

# Eavesdropping on wha

Undersea noises can disorientate and even damage the hearing of whales, dolphins and other sea mammals. Poppy Leeder visited an innovative project in Plymouth that aims to solve this issue.

Environmental groups often blame research and exploration ships when whales and dolphins become stranded on beaches. They say seismic surveys, which use very loud noises to image the subsea geology, damage sea mammals' hearing, disorientating them and causing them to lose their way. There is speculation that this is why the northern bottlenose whale ventured up the Thames estuary last year causing a media sensation.

As part of my work with NERC's Knowledge Transfer team I went down to the West Country to meet a group of scientists from the University of Plymouth who are developing a better way to protect whales and dolphins from this kind of seismic survey equipment.

Geologists use seismic surveys to tell us about how the Earth's crust was formed and for identifying features such as major meteorite impacts. The oil and gas industry use similar techniques to identify new reserves. Both scientists and industry use equipment that directs loud pulses of noise at the seabed to produce a 'map' of the seafloor. The problem is that whales and dolphins use sound to communicate, to orientate themselves and to locate food. If their hearing is damaged this can reduce their ability to feed, navigate and communicate effectively, and may have a knock-on effect on the viability of the wider population. Because sound is so important to sea mammals we must take all precautions to minimise the impact of man-made noises.

UK guidelines state that seismic equipment cannot begin if crew sight a cetacean within 500m of the ship. If the crew can confirm that no marine mammals are in the vicinity, they can ramp up the sound source to full amplitude over a period of 20 to 40 minutes. In other areas of the world the guidelines are stricter, requiring that crew shut down the sound source if sea mammals breach the exclusion zone during the survey.

The detection system in place at the moment relies on a device that can say there is a whale or dolphin near the ship, and someone on deck constantly scanning the sea – a marine mammal observer.

Looking at 360° of calm sea for hours on end is tiring and

monotonous, and it can be almost pantomime-like with the observer looking one way while the cetacean briefly surfaces behind them. The University of Plymouth team and a company that carries out seismic surveys, Westland GeoProjects, received a Knowledge Transfer Partnership grant to develop a solution to this dilemma.

The project brings together marine ecologists, cetacean biologists, ecotoxicologists, geophysicists and hydrographic surveyors. Their new system can detect whales and dolphins at greater distances and pinpoint their direction. Hydrographic surveyor Victor Abbott, from the University of Plymouth, who helped set up the partnership, said, 'The system we are developing could be described as an eavesdropping mechanism that listens out for sea mammal noises.'

'It will aid the detection of mammals at night, in bad weather and while they are below the surface – a major advance on using human observers,' he added.

Westland GeoProjects, who carry out surveys around the world, want to install the detection device permanently on their ship, the *Geolog Dmitri Nalivkin*. Managing director John Duncan said, 'We always use a monitoring system when we do seismic surveys, but we think we could do better. This new system is a real step forward in technology.'

Postgraduate student Ross Compton, who is employed on the project, is developing the new monitoring system as well as identifying other opportunities. So far he has helped set up a hands-on marine mammal observation training course at the university which started in January.

Ross says that although they are working on developing a more effective monitoring system, 'our knowledge of the vocal repertoires of some animals is still not great, we need to develop this further to make best use of new monitoring systems.'

Oil and gas companies are already showing interest in the technology and the team hope these industries will adopt it in the near future. At a time when cetaceans are feeling the stress of living so close to some very noisy neighbours, it may even open the door to more effective legislation.

“The system can detect sea mammals at night and in bad weather.”

# ales and dolphins ■

■ *Poppy Leeder is NERC's knowledge transfer funding schemes policy manager, email: [fv@nerc.ac.uk](mailto:fv@nerc.ac.uk)*

*Ross Compton is an associate on the Knowledge Transfer Partnership project based at Westland GeoProjects, Belle Vue Lane, Bude, Cornwall. Tel: 01288 356090, email [rossc@wgeo.co.uk](mailto:rossc@wgeo.co.uk).*

*Victor Abbott is a Senior Lecturer in the School of Earth, Ocean and Environmental Science at University of Plymouth, Devon. Tel: 01752 232424, email: [vabbott@plymouth.ac.uk](mailto:vabbott@plymouth.ac.uk).*

*More information at [www.wgeo.co.uk](http://www.wgeo.co.uk)  
KTP is a DTI initiative, details can be found at [www.ktponline.org.uk](http://www.ktponline.org.uk)*