

# The Washington Post

## U.S. climate report says global warming impact already severe

By Darryl Fears

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The government's newest national assessment of climate change, released early Tuesday, declares what a wide majority of scientists say is clear: Americans are already feeling the effects of global warming.

Heavy Northeast downpours unleashed by super storms such as Sandy, flooding from sea-level rise from Norfolk to Miami along the Atlantic Ocean, record-setting monster wildfires in several Western states, a crop-destroying heat wave in the Midwest, and drought that has parched southern California, have all taken place in recent years.

"The report affirms a number of things we have known," said Katharine Hayhoe, a Texas Tech University professor and lead co-author of the changing-climate chapter of the assessment.

"But there are new aspects," Hayhoe said. "For a long time we have perceived climate change as an issue that's distant, affecting just polar bears or something that matters to our kids. This shows it's not just in the future; it matters today. Many people are feeling the effects."

The decade starting in 2000 was the hottest on record, and 2012, the year Sandy followed an epic summer drought, was the hottest ever recorded in the nation's history, the report says. U.S. temperature is 1.3 degrees to 1.9 degrees Fahrenheit warmer now than it was in 1895, and most of that increase — 80 percent, the assessment says — occurred over the last 44 years.

David Wolfe, a professor at Cornell University who was a lead co-author of the report's chapter on change in the Northeast, said that might sound frightening, but he and other authors of the study are optimistic that climate impacts can be mitigated.

Business leaders are looking more toward investments in renewable energy, he said. This third assessment, unlike the others, offers a Web site with interactive tools showing Americans how to reduce climate impacts.

"It will be a living document, a resource for people," he said. "It's a place to start."

Wolfe's optimism wasn't universally shared, even among some co-authors who described the assessment as too conservative — a consensus document meant to reflect the diverse views of the more than 300 scientists who crafted it.

Other contrarians include libertarians at the Cato Institute, founded by Charles and David Koch, brothers whose multibillion-dollar fortune is partly derived from fossil fuels, and are well-known to deny the impacts of climate change.

Cato researchers Paul C. Knappenberger and Patrick J. Michaels said the assessment was “biased toward pessimism,” the opposite of how Wolfe described it. As a resource, it is meant to justify “federal regulation aimed towards mitigating greenhouse gas emissions.”

To mark the release of the report, President Obama is expected to speak with a number of national television meteorologists from across the country about climate change early Tuesday afternoon.

The report's early reception reflects the deep partisan divide over climate that fractures along party lines and even has finer breaks within each party, between liberals and progressives and mainline conservatives and tea party factions.

The federal climate assessment brought together hundreds of climate experts in academia and government to guide U.S. policy based on the best available climate science. They were billed by the U.S. Global Change Research Program as “the largest and most diverse team to produce a U.S. climate assessment.”

They worked for several years, holding 70 workshops nationwide and revising the final drafts to reflect thousands of public comments. They were guided by a 60-member panel called the National Climate Assessment and Development Advisory Committee.

Echoing the findings of a global report by climate scientists at the International Panel on Climate Change, U.S. scientists said the climate is changing in the United States almost without a doubt and that the warming of the past 50 years is primarily due to emissions of heat-trapping gases released by humans.

Burning coal for electricity, using oil and gasoline in vehicles, clear-cutting forests and engaging in certain agricultural practices — all for the convenience of humans — contribute to the problem, the assessment said.

By the end of the century, temperatures could be up to 5 degrees higher if the nation acts aggressively to reduce greenhouse gas emissions from industry, or up to 10 degrees if emissions are high.

The higher the temperature, the more dire the impact. Extreme weather in the United States has “increased in recent decades,” the report said.

The assessment carves the nation into sections and examines the impacts: More sea-level rise, flooding, storm surge, precipitation and heat waves in the Northeast; frequent water shortages and hurricanes in the Southeast and Caribbean; more drought and wildfires in the Southwest.

Rapidly receding ice and shrinking glaciers are occurring in Alaska, which warmed twice as fast as the rest of the country in the past 60 years. And warmer oceans, along with increased acidification, particularly in the Pacific, have put marine life in peril.

Sea-level rise is a major concern to the District, Maryland and Virginia. A report last year by the Maryland Commission on Climate Change found that coastal sea-level rise on the state shoreline will range from slightly less than a foot to more than two feet by mid-century, and from two to six feet by the end of the century, depending on whether carbon emissions increase or decrease.

Climate change is also leading to heat stress events, forcing people with respiratory illnesses to turn to devices such as inhalers or to hospitals, the federal assessment said. It is leading to more severe allergies and waterborne illnesses as pathogens increase. Minority communities are especially vulnerable.

Extreme heat causes more deaths than other weather events, and that is expected to continue. Such deaths have decreased in recent years, but the assessment attributed that to better weather forecasting.

Cato's researchers took issue with that. Knappenberger and Michaels pointed to "peer-reviewed" research in the journal Nature Climate Change showing extreme heat impacts "are often overplayed while the impacts of adaptation to heat are underplayed."

The risk of dying from extreme heat has declined for decades and by now "this should be rather unsurprising as it has been demonstrated over and over again."

But increased heat doesn't just affect humans. In warmer and more acidic oceans, particularly the Pacific, the effects of climate change are deadly, said Drew Harvell, a Cornell University professor of ecology and a co-author of the marine resources chapter of the assessment.

Marine scientists in the Pacific have traced the mass die-off of the sunflower star, a type of sea star, to warmer temperatures. In a laboratory, 10 sunflower stars were placed in water with normal temperature and another 10 in water only 1 degree warmer.

Within two days, half the sunflower stars in the warmer water were dead. "It's going to get worse with warming," Harvell said.

Thirty percent of carbon released into the atmosphere is sucked up by the ocean, leading to acidification that's killing coral and shell life. Coral protects young fish from predators, and tiny shellfish, at the bottom of the food chain, help feed entire ecosystems.

“A third of all coral is at the risk of extinction,” Harvell said. After two decades of studying marine life, she holds a more negative view of the future than both Wolfe and the Cato researchers.

“It’s important to understand that this is a very, very, very conservative document, a consensus document,” Harvell said of the assessment. The truth is more dire, she said.

“The Pacific Ocean is the place with the most extreme problem with acidification and salmon, mussels, things heavily affected,” she said. “I’m not sure there are many mitigations to these impacts. There’s hope, but there’s got to be some pretty radical changes to practices and policies.”

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