

The State of Climate Change Science



Dr. Erich Osterberg, Dartmouth College
and UVAW Vice Chair

Climate Partners Summit
February 25, 2021



Climate Change Science

Five Key Facts:

It's real.

It's us.

Scientists agree.

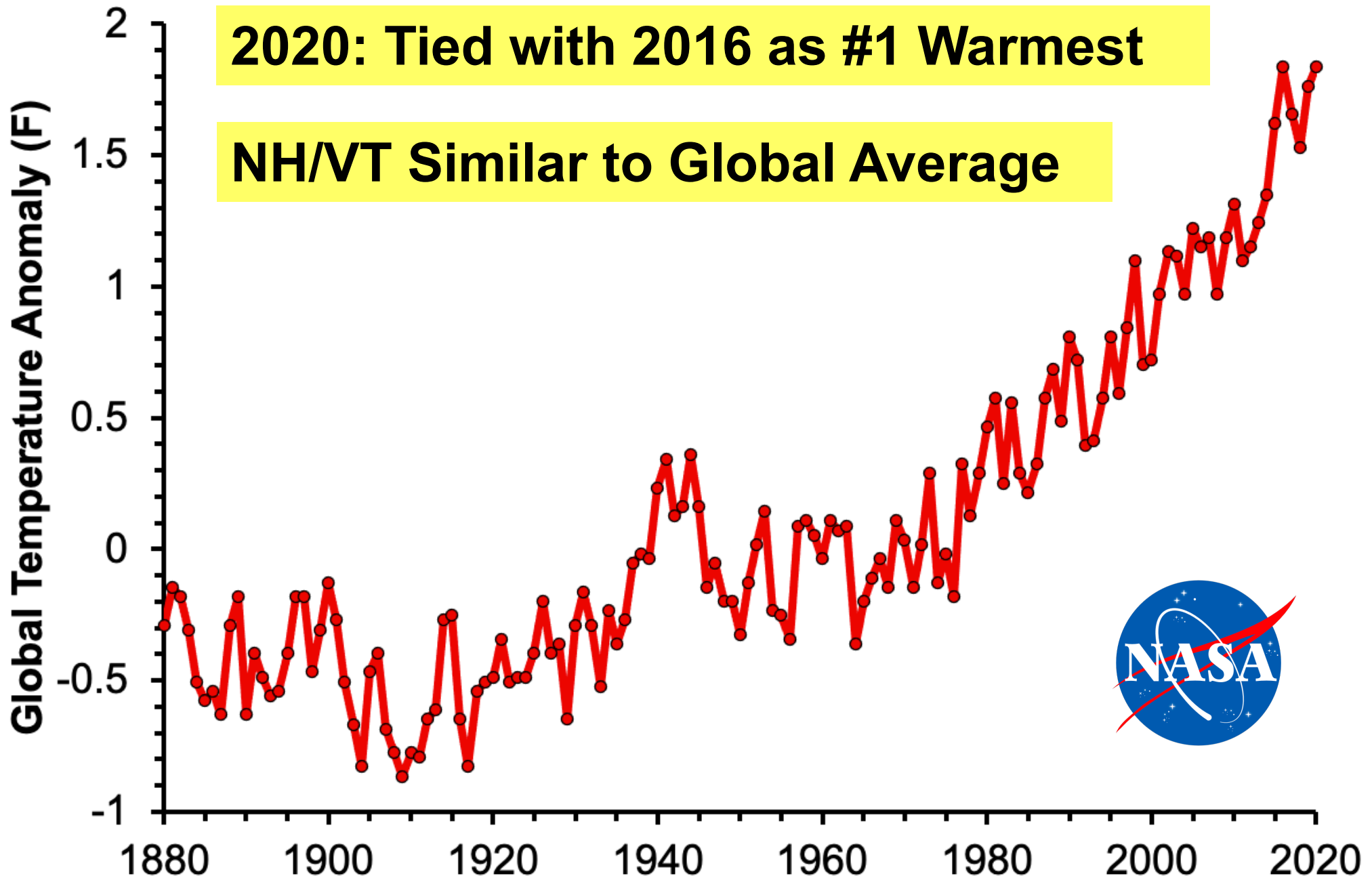
It's bad.

We can fix it!

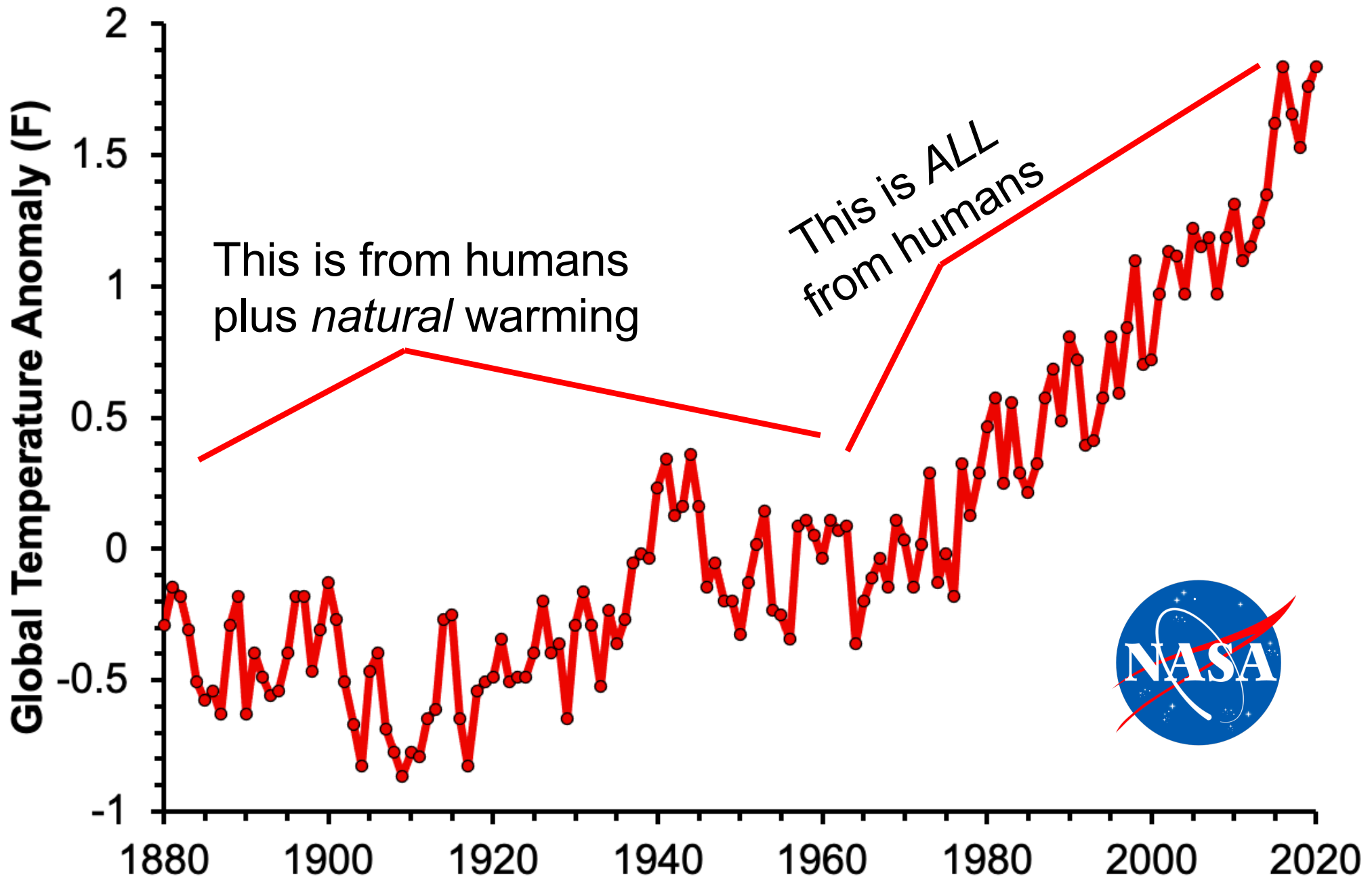
The Earth has Warmed over 2°F...and Rising Fast

2020: Tied with 2016 as #1 Warmest

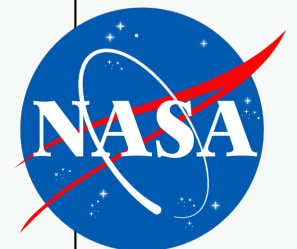
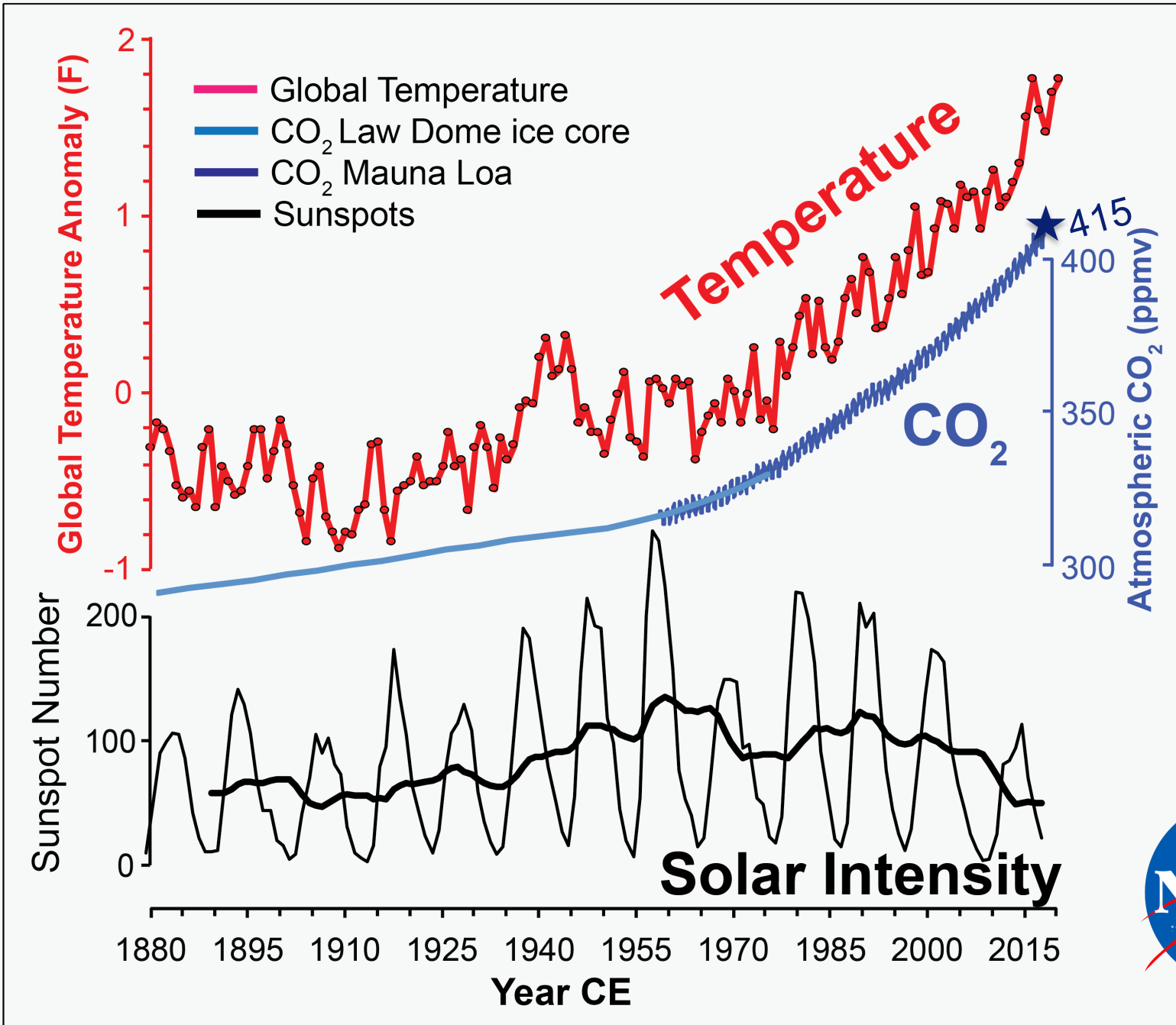
NH/VT Similar to Global Average



The Earth has Warmed over 2°F...and Rising Fast

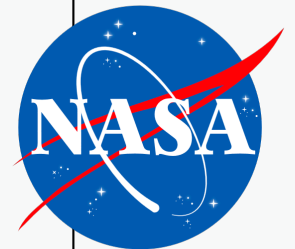
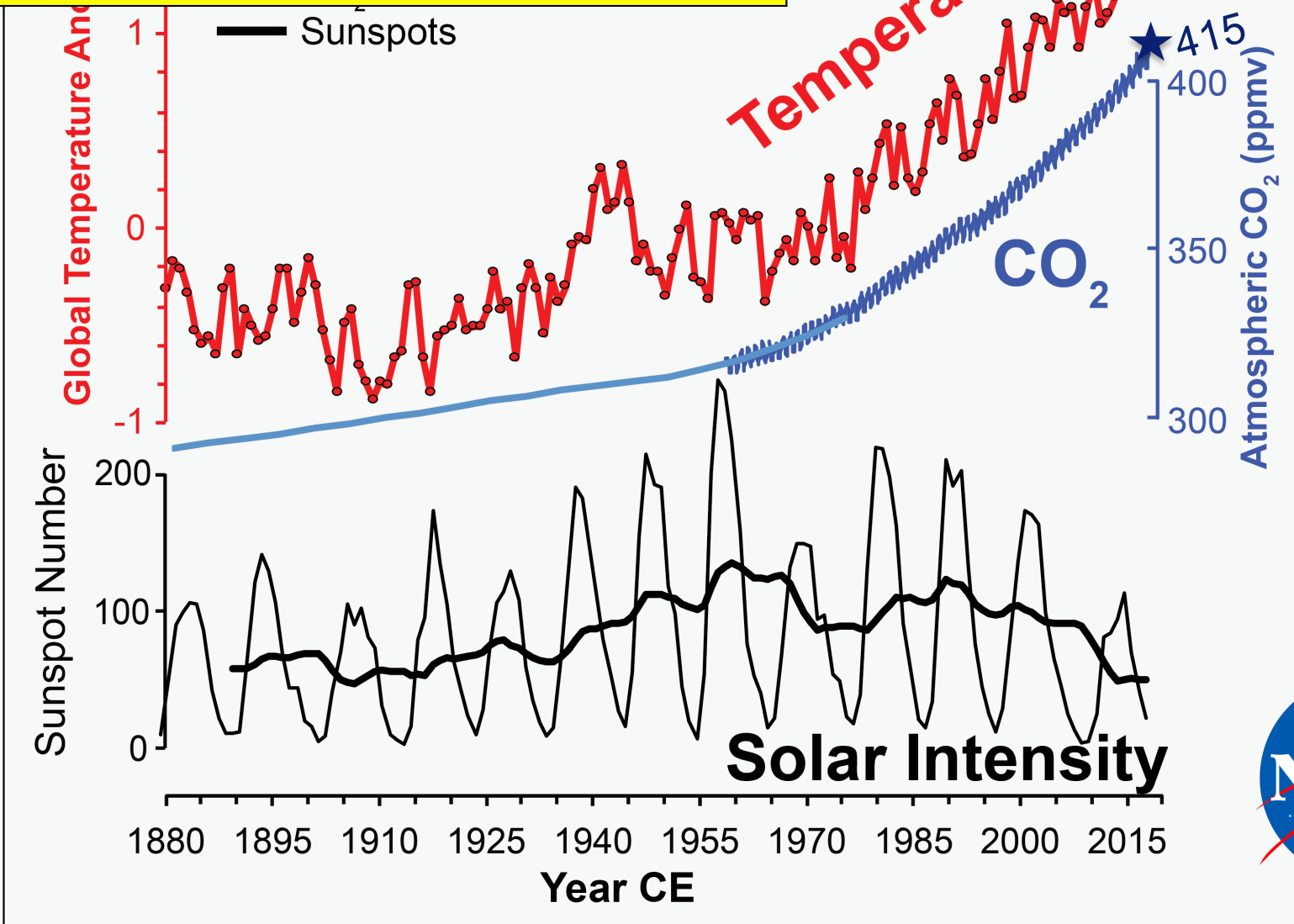


We *Should* Be Slightly Cooling Since ~1960



We *Should* Be Slightly Cooling Since ~1960

- Highest CO₂ for 3-15 million years
- Modern CO₂ rise from humans is 150 times FASTER than natural



'Endless' wildfire season sets record as more winds threaten power outages in Southern California

Doyle Rice USA TODAY

Published 12:35 p.m. ET Dec. 23, 2020 | Updated 1:54 p.m. ET Dec. 23, 2020

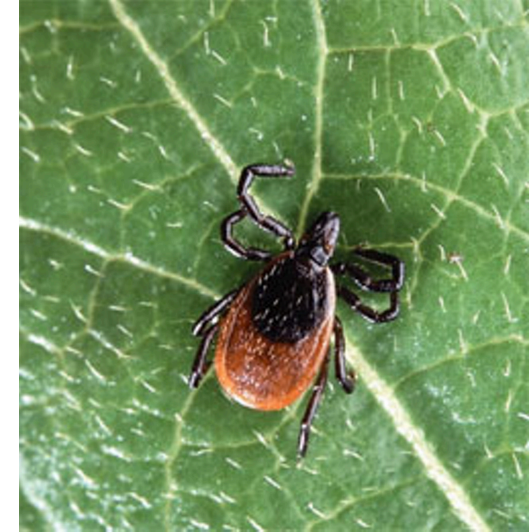
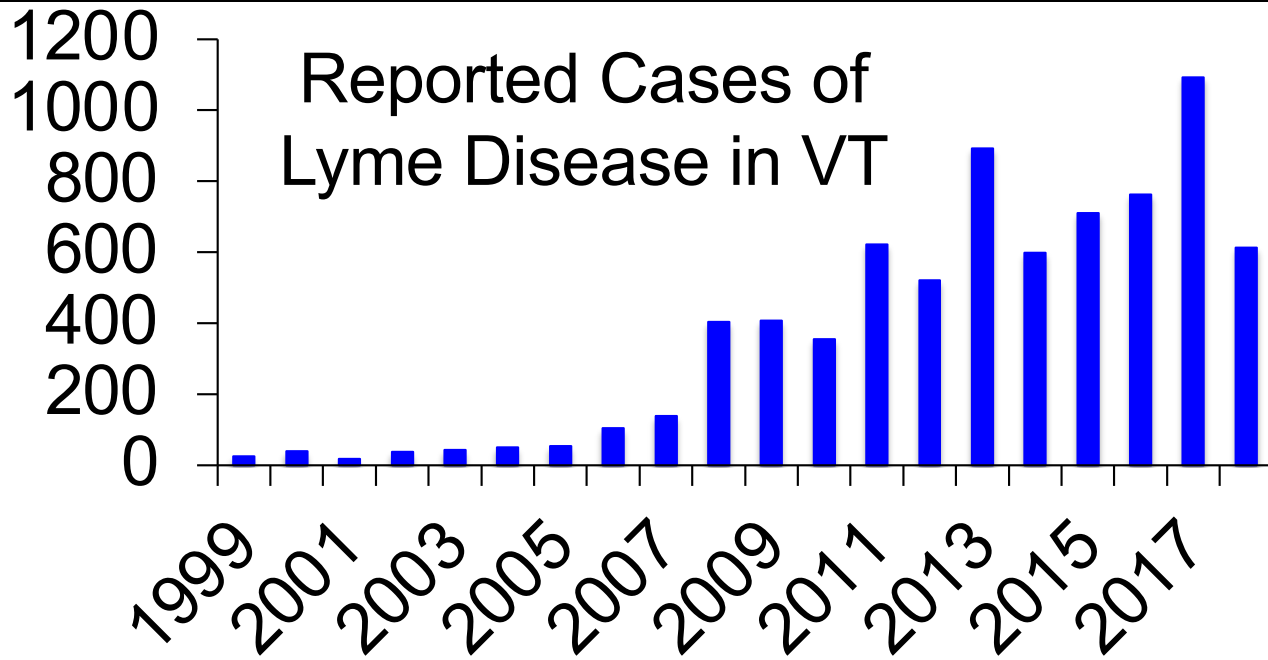
LA County records highest-ever temperature

By **Paul Vercammen**, **Hollie Silverman**, Ross Levitt and Susannah Cullinane, CNN

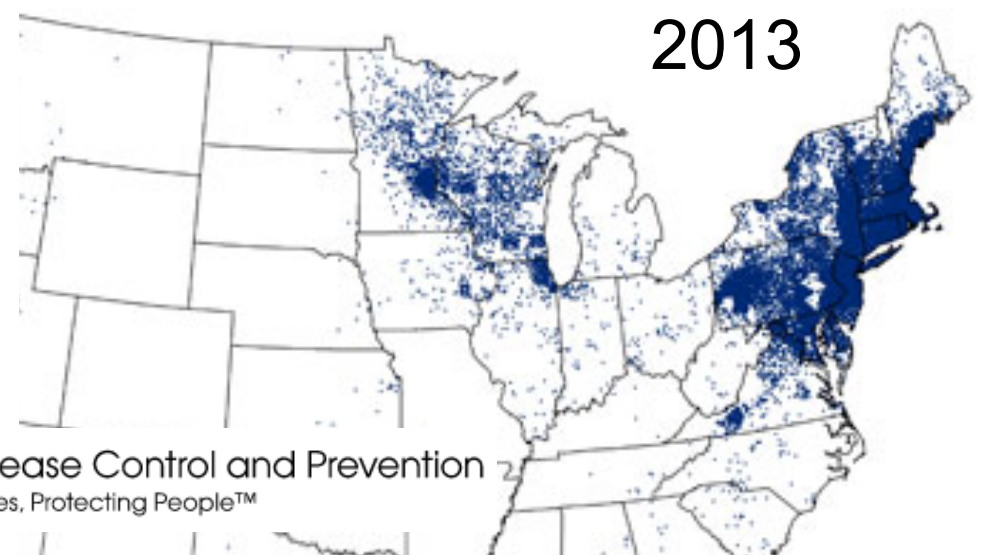
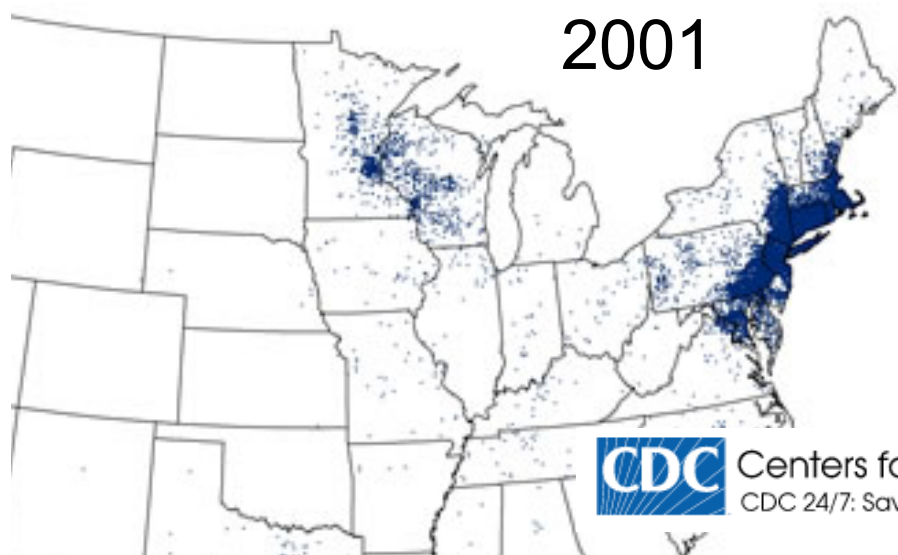
🕒 Updated 9:31 PM ET, Sun September 6, 2020



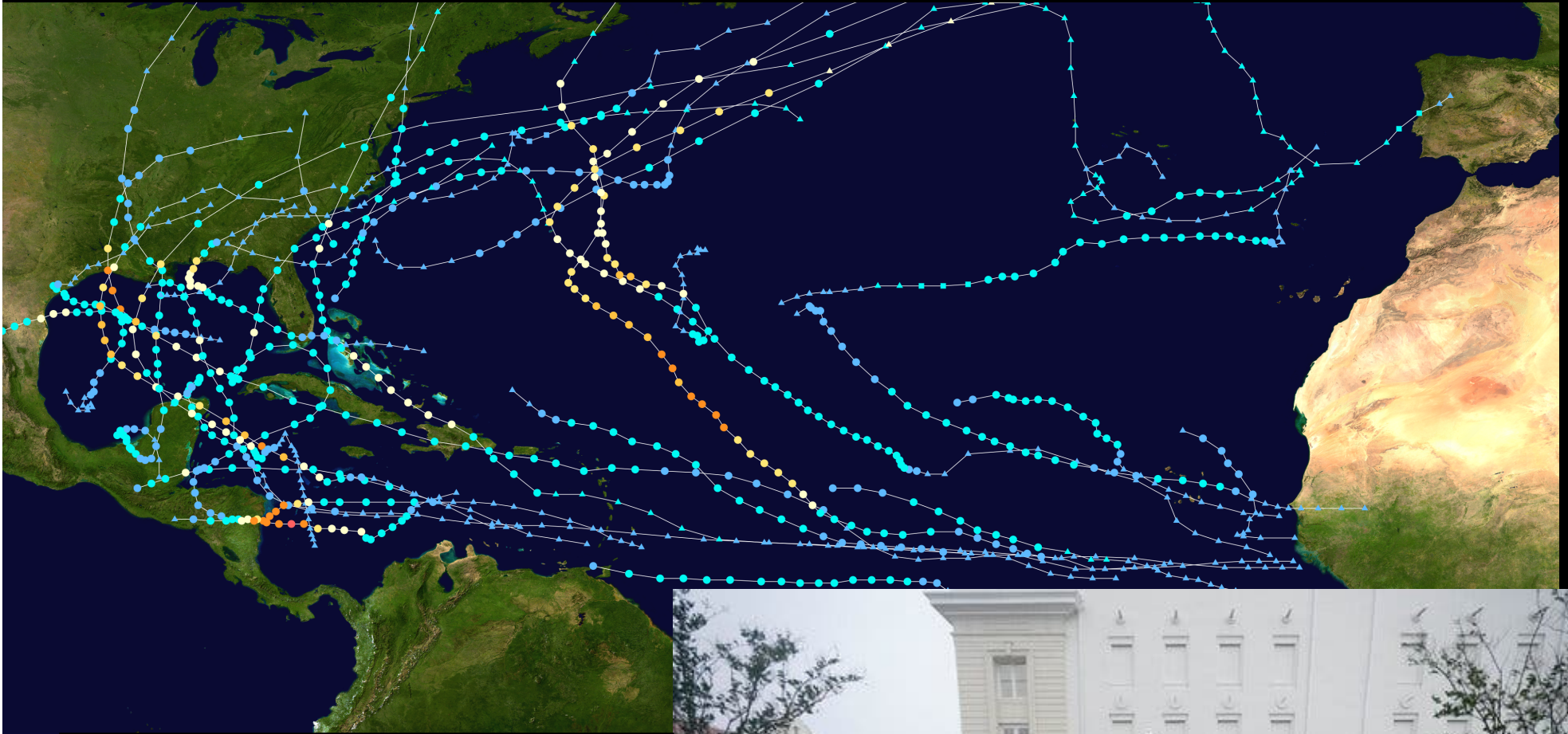
Increased Lyme Disease in NE with Warmer Winters



Reported Cases of Lyme Disease



2020 Record Hurricane Season



Warmer oceans make hurricanes more powerful and rainier

Wikipedia Commons



NH & VT: Extreme Storms are MORE Extreme



Since 1996:
~50% Jump in
Extreme Rainfall
that Causes Flooding
(Huang et al., 2017; 2018)

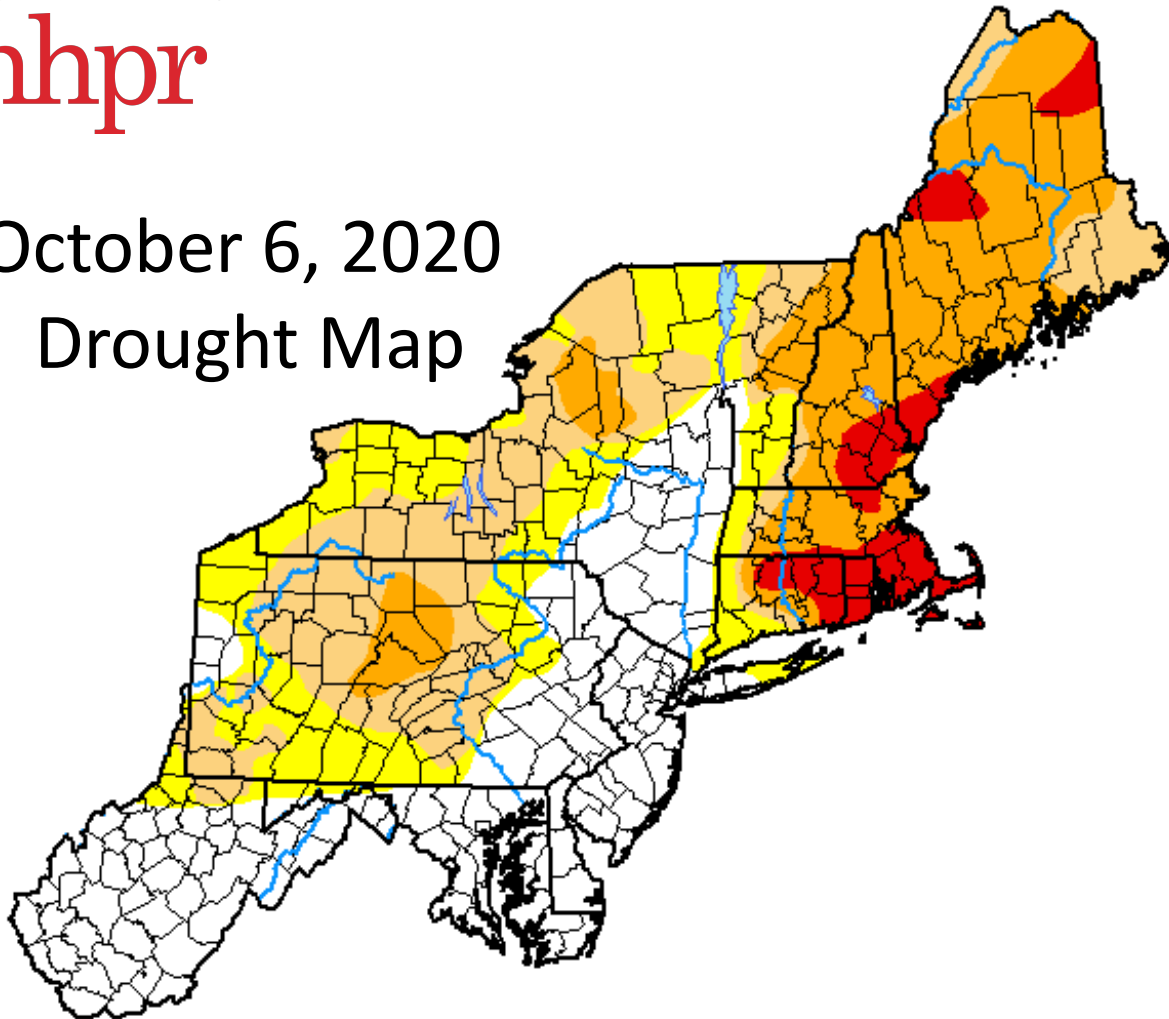
Yes, More Summer-Fall Drought Too....

As New Hampshire Enters Extreme Drought, Officials Urge Water Conservation

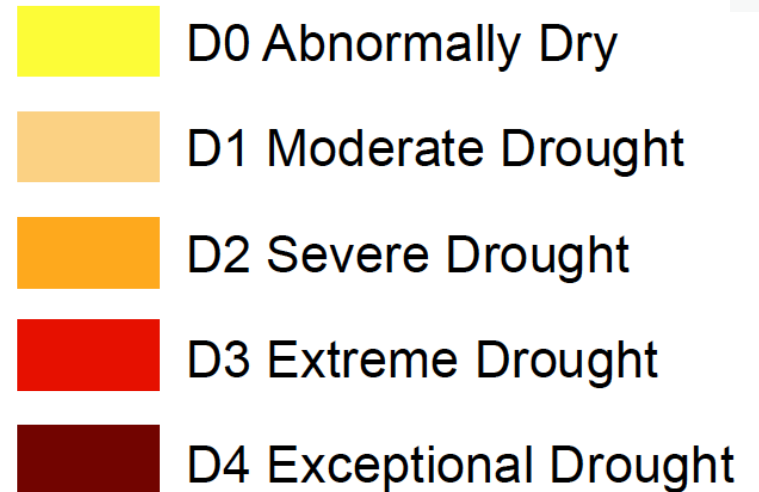
By ANNIE ROPEIK • SEP 24, 2020

nhpr

October 6, 2020
Drought Map



Drought Intensity:



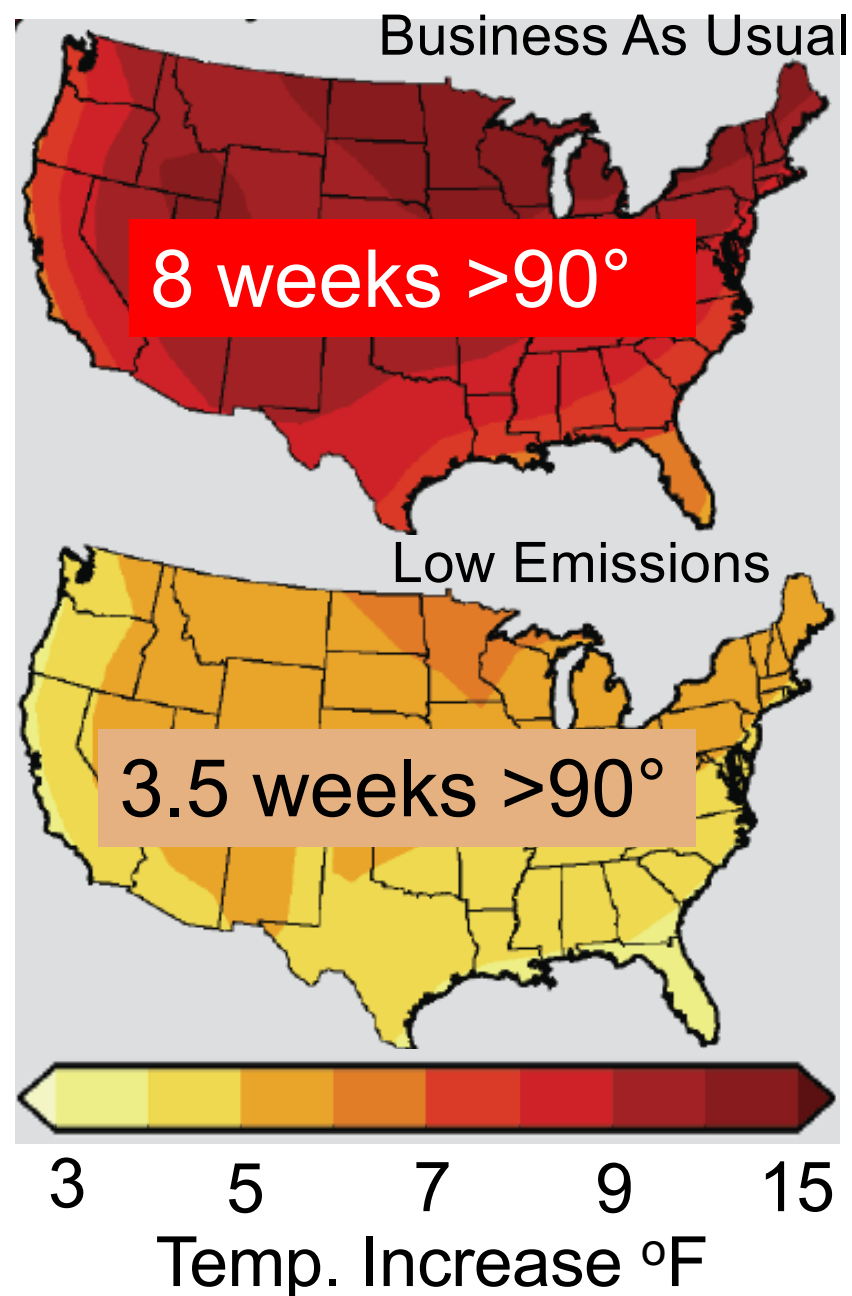
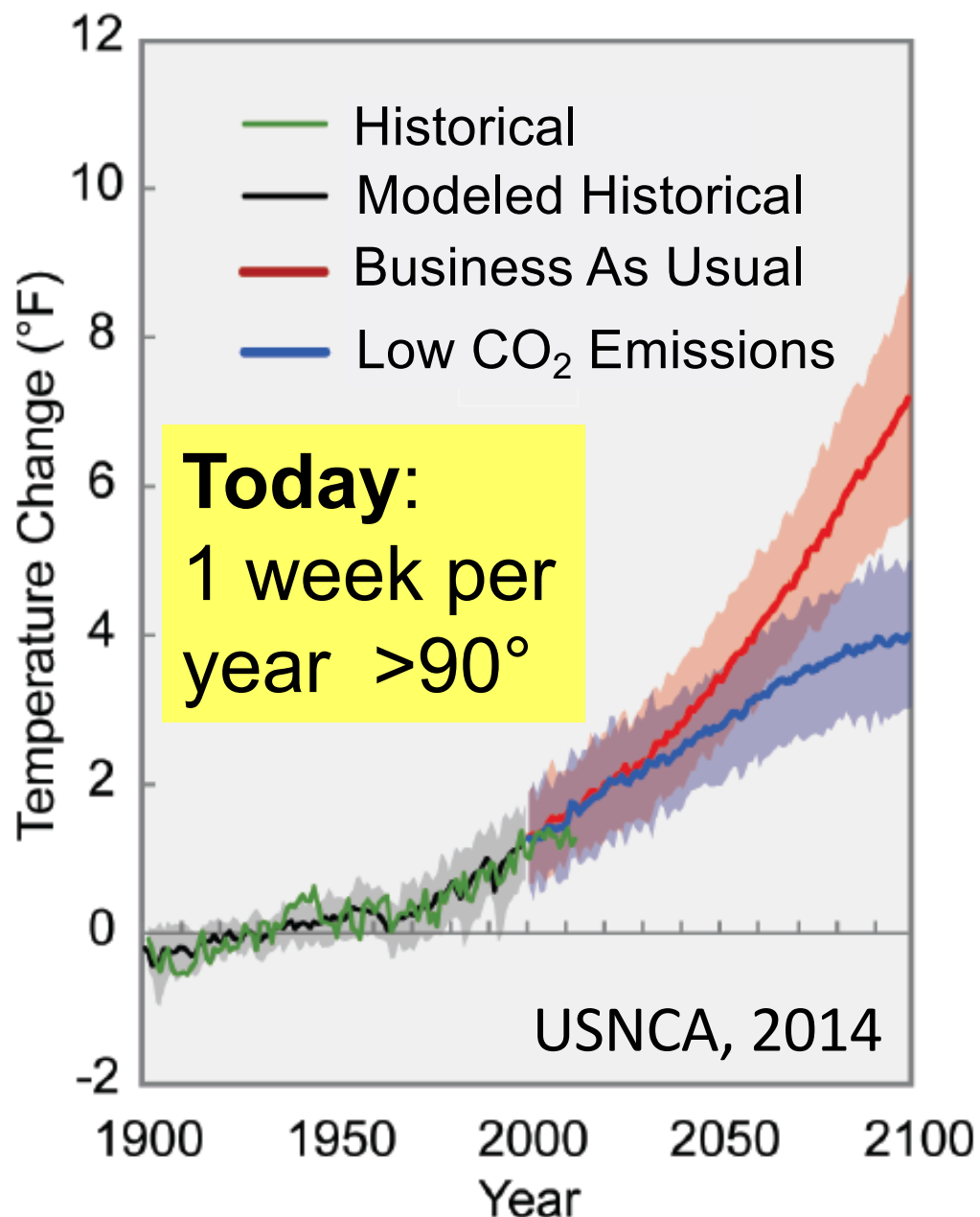
Author:

David Simeral
Western Regional Climate Center



droughtmonitor.unl.edu

Our Choice: Temperatures 4 or 8+ °F Warmer by 2100



NH Coast Looked Like This ~20,000 years ago
The last time the Earth was ~8-9°F colder



Athabasca Glacier, Jasper Natl. Park, Canada

The lower glacier will be gone in 2060

2017



Athabasca Glacier, Jasper Natl. Park, Canada

The lower glacier will be gone in 2060



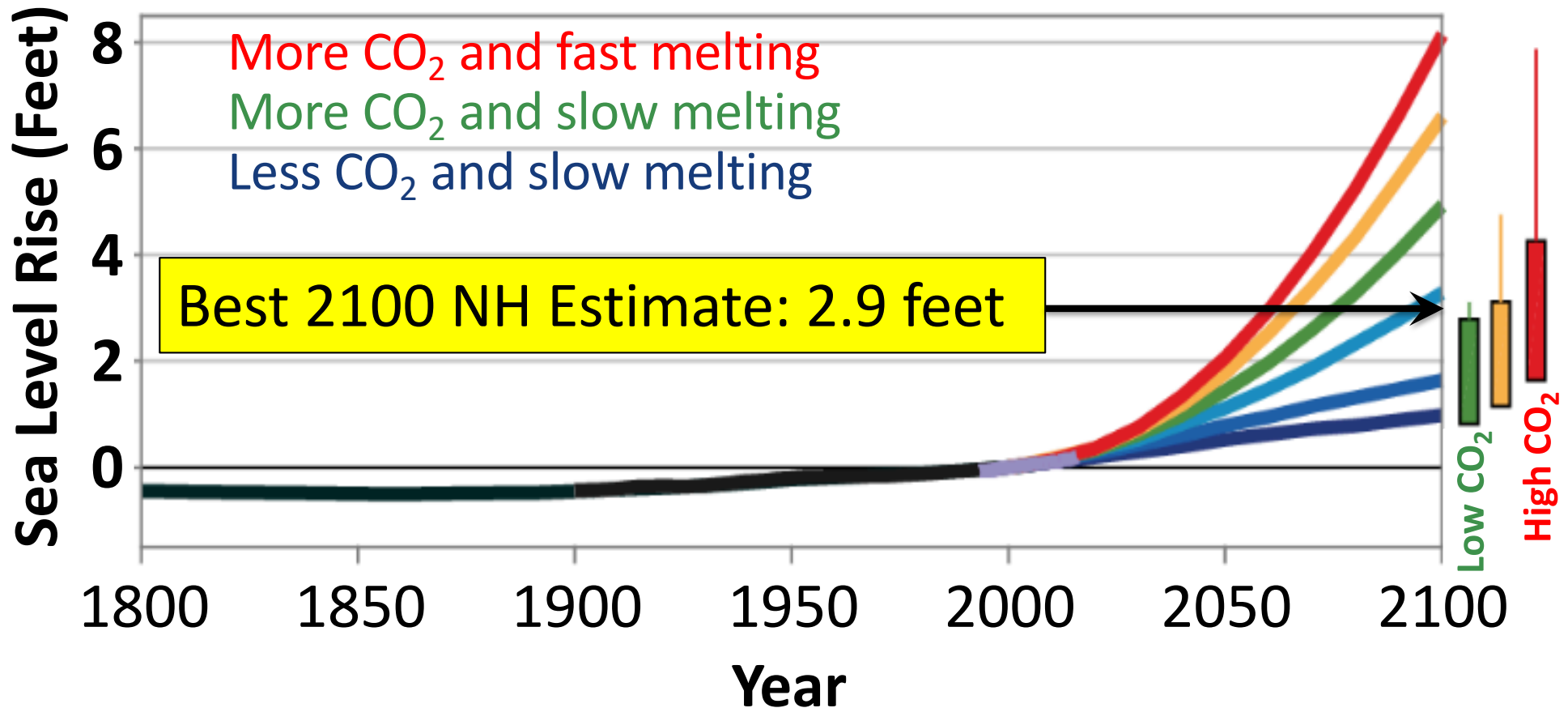
NH Seacoast Lost \$15 million from Sea Level Rise: Sea Level is already ~8 inches Higher, and Rising..



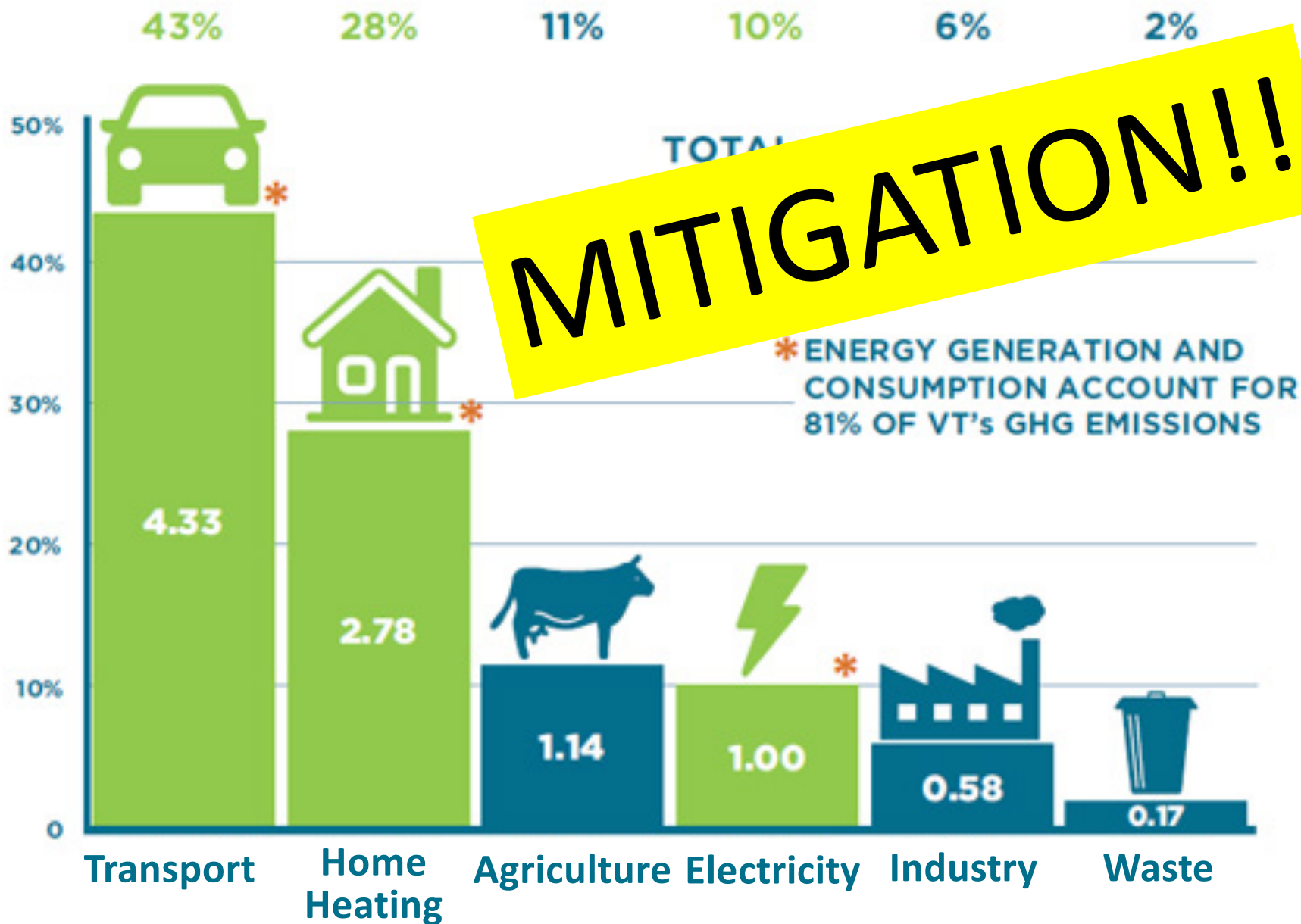
Credit: Joann Theriault

Our Choice: 1.5-4+ Feet of SL Rise by 2100

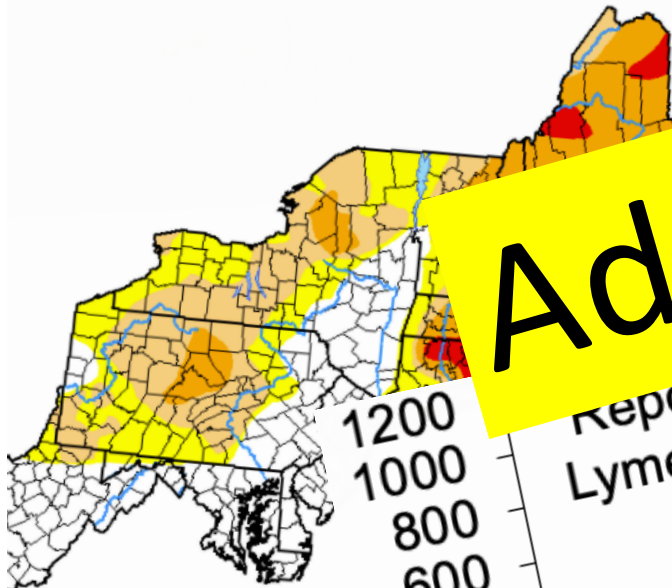
- We must reduce CO₂ as quickly as possible
- Some disruptive sea level rise is unavoidable (and already here)



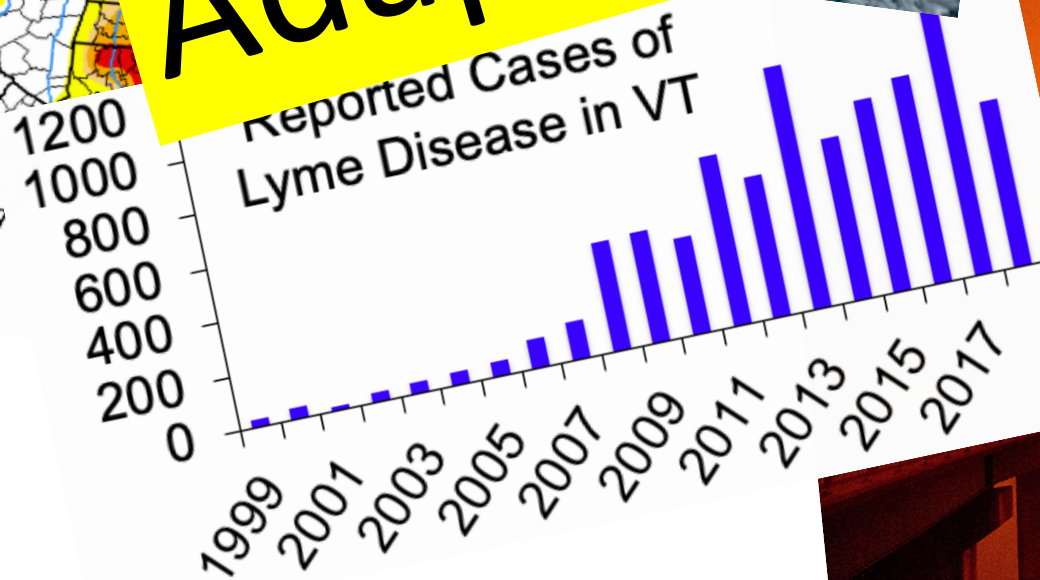
We Must Reduce CO₂ Quickly



Climate Impacts are Already HERE



Adaptation!!



Climate Change Science

Five Key Facts:

It's real.

It's us.

Scientists agree.

It's bad.

We can fix it through

Mitigation and Adaptation.