

# Climate change threat to dolphins' survival

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Dolphin mother and calf in Shark Bay. Credit: Sonja Wild

An unprecedented marine heatwave had long-lasting negative impacts on both survival and birth rates for the iconic dolphin population in Shark Bay, Western Australia. Researchers at UZH have now documented that climate change may have more far-reaching consequences for the conservation of marine mammals than previously thought.

In early 2011, a heatwave caused the [water temperatures](#) in Shark Bay to rise to more than four degrees above the annual average. The extended period caused a substantial loss of seagrass, which drives the Shark Bay ecosystem in this coastal area, a UNESCO world heritage site.

Researchers from UZH have now investigated how this [environmental damage](#) has affected survival and reproduction of [dolphins](#). They used long-term data on hundreds of animals collected over a 10-year period from 2007 to 2017. Their analyses revealed that the dolphins' survival rate has fallen by 12 percent following the heatwave of 2011. Moreover, female dolphins were giving birth to fewer calves—a phenomenon that lasted at least until 2017.

## **Negative influence of the heatwave is unprecedented**

"The extent of the negative influence of the heatwave surprised us," says Sonja Wild, former Ph.D. candidate at the University of Leeds and first author of the study. "It is particularly unusual that the reproductive success of females appears to have not returned to normal levels, even after six years."

There are several possible explanations for this phenomenon, including neglect of calves, increased newborn mortality, delayed [sexual maturity](#) or a combination thereof, but researchers have not yet been able to investigate them in detail.



Three dolphins over seagrass. Credit: Simon J Allen, Shark Bay Dolphin Research Alliance

### **Tool-using dolphins are less affected**

Interestingly, the [heatwave](#) did not have the same effect on all dolphin groups. Dolphins that use sponges as tools—a socially learned foraging technique that helps dolphins to locate food in deep water—were not as badly affected as those that do not use this technique.

"Nevertheless, our work raises concerns that such sudden events might have quite negative long-term effects even in groups of marine mammals

that are known to adapt usually well to novel environmental conditions," says Sonja Wild.

## Dire news for entire oceanic ecosystems?

The UZH researchers show in their study for the first time that marine heatwaves not only affect organisms at lower levels of the food chain, but also might have considerable long-term consequences for the animals at the top, such as dolphins.

"Marine heatwaves are likely to occur more frequently in the future due to [climate change](#)," says study leader Michael Krützen, professor at the Department of Anthropology at UZH. "This is worrying not only for the long-term prospects of marine mammal populations, but also for the entire oceanic ecosystems."

The study is published in *Current Biology*.

**More information:** *Current Biology*, [DOI: 10.1016/j.cub.2019.02.047](https://doi.org/10.1016/j.cub.2019.02.047)

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