

**FURTHER INFORMATION**

**Ref: A2061**

**Senior Research Associate – Coral reef fish ecology and functioning in the Chagos Archipelago  
(Bertarelli Foundation Grant)**

PI, Prof Nick Graham, Lancaster Environment Centre, Lancaster University, UK

**The Project**

Lancaster Environment Centre (LEC) is seeking to appoint a Post-Doctoral Research Associate in marine science. The project is in collaboration with the Australian Institute of Marine Science, and Stanford University, enabling collaborative opportunities.

The Chagos Archipelago (British Indian Ocean Territory) is unique in the Indian Ocean, with the northern archipelago uninhabited and experiencing very little direct human impact. This results in Chagos having very high fish biomass, and unique trophic structure as compared to other locations across the Indian Ocean and globally (MacNeil et al. 2015; McClanahan et al. 2015; Graham et al. 2017). Another unique facet of the archipelago is its seabird colonies, with Chagos boasting 10 International Bird Areas (IBAs). However, while some islands have very large breeding seabird colonies, others have very few birds due to invasive rats. Collectively, these attributes provide some unique natural experiment opportunities for comparison to other coral reef locations in the Indian Ocean and beyond.

This project will aim to understand reef fish ecology and functioning of the Chagos Archipelago compared to other coral reef locations, and how the ecosystem is responding to the major 2016 coral bleaching event. Underwater visual census surveys of reef fish communities in Chagos will build on a time series and extensive spatial data across the Indian Ocean, enabling diverse questions including those related to illegal poaching, habitat change, and functional structure.

Seabirds feed predominantly in pelagic ecosystems, and return to the islands to roost and breed. As such they deposit substantial quantities of nutrients on the islands in the form of guano. Such spatial subsidy of nutrients can have a major influence on terrestrial vegetation and invertebrates (Croll et al. 2005), and in turn leach into the nearshore marine environment, bolstering plankton densities and influencing manta ray feeding patterns (McCauley et al. 2012). In Chagos, fish grow faster and overall fish biomass is greater adjacent to islands with seabirds (Graham et al. unpublished data). This bolstering of productivity is likely to have a substantial influence on ecosystem functioning. This project will assess how seabird nutrient inputs influence reef fish ecosystem functioning, the resistance of reefs to thermal stress and, the ability of reefs to recover from coral bleaching.

**Further reading:**

- Croll et al. (2005) Science 307 : 1959-1961
- Graham et al. (2015) Nature 518:94-97
- Graham et al. (2017) Current Biology 27 : 231-236
- MacNeil et al. (2015) Nature 520: 341-344
- McCauley et al. (2012) Scientific Reports 2 : 409
- McClanahan et al. (2015) Conservation Biology 29: 409-417

**The Department**

Lancaster Environment Centre forms one of the largest and most prestigious groups of interdisciplinary environmental researchers in the world, with over 200 staff, and research and teaching that span the Environmental, Biological and Social Sciences. LEC was formally constituted on 1<sup>st</sup> August 2008 through the merger of three successful university departments (Environmental Science, Geography and the non-Medical parts of Biology) and now operates as a fully integrated university department on a single site. It is the largest department in Lancaster University and a key player in the strategic development of the institution and the Faculty of Science and Technology. The co-location of the NERC Centre for Ecology and Hydrology on the Lancaster campus as part of the LEC complex adds critical mass in environmental research capacity enabling staff from both organizations to work closely together in a formal collaboration. LEC currently admits about 240 undergraduate students and 100 postgraduate (MSc/PhD) students each year and teaches across a wide range of degree schemes.

**The University**

Lancaster is the Times University of the Year, ranked 6<sup>th</sup> overall in the UK, and is in the top 1 percent of the world ranking (QS). The university continues to grow its reputation for teaching and research excellence both nationally and internationally. Established in 1964, Lancaster currently has over 12,000 students and has had £450 million invested in the campus over the last ten years. The University boasts an idyllic campus that combines city, coast and countryside all into one. The campus setting conveys a tranquil ambiance whilst offering such a range of facilities it can almost be called a small town in its own right. More recently, Lancaster University has developed a portfolio of teaching partnerships overseas, as part of its global outreach internationalisation strategy.

**The City and the Region**

The main campus lies 3 miles outside the City of Lancaster and is easily accessible via road, rail and bicycle. The city centre is just 15 minutes away by bus, and was recently ranked one of the top 10 most vibrant cities in the UK thanks to its arts scene and student population. The City of Lancaster also enjoys a long and diverse history dating as far back as 1193, and has a well-maintained iconic city centre and medieval castle. The campus is just 30 miles south of the beautiful Lake District and about the same distance from the Yorkshire Dales. It is very well connected by road and rail, with Manchester (and its international airport) just over an hour distant, while the train journey to London takes under two and a half hours.

**Further information**

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