

PhD opportunity:

Population dynamics and behaviour of the bluebottle



Many Australians have had a painful bluebottle sting when swimming at the beach, yet little is known about the bluebottle, its lifecycle and behaviour.

This PhD project is part of a large ARC Linkage Project that is a collaboration between the University of New South Wales, Griffith University and Surf Life Saving Australia. The aim of the PhD project is to understand and predict bluebottle's arrival to shore.

The bluebottle (*Physalia physalis*) is a colonial cnidarian that floats on the ocean surface and is transported by the currents and the wind. The float (also known as the sail) comes in left and right-handed forms, with each form predicted to move in different directions relative to the wind. The different forms are easily observed on beach stranded individuals, but no data exist in Australia on the abundance of each form and their population dynamics throughout the year.

No aquarium has managed to keep bluebottles alive for more than a week, and hence little is known about the bluebottle's behaviour in response to specific environmental factors. A purpose-built tank is being developed at Sea World (Gold Coast) that will enable experiments on the behaviour of bluebottles to be undertaken. An outcome of this project may be the addition of bluebottle display within the Sea Jellies Illuminated exhibition.

Aims

Impact of bluebottle behaviour on their movement.

Bluebottles exhibit complex behaviours that may affect their movements. They can inflate and deflate their float, rhythmically extend and contract their tentacles and, in calm conditions, exhibit a unique rolling behaviour. In a purpose-built tank at Sea World, you will determine how variation in air flow (i.e. wind strength) influences these behaviours, and to what extent this will impact their movement.

Population dynamics of bluebottles.

Field work on beaches, laboratory experiments, offshore survey techniques and *in-situ* sampling of live specimens will be used to explore bluebottle abundance, distribution, swarms, behaviour.

You will investigate the temporal and spatial variability of abundance, size and proportion of left and right-handed individuals from regular surveys.

Surveys will be conducted in the lab (at the Griffith University Sea Jellies Research Laboratory at Sea World), on the beach in the Sydney region, and on various vessels. You will get to join the IMOS (Integrated Marine Observing System) monthly boat surveys off Port Hacking (20 km from Sydney) and opportunistic field work during offshore swarms to monitor the bluebottle abundance and distribution at sea over the project using visual surveys.

Student benefit

You will be based at UNSW Sydney and benefit through working with a supportive team of academics from UNSW and Griffith University, and professionals from Surf Life Saving Australia and IMOS. You will use the Griffith Sea Jellies Research Laboratory at Sea World (Gold Coast) to conduct experiments on the bluebottle behaviour and perform the beach surveys and field work around Sydney.

Through this project, you'll learn how to:

- Conduct beach surveys for marine organisms
- Conduct ocean fieldwork
- Conduct lab work at Sea World
- Apply critical thinking, statistical analysis and scientific writing
- Manage a major research project
- Research historical records
- Develop community engagement and communication skills.

Supervisors: Prof Alistair Poore (UNSW BEES, a.poore@unsw.edu.au), Prof. Kylie Pitt (Griffith University, k.pitt@griffith.edu.au), Dr Jaz Lawes (Surf Life Saving Australia, JLawes@slsa.asn.au), Dr Amandine Schaeffer (UNSW School of Mathematics and Statistics, a.schaeffer@unsw.edu.au).

Candidate profile

- Recently completed an Australian Honours (First Class or good 2A honours with publication) or Masters (in the last five years) in biological sciences, environmental sciences, marine biology or oceanography.
- Have a love of the ocean, invertebrates, and being on boats.
- Driving licence.

Applicants should have a strong background in biology, ecology or environmental sciences, and be confident with quantitative analyses and data management (using R, Python or Matlab). They will be interested in working in field and laboratory environments, with a hands-on, practical approach to field and teamwork. A boat licence is not essential but is recommended. Candidates must have enthusiasm for working with researchers across multiple disciplines, and strong written and oral English skills.

Peer-reviewed publications, previous knowledge of any of the following (marine ecology, behavioural ecology, jellyfish ecology, physical oceanography, modelling and forecasting), and a capacity to develop and implement innovative modelling and statistical approaches will be viewed favourably.



Applications

Students will be enrolled through the [Higher Degree Research Training Program](#) at UNSW Sydney. Students need to have First Class honours (or good 2A honours with publication) or a research Master's degree with high GPA and apply for the [Domestic Research Scholarship](#) through the Australian Government Research Training Program (RTP, \$35,000 per annum for 3.5 years). Please note that international students will only be considered if they are eligible for the international scholarship.

If you are confident that you are eligible for an RTP research scholarship, expressions of interest should first be submitted to Dr Schaeffer (a.schaeffer@unsw.edu.au) with subject line "PhD Application for Bluebottle project". Please attach a single PDF file that includes: a brief cover letter/statement of interest and experience (one page maximum), a CV including the names and contact details of two referees (two pages max), and an academic transcript.

For more information, please contact the supervision team.

