



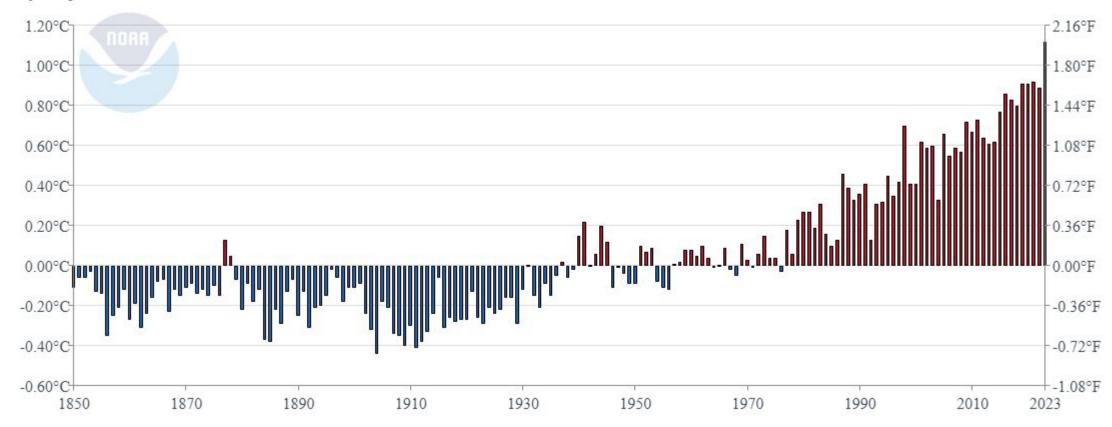




A Hot Summer: Exceeding Records For July By ~0.3c

Global Land and Ocean

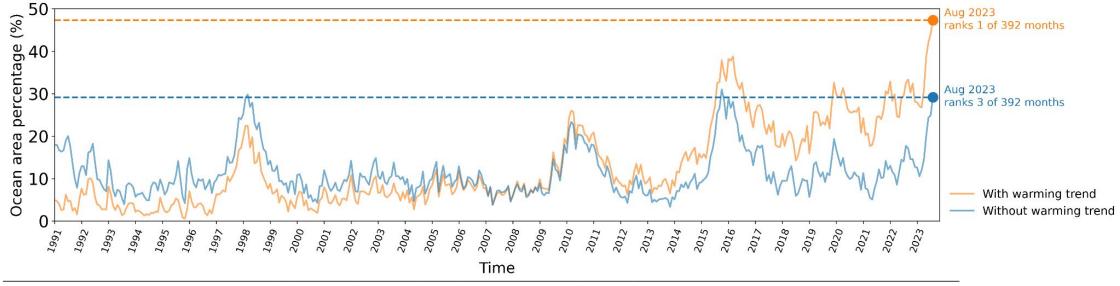
July Temperature Anomalies

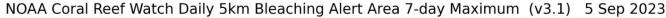


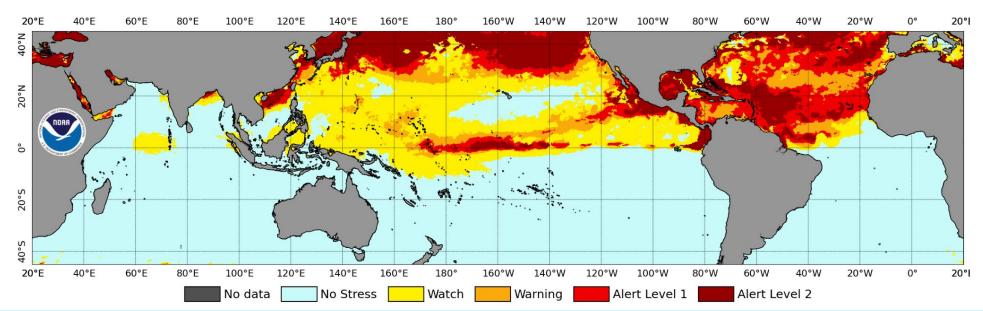




Marine Heatwaves & Impacts

















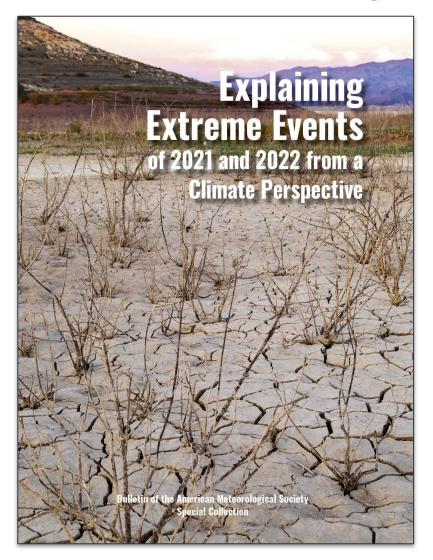








Climate Attribution Science: Magnitude and Likelihood of Events Globally Increasing



Selected Significant Climate Anomalies and Events in 2022

GLOBAL AVERAGE TEMPERATURE

The Jan-Dec 2022 average global surface temperature was the sixth highest since global records began in 1880.





SEASON

Near-average activity:

HURRICANE FIONA

cyclone on record for Canada.

In Sep, Fiona affected the Caribbean.

It made landfall in Nova Scotia as the people strongest and costliest post-tropical

year on record.

SOUTH AFRICA

South Africa during

Record-breaking rain fell

across parts of eastern

GLOBAL CYCLONE ACTIVITY

88 storms, including 40 hurricanes/

cyclones/typhoons.

2022 was Africa's 10th-warmest

14 storms, including

CONTIGUOUS U.S.

year on record.

Dry and warm conditions contributed to damaging wildfires across the West during Northern Hemisphere spring through fall.

HURRICANE AGATHA

Hurricane Agatha was the strongest May hurricane on record to hit-Mexico's Pacific coast.

EASTERN NORTH PACIFIC HURRICANE SEASON

Near-average activity: 19 storms, including 10 **HURRICANE IAN**

After knocking out Cuba's power grid, lan made landfall in southwestern Florida just shy of Category 5 strength causing record heavy rain and catastrophic storm surges across parts of Florida.

SOUTH AMERICA

South America had its 12th-warmest year on record.

SOUTHERN SOUTH ÁMERICA

An intense heat wave affected parts of the region in Jan, resulting in multiple temperature records.

ANTARCTIC SEA ICE EXTENT

The Antarctic had its fourth-smallest annual maximum and its smallest minimum annual extents on record.

JAPAN

A heat wave scorched Japan in Jun, marking the worst documented streak of hot weather in that month since

> WESTERN NORTH PACIFIC TYPHOON **SEASON**

Below-average activity: 22 storms, including 12

VESTERN PACIFIC TYPHOONS Typhoon Hinnamnor, which hit South

Korea, and Typhoon Noru, which moved across the northern Philippines and into Vietnam and Laos, brought heavy rainfall destructive flooding and strong gusts to the region in Sep.

Oceania had a top-20



Heavy rain caused severe

flooding in parts of southern

China in Jun. Some locations

Near-average activity: 9 storms, including 5 cyclones.

during Jul and Aug, causing were hit by the heaviest rain

NORTH INDIAN OCEAN

7 storms, including 1 cyclone

CYCLONE SEASON

Below-average activity:

MADAGASCAR

Record-breaking rain fell

devastating floods that

affected over 30 million

Major cyclones Batsirai and Emnati, as well as Tropical Storm Dumako made landfall in Madagascar in Feb - the first time since Jan 1988 that three storms made landfall in Madagascar in a single

Feb through early Mar.

AUSTRALIA Extreme rain and flooding affected parts of eastern Australia from late

> SOUTHWEST PACIFIC CYCLONE SEASON

Below-average activity: 6 storms, including 2 cyclones.

Please note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/

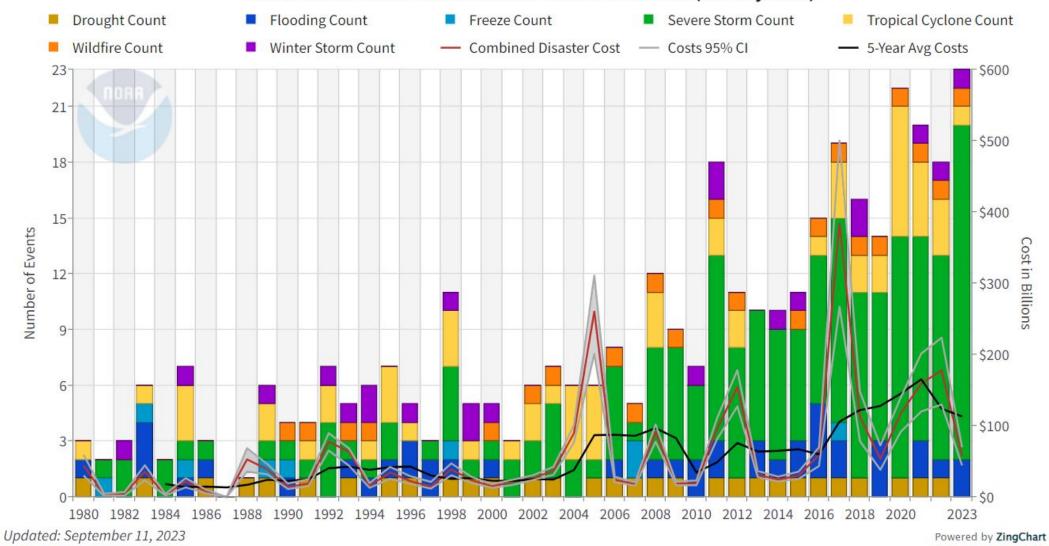




遊

U.S. Extreme Weather and Climate Events: Cost & Number

United States Billion-Dollar Disaster Events 1980-2023 (CPI-Adjusted)

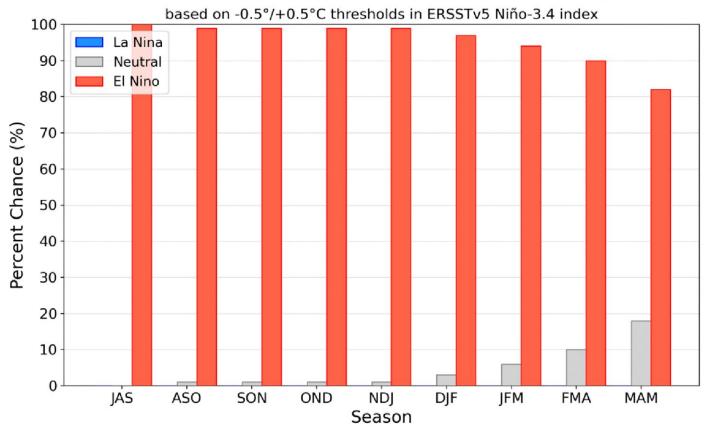




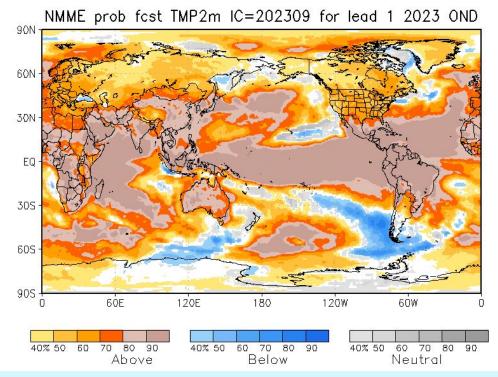


Seasonal Outlook: El Niño Developing

Official NOAA CPC ENSO Probabilities (issued Aug. 2023)



- 90% chance of at least a moderate El Niño (>1.0 C anomaly)
- 66% chance of a strong El Niño (>1.5
- C anomaly)
- 30% chance of at least strength of 97-98 extreme El Niño







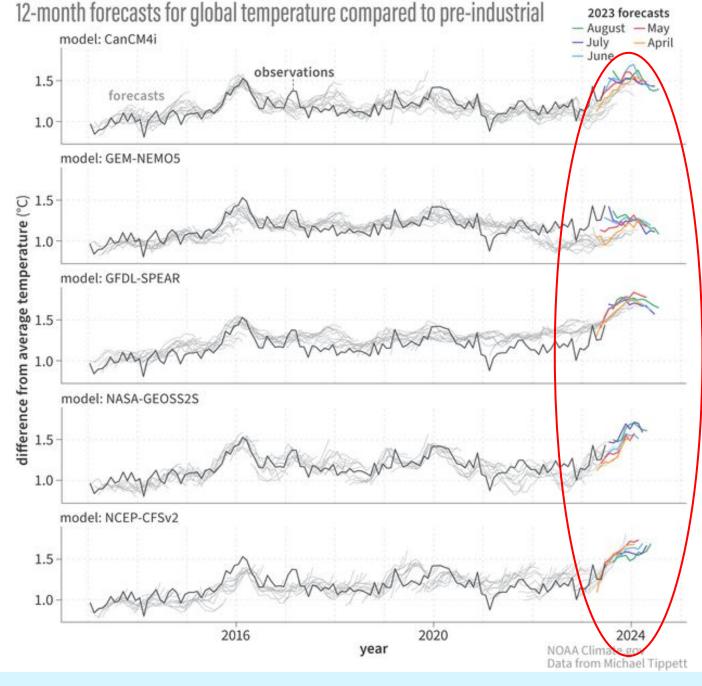








Impact of El Nino: Global Temperature through 2024







遊



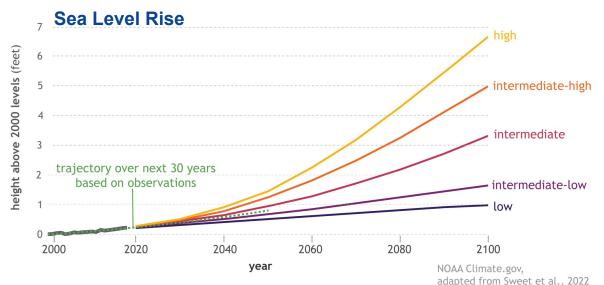


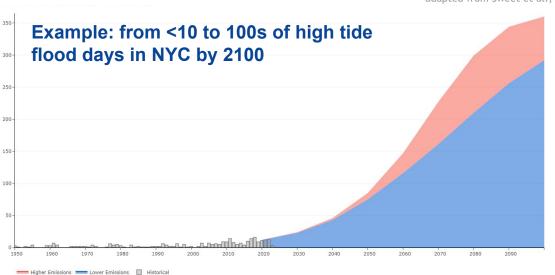






Projections





Accessing best of federal government projection information: Climate Mapping for Resilience and Adaptation www.resilience.climate.gov





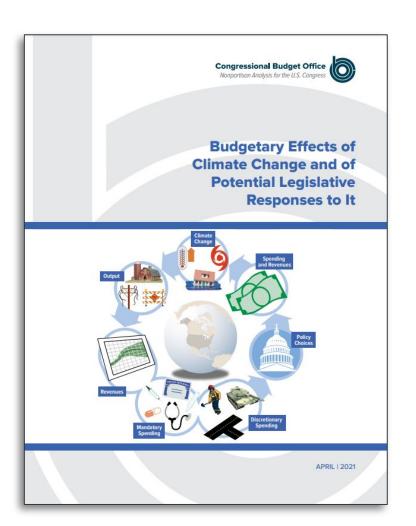


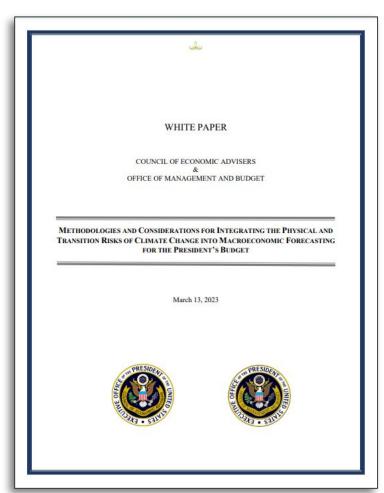


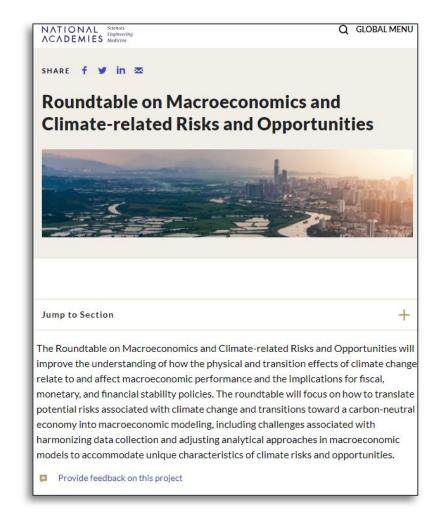
郊

Integrating the Physical and Transition Risks of Climate Change Into Macroeconomic Models

Congressional Budget Office, Office of Management and Budget, National Academies













Climate Change in the Economic Report of the President March 2023













ECONOMIC
REPORT
OF THE

PRESIDENT

TRANSMITTED TO CONGRESS | MARCH 2023

TOGETHER WITH THE ANNUAL REPORT
OF THE COUNCIL OF ECONOMIC ADVISERS



Chapter 9

Opportunities for Better Managing Weather Risk in the Changing Climate

Global temperatures as high as those in recent years are unprecedented in the time span of human civilization and have likely not been seen in at least the last 125,000 years of Earth's history (Gulev et al. 2021). Many nations, including the United States, are working ambitiously to limit the impact of climate change by reining in greenhouse gas emissions and harnessing the opportunities of the clean energy transition. However, given the time it takes to transform the global energy system and for the climate to respond, the climate will continue changing at least until global greenhouse gas emissions fall to zero. In the coming decades, more intense and frequent weather extremes and the uncertainty of the changing climate will present a range of economic and financial risks to the U.S. economy and will confront the Federal Government with related fiscal challenges. Physical climate risks can be managed by anticipating and planning for coming changes in climate, a process known as adaptation. Adaptation presents opportunities to lower climate change costs over the long-term while also building resilience to natural hazards and weather risks today.

The design of climate adaptation policies must recognize that actors across the United States, including individuals and businesses and all levels of government, already face incentives to adapt to climate change. But they also face informational, financial, and legal constraints that may limit their ability to adapt. Targeting adaptation policies to alleviate these constraints and address related market failures should be most effective in supporting private action.

273

















NOAA and NSF to create research center in response to insurance industry climate needs

Focus areas: Across NOAA Topics: natural disasters, climate change









May 16, 2023









Partnership Examples



Focus areas: Climate, Research Topics: infrastructure, Climate-Ready Nation

UPDATED: February 15, 2023. Updated to include the link to

February 2, 2023





Focus areas: Research Topics: climate

November 30, 2022



← Press Releases

EPRI, NOAA Sign MOU on Energy Sector Physical Climate Risk Assessment

Research Portfolio Thought Leadership Events Training Journal About Careers

Aug 9, 2022

Los Angeles, Calif. (Aug. 9, 2022) -- EPRI and NOAA are pleased to announce they have entered into a three-year memorandum of understanding (MOU) focused on developing a scientifically based approach to physical climate risk assessment in the energy sector.

As extreme weather increases in frequency and intensity, along with society's dependence on electricity, it's imperative there is a consistent approach to the assessment of physical climate risks, such as understanding the increasing probability and intensity of hazards like extreme precipitation, heatwaves, and hurricanes, driven by potential changes in climate. Earlier this year, EPRI launched Climate READi™: Power (REsilience and ADaptation initiative), convening global thought leaders and industry stakeholders to address power system climate resilience and adaptation. NOAA is one of the first governmental stakeholders to join the collaborative effort.

Under the MOU, the organizations agreed to share publicly available knowledge, data, industry specific research, and ideas related to physical climate risk assessment, while leveraging respective resources, expertise, and facilities, among other provisions.









National Strategy to Develop Statistics for Environmental Economic Decisions

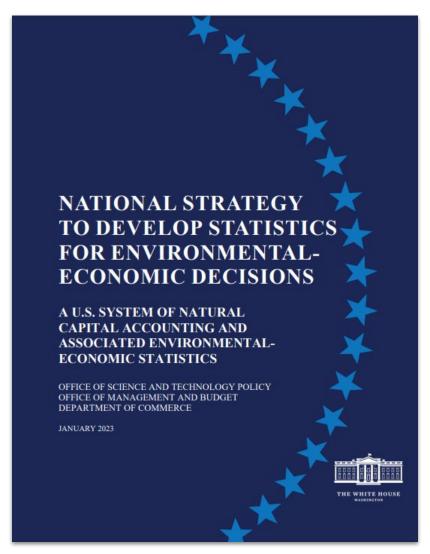
























UNITED

STATES

San Antonio







Climate Outlooks

Kansas City

Minneapolis

Milwaukee

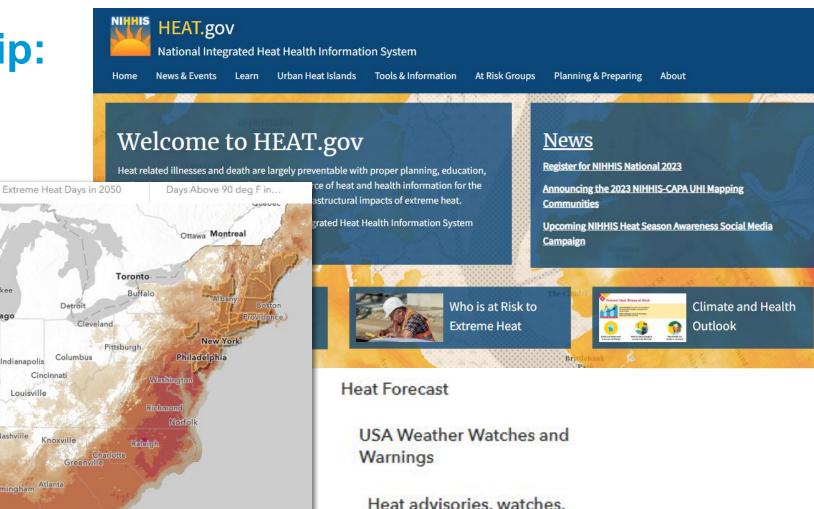
Chicago

Indianapolis

Louisville

Cincinnati

Jacksonv



Heat advisories, watches, warnings



Excessive Heat Warning



Excessive Heat Watch



Heat Advisory



Monterrey

Island



*>



NCEI: https://www.ncei.noaa.gov/

Sea Level Rise Viewer: https://coast.noaa.gov/slr/

NOAA Climate.gov: https://www.climate.gov/

U.S. Climate Resilience Toolkit: https://toolkit.climate.gov/

Climate Mapping for Resilience and Adaptation: https://resilience.climate.gov/

National Integrated Heat Health Information System: https://www.heat.gov/

National Integrated Drought Information System: https://www.drought.gov/

Climate Adaptation Partnerships Program:

https://cpo.noaa.gov/Divisions-Programs/Climate-and-Societal-Interactions/CAP-RISA

Billion Dollar Weather and Climate Disasters: https://www.ncei.noaa.gov/access/billions/

Global Climate Report:

https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202301

An Evidence-based Collaborative Framework for Improving Predictive Capabilities

2022 Sea Level Rise Technical Report



