

Counting underwater vital for marine conservation

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Understanding how genetic diversity occurs within species is paramount for conservation, according to University of Queensland scientists.

The new research by UQ biologists has identified regions of high and low multi-species genetic diversity in Australia's marine waters.

Lead author and Honorary Research Fellow with UQ's School of Biological Sciences, Lisa Pope said the varying genetic diversity had implications for both marine conservation and broader understanding of how species form.

"Higher genetic diversity offers a greater chance of adapting to climate change, and so regions of high diversity could be included in the decision process for designating marine reserves," she said.

"Understanding patterns of diversity within species can also help us understand species formation."

According to Dr Pope, [species diversity](#) followed a strong geographic pattern, with more species found at the equator, decreasing towards the poles, but little was known about patterns within species.

The researchers gathered existing data on the genetic diversity of populations from a broad range of marine species around Australia, generating a database that can be used by all researchers.

"It was amazing to realize how much data already existed to start taking a look at patterns of marine genetic diversity," Dr Pope said.

"Australian scientists have achieved a lot since the 1980s when genotyping really started for wild species.

"By publishing in an open access journal, and including the database, we really hope this will be a useful resource for other scientists to add to, or take in different directions."

With this information they examined the genetic diversity of more than 1000 populations from more than 100 species in marine regions around Australia.

Using a statistical analysis method, that took into account factors such as the relationships among species and the size of the sample, they determined that region and latitude explained a large amount of the variation in genetic diversity of populations at this broad geographic scale.

"We found some interesting patterns. For example, Joseph Bonaparte Gulf, straddling the Northern Territory and Western Australian borders, showed unusually high genetic diversity, but contains few reserves," Dr Pope said.

"It would be great to add this information into the [decision process](#) for prioritising the formation of new reserves.

"Our climate is changing at an unprecedented rate, with oceanic warming and acidification. We need to tackle this problem from many angles, and factoring in [genetic diversity](#) could help [species](#) adapt more readily to this change."

Dr Pope said her work was undertaken on a part-time Women's Fellowship offered by UQ. Her co-researchers are Dr Cynthia Riginos, Associate Professor Jennifer Ovenden, Jude Keyse and Dr Simon Blomberg in the Schools of Biological Sciences and Biomedical Sciences. Dr Pope is currently working for the Institute for Social Science Research.

The findings are published in *PLoS ONE*.

Provided by University of Queensland

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