

USV to Monitor Ocean Noise



A pioneering project to find out how increasing levels of man-made noise in the sea is affecting marine life has begun in Plymouth. Plymouth University Marine Institute scientists are working with AutoNaut and its 5m wave-propelled [unmanned surface vessel \(USV\)](#), towing a Seiche passive acoustic monitoring (PAM) array.

This technology enables the gathering of essential underwater sound data that is both high quality and cost-effective. Dr Clare Embling and Dr Simon Ingram, both lecturers within the School of Marine Science and Engineering and experts in marine mammal biology and bio-acoustics, are the academic leads in the project.

According to Clare Embling, increasing levels of shipping and marine development raise noise levels in the sea and can make it more difficult for animals to communicate, and can displace animals from important feeding or nursing grounds and sometimes even cause physical injury. Simon Ingram sees the AutoNaut as a quiet autonomous platform that allows the researchers to monitor noise levels as well as the sounds produced by marine life, such as the whistles and clicks of dolphins and porpoises over very large areas and long periods of time. This information will enable the assessment of how marine noise affects marine life.

Trials Successfully Completed

Two days of initial trials of the autonomous concept were completed successfully in July, led by the companies, who both have bases in Devon. The 5m AutoNaut towed the array quite comfortably in light conditions according to Mike Poole, director of AutoNaut Ltd. Speed was reduced by drag, but steering and performance were not affected. The AutoNaut was piloted remotely from the company's Chichester base and the AutoNaut can stay at sea for months while being piloted from the shore.

The PAM data Seiche gathered on background sound in the English Channel will undergo a technical analysis to scope noise levels. A further step is to combine with Seiche's capability to transmit full, raw audio signal from an at-sea platform. This raises the clear possibility of 24/7 real-time remote monitoring by trained operators positioned on land.

Future Developments

Seiche manufactures a range of underwater acoustic monitoring equipment from research level data recorders to high-performance digital arrays for defence applications. A new digital array will be deployed from another AutoNaut later this year as part of the NATO's 'Unmanned Warrior' exercise, with the aim of detecting submarine activity.

Measuring noise in the oceans is an expensive business, either from specialist vessels, or drifting buoys, or [hydrophones](#) fixed to installations. By making the operation autonomous - piloted, monitored and analysed from ashore - it should be possible to gather much more data over long periods very cost effectively.

This project is the first fruit of a partnership agreed in January 2016 between Plymouth University and AutoNaut. It gives the University access to the autonomous technology embodied in AutoNaut and Seiche's PAM. Mike Poole added that the cooperation makes it possible to gather all kinds of data about the seas in new ways without sending people into dangerous areas. AutoNaut gains by working with the University, and the University benefits through its involvement with some of the most innovative and entrepreneurial small businesses in the UK and their pioneering autonomous applications.