Faculty of Science
Summer Research Scholarships 2026/2027

Projects (Institute of Marine Science)

Project code:	SCI001
Project title:	**Biofouling seasonality and community dynamics for marine biosecurity applications**
Discipline:	Institute of Marine Science
Supervisor(s)	Pablo Saen-Agudelo (Institute of marine Sciences, UoA) Ian Davidson (Cawthron Institute) Ulla von Ammon (Cawthron Institute) Malindi Gammon (Cawthron Institute)
Contact details	pablo.saenz-agudelo@auckland.ac.nz
Skills Needed	• Basic laboratory skills and attention to detail • Basic familiarity with statistical programming software (e.g. R) and statistics, or a willingness to learn • Field work participation • (Optional) interest in taxonomic illustration or imagery

Project description

Ecological surveillance and monitoring are often used interchangeably, but there are important distinctions between them. Surveillance focuses on detecting 'abnormalities', such as specific pests, pathogens or diseases. Monitoring is the routine collection of information on ecological communities or populations to understand their baseline 'normality'. In marine biosecurity, both approaches are useful for detecting new introductions and understanding longer-term community interactions of introduced species.

This project leverages an ongoing seasonal biofouling monitoring study in Nelson Marina to understand benthic community change over time and support marine biosecurity surveillance. Standardised settlement plates are deployed and retrieved at regular intervals and processed to measure species composition, successional patterns, and temporal shifts in community structure. The study draws on an existing ~2-year time series, alongside archived specimens.

The student main tasks will be:

- Participate in field work (settlement plate deployments and retrievals) at Nelson Marina.
- Conduct taxonomic identification of biofouling communities in the wet lab (training provided).
- Perform the first inter-annual variability analysis of community composition across the 2-year time series.
- Apply molecular barcoding (DNA-based assays) to taxonomically challenging or high-risk organisms from current and archived sample.
- Produce a short report on biofouling succession, non-indigenous species (NIS), integrated morphological and molecular findings for Port Nelson, and complementarity of monitoring and surveillance approaches.

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Projects (Institute of Marine Science)

Project code:	SCI002
Project title:	**Optimizing raingarden media for capturing tyre wear pollution**
Discipline:	Institute of Marine Science
Supervisor(s)	Samantha Ladewig Simon Thrush
Contact details	Samantha.Ladewig@auckland.ac.nz
Skills Needed	• Interest in environmental pollution and stormwater management • Basic laboratory skills • Attention to detail and good record keeping • Interest in laboratory experimentation

Project description

Tyre wear particles (TWP) are an emerging contaminant found in urban waterways. As tyres wear during driving due to friction against roads, they release microscopic natural and synthetic (i.e., plastic) rubber particles and associated chemicals that can negatively affect aquatic organisms and ecosystem processes. This project will investigate whether different type of raingarden media can remove TWP from stormwater. The student will compare several different raingarden media materials and evaluate their effectiveness at reducing TWP concentrations under controlled laboratory conditions. The project will involve preparing laboratory exposure experiments, filtering and processing samples, using a microscope, and analysing changes in particle abundance. This project will provide hands-on experience in marine pollution research, environmental remediation approaches, and laboratory-based experimental design. The findings may contribute to future strategies for reducing TWP pollution entering coastal ecosystems. Specifically, this work will inform environmental managers and transport authorities in Auckland on the effectiveness of currently employed raingarden media materials. It will inform them how to optimize for capturing TWP pollution and other contaminants, including other types of microplastics. The project is closely connected to ongoing collaborations with Auckland Transport's Chief Scientist, Cathy Bebelman, and a UoA Research and Development Fund on mitigating the impacts of TWP.

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Projects (Institute of Marine Science)

Project code:	SCI003
Project title:	**AI-Assisted Drone Monitoring of Mussel Bed**
Discipline:	Institute of Marine Science
Supervisor(s)	Wenjie Wu Katerina Taskova (Computer Science)
Contact details	wenjie.wu@auckland.ac.nz
Skills Needed	• Marine ecology and computer vision interest, • Fundamental ML knowledge • Advanced Python skills

Project description

This summer project will expand an AI-assisted drone-image analysis workflow for monitoring intertidal green-lipped mussel beds in New Zealand. The student will work with high-resolution drone imagery, ecological annotation, model outputs, and field-based validation data to improve automated detection of mussel-bed coverage in complex coastal habitats.

Preliminary results had already shown that local ecological annotation and model fine-tuning can improve mussel-bed detection in complex coastal environments. This summer project will build on this foundation by expanding the application range and training depth of the model. The student will help add more annotated imagery, include a wider range of habitat conditions, and test model performance across different mussel-bed structures, surrounding habitats, and survey conditions. This will help strengthen the workflow towards broader use in mussel-bed degradation monitoring and coastal habitat assessment.