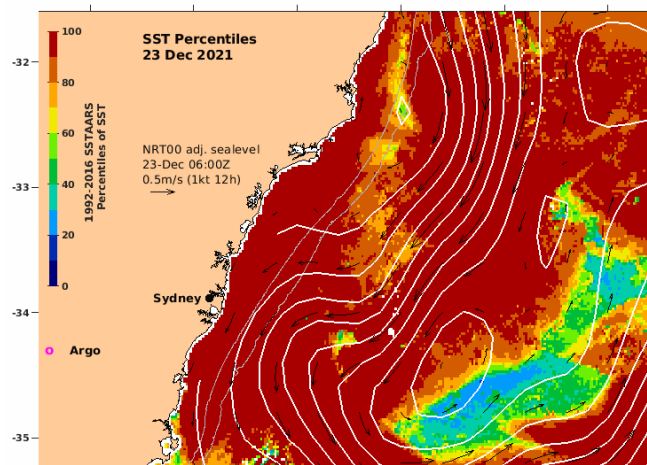


PhD student Opportunity @ UNSW Sydney

www.oceanography.unsw.edu.au

Extreme ocean warming in coastal waters of Southeast Australia



With the projected rise of ocean temperatures globally, extreme ocean weather events such as Marine Heatwaves (MHWs) are expected to become increasingly common and more intense. MHWs regularly occur off the coast of Southeast Australia, with ocean temperatures sometimes reaching 4°C above normal.

We presently know little on how MHWs develop in coastal areas and their impact on coastal physics and biogeochemistry. Yet we have a vast amount of ocean data at our fingertips.

The aim of this PhD project is to explore how MHWs develop and the biogeochemical impact in the coastal waters off Australia inshore of the East Australian Current. This project is part of a larger program of work exploring MHWs and will be based at the University of New South Wales (UNSW), Sydney Australia.

Through Australia's Integrated Marine Observing System (IMOS) the candidate will have access to large untapped observational data sets. Data have been collected off eastern Australia using autonomous underwater gliders quarterly since 2008. These remote ocean robots dive to depths of up to 200 m and measure ocean variables such as temperature, salinity, and chlorophyll fluorescence. In addition, we have collected over 70 years of continuous ocean measurements at the national reference station, a decade of moored time series at multiple mooring stations along the NSW coastline. These data will be combined with satellite remote sensed data including sea surface temperature and chlorophyll.

Aims

MHWs in coastal waters will be identified their biophysical characteristics and drivers explored over time and space along SE Australia.

The project will follow two approaches:

1. Systematic exploration - MHWs will be investigated in coastal regions using multiple data sets.
2. Case studies – specific MHWs will be investigated in detail, identified through data exploration.

The physical mechanisms involved and the biogeochemical response to MHWs will be explored with a focus on investigating what happens below the surface and at finer scales.

Student Benefit

You will be based at UNSW Sydney and benefit through working with a supportive and diverse team.

Through this project, you will learn how to:

- Code in Python and Matlab
- Explore and manipulate large geophysical data sets and adhere to open science principles
- Write clearly and effectively
- Communicate your findings to various audiences through written and oral communication with opportunities to present research findings at a domestic or international conference
- Conduct ocean fieldwork and gain practical experience deploying / recovering gliders and moorings on small or large vessels if desired
- Contribute to a major research project and work as part of a vibrant team.

Supervisors

Your supervisors will be Prof. Moninya Roughan (UNSW School of Biological, Earth & Environmental Sciences, mroughan@unsw.edu.au) and Dr Amandine Schaeffer (UNSW School of Mathematics and Statistics, a.schaeffer@unsw.edu.au).

Candidate Profile

- Recently completed Honours (first class) or Masters (in the last five years) in oceanography or environmental sciences
- You will have a passion for the ocean and will be technically minded and keen to explore new data sets
- You will have some previous experience in quantitative analysis, statistics, and data management
- You have basic knowledge in at least one programming language (preferably Python or Matlab)
- You will be comfortable working independently at times



Peer reviewed publications in quality journals, and prior knowledge of physical and/or biogeochemical oceanography, and data collection methods are not essential but will be viewed favorably.

Scholarship deadline:

Students will be enrolled through the Higher Degree Research Training Program at UNSW Sydney. Domestic and International students can apply for either the Domestic Research Scholarship or International Research Scholarship through the Australian Government Research Training Program (RTP, \$28,854 per annum for 3.5 years). Students need to have first class honours or a research Masters degree, a publication in a quality journal will enhance scholarship ranking chances. Please note that international students need to have co-authored a quality peer-reviewed publication to be considered.

Applications for scholarships close on

- **30th September** for start in Term 1 2023 (domestic) or Term 2 2023 (international) or
- **27th January 2023** for start in Term 2 2023 (domestic) or Term 3 2023 (international).

If you meet these criteria, Expressions of Interest should be submitted to Prof. Moninya Roughan (mroughan@unsw.edu.au) with subject line "PhD application for MHW project". Please attach a single PDF file that includes:

- Brief cover letter/statement of interest and experience (one page maximum)
- CV including publication list and the names and contact details of two academic referees
- Academic transcript showing courses and grades in English.

Beyond the closing date expressions of interest will still be accepted and may be considered for subsequent rounds.

UNSW Application details

Please familiarize yourself with the application process

<https://research.unsw.edu.au/key-dates>

Scholarship information

International students: <https://research.unsw.edu.au/international-research-scholarships>

Domestic students: <https://research.unsw.edu.au/domestic-research-scholarships>

Coastal and Regional Oceanography Lab

www.oceanography.unsw.edu.au

