SAMS is a Company Limited by Guarantee registered in Scotland (SC009292) and a registered Scottish charity (009206). It is a Learned Society with 50 members and employs 3 staff at the Scottish Marine Institute near Oban.

SAMS administers its commercial services through a wholly owned commercial subsidiary company SAMS esearch Services Limited (S SL).

SAMS also hosts The European Centre for Marine iotechnology. ECM is a business incubator for new marine biotechnology companies and currently hosts two tenants. A ugpharm iodiscovery Ltd and GlycoMar Ltd.

SAMS is a collaborative centre of the U 's Natural Environment esearch Council www.nerc.ac.uk and an academic partner of the U Millennium Institute www.uhi.ac.uk

GO E NANCE ST UCTU E

SAMS is ruled by its members who elect office bearers at the Annual General Meeting. SAMS Council chaired by the SAMS President has responsibility for strategy risk management and appointment and performance of executive management. Council is supported by a oard and five committees. Council members are the non-executive directors of the company.

The director of SAMS is responsible for the effective management of the organi ation and is supporte

SAMS' Dr Finlo Cottier, Lecturer in Polar Oceanography

ANIMALS ON T E A TI CIAL EE

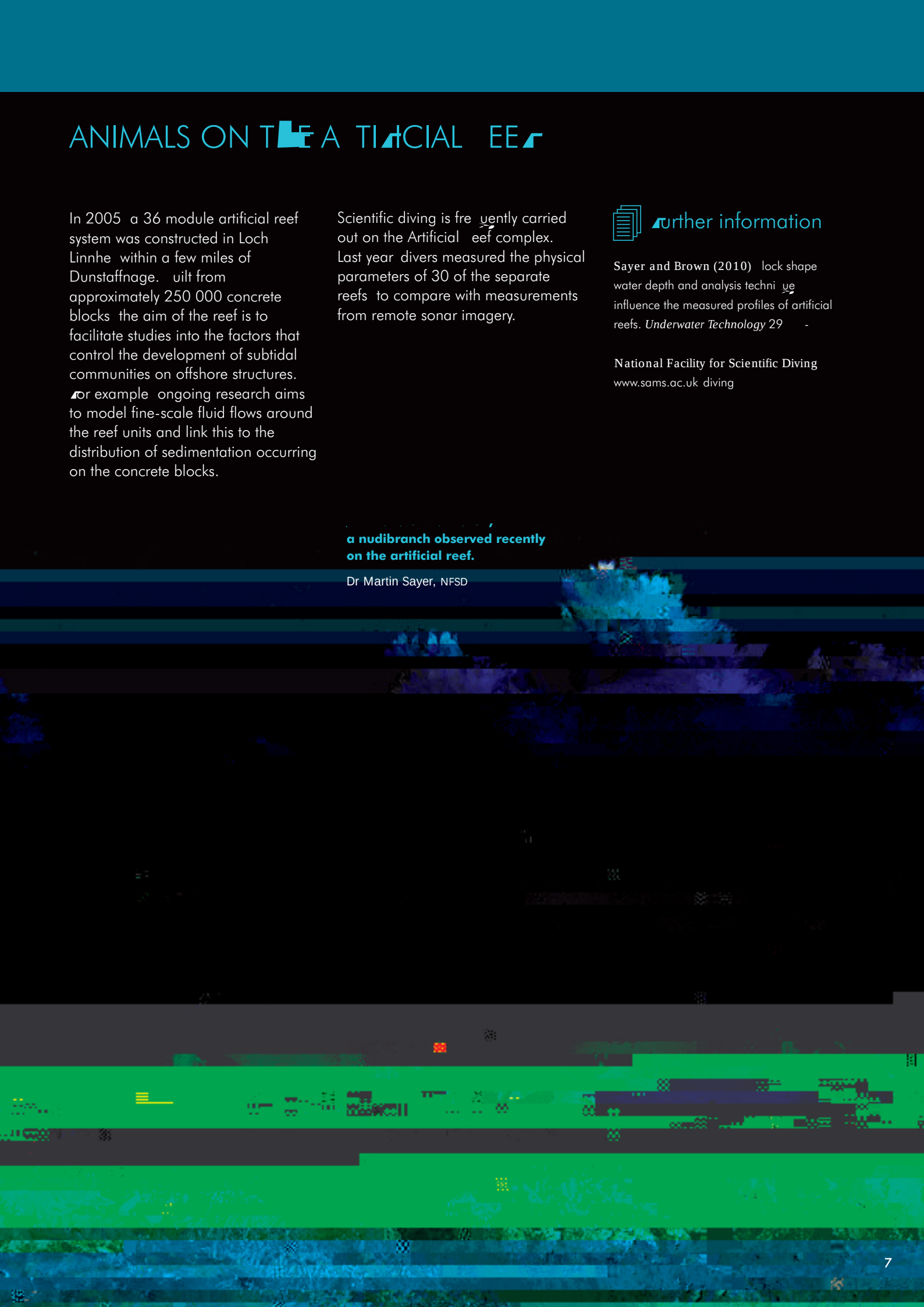
In 2005 a 36 module artificial reef system was constructed in Loch Linnhe within a few miles of Dunstaffnage. uilt from approximately 250 000 concrete blocks the aim of the reef is to facilitate studies into the factors that control the development of subtidal communities on offshore structures. or example ongoing research aims to model fine-scale fluid flows around the reef units and link this to the distribution of sedimentation occurring on the concrete blocks.

Scientific diving is fre uently carried out on the Artificial eef complex. Last year divers measured the physical parameters of 30 of the separate reefs to compare with measurements from remote sonar imagery.

urther information

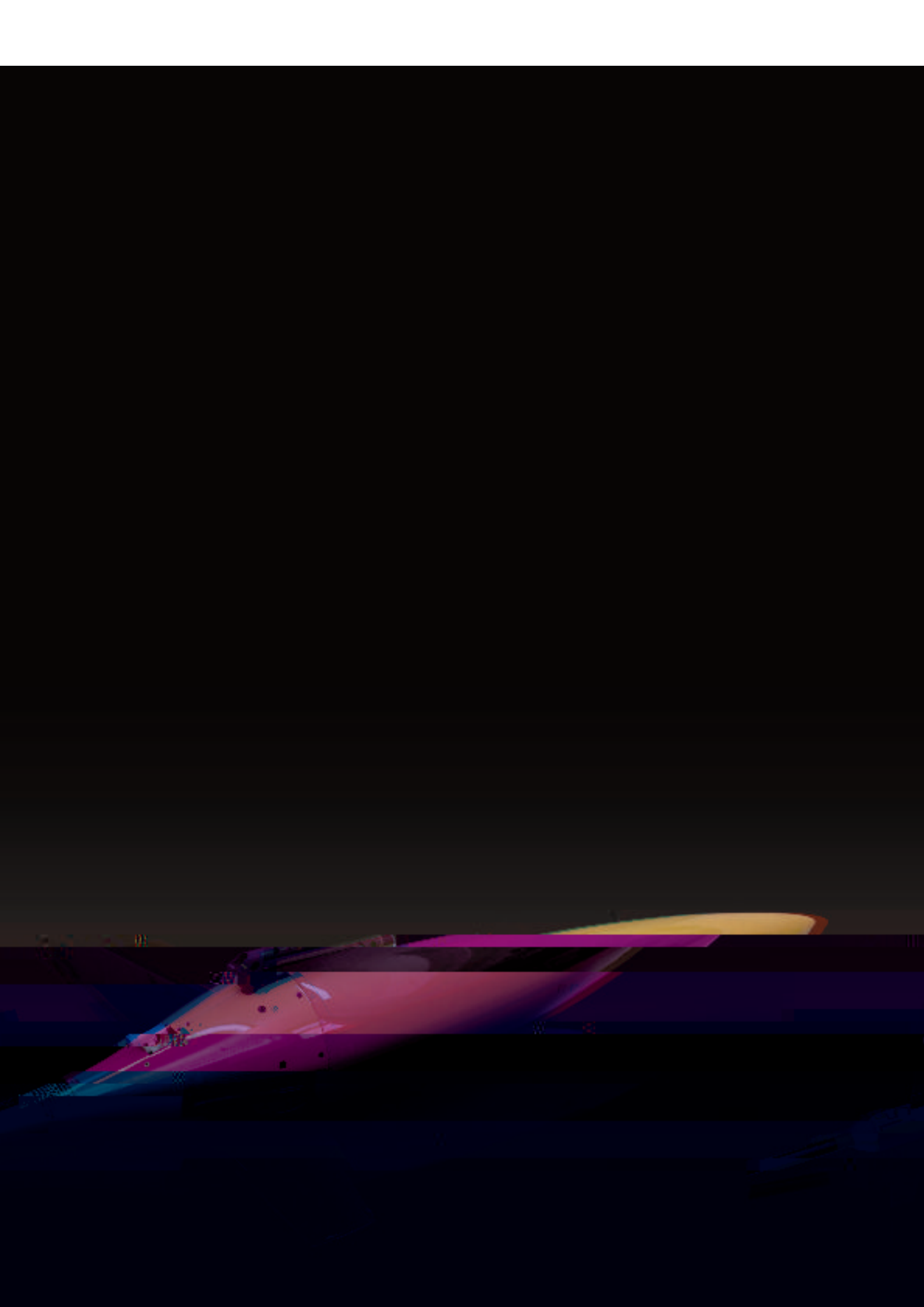
Sayer and Brown (2010) lock shape water depth and analysis techni ue influence the measured profiles of artificial reefs. *Underwater Technology* 29 -

National Facility for Scientific Diving
www.sams.ac.uk diving



a nudibranch observed recently on the artificial reef.

Dr Martin Sayer, NFSD



EST ASSU ED. OU ISHIS CE TIHED

Dr Clive Fox, SAMS fisheries scientist, plays a key role on accreditation teams for the Marine Stewardship Council (MSC) via the accreditation body Moody Marine. MSC certification ensures that fisheries conform to approved standards, giving processors and the public assurance that products bearing the MSC logo come from fisheries managed to promote sustainability. The accreditation process involves extensive site visits and consultation with the fishery and other stakeholders such as environmental NGOs.

Evaluation and scoring is carried out against three principles: the status of the target stock, the impacts of the fishery on other species and the environment; and the legal and enforcement framework in which the fishery operates. The accreditation process is very open, with all reports being peer reviewed and put on the

Sea ice plays a critical role in the
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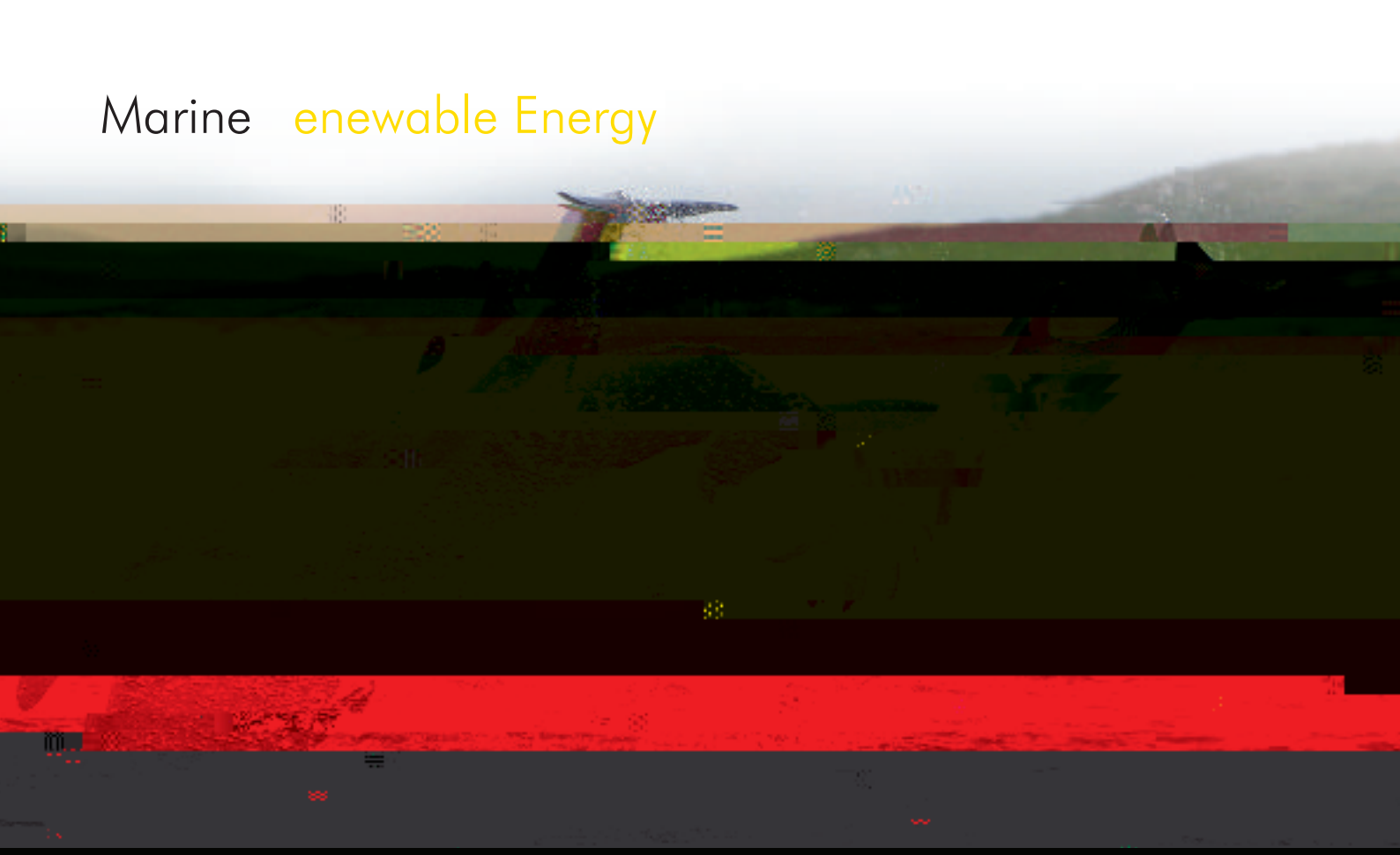
Arctic esearch

SEAWEED AND OOM CETE DI E SIT IN T E CANADIAN MA INE A CTIC

Frithjof C. Küpper[1], Pieter van West[2], Martin D.J. Sayer[3], Hiroshi Kawai[4iro]

Methane is responsible for about a fifth of global warming potential, second only to carbon dioxide in its importance as a greenhouse gas. Its predominant sources are made up of both natural and man-made components and include wetlands, landfills, fossil fuel production, biomass burning and agriculture (particularly rice cultivation and intestinal methane from livestock such as cows and sheep). The study of these potential sources of methane has gained much interest in the past few years, due to the importance of methane in past, present and future climate change.



SETTING STANDA DS MA INE ENE G

Dr Bob Batty SAMS Honorary Research Fellow

The need to source energy from renewable sources is driven by climate change, the increasing cost of fossil hydrocarbon fuels and the need to improve energy security. Both hydro power and wind power have a long history, though only in recent years has the latter made a significant contribution to our energy supply.

Now, marine energy – from waves and tidal streams – brings the potential to deliver vast quantities of power. Most of the energy in the oceans is too diffuse and too far from shore to be exploited, but there are areas where waves and currents are sufficiently dense to be exploitable. Much of this resource is in Scottish waters. The Pentland Firth, for example, is often touted by Scottish politicians as the Saudi Arabia of marine power. Tidal stream power has the advantage that its availability is predictable, unlike wind power. However its disadvantage is that the marine environment is often hazardous and difficult to work in.

Unlike hydro and wind power, the development of wave and tidal stream power is in its infancy; many devices are being conceived, developed and tested. Some demonstration scale projects are now feeding power to the grid, such as the Marine Current Turbine in Strangford Loch. However, unlike wind power, where almost all wind turbines are of a very similar three-bladed horizontal axis design, the marine energy devices are remarkably diverse in their characteristics. [illegible]

and economic issues. The project itself brings together representatives of nearly all aspects of the marine energy sector, from university scientists and engineers, device developers, energy companies, certification agencies, and even journalists with an interest in renewable energy. Now at the half way stage, the three year project is funded by the European Commission as part of its 7th Framework Programme under the Energy topic and currently includes 22 partners from 10 member states.

At SAMS we are contributing to work on Environmental Impact Assessment, collaborating closely with colleagues from the Wave Energy Centre and the Sea Mammal Research Unit. The environmental impacts of marine energy extraction are far from being fully understood and are difficult to predict. An important task, therefore, was to compile a review of the main uncertainties regarding environmental impacts of ocean energy devices. The major areas of uncertainty include: interference with benthic habitats; artificial reef effects (which may be beneficial); noise disturbance; electromagnetic fields; and interference with marine animal movements. There may as yet be no actual evidence of negative effects in these areas, but because the risk is unknown, or not quantifiable, the consequences of negative impact could be severe.

In an effort to understand the processes that lead to a risk of collision between animals and the moving parts of marine energy converters (the tips of turbine blades can be moving through the water at speeds up to 30 mph), and to identify gaps in knowledge that require further investigation, we are using and developing encounter and evasion models. Encounter models have been used extensively in ecology to estimate predator-prey interactions of marine animals and to assess risk of predation mortality. Such models can also be used to predict rates of encounter of animals with renewable energy devices.

At SAMS we have developed a 3-dimensional encounter model to assess the relationship between animal size and encounter rate with tidal turbines, as well as the risk for individual species. Our model shows that encounter rate increases with body size, indicating greater risk to larger animals such as marine mammals. thihihihihihihideo

Further information

www.equimar.org

Dr Tracy Shimmield SAMS

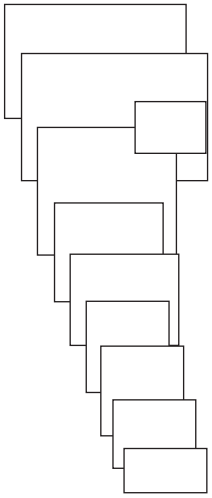
The world's expanding population will continue to utilise the earth's resources and the environmental impacts of the extraction of non renewable resources such as oil and minerals are a constant source of public and scientific concern. In addition, the marine environment continues to be a repository for waste resulting from both land based and deep sea mining and oil extraction. In all cases there is an urgent need to identify and measure potential impacts so that these can be minimized and mitigated as far as possible.

Papua New Guinea (PNG) is a developing nation with rich mineral resources and an important mining sector. According

in 2004 after a total discharge of approximately 90 million tonnes. In addition, an environmental baseline study was carried out at the mainland site of Basamuk, a proposed discharge point for tailings from an inland nickel-cobalt mine currently under construction. These three contrasting sites offer the opportunity to establish the pre-impact baseline conditions at Basamuk, to identify and record any impacts of ongoing DSTP at Lihir

The warm surface current that flows northwards past the west coast of Scotland is an important arm of the global thermohaline (and Atlantic meridional) overturning circulation (the THC). It plays a signifi

depth (CTD) section from Scotland to Rockall in 1975. This section, which in the 1990s was



importantly, well-supported results. Amongst the more intriguing findings were a rather distant relationship of right whales with the other living species of baleen whales (the two being separated by a large number of fossil taxa) as well as a close relationship of the pygmy right whale with the grey whale and the rorquals. The former result is important, as it underlines the evolutionary uniqueness of the right whale lineage, which is separated from the other extant lineages by at least 28 million years of evolution (as indicated by the presence of fossils of that age); the latter, because it represents the first time ever that this relationship has been identified in a morphological study. Given that analyses based on DNA also seem relatively consistent in grouping the pygmy right whale with rorquals and the grey whale, the findings of this study may be a first step toward a reconciliation of the often contradictory phylogenetic signals obtained from molecular and morphological data.

Mysterious mysticetes – with teeth

This analysis also yielded some results that are rather interesting from an ev

On the 7th of August 2009, I left Scotland for a semester at the University Centre on Svalbard (UNIS). It is the world's northernmost higher education institution, located at 78°N. I arrived at half eleven at night, the sun was still shinning and there were lots of mountains with no trees on them at all - very different from Oban!

Student accommodation was in old mining barracks: these were amazingly sociable. On my floor were three Swedes, three Norwegians and three Germans. We hit it off immediately and became close friends. In fact, meeting new people from all over the world was one of the best parts of the experience.

The first week on Svalbard included a two day safety course: we had to jump into the fjord (thankfully wearing a survival suit), learn first aid, how to set up camps, and finally received rifle training.

This included how to load, aim and fire in case we were ever in a situation with a polar bear. Polar bears are common in Svalbard and rifles are used as a standard safety precaution. If you see a polar bear, firstly you

sh

Early days

Margaret Barnes was born in Manchester on 26 August 1919. After a brief period in Wales her family moved back to England where she continued her education in Devon and in 1939 was awarded a BSc from the University of London. Her further education was partly interrupted by the outbreak of World War II and she went to work in industry where she spent the following six years using her training as a chemist to investigate colloidal graphite lubricants. During this time, and with characteristic determination, she used her spare time to study for an MSc which she was awarded in 1945 at the end of the war.

Husband and wife team

She had met her future husband Harold while at college and they married in 1945. Harold was also a chemist but in 1943 had been seconded to the Scottish Marine Biological Association's (SMBA) Marine Station at Millport in the Firth of Clyde where he was involved in the development of antifouling paints. After their marriage Margaret joined him in Millport and it was there that their lifelong partnership in science began.

Barnacle research

Harold's early work was varied, but he had developed an interest in barnacles during his antifouling work and began publishing on the group in the early 1950s. Margaret acted as his assistant, officially designated by the Marine Station in the SMBA's restrictive practices of the time as an 'unpaid permanent visiting worker'. It

The Scottish Associatio