
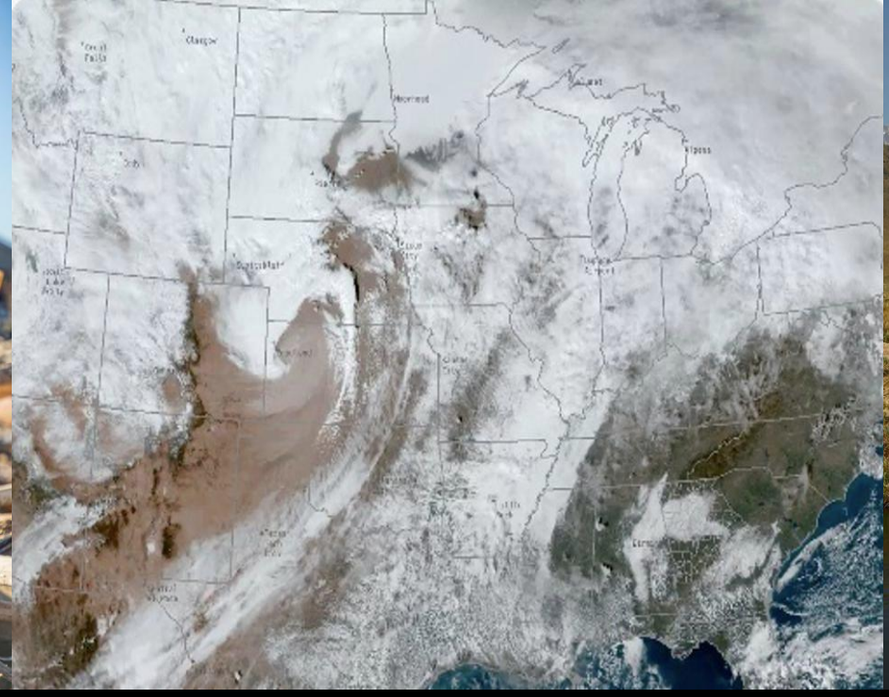


The Extreme Weather – Climate Gap: Implications for Vulnerable and Marginalized Communities

Dr. Marshall Shepherd
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Host, Weather Channel's Weather Geeks
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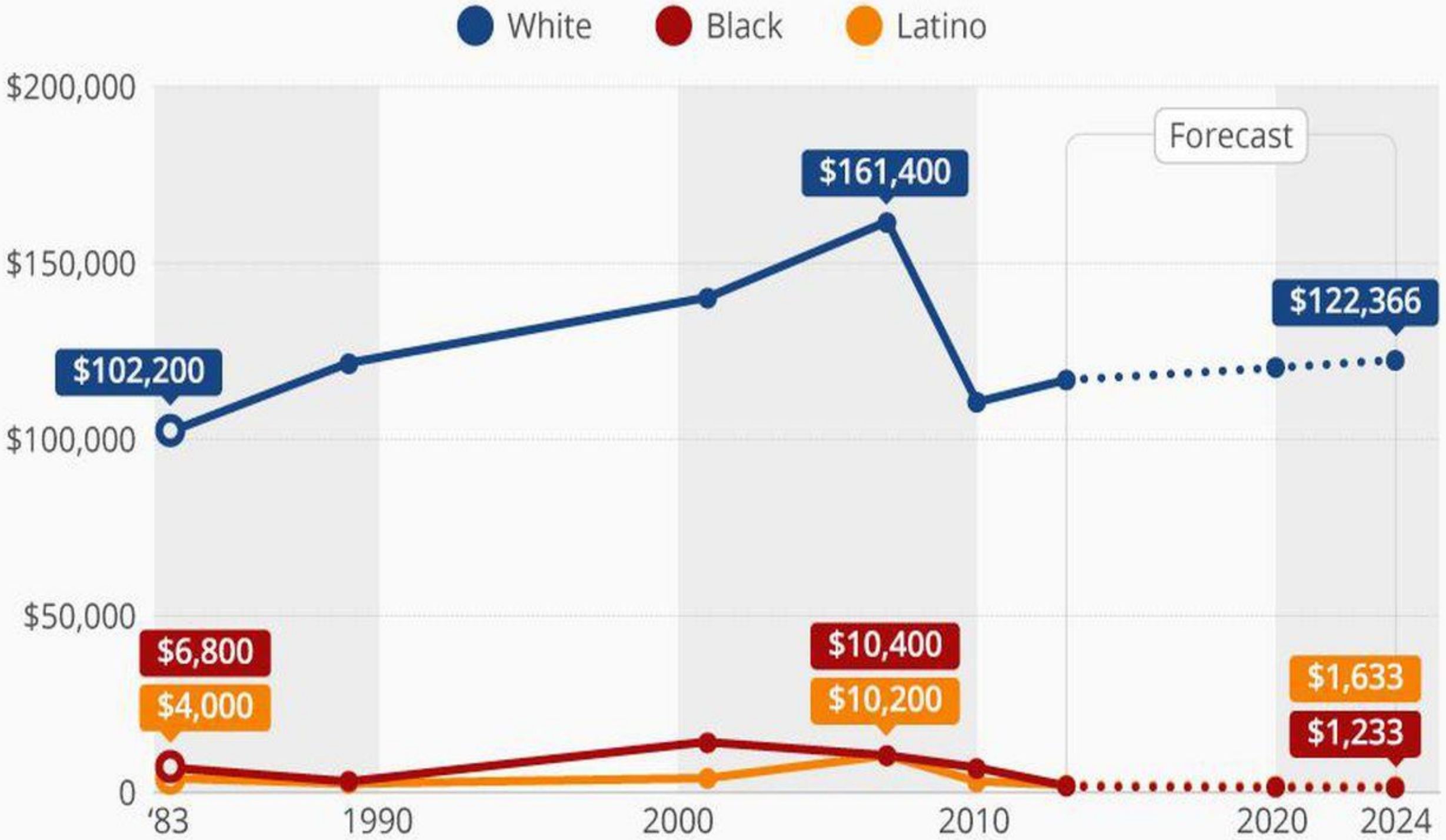
Images via Forbes/Getty

The gap between the rich and poor is growing among and within most nations.....The global environment shows signs of widespread deterioration. Both natural and social environments are increasingly vulnerable to catastrophic disturbances.

—*Gilbert F. White*

Racial Wealth Inequality Is Rampant In The U.S.

Median household wealth by race/ethnicity in the United States (1983–2024)



@StatistaCharts Source: Prosperity Now & Institute For Policy Studies

Forbes statista

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 2019

UNIVERSITY OF GEORGIA

Are we in a “new normal” climate?

Yes. Yes. Yes. I will even go further. As I recently told reporters, we don’t have to refer to it as a “new normal.” It is normal

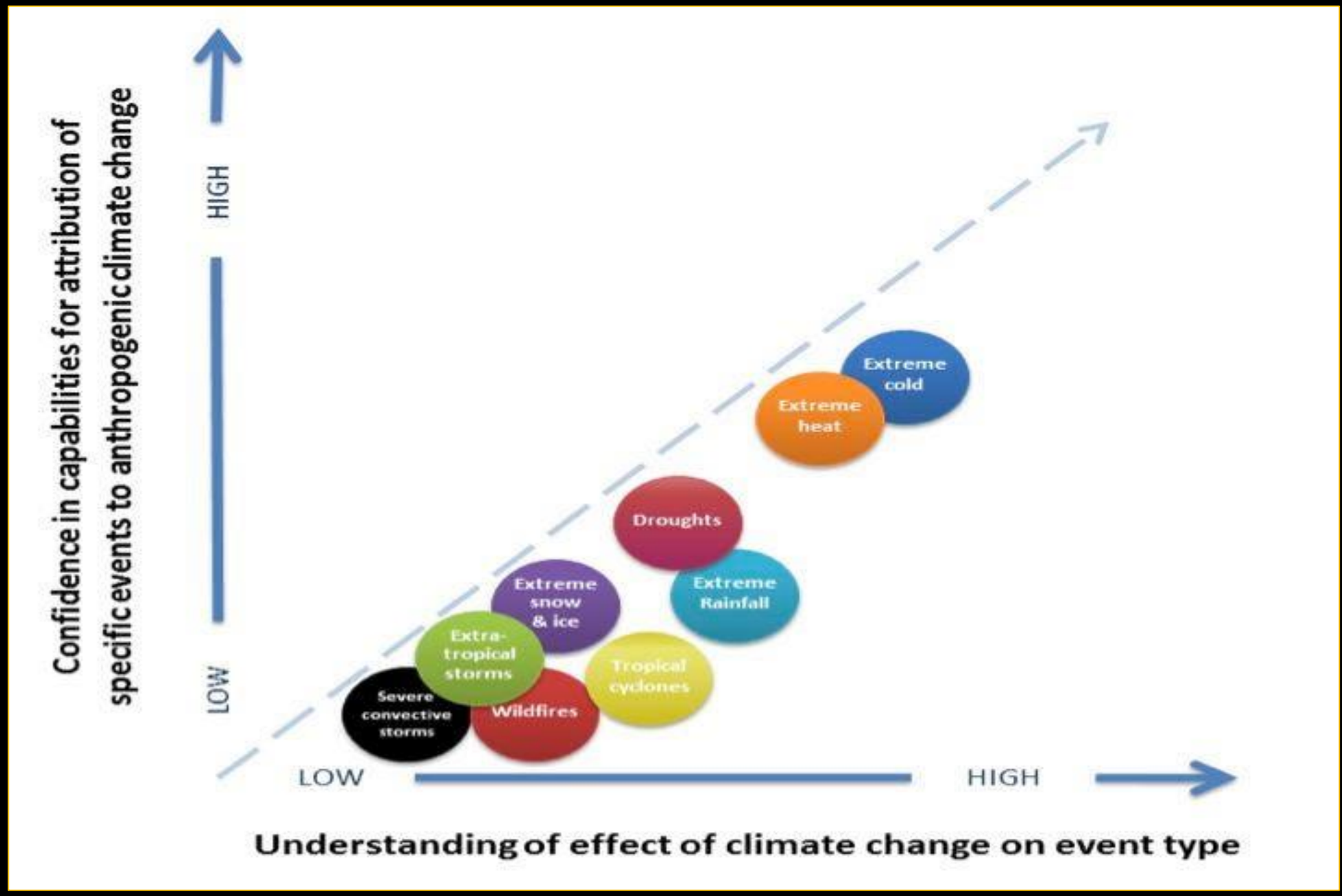
What do think of this being the warmest this or the wettest that?

This type of information is not breaking news anymore. Expect extreme temperature, rainfall, sea level, Arctic sea ice loss or hurricane intensity records to be broken frequently and with startling magnitudes at times.

Are we acting fast enough?

No. We know the DNA is in climate change because of attribution studies and compound events are a multiplier

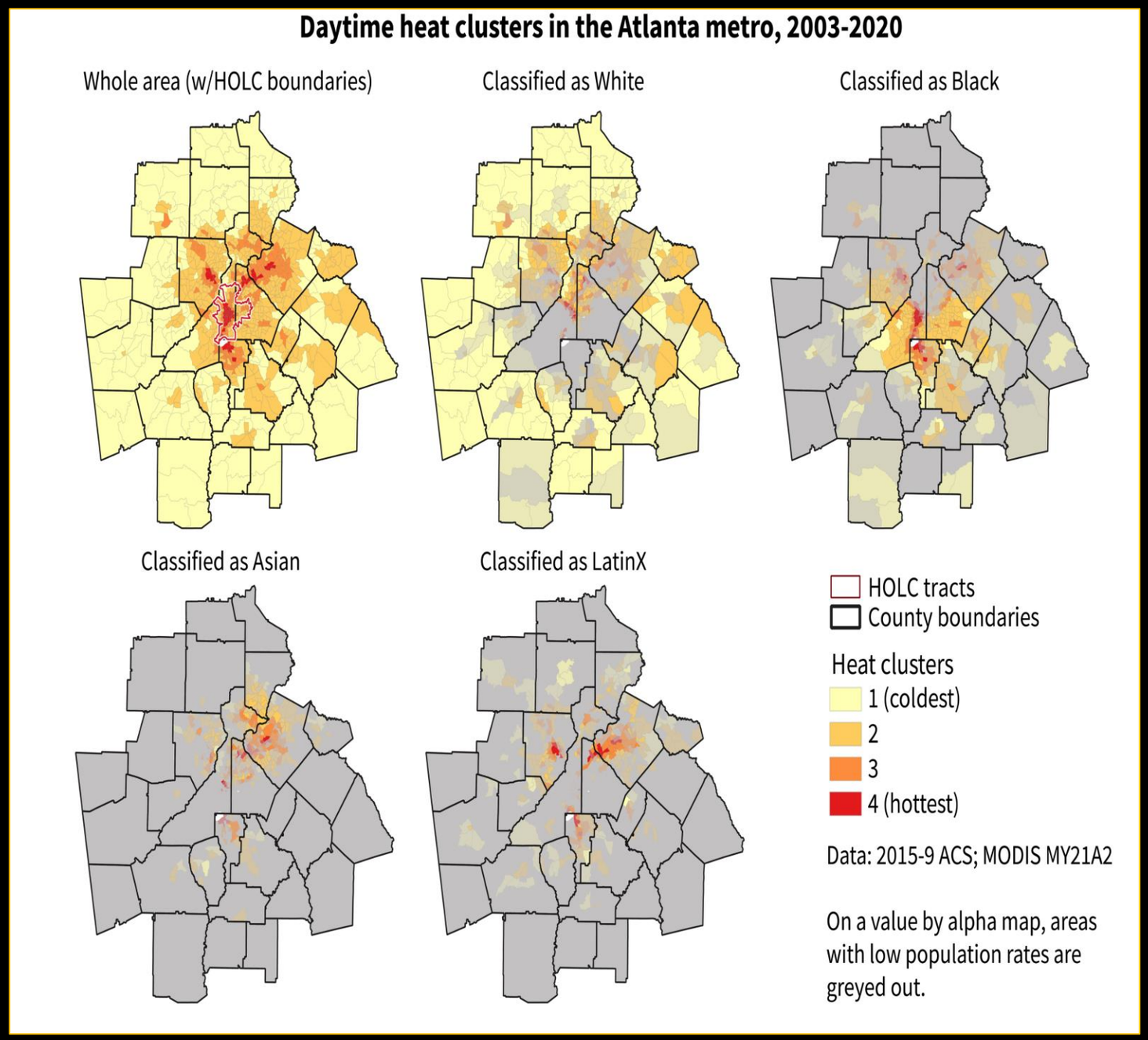
An Important Point on Attribution, Extreme Weather and Climate Change



National Academies/NRC

> Environmental justice embraces the principle that all people and communities have a right to equal protection and equal enforcement of environmental laws and regulations....Today, zip code is still the most potent predictor of an individual's health and well-being. Individuals who physically live on the "wrong side of the tracks" are subjected to elevated environmental health threats and more than their fair share of preventable diseases....Reducing environmental, health, economic and racial disparities is a major priority of the Environmental Justice Movement.

What is the Weather-Climate Gap? – A disproportionate sensitivity to extreme weather-climate events and a delay in the ability to bounce back



Source: Shepherd et al. 202

COMMUNITIES OF COLOR

Some communities of color living in risk-prone areas face cumulative exposure to multiple pollutants.

Adaptation plans that consider these communities and improve access to healthcare help address social inequities.

OLDER ADULTS

Older adults are vulnerable to extreme events that cause power outages or require evacuation.

Checking on elderly neighbors and proper emergency communication can save lives.

CHILDREN

Children have higher risk of heat stroke and illness than adults.

Adults can lessen risk by monitoring exertion and hydration.

LOW INCOME COMMUNITIES

Low income families are at risk of physical and mental illnesses during flooding and in crowded shelter conditions.

Comprehensive disaster management can improve resiliency for people with limited resources.

Are Black Americans Underserved by the NWS Radar Network?

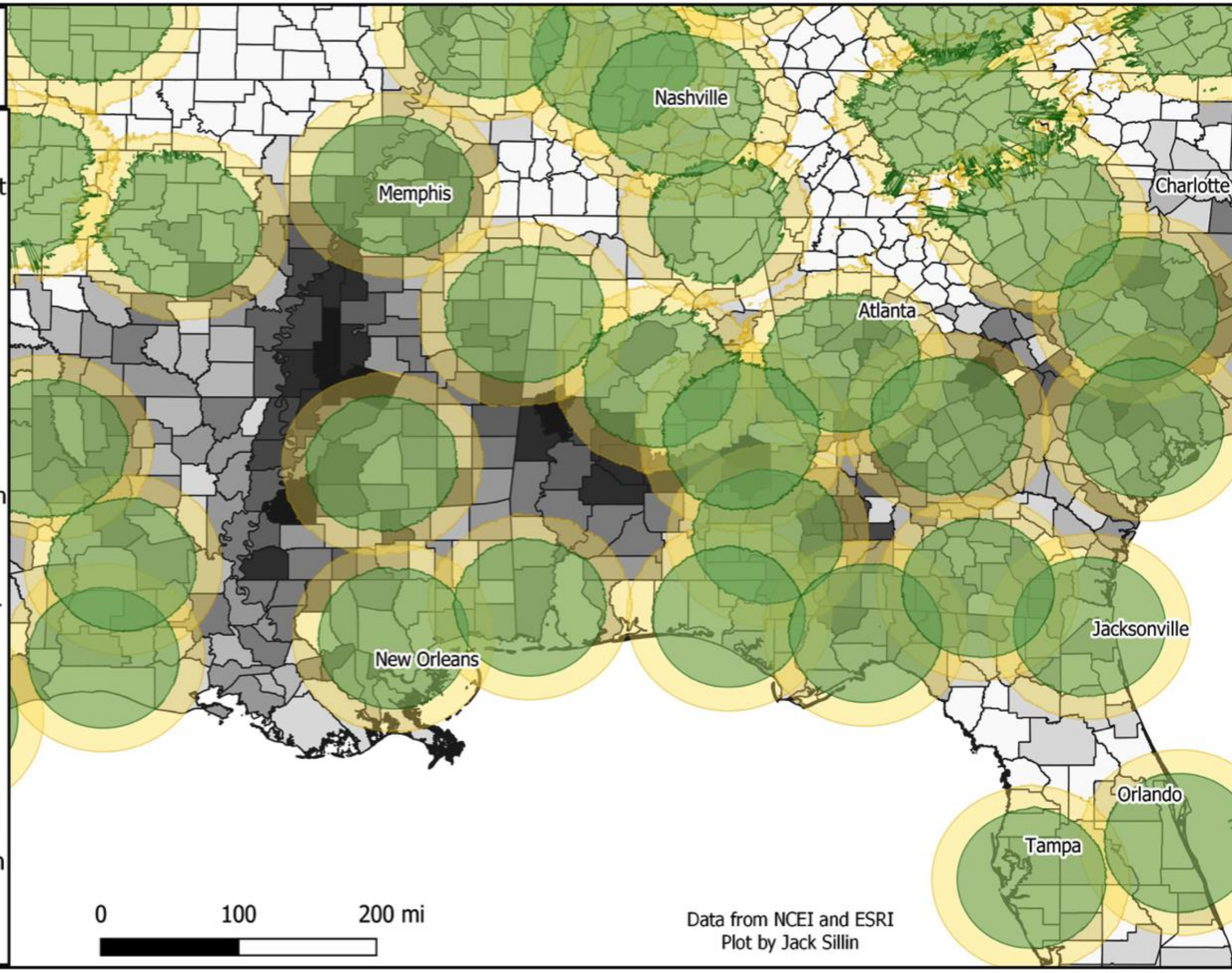
Excellent Radar Coverage
Good Radar Coverage

Weather radars detect storms by sending beams of energy out into the atmosphere and listening for energy that bounces back off rain, snow, hail, and anything else in the atmosphere.

The farther a storm is from a radar site, the less information we can get about it due to the beam height rising farther off the ground, and the beam width expanding leading to lower resolution.

High resolution radar data near the ground can be critical in many situations such as when severe thunderstorms and tornadoes threaten.

Many majority-Black parts of the Southeast are relatively far from radar sites, meaning that it's harder to gather information about storms impacting these areas.



Black Population Share

0-10% 10-20% 20-30% 30-40% 40-50% 50-60% 60-70% 70-80% 80-90% 90-100%

Our Conundrum - We Land On Mars But People Languish Without Power after a Hurricane or Ice Storm

Ian Giammanaco is an expert in the housing resilience and risk mitigation field.

“Being proactive with resilience has shown even a 10 to 1 return on reducing losses from catastrophic events.”

What we need now…

Increasing resilience across all infrastructure sectors (engineered and nature based solutions)

A ”Warp-Speed” or Apollo-Level Effort Is Required For The Climate Crisis

Marginalized, poor, and people of color suffer disproportionately from extreme weather events so close the Weather-Climate Gap

How the Storm Turned Basement Apartments Into Death Traps

At least 11 people were found dead in basements after torrential rains flooded New York City — nearly as many as those killed by Hurricane Ida in Louisiana, where the storm made landfall.

A weather, water, and climate enterprised scale for 21st century “normal’

The 5 P’s

A New NOAA “Decadal” Weather Research Report Is a Start

- “Accelerate development of an Earth system modeling approach to improve forecast accuracy and lead time;
- Increase investments in social and human behavioral data collection and sciences to better understand how weather products are used and to support co-development of improved products;
- Prioritize immediate investments in fundamental research on data assimilation to deliver sustained improvements in forecast skill and to train the next generation of experts in this area to fill an existing critical workforce gap;
- Fully implement and expand rapidly the existing plans for improved weather data dissemination, increasing understanding through open-science approaches, and expanding applications through weather industry partnerships;
- Expand high-performance computing capacity by two orders of magnitude over 10 years to support operational forecasts and data dissemination and provide critically lacking capacity in weather research;
- Fill gaps in existing Earth system observing networks with existing, proven or augmenting technologies to expand coverage, especially in underserved regions;
- Support reanalysis and reforecasting vital to Earth system model evaluation and improvement, to characterize extremes, and provide training datasets for artificial intelligence product applications;
- Target the understanding and prediction of high-impact weather to match the urgent need imposed by climate trends, population and infrastructure increases, and disproportionate impacts on vulnerable communities;
- Target water cycle extremes and their cascading impacts to improve flood and drought prediction and to enable forecast-informed reservoir operations; and
- Develop improved and increasingly objective methods to balance investments across the weather information value chain and expand efforts to more precisely target future investments.”