NC STATE UNIVERSITY

Project Nighthawk Feedback Session

NC Fire Environment Committee Meeting

Corey Davis and Kirsten Lackstrom

NORTH CAROLINA CLIMATE OFFICE

CISA

NOAA

NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM NIDIS

Project Background

Goal: Provide ***relevant***, ***accessible***, and ***actionable*** drought-related information to decision makers tailored to specific sectors

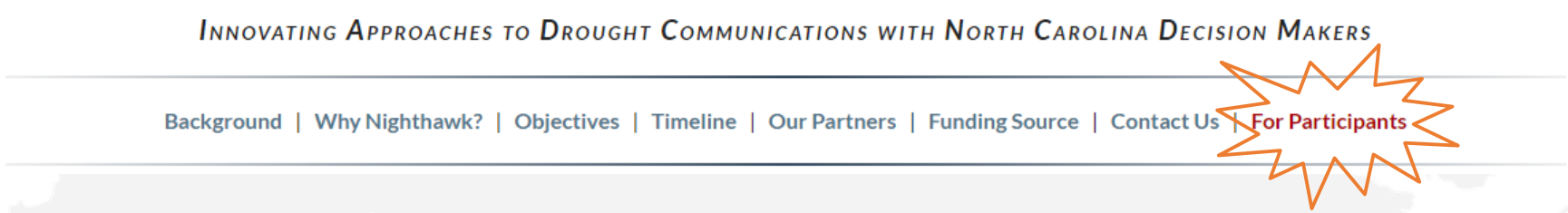
Official Title: *"Innovating Approaches to Drought Communications with North Carolina Decision Makers"*

Code Name: *Project Nighthawk*

The common nighthawk. Photo by Andy Reago and Chrissy McClarren, shared under CC BY 2.0.

Informed Consent

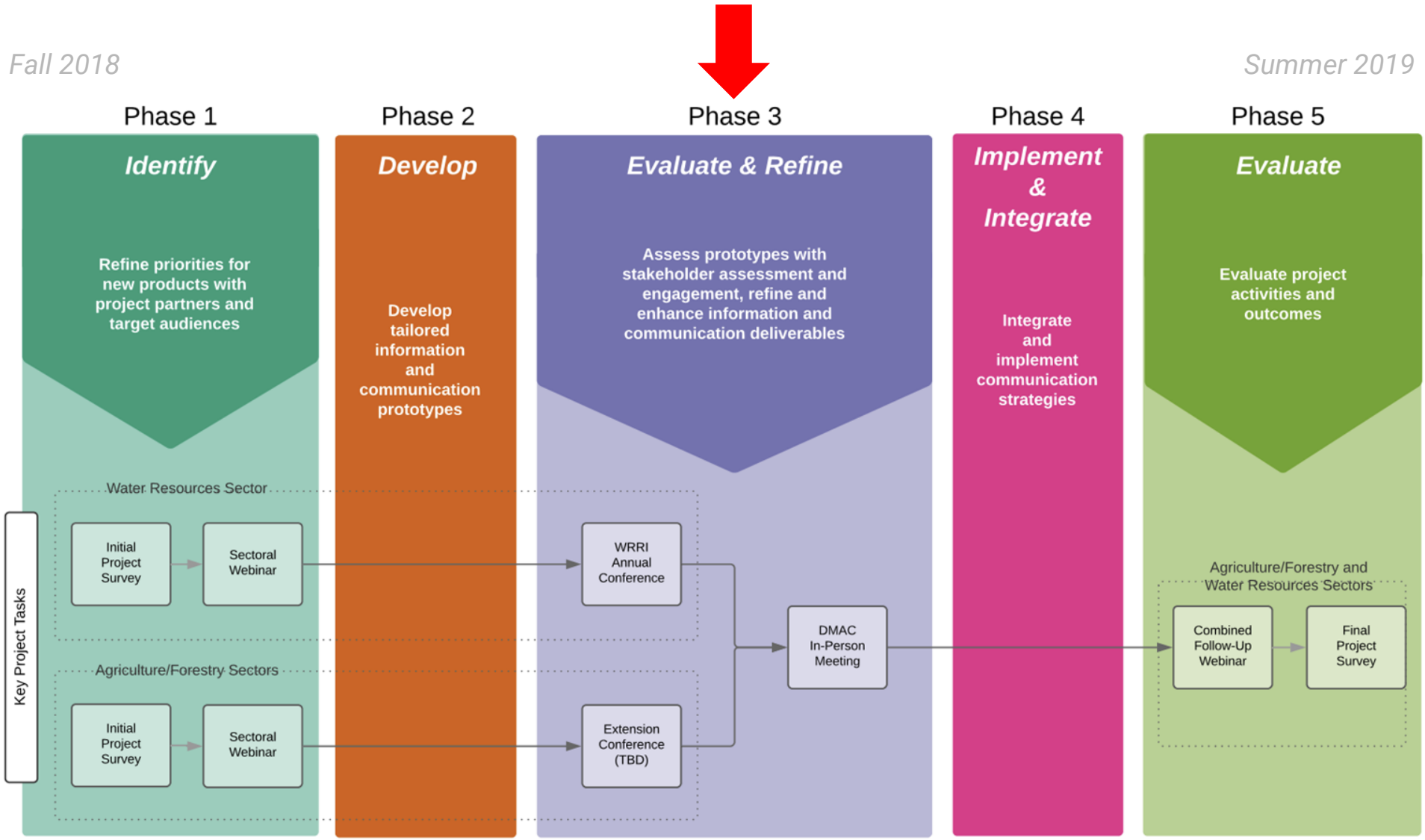
More information at ***http://climate.ncsu.edu/nighthawk***



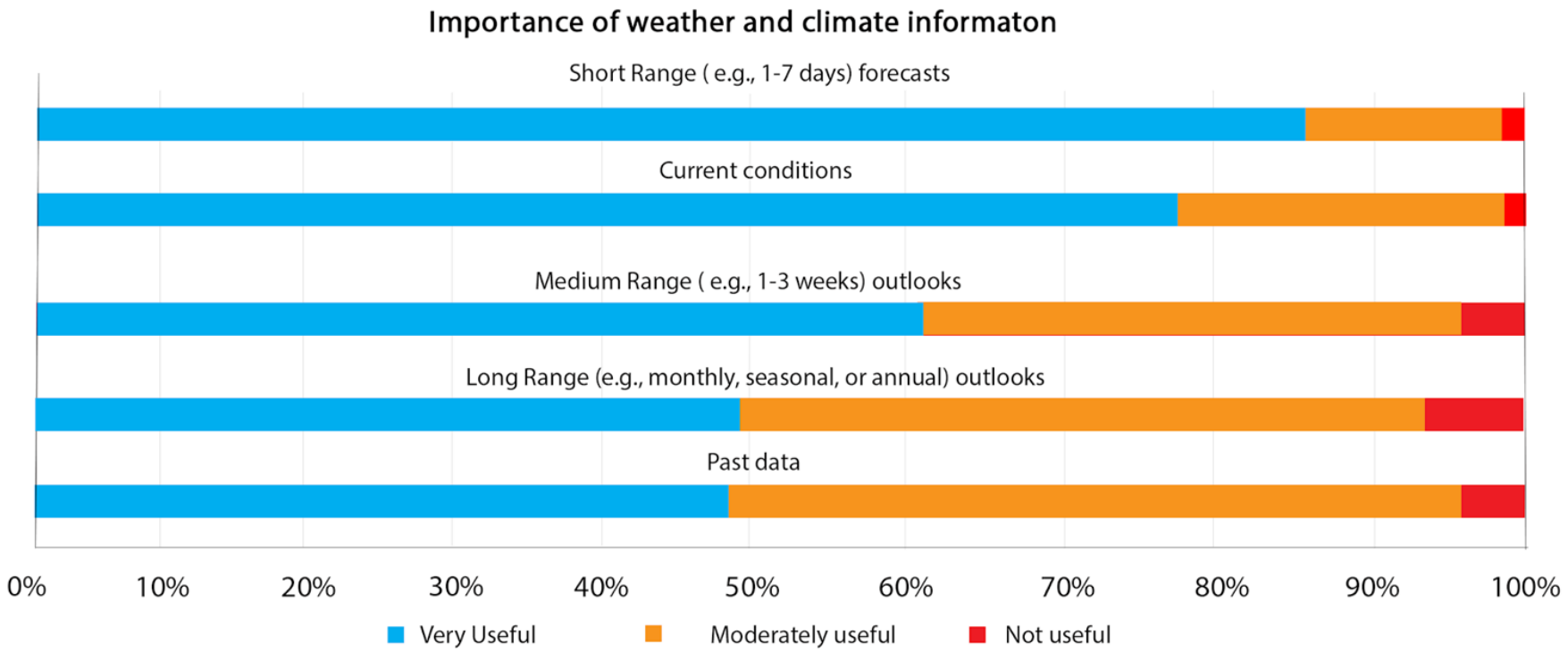
Any questions?

Project Nighthawk Phases

Fall 2018 *Summer 2019*



Selected Survey Results (Ag/Forestry)



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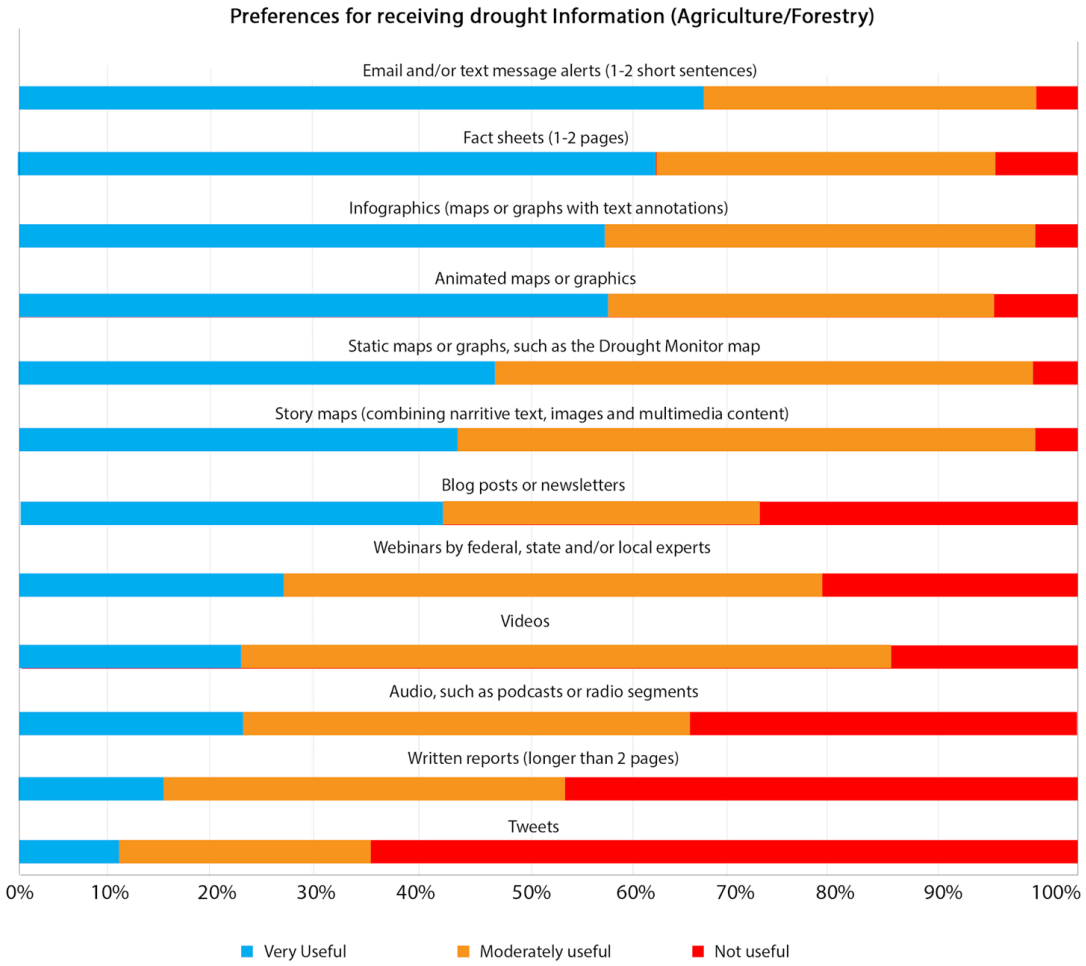

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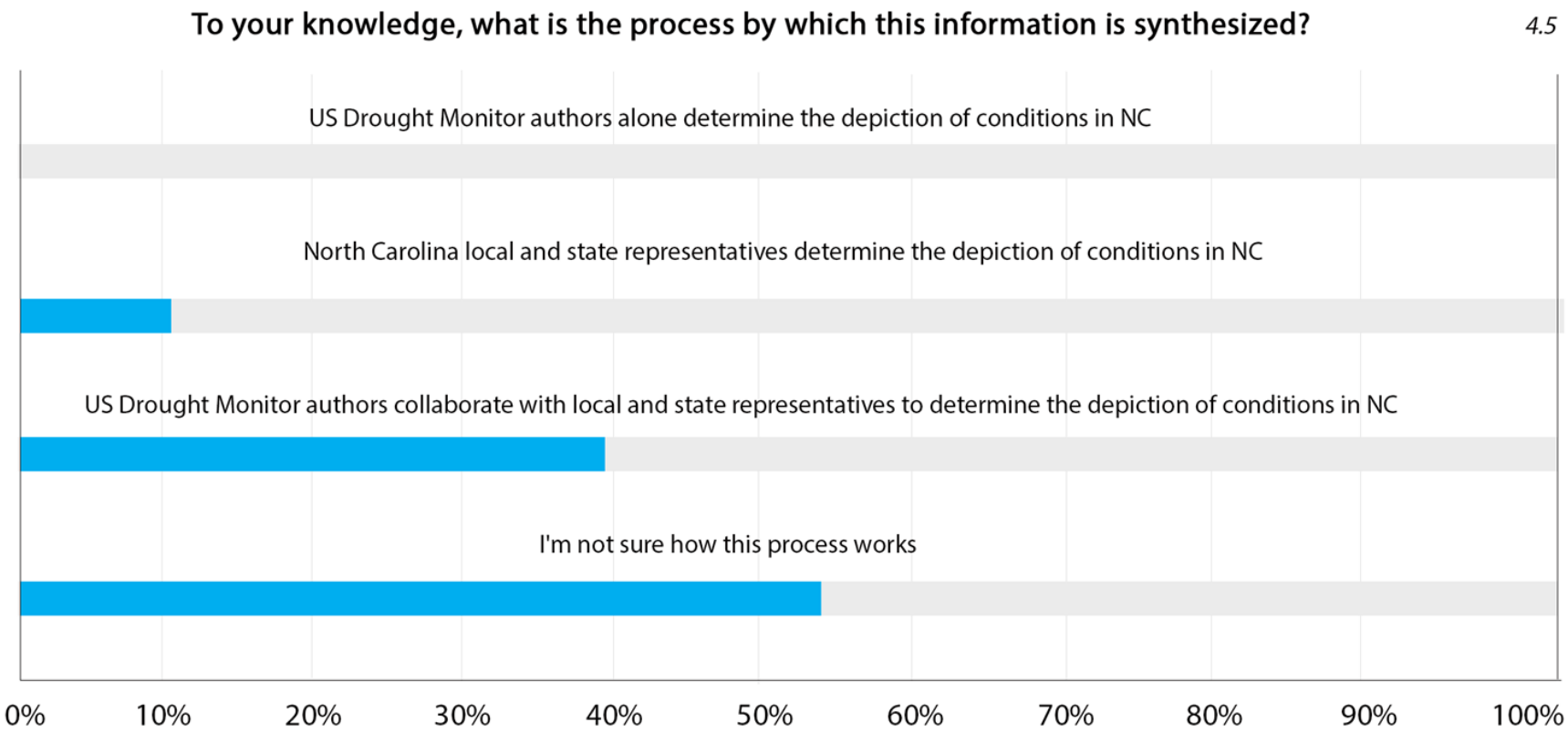


Main Takeaways So Far

- Current conditions and short-range forecasts are generally the most useful
- Users prefer information in a variety of formats
  - Including email alerts, factsheets, & infographics
  - Content both pushed to them and web-accessible
- The NC drought monitoring process needs more transparency
  - Explaining the reasoning behind map changes

Your Drought Information Needs

- Where do you go for drought information?
  - FWIP? ncdrought.org? Other sites?
- Where do you go for weather forecasts and outlooks?
  - Are current NOAA/NWS products sufficient?

Fire Weather Intelligence Portal
A product of the State Climate Office of North Carolina

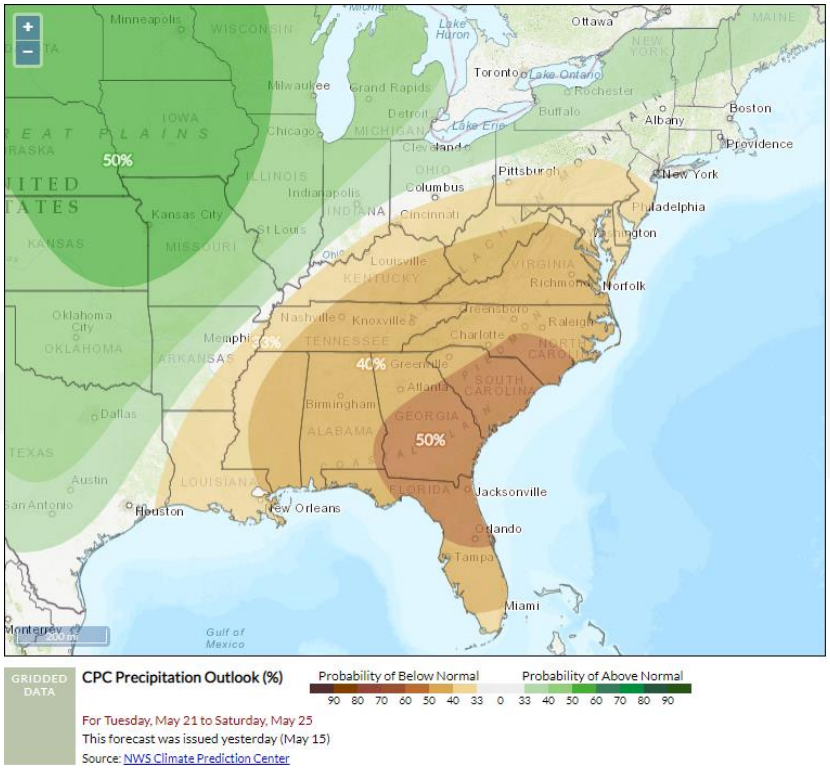
NORTH CAROLINA
Drought Management Advisory Council

NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM
NIDIS
Drought.gov
U.S. Drought Portal

NATIONAL WEATHER SERVICE

NORTH CAROLINA CLIMATE OFFICE
CISA
NOAA
NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM NIDIS

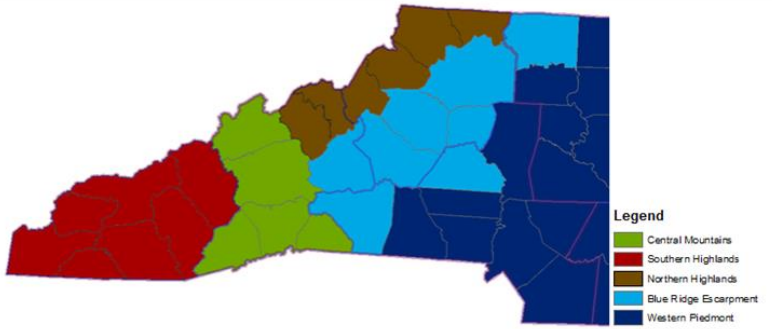
Your Drought Information Needs



- How does this information fit in your decision-making?
- Do you have access to the information you need or are interested in?
- What are your other drought info. needs?

Your Drought Information Needs

- Who are you sharing drought information with?
  - Are you sharing info. directly from the FWIP?
  - How do you share this info.? (email, etc.)

SUMMARY	FIRE DANGER RATING AREAS (FDRAS) FOR REGION 3
Fire Danger will be slightly elevated today with low RH and moderate wind. Rain moving in this evening through Saturday should lower fire danger considerably. Sunday through the remainder of the period will see dry weather and lower RH which will slowly increase fire danger through the region. • Minimum RH will be around 30% for today, climbing to 40-50% for tomorrow and climbing further to the 60-80% range for Friday-Saturday. For the remainder of the period, expect 35-45%. • Winds will generally be S/SW under 10 MPH for today and tomorrow, with gusts to 20 on the ridge tops. For Friday, they should be from the S at 10-15. For the remainder of the period, expect W winds, 10-15 MPH for Saturday and Sunday, dropping back to 5-10 for Monday and Tuesday. • High temperatures will be in the 70s-80 for today and tomorrow, dropping back to the 50s-low 60s for Friday and Saturday, before returning to the 70s for the remainder of the period. Lows will be in the upper 40s to mid-50s except mid-30s to mid-40s for Friday and Saturday nights. • ERCs bounced up and down but remained below average last week. They are predicted to hold steady through the weekend, then climb above average later in the period except Western Piedmont which should be around average. 100 HR FMs will be dropping to slightly below normal during the period for the Central Mountains and Blue Ridge, but well below average for the remainder of the FDRAs. • 1000 HR FMs have recovered further this past week with all stations above the 20% threshold. • There is little or no potential for a significant fire. • Greenup has accelerated this week, with D-12 ahead of last year. Potential frost in the mountains may slow this over the weekend.	

Prototypes in Development

- Short-range outlooks
- Weekly drought overviews
- “About the DMAC” resources

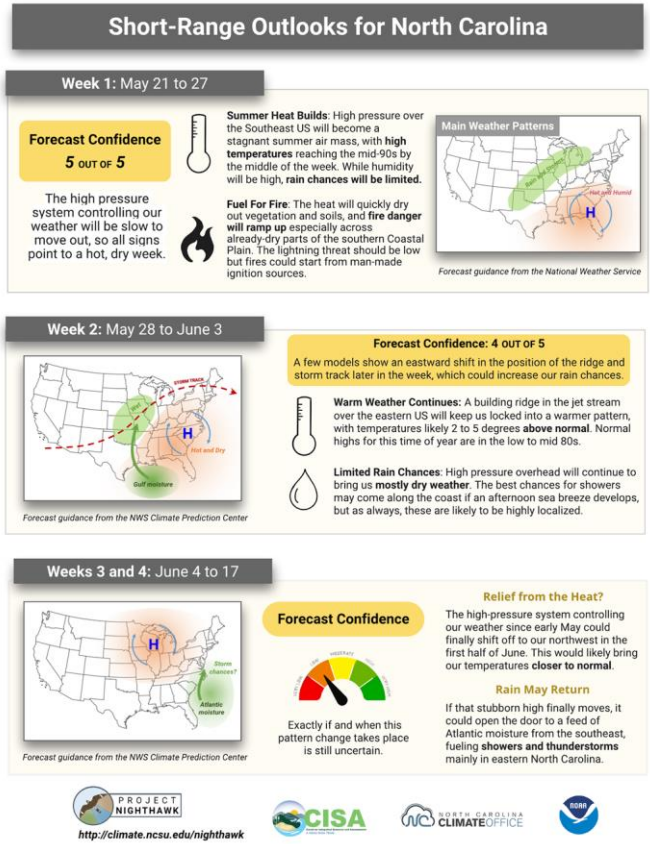
Short-Range Outlooks

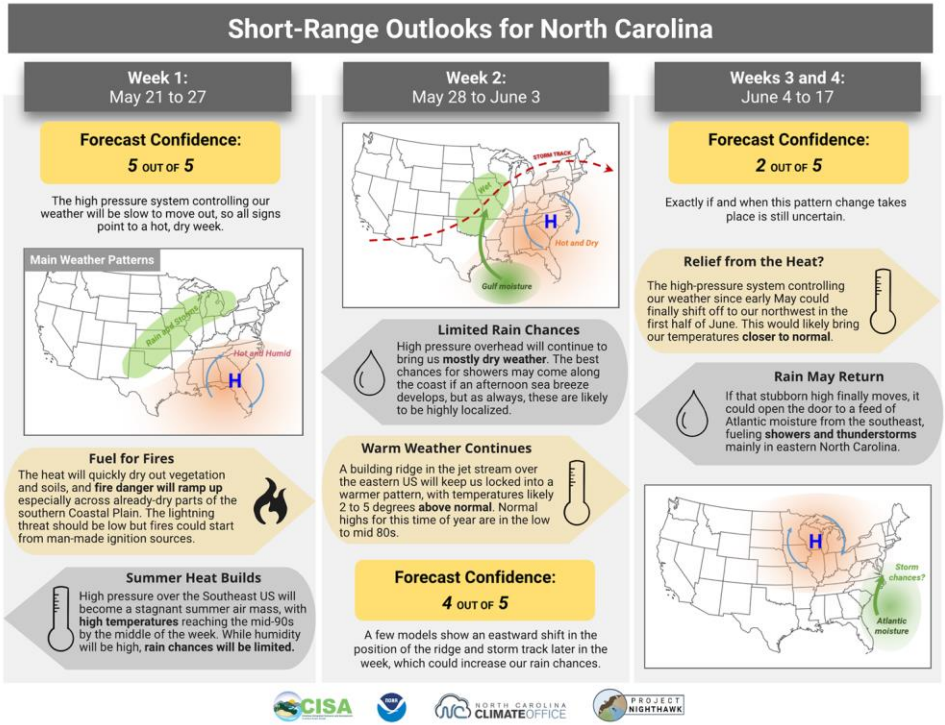
Goal: Give weather outlooks, including expected impacts, for the next 1 to 4 weeks in an easily readable format

Possible Approach:

- A one-page fact sheet outlining weekly forecasts and possible impacts

Short-Range Outlook Example





Weekly Drought Overviews

Goal: Provide insights into NC's weekly drought discussions for release alongside each week's map

Components:

- Blog post summaries
- Email alerts/notifications
- Infographics

Blog Post Example

Moderate Drought Expands Across the Piedmont

Posted on November 9, 2017 by Corey Davis

Another dry week in central and eastern North Carolina has led to expansion of Abnormally Dry and Moderate Drought conditions on the US Drought Monitor.

The multi-agency North Carolina Drought Management Advisory Council (NC DMAC) reviewed recent conditions on Tuesday afternoon and provided input to the US Drought Monitor author, including recommendations for the following changes on this week's map:

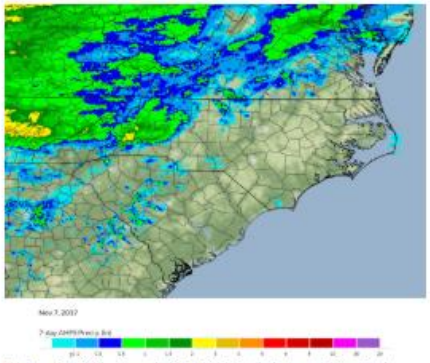
- Moderate Drought (D1) conditions were added to parts of Rockingham, Guilford, Randolph, and Stanly counties in the central Piedmont, including the cities of Greensboro, Asheboro, and Reidsville
- Moderate Drought was also expanded to cover northern Wake County in the Falls Lake area
- Abnormally Dry (D0) conditions were introduced into Lenoir County, including the city of Kinston

These changes were based on a number of objective indicators that show the increase in dryness across the state:

This week's US Drought Monitor map for North Carolina

A Lack of Rainfall

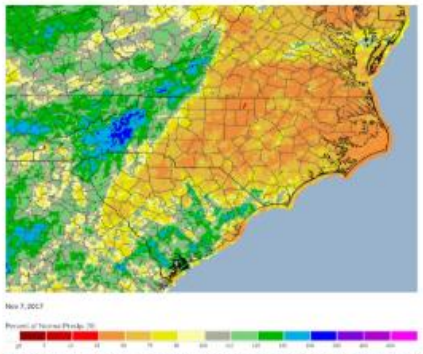
Precipitation was largely limited to the Mountains over the past 7 days. A shower over Rockingham County brought about half an inch of rain to Reidsville, but it was still yet another below-normal week. Elsewhere in the Piedmont and Coastal Plain, most locations received no rain at all.



Total precipitation from November 1-7, 2017; from the Integrated Water Portal

A Sharp Precipitation Divide

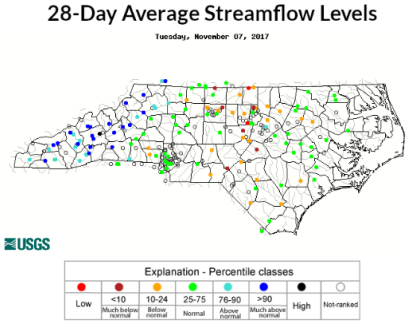
Wet in the west and dry in the east has been the recent trend across North Carolina. Over the past 60 days, much of the Mountains has received above-normal rainfall – including from the remnants of Hurricane Irma – while parts of the Piedmont and Coastal Plain have seen just 25 to 50% of their normal precipitation.



Percent of normal precipitation for the 60 days ending on November 7, 2017; from the Integrated Water Portal

Struggling Streams

The lack of recent rainfall has caused streamflows to decline, especially in the northern and central Piedmont. Monitoring sites along the Cape Fear River at Lillington, Pittsboro, and Gibsonville have all had their 28-day average streamflows drop into the much below normal range.



Average streamflow conditions over the past 28 days; from USGS WaterWatch

Lakes Levels Lowering

Reservoirs across the Piedmont are also feeling the effects of the recent dry weather. Falls Lake, Jordan Lake, and Kerr Lake have all fallen more than two feet below their target levels, according to the US Army Corps of Engineers. That decline began in the late summer but has accelerated recently due to the lack of rainfall, especially in the upper Cape Fear River basin.

Falls Lake levels (pink) compared to targets (blue line) since late July; from www.LakeLevels.info

With harvesting being finished and the end of the growing season expected soon – possibly as soon as this Saturday morning, when low temperatures are expected to drop below freezing across much of the state – the agricultural impacts of the recent dry spell have been limited.

Extension agents in the northern Piedmont have noted that rain is needed to germinate the recently planted small grains and grasses, but otherwise, the dry weather has helped farmers get into the fields to harvest.

Impacts to water resources have been much more pronounced, especially to surface water conditions such as streamflows and reservoir levels.

Although the upcoming short-range and long-range forecasts don't offer much hope of a wet pattern emerging, the approaching winter season should at least limit evaporation and overall water demand. In addition, the worst of the dryness has emerged only in the past two months, so it hasn't become a significant long-term event.

Infographic Examples

North Carolina Drought Update

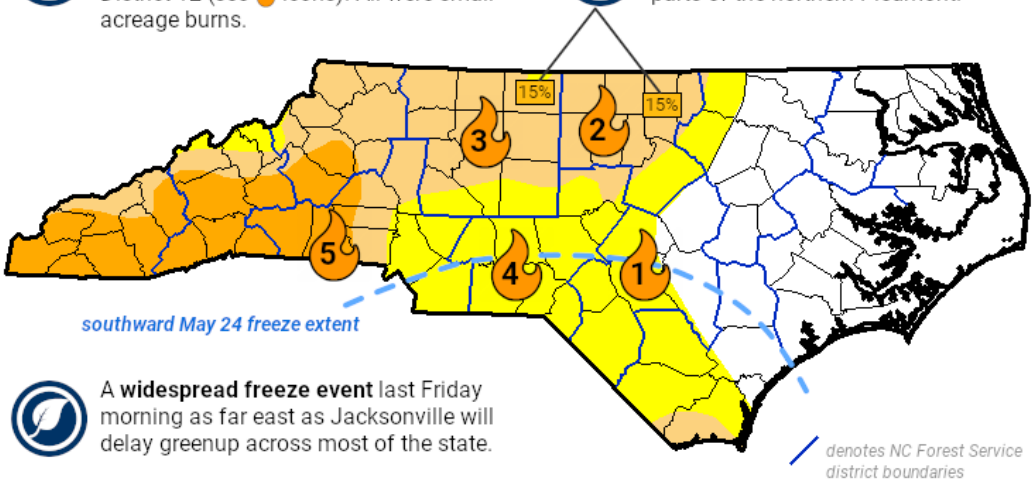
For the week ending March 28, 2017

This Week's Drought Monitor of North Carolina Map

From the US Drought Monitor, authored by Eric Luebehusen (USDA) with input from the North Carolina Drought Management Advisory Council

Last Tuesday, **10 wildfires** were reported in Region 2 with an additional **5 fires** in District 12 (see 🔥 icons). All were small acreage burns.

The **1000-hour fuel moisture** values have dropped to 15% in parts of the northern Piedmont.

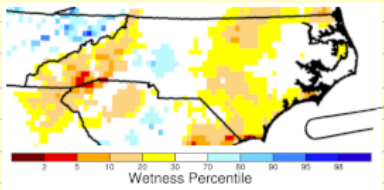


A **widespread freeze event** last Friday morning as far east as Jacksonville will delay greenup across most of the state.

Forestry/Fire Summary

Notes about this week's drought map

- Up to **3 inches of rain** last week in the Mountains led to improvement from **Severe** to **Moderate Drought** in several counties
- **Less than a half-inch** of rain fell in eastern NC, with **Moderate Drought** expanding into Brunswick Co.
- **Soil moisture levels** (right) are lowest in the Mountains and northern Piedmont



Surface soil moisture drought indicator from NASA GRACE on March 27, 2017

Drought Monitor Intensity:

- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

This infographic is a product of

PROJECT NIGHTHAWK

http://climate.ncsu.edu/nighthawk

Infographic Examples

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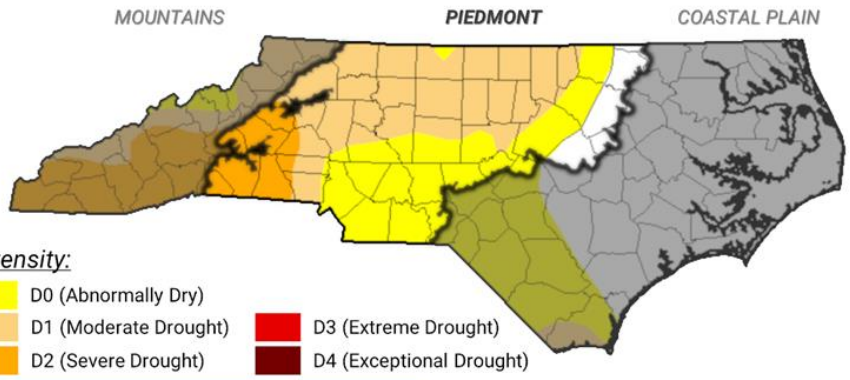
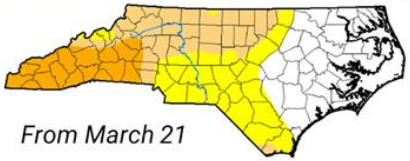


Last Week's Drought Map



From March 21

This infographic is a product of

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Piedmont Summary

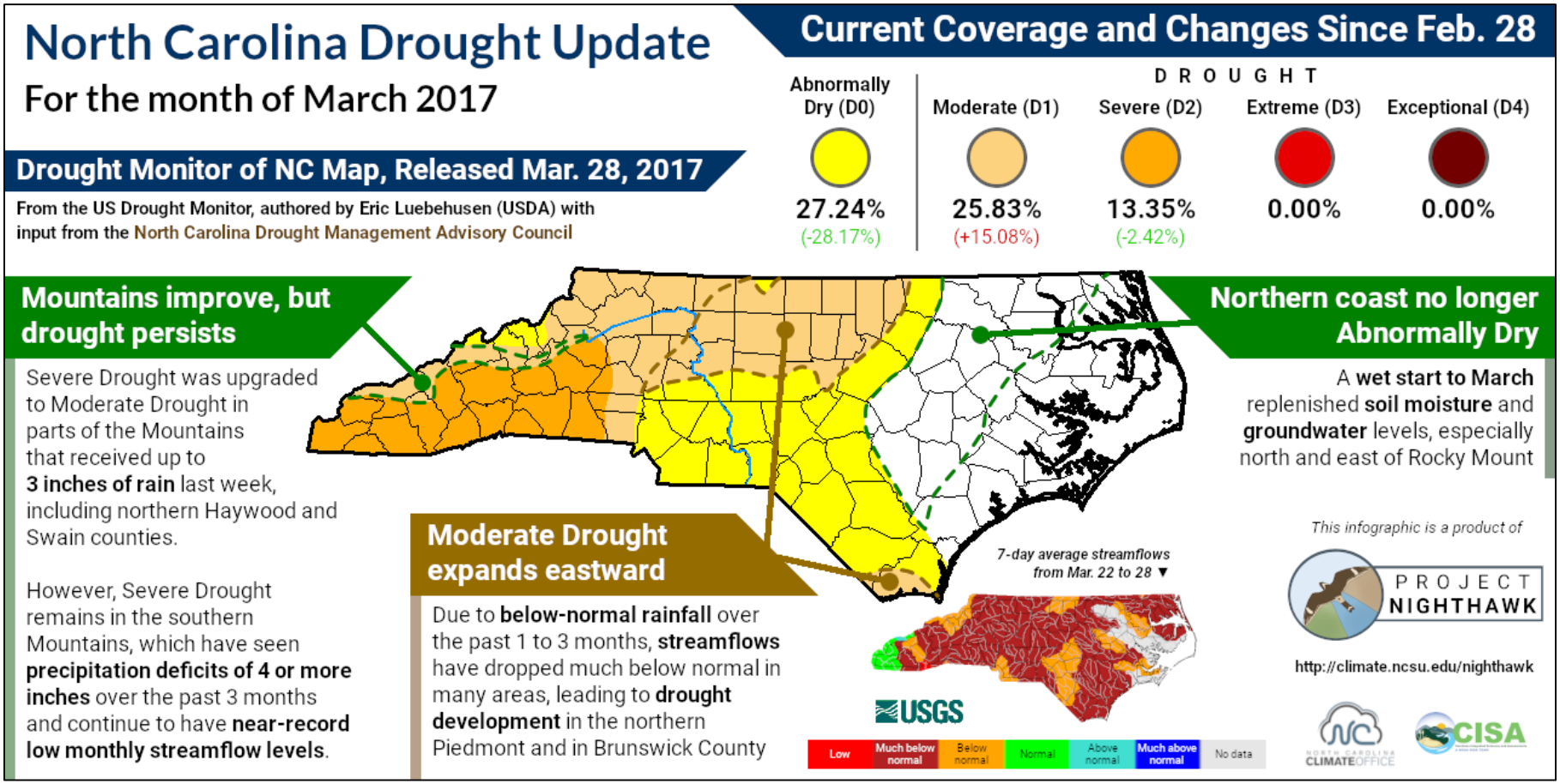
- The northern Piedmont remains in **Moderate Drought** as streamflows and soil moisture levels continue to decline
- After a week with little to no rainfall, the southeastern Piedmont is still **Abnormally Dry**, but is being monitored for further degradation
- Reservoirs across the region remain at or near normal levels

Weather Outlook for the Week of Thu., Mar. 30

Forecast guidance from the National Weather Service

Friday: A cold front will bring a chance of rain, mainly in the northern counties. **Monday:** Pop-up showers and thunderstorms are possible in the afternoon.

Infographic Examples



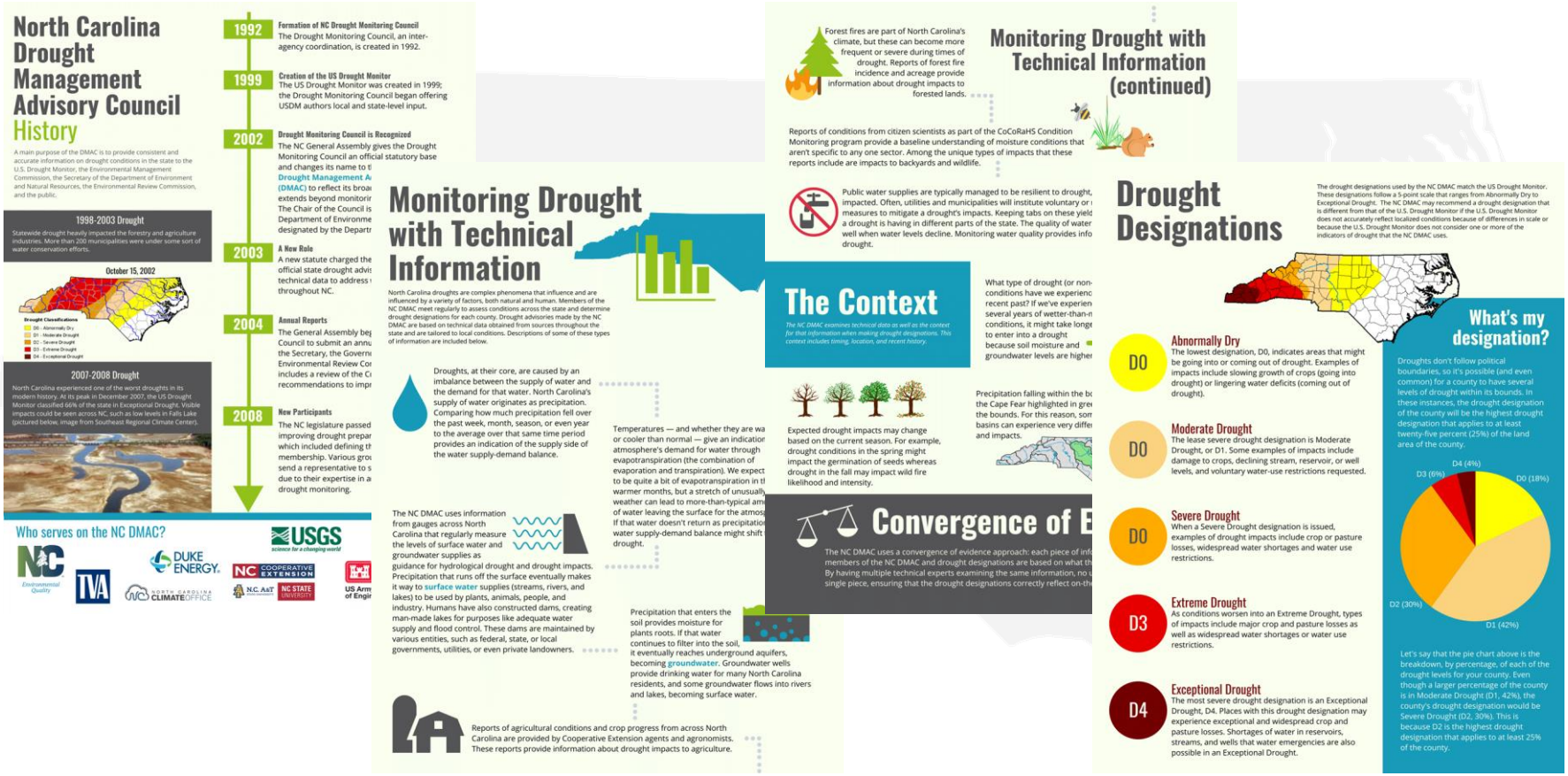
“About the DMAC” Resources

Goal: Provide background information about the NC DMAC and its history, membership, and weekly drought monitoring process

Possible Approaches:

- Infographics
- Story maps
- Updated content for ncdrought.org

“About the DMAC” Resources



Project Nighthawk Next Steps

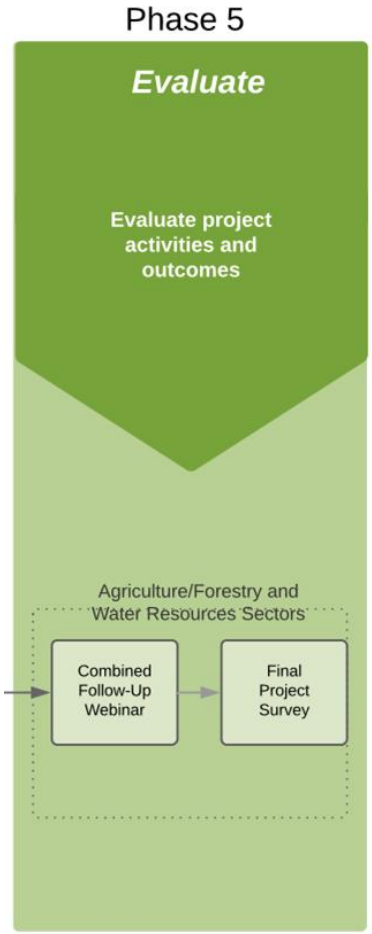
Phase 4

Implement & Integrate

Integrate and implement communication strategies

- Revise prototypes based on Phase 3 feedback
- Begin testing Weekly Drought Updates and Short-Range Outlooks
  - Seeking representatives to receive these and share feedback
  - How can these supplement Cabe's regional fire danger assessments?

Project Nighthawk Next Steps



- This summer and fall, we'll evaluate what we've done
- Seeking additional feedback opportunities for ag, forestry, and water resources sectors
  - Could you recommend any conferences or events to attend?

Questions or Suggestions?

https://climate.ncsu.edu/nighthawk