



WKU

Weather Operations



FOCUS-BASED WEATHER FORECAST APPLICATIONS AND CLIMATE OUTLOOKS



Partners | Affiliates



DR. JOSH DURKEE | ASSOCIATE PROFESSOR OF METEOROLOGY & CLIMATE SCIENCE RESEARCH

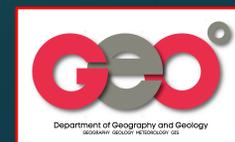
DIRECTOR: COLLEGE HEIGHTS ATMOSPHERIC OBSERVATORY FOR STUDENTS

DIRECTOR: WHITE SQUIRREL WEATHER: WKUWEATHER.COM

DIRECTOR: FIELD METHODS IN WEATHER ANALYSIS & FORECASTING PROGRAM

METEOROLOGY PROGRAM | DEPARTMENT OF GEOGRAPHY & GEOLOGY

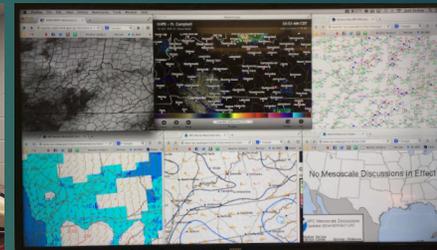
WESTERN KENTUCKY UNIVERSITY



CHAOS

COLLEGE HEIGHTS ATMOSPHERIC OBSERVATORY FOR STUDENTS

Learning | Application | Monitoring | Prediction | Research



Extreme-Event Forecast | Nowcast Discussions

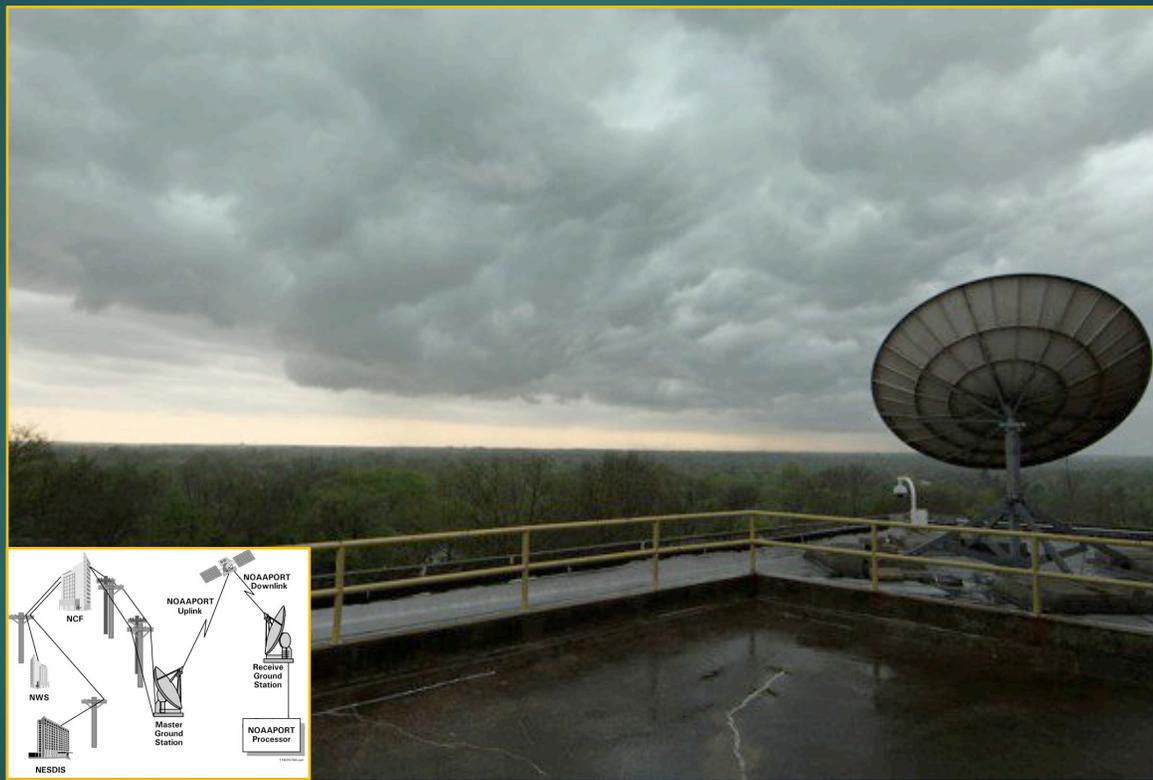
Real-Time Weather Monitoring



- ▶ Instrumentation to observe weather conditions from WKU
- ▶ Help with WKU storm water monitoring
- ▶ WKU onsite and commuter-related hazards



NOAAPORT Observation Deck



CHAOS



@wkchaos



© Josh Durham





How do we pull this together in a cohesive way?

- ▶ WKU is a microcosm of real-world operations, especially when it comes to weather-related hazards.
- ▶ Weather emergency operations at WKU should mimic so-called real world operations.

- ▶ "Real world"

- ▶ NWS | Broadcast | Emergency managers | Spotter groups

- ▶ WKU

- ▶ CHAOS | Storm Team | EHS | Storm Toppers





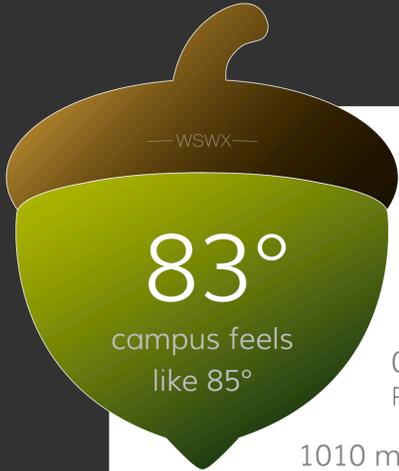
WHITE SQUIRREL WEATHER[®]

October 2016

wkuweather.com

A product of CHAOS: a real-time weather and climate monitoring system focused specifically on WKU.

WHITE SQUIRREL WEATHER



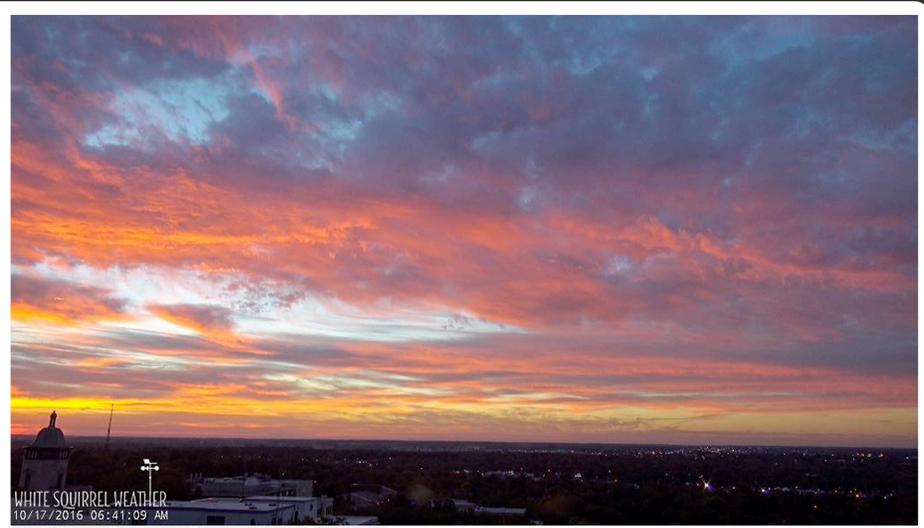
64.6°F Dew Pt.

54% Humidity

0.00 in Precipitation

1010 mb Pressure

1.9 UV Index



WHITE SQUIRREL WEATHER 10/17/2016 06:41:09 AM

- Nestcam Radar Air Quality Traffic

This Afternoon



87°

Tonight



67°



waning gibbous

“WEATHER NEVER STOPS”

WKU Storm Ready University

National Weather Service

@WKUweather





Switchboard "Theater" Display

4K camera

WHITE SQUIRREL WEATHER
10/26/2016 01:40:50 PM

Nestcam Radar Air Quality Traffic

Custom Radar

Nestcam Radar Air Quality Traffic

Live Traffic

Nestcam Radar Air Quality Traffic

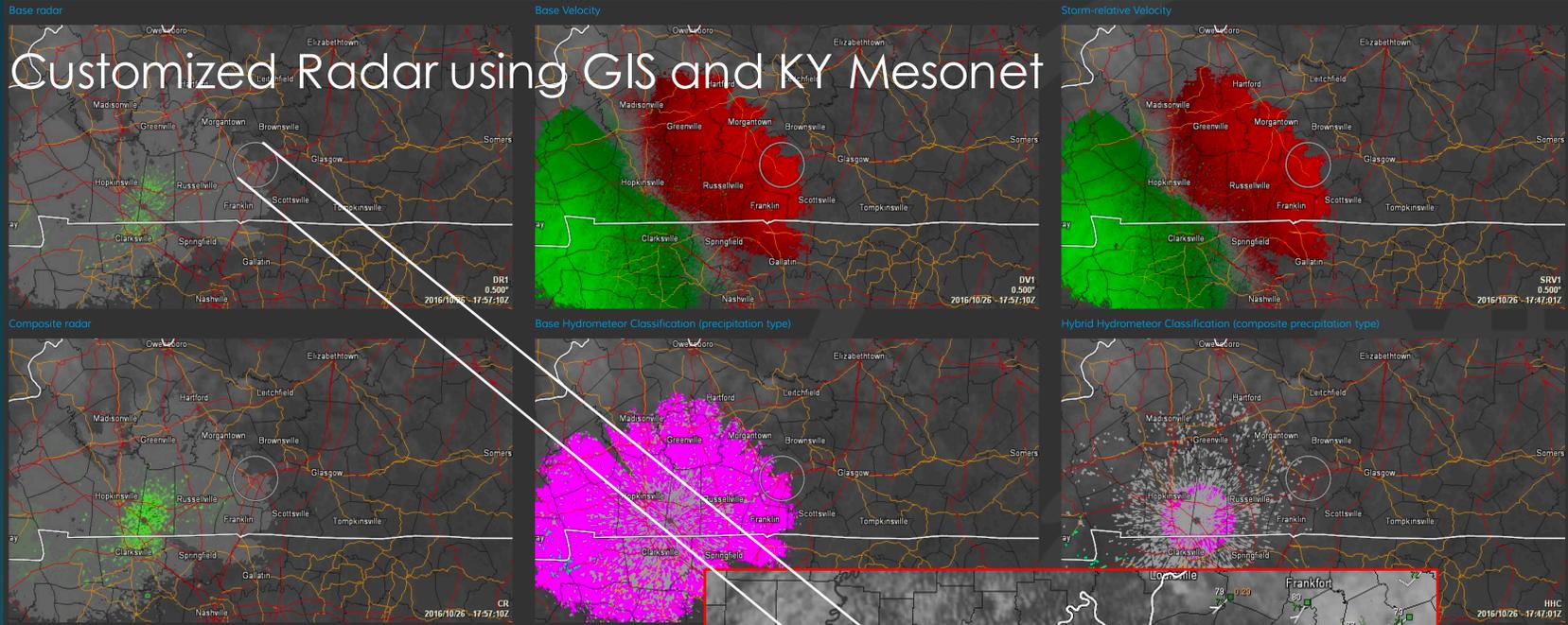
Current AQI (Combined PM and O₃)

Wednesday, October 26, 2016 2:00 PM EDT

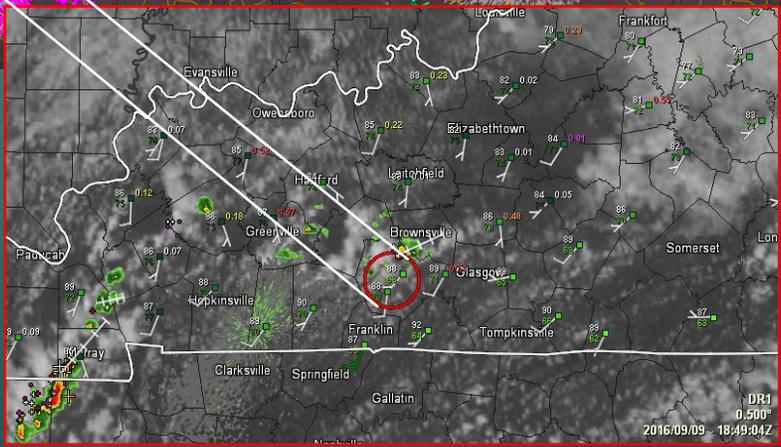
Air Quality

Good
Moderate
Unhealthy for Sensitive Groups
Unhealthy
Very Unhealthy
Hazardous

Nestcam Radar Air Quality Traffic



Real-time lightning indicator





WKU

Focused-based efforts

REAL-TIME MONITORING FOR EMERGENCY PREPAREDNESS & SPECIFIC NEEDS



Emergency Preparedness

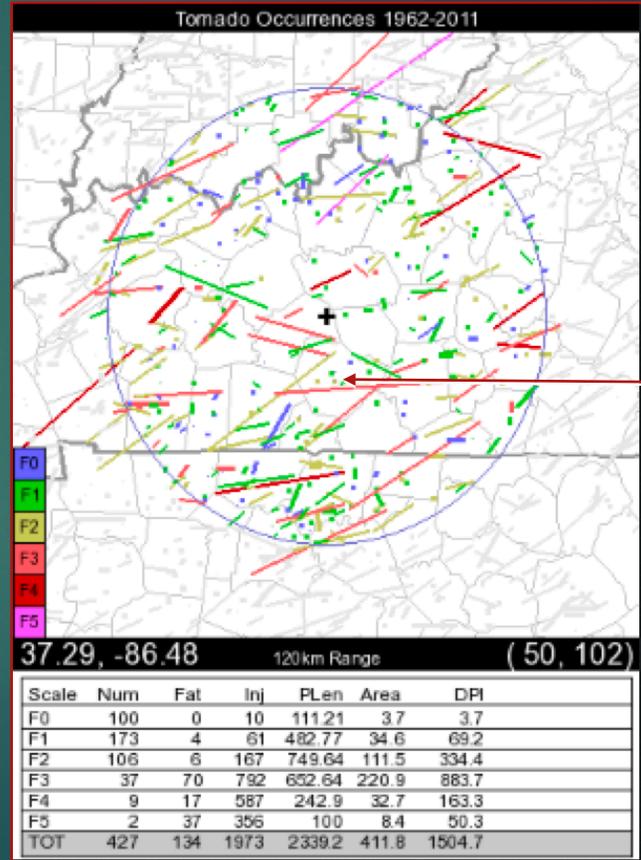
- ▶ Severe Weather | Winter Weather
- ▶ Dangerous Lightning | Flooding
- ▶ Campus Population & Visitor Safety
- ▶ Outdoor Events & Festivals
- ▶ High School Championships



View of a tomado from CHAOS



View of lightning from CHAOS



WKU

Forecast Needs & Applications



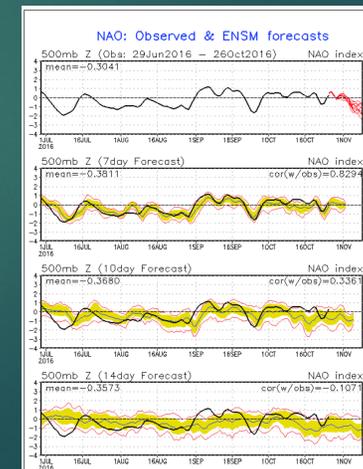
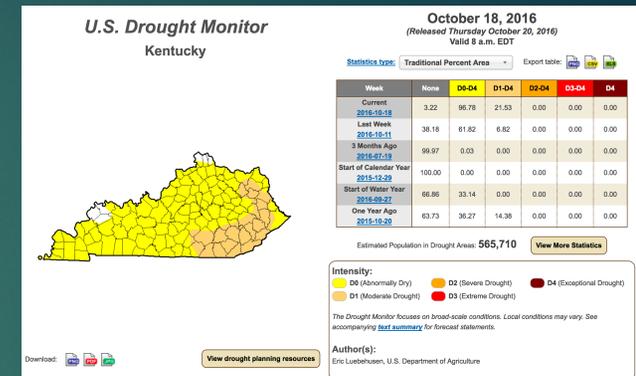
- ▶ Facilities Management
- ▶ Campus construction
- ▶ Campus delays and closures
- ▶ Campus Events – Indoor and Outdoor (including off AY times)
- ▶ Athletics – Tournaments – Training Events – Graduations
- ▶ Storm Ready
 - ▶ Comes back to real-time monitoring and prediction for emergency preparedness
- ▶ Safe Communities



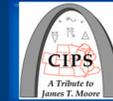
Other options: Climate Outlooks



- ▶ Much different than a forecast and a nowcast
- ▶ Often starting at 2 weeks to monthly and seasonal time scales
- ▶ Deals more with pattern recognition & clues about temps and precipitation; less on specifics like a forecast
- ▶ Can be thrown off by weird meteorology
 - ▶ hurricane, heavy snow pack, or a persistent drought



Climate Analysis



Cooperative Institute
for Precipitation Systems



Hardware issues are currently limiting the CIPS Analog Guidance. As a consequence, we are not offering the full suite of forecasts. Thank you for your patience.

CIPS Historical Analog Guidance

Home
Maps And Data
Supplemental Info
About USDM
USDM News

United States Drought Monitor

Home
Login

U.S. Drought Monitor

October 18, 2016
(Released Thursday, Oct. 20, 2016)
Valid 8 a.m. EDT

Current National Drought Summary

Summary

Dry, hot conditions across the central and southern U.S. contrasted with heavy rain and mountain snow in the northwestern quarter of the nation. As a result, drought continued to rapidly intensify from the Delta to the Southeast, with drought intensification also noted over portions of the Northeast. Conversely, large swaths of drought were reduced or eliminated from the northern Rockies into the Pacific Northwest.

Drought Impact Types:

- ☐ Definites dominant impacts
- ☐ Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- ☐ Long-Term, typically greater than 6 months (e.g. hydrology, ecology)
- ☐ Intensity
- ☐ D0 Abnormally Dry
- ☐ D1 Moderate Drought
- ☐ D2 Severe Drought
- ☐ D3 Extreme Drought
- ☐ D4 Exceptional Drought

Author:
Eric Luebbehusen
U.S. Department of Agriculture

<http://droughtmonitor.unl.edu/>

NOTE: To view regional drought conditions, click on map above. State maps can be accessed from regional maps.

The data cutoff for Drought Monitor maps is each Tuesday at 8 a.m. EDT. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

[Download PDF](#)
[View last week's map](#)
[Statistics Comparison](#)
[Statistics Table](#)
[Change Maps](#)

The U.S. Drought Monitor is produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration.

For local details and impacts, please contact your [State Climatologist](#) or [Regional Climate Center](#).

How is drought affecting you? Submit drought impact and condition reports via the [Drought Impact Reporter](#).

The National Drought Mitigation Center | 3310 Holdrege Street | P.O. Box 830988 | Lincoln, NE 68583-0988
phone: (402) 472-6707 | fax: (402) 472-2946 | [Contact Us](#) | [Web Policy](#)

CLIMATE PREDICTION CENTER

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME
LEGACY WEBSITE
NWS / NCEP
SEARCH

OUTLOOKS
ENSO
NEWS
FEATURED PRODUCT
ANNOUNCEMENTS
LEARNING CENTER
ABOUT

CPC Featured Product

October 28, 2014

Global Tropical Hazards Outlook

Global Tropics Hazards and Benefits Outlook - Climate Prediction Center

Week 1 - Valid: Nov 19, 2014 - Nov 25, 2014

Week 2 - Valid: Nov 26, 2014 - Dec 02, 2014

Tropical Cyclone Formation: Development of a tropical system (tropical depression - TD, or greater strength).

Above-average rainfall: Weekly total rainfall in the upper third of the historical range.

Below-average rainfall: Weekly total rainfall in the lower third of the historical range.

Above-normal temperatures: 7-day mean temperatures in the upper third of the historical range.

Below-normal temperatures: 7-day mean temperatures in the lower third of the historical range.

Product is updated once per week, except from 81° - 142°E for the region from 125E to 90E to 40N. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.

CPC forecasters generate a hazards outlook for the global tropics every Tuesday, identifying areas where enhanced or suppressed rainfall is favored, as well as where tropical cyclones are expected to form. In some cases, temperature extremes are highlighted where major impacts are likely due to delayed monsoon onset or excursions of arctic air masses into the subtropics. The outlook covers both Week-1 and Week-2, leveraging expert analysis of the Madden-Julian Oscillation (MJO) and other types of tropical variability. The outlook is updated every Friday during the Atlantic and East Pacific hurricane seasons to account for the latest information on the formation of potentially impactful tropical cyclones.

The maps are accompanied by an expert discussion that explains the forecast rationale while addressing the key uncertainties in the outlook. Additionally, a brief synopsis of how the forecast pattern of anomalous tropical convection could impact the extratropical circulation is often given during the wintertime, when such teleconnections

Credit: NOAA, Climate Prediction

Latest Featured Products

Global Tropical Hazards Outlook

The ENSO Blog

ENSO Diagnostic Discussion

Drought Outlooks

CPC Outlooks

Follow us on Facebook

Follow us on Twitter

Summary



- ▶ **Focused-based forecasting** is rapidly being utilized **across all sectors**
- ▶ WKU has a wealth of infrastructure to expand outside of campus needs
 - ▶ Met Program, KY Mesonet, White Squirrel Weather, GIS, Super-computing, Private data pipe, custom output
 - ▶ **Examples:**
 - ▶ State-wide precipitation monitoring for water resource management
 - ▶ State-wide temperature monitoring for distress applications (crops; energy, etc.)
 - ▶ State-wide wind monitoring (high-wind hazards, crop failure, energy, etc.)
 - ▶ Drought applications
 - ▶ Flood risks
 - ▶ Real-time nowcast monitoring of extreme storms and long-term seasonality
 - ▶ Custom forecast computer models for targeted areas & applications
 - ▶ Custom data management and output

