Postgraduate Research Opportunities
Marine Science
Aquaculture and Fisheries
Oceanography
Environmental Marine Science

2019
A postgraduate degree in Marine Science helps you to investigate the ocean on your own terms. At Otago, we offer many different opportunities for people who want to pursue research in the sea or who are planning profession careers associated with Marine Policy and Management. From life scientists to numerical modellers to environmental managers, there’s a marine postgraduate option for you. Marine Science Research takes place from the tropics to the poles: in labs, on boats, on land, on computers, in our heads and underwater.

**Postgraduate Degrees in Marine Science at Otago**

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<tr>
<th>Degree</th>
<th>Description</th>
<th>Background needed</th>
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<tr>
<td><strong>Postgraduate Certificate in Applied Science</strong>&lt;br&gt;Marine Environmental Science (60 points)</td>
<td>The PGCertAppSc in Marine Environmental Science (Jan-Jul) allows you to upskill with a Professional Qualification in Marine Science and Marine Environmental Issues. A good option for those who want to broaden their expertise while already in a career.</td>
<td>BSc in related discipline or equivalent experience</td>
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<tr>
<td><strong>Bachelor of Applied Science with Honours</strong>&lt;br&gt;Aquaculture and Fisheries (120 points)</td>
<td>The BAppSc (Hons) in AQFI allows you to carry out a field or lab-based research project while studying in the areas of aquaculture, human impacts, and fisheries (Jan – Oct).</td>
<td>BSc in related discipline</td>
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<tr>
<td><strong>Postgraduate Diploma in Science</strong>&lt;br&gt;Marine Science (120 pts)</td>
<td>The PGDipSci is a one-year degree (Feb-Oct) that allows you the choice between desktop and field research. Students can do a small desktop research project (20 points) and take five 400-level papers, or they can do a larger field-based research project (40 points) and take four 400-level papers.</td>
<td>BSc in related discipline</td>
</tr>
<tr>
<td><strong>Postgraduate Diploma in Applied Science</strong>&lt;br&gt;Marine Environmental Science (120 points)</td>
<td>The PGDipAppSc is a full-year (Jan-Dec) one-year coursework professional degree that provides an opportunity to upskill in the challenges of the marine sector with a range of disciplinary and applied subject options including aspects of Politics, Law, Environmental Management and other topics as appropriate.</td>
<td>BSc in related discipline or equivalent experience</td>
</tr>
<tr>
<td><strong>Master of Applied Science</strong>&lt;br&gt;Marine Environmental Science (180 points)</td>
<td>The MAppSc is a full-year (Jan-Dec) Professional Qualification for those interested in working in the marine sector. It provides grounding in a range of marine environments and processes with a focus on policy and management challenges from human interaction with the marine environment. It includes a 40 point Independent Study Project</td>
<td>BSc in related discipline or equivalent experience</td>
</tr>
<tr>
<td><strong>Masters Degree</strong>&lt;br&gt;Marine Science</td>
<td>The MSc in Marine Science is a two-year research degree. In the first year, students take papers and prepare a research proposal based on a field pilot study. In the second year, students carry out full-time independent research, leading to production of a thesis.</td>
<td>BSc in related discipline</td>
</tr>
<tr>
<td><strong>Masters Degree (thesis only)</strong>&lt;br&gt;Marine Science</td>
<td>Students who have already carried out postgraduate study may be admitted to the second year of the MSc, to carry out independent research leading to production of a research thesis.</td>
<td>BSc(Hons) or PGDipSci in related discipline or equivalent</td>
</tr>
<tr>
<td><strong>Doctor of Philosophy</strong></td>
<td>The PhD is the University’s highest-level research degree. It normally takes three years of research. We accept only the very best students into this programme.</td>
<td>BSc(Hons) or MSc in related discipline</td>
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*Research Students must have a project and a supervisor before they enrol.*

This booklet is designed to help you find the perfect match. For further assistance, please contact us on: marine.science@otago.ac.nz

**What if I have changed direction?** If you have a Bachelor’s degree but didn’t study a discipline related to Marine Science, you can still change your mind. The Diploma for Graduates (DipGrad) allows you to take a year’s worth of undergraduate papers in Marine Science in order to gain the skills you’ll need for postgraduate study.
Marine Science Academic Staff and Research Projects

Dr Bridie Allan
Research Interests: Predator-prey relationships and how they change under stress, particularly climate change.
Potential Research Projects: Please contact Dr Allan if you are interested in this topic.
For more info: https://www.otago.ac.nz/marinescience/staff/otago683465.html

Dr Catherine Beltran
Research Interests: Phytoplankton (coccolithophores and diatoms) geochemistry, molecular paleoenvironmental proxies (paleothermometry, sea ice, salinity), Cenozoic paleoclimate and paleoceanography, Southern Ocean.
Potential Research Projects: Investigating Antarctic ice sheet response to past Southern Ocean warming; a new diatom based molecular sea surface thermometer to predict the future of the Antarctic Ice Sheet; terrestrial plant community reconstructions using organic biomarker records in
For more info: http://neon.otago.ac.nz/research/corgeps/index.html

Professor Steve Dawson
Research Interests: Conservation biology and ecology of marine mammals (especially Hector's dolphin, sperm whales and bottlenose dolphins); incidental catch of marine mammals in fisheries; acoustic behaviour of whales and dolphins.
Prof Dawson has a full research group at present.
For more info: http://www.otago.ac.nz/marinescience/staff/stevedawson.html
**Associate Professor Chris Hepburn**

**Research Interests:** Customary fisheries management; fisheries restoration; integrated aquaculture; impacts of elevated CO₂ on coastal ecosystems; ecology and physiology of macroalgae; invasion by exotic marine organisms; macroalgal/invertebrate interactions.  
Please contact Assoc Prof Hepburn if you are interested in these topics.  
**For more info:** [http://www.otago.ac.nz/marinescience/staff/chrishepburn.html](http://www.otago.ac.nz/marinescience/staff/chrishepburn.html)

**Associate Professor Miles Lamare**

**Research Interests:** Marine ecology; population biology; marine invertebrate biology; and the ecology and physiology of marine invertebrate larval stages.  
**Potential Research Projects:** Ecology of geographically expanding sea urchins, and the role of larval stages in expansion; the response of invertebrate larvae to warming, ocean acidification and reduced oxygen; the response of hybrid larvae to climate change.  
Please contact Assoc Prof Lamare if you are interested in marine invertebrate reproduction and ecology.  
**For more info:** [http://www.otago.ac.nz/marinescience/staff/mileslamare.html](http://www.otago.ac.nz/marinescience/staff/mileslamare.html)

**Dr Jean McKinnon**

**Research Interests:** Age, growth and diet of marine invertebrates, particularly cephalopod molluscs; behaviour of cephalopod molluscs; the effect of land use on mudflat biodiversity; citizen science for collecting baseline data.  
**Potential Research Projects:** Dominance hierarchy formation in the midget Octopus (*Octopus huttoni*); age and size relationships in the Bobtail squid (*Sepioloidea pacifica*); the effect of citizen science on attitudes to science and nature; the effect of land use on mudflat diversity.  
**For more information:** email [jean.mckinnon@otago.ac.nz](mailto:jean.mckinnon@otago.ac.nz)
Dr Will Rayment

**Research Interests:** Ecology and conservation biology of cetaceans; capture-recapture methods and analyses; species-habitat relationships; efficacy of Marine Protected Areas and MPA networks; cetaceans and seabirds of the Otago coast - abundance, distribution and impacts.

Please contact Dr Rayment if you are interested in these topics.

For more info: [http://www.otago.ac.nz/marinescience/staff/willrayment.html](http://www.otago.ac.nz/marinescience/staff/willrayment.html)

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Dr Christina Riesselman

**Research Interests:** Cenozoic paleoceanography and paleoclimate; Antarctic climate evolution; micropaleontology and applications of diatoms; stable isotopes and other geochemical proxies of paleoenvironmental change.

Please contact Dr Riesselman if you are interested in these topics, at any level.

For more info: [http://www.otago.ac.nz/marinescience/staff/christinariesselman.html](http://www.otago.ac.nz/marinescience/staff/christinariesselman.html)

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Dr Peter Russell

**Research Interests:** Coastal oceanography; river & estuarine physical processes; remote sensing; customary fisheries.

**Potential research projects:** Up-welling along the Otago; shallow brine pools in the Waikouaiti River; secondary flow around meandering bends in the Clutha delta and nutrient delivery.

For more info: [http://www.otago.ac.nz/marinescience/staff/peterrussell.html](http://www.otago.ac.nz/marinescience/staff/peterrussell.html)
**Dr Candida Savage**

**Research Interests:** Marine ecology with a focus on human impacts in coastal and estuarine ecosystems; drivers of change and multiple stressors in marine ecosystems.

Dr Savage is not currently taking on new students.

For more info: [http://www.otago.ac.nz/marinescience/staff/candidasavage.html](http://www.otago.ac.nz/marinescience/staff/candidasavage.html)

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**Professor Abby Smith**

**Research Interests:** Biomineralisation and geochemical signals in skeletons; bryozoans as important carbonate producers; ocean acidification and dissolution in temperate coastal and shelf environments.

**Potential Research Projects:** Growth, calcification and skeletal mineralogy of barnacles; effects of sea water chemistry on urchin feeding apparatus; New Zealand-wide production of carbonate by cockles.

Please contact Prof Smith if interested in skeletal carbonate questions.

For more info: [http://www.otago.ac.nz/marinescience/staff/abigailsmith.html](http://www.otago.ac.nz/marinescience/staff/abigailsmith.html)

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**Dr Rob Smith**

**Research Interests:** The impacts of a changing climate on the physics and biology of Southern Ocean fronts; the role of flow-topography interactions in promoting oceanic productivity; open-ocean deep convection and its influences on ocean circulation and global climate.

**Potential Research Projects:** Please contact Dr Smith if you are interested in these topics.

For more info: [https://www.otago.ac.nz/marinescience/staff/otago664247.html](https://www.otago.ac.nz/marinescience/staff/otago664247.html)
Dr Ata Suanda
Research Interests: coastal exchange processes: Internal waves, wind- and wave-driven flows.
Potential Research Projects: Please contact Dr Suanda if you are interested in these topics.
For more info: https://www.otago.ac.nz/marinescience/staff/otago683444.html

Professor Gary Wilson
Research Interests: Antarctica’s role in the evolving global ocean and climate system; New Zealand ocean and climate response to changing forcing agents (both internal such as atmospheric carbon dioxide and external such as changes in the earth’s orbital parameters); records of environmental change and sea level rise in seismic records and marine sediment cores; and the application of paleomagnetic and physical properties methods to dating and correlation and as proxies for environmental change.
Potential Research Projects: Please contact Prof Wilson if you have an interest in these areas.
For more info: http://www.otago.ac.nz/marinescience/staff/garywilson.html

Professor Steve Wing
Research Interests: My research group focuses on biogeochemical cycling in food webs to resolve how organic matter sources and changes to food web structure influence productivity and resource use by higher trophic level groups such as lobsters, fish, marine mammals, sea birds and people. I have research projects in Fiordland, Antarctica, and the sub-Antarctic Islands.
Potential Research Projects: Please contact Prof Wing if you have an interest in these areas.
For more info: http://www.otago.ac.nz/marinescience/staff/stephenwing.html
# Fourth Year Study in Marine Science at Otago -- Papers to be offered in 2019

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Start-End</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARI 401</td>
<td>Advanced Methods in Marine Science</td>
<td>Feb-Jul</td>
<td>Two week-long field trips, seminars and workshops on skills and statistics</td>
</tr>
<tr>
<td>MARI 402</td>
<td>Applied Field Methods for Marine Environmental Science</td>
<td>Jun-Nov</td>
<td>Two field-based projects. Priority enrolment for MAppSc and PGDipAppSc candidates</td>
</tr>
<tr>
<td>MARI 403</td>
<td>Critical Thinking for Environmental Scientists</td>
<td>Jan-May</td>
<td>Focuses on evaluation and presentation of environmental science information to inform policy</td>
</tr>
<tr>
<td>MARI 451</td>
<td>Special Topics in Marine Science or Reading Ecology</td>
<td>Feb-Jun</td>
<td>A reading course, students lead seminar discussions, focused on marine or ecology issues</td>
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<tr>
<td>ECOL 411</td>
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<tr>
<td>MARI 429</td>
<td>Coastal Marine Environment</td>
<td>Feb-Oct</td>
<td>Field-based course: design and carry out coastal marine sampling transects. Priority enrolment for MSc and PGDipSci</td>
</tr>
<tr>
<td>MARI 431</td>
<td>Antarctic and Southern Ocean Science</td>
<td>Jul-Oct</td>
<td>Physical science of the Southern Ocean and poles through labs and seminars</td>
</tr>
<tr>
<td>AQFI 421</td>
<td>Advanced Aquaculture and Fisheries</td>
<td>Jan-Mar</td>
<td>Field-based course on coastal impacts; includes field trip in Jan-February</td>
</tr>
<tr>
<td>OCEN 450</td>
<td>Data Analysis Methods in Oceanography</td>
<td>Jul-Oct</td>
<td>Hands-on practice in analysing patterns of data in time and space</td>
</tr>
<tr>
<td>APPS 597</td>
<td>Supervised Independent Study (for MAppSc candidates)</td>
<td>Jan-Dec</td>
<td>Supervised development of a position paper on environmental problem or challenge appropriate to the MAppSci</td>
</tr>
<tr>
<td>APPS 598</td>
<td>Industry Placement (for MAppSc candidates)</td>
<td>Jan-Dec</td>
<td>Placement in a government, industry or not-for-profit institutions appropriate to the MAppSci degree</td>
</tr>
<tr>
<td>MARI 480</td>
<td>Independent Project (for PGDipSci candidates)</td>
<td>Feb-Oct</td>
<td>Desktop research, does not lead on to other research degrees</td>
</tr>
<tr>
<td>MARI 490</td>
<td>Dissertation (for PGDipSci or BAppSc (hons) candidates)</td>
<td>Feb-Oct</td>
<td>Research project carried out within the year</td>
</tr>
<tr>
<td>MARI 495</td>
<td>Masters Thesis Preparation (for MSc candidates)</td>
<td>Feb-Dec</td>
<td>Pilot study and proposal for research to be carried out in the second year</td>
</tr>
</tbody>
</table>

Postgraduate students may incorporate one paper in a different discipline into their degrees, with permission of the HOD or Fourth-Year Coordinator

## Where to from here?

**For general information** on these degrees, go to: [http://www.otago.ac.nz/courses/qualifications/](http://www.otago.ac.nz/courses/qualifications/)

**How to apply?** Use the “Apply Now” button on the relevant qualification page.

**When?** Places are limited in the MAppSc and the PGDipAppSc -- candidates should apply on or before September 1, though late applications may be accepted if places are available. Applications for the MSc and the PGDipSci are due on 10 December, but candidates should talk to potential supervisors about projects and apply sooner to ensure a place in their preferred area of interest. Offers of places will be made by 1 October where possible. Applications to the PhD and MSc Thesis Only can be submitted at any time.

**How much will it cost?** Fees information is here: [http://www.otago.ac.nz/study/fees/ - feebands](http://www.otago.ac.nz/study/fees/)

**Need money?** Scholarships information is here: [http://www.otago.ac.nz/study/scholarships/](http://www.otago.ac.nz/study/scholarships/)

**Need to ask a more specific question?** Contact Marine Science at [marine.science@otago.ac.nz](mailto:marine.science@otago.ac.nz)