Project title: Modelling climate, oceanography, and carbonate production of corals in the Pliocene

Location: School of Geographical Sciences, University of Bristol (Bristol, UK)

Supervisor: Prof Dan Lunt (d.j.lunt@bristol.ac.uk)

Summary: An Earth System modelling approach will be used to investigate global change through Pliocene, and the implications for carbonate production of corals will be explored. A suite of palaeogeographic maps with a temporal resolution of ~1 million years (including the Holocene as a baseline) will provide the basis for a set of global climate model (HadCM3 and/or UKESM) simulations. Sensitivity studies to the palaeogeography, particularly in the region of the Coral Triangle, and orbit and CO2 will be carried out, in order to fully explore the uncertainties in the Pliocene climate.

Objectives of the project:
1) To produce a Pliocene climate “Atlas”, generated from output from a climate model, and evaluated using proxy climate data.
2) To explore the sensitivity of this modelled climate to uncertainties in atmospheric CO2 and palaeogeography, and the envelope of orbital variability.
3) To explore in detail the oceanography (in particular, its variability on multiple timescales from seasonal to orbital) of south-east Asia in the Pliocene.
4) To study implications for carbonate production of corals.

Expected results: It is expected that the model results will provide a fascinating insight into the global oceanographic state in the Pliocene, with an emphasis on the sensitivity of the system to the various drivers. Analysis will focus on modes of variability, such as ENSO, and its expression in the Coral Triangle. An expected result is a prediction of the time-varying magnitude and frequency of ENSO, and other modes, through the Pliocene.

Secondments: GUF and/or Deltares.

Eligibility criteria: EU eligibility criteria for candidates: Candidates of any nationality, but in order to be eligible for the positions the following criteria applies to all applicants: 1) The applicant shall at the time of recruitment be in the first four years of his/her research career and have not been awarded a doctoral degree. 2) The applicant must not have resided or carried out his/her main activity in the country of the host institute for more than 12 months in the 3 years immediately prior to the recruitment.

Candidate profile: Candidates must hold a degree in the physical sciences (e.g. Physics, Mathematics, Earth Sciences, Geography). We are looking for highly motivated students with good communication skills. Experience with climate modelling is desirable but not essential.

Application
To apply, visit our prospectus page, [http://www.bristol.ac.uk/study/postgraduate/2019/sci/phd-geographical-sciences/](http://www.bristol.ac.uk/study/postgraduate/2019/sci/phd-geographical-sciences/)

For further information please contact Dan Lunt (d.j.lunt@bristol.ac.uk)
An Early-Stage Researcher (ESR) positions are available as part of the MSCA ETN ‘4D-REEF’

PAST, PRESENT AND FUTURE OF TURBID REEFS IN THE CORAL TRIANGLE

We are pleased to advertise an Early-Stage Researcher (PhD) positions to begin in October/November 2019, as part of the MSCA Innovative Training Network “Past, present and future of turbid reefs in the Coral Triangle (4D-REEF)”. The position is for 3 years, and requires the enrolment in our PhD programme, enhancing your career perspectives in both the academic and non-academic sector. In addition to the PhD project, you will benefit from an exciting training programme comprising an integrated curriculum of local and network wide training activities related to the development of scientific knowledge and the enhancement of transferable skills.

Overall Project Objectives

Using a variety of paleo-ecological and present-day data, 4D REEF investigates the hypothesis that turbid coastal environments provide a refuge for coral reefs in periods of warm climate. The key questions to be addressed are:

1) What was the biodiversity of turbid reefs in the past and in what habitats did the reefs grow in past warmer periods of the Earth’s history, and how does this compare to the present? (WP1)
2) What are the environmental constraints on ecosystem functions of turbid reefs? (WP2)
3) How can we use information from past reefs to better understand the future trajectories of modern coral reefs, and apply this towards reef restoration actions? (WP3)

By answering these questions, we aim to understand the role of turbid reefs for the future of marine ecosystems in the Coral Triangle as they respond to anthropogenic environmental change.

Benefits

The benefits of this project for you and the future of your career are many fold, here’s a few key aspects that 4D-REEF can offer you:

- Working on the forefront of many aspects of the (paleo)ecology of turbid reefs and the environments they develop in, applying innovative techniques.
- You will be employed by the host organisation for 36 or in some cases 48 months.
- A competitive salary plus allowances. Moreover, funding is available for technical and personal skills training and participation in international research events.
- You will benefit from the designed training programme offered by the host organisation and the consortium.
- You will participate in international secondments to other organisations within the 4D-reef network and in outreach activities targeted at a wide audience.
- You will be part of an international research consortium of over > 25 researchers.