

JASCO's Sound Monitoring Technology Used to Protect the Orcas

Submitted by Lindsay Wallace Fri, 2015-02-06 11:39

Sound is a powerful tool for studying the ecosystem beneath the surface of the sea. Nowhere is it more important than in the Salish Sea, the critical habitat of the endangered southern resident orcas.

JASCO Applied Sciences (Canada) Ltd. designs and manufactures instruments that measure and monitor the effect of noise on marine life. The company has recently taken its undersea sound-monitoring technology in a new direction through its participation in efforts to protect orcas off Canada's west coast. "It's a high-water mark for us from a technology point of view," JASCO president Scott Carr said in an interview. "Technology originally developed to detect submarines is now used to protect sea animals."

The University of Victoria's Ocean Networks Canada operates the world's most advanced cabled ocean observatories off British Columbia's coast and the Arctic for the advancement of science and the benefit of Canada. These observatories supply continuous power and Internet connectivity to a broad suite of subsea instruments from the coast to the deep sea and allow researchers to operate instruments remotely and transmit real time, digital data freely to any computer on the globe.

JASCO has been collaborating with the Ocean Networks Canada's Innovation Centre since 2012 on a product development and demonstration project related to their new Autonomous Multichannel Acoustic Recorder (AMAR). The AMAR is JASCO's advanced system for collecting and delivering precisely calibrated acoustic and oceanographic data for ocean monitoring. It enables scientists to collect data from numerous oceanographic instruments including arrays of underwater microphones (hydrophones). The information can be transmitted in real time when the instrument is connected to cabled observatories such those deployed by Ocean Networks Canada off the BC coast.



JASCO AMAR and hydrophone array being lowered to the seafloor at the VENUS observatory's Strait of Georgia East site (at 170 m depth).

Since September 2013, two of these advanced sound-monitoring systems have been operating on the VENUS observatory in the Strait of Georgia at depths of 100 and 170 metres. A major purpose of this mission was to demonstrate the multi-sensor data collection and streaming capability of the AMARs, each connected to an array of four hydrophones and a variety of other oceanographic sensors. In addition, scientists, port authorities and local communities are interested in the real time detection, identification and localization of calls from mammals in the Salish Sea, between BC and the State of Washington. An important objective is to establish a set of accurate benchmark measurements of underwater noise to which these animals are exposed.

“The development of the AMAR system has progressed very quickly, surpassing our expectations,” notes Tom Dakin, the Innovation Centre’s Sensor Technology Development Officer. “JASCO’s hydrophone arrays and software have now given us the ability to track

vocalizing sources in three dimensions and automatically count and classify marine mammals.?

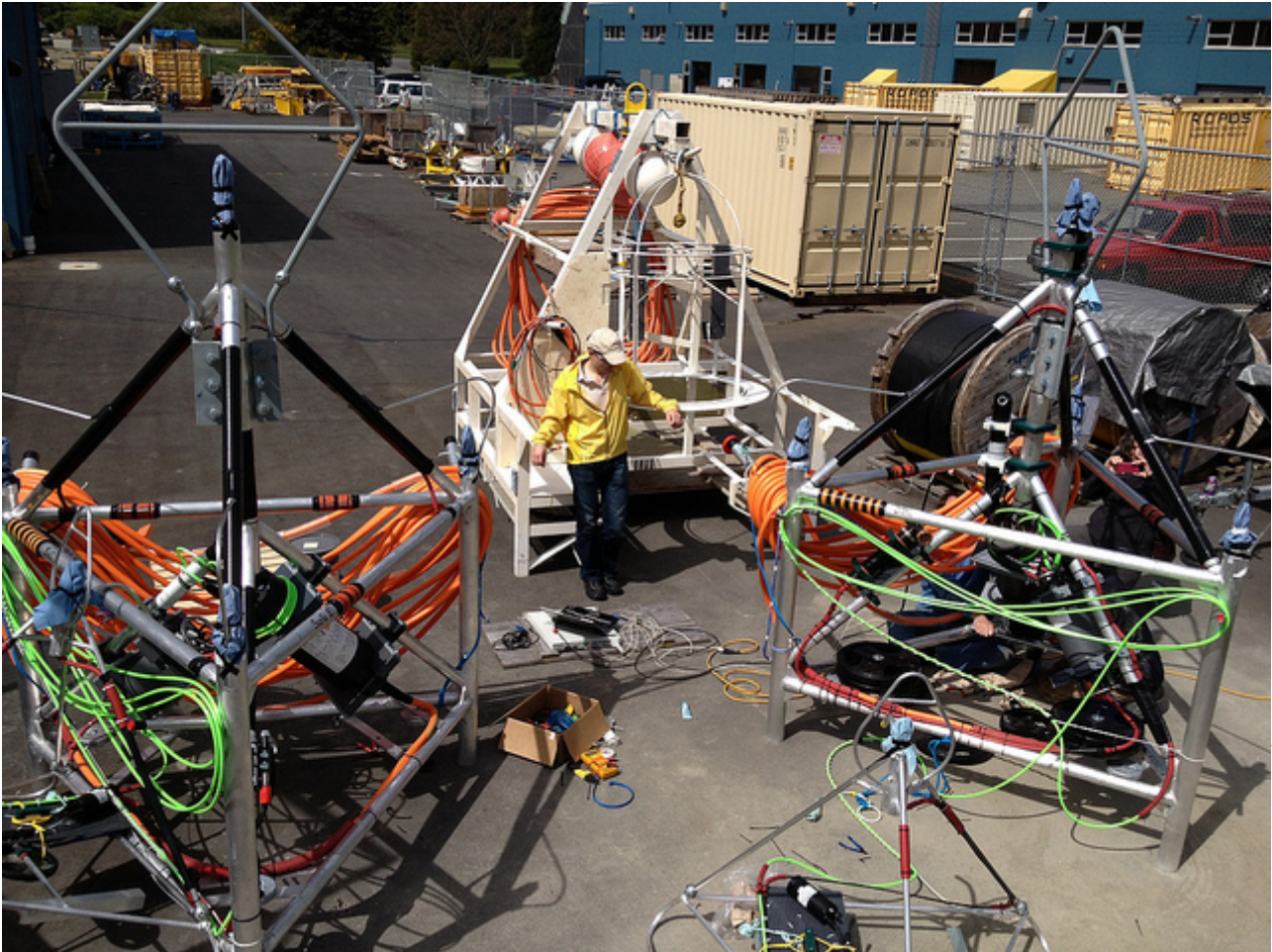
Xavier Mouy, a JASCO bio-acoustics specialist who has been developing the AMAR software for several years, is pleased with the results: "We currently have many samples of calls and echolocation clicks from killer whales and Pacific white-sided dolphins. Our focus is to monitor marine mammal presence by detecting these sounds and to examine changes in their positions or calling behaviour that could be associated with exposures to man-made noise.?"

While the technique has been known for some time, says Dakin, this is the first implementation on an ocean observing system where data can be gathered in real time, 24/7, and made publicly available. "This test demonstration also provides an excellent opportunity for Ocean Networks Canada to evaluate the AMAR as the foundation for ONC's small-scale observatories in remote locations, such as our Arctic observatory or the monitoring systems being installed for communities along the BC coast under the Smart Ocean? initiative.?"

The systems, which have been deployed for just a year, are already generating significant market interest and new revenue for the company. "We expect AMAR Observer and related services to generate more than an additional 15% annual revenue to JASCO's business over the next several fiscal years," says John Moloney, JASCO's Business Development Officer.

From origins in 1980's defence research, JASCO has become an international leader in undersea acoustics, providing consulting and research services for assessing and mitigating underwater noise. JASCO has recently hired new employees in both Canada and the US to support increased demand for Observer-related research and development. John Moloney adds, "Our collaboration with Ocean Networks Canada has certainly opened the door to other R&D opportunities both nationally and abroad.?"

This Canadian success story has leveraged Ocean Networks Canada's cabled observatory in the Strait of Georgia, along with the knowledge and expertise of ONC's science and engineering staff, to help JASCO Applied Sciences develop an entire new "AMAR Observer?" product line and service offering.



JASCO's AMAR arrays, with four hydrophones each, being prepared for installation on the seafloor in ONC's observatory in the Strait of Georgia.

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