



7th May 2018

Discovery of 100+ new species around Bermuda confirms a new zone in the ocean

Results from Nekton Mission I, the XL Catlin Deep Ocean Survey, released today ahead of the Ocean Risk Summit in Bermuda provides confirmation of a new zone in the ocean, the Rariphotic Zone (Rare Light Zone) from 130 metres to 300 metres.

The Rariphotic Zone is the fourth zone confirmed in the top 3000 metres of the ocean, each defined by distinct biological communities living at different depths. The zones are the Altiphotic (0 metre to 40 metres), Mesophotic (40 metres to 130 metres), Rariphotic (130 metres to 300 metres), and Bathyal Zone (300 metres to 3000 metres).

Alex Rogers, Scientific Director of the Nekton Oxford Deep Ocean Research Institute ('Nekton') and Professor of Conservation Biology at the University of Oxford, believes this discovery could challenge assumptions of biodiversity of life patterns, including the number of different species in the ocean.

"If life in the shallower regions of the deep sea is so poorly documented it undermines confidence in our existing understanding of how the patterns of life change with depth," says Professor Rogers.

During field research, the discovery of a major subsea algal forest on the summit of the previously under explored Plantagenet Seamount (locally known as Argus) provided the first indications of a potentially major scientific breakthrough. Just 15 miles off the coast of Bermuda, the slopes of the Seamount were found to have gardens of twisted wire corals and sea fans. There were also communities of sea urchins, green moray eels, yellow hermit crabs and other mobile fauna feeding off zooplankton and algae drifting off the summit and settling on the deep seabed. There are more than 100,000 seamounts globally but less than 50 have been biologically sampled in detail.

Following the survey, laboratory analysis conducted by a network of scientists from across 15 different marine research institutes revealed the discovery of over an estimated 100 new species including very small animals such as tanaids to dozens of new algae species and larger charismatic animals such as black wire coral that stand up to two metres high.

"We believe we have discovered dozens of new species of algae including the deepest ever record to have had its DNA sequenced. Many are recognised for demonstrating a new biogeographical link between Bermuda and the Indo-Pacific", says Professor Craig Schneider, Trinity College, USA, one of the participating scientists.

“We have discovered at least 13 new crustacean species including tanaids, gnathiid isopods and leptostracans,” explains Professor Nick Schizas, University of Puerto Rico at Mayaguez, who participated in the Mission.

“Considering the Bermuda waters have been comparatively well studied for many decades, we certainly weren’t expecting such a large number and diversity of new species,” explains Professor Rogers. “These discoveries are evidence of how little we know and how important it is to document this unknown frontier to ensure that its future is protected.”

Since September 2016, scientists drawn from a network of over a dozen participating marine research institutes have collaborated to analyse 40,000 specimens and samples, and 15,000 litres of water samples. The team developed new techniques to collect data from 240 video transects. The first peer-reviewed scientific papers have been published from the XL Catlin Deep Ocean Survey. It documented the deepest recorded evidence of lionfish globally which reveals the spread of this invasive species is deeper into the ocean than previously known.

The synthesis of results from the XL Catlin Deep Ocean Survey is expected to be published by September 2018. At least 20 scientific papers are expected to be published in total.

CEO of XL Bermuda Ltd/Insurance, Patrick Tannock, who chairs XL Catlin’s philanthropic XL Foundation which funded the XL Catlin Deep Ocean Survey, says: “As a future-focused, innovative insurance and reinsurance company, we at XL Catlin believe that preparing for emerging and unknown risks is imperative. Given that there is still much to be learned about how changes to the ocean will impact businesses, communities and society in the future, we are extremely interested in the findings from the XL Catlin Deep Ocean Survey and look forward to receiving the published report of the amalgamated results and scientific papers.”

In March 2018, in the scientific journal Nature Scientific Reports, Dr. Carole Baldwin from the Smithsonian Institute described the discovery of unique reef-fish communities living above the seabed between 130 and 309 metres around the Caribbean island of Curacao that are taxonomically distinct from shallower animals. Lacking an existing name for this depth zone Dr. Baldwin proposed ‘rariphotic’.

Results from the XL Catlin Deep Ocean Survey in Bermuda confirm that a similar zonation of life exists in the water column, and provides additional evidence of this zonation within the biota of the seabed including corals, sponges and algae.

The XL Catlin Deep Ocean Survey’s transect data from the Kelvin Seamount on habitat and species presence has already been used by North West Atlantic Fisheries Organisation to increase protection of the area. The Mission also saw the launch of the United Nations Educational, Scientific and Culture Organisation’s (UNESCO) World Heritage in the High Seas Programme. The Mission has been credited as the spark for Sky PLC’s Ocean Rescue Campaign.

Ends.

EDITOR'S NOTES

The XL Catlin Deep Ocean Survey is a major scientific marine research expedition to investigate ocean function, health, and resilience across the Northwest Atlantic and focused on Bermuda. The field research was conducted in July and August 2016. Two research vessels were utilised from the United States and Canada, furnishing portable labs capable of specimen sorting, microscopy, and genomics. Technical dive teams operated to 90 metres performing line transects and sampling of benthic specimens. A total of thirteen different research tools were deployed including two Triton manned submersibles operating to 300 metres with a remotely vehicle (ROV) undertaking sampling down to 1500 metres.

The Mission also saw the field-testing, creation and publication of a new standard method for conducting ocean research. The General Ocean Survey and Sampling Iterative Protocol (GOSSIP) enables marine scientists to measure physical, chemical and biological indicators (essential ocean variables or EOVs) in a standardised way to generate comparable data on the function, health and resilience of the ocean. (*Further details on GOSSIP:* <https://nektonmission.org/science/nekton-protocol>).

Of historical note, from 1930 to 1934, William Beebe and Otis Barton became the first people ever to descend into the deep ocean (beneath 200metres). Their dives were conducted in Bermuda and their dive sites were revisited by the Mission.

Further details about the Nekton Mission 1, XL Catlin Deep Ocean Survey:

- Scientific Publications & Cruise Report: <https://nektonmission.org/science/publication-cruise-reports>
- Film: XL Catlin Deep Ocean Survey: Results: <https://youtu.be/wgr6aBL1gwk>
- Below the Mesophotic, Dr. Carole Baldwin Publication in Nature Scientific Reports: <https://www.nature.com/articles/s41598-018-23067-1>

MEDIA CONTACTS

- For more information or to schedule an interview please contact the Media Office of the Nekton Oxford Deep Ocean Research Institute: media@nektonmission.org / +44 7984 677509.
- For additional media materials from the Mission (still images, VNR, briefing notes) visit our newsroom available at: <https://nektonmission.org/about/press>

ABOUT NEKTON OXFORD DEEP OCEAN RESEARCH INSTITUTE (www.nektonmission.org)

The mission of the Nekton Oxford Deep Ocean Research Institute (Nekton) is to explore the deep ocean to reveal the unknown for the benefit of humanity. Nekton undertakes multidisciplinary scientific research into the state of the deep ocean, the planet's most critical yet least explored ecosystem. Nekton's discoveries inform global decision makers and ignite public interest to catalyse change. The Nekton Oxford Deep Ocean Research Institute is a charity, established in the UK, with headquarters in Oxford.

ABOUT XL CATLIN DEEP OCEAN SURVEY (www.nektonmission.org/mission-i)

The XL Catlin Deep Ocean Survey is Nekton's first multidisciplinary scientific research mission to investigate the state of the deep ocean around Bermuda, the Sargasso Sea and

the NW Atlantic. The mission aims to create, develop and field test a new standardised methodology for marine scientists around the world to assess the function, health and resilience of the deep ocean.

ABOUT XL CATLIN – www.xlcatlin.com

XL Catlin, presenting partner of the Ocean Risk Summit, is the global brand used by XL Group Ltd's (NYSE:XL) insurance and reinsurance companies which provide property, casualty, professional and specialty products to industrial, commercial and professional firms, insurance companies and other enterprises throughout the world. Clients look to XL Catlin for answers to their most complex risks and to help move their world forward.

ABOUT THE GENERAL OCEAN SURVEY AND SAMPLING ITERATIVE PROTOCOL ('GOSSIP')

1. Publication: In Oceanography: <http://www.tos.org/oceanography/article/a-multidisciplinary-approach-for-generating-globally-consistent-data-on-mes>
2. Further information about the Protocol <https://nektonmission.org/science/nekton-protocol>
3. Protocol Film: <https://youtu.be/BGekxHxb4b4>

LEAD SCIENTISTS:

- **PROFESSOR ALEX ROGERS:** Alex is Professor of Conservation Biology at the Department of Zoology, Fellow of Somerville University of Oxford, Scientific Director of Nekton Oxford Deep Ocean Research Institute and the International Programme on the State of the Ocean. He has led and participated in 20 major marine expeditions including coordinating technical dive teams. His marine policy work includes projects for the UN International Seabed Authority, UN Division of Ocean Affairs and Law of the Sea, IUCN, Global Ocean Commission, and the G8+5 Global Legislators Organisation for a Balanced Environment (GLOBE).
- **DR LUCY WOODALL:** Oxford University, Nekton Principal Scientist, UK, Advisor to IUCN, OSPAR Commission, UK Government