

When it rains, snake bites soar

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Hikers and trail runners be warned: Rattlesnakes and other venomous reptiles may bite more people during rainy years than in seasons wracked by drought, [a new study shows](#).

The research, which was led by Caleb Phillips of CU Boulder and Grant Lipman of the Stanford University School of Medicine, examined 20 years of snake bite data from across California. Their findings contradict a popular theory among many wilderness health professionals that drought might increase snake bites by pushing the reptiles out into the open where they are more likely to run into people.

Instead, the group discovered that for every 10 percent increase in rainfall over the previous 18 months, cases of snake bites spiked by 3.9 percent in California's 58 counties. In other words, while rattlesnakes may not sing in the rain, they seem to bite more when the climate gets wet.

The results could have implications for efforts to prevent and treat dangerous encounters between humans and snakes—especially as climate patterns shift across the western United States.

“This study shows a possible unexpected, secondary result of climate change,” said Phillips, an adjunct assistant professor in [CU Boulder's Department of Computer Science](#). “We probably need to take climatological changes into account when we coordinate systems that may seem unrelated like planning how we distribute antivenin supplies or funding poison control centers.”

Trail sightings

The team suspects that the reason for the surge in snake bites during wet years may come down to snake food. Mice and other rodents, the prime meals for rattlesnakes, flourish in rainy years—and that might give snakes a boost.





Colorado is home to a scaly trio of venomous pit vipers. From top to bottom, the prairie rattlesnake (*Crotalus viridis*), massasauga rattlesnake (*Sistrurus catenatus*) and western rattlesnake (*Crotalus oreganus*). (Credits: [CC photo](#) by Todd Pierson [via Flickr](#); [CC photo](#) by Tim Vicekrs [via Wikimedia Commons](#); [CC photo](#) by California Department of Fish and Wildlife [via Flickr](#))

Phillips and Lipman decided to probe this hazard because of a mutual hobby: trail running. “I’m an outdoor nerd,” Phillips said. “I run a lot on South Table Mesa in Golden, and I see a number of rattlesnakes out there.”

The researchers wondered how climate change might influence the frequency of such encounters. They pored through 5,365 cases of rattlesnake bites reported to the California Poison Control System between 1997 and 2017. The team compared those cases to a range of other information, including climate data from NASA and drought records from the National Drought Mitigation Center.

What the group found was surprising: When California counties experienced drought, recorded cases of snake bites dropped off. Those incidences hit record low levels statewide in 2015 and 2016 when California was in the middle of a historic dry spell. The decrease isn’t huge, but “it’s a significant change if you’re considering the public health implications,” Phillips said.

The researchers [published their findings today](#) in the journal *Clinical Toxicology*.

Outdoor safety

The broader implications of the study are still up in the air. Research in Colorado and other parts of the United States suggests that the impact of warming temperatures on rainfall patterns will be a mixed bag, with some regions experiencing more severe storms and others seeing drier weather.

Phillips said that he’d be eager to find out if the same trends appear outside of California. Colorado is home to three closely-related species of venomous reptiles: prairie, western and massasauga rattlesnakes. Bites from these animals rarely kill humans, but tragedy can strike. Colorado triathlete Dan Hohns, for example, died from a rattlesnake bite in 2017.

Regardless, Phillips urges outdoor enthusiasts like himself to stay calm. He is a trained wilderness first responder and emergency medical technician and said that you can avoid snakes with a simple strategy: give rattlers plenty of room and exercise common sense.

“If you encounter a rattlesnake,” Phillips said, “don’t pick a fight with it, and it won’t pick a fight with you.”

For more information about avoiding and responding to snake bites, see this [tip sheet](#) from the U.S. Centers for Disease Control and Prevention.

Other co-authors of the study include Derrick Lung and Hallam Gugelman of the University of California, San Francisco School of Medicine and Katie Doering of the Stanford School of Medicine.