

# **Training Seminar: Climate Change Data in Environmental Auditing**

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## **Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks**

Presentation to the 16<sup>th</sup> EUROSAI WGEA Annual Meeting

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## About GAO

- GAO is an independent, nonpartisan agency that works for the U.S. Congress.
- GAO investigates how the federal government spends taxpayer dollars.
- GAO's work is primarily done at the request of congressional committees or is mandated by public laws or committee reports.



## Climate Change is a High-Risk Issue

- At the start of each new Congress, GAO calls attention to areas that are high risk.
- GAO designated climate change as a high-risk issue in 2013 (GAO-17-317).
- Climate is a complex, crosscutting issue that poses risks to many environmental and economic systems and presents a significant financial risk to the federal government.



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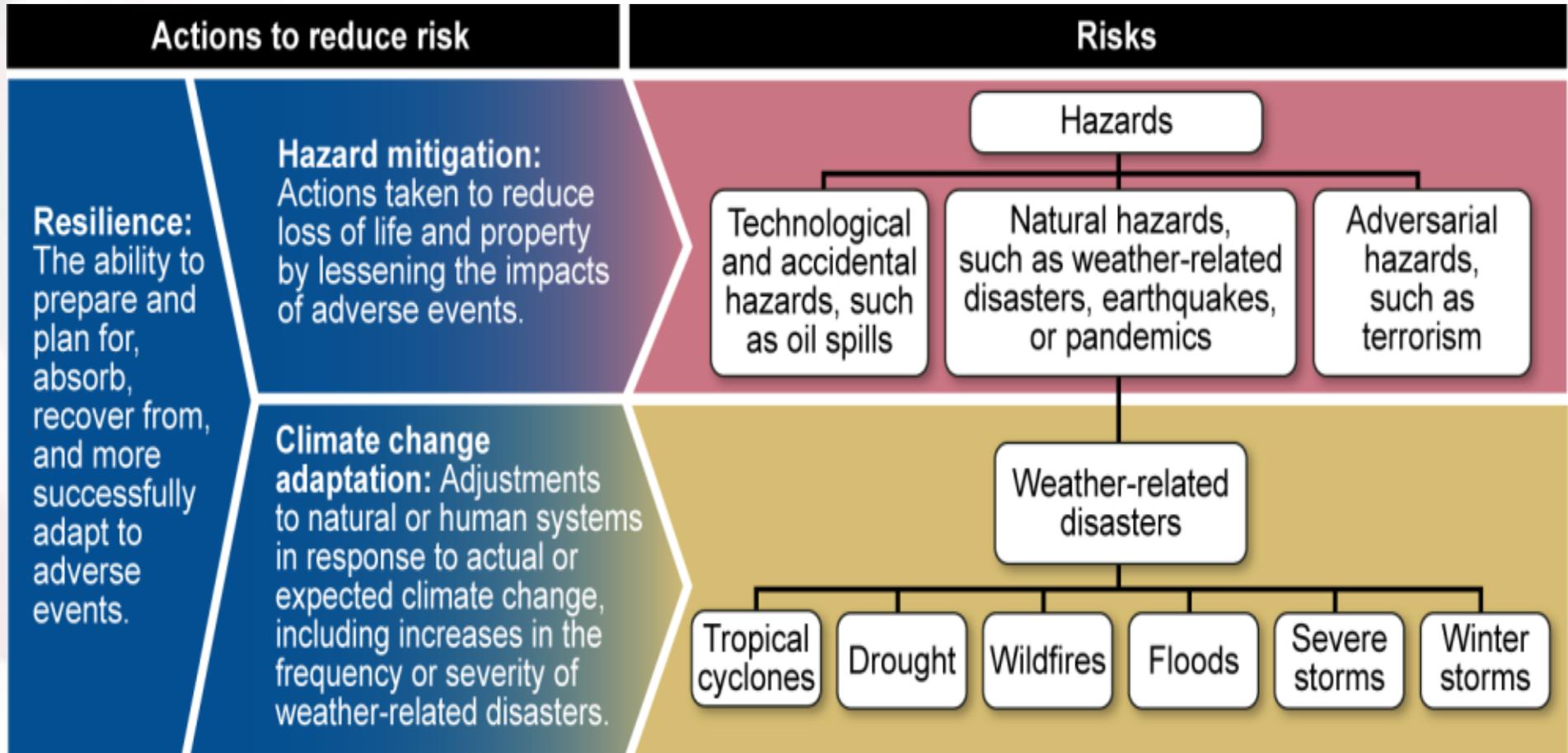
## GAO's Climate Change Work Addresses Federal Fiscal Exposure

- GAO has identified federal fiscal exposure to climate risks in 5 areas:
  - infrastructure,
  - insurance,
  - technical assistance,
  - disaster assistance, and
  - strategic planning.
- GAO has ongoing work and completed work in each of these categories.
- The quality and usefulness of data on climate change is an underlying challenge in all of these areas.

# Enhancing Climate Resilience can Reduce the Federal Government's Fiscal Exposure

- Enhancing climate resilience can help reduce the potential impacts of climate change.
- Enhancing climate resilience:
  - Is synonymous with adaptation—that is, adjustments to natural or human systems in response to actual or expected climate change.
  - Can cost additional money up front, but could also reduce potential future damage from climate-related events.

# Relationship among Risks, Resilience, Hazard Mitigation, and Climate Change Adaptation



Source: GAO analysis of Presidential Policy Directive 8, previous GAO work, and National Oceanic and Atmospheric Administration data. | GAO-16-454

## GAO's Climate-related Audits

- Audits have focused primarily on adaptation and building resilience and on actions the federal government needs to take to adapt to the effects of climate change
- Discuss 3 Recent Audits
  - Climate Information for Design Standards and Building Codes
  - Potential Economic Effects of Climate Change to Help Reduce Fiscal Exposure
  - National Climate Information Systems

## Climate Information for Design Standards and Building Codes

- *Improved Federal Coordination Could Facilitate Use of Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications (GAO-17-3)*
- *Design standards and building codes generally use historical climate observations.*

*“Continuing to build with current standards and codes could cost the federal government billions of dollars in repairs, flood insurance, and disaster relief.”*

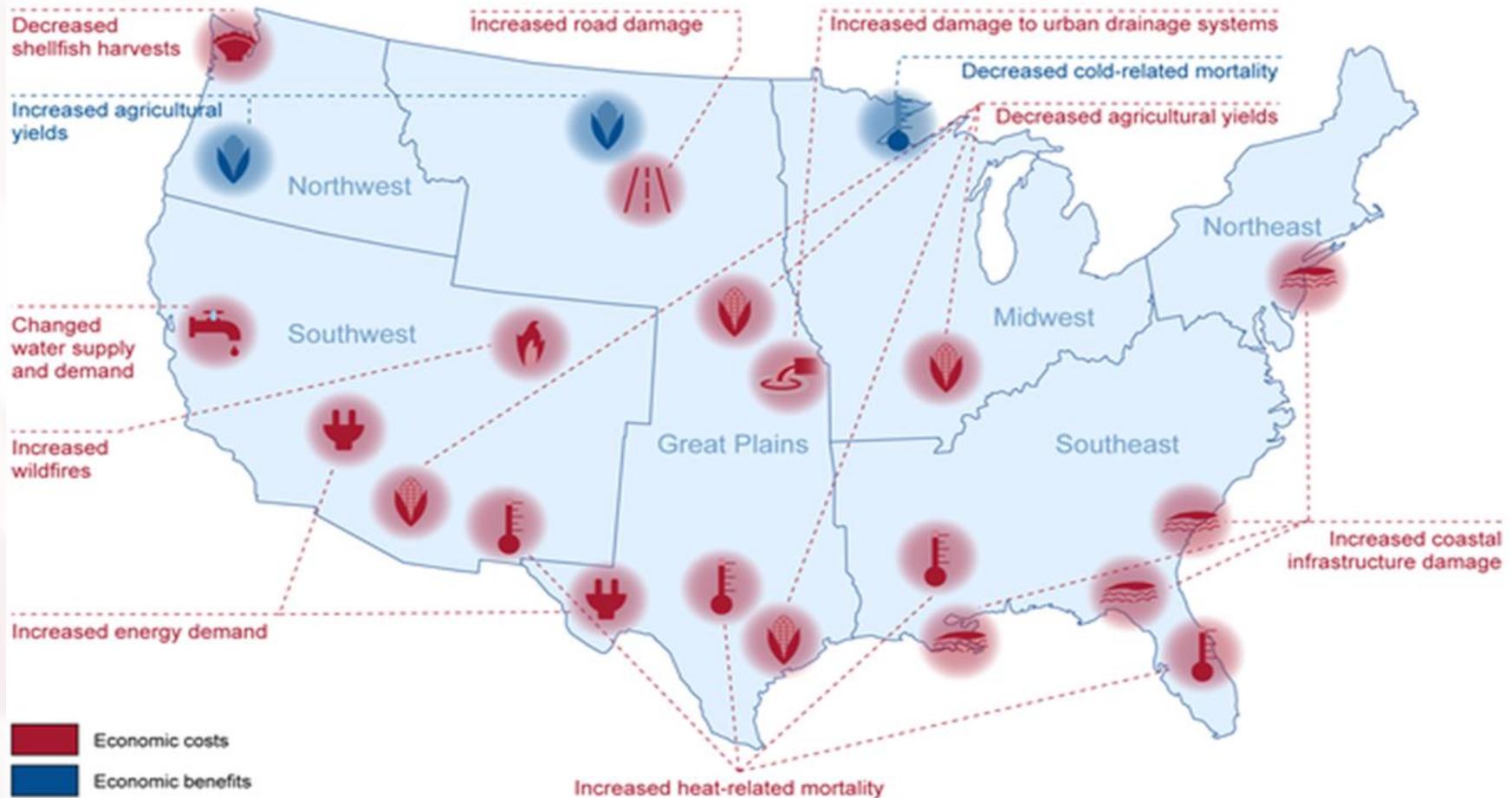


Source: GAO. | [www.gao.gov](http://www.gao.gov)

## Design Standards and Building Codes—Data & Information Used

- Reviewed reports and documents from the 17 standards-developing organizations and experts.
- Standards-developing organizations:
  - develop design standards, building codes, and certifications
  - Covered four infrastructure sectors—energy, government facilities, transportation systems, and water and wastewater systems.
- We identified through interviews with academics, experts and professional societies the 17 standards-developing organizations
- Challenges: Standards setting organizations face institutional and technical challenges to using the best available forward-looking climate information.

# Potential Economic Effects of Climate Change to Help Reduce Fiscal Exposure (GAO-17-720)



Sources: GAO analysis of Environmental Protection Agency, *Climate Change Impacts in the United States: Benefits of Global Action* (Washington, D.C.: 2015), and Solomon Hsiang et al., "Estimating Economic Damage from Climate Change in the United States," *Science*, vol. 356 (2017); Map Resources (map). | GAO-17-720

# Potential Economic Effects of Climate Change—Data & Information Used

- We conducted a literature review to identify the methods used to estimate the economic effects of climate change in the US and what estimates had been produced.
- We interviewed 26 experts, including agency officials, researchers, and consultants, identified through literature searches and snowball sampling.
- Of the 30 studies GAO identified, only 2 included estimates of the potential economic effects of climate change in the US on a national-scale and across different sectors and regions.
- Challenges: Methods produce imprecise results because of data and modeling limitations—it is difficult to explain links between climate models and economic models.

## National Climate Information System Could Help Decision Makers

- *Climate Information: A National System Could Help Federal, State, Local, and Private Sector Decision Makers Use Climate Information (GAO-16-37)*

*“The U.S. federal government’s climate data are fragmented across individual agencies that use the information in different ways to meet their missions.”*

- We selected the national climate systems of Germany, the Netherlands, and the United Kingdom for our review.



# National Climate Information Systems—Data & Information

- Identified and reviewed over 60 relevant reports and studies from 2000 to 2014 including peer reviewed journals, trade and industry journals, government reports, and publications from research organizations.
- Interviewed nonprobability sample of over 40 U.S. stakeholders, including current and former federal officials, local decision makers, researchers, and consultants.
- Visited nonprobability sample of three countries with systems to coordinate the development, archiving, and use of climate information by decision makers—Germany, the Netherlands, and the United Kingdom.
- Challenges: Understanding the governing structures of the information systems in these countries and how we can apply the lessons to the US governing structures.

## **Climate Change Information for Federal, State, Local, and Private-Sector Decision Makers**

- The Executive Office of the President (EOP) has a role in helping federal, state, local, and private sector decision makers access and use the best available climate information.
- GAO recommends designating a federal entity to help facilitate:
  - authoritative climate observations and projections,
  - a national climate information system with defined roles,
  - provision of the best available forward-looking climate information to U.S. standards-developing organizations.

# Ongoing Work on Climate Change

- International Migration, National Security, and Development Assistance (December 2018)
- Resilience of Domestic Water Systems (Late 2018)
- Resilience of Coast Guard Infrastructure (December 2018)
- Benefits of Climate Resilience and Funding for Projects of National Significance (March 2019)
- Climate Impacts, Domestic Migration, and Managed Retreat (TBD)
- Hazardous Waste Sites, Sea Level Rise, and Extreme Events (TBD, *see next slide*)
- Social Cost of Carbon in the United States and Abroad (TBD)
- Impacts of Climate Change on the Nation's Highways (Not Yet Staffed)
- Accounting for Potentially Damaging Weather in DOD Project Design (Not Yet Staffed)

# Data to Identify Hazardous Waste Sites that may be Impacted by Climate Change

- The US EPA oversees the cleanup of highly contaminated hazardous waste sites.
- We plan to use nationally-available data sets on sea level rise, flooding, storm surge, and wildfires to identify sites that are located in areas that may be impacted by effects of climate change.

In 2017, a site outside of Houston, Texas was flooded by Hurricane Harvey, resulting in a release of dioxins to the San Jacinto River.



## Questions?





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