

## Mapping the Burdwood Bank: edge of the continental shelf

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Research scientists Dr Ander de Lecea and Dr Marina Costa of SAERI recently completed their first surveys of the Burdwood Bank, kicking off the “Fine Scaling of the Marine Management Areas of the Falkland Islands” (MMA) project.

The Burdwood Bank is an area known to be important for seabirds and mammals, and believed to house high benthic biodiversity (little species in the seabed). However there are still large gaps in our understanding of its role in supporting the rich fisheries and charismatic marine life of Falkland waters. This area is also likely to be very important in the face of ongoing climate change; because it’s located at the southern edge of the continental shelf; it’s the ‘last stop’ for many species whose ranges are shifting South with warming sea temperatures.

Beyond this, the ocean plunges to great depths, which some species cannot survive and/or cross. Being able to understand an ecological baseline for the region should help us to better understand it and manage it, as it will allow us to identify any ecosystem shifts in the long run.



The rough seas of the Burdwood Bank

The Bank is also thought to be important for blue carbon ecosystem services, meaning that the area may help to trap greenhouse gases from the atmosphere over long periods of time and store them. From other areas that perform these vital services, we know that destroying these ecosystems could mean lower capacity for the oceans to store carbon in the long term, which could have further implications for climate change. The Burdwood Bank is obviously quite far South in an area of rough and challenging seas, so the British Antarctic Survey, as a partner in the project, has helped to make research on the Burdwood Bank a reality.

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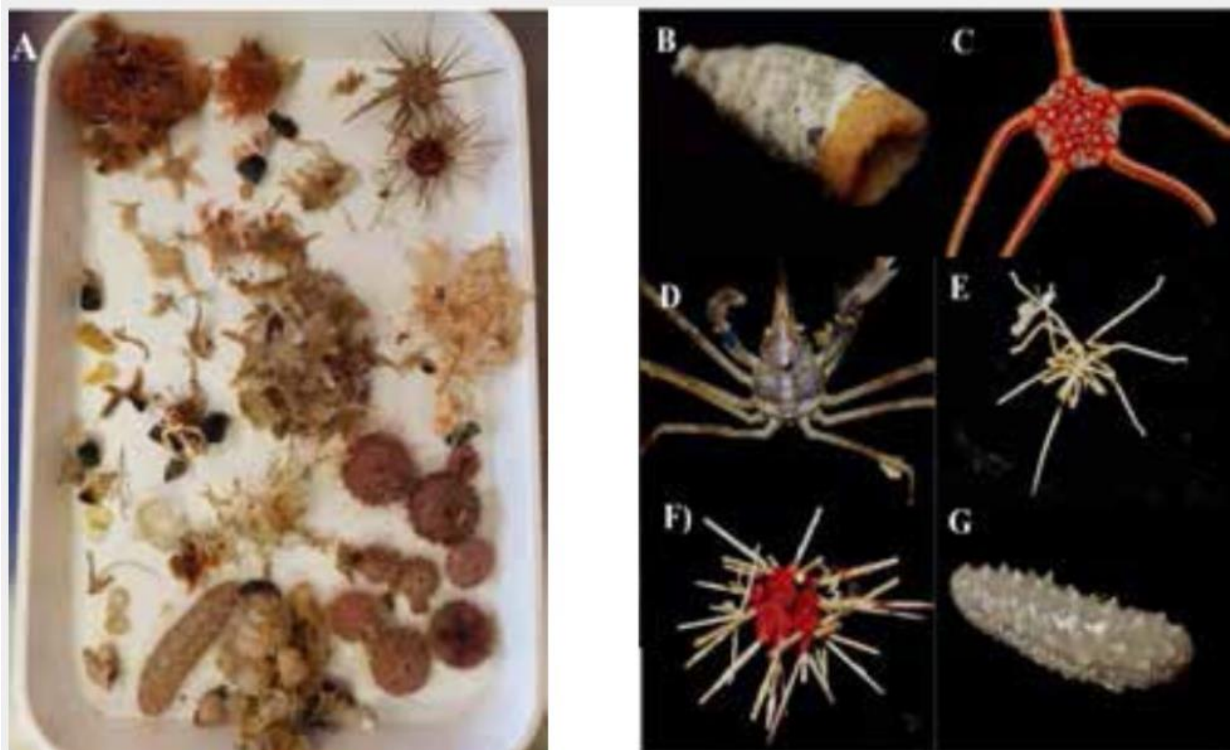
Deploying survey equipment

In early December 2018 Dr de Lecea and Dr Costa boarded the RRS James Clark Ross (JCR), and made their way down to the Bank. There they deployed scientific equipment, including: a high-resolution multibeam ecosounder and TOPAS (sub-bottom profiler) to map the sea floor, and mini Agassiz trawls to collect animals from depths of 400m to 1300 m for study. They

mapped a 6,096.44 km<sup>2</sup> area at in high definition and collected over 365 different samples. Much work is now required counting and identifying species in collaboration with experts at BAS (UK) and at the Italian National Antarctic Museum in Genoa, Italy, who will assist in carrying out identifications through genetic analyses. We hope to have some new species discovered and named!

This Darwin Plus-funded project lead by SAERI builds on previous work of the Marine Spatial Planning within the Falkland Islands, which was first explored during 2014-2018. Following its successful conclusion, the Falkland Island Government contracted SAERI to undertake a second phase (MSP Phase II; July 2017 to December 2017) which covered three key aspects, including an assessment of fishing closure areas as sites for potential marine management areas (MMAs) against international criteria for Marine Protected Areas. Three areas were identified including the Burdwood Bank, Beauchêne Island and the inshore waters. In order to consider their implementation, the current Darwin-Plus MMA project sets out to conduct key baseline work required for their effective design and management. Five steps have been identified; development of 1) economic consequences of any design (present and future), 2) Policy formulation, 3) Site Management Plans, 4) Suggested legislative framework and 5) Legacy Planning (resourcing, financial, human). Thanks to this key information gained on this first research cruise, we will be able to make the most of a longer research trip on the JCR in summer 2019/2020, that will include seabed photography, more seabed mapping, and species sampling of this dynamic feature of the Falklands marine ecosystem.

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Example of specimens separated from the gravel in the trawl (A), as well as a small example of individual organisms preserved. These are, by class: (B) an Anthozoa, (C) an Ophiuroidea, (D) Malacostraca, (E) Pycnogonida, (F) Echinoidea, and (G) Holothuroidea. Figure A courtesy of A Roman Gonzalez, pictures B to G taken by CJ Sands.

If you want to know more about this research program, come to the Dockyard Museum on March 1 (5pm) where Marina and Ander, will be giving a talk about their work on the Burdwood Bank and trip to Antarctica showing some of the organisms that they collected there, and sharing their experience on the JCR and with British Antarctic Survey on their ICEBERGS2 project in Antarctica. The researchers thank the Darwin Initiative for the funding support via their Darwin+ scheme and the Falkland Island Government via the Environmental Studies Budget scheme.

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