

Life as a Climatologist

Ryan Boyles

Director, State Climate Office of North Carolina

Extension Assistant Professor,

Department of Marine, Earth, and Atmospheric Sciences

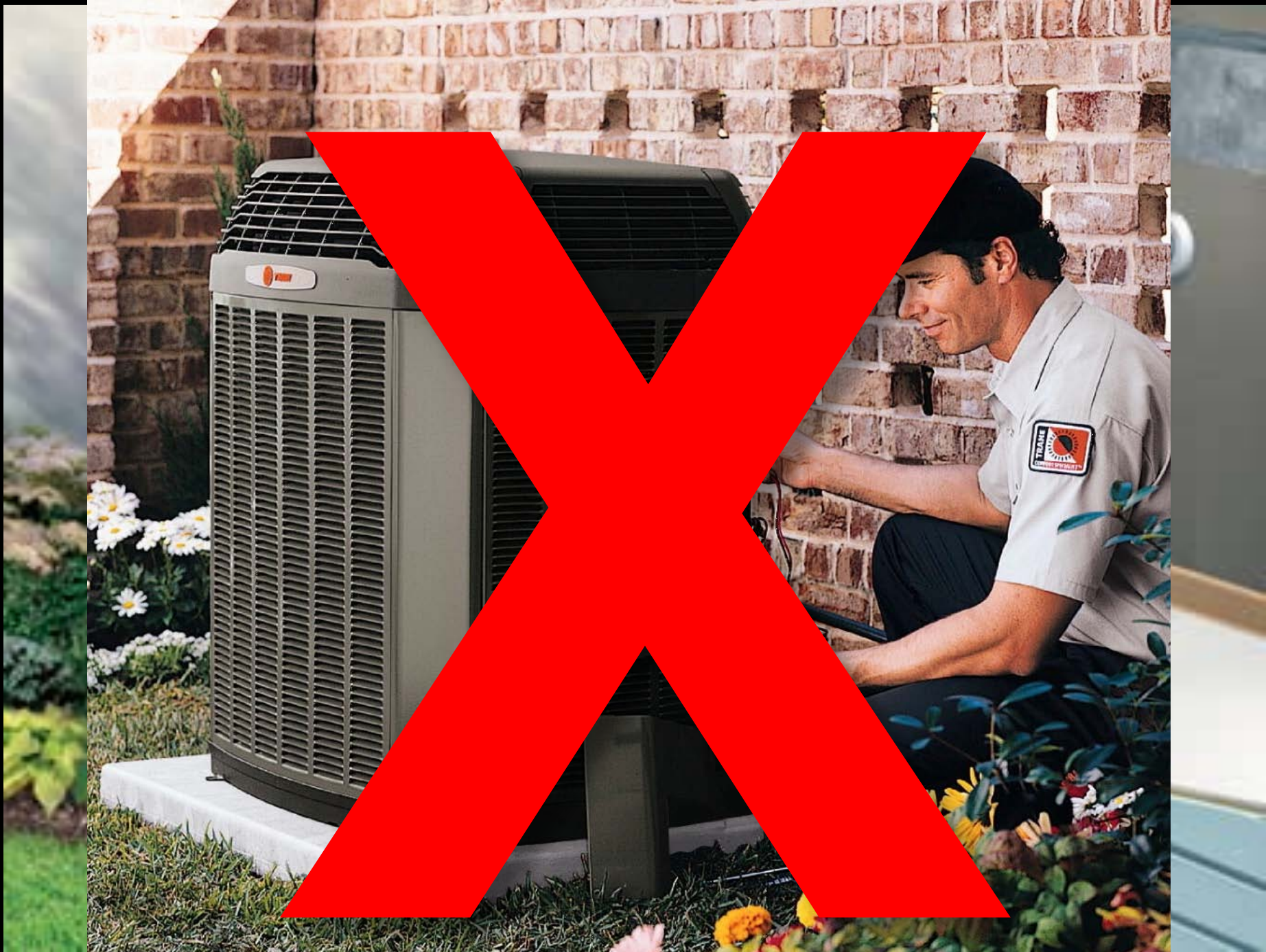
NC State University

CoCoRaHS WxTalk Series

February 20, 2014



NORTH CAROLINA
CLIMATE OFFICE



What is a climatologist?

Studies climate

Sometimes called a “climate scientist”

Physics of the earth climate system

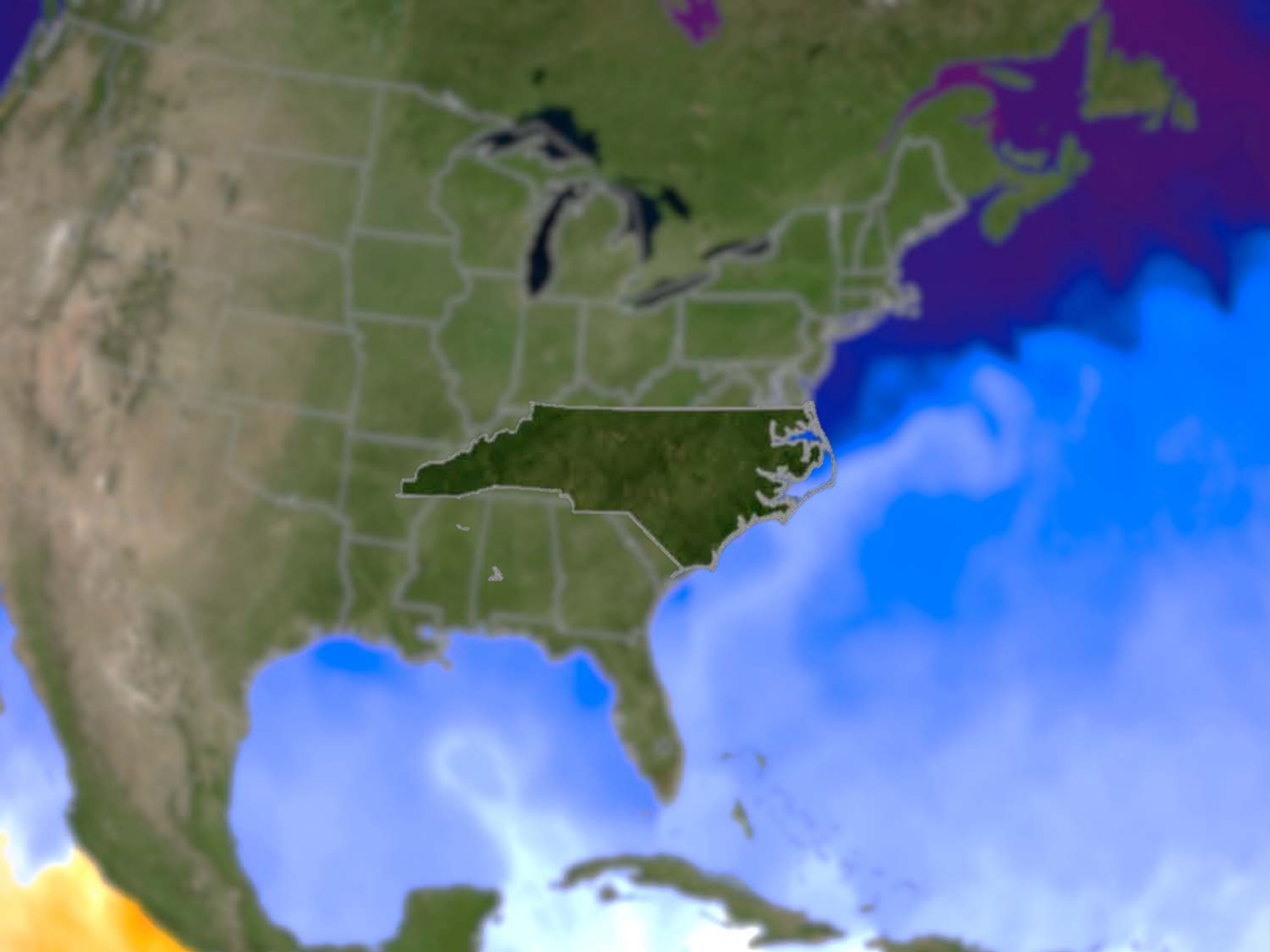
Applied climatologist



State climatologists

- Often applied climatologists
- Focus on climate services
 - Delivering climate science, climate data
 - Translating science into practice
 - Extension, outreach
- Aware of larger picture, but focused on limited geography (state)





A day in the life of...

Students and scientists

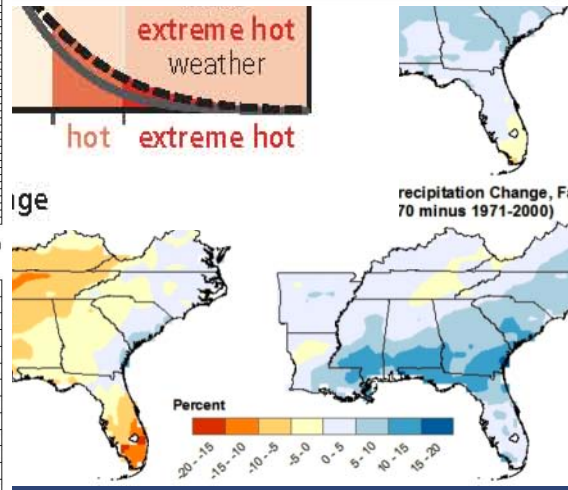
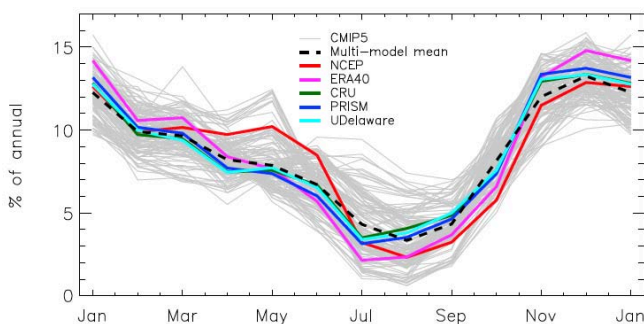
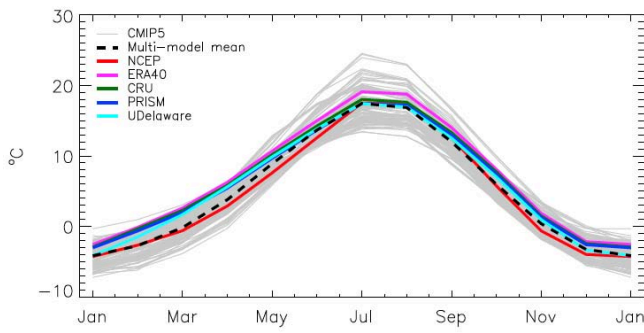
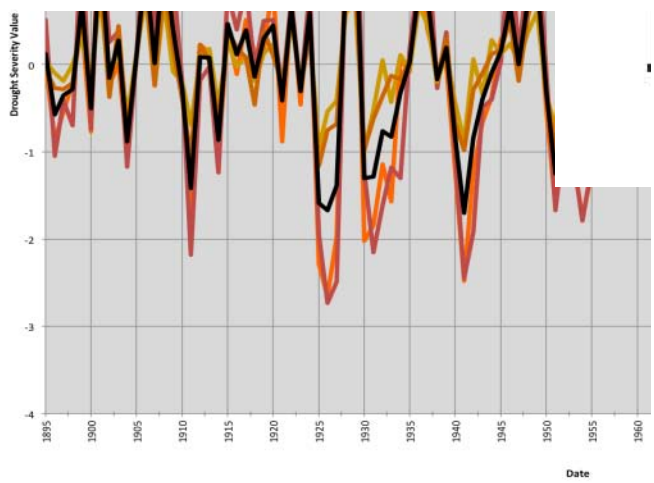
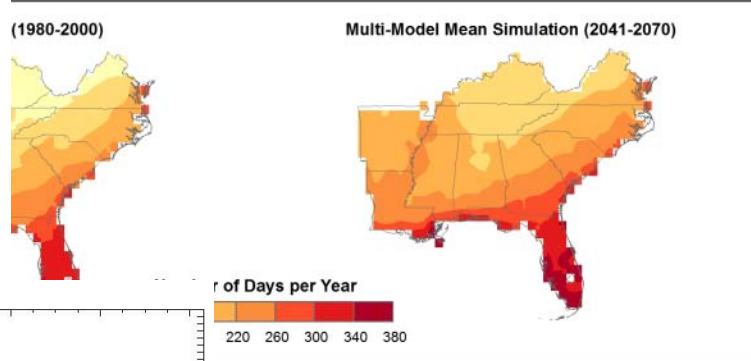
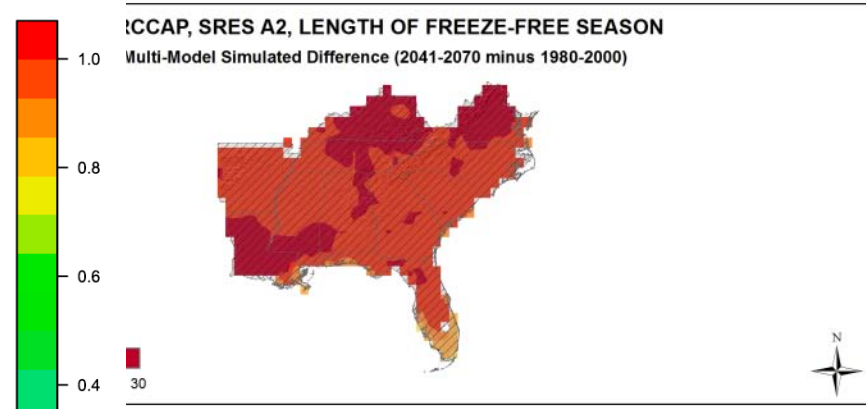
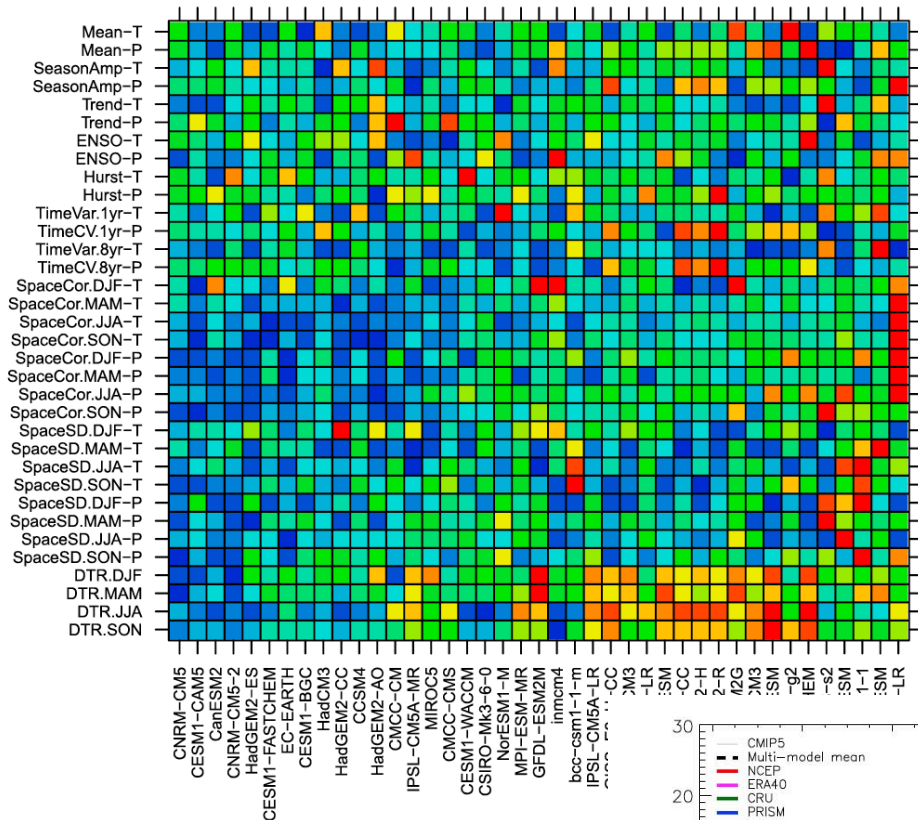
Data

Communication



Students and Scientists







Data

- Historical data, current conditions
 - Records and extremes
- Collecting, analyzing new data
 - Mesonets, CoCoRaHS
- Statistics!

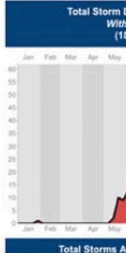
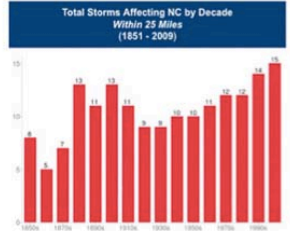
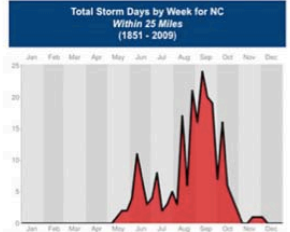


Communicating Science, Data to Others



Statistic	Direct Landfalling Storms in NC	Non-landfalling Storms Affecting NC Within 25 Miles	Total Storms Affecting NC
Number of Storms	72	103	175
Percentage of Storms	4.36%	6.23%	10.59%
Average Years Between Storms	2.19	1.53	0.90
Average Storms Per Week	0.46	0.65	1.11

Statistic	Direct Landfalling Storms in NC
Number of Storms	72
Percentage of Storms	4.36%
Average Years Between Storms	2.19
Average Storms Per Week	0.46



Climate Education for Agriculture

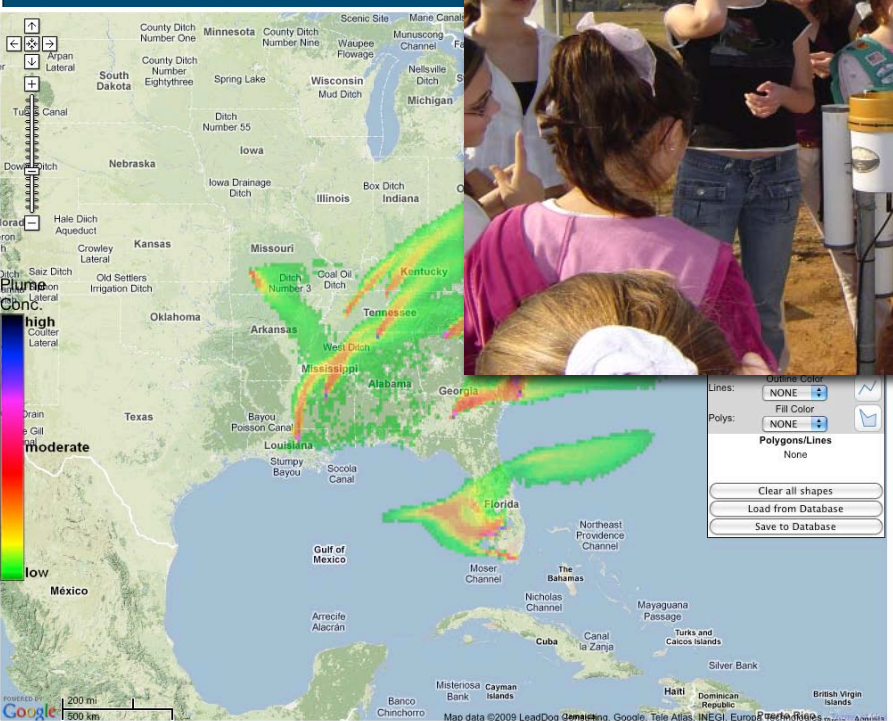
Index Background and Basics Climate Variability Climate Change

Humidity

Humidity is a measure of the amount of moisture in the air. It tells you how comfortable it is to be outside, and if there is enough moisture to create clouds and rain.

Why do I care? Humidity has a huge impact on your health and the health of your crops. It affects the ability of both plants and people to cool themselves through evaporation. It is also important to precipitation formation.

Humidity tells you the moisture content of the atmosphere, or how much water vapor there is in the air. When the humidity is high it feels oppressive outside because sweat doesn't evaporate and provide cooling. When the humidity is low you feel cooler, but your skin dries out and you get dehydrated more easily because more moisture is being evaporated from your body. The same thing applies to crops in high and low humidity and dew point are the two main ways



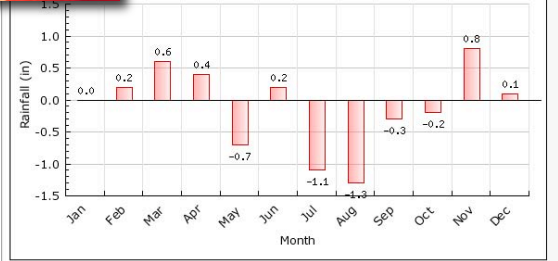
County Maps: Select State

Current Climate Phase: El Niño

El Niño reaches moderate strength and continues to build in the Pacific Ocean.

Month	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Probability Distribution	4.6	3.8	3.2	4.8	4.6	3.6	4.2	2.8	3.7	3.3	0.1
Probability of Exceedance	0.6	0.4	-0.7	0.2	-1.1	-1.3	-0.3	-0.2	0.8	0.1	

Total Rainfall - Deviation from All Years Johnston, NC - El Niño Years



State + County
 NC JOHNSTON

- NEUTRAL
- EL NIÑO
- LA NIÑA
- All Years

Graph All

Communication

- Historical, current conditions
 - What drives hot and cold, wet and dry?
 - How does this year compare?
 - Why did this happen?
- Seasonal, long-term projections
 - What are the risks?
 - How might this impact decisions?
 - What is our confidence?



Communication

- Science translation
- Technology, computers
 - Visualize data
 - Decision support



Research

- Often Client Driven



THE A-TEAM



Research

- Often Client Driven
- Often cross-discipline
 - Agriculture
 - Water resources
 - Human and environmental health
 - Decision context



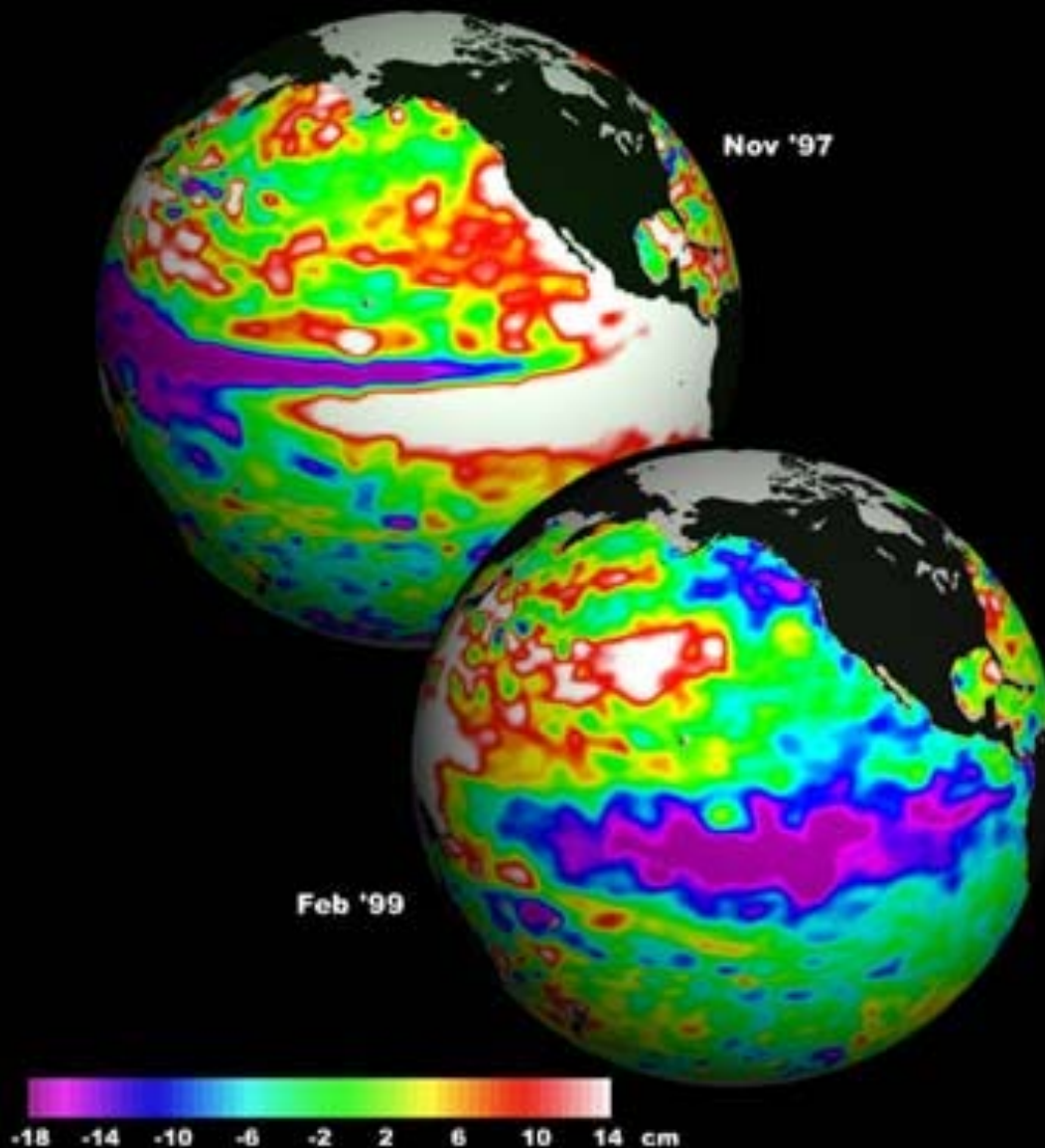
What Gets Us Excited?







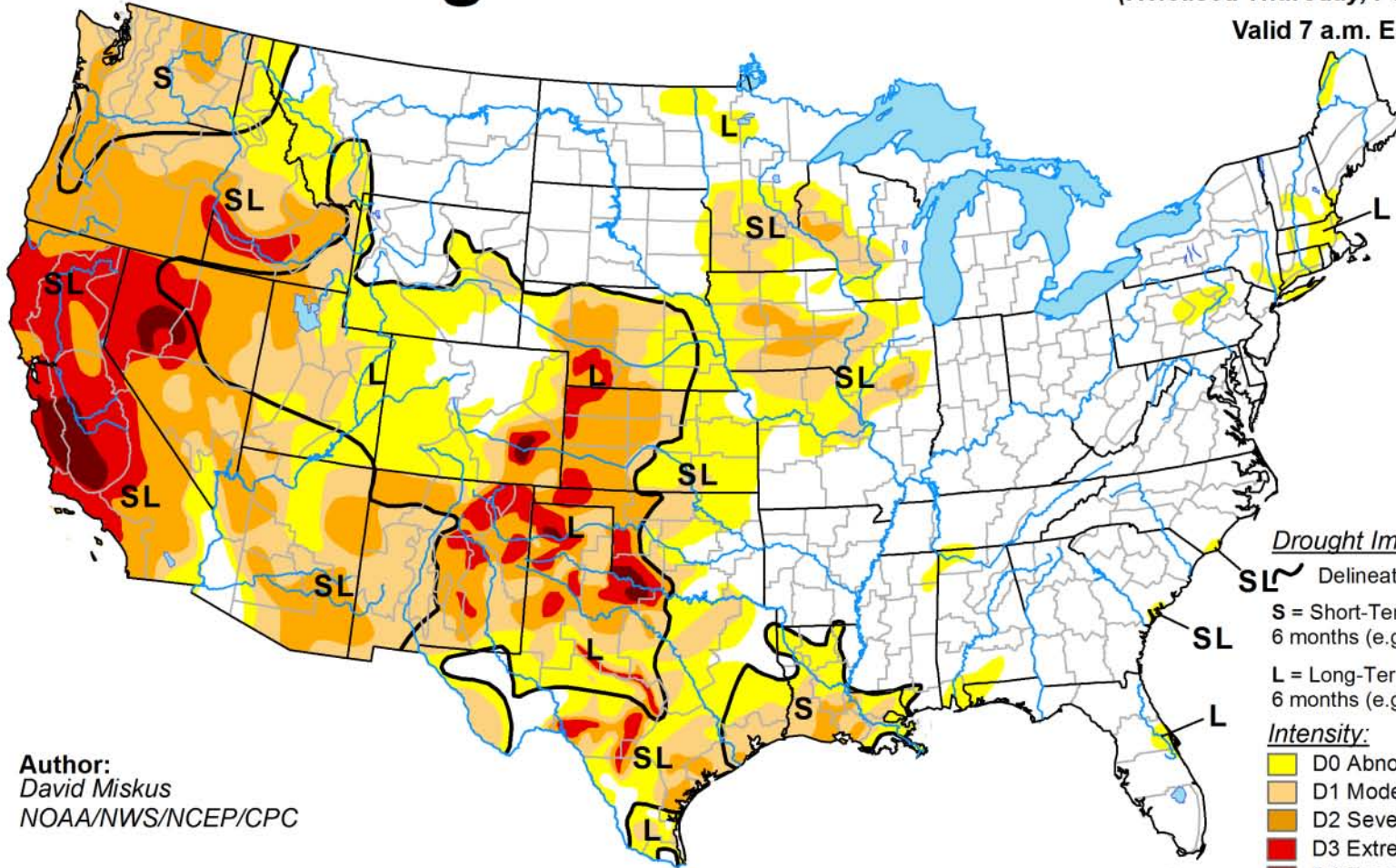
El Niño / La Niña



U.S. Drought Monitor

February 11, 2014
(Released Thursday, Feb. 13, 2014)

Valid 7 a.m. EST



Author:
David Miskus
NOAA/NWS/NCEP/CPC

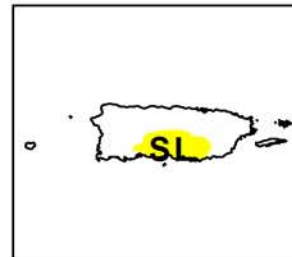
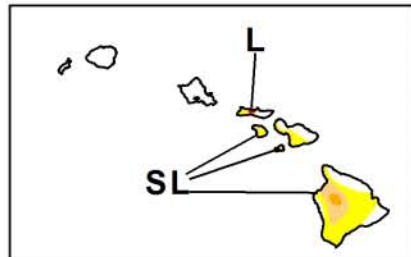
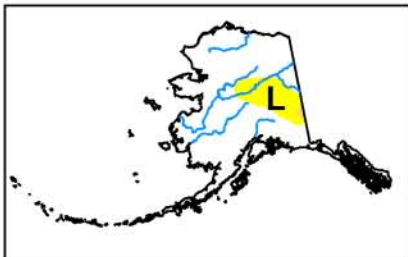
Drought Impact Types:

- SL** ~ Delineates dominant impacts
- S** = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L** = 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

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



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

What Brings Us Down?



Media

“_____ is due to global warming”

Complex science boiled down to 5 seconds, 1 sentence

General misunderstanding of scientific process



Data

There's never enough of what we want

There's always too much to manage and visualize



<http://www.nc-climate.ncsu.edu/>
Twitter @NCSCO

ryan_boyles@ncsu.edu
919-515-3056 or 877-718-5544

Hurricane Rita, September 21, 2005 - Courtesy NASA

