Josh Durkee, Ph.D.

Consulting Meteorologist

2020-present

Professor, Graduate Faculty, Honors Faculty

Vice Chair (2021-present) for Earth, Environmental, & Atmospheric Sciences

Western Kentucky University, Bowling Green, KY.

2018-present

University Meteorologist

Western Kentucky University

Bowling Green, KY.

2016-present

Faculty Leadership Fellow

Western Kentucky University

Bowling Green, KY.

2016-present

Adjunct/Visiting Professor

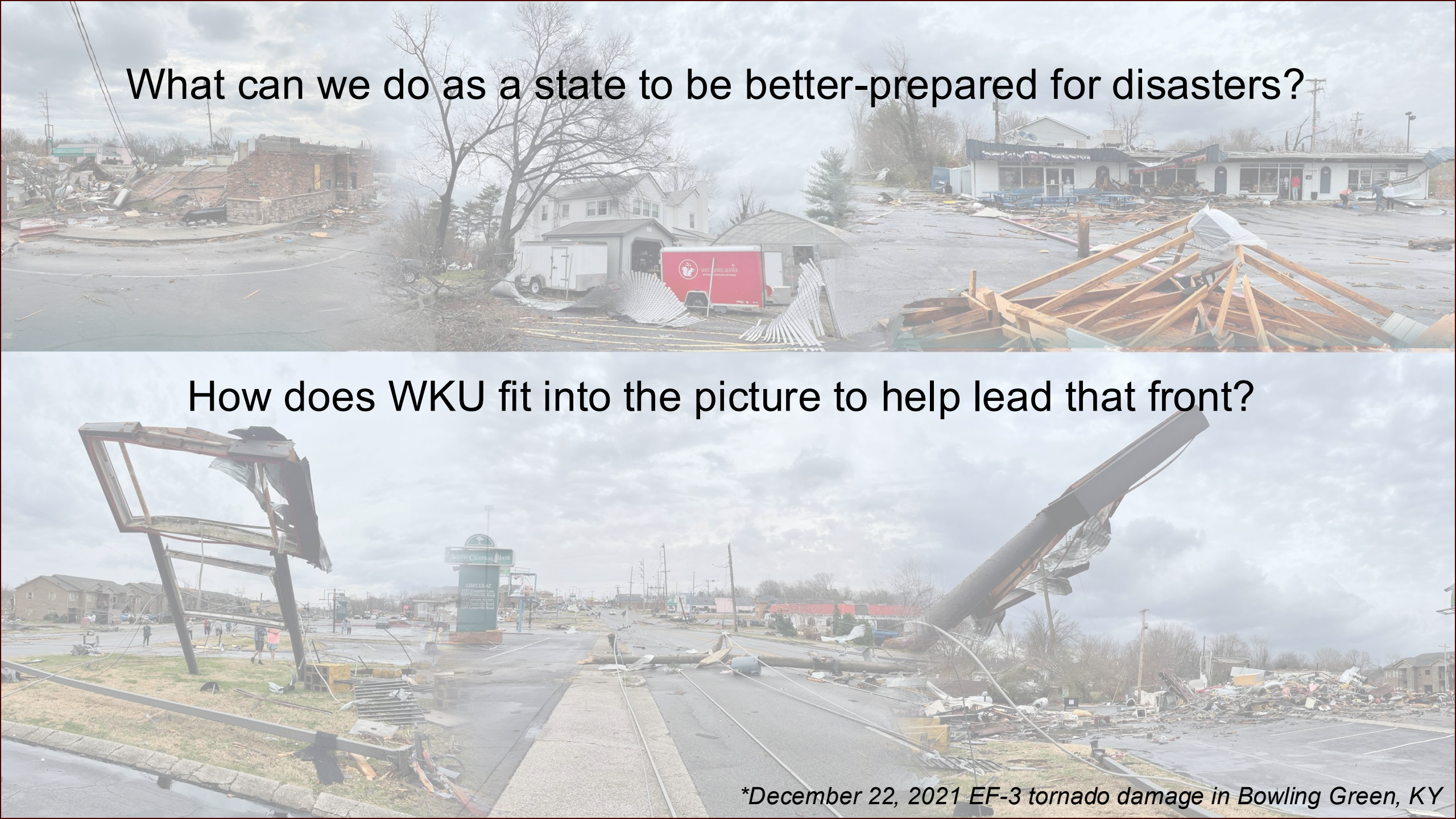
Department of Geosciences

Fort Hays State University

Hays, KS.

What can we do as a state to be better-prepared for disasters?

How does WKU fit into the picture to help lead that front?



*December 22, 2021 EF-3 tornado damage in Bowling Green, KY

Photo by Joe Imel

WKU

DISASTER SCIENCES

Consortium of Disaster Science & Management

Academic Programs

- B.S. Meteorology
- M.S. Homeland Security Science
- Emergency Management
- Disaster Science Certificate (*graduate/undergraduate*)
- Geographic Information Systems

Workforce Training

Industry Partners

- Kentucky Bourbon Industry
- University Events
- D1 Athletics
- World Major Marathons
- Major National Festival Events
- Professional Sports Industry

Companion Programs

- Public Health
- Military Science
- Criminology
- Environmental Science
- Kinesiology Sports & Recreation
- Organizational Leadership

Multidisciplinary Collaboration

New Academic Programs

- B.S. Disaster Science
- M.S. Disaster Science
- Ph.D./DSc Disaster Science

Key Initiatives

Kentucky Climate Center: State Climate Office
- *State Climatologist/Assistant State Climatologist
- *Official repository for state-wide weather & climate data
- *Primary research for scientific inquiry

Kentucky Mesonet: Weather Data Collection/Climate Monitoring Network
- *Director: Kentucky State Climatologist
- *Official state-wide weather & climate infrastructure network

Disaster Science Operations Center: Operational Meteorology & Emergency Management
- *Directors: University Meteorologist & University Emergency Manager
- *Nexus for Disaster Preparedness (vision: state hub)
- *Meteorological Forecasting, Emergency Planning, Crisis Management, Decision-Support for agencies, venues, and events (remote and onsite)
- *Professional Training: advanced forecasting for severe weather, FEMA certifications, microdentialing for custom needs, education outreach
- *Research-to-operations for industry enhancement
- *Primary research for scientific inquiry

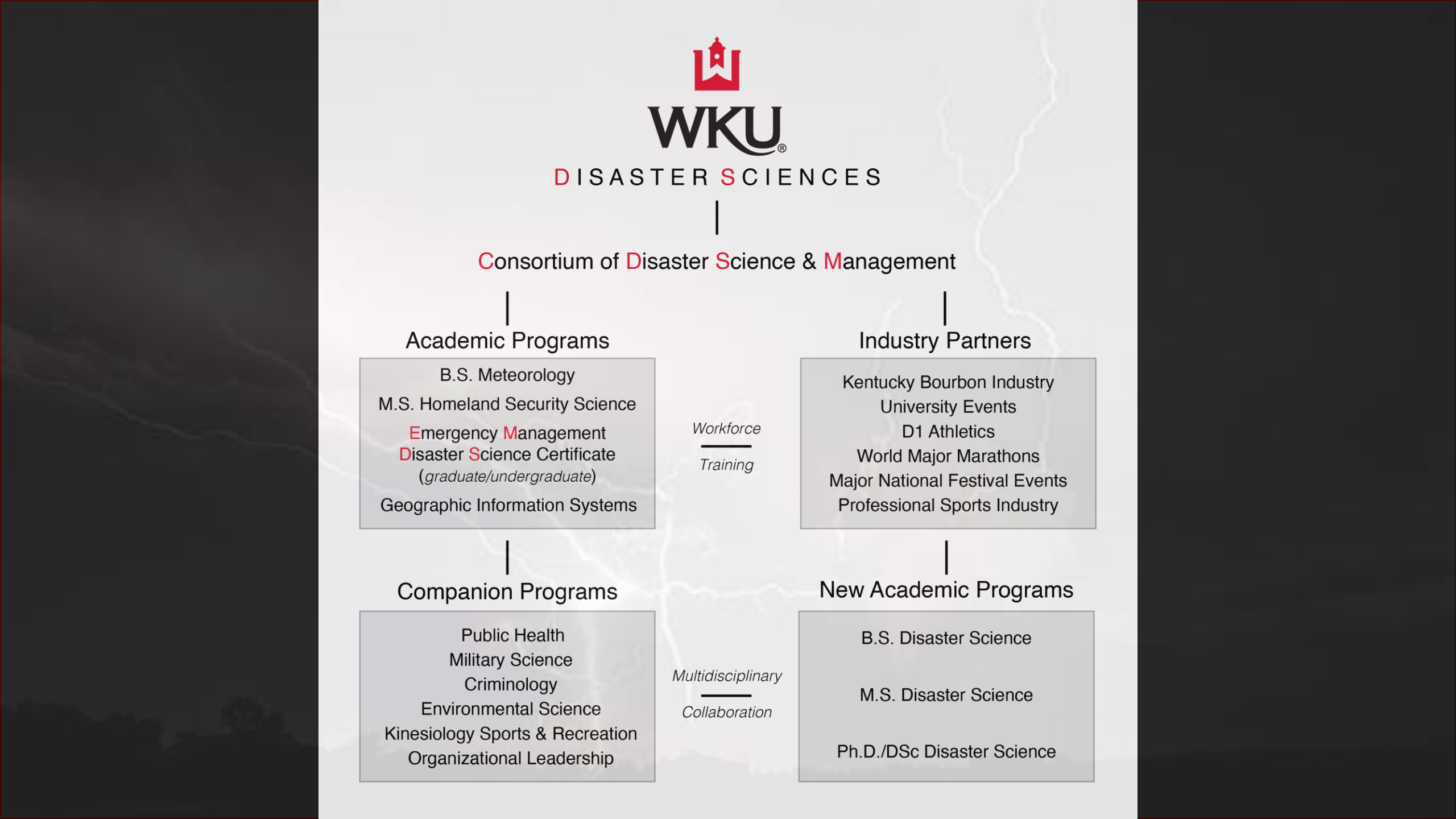
A Synoptic Perspective of the Record 1–2 May 2010 Mid-South Heavy Precipitation Event

BY JOSHUA D. DURKEE, LEE CAMPBELL, KYLE BERRY, DUSTIN JORDAN, GREGORY GOODRICH, REZAUL MAHMOOD, AND STUART FOSTER

During 1–2 May 2010, a series of strong thunderstorms led to 41, 57, and 43 tornado, severe wind, and severe hail reports, respectively, across portions of the southern United States. In addition to severe weather, these storms also distributed record-setting rainfall amounts across the mid-South region, which contributed to historic flooding across portions of central and western Kentucky and Tennessee (Fig. 1). This heavy precipitation event was sampled by multiple surface observational networks, including (but not limited to) 48 research-grade automated stations from the Kentucky Mesonet (www.kymesonet.org), first-order automated stations from the National Weather Service (NWS; www.ncdc.noaa.gov/oa/ncdc.html), and Community Collaborative Rain, Hail and Snow Network Stations (CoCoRaHS), some of which recorded more than 350 mm of rain during the two-day period across portions of the region (Fig. 2).

The Kentucky Mesonet station in Bowling Green recorded the greatest rainfall intensity for the state, with 8.38 mm during a 5-min period, and 50.8 mm during an hour (Fig. 3). Bowling Green, Kentucky, also received the greatest amount of rainfall in the state with 258 mm, which broke the previous all-time two-day precipitation record for the state of 211 mm set during 6–7 December 1924. Moreover, Bowling Green received more than 120 mm each day, which ranks as the sixth (124.9 mm) and eighth (120.6 mm) greatest daily rainfall totals in Kentucky since 1900. According to the NWS office in Nashville, Tennessee, Camden, Tennessee, received the most rainfall in the state with 493 mm, which also set a new precipitation record. One CoCoRaHS station in Camden reported nearly 338 mm during a 24-h period, which was 7.62 mm shy of the all-time 24-h precipitation record for Tennessee. Nashville received more than 150 mm each day of the event, which ranked as the third-most (158.2 mm) and greatest (184.2 mm) 24-h rainfall accumulations of all time, and subsequently marked the wettest May on record for the city. In fact, many prior rainfall records that fell to the 1–2 May 2010 extratropical heavy precipitation event were originally produced by systems that were tropical in origin (e.g., Hurricanes Frederic and Katrina in 1979 and 2005, respectively).

Dating back to November 2009, antecedent precipitation across central Kentucky and Tennessee was as much as 300 mm below normal, which resulted in moderate drought conditions, according to the U.S. Drought Monitor. However, despite the relatively dry surface conditions, the intense rainfall that began 1 May resulted in runoff into nearby streams and rivers. Repeated heavy precipitation during the 48-h period ultimately helped produce 20 new flood-stage records within six river basins across the region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(graduate/undergraduate)
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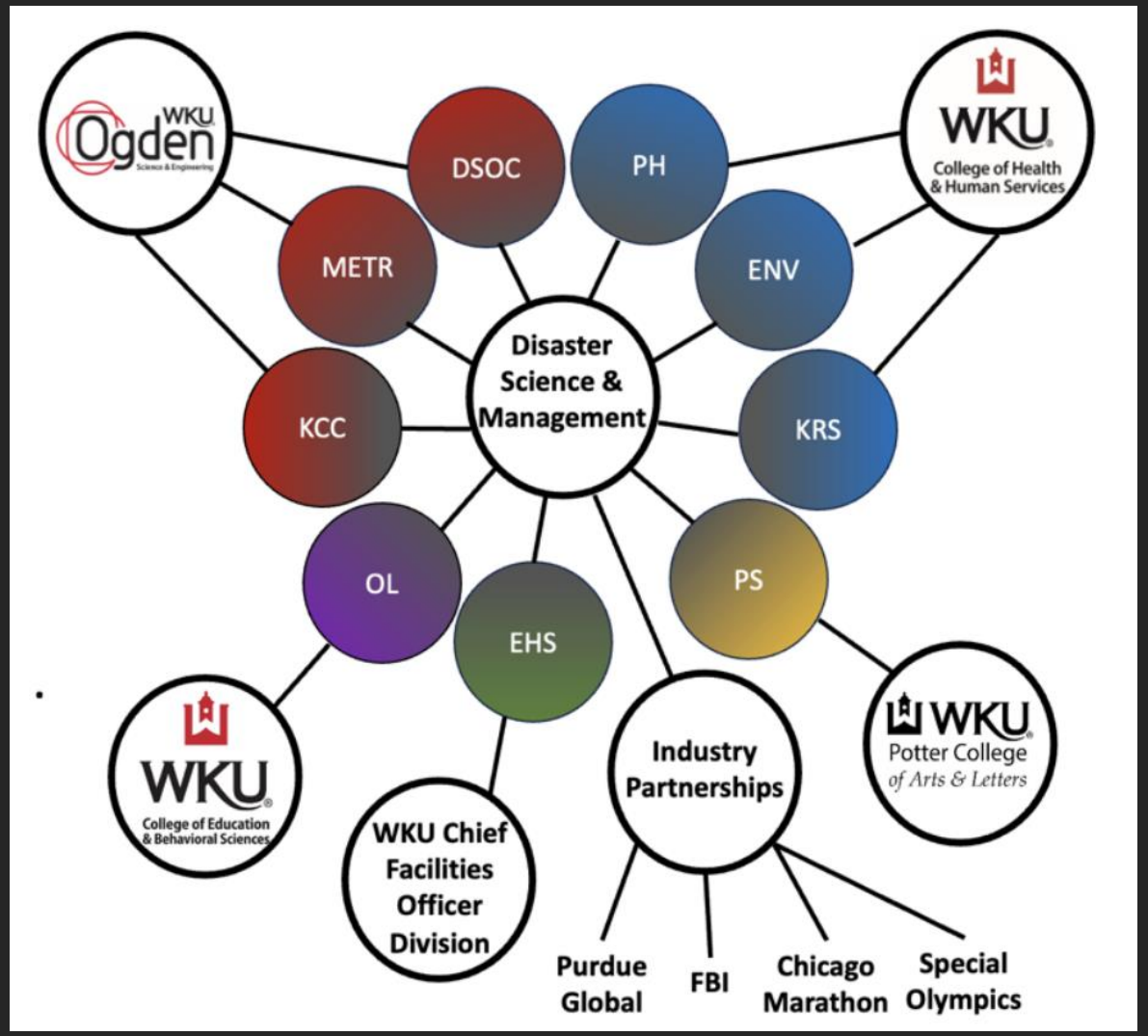
D1 Athletics
World Major Marathons
Major National Festival Events
Professional Sports Industry
Workforce
Training
Companion Programs
Public Health
Military Science
Criminology
Environmental Science
Kinesiology Sports & Recreation
Organizational Leadership
Multidisciplinary
Collaboration
New Academic Programs
B.S. Disaster Science
M.S. Disaster Science
Ph.D./DSc Disaster Science

- Kentucky, specifically, is highly susceptible to natural hazards, where between 1990-2022, seven of the top twelve counties in the U.S. with the most federal disaster declarations were in the state.

- Despite the elevated risk our region has, there are limited educational opportunities within the Commonwealth for students to gain the necessary skills and experiences to successfully enter the workforce as a disaster scientist and/or emergency manager with contemporary skills in crisis mitigation, management, and response.



*WKU is well-poised to serve as the hub of disaster preparedness for the Commonwealth

Department of
Earth, Environmental, & Atmospheric Sciences

Degrees offered:

- **Bachelor of Science** in Meteorology (50 hrs)
- Certificate in Emergency Management Disaster Science (EMDS; 15 hrs)
- Certificate in Geographic Information Systems (GIS; 20 hrs)

WKU Meteorology Career Placement

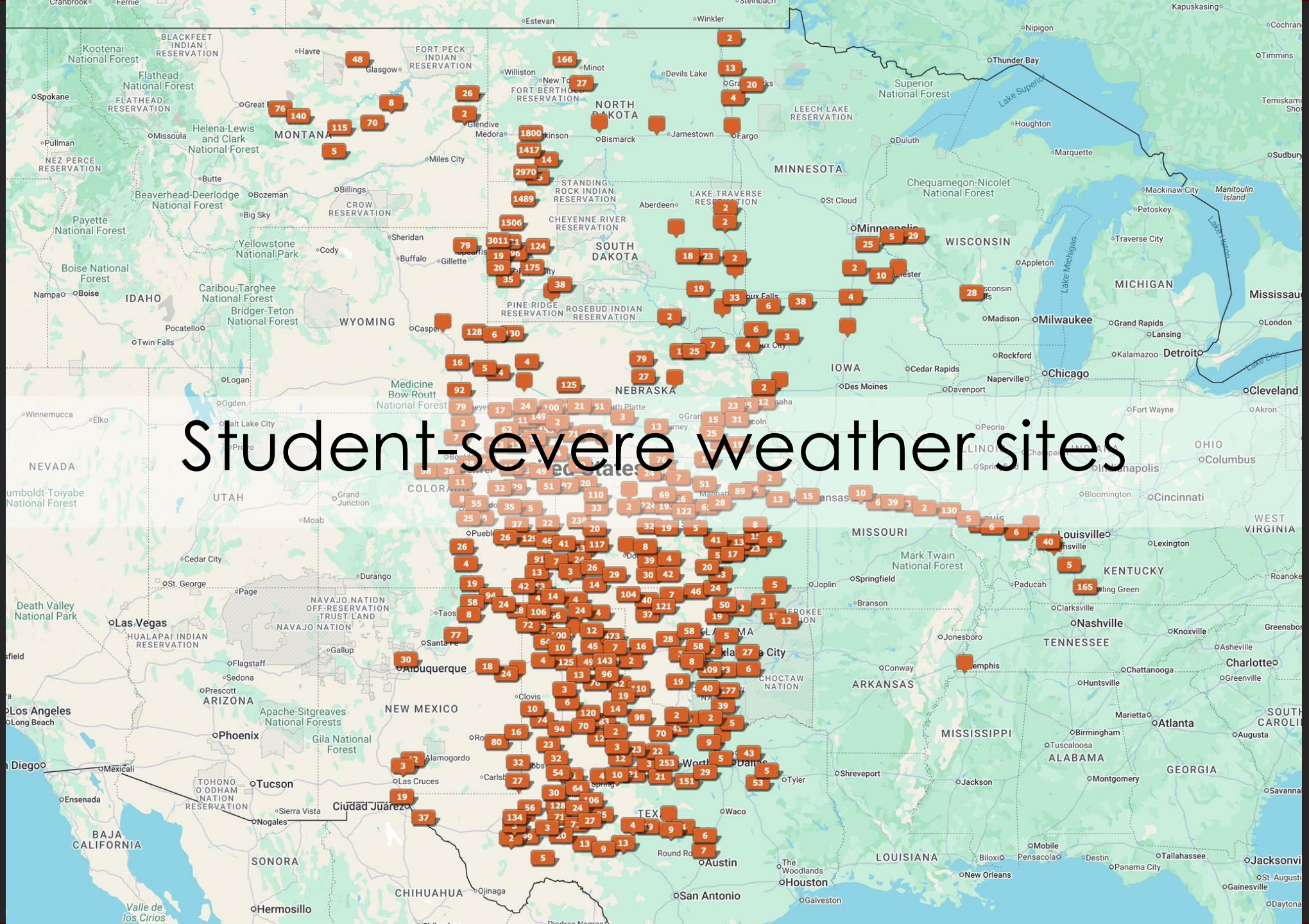
- Operational Forecasting (NWS)
- Broadcast Meteorology
- Emergency Management
- Corporate/Enterprise Solutions
- Graduate School/Climate Research

The B.S. in Meteorology degree at WKU meets all the requirements (GS-1340) for employment by the National Weather Service and American Meteorological Society.

WKU METEOROLOGY


WKU STORM CHASE


© JOSH DURKEE


Student-severe weather sites

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*Research-to-operations for industry enhancement

*Primary research for scientific inquiry

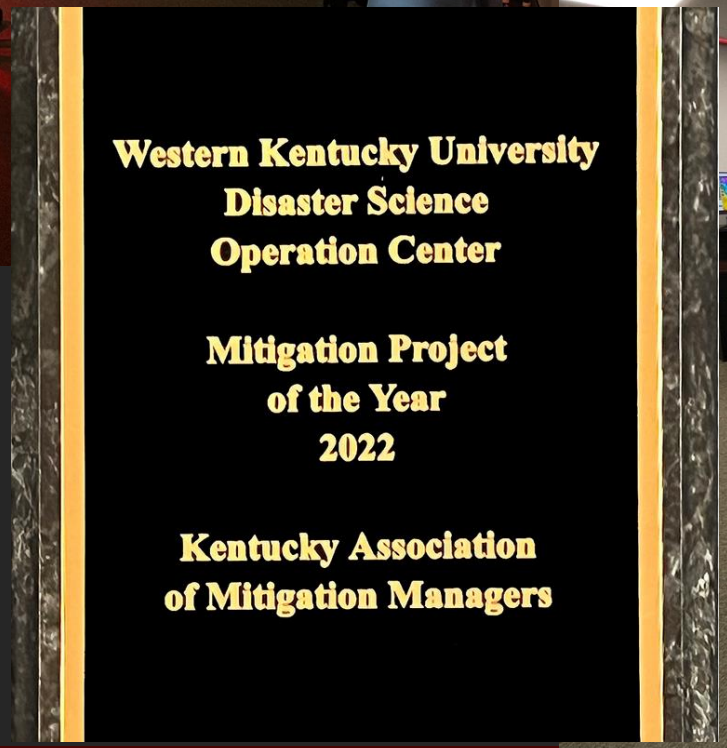
DISASTER SCIENCE OPERATIONS CENTER

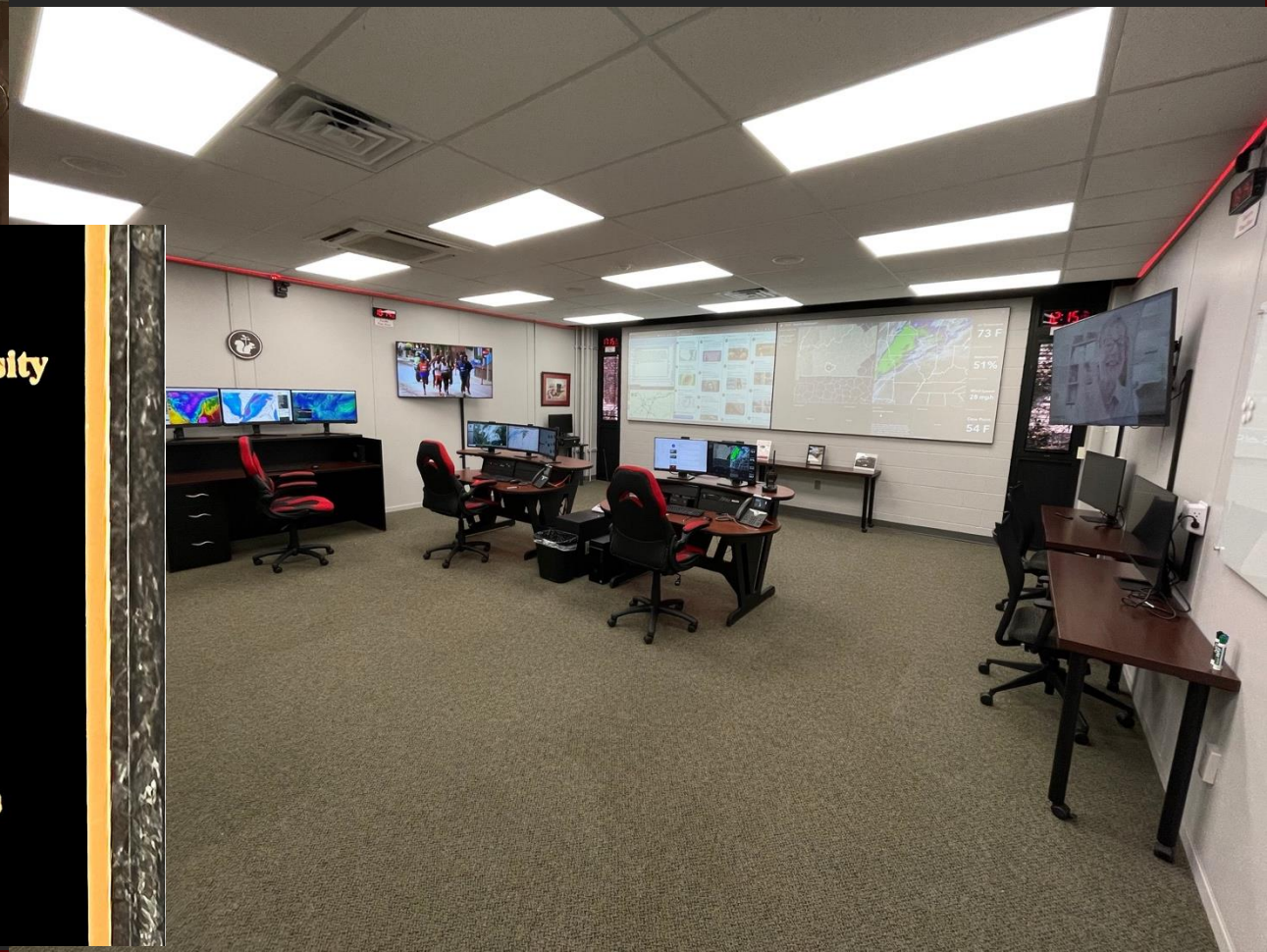
Proactive Intelligence


DSO
DISASTER SCIENCE OPERATION
NWS Storm Prediction Center
News 40 | WNKY Television
WHAT'S HAPPENING SOKY – World's Greatest Studio Art Tour
WKU Police


DSOC Weather Dashboard
69.1 F
59%
22 mph
54 F
15:30
10:30
DSOC
DISASTER SCIENCE OPERATIONS CENTER


DISASTER SCIENCE OPERATIONS CENTER

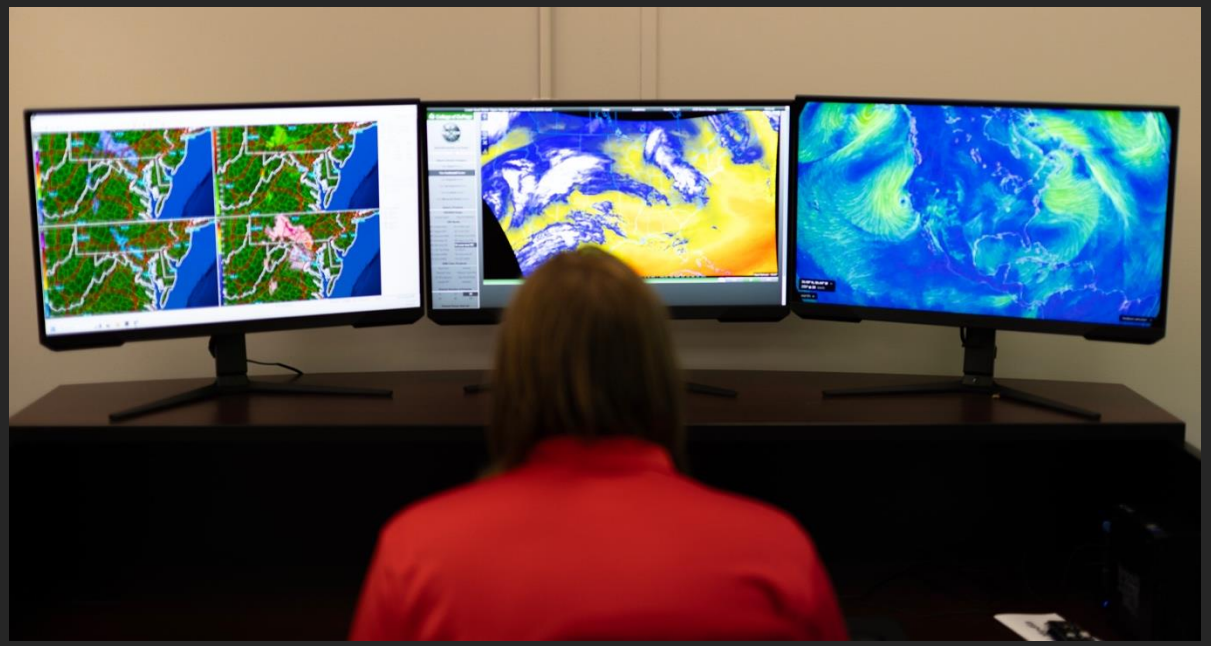

Western Kentucky University
Disaster Science
Operation Center
Mitigation Project
of the Year
2022
Kentucky Association
of Mitigation Managers

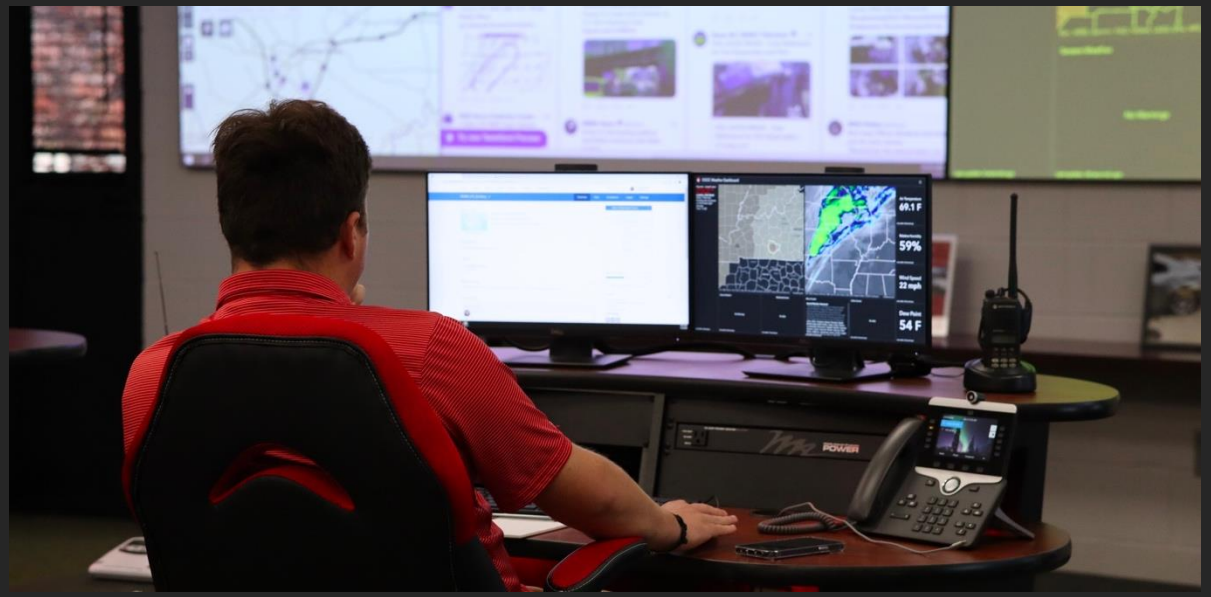


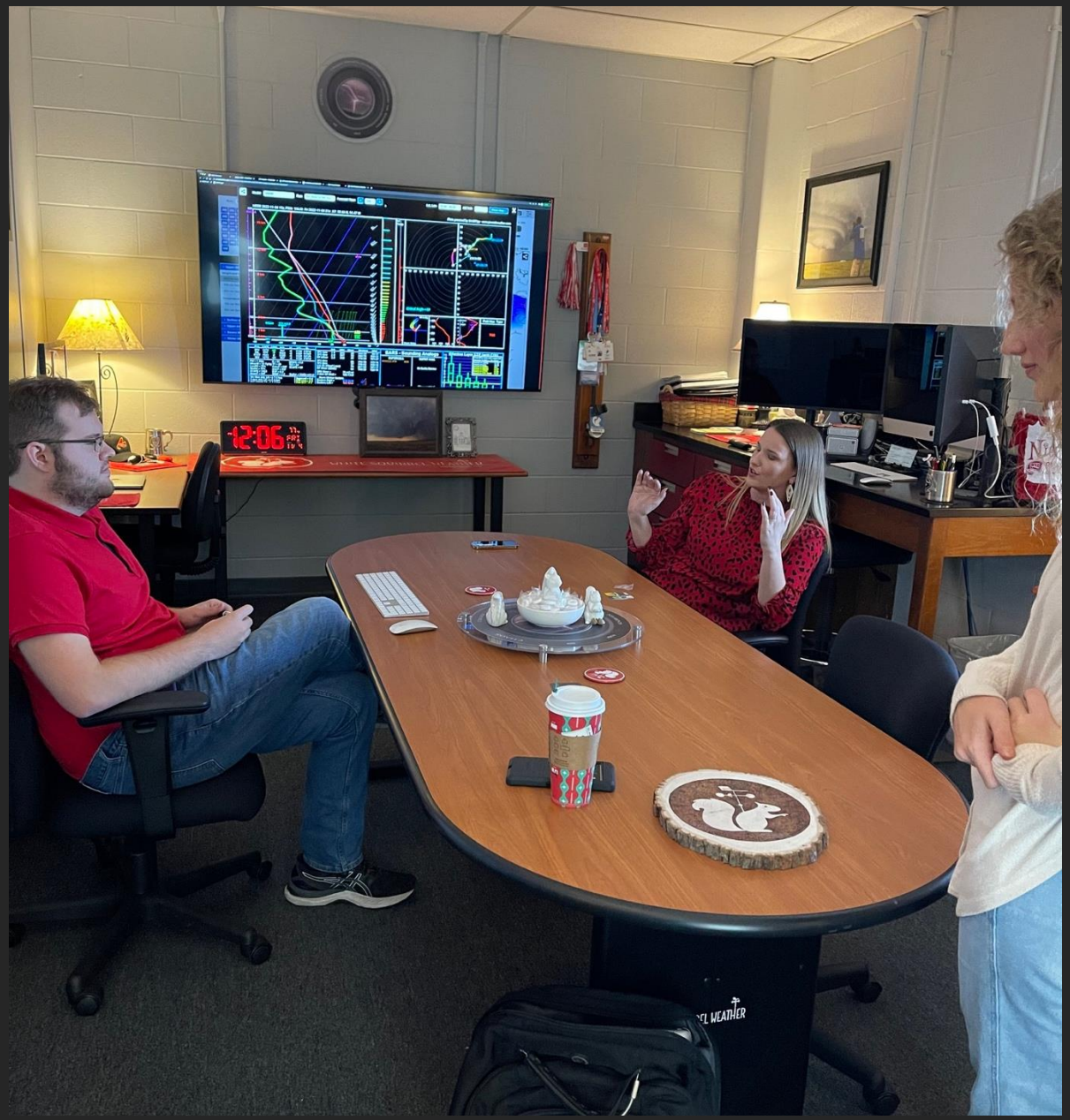
DSOC Research Studio

DSOC Training Classroom

Forecast Briefing Space




POWER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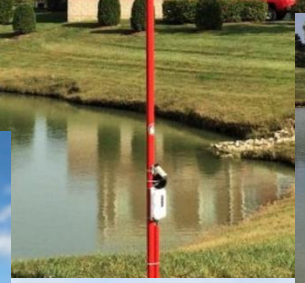
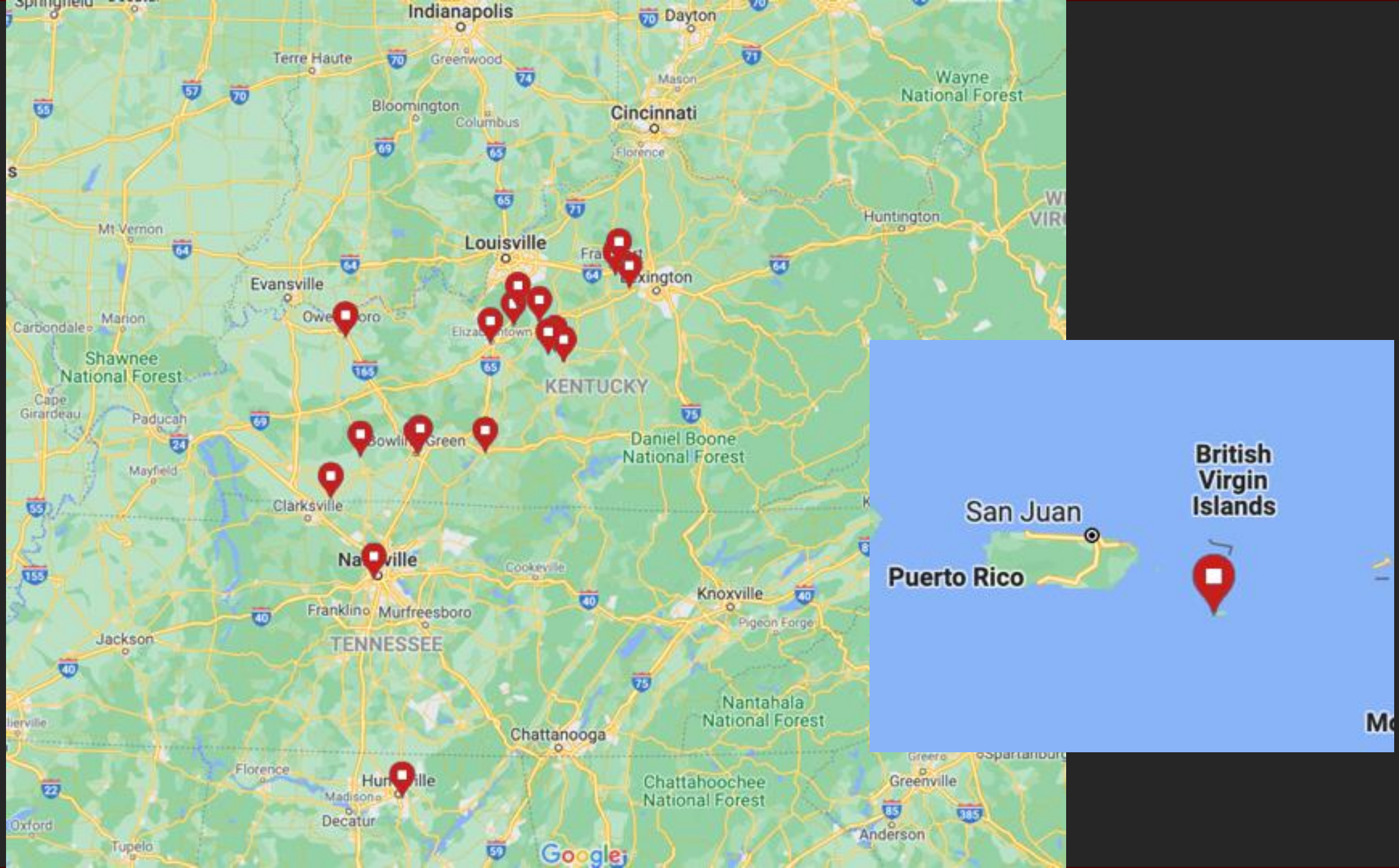



WHITE SQUIRREL WEATHER
07/12/2017 05:49:16 PM


STOP


WHITE SQUIRREL WEATHER.
at Western Kentucky University
WKU
WKU
WKU
PBS
npr


Indianapolis
Dayton
Terre Haute
Greenwood
Bloomington
Columbus
Cincinnati
Mason
Wayne
National Forest
Florence
Huntington
Mt Vernon
Louisville
Evansville
Lexington
Carbondale
Marion
Shawnee
National Forest
KENTUCKY
Cape
Girardeau
Paducah
Bowling Green
Daniel Boone
National Forest
Mayfield
Clarksville
Nashville
Cookeville
Knoxville
Pigeon Forge
Franklin
Murfreesboro
TENNESSEE
Jackson
Nantahala
National Forest
Chattanooga
Florence
Madison
Decatur
Chattahoochee
National Forest
Greenville
Anderson
Oxford
Tupelo
San Juan
Puerto Rico
British
Virgin
Islands
Google


Maker's Mark

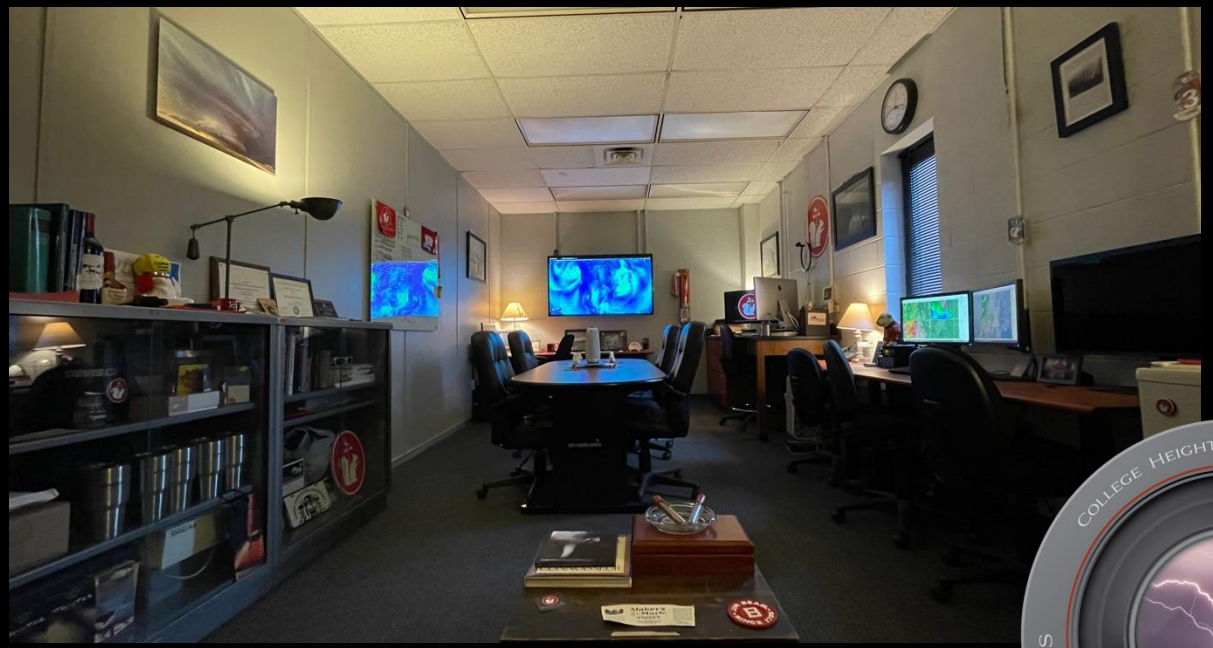

WHITE SQUIRREL WEATHER


JIM BEAM


Maker's Mark

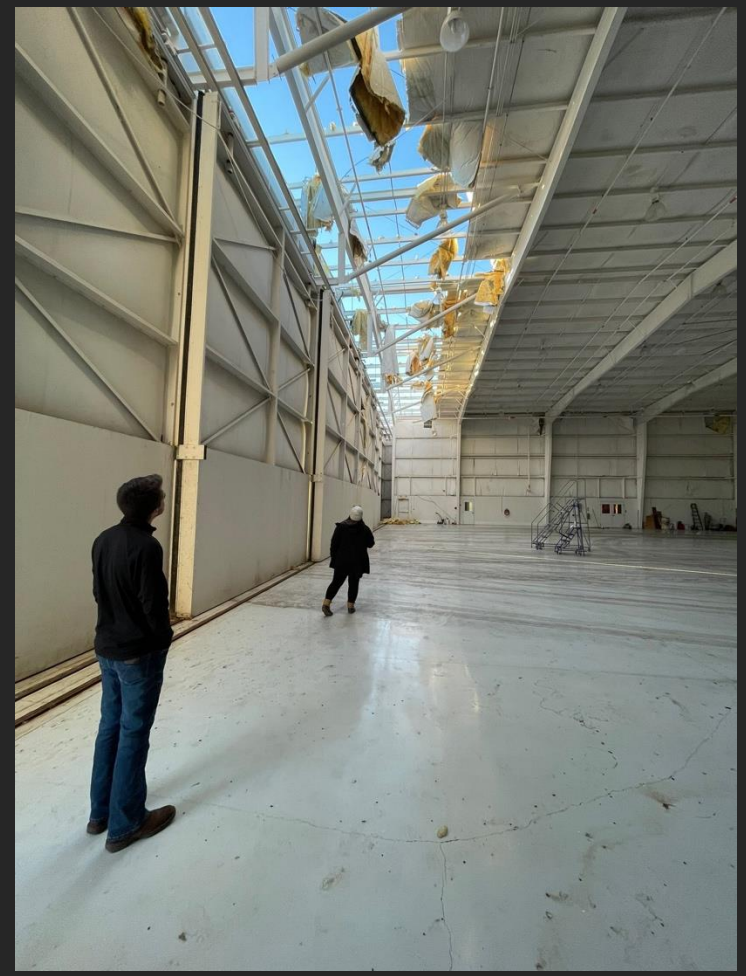

JIM BEAM
TASTING ROOM
DISTILLED AND BOTTLED BY
JAMES B BEAM DISTILLING CO
BEAM • CLERMONT
FRANKFORT, KENTUCKY USA


CRUZAN

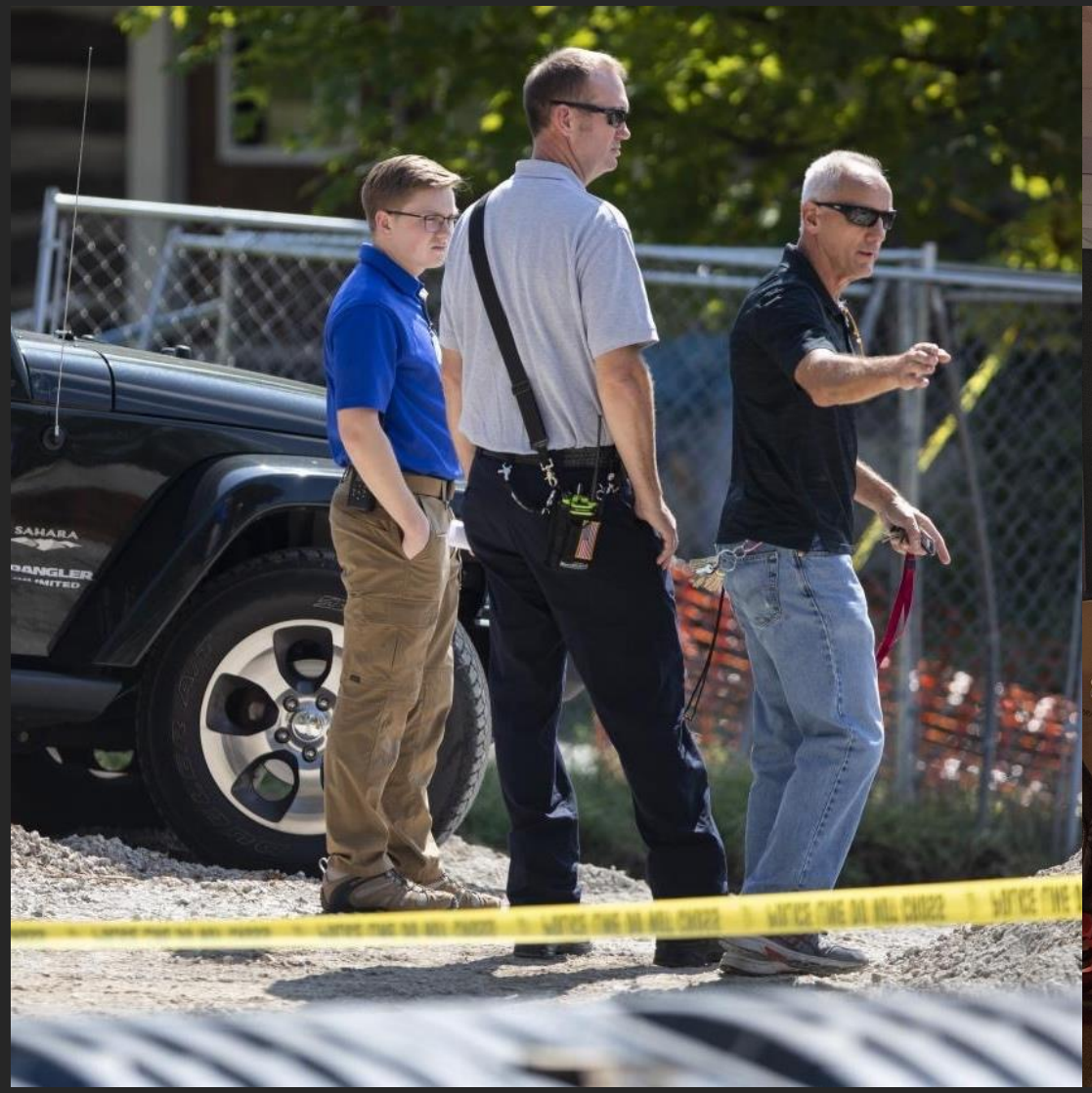



College Heights Atmospheric Observatory for Students
CHAOS
H.264
20x

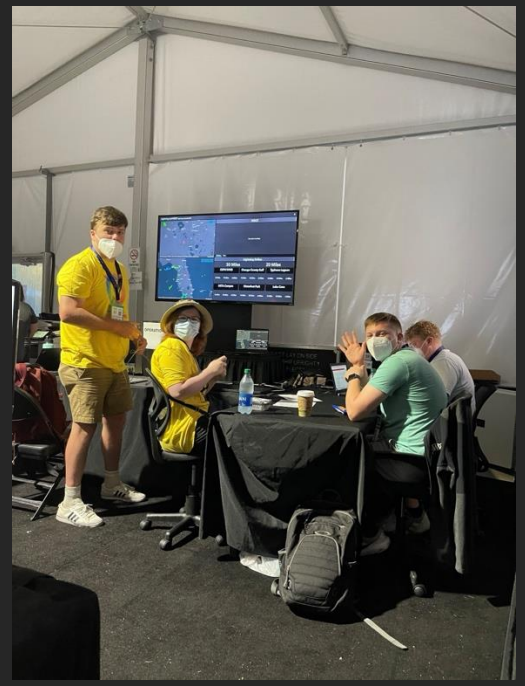
WKU METEOROLOGY, DSOC, WHITE SQUIRREL WEATHER, WKU ENGINEERING, NWS SURVEY TORNADO DAMAGE DEC 2021



DSOC Operations: local bomb threat



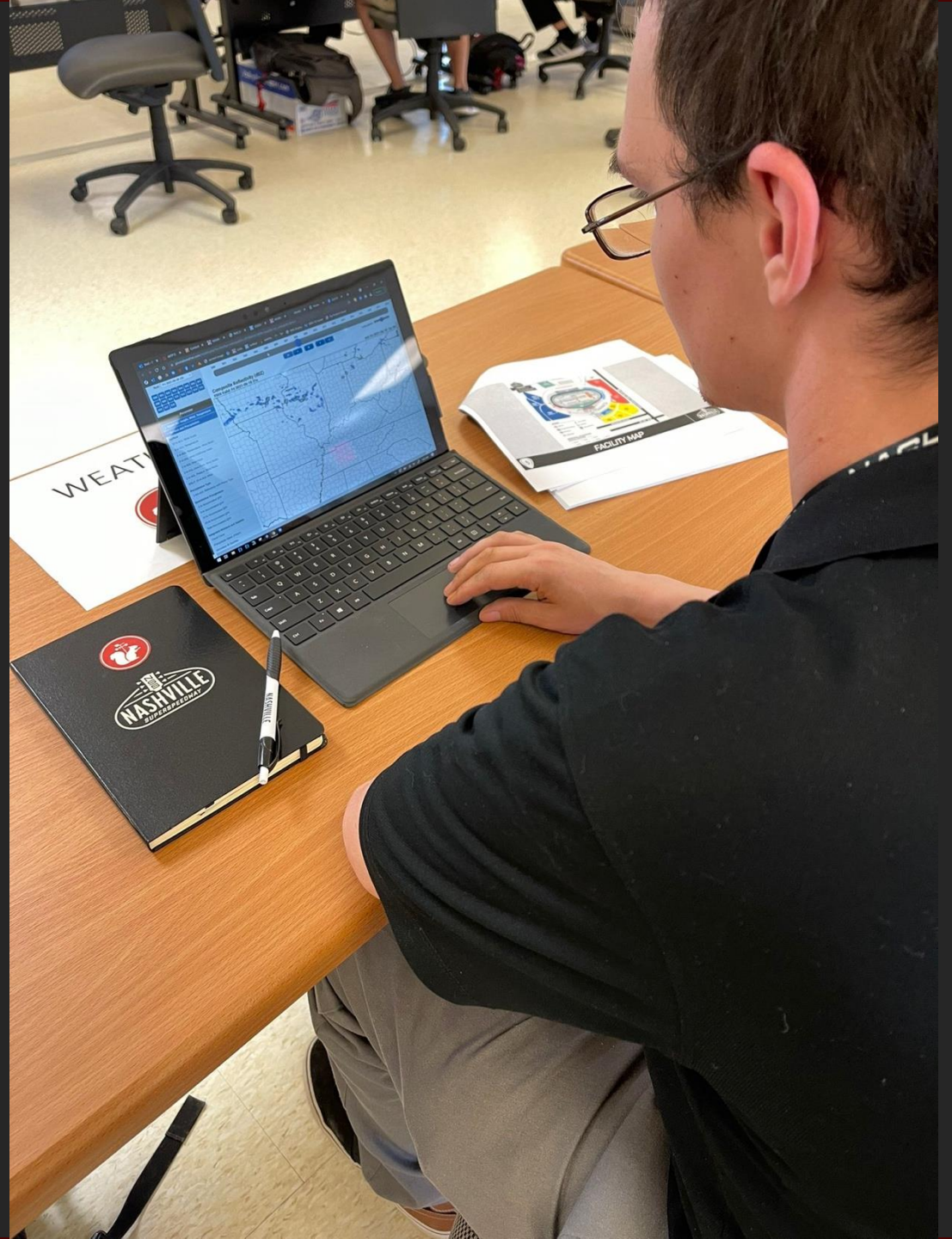
Student-centered Initiatives: All Hazards



Applied Research-to-Operations


NASHVILLE
ally
400
DOORDASH
#NASHCAR

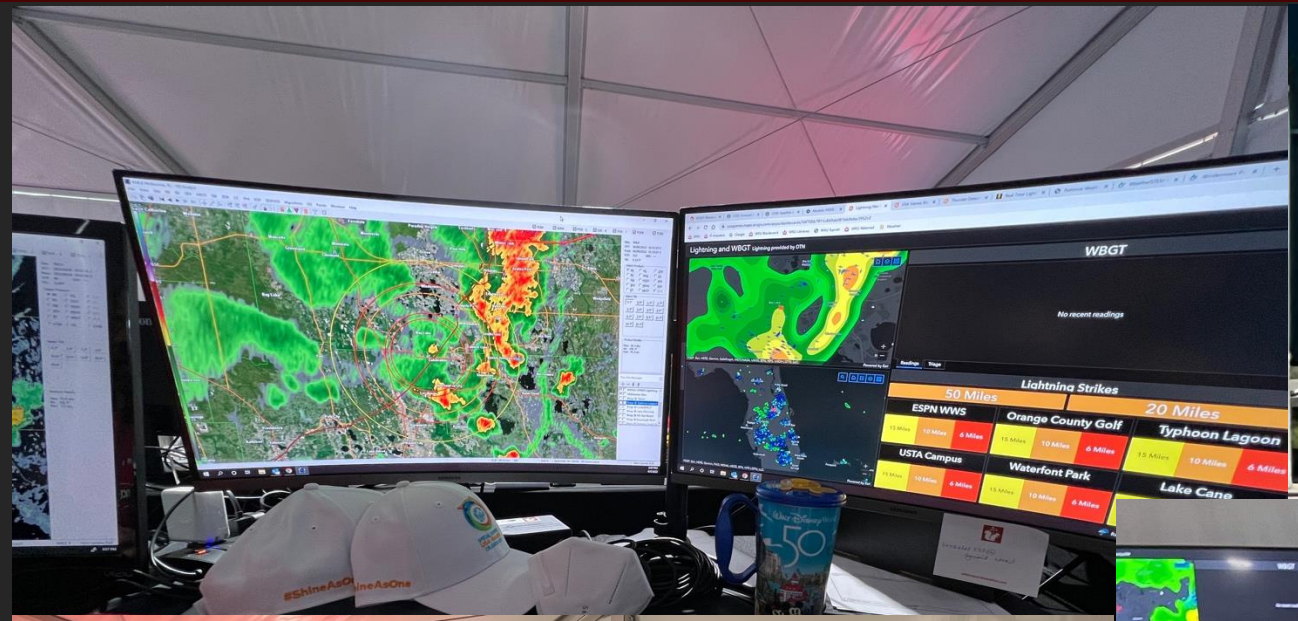

JOC Meteorologist 364455
NASCAR
Your current options
Redial
New Call
CFwdALL
messages
directories
services
help
settings
VOLUME
HEADSET
MUTE
SPEAKER


FACILITY MAP
NASHVILLE
SUPERSPEEDWAY

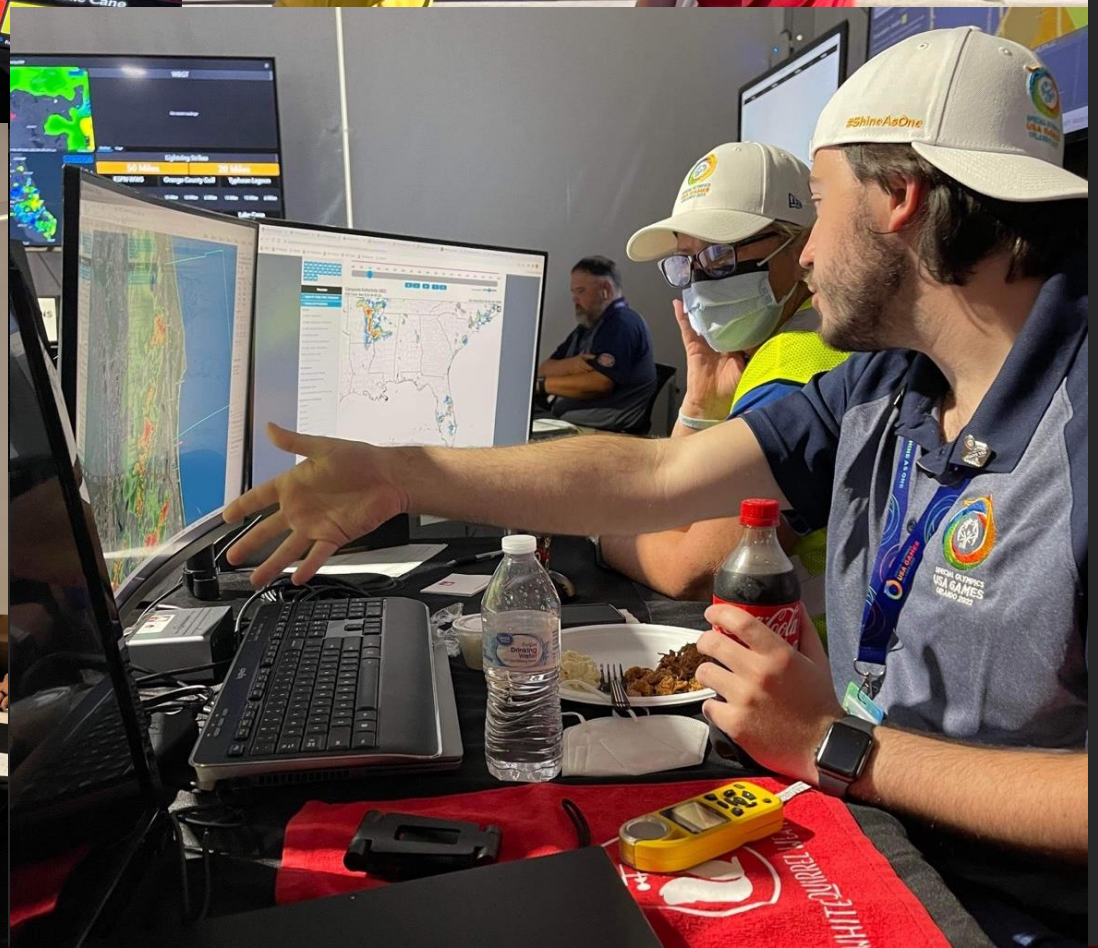
Special Olympics: USA Games

SPECIAL OLYMPICS
USA GAMES
ORLANDO 2022

On-site Operations & Decision-Support


WBGT
No recent readings
Lightning Strikes
50 Miles
20 Miles
ESPN WWS
Orange County Golf
Typhoon Lagoon
USTA Campus
Waterfont Park
Lake Cane

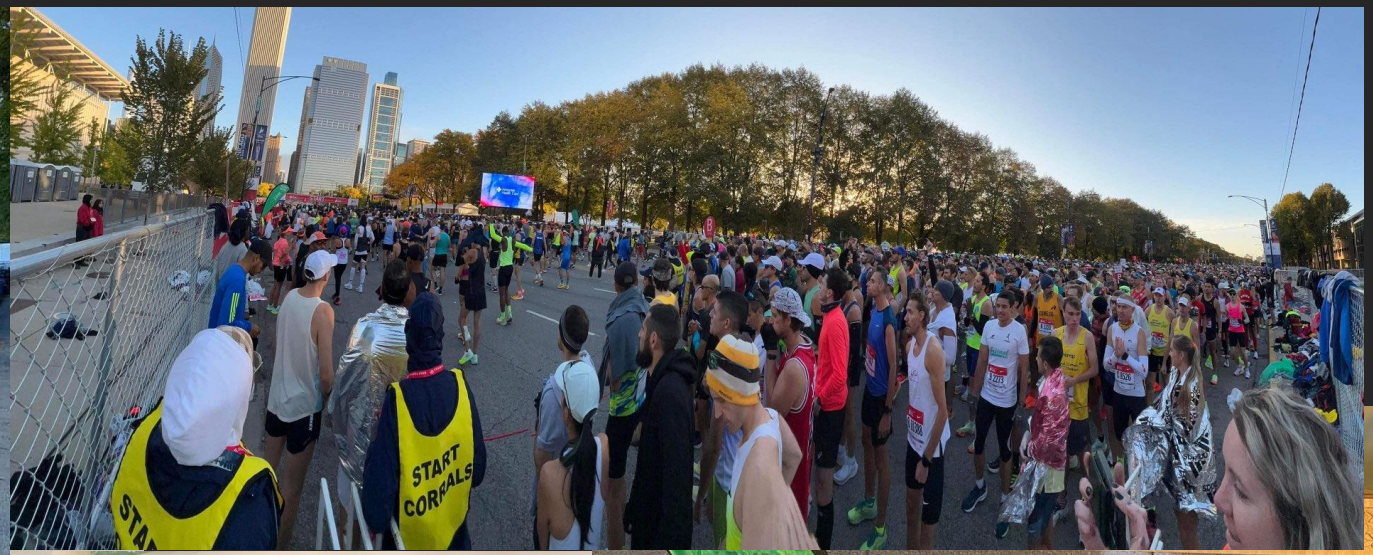

Lightning and WBGT
WBGT
Orange County National Golf Center and Lodge
ESPN Wide World of Sports
USTA National Campus
Lightning Strikes
50 Miles
20 Miles
ESPN WWS
Orange County Golf
Typhoon Lagoon
USTA Campus
Waterfont Park
Lake Cane

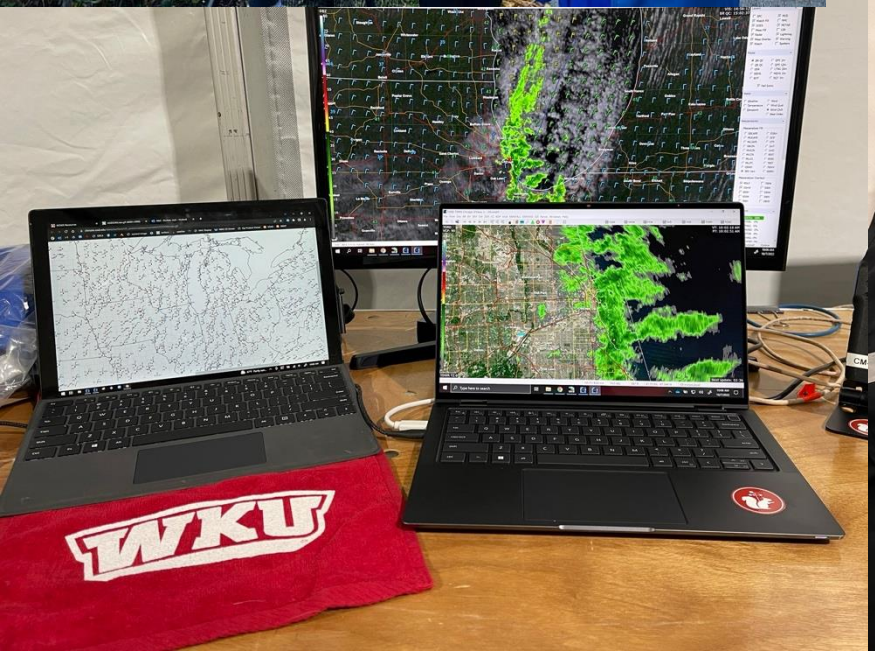

#ShineAsOne

Chicago Marathon

BANK OF AMERICA
Chicago
Marathon

Research-to-operations in action





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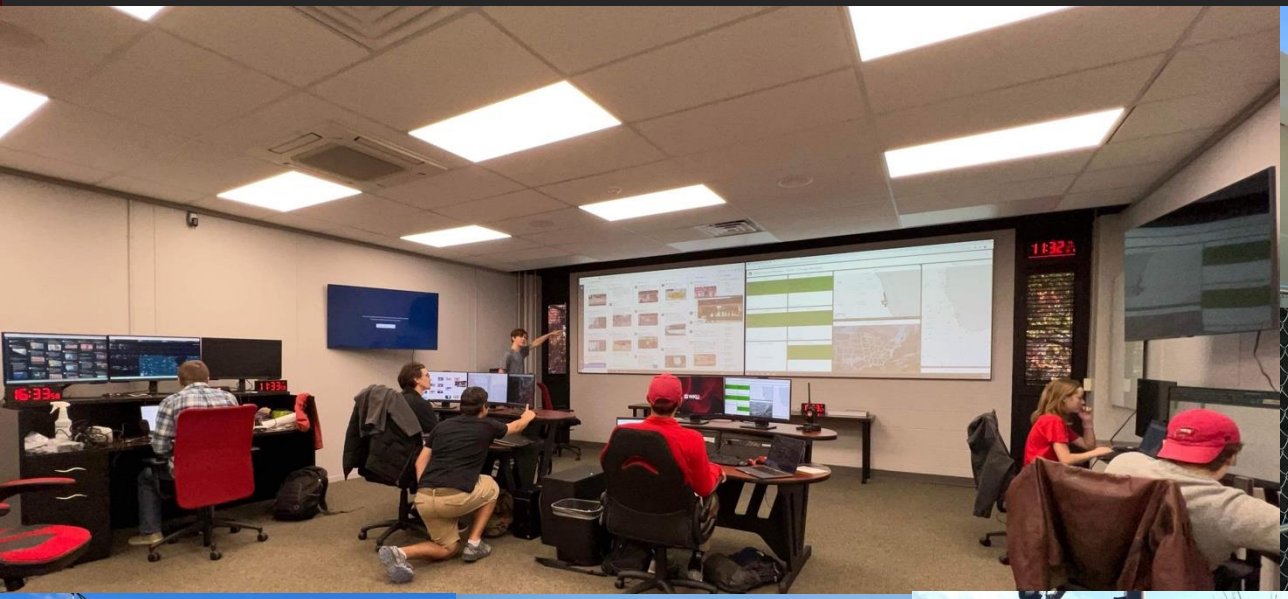
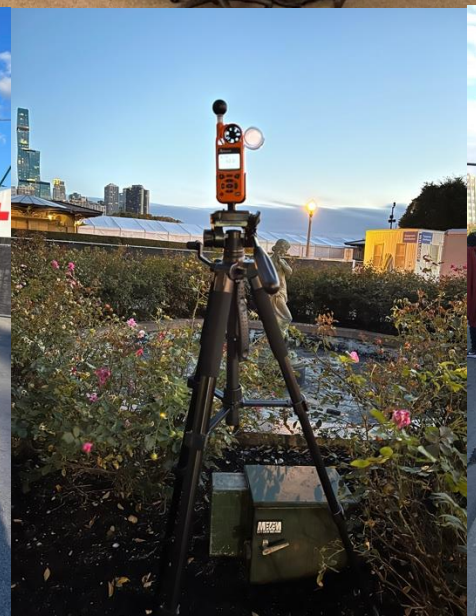
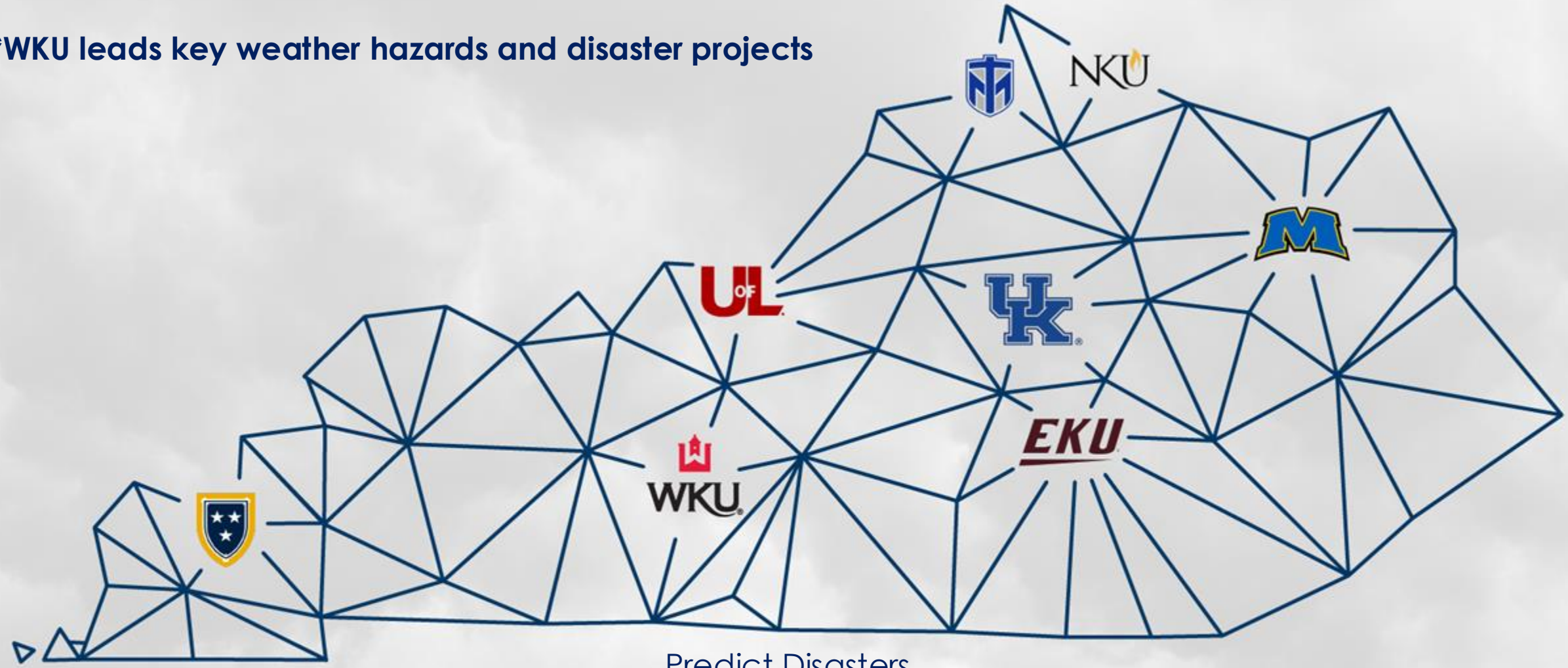




***WKU leads key weather hazards and disaster projects**



Predict Disasters

Develop Big Data

CLIMBS

Build Response Systems

KY NSF EPSCoR

Student Success

Career Placement:

- National Weather Service (numerous offices)
- Storm Prediction Center
- NOAA Weather Prediction Center
- County Emergency Management (numerous offices)
- University Emergency Management
- National Water Center
- Private Sector Forecasting & Consulting
- Broadcast Communications
- Health Services
- Law Enforcement
- Fire
- Computer Systems Technology
- Military
- GIS
- Academics and Research
- State Government

Awards & Recognition

- Walter J. Bennett Public Service Award: 2023
  - DSOC - White Squirrel Weather Forecasting & Decision-Support
  - National Weather Association
- Mitigation Project of the Year Award: 2022
  - Disaster Science Operations Center (DSOC)
  - Kentucky Association of Mitigation Managers
- Local Chapter of the Year Award: 2022
  - Student Chapter of the National Weather Association
  - National Weather Association
- Weather Ready Nation Ambassador of Excellence Award: 2020
  - DSOC - White Squirrel Weather
  - NOAA National Weather Service
- WKU Athletics TOPSY Award: 2019
  - DSOC - White Squirrel Weather
  - Western Kentucky University Athletics
- Life in the Field Award: 2014
  - Field Methods in Severe Weather Analysis & Forecasting
  - American Geosciences Institute
- National Creativity and Innovation Award: 2010
  - Field Methods in Severe Weather Analysis & Forecasting
  - North American Association of Summer Sessions

Similar Models

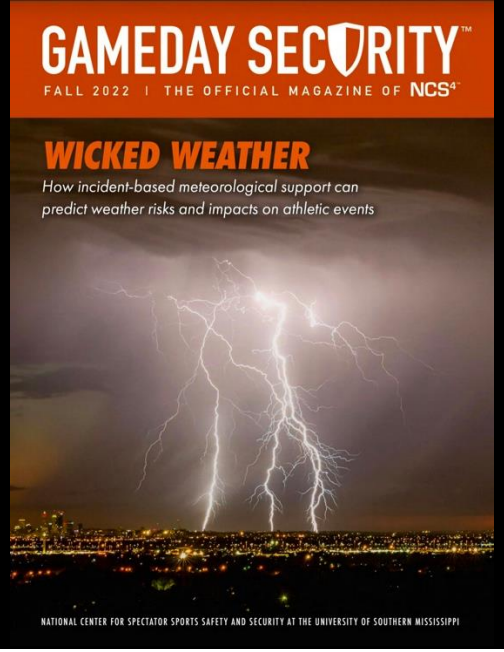
State Weather Risk Communication Center (SWRCC)

The State Weather Risk Communication Center (SWRCC) is a first-of-its-kind partnership between the University at Albany and New York State Division of Homeland Security and Emergency Services that leverages UAlbany's expertise in atmospheric sciences to help state and local emergency managers prepare for and respond to severe weather.

*WKU strategically aligned with new programs in Disaster Science & newly prioritized academic building

DSOC

DISASTER SCIENCE OPERATIONS CENTER



WKU | EEAS

Earth, Environmental, & Atmospheric Sciences