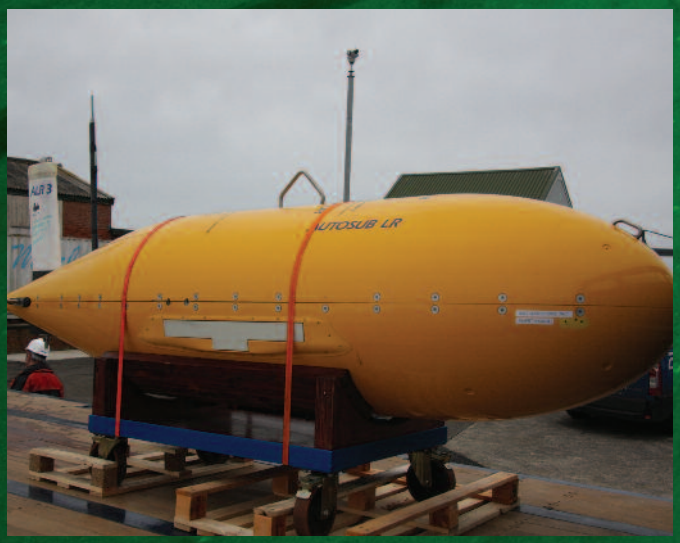
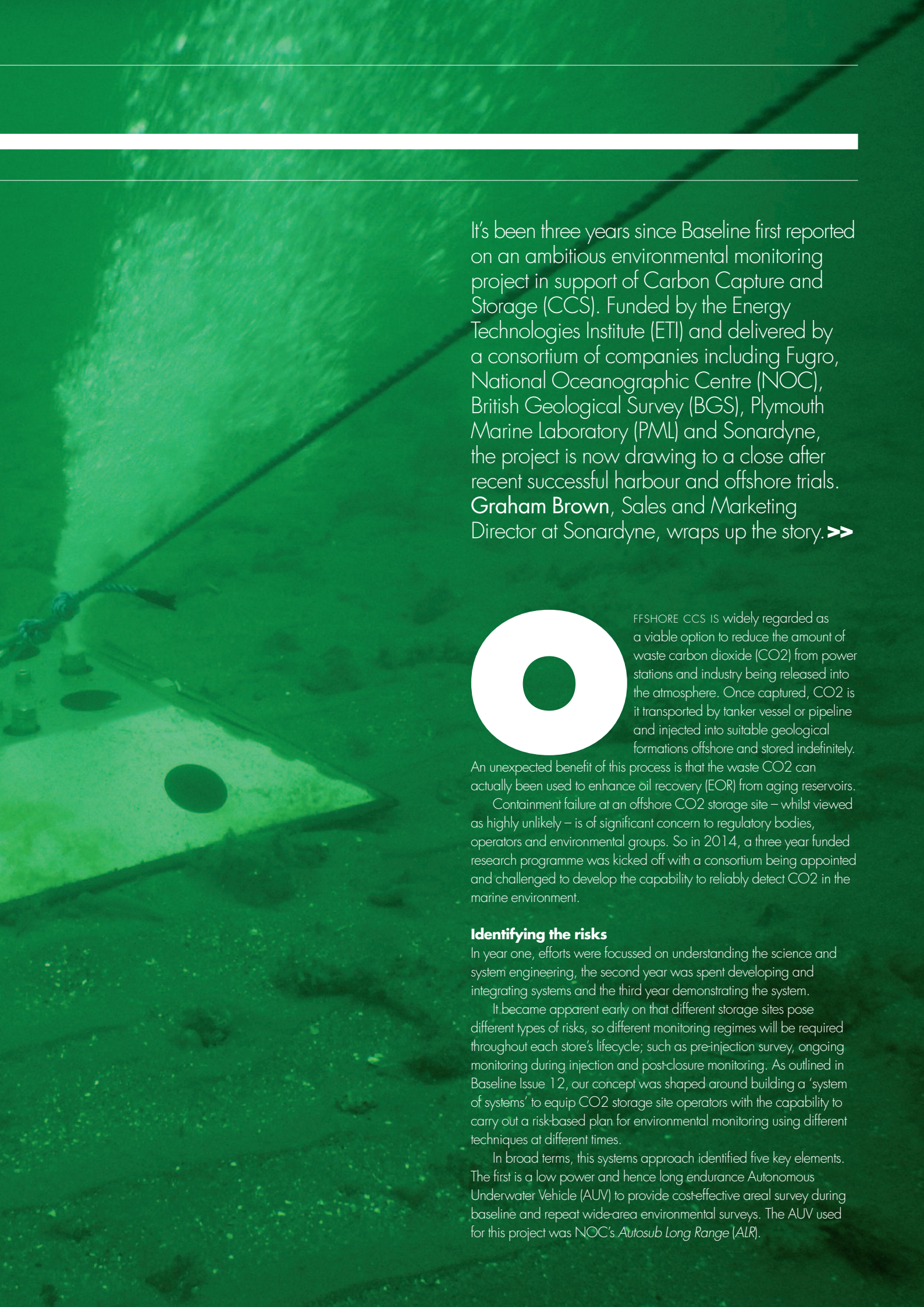
FROM CONCEPT TO REALITY: A SYSTEM TO MONITOR CCS SITES USING MARINE ROBOTICS



A seabed lander equipped with a Sentry integrity monitoring sonar and Compatt 6 communications transponder and (left), NOC's *Autosub LR*, are readied for deployment ahead of several weeks of harbour testing in Portland Harbour. Both were used to hunt for simulated CO2 leak from a variable flow leak target (main image).



It's been three years since Baseline first reported on an ambitious environmental monitoring project in support of Carbon Capture and Storage (CCS). Funded by the Energy Technologies Institute (ETI) and delivered by a consortium of companies including Fugro, National Oceanographic Centre (NOC), British Geological Survey (BGS), Plymouth Marine Laboratory (PML) and Sonardyne, the project is now drawing to a close after recent successful harbour and offshore trials. **Graham Brown**, Sales and Marketing Director at Sonardyne, wraps up the story. **>>**

OFFSHORE CCS IS widely regarded as a viable option to reduce the amount of waste carbon dioxide (CO2) from power stations and industry being released into the atmosphere. Once captured, CO2 is it transported by tanker vessel or pipeline and injected into suitable geological formations offshore and stored indefinitely. An unexpected benefit of this process is that the waste CO2 can actually been used to enhance oil recovery (EOR) from aging reservoirs.

Containment failure at an offshore CO2 storage site – whilst viewed as highly unlikely – is of significant concern to regulatory bodies, operators and environmental groups. So in 2014, a three year funded research programme was kicked off with a consortium being appointed and challenged to develop the capability to reliably detect CO2 in the marine environment.

Identifying the risks

In year one, efforts were focussed on understanding the science and system engineering, the second year was spent developing and integrating systems and the third year demonstrating the system.

It became apparent early on that different storage sites pose different types of risks, so different monitoring regimes will be required throughout each store's lifecycle; such as pre-injection survey, ongoing monitoring during injection and post-closure monitoring. As outlined in Baseline Issue 12, our concept was shaped around building a 'system of systems' to equip CO2 storage site operators with the capability to carry out a risk-based plan for environmental monitoring using different techniques at different times.

In broad terms, this systems approach identified five key elements. The first is a low power and hence long endurance Autonomous Underwater Vehicle (AUV) to provide cost-effective areal survey during baseline and repeat wide-area environmental surveys. The AUV used for this project was NOC's *Autosub Long Range* (*ALR*).