

# Climate change hitting home, White House report led by UA says

By Tony Davis

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The Southwest is heating faster than the rest of the country. Sea levels are rising. Oceans are acidifying. The North Atlantic's hurricanes are intensifying. Piñon and lodgepole pines are dying.

These and other big changes are connected by the common thread of global climate change from human-produced greenhouse gas emissions, said a White House report released Tuesday.

The third National Climate Assessment was a massive undertaking with a top University of Arizona researcher in charge and seven other UA scientists contributing. It was produced by scientists, engineers, government officials, utility leaders and other experts and reviewed by the National Academy of Sciences.

"This is the most comprehensive evaluation of impacts of climate change ever conducted," said **Kathy Jacobs**, a UA environmental science professor who directed the report's production from the White House's Eisenhower Executive Office Building. "The conclusions are it's happening now, and it's affecting all Americans."

While environmental groups greeted the report positively, conservative think tanks, Republican elected officials and many industry officials blasted it as alarmist.

Researchers with the libertarian Cato Institute called the assessment "biased toward pessimism," aimed at justifying regulation of industry to cut CO2 emissions. **Charlie Drevna**, president of the American Fuel and Petrochemical Manufacturers, said, "This is more a political document than a scientific document."

Four UA researchers' takes:

**SOUTHWEST:** Over the past 50 years, less late-winter precipitation has fallen as snow. Snow melted earlier. Streamflow has dropped 5 to 37 percent in the Colorado and three other Southwestern river basins from 2001-10 compared to the 20th century. Future heat, drought and

extreme weather will test farmers' longstanding ability to adapt to changing conditions, the report said.

UA climate scientist **Gregg Garfin**, a lead author on the report's Southwestern chapter, found reasons for optimism and concern. First, Arizona has done better than California and some other Western states weathering the drought, because Lakes Mead and Powell at its borders with Nevada and Utah are so big — although they're dropping.

We're vulnerable because this region is at the edge of where drying and wetting areas meet, he said. With the temperature-increase "bull's-eye" at the northern edge of the Colorado River Basin, "those things combine to decrease the snowpack and reliability of having water from those big mountain ranges," he said.

Also, Arizona's heat gave it the highest rate of heat-related deaths in any state since 1995, the report said. The state needs to do a better job preparing for temperatures rising up to 7 more degrees by 2100, Garfin said. The state conducted a public health emergency planning exercise in March, and found many Arizona hospitals weren't prepared for a combined heat wave and power outage for more than a day, he said.

**FORESTS:** Tree die-offs hit this region in 1996 near Flagstaff. In 2002, piñon pines died across the Southwest. There's been massive deaths of lodgepole pines from Colorado northwest to British Columbia, said **David Breshears**, a UA natural resources professor and a lead author for the report's forests chapter. The East hasn't seen such a die-off.

The report gave no clear reasons for this, but Breshears points to the natural water stress from our arid climate, and our worsening droughts.

One still-unproven solution studied in the report is the potential to use forests as fuel to generate electricity. That could help restore forests by removing much of the dead wood left by wildfire and insect attacks.

The most important thing Breshears said he has learned since the 2009 climate assessment is that, "Increased temperatures are a really dangerous thing for forests and we need to recognize and deal with that." How well society deals with that by reducing greenhouse gas emissions will determine whether he's optimistic or pessimistic, he said.

**THE ECONOMICS:** **Diana Liverman**, UA's Institute for the Environment's co-director, was a lead author on a chapter looking at climate change research. She thinks the economics of climate change need more attention — costs and benefits of the changes, and for adapting to and mitigating them.

"The national climate assessment doesn't have a separate chapter on economics, although it's dealt with in the urban and energy chapters," she said. "Of course there will be impacts."

She says one problem is inadequate financing in general for economics and social science research. Second, federal agencies managing the economy aren't involved in producing reports

like this one. Third, businesses have important information on economic impacts, and “you have to build trust with the private sector to get that sort of information,” Liverman said.

**OUTLOOK:** While Congress has killed legislation to cut greenhouse gas emissions, UA’s Jacobs said that all over the country, cities are using more hybrid vehicles, insulating old buildings and making new and replacement infrastructure more energy efficient.

Despite the Southwest’s chronic water problems, Jacobs notes Arizona has a “very progressive” water management system, focusing on importing renewable supplies and conservation. Jacobs, a former director of the State Department of Water Resources’ Tucson office, now directs UA’s Center for Climate Adaptation and Solutions.

And, while opinion polls find that climate change generally isn’t people’s top priority, Jacobs noted that: “In the 90 minutes after this was first released (Tuesday) morning, we got 15,000 hits on our website. It’s an enormous interest. It’s untapped but it’s there.”

The Associated Press and The Washington Post contributed to this article. Contact reporter Tony Davis at [tdavis@azstarnet.com](mailto:tdavis@azstarnet.com)