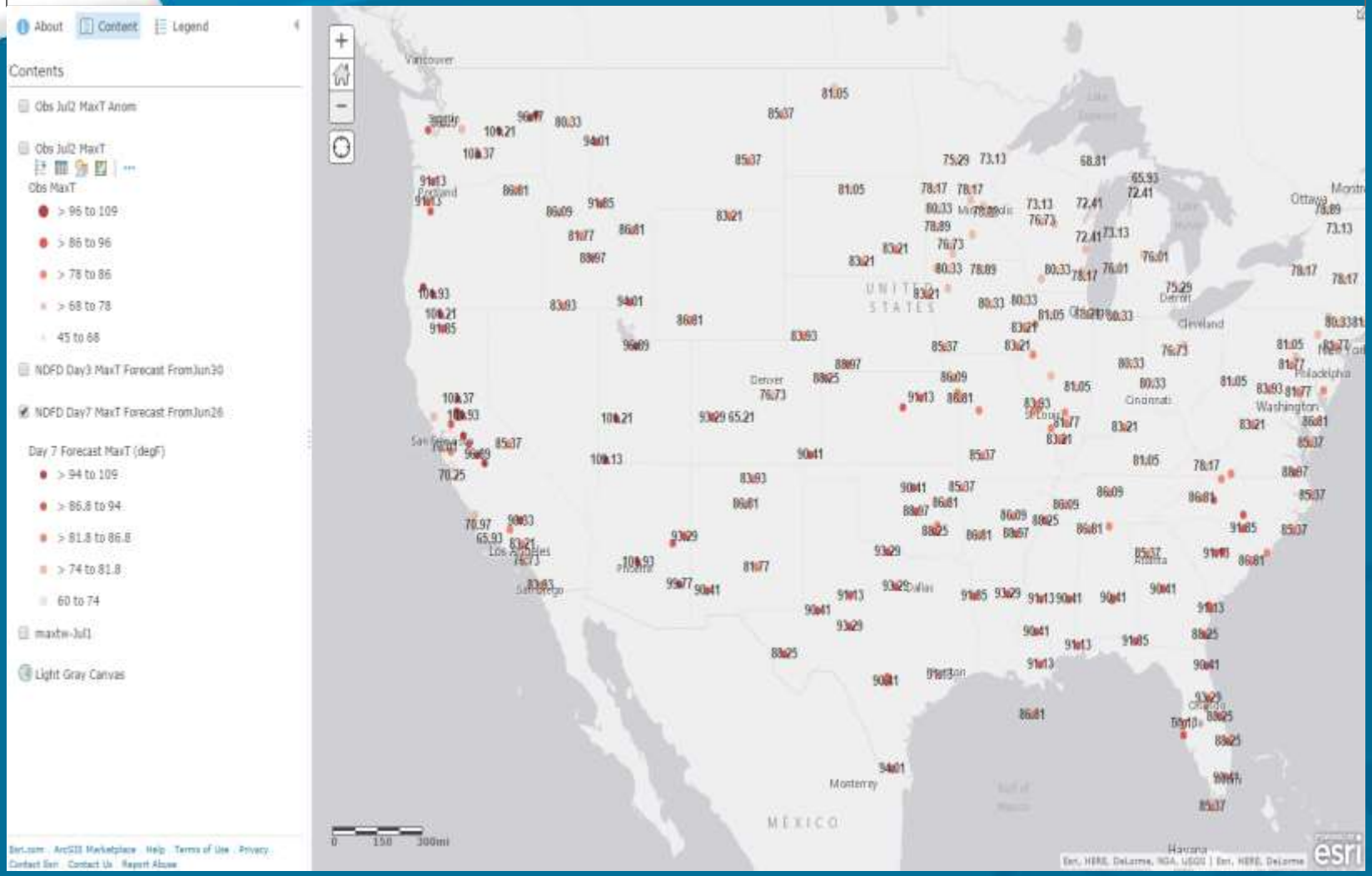



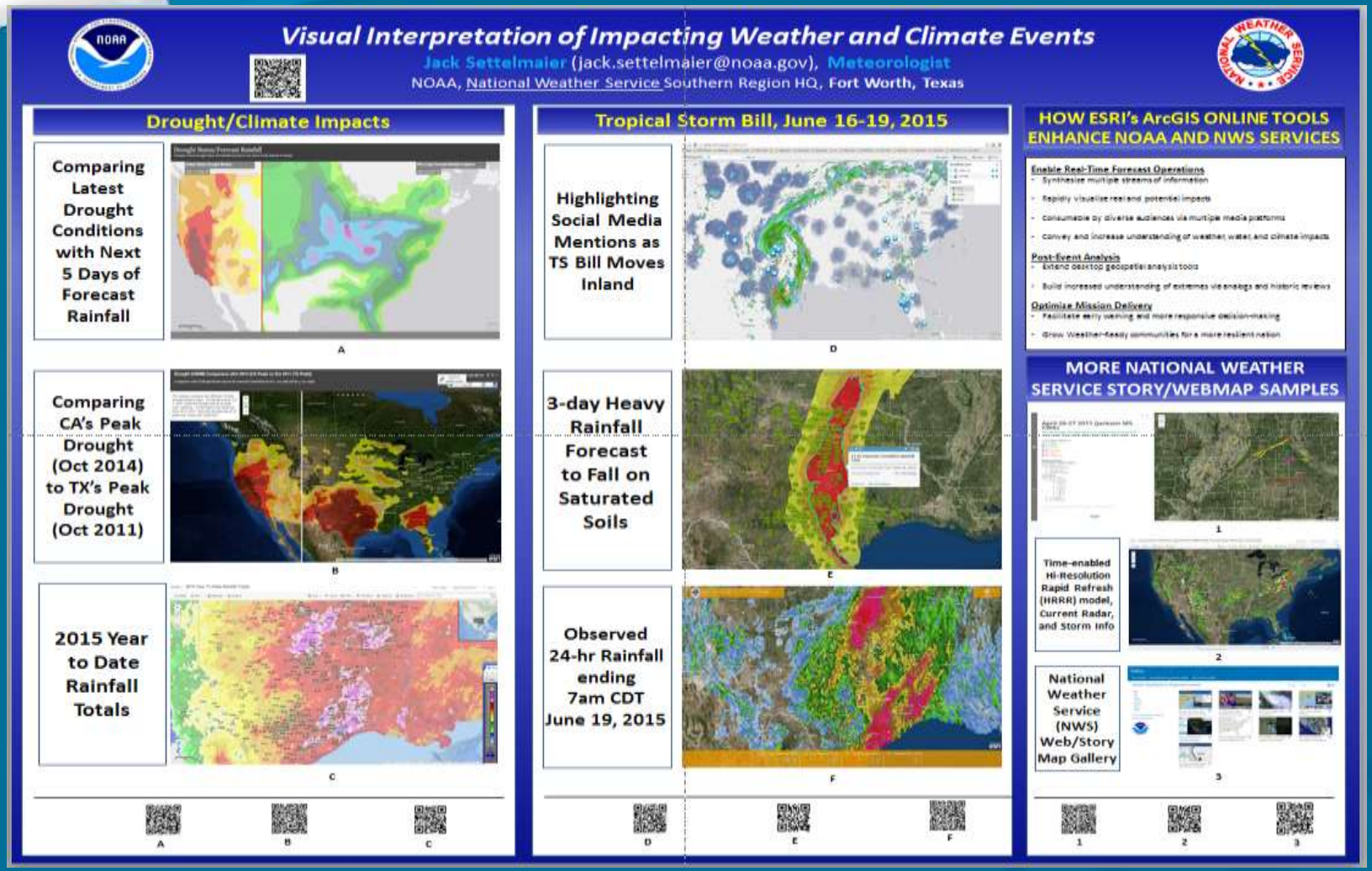
# Verification/Comparison--Forecast vs Observed



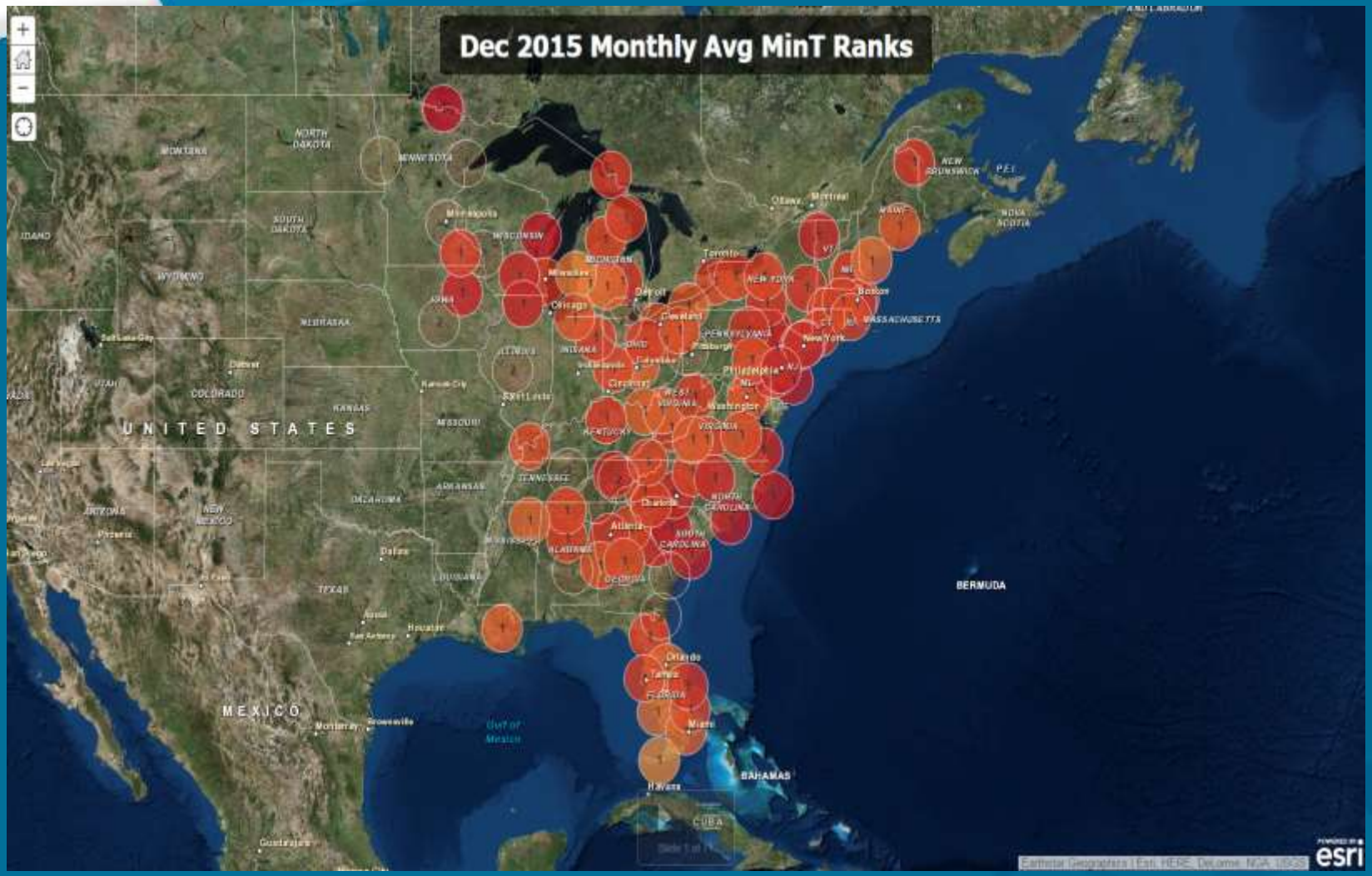
# StoryMaps

- Storymap Templates
- …Numerous Options
- …To Convey
- …Impact Context
- …About Weather and Climate Events

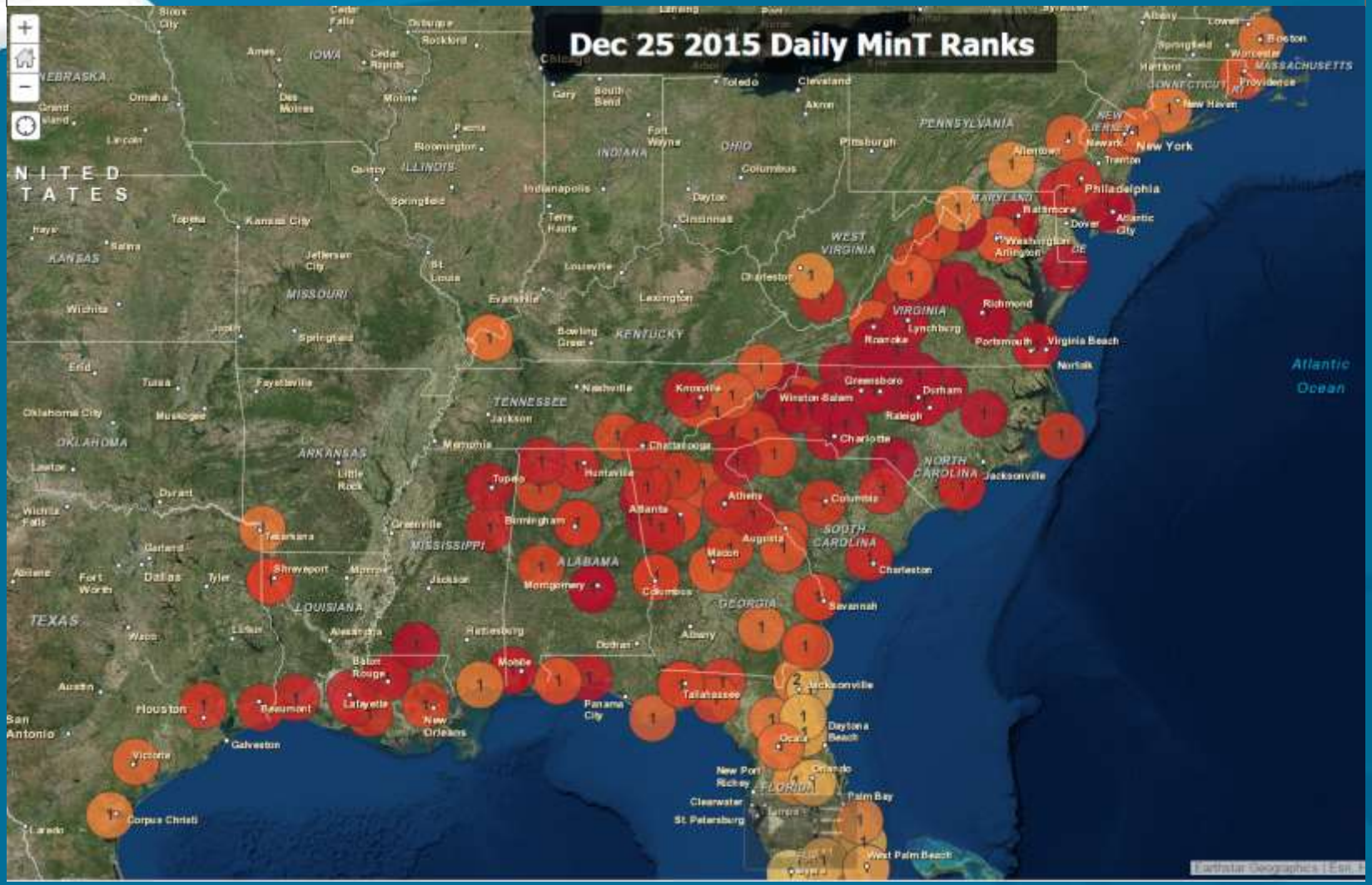
# Map Gallery Poster



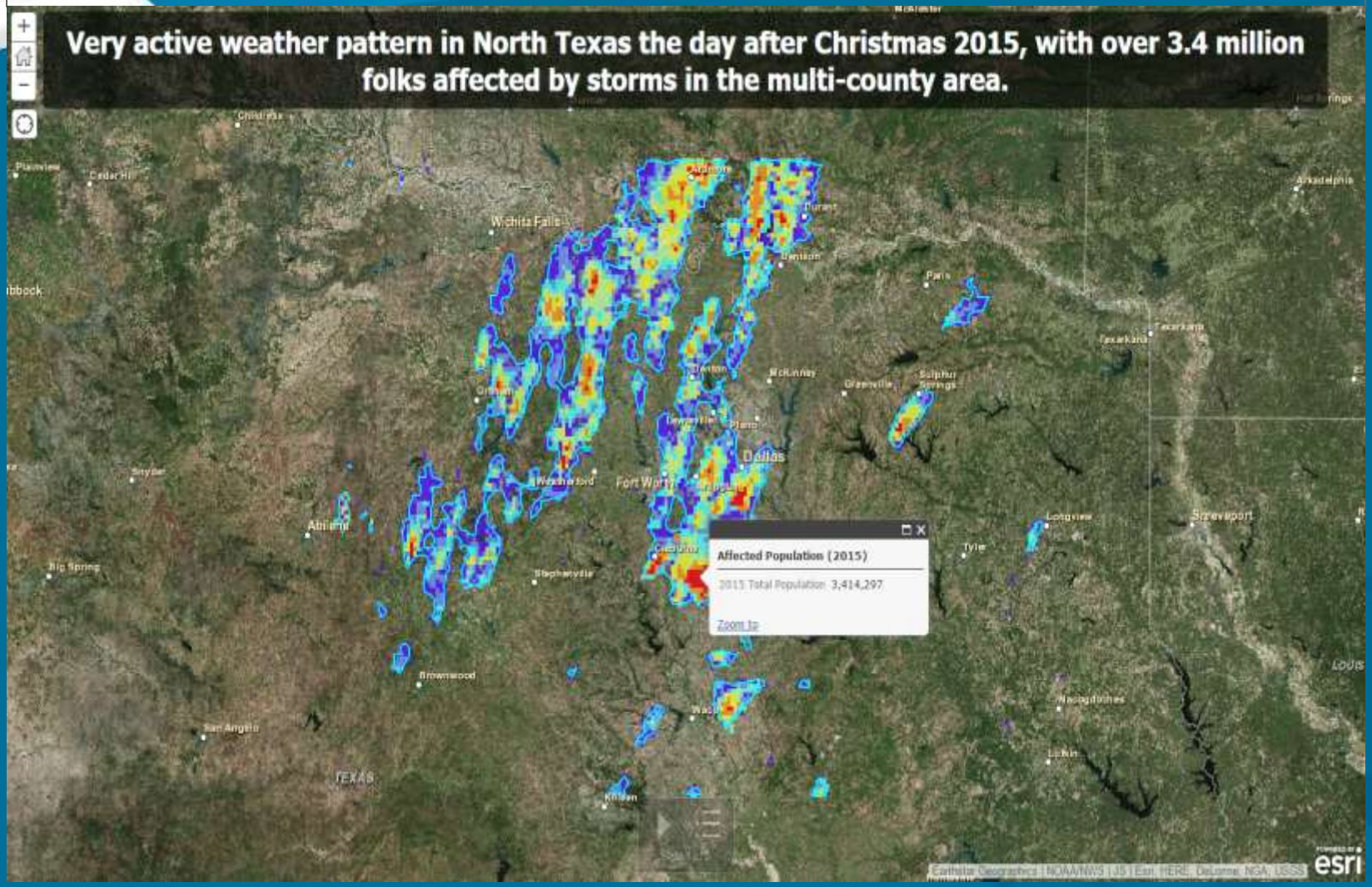
# Webmap Presentation View—Anomalous Dec Warmth



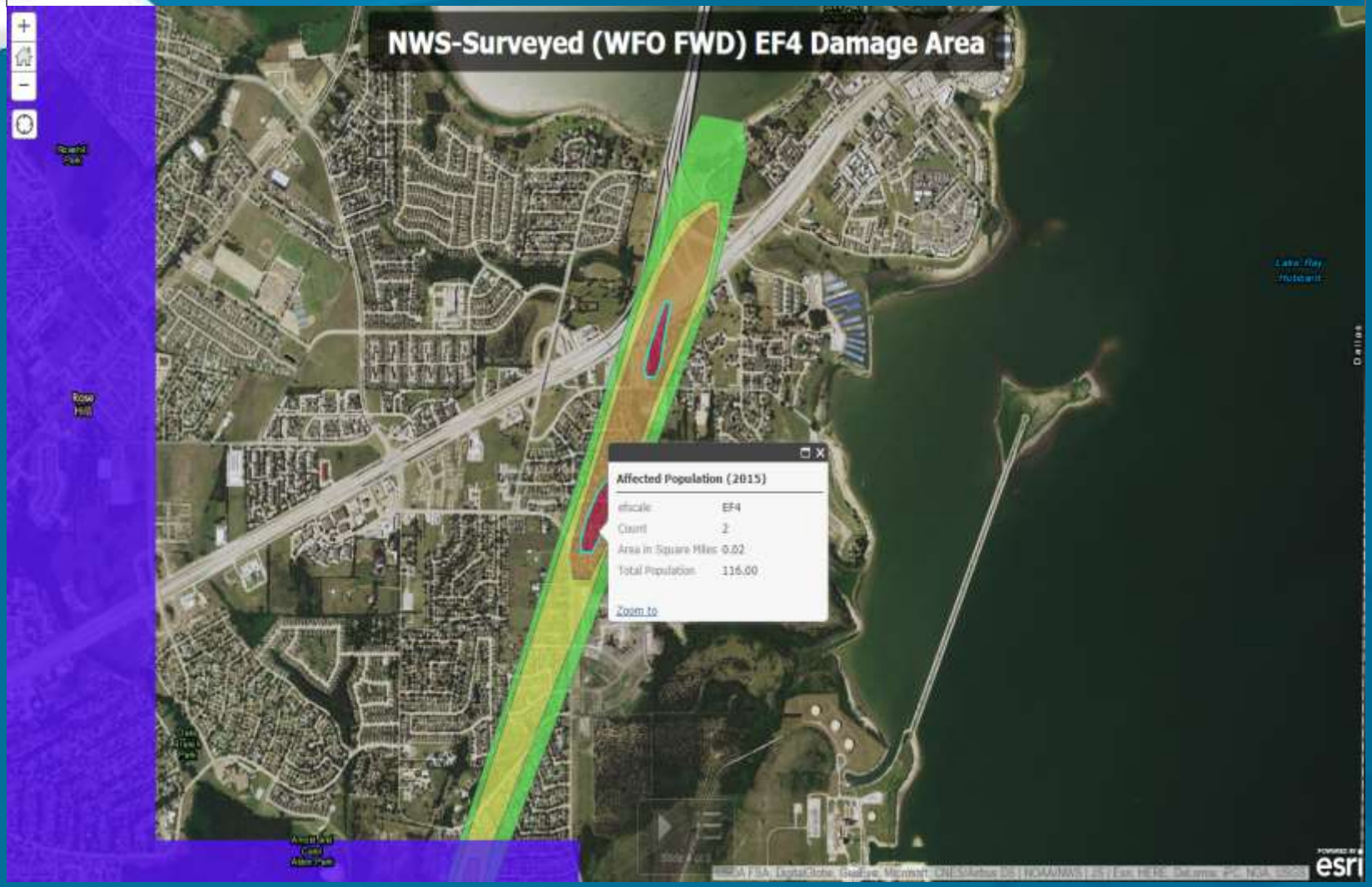
# Record Morning Low Temperatures—Christmas 2015



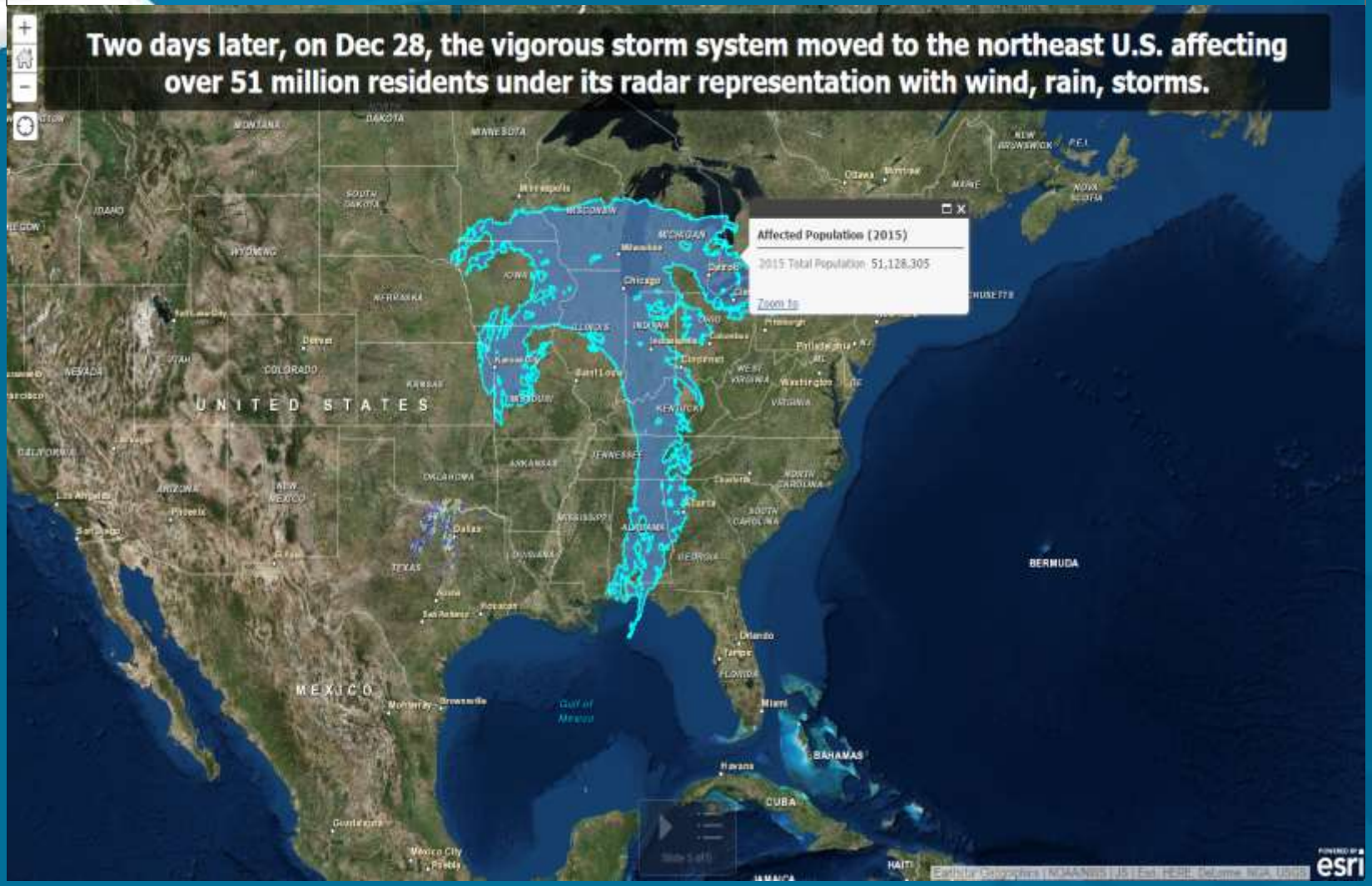
# Webmap Presentation View—Event Review



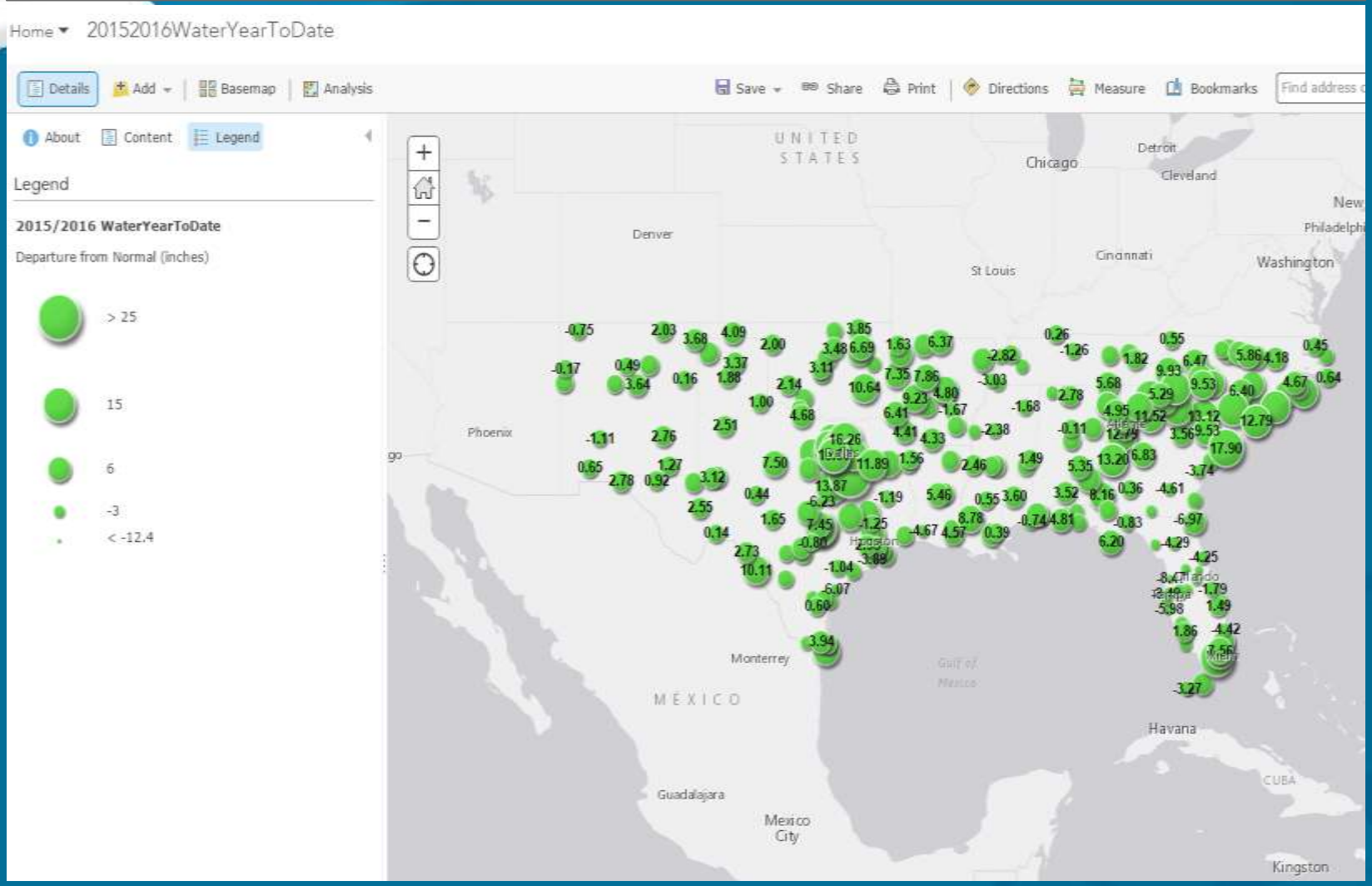
# Tornado Damage Path



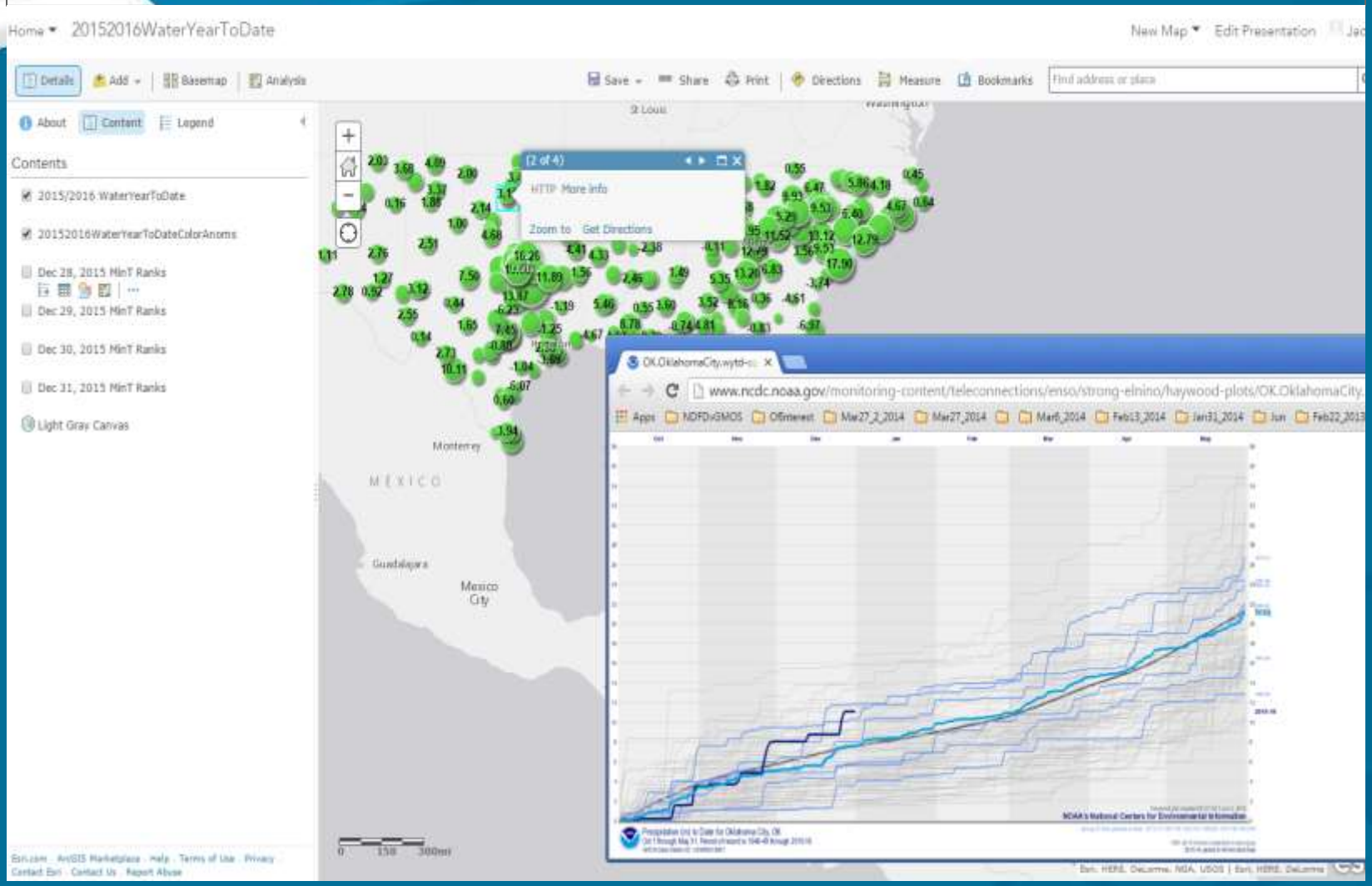
# Impacted Population under Large Storm System



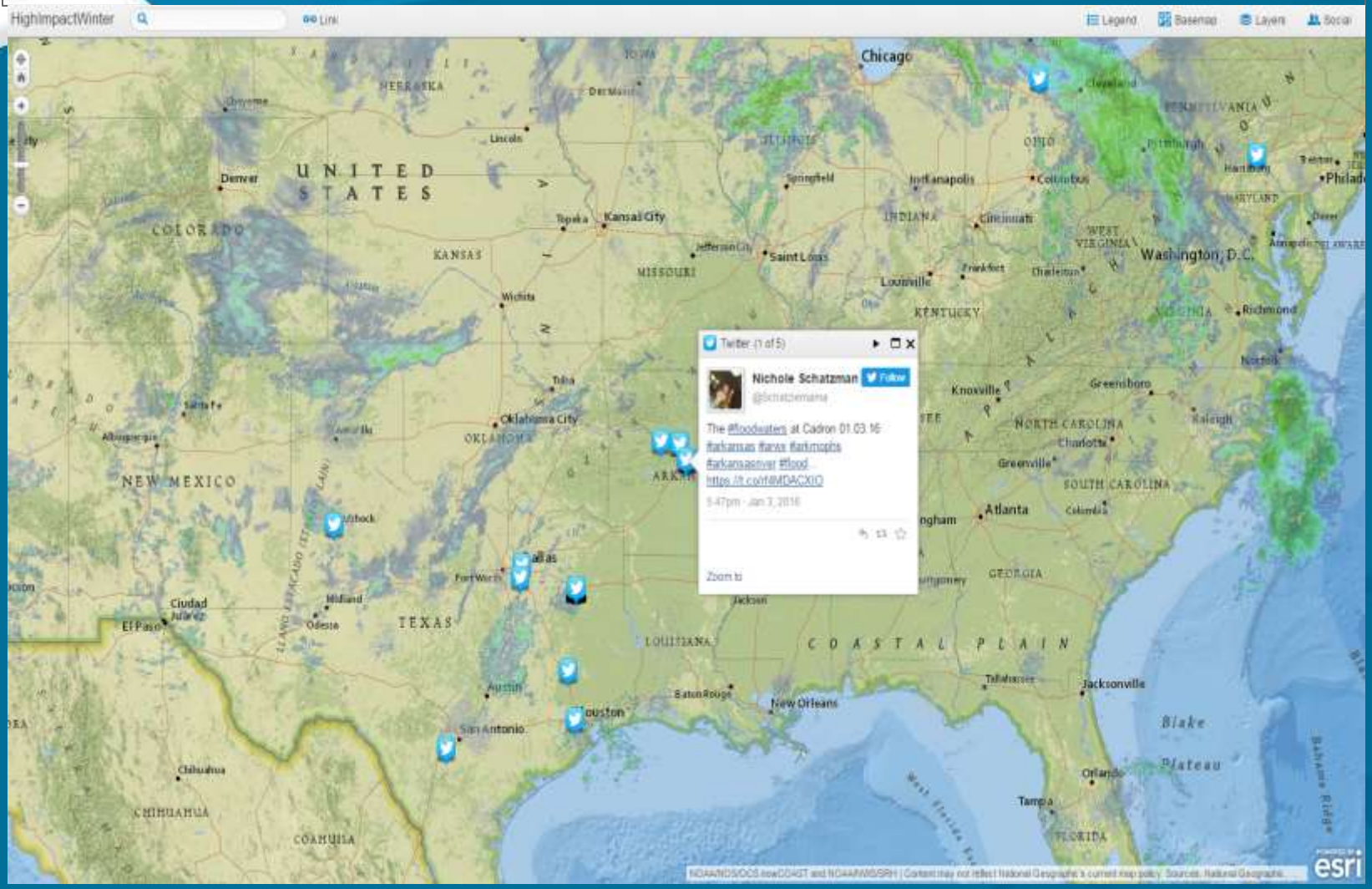
# Webmap—Water Year To Date (Rainfall Anomaly Since Oct 1, 2015)



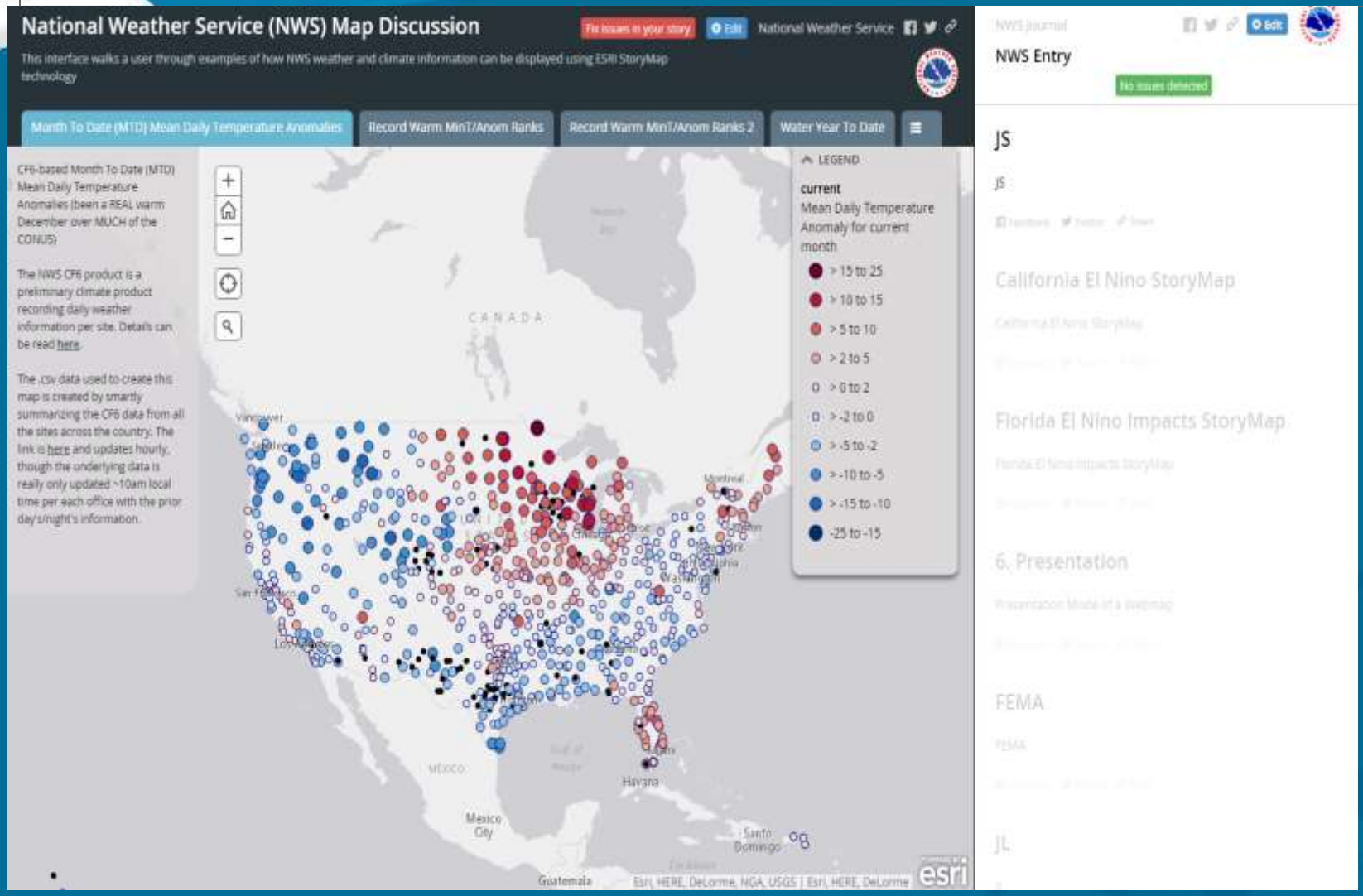
# Water Year To Date (since 10/1/15) (El Nino Watch)



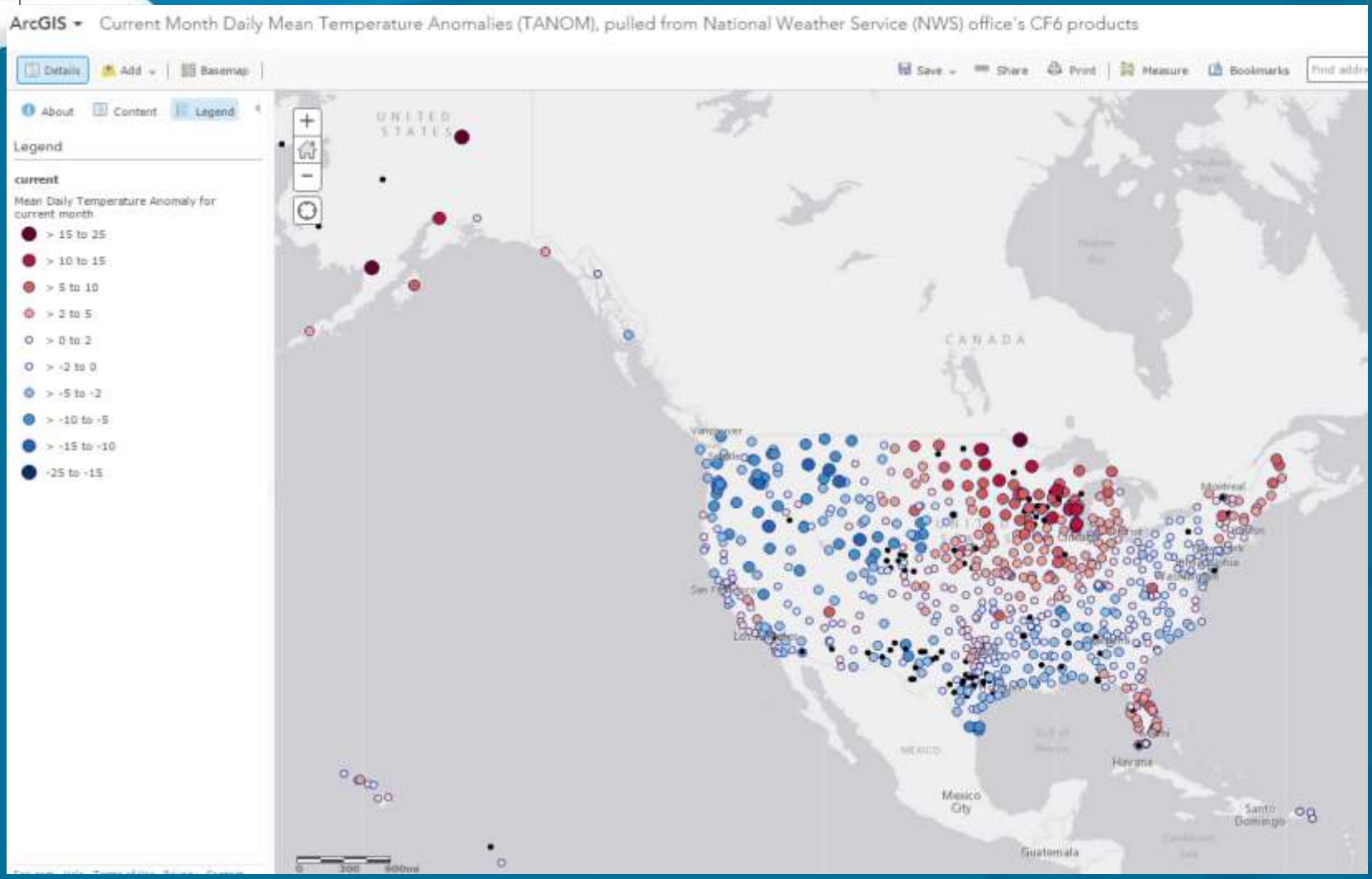
# Webpage—Social Media Awareness



# Map Journal Template



# Current Month to Date Mean Daily Temperature Anomaly



# Southern CA Impacts from El Nino—Jayme Laber (WFO LOX)

## What El Niño Means for Southern California

When the forecast calls for an El Niño, how does that impact Southern California?

How much rain can we expect with these events?

How often do they occur?

Are all El Niño's the same?

What can we do to be better prepared?

This story map will try to answer these difficult questions for Southern California while providing a brief background of El Niño.

**Scroll down to see more.**

Photo Credit for the image displayed to the right: Mel Melcon (Los Angeles Times)

What Is an El Niño?

NWS Entry

California El Nino StoryMap

California El Nino StoryMap

Florida El Nino Impacts StoryMap

6. Presentation

FEMA

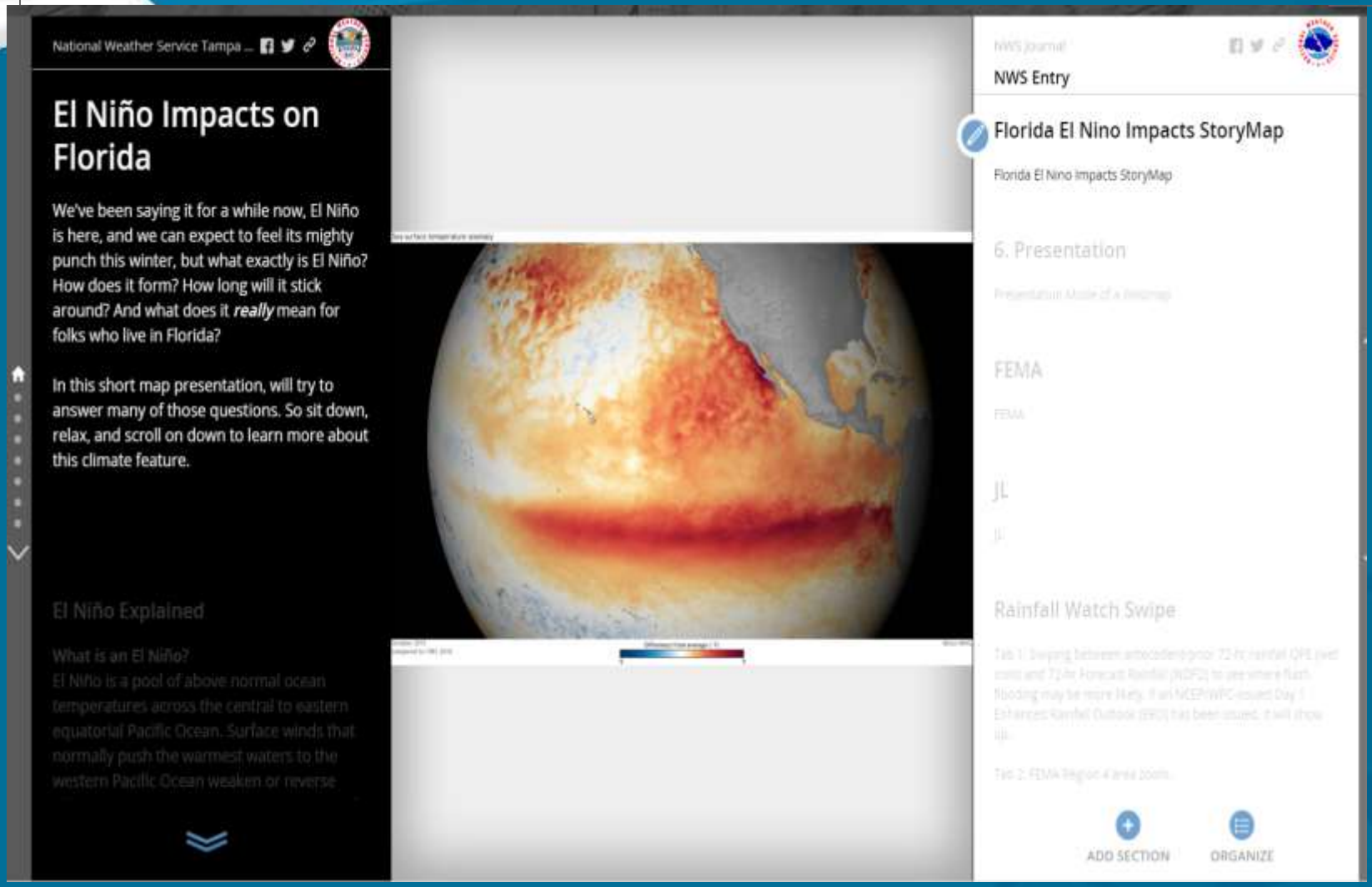
JL

Rainfall Watch Swipe

ADD SECTION

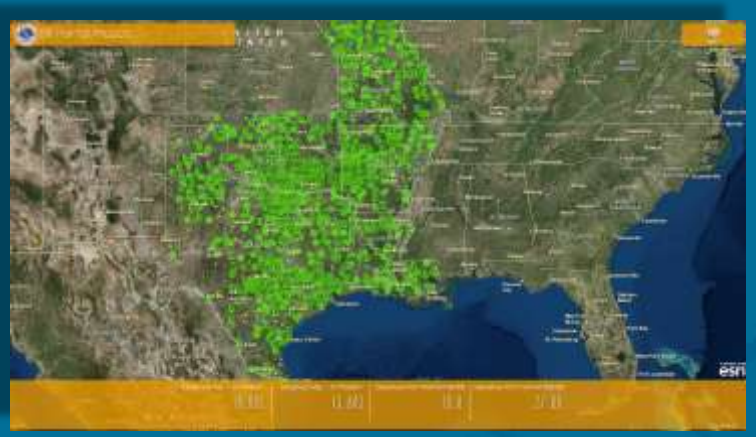
ORGANIZE

# Florida Impacts from El Nino—Marcus Austin (WFO Tampa)



# Summary

- GIS Enables….
- …Numerous Options
- …To Convey
- …Impact Context



- …About Weather and Climate Events

# More Info---Examples

- NOAA/NWS Booth (Exhibit Hall—5pm)

- Email: NWS_GIS_Info@noaa.gov
  - Jack.settelmaier@noaa.gov

- Website: http://www.nws.noaa.gov/gis/

# Questions??

# Comments??