

Scientists predict dramatic increase in flooding, drought in California

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California may see a 54 percent increase in rainfall variability by the end of this century, according to new research from the lab of Assistant Professor Da Yang, a 2019 Packard Fellow and atmospheric scientist

with the University of California, Davis.

Writing in the journal *Nature Climate Change*, Yang and his co-authors predict the entire West Coast will experience greater month-to-month fluctuations in extremely dry and wet weather, especially in California. The lead author is Wenyu Zhou, a postdoctoral researcher in the Lawrence Berkeley National Laboratory where Yang has a dual appointment.

The study explores the Madden-Julian oscillation (MJO), an atmospheric phenomenon that influences rainfall in the tropics and can trigger everything from cyclones over the Indian Ocean to heatwaves, droughts and flooding in the United States. Yang, Zhou and their team show that as the Earth's climate warms, the dynamics controlling MJO will expand eastward and cause a huge uptick in extreme weather in California.

"I was surprised by the magnitude of the effect," said Yang, an assistant professor with the UC Davis Department of Land, Air and Water Resources. "A 54 percent increase in [rainfall variability](#) will have very significant impacts on agriculture, [flood control](#) and water management."

In 2019, Yang was among 22 early-career scientists and engineers nationwide to receive the prestigious Packard Fellowship. He is the first recipient of the award for the UC Davis College of Agricultural and Environmental Sciences.

This study was supported by the David and Lucille Packard Foundation and by the project "Toward Accurately Predicting California Hydroclimate by Cracking the Tropical Storm King," which is funded by the U.S. Department of Energy.

Yang and his team use [satellite observations](#) and computer models to study the physics of rainstorms and atmospheric circulation in a

changing climate. They are working to understand what [environmental factors](#) control the size and duration of rainstorms and how the collective effects of rainstorms, in turn, shape Earth's climate.

More information: Wenyu Zhou et al, Amplified Madden–Julian oscillation impacts in the Pacific–North America region, *Nature Climate Change* (2020). DOI: [10.1038/s41558-020-0814-0](https://doi.org/10.1038/s41558-020-0814-0)

Provided by UC Davis

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