This is the newsletter for the Marine Studies Group of the Geological Society of London. We are happy to be back in action and ready to act as a resource for the Marine Geoscience community in the UK!

What are we: We are a special interest group of the Geological Society of London. We promote meetings and gatherings for the Marine Geoscience community. What is Marine Geoscience? It comprises marine geology and geophysics, marine sedimentology, palaeoceanography, marine resources and resource management. We seek to be a resource for those in the UK interested in the broad field of Marine Geoscience, to interact with the UK-Integrated Ocean Discovery Programme (UK-IODP) and Challenger Society (Oceanography).

CHECK US OUT ON TWITTER! @marinestudies1
The signature meeting of the Marine Studies Group is the Shackleton Conference, a biannual event which took place for the first time on September 18, 2017. The Shackleton Conference provides a regular opportunity for the marine geoscience community to gather in London. We had over 60 attendees at the inaugural meeting, and our keynotes were:

Carrie Lear, Cardiff University
- *Ice sheet stability: A palaeo perspective*

Rosalind Rickaby, University of Oxford
- *The role of phytoplankton in the carbon cycle*

Damon Teagle, University of Southampton
- *The formation and evolution of new crust at ocean ridges: Tackling a fundamental Earth science challenge from multiple directions*

Rosalind Coggon, University of Southampton
- *The South Atlantic drilling project, multiple collaborations in marine science*

Bob Gatliiff – British Geological Survey
- *A BGS forward look at Marine Geoscience in the UK: Priorities in a time of change*

Russell Wynn - NOC, Southampton
- *Marine robotics and their applications for marine geoscience*

In addition, we had 30 posters and a lively poster session where much food was consumed and the future of the marine geoscience community was discussed. We ended the day with a 30-minute discussion of what the Marine Studies Group can be doing to better support the Marine Geoscience community, including the dissemination of news and information through this newsletter. We recognized that one of the challenges for this community is its breadth – marine geoscience comprises palaeoceanography, marine physical sedimentology, oceanic crust and hydrothermal interactions, marine geophysics, geophysical hazards and everything in between. How do you engage with, and interact with all these communities and various interests at once? What can we best do to support this community. Many attendees wrote suggestions after the conference, and nearly everyone at the conference thought it was an excellent selection of speakers and science. One quote: “As a general review of the subject and an indication of advances being made, I thought it was excellent and I would try to get to meetings at such an attractive venue”
SAVE THE DATE
September 23, 2019 at Burlington House, Geological Society, for the Geological Society’s ‘Year of Carbon’

The Shackleton Conference: Marine Geoscience and Carbon
– Carbon storage and the reconstruction of the carbon cycle.
More details and a programme early next year!

Did you see us? The Marine Studies Group sponsored the student poster prizes at the 2017 Annual UK-IODP (UK-Integrated Ocean Discovery Program) meeting. Committee member Sally Morgan was on hand to give out the awards.

We also sponsored the poster prize and reception, along with the Geochemistry Group, at the massive celebration for the 50th anniversary of ocean drilling in September 2018. Photos to follow!

Upcoming meetings we are co-sponsoring:
Marine Minerals: A new resource for the 21st Century
Check out the website at https://www.geolsoc.org.uk/marineminerals18

The 5th International Sclerochronology Conference, in Split, Croatia
http://jadran.izor.hr/isc2019/index.html

As always we are looking to spread the word about conferences of interest to Marine Geologists, do let us know if you hear of any!
News! Smart boulders measure fast and powerful seafloor avalanches

Robotic sensors disguised as boulders, or ‘smart boulders’, have been used to measure the initiation and evolution of huge seafloor avalanches (turbidity currents) for the first time, revealing some surprising findings that will help inform where best to lay the seafloor cables that keep the internet running. A recently-published paper in the journal Nature Communications, shows that submarine avalanches of rock and sand can travel across the seafloor at almost 30 km/hour (similar to a human sprinter), and are powerful enough to move objects weighing almost one tonne for several kilometres. Submarine sediment avalanches regularly damage global networks of seafloor telecommunication cables, but are notoriously difficult to directly measure due to their powerful nature. This multi-year project is the most ambitious attempt yet to measure these avalanches; a total of 15 turbidity currents were tracked, some of which travelled for over 50 km into the deep sea.

More than 50 instruments were installed on and above the seabed within Monterey Canyon offshore California, including novel smart boulders designed to travel within the avalanches and measure their speed and movement. One of these smart boulders was also attached to a heavy (800 kg) frame that was carried several kilometres down the canyon within a slurry of sand and rock fragments. The presence of such a dense sediment-rich layer at the base of the avalanche came as a surprise, and challenges many existing theories about how these flows behave.

Repeated seafloor surveys made by AUVs revealed that the zone of seafloor affected by this powerful and dense layer was only limited to a thin central part of the submarine canyon. As flows travelled further to deeper water where the canyon was wider, they were also found to slow down. These new findings provide valuable information to identify safe crossing points across other canyons for new seafloor cables and pipelines. MSG Committee member and National Oceanography Centre (NOC) scientist Dr Mike Clare, one of the authors of this paper, said “The dense nature of the submarine flows came as a surprise. It means they could cause more damage to communication cables than we thought. It will also make them harder to image.” One of the other key findings of this 18-month, international, collaborative investigation, is that these powerful avalanches do not necessarily need a big event to trigger them. Dr Clare continued “If you think about snow avalanches, you can trigger one with a stick of dynamite dropped from a helicopter. On the other hand, if the conditions on the slope are just right, even a handclap up the valley could trigger one... The lack of a specific trigger makes it hard to predict precisely when these events will occur, but we found they are more common during stormy seasons, which helps forecast periods when they are more likely.”

The project was led by Monterey Bay Aquarium Research Institute, supported by United States Geological Survey, Ocean University of China, Quindao National Laboratory for Marine Science and Technology, Durham University, Hull University, University of Southampton and National Oceanography Centre.

Industry Insights with BP Geohazards Team Leader Gareth Wood

Through the Oil and Gas industry downturn these last few years, the result of a fickle oil price, we have seen the Upstream Business shift focus to build a portfolio dominated by gas and advantaged oil, underpinned by a ‘Value over Volume’ approach. It is likely that capital spend will continue to be disciplined for the foreseeable future in a bid not to repeat the spending regime of yesteryear, where significant seismic spend was seemingly justified more easily to unlock tough assets in remote frontier basins.

In today’s low-cost environment, BP remains committed to the right data, at the right time, underpinned by a strong value case. Our data needs are driven more by efficiency and less about precision, with data density the number one factor for image quality.

Project cycle times have drastically reduced in response to the cost challenge. Where a Development could take several years to come to fruition before the Downturn, planning time can be as little as 6 months now. The data needed to support these projects (Geophysical and Geotechnical) is required very early in the planning process, and thus, the site investigation world is on the back foot to deliver in time to influence decisions. Therefore, we need to get smarter on delivery, and how we access data.

The ability to cover large areas of the seafloor efficiently can be achieved with systems such as the Ocean Infinity concept, used recently in the search for the MH370. Utilising multiple Hugin Autonomous Underwater Vehicles (AUV’s), tracked by Autonomous Surface Vehicles (ASV’s) all launched from a single Mother vessel, these systems can cover huge areas of the seafloor in relatively short time. Although systems such as these are costly, there is an economic tipping point when they become more efficient, delivering data faster to the client.

Another aspect to efficiency is instant access to data through Remote Access and High-Speed Networks. Broadband technology now allows us to remotely login to workstations on the vessel, so we can process and interpret data in near real-time while reducing the number of people on vessels, but also facilitate high-speed transfer of large datasets to shore for analysis and rapid decision making.

While technological advancements are an important factor, it’s still the people that make the difference. And it is here where we face our greatest challenge. The downturn has forced companies to review their organisations and most have reduced by 25%. This has resulted in two problems: significant experience has been lost, and O&G is no longer an attractive proposition to Graduates. The industry must change its image and widen its energy portfolio to remain competitive in the Energy Business. But also encourage technological advancement, and innovative working environments to attract the best technical skills.
Finally: An interview with Marine Geologist, Alejandro Roman Gonzalez, a research fellow at the University of Exeter, soon leaving for a cruise in Antarctica

What are the objectives and why are you going?
The objective of the ICEBERGS project is to assess the impacts of ongoing deglaciation in coastal fjords along the West Antarctic Peninsula upon the marine benthic communities. These fjords are located at Marian Cove (King George Island), Börgen Bay (Anvers Island) and Ryder Bay (Adelaide Island) and each present marine terminating glaciers with known retreat rates.

What are the biggest challenges?
The logistics of working in a remote and extreme environment such as the Antarctic cannot be underrated. Wild storms and currents in the Drake Passage and in the Southern Ocean can be truly awesome, and I am using the literal meaning of the word awesome. Drifting icebergs from glaciers and ice sheets can pose a great risk as does the possibility of getting locked in the sea ice. On the science side, ICEBERGS is a very ambitious international project, and processing and analysing the vast amount of data that the project will generate presents a further challenge.

What are the range of scientific activities and scientists on the cruise?
The ICEBERGS cruise scientific crew is made up of a wide range of scientists with very different areas of expertise. Our Chilean colleagues from Universidad Católica Santísima Concepción specialize in environmental genetic characterization. The University of Exeter team are experts in sclerochronology and palaeoclimate and our colleagues from the British Antarctic Survey have expertise in Antarctic benthic ecosystems. In addition, the expertise and experience of the crew of the RRS James Clark Ross are invaluable to the success of this research enterprise.

What makes Marine geology special?
Retreating glaciers along the West Antarctic Peninsula are opening sections of the marine sediments, previously locked in ice, to the sea. In this sense these coastal fjords present very dynamic geomorphological process, which we have seen to vary radically along the fjord. In addition, the geology of these coastal embayments condition the marine communities that will develop. Furthermore, due to the sometimes rapid retreat rate of the glaciers, we have been able to map the bathymetry of till now uncharted regions of the seabed, an opportunity which I think it is both exciting (for the science) but also worrying (because it indicates how quickly some of the effects of climate change can manifest themselves).
Meet your committee!

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Feel free to email any of us, or marinestudiesgroup@gmail.com if you have any questions or comments! Check us out on Twitter!