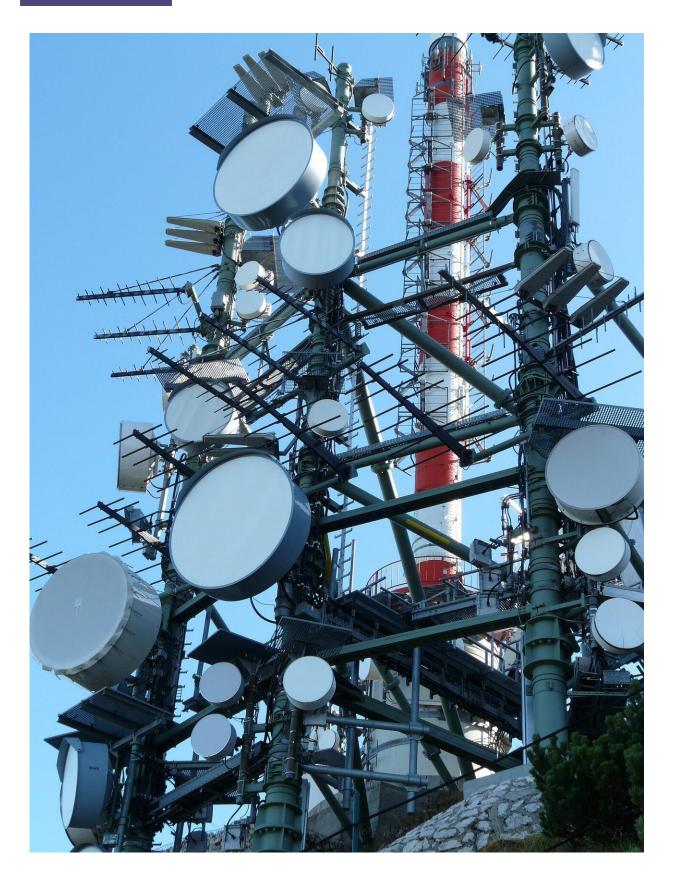# Trump 5G push could hamper forecasting of deadly storms

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As atmospheric rivers dumped record volumes of rain on California this spring, emergency responders used the federal government's satellites to warn people about where the storms were likely to hit hardest.

Many government scientists say such warnings may become a thing of the past if the Trump administration's Federal Communications Commission pushes forward with plans to auction off radio frequency bands adjacent to one that weather forecasters use.

In May, the FCC finished accepting bids on a radio frequency bandwidth that agency officials say will enable U.S. companies to compete in the 5G wireless field, which offers the tantalizing prospect of a much faster, more reliable cellphone signal. Nearly 30 cellular companies bid on nearly 3,000 licenses, bringing in more than $2 billion.

That band—24 gigahertz—sits right next to one that federal scientists use to detect water vapor emissions in the atmosphere. Officials with NASA and the National Oceanic and Atmospheric Administration worry 5G traffic in the adjacent band will interfere with their detection of the faint signal emitted by atmospheric water.

That will make it difficult for them to monitor, predict and forecast hurricanes and dangerous weather events such as California's atmospheric rivers, said Marty Ralph, a research meteorologist at Scripps Institution of Oceanography at the University of California, San Diego.

The science agencies aren't suggesting the FCC stop pursuing 5G in the 24-GHz band. Instead, they disagree with the communications agency

about how loud those signals can be.

FCC officials set a standard they believe will keep the 5G noise quiet enough for NOAA and NASA to keep "hearing" atmospheric water vapor.

But the federal science agencies say it's not enough—by a factor of 5,000.

In May, Neil Jacobs, NOAA deputy administrator, told a congressional committee that the FCC's move threatens to kill 77% of the data the agencies acquire from their passive microwave sounding instruments and degrade forecasting accuracy by 30%.

NASA's administrator, Jim Bridenstine, was even more cautionary at an agency town hall meeting in April. He told the audience of scientists and engineers that interference from 5G could bring forecasting accuracy back to levels not seen since 1978.

"In other words," he told the audience, "instead of giving a seven-day forecast, you're going to get a two- or three-day weather forecast."

Many of the satellite measurements are made over the ocean, where ground-based measurements aren't available and where "ocean-based atmospheric profiling measurements are extremely sparse," said Ralph, the Scripps scientist.

In California, those measurements are crucial. Atmospheric rivers develop in the Pacific, and accurate forecasting of the "Pineapple Express" storms help emergency crews prepare for flooding and mudslides, such as the deadly ones in Montecito last year. Satellites such as NOAA's GOES-R routinely monitor the 23.8-GHz frequency, helping forecasters make their predictions.

Such forecasts are also essential for water managers, who must balance decisions on reservoir levels, Ralph said. If a forecast shows heavy rains coming and dam managers can rely on that prediction, they can quickly drain reservoirs and free up flood-control space without fear the precious water will be lost.

The importance of "listening" to water vapor was underscored by NOAA's Jacobs. He testified that Europe's forecasting model relied on the water vapor data, allowing it to accurately predict Superstorm Sandy's track up the East Coast in 2012, several days before it made landfall. Studies have shown that if the data had been removed, models would have shown the storm going out to sea.

Both NOAA and NASA were vocal this spring about their concerns, but neither agency made experts available this month to comment for this story. In the meantime, President Trump's appointee as FCC chief has sought to cast critics as being against advances in cellular service.

"I think, unfortunately, some folks in the federal government believe, wrongly, that for whatever reason the development of 5G technology in this and other bands shouldn't happen," said FCC Chairman Ajit Pai at a Senate hearing last week.

Officials from the [telecommunications industry](#) and Pai, who previously worked as associate general counsel at Verizon Communications Inc., say the science agencies are going overboard—that the FCC has placed protections in its licensing requirements to prevent interference.

They also argue that the protections NOAA and NASA seek would hobble the promise of 5G technology.

Pai noted the proposed limit is the same one that the FCC has used for decades. If the federal sciences agencies had an issue with it, he argues,

they should have brought it up in 2016 when discussions began.

The FCC and cellular industry have also criticized the studies NOAA and NASA have prepared on the issue, which they describe as "fundamentally flawed" and "inappropriate."

"There were basic things about 5G that were wrong, all of which would basically invalidate the study," said Nick Ludlum, chief communications officer for the Cellular Telecommunications Industry Assn., the industry trade group.

That's not how the NOAA sees it. According to Jacobs, the three agencies have been looking at the issue since 2016, and despite one flawed study, new analyses have continued to support the science agencies' more stringent protections.

Both the Navy and NASA have concurred with his agency's analysis, he said, and considering that NASA "sent a man to the moon 50 years ago using calculators, I would certainly trust their input."

Critics say the administration's push for high-wave-frequency 5G has divided federal agencies and left the United States without a unified position on 5G deployment as it prepares to negotiate with South Korea, France and China at the U.N.'s World Radio Conference this fall in Egypt—the world's forum for setting international spectrum standards. Most other nations have suggested more protective standards to keep 5G from encroaching into passive weather monitoring bandwidths.

"The situation is an embarrassment," said Jessica Rosenworcel, one of five FCC commissioners, at a Senate hearing this month. She chided her agency for auctioning licenses before the situation had been resolved.

On Tuesday, Rep. Eddie Bernice Johnson, a Texas Democrat and

chairwoman of the House Committee on Science, Space and Technology, and the panel's ranking member, Republican Rep. Frank D. Lucas of Oklahoma, sent a letter to the Department of Commerce and NASA asking for clarification on the issue—noting the contradictory statements made by the different agencies.

"The committee must have the most complete information to inform us about these contradictory statements, and there is limited time available" given the upcoming U.N. meeting and the effects this issue could potentially have on our weather forecasts, wrote Johnson and Lucas.

Experts from both sides agree the matter is not likely to go away soon. More auctions are on the calendar, including several other key bandwidths the science agencies rely on for forecasting. And with the World Radio Conference looming, it'll soon become front and center.

"Radio frequency allocations is a very arcane subject to most people," said Ralph, the Scripps researcher, who also directs the Center for Western Weather and Water Extremes. "But our weather enterprise skill depends on having the proper protection for certain bands in those frequencies."

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