

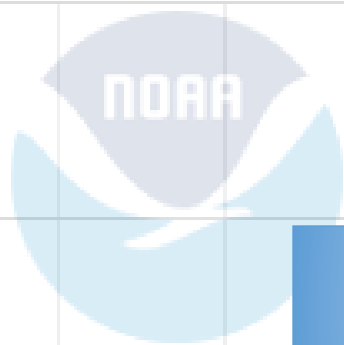


University of
Massachusetts
Amherst

2023 Update Mtg Jan 25: Climate Change Update

Item Type	article;article
Authors	Sandler, Hilary A.
Download date	2026-06-15 23:06:29
Link to Item	https://hdl.handle.net/20.500.14394/9017

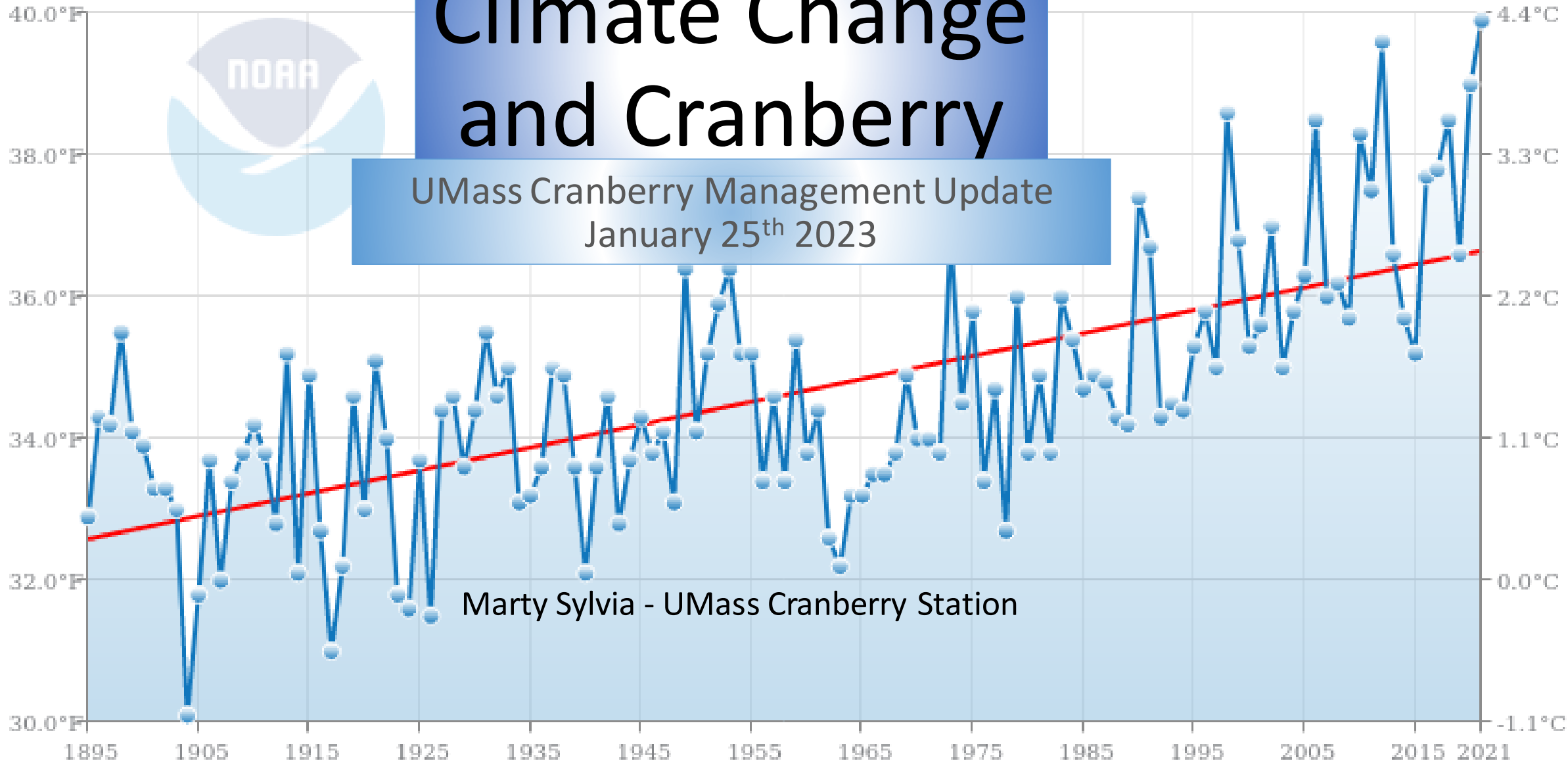
1895-2021 Trend
(+0.3°F/Decade)



Climate Change and Cranberry

UMass Cranberry Management Update
January 25th 2023

Marty Sylvia - UMass Cranberry Station



Do you think climate change is impacting your farm?

YES	98	70%
Maybe	4	
NO	29	
Not sure	9	
Not applicable	2	
Total response	142	

Did your bogs go under water in 2022 in the Sept rain event?

YES	55	40%
Almost	36	25%
NO	43	
Not applicable	8	
Total response	142	

What worries you most about Climate Change (in 2021)?

water (too much too little)	52
Heat in summer and fall	35
Lush growth	1
Warm winters	21
Rotting fruit	31
Total response	140

4 others said all of the above

What Climate Change trends have you seen?

(2021)

more frost	22
more rain	52
less rain	32
temp swings	103
delayed color	40
Total response	140 (multiple answer)

Boston racks up fourth driest and hottest summer on record

“We've been taking records for well over 100 years. That's pretty significant.”



The sun sets over the Boston skyline at the World's End Reservation on a June evening.
Carlin Stiehl for The Boston Globe

Boston.com August 31, 2022

Boston has had just 4.42 inches of rainfall in the past three months, compared to an average of [10.39 inches](#), according to the National Weather Service. “We’ve been taking records for well over 100 years and the fourth driest? That’s pretty significant,” said Bill Sullivan, a meteorologist for the NWS in Norton. Boston’s driest summer came in 2016, with a mere 3.92 inches of precipitation. 2022 is the second year in the 21st century to crack the top four, falling behind 1957 and 1949.

Drought conditions have plagued all of Massachusetts this summer. Nearly 96% of the entire state remained under severe or extreme drought last week, according to [the U.S. Drought Monitor](#)’s weekly report released August 25. This mass dryness affects everything from crops, to wildlife, to water quality. The next weekly drought report will be released Thursday.

Washington Post

August 16, 2022

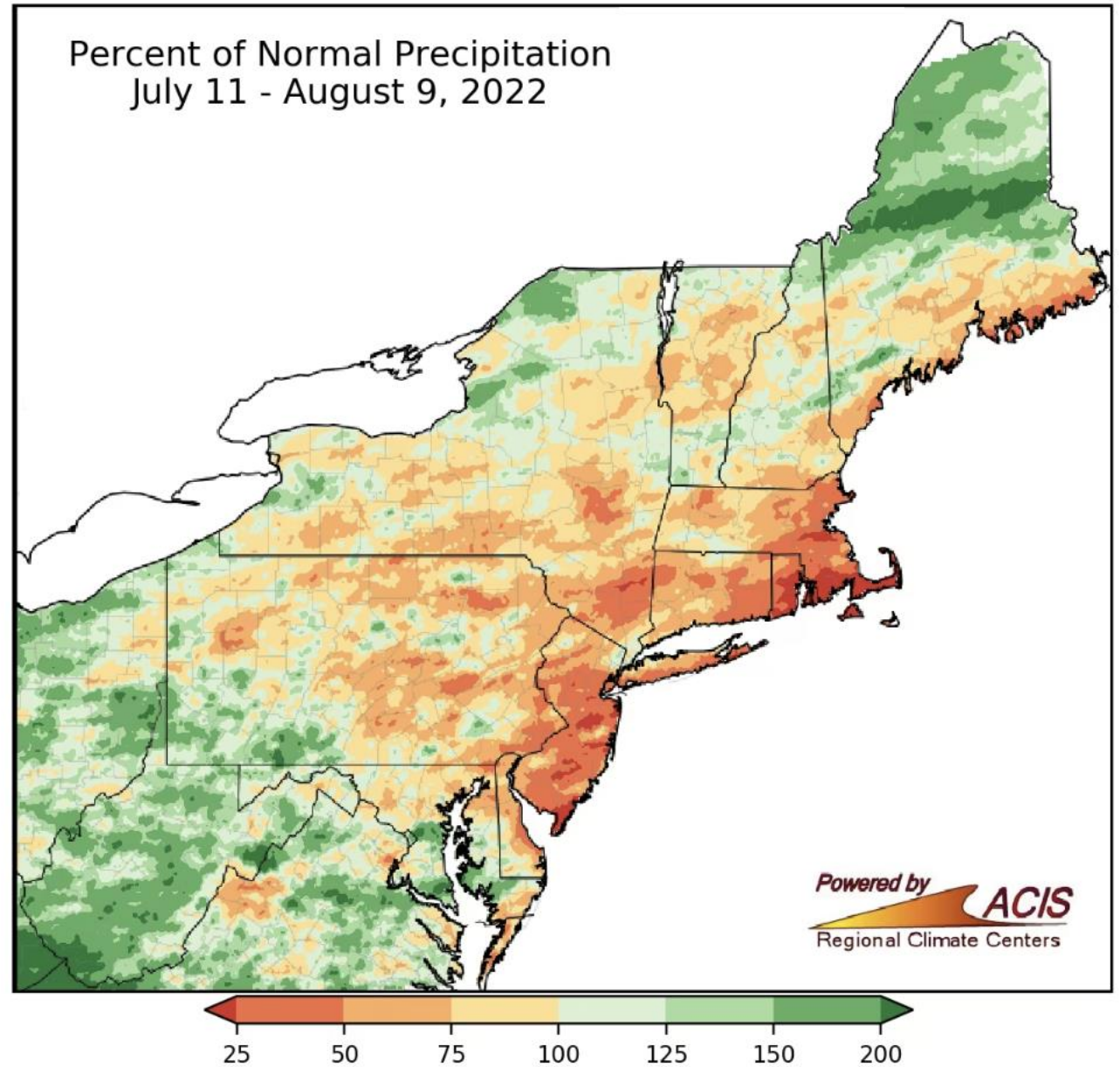
The Northeast is in the middle of an intense drought

Rivers have been reduced to a trickle in the most severely affected areas, and farmers are facing consequences summer without rain

By Zach Rosenthal
August 16, 2022 at 1:27 p.m. EDT

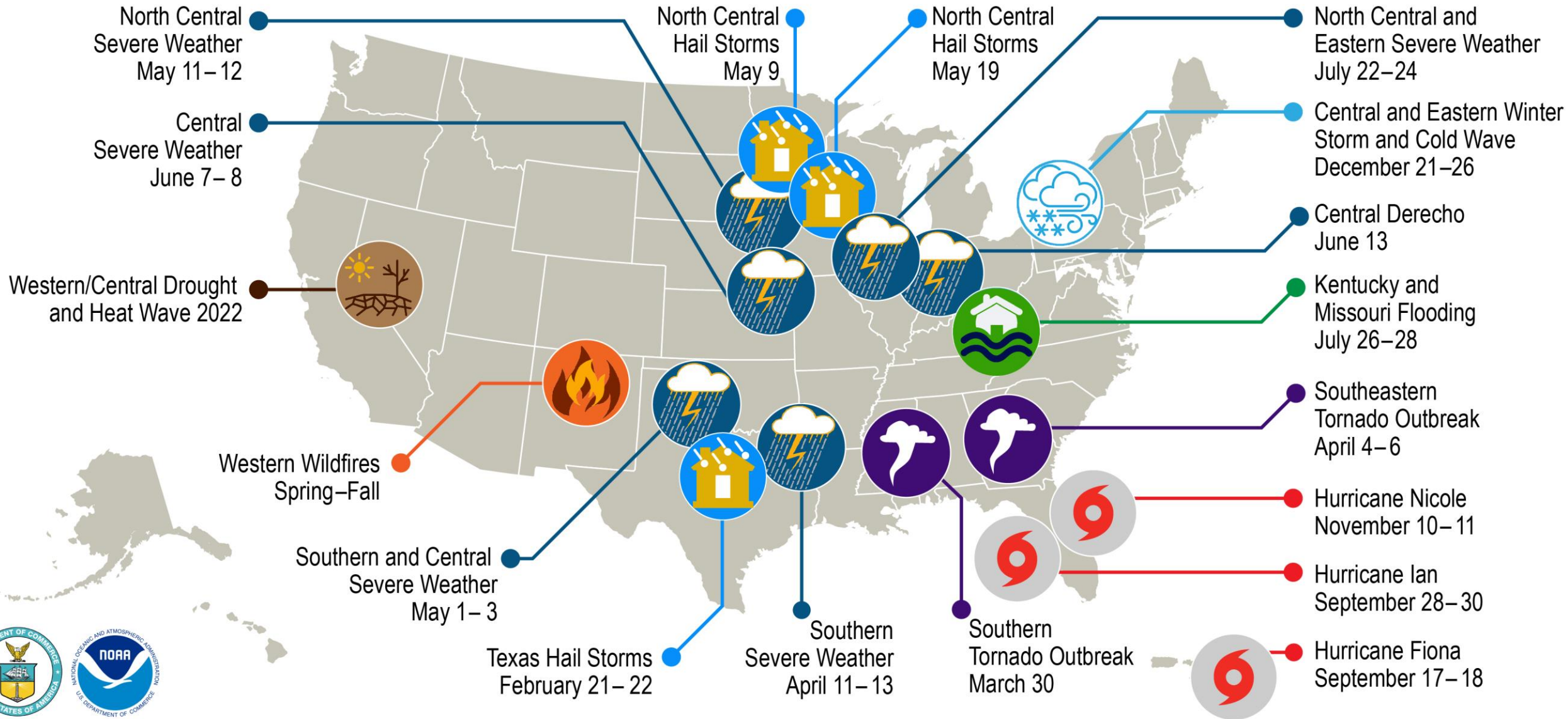
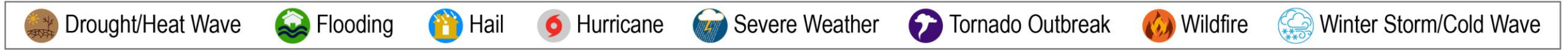


A sign announces a water ban in Scituate, Mass. (Michael Dwyer/AP)



Below-normal rainfall has been observed across a vast swath of the Northeast over the past 30 days, with departures notable over New Jersey and eastern Rhode Island and Massachusetts.

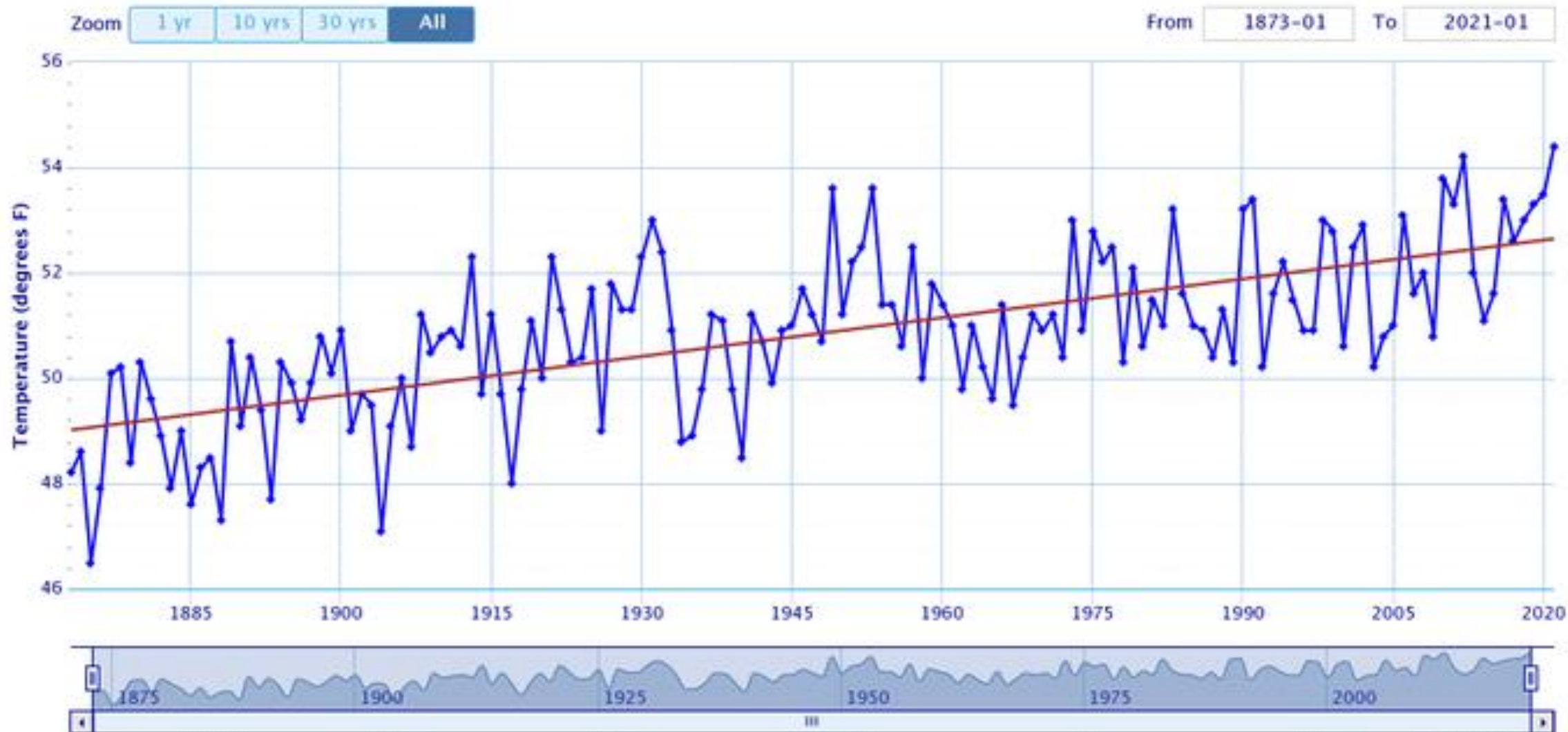
U.S. 2022 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.

Mean Avg Temperature - Boston Area, MA (ThreadEx)

Use navigation tools above and below chart to change displayed range



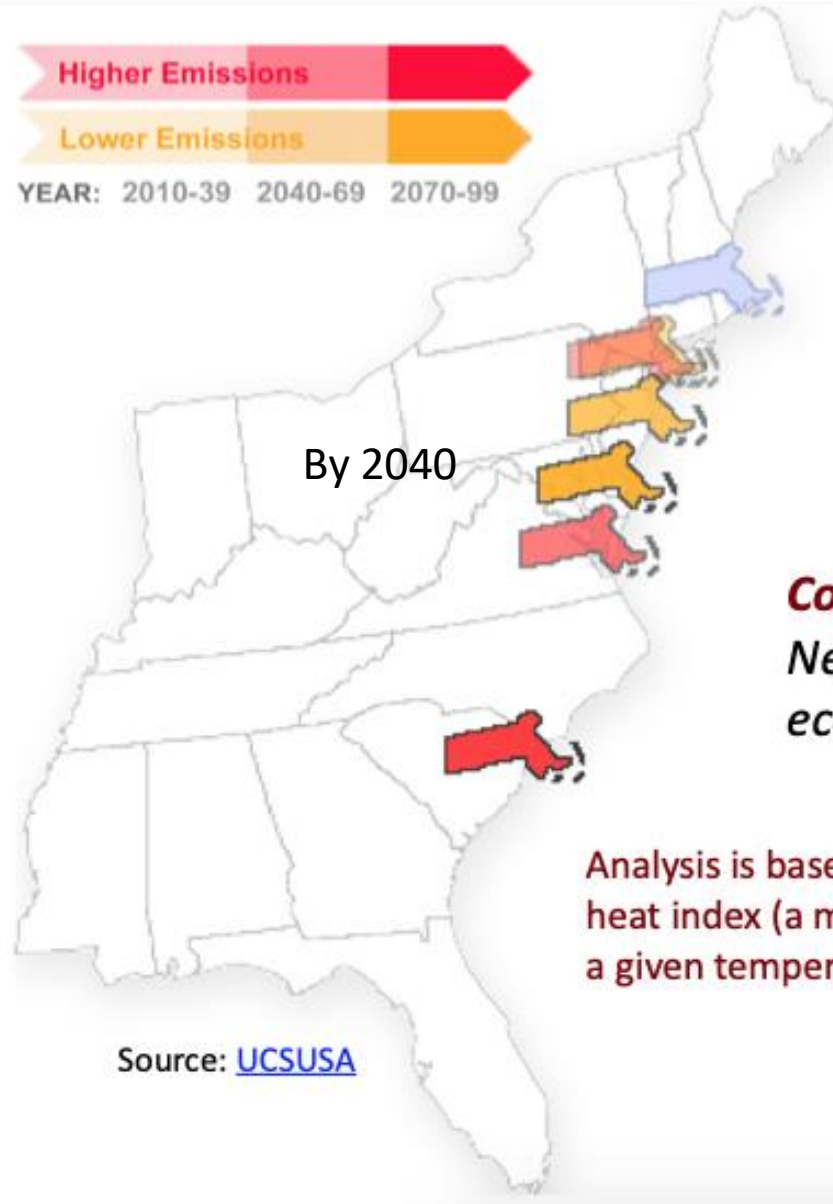
Powered by ACIS

Michael Rawlins reported Boston has warmed by approximately 3.6 F (2 C) since record keeping began in the area in 1873.

Migrating Massachusetts Climate



- Is there a way to compare Massachusetts weather to that of New Jersey?
- Is Massachusetts going to be the “new” New Jersey in weather?



PROJECTIONS

Summer in Massachusetts by the end of this century could feel like a present-day typical summer in South Carolina.

Consequences:

Negative impacts on human health, ecosystems, and the economy.

Analysis is based on changes in average summer heat index (a measure of how it actually feels for a given temperature and humidity).

Source: UCSUSA



Climate Change seems to be **impacting** us in cranberry in every aspect of growing.

- Increased Poison Ivy
- Research and article from 2006 by Duke University showed increased CO2 had poison ivy grow 60% better

Plants exposed to more atmospheric carbon dioxide, mimicking climate shifts, grow faster and larger — and the urushiol in them is much more allergenic. *NYT 5/12/21*



Climate change is making poison ivy stronger and itchier

Carbon dioxide and warmer soils could be supercharging everyone's least favorite plant.

The urushiol isn't just more plentiful; it might also be more potent. *WebMD*

Research shows that the main culprit behind climate change — increased concentrations of carbon dioxide in the atmosphere — is supercharging poison ivy.

Grist, Zoya Teirstein 7/19/21



Ed Reschke / Getty Images

Climate Change seems to be **impacting** us in cranberry in every aspect of growing.

- Extended bloom periods
 - causing long fungus inoculation timing?
 - more fungicides?
- Earlier bloom?
 - Frank Caruso had alleged earlier flowering date 10 years ago!
- Confounded by new hybrids that bloom even earlier!

Int J Biometeorol
DOI 10.1007/s00484-013-0719-y

SHORT NOTE

Cranberry flowering times and climate change in southern Massachusetts

**Elizabeth R. Ellwood · Susan R. Playfair ·
Caroline A. Polgar · Richard B. Primack**

Received: 13 February 2013 / Revised: 6 August 2013 / Accepted: 11 August 2013
© ISB 2013

Abstract Plants in wild and agricultural settings are being affected by the warmer temperatures associated with climate change. Here we examine the degree to which the iconic New England cranberry, *Vaccinium macrocarpon*, is exhibiting signs of altered flowering phenology. Using contemporary records from commercial cranberry bogs in southeastern Massachusetts in the United States, we found that cranberry plants are responsive to temperature. Flowering is approximately 2 days earlier for each 1 °C increase in May temper-

temperatures associated with global change (Root 2003; Parmesan and Yohe 2003; Primack et al. 2004; Rushing and Primack 2008). Flowering time of wild plants is particularly responsive to changes in temperature (Auerbach et al. 2010; Menzel et al. 2006) and long-term observations are critical for detecting phenological patterns (Bolter et al. 2013; Studer et al. 2005). Limited research suggests that agricultural crops and fruit trees respond similarly to the flowering of wild plants, with advanced phenology in v

Climate Change seems to be **impacting** us in cranberry in every aspect of growing.

- Increased spring frost
 - Earlier frost, more frost?
- Too much water
 - Wet bogs, humidity
 - Increased pathogens
 - Flooding (deluge rains not farmers rains)
- Too little water
 - Drought conditions
 - No water for irrigation
 - No water for harvest
- Increased summer temps
 - Burnt tips in July
 - Scalded berries in sept
- Increased # of warm fall nights
 - Increased rot
 - Color comes later
- Harvesting comes later
 - Used to be early to mid Sept
 - Now starting in October
- No winter
 - No ice for sanding
 - No flooding
 - HUGE temperature swings
 - Chilling requirement

Climate Change seems to be **impacting** us in cranberry in every aspect of growing.

How to adapt?

- Increased spring frost
 - Earlier frost, more frost?

Reliable automation
- Too much water
 - Wet bogs, humidity
 - Increased pathogens
 - Flooding (deluge rains n...)

Drain tile
Clean ditches
Prune
Sand
- Too little water
 - Drought conditions
 - No water for irrigation
 - No water for harvest

Holding ponds
Water supply
- Increased summer temps
 - Burnt tips in July
 - Scalded berries in sept

Tensiometers
Short Irrigations

- Increased # of warm fall nights
 - Increased rot
 - Color comes later

Canopy Mngt
Prune
- Harvesting comes later
 - Used to be early to mid
 - Now starting in October

Efficient Harvest
Receiving Station
- No winter
 - No ice for sanding
 - No flooding
 - HUGE temperature swings
 - Chilling requirement

Alternative Sanding
Faster Flooding

Resilience, mitigation, adaptation

Chris Neills questions

Perceptions of extremes?

Are dry and/or wet years more extreme and coming at different frequencies.

Are growers prepared to deal with them?

- reliable water supply might be prepared for drought but if if wetland type bog wet years might be the problem

How many with a water supply problem

How many where dry is a bigger problem

How many where too much water is the problem

Solutions?

- Water supply
- Improve water holes
- Better drainage
- Tensiometers
- Canopy management
 - mitigate crumbly growing conditions
 - Help with color development



**Woodwell Climate
Research Center**

CLIMATE SCIENCE FOR CHANGE.

149 Woods Hole Road
Falmouth, MA, 02540-1644

info@woodwellclimate.org
508-540-9900