

## Researchers fly into heart of California storm to gather key data

By Kurtis Alexander

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NOAA research meteorologist Allen White provides a briefing on the joint mission to study the atmospheric river this week at McClellan Airport near Sacramento.

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Kyler LeGault, 9, of San Francisco holds on to his umbrella as he fights the wind and rain while walking along West Portal Avenue toward the toy store Growing Up Arts and Crafts where he was going with his mother, Anya LeGault (not shown) to get a reward after a doctor's appointment on Friday, February 6, 2015 in the West Portal neighborhood of San Francisco, Calif. Anya LeGault said she likes to support local businesses.

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A small fleet of planes is doing the last thing you'd expect with a powerful storm moving in — flying right into its heart.

The air campaign, begun near Sacramento, is not only one of the most daunting attempts to learn about real-time weather on the West Coast, but the biggest and most expensive, involving a \$10 million joint mission between the federal government, the state and a handful of universities.

The team, led by NASA, the [National Oceanic and Atmospheric Administration](#) and the [Department of Energy](#), deployed four aircraft and a research ship to gather information about the incoming system, known as an atmospheric river. Atmospheric rivers are little-understood weather patterns responsible for much of California's rainfall — or lack thereof.

"We're trying to understand: What is the water budget in an atmospheric river?" said [Allen White](#), a research meteorologist for NOAA who is helping mastermind the CalWater 2015 project. "We want to know where they're going to make rain and how long they're going to last."

The expectation is that the mission's findings will help water managers along the West Coast make plans.

Atmospheric rivers are found across the globe. They act like rivers in that they carry a long, narrow band of moisture through the sky, generally moving water vapor and heat from the tropics toward the poles.

Unlike hurricanes on the East Coast, atmospheric rivers haven't been studied a lot, White said. The systems, however, are responsible for many of California's winter storms, including the rains that caused widespread flooding and power failures in early December.

A typical California winter sees about a half-dozen atmospheric rivers, some more powerful than others, bringing 50 percent of the seasonal rainfall, according to NOAA scientists.

"The last three years you haven't had enough atmospheric rivers, so therefore you're in a serious drought," White said.

The NOAA's P-3 aircraft, the Hurricane Hunter, was scheduled to fly missions through the weekend at about 8,000 feet into the atmospheric river, an effort to measure links between the ocean and the conditions above.

"They'll be in the clouds, with pretty strong winds," White said, "so it will be bumpy."

Three other planes, flying above and below the Hurricane Hunter, will take other readings on the giant air mass, from wind speed to temperature to how much pollution is up there. The NOAA's largest research ship, the [Ronald H. Brown](#), will be in the choppy waters beneath.

*Kurtis Alexander is a [San Francisco Chronicle](#) staff writer. E-mail: [kalexander@sfchronicle.com](mailto:kalexander@sfchronicle.com) Twitter: [@kurtisalexander](#)*

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