

# Age matters when it comes to adapting to the effects of climate change

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A new study of Antarctic clams reveals that age matters when it comes to adapting to the effects of climate change. The research provides new insight and understanding of the likely impact of predicted environmental change on future ocean biodiversity.

Reporting this week in the journal *Global Change Biology* scientists from British Antarctic Survey (BAS) and from Germany's University of Kiel and the Alfred Wegener Institute reveal that when it comes to environmental change the reaction of Antarctic clams (*laternula elliptica*) – a long-lived and abundant species that lives in cold, oxygen-rich Antarctic waters – is different depending on how old the animal is.

The study showed that whilst young clams (average of three years old) try to move to a better area in the sea-bed sediments when they sense warmer temperature or reduced [oxygen levels](#), the older (18 years old) more sedentary clams stay put. This has implications for future clam populations because it is the older animals that reproduce. Scientists anticipate that future oceans will be slightly warmer and contains less oxygen (a condition known as hypoxia).

Lead Author Dr [Melody Clark](#) of [British Antarctic Survey](#) said, "Antarctic clams play a vital role in the [ocean ecosystem](#). They draw down carbon into sea-bed sediments and circulate ocean nutrients. We know that they are extremely sensitive to their environment. Our study suggests that the numbers of clams that will survive a [changing climate](#) will reduce.

"The Polar Regions are the Earth's [early warning system](#) and Antarctica is a great natural laboratory to study to future global change. These small and rather uncharismatic animals can tell us a lot about age and survival in a changing world – they are one of the 'engines of the ocean'."

Co-author, Eva Phillip, from the University of Kiel, says: "The study shows that it is important to investigate different ages of a population to understand population wide changes and responses. In respect to Antarctic clams it has been indicated in previous studies that older individuals may suffer more severely in a changing environment and the new study corroborates this assumption. Only the investigation of population-wide effects makes it possible to draw conclusions for coastal ecosystems."

Like humans, clams' muscle mass decreases as they get older. This means they get more sedentary. So when changes are introduced into their habitat, the older clams tend to just sit it out until conditions revert back to normal.

Doris Abele of the Alfred Wegener Institute in Germany says: "Our study shows that the physiological flexibility of young clams diminishes as they get older. However, the species has evolved in such a way that the fittest animals, that can tolerate life in an extreme environment, survive to reproduce into old age. Climatic change, affecting primarily the older clams, may interfere with this evolutionary strategy, with unpredictable consequences for ecosystems all around Antarctica."

**More information:** The paper Hypoxia impacts large adults first: consequences in a warming world, is published by *Global Change Biology* on 18 April 2013.

Provided by British Antarctic Survey

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