



Pacific
Community
Communauté
du Pacifique

JOB DESCRIPTION

Job Title:	Postdoctoral Researcher (Marine Ecosystem Modelling)
Division / Programme:	Oceanic Fisheries Programme, FAME
Location:	Noumea
Reporting to:	Senior Fisheries Scientist (Tuna Population Modelling)
Number of Direct Reports:	0
Purpose of Role:	The purpose of the job is to undertake a programme of work that supports the development and application of fisheries and ecosystem population dynamics models to tuna fisheries in the western and central Pacific Ocean. The role will have a strong focus on projecting the impact of climate change on tuna populations over seasonal, decadal and longer timeframes to assist the development of advanced warning systems and to evaluate adaptation options that mitigate adverse climate impacts on fisheries.
Date:	September 2022

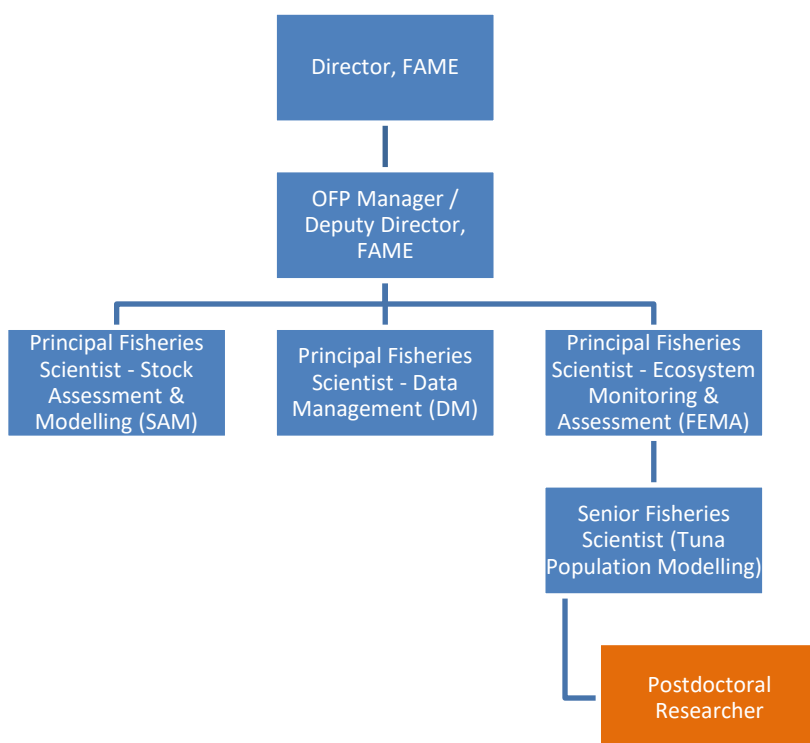
Organisation Context:

The **Pacific Community** (SPC) is the principal scientific and technical organisation in the Pacific region, supporting development since 1947. We are an international development organisation owned and governed by our 27 country and territory members. In pursuit of sustainable development to benefit Pacific people, our unique organisation works across more than 25 sectors. We are known for our knowledge and innovation in such areas as fisheries science, public health surveillance, geoscience, and conservation of plant genetic resources for food and agriculture.

The **Fisheries, Aquaculture and Marine Ecosystems** (FAME) Division includes the Oceanic Fisheries Programme (OFP) and Coastal Fisheries Programme (CFP). The goal of the OFP is to ensure fisheries that exploit the region's resources of tuna, billfish and related species are managed for economic and ecological sustainability using the best available scientific information. In pursuing this goal, the OFP provides scientific support for the management of fisheries for tuna and associated species, with a strong focus on stock assessment and modelling, fisheries and ecosystem monitoring and analysis and data management. The OFP works closely with member countries and territories, the Western and Central Pacific Fisheries Commission, the Forum Fisheries Agency, the Parties to the Nauru Agreement and other regional and sub-regional entities.

The **Fisheries & Ecosystem Monitoring & Analysis** (FEMA) Section of the OFP undertakes a broad range of tuna fisheries and tuna ecosystem monitoring and analysis work. This work is supported by data collection and monitoring from the fisheries and the oceanic tuna ecosystem and the development of ecosystem and tuna models. This includes the ecosystem dynamics model SEAPODYM; a numerical model simulating the spatiotemporal population dynamics of exploited fish species driven by physical and biogeochemical oceanic variables. Quantitative applications of the SEAPODYM model to study the dynamics and the impact of climate change on the exploited highly migratory fish stocks is a current priority for developing options for mitigating against the negative impacts of climate change on oceanic

fisheries. This position will contribute to ongoing research projects working on existing and new applications of the SEAPODYM model.



Key Result Areas:

The position of **Early Career Researcher (Fisheries)** encompasses the following major functions or Key Result Areas:

- Assist the curation and development of the SEAPODYM code for multi-resolution modelling of tuna population dynamics.
- Apply SEAPODYM and similar models to evaluate the impacts of current and future climate regimes on the distribution and abundance of tuna and similar species in the Pacific Ocean.
- Contribute to the development of authoritative scientific advice provided to SPC members on the impacts of climate change on Pacific tuna resources.
- Support initiatives to develop national and regional capabilities in climate modelling

The requirements in the above Key Result Areas are broadly identified overleaf.

<i>Jobholder is accountable for</i>	<i>Jobholder is successful when</i>
Code curation and development (25%) • Using and contributing to the development of existing numerical models • Adhering to best practices in code development and version control. • Contributing to the development of diagnostics to evaluate model performance	• Fit for purpose code contributions • Augmented code repositories • Up to date documentations
Apply SEAPODYM and similar models (45%) • Preparing input data: oceanographic forcing and the data necessary to inform model dynamic processes and to estimate model parameters • Designing and running parameter estimation, performing model error analysis and model validation to update SEAPODYM reference models	• SEAPODYM models are updated with available data. • SPC members have access to updated projections on the impacts of climate change on their tuna resources. • Tools (e.g. advanced warning systems) for mitigating the impacts of climate change on tuna resources are operational

Jobholder is accountable for	Jobholder is successful when
• Contribution to continuous development of diagnostic and analytical routines such as sensitivity analysis, likelihood profiling, etc. • Undertake evaluations of the impacts of current and future climate regimes on Pacific tuna population dynamics	
Technical Advice (15%) • Participates in international conferences and meetings dealing with ocean ecosystem modelling, ocean climate change and ecosystem monitoring. • Leading or contributing to reports and publications	• Working Papers provided to WCPFC Scientific Committee • SPC Policy Briefs and Annual Report Cards • Publications in the top 25% ranking of peer-reviewed journals
Develop capabilities (15%) • Participating and contributing to workshops and training to build capacity for national and regional institutions to apply climate models to evaluate impacts on Western Central Pacific Ocean ecosystems and tuna fisheries.	• Fisheries and other natural resource management officers in SPC member administrations are able to articulate the impacts of climate on tuna and negotiate outcomes that mitigate against impacts

Note

The above performance standards are provided as a guide only. The precise performance measures for this position will need further discussion between the jobholder and manager as part of the performance development process.

This section may be copied directly into the Performance Development forms (Part 1 – Expected Results).

Work Complexity:

Most challenging duties typically undertaken:

- Deep understanding of modelled processes and optimization problem
- Need to manipulate and analyse large amounts of various types of data

Functional Relationship Skills:

Key Internal/External Contacts	Nature of the contact most typical
INTERNAL: • OFP-FEMA colleagues • OFP Stock Assessment and Modelling Section • OFP Data Management Section • Coastal Fisheries Programme • PCCOS • Climate Change and Environmental Sustainability Programme	• Collaboration and information sharing with other OFP sections • Performance appraisal, work planning • Collaboration on research programmes • Ad-hoc advice • Administrative tasks
EXTERNAL : • SPC member fishery departments • Officers from other regional institutions (FFA, PNAO) • WCPFC Scientific Committee • Research Organisations and Universities (e.g. IRD, CSIRO, UNSW, IATTC, IFREMER, UNC, SPREP, USP, NIWA) • International Climate Change institutions	• Provision of advice. • Collaboration on research programme. • Response to ad hoc requests for data and analyses. • Attendance at regional workshops, in-country visits. • Presentation of results and related stakeholder consultations.

Level of Delegation:

The position holder has no delegated responsibility as per SPC's Instrument of Delegation.

Person Specification:

This section is designed to capture the expertise required for the role at the 100% fully effective level. (This does not necessarily reflect what the current jobholder has.) This may be a combination of knowledge / experience, qualifications or equivalent level of learning through experience or key skills, attributes or job specific competencies.

Qualifications

Essential:	Desirable:
PhD in Applied Mathematics, Mathematical Ecology or a related field with a background in modelling and numerical analysis.	

Knowledge / Experience

Essential:	Desirable:
- Up to 3 years of experience after the completion of the PhD - Knowledge and understanding of partial differential equations, their analytical and numerical solutions. - Knowledge and practical experience in solving optimization problems. - Knowledge of statistical methods for data integration and analysis. - Knowledge of programming language(s) applied to numerical problems. - Programming experience in R, Python or similar high-level language for manipulating large volumes of data - Linux computing environment - Ability to write academic texts in English. - Proven ability to work as part of an inter-disciplinary and/or multi-cultural team	- Knowledge of Eulerian and Lagrangian models describing animal movement and dispersal. - Programming experience in C++. - Familiarity with oceanography and fisheries - Proficiency or (at least) a working knowledge of French.

Key Skills /Attributes / Job Specific Competencies

The following levels would typically be expected for the 100% fully effective level:

Expert level	Ecosystem modelling and programming
Advanced level	- Report writing and verbal communication skills in English - Knowledge of parameter estimation techniques - Ability to deal with confidential information in a professional manner
Working Knowledge	- Fisheries science methods - Tuna biology and ecology
Awareness	- Good understanding of tuna fisheries in the Western and Central Pacific region - Fisheries management principals - SPC policies relating to recruitment, gender, harassment, and others

Key Behaviours

*All employees are measured against the following **Key Behaviours** as part of Performance Development:*

- Change and Innovation
- Interpersonal Skills
- Teamwork
- Promotion of Equity and Equality
- Judgement
- Building Individual Capacity
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Personal Attributes

- Highly motivated with strong interest in their work
- Effective communicator
- Patience and ability to keep focused on the job
- Thorough and conscientious
- Resilient
- High level of professional integrity and ethics

Change to Job Description:

From time to time it may be necessary to consider changes in the job description in response to the changing nature of our work environment – including technological requirements or statutory changes. Such change may be initiated as necessary by the Director Corporate Services. This Job Description may be reviewed as part of the preparation for performance planning for the annual performance cycle.