

UNL Weather Camp June 11 - 15, 2018

Tornado - Kanopolis Lake, KS

Photo by Scott Blair

NWS, Kansas City



We are part of the UNL Big Red Camp program
<https://4h.unl.edu/big-red-camps-sessions>



Weather Camp 2018 Instructors: Evan, Bryan, Dalton, Maddy (and Max not in the photo)

2018 Weather Camp Schedule

Monday June 11:

8:30 am -- 8:45 am	Travel to City Campus; Leave from Hardin Hall
8:45 am – 9:45 am	Welcome and Weather Discussion/Observations; Bessey Hall 104
9:45 am – 11:00 am	Observing the Weather and Climate -Inside/Outside Experiments
11:00 am – 12:00 pm	Brian Buller, Monsanto, Drones and Agriculture
12:00 pm - 12:30 pm	Lunch
12:30 pm – 1:00 pm	Travel to LI-COR
1:00 pm – 2:30 pm	LI-COR tour
2:30 pm – 2:45 pm	Travel to city campus
2:45 pm - 4:15 pm	Observing the Weather and Climate -Inside/Outside Experiments
4:15 pm - 4:30 pm	Travel back to East Campus

Day 1: Monday, June 11, 2022





Brian Bueller, The use of drones, aka UAV's, in agriculture

Tornado Cleanup

Grower saved time and money finding debris with drone



Accurate Crop Loss Assessment



MULTILEVEL DAMAGE MAPPING

3-Class Damage Level Analysis: 25%, 50%, 75% crop damage
Damage levels are based on visual severity of bleached and crop canopy depression metrics



Damage Class (potential yield loss)	Percent of Field	Area Per Class (acres)	Equivalent Total Loss (acres)
Mild	25%	13.1	3.5
Moderate	50%	19.2	10.2
Severe	75%	16.5	13.2

Damage class area estimates should be given a ±2% margin of error.

Equivalent Area of Total Loss Potential*: 26.8 Acres (10.8 ha) = 25.3% of the field

In one instance, DroneDeploy helped a farmer identify crop loss of **almost 50%**, compared to the 34% offered by the insurance adjustor and he was able to recoup **\$110,000 from insurance**





Visiting *LI-COR* in Lincoln, NE. Their mission: Biosciences designs and manufacturing instrument systems and research tools for environmental and biotechnology research.











Group photo at Li-Cor with our host Kristen

Temperature Vs. Pressure

Linear relationship (as one variable increases, the other variable increases by an equal amount)

So, as temperature increases pressure also increases

Is warm or cold air less dense??

-Warm air is less dense

Is dry or moist air less dense??

-Moist air is less dense

Dalton gives a presentation on basic weather processes

Facilities Help
Call 472-1550

Multi-Media Help
Call 472-5511



<https://docs.google.com/presentation/d/1nhq1Arhq2pwULd1EgNXq-RSHYzoQ3JZf6vN2>

Temperature Vs. Pr

Linear relationship (as one variable in amount)

So temperature increases pressure

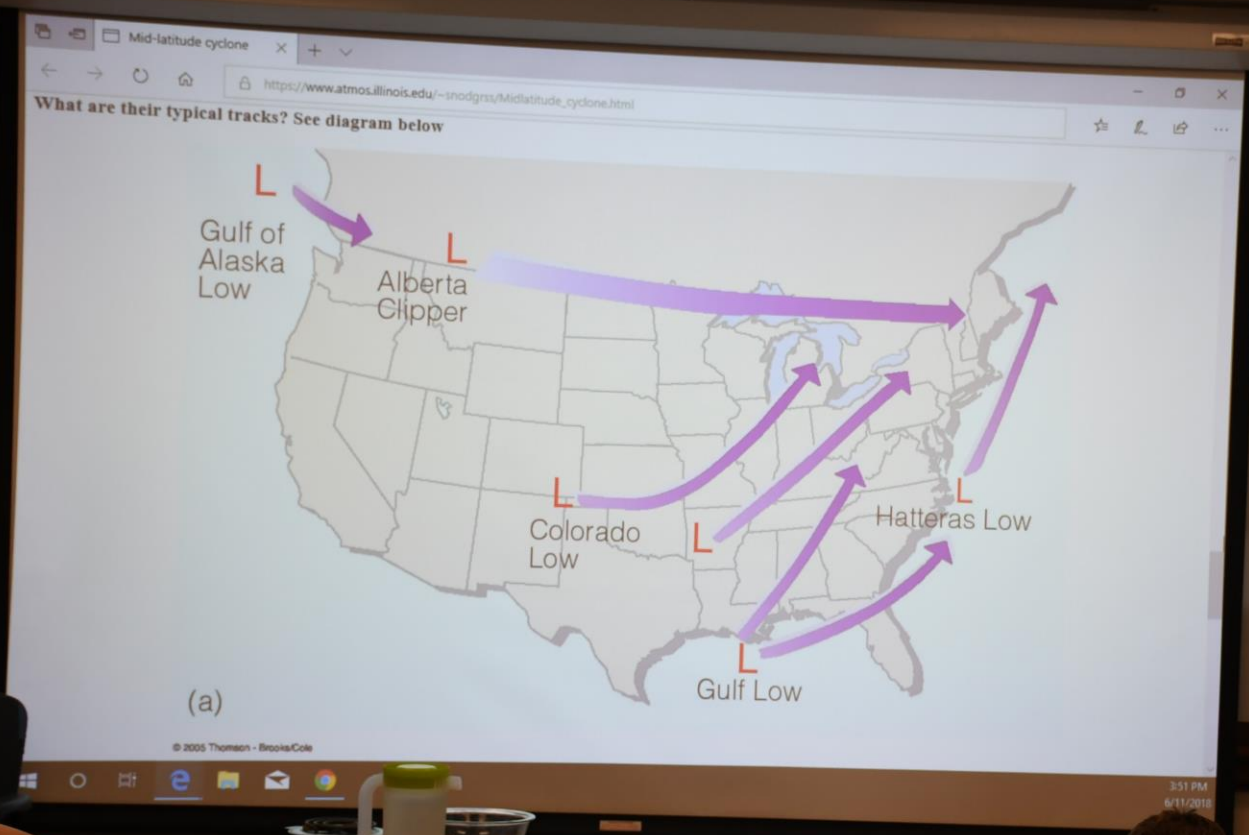
or cold air less dense??

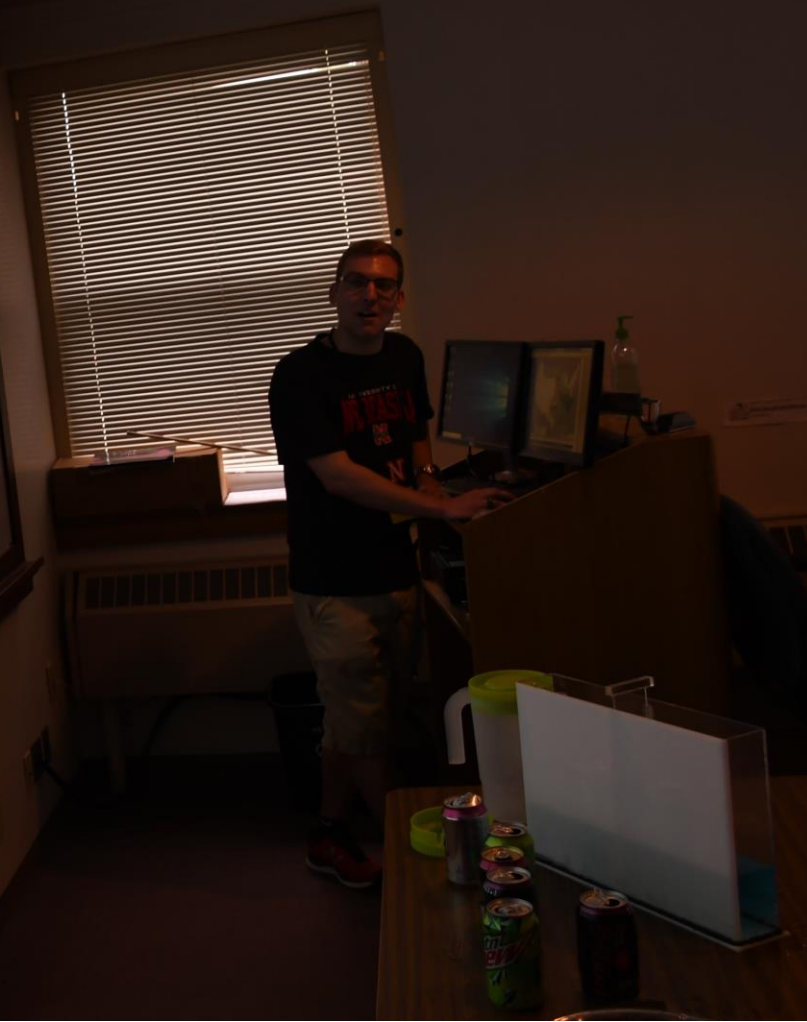
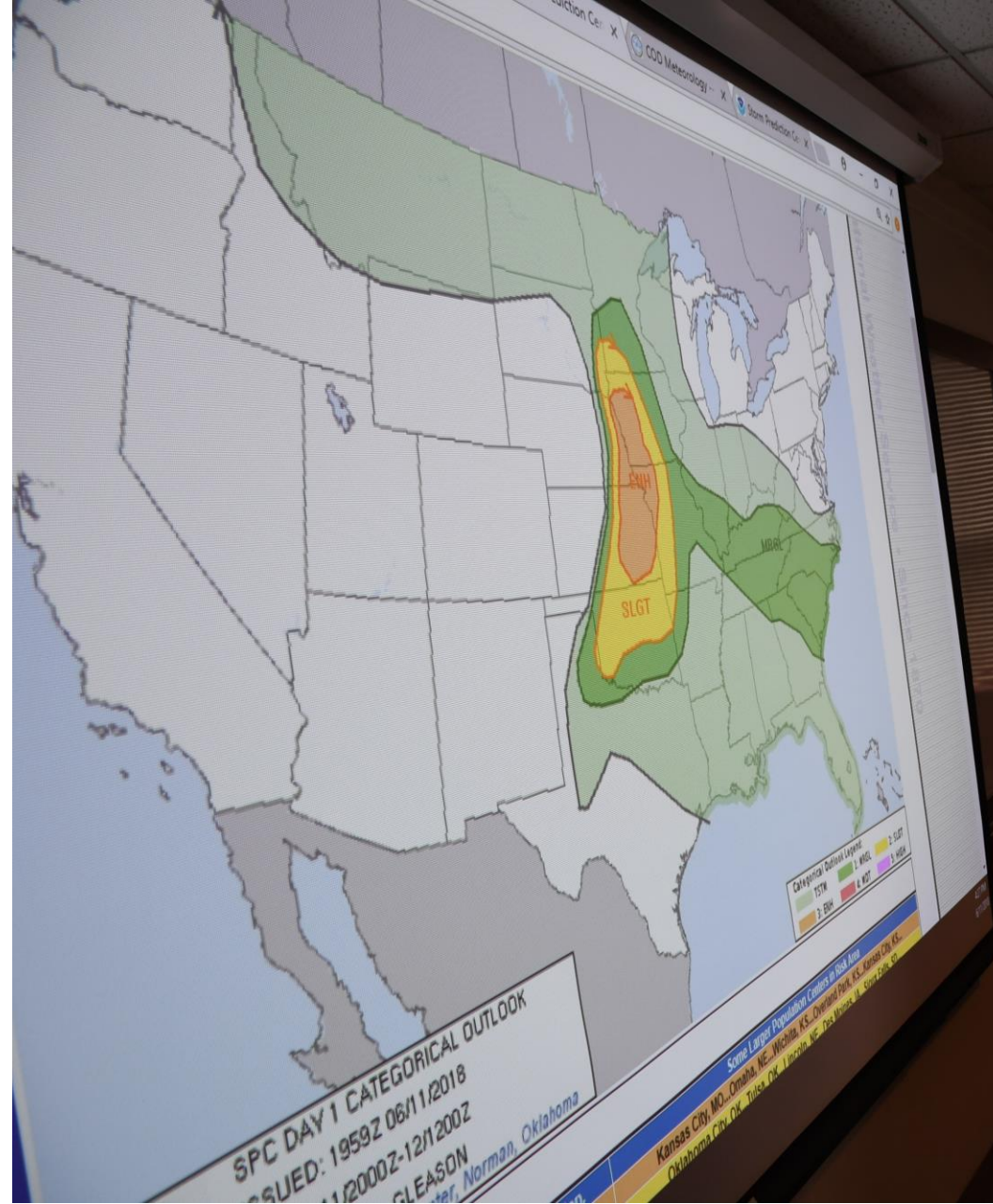
is dense

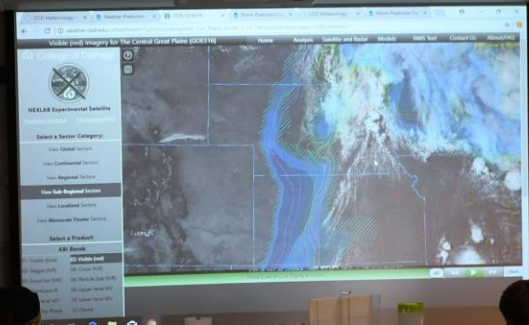
is less dense??

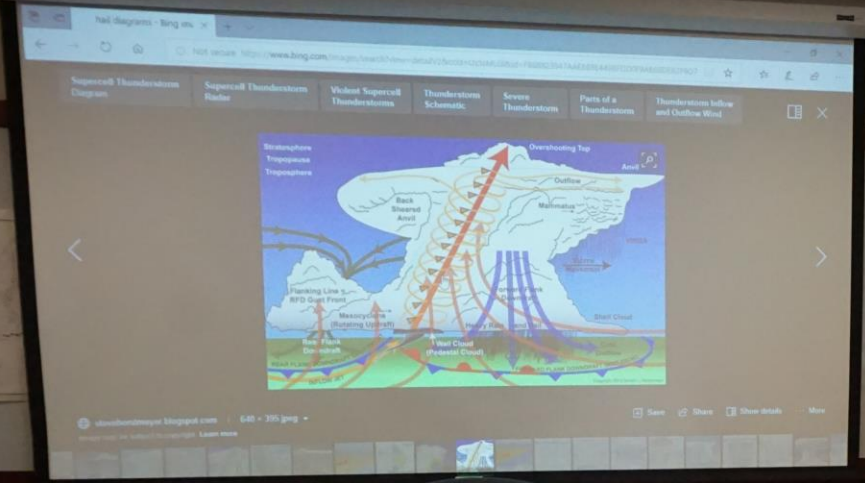
is dense

JUST DO









Handwritten notes on a whiteboard:

7475' Anvil	2940' Stratosphere
150' Base	1150' Dry Air
11500' Top	11000' Top
10000' Wet Cloud	2015' Precip. Anvil
10000' Dry Cloud	2000' Precip. Anvil
10000' Precip. Anvil	19000' Top

Teacher standing at a podium, presenting to the class.

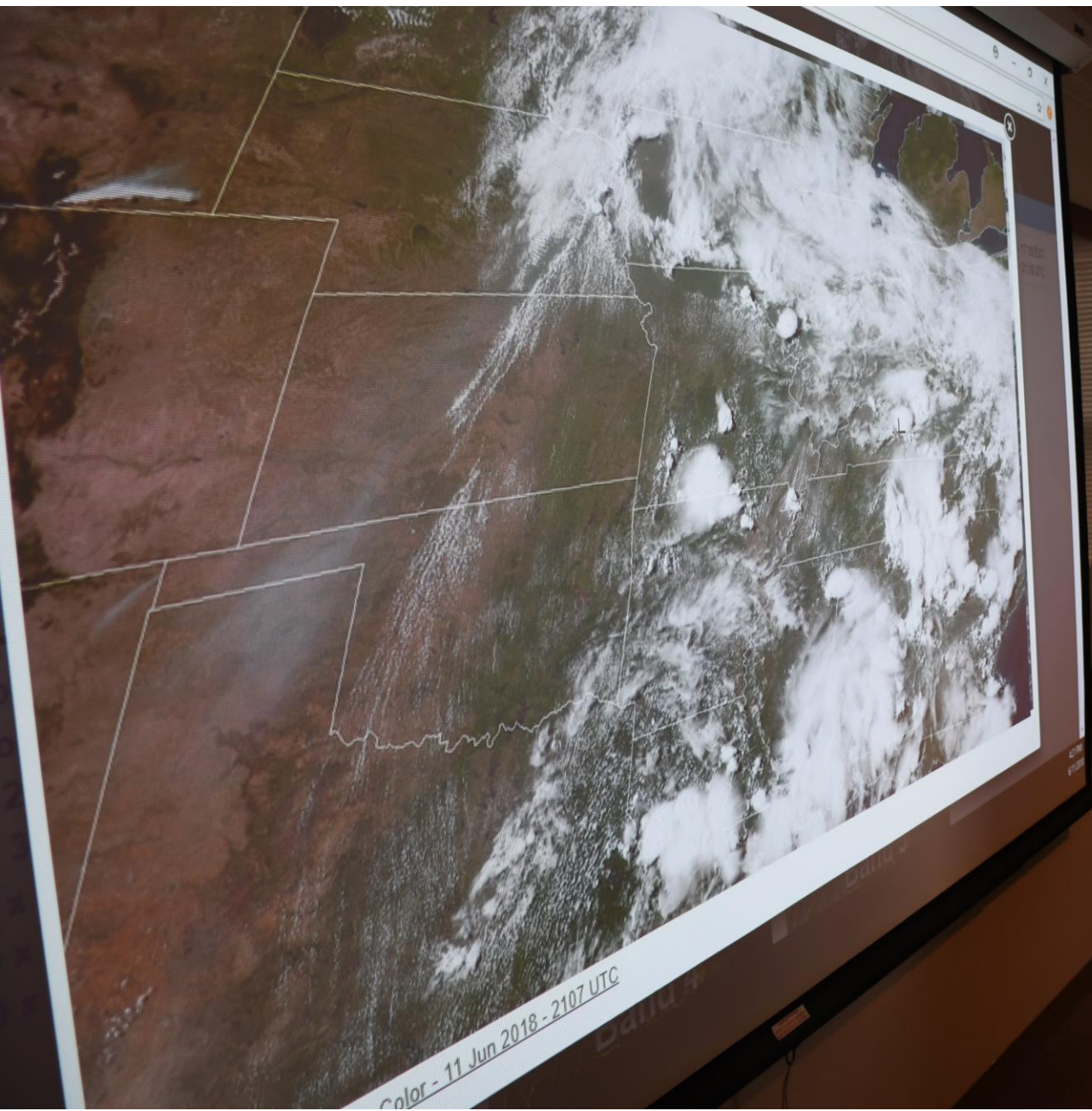
Student in the foreground wearing a blue t-shirt with the text: "THERE'S A MAGIC IN THE SOUND OF FRESH AIR."

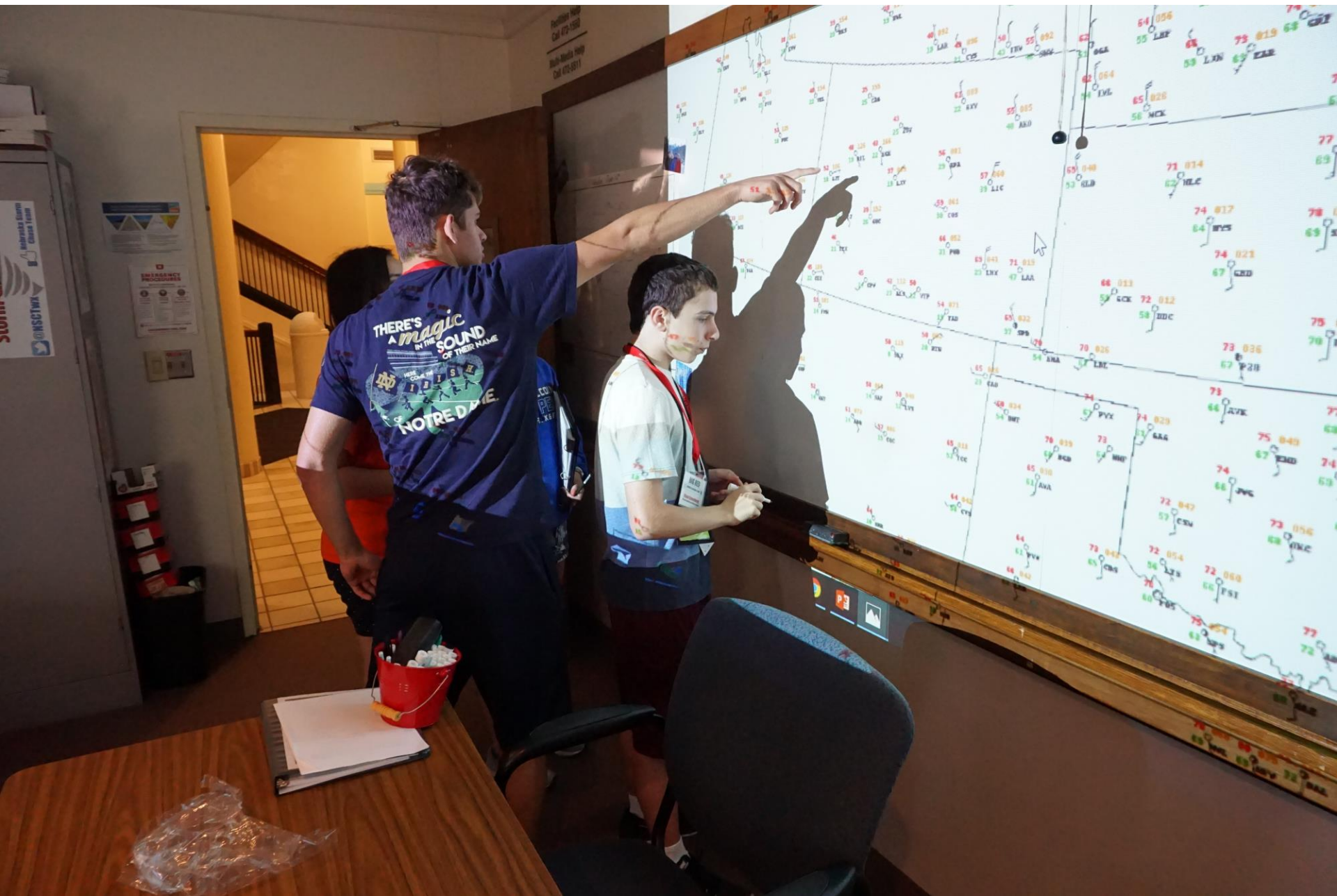
Student in the foreground wearing an orange t-shirt.



Student in the foreground wearing a maroon t-shirt.

Student in the foreground wearing a white t-shirt.





Learning how to interpret weather maps (station model)



Can Crush: pressure-temperature experiment

2018 Weather Camp Schedule

Tuesday June 12:

8:30 am – 9:45 am	Travel to Offutt Air Force Base
10:00 am – 11:30 am	Offutt Air Force Base Tour
11:30 am – 12:00 pm	Travel to Raytheon
12:00 pm - 12:30 pm	Lunch
12:30 pm – 2:00 pm	Raytheon Tour
2:00 pm – 3:30 pm	Travel to City Campus
3:30 pm – 4:15 pm	Observing the Weather and Climate -Inside/Outside Experiments
4:15 pm – 4:30 pm	Travel to back to East Campus

Day 2: Tuesday, June 12, 2022



557th WEATHEROWING





At Offutt Air Force Base in Omaha and the 557th Weather Wing





Group photo at Offutt Air Force Base with our U.S. Air Force hosts



Visiting Raytheon in Omaha, NE



Raytheon
Intelligence, Information
and Services

The funny thing about...

The WEATHER

Careers, Science, Engineering,
Innovating
the Future

Mark Cornell
Senior Engineer

The slide features a weather map of the United States with color-coded temperature zones (red for hot, yellow for warm, green for moderate, blue for cool). To the right of the map is a small globe icon.

Raytheon

WENCHEN

TORTILLA
CRISP

PRISON



Dani, standing in front, is a graduate of our UNL program and now works at Raytheon







Back at the classroom in Lincoln and our instructors demonstrating basic weather processes

Monday, June 11, 2018



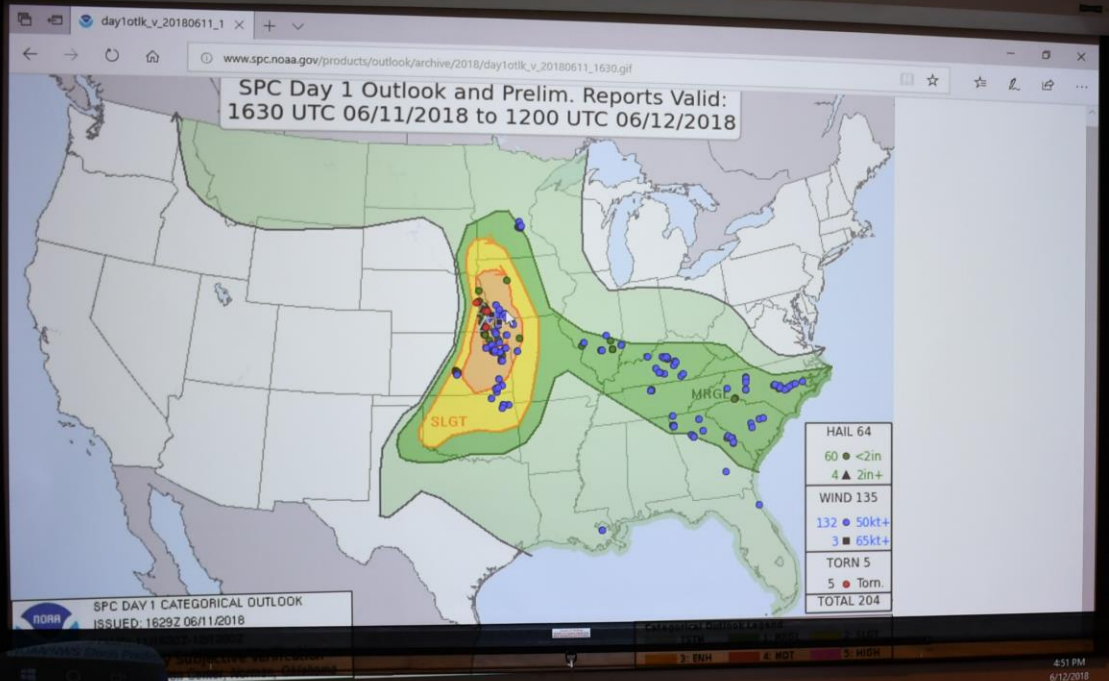




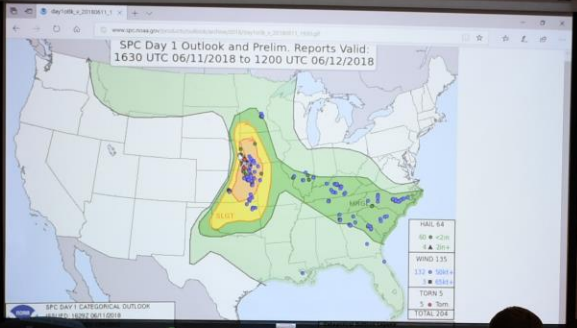
Weather Camp students trying out some of the science demonstrations



Daily weather observations for our weather journals



Weather Camper Ethan discussing the Storm Prediction Center severe weather outlook



Post Office Box
Call 472-1338
Main Office Phone
Call 472-2511

Red-Headed
Red-Headed

2018 Weather Camp Schedule

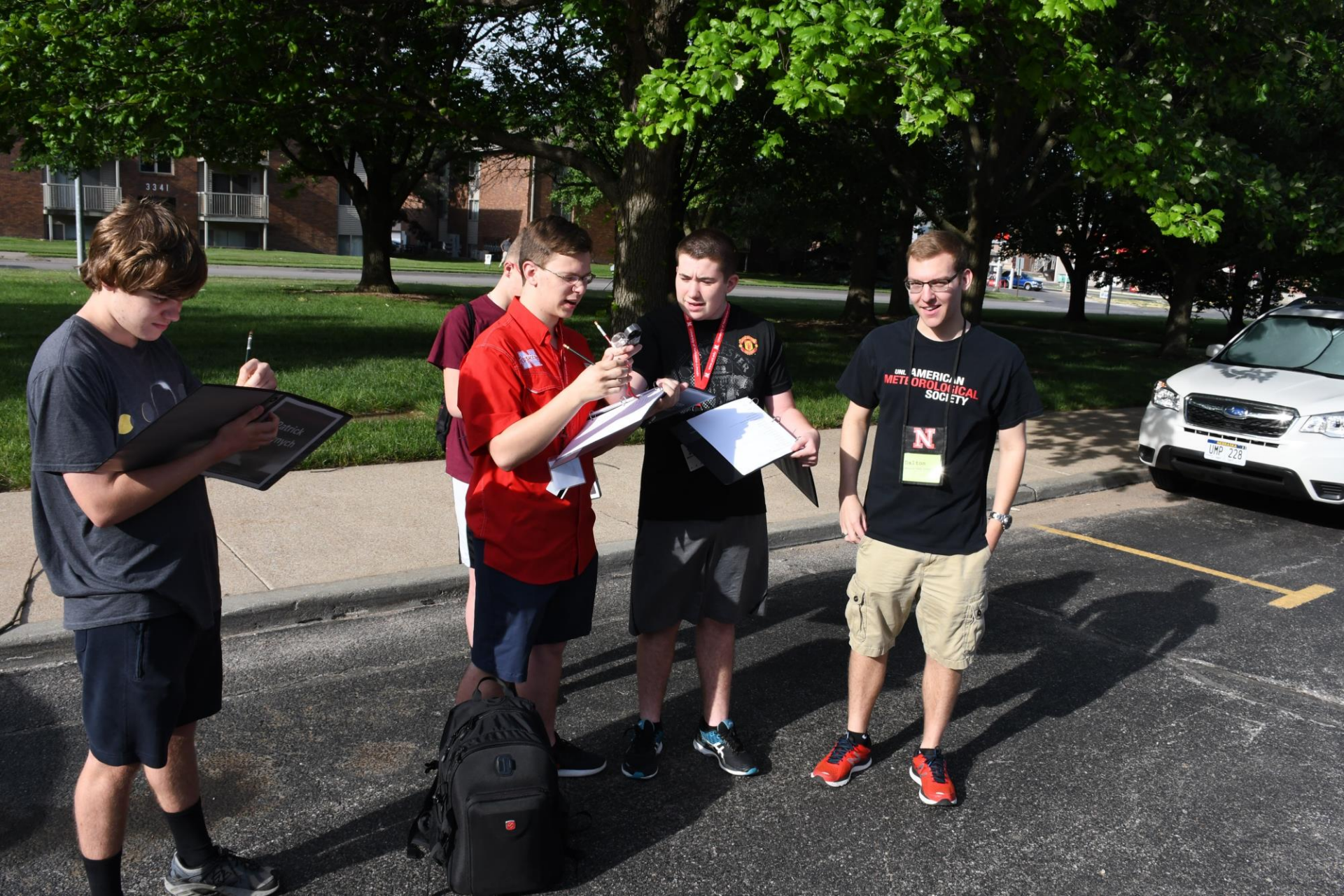
Wednesday June 13:

8:30 am – 9:00 am	Weather Discussion; Hardin Hall
9:00 am - 9:45 am	Observing the Weather and Climate -Inside/Outside Experiments
9:45 am – 10:00 am	Travel to 10/11 Studios
10:00 am – 11:00 am	10/11 Studio Tour
11:00 am – 11:15 am	Travel to City Campus
11:15 am – 12:00 pm	Lunch
12:00 pm – 1:00 pm	Inside/Outside Experiments
2:00 pm – 3:00 pm	Inside/Outside Experiments
3:00 pm - 4:15 pm	Observing the Weather and Climate -Inside/Outside Experiments
4:15 pm - 4:30 pm	Travel to East Campus

Day 3: Wednesday, June 13, 2022



Doing our daily weather observations for our weather journal





Our daily weather map discussion





Visiting TV Meteorologist Brad Anderson at the KOLN-KGIN TV weather studio in Lincoln



Brad Anderson shows the weather campers the engineering room at the TV studio





Brad shows how to use the clicker and green screen to one of our weather campers







UNL Weather Camp Director, Dr. Ken Dewey being interviewed in the TV studio



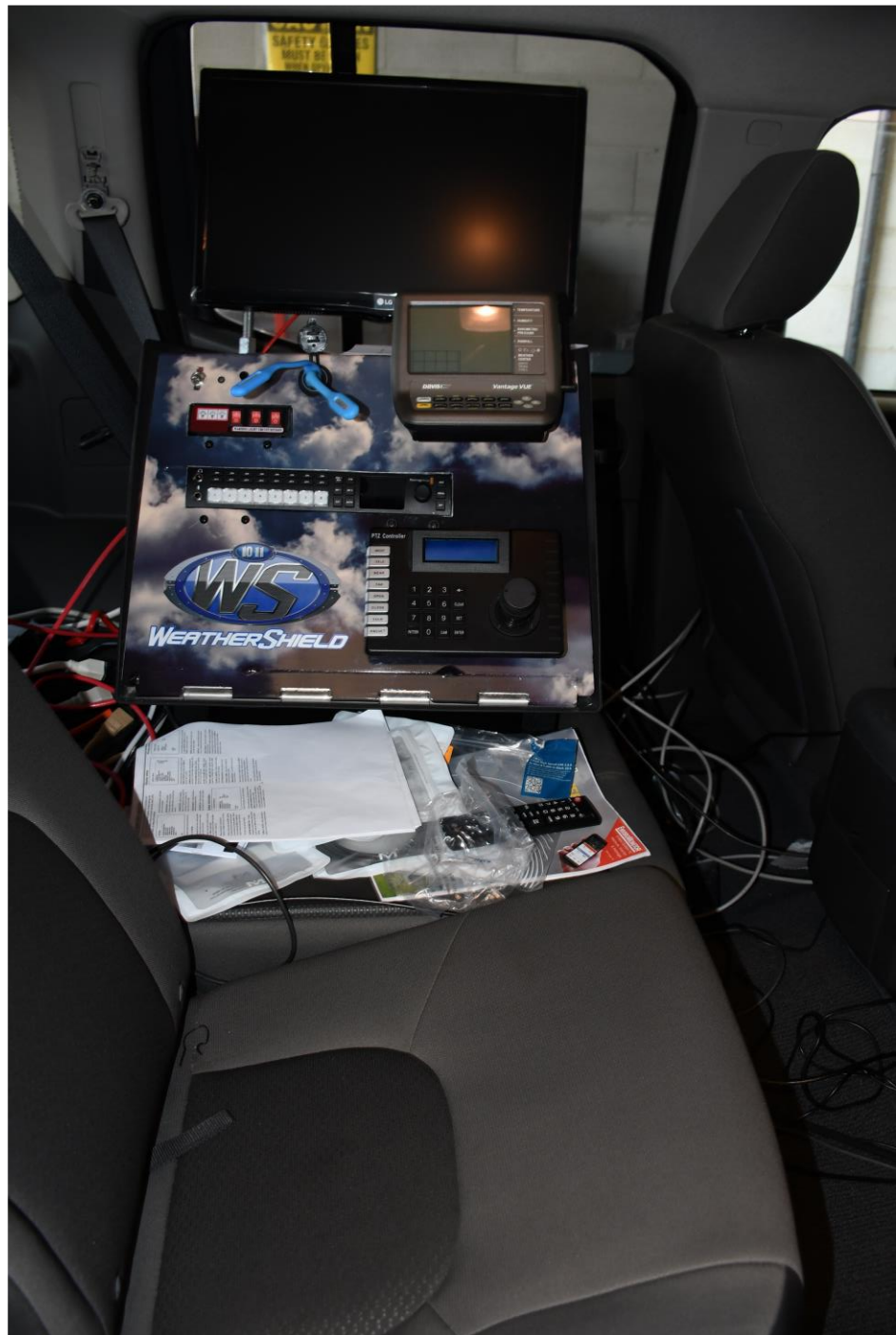
10 11 NOW
WEATHER

Sponsored By
National
Furnace and Air Conditioning

10 11
WS

X TERRA

NEXEN





10 11 NOW
WEATHER!

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National
Furnace and Air



Touring the newsroom of the TV Station

Active Users

100	10.0%
87	10.0%
59	11.0%
45	5.0%
37	7.0%
33	6.0%
21	4.0%
1	1.0%
1	1.0%





Back in the classroom demonstrating convection using a hair dryer and some ping pong balls to show how hail forms





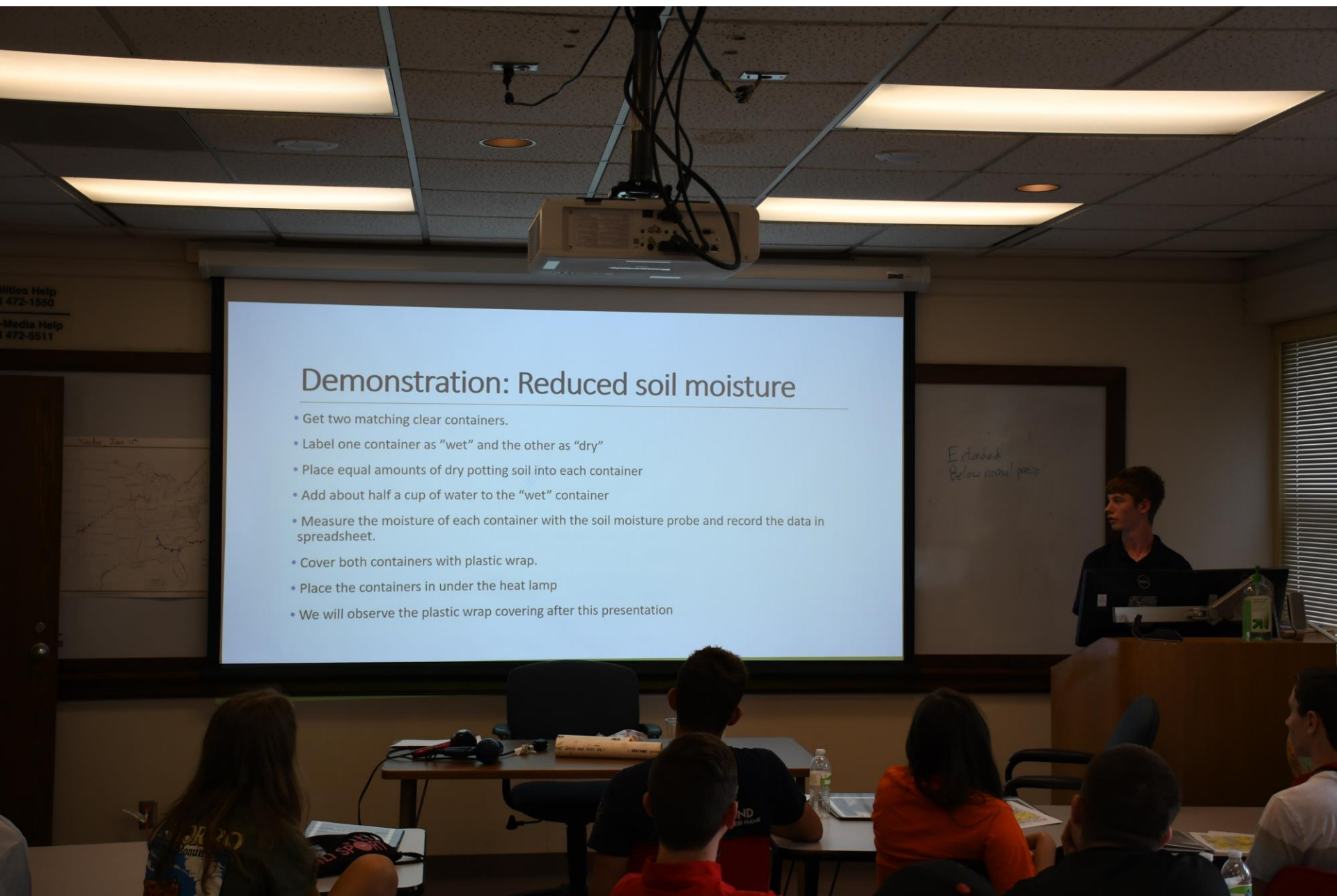
Bryan had an activity to help the students better understand the formation and impacts of droughts

Office Help
472-1550
Media Help
472-5511

Demonstration: Reduced soil moisture

- Get two matching clear containers.
- Label one container as "wet" and the other as "dry"
- Place equal amounts of dry potting soil into each container
- Add about half a cup of water to the "wet" container
- Measure the moisture of each container with the soil moisture probe and record the data in spreadsheet.
- Cover both containers with plastic wrap.
- Place the containers in under the heat lamp
- We will observe the plastic wrap covering after this presentation

Extended
Below normal precip







Learning about water management during drought conditions by playing the UNL designed game “Water Banking”



Drought Impacts

- What are some of the impacts?
 - Public water supply systems experience potable water demand problems
 - Rural water districts develop operation problems
 - Increased irrigation may overuse available aquifer and municipal water supplies
 - Reduced soil moisture on cropland poses economic loss to farmers
 - Many more!!!
- How do we lessen the impacts?
 - Water conservation - How?
 - Recognize drought in early stages - How?
 - Education!!!





The instructors put together a side series called "How well do you know your weather?". The students answered questions and engaged in spirited discussion



Facilities Help
Call 472-1832
Multi-Media Help
Call 472-8511

How well do you know your weather?

☁️🌧️ ☀️ ⚡️☁️ ❄️☁️

THERE'S A MESSAGE IN SOUND

mean line



High atmospheric pressure is usually associated with dry weather.
Hit or Myth?
Hit!

Facilities Help
Call 472-1390
Multi-Media Help
Call 472-6311


El Niño
Below normal
...
...
...

Beardon Clive
Sunglasses
Phone
Snacks

Facilities Help
Call 472-1508
Multi-Media Help
Call 472-8811

All 50 states have observed
tornadoes
Hit or Myth?

Hit!
Even Alaska has seen
tornadoes!!





Evan shows the weather campers how to use the Severe Plot program on-line at the Storm Prediction Center

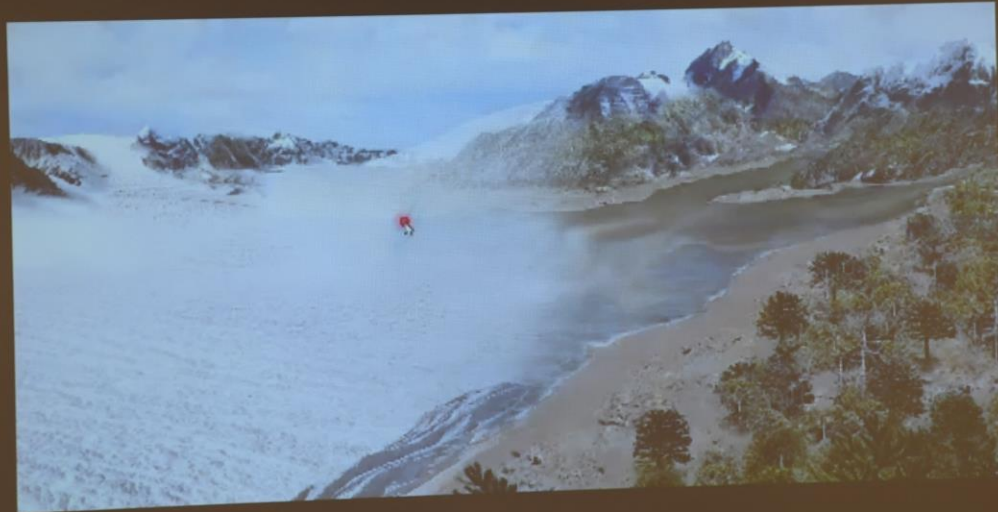
2018 Weather Camp Schedule

Thursday June 14:

8:30 am - 8:45 am	Travel to City Campus; Leave from Hardin Hall
8:45 am - 9:45 am	Weather Discussion/Observations; Bessey Hall 104
9:45 am – 11:30 am	Memorial Stadium Microclimate
11:30 am – 12:00 pm	Lunch
12:00 pm – 1:00 pm	Inside/Outside Experiments
1:00 pm – 2:00 pm	Inside/Outside Experiments
2:00 pm – 3:00 pm	Observing the Weather and Climate -Inside/Outside Experiments
3:00 pm – 4:00 pm	practice green screen weathercast
4:00 pm – 4:15 pm	Travel to East Campus

Day 4: Thursday, June 14, 2022

Climate Change: Past, Present, Future



Dr. David Harwood
Dept. of Earth & Atmospheric Sciences
University of Nebraska-Lincoln

Dr. David Harwood, UNL Earth and Atmospheric Sciences Professor, was in the field, but sent us a video about Climate Change, Past, Present and future



Weather campers then engaged in discussion about the topic



Calibrating our instruments prior to going into Memorial stadium to take temperature measurements throughout the entire stadium















26

37
36
35
34
33
32
31
30





16A

16B-1

16B-2

15

16



Touring the Press Box high above the stadium floor





Checking out the room where the football coach meets with the press following the game



Way up high in the East Stadium upper deck









NEBRASKA

HUSKERS

N

TOM OSBORNE FIELD

NATIONAL CHAMPIONS

CONFERENCE CHAMPIONS

NEBRASKA FOOTBALL



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	A	B	C	D	E	F
1	Memorial Stadium					
2	CF Red	Grace				
3	CF White		Ethan			
4	CF Dark Green	118	121			
5	CF Light Green	114.5	118			
6	W Stadium Sun	115.5	121.8			
7	W Stadium Shade	120.5	120.7			
8	E Stadium Sun	117	90.4			
9	E Stadium Shade	87	81.5			
10	S Stadium Bottom	88	90.4			
11	S Stadium Top	77	81.5			
12	S Stadium Walkway	107.5	114.4			
13	N Stadium Bottom	112	86.1			
14	N Stadium Top	78	78.8			
15	N Stadium Walkway	106	106.2			
16	E Stadium Addition	114.5	108			
17		76				
18		113.5				
19						



Back in the classroom, collecting and analyzing the data from inside the stadium



Visiting the UNL Meteorology lab to learn more about careers in atmospheric sciences







Dr. Adam Houston, UNL Meteorology, meets with the weather campers to tell them about his instrumented research vehicle that they use in tornado research













Touring the UNL NIMBUS laboratory where they are conducting drone research





Temperature profiling

- Challenges of lower atmospheric profiling
 - Cost, z-resolution, balloon-drift, deployment flexibility
- Suitability of UAS in lower atmospheric profiling
- Challenges in using UAS for lower atmospheric profiling
 - Battery life, pilot training, uncertainty of airflow around propeller being representative of actual air properties



<https://www.premierflight.com/newsletters/TrainingArticles/HiWeather/Balloon.html>



Image Credit: Dr. Garrick DeWeaver

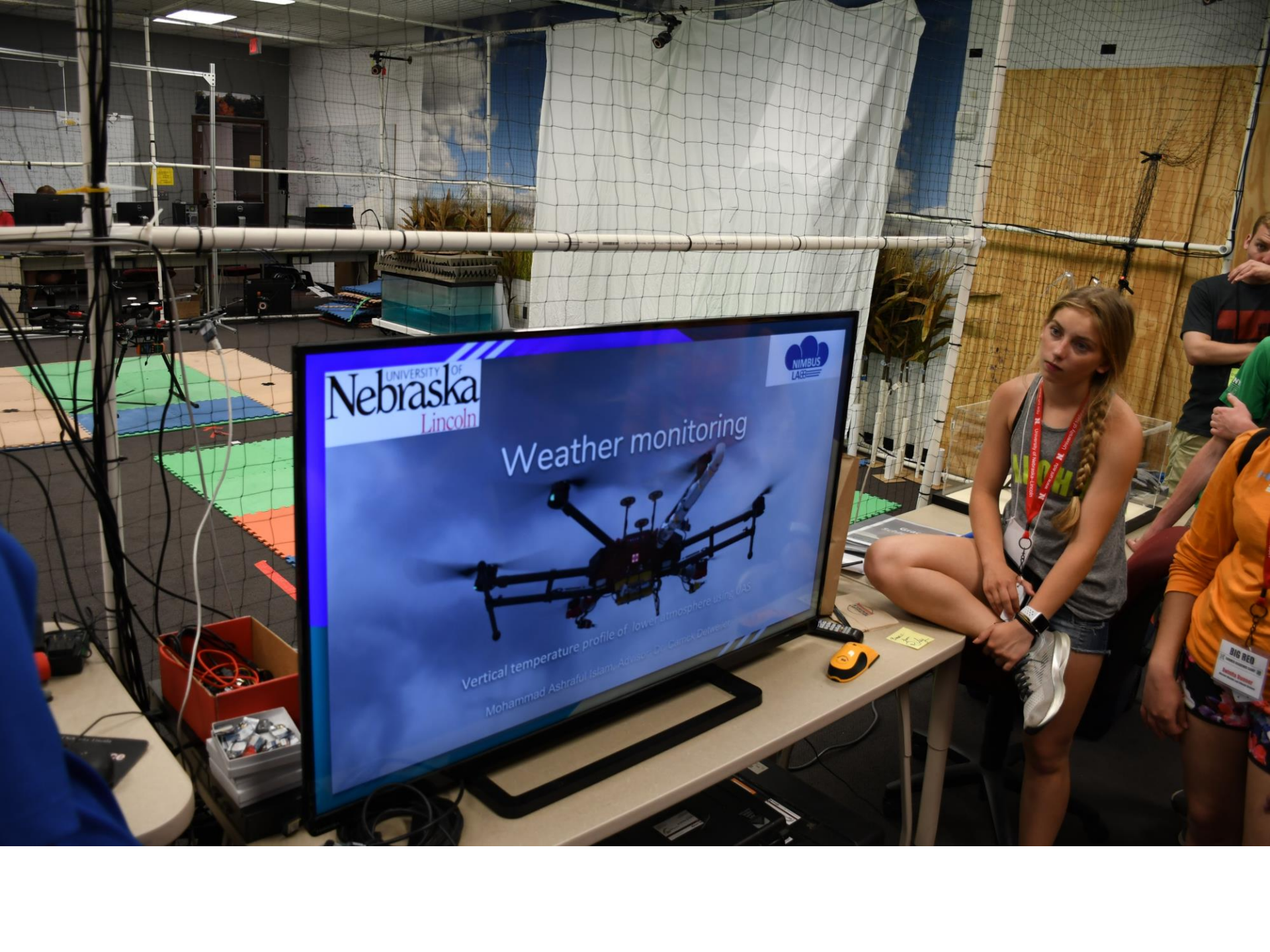
UNIVERSITY OF
Nebraska
Lincoln

NIMBUS
LAB

Weather monitoring

Vertical temperature profile of lower atmosphere using UAV

Mohammad Ashraful Islam, Advisor: Dr. Ganesha Debnath









Back in the classroom learning about heat conduction

Facilities Help
Call 472-1550
Multi-Media Help
Call 472-5511

- (4) 1. IR Thermometers
- 2. Drought - Soil Moisture
- 3. Memorial Stadium Microclimate
- (1) 4. Temp/Albedo-Conduction
- 5. Hairstone and Hair Dryer *Donovan, Brandon*
Severe Weather Safety
Verification
-Can Crusher *Dominic, Nicholas*

Foam: 77.0°F

Metal: 77





Late afternoon, all of the UNL Big Red Camps gathered together and each camp, including ours shown the stage, described for the group what they had been doing all week in camp



Weather Camp 2018!

University of Nebraska - Lincoln

Welcome to the
UNL WEATHER CAMP



2018 Weather Camp Schedule

Friday June 15:

8:30 am - 9:15 am	Weather Discussion/Observation; Hardin Hall 162
9:15 am - 9:45 am	Prepare for Capstone Event
9:45 am – 10:00 am	Travel to Green Screen Studio
10:00 am – 12:00 pm	Green Screen Experience, Mike Kamm, Ag. Communications
12:00 pm - 12:15 pm	Travel back to classroom
12:15 pm – 1:00 pm	Lunch
1:00 pm - 1:15 pm	Prepare for Capstone Event
1:15 pm - Completion	Capstone Event

Day 5: Friday, June 15, 2022

Daily weather map discussion





Daily weather observations for our weather journals



IT'S A
METEOROLOGY
THING, YOU
WOULDN'T
UNDERSTAND



Each weather camper practicing doing a weathercast before they went over to the green screen room to be recorded



This Week's 7 Day Outlook

Today	Sat	Sun	Mon	Tue	Wed	Thur
-Hot-	-Hot-	-Hot-				
100° 75°	99° 74°	97° 72°	89° 68°	86° 65°	87° 67°	90° 67°





UNL Weather Camp 2018 Television

Weathercaster
Ethan Greenberg

SPC Outlook 6/11/18



SPC DAY 1 CATEGORICAL OUTLOOK
ISSUED: 1859Z 06/11/2018
VALID: 11/0000Z-12/200Z
FORECASTER: GLEASON
NCA/NWS Storm Prediction Center, Norman, Oklahoma

Categorical Outlook Legend:

TSTM	1: MR
2: ENH	4: H



This Week's 7 Day Outlook



Today	Sat	Sun	Mon	Tue	Wed	Thur
100° 75°	99° 74°	97° 72°	89° 68°	86° 65°	87° 67°	90° 67°



Braedyn
McBroom

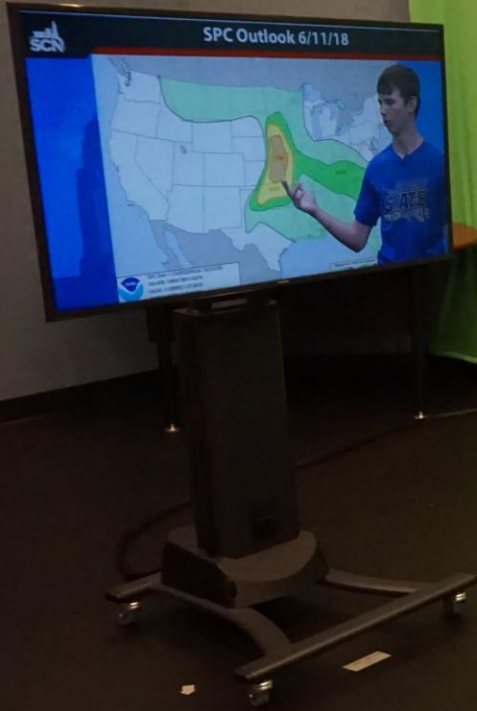


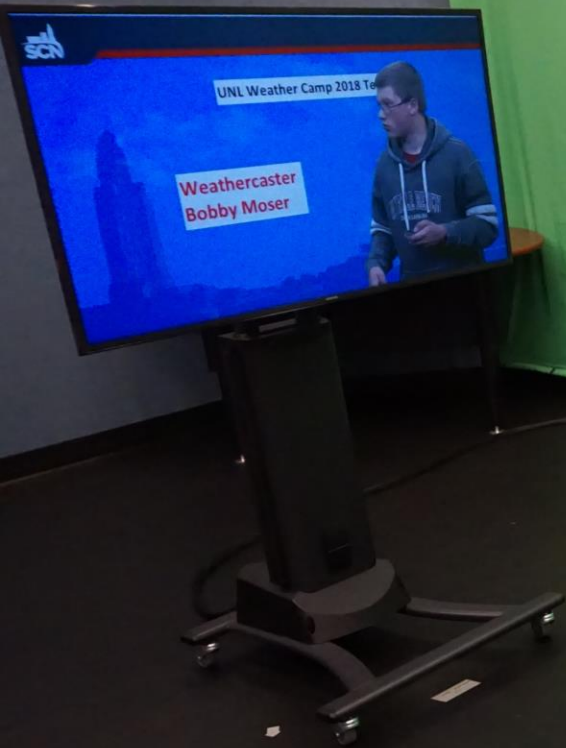
Mike Kamm, Producer, IANR Media at UNL and an Electronic Media Specialist helps the Weather Campers get ready for their experience of doing a Green Screen weathercast











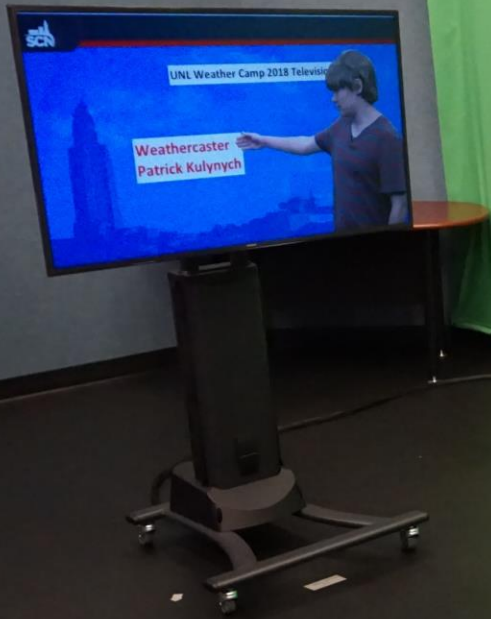
Today's Almanac

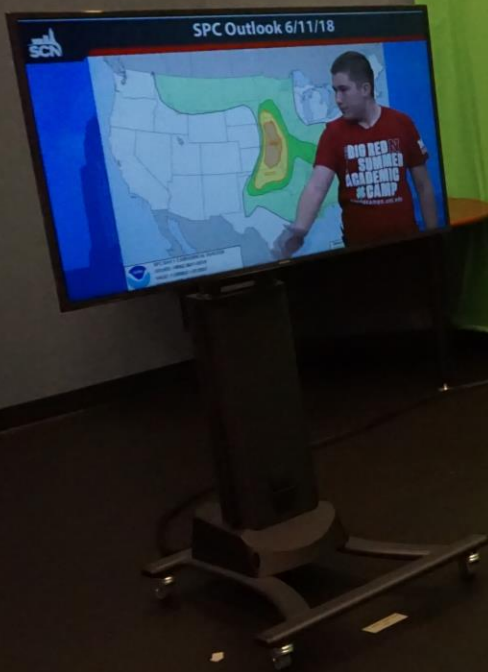
Friday, Jun 15th, 2018

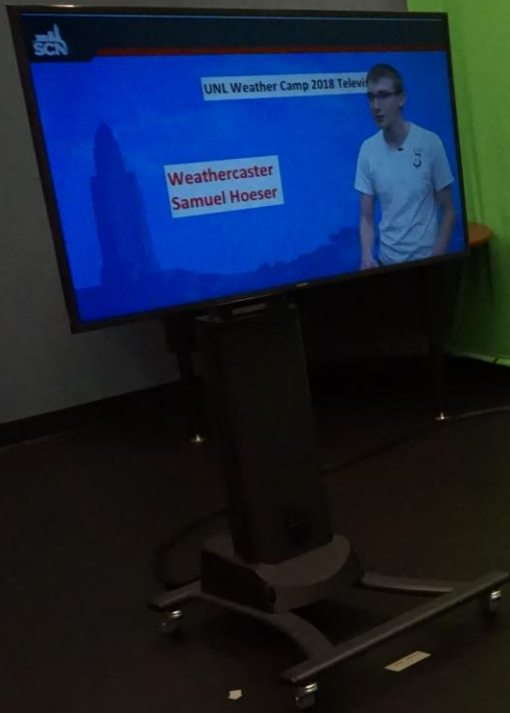
	Low	High
Forecast	75°	100°
Average	61°	84°
Record	44° (1970)	108° (1940)

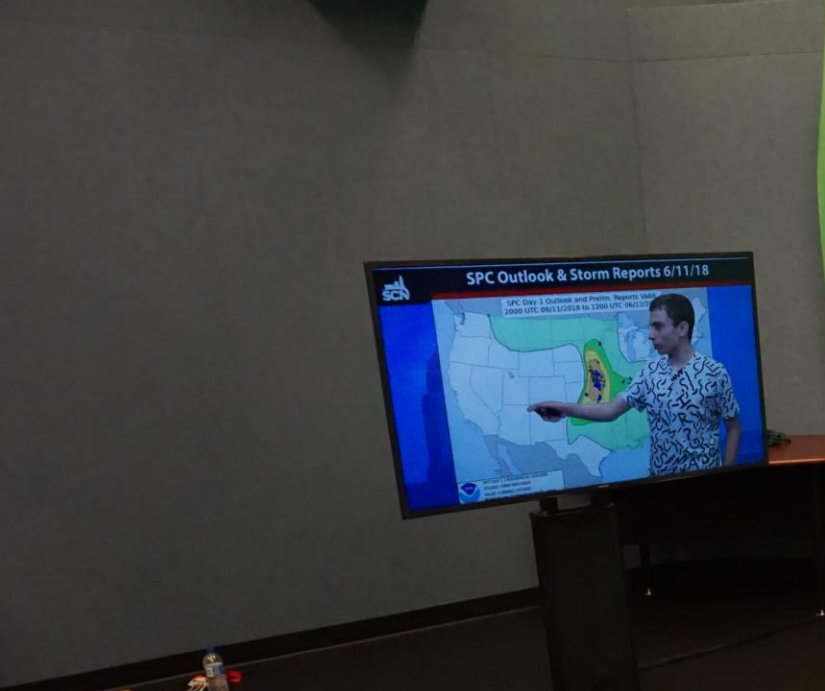
Sunrise: 5:54 am Sunset: 8:39 pm

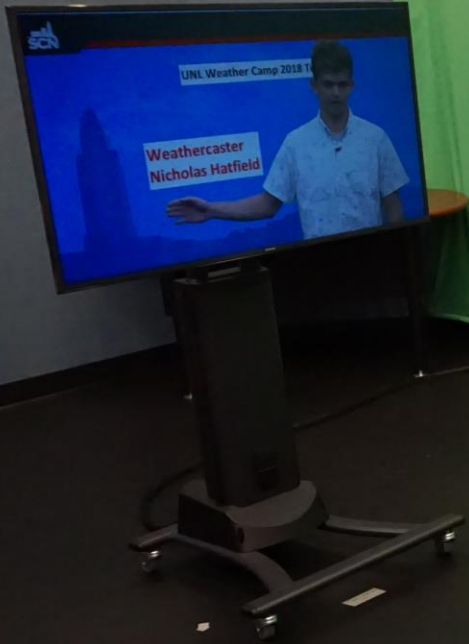












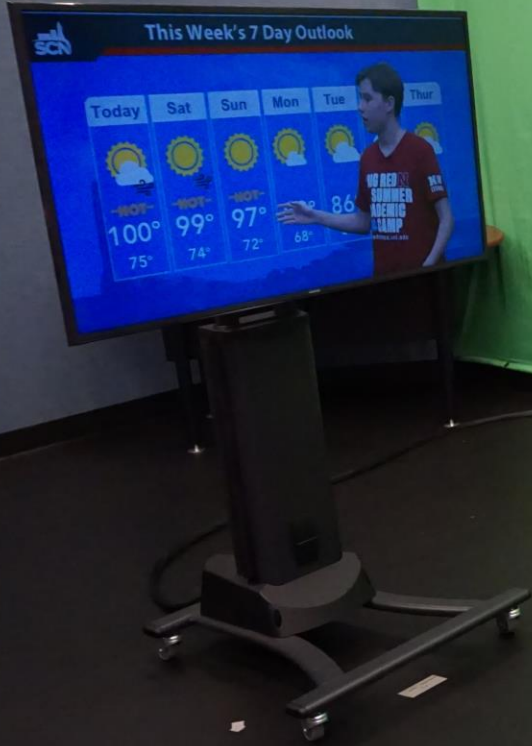














At the conclusion of all their individual weathercasts, we took a group photo in front of the green screen (note the monitor off to the left)



Relaxing before the parents arrived and the start of our Capstone event



When Thunder Roars, Go Indoor!

Item	Price
Memorial Stadium	100
Calibration	100
CF Red	100
CF White	140
CF Dark Green	100
CF Light Green	100
W Stadium Sun	100
W Stadium Shade	100
E Stadium Sun	100
E Stadium Shade	100
S Stadium Bottom	100
S Stadium Top	100
S Stadium Walkway	100
N Stadium Bottom	100
N Stadium Top	100
N Stadium Walkway	100
E Stadium	100



Capstone 2018. The parents and friends of the weather campers have arrived, and we are ready to showcase what we did all week



N Welcome to the N
UNL WEATHER CAMP



snr user
H# over!



The amount of time between the flash of lightning and the sound of thunder tells you how far away the lightning is. Hit or Myth?

Welcome to the U.S. OPEN CAMP



Thursday

After taking weather observations and watching a virtual presentation by Dr. Dave Harwood, campers walked over to Memorial Stadium to study microclimates. Later in the day, campers met Dr. Houston, who showed them the Comet Chase Vehicle and talked about the technical side of storm chasing. Afterwards, they went to the Nimbus Lab on campus to meet with Dr. Carrick Detweiler who ran demonstrations involving drones.



Welcome to the
UNL WEATHER CAMP

163A

EQUIPMENT

NEW
UNL
WEATHER
CAMP
unl.edu

N | E
EXTENSION





Offutt AFB



57th WEATHER WING



Welcome to the UNL WEATHER CAMP

163A EQUIPMENT

PLEASE KEEP FAIR AISLES CLEAR OF CHAIRS



Each of the instructors (and Dalton not in the photo) received a certificate saying that UNL proudly recognized that they were an outstanding Weather Camp Instructor



Each of the weather campers received a certificate of achievement from our weather camp Director and another one from the Big Red Camps Director

JUNE 10-15, 2018



WEATHERCAMP

The University of Nebraska-Lincoln
proudly recognizes

Cameron Campbell

for being "Weather Wise"



Sponsored by UNL 4-H Big Red Camps, UNL Earth & Atmospheric Sciences,
UNL Geography, Nebraska Extension, Raytheon and LI-COR

Certificate of Accomplishment

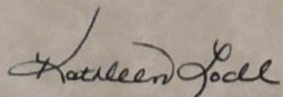
presented to

Braedyn McBroom

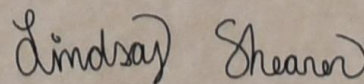
in recognition of completion in

Discover Weather and Climate Science

June 15, 2018



State 4-H Program Administrator



Camp Representative



Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln cooperating with the Counties and the United States Department of Agriculture.

The 4-H Youth Development program abides with the nondiscrimination policies of the University of Nebraska-Lincoln and the United States Department of Agriculture.



I heard laughter and noise in the hallway, and they called me out there to take one more photo, a group photo of all the weather campers and instructors