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IMAS
INSTITUTE FOR MARINE & ANTARCTIC STUDIES

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IMAS study tests impact of oil and gas exploration noise on lobster embryos

In one of the first studies of its type in the world, scientists from the University of Tasmania's Institute for Marine and Antarctic Studies (IMAS) and Curtin University have researched the impact on the embryonic development of spiny lobster of seismic air guns used in the oil and gas exploration industry.

Published in the leading science journal [Nature Scientific Reports](#), the study's field tests found that the compressed air guns used to explore for sub-seafloor deposits did not adversely affect the development of spiny lobster embryos.

IMAS Principal Investigator, Associate Professor Jayson Semmens, said that while the spiny lobster fishery is worth an estimated US\$775 million across 90 countries, knowledge of the effects of air gun exposure had previously been almost non-existent.

"Seismic air guns are a significant source of noise in marine environments worldwide, but despite the ecological and economic importance of marine invertebrates like lobsters, little is known about how they're affected by sound from air guns.

"The limited research that has been conducted around the world into impacts of air gun use in seismic testing has largely been confined to laboratory test environments which do not replicate a real world context.

"Our study found that concerns about the impact of seismic air guns on spiny lobster embryonic development through exposure of females carrying eggs were unfounded, however the study did not consider other species or other life stages of the spiny lobster.

"This is a relatively new field of research and more work needs to be done across a wide range of marine species and their various life stages which may be susceptible to the impact of anthropogenic noise," Associate Professor Semmens said.

The paper's first author, Dr Ryan Day, said human generated sound in aquatic environments is a potential concern because sound travels further, faster and more efficiently in water.

“In this study we conducted tests with egg-carrying female spiny lobsters on a shallow reef in Storm Bay, Southern Tasmania, using three different air gun configurations at various distances.

“We found no differences in the quantity or quality of hatched larvae, suggesting that early stage embryonic spiny lobsters are resilient to air gun signals and demonstrating that caution is needed when extrapolating laboratory results to real world scenarios.

“The spiny lobster is a useful model because it is the most valuable single species fishery in Australia and among the most valuable fisheries worldwide.

“However, until further research is undertaken on more life stages of the lobster, including larvae, as well as other marine invertebrates, we will be unable to draw further conclusions on the potential impacts of seismic surveys,” Dr Day said.

The study was supported on behalf of the Australian Government by the Fisheries Research and Development Corporation (FRDC), as well as The CarbonNet Project of the Victorian Department of Economic Development, Jobs, Tourism and Resources; and Origin Energy.

It is part of a broader \$820,000 four-year research program looking at seismic testing to establish best practice procedures as part of an ongoing collaboration between government, research organisations and industry.

The paper “*Seismic air gun exposure during early-stage embryonic development does not negatively affect spiny lobster *Jasus edwardsii* larvae (Decapoda: Palinuridae)*” is available online at www.nature.com/articles/srep22723.

Photos and video of the study are available at https://www.dropbox.com/sh/1n2vgu6ua27jpx2/AAB6Vrxt_DbXP8_rMvz40j5Ma?dl=0.

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