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Watching out for whales: Australian technology gives eyes to explorer ships

The University of Sydney researchers have joined forces with industry and the NSW Smart Sensing Network to give sight to marine oil and gas exploration vessels.

A collaboration between Earth Ocean and Space, ArborCarbon and [the University of Sydney](#) scientists, the team have received \$94,654 in the latest round of the [federal government's Business Research and Innovation Initiative \(BRII\)](#) grants to assess the feasibility of an innovative system to automate real-time detection of whales onboard seismic survey ships.

Seismic survey ships find oil and gas resources by firing air guns that release compressed air into the ocean. Regulations to protect whale hearing from the noise require the air guns to be shut down when whales come closer than a certain specified distance. Marine mammal observers on the ships keep a continual lookout for whales and warn when whales are approaching as well as estimating their distances.

[Associate Professor Eleanor Bruce](#) from the University of Sydney Marine Studies Institute says currently the detection of whales at sea relies on trained onboard observers who are only able to survey during daylight hours.

"Accurate detection of whales at night and under poor visibility is a key issue that is lacking a viable solution," says Professor Bruce.

"Improving round-the-clock detection rates will minimise potential harm to whales from vessel sound and potential collision."



The researchers believe the BRII funding provides an exciting opportunity to demonstrate the feasibility of translating this leading-edge research on thermal sensing, whale behaviour, machine learning and robotic engineering into tangible solutions for improving whale detection at sea.

“Whales can be detected if they are on the surface of the water, most commonly by their large exhalations [blows],” says Professor Bruce.

“These blows are warmer than the surrounding environment, so they are easily detectable with a thermal infrared camera.”

The adoption of smart sensing technologies specifically designed for operational marine environments enhances the accuracy of whale detection, location and identification during night time surveys.

NSSN Environment & AgTech Theme Leader [Dr Tomonori Hu](#) has also brought his thermal sensing expertise to this project.

“Tomonori Hu’s expertise in optical sensor technologies, optical pointing systems and the commercialisation of research will be an asset to our team,” says Professor Bruce.

“This work is highly technical and the resolution and effectiveness of these sensors will ultimately impact on how successful our system will be for rapid automated detection of whales at sea.”

The feasibility study is currently in progress and field-testing has begun in Jervis Bay to capture thermal images of dolphins as whale season has not yet started.

The team have three months to complete and deliver the feasibility study to BRII. If successful, the team may receive up to \$1 million to take the concept to the development and commercialisation stage.



The project team includes Associate Professor Eleanor Bruce, Dr Edwina Tanner, Professor Doug Cato, Associate Professor KC Wong, Dr Tomonori Hu, Alex Jones and Scott Sheehan. This study was funded by the Federal Government's Business Research and Innovation Initiative (BRII).

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