

# Rattlesnakes may like climate change

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Former Cal Poly undergraduate Mallory Harmel radiotracks rattlesnakes at Montaña de Oro State Park near Los Osos, California, on a foggy morning in summer 2018. Credit: Hayley Crowell

When it comes to climate change, not all organisms will lose out. A new

Cal Poly study finds that rattlesnakes are likely to benefit from a warming climate.

A combination of factors makes a [warming climate](#) beneficial to rattlesnakes that are found in almost every part of the continental United States but are especially common in the Southwest.

Rattlers are experts at thermoregulation. Researchers found that, when given a choice, the snakes prefer a body [temperature](#) of 86-89 degrees Fahrenheit, a much warmer temperature than they generally experience in nature. The average body temperature of coastal rattlesnakes in the study was 70 degrees, and for inland rattlers it was 74 degrees Fahrenheit.

"We were surprised to see how much lower the body temperatures of wild snakes were relative to their preferred [body](#) temperatures in the lab," said Hayley Crowell, a graduate student researcher and project lead. "There are a lot of ecological pressures in nature that could prevent rattlesnakes from basking, such as the risk of increased exposure to predators. A warmer climate may help these snakes heat up to temperatures that are more optimal for digestion or reproduction."

Longer periods of warmer temperatures would also give rattlesnakes a longer active season, giving them more time to hunt and feed. Because snakes are ectothermic, or cold-blooded, they cannot regulate their [body temperatures](#) like warm-blooded animals. Instead, they rely on their surroundings to provide heat, which restricts their activity in cold weather.

In addition to seasonal changes, rattlers could spend more active hours during a given day.

A possible lack of prey—rattlesnakes eat mostly rodents, but may also

eat insects and other reptiles—resulting from a warming [climate](#) may not be a big problem for the snakes either.

The research team discovered that the snakes use energy extremely efficiently. To subsist, an adult male [rattlesnake](#) needs only 500-600 calories for an entire year, which is about one ground squirrel, the equivalent of only about half a large burrito. Though in the [real world](#) a rattler needs additional calories to hunt and bear young among other activities, the calculations point to the snakes' ability to survive even if prey isn't plentiful. Humans, by comparison, need about 1,300 times as many calories to survive.

"Rattlesnakes require very little energy to exist," said Crowell, who earned a master's degree in biological sciences at Cal Poly.

Rattlesnakes are widespread throughout California, and the seven species of these vipers in the Golden State can be found from the coast to the desert. An increase in the number of snakes could affect entire ecosystems. Rattlesnakes are a keystone predator for ground squirrels in California and are prey for raptors and many other animals.

"We are so used to [climate change](#) studies that forecast [negative impacts](#) on wildlife—it was interesting to see such starkly different findings for these snakes," said Crowell, who is seeking a doctorate at the University of Michigan.

**More information:** Hayley L. Crowell et al, Thermal ecology and baseline energetic requirements of a large-bodied ectotherm suggest resilience to climate change, *Ecology and Evolution* (2021). [DOI: 10.1002/ece3.7649](#)

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