Activities at the Oklahoma Climatological Survey Dr. Kevin Kloesel, Director longhorn@ou.edu



The treaty was negotiated by John Quincy Adams (SecState under Monroe) and Luis de Onis (FgnMin for King Ferdinand VII) in 1819.

Agreed upon in Treaty of Guadalupe Hidalgo in 1848.

Upheld by Supreme Court in 1896.

A quick history diversion...

Texas Military Forces

- Texas Army National Guard
- Texas Air National Guard
- Texas State Guard
- Texas Ranger Division

Oklahoma Army

Oklahoma National Guard

- National Guard
 Oklahoma Air National Guard
- Oklahoma Highway

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the suit of the Re

Patrol

ciety©

July 1931, **Governors Ross** Sterling and "Alfafa" Bill Murray pitted **Oklahoma state** troops against the Texas Rangers in the **Red River Bridge** War.

More history



Let's start by putting you in our shoes!

What do you see?

Is there a threat?





































Download a complete list of Awards of Excellence Recipients

Outstanding Research/Science Park Award

Recognizes the parks that excel in bringing technology from the laboratory to economically viable business activities, thus promoting the growth of businesses, jobs and public revenue. These parks actively participate in the university community, creating an important positive effect on university research funding and on recruitment of superior students and faculty.

2013	University of Oklahoma Research Campus Norman, Oklahoma
2012	Buffalo Niagara Medical Campus Buffalo, New York
2011	Research Park at the University of Illinois at Urbana-Champaign Champaign, Illinois
2010	Virginia Tech Corporate Research Center Blacksburg, Virginia



Twelve units from federal and state government plus academia, co-located to foster collaboration across research, operations, education and outreach.

15 private sector weather and hydro- companies, along with other governmental entities are located in the partners neighborhood across the street



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Oklahoma Water Survey Education, Research, Outreach on Water Issues

Established on January 26, 2011 by the University of Oklahoma Regents. The Oklahoma Water Survey is to serve the University research community, and act as a catalyst to the wide and deep expertise in education, research and outreach in water issues.

Links

Welcome to the Oklahoma Water Survey Website.

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Education Research Outreach



The Oklahoma Climate Survey includes The Oklahoma Mesonet, the Southern Climate Impacts Planning Program (NOAA RISA), and The Office of the Oklahoma State Climatologist

CAL HOBSON A

AHOMA



- Weather and climate network covering the State of Oklahoma-- Planned 1986-1991. The idea was conceived following disastrous Tulsa flood of 1984. Similar ideas were blossoming in Stillwater for an agricultural network.
- Commissioned in 1994
- Atmospheric measurements with 5-minute resolution, available to users within 5 minutes of collection
- Subsurface temperature and moisture measurements at various depths
- Over 4 billion observations archived







120 Sites: Average Spacing is ~30 km (19 miles)

- 120 remote weather stations
- 3300 sensors and 250 computers linked
- About 700,000 observations ingested each day
- 2-way communications
- Solar powered
- 30-day storage in on-site dataloggers
- Produce ~63,000 products and files for users each day



Technical Details



- 8 Full-time staff for site installations and maintenance, lab calibrations, and manual quality assurance
- 10 Full-time staff for computer system maintenance/operations, software and web development, and technical support
- 4 Full-time staff for climate services, education, and formal outreach
- 4 Full-time staff for administrative support
- 1 Full-time staff for research
- 10 student employees & graduate students





People

• Every Five Minutes:

- Air Temperature 1.5 m and 9 m
- Relative Humidity 1.5 m
- Rainfall (tipping bucket)
- Barometric Pressure
- Solar Radiation 1.8 m
- Wind Speed/Direction 10 m
- Wind Speed 2 m

Every Fifteen Minutes:

- 5 cm soil temperature — bare soil/natural sod
- 10 cm soil temperature — bare soil/natural sod
- 30 cm soil temperature — natural sod
- Every Thirty Minutes:
 - ▶ 5 cm soil moisture
 - 25 cm soil moisture
 - ▶ 60 cm soil moisture

Measurements at a Mesonet Site



Mesonet Calibration Lab





http://www.mesonet.org







FIGURE 4.4. AVERAGE ANNUAL PRECIPITATION FOR 1981 TO 2010 (INCHES) (SOURCE DATA FROM TWDB, 2005 AND PRISM CLIMATE GROUP, 2011). FIGURE 4.5. AVERAGE ANNUAL GROSS LAKE EVAPORATION FOR 1971 TO 2000 (INCHES) (SOURCE DATA FROM TWDB, 2005).



We do it all the time!



We do it all the time!



365-Day Rainfall (inches)

10:40 PM October 14, 2013 CDT Created 10:44:09 PM October 14, 2013 CDT. © Copyright 2013

Does it look like climo?





ATTRIBUTION IS THE "HOLY GRAIL" OF ANY STATISTICAL STUDY!

Why did Planet KD35's "climate" decrease by 2 points per game from 2009 to 2013?

- 1. Planet KD climate is getting "colder"??
 - a) Getting older?
 - b) Injury?
 - c) ??
- 2. Planet KD climate influenced by teammates?

a) Russell Westbrook taking too many shots?

- b) Kendrick Perkins losing the ball out of bounds too often?
- 3. Planet KD climate influenced by coaching decisions?
 - a) pass more (assists from 2.8 in 2009 to 4.6 in 2013)?
 - b) play less (played 120 fewer minutes in 2013 than in 2009)?

4. Planet KD climate influenced by defense? (There are 5 players trying to prevent him from scoring!) *(he doesn't go to his left well!)*

Could it be a complex combination of all 4? Or more? Internal factors? External factors? A combination? Can we even list them all? (and the domain is but 50 feet by 94 feet!!)



The Climatologist's Shot Chart!!

Temperature Anomalies May 2011

(with respect to a 1971-2000 base period)

National Climatic Data Center/NESDIS/NOAA



The "climate" of any location is usually characterized by using an average!

For example, the "average" high temp in Oklahoma City on June 10 is 85F

exactly does that mean to you?

(and that "average" is valid for a 30-yr period)









SCIPP - OU/LSU Partners = Extreme Events

- Our climate is realized through extreme events
- Federal disaster declarations are a measure of significant economic impact
- Oklahoma has 36 since 2000, the most in the country (Texas 19)
- Heat waves, floods, and droughts have become more frequent and intense
- Trends in hurricanes and severe storms, including tornadoes, are uncertain
- Becoming more sensitive to extreme events, greater damage and economic losses









The obligatory empty reservoir!















MANAGING DROUGHT

SCIPP is holding bi-weekly discussions of the drought and its impacts, on the 2nd and 4th Thursdays of each month at 11:00 a.m. Central Time. To join in, please register and we will send login details.

Register for Drought Webinars

Name	
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Register	
egister for Multi-Hazards Webinar	5
egister for Multi-Hazards Webinar	5

Register

Southern Climate Monitor August 2013 Issue



Highlights of August 2013:

- Tornado Safety in Schools
- Drought Update
- Temperature and Precipitation Summary

Subscribe to the Monitor

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11 Oct

RT @Hal_Needham: NOAA Website Provides Excellent Wind Profile Maps of Tropical Cyclone #Phailin stormsurge2010.blogspot.com #NOAA #surge #India



11 Oct SA

RT @Hal_Needham: #Phailin air pressure down to 883 hPa. Lowest landfall air pressure in U.S. was 892 in Labor Day #Hurricane of 1935. Expand



11 Oct

#Phailin air pressure down to 883 hPa. Lowest landfall air pressure in

Tweet to @SCIPP_RISA

Follow Us





www.southernclimate.org











Join the H₂O Heroes!

Welcome to the H₂O Heroes program: a unique water education curriculum created just for educators and the specific educational needs of your students. Six exciting adventures have been developed with the goal of piquing the interest of young students about the importance of water in their communities and inspiring them to become real-life H₂O Heroes.

- The Tale of the Mysterious Chest Kindergarten Program
- Earth Explorations First-Grade Program
- Exploring Their Watershed Second-Grade Program
- Becoming an H2O Hero Third-Grade Program
- Earth Explorations Fourth-Grade Program
- A Journey From Rain to Drain Fifth-Grade Program

SAWS – San Antonio

The Importance of Education/Outreach



The Importance of Education/Outreach



The closing few slides are borrowed WITHOUT permission!





Water loss audits for 2010

- 16.8 percent loss
 - 3.1 apparent
 - 13.7 real





What can you do with that information?





Communication will be the key to our success!