

IMPERIAL

PhD opportunity (2027 start): Hydrodynamics of coral reef restoration

Supervisor: [Dr Adrien Lefauve](#)

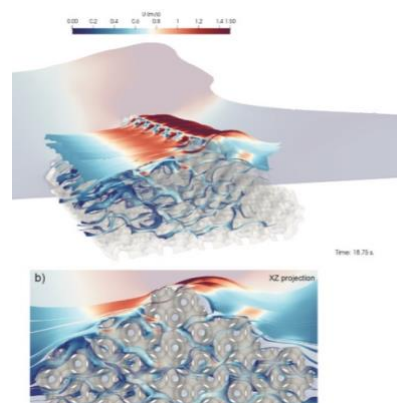
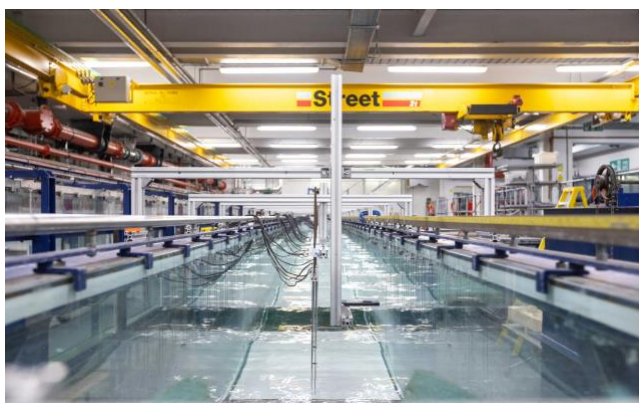
Institution: Imperial College London

Department: [Civil and Environmental Engineering](#) and [Grantham Institute – Climate Change and the Environment](#), South Kensington Campus

Project summary: Coral reefs support biodiversity, livelihoods and coastal protection, but are increasingly threatened by ocean warming. Restoration helps damaged reefs recover, yet we still need to understand where and how it is most likely to succeed. This project will investigate how ocean flows shape the conditions experienced by corals, with the aim of informing restoration strategies. It builds on collaborations with researchers and organisations in Bali, including Indonesia's National Research and Innovation Agency (BRIN). The research could address several connected questions:

- **Coastal oceanography:** How do tides, waves and currents create different conditions between restoration sites and depths?
- **Temperature variability:** Can periodic intrusions of cooler water reduce heat exposure, what is the origin of these intrusions, and how does this vary across sites?
- **Restoration structures:** How do their shape, spacing and arrangement affect circulation, mixing and the transport of heat, nutrients and sediment?
- **Larval transport and settlement:** How do flows influence the delivery, retention and settlement of coral larvae on artificial structures?
- **Restoration strategy:** How can this understanding guide site selection, deployment depth and restoration design?

The precise focus will be developed around the student's interests and strengths. Methods could combine field observations in Indonesia, laboratory experiments at Imperial's leading [Hydrodynamics Laboratory](#) and numerical modelling. Working with local researchers and restoration practitioners will help connect fundamental fluid mechanics with practical decisions about reef recovery and resilience.



You will join Imperial's Department of Civil and Environmental Engineering and the Grantham Institute, benefiting from a world-leading education, professional development and research environment in environmental fluid mechanics, climate change and sustainability

Funding: There is currently no dedicated funding attached to this opportunity. Suitable candidates may be supported in applying for [departmental or Imperial scholarships](#), subject to eligibility, availability and competitive selection. Applicants are also encouraged to explore external funding, including scholarships from their home country, such as **LPDP for Indonesian applicants**. Please explain your proposed funding route when enquiring. We cannot consider applicants without a realistic funding route.

Candidate profile: We welcome applicants with:

- A strong academic record in engineering, physics, applied mathematics, oceanography or a closely related discipline, including a Master's-level qualification.
- An interest in fluid mechanics and the physical processes governing environmental flows.
- Experience in scientific programming and data analysis, e.g. using MATLAB, Python or Julia.
- Strong analytical, communication and organisational skills, and the motivation to work independently and across disciplines.

Previous experience in coral reef research, fieldwork or scuba diving is desired but not essential. Applicants should meet Imperial's academic and English-language admission requirements.

How to express interest: Please email me at a.lefauve@imperial.ac.uk, using the subject line "PhD enquiry: Coral reef hydrodynamics", and attach the following in one PDF under 10 MB:

- **A short cover letter, no more than one page**, explaining which research questions interest you, why your background is suitable, and relevant research, programming or field experience.
- **Your CV.**
- **Undergraduate and Master's transcripts**, including the grading scale where available.
- **Your preferred start date and proposed funding route**, including any scholarship eligibility and application deadlines.
- **Details of two academic referees**, who will not be contacted without prior notice.

Include English-language test results if already available. A formal application through Imperial's admissions system is not required at this initial stage.

Please address the project specifically. Generic enquiries without the requested information will not receive a response.