

## Pace of climate change will challenge reptiles and amphibians

**Ectotherms – animals that regulate their body temperature through the external environment – may be resilient to some climate change impacts, but may not keep pace with the rapid rate of change, leading to potentially disastrous outcomes for biodiversity.**



Credit: Flickr/Peter [CC BY-NC-SA 2.0](https://creativecommons.org/licenses/by-nc-sa/2.0/)

A study by researchers from the Universities of Sydney and Queensland points out that many animals can modify the function of their cells and organs to compensate for changes in the climate and have done so in the past. However, the current rapid rate of climate change will outpace animals' capacity for compensation (or acclimation), the study warns.

The research, just published in *Nature Climate Change (Letters)*, was led by Professor Frank Seebacher from the University of Sydney, and Professor Craig Franklin and Associate Professor Craig White from the University of Queensland.

The researchers say that predicted that changes to temperature fluctuations as well as to overall temperature would require animals to function across a broader range of conditions.

This is a particularly difficult challenge for ectotherms, animals that rely on external sources of heat to control body temperature. Ectotherms make up more than 90 per cent of all animals.

The researchers studied 40 years of published data to assess how biological functions change in response to a sudden fluctuations in environmental temperatures.

They found that the physiological rates of ectothermic animals, such as heart rate, metabolism and locomotion, had increased already over the past 20 years with increasing average temperatures.

‘It is important that animals maintain the right balance between the large number of physiological functions, despite

environmental fluctuations. An increase in temperature that leads to changed reaction rates can upset that balance and cause the decline of individuals and species,' said Prof Seebacher.

'For example, movement requires energy and oxygen to be delivered to muscles. However, if metabolism or the cardiovascular system can't cope with increased temperatures, animals can no longer move to forage, migrate or interact with each other.

'The overall trend in the last 20 years has been to increased physiological rates, and we predict that this would continue to increase with increasing temperature.

'Even if animals are able to maintain the balance of their physiological functions in a warmer climate, increased metabolism leads to increases in the food resources needed and could upset the balance in ecosystems, particularly if predator and prey populations respond very differently to the environmental temperature change.'

Source: University of Sydney

From **ECOS** online <http://www.ecosmagazine.com/?paper=EC14305>