"A Climate Conversation"

Introduction to Climate Science Webinar

Part of the "Building a Climate Resilient National Capital Region" series of webinars and workshops

http://www.mwcog.org/environment/climate/resilience.asp

National Capital Planning Commission

GSA

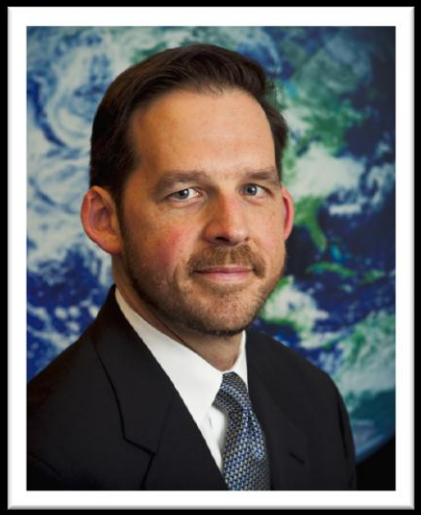
NASA

Metropolitan Washington Council of Governments

Smithsonian

United States Global Change Research Program

Opening Remarks



Lawrence Friedl
Director, Applied Sciences Program,
Earth Science Division
National Aeronautics and Space
Administration (NASA)

A Climate Conversation:

The Decision-Maker

Olga Dominguez

Associate Administrator for Strategic Infrastructure

NASA's Strategic Sustainability Officer

A Climate Conversation:

The Scientist

Goddard Institute for Space Studies

NASA

COLUMBIA UNIVERSITY

Dan Bader

Research Analyst

NASA Goddard Institute for Space Studies

Trucks Carrying Hurricane Relief Supplies Await Distribution Instructions at NASA's Stennis Space Center

Responding to Climate Risks

Mitigate to reduce our impact on natural systems…

…and ***adapt*** where we nevertheless expect impacts.

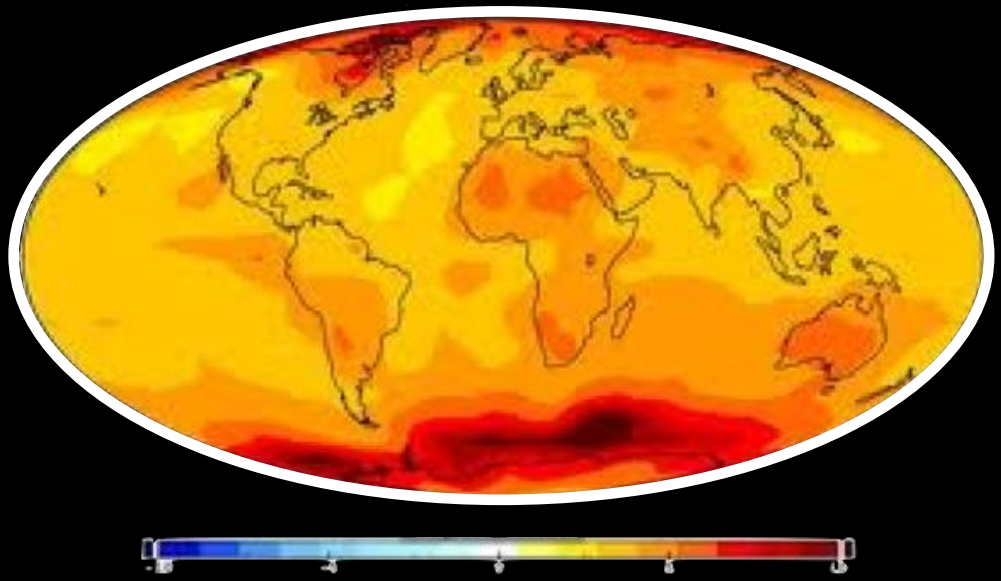
Question

Distinction between weather and climate?

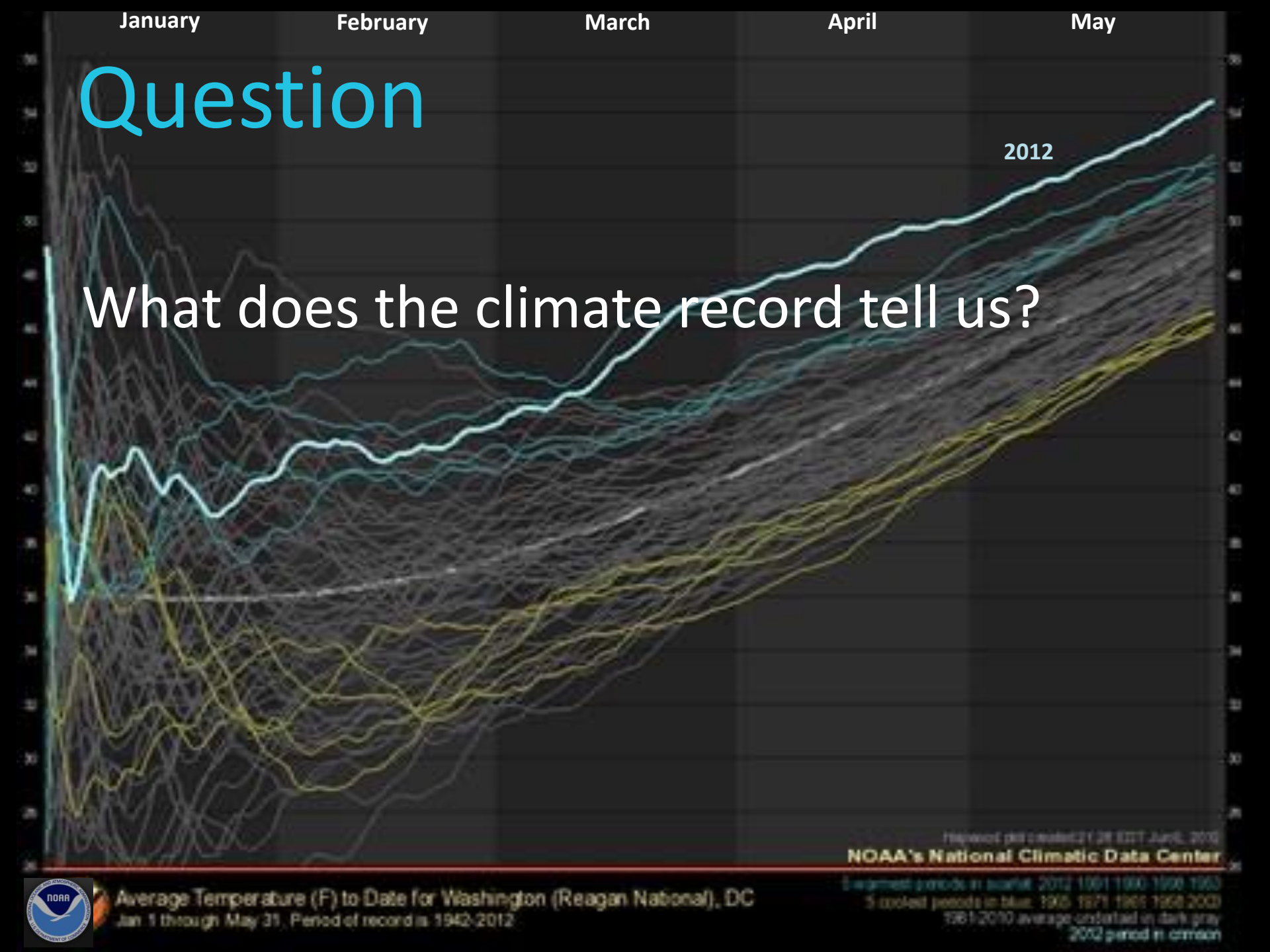
Comparing Weather and Climate

Weather describes current and near-term conditions

Climate describes weather patterns over a longer term



"Weather is what you get; climate is what you expect."

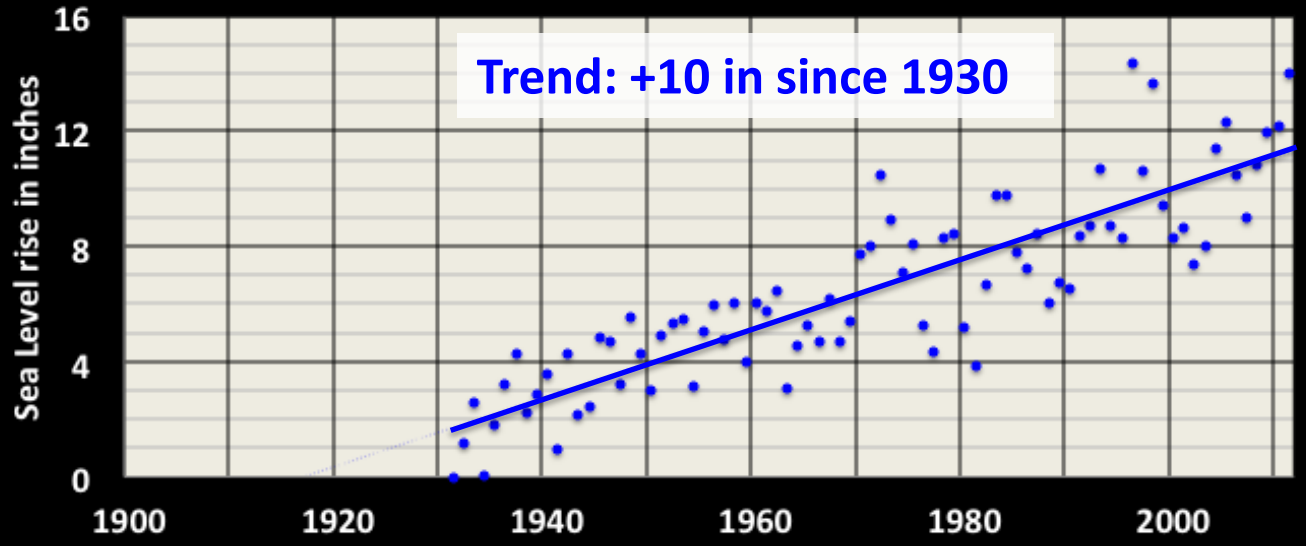


Question

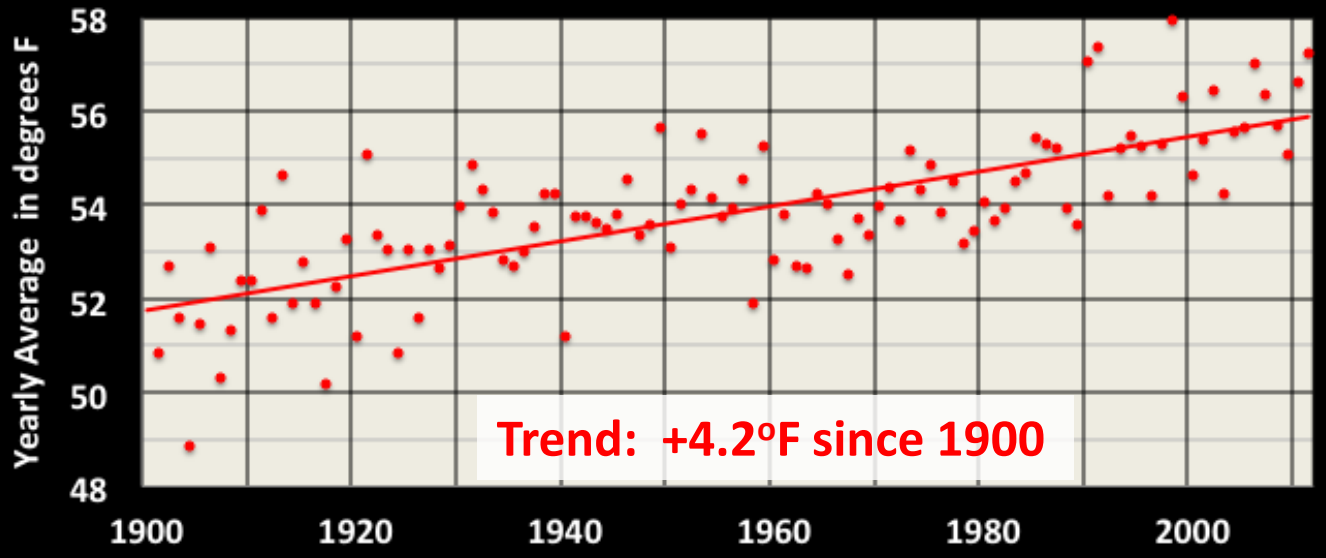
What does the climate record tell us?

What's already happened ***locally***?

Sea Level
has risen over decades, though individual years vary somewhat



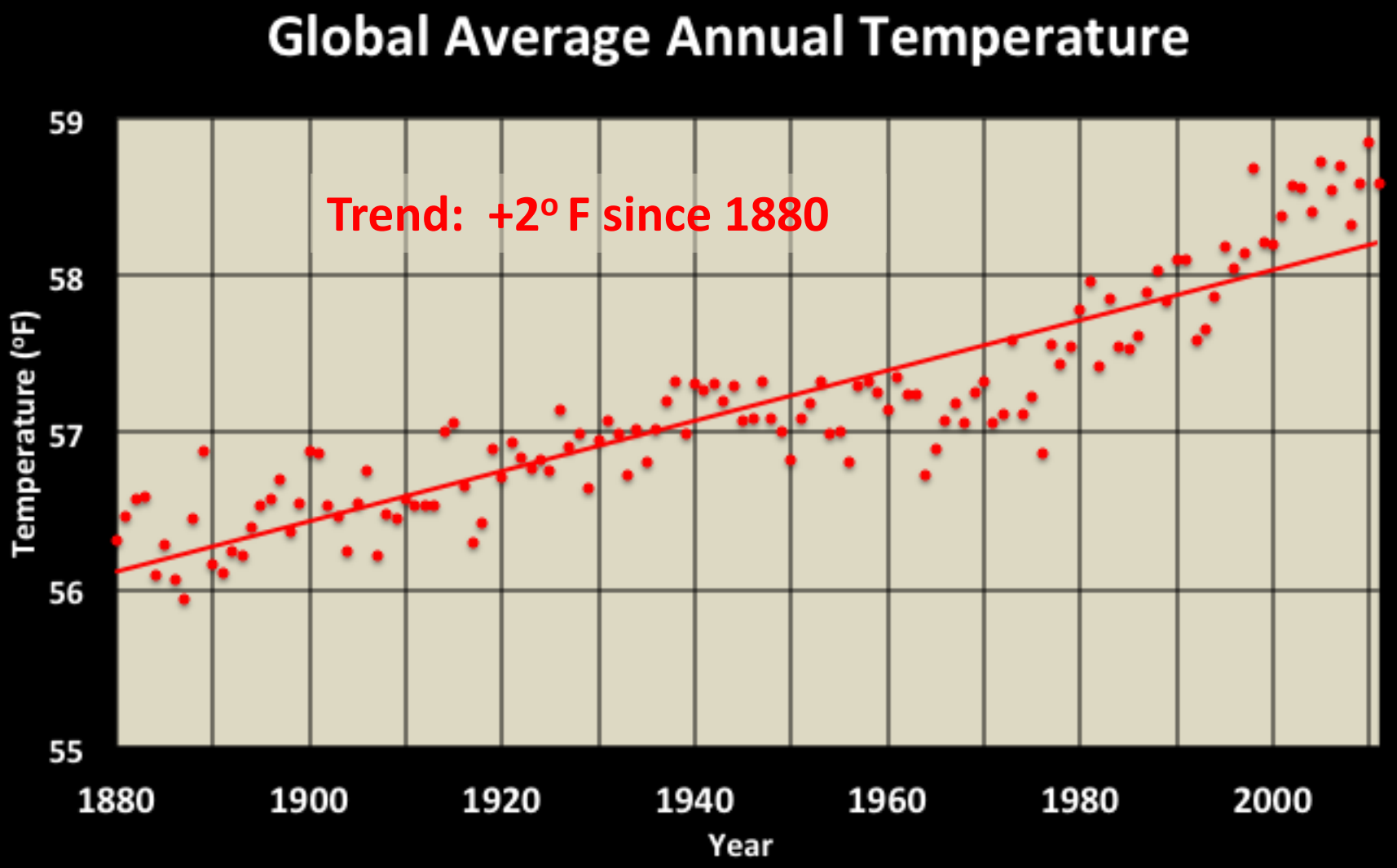
Temperature
has risen too, but the trend varies more year-to-year



A century of local data tells us the climate is changing

NOAA 2013

Part of a larger pattern?

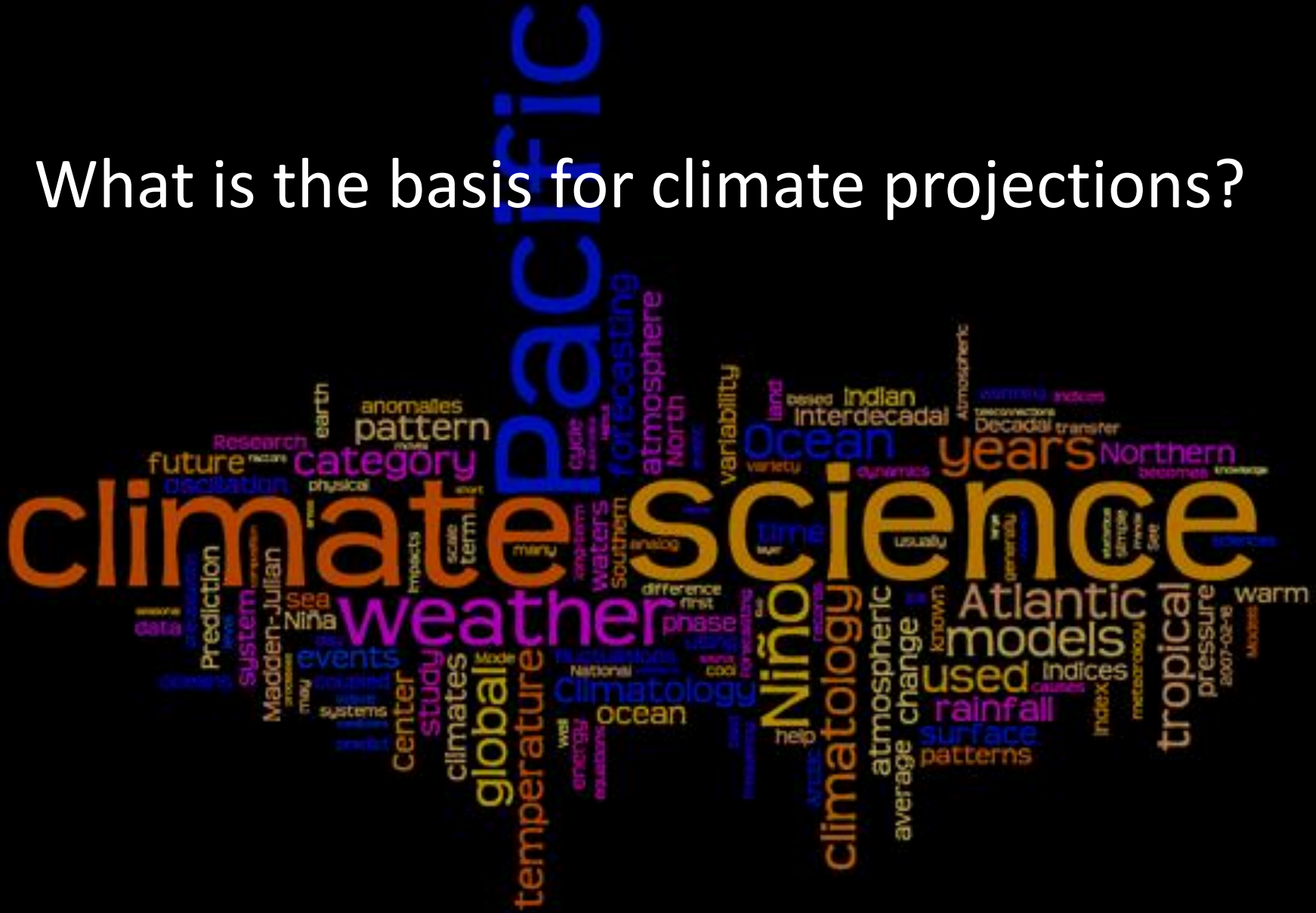


Observed local patterns reflect world-wide trends

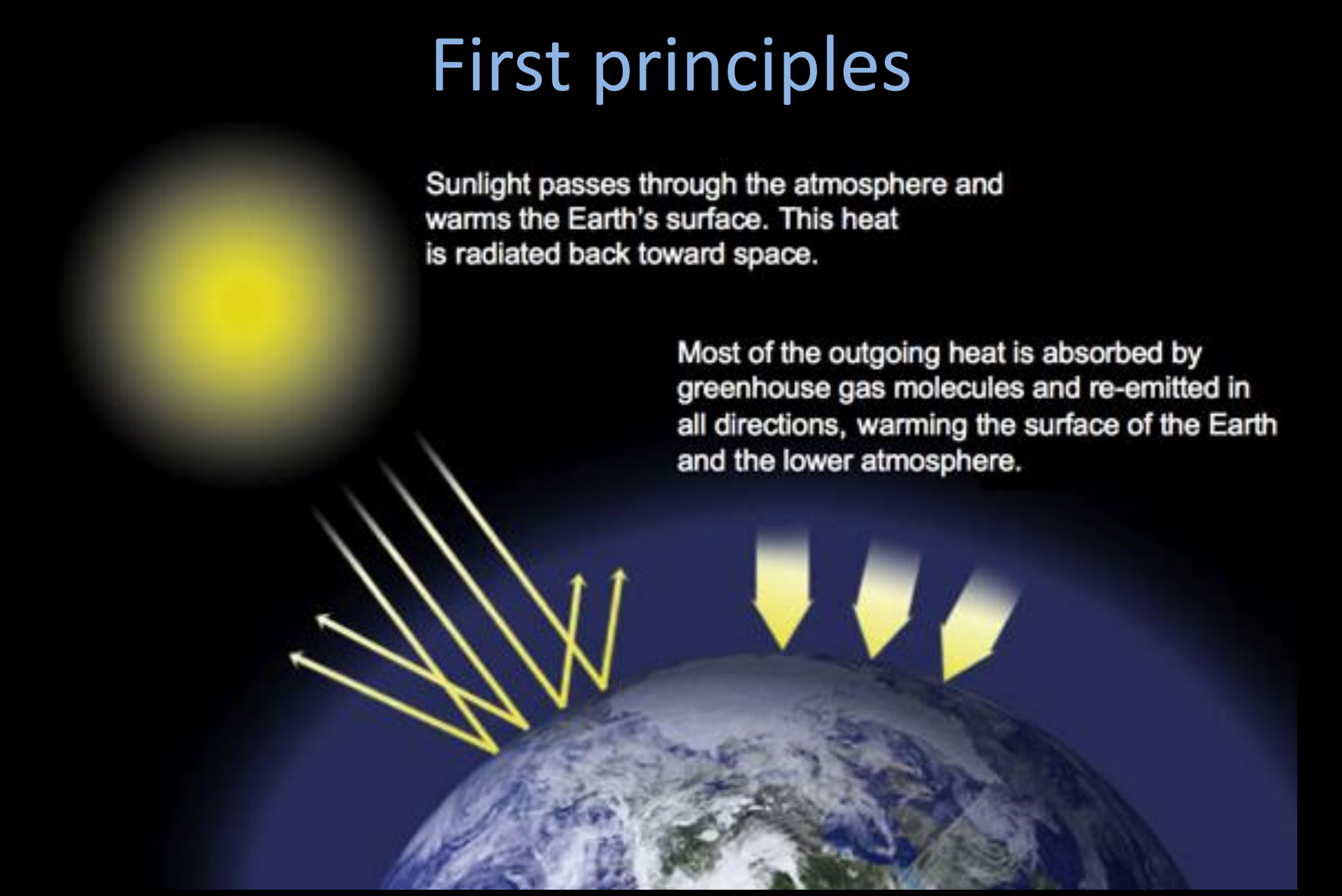
NASA GISS

Question

What is the basis for climate projections?



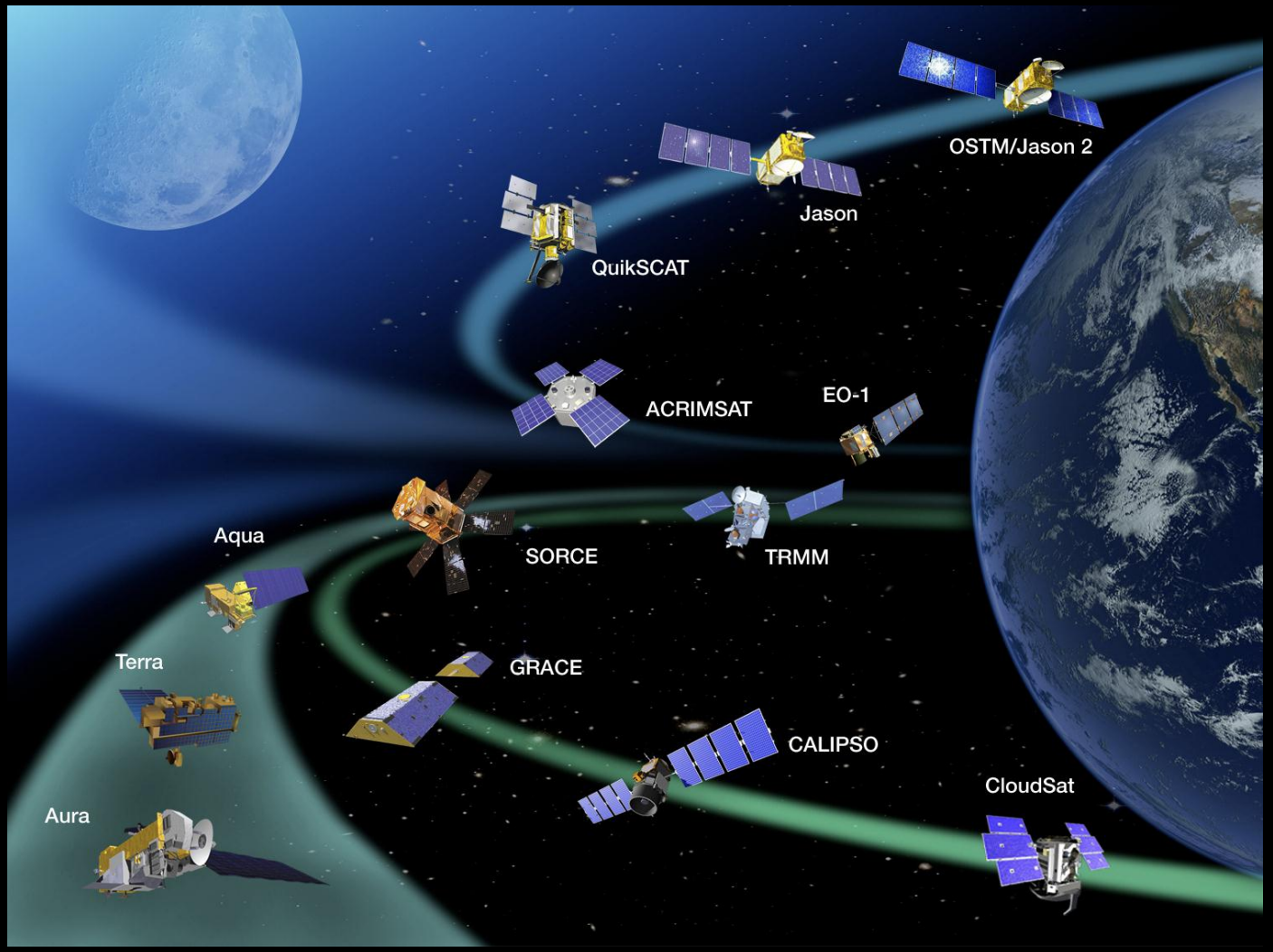
First principles



Scientists have understood this pattern for over a century

NASA

Gathering better data



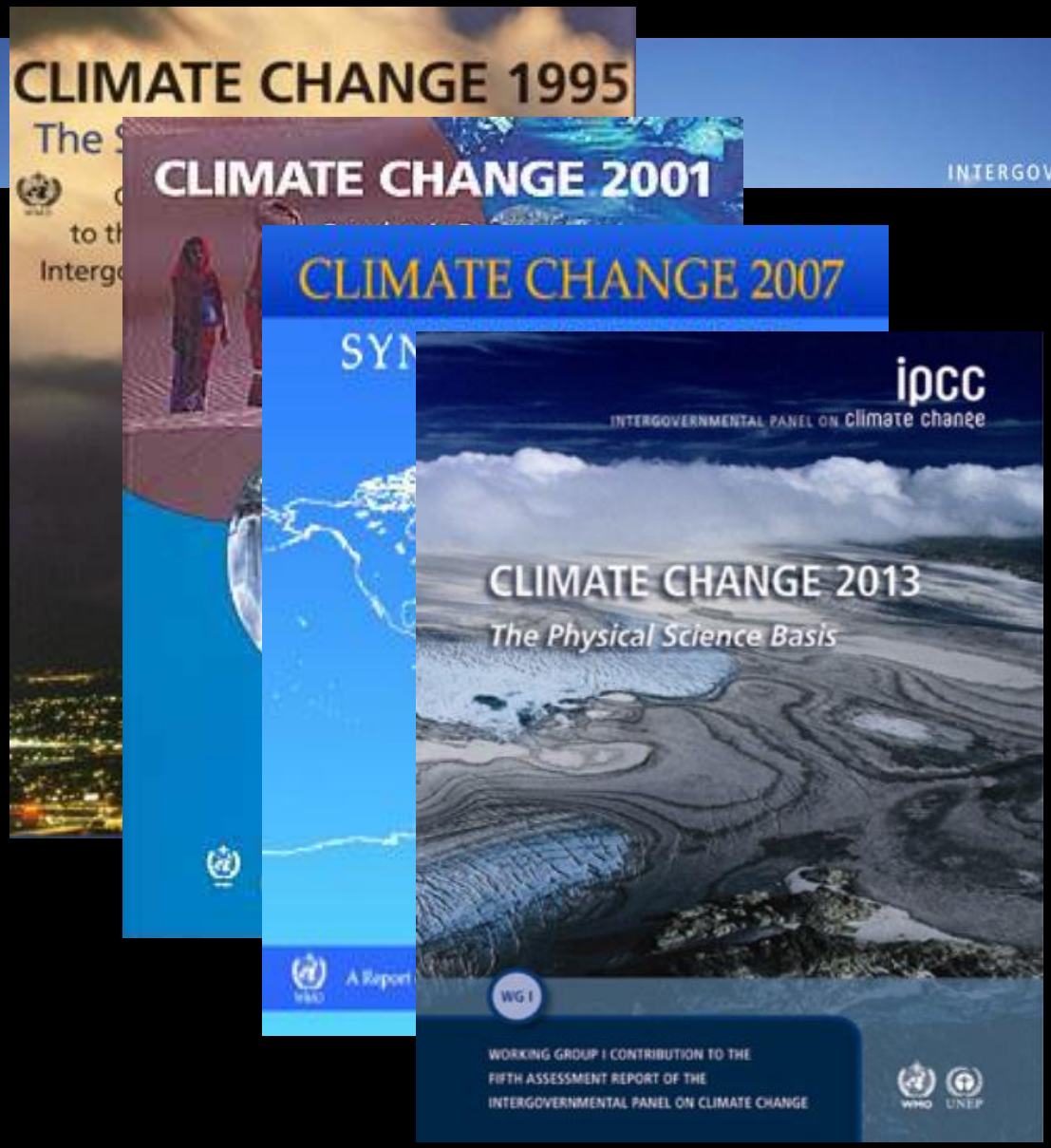
NASA's orbital perspective is a critical vantage-point

NASA

Building on a strong foundation

Powerful computer models let us test and refine hypotheses

Intergovernmental Panel on Climate Change

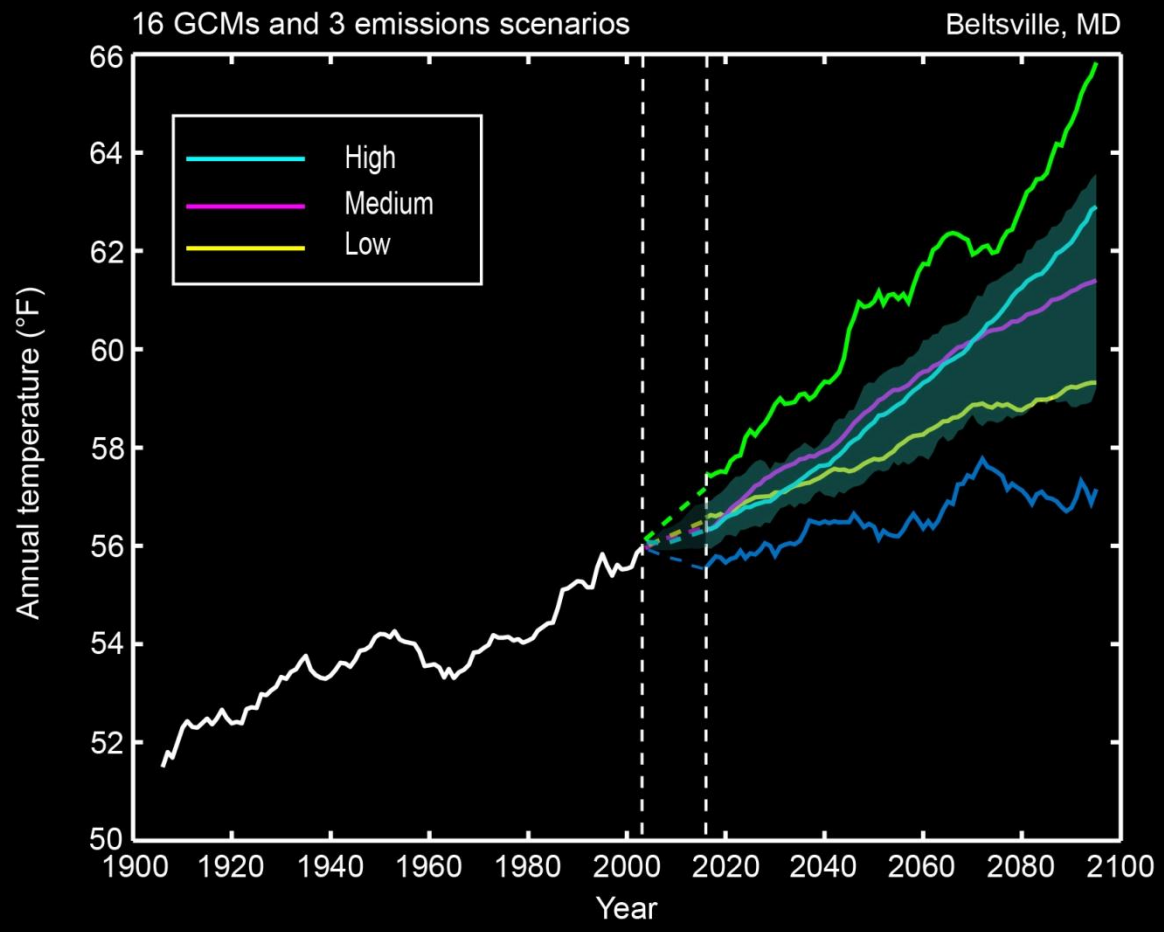


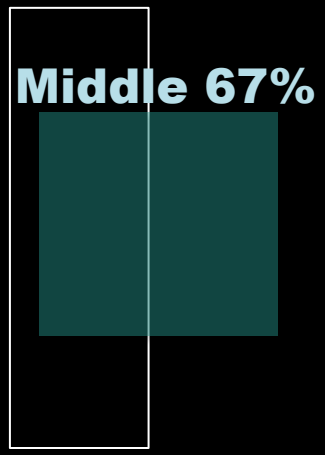
Consensus-based projections using

- Several models
- Several future greenhouse gas emission scenarios

Updated as the science advances

IPCC Models

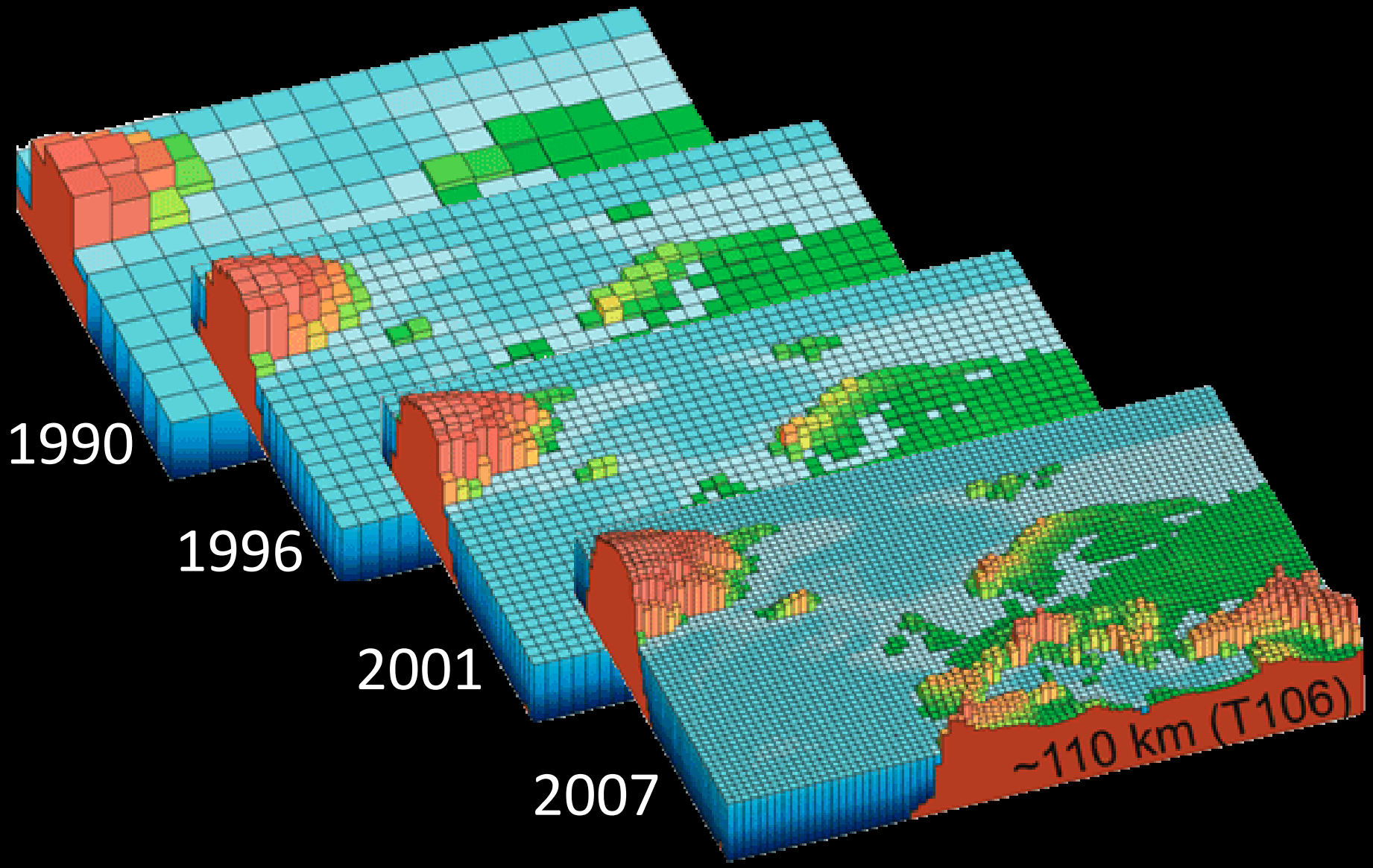




Central range of models is basis for NASA's projections

NASA GISS 2013

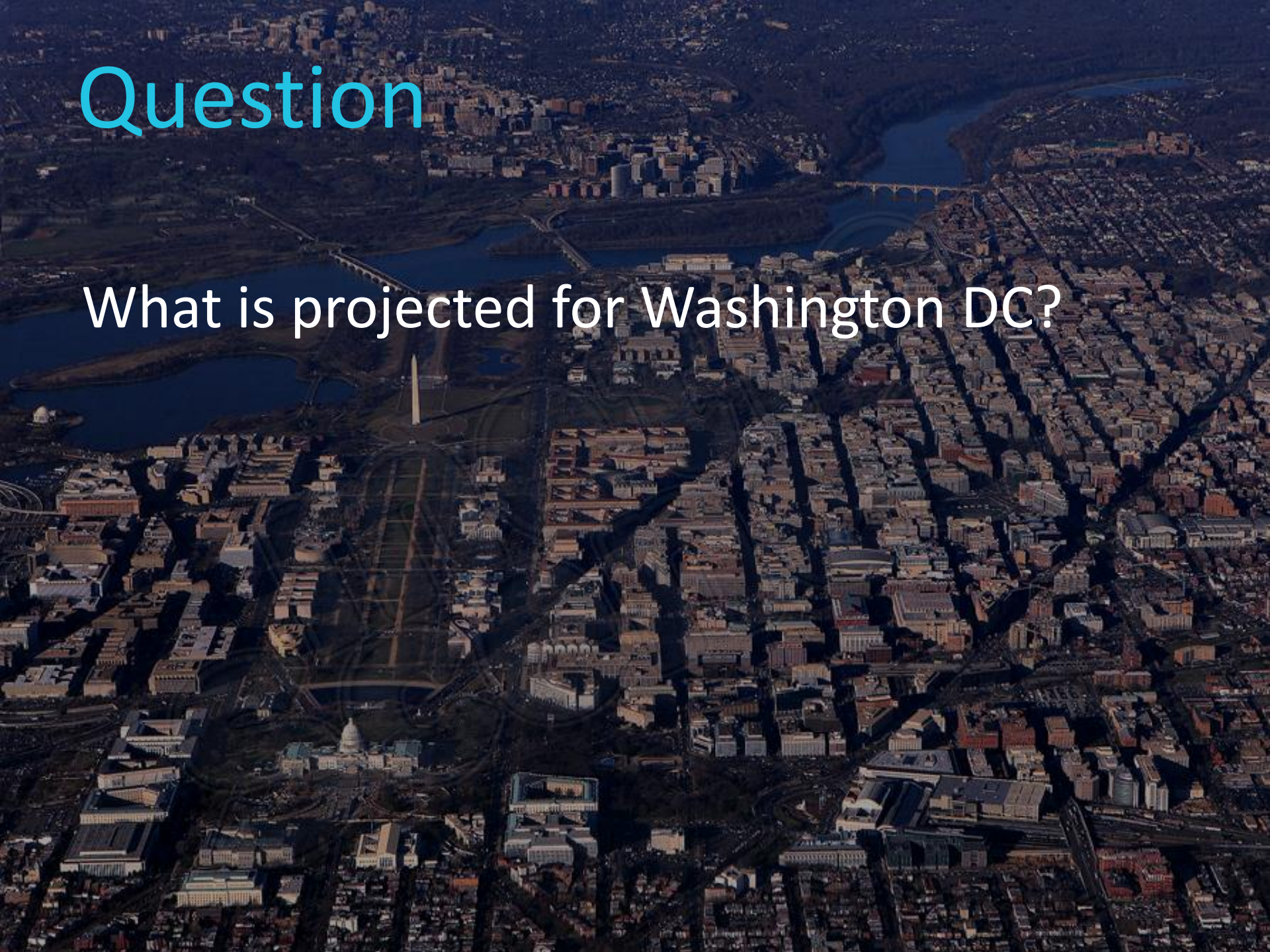
Rising precision/resolution over time



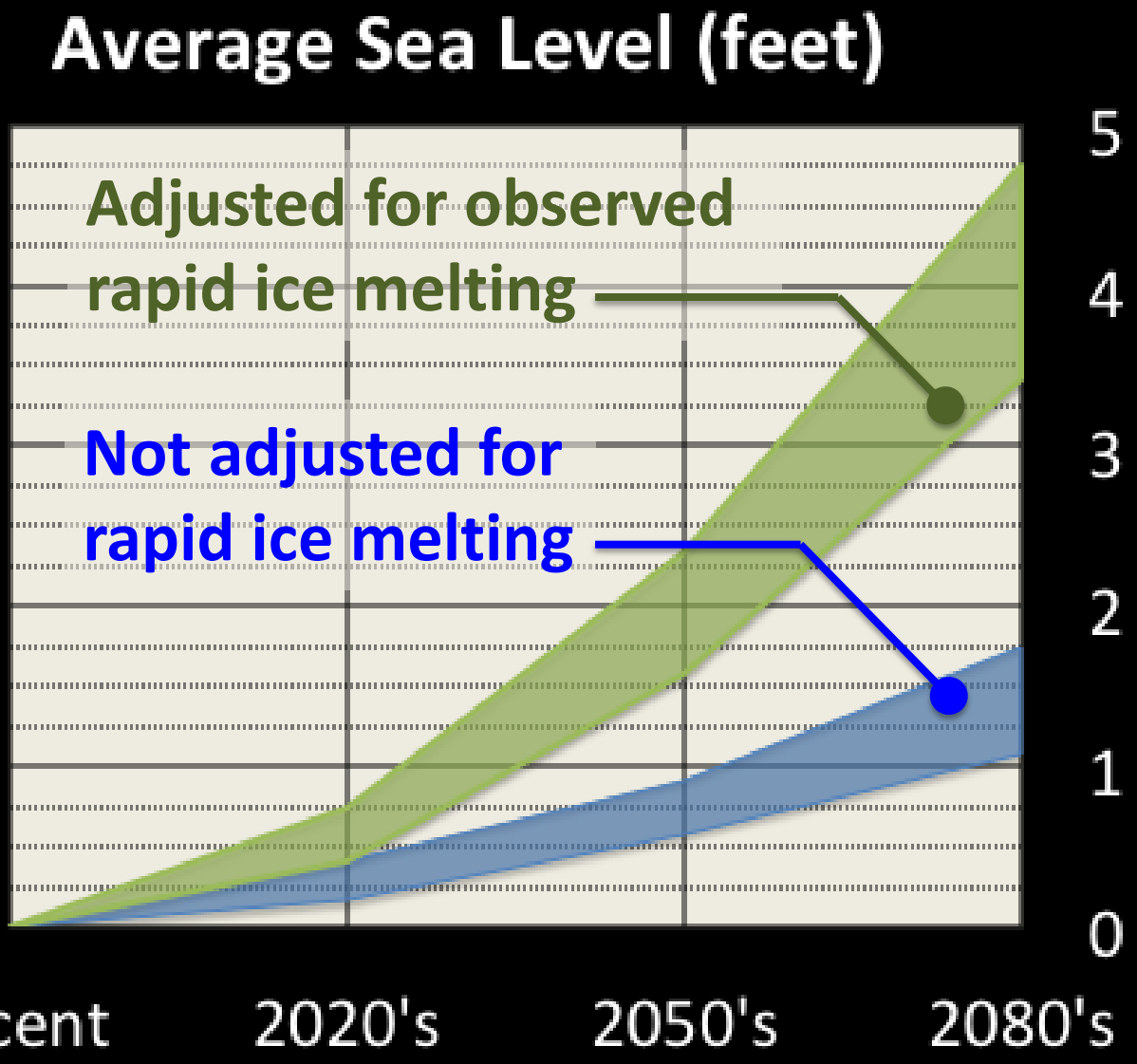
New models + better data = more specific projections

Question

What is projected for Washington DC?



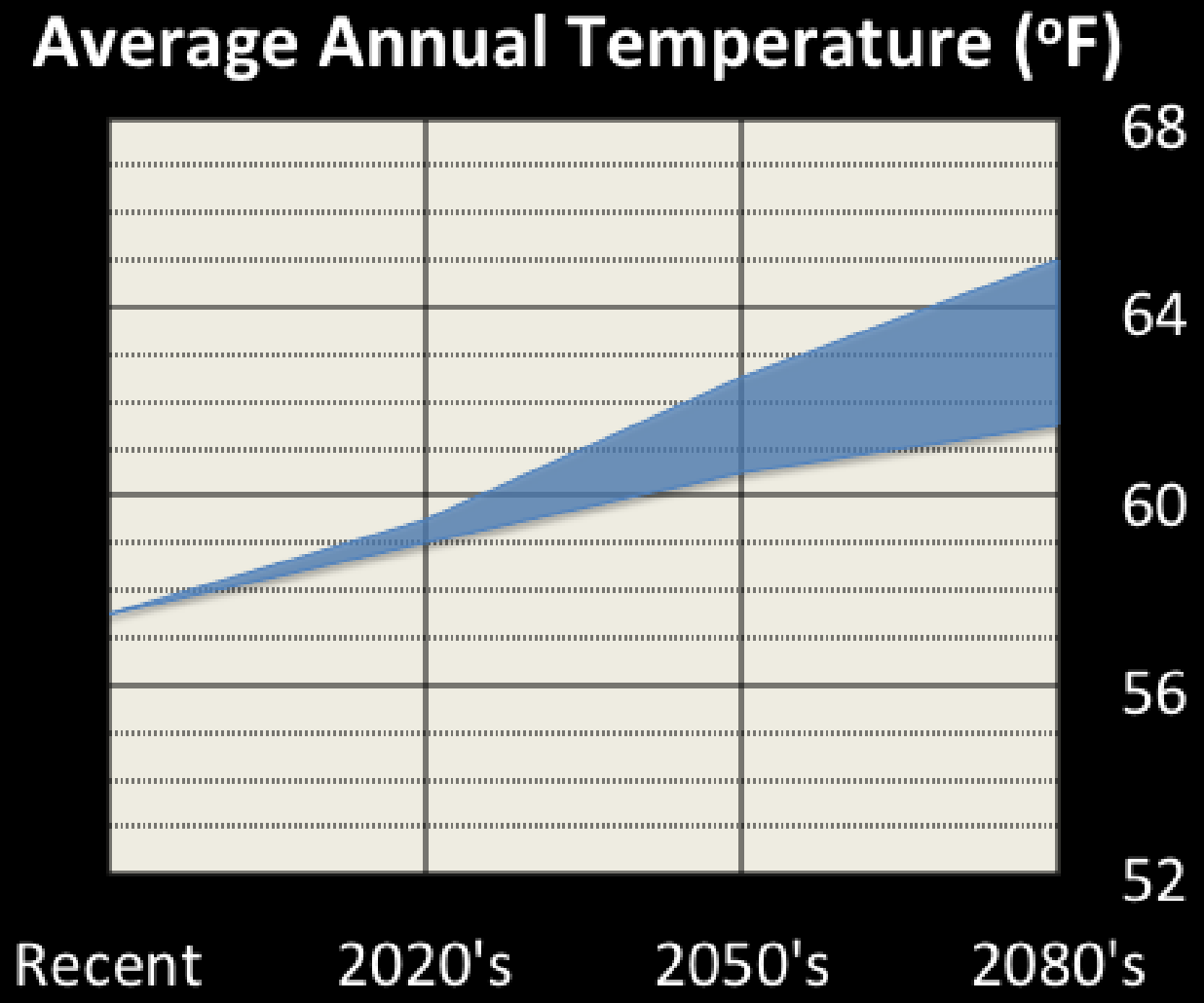
What is projected locally?



Sea level rise is projected to accelerate this century

NASA GISS 2013

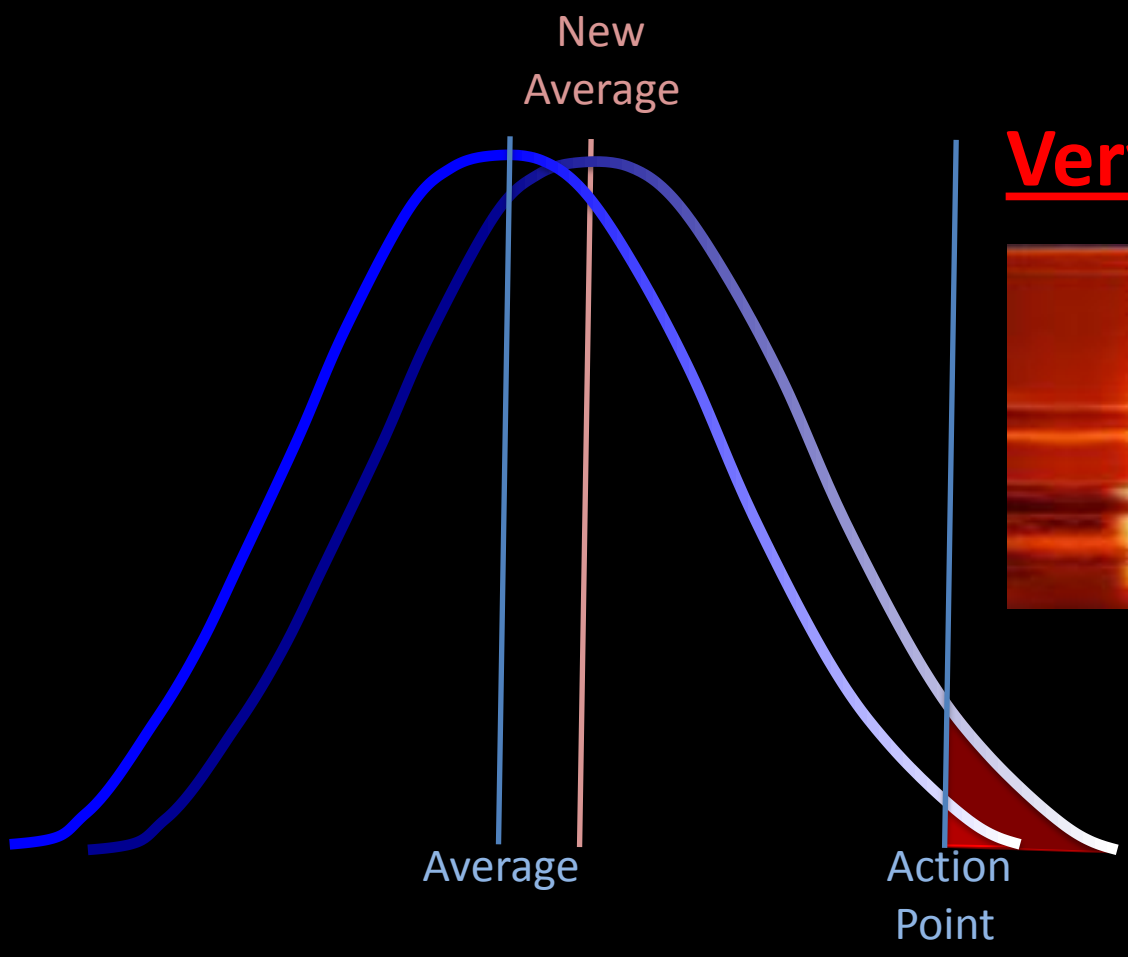
What is projected locally?



Average temperatures are projected to rise

NASA GISS 2013

What can a few degrees warmer do?

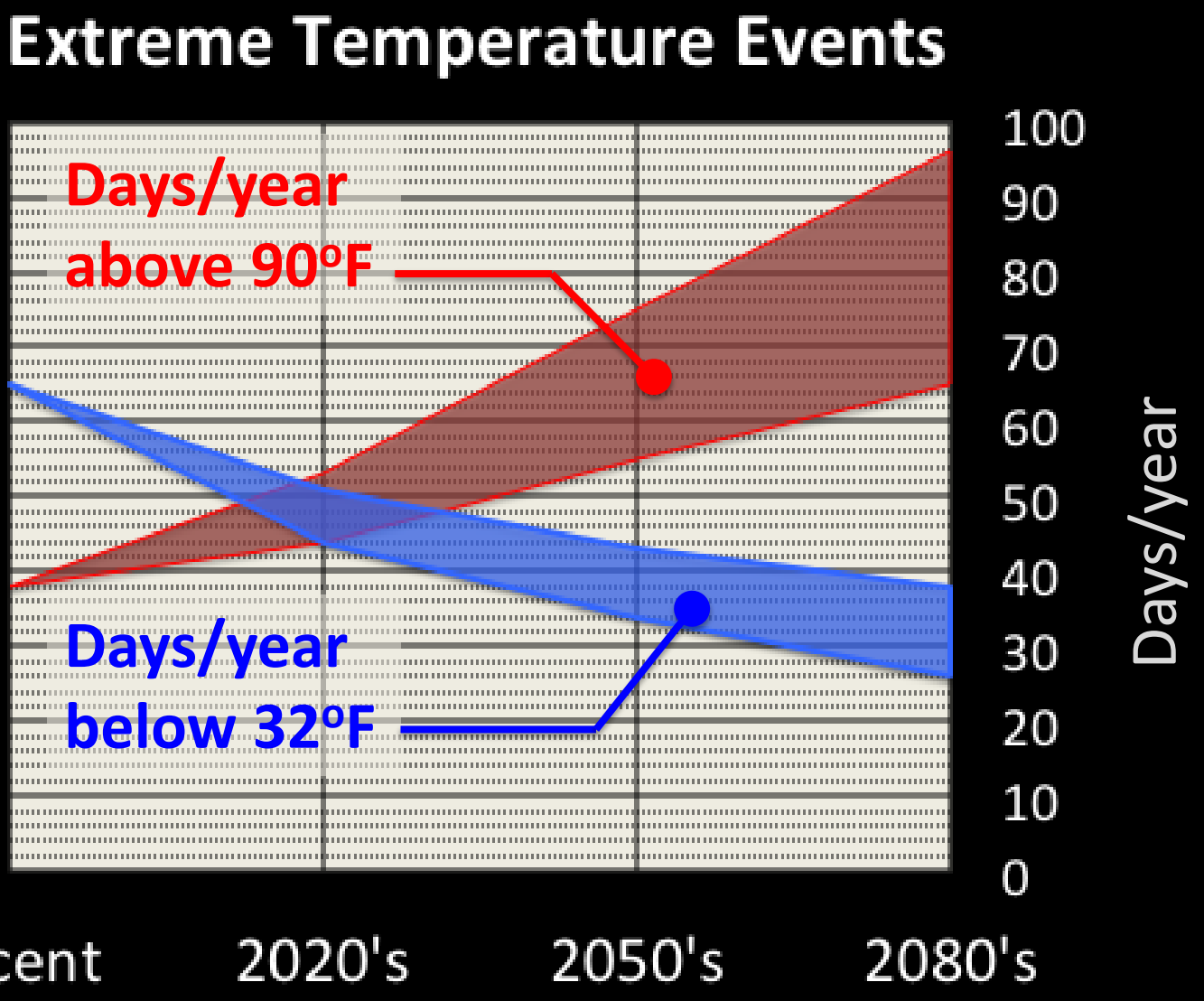


Very Likely Increase:

Extremely warm days

A small average change can mean a big effect on extremes

What can a few degrees warmer do?

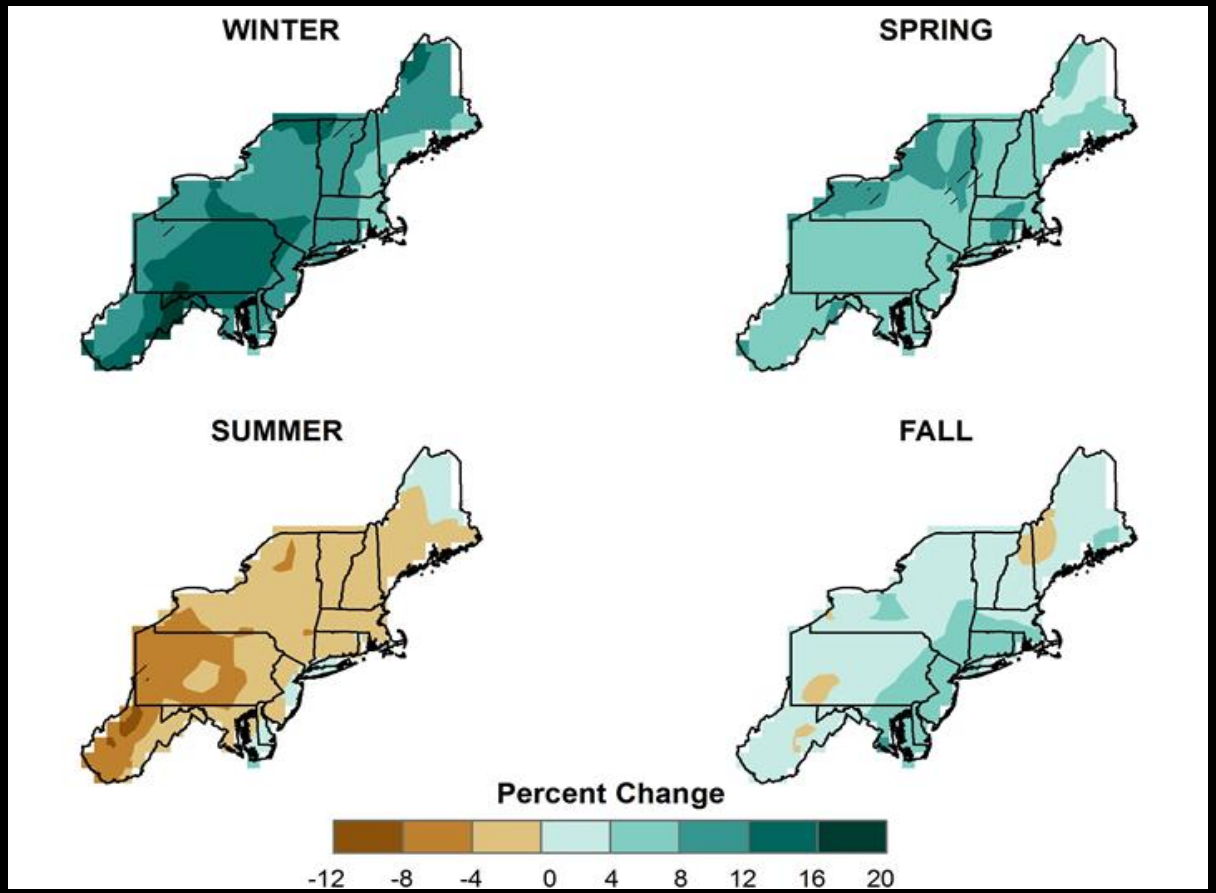


Extremes can change much faster than averages.

NASA GISS 2013

NCA Regional Climate Scenarios

- Information on precipitation are illustrated here for the Northeast Region. Other regions available at: http://scenarios.globalchange.gov/node/1155



Seasonal changes simulated by NARCCAP* indicate an increase in precipitation for winter, spring, and fall, but a decrease for summer

National Climate Assessment 2013

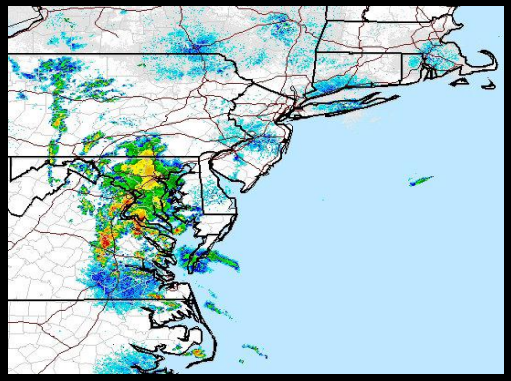
*North American Regional Climate Change Assessment Program (NARCCAP)

Question

What other changes are projected?

What other changes are projected?

Likely Increase



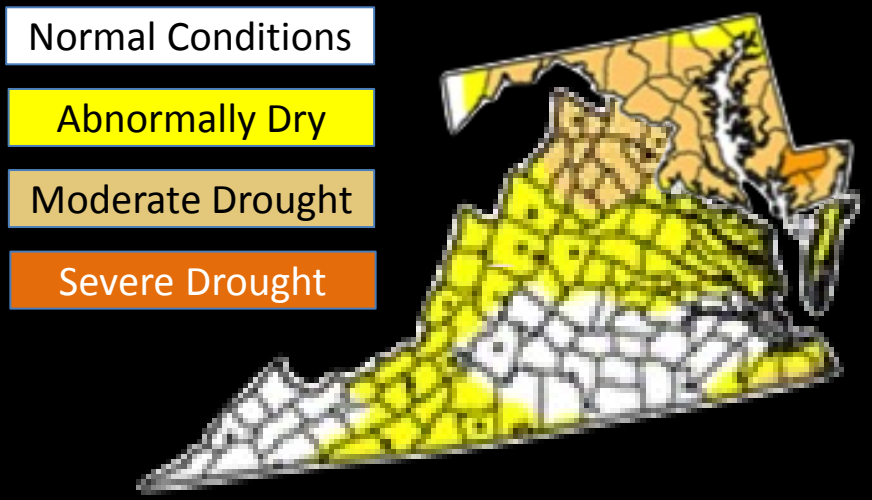
Intense rainfall events

Likely Decrease

Snowfall frequency & amount

More likely than not

Increases in drought events



There's more to consider than averages

NASA GISS 2013

Question

What types of impacts might these projected changes have on us in terms of workforce, communities, and natural systems?

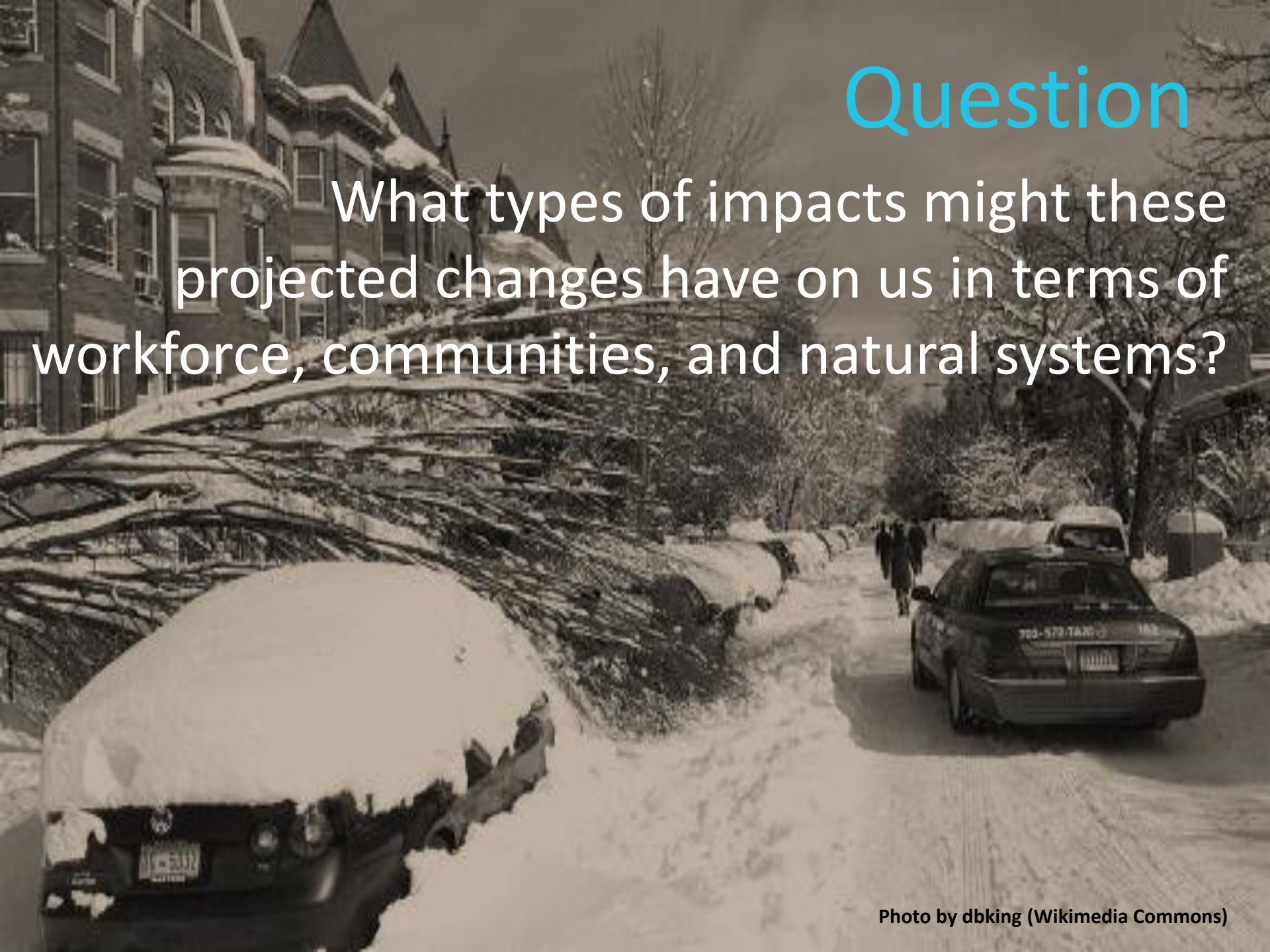
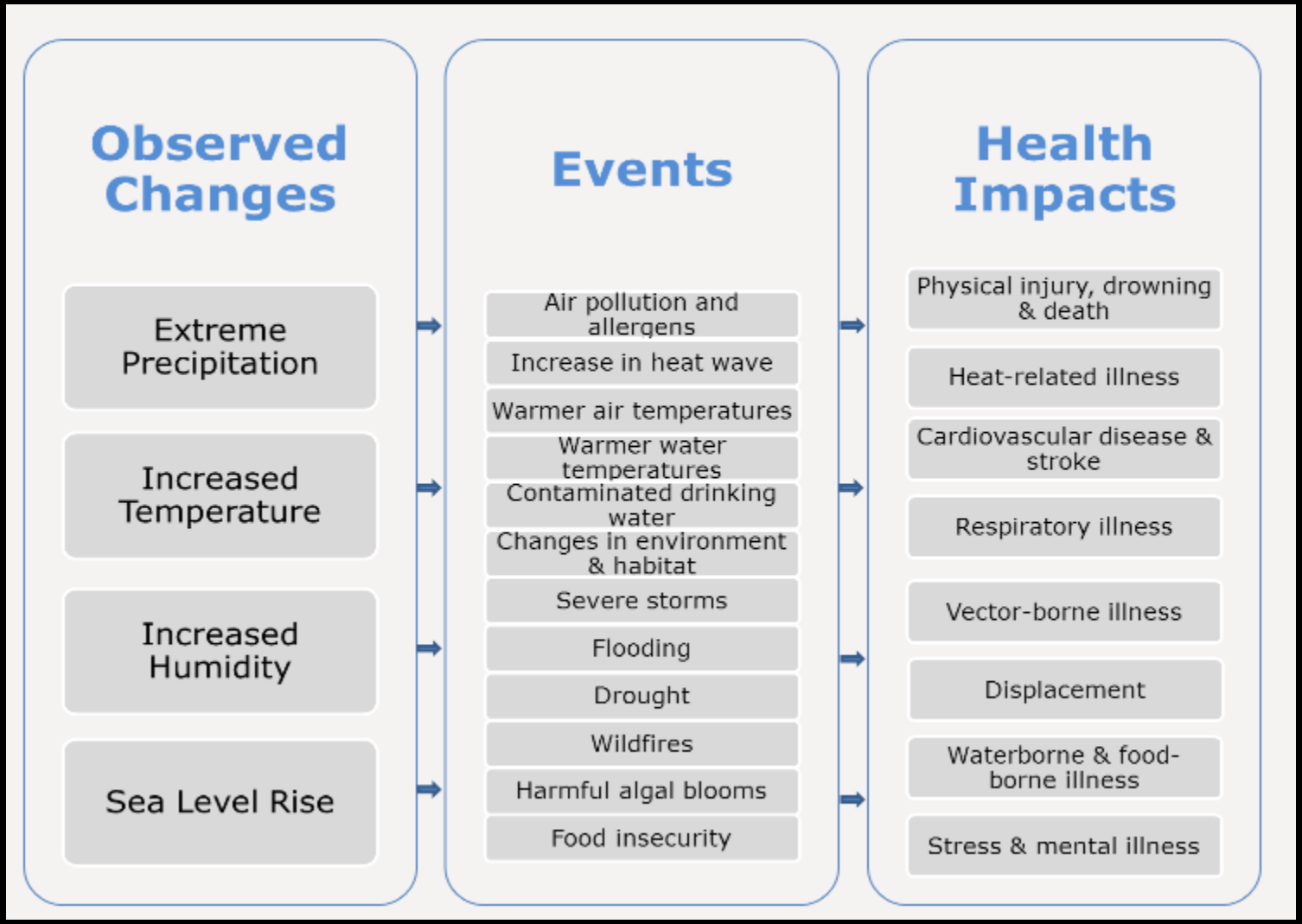


Photo by dbking (Wikimedia Commons)

Public Health Impacts



Maryland Department of Health and Mental Hygiene

The Most Immediate Climate-Related Threats to Public Health in this Region

- Air quality
- Extreme heat
- Floods, droughts, and extreme weather events
- Vector borne diseases
- Food borne illness
- Sea level rise
- Contaminated drinking water
- Malnourishment & food insecurity

The Most At-Risk Populations

- Young children
- Elderly 65 years old and older
- Elderly people that live alone
- Communities already stressed by environmental justice and health factors
- Socially isolated persons
- Chronically ill people or people with respiratory diseases
- Persons living in low-lying land areas
- Persons that have a low socioeconomic status

Maryland Department of Health and Mental Hygiene (2014)

Natural Systems Impacts

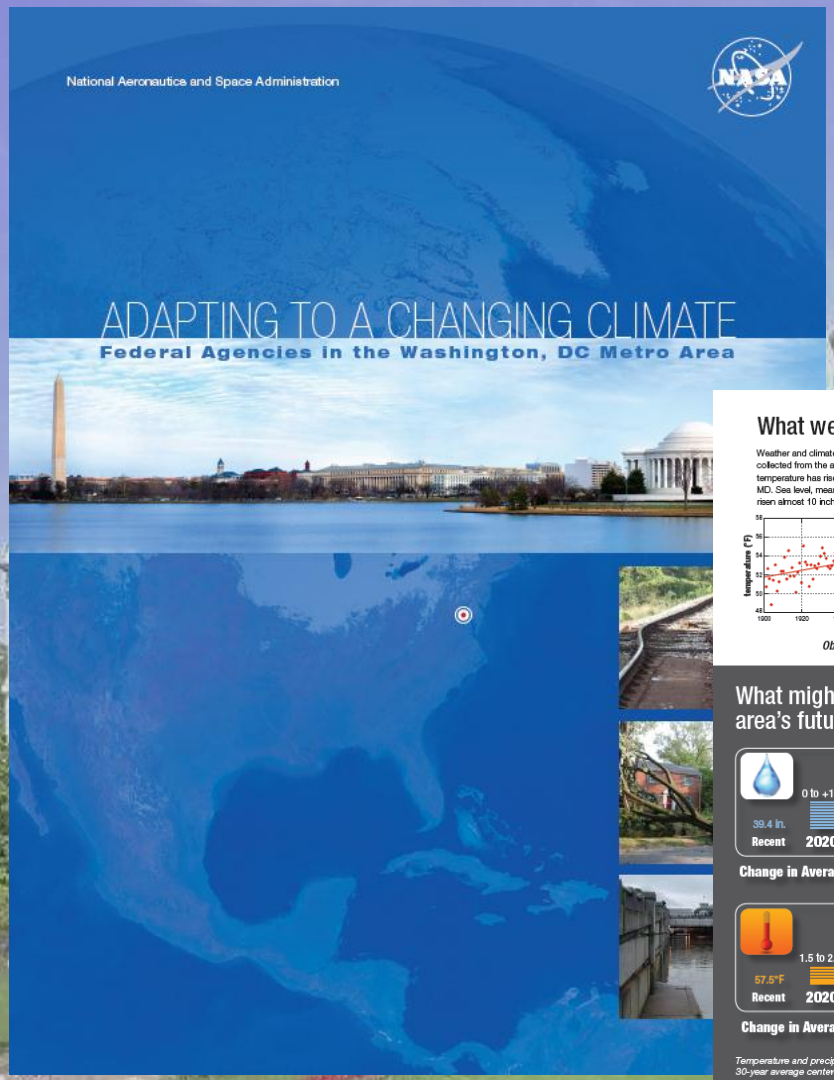
EXAMPLES:

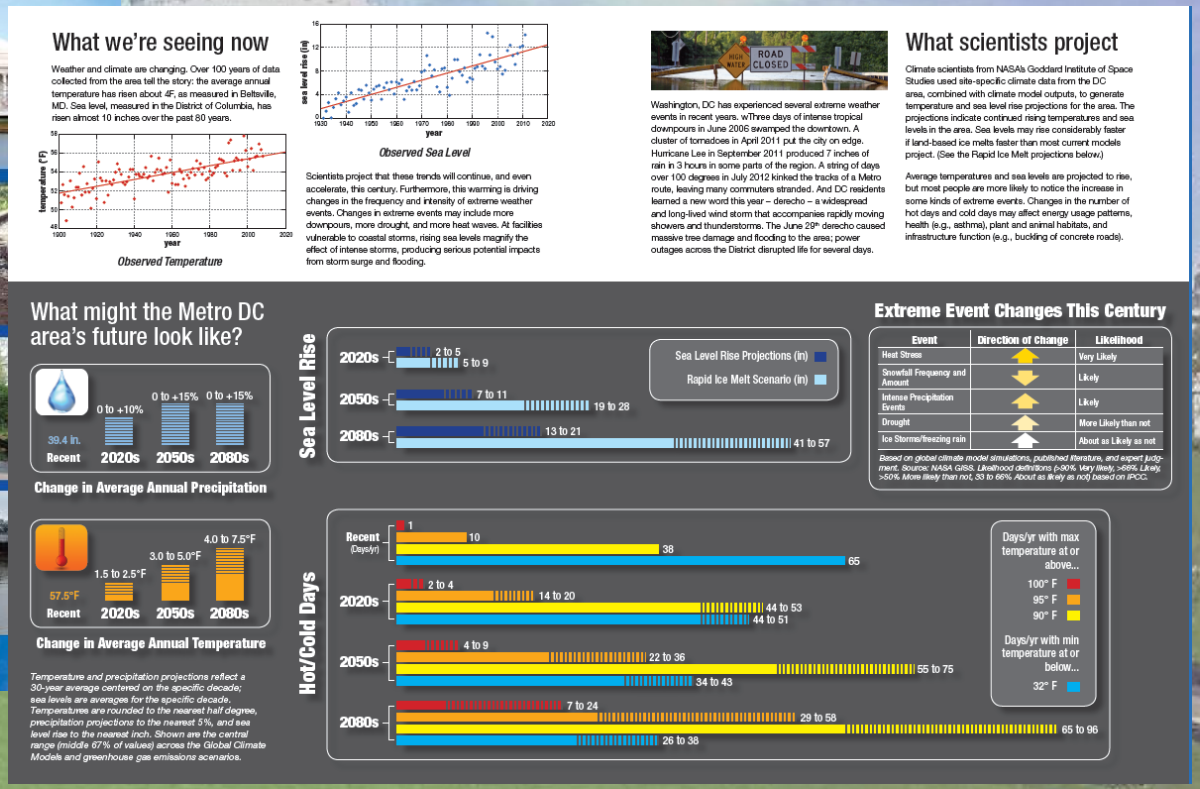
- Inundation of wetlands and low-lying areas.
- Native species may be forced out of the area.
- Dead zones in the Chesapeake Bay will likely increase.
- Establishment of invasive populations of species.
- Degraded water quality in coastal bays due to increases in winter-spring runoff.
- Increased length of the growing season early in century.
- Milk and poultry production negatively impacted by heat stress later in the century.
- Increased forest vulnerability to drought, insect pests, and forest fires.

University of Maryland Center for Environmental Science (2014)

For more information…

http://www.mwcog.org/environment/climate/resilience.asp

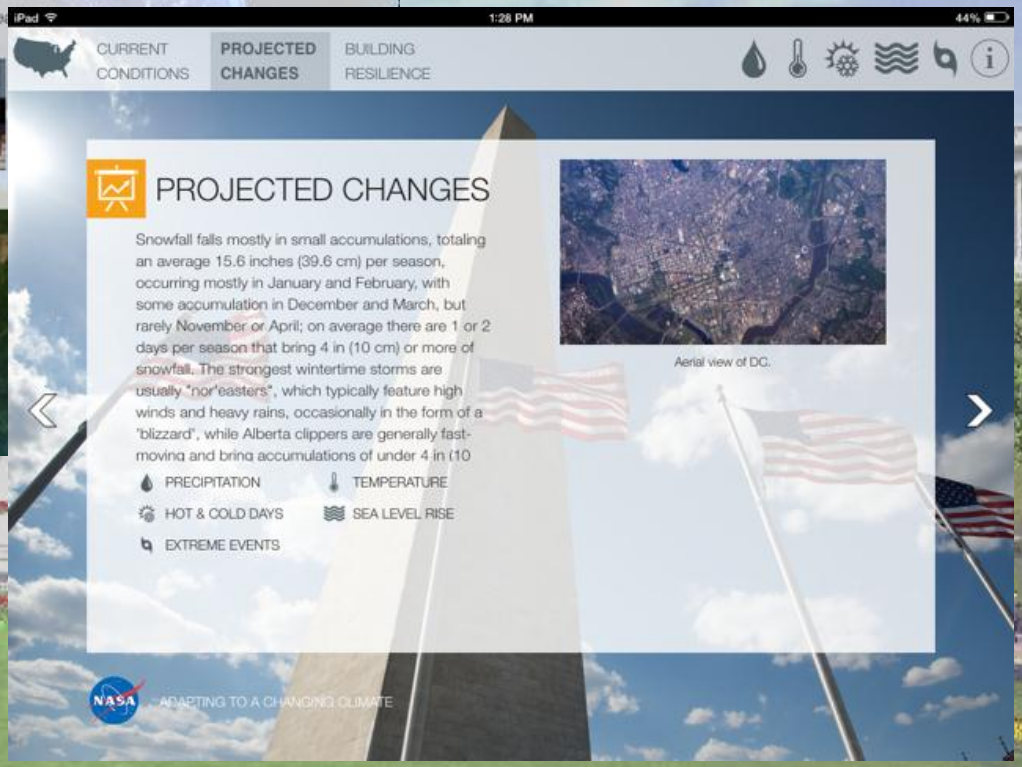




NASA

For more information…

COMING SOON, mobile app with basic location-specific info:



NASA

QUESTIONS*?

*You may also pose questions to NASA climate scientists at any time during the course of this series of webinars and workshops using the link under the Questions & Feedback section on:

http://www.mwcog.org/environment/climate/resilience.asp

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