2021-2022

EXTENSION ACTIVITIES HIGHLIGHTS

from The North Carolina State Climate Office

The NC State Climate Office continued to engage in dialogue with county and university Extension personnel over 2021-2022 to understand how NCSCO can best support Extension's weather and climate data and information needs. In addition to strengthening partnerships through these trust-building engagements, NCSCO also gave over 15 talks in collaboration with Extension, including to master gardener associations, cattlemen's groups, and area farmers. Most of these centered on climate, and climate change, impacts to agriculture or gardening, as well as climate-based tool demonstrations. Outcomes of these activities also included insights into climate information needs of Extension agents and their clients, which informed the development of new and updates to existing climate-based tools.

5TH GRADE WEATHER-CLIMATE KITS

During a meeting with personnel from the Carteret County Center for NC Cooperative Extension, the need for weather and climate support for 5th grade teachers was communicated. Based on this discussion, NCSCO partnered with Carteret County 4-H to pilot the development of weather-climate 'kits' to supplement 5th-grade teachers' weather units at Bogue Sound Elementary. NCSCO modified lessons previously developed with the Science House to meet specific needs of teachers (e.g., preferred topics, time constraints), and purchased and organized supplies for 15 kits (5 lessons x 3 classrooms). Carteret County 4-H collected input from teachers on instructional and content needs and coordinated with the elementary school to implement these kits in Spring 2022. Based on positive feedback, we are in the early stages of planning how to reuse and expand these kits to other regions for the 2022-23 school year.

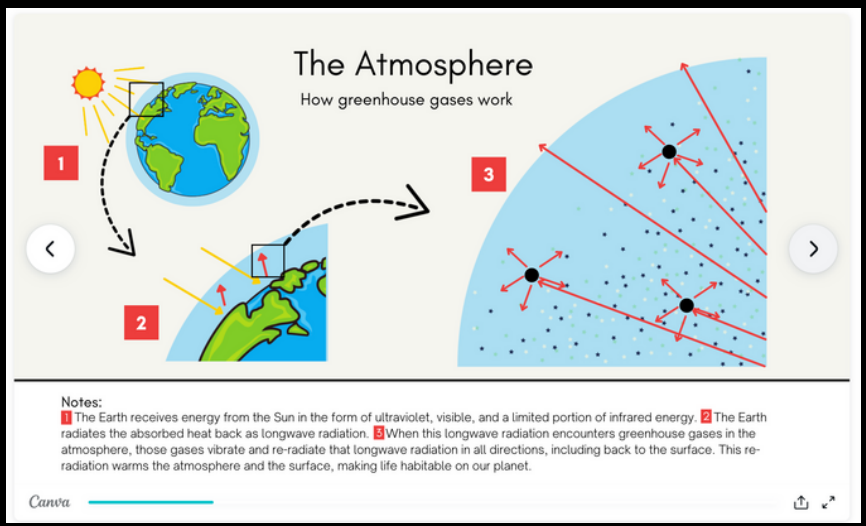
CLIMATE CHANGE EDUCATION

climate.ncsu.edu/learn/climate-change-lessons/

Over the past two years, requests for climate change information in the form of educational presentations from the NCSCO by Extension colleagues has increased substantially. To aid in meeting this demand, NCSCO developed a climate change curriculum and three-part lesson series that covers (1) the science of climate change; (2) North Carolina's changing climate and adapting to climate impacts in the state; and (3) climate solutions. These lessons are provided as online presentations that learners can step through at their own pace. In addition, slides and lecture notes are available for educators who would like to incorporate these materials into their existing programming. Many requests for talks in the past year have come from Master Gardener groups, so these lessons were developed to target this audience specifically while still being broadly applicable to most adult audiences in NC.

This slide from the first of the three-part series of online climate change lessons supports learners' conceptual understanding of the atmosphere and the role of greenhouse gases in moderating our planet's climate. Learners can click arrows to move forward or backward in the presentation at their own pace.

https://climate.ncsu.edu/learn/climate-change-lessons/



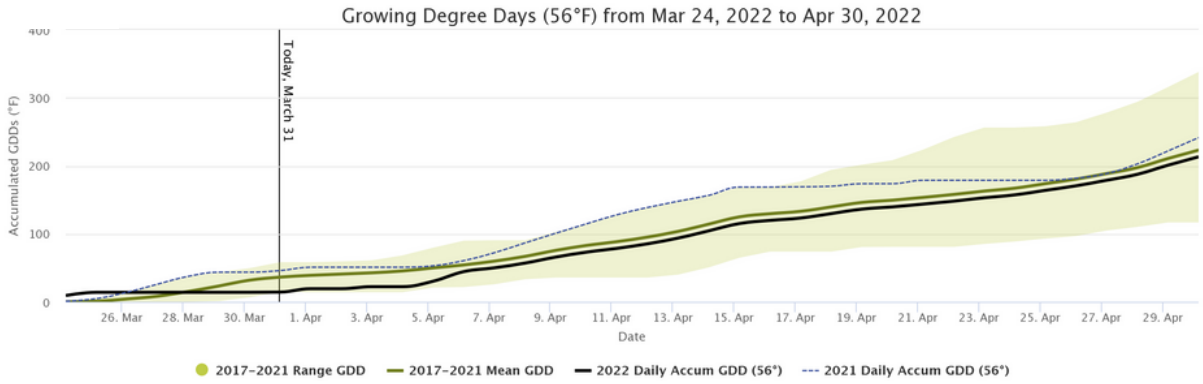
NEW AND UPDATED TOOLS

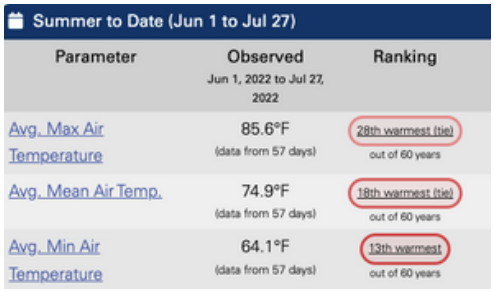
Growing Degree Day Explorer

https://products.climate.ncsu.edu/ag/gdd-explorer

During the 2021 State Extension Conference and in conversations throughout 2021-22, agents expressed a need for a way to easily view current, past, and forecasted growing degree days (GDDs) for North Carolina locations. In response to these requests, NCSCO built the **Growing Degree Day Explorer.** Users enter or select start-end dates and a base temperature and the tool outputs seasonal GDD accumulations. Built on gridded data, this tool uses a combination of historic observations, forecasts from the National Weather Service, and historic averages to provide accumulated GDD estimates and predictions. Beta testing with key users, especially Craven County Extension, supported the tool's design and output to best meet user needs. The GDD Explorer was launched in March 2022 and feedback over the 2022 planting and growing seasons will guide updates and refinements to the tool in fall-winter 2022.

Example output from the GDD Explorer shows observed and predicted GDD accumulations for the current year (2022) and previous year (2021) overlaid with the historic 5-year average and range.





Summer to Date (Jun 1 to Jul 27)

Parameter	Observed (Jun 1, 2022 to Jul 27, 2022)	Ranking
Avg. Max Air Temperature	85.6°F (data from 57 days)	28th warmest (tie) out of 60 years
Avg. Mean Air Temp.	74.9°F (data from 57 days)	18th warmest (tie) out of 60 years
Avg. Min Air Temperature	64.1°F (data from 57 days)	13th warmest out of 60 years

Station Scout

https://products.climate.ncsu.edu/cardinal/scout

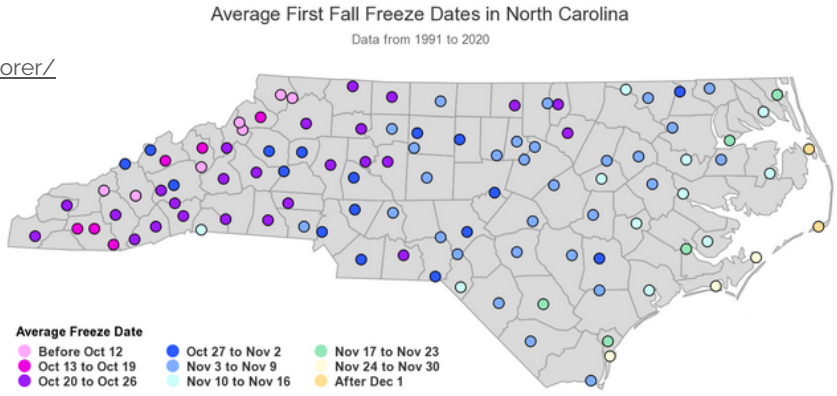
We continue to make updates to the **Cardinal** data retrieval system and **Station Scout** tools based on feedback from our users, many of whom are in Extension. A key upgrade as made in summer 2022 with the launch of the Almanac feature which enables users explore the climatological context of current weather rankings for stations.

Pictured at left: Rankings for a weather station in Danbury, NC, enable users to quickly assess how recent weather compares to the station's 60+ year history.

Freeze Date Explorer

https://products.climate.ncsu.edu/climate/freeze-explorer/

In winter 2021-2022, we additionally updated a tool to view historic observed and average dates for the first and last freeze based on long-term monitoring stations. This tool was originally developed to support Horticulture Extension and the updates, which include the ability to view averages based on different periods in time, were added to support educational initiatives around gardening and climate.



Over the most recent 30-year normals period, the average date of the first fall freeze ranges from late October in the mountains to after December 1 along the Outer Banks.

NORTH CAROLINA CLIMATEOFFICE

NC COOPERATIVE EXTENSION

N.C. A&T STATE UNIVERSITY

NC STATE UNIVERSITY