



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

## Six PhD Scholarships in Marine Ecosystem Science

We are looking for six highly motivated individuals to undertake research at the University of Waikato leading to a PhD. The PhDs are supported through Phase II of the New Zealand Government funded National Science Challenge – *Sustainable Seas* ([www.sustainableseaschallenge.govt.nz](http://www.sustainableseaschallenge.govt.nz)). This is a large multi-institutional and trans-disciplinary programme involving researchers from throughout the country that will underpin the transformation of New Zealand marine management to a holistic, ecosystem based management (EBM) approach. The PhDs are all aligned with Challenge core projects; two within the **Tangaroa Program** where research is driven by the aspirations and needs of Māori, two within **Theme 1: Understanding Degradation & Recovery in Social-ecological Systems** and, two within **Theme 3 Risk & Uncertainty**. The specifics of each PhD project will be developed in conjunction with the successful candidate to best match interests and capabilities but will be in following broad areas:

- 1. Tangaroa Program: Project T1 - *Awhi Mai Awhi Atu: Enacting kaitiakitanga-based EBM*** (Scholarships 1a & 1b)  
At the heart of this project is the development of a kaitiakitanga based and place-based cultural approach to EBM that is relevant to the aspirations of iwi, hapū and Māori organisations. Ecologically, Ōhiwa Harbour in the eastern Bay of Plenty has been transformed by stressors that have orientated from the land and sea. Of particular concern to iwi has been the rapid increase in predatory sea stars which have decimated ecologically and culturally important shellfish populations that have sustained the harbour and people for generations. Bridging indigenous ecological knowledge and western science, scholarship 1a will investigate why there are so many sea stars and how might their populations be controlled. Scholarship 1b will examine pipi (*Paphies australis*) & cockle (*Austrovenus stutchburyi*) distribution and management options. Both scholarships will directly compliment that undertaken by another student focused on green lipped mussel (*Perna canaliculus*) habitat requirements and collectively will assist iwi in mussel restoration efforts and harbour wide shellfish management actions, key components in the formation of an EMB plan for Ōhiwa Harbour.
- 2. Theme 1: Project 1.1 - *Ecological responses to cumulative effects*** (Scholarships 2a & 2b)  
Interactions among stressors (both natural and human induced) often generate adverse ecological effects at thresholds well below those anticipated for single stressors. Research that builds understanding of the cumulative effects of multiple stressors on ecological function is central to EBM - it will inform stressor management and system capacity for new activities ensuring that functions, services and values are maintained or allow recovery of degraded systems. Research in this project will focus on **seafloor ecosystems** and Scholarship 2a will be dedicated to understanding the role of stressor interactions (and feedbacks) on ecological function and/or developing new approaches to assessing recovery potential of degraded ecosystems. Scholarship 2b will focus on understanding the processes and conditions that are preventing the recovery of a key seafloor habitat forming species, the horse mussel *Atrina zealandica*.
- 3. Theme 3: Project 3.2 - *Communicating risk & uncertainty*** (Scholarships 3a & 3b)  
Risk assessment aims to characterise uncertainty which can then be used to prioritize management interventions and trade-offs. Traditionally risk assessment has focused on single

pressure-response relationships. However recent advances that incorporate risk provide a mechanism for assessing cumulative impacts of multiple pressures on many ecosystem components which is essential for EBM. Scholarship 2a will involve assessing how uncertainty changes moving from single to multiple stressor relationships and increasing scale. Cumulative pressures arising from both marine and land-based activities impacting the marine environment will be considered. Scholarship 2b will focus on the development of species distribution models that include biotic and abiotic interactions with the aim of improving prediction accuracies for marine management.

More information on themes and the specific core research projects that will fund the scholarships can be found at [www.sustainableseaschallenge/2019-2024-projects](http://www.sustainableseaschallenge/2019-2024-projects) and the linked documents.

As part of the Sustainable Seas programme students will be very well supported, both in terms of access to research facilities and mentoring. Researchers from University of Waikato, University of Auckland, University of Otago and the National Institute of Water & Atmospheric Research (NIWA) will jointly supervise the research. The supervisory team have a long history of integrative, collaborative coastal research and these scholarships represent an excellent opportunity to be part of a transformational research program.

The successful candidates must have an MSc or BSc(Hons) (or equivalent qualification), ideally in marine ecology/oceanography or a related discipline. However, background is less important than a strong interest ecology, ecosystem science and good quantitative/modelling skills. The successful candidate for Scholarship 1 must also have a strong interest in co-developing research with Māori and dedicated to working at the interface of indigenous ecological knowledge and western science. A key requirement of all candidates is a willingness to undertake integrative research across a range of disciplines.

The scholarship is open to students of any nationality and includes a competitive stipend plus fees for three years. The candidate must meet all entry requirements for the University of Waikato doctoral programme (see [www.waikato.doctoralrequirements](http://www.waikato.doctoralrequirements)). The scholarships will remain open until filled and the start date is negotiable but we expect the successful candidates to have enrolled by December 2020.

To apply please send a CV, copy of your academic transcript record and a brief statement of research interests and how they align with the scholarship(s) you wish to be considered for to:

#### **Scholarships 1a & 1b**

Associate Professor Kura Paul-Burke  
Environmental Research Institute,  
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email: [kura.paul-burke@waikato.ac.nz](mailto:kura.paul-burke@waikato.ac.nz)

#### **Scholarships 2a & 2b**

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<https://conradpilditch.wordpress.com/>

#### **Scholarships 3a & 3b**

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