**Further Information – PDRA: Pelagic Subsidies to Coral Reefs**

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**The Project**

Lancaster Environment Centre (LEC) is seeking to appoint a Post-Doctoral Research Associate in marine science. The project is based within the LEC REEFS research group, with associated research partners and significant opportunities for international collaboration.

The transfer of pelagic energy into coral reef food webs is a significant source of nutrients for island ecosystems, helping to fuel growth and biomass in corals and fishes, and supports important coastal fisheries for reef fishes that feed in pelagic habitat. Pelagic subsidies move through multiple pathways, including planktivorous fishes accessing nearshore plankton and top predators foraging on pelagic fishes. The availability of pelagic nutrients is also controlled by oceanographic processes such as internal waves. Isotopic techniques have helped to quantify pelagic contributions to reef fish diets, while oceanographic models and remote-sensing datasets have developed understanding of the physical mechanisms delivering pelagic energy to reef environments (e.g. the Island Mass Effect). However, pelagic contributions to fish diets vary among species and habitats, while oceanographic forcing is seasonally and regionally variable, with planktonic subsidies moderated by physical characteristics such as bathymetry. As such, we lack a quantitative understanding of how pelagic ~ reef connectivity varies at large scales, and how shifts in the relative contribution of pelagic and benthic energy pathways might alter reef functions and services (e.g. fisheries).

This project will draw on existing isotope samples, large-scale oceanographic and remote-sensing datasets, and community ecology data, to quantify variation in pelagic subsidies between reef habitats, islands, and regions. Practical knowledge and experience with physical oceanography methods, including biophysical modelling, or with stable isotope analysis (e.g. Bayesian mixing models) will be highly valued. Field work in focal study systems (e.g. Indian Ocean) may be required to collect ecological samples, requiring underwater experience (e.g. SCUBA), while stable isotope techniques and remote-sensing analysis (e.g. COPERNICUS, MODIS) are highly desirable skills for the position. This macroecological approach will require effective collaborative research between you and experts in oceanography, isotope ecology, and community ecology. These themes and study systems permit a diversity of approaches and questions to be asked, which candidates are encouraged to think through in applying.

**Further reading:**

* Robinson et al. (2023) *Trends in Ecology & Evolution* **39**
* Benkwitt et al. (2021) *Current Biology* **31**
* Williams et al. (2018) *Marine Biology* **165**
* Skinner et al. (2021) *Science Advances* **7**
* Morais et al. (2021) *PLoS Biology* **19**
* Messié et al. (2022) *Nature Geoscience* **15**

**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 1st 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. Within the department there is a strong research grouping on tropical issues, including hyperdiverse ecosystems such as tropical forests and coral reefs, and connections with Lancaster’s Data Science Institute. The successful applicant would be part of the LEC-REEFS research group, comprising ~25 coral reef scientists ([www.lec-reefs.org](http://www.lec-reefs.org)).

**The University**

Lancaster is consistently ranked in the top 10 across all three major UK university league tables, 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 (15-30 minutes by bus or bicycle). Lancaster 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 from the beautiful Lake District National Park, with extensive opportunities for hiking, running, swimming, cycling, and climbing. It is very well connected by road and rail, with Manchester (and its international airport) one hour away, and trains to Glasgow, Edinburgh, or London in under three hours.

**Further information**

Informal enquiries to Dr James Robinson (james.robinson@lancaster.ac.uk).