

# Post-Doctoral researcher (Moana - fixed term)

MetOcean Solutions (MOS)

<b>Title:</b>	<b>Post-Doctoral researcher (fixed-term 2 years)</b>
<b>Division:</b>	<b>MetOcean Solutions (MOS)</b>
<b>Location:</b>	Raglan
<b>Responsible to:</b>	Team Leads Moana Modelling Suite and Connectivity
<b>Date:</b>	July 2020
<b>Code:</b>	TBC

## Purpose

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To lead research planning, complete investigations, prepare research papers and present findings.

## Context

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The Moana Project is a collaboration between the MetService, NIWA, New Zealand Universities, the fishing industry, and community partners to improve understanding of ocean circulation, connectivity and marine heatwaves around New Zealand. The project aims to support sustainable growth across the national seafood industry including Māori-owned businesses, commercial fisheries and offshore aquaculture. This position is an opportunity to join a multi-disciplinary team spanning physical oceanography, marine ecology, numerical modelling, and mātauranga Māori perspectives.

The selected post-doctoral researcher will investigate the impacts of ocean warming and circulation changes on connectivity of kaimoana (seafood) around New Zealand. The aim is to incorporate biological characteristics critical to survival of three kaimoana species, rock lobster, green-lipped mussels, and NZ abalone, into trajectory modelling. Characteristics such as larval spawning season, location, pelagic larval duration, vertical migration, horizontal swimming and mortality variables will be added to particle tracking algorithms applied to the Moana Project model outputs. The seasonal and inter-annual variability in larval trajectories will be diagnosed. Future climate scenarios will be run taking into account thermal thresholds impacting kaimoana survival and changes in circulation patterns driving range shifting. The future scenarios models come from CSIRO ocean downscaling (Cetina Heredia et al. 2016) and will be assessed against contemporary results. This is key to understand the recruitment and connectivity within a changing ocean for future fisheries and mussels aquaculture management. Specifically, the candidate will:

- Gain access to an RCP8.5 climate change scenario for the New Zealand region for use in the kaimoana connectivity study.
- Assess climate-driven changes in temperature and circulation across the Tasman Sea and around New Zealand.
- Write and submit a paper on the impact of climate driven changes on kaimoana settlement in New Zealand and across the Tasman Sea.
- Write and submit a paper on modelling to investigate the impact of climate change on connectivity of 3 kaimoana species around New Zealand.

## Accountabilities

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1. Team Member of the Moana Connectivity Team

2. Deliverables:

Year 1:

- Lead the research planning and progression for the investigation of the impact of ocean warming and circulation changes to kaimoana connectivity
- Obtain RCP8.5 (or latest most appropriate) climate scenario model outputs for the NZ region
- Scientific Expert develops and delivers assessment of climate-driven changes in temperature and circulation across the Tasman Sea and around New Zealand (“NZ”)
- Write and submit a paper on climate driven changes to kaimoana settlement across the Tasman Sea
- Investigate the impact of climate change on connectivity of kaimoana species
- Work closely with PhD 8 to integrate aspects of national scale kaimoana genetic connectivity into models of connectivity under climate change scenarios
- Scientific expert for research progression of PhD 8 as requested by Moana Connectivity Team lead
- Present preliminary results at conferences
- Incorporate effect of temperature (e.g. shortened pelagic larval phase, survival as a function of temperature) into dispersal modelling.

Year 2:

- Lead the research progression for the investigation of the impact of ocean warming and circulation changes on kaimoana connectivity
- Write and submit a paper on modelling to investigate the impact of climate change on connectivity of 3 kaimoana species around New Zealand

3. To be aware and familiar with the Company’s current Safety Policy, including the safety of all aspects of workstation set up and use of computer equipment. Information on other Company policies and procedures can be obtained from MetService. We remind you that you are required by law to take all practicable steps to ensure your own safety while at work and that to ensure that your actions or inactions do not cause harm to any other person.

## Key Relationships

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### **Internal:**

- MetOcean GM
- MRD Team members
- MetService Head Research Partnerships
- Moana Project Director
- Moana Project Management Team

### **External:**

- Moana Connectivity Team
- Research partners nationally and internationally.

### **Staff Responsibility:**

Direct Report: Nil

Indirect Report: Nil

### **Financial Responsibility:**

Budget: Nil

Delegated Authority: Nil

## Person Specification

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### Knowledge, Skills & Qualifications:

#### Essential:

- A PhD. in Oceanography (Physical Oceanography preferable),
- Experience in particle tracking (modelling) as this applies to coastal regions (OpenDrift preferable), with relevance and application to gene flow amongst marine species,
- Experience with connectivity analysis of marine species,
- Documented research experience and knowledge of multidisciplinary marine science,
- Track record in analysing and critically assessing oceanographic models and data,
- Experience working with large geophysical datasets,
- Experience working on a Linux HPC environment,
- Strong technical and scientific writing skills in English with a track record in scientific publication.
- Constructively relates to a wide range of people with open-mindedness and good-will

#### Desirable:

- Ability to work with a range of different particle tracking software platforms,
- Ability to work with a large group of research collaborators and the many and varied stakeholders who are part of the Moana Project,
- Knowledge of transfer matrix connectivity analysis,
- Experience with lagrangian coherent structure analysis methods,
- Experience with Python and LaTeX,
- A curious mind that will explore new technologies,
- Enjoy being part of an international team that moves quickly,
- A quick learner with a “can do” attitude,
- A methodical and logical approach to solving problems, and
- An ability to prioritise tasks and manage projects in a timely fashion.

**Note:** The requirements of this position description may change from time to time to meet operational or other requirements.

Our Values	Values in Action	Values Descriptor
<p><b>ADAPTABILITY AND FLEXIBILITY</b></p> <p>To be flexible and adaptable in response to, and ahead of, changes in conditions and stakeholder needs.</p>	<p><b>Embrace Change</b></p> <p><b>Optimise our Business</b></p>	<p>Recognises that change is at the core of our business. Knows how to make change work, by thinking ahead or being open minded to new ideas.</p> <p>Makes the most of our business opportunities. Is responsive, makes smart decisions and positions our business to achieve its goals.</p>
<p><b>THE POWER TO SHINE</b></p> <p>Having the skills, abilities, drive and support to do a great job.</p>	<p><b>Recognise Success</b></p>	<p>Takes the initiative to bring out the best in themselves and others. Celebrates successful outcomes.</p>
<p><b>EVERYONE IS VALUED</b></p> <p>To appreciate equally the value of everyone working at MetService and their individuality.</p>	<p><b>Collaborate</b></p> <p><b>Respect All</b></p>	<p>Actively contributes to a work environment where together we achieve our goals. Openly communicates and cooperates with colleagues, customers and suppliers.</p> <p>Recognises and shows a genuine appreciation for the strengths and opinions of others. Engages in debates in a respectful manner.</p>
<p><b>ACHIEVEMENT</b></p> <p>To achieve something noteworthy and admirable through meeting challenges both personally and professionally.</p>	<p><b>Take Ownership</b></p>	<p>Takes responsibility for their own decisions and actions. Always works with the best business interests of MetService at heart.</p>
<p><b>FREEDOM TO ENJOY LIFE</b></p> <p>Working for a financially successful company with a sustainable future.</p>	<p><b>Support Growth</b></p> <p><b>Enable Innovation</b></p>	<p>Future focused or an advocate for continued improvement where we learn from experiences and mistakes.</p> <p>Supports a climate of creativity and new ways of doing things.</p>