2016 Big Red Summer Academic Camps

bigredcamps.unl.edu

"Exploring Weather & Climate Science"

June 6-10, 2016

We are proud to be part of the UNL 4-H Camp Program

Institute of Agriculture and Natural Resources

NEBRASKA 4-H

UNL is part of the National Weather Camp Program

UNL Weather Camp 2016
Lead Instructor: Maddy Diedrichsen
Instructor: Dalton Van Stratten

Weather Camp 2016: The Week in review

Monday June 6, 2016

Weather Map Discussion

Weather Journal, i.e. outside weather observations

Experiment: how different containers heat from sun's energy

Build a cloud wheel

Experiment: temperatures of surfaces using temperature guns

Creating our cloud spotter wheels: http://www.srh.weather.gov/srh/jetstream/clouds/images/cloudspotter.pdf

Daily weather observations and data collection

An experiment to see how different surfaces heat up from solar energy. Starting with shade then……..

in sunshine throughout the day

Temperature measurements (in degrees F) were made over a 5 hour time period on Monday, June 6, 2016.

The differences from the starting temperature to the final temperature were then calculated by each of the camper researchers.

Temperature increases:

Black sand warmed as much as 72.9 degrees

Dry dirt warmed as much as 68.6 degrees

Rocks warmed as much as 51.0 degrees

Water warmed on average only 9.8 degrees

Wet sand warmed on average only 10.9 degrees

The hottest temperature observed at the end of the experiment was 149.9 F in the black sand container

Using temperature guns to see how color influences solar radiation absorption and heating

This car was 123F but the darker cars were as hot as 160F

Using our laser temperature guns we measured temperatures on different surfaces around Hardin Hall on Monday June 6, 2016

Actual air temperature: 86F
Highest observed temperature: 196F inside car dash board

Examples of some measurements:
Black car fender: 160F
Asphalt: 143F
Blue car fender: 130F
Concrete: 126F
White Car Door: 123F
Gray dumpster in sun: 96F
Tree trunk in shade: 83F
Tree leaf in shade: 82F
West wall of Hardin Hall in sun for only 1 hour: 83F
East wall of Hardin Hall in shade for only 1 hour: 97F

Tuesday June 7, 2016

Daily weather map discussion

Daily outside weather observations

Road Trip: >>>>>>>>

Visit the National Weather Service Office in Omaha/Valley, NE

Visit Raytheon (defense contractor, satellite research), Omaha, NE

Visit 557th Weather Wing at the Offutt Air Force Base, Bellevue, NE

Tuesday was our ROAD TRIP day to Omaha!

Happy campers on the way to Omaha

First stop: The National Weather service Forecast Office in Valley/Omaha, Nebraska

UNL graduate and NWS Climate expert, Dr. Barb Mayes gave us a tour of the office

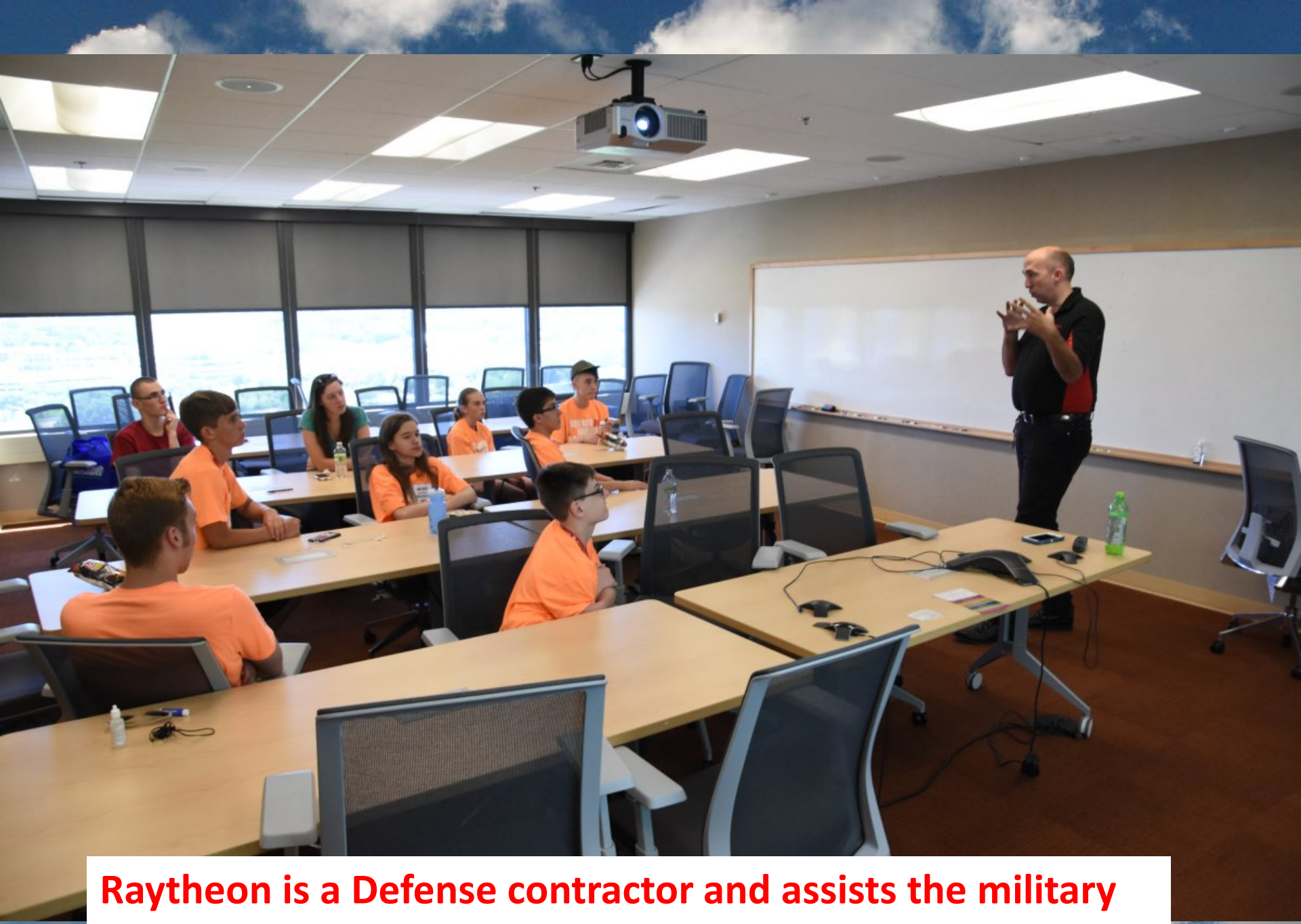

National Weat
NOAA
Omaha/Va
Nebrask

The main forecast floor of the National Weather Service

Outside instruments and radar tower

Barb explaining how they collect weather data

And then we travelled to Raytheon Corporation, a major satellite research agency where we learned about satellite technology and weather forecasting from Mark Cornell



Raytheon is a Defense contractor and assists the military in their operations

We saw a live demonstration of how they were helping the Air Force planes on that day

Then we headed over to the 557th Weather Wing at the Air Force Base in Bellevue, NE.

We had a briefing from several military officials in the auditorium.

Then we toured the small Air Force museum in the lobby.

We then entered the top secret forecasting unit (never open to the public) and their top secret computer center.

Here are some photos……

Opps, that’s right, we weren’t allowed to take any photos!

Wednesday June 8, 2016

Daily weather map discussion
Daily outside weather observations
Experiment: collect temperatures throughout Memorial Stadium
Tour the stadium
Visit the computer lab at the Meteorology Department, city campus
See a fully instrumented vehicle “Mesonet” used for storm research
Play “Severe Storms Warning Hotseat” in Hardin Hall computer lab
Play “Severe Weather Hit or Myth”

After our morning weather observations we headed over to Memorial Stadium


N NEBRASKA N

Weather Camper Name: _____ Temperature Gun # _____

Using your temperature gun, find the temperature at the following locations:

Center Field: The Red Color: _____

Center Field: The White Color: _____

Center Field: The darker Green color: _____

Center Field: The lighter Green Color: _____

West Stadium: 50 Yard Line, 10 rows up, in the sun, on the seats: _____

West stadium: 50 yard line up under the skyboxes well into the shade, on the seats: _____

East Stadium: 50 Yard Line, 10 rows up, in the sun, on the seats: _____

East stadium: 50 yard line up under the skyboxes well into the shade, on the seats: _____

South Stadium: bottom row of seats: _____

South Stadium: top row of seats: _____

South Stadium: inside, underneath the stadium, on the floor: _____

North Stadium: bottom row of seats: _____

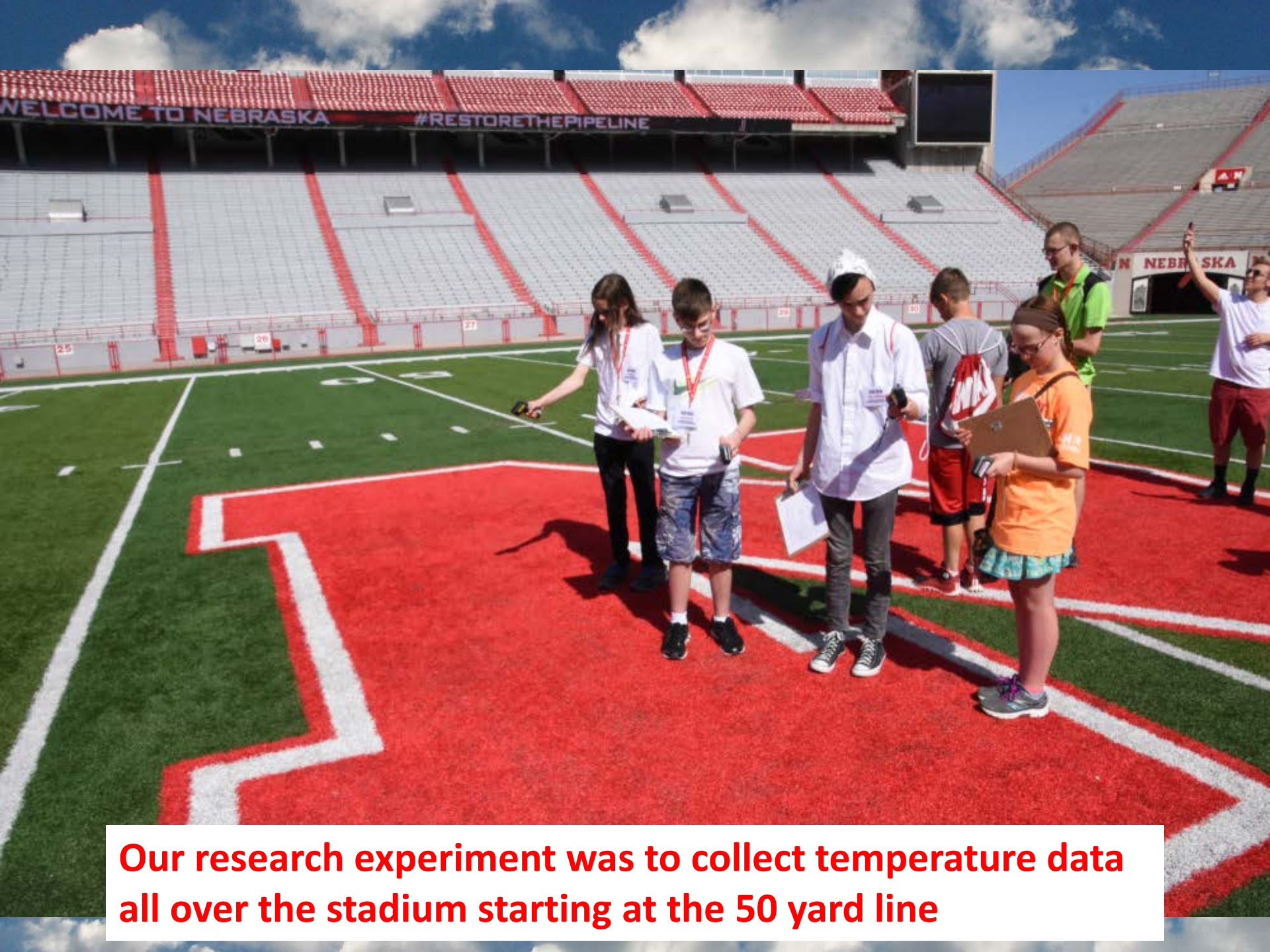
North Stadium: top row of seats: _____

North Stadium: inside, underneath the stadium, on the floor: _____

East stadium: new addition top row (via elevator): _____

Our data work sheet for Memorial Stadium


1970
1971
1994
NATIONAL CHAMPIONS
1995
1997
CONFERENCE CHAMPIONS
NEBRASKA FOOTBALL
#GBR
WELCOME TO NEBRASKA
#RESTORETHEPIPELINE
WEATHER CAMP



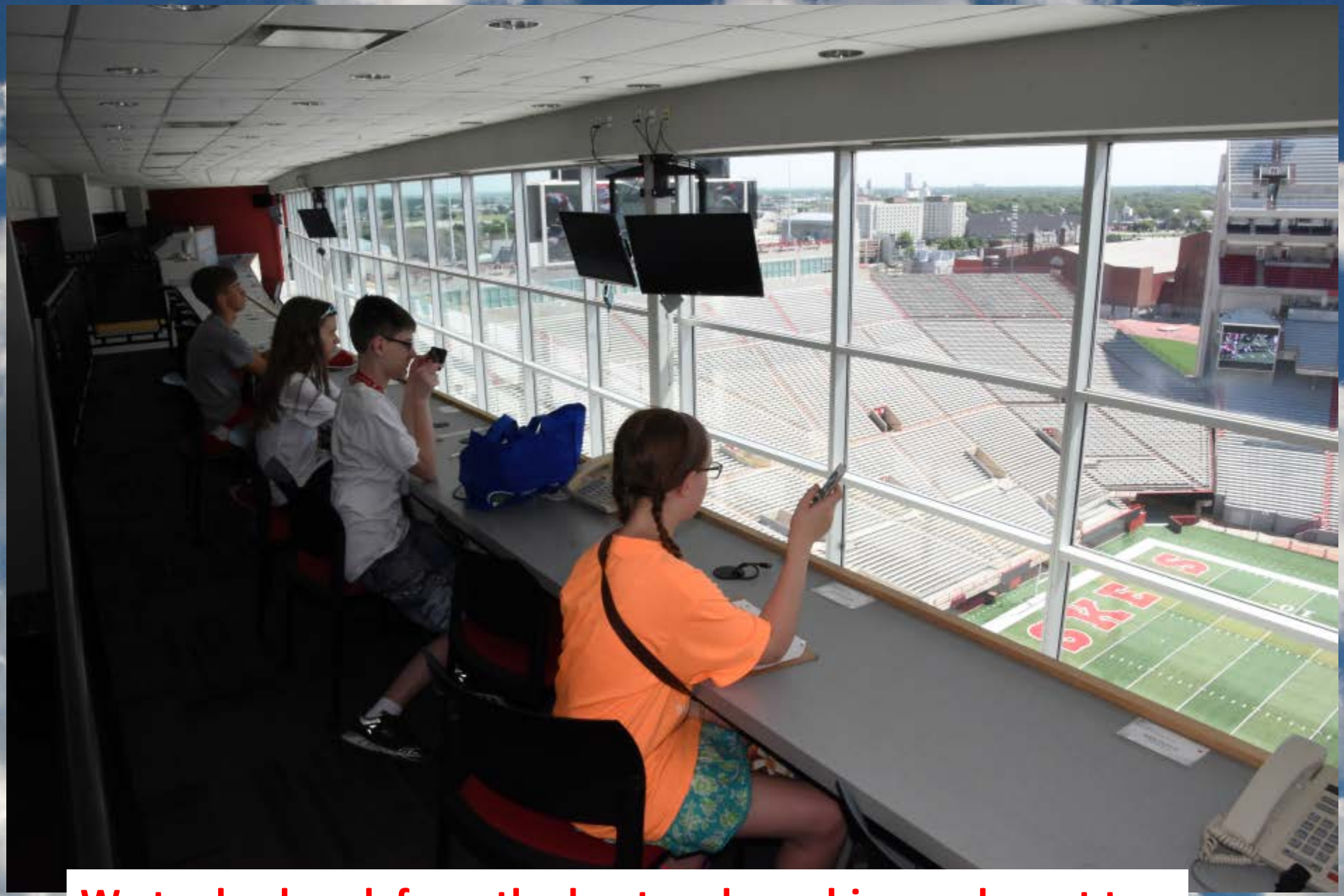
Our research experiment was to collect temperature data all over the stadium starting at the 50 yard line


WELCOME

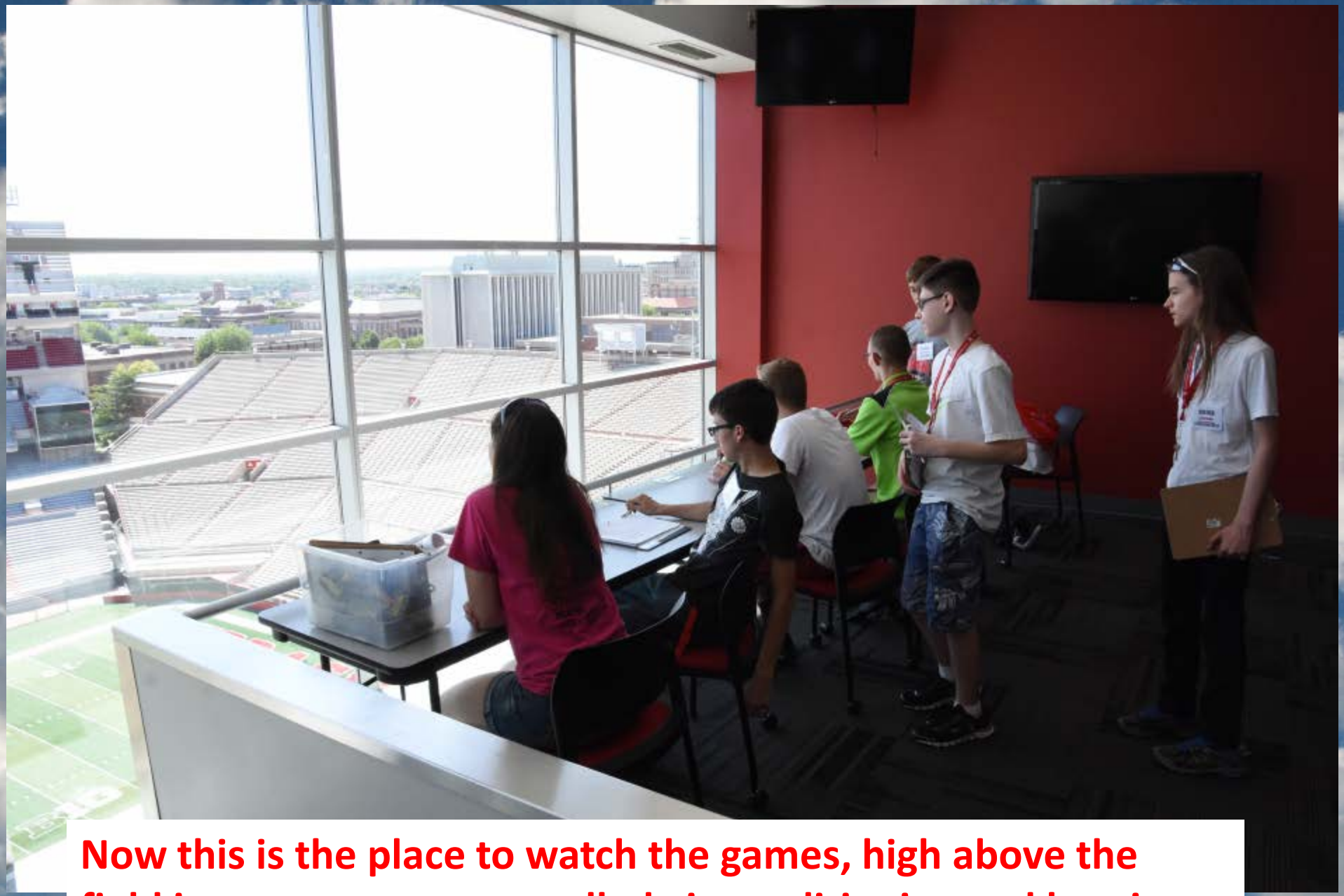
At the top of the South Stadium

At the top of the South Stadium

A 4.5 mph wind speed at the top of the South Stadium



We took a break from the heat and sunshine and went to the air conditioned press boxes high above the field.



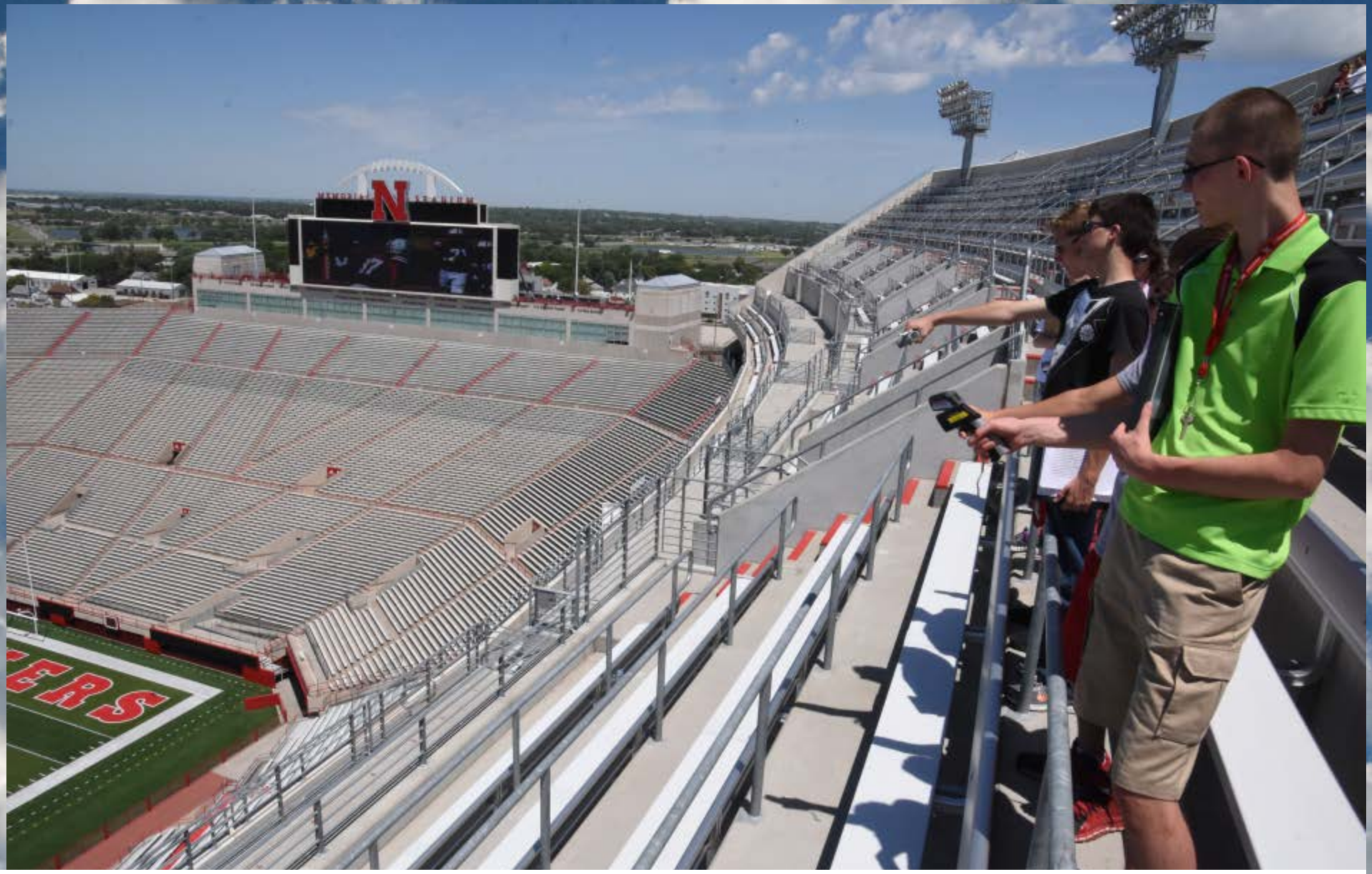
Now this is the place to watch the games, high above the field in temperature controlled air conditioning and heating

We stepped into the Husker's media room and pretended that we were giving a post game interview to the press!

We then headed to the very top of the new East Stadium addition. Look how far down the top of the South Stadium is !!!!

On top of the stadium way above the city


What a perfect place to watch the weather!



It was also hot up here with a temperature of 120 F on the seats

On the way back down we paused for a group photo.

Go BIG…….Weather!!

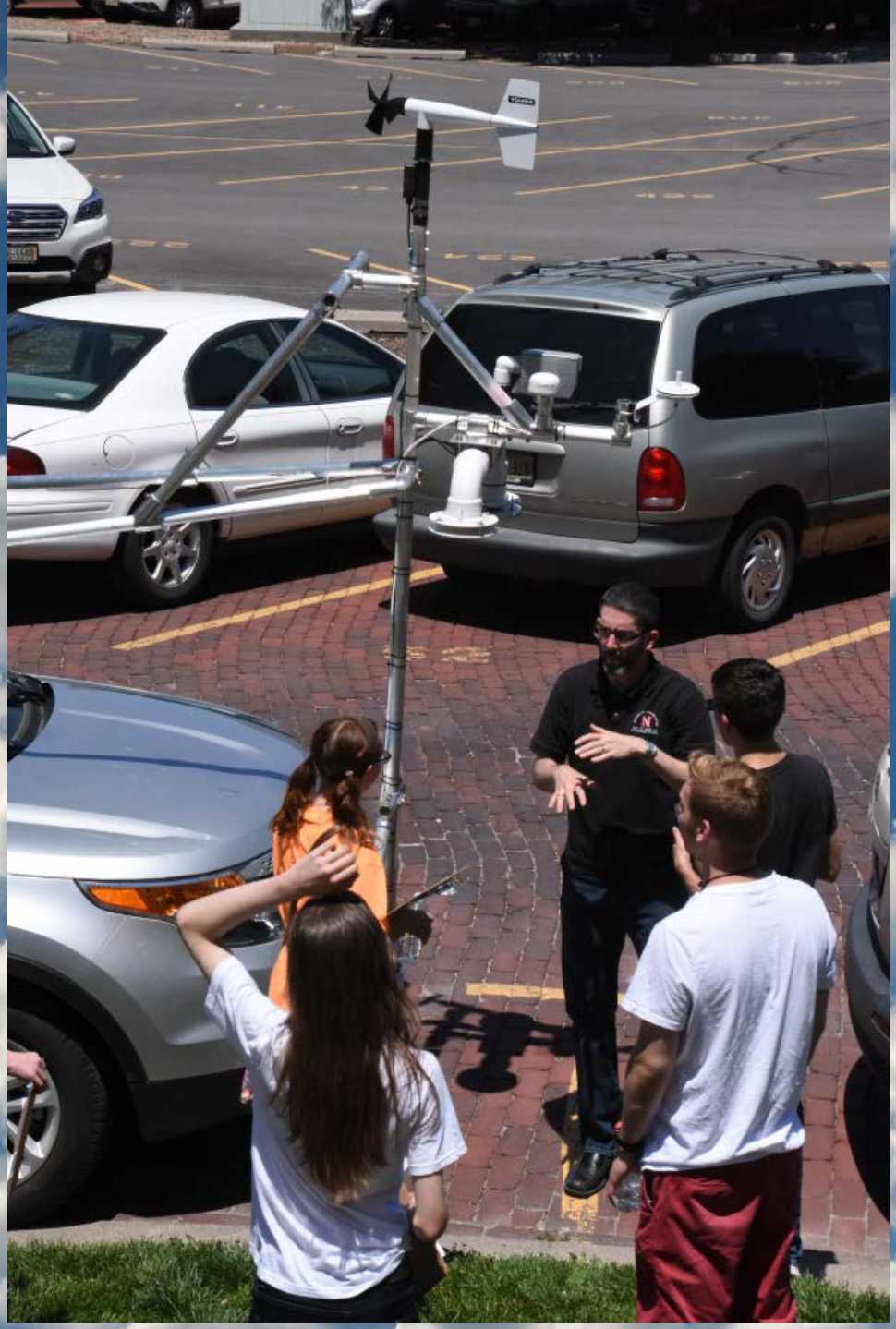
	EVAN	JOSH	LIAM	TREVOR	CODY	MOLLIE
Center Field-Red	99.5	130.0	111.0	115.5	109.0	110.5
Center Field-White	98.6	112.0	107.0	106.0	101.0	107.0
Center Field-Dark Green	108.3	116.0	114.5	113.0	117.0	112.1
Center Field-Light Green	104.8	118.0	116.0	112.0	116.0	113.3
West Stadium-Sun	100.2	107.0	106.5	100.0	106.7	104.1
West Stadium-Shade	70.9	78.0	81.0	79.0	78.2	77.9
East Stadium-Sun	76.6	86.0	74.5	97.0	87.0	88.7
East Stadium-Shade	66.8	74.0	76.0	77.0	73.7	73.4
South Stadium-Bottom	92.1	97.0	96.5	67.0	95.0	95.3
South Stadium-Top	94.6	97.5	100.5	92.0	103.4	99.0
South Stadium-Underneath	69.7	69.0	71.0	97.0	70.4	68.0
North Stadium-Bottom	83.1	98.0	98.5	72.5	98.6	95.3
North Stadium-Top	90.9	90.0	93.0	90.0	102.0	98.0
North Stadium-Underneath	68.3	69.0	73.5	75.5	73.7	69.7
East Stadium-Addition	86.7	120.0	110.5	111.0	117.5	107.0
	concrete	seats	seats	seats	seats	seats

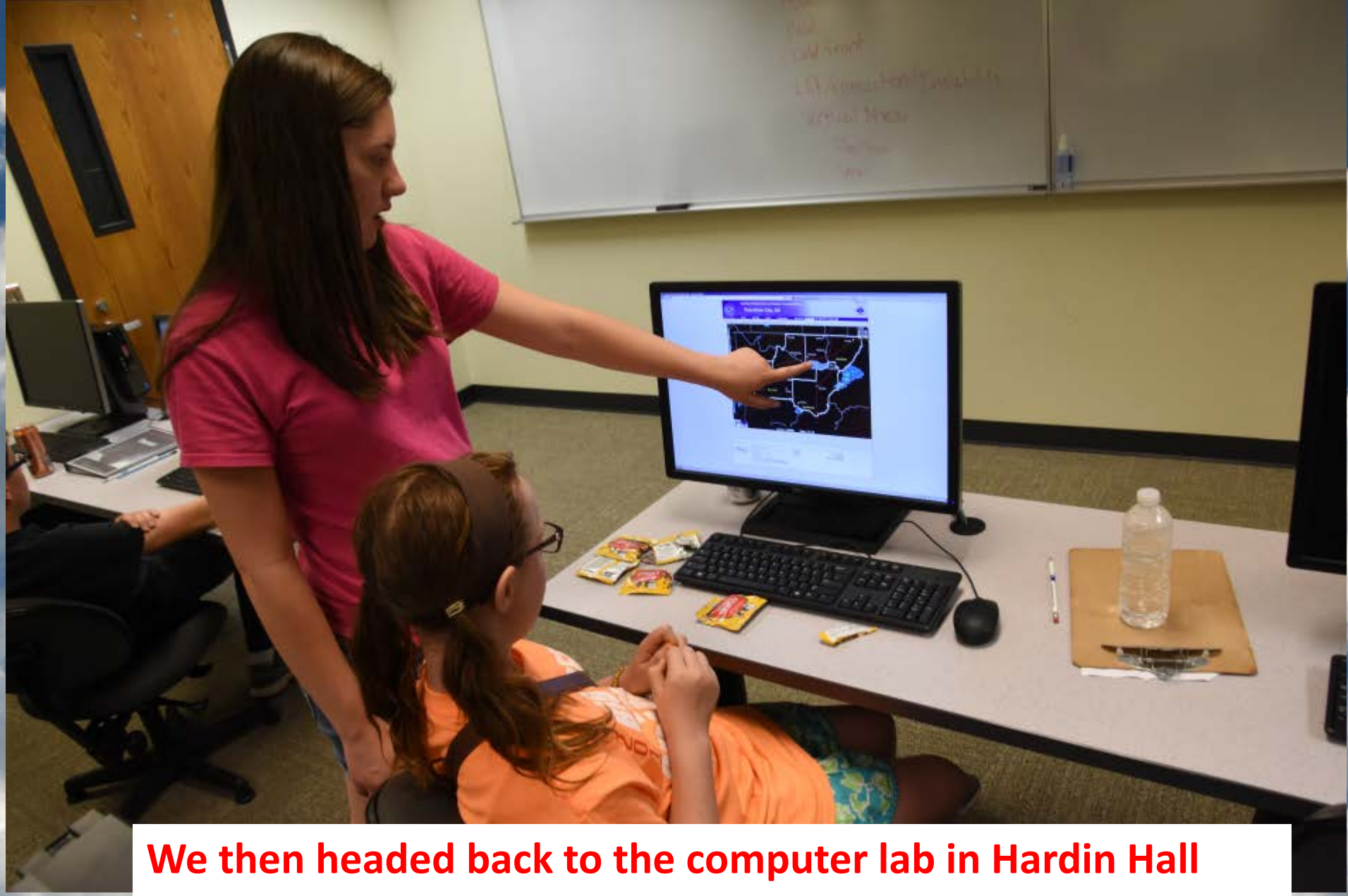
Our stadium temperature experiment results.
Temperatures are degrees F

We then headed over to the meteorology department which is just across the driveway from Memorial Stadium

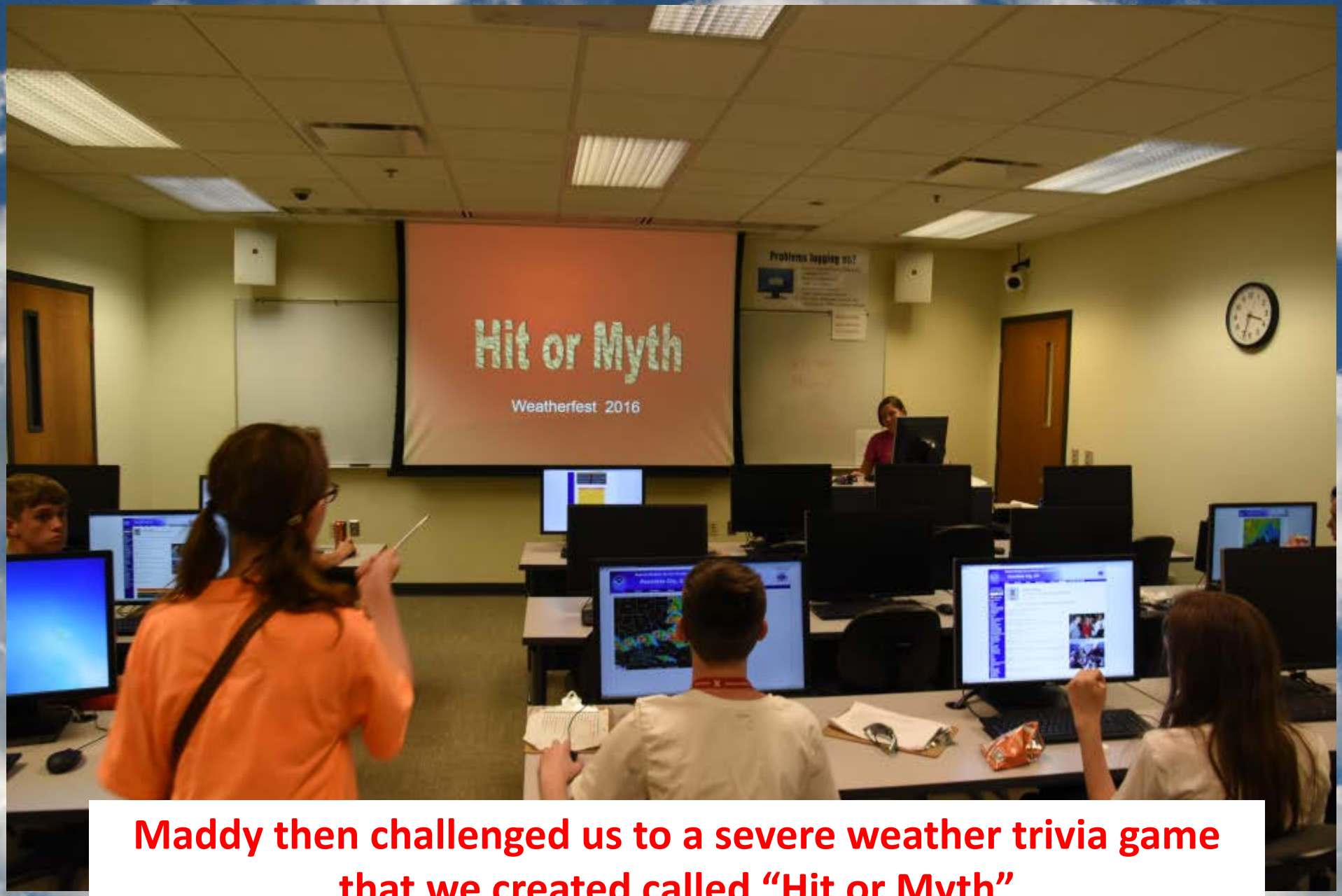
Dr. Adam Houston and several current UNL meteorology students visited with us and talked about weather and climate research and careers and how to prepare for college

Dr. Houston showed us one of his severe storms research vehicles which had lots of computers and weather sensors





We then headed back to the computer lab in Hardin Hall and Maddy helped us with a computer educational program called “Hot Seat: The NWS Warning Decision Simulator”



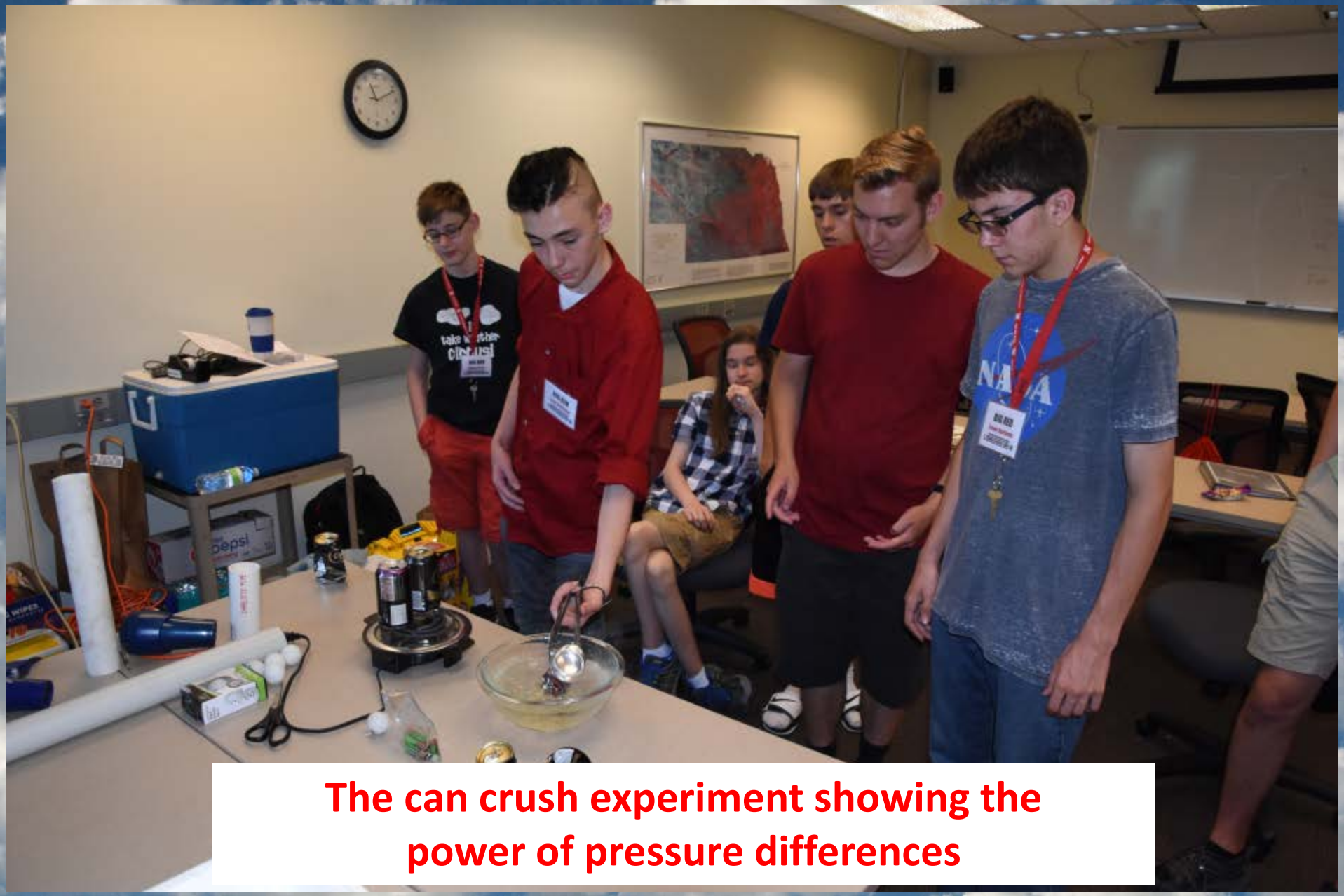
Maddy then challenged us to a severe weather trivia game that we created called “Hit or Myth”


Doppler radar will observe ALL tornadoes.
Hit or Myth?

Thursday June 9, 2016

Daily weather map discussion
Daily outside weather observations
Experiment: Can Crush, showing pressure differences
Experiment: tornado in a bottle
Experiment: Demonstrate convection
Firenado demonstration
Start practicing for the Green Screen weathercasting experience
Visit from Rusty Dawkins, Channel 10/11 TV Weathercaster
Outside experiments with Kristen Skolaut of LI-COR instrument Co.
All camps meeting in auditorium to showcase each camp's activities

Morning weather observations



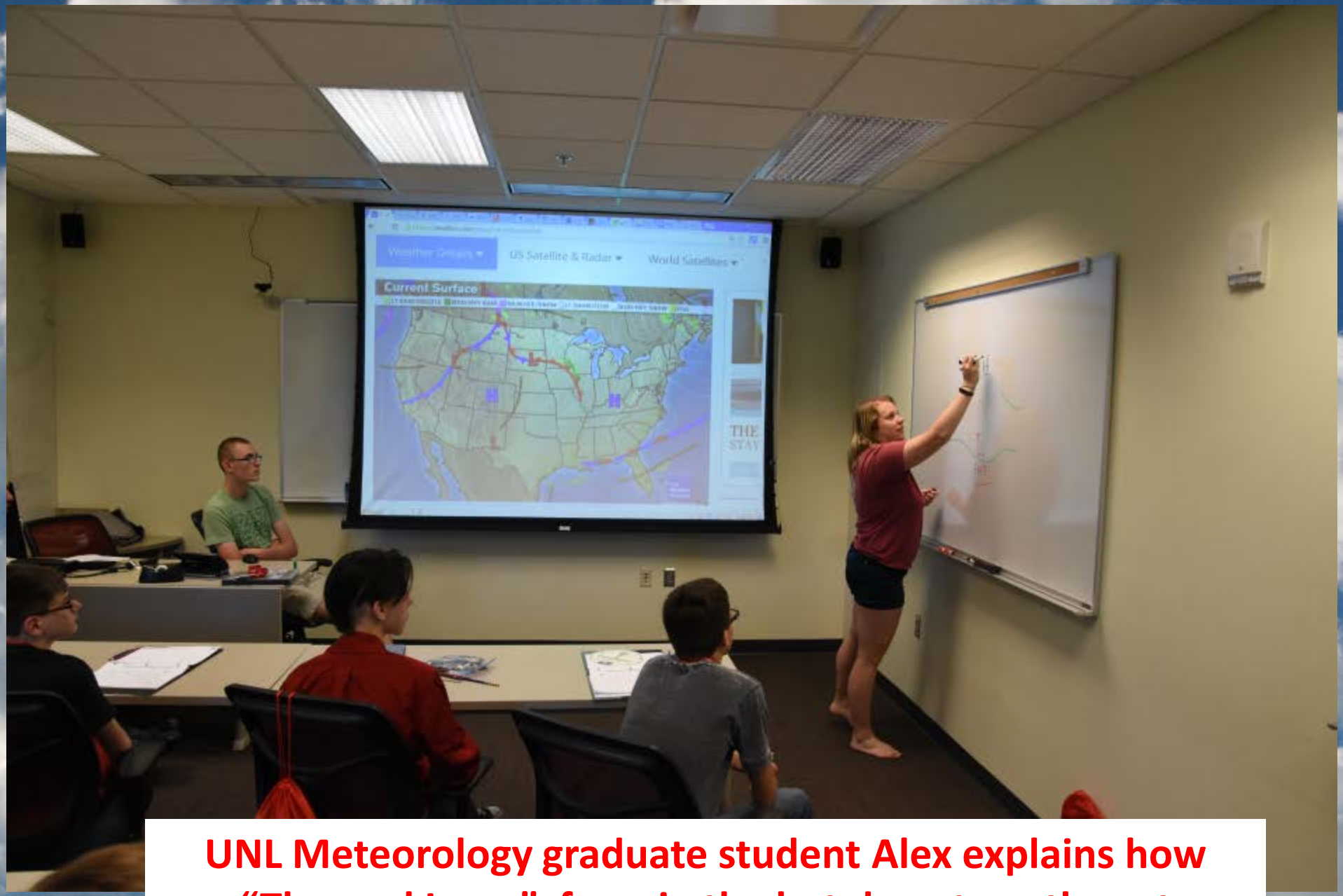
The can crush experiment showing the power of pressure differences

Setting up the “clouds in a bottle” experiment

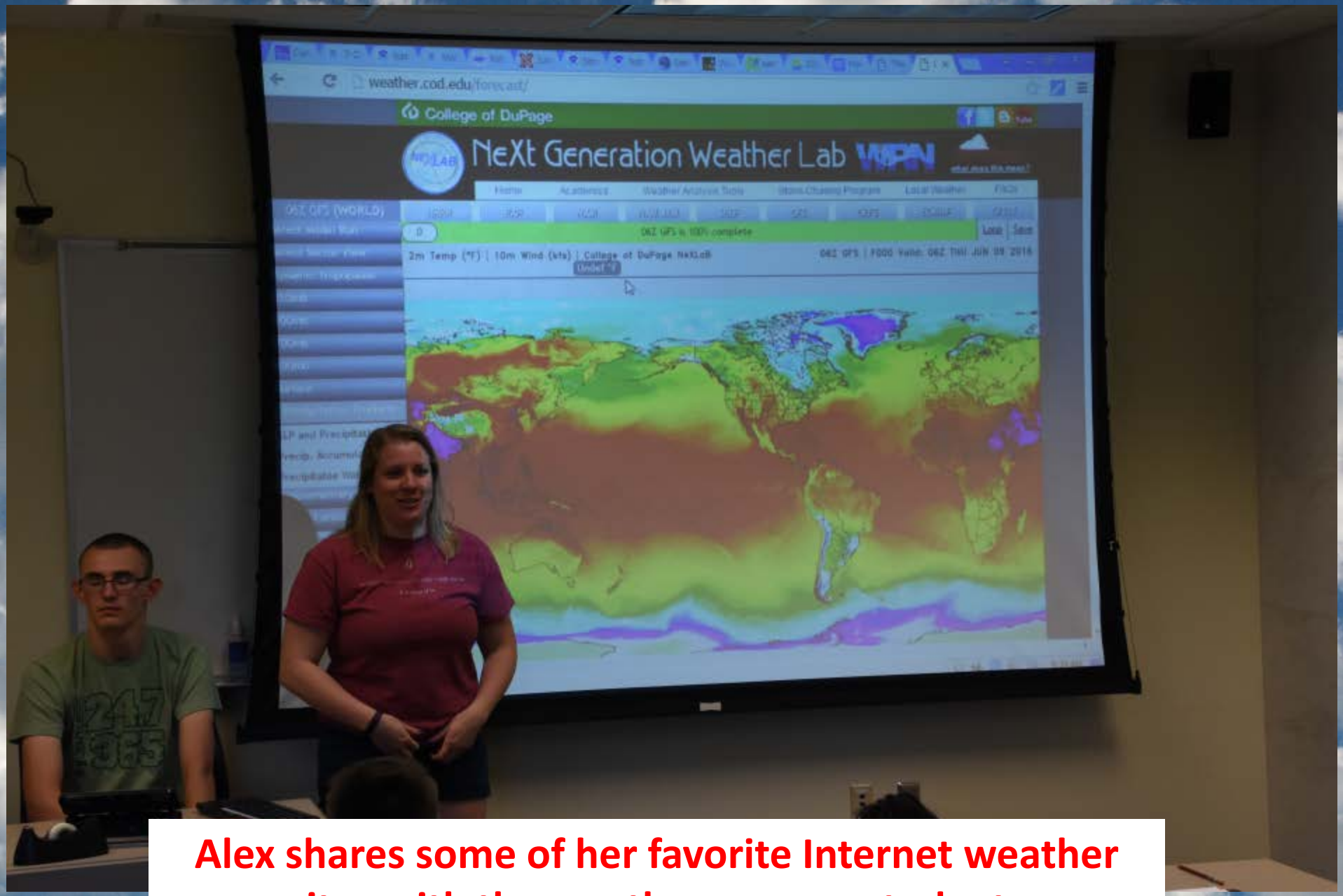
Tornado in a bottle demonstration

Demonstrating how convection can lead to formation of hailstones

Hailstones shower down on the weather campers



UNL Meteorology graduate student Alex explains how "Thermal Lows" form in the hot desert southwest



Alex shares some of her favorite Internet weather sites with the weather camper students

Weather Campers practice for their Green Screen weathercaster experience scheduled for later in the week

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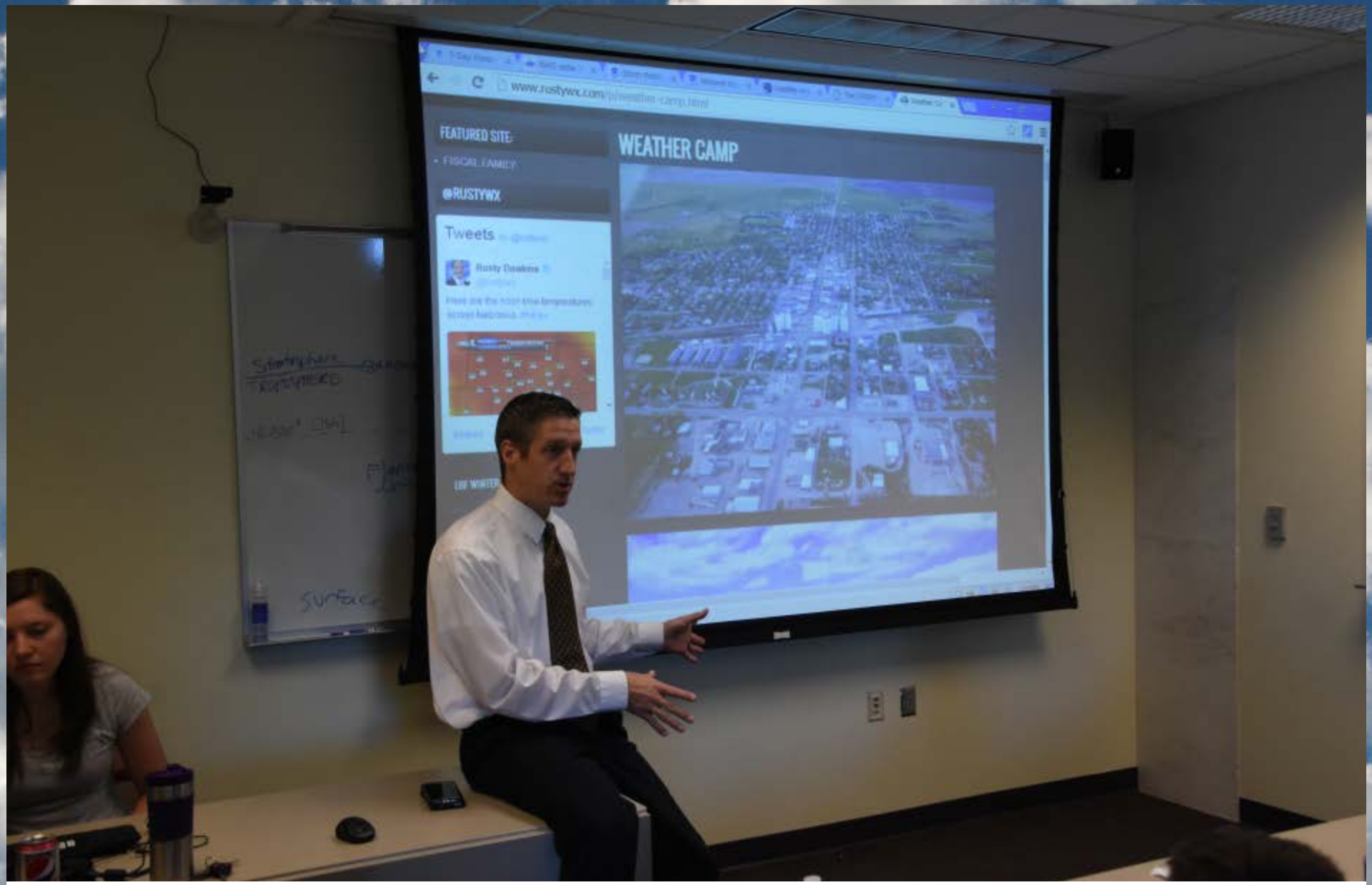
Rusty Dawkins, Channel 10/11 TV meteorologist, met with the weather camp students.

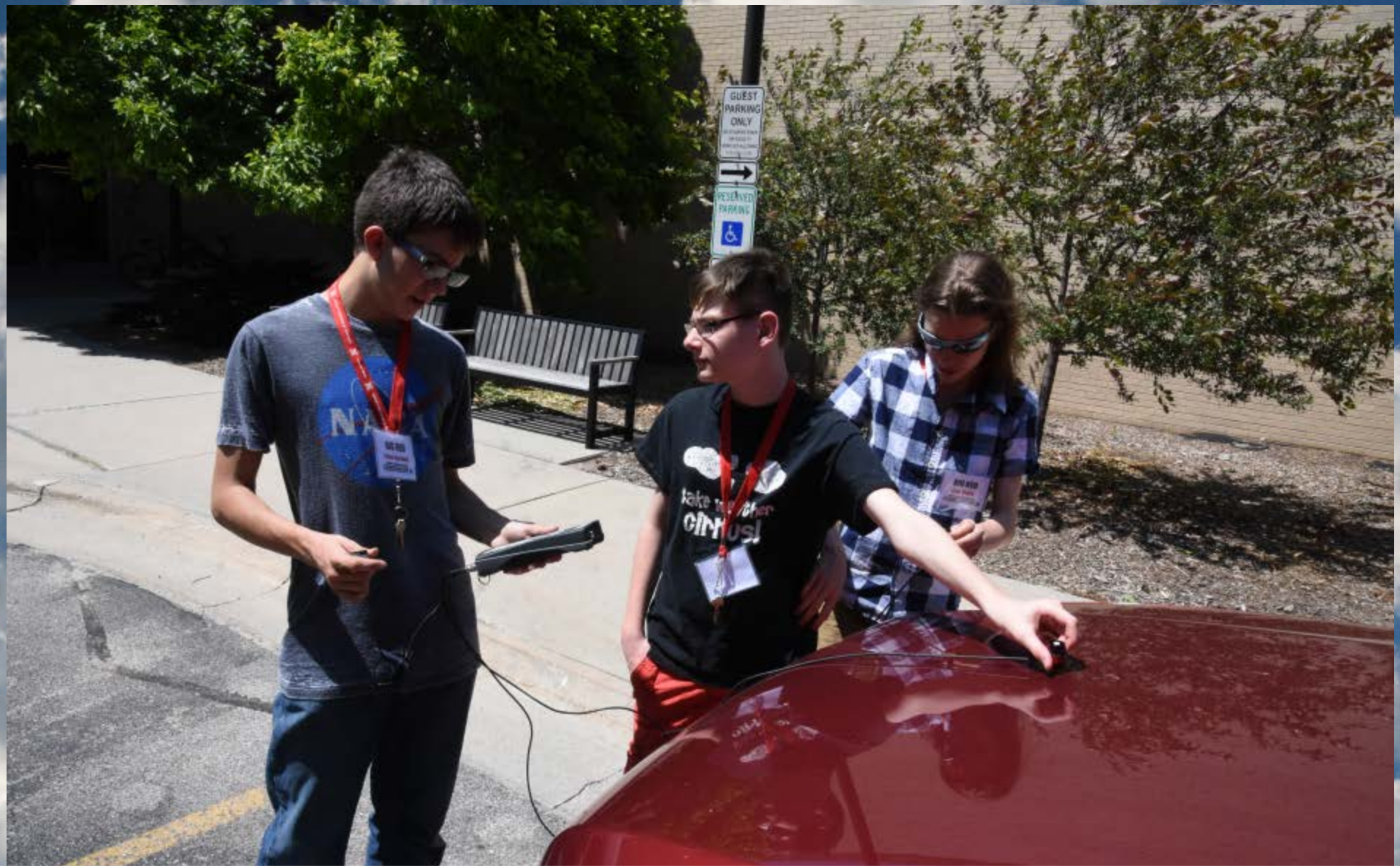


Rusty Dawkins talked about careers in broadcast meteorology.

Maddy demonstrates her “firenado” to Rusty Dawkins.

Kristen Skolaut of LI-COR, a Lincoln environmental instruments company, came to our Weather Camp

We learned about the many properties of light and solar radiation



Using light sensors and measuring incoming solar radiation

Getting ready to measure how much light passes through the tinted window at the back of this SUV. Yes we closed the hatch and Cody said he felt like he was in an “Easy Bake” oven

All of the academic camps came together late Thursday afternoon

Giving a preview of our Weather Camp week to the other camps

Friday June 10, 2016

Daily weather map discussion
Daily outside weather observations
Practice for the green screen weathercaster experience
Produce weathercasts in the Ag communications TV Studio
Practice for the Capstone presentation scheduled for early afternoon

Afternoon Capstone activity:
Slide show of the week's activities.
Show each camper's weathercasting video
Camp completion certificates (4-H)
Camp completion certificates (National Weather camp)
Gifts (Nebraska Weather book; laminated cloud chart, NASA global night lights poster)

Weather campers doing the daily weather map discussion

Practicing for our Green Screen experience as a weathercaster

Practicing for our Green Screen experience as a TV weathercaster

At the Ag. Communications TV Studio

Very tall Levi lost his head…check out the monitor!

A photo of a weather camper doing his weathercast video

A photo of a weather camper doing his weathercast video

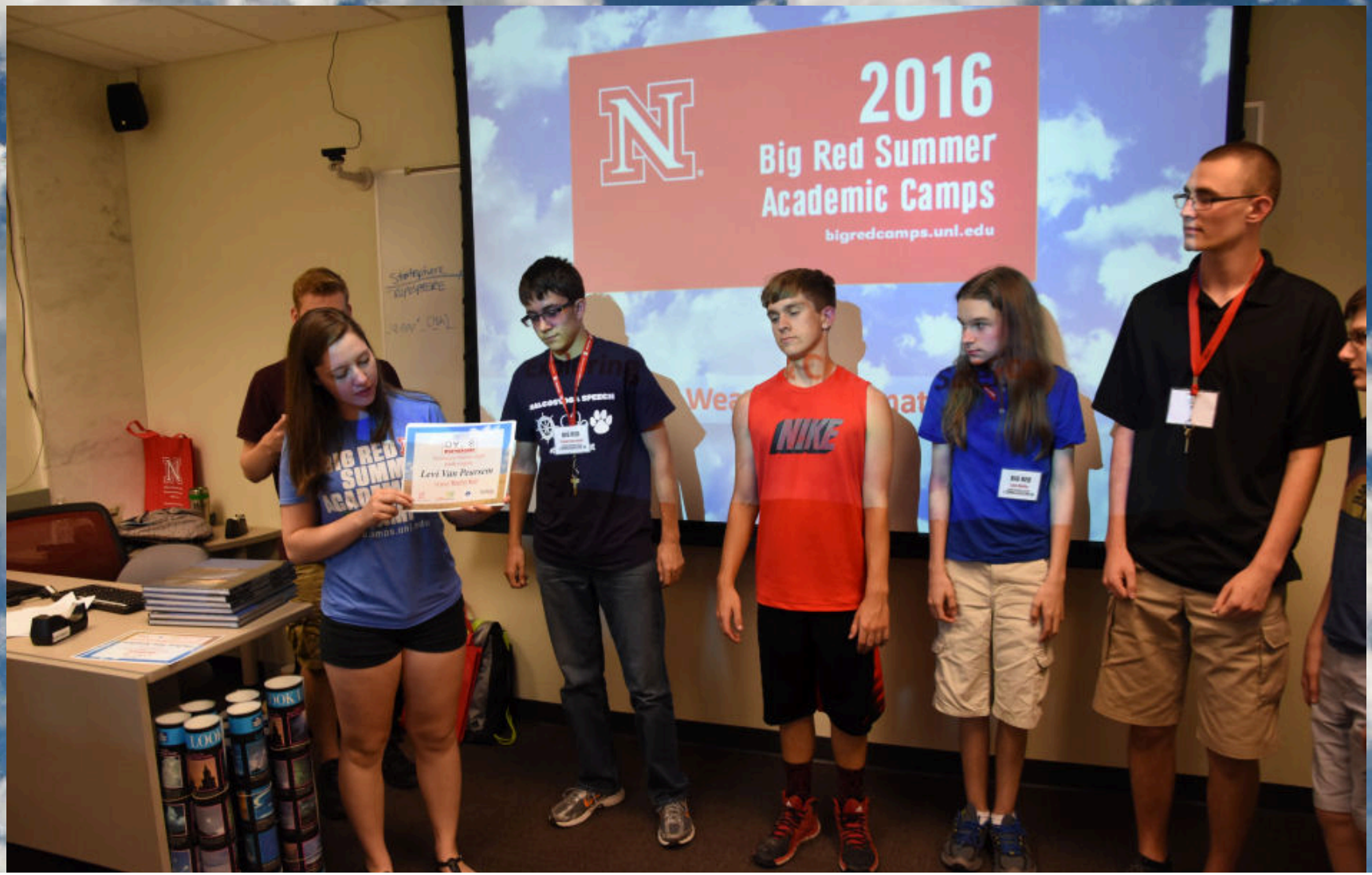
Inside the production studio where the videos were recorded

The Capstone Event: a program presented by the two instructors for the camper's family and friends

The Capstone Event: the Campers review their week at Weather Camp

The Capstone Event: the Campers review their week at Weather Camp

The Capstone Event: the videos of each of the campers doing their weathercasts at our TV studio were shown to their family and friends



The Campers receive our National Weather Camp "Weather Wise" certificates

The Campers receive their “graduation” certificates from UNL 4-H

The Campers receive their Nebraska Weather Book (author Nancy Gaarder) as a gift from the Weather Camp staff

The gifts keep coming! A laminated cloud chart for each camper

The gifts keep coming! A poster from NASA showing the lights around the globe at night as seen by satellite

Thank you LI-COR for your generous financial support of our Weather Camp. Your donation helped give scholarships to the students to help reduce their cost of attending the camp.

Who is LI-COR? From the extremes of the rain forests in South America to the harsh conditions of the Antarctic, and to cutting edge research laboratories around the globe, scientists rely on products from LI-COR Biosciences to provide answers to their questions.

LI-COR first introduced scientific instruments for plant science research and quickly grew to provide scientists tools for such diverse disciplines as atmospheric research and the study of how proteins interact at the cellular level.

LI-COR Biosciences is a global leader in the design, manufacture, and marketing of high quality, innovative instruments, software, reagents, and integrated systems for plant biology, biotechnology, drug discovery, and environmental research.

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Who is Raytheon? Raytheon: One global team creating trusted, innovative solutions to make the world a safer place.

Raytheon Company is a technology and innovation leader specializing in defense, civil government and cybersecurity solutions.

Raytheon, Founded in 1922, provides state-of-the-art electronics, mission systems integration, capabilities in C5I (command, control, communications, computing, cyber and intelligence), sensing, effects and mission support services. Raytheon is headquartered in Waltham, Massachusetts.

Raytheon has a branch office in Omaha, NE, that specializes in the Search, Detection, Navigation, Guidance, Aeronautical, Nautical Systems, satellites and Instruments industry

Thank you

Nebraska 4-H, Big Red Camps (especially Lindsay Shearer and Sue Ellen Pegg)for your administrative assistance

Mark Cornell, Raytheon, for visiting with the weather campers

Rusty Dawkins for sharing your weathercaster career experiences

Barbara Frith, 557th Weather Wing, for arranging the Air Force Tour

Adam Houston & your students for the tour of the UNL Meteorology Lab and showing them your Mesonet research vehicle

Mike Kamm Ag communications for helping the students with their weathercasts

Barb Mayes, NWS, for giving a tour to our weather campers

Danny McEntarffer, UNL Athletics, for hosting our weather campers at Memorial Stadium "Go Big……. Weather!"

Shawna Richter-Ryerson for tagging along with us on June 7 and your excellent article about the camp (http://newsroom.unl.edu/announce/snr/5478/31065)

Kristen Skolaut for demonstrating the LI-COR light meters

Deb Veldhuis, Raytheon, for arranging our visit to your facility

The UNL Weather Camp returns next June 2017 as part of the Big Red 4-H camp program. Look for details later this Fall 2016

http://go.unl.edu/weathercamp