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Highlight:

From Tenerife to Trinidad - ERC research team gets ready to dive to deepest-known parts of the Equatorial Atlantic Ocean

11 October 2013

An international team of researchers, led by European Research Council grantee Laura Robinson, heads out to sea from Tenerife (Spain) on 13 October. The scientists will sail on the British research vessel, the James Cook, to explore the deep-sea corals of the Equatorial Atlantic Ocean. Equipped with the ISIS remotely-operated vehicle (ROV), the boat will allow them to study the past and present ocean chemistry and assess its impact on fragile deep-sea ecosystems. The cruise will reach its final destination, Trinidad, at the end of November 2013.

Oceans are undoubtedly a key part of the climate system and variations in the circulation of heat, carbon and nutrients in their water masses are likely to affect global climate change. The team of oceanographers headed by British Dr Laura Robinson that is embarking on their voyage on Sunday is about to cross the Atlantic to collect and analyse samples of corals, seawaters and sediments throughout their route.

From Southampton harbour (UK) where she prepared for her upcoming cruise, Dr Laura Robinson commented: *“Our research team is excited at the idea of starting this long 48 day cruise. We have already loaded some 130 boxes onto the boat, filled with science kits and personal items. All our equipment and labs on boat must be prepared in advance so that they are ready for action when we reach warmer climes”.*

The team brings together oceanographers, geochemists and marine biologists, amongst whom is also Dr Veerle Huvenne, a Belgian ERC grantee from the National Oceanography Centre (Natural Environment Research Council) in the UK. They will be looking at both modern and fossil corals, trying to better understand their habitats, ecology and chemistry and fill the gaps in our knowledge of oceanic history. The James Cook has been specially equipped with 5 different scientific and control laboratories to meet the needs of the research group and provide for the use of specialist geochemical techniques. The crew will work 12 hour shifts from 4am to 4pm and 4pm to 4am to allow for constant operation of the labs and maximise productivity.

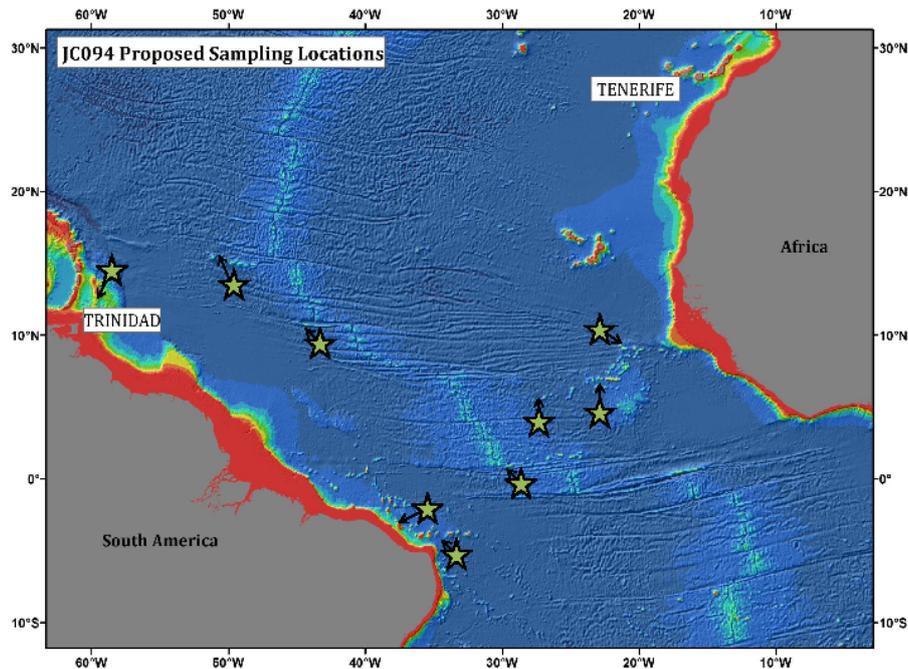
One of the most innovative aspects of this research is to use skeletons of deep-sea corals for analysis and match them with seawater and sediment samples in a single programme. The combination of ship board field work, modern calibrations and cutting-edge geochemical analyses, will help the team to produce the relevant samples and data.



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The scientists also expect to explore new regions, collecting materials from areas which are ideally located for detecting abrupt changes in ocean circulation. The areas they plan to visit depend on a wide range of scientific and logistical factors but include the seamount chains of Sierra Leone Ridge, the Atol das Rocas and the Mid-Atlantic Ridge (see map below).



Source: Shannon Hoy, Tropics research cruise

Talking about the mysteries around these unexplored sites, ERC grantee Laura Robinson says: *“My goal is to understand the dynamics and connections between the deep ocean and the climate in the past, and how these changes have impacted fragile marine ecosystems. For instance, many species of deep-sea corals have skeletons which are susceptible to degradation by ocean acidification”*. She adds: *“Previous discoveries have taught scientists to expect the unexpected. Marine research certainly holds clues to determine the cause of local extinction and repopulation events. During our cruise, we will explore the impact of temperature, salinity and nutrient supply on these corals and we hope to provide new insights into deep-sea oceanography including the processes involved in abrupt climate change, past and present.”*

The expedition is being run from the James Cook, an 89mx18m British research ship, named after the 18th century explorer who blazed a trail of discovery around the Pacific. The vessel is equipped with the latest technology able to open up and understand the underwater world, its landscapes and unusual forms of life. In particular, the team will use ISIS, a tethered underwater robot that is unmanned, highly manoeuvrable and controlled by an operator aboard the James Cook. The ROV can function in the depths of the ocean and is equipped



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with sonars, cameras, manipulators and instruments to measure water clarity, light penetration and temperature. *“From an engineering perspective, the Isis ROV which operates on the James Cook, is a fantastic piece of equipment”* says Dr Laura Robinson. *“It will allow us to take precision samples and to conduct experiments at depths unreachable by human divers”.*

Dr Veerle Huvenne adds: *“On this expedition, I will be coordinating all the mapping activities. We will use the ship-borne multibeam echosounder to create maps of the seamounts and dive sites. Combined with the information we will get from the video recordings, this will give us a good idea of the spatial distribution of benthic communities and seabed features.”*

Working respectively at the University of Bristol and at the National Oceanography Centre in Southampton (Natural Environment Research Council), Laura Robinson and Veerle Huvenne are amongst over 900 UK-based scientists funded by the ERC. They say: *“This type of research requires expensive field work and labour intensive laboratory components. The ERC grant is then very well suited; it allows us to mount seagoing expeditions, and develop cutting-edge programmes, while also guiding and training post-docs and graduate scientists”.*

Listen to the podcasts of Laura Robinson made a few days before departing:

[Podcast 1](#) ■ Aim of the cruise and importance of this research for science, citizens and policy-makers

[Podcast 2](#) ■ Working aboard the James Cook (labs, shifts, dives and equipment)

[Podcast 3](#) ■ Laura Robinson’s career and the impact of ERC funding

Several dives are scheduled in the coming days, the first site to be reached between 18 and 19 of October. For more information (including pictures and videos of the cruise), follow the ERC [Twitter](#) and [Facebook](#) accounts.

Also click [here](#) for an interactive live map tracking the James Cook during its cruise.

Links from the research team:

[Blog](#) ■ [Facebook page](#) ■ [Twitter account](#)

For audiovisual footage on the research of Veerle Huvenne, click [here](#). (Dive carried out in 2011, presenting a section of the seafloor on Rockall Bank at ca. 180m water depth).

Projects details:

ERC grantee: Laura Robinson

Host institution: University of Bristol (UK)

ERC project: Reconstructing abrupt Changes in Chemistry and Circulation of the Equatorial Atlantic Ocean: Implications for global Climate and deep-water Habitats (CACH)

ERC call: Starting grant 2011

ERC funding: €2 million for five years



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ERC grantee: Veerle Huvenne

Host institution: National Environment Research Council (UK)

ERC project: COmplex Deep-sea Environments: Mapping habitat heterogeneity As Proxy for biodiversity (CODEMAP)

ERC call: Starting grant 2010

ERC funding: €1.4 million for five years

Note to the editors

The European Research Council (ERC)

Set up in 2007 by the European Union, the ERC aims to stimulate scientific excellence in Europe by encouraging competition for funding between the very best, creative researchers of any nationality and age based in Europe. Since its launch, the ERC has selected some 3,860 researchers and their frontier research projects for funding. The ERC operates according to an "investigator-driven", or "bottom-up", approach, allowing researchers to identify new opportunities in all fields of research (Physical Sciences and Engineering, Life Sciences and Social Sciences and Humanities), without predetermined priorities. It has also become a benchmark of the competitiveness of national research systems and it complements existing funding schemes at national and European levels.

The ERC, which is currently funded under the EU's Seventh Research Framework Programme (FP7), has a total budget of €7.5 billion from 2007 to 2013. In November 2011, the European Commission proposed a substantial increase of the ERC budget to over €13 billion under *Horizon 2020*.

The ERC is composed of an Executive Agency and a Scientific Council. The Scientific Council is made up of 22 top researchers and sets the ERC's scientific strategy. The ERC is led by President Prof. Helga Nowotny and the Scientific Council is represented in Brussels by Secretary General Prof. Donald Dingwell. The ERC Executive Agency implements the "Ideas" programme and is led by Director Pablo Amor.

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