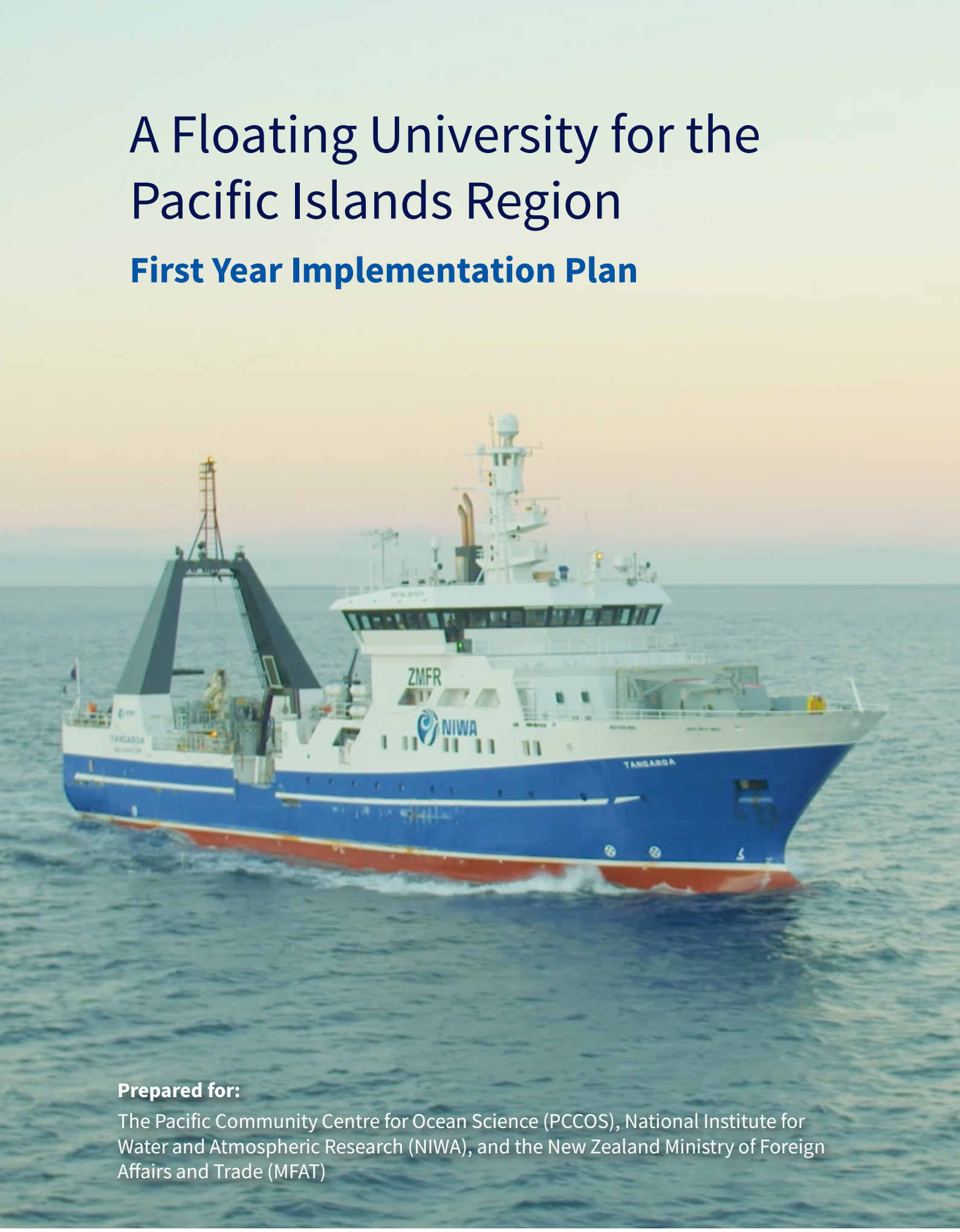
A Floating University for the Pacific Islands Region

First Year Implementation Plan



Prepared for:

The Pacific Community Centre for Ocean Science (PCCOS), National Institute for Water and Atmospheric Research (NIWA), and the New Zealand Ministry of Foreign Affairs and Trade (MFAT)

Pacific Community
Communauté du Pacifique

NEW ZEALAND
FOREIGN AFFAIRS & TRADE
Manatū Aorere

pccos
The Pacific Community Centre for Ocean Science

NIWA
Taihoro Nukurangi

Introduction

This document outlines the key elements of a new Floating University for the Pacific Islands and a first-year implementation plan. This draft document is designed to support a consultation and co-design process with key stakeholders from the Pacific Islands region and key international development partners from New Zealand and elsewhere. This scope of this report has been informed by a series of interviews with ocean science experts from the Pacific Community and international partners.

A Floating University for the Pacific Islands, is based initially on NIWA's scheduled cruises to service the new Deep-Ocean Assessment and Reporting on Tsunami (DART) network that was established across the southwestern Pacific Ocean to support detection and analysis of potential tsunami risks. This initiative is intended to allow students and early career scientists from Pacific Island nations to conduct research at sea driven by Pacific Island community needs and priorities. The Floating University will support cohorts of participants and provide an environment to help young scientists progress in their careers whilst meeting Pacific Island needs for ocean science.

Pacific Island early-career scientists and students will join *Tangaroa* DART maintenance cruises and participate in an ongoing ocean monitoring program by collecting and processing samples, managing data, and analyzing results. Participants will also be exposed to basic ocean engineering, instrumentation, and other technologies involved in ocean science. The Floating University will create a community of participants and provide opportunities for them to share scientific results in local and regional forums and to engage with policy makers who need their science.

This initiative will help Pacific Island countries and partners to achieve the following key goals:

- To help Pacific Island countries and territories determine how best the proposed initiative can support their goals in terms of building greater capacity in ocean science to help meet their national policy goals;
- Support the key objectives of the United Nations Decade of Ocean Science for Sustainable Development (2021-2030);
- Support efforts to increase climate resilience across the Pacific region by building local capacity to address key issues such as ocean acidification, coral reef health, biodiversity beyond national jurisdictions, biosecurity, coastal resilience and food security, and the management of key resources such as the regional tuna fisheries; and,
- Addressing the global inequalities in ocean science by providing Pacific Island nations with clear pathways for building capacity and supporting efforts to address their own ocean science priorities.

Context

The ocean sustains and connects Pacific Island nations and communities, but the ocean is changing rapidly. New threats to ocean systems, from ocean acidification to marine debris, along with natural hazards from sea level rise to tsunamis, threaten the health, well-being, and overall resilience of island peoples. There is an urgent need for Pacific Island nations to have access to scientific information and analyses to help understand the changing ocean, and new and developing threats so they can adapt, mitigate, and otherwise make sound decisions about community resilience.

Given the size of their Exclusive Economic Zones (EEZ), many "Small Island Developing States" refer to themselves as Large Ocean States. As one example, Fiji has an EEZ of 1.29 million km2, and any efforts to support the sustainable management and protection of Fiji's ocean environment and resources will depend on ocean science and the ability to apply ocean science results to management policies.

This collaboration with Pacific Island developing states and New Zealand's own Māori and Pasifika communities to build ocean science capacity and to integrate traditional knowledge and western science will:

- Allow early career scientists and other participants to lead in managing the vast areas and rich resources for which large ocean states are responsible;
- Give Pacific Island developing states and New Zealand's Māori and Pasifika communities agency to understand and manage and protect ocean resources—and to respond to challenges that threaten those resources;
- Create a substantial contribution to advancing New Zealand's new Pacific Regional Four-Year Plan goals and the U.N. Decade of Ocean Science in Support of Sustainable Development objectives;
- Leverage the value of New Zealand's investment in DART mooring maintenance;
- Create opportunities for philanthropic groups, regional organizations, and other nations to contribute to magnify New Zealand's investment; and,
- Pay back investments in the Floating University for the Pacific Islands many times over in community resilience and sustainable livelihoods and economies throughout the region.

Opportunity

NIWA uses the *Tangaroa* to service a 12-mooring DART array in deep ocean waters with annual cruises to different parts of the array so that each mooring is serviced biannually. As the task of maintaining these moorings requires only a small operations crew and most of the time at sea consists of transiting to mooring locations, there is significant capacity for NIWA to host science operations involving six to eight scientists during these DART mooring maintenance cruises. New Zealand is committed to maintaining these moorings for the next 10 years.

NIWA sees the DART tsunameter maintenance cruises on *Tangaroa* as a way to create opportunities for Pacific Island early career scientists and students to learn about, and conduct research at sea. Participants who sail on *Tangaroa* cruises then become part of a community with similar experiences. Long term engagement with, and support for, Floating University participants results in "end-to-end" support for participants that includes training, mentoring, professional support, and more. The Floating University for the Pacific Islands will result in professional development pathways for young Pacific Island scientists, including Māori and Pasifika scientists, encourage Pacific Island students to pursue ocean science disciplines, and support the weaving together of mātauranga Māori and other Pacific ways of understanding and science in the service of greater understanding.

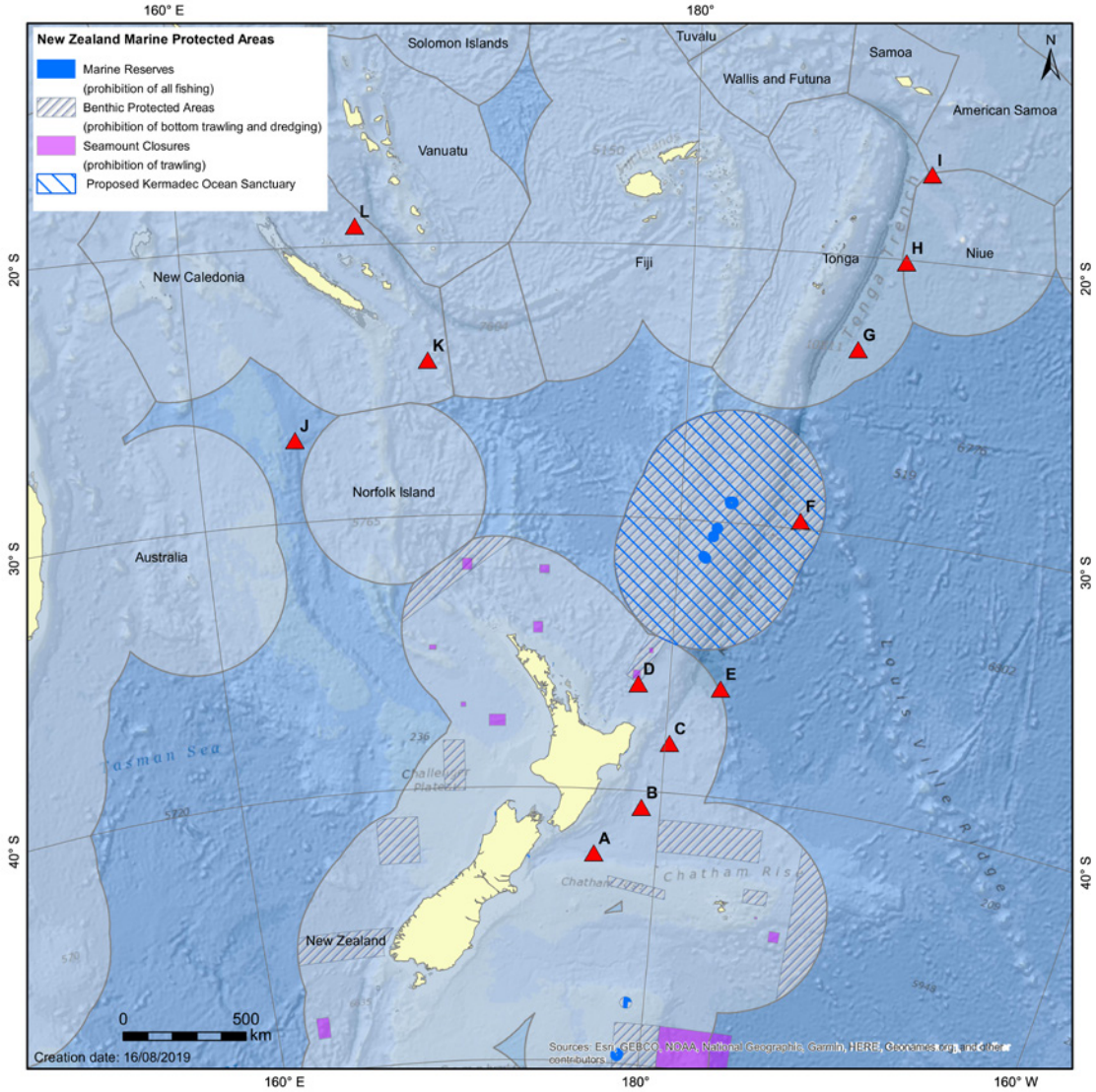
Operations

DART Tsunameter Array

This map shows the location of the DART moorings NIWA services and the approximate schedule for bi-annual service of each mooring. During maintenance cruises, *Tangaroa* collects typical surface measurements, along with acoustic fisheries data and multibeam mapping data. It also deploys Argo floats and other instruments on an opportunistic basis. The ship is capable of deploying autonomous underwater vehicles (AUVs) gliders, and similar vehicles. With modifications, *Tangaroa* could also deploy remotely operated vehicle systems (ROVs) and other technologies a partner might provide. In short, *Tangaroa* is a highly capable deep ocean research platform.

During transits between moorings, Floating University for the Pacific Islands participants aboard the *Tangaroa* will collect time series data for ocean chemistry, conduct fisheries surveys, deploy, and recover instruments, and many other activities to further understanding of the ocean exploration or research themes identified as priorities. A time series monitoring program will be the nucleus of Floating University activities aboard the *Tangaroa*; such a monitoring program would expose participants to all aspects of ocean research from instrumentation to data analysis. More advanced participants will be able to conduct additional research of their design, consistent with the *Tangaroa's* capabilities.

That NIWA is able to commit to voyages years in advance is virtually unprecedented in ocean exploration and research. It is a unique and important opportunity to expand understanding of the ocean environment whilst engaging early career scientists, students, and practitioners from Pacific Island nations.



Tangaroa DART Mooring Service Schedule
Moorings A, B, C, E in December of odd years; about 17 days at sea
Moorings F, G, H, I between June and August of even years; about 28 days at sea
Moorings J, K, L, D between June, and August of odd years; about 28 days at sea

Floating University for the Pacific Islands Evolution

NIWA's regular service of the DART tsunameter array is the initial backbone of the Floating University. As experience is gained and new partners engaged, the Floating University for the Pacific Islands will evolve and include new elements such as these:

Research Themes and Curriculum

- Advice from Indigenous Pacific Islanders is that they should select research priorities. How are research themes identified (including consultation with holders of traditional knowledge and wisdom)?
- Once priorities/themes are identified, how is research planning done and necessary permits acquired for specific *Tangaroa* cruises?

Identifying Early Career Scientists, Students, and Mentors

- How will we identify potential students, early career scientists and mentors from initial target countries of Samoa, Tonga, Tuvalu, Cook Islands and Niue?
- Need for relationships with University of the South Pacific, National University of Samoa, others, including NZ universities with students from the key communities. Also, with regional organizations

Indigenous Knowledge

- Science operations must include time and space for protocols and for traditional knowledge holders to participate.
- Science operations and traditional knowledge must be woven together throughout every aspect of the Floating University program with a goal of creating broad understanding.
- Note that some forms of traditional knowledge (e.g., navigation) are natural complements of typical *Tangaroa* operations. Others will be less obvious but equally important.
- There is a need for a group of advisors (elders) from the Pacific Island community (including Māori) to guide the Floating University program on these and other issues.

Building Cultural Relationships Among Participants

- In-person meetings prior to cruises to share cultural and traditional knowledge.
- Develop protocols and build operations to integrate them
- Series of meetings/talanoa for participants focused on integrating traditional knowledge and science results from cruises. These will be a component of the overall program and participation would grow as more young scientists go to sea and become alumni of *Tangaroa* cruises.

Communications

A robust communications program is essential to the success of the Floating University for the Pacific Islands. Stakeholders (including Pacific Island nation representatives), participants and potential future participants, and potential partners all need information about the Floating University. Accordingly, the Floating University for the Pacific Islands will include a communications program with the following elements.

Communications Strategy

- Outreach to engage potential participants and mentors (networked with regional organizations and others working in education, ocean science);
- Way to share results of the program, of individual cruises in terms relevant to key organizations (Pacific Island nations/communities; government/MFAT; regional organizations, philanthropic organizations, other funders/stakeholders, etc.);
- Media relationships/campaigns in NZ and Pacific Island nations/communities as appropriate; and,
- Targeted messaging and products for potential partners.

Communicating Science Results to Decision Makers

- Talanoa process so participants can put results in a context relevant to decision makers and elders
- Engaging local/national decision makers to share science results placed in context of traditional knowledge.

Benefits

A Floating University program would deliver benefits to Pacific Island nations and meet New Zealand and Pacific Community priorities for the region. It would result in a network of scientists and practitioners across the Pacific region of most interest to New Zealand that is able to:

- Conduct research and analyze ocean processes, including processes such as ocean acidification and other climate change effects with profound implications for the region, such as impacts on the regional tuna fisheries;
- Contribute to management strategies for issues like sustainable fisheries, biodiversity beyond national jurisdiction, and marine debris;
- Draw connections between science results from the deep ocean and community resilience (e.g., identifying ways to reduce stresses on coral reefs given the threat of ocean acidification);
- Support and amplify regional organizations' initiatives in climate, ocean, and fisheries science and distribute science results to Pacific Island member states;
- Identify solutions that resonate with Pacific Island nations as they address real-world problems and challenges;
- Create relationships and partnerships with New Zealand organizations and scientists that will lead to future opportunities for collaboration; and,
- Create opportunities to bring together mātauranga Māori and science in at- sea operations and to learn how at-sea research should be modified to conform to Māori and other Polynesian protocols.

Domestic and International Context

A range of domestic and international organizations and institutions are potential Floating University partners. If NIWA provides the *Tangaroa*, other partners are essential to realize the vision. The Floating University for the Pacific Islands will develop linkages to relevant organizations, including:

- New Zealand Ministry of Foreign Affairs and Trade
- New Zealand Ministry of Education
- New Zealand Department of Conservation
- New Zealand Universities
- The Pacific Community's **Oceans and Maritime Programme**
- South Pacific Regional Environmental Programme
- Pacific Island Forum
- UN Decade of Ocean Science for Sustainable Development
- European Union **Horizon Europe Programme**
- Australia's CSIRO
- Pink Flamingos (a group of ocean exploration philanthropic organizations led by Schmidt Ocean Institute)
- Existing relationships like **UNESCO's Unitwin** Science for Pacific Small Island Developing States
- **New partnerships** like New Zealand's association with The European Union's Horizon Europe research and development program (**EURAXESS**)

Floating University for the Pacific Islands
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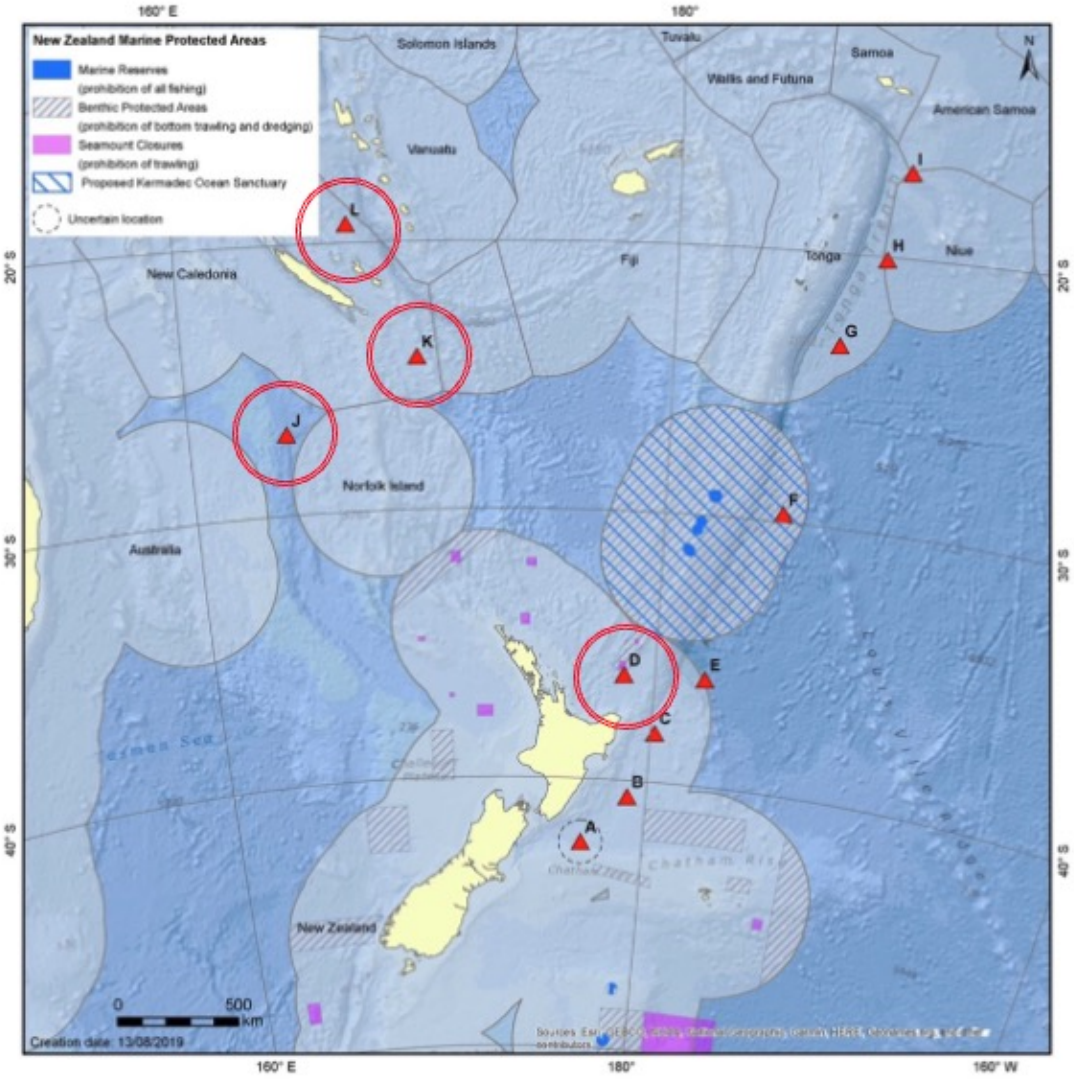
2023 Operations

For 2023, NIWA will service four moorings (J, K, L, and D; see diagram) from 20 May to 16 June, for cruise duration of 27 days. The *Tangaroa* will depart from and return to Wellington.



The primary objectives for the first Floating University for the Pacific Islands cruise are to trial the concept design and to:

- initiate a 10-year monitoring program to be conducted by the Floating University;
- develop a program for future Floating University participants that includes introductions to, and training in, monitoring and observations, instrumentation, data collection, data analysis, and other relevant topics;
- evaluate the inaugural cruise to refine approach for out-years;
- establish the basis for future partnerships with other organizations that operate ocean research vessels in the region and other relevant organizations; and,
- establish the basis for attracting future funding.

Floating University for the Pacific Islands
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2023 Task and Timeline Schedule

1. **Consultation with NIWA Principals and Cruise Planners - February**
   Present Floating University for the Pacific Islands concept, understand the nature of cruise plan inputs needed. Initial discussion/review of berthing and other at-sea issues.

2. **Establish Monitoring Program Design Committee**
   February Assemble a small team to design an initial first-year monitoring program that is technically feasible given the *Tangaroa's* capabilities. The committee should reference national and regional needs and existing programs/networks. Consider acoustic monitoring for migratory species. Consider student-led data collection, data management, analysis as well as operational aspects (deployments, instrumentation). The committee should also consider the value of a monitoring station similar to the Hawai'i Ocean Time Series/ALOHA Station and other approaches for the outyears, understanding the requirement that Pacific Island nations are engaged with the long-term monitoring program to ensure it meets their needs. Data management, and the ability to ingest data from other systems will be critical. Argo floats, drifters, sea surface temperature, salinity, and color data, and other relevant data will add value to what the *Tangaroas* systems can collect and greatly expand opportunities for Floating University for the Pacific participants. The monitoring committee should include individuals with expertise in physical and biological oceanography, fisheries, migratory species (in particular marine mammals) and existing monitoring programs in the region.

3. **Integrate Monitoring Program into Tangaroa Cruise Plan [TBD]**
   Monitoring team works with *Tangaroa* representatives to integrate a monitoring program into the 2023 cruise plan. Note that as one of the DART stations is in New Caledonian waters, a Marine Scientific Research permit application is to be filed six months in advance of proposed activities. NIWA plans to submit a broad application that will include water sample collection and other basic measurements/ collections. Should issues arise, however, monitoring can take place outside all EEZs.

4. **Select Mentor, Participants - February**
   Mentor and participants selected based on interest in Floating University for the Pacific Islands concept, ability to help shape 2024 and outyear program, at-sea experience in the region, and availability. Importantly, these participants will help trail the concept and must be able to help design the at-sea program for the outyears during and post-2023 cruise.

5. **Design and Provide Seminar for Tangaroa Crew April (Mike)**
   This seminar will explain objectives, introduce participants, and solicit ideas for smooth implementation.

6. **Design and Provide Training for Mentor and Participants - March-April**
   This training will address the Floating University for the Pacific concept, the monitoring program, the *Tangaroa* Cruise Plan, considerations for life at sea, and other issues intended to prepare participants with the information they need and to calibrate expectations.

7. **Design Evaluation Plan April**
   The evaluation plan will consider first-year results and make recommendations for how the program can be improved for the following year. Participants and *Tangaroa* crew will provide primary input. Surveys and interviews, along with the program coordinator's observations will be the major inputs for an evaluation report.

8. **Consult with Stakeholder Media Groups - March-April**
   Develop media plans and events in collaboration with NIWA, SPC, and MFAT media groups.

9. **Make Travel Arrangements, Other Logistics - March-April**
   Work with SPC/PCCOS to prepare travel, other logistics for participants.

10. **Develop and Launch Communications and Marketing Plan - May**
    Communications and marketing initiative will roll in media plans and events, supporting media, and a social media presence.

11. **Tangaroa Departs Wellington - 20 May**
    Mentor, student participants, and program coordinator aboard. Program coordinator serves as primary liaison between mentor/participants and *Tangaroa* crew and vice versa.

12. **Real Time Program Development and Assessment - May-June**
    Program coordinator leads mentor and participants in monitoring program activities, receiving input from, and recording observations about how the program operates. Based on at-sea experiences, the team will outline a robust draft program design for 2024 and outyears by the time the *Tangaroa* returns to Wellington.
13. **Tangaroa Returns to Wellington - 16 June**
14. **Post-Cruise Assessment - June-July**
    Participants and *Tangaroa* crew take surveys and participant interviews.
15. **Post-Cruise Report and Briefings for Stakeholders - August**
    Post-cruise report and briefings for stakeholders from NIWA, SPC, and MFAT
16. **Video/Media on First-Year Program Results - August**
    A video and supporting materials (such as a digital brochure and a mini-website) that describes first-year activities and results as well as plans for 2024-25. Materials should target Pacific Island nation leadership and resource managers, potential participants, potential new partners.
17. **2024-25 Implementation Plan - September**
    A second- and third-year implementation plan based on evaluation results and additional input from stakeholders and participants.
18. **Apply for EU Horizon Funding - October**
    Through a recent agreement between New Zealand and the European Union, NZ entities will be able to apply for EU Horizon funding. The Floating University could be a good fit.

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2024-2032 Task and Timeline Cycle

Based on the 2023 trial results, a program cycle for 2024 through 2032 can be developed, to be refined each year as experience is gained. Key elements of this cycle are outlined below. Note that while this task and timeline cycle necessarily focuses on plans for winter *Tangaroa* DART service cruises, the model and/or its elements are intended to be available to any organization that wishes to collaborate under the Floating University for the Pacific Islands framework.

1. **Re-Convene Monitoring Committee with Pacific Island - October**
    Representation
    Revisit monitoring plan with Pacific Island representatives to assess initial 2023 effort and revise as needed.
    Either in conjunction with this group or in parallel with another, an open data management architecture should be developed that accommodates data expected to be collected by Floating University for the Pacific participants and allows for the integration of data from other relevant sources (e.g., Argo floats, drivers, ocean color, sea surface temperature, sea surface salinity). Considerations include data management hardware and software to be available to participants.
    Similarly, opportunities for data analysis by participants during cruises should be considered. Access to data, data analysis and visualization software, and instruction for participants, among other issues, should be considered.
2. **Integrate Monitoring Program into Tangaroa Cruise Plan January**
    Monitoring team works with *Tangaroa* representatives to integrate the monitoring program into the annual DART cruise plan and into Marine Scientific Research permit applications.
3. **Select Mentor, Participants - February**
    Mentor selected based on interest in Floating University for the Pacific Islands concept, at-sea experience in the region, and availability. Mentor helps select three to five student participants based on academic interest, experience, and suitability for an extended cruise.

4. **Consult with Students' Home Island Stakeholders - April**
   Present concept and solicit perspectives from participants' home island resource managers, educators, and political leadership.

5. **Consult with Students' Home Island Traditional Leaders - April**
   Present concept and solicit perspective from participants' home island traditional leaders and keepers of traditional and indigenous knowledge.

6. **Adapt Tangaroa Cruise Plan as Needed - April**
   Share results of island consultations with *Tangaroa* planners and collaborate to incorporate changes or adaptations as needed.

7. **Design Annual Seminar for Tangaroa Crew - May**
   Explain annual objectives, introduce participants, and solicit ideas for smooth implementation.

8. **Design Training for Mentor and Participants - May**
   Address the Floating University for the Pacific concept, the monitoring program, the *Tangaroa* Cruise Plan, considerations for life at sea, and other issues intended to prepare participants with the information they need and to calibrate expectations.

9. **Refine/Adapt Evaluation Plan - May**
   Consider past years' results and make recommendations for how the program can be improved for the following year. Participants and *Tangaroa* crew will provide primary input. Surveys and interviews, along with the program coordinator's observations will be the major inputs for an evaluation report.

10. **Consult with Stakeholder Media Groups - May**
    Develop media plans and events in collaboration with NIWA, SPC, and MFAT media groups.

11. **Develop and Launch Communications and Marketing Plan - May**
    Launch media plans and events; add/update a mini website, supporting media, and a social media presence. Design logo design. Acquire swag for participants and *Tangaroa* crew (t-shirts, other gear).

12. **Make Travel Arrangements, Other Logistics - May**
    Work with SPC to prepare travel, other logistics for participants.

13. **Conduct Seminar for Tangaroa Crew June [TBC]**

14. **Conduct Training for Participants - June**

15. **Prepare Information Briefs for Stakeholders - June**
    Inform NIWA, SPC, MFAT (and other) stakeholders about the status of the program pre-cruise.

16. **Tangaroa Departs Wellington - July**
    Mentor, student participants, and program coordinator aboard. Program coordinator serves as primary liaison between mentor/participants and *Tangaroa* crew and vice versa.

17. **Real Time Assessment - July-August**
    Program coordinator monitors program activities, receives input from crew and participants, and records observations about how the program operates.

18. **Post-Cruise Assessment - September**
    Participants and *Tangaroa* crew take surveys and participant in interviews.

19. **Participants' Post-Cruise Group Report - September**
    Under the guidance of the mentor and the program coordinator, student participants prepare a post-cruise report that describes operational and science results and includes recommendations for out-year Floating University cruises.

20. **Post-Cruise Report - October**
    Post-cruise report for stakeholders prepared that includes input taken from Tasks 17-19.

21. **Post-Cruise Briefings for Stakeholders - October**
    Stakeholders from NIWA, SPC, and MFAT briefed on first year results.

22. **Post-Cruise Participant Presentations**
    Student participants and their mentor(s) supported to present results (based on their report at Task 20) at a major New Zealand, regional, or international conference. Appropriate venue to be determined, mindful that such conferences are a good place to engage potential new partners.

23. **Video/Media on Program Results to Date - TBD**
    Produce video and supporting materials (such as a brochure) that describes first-year activities and results as well as plans for 2024-25. Materials should target Pacific Island nation leadership and resource managers, potential participants, potential new partners.

24. **2024-25 Implementation Plan - TBD**
    Develop next-year implementation plan based on prior years' evaluation results and additional input from stakeholders and participants.

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Staffing and Resources

Stakeholders

Significant contributions from NIWA and SPC, as primary stakeholders, are needed for the success of the Floating University for the Pacific Islands:

NIWA: In addition to the time needed from the *Tangaroa* crew (before, during, and after the cruise), attention and input from senior management and experts in mātauranga Māori is required. NIWA scientists are needed to help design the monitoring and work program while at sea. Communications staff will play a role. And others (engineers, data managers, IT support) will be needed to ensure success.

SPC: SPC kindly has committed to fund travel and to manage travel-related logistics for participants. In addition to the staff requirements for logistics, SPC scientists and other experts are needed to help design the monitoring and work program while at sea. A SPC scientist may be a logical at-sea mentor; in any case, SPC scientists and planners will be needed to provide guidance before, during, and after the cruise.

Program Coordination

Managing the first year of the Floating University for the Pacific Islands is a significant undertaking. It is estimated that .25 FTE is required to oversee this effort, including participation in the 2023 cruise. Travel funds are also required. A contractor to SPC or NIWA is recommended. In addition, program coordination tasks provide a good opportunity for a young Pacific Islander to contribute as part of the team; other program management support from PCCOS (or SPC generally) would strengthen the effort.

Communication and Marketing

An effective communications and marketing strategy and program will help raise awareness of the Floating University for the Pacific Islands in the region, document the 2023 cruise, and set the stage for the following years' program activities and importantly, to set context for potential partners. A communications and marketing consultant is recommended to develop and implement this effort.

Equipment

Equipment needs will depend on the instruments available on the *Tangaroa* and the requirements of the monitoring and work program developed for the cruise. Requirements set by the monitoring and data management planning efforts referenced elsewhere may involve portable drives that integrate into the *Tangaroa's* IT system. Participants may need laptops or the loan of laptops. At-sea gear for participants will also be needed.

Long-term equipment needs will become clearer after this 2023 cruise. As the program matures, there will likely be other opportunities and/or needs related to instrument or vehicle deployments from the *Tangaroa*.

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2023 Budget

	In-kinds?	Description	Cost/Value (USD)
NIWA	**Y**	Tangaroa ship time and crew	$875K-1.3M
NIWA	**Y**	Participation in program design and implementation (e.g., science consultation)	TBC
SPC	**Y**	Participation in program design and implementation	TBC
SPC	**N**	Mentor (TBD)	TBC
SPC	**N**	Travel and logistical support for participants	TBC
Contract	**N**	Program coordination (.25 FTE)	$58.3K
Contract	**N**	Communications	TBC
Contract	**N**	Travel for program coordination, communications	TBC
	?	Equipment and Supplies	TBC

Out-Years

In the out-years, there will be addition expenses (and funding partners), depending on how the Floating University for the Pacific Islands evolves, such as:

- Research grants
- Engaging holders of traditional knowledge (and sharing expedition results with communities)
- Data analysis and archiving
- Events for sharing results (e.g., Ocean Sciences, regional meetings, NZ science meetings)

Appendix I

Scoping Process and Results

To further scope the concept of a Floating University for the Pacific Islands, we shared the draft concept document with regional stakeholders, potential participants, potential partners and collaborators, science experts, relevant non-governmental organizations, and others whose views we felt would help inform the validity of the Floating University. Our primary objective with these initial interviews was to define the potential scope of the Floating University concept before engaging in a wider talanoa with key stakeholders such as Pacific Island ocean scientists, academics, policy makers, leaders, and students. We were not able to consult with many holders of traditional and indigenous knowledge, however. This is an important gap that must be filled as soon as possible.

Having shared the draft concept in advance of video calls, we asked each interviewee their views about the merits of the idea, whether they would be willing to participate in such a Floating University, and their ideas for improving and/or refining the Floating University as presented in the concept document.

Interviewees were, without exception, enthusiastic about the concept and recognized it as a potentially important contribution to Pacific Island nations' ability to participate in the critical science investigations, develop their own science capacity over time, integrate traditional and indigenous knowledge and western sciences and to build a cross-Pacific cohort of young scientists trained to tackle the most pressing ocean-related issues on behalf of their communities, their nations, and their region.

Almost all interviewees offered to support the Floating University for the Pacific Islands by making connections with potential stakeholders and funders, helping to recruit participants and mentors, offering in-kind services, by contributing berthing on their own ocean research/exploration cruises, and other assistance.

Key outcomes of the scoping process included:

- Interviewees agreed that a Floating University for the Pacific Islands would fill important gaps in educational opportunities. Cruises could both expose participants to new opportunities and provide a stepping stone for participants keen to pursue ocean science. Further, the Floating University could play a critical role in forming trans-Pacific networks of early career scientists (and reinforce existing relationships). Finally, the Floating University could form an important link in a career pathway in ocean science and management for Pacific Islanders. These considerations should be integral to planning, implementation, and follow up.
- Interviewees recommended expanding the original concept of providing at-sea research opportunities for early career scientists to include an ongoing ocean observations monitoring program that would expose undergraduate and graduate participants to all aspects of ocean research (instruments, operations, data collection, data management, analysis, etc.).
- R/V *Tangaroa's* regular cruise tracks create an important opportunity to contribute to regional ocean observations for ocean acidification and other key parameters, including the nascent New Zealand Ocean Observation System as well as established networks like Australia's Integrated Marine Observing System, the Pacific Ocean Observing System, and ongoing research monitoring programs.
- All three operators of research vessels consulted expressed interest in working with the Floating University for the Pacific Islands to host participants and to help design programs aboard research vessels.
- An appropriate administrative structure for the Floating University is needed. and "Starting small and scaling up" as experience is gained is important to manage expectations and grow relationships and partnerships.
- Care should be taken to ensure all appropriate Island nations (e.g. from Melanesia to the Cook Islands) have equal--and genuine--opportunities to participate and contribute to the Floating University for the Pacific Islands.

Interview Summaries

The Pacific Community (SPC)

Molly Powers-Tora, Team Leader, Ocean Management and Literacy, Pacific Community-SPC.
There are a number of programs to support early career scientists in the Pacific Islands sponsored by UN organizations like the World Meteorological Organization and regional organizations like the Pacific Community. Ms. Powers-Tora noted that these programs are potential partners for a Floating University for the Pacific Islands and can help identify appropriate participants. She also described Pacific Island needs for ocean data for management decisions.

Katy Soapi, Coordinator for the Pacific Community Centre for Ocean Science (PCCOS)
The opportunity to learn directly from experts on a vessel in the context of a scientific field expedition is: "worth a lot more than spending one year in the lab or spending one year of desktop study." The "holistic" experience provided by the Floating University could inspire young Pacific Islanders and build a whole generation of role models for the region. We need to build capacity in research, monitoring, and data collection, but we also need to build local capacity to analyze the information and use it for decision making. It will be very important to continue to consult and work closely with others working in this space. We also need to think seriously about career pathways and finding opportunities to retain and support professional development within the region.

Vessel Operators

Allison Fundis, Chief Operating Officer, Ocean Exploration Trust.
Ocean Exploration Trust (OET), founded by Robert Ballard, has been a major driver for ocean exploration and associated technologies since it was established in 2007. OET operates the E/V Nautilus, a capable ocean exploration and research vessel, and a variety of education and career development programs targeted to underserved minorities. OET is keen to partner with a Floating University for the Pacific Islands by sharing information, hosting Pacific Island scientists on appropriate Nautilus cruises and other activities that would benefit common objectives for creating opportunities for early career scientists to work at sea and sharing ocean exploration and research results with Pacific Island nations.

Tara Martin, Research Team Leader, CSIRO.
CSIRO operates the Australian national marine facility vessel R/V Investigator, a vessel in a similar class to *Tangaroa*. CSIRO has experience with programs that provide early career scientists opportunities to do the sea, like the Indigenous Time at Sea Scholarship program, and, more broadly, the Collaborative Australian Postgraduate Sea Training Alliance Network (CAPSTAN). Dr. Martin offered to share lessons learned from starting up these programs. She also suggested that there could be opportunities for collaboration between CSIRO and a Floating University, such as placing Floating University young scientists aboard appropriate R/V Investigator cruises and vice-versa, as well as contributing Australian scientists and mentors for Floating University cruises aboard the R/V *Tangaroa* and other platforms.

Carlie Wiener, Director of Communications and Engagement Strategy, Schmidt Ocean Institute. Schmidt Ocean Institute (SOI) has operated in the Pacific extensively in the past and will remain focused on the region over the next few years. SOI has focused on partnerships as fundamental to its operations and has collaborated with the U.S. National Oceanographic and Atmospheric Administration ocean exploration program, Robert Ballard's Ocean Exploration Trust, CSIRO, and many other organizations in the Pacific. SOI is also a leader in the U.N. Decade of Ocean Science. As SOI has its own programs to bring young scientists to sea, the organization is not likely fund the Floating University directly. But there are many possibilities for partnership, including hosting young scientists the Floating University of the Pacific Islands identifies as a good match for Schmidt Ocean Institute cruises. Dr. Wiener also offered to help make connections with other NGO and foundation operators of research and exploration vessels through the informal alliance of these organizations SOI has formed known as the "Pink Flamingos." SOI operates Falkor Too.

Foundations and NGOs

Jessica Cramp, Executive Director, Sharks Pacific Sharks
Pacific is a project to engage Pacific Island communities in protecting sharks and their habitat. Dr. Cramp is based in Rarotonga. She supports the concept of the Floating University as valuable for Pacific Islanders and potentially, organizations such as Sharks Pacific that need quality scientific information about the deep ocean. Dr. Cramp provided helpful comments on the draft implementation plan and is keen to provide ongoing advice on research programs that might be conducted on the *Tangaroa* and other Floating University platforms.

Jacqui Evans, Founder, Moana Foundation.
Ms. Evans founded the Moana Foundation after winning the Goldman Environmental Prize in 2019. She had managed the Marae Moana Marine Reserve in the Cook Islands. She is strongly supportive of the Floating University for the Pacific Islands concept, concerned only that Cook Islanders have opportunities to participate and the Cook Islands benefit from ocean research that might be conducted during Floating University cruises. She is keen to remain involved as an advisor and identified others who could help advise on development of the Floating University.

Consultants

Sangeeta Mangubhai, Principal, Talanoa Consulting (Fiji)
Dr. Mangubha's background is in fisheries and coral reef ecology, combined with her work with communities across the Pacific. She expressed interest in the Floating University for the Pacific Islands as relevant to her work helping decision makers and local communities develop and implement science-based management policies. She reinforced the need to make ocean science results available to Pacific Island nations and to ensure research conducted is of value to them.

Government and Regional Organization Representatives

Valerie Allain, Senior Fisheries Scientist, Pacific Community
Dr. Allain's extensive experience working with Pacific Islanders on the science behind sustainable fisheries--as well as her practical experience hosting students from Pacific Island nations made her comments particularly useful. She noted the importance of a day-to-day structure for participants and the need to be realistic about their backgrounds. She suggested a program to train participants in ocean science that would also product data of value to the region. This approach would not preclude hosting participants that were positioned to conduct their own research. She also stressed the importance of establishing career paths for Pacific Islanders that allow experts to contribute to their home nations.

Doug Ramsay, Manager, Pacific Rim, National Institute for Water and Atmosphere
NIWA is active in Pacific regional organizations for ocean observations and marine science. Mr. Ramsay provided a useful overview of such programs to which a Floating University for the Pacific Islands might contribute. He noted the lack of science opportunity and so capacity in the Pacific Islands--as well as a dearth of Māori and Pasifika scientists and technicians in NIWA. He stressed that Floating University opportunities should be made available to students early to expose them to different aspects of the scientific endeavor and to encourage them to pursue careers in marine operations, engineering, and data as well as science. He reinforced the importance of creating career paths for young scientists to follow as well as a peer community. Finally, Mr. Ramsay outlined various approaches to instrumentation during tsunameter maintenance cruises.

Shereen Sharma, Head of Engagement and Development, Nippon Foundation-GEBCO Seabed 2030 Project.
Among GEBCO-Seabed 2030 priorities is supporting Pacific Islanders and other underserved groups to hydrography and related ocean science. Ms. Sharma is very willing to help the Floating University for the Pacific Islands develop programs or modules for multibeam surveying and analysis, data management, and related areas in her capacity as Head of Engagement and Development. As she is knowledgeable about the Nippon Foundation, she may be willing to help the Floating University investigate support from the Nippon Foundation. Ms. Sharma is happy to provide further advice on program development.

Academics

Letitia Finkel, Executive Dean for Education, University of Canterbury.
As a professional educator as well as academician, Dr. Finkel was supportive of the Floating University concept. She identified a number of colleagues at the University of Canterbury who specialize in the intersection of traditional and indigenous knowledge and western science who may be resources as the program develops.

Michelle Heupel, Director, Integrated Marine Observing System, University of Tasmania.
Australia's Integrated Marine Observing Systems (IMOS) collects ocean data from a wide variety of instruments, moorings, vehicles, and research cruises and makes these data available through a portal. It is part of the Global Ocean Observing System and similar to the nascent New Zealand Ocean Observing System (NZ-OOS). As regular R/V *Tangaroa* tsunameter cruises will likely collect data relevant to IMOS, as well as for NZ-OOS. Dr. Heupel endorsed the concept of routine observations collected by Floating University participants and provided advice on types of instruments and training that might be appropriate for Floating University participants. She is willing to continue to advise on the development of the Floating University and is willing to help make connections with other integrated ocean observing systems to help ensure that data collected aboard the *Tangaroa*, and other Floating University platforms is useful and relevant to the larger ocean observing system community--and the scientists and managers that use ocean observing data.

Noelani Punawai, Assistant Professor, University of Hawaii Hawai'inuiākea School of Hawaiian Knowledge
In the 2022 In Kupe's Wake, a report and recommendations for improving educators' access to ocean exploration results, Dr. Punawai urged that early career scientists be provided with opportunities to conduct research at sea--and to share their experiences and results with Island elders, ocean resource managers, and their peers. She considered the Floating University for the Pacific Islands concept to be consistent with that report's recommendations. Dr. Punawai noted the importance of these opportunities, but also of creating a trans-Pacific peer group for early career scientists. As an expert in the intersection between traditional knowledge and western science, Dr. Punawai reinforced the importance of including traditional knowledge into the design of Floating University cruises.

Antony Vaivia, PhD candidate, University of Auckland.
A Cook Islander who grew up in New Zealand, Mr. Vaivia's research focused on coastal fisheries in the Cook Islands. His perspective is that opportunities such as the Floating University for the Pacific Islands are invaluable in showing Pacific Islanders what is possible, not just in providing opportunities for early career scientists. He noted that too often, students' perspectives were limited to what they had been exposed to and that they can't imagine broader opportunities in ocean science, engineering, and technology, however critical these areas may be to understanding issues that affect Pacific Island nations. A Floating University would help to create a larger pool of scientists by providing exposure and opportunity.

Sponsors

In addition to the interviews summarized above, we held consultations with our primary sponsors to refine and strengthen the implementation plan. Their advice and direction was invaluable.

Jerome Aucan, Head, Pacific Community Centre for Ocean Science

Finbar Kiddle, Senior Advisor, NZ Ministry of Foreign Affairs and Trade

Mike Williams, Chief Scientist for Oceans, National Institute for Water and Atmosphere

Appendix II

References and Resources

We referred to the following key documents, among others, in developing this first-year implementation plan:

- NIWA Strategic Plan/other planning documents
- MFAT Pacific Regional Four-Year Plan
- UN Decade of Ocean Science for Sustainable Development
- Pacific Community Strategic Plan 2022-2031
- Pacific Islands Forum 2050 Strategy for the Blue Pacific Continent
- Pacific Islands Forum Fisheries Agency Strategic Plan 2020-2025

Authors

Flinch Marketing prepared this document under a contract with The Pacific Community.

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