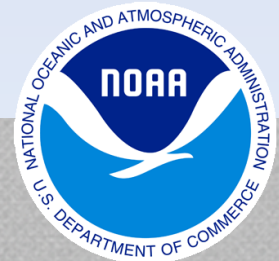


NCDC Outreach and Engagement



Tamara G. Houston
Sectoral Engagement Lead

March 20, 2013



Why Frost and Freeze Matters

- **Agriculture and Horticulture Communities**
 - Impacts planting dates and growing season lengths
- **Construction Community**
 - Impacts foundation depths and may cause foundation heave.
- **Transportation Community**
 - Impacts road conditions and may cause pavement heave.



What is Frost and Freeze?

Frost - Frost describes the formation of thin ice crystals on the ground or other surfaces in the form of scales, needles, feathers, or fans. Frost develops under conditions similar to dew, except the temperatures of the Earth's surface and earthbound objects falls below 32°F.

Freeze - A freeze is when the surface air temperature is expected to be 32°F or below over a widespread area for a climatologically significant period of time. Use of the term is usually restricted to advective situations or to occasions when wind or other conditions prevent frost.

"Killing" may be used during the growing season when the temperature is expected to be low enough for a sufficient duration to kill all but the hardiest herbaceous crops.

NWS Glossary: <http://w1.weather.gov/glossary/>



Frost and Freeze Products

- **National Weather Service**

- Frost Advisory
- Freeze Watch/Warning
- Hard Freeze Warning

- **National Climatic Data Center**

- Supplemental Normals
 - Frost-Freeze Probabilities of Occurrence, Probability Dates, Growing Season Length
- Air Freezing Index
 - A measure of how much and how often air temperatures are above and below freezing during the winter.

- **NOAA Partners**

- Midwest Regional Climate Center
- RENCI/NEMAC
- CICS-NC
- ERT

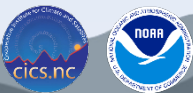
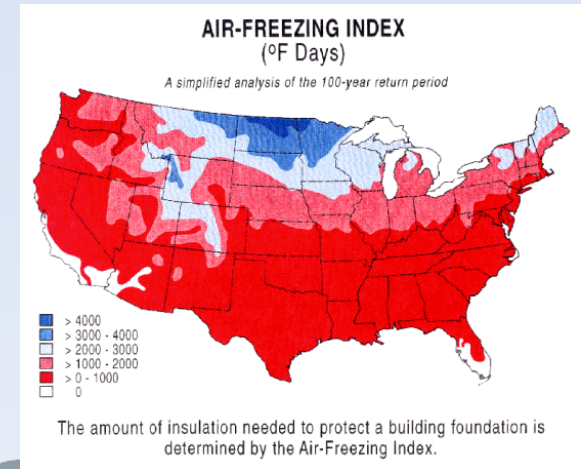
03/11/2013
 U.S. Department of Commerce
 National Oceanic & Atmospheric Administration
 National Environmental Satellite, Data, and Information Service
 Summary of Annual Normals
 1981-2010
 National Climatic Data Center
 Federal Building
 511 Patton Avenue
 Asheville, North Carolina 28801
 706/616-7800
 www.ncei.noaa.gov
 (NCEI) 010200020012
 Doc: 042 F, Lit: 35, 43274, Ltr: 35, 03F 24

Station: ASHEVILLE REGIONAL AIRPORT, NC US
 Elev: 942 ft., Lat: 35.4327°N, Lon: 82.5129°W

Temp (F)		Freeze Data									
		Spring Freeze Dates (Month/Day)					Fall Freeze Dates (Month/Day)				
		Probability of later date in spring (through Jul 31) than indicated ¹⁾									
36	36	28	28	28	28	28	28	28	28	28	28
36	37.4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
36	39	0.04	0.02	0.02	0.04	0.04	0.02	0.02	0.04	0.02	0.04
36	40.6	0.14	0.14	0.10	0.09	0.09	0.11	0.10	0.09	0.11	0.10
36	43.0	0.40	0.40	0.37	0.32	0.32	0.35	0.35	0.32	0.35	0.34
36	45.4	0.74	0.74	0.70	0.58	0.58	0.63	0.63	0.58	0.63	0.61
36	47.8	0.96	0.96	0.93	0.79	0.79	0.85	0.85	0.79	0.85	0.83
36	50.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
36	52.6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
36	55.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Temp (F)		Freeze Free Period									
		Probability of longer than indicated freeze free period (days)									
36	36	28	28	28	28	28	28	28	28	28	28
36	37.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	40.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	43.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	45.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	47.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	50.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	52.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	55.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

¹⁾Probability of observing a temperature as high, or colder, later in the spring or earlier in the fall than the indicated date.
 0.00 indicates that the probability of occurrence of freeze-free temperature is less than the inclusion probability.
 Derived from 1981-2010 5-day monthly complete daily data.
 Complete Documentation available from: www.ncei.noaa.gov/products/normal/supplemental



Engagement: Data to Decisions

NOAA NATIONAL CLIMATIC DATA CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Home About NCDC Contact Help **New to Climate Information?** **SEARCH**

Data Access

- Most Popular Data
- Land-Based Station Data
- Satellite Data
- Radar Data
- Model Data
- Weather Balloon Data
- Marine / Ocean Data
- Paleoclimate Data
- Severe Weather
- Other Data Access

Climate Information

- Climate of the U.S.
- Analyses
- Extreme Events
- Statistical Weather and Climate Information
- Sectoral & Regional
- International
- Science Papers and Publications

Most Popular Data

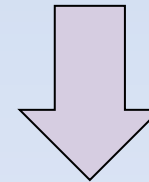
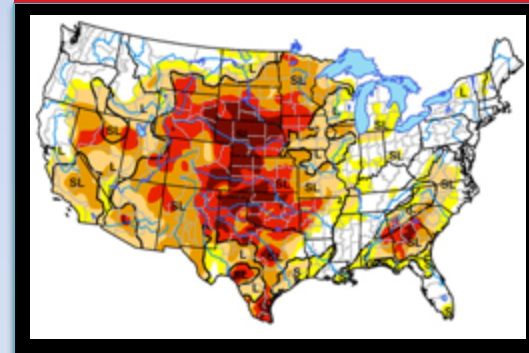
Click on one of the links below to jump to the details of the listed dataset or product:

- [U.S. Local Climatological Data](#)
- [Global Historical Climatology Network-Daily \(GHCN-D\)](#)
- [Integrated Surface Data, Hourly, Global](#)
- [1971-2000 U.S. Climate Normals Products](#)
- [Storm Data Publication/Database](#)
- [Climatological Data Publication](#)
- [Hourly Precipitation Data Publication/Database](#)
- [U.S. Annual Climatological Summary](#)
- [Weather Maps/Charts](#)
- [Comparative Climatic Data \(CCD\)](#)
- [Climatic Wind Data Publication](#)
- [Climate Maps of the United States](#)
- [CD-ROMs/DVDs](#)
- [Climate Indices](#)
- [Global Summary of the Day \(GSOD\)](#)
- [U.S. Historical Climatology Network \(USHCN\)](#)
- [Climates of the World/Historical Climate Summary](#)
- [Historical Significant Events Imagery](#)
- [Regional Climate Centers/National Weather Service Products](#)
- [Various Webpage Resources](#)
- [Analyses/Climate Monitoring](#)

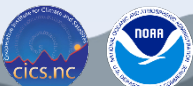
* Access to online data (online meaning available through our website for online delivery) is now free to everyone. Some orders could be subject to a certification, consultation fee or handling charge. See the [notes](#) at the bottom of this page.

<http://www.ncdc.noaa.gov>

Climate Information

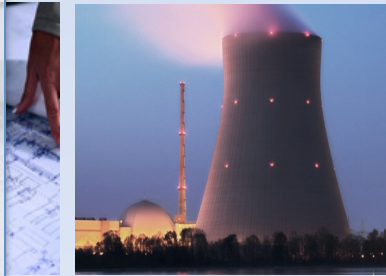


Business Decisions



Serving Wide Range of Customers... However...

Consulting Meteorologist
Agriculture
Contractor
Utilities
Federal Government
State/Local Government
Research
Media
University
Insurance
Engineering
Individual
Legal
Other Business



- How is climate information being used?
- What datasets are enabling decision-making?
- What climatic information does the customer need?

Building the Conversation with the User Community:

NCDC SECTORAL ENGAGEMENT INDUSTRIES

- Agriculture
- Civil Infrastructure
- Coastal Hazards
- Energy
- Health
- Insurance
- Litigation
- Marine and Coastal Ecosystems
- National Security
- Tourism
- Transportation
- Water Resources



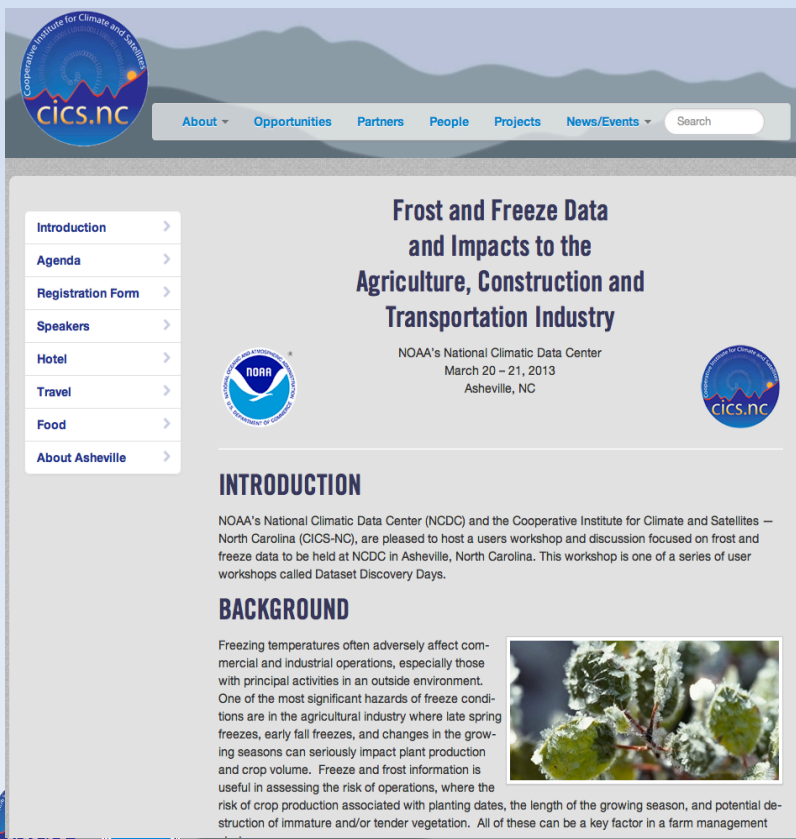
Example NOAA Climate Products and Services



NCDC Outreach and Engagement: User Workshop Series

ONE-DAY USER WORKSHOP SERIES

- Advance literacy on climate data and products for the private sector, and increase understanding of users' needs for climate information
- Discuss example case studies of decision-support tools and their applications
- Understand barriers / challenges faced by private sector and professional associations in uses of data



The screenshot shows the CICS-NC website interface. At the top left is the CICS-NC logo. Below it is a navigation menu with links for About, Opportunities, Partners, People, Projects, and News/Events, along with a search bar. The main content area features a sidebar on the left with a list of menu items: Introduction, Agenda, Registration Form, Speakers, Hotel, Travel, Food, and About Asheville. The main content area is titled "Frost and Freeze Data and Impacts to the Agriculture, Construction and Transportation Industry" and includes the NOAA and CICS-NC logos, the event dates (March 20-21, 2013) in Asheville, NC, and sections for "INTRODUCTION" and "BACKGROUND". The introduction text states that NOAA's National Climatic Data Center (NCDC) and CICS-NC are hosting a series of user workshops called Dataset Discovery Days. The background section discusses the impact of freezing temperatures on commercial and industrial operations, particularly in agriculture, and includes a photograph of frost-covered plants.

- SCHEDULE -

- **Storm and Severe Weather**
 - *November 28 – 29th, 2012*
- **Frost and Freeze Data**
 - *March 20 – 21st, 2013*
- **Sea Surface Temperature**
 - *July 30th, 2013*
- **Website: www.cicsnc.org/events/ddd/**

NCDC Outreach and Engagement: Executive Forum on Business and Climate

June 3-6, 2013



FORUM VISION

Advance
Climate
Information

Capacity
Building

Building
Networks &
Knowledge
Exchange

BACKGROUND

- NOAA's NCDC and CICS-NC is examining how US businesses can develop a strategic advantage by employing weather and climate information for better decision-making
- Currently in process of developing a four-day executive forum that explores the connection between weather and climate information and the industries that not only rely on this data but also are impacted by changes in trends of this data.
- Through a combination of interactive discussions, case studies, lectures, and scenario-planning activities, participants will become familiar with climate science, available weather and climate data and science, weather and climate risk implications, available tools in the market, the broader climate market and the current state of the regulatory and policy framework.

OBJECTIVES:

- **Expand each participant's knowledge and awareness of weather/climate information and impacts on the resources relevant to businesses**
- **Establish an ongoing educational seminar with expertise from the scientific community (NCDC and CICS-NC) in Asheville, North Carolina**
- **Scale up seminar and training to business leaders**
- **Grow network of weather and climate informed decision-makers**

Moving Forward

- Focus on user-driven science.
- Greater emphasis on applications of science and data.
- NCDC recognizes the need to connect with users.
- Partnerships across the public/private/academic enterprises.
- Opportunities to interact and participate in workshops and conversations.



Questions?

Tamara G. Houston

Sectoral Engagement Coordinator

NOAA's National Climatic Data Center

Tamara.Houston@noaa.gov

(828) 271-4266

