

CLIMATE TOOLS AND RESOURCES

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SOUTH CENTRAL CLIMATE ADAPTATION SCIENCE CENTER

UNIVERSITY OF OKLAHOMA



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WHY USE CLIMATE DATA?



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Climate Data...

- Provides physical evidence of what the climate was like historically
- Does not change whereas our memories of certain events or time periods can change
- Provides supporting material that is required for a project report, grant application, legal proceeding, etc.
- Allows us to measure past events

CLIMATOLOGICAL TOOLS

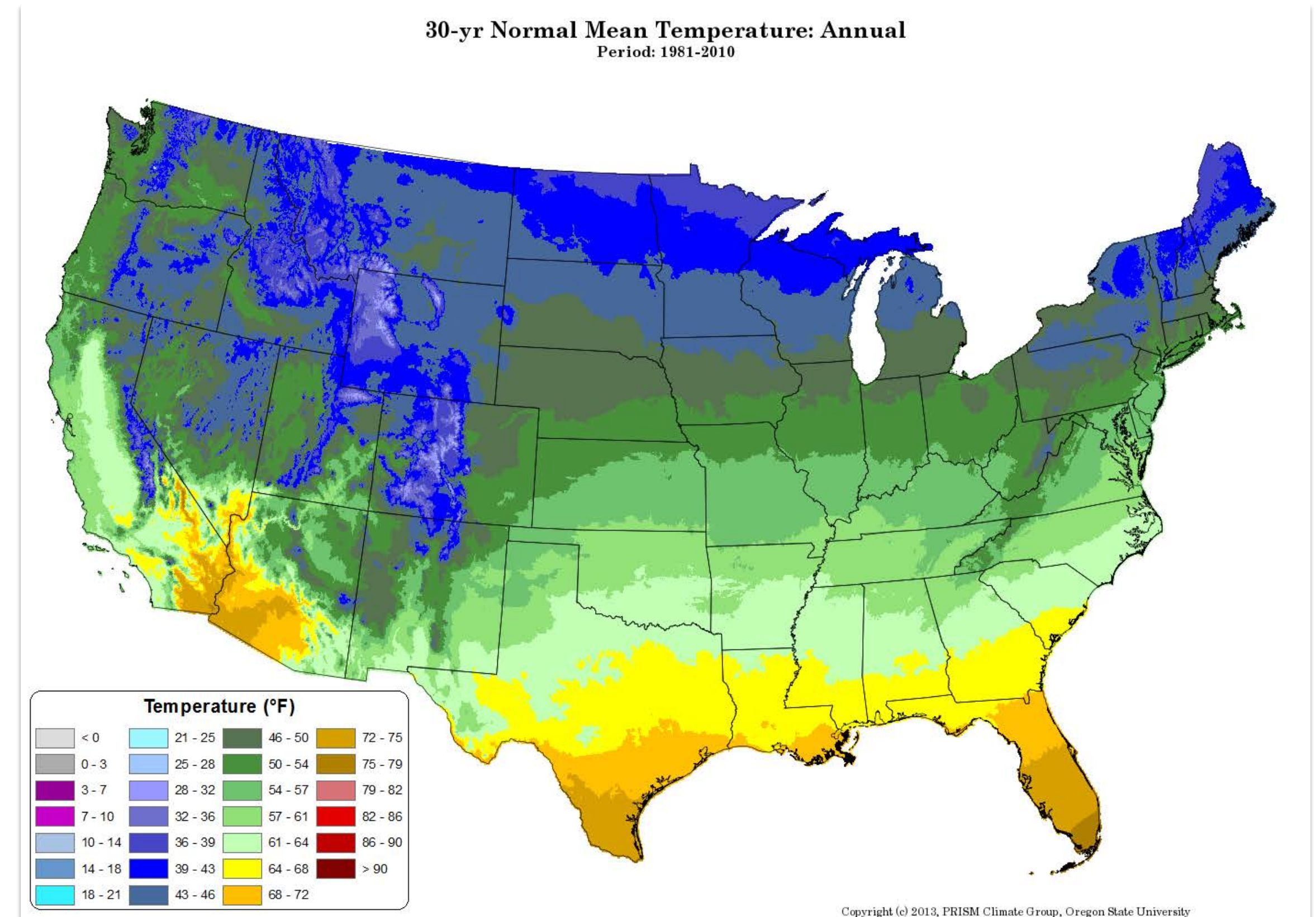
PAST CONDITIONS



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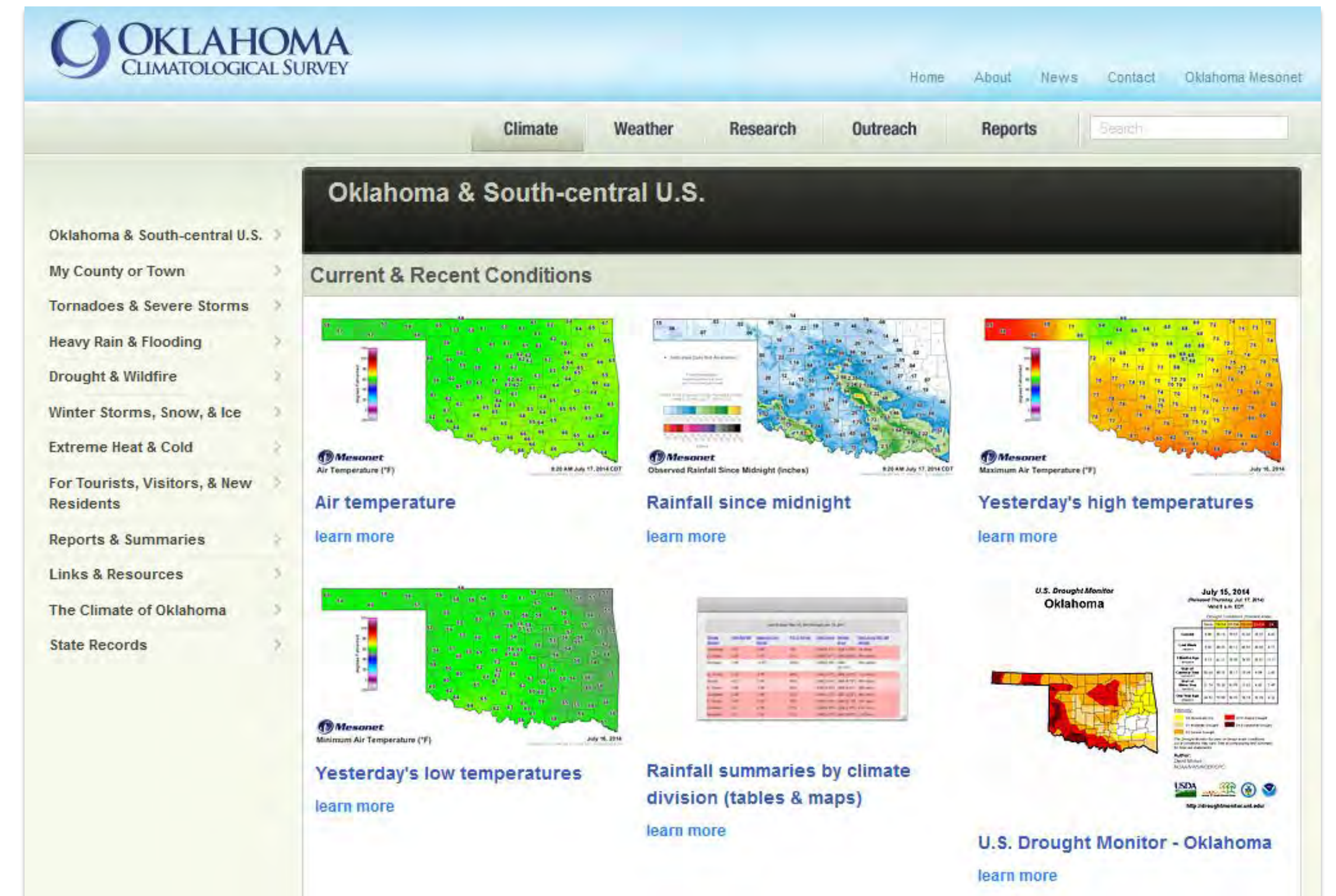
PRISM CLIMATE MAPS

- Provides temperature and precipitation maps and data for various spatial and temporal scales
- <http://www.prism.oregonstate.edu>

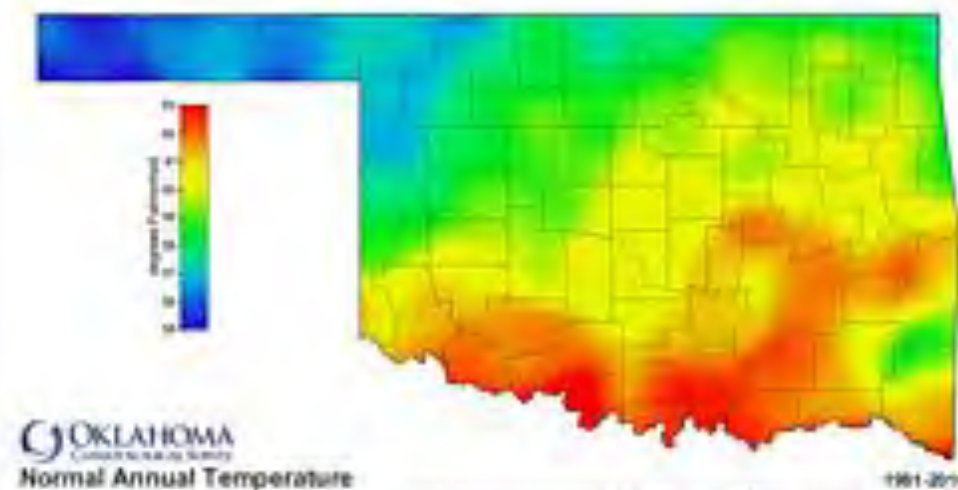


LONG-TERM AVERAGES AND EXTREMES

- Maps and graphs that provide long-term data on temperature, precipitation, snowfall, tornadoes, etc. for Oklahoma
- <http://www.climate.ok.gov/>



Long-term Averages & Extremes



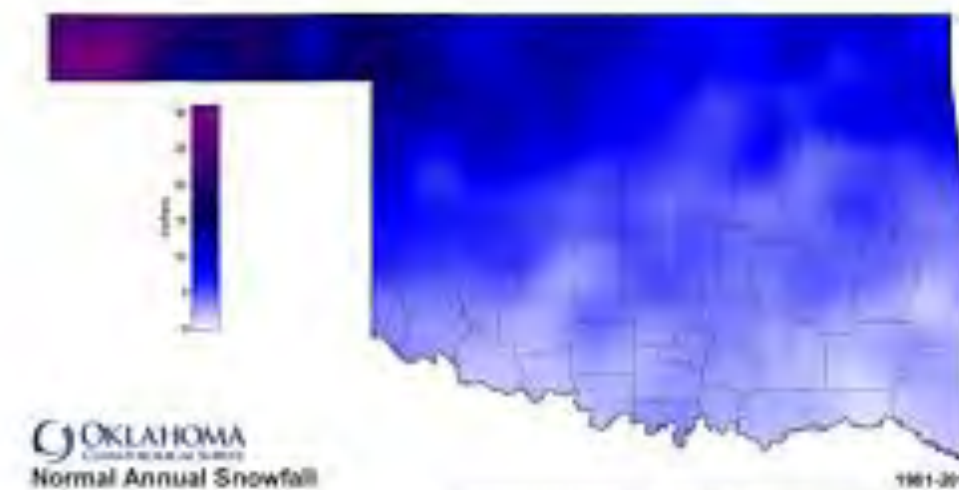
Normal annual temperature

[learn more](#)



Normal annual precipitation

[learn more](#)



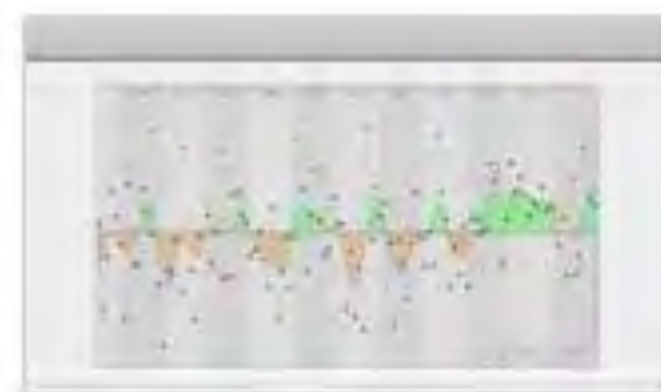
Normal annual snowfall

[learn more](#)



Temperature history - Annual, statewide

[learn more](#)



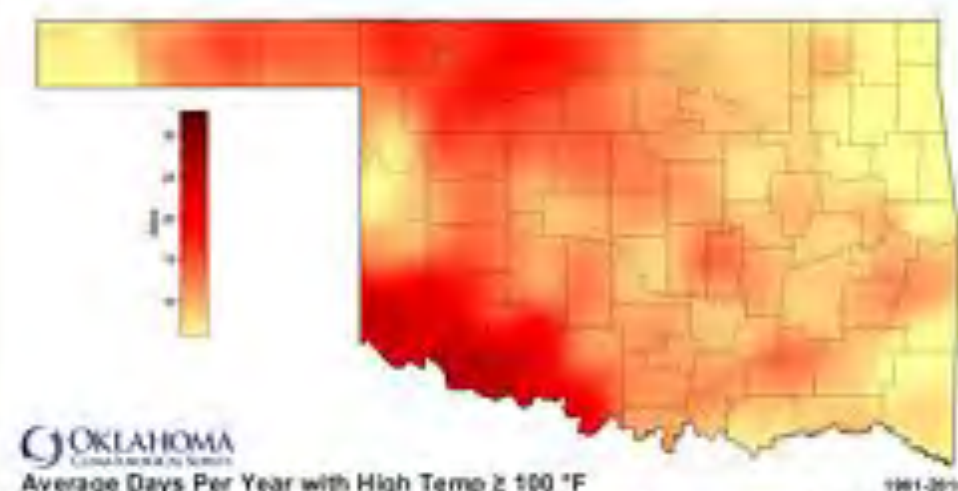
Precipitation history - Annual, statewide

[learn more](#)



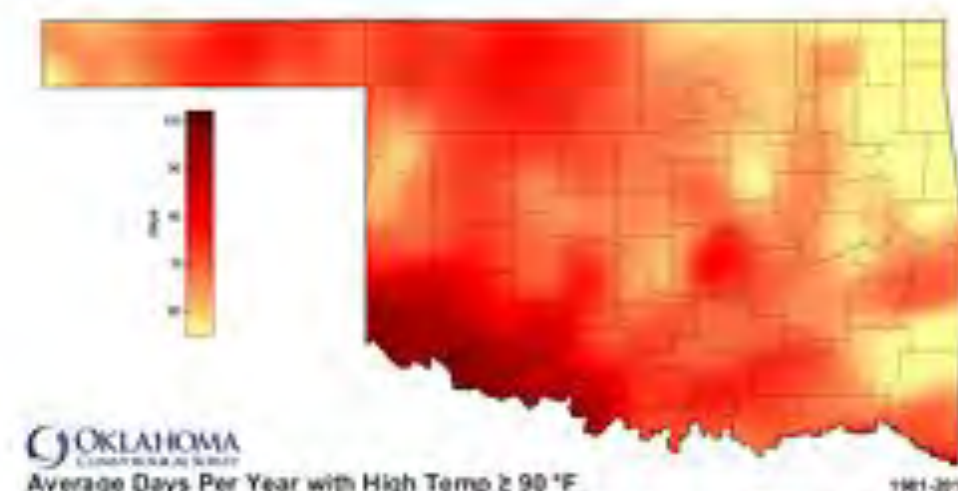
Total number of tornadoes by county

[learn more](#)



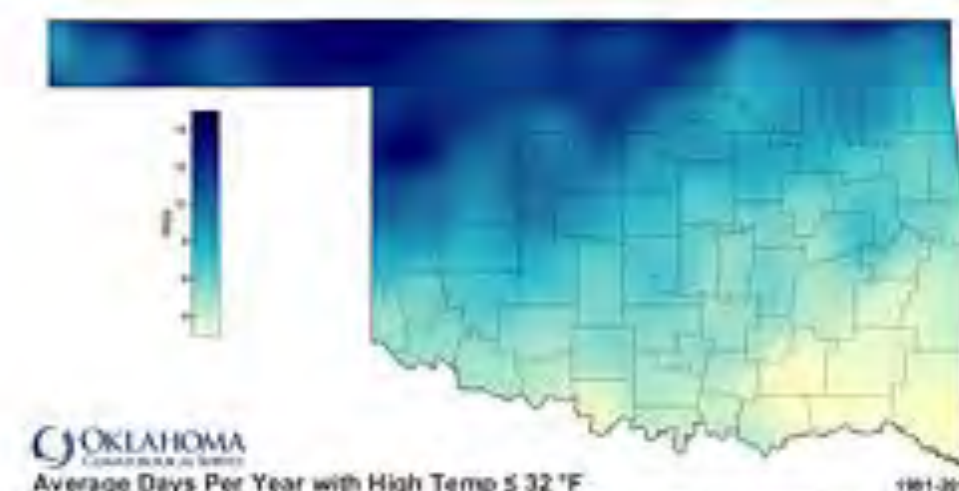
Average number of days with highs above 100°F

[learn more](#)



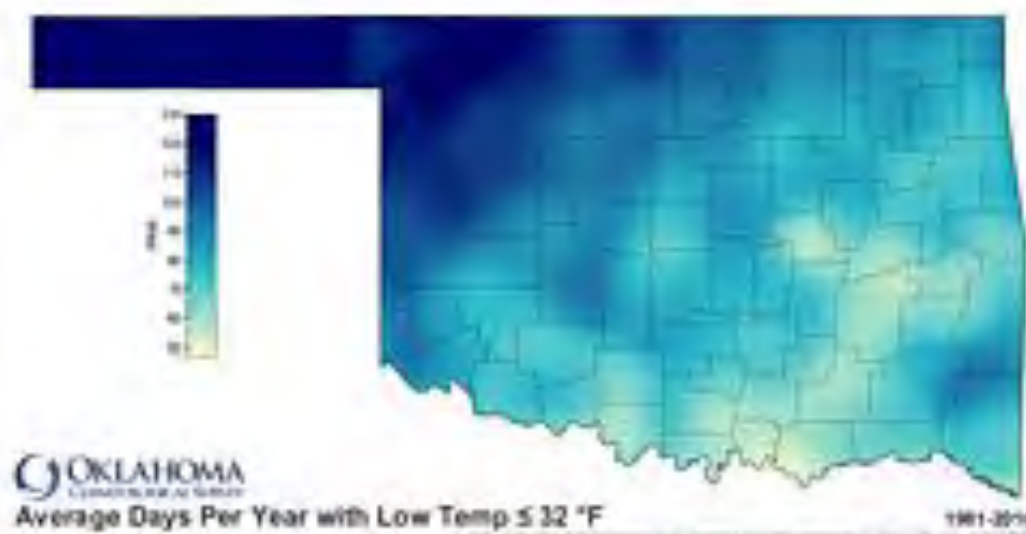
Average number of days with highs above 90°F

[learn more](#)



Average number of days with highs below 32°F

[learn more](#)



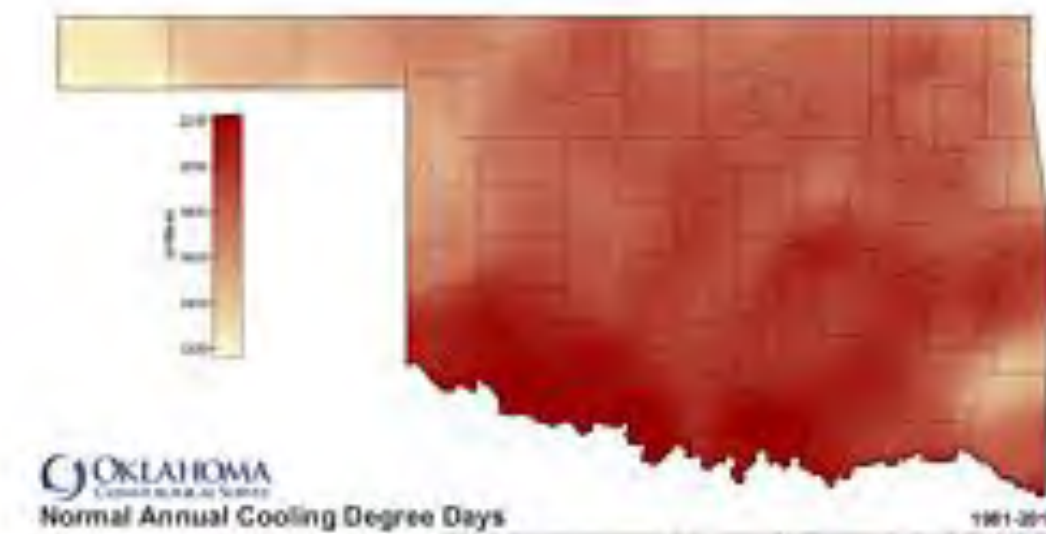
Average number of days with lows below 32°F

[learn more](#)



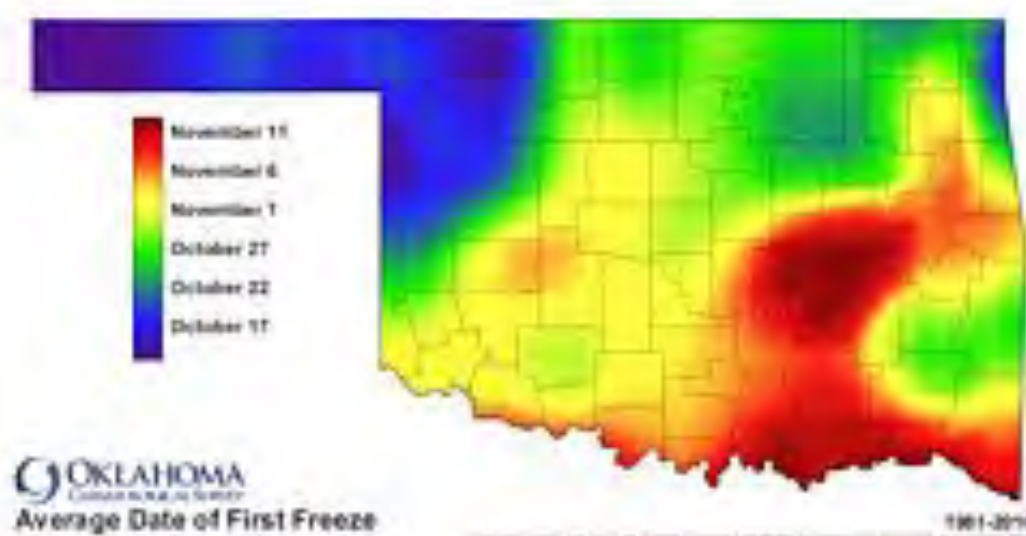
Average annual heating degree days (HDD)

[learn more](#)



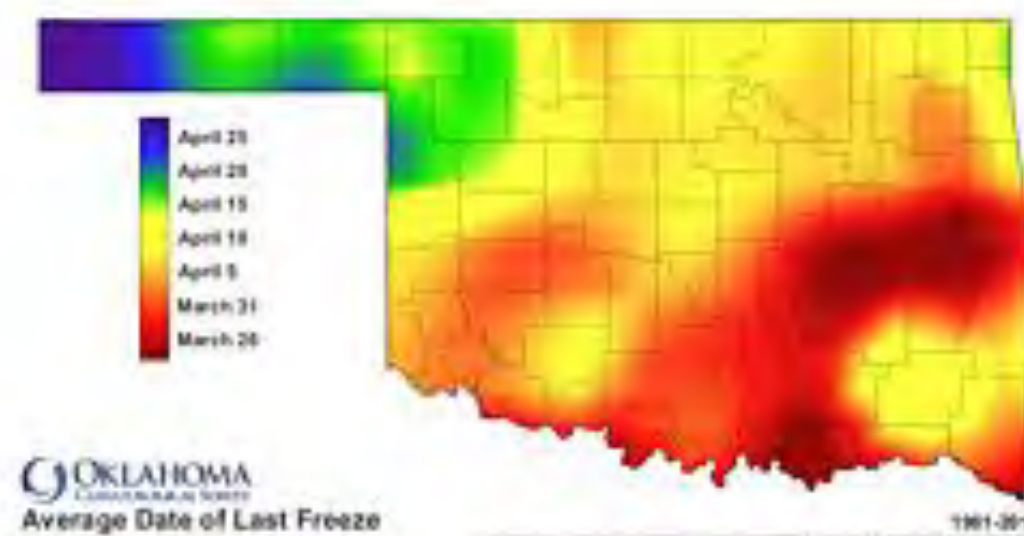
Average annual cooling degree days (CDD)

[learn more](#)



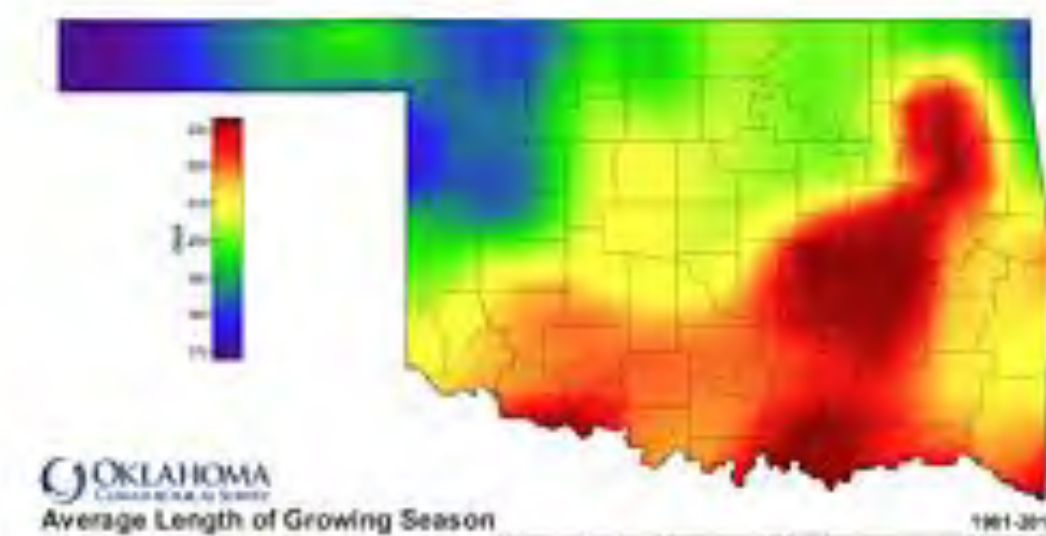
Average date of first freeze

[learn more](#)



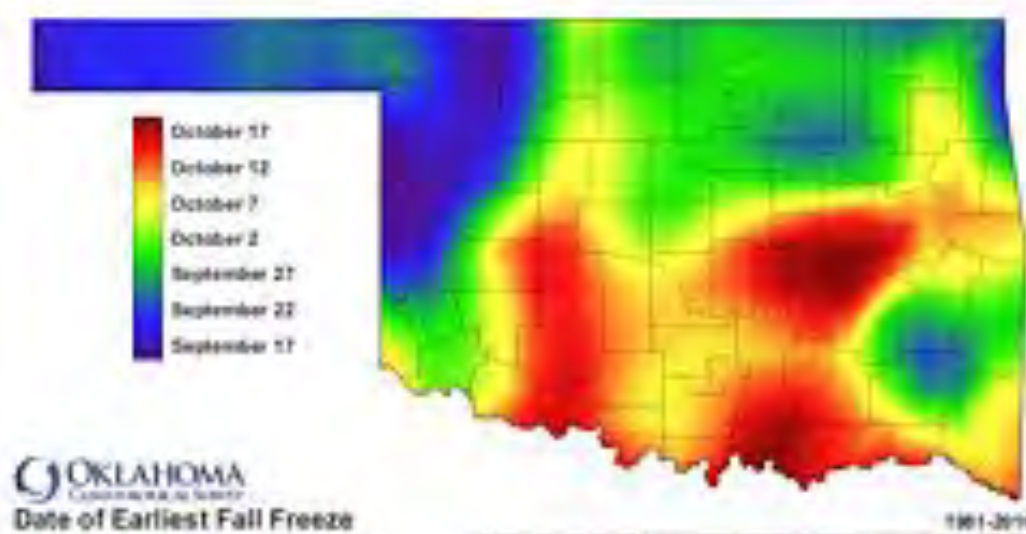
Average date of last freeze

[learn more](#)



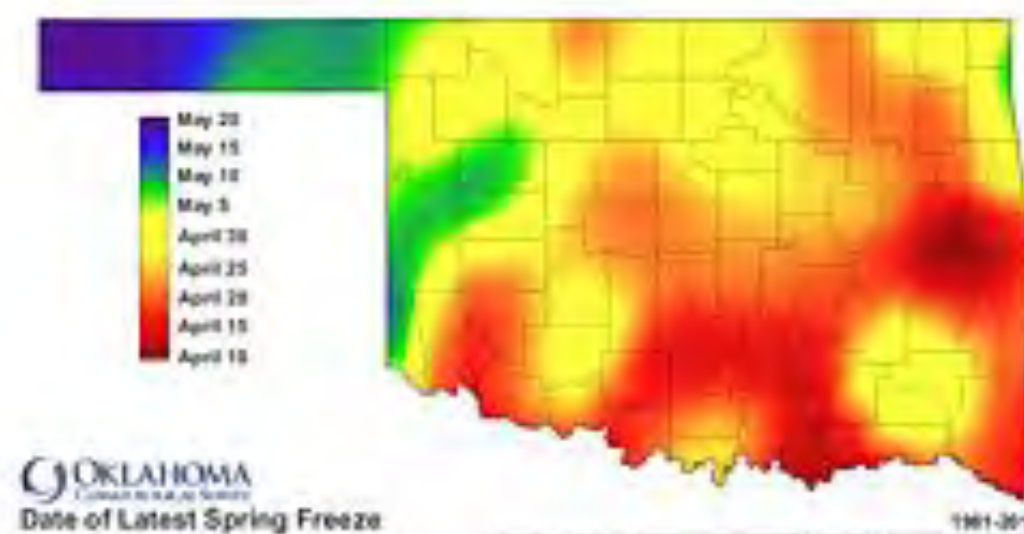
Average length of growing season

[learn more](#)



Earliest fall freeze

[learn more](#)

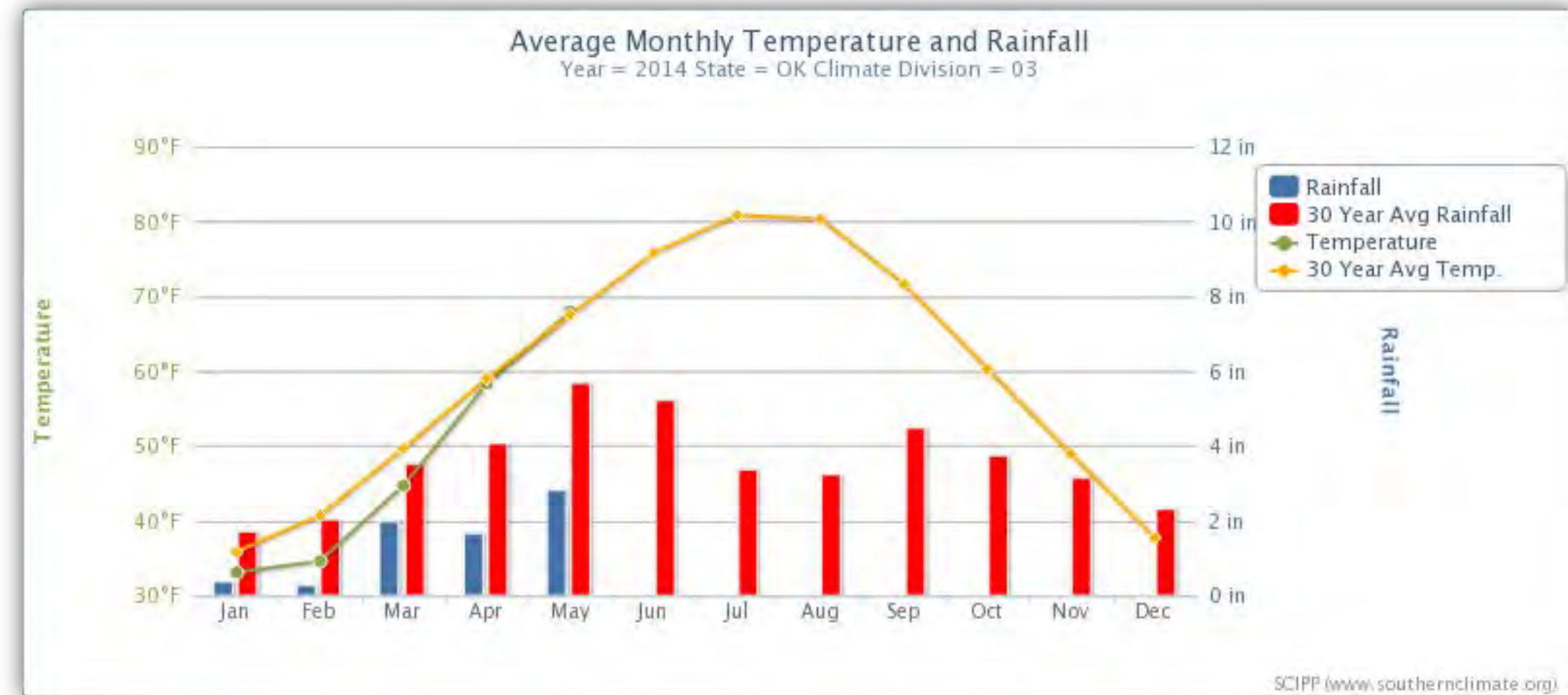


Latest spring freeze

[learn more](#)

AVERAGE MONTHLY TEMPERATURE & PRECIPITATION

- Displays information on how a particular year's monthly temperature or precipitation observations compare to the normal (30-year average)
- <http://www.southernclimate.org/pages/data-tools>



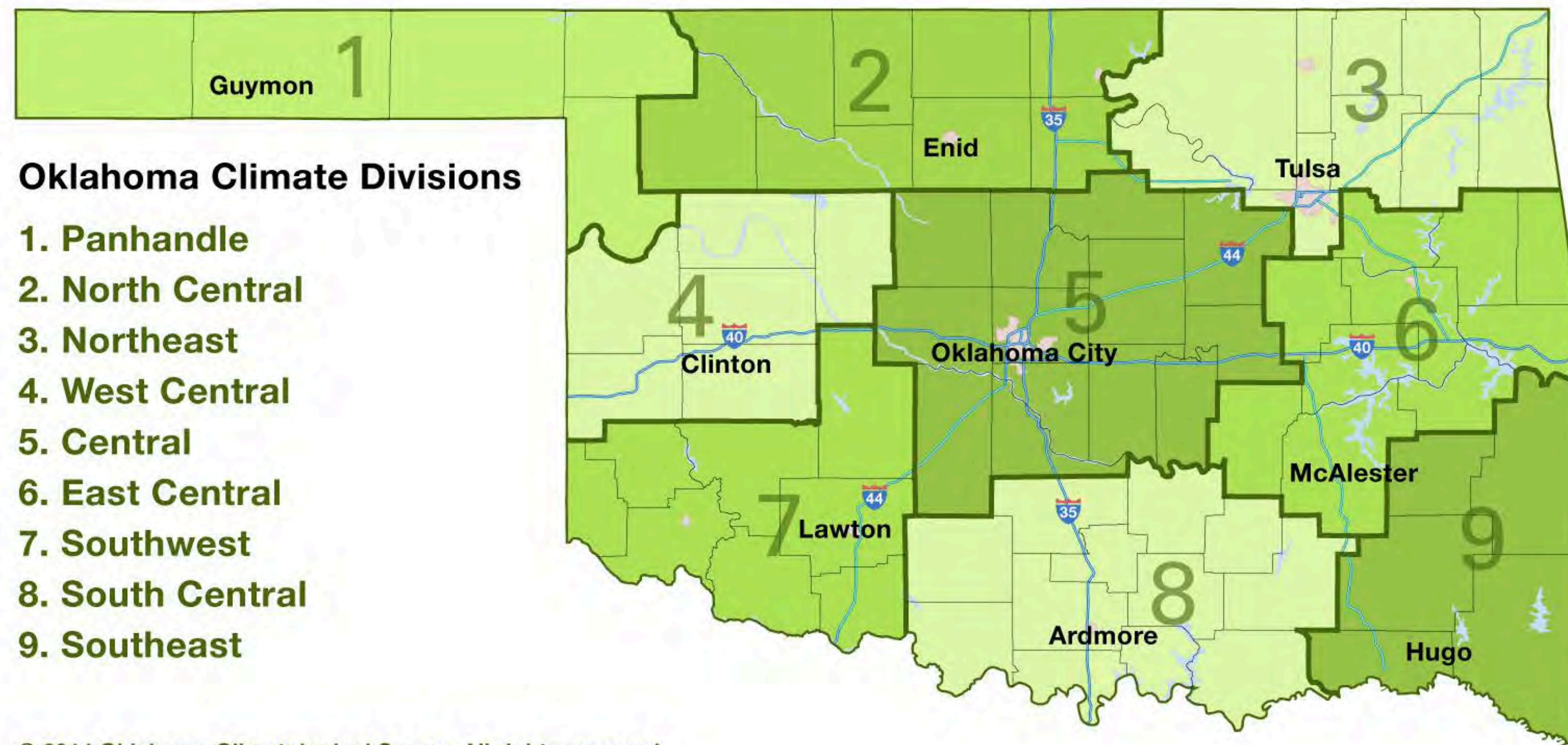
DROUGHT RISK ATLAS

- Provides users the ability to see how drought designations have changed over the years
- <http://droughtatlas.unl.edu/>



CLIMATE DIVISIONS

Each state has anywhere from 3-10 divisions



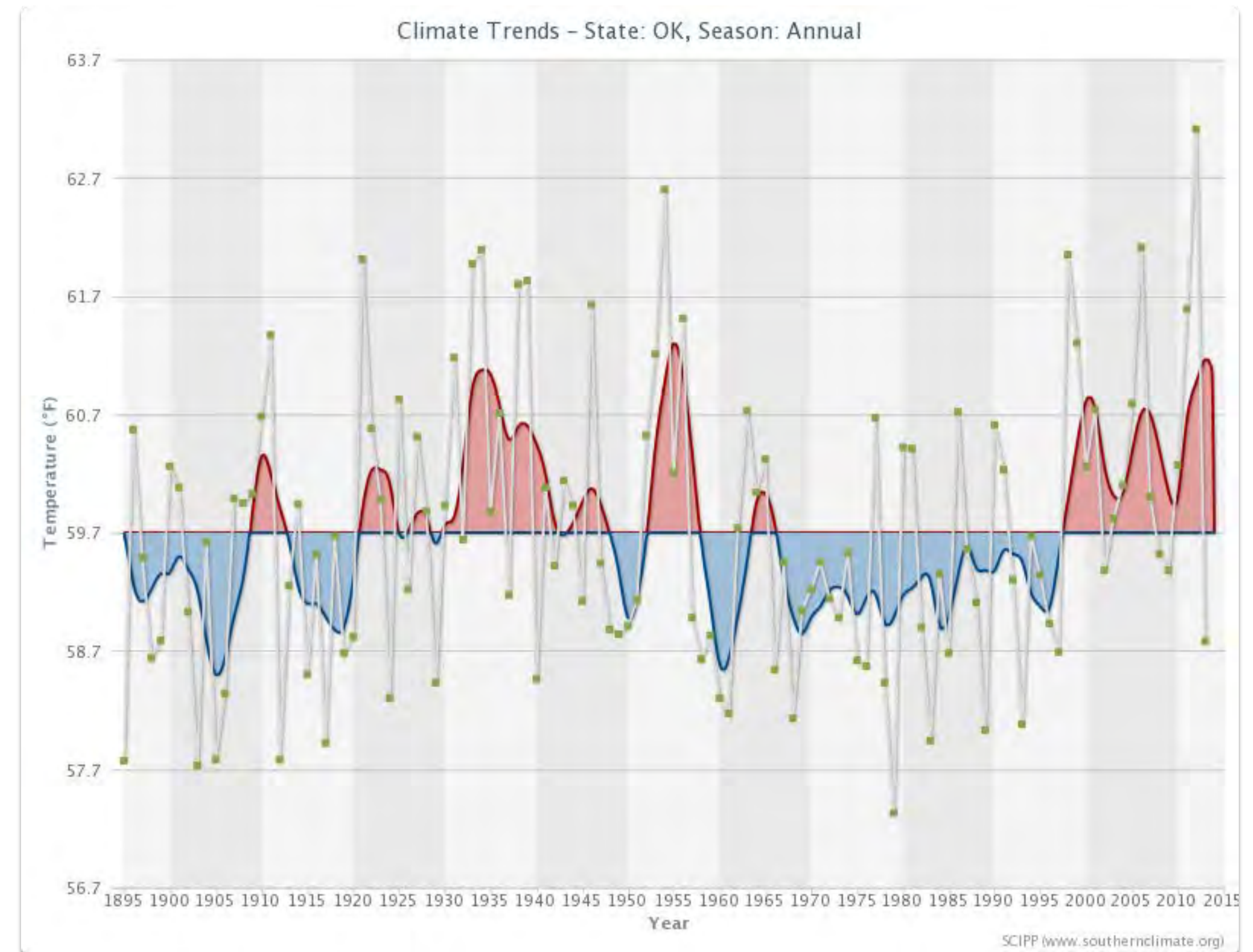
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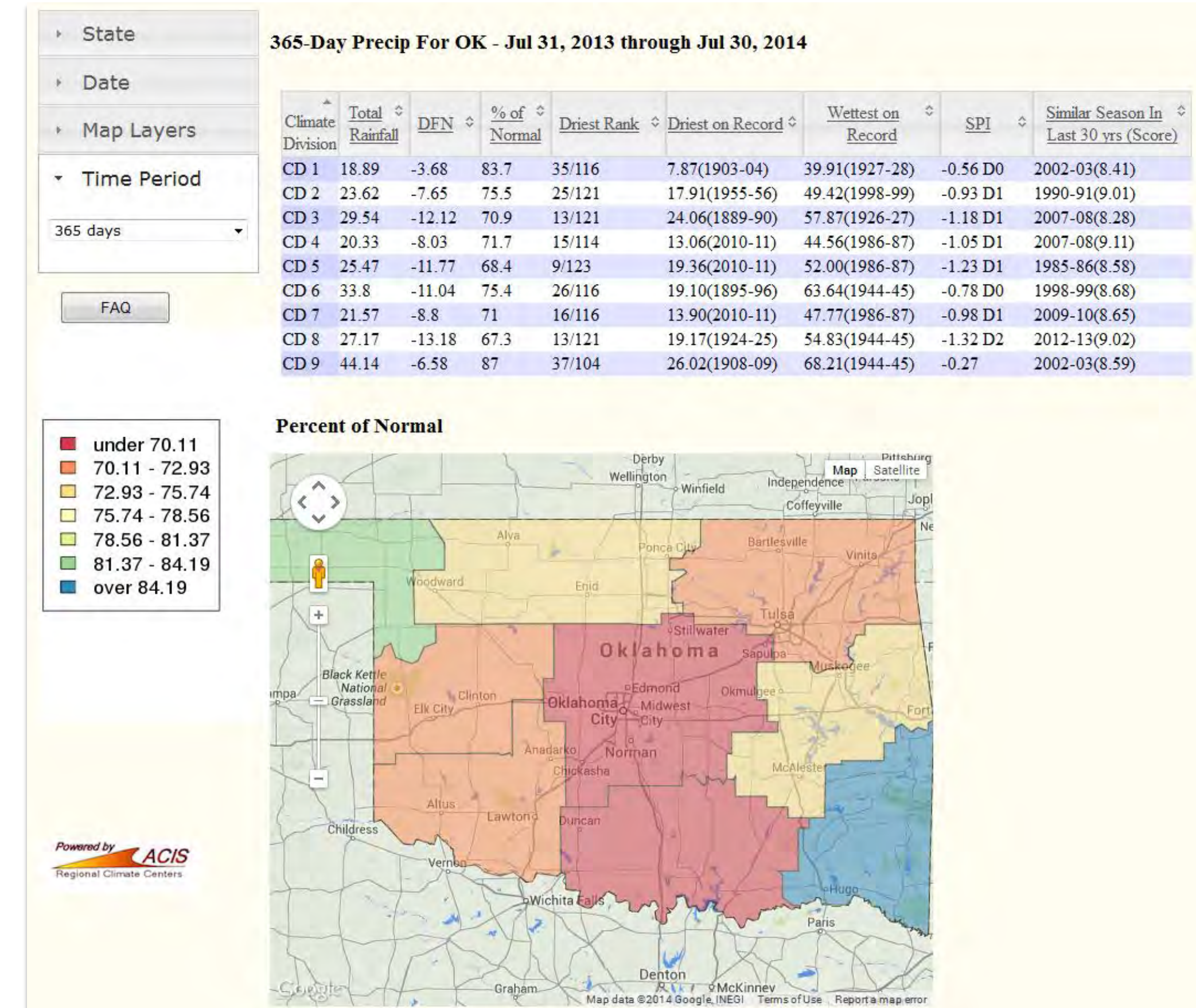
HISTORICAL CLIMATE TRENDS TOOL

- Temperature & precipitation trends
- Can be produced for any state or climate division in the lower 48
- <http://www.southernclimate.org/pages/data-tools>



SOUTHERN U.S. DROUGHT TOOL

- Displays information on drought severity
- Useful for understanding precipitation deficits over a relatively short time period
- View statistics by climate division
- <http://www.southernclimate.org/pages/data-tools>



GLOBAL CLIMATE DASHBOARD

- Interactive display gives viewers a look at global climate conditions over different periods of time
- <http://www.climate.gov>



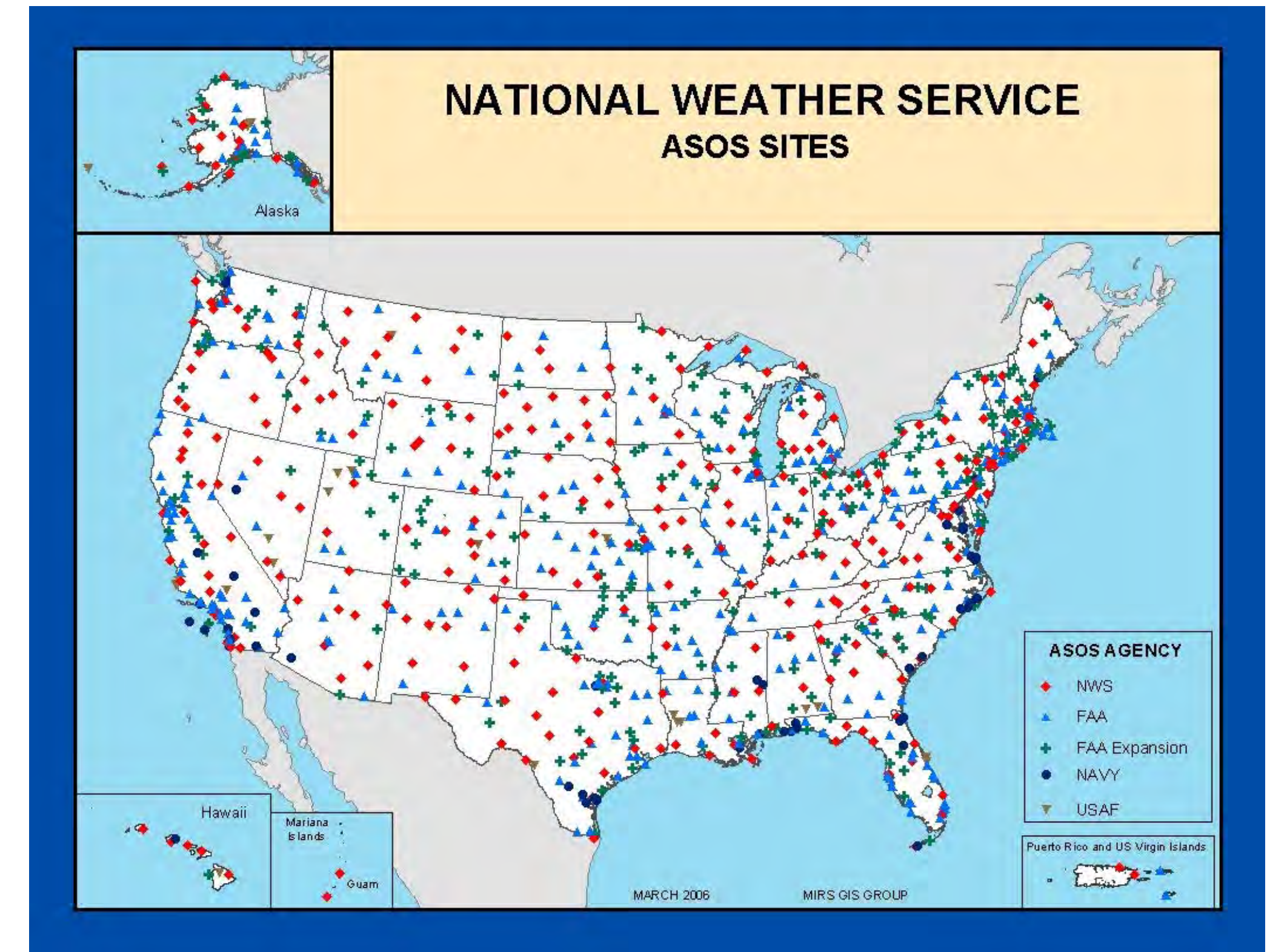
WEATHER OBSERVATION NETWORKS



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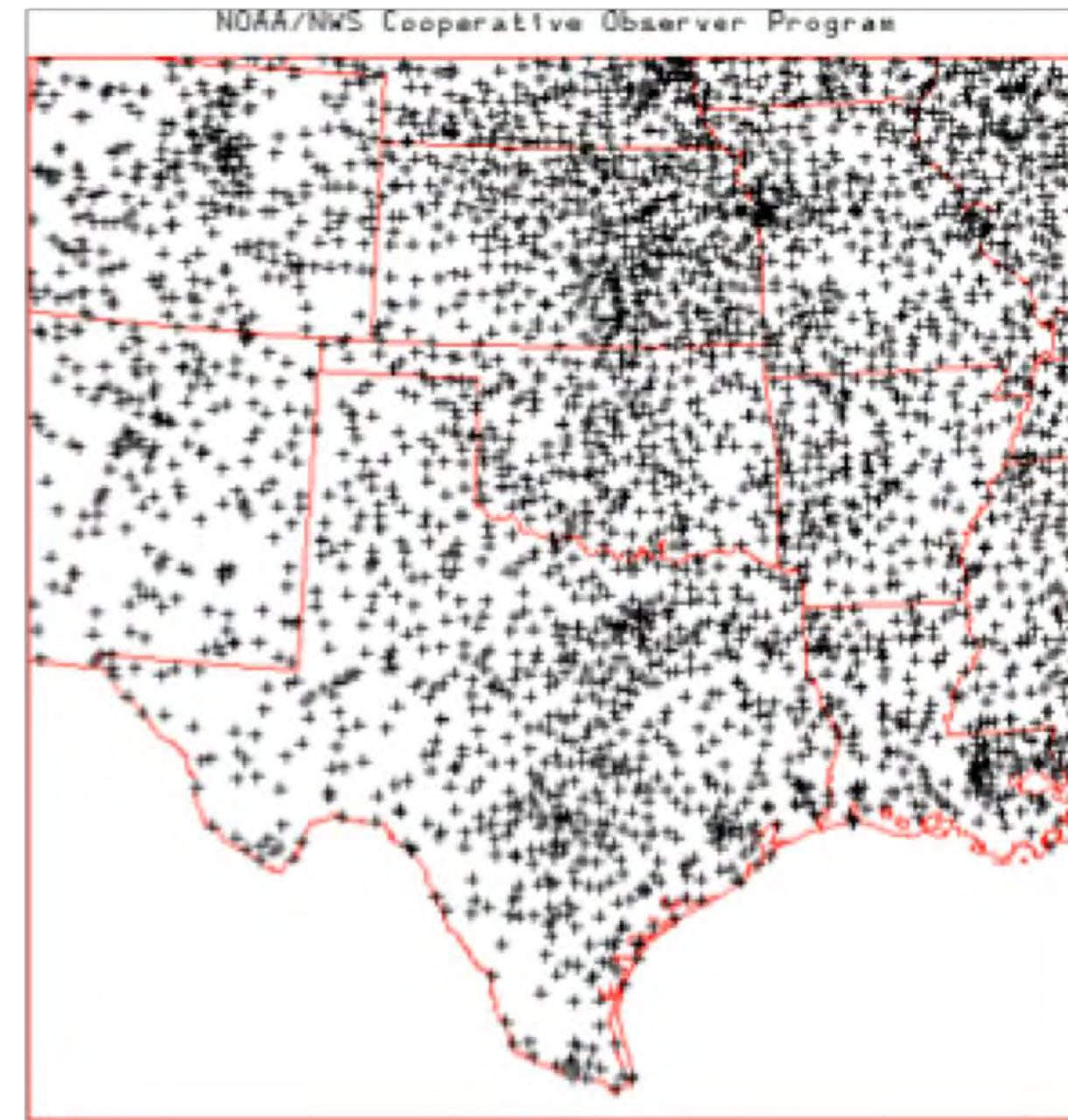
AUTOMATED SURFACE OBSERVING SYSTEM

- Nation's primary surface weather observing network
- Operates 24/7, 365 days per year
- Includes observations of sky conditions, visibility, pressure, temperature, precipitation, wind, etc.
- <http://www.nws.noaa.gov/asos/>



NWS COOPERATIVE OBSERVER PROGRAM

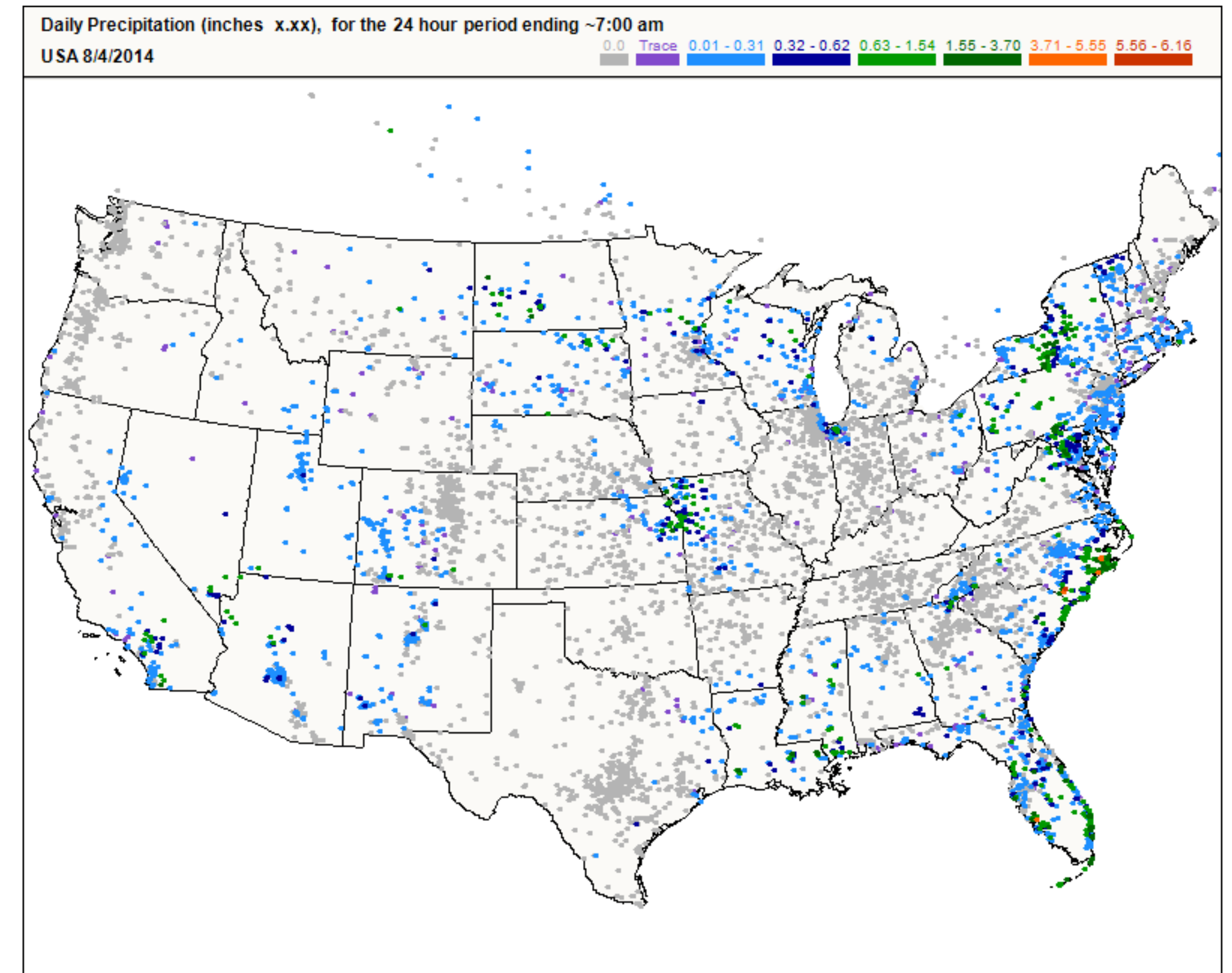
- Dates back to 1870
- Consists of almost 11,000 volunteers
- Daily max/min temperature, snowfall, and 24-hour precipitation
- <http://www.nws.noaa.gov/om/coop/>



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COMMUNITY COLLABORATIVE RAIN, HAIL, & SNOW NETWORK

- Established in 1998
- "Volunteers working together to measure precipitation across the nation."
- Rainfall, snowfall, & hail are recorded
- <http://www.cocorahs.org/>



MONITORING TOOLS

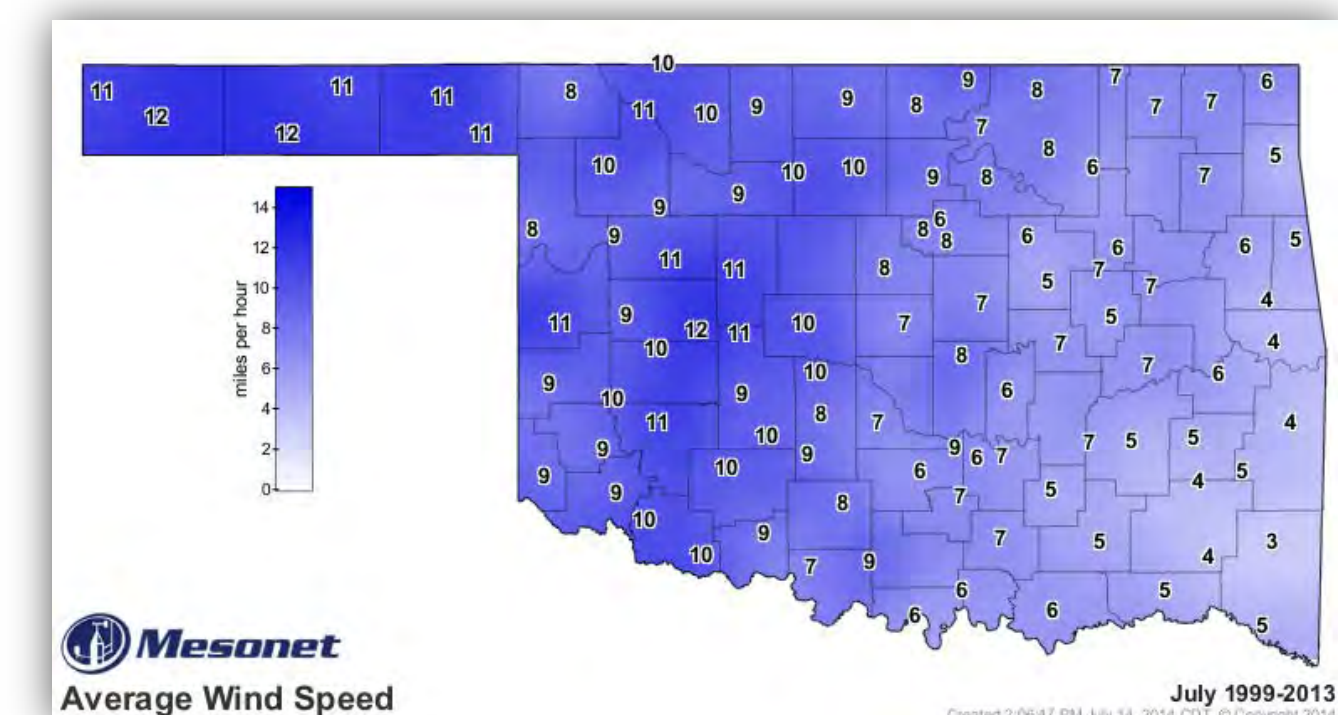
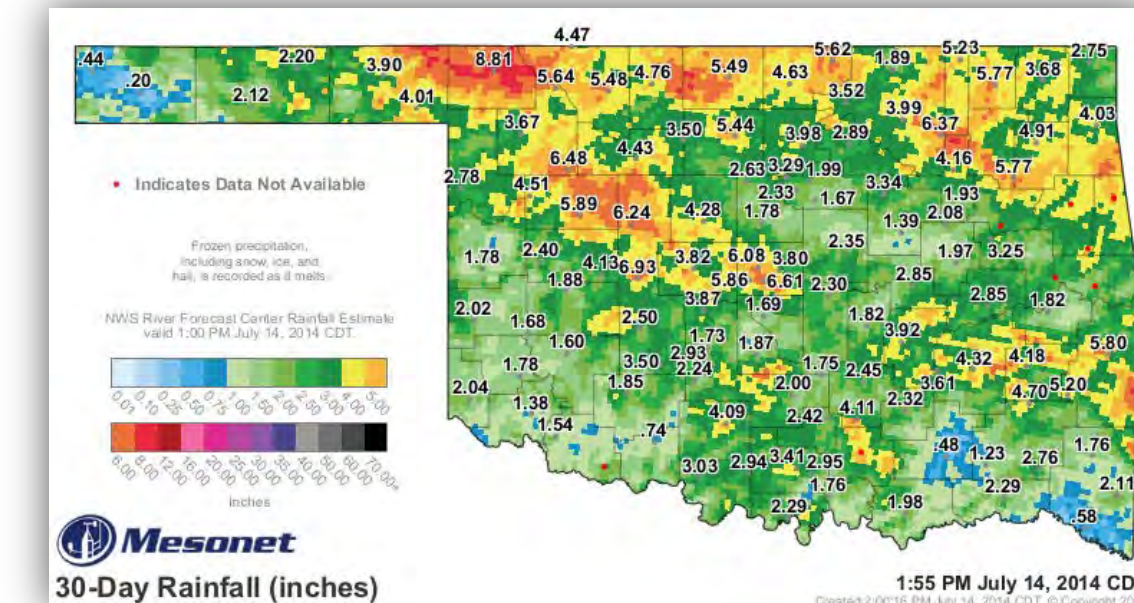
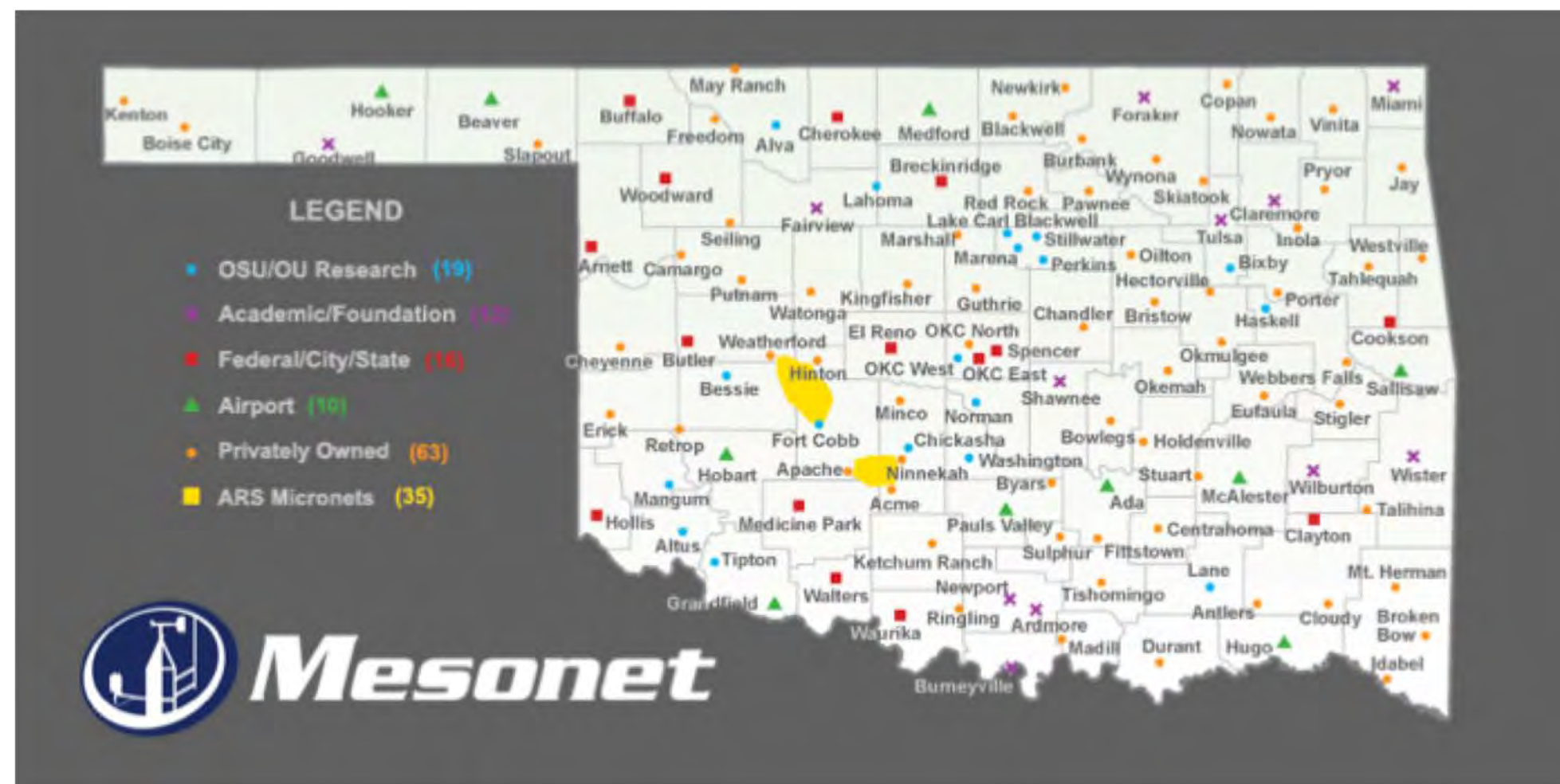
CURRENT CONDITIONS



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OKLAHOMA MESONET

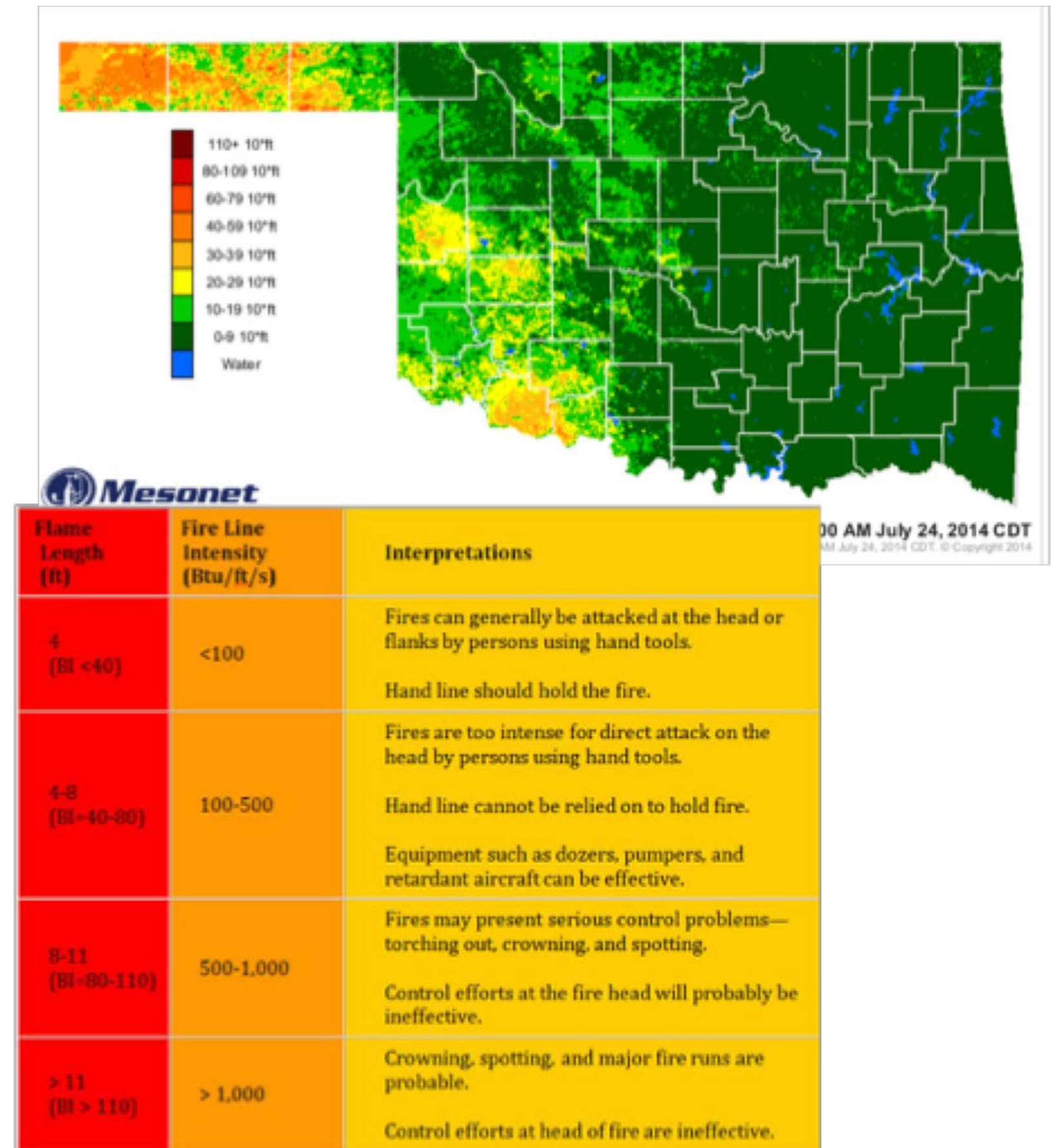
- Monitors weather conditions around the state, including temperature, precipitation, wind speed and direction, soil moisture, solar radiation, etc.
- <http://www.mesonet.org>



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BURNING INDEX (FIRE CONDITIONS)

- Represents potential fire conditions based on short-term meteorological factors and satellite measurements of vegetative health
- Higher the number, the more difficult it would be to fight a fire
- https://www.mesonet.org/index.php/agriculture/map/range_forest/fire_danger/burning_index1



HEAT INDEX CHART

- Shows what the heat index would be based on current temperature and relative humidity
- http://www.nws.noaa.gov/om/heat/heat_index.shtml

NOAA's National Weather Service

Heat Index

Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution

Extreme Caution

Danger

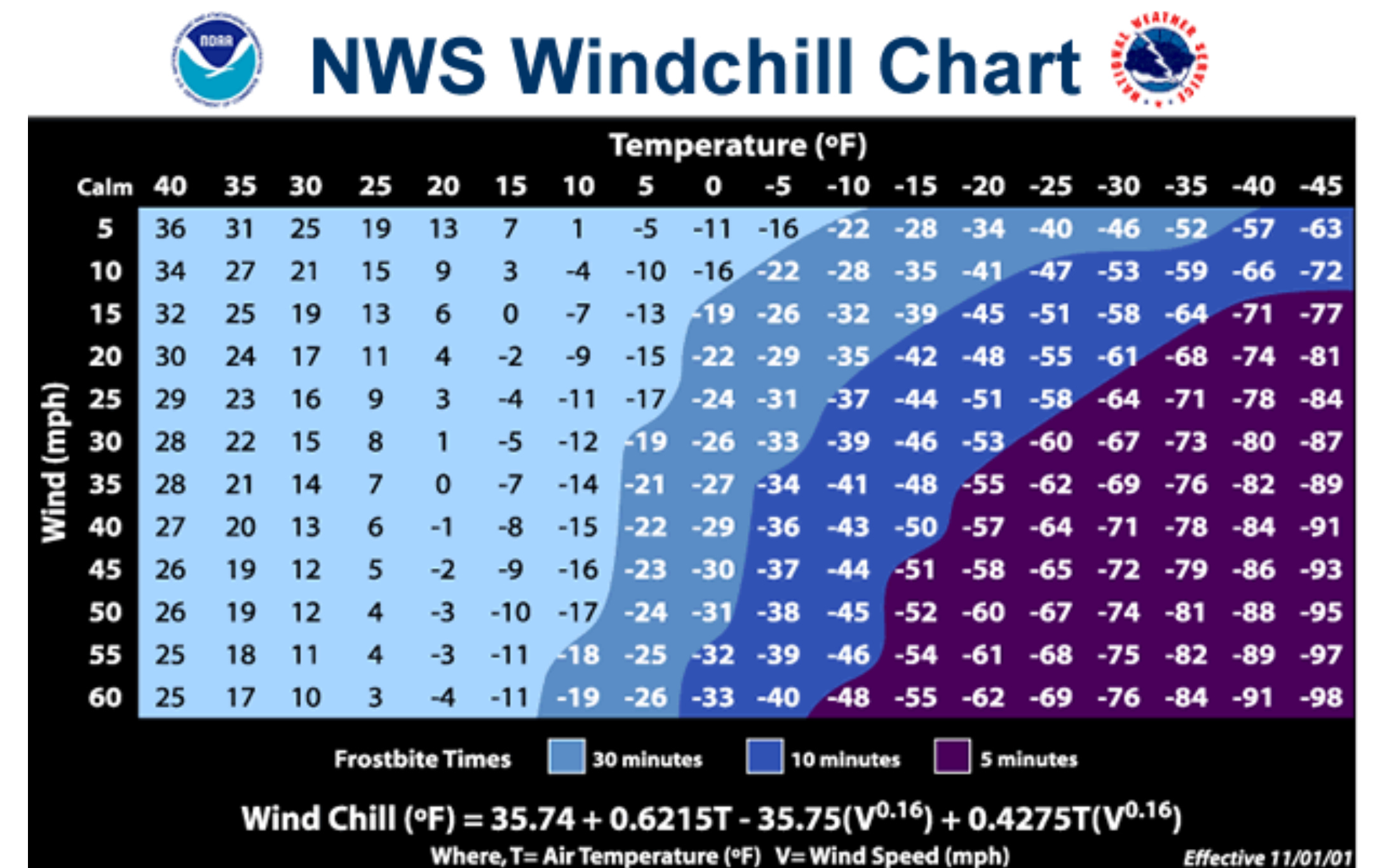
Extreme Danger



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WIND CHILL CHART

- Shows what the wind chill would be based on current temperature and wind speed
- http://www.nws.noaa.gov/om/cold/wind_chill.shtml



U.S. DROUGHT PORTAL

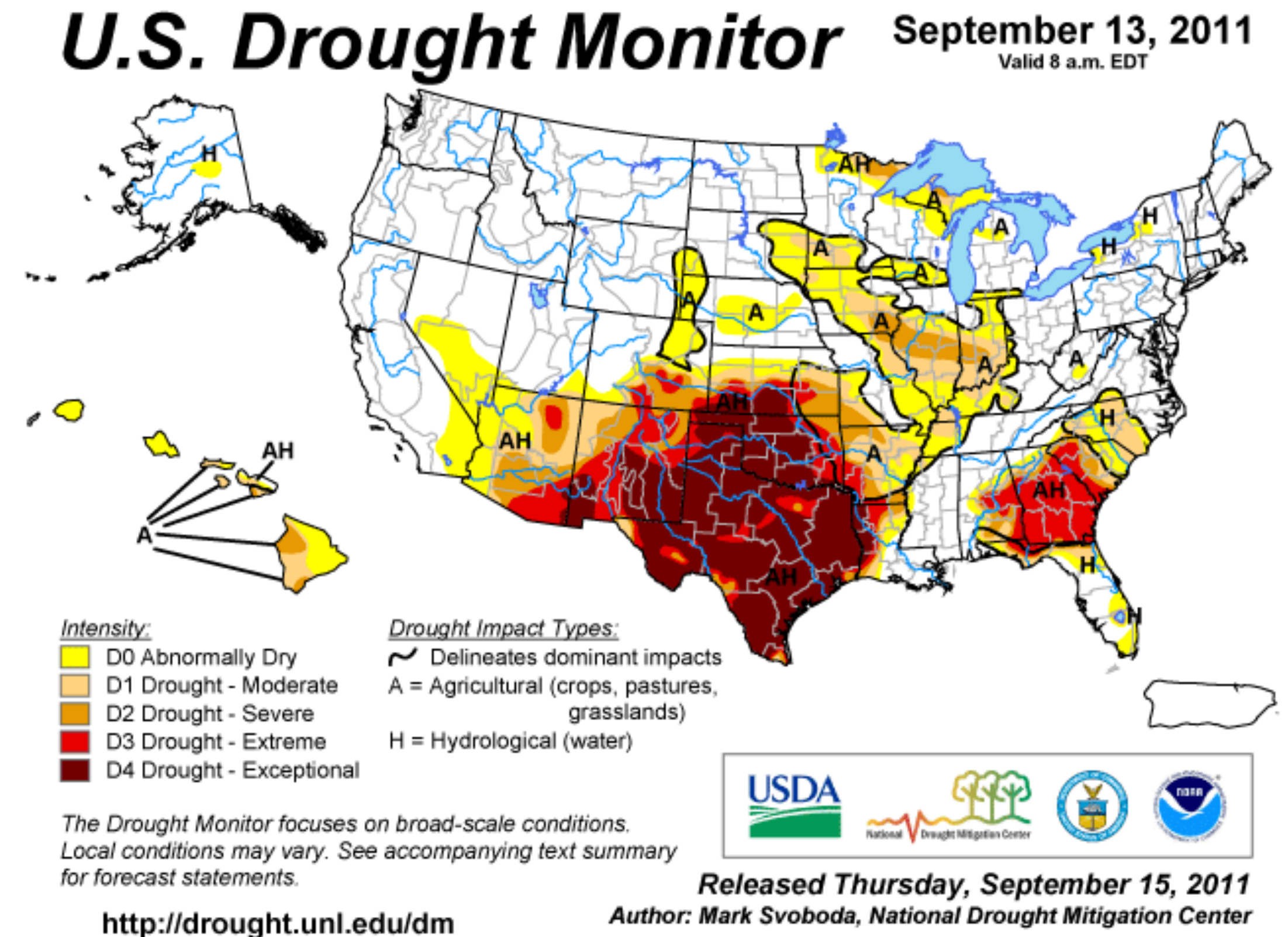
- Provides users with data, maps, and tools related to drought. Links to other drought-related sites.
- <https://www.drought.gov/drought/>



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U.S. DROUGHT MONITOR

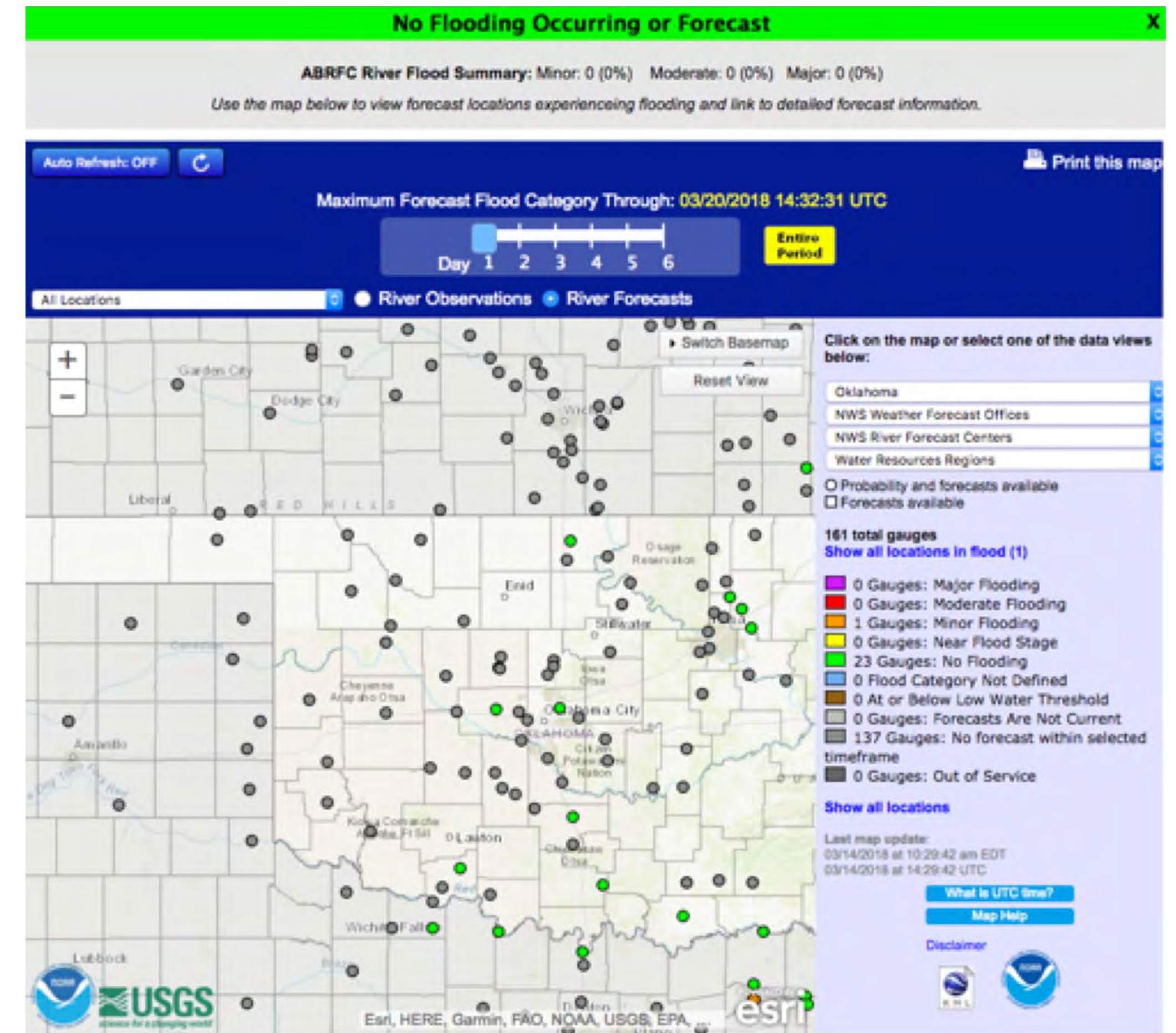
- Shows current drought conditions across the nation based on various observations
- <http://droughtmonitor.unl.edu>



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FLOOD OBSERVATION DATA

- Shows flood conditions (or lack thereof) throughout the state and region
- <https://www.weather.gov/abrffc/>



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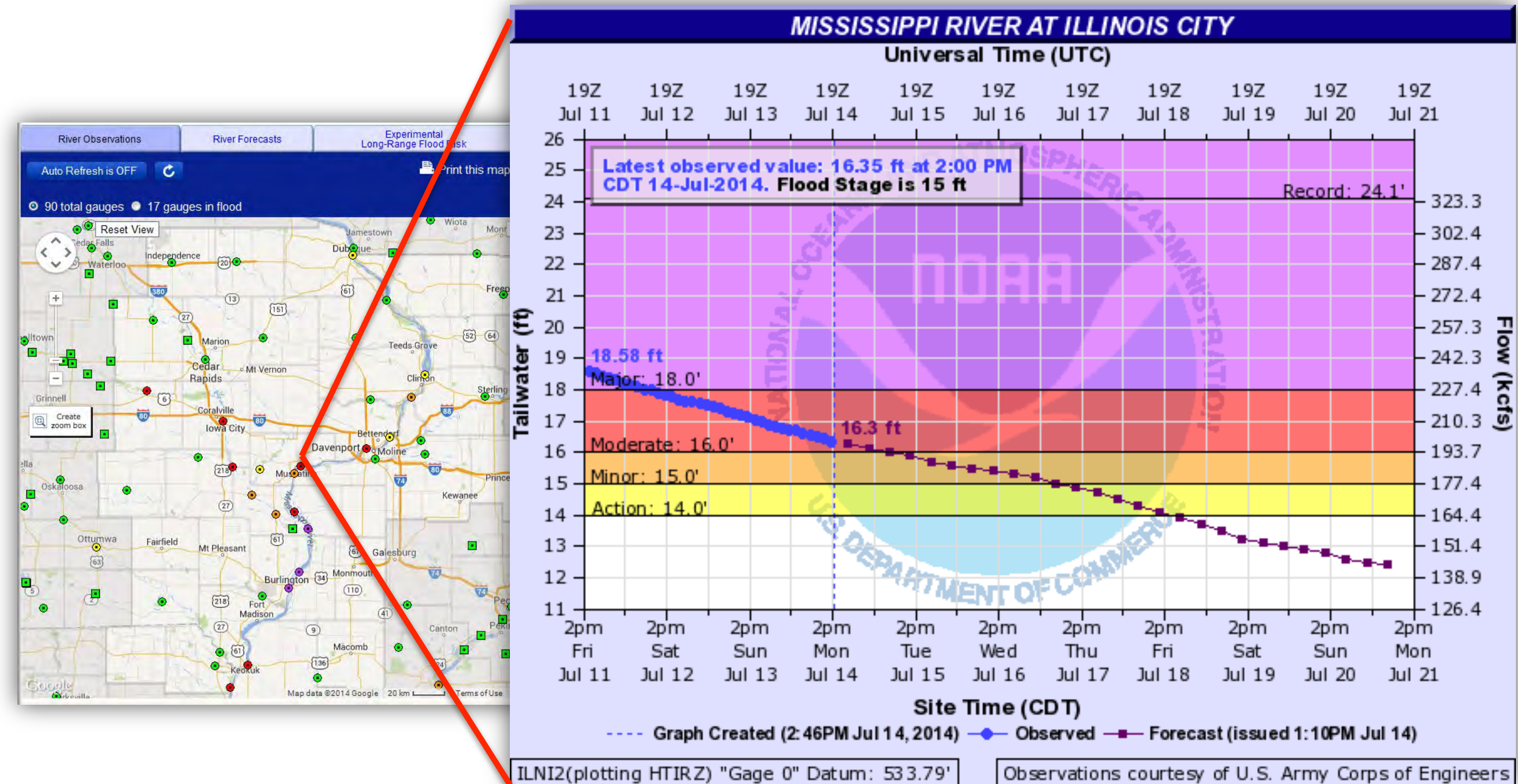
FORECASTING/PROJECTION TOOLS FUTURE CONDITIONS



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FLOOD FORECAST TOOL

- Hydrographs provide users the ability to see what flood is already occurring, as well as what is forecasted for that area
- <https://water.weather.gov/ahps/region.php?state=ok>



SPIA INDEX

- Used by utility industry to anticipate impacts and damages of an icing event
- Index uses NWS forecast parameters to predict the spatial coverage, total ice accumulation, and potential damage from ice storms
- <http://www.spia-index.com/>

The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009

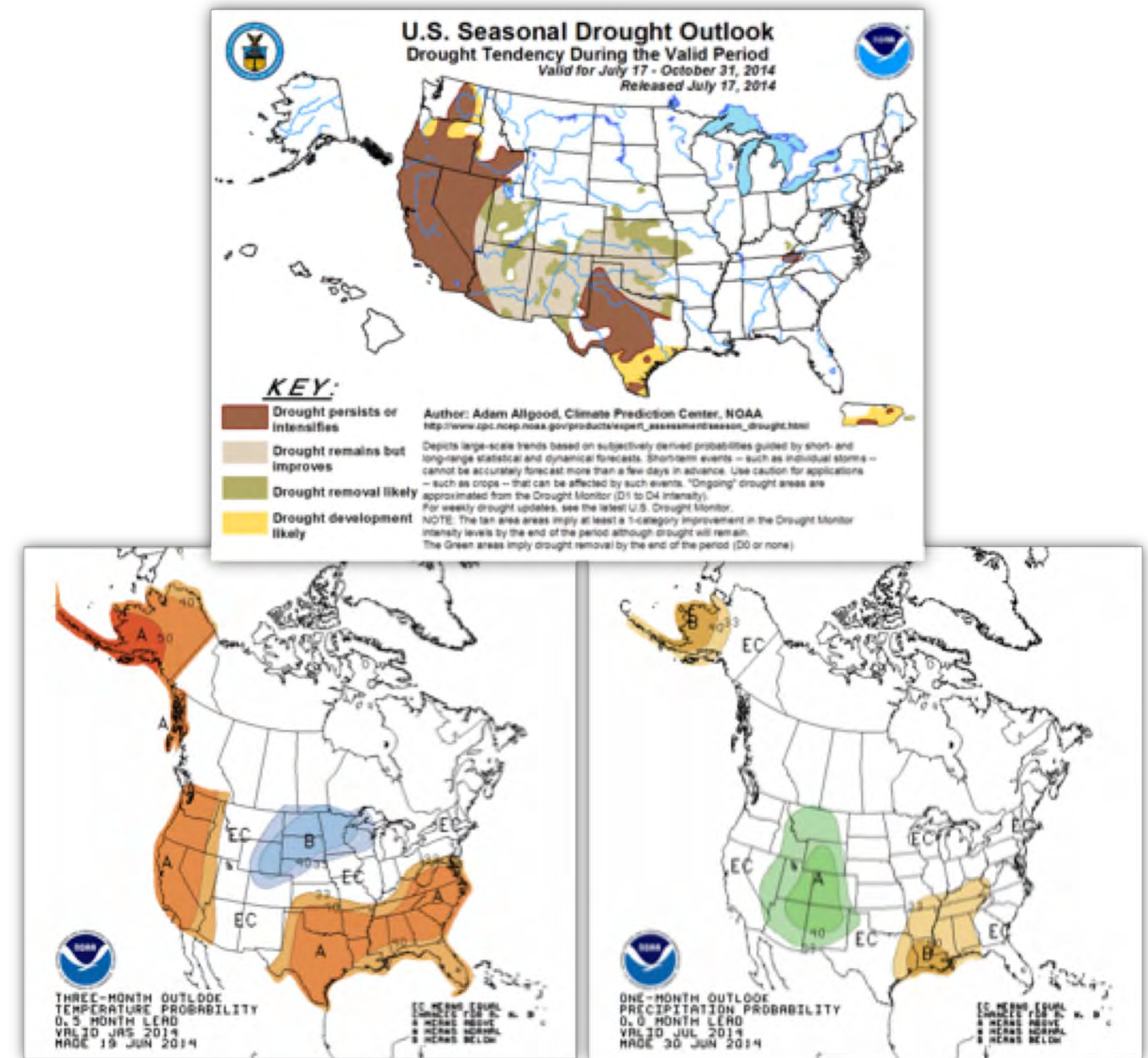
ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)



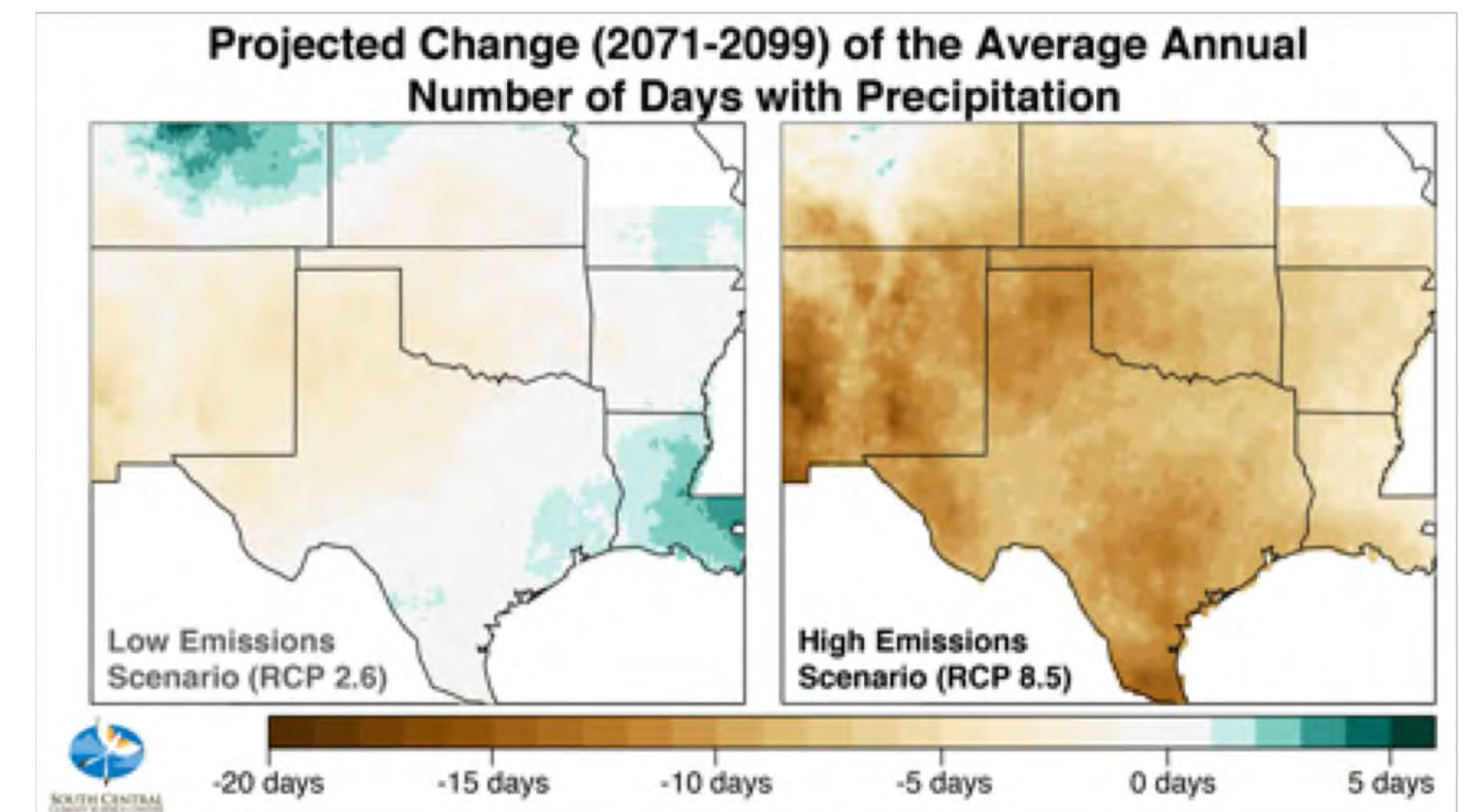
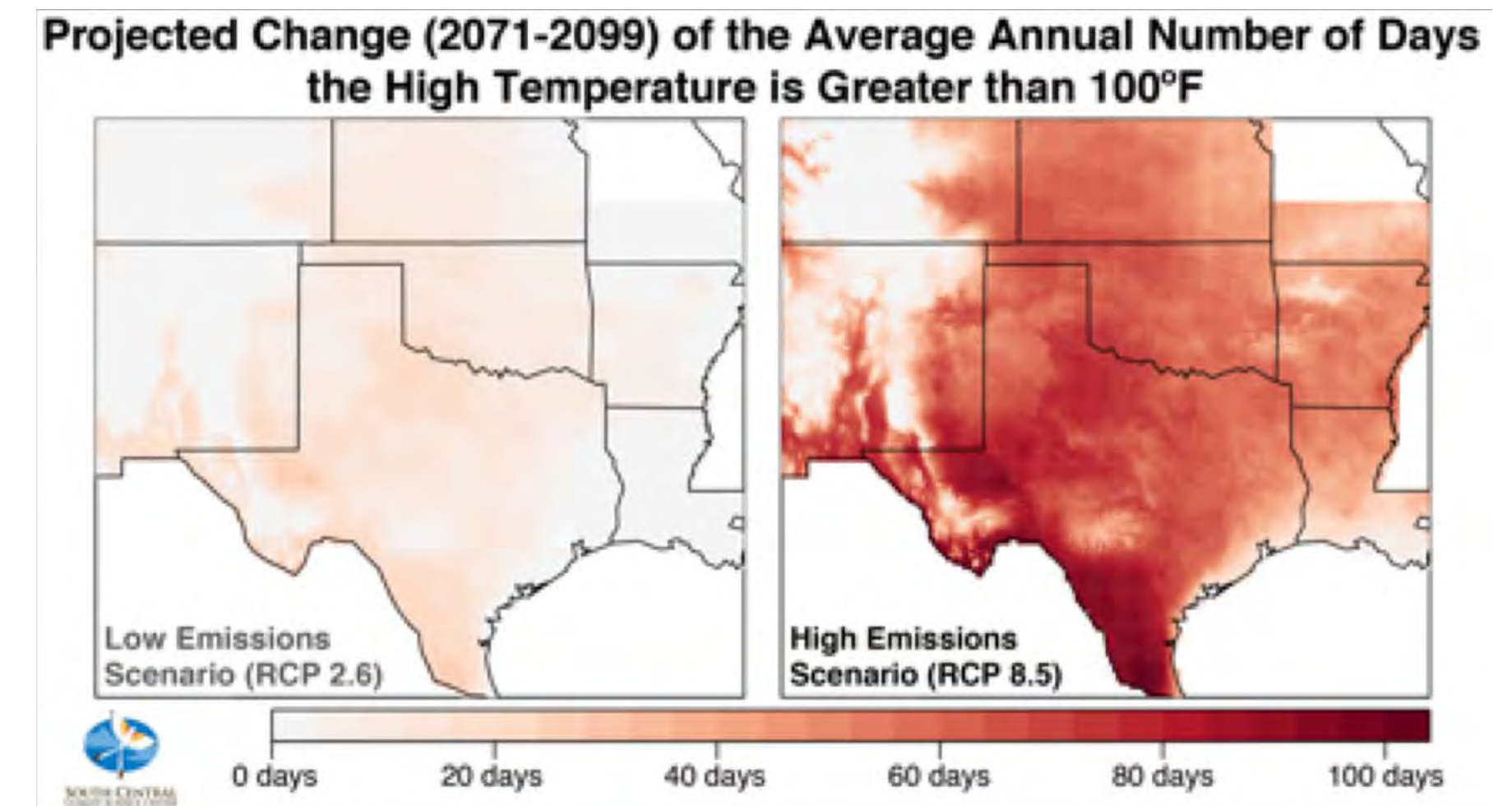
CLIMATE PREDICTION CENTER OUTLOOKS

- Drought Outlook: forecast for whether drought will improve or get worse
- Seasonal Outlooks: shows probability of above or below average temperature or precipitation (1 and 3 month outlooks)
- <http://www.cpc.ncep.noaa.gov/>



CLIMATE PROJECTIONS

- Provides information about future climate conditions in our region for both the mid- and end-of-Century
- Available maps include projected change in average high and low temperature, number of heat wave events, average precipitation, etc.
- For more information, email info@southcentralclimate.org



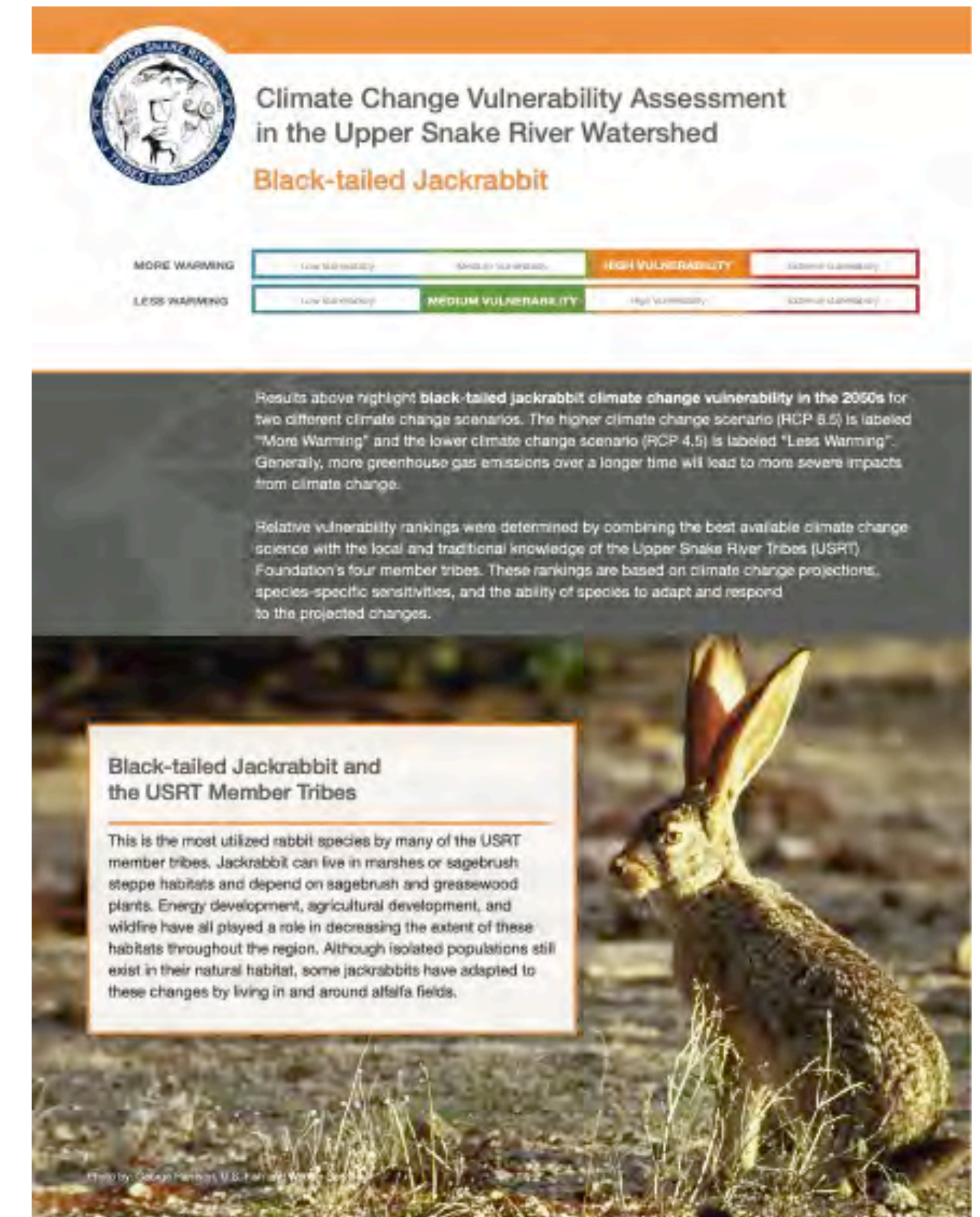
OTHER TOOLS/PRODUCTS



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RESEARCH EFFORTS

- Vulnerability assessments for several species, including the Black-tailed Jackrabbit
- For more information, contact sascha@adaptationinternational.com



RESEARCH EFFORTS

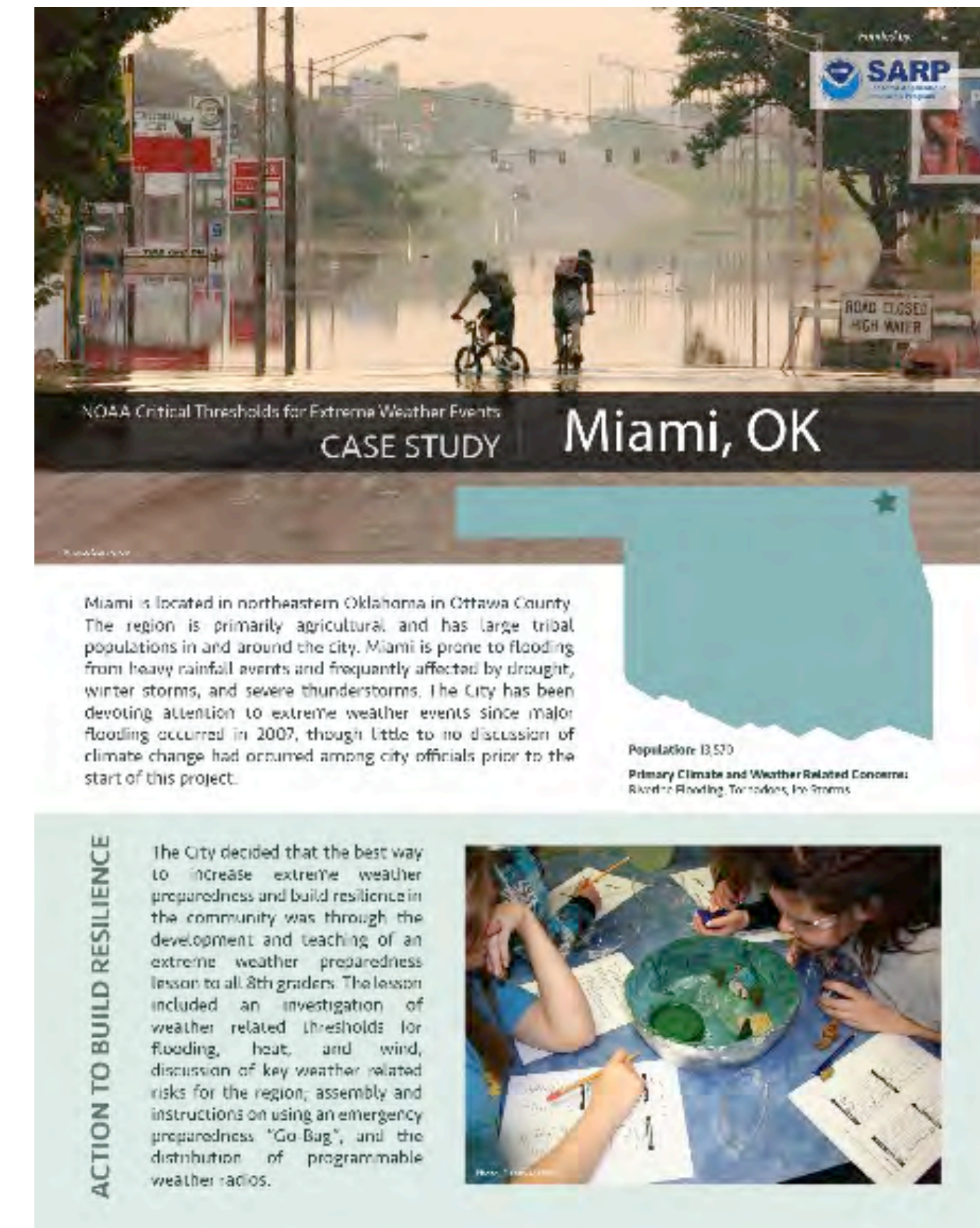
- Summary of climate and extreme weather events that affect the City of Miami, OK
- http://www.southernclimate.org/documents/The_Climate_of_Miami_OK_Final.pdf



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RESEARCH EFFORTS

- Case Study: Identify and develop climate projections to plan for impact-relevant extreme events
- Guide climate adaptation and resilience efforts
- http://www.southernclimate.org/documents/2017-07-11_Miami_OK_Final_WEB.pdf



MEDIA AND APP RESOURCES

- Mobile Apps:
 - Oklahoma Mesonet (FREE)
 - RadarScope (\$10)
 - iMap Weather Radio (\$10)
- Global Weirding Video Series by Dr. Katharine Hayhoe
 - Tackles common myths related to climate change
 - <https://www.youtube.com/channel/UCi6RkdaEqgRVKi3AzidF4ow>



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MEDIA AND APP RESOURCES

- Managing for a Changing Climate Online Course
 - Free online course by the South Central Climate Adaptation Science Center
- <https://www.youtube.com/watch?v=oDr0R11JXHA&list=PLeQQSAEHE5PoblZ-Kfqt9FJDVX77SYBqX>



ACKNOWLEDGEMENTS



QUESTIONS?



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