Innovating Approaches to Drought Communications with North Carolina Decision Makers

FINAL PROJECT SUMMARY

Motivation

This collaborative project between the State Climate Office of North Carolina (SCONC) and NOAA's Carolinas Integrated Sciences and Assessments (CISA) program focused on improving the usability and communication of drought-relevant information for North Carolina decision makers. The project's motivation stemmed from needs articulated by the North Carolina Drought Management Advisory Council (DMAC) and constituents such as N.C. Cooperative Extension agents and public water supply system managers. These needs included a better understanding of how drought is monitored, the climatic and environmental conditions that can cause or worsen drought conditions, and drought impacts on various sectors and regions of the state. The project objectives were to:

- Develop tailored, sector-specific information for drought-relevant decisions
- Deliver information in accessible and actionable formats
- Improve the transparency of the drought monitoring process through enhanced engagement and communications with decision makers

Throughout the project, SCONC and CISA engaged with decision makers to identify and prioritize drought information needs, develop new informational resources and prototypes, and obtain feedback on the usability and usefulness of those new products. The project was designed as an iterative process (Figure 1) and focused on three key sectors affected by drought: agriculture, forestry, and water resources. **Visit the project's website for the full project report and examples of resources developed under the project: https://climate.ncsu.edu/drought_comm.**

Project Approach

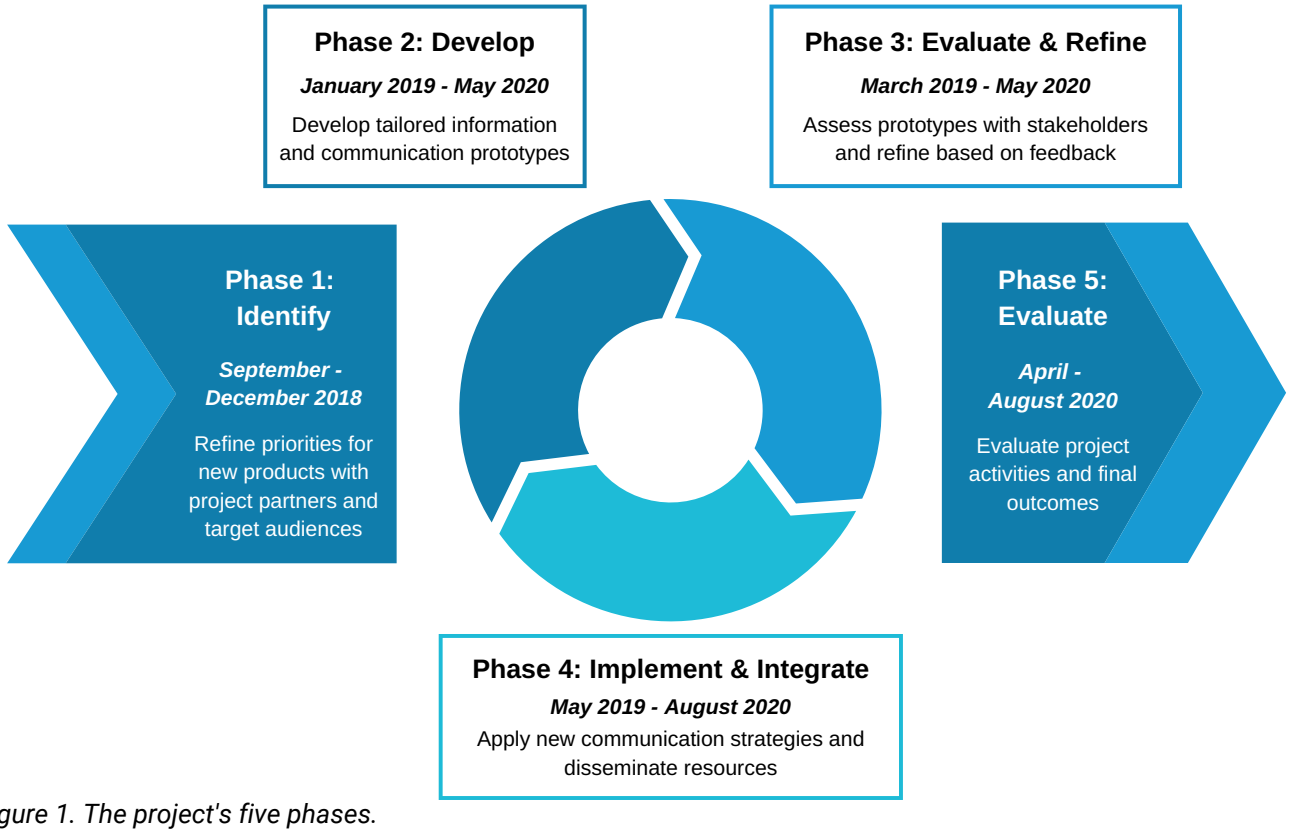


Figure 1. The project's five phases.

KEY FINDINGS AND TAKEAWAYS

1 WORK TOWARD SUSTAINED ENGAGEMENT

This project's success is partly owed to our **ability to leverage existing networks and partnerships**, as well as related activities at the SCONC.

- We partnered with the NC DMAC to ensure project outputs are available on the ncdrought.org website. This includes the story map describing the NC DMAC's history and monitoring process and the infographics describing the weekly drought map and forecasted conditions over the next few weeks.
- Through ongoing projects and activities with N.C. Cooperative Extension and the NC Fire Environment Committee, we expanded the reach of the project outputs and findings, such as through educational training sessions.
- An exciting outcome of the project is a new collaboration with the Internet of Water and Triangle Water Supply Partnership. The Internet of Water is leading an effort to pilot a "Water Supply Dashboard" with the Triangle Water Supply Partnership, downstream utilities, and the NC Division of Water Resources. This is a direct outgrowth of a priority we identified in Phase 1 and refined through subsequent project activities. The Water Supply Dashboard will be a site for discovering real-time water supply information, and will help water resource managers monitor and communicate water supply status and risk reduction measures or decisions.

It is imperative to highlight that **ongoing engagement and sustained dialogue** with information users **requires devoted or leveraged resources, such as through a grant or other budget allocation**. Do not underestimate what is required: staff time, science translation skills, and ability to build relationships.

2 USE YOUR AUDIENCE'S PREFERRED COMMUNICATION CHANNELS

It is important to **disseminate new information through channels that users are already tuned into, rather than creating a new channel** that would require work for end-users to discover. The NC DMAC's website (ncdrought.org) was revealed early on to be a trusted, go-to resource for drought information, but one that needed updates to allow information to be uncovered more readily and to deliver that information in more digestible pieces. While working with the NC Division of Water Resources to create and update information resources for this website, we considered users' preferences for different types of formats such as story maps and factsheets.

It is important to know **how information is used and shared**, as this may vary based on the sector or stakeholder group. For example, Extension agents and NC Forest Service personnel indicated they did (or would) use information resources to inform themselves as well as their clients or constituents by sharing them directly. Water utility representatives indicated they do (or may) use information for their own situational awareness, but that they prefer to use their own "branding" when sharing information with their clients or constituents.

The project's stakeholders additionally indicated preferences for combinations of web-based and emailed information. Social media is a growing medium for communicating information, but preferences varied among our target sectors. Water managers and National Weather Service (NWS) offices, for example, preferred Twitter, while Extension agents preferred Facebook.

Priorities and Final Products

Priority 1. Narratives to accompany the NC Drought Map and synthesize the weekly drought status in NC.

Weekly Drought Update infographics

Priority 2. Resources that relate anticipated short- and long-range conditions to drought conditions and local- and sector-specific effects in NC.

Short-Range Outlook infographics

Priority 3. Contextualized and sector-specific information to support use and understanding of drought information.

Workshops and trainings

Historical drought factsheets

Collaboration with the Internet of Water to develop a Water Supply Dashboard

Priority 4. Resources that describe the NC DMAC, its purpose, its weekly drought monitoring process, and how this relates to the US Drought Monitor.

Story map and factsheets about the NC DMAC and its weekly drought monitoring process

Recommendations to improve the NC DMAC's website to increase the accessibility and discoverability of information

View examples of these resources on the project website: https://climate.ncsu.edu/drought_comm

3 PLACE DROUGHT INFORMATION IN CONTEXT

Information is used and valued if it **ties to a specific decision or action** to be taken. We sought to provide context in all resources developed under this project, such as the Weekly Drought Update Infographic (Figure 2). This infographic incorporates text and icons to annotate impacts and changes to drought indicators across the state. Through engagement with various participants and sectors, we also learned more about the seasonality and timing of their decisions and how drought's varying effects on the different sectors affected when and how they want to interact with drought information.

Drought is important to all our target sectors, but at different times and in different ways. While some preferences are universal, such as the importance of emphasizing impacts rather than objective indicators when communicating drought status, **the exact type and extent of use is related to the drought severity and specific sector.**

- Agricultural extension agents are likely to use these products year-round, regardless of drought conditions.
- Water managers indicate that they follow their own metrics for drought monitoring, but they would appreciate additional information resources during drought events to help communicate information about causes and future conditions.

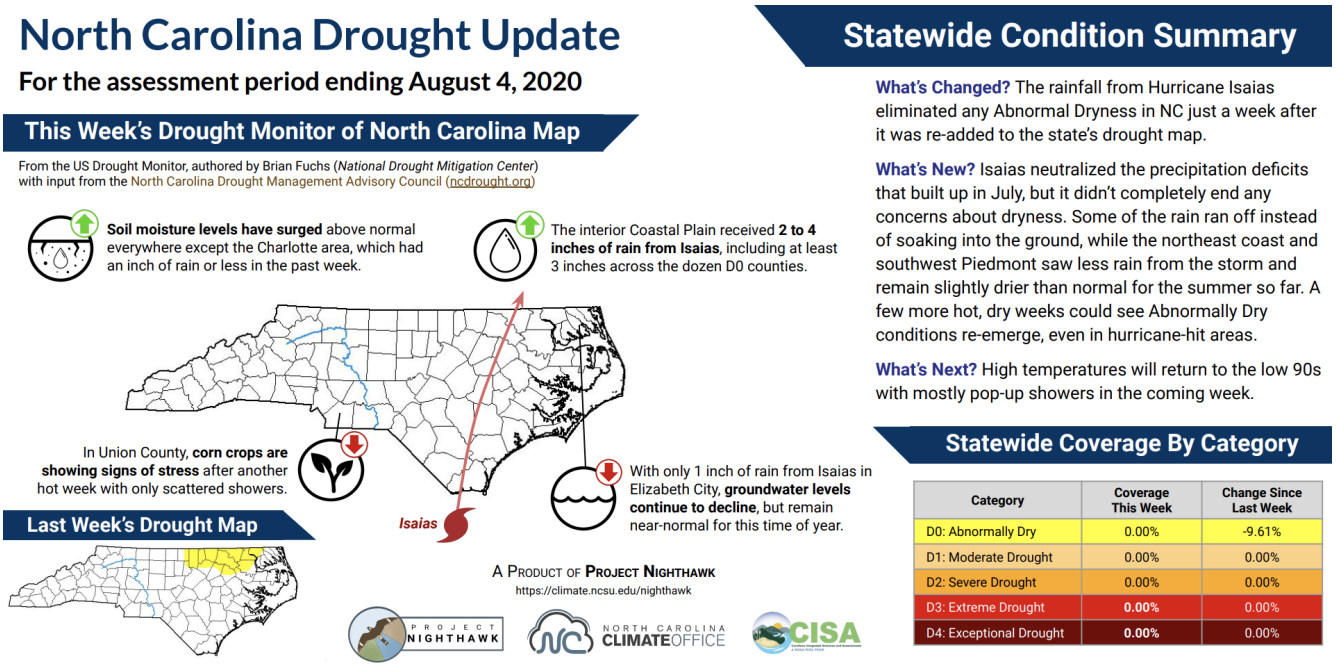


Figure 2. Example Weekly Drought Update Infographic from August 2020.

4 TRANSLATE THE SCIENCE WITHOUT OVERSIMPLIFYING

Creating and producing explanatory infographics assumes a baseline level of knowledge among consumers. Our engagements with project stakeholders revealed that this assumption may not hold true, particularly among the diverse set of users who consume weather, climate, and drought information to inform various activities and decisions. **We therefore prioritized producing and providing information that explains how to access, interpret, and apply technical types of information to fill in knowledge gaps among our target audiences.**

Participant feedback indicated **preferences for partially translated technical and scientific information.** Some technical information was still preferred, particularly if it could be used as a learning opportunity for themselves or others.

While users favored partially translated and non-technical language in the product prototypes, they also relayed **the importance of connecting information to the original data source or information creator** in the product and using reputable and **trusted sources** such as the SCONC or NWS.

KEY FINDINGS AND TAKEAWAYS

5 DON'T JUST CREATE, EVALUATE

By integrating evaluation and systematic user engagement throughout our project, we sought to ensure that the final products would not only be useful, but used by our target audiences.

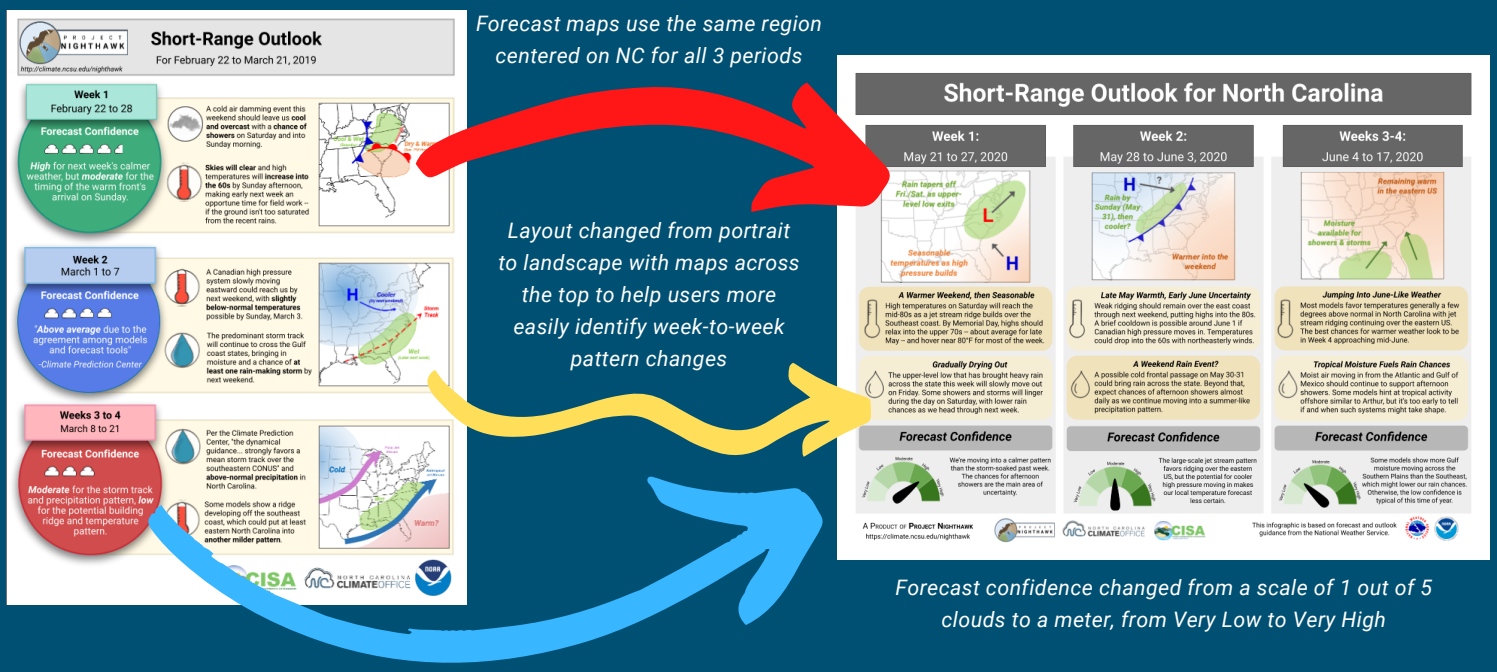
Informational products, especially the Weekly Drought Update and Short Range Outlook infographics, received multiple rounds of evaluation with participants from our target sectors and others involved in drought monitoring such as DMAC members and NWS personnel. Through quantitative and qualitative data collection and analysis we learned which **standardized formats and design elements help users read and consume the information on a week-to-week basis**.

Feedback from participants revealed that **their use of informational resources is influenced by the perceived credibility and legitimacy of those resources**. To foster these characteristics in the information prototypes, we tried to convey decision-relevant information and elucidate the "behind the scenes" process to make information more transparent to the end-user. For example, the Weekly Drought Updates (Figure 2) were designed not only to communicate when changes to the NC Drought Map occur, but also to explain the rationale when changes did not occur.

Project participants reported their main use (real or potential) of the informational resources we developed was for **maintaining situational awareness of current or emerging conditions** and that **the resources we developed could serve as an alert or early warning of changing conditions**. Some participants also indicated using project outputs to justify or inform specific decisions, such as for fire response and management or agricultural decisions.

Example: *The Evolution of our Short-Range Outlooks*

Through our iterative design process, we continually evaluated and refined our developed resources to better meet the needs of our target sectors. This example highlights changes to our Short-Range Outlook infographics, from the first prototype to the final product.



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