

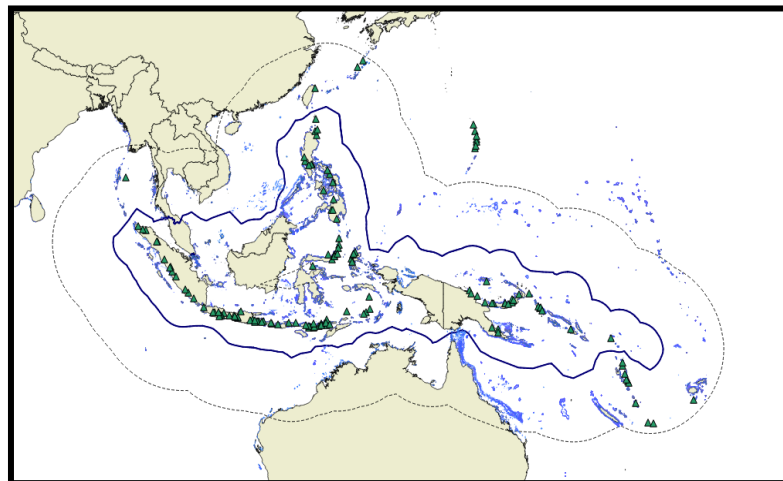
**Project title: Modelling environmental controls on coral species distribution in the Coral Triangle (ESR6)**

**Location:** School of Earth Sciences, University of Bristol (Bristol, UK)

**Supervisors:**

Dr Erica Hendy (Bristol; [e.hendy@bristol.ac.uk](mailto:e.hendy@bristol.ac.uk)  
<http://www.bris.ac.uk/earthsciences/people/erica-hendy/index.html>)  
Dr Elena Couce (CEFAS; Lowestoft, UK; <https://www.cefas.co.uk/>)  
Dr Susanna Jenkins (Earth Observatory of Singapore;  
<https://earthobservatory.sg/people/susanna-jenkins>)

The "Coral Triangle" is recognised globally as a conservation priority. Although representing just 1.6% of the world's ocean (dark blue outline on map), this region contains over 75% of known coral and coral reef fish species, and in total ~20% of all known marine species. Yet the region has experienced dramatic climatic and geological changes since the late Neogene.



Assessing these environmental controls on coral species distribution within the Coral Triangle is critical for future risk analysis and management of the regional biodiversity and marine resources.

**Objectives of the individual project**

- 1) To use probabilistic hazard and risk assessment tools to quantify spatial patterns of geological processes that will impact coral reefs across the Coral Triangle. Specific question: How are species richness patterns correlated with rates of disturbance?
- 2) To model the spatial distribution of coral species by applying ecological niche models (ENMs), using the environmental data outputs from the climate and oceanographic modelling (ESR15) and probabilistic hazard maps (Obj. 1), trained and validated against the largest available dataset of collection records of extant coral taxa (ESR 9).
- 3) To hindcast late Neogene and Holocene coral taxa distributions and explore biogeographic patterns and environmental controls.

**Expected results:** This project will map geological hazards that need to be considered in regional conservation policy and marine resource management, as well as provide information drivers of past species richness, biogeographic patterns, and species turnover.

**Secondments:** EOS (Singapore), CEFAS (Lowestoft, UK), NHM (London, UK)

**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 UK for more than 12 months in the 3 years immediately prior to the recruitment.

**Candidate profile:** This project would ideally suit a candidate with strong quantitative and computing capabilities, a passion for marine science and a flair for data visualisation. The project will heavily rely on the application of R, Matlab and ArcGIS, and include the use of a Linux operating system, so some prior experience is very desirable, however, training will be provided. This is an interdisciplinary project requiring strong networking and communication skills. Candidates must hold a degree in either physical (e.g. Earth Sciences, Geography) or life sciences (specialising in ecology and statistical methods).

**This is 1 of 15 Early-Stage Researcher (ESR) positions available as part of the MSCA ETN '4D-REEF'**

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

### 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 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?
- 2) What are the environmental constraints on ecosystem functions of turbid reefs?
- 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?

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.

More information about 4D-REEF is available at: <https://www.naturalis.nl/en/4d-reef>

We are pleased to advertise 15 Early-Stage Researcher (PhD) positions as part of the MSCA Innovative Training Network "Past, present and future of turbid reefs in the Coral Triangle (4D-REEF)". All the positions correspond to three or four years hiring depending on the institute, and require the enrolment in a PhD programme enhancing their career perspectives in both the academic and non-academic sector. Each ESR will crucially gain inter-sectoral experience in an individual ESR research project. In addition to their individual doctoral projects, all ESRs 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. At the core of the training programme lie the research projects conducted by the ESRs, which are enhanced by all other training events and activities the consortium provides during the project's life span.