

Warming oceans will affect sharks' brains

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Credit: Macquarie University

Rising ocean temperatures due to climate change will not only be felt by smaller organisms like coral, but will also impact apex predators, according to new research.

The study from the Macquarie University Fish Lab found that increasing

water [temperature](#) by just 3°C altered the behaviour of hatchling sharks.

Baby sharks incubated at temperatures predicted by the end of the century had very different turn preferences compared to sharks reared in present day water temperatures.

"Shark brains are very similar to ours in that they have two hemispheres, each specialised in analysing specific information. Brain lateralisation is like having a dual processor computer: it allows the brain to process information more efficiently," said lead author Catarina Vila-Pouca, from the Department of Biological Sciences.

"Strong lateralisation is associated with enhanced intelligence and is often manifested in behaviour, for example in left- or right-handedness or preference to turn left or right when detouring a barrier," said Ms Vila-Pouca.

Associate Professor Culum Brown of the Department of Biological Sciences and the leader of The Fish Lab said many of the embryos died when exposed to high temperatures, but those that survived had stronger laterality, suggesting enhanced cognitive abilities.

"They are likely compensating for poor growth due to [high temperatures](#). It is very likely that such changes will affect the way sharks navigate, learn about their environment, and interact with each other," said Associate Professor Brown.

"This has important implications for survival because it could impact on them finding food, mates and avoiding predators."

Co-author Connor Gervais, also from the Department of Biological Sciences, said the study warns about large scale disturbances caused by [climate change](#).

"Our results provide further evidence that sharks are susceptible to the effects of future ocean warming. As top predators, [sharks](#) help to balance marine ecosystems and changes in their normal behaviour will cascade through the whole system and can disrupt marine food chains."

More information: Catarina Vila Pouca et al. Incubation under Climate Warming Affects Behavioral Lateralisation in Port Jackson Sharks, *Symmetry* (2018). [DOI: 10.3390/sym10060184](https://doi.org/10.3390/sym10060184)

Provided by Macquarie University

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