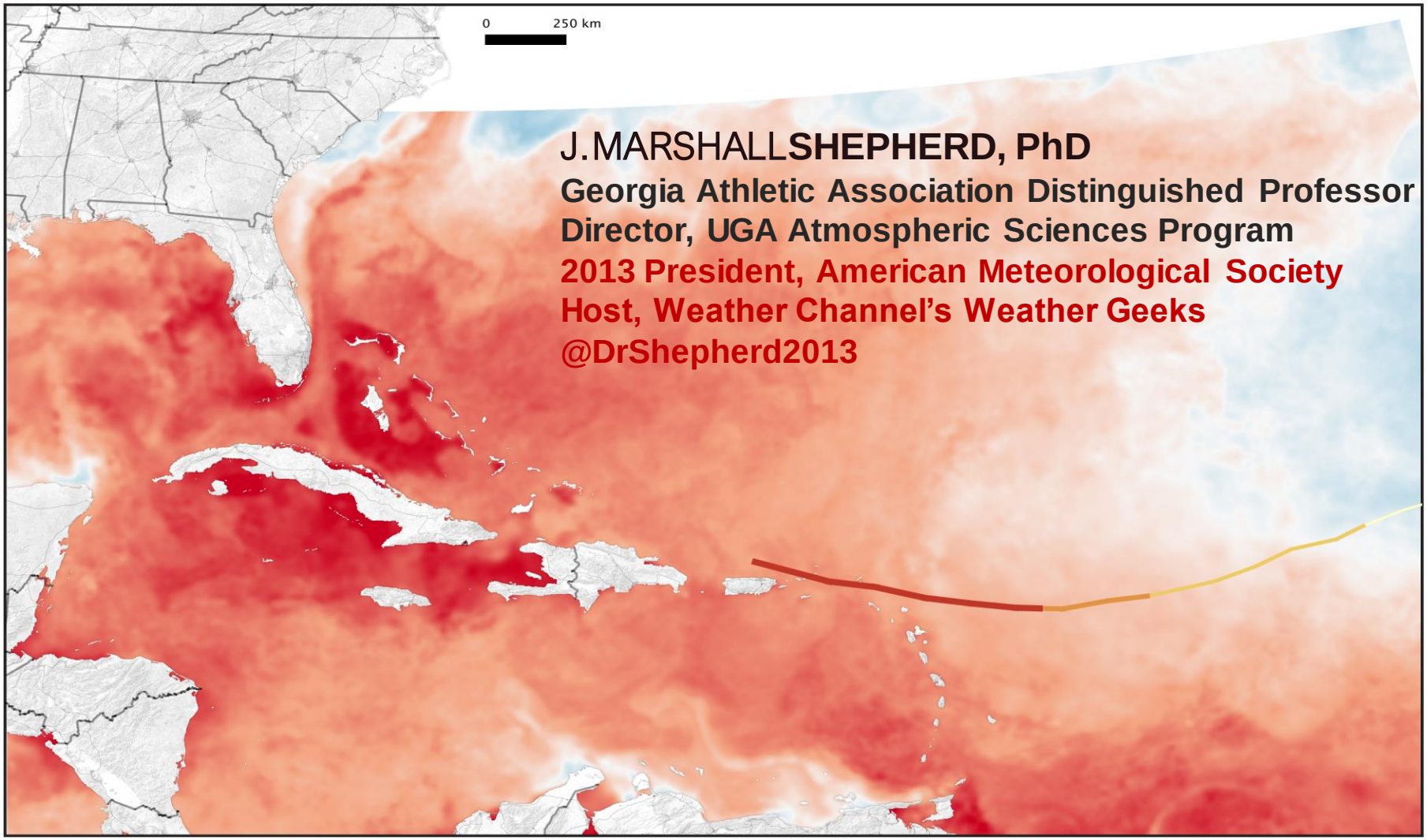
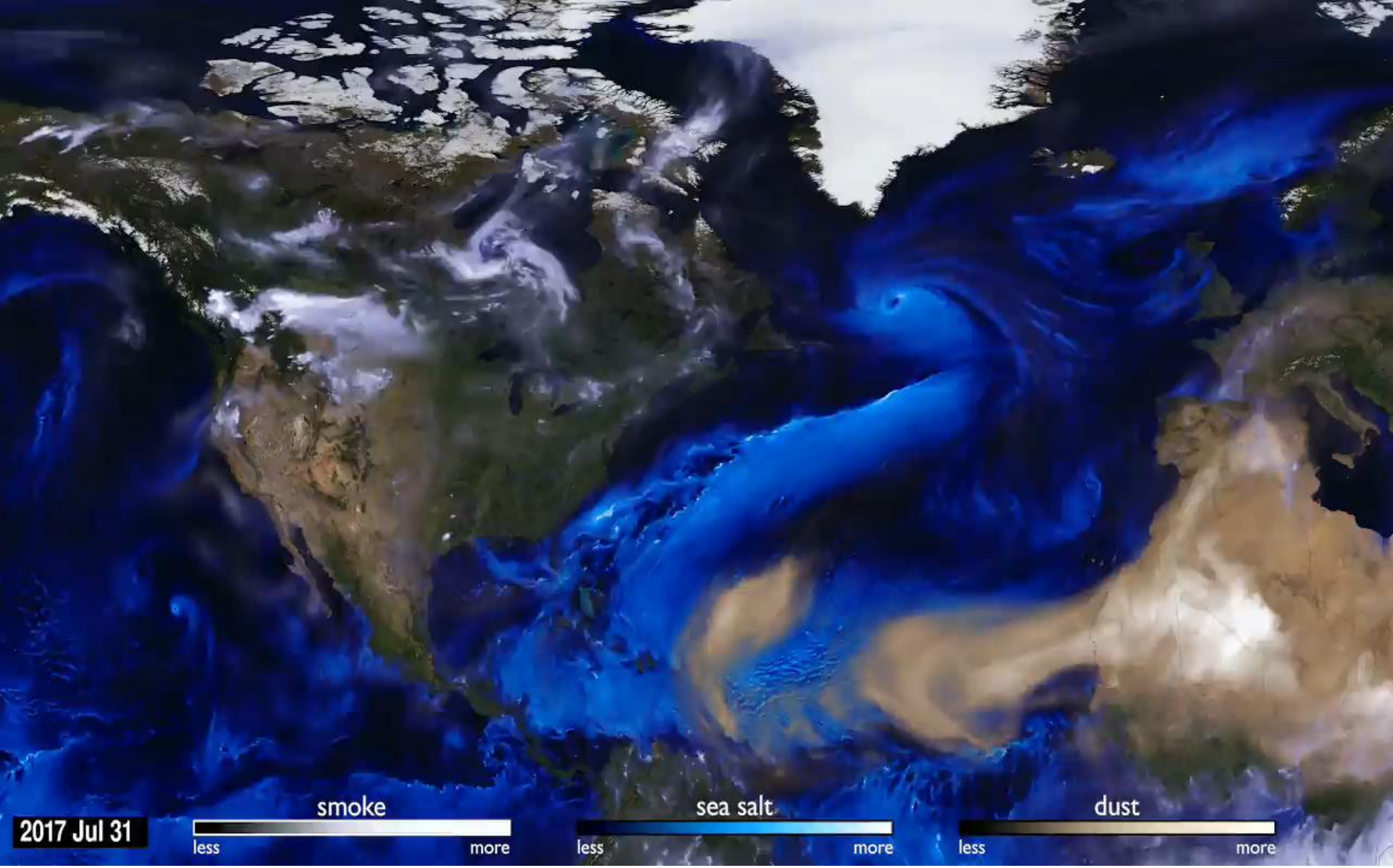
The Science Motivating The Green New Deal




Sean Compton
The Weather Channel



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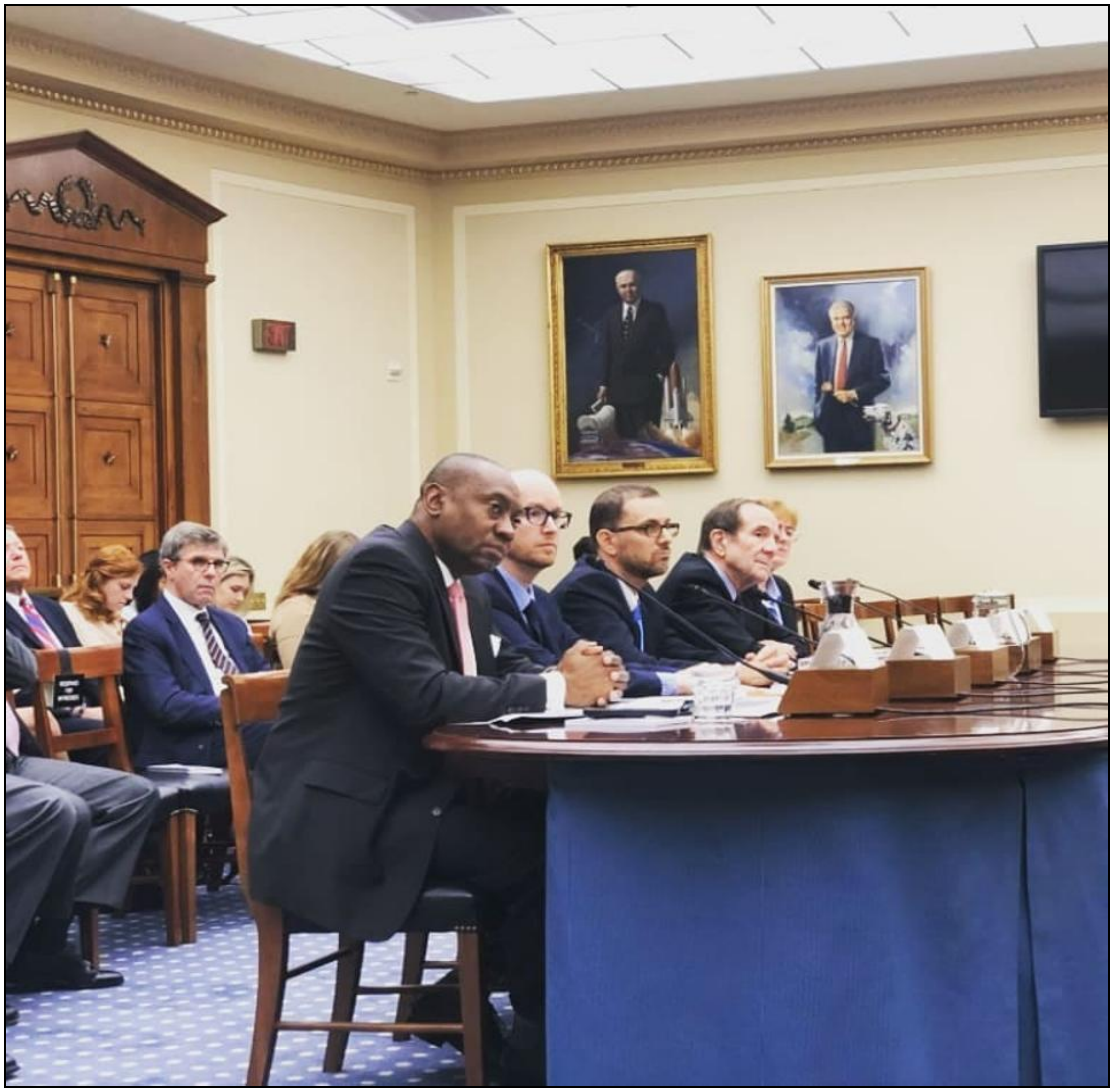
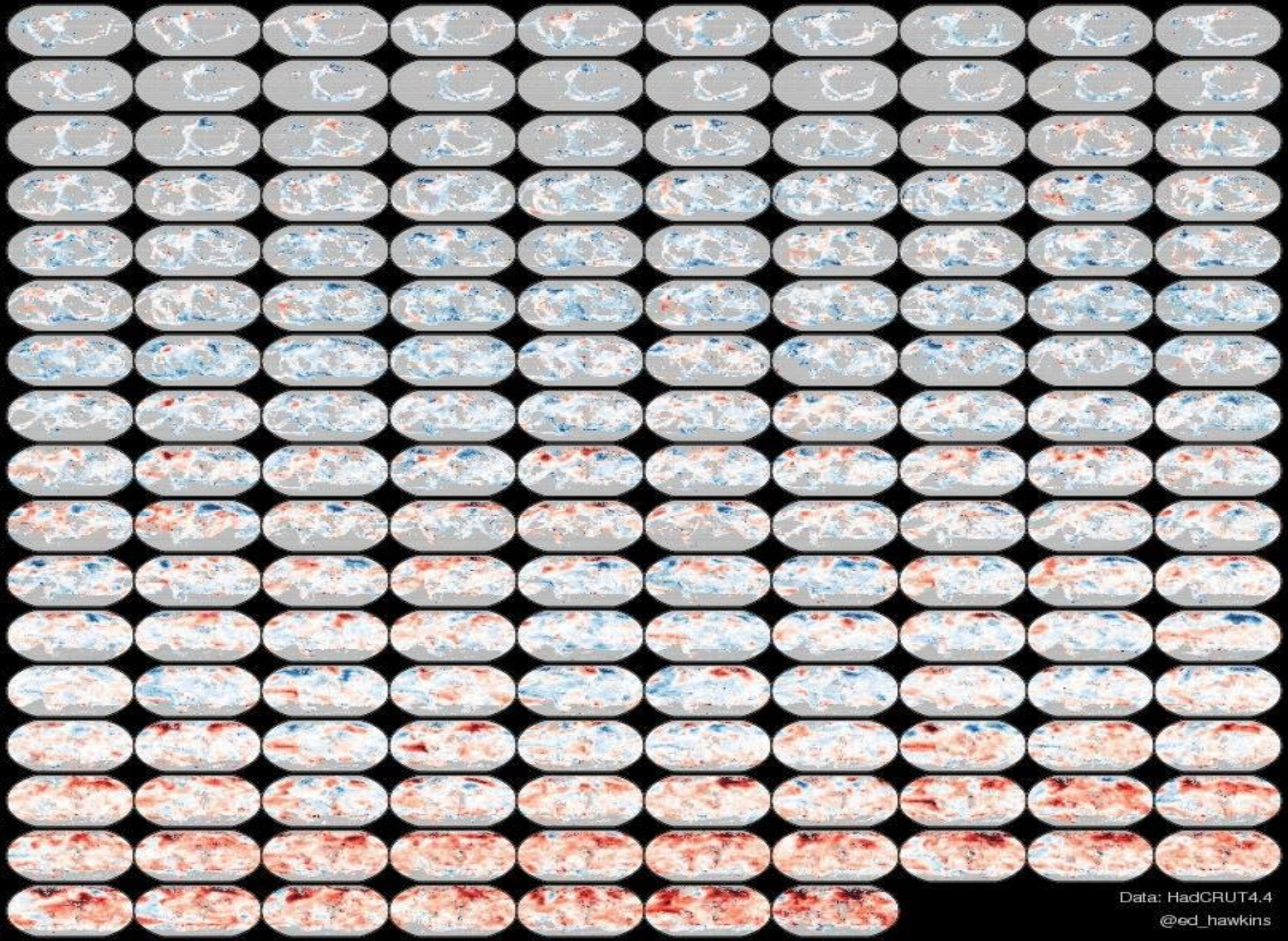


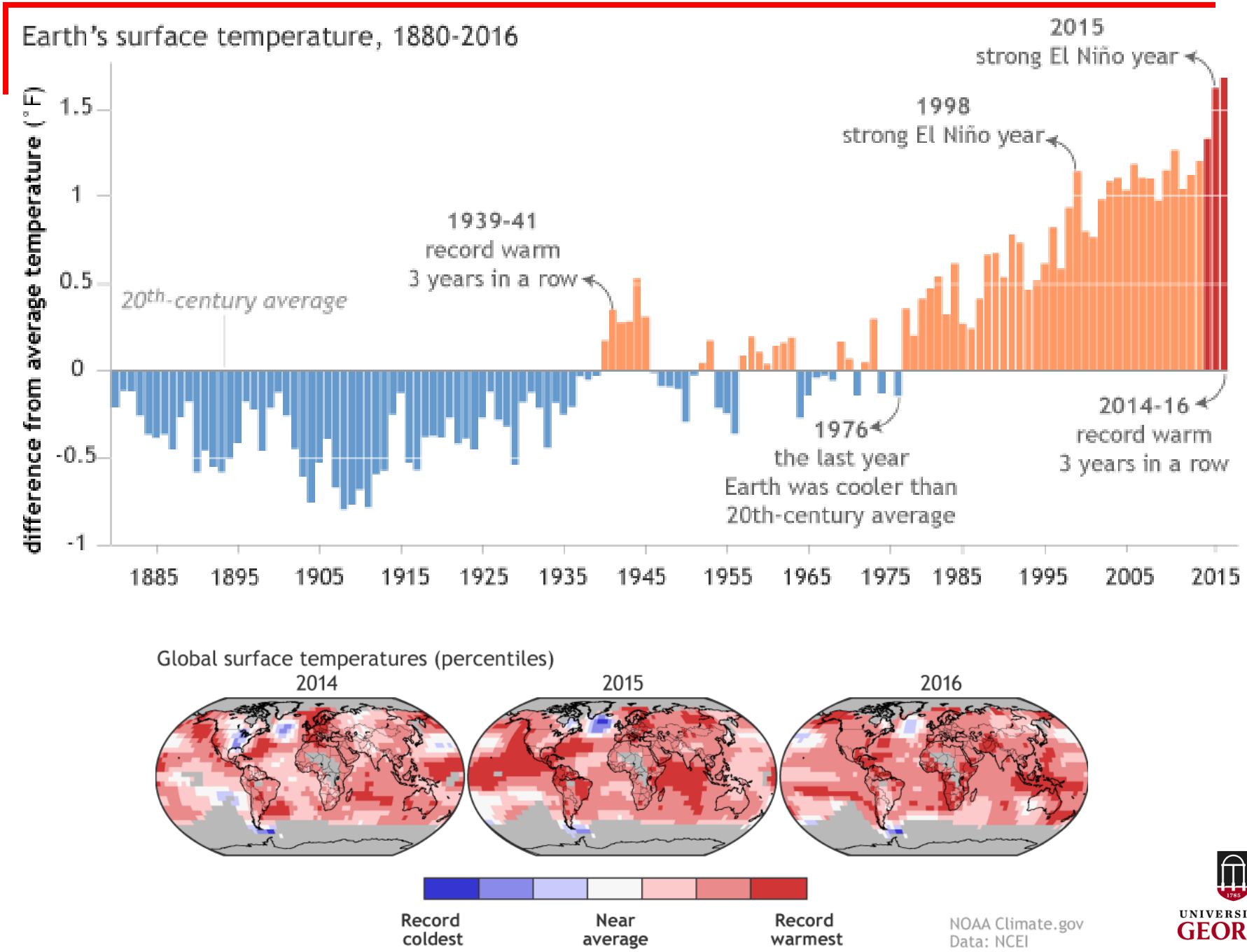
The Extremes are becoming more extreme, and people feel them far more than "averages"

--Dr. Marshall Shepherd

Testifying Before The U.S. House of Representatives Science Committee in October 2019

Mapping global temperature changes: every year from 1850 to 2016





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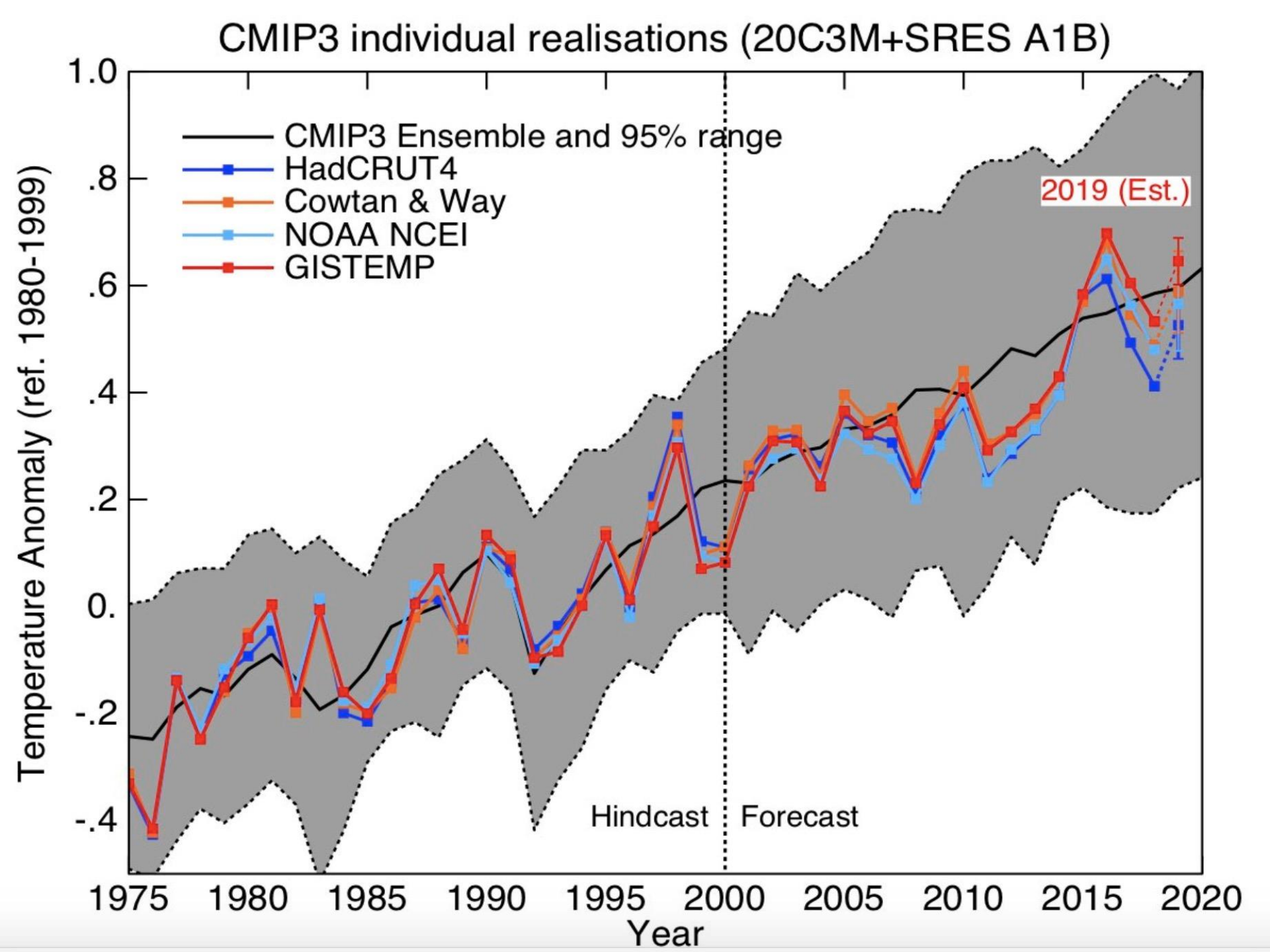
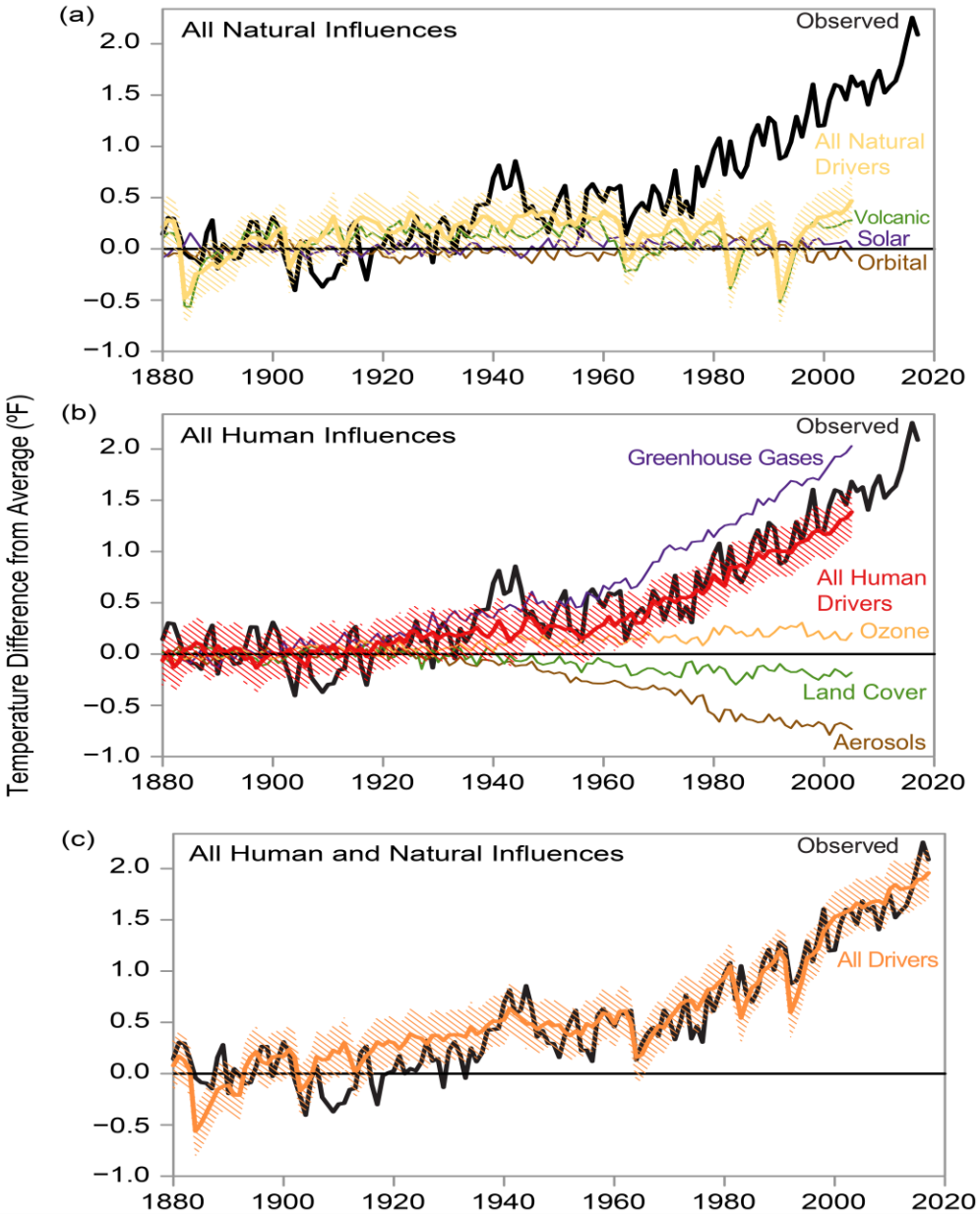

CMIP3 individual realisations (20C3M+SRES A1B)
CMIP3 Ensemble and 95% range
HadCRUT4
Cowtan & Way
NOAA NCEI
GISTEMP
2019 (Est.)
Hindcast
Forecast
Temperature Anomaly (ref. 1980-1999)
1.0
.8
.6
.4
.2
0.
-.2
-.4
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

How do we know it's us?



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But Doesn't Climate Change Naturally?

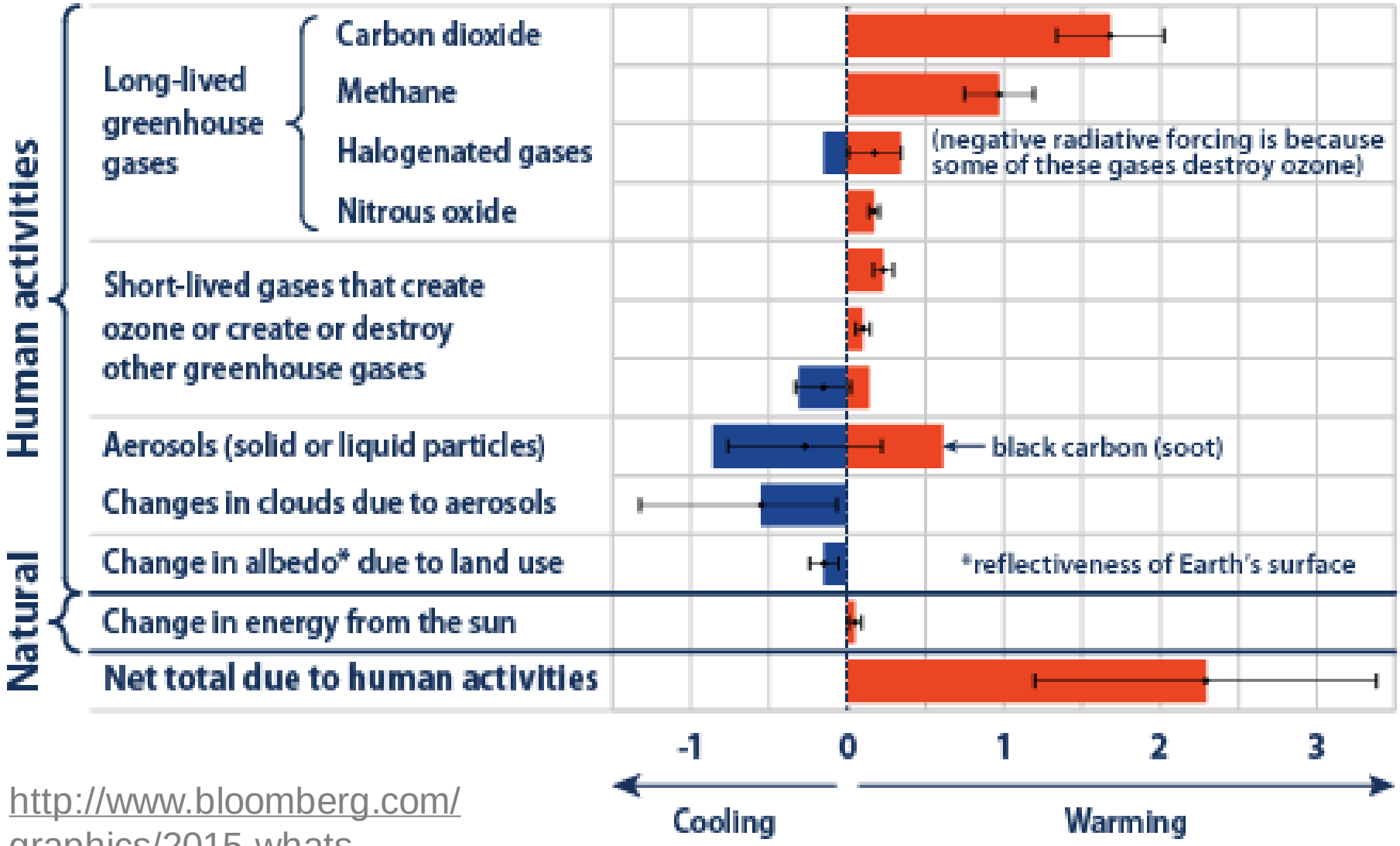
YES……..

Examples:

•Ice ages (100,000 year long cycles related to orbit around sun)
•Pacific Decadal Oscillation (related to 30-40 year oscillations in Pacific Ocean temperatures)
•Sunspots (related to 11 year sunspot cycle—iffy)
•El Nino Southern Oscillation (related to interactions between tropical Pacific ocean and atmosphere)—3 to 5 year cycles on average
•Arctic Oscillation (short-term variations in atmospheric pressure in North Atlantic—week to month variation)

But there is a **BUT**

Figure 2. Radiative Forcing Caused by Human Activities Since 1750



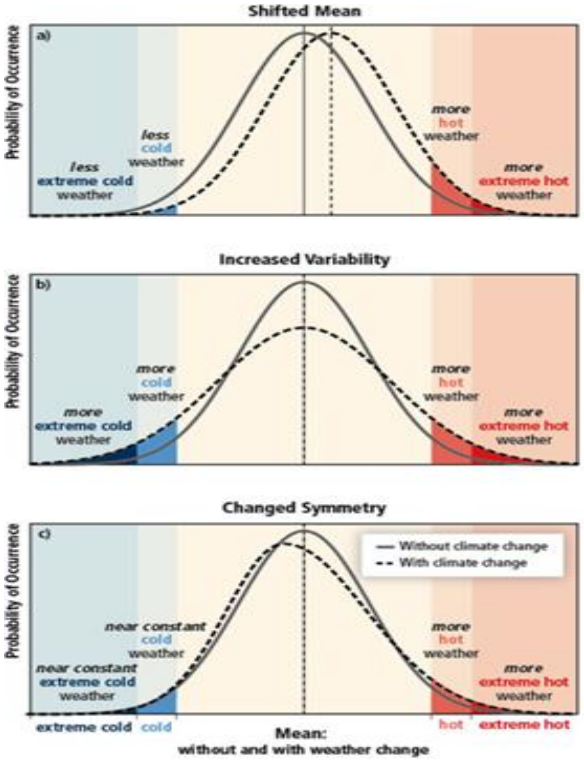
http://www.bloomberg.com/graphics/2015-whats-warming-the-world/

The Jacobson plan –while only 1 potential approach, is currently the most detailed and well-known – would be met with:

- 30.9% onshore wind
- 19.1% offshore wind
- 30.7% utility-scale photovoltaics (PV)
- 7.2% rooftop PV
- 7.3% concentrated solar power (CSP) with storage
- 1.25% geothermal power
- .37% wave power
- 0.14% tidal power
- 3.01% hydroelectric power.

It's not "either/or"…It's "and

- Observed frequency, intensity, and duration of some extreme weather events have been changing as the climate system has warmed



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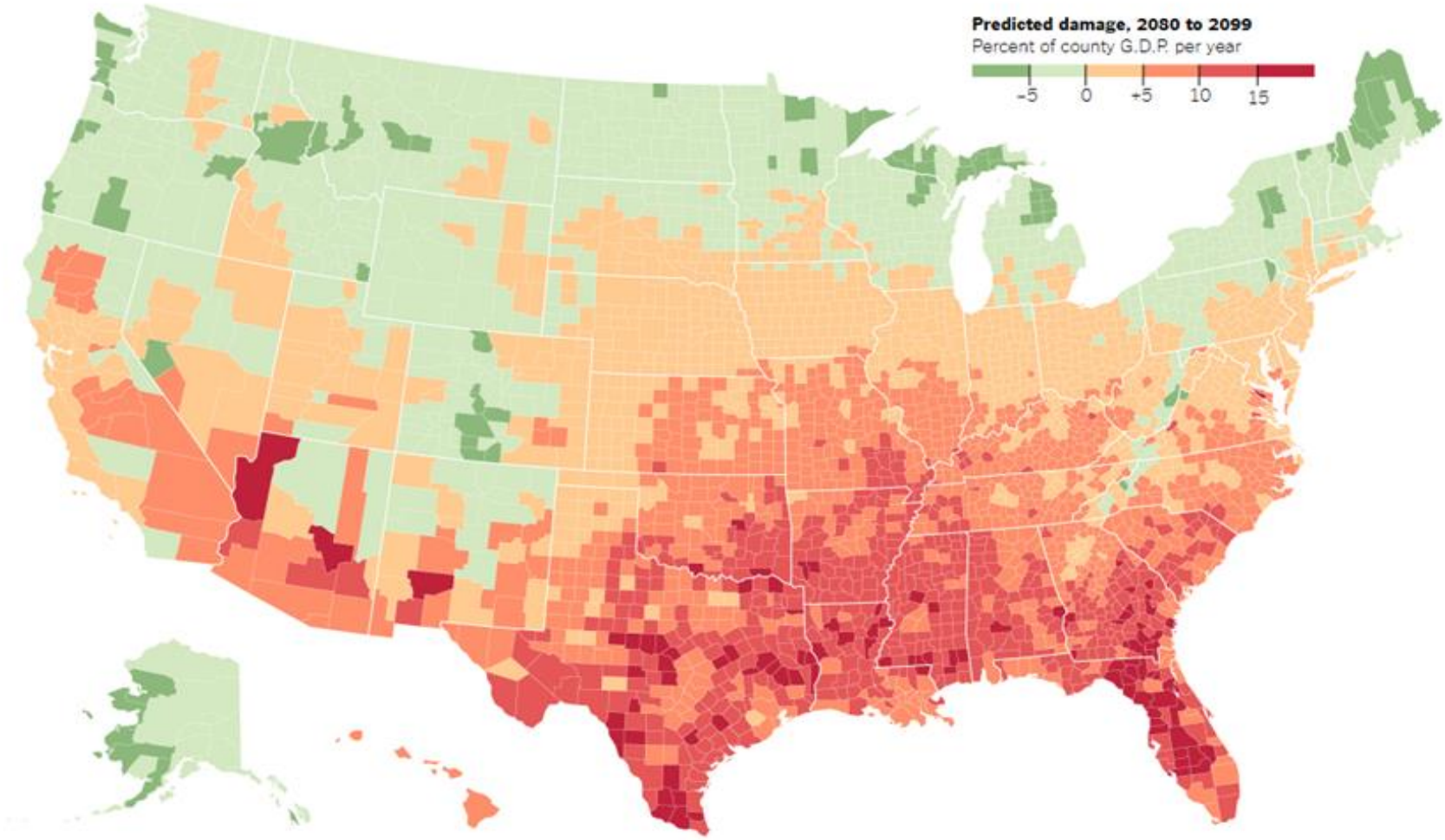
As Climate Changes, Southern States Will Suffer More Than Others

By BRAD PLUMER and NADJA POPOVICH JUNE 29, 2017



As the United States confronts global warming in the decades ahead, not all states will suffer equally. Maine may benefit from milder winters. Florida, by contrast, could face major losses, as deadly heat waves flare up in the summer and


Temperature and precipitation extremes (like flooding) can increase pathogen load.
Climate can also alter weed, insect, and fungal populations and increase pesticide use.
Rising carbon dioxide can directly influence nutritional content of foods.
Warmer temperatures can result in greater food spoilage.
Extreme climate events can disrupt food distribution.