SOCPacific
A Sea of Connections

Valuing Reef Passages in the South Pacific Region

IRD Summer School Report

Training in Inter-Disciplinary and Ethnoecological Studies (TIDES) of Reef Passages

8 – 12 September 2025

The University of the South Pacific, Suva, Fiji

The event was made possible in collaboration and support by:

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Report Overview

As part of SOCPacific2R Project, a Summer School was held on September 8–12, 2025 at The University of the South Pacific in Suva, Fiji, which focused on Training in Inter-Disciplinary and Ethnoecological Studies (TIDES) of Reef Passages.

Program Highlight: The five-day workshop combined facilitator presentations with hands-on exercises on topics including research ethics, ethnobiology, gender & social inclusion, participatory mapping, and *talanoa* methods.

Participants: Fourteen students participated in summer school. 10 representing The University of the South Pacific, 3 from the University of New Caledonia, and 1 from French Polynesia.

Key themes:

- Collaboration across disciplines and with local communities.
- Integrating traditional knowledge with science to strengthen ecological understanding and resource management.
- Ethical practices such as free, prior, and informed consent.
- Gender equity, disability, and social inclusion in conservation and research.
- Participatory approaches like community mapping to value diverse perspectives.

This report was compiled by:

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Day 1 – Monday 8th September 2025

Session 1: Why inter- and transdisciplinary matter? How can people from different disciplines and from non-academic backgrounds co-produce knowledge?

Facilitator: Annette Breckwoldt

Interdisciplinary research is essential but challenging. Success depends on equity, trust, strong disciplinary expertise, and genuine collaboration across social, economic, and environmental pillars. Key themes discussed during this session:

1.1 **Importance of interdisciplinary, multidisciplinary, and transdisciplinary approaches**

- Collaboration across natural sciences, social sciences, and stakeholders is essential for meaningful outcomes.
- Though often underfunded and time-consuming, such collaboration is critical to addressing urgent environmental and social challenges.
- Requires openness, curiosity, and willingness to cross boundaries.

1.2 Three pillars of research

- Social, Economic and Environmental: All research must be sustainable, bearable, and equitable.
- Funding should be balanced between natural sciences and social sciences.

1.3 Equity in collaboration

- Equity must be prioritized when merging disciplines.
- Challenges include:
    - Timeline misalignment: Natural sciences often begin fieldwork before community agreements, leaving social sciences behind.
    - Imbalance of power: Natural sciences dominate funding, coordination, and decisions.
    - Late involvement of minority disciplines reduces meaningful input.

1.4 Team building & collaboration principles

- Effective interdisciplinary teams require attention.
- Majority vs. Minority disciplines (power, funding, influence).
- Resources and finances.
- Evaluation standards and leadership roles.
- Target audiences of research.
- Recruitment processes.
- Trust and long-term relationships between researchers and communities are crucial.

1.5 Benefits of interdisciplinary work

- Creates unexpected insights and strengthens research outcomes.
- Combining perspectives leads to more robust solutions.
- Builds stronger collaboration through shared power and equity.

1.6. Challenges in academia

- Rigid curricula and traditions make interdisciplinary collaboration difficult.
- Strong disciplinary expertise remains essential; interdisciplinary projects succeed only when each member is skilled in their field.
- Academia requires persistence and curiosity to overcome barriers.

1.7 Sustainability & environmental urgency

- Human activities (plastics, fishing, shipping, transport, settlements) have severely impacted ecosystems.
- Interdisciplinary research is urgently needed to reduce harm and support local/global environmental efforts.
- Academics play a key role in strengthening these efforts from diverse perspectives.

1.8. Principles for success

- Build equity and shared power across disciplines.
- Break traditional hierarchies (e.g., professor–student roles).
- Apply the 4 P: Positionality, Power, Participation and Partnership.
- Collaboration is more rewarding than competition.

Session 2: Presentation of an example focussed on balolo in Fiji: Fish is the sign, but fertility is the real issue.

Facilitators: Simonne Pauwels & Kelly Brown

2.1 Scientific Gaps & Challenges

Research on balolo (Palola/Eunice viridis) remains limited, with species identity across Fiji, Samoa, and the Indian Ocean still unclear. Reef habitats and ecological niches are poorly documented, and monitoring is inconsistent, costly, and logistically difficult. Conservation efforts face challenges, as past studies relied on destructive sampling methods. Balolo populations, along with reef ecosystems more broadly, are threatened by degradation, climate change, and pollution. Similarly, scientific knowledge of shark species lags behind their deep cultural significance, underscoring the need to integrate biological research with traditional ecological knowledge to strengthen conservation and management.

2.2 Cultural Importance

Balolo and sharks are deeply valued in Pacific communities, not only as sources of food but as symbols of tradition and identity. Sharks, in particular, are associated with chiefly lineages, fertility, alliances, and social organization, and their significance is embedded in songs, rituals, and oral histories. Traditional hunting tools, such as spears used specifically for sharks and turtles, reflect the cultural specificity and ecological knowledge passed down through generations.

See Figure below of the description in a **traditional Fijian lunar calendar**, detailing the specific "moons" (*vula*) that correspond to each month of the year. Each month is defined by ecological markers, agricultural cycles (particularly yam cultivation), and seasonal weather patterns.

Vula i Sevu, literally moon of the offering of the first fruits (of the yam) or *vula Iribuli*, moon of the constellation Belt and sword of Orion, everything is mature, February.
Vula i Kelikeli, moon of the draining channels (of the yam gardens), March.
Vula i Gasau, moon of the flowering of the reeds, *Miscanthus floridulus*, they will be used for the staking of yams, April.
Vula i Doi, moon of the flowering of the shrub *Alphitonia zizyphoides*, the violent winds are called *doi* winds, they announce the end of the cyclone season, May.
Vula i Werewere, moon of the weeding, the first yams are planted, June.
Vula i Cukicuki, moon of the digging (*cukicuki*) and planting of yams, July.
Vula i Se-ni-drala or Vula i Kawakawa, moon of the flowering of the *Erythrina variegata* tree, the signal for planting yams, August.
Vula i Vavakada, moon of the staking of yams, September.
Vula i Balolo Lailai, moon of the small *balolo*. The *ki* or *deu*, *Upeneus vittatus*, yellowstriped goatfish, comes to spawn in large numbers in some areas, the tree *Cananga odorata*, *Annonaceae* or ylang ylang is in flower, October. Also called vula i kadrekadre, month of the germination of yams
Vula i Balolo Levu, moon of the numerous *balolo*, the marine and terrestrial crabs spawn, November.
Vula i Nuqa Lailai, moon of the *Siganus vermiculatus*, Siganidae or vermiculated spinefoot, coming in small numbers. Sometimes there is still an appearance of balolo, December.
Vula i Nuqa Levu, moon of the numerous vermiculated spinefoot, profusion of fish and crustaceans inside the reef, numerous blooms on land, January.

Source: Presentation of Simonne Pauwels

2.3 Community Knowledge & Collaboration

Communities offer vital insights into the timing of spawning events and the specific reef locations where species like Balolo appear. Their traditional ecological knowledge is essential for guiding effective research and conservation efforts. This collaborative approach is not only valuable for Balolo but also broadly applicable to sharks and other marine species across the Pacific.

2.4 Personal Reflection & Teaching

The project demonstrated that research becomes stronger when paired with community knowledge. Through this work, traditional biological insights have been integrated into marine science teaching at USP, ensuring that students learn to value both scientific data and cultural wisdom. This experience reinforced the importance of combining science, culture, and conservation, highlighting how such an approach strengthens ecological understanding while honouring the knowledge systems of Pacific communities.

Session 3: Workshop on Reef Passages

Elodie Fache, Annette Breckwoldt, Jasha Dehm, Amanda Ford, Salanieta Kitolelei, Simmonne Pauwels & Dominique Pelletier

When approaching the subject of reef passages, it is essential to begin with individual awareness of, and collective obligations to, these vital ecosystems. Recognizing gender-based and age-based practices and perspectives on traditional knowledge and oral narratives enriches this dialogue, ensuring that diverse voices and lived experiences are acknowledged and valued.

Activity 1

The participants were divided into 4 groups and given A3 pictures of the coastline in Gau Island. The participants were to then answer a few questions based on the image such as:

1. Naming places
2. Uses and activities around reef passages
3. Living beings, as well as other beings and things, depending on or passing through reef passages
4. How people in the South Pacific region take care of reef passages
5. Threats

Refer to Appendix E for more details

Each group produced a poster, including their answers to these different questions, and presented a summary of its discussions. See Appendix E for more details.

Then all participants discussed to what extent this activity could be used in a Fijian rural village to explore local uses, views, values, caring practices and visions for the future relating to a specific reef passage.

The discussion included thoughts on how, when approaching the subject of reef passages, it is essential to begin with understanding local uses and values associated with these vital socio-ecosystems. To deepen engagement, the organization of focus groups and other participatory research activities should take into consideration gender as well as age. This can be facilitated by a comprehensive stakeholder mapping exercise, compiling a clear list and characteristics of all stakeholders involved, to guide inclusive and coordinated action for reef passage research and management/conservation.

Session 4: Introduction to ethnoecology & important basics to get on the same wavelength

Facilitators: Elodie Fache and Sebastian Ferse

Ethnoecology and transdisciplinary research strengthen conservation by combining scientific methods with local ecological knowledge, though challenges in communication and integration remain.

Terminology:

- **Ethnoecology**: Examines complex past and present relationships between people, society, economy, politics, and the environment.
- **Interdisciplinary Studies**: Cross disciplinary boundaries within academic fields.
- **Transdisciplinary Studies**: Extend beyond academia to cross social and economic boundaries, focusing on people–environment relationships.
- **Deductive reasoning** starts with a general theory and tests it with specific evidence.
- **Inductive reasoning** starts with specific observations and builds toward a general theory.

Indigenous knowledge provides valuable seasonal insights into large spawning aggregations, which are especially important for species that are vulnerable to overfishing. For example, at Tiburon Island, green turtles dominate during the winter months and are known to spend extended periods resting on seabeds. This is complemented by **local ecological knowledge**, which is held by specific groups of people and passed down from generation to generation, offering critical guidance for conservation and management efforts.

Challenges while conducting research:

- Language barriers can make communication and knowledge-sharing difficult.
- Different ways of explaining nature may lead to misunderstandings between researchers and local communities.
- Translating traditional practices into usable frameworks is often complex and requires sensitivity.
- Identifying appropriate units of analysis is challenging when integrating local knowledge into broader scientific contexts.
- Finding effective forums for communication, such as respectful engagement with elders, is essential but not always straightforward.

Social event

During this event participants get to know each other. Since it was cold, the group first played a game indoors.

Participants were divided into groups and given pictures of different marine organisms. Each group discussed:

- The common name of the organism
- The name in their own dialect

- Any special cultural or personal connection to that marine life

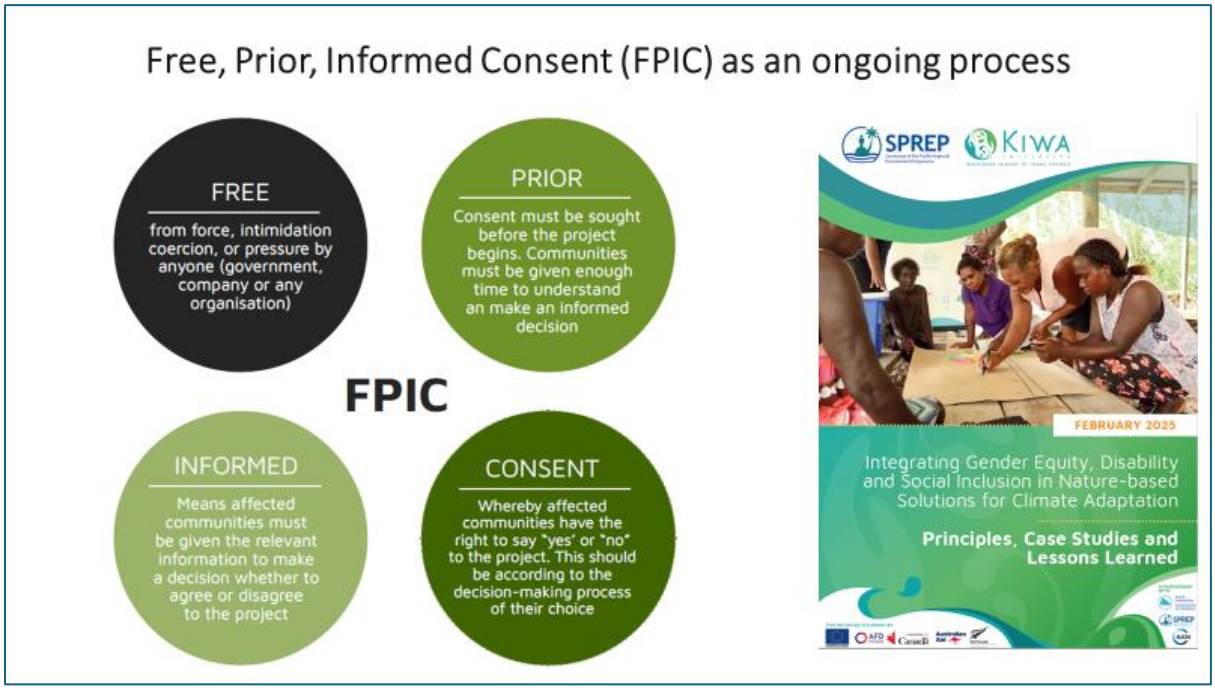
Later, participants gathered outside in the seafood village for a kava.

Day 2 – Tuesday 9th September 2025

Session 5: Research Ethics

Facilitators: Elodie Fache, Annette Breckwoldt & Salanieta Kitolelei

The International Society of Ethnobiology Codes of Ethics (1996–2006) established 17 guiding principles designed to foster equitable and respectful relationships with Indigenous peoples, traditional societies, and local communities. Central to these principles is the emphasis on responsibility, genuine partnership, collaboration, and the ongoing requirement of free, prior, and informed consent (FPIC) to build trust and safeguard rights. Research must be adapted to diverse audiences and multicultural contexts, ensuring respect and minimizing harm.



Source: SPREP (2025) Integrating gender equity, disability and social inclusion in nature-based solutions for climate adaptation. Principles, case studies and lessons learned. Mangubhai S, Chung M (authors). Kraft M (eds). Apia, Samoa: Secretariat of the Pacific Regional Environment Programme.

At the University of the South Pacific (USP), human research ethics align closely with these international standards, while broader frameworks such as the European Commission's ethics in social sciences reinforce the importance of participant protection during consent processes. Research ethics are further grounded in deontological principles: academic freedom, impartiality in recruitment, protection against violence, discrimination, and harassment, and safeguarding personal data as well as scientific integrity principles, including reliability, honesty, respect, and accountability. Together, these frameworks highlight the need for ethical rigor, cultural sensitivity, and integrity in all research practices.

Activity 2

Different scenarios were placed up on the slides,
and the participants with the facilitators discussed the different scenarios and possible decisions/outcomes

Case 1: Witness to murder
https://americananthro.org/practice-teach/handbook-on-ethical-issues-in-anthropology/chapter-3/case-3-witness-to-murder/

Case 2: Falsified Data
https://americananthro.org/practice-teach/handbook-on-ethical-issues-in-anthropology/chapter-3/case-11-the-case-of-the-falsified-data/

The questions guiding these group discussions were:
How would you act/react in this type of situation?
What are the arguments for, and against, this way of acting/reacting?
What would you consider right or wrong? moral or immoral?

Session 6: Gender Equity, Disability, Social Inclusion (or GEDSI) approaches

Facilitators: Sangeeta Mangubhai & Kimberly Samson

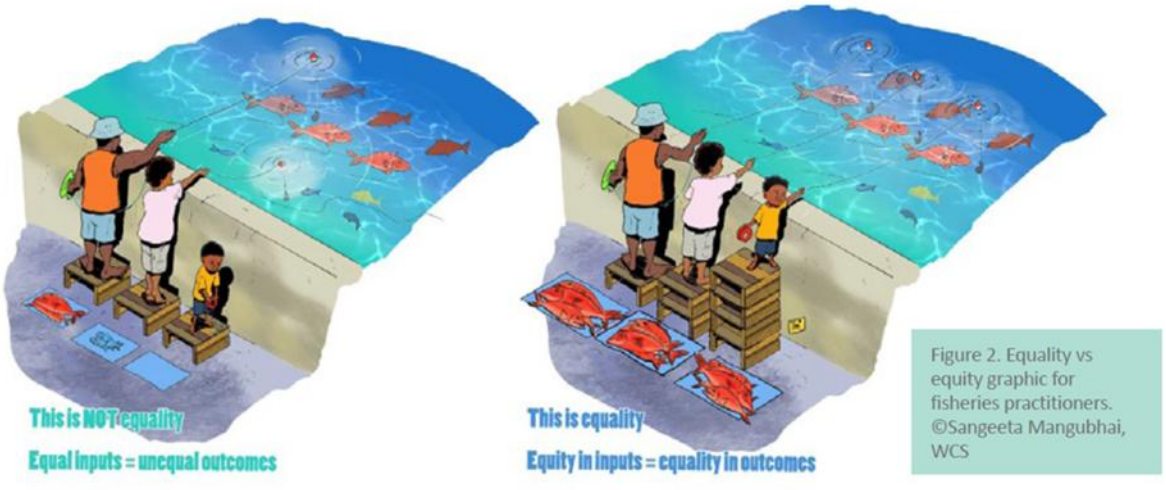
Activity 3a: Power Walk or Privilege Walk

In this activity, often called a Power Walk or Privilege Walk, participants each take on a character profile and line-up side by side. The facilitator then calls out different life events or opportunities, and participants step forward if their character benefits or step back if they do not. As the exercise progresses, the group's positions reveal how certain identities, such as men with fewer caregiving responsibilities - move ahead, while others, like women balancing work and family, fall behind. The final visual outcome highlights systemic inequalities and sparks reflection on privilege, gender, and social roles.

See Appendix E for more details.

Gender and sex are distinct concepts: sex refers to biological characteristics, while gender encompasses socially constructed identities, roles, norms, relationships, and power dynamics. Gender identity reflects an individual's deeply felt internal experience, which may or may not align with their biological sex at birth. Misconceptions persist, such as equating gender solely with women or numerical representation, assuming opportunities should be restricted by sex, or treating gender roles as fixed. Culture changes, inclusion is important, and identity comes

from experience. Gender stereotypes, often formed between ages 5–7, influence children's perceptions of roles and identity.



Source: Mangubhai, Sangeeta. 2021. Gender equality vs equity: Say goodbye to apple-picking and baseball matches! SPC • Women in Fisheries Information Bulletin #33: 66

Understanding gender differences requires attention to roles, responsibilities, access, and resource management. Importantly, equality and equity must be distinguished: equality assumes uniform support, while equity provides tailored support based on individual needs. Within the Pacific, disability inclusion is a critical dimension of GEDSI, with approximately 1.7 million people in Pacific Island Countries (PICs), 15% of whom live with disabilities, facing barriers to resources, rights, and participation in daily life. GEDSI principles aim to balance power and resource access across diverse groups, promoting inclusive environments that support identity, comfort, and participation, particularly within universities and community institutions. Together, these frameworks highlight the need for culturally sensitive, equitable, and inclusive approaches to research, education, and resource management.

Activity 3b: Gender stereotypes

A question was presented to the participants on what is one gender stereotype that has been challenging for you in your life?

See Appendix E for more details.

Session 7: Participant observation

Facilitators: Elodie Fache & Annette Breckwoldt

Field notes and reflexivity are central to qualitative research, as timely writing preserves detail and depth while reflexive diaries capture both observations and the researcher's evolving positionality. Revisiting notes supports long-term memory and highlights growth through shifting interpretations. Visual tools such as photos, drawings, and videos can complement written notes, though they may influence participant behavior and are sometimes requested as acts of reciprocity. Choosing between writing and photography depends on context, participation, and practical constraints, while embodied involvement such as joining fishing activities strengthens memory and provides deeper insight.

Participant observation offers rich, high-density qualitative data but is time- and labor-intensive, particularly in short-term projects. It requires immersion in community life, engaging with daily routines and conversations, and employing all five senses to understand motivations and actions. Observation and description are inseparable, with written accounts serving as testimony and evidence for research argumentation. Ethical considerations, including consent for notes, photos, and recordings, underpin all data collection. The method exists on a continuum between participation and observation, revealing discrepancies between beliefs and behaviors. Researchers must reflect on positionality and bias to maintain rigor, while lively, detailed descriptions capture tensions, complexities, and diversity.

Facilitators emphasized that there is no single template for notetaking; systematic detail is more important than uniformity of style. Participant descriptions varied widely, from general dynamics and group comparisons to specific interactions and contextual details. Neutrality and objectivity are difficult to sustain in human-centered research, making transparency about personal perspectives essential.

Activity 4

The participants were given pieces of paper and instructed to describe a special moment from the summer school the previous day, during which they were doing participant observation without knowing it!
The participants then swapped notes and then some descriptions were read to the group. Similarities and differences between these descriptions were commented and discussed.

Session 8: Boundaries, activities, rules, practices and markets which govern resource use in fishing spaces

Facilitator: Jokim Kitolelei

The research highlights the importance of studying fishing boundaries, activities, rules, management practices, and market dynamics through a bottom-up approach that prioritizes community perceptions and local knowledge. Across the Pacific, ineffective coastal fisheries management remains a widespread challenge. Formal stock assessments are identified as essential, yet isolation and limited capacity hinder enforcement, particularly where small fishing boundaries increase the likelihood of fishers exploiting resources beyond their designated areas.

In Fiji, the complexity of managing 410 traditional fishing grounds is compounded by unclear boundaries within communities. The study emphasizes the need for collaborative efforts between the Fisheries Commission, government, and local communities to improve boundary recognition and resource management. Tools such as GPS and ArcGIS mapping were employed to track fishers' movements, offering valuable insights into spatial use patterns.

The governance of fisheries resources involves both formal and informal rules, with adherence varying across communities. Non-compliance by some individuals can undermine collective management by encouraging others to disregard rules. To address these challenges, the study applies the BARPM framework (Boundaries, Activities, Rules, Practices, and Market), which integrates ecological, social, and economic dimensions. This approach highlighted the importance of communities understanding their fishing boundaries and practices but also the market dynamics that shape resource use.

Discussion based on questions during session: When fishers operate outside designated boundaries, they risk violating protected areas and traditional taboo zones, as noted in Fiji, while in Tonga such boundaries are shaped by the monarchy, with chiefs unable to restrict fishing beyond their own domains. Customary fishing rights play a central role in defining and enforcing these boundaries, as communities collectively agree on limits and recognize violators as outsiders, with clans negotiating rights to ensure fair management, as described in New Caledonia. Overall, fishing boundaries help safeguard marine ecosystems by fostering respect between villages, reducing disputes, and minimizing conflicts over access to resources, thereby supporting both ecological protection and social harmony.

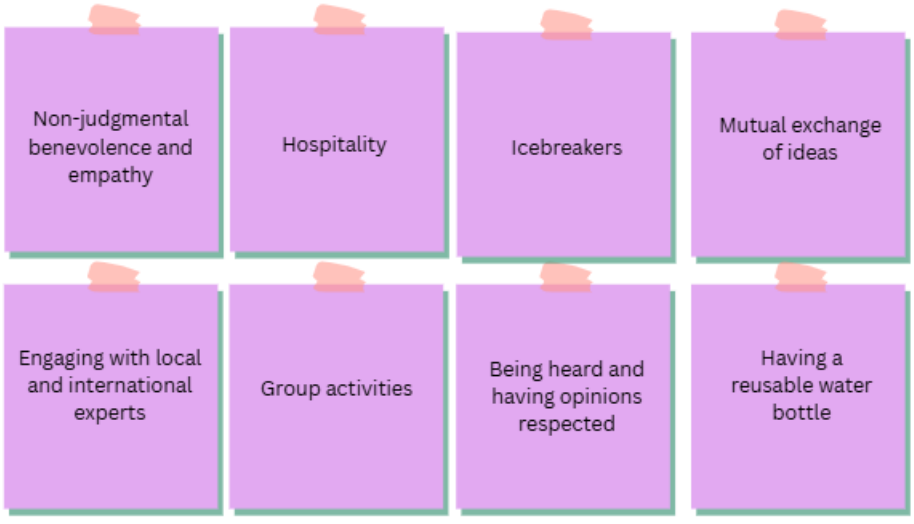
Social event

Mid-event reflection session: There were questions provided to gauge how the summer school was. The questions were written up on butcher papers and stuck all around the seafood village. The participants were placed into groups and instructed to discuss the answers and put them up on sticky notes. The answers to these questions have been summarised below.

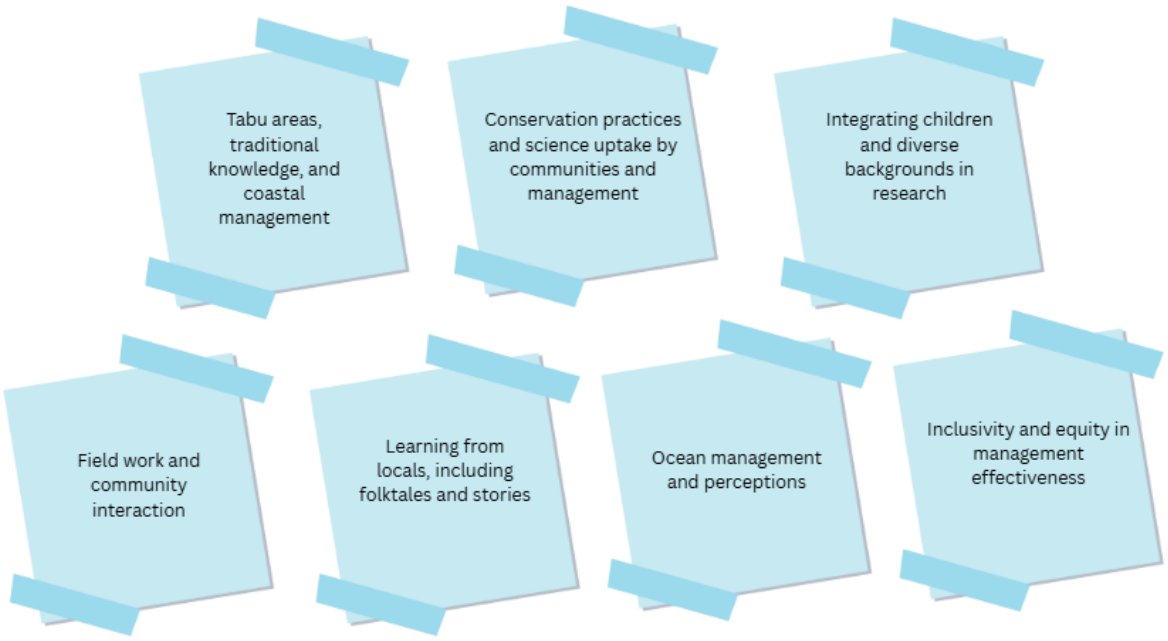
1. **What specific skills or knowledge are you hoping to gain this week? Are there any topics you're especially curious to explore?**

2. **What does inclusive and respectful collaboration look like to you?**

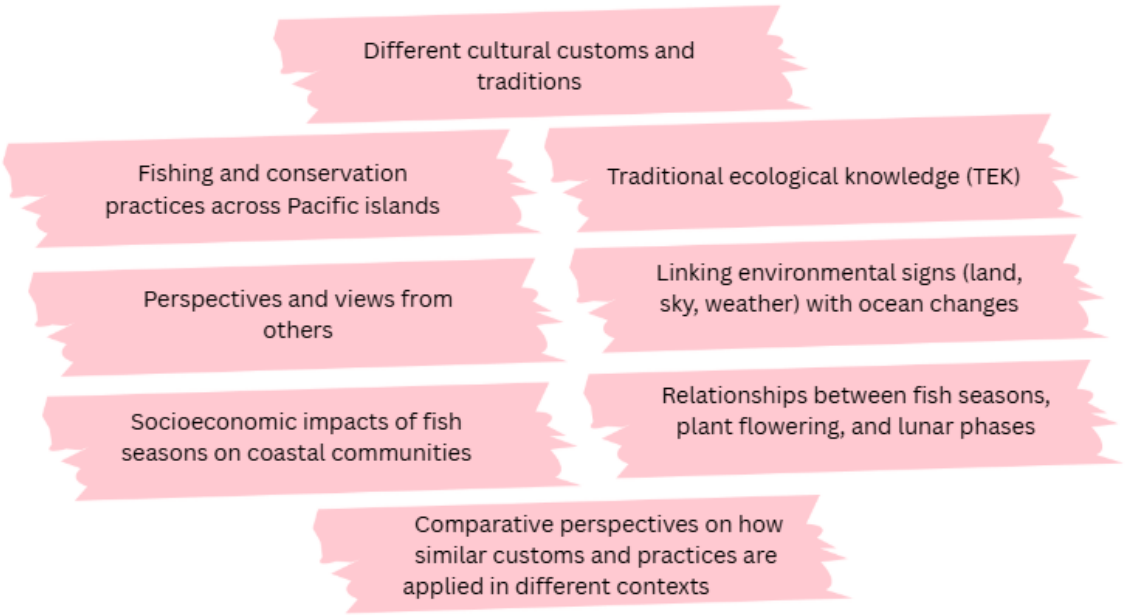
3. **What helps you feel supported and engaged in a learning environment?**



4. **What is your research project about, or what excites you most in your discipline?**



5. **What are you most excited to share or learn from other cultural perspective?**



6. **Are there cultural practices- such as folklore, traditional knowledge, or token species that you personally connect with or find meaningful?**

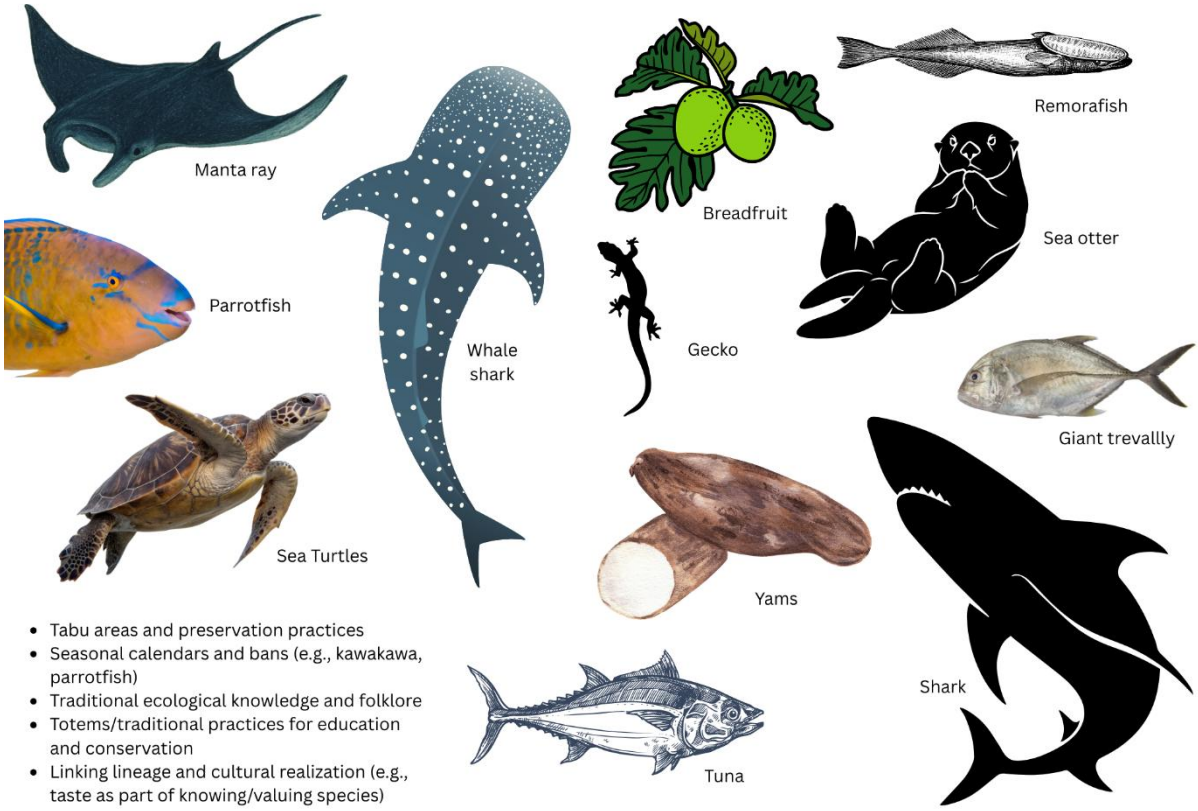
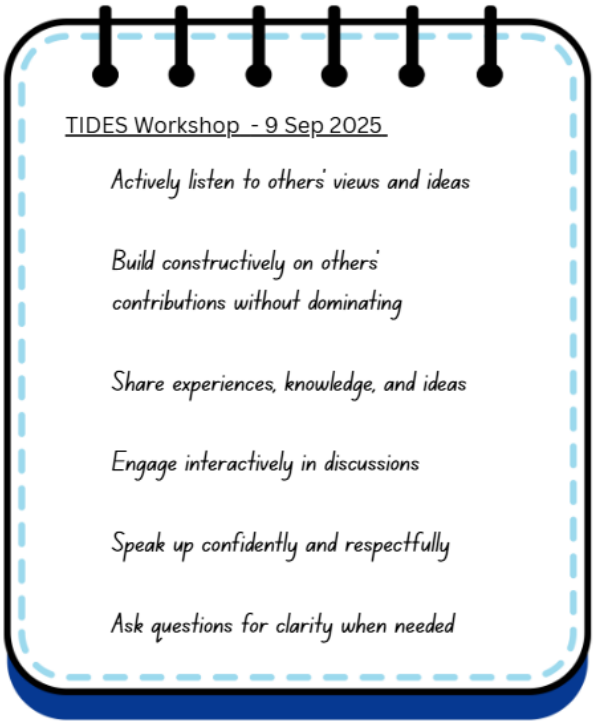


Image created in Canva by Shritika Prakash, Ika Bula Consultants – for illustration purposes only

7. How do you hope to contribute to group learning and discussions



8. **How does the summer school theme relate to your academic, cultural or personal interactions**

Academic

- Deepen understanding and raise awareness of reef passages, especially for coastal communities.
- Explore management of coastal areas through transdisciplinary approaches and the land–ocean continuum.
- Highlight the importance of integrating traditional methods with modern scientific analyses.
- Address gaps in marine science education, particularly the lack of focus on interdisciplinary research.

Cultural

- Learn from traditional fishing methods and knowledge, including practices borrowed across Pacific countries.
- Value oral traditions passed down by elders.
- Recognize the ocean-dependent livelihoods of island communities.
- Appreciate how cultural practices shape conservation and resource management.

Personal

- Passion for marine and social sciences, with diverse visions of the ocean.
- Strong interest in marine ecosystems, reef passages, and conservation methods.
- Gained awareness and insights that serve as an eye-opener and guide for thesis work.

9. **What are your feelings about these first 2 days? What have you particularly liked or learnt?**

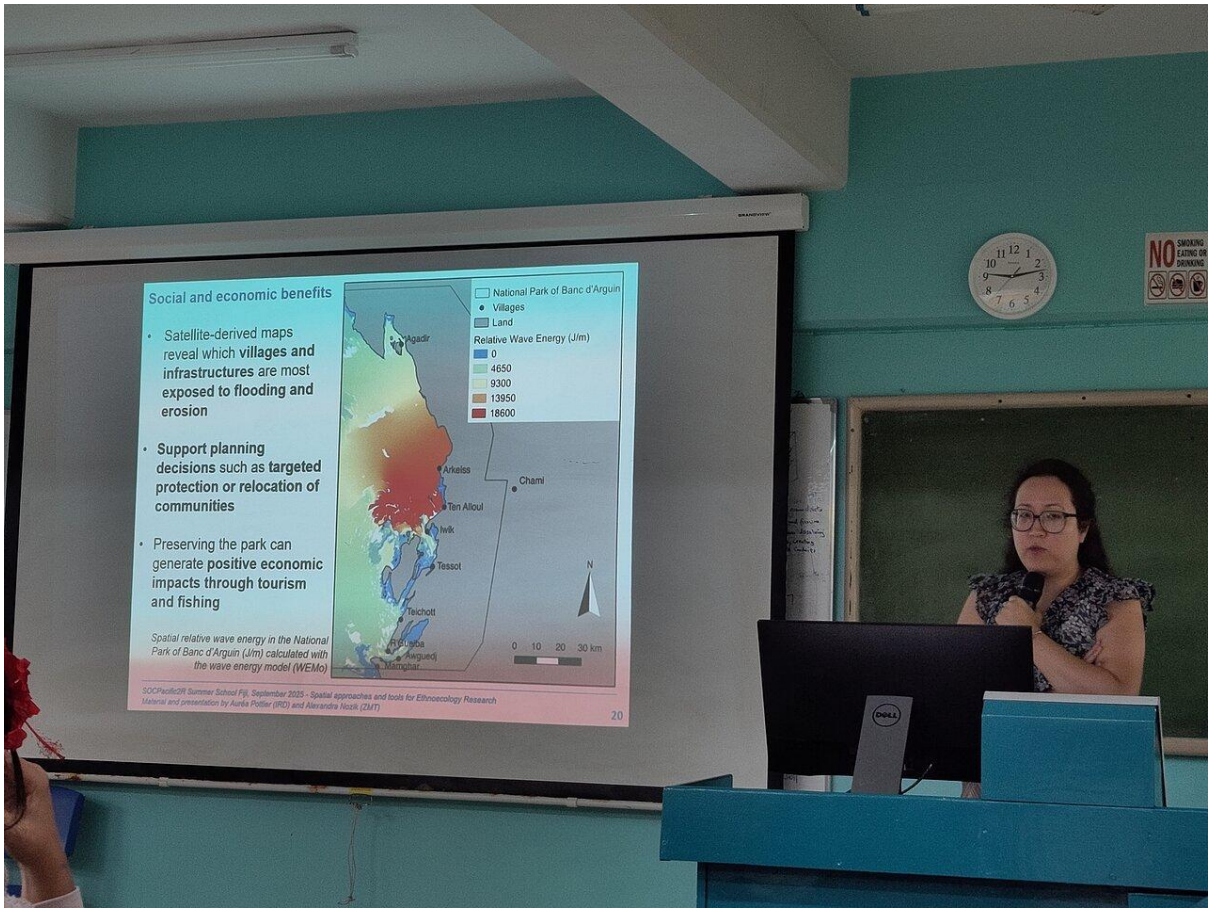
10. What kinds of connections or collaborations would you like to build (for example, to support your future steps in the academic world)

- Collaborating with researchers, marine biologists, and Oceania stakeholders to strengthen marine conservation and regulations.
- Building connections with both international and local experts.
- Participating in workshops related to my field of study.
- Exploring internship opportunities to gain practical experience.
- Bridging disciplines through interdisciplinary approaches.
- Pursuing continuous training and skill development.
- Engaging in group collaboration by listening, sharing, and exchanging ideas with experts.

Day 3 – Wednesday 10th September 2025

Session 9: Spatial approaches and tools for ethnoecology research

Facilitator: Auréa Pottier



Spatial dimensions provide valuable tools for visualizing the complex relationships between knowledge, practices, society, and the environment. Geographic Information Systems (GIS) enable the storage, analysis, and integration of diverse forms of local and scientific knowledge, including medicinal plant distributions, forest cover, and climate data. These systems draw on both ethnological sources (oral histories, practices, archives) and biological/ecological sources (land cover, climate maps, citizen science, surveys).

By integrating such diverse inputs, spatial approaches reveal otherwise invisible relationships, support consent and knowledge sharing, and enhance accessibility through multimedia integration, storytelling, and cultural experiences. Remote sensing contributes large-scale, regularly updated monitoring of land, ocean, climate, and disasters, while participatory mapping allows communities to represent ecological, social, and spiritual values. Story mapping, using videos and images, strengthens engagement, and web mapping provides interactive, collaborative platforms, though challenges remain with outdated or sensitive data.

The session highlighted that spatial approaches:

- enrich ethnoecology by bridging local ecological knowledge and spatial analysis.
- support documentation and cultural heritage preservation, co-management of resources, and policy and decision-making.
- approaches must always respect ethics and knowledge sovereignty, ensuring that communities retain control over how their knowledge is represented and shared.

Session 10: Participatory mapping exercise and examples

Facilitator: Jasha Dehm

Participatory mapping is a collaborative process designed to capture local knowledge, empower communities, and support collective construction of spatial information. Its strength lies in being locally grounded and inclusive, engaging all genders and age groups. However, limitations include reduced accuracy and the potential inclusion of sensitive information.

Ethical considerations are central: researchers must ensure free, prior, and informed consent, train participants in handling sensitive data, and carefully address questions of map ownership. Challenges arise when maps contain limited information, making them less useful for

participants, though familiarity with an area can help fill gaps through imagination and contextual knowledge.

The process involves collaboration among diverse stakeholders and can be supported by platforms such as Sea Sketch and Seamap, which provide free mapping resources.

Group activities emphasized that there is no "right or wrong" way to map, but rather good practices to follow. Exercises explored self-presentation, resource availability, map usage, and stakeholder engagement, with the overarching goal of gathering information to advance protected area management.

Activity 5

The participants were divided into four groups working on the same questions on different maps with variable information provided. Students used their knowledge to answer the questions. Students used different colored pens to create their own legends and map out areas such as MPAs, sand mining, migratory species, fishing, etc.

Map 1 was a close version of the Suva peninsula.

Map 2 the out version of the Suva peninsula and the Beqa and Yanuca Island

See Appendix E for more details.

Session 11: A practical exercise on mental maps

Facilitator: Elodie Fache

What are mental maps?

Mental maps are cognitive maps based on how people perceive, remember and navigate their environment. People externalize their memory and spatial knowledge onto paper, digital tools and other media.

Mental maps connect social knowledge based on local perception, memory and attachment to places with scientific research. They help to identify differences in knowledge between groups in terms of age, gender and experience.

Mental maps always spark dialogues with communities. They are neither right nor wrong as it is based on different knowledge systems. It can be compared with scientific maps to find overlaps or gaps.

It is valuable as a methodology because the process of drawing, comparing and discussing is often more important than the final map. It encourages community engagement and shared knowledge production.

Activity 6

The participants were instructed to draw a map of the area in which the summer school was taking place. Once the facilitator went through all the groups, it was seen that there were three scales to the drawings:

1. *The room*
2. *The campus*
3. *The campus with the environment*

Session 12: Participatory mapping vs proprietary mapping: OpenStreetMap and Google compared

Facilitator: Auréa Pottier

OpenStreetMap (OSM) is a global, community-driven mapping initiative that empowers volunteers to contribute geographic data, making it particularly valuable in rural and under-mapped regions. Unlike proprietary platforms such as Google Maps, OSM is free, open, and editable, allowing communities to represent their own spaces and ensuring that mapping is not limited to commercial priorities. Its open-source nature enables data to be reused and adapted for research, planning, education, conservation, and community projects.

OSM's importance lies in its wide-ranging applications, from disaster response and conservation to education and transport planning. Data can be downloaded in multiple formats, such as shapefiles, and integrated into GIS tools like QGIS, bridging local knowledge with technical applications. However, limitations include reliance on free satellite imagery, which may be outdated or incomplete, and variability in accuracy depending on community participation.

Ethical considerations are critical: mapping is never neutral, and sharing sensitive data (e.g., fishing grounds, wildlife habitats) can expose communities to risks. Responsible use requires consultation, consent, and balancing openness with protection. Initiatives such as the Humanitarian OpenStreetMap Team (HOT OSM) demonstrate OSM's potential for disaster preparedness, resilience, and global good. Moving forward, collaborative contributions through workshops and projects can strengthen ownership, inclusivity, and collective knowledge, provided ethical safeguards are maintained.

Session 13: Presentation of the paper "Spatial use of marine resources in a rural village: A case study from Qoma, Fiji"

Facilitator: Salanieta Kitolelei

Purpose: The study explored gendered knowledge differences between men and women.

"You can only accept the strengths if you acknowledge the limitations."

Knowledge is deeply dependent on its holders and remains vulnerable to loss through the impacts of western influences, religion, and broader cultural shifts, with Indigenous Traditional Knowledge (ITK) often undervalued or overlooked in modern contexts.

Methodology:

- Used participatory GIS as a tool for mapping.
- Two separate maps were created by groups of men and women to compare perspectives.

Results

- Fishing practices differed:
    - Men fished outside traditional fishing boundaries, often using spears.
    - Women fished within traditional fishing boundaries, using nets.
- Species targeted varied between genders, even in shared spaces.
- Species were categorized into endangered and culturally important groups.

Intergenerational Knowledge Transmission	Traditional Ecological Knowledge (TEK)	Local Management Strategies
Children learn by doing and observing elders. Young men identified and caught more fish compared to older men and women, though older men sometimes caught more in specific contexts.	Seasonal indicators guide resource use. Example: Breadfruit fruiting signals the availability of land crabs.	Practices included praying rituals and customary beliefs to regulate resource use. These strategies reflect cultural values embedded in ecological management.

Overall, the study highlights how gender, age, and cultural practices shape ecological knowledge and resource use. Participatory mapping revealed differences in fishing practices, species targeted, and management strategies, highlighting the importance of respecting ITK while integrating it into research and conservation planning.

Related publication:

Kitolelei S, Lowry JH., Qaqara N, Ryle J, Veitayaki J and Piovano S (2022) Spatial use of marine resources in a rural village: A case study from Qoma, Fiji. Front. Mar. Sci. 9:993103. doi: 10.3389/fmars.2022.993103

https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2022.993103/full

Session 14: Launch of SOCPacific2R's webmap of reef passages

Facilitators: Auréa Pottier & Elodie Fache

This session launched a prototype Webmap of reef passages in Fiji, New Caledonia and French Polynesia, which was created by two students in Montpellier, France, as part of SOCPacific2R. The reef passages were identified and characterized through satellite imagery. The next step will be to strengthen this Webmap by integrating feedback from various actors and field data.

This Webmap is available here: https://socpacific2r.github.io/ReefPassages/#webmap. During the presentation, all participants of the summer school were invited to become contributors to this Webmap, by clicking on "I would also like to contribute" (above and below the map), which gives access to an online form to be completed, either for a reef passage identified on the Webmap or a reef passage that is not yet identified on the Webmap: https://ee-eu.kobotoolbox.org/x/VvdYHZOb

The definition of reef passages remains contested, as different groups interpret them in varying ways, some describing passages between reefs, others between islands, and still others across submerged features, highlighting the complexity and diversity of perspectives surrounding these vital marine spaces.

Social event

Ms. Suzanne Turaganiwai, co-founder of the Pacific Ocean Litter Youth Project spearheaded this session. She had the participants divide themselves into groups and with the theme of "reef passages" gave the participants clean litter that was picked up from various cleanups, with paint and canvas for them to paint. Once that was done, the participants were required to present their work.

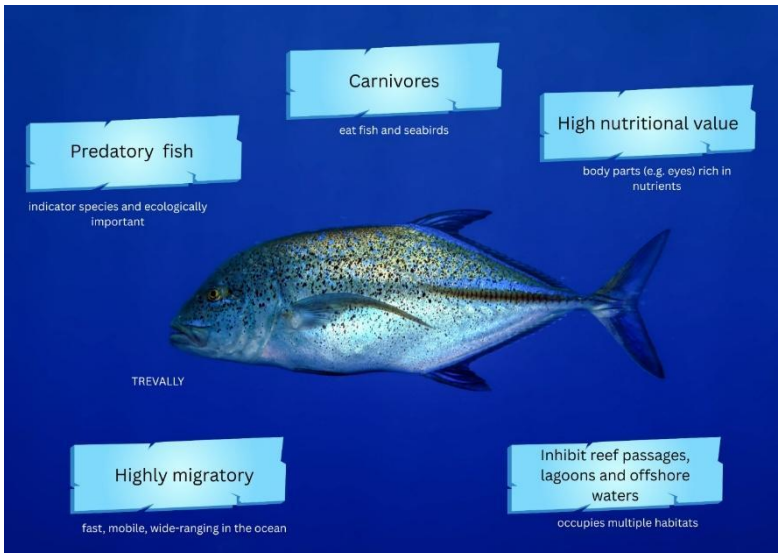
Day 4 – Thursday 11th September 2025

Short introduction: Reefs as living libraries: Ethnobiology of coral reef systems and their fish

Facilitator: Annette Breckwoldt

Communities hold extensive **traditional ecological knowledge (TEK)** about trevally and other species, encompassing life stages, production cycles, and cultural practices. The Trevally is a fast, highly migratory predatory fish that plays an important ecological role as an indicator species. It occupies diverse habitats including reef passages, lagoons, and offshore waters, and is known for its carnivorous diet, feeding on fish and seabirds. Trevally also holds high nutritional value, with body parts such as the eyes being particularly rich in nutrients. Its mobility and habitat range make it a key species in understanding reef ecosystem dynamics and marine food webs.

The knowledge passed down through generations, includes processing techniques and preparation methods that are vital for **sustainable resource use**. Importantly, TEK highlights the **connection between marine and terrestrial environments**, reinforcing the need to preserve and reflect on traditional practices for future generations.



Indigenous knowledge also provides valuable insights **for community-based resource management**, guiding strategies that integrate cultural beliefs and ecological understanding. Trevally is recognized as a **keystone species** with significant social and sociocultural value, making it central to both ecological balance and community livelihoods.

Session 15: Transformative change assessment (IPBES)

Facilitator: Catherine Sabinot

The **2019 global assessment on transformative change**, involving experts from 42 countries (53% women, 46% men), emphasized the need to address the **underlying causes of biodiversity loss**. These include disconnection from nature, concentration of power and wealth, prioritization of short-term material gain, and systemic inequalities. Challenges such

as inadequate policies, unsustainable production and consumption, and limited access to clean technology further exacerbate the crisis.

The **transformative change framework** highlights the importance of evolving knowledge and values, particularly in ocean environments, and integrating **local and indigenous knowledge**. Key principles include equity, anti-colonialism, and reciprocal human–nature relationships, recognizing the global interconnectedness of biodiversity loss and ecosystem collapse.

Strategies for transformative change focus on **conservation, restoration, and sustainable use**, alongside transforming dominant economies and cultural norms. Five core strategies are identified:

1. Sustainable stewardship of resources
2. Sectoral change across industries
2. Inclusive, accountable, and adaptive governance systems
3. Shifting societal views and values away from domination
4. Embedding equity and long-term sustainability in decision-making

Ultimately, transformative change is about creating a **just and sustainable world**. It requires principled strategies and actions, results from both small and large-scale changes, and identifies roles for everyone in enabling this shift.

Session 16: Balolo, calendar, rituals and cosmology in Fiji (east and west)

Facilitator: Simmone Pauwels

Balolo worm is deeply embedded in Fijian tradition, ecology, and social life. It marks seasonal cycles, symbolizes fertility and life, regulates community harmony, and reflects differences between East and West Fiji's social structures. Its harvest blends ecological signs, cultural practices, and ancestral reverence.

The first recorded mention was by Reverend Lyth in 1850, highlighting the importance of careful documentation. Research teams noted challenges in discussing balolo in mixed-gender settings due to its associations with sexuality and fertility, with coral spawning serving as a natural indicator of balolo emergence.

The Fijian calendar divides the year into land and sea periods, with October to January marking key harvest months. Balolo, referred to as *ika ni yabaki* in Fiji ("fish of the harvest"), is linked to fish scarcity and local economies. Rituals include women preparing nets and attire, waiting overnight at beaches, and cooking the worms using traditional and modern methods.

Symbolically, balolo represents life, fertility, and social cohesion. Its absence may signal community discord, while its presence is believed to sustain ecological balance. East Fiji's hierarchical Vanua system contrasts with West Fiji's egalitarian Yavusa leadership, a distinction reshaped by colonial governance.

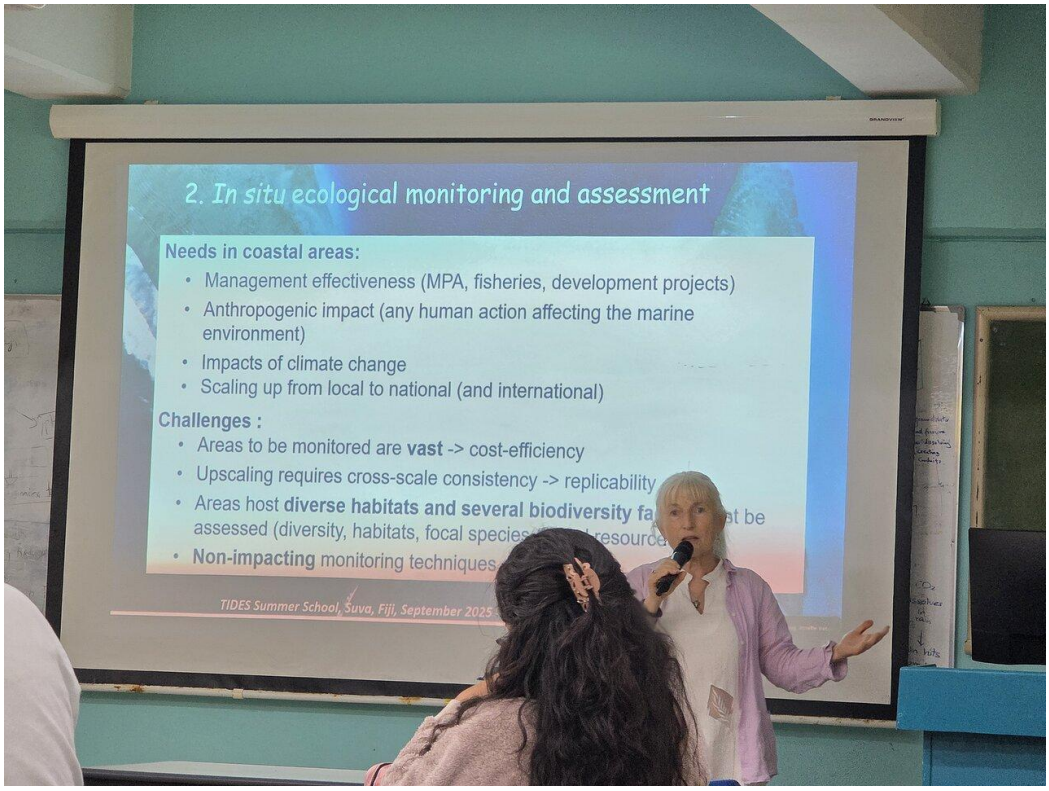
Traditional priests predict balolo's arrival, which is celebrated with communal feasts and offerings to ancestors. In East Fiji, balolo is seen as a gift from beyond the reef; in West Fiji, it is tied to ancestral land occupation. Chiefs oversee the harvest, while women play central roles in attraction rituals.

Comments included two research perspectives:

- Since not all fish is "Ika ni Yabaki", it would be interesting to see what fish is associated with the annual succession.
- Further studies of the geographical, physical and biological requirements for balolo worms to appear would be interesting, as they usually appear 8 days after lunar phase (7 days in Samoa). Is this consistent? Why?

Session17: Facets of biodiversity in coral reefs and associated ecosystems - Science for monitoring and supporting conservation

Facilitator: Dominique Pelletier



Effective coral reef monitoring must be actionable, directly informing practice, policy, and community empowerment in line with global goals such as SDG 14. This requires transdisciplinary projects, innovative techniques, and integration across sites and disciplines to achieve shared conservation outcomes.

Indicators and metrics are central to monitoring: metrics provide raw calculations (e.g., fish abundance, fishing effort), while indicators distill these into meaningful measures of progress.

For accessibility, indicators should be simplified into visuals such as dashboards or color codes, though defining thresholds remains challenging due to limited data and lack of consensus. Combining ecological metrics (stock levels, fish diversity) with human-use metrics (fishing pressure, community perceptions) ensures a holistic approach.

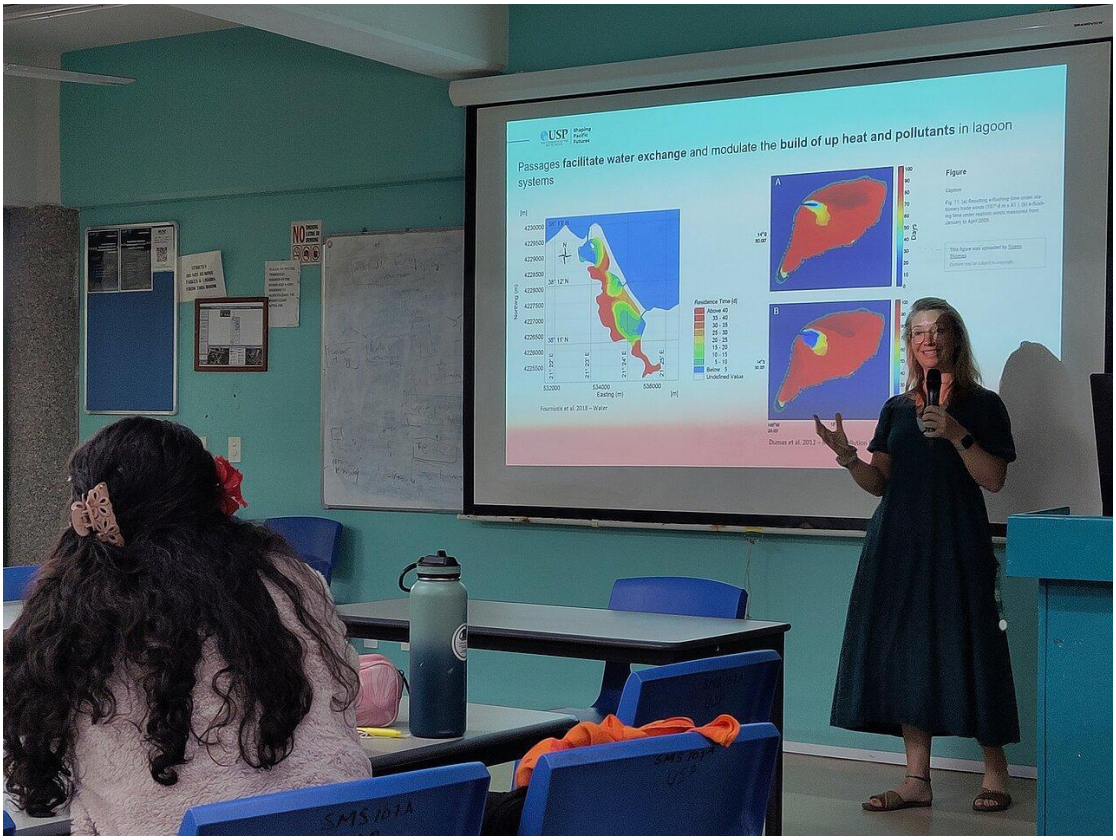
Tools and interfaces are critical, as managers often lack time or expertise to process raw data. User-friendly software for plotting, GIS mapping, and simple analyses, alongside decision-support tools, enables evaluation of MPA effectiveness and comparisons across sites.

Ecological monitoring techniques rely on standardized, non-destructive protocols such as underwater video and unmanned aerial vehicle (UAV) outputs include habitat typologies, fish diversity maps, and species metrics, which inform environmental impact assessments, habitat mapping, and monitoring of tourism or mining impacts.

Fish spawning aggregations (FSAs) are vital for reproduction but highly vulnerable due to their predictability. Local knowledge complements scientific monitoring, while video surveys provide data to guide seasonal closures and fisheries management.

Session 18: Reef ecology, impacts and monitoring

Facilitator: Amanda Ford



Fiji's coral reef management integrates ecological monitoring, traditional knowledge, and community-driven initiatives, creating a strong foundation for sustainable conservation. Coral

spawning follows a seasonal calendar, with mass events in October–November coinciding with the balolo worm harvest. Reefs face serious threats, including phase shifts to sponge or seaweed systems, shifting baselines where younger generations normalize degradation, and local stressors such as anchoring, sewage, and debris. Modern fishing gear has also reduced herbivory, altering reef balance.

Monitoring requires transdisciplinary collaboration, producing practical outcomes and decision-support tools for marine protected areas (MPAs). Local monitoring enables site comparisons and broader aggregation, with key metrics including fish abundance, habitat protection, and diversity indicators. Fish spawning aggregations (FSAs) are vital but vulnerable; combining fisher knowledge with ecological surveys strengthens seasonal closures and management strategies.

Customary practices such as taboo areas blend with modern science in Locally Managed Marine Areas (LMMAs), which improve fish populations and coral cover. Community involvement is expanding through photo monitoring, AI-supported tools, and initiatives like the Women of Melanesia program, which empower women in resource management.

Despite climate threats, some corals show resilience, such as fluorescent bleaching that acts as a natural sunscreen. Removing local stressors like overfishing and pollution enhances recovery potential. Actionable research, shared management goals, and user-friendly tools ensure monitoring data informs policy and empowers communities, bridging science with practice for effective reef conservation.

Session 19: Using TEK and natural science for identification of fisheries resources

Facilitator: Salanieta Kitolelei

Traditional ecological knowledge (TEK) in Fiji provides detailed taxonomies, seasonal indicators, and cultural practices that complement scientific approaches to fisheries management. TEK highlights locally rare and endangered species, gendered fishing practices, and ecological cues linking land and sea, ensuring sustainable harvests. Customary closures, taboos, and rituals regulate resource use while reinforcing cultural values. Oral traditions and local languages are central to knowledge transmission, though modernization and language loss pose risks.

Examples illustrate TEK's depth: species are classified by behavior, size, and life stage, with distinct local names guiding harvest decisions; seasonal shellfish cycles reveal ecological patterns often missed by short-term scientific surveys. Elders maintain holistic taxonomies of marine life, organized hierarchically, while dialects preserve ecological detail. Integration with science through cross-referencing strengthens species identification, and TEK contributes insights into spawning sites, migration, and sustainable harvesting. The Fijian fishing calendar aligns resource use with natural cycles, emphasizing community responsibility. Current efforts

focus on documenting species names, creating educational resources, and preserving cultural practices such as whale tooth and shell exchanges disrupted by colonization.

Activity 7

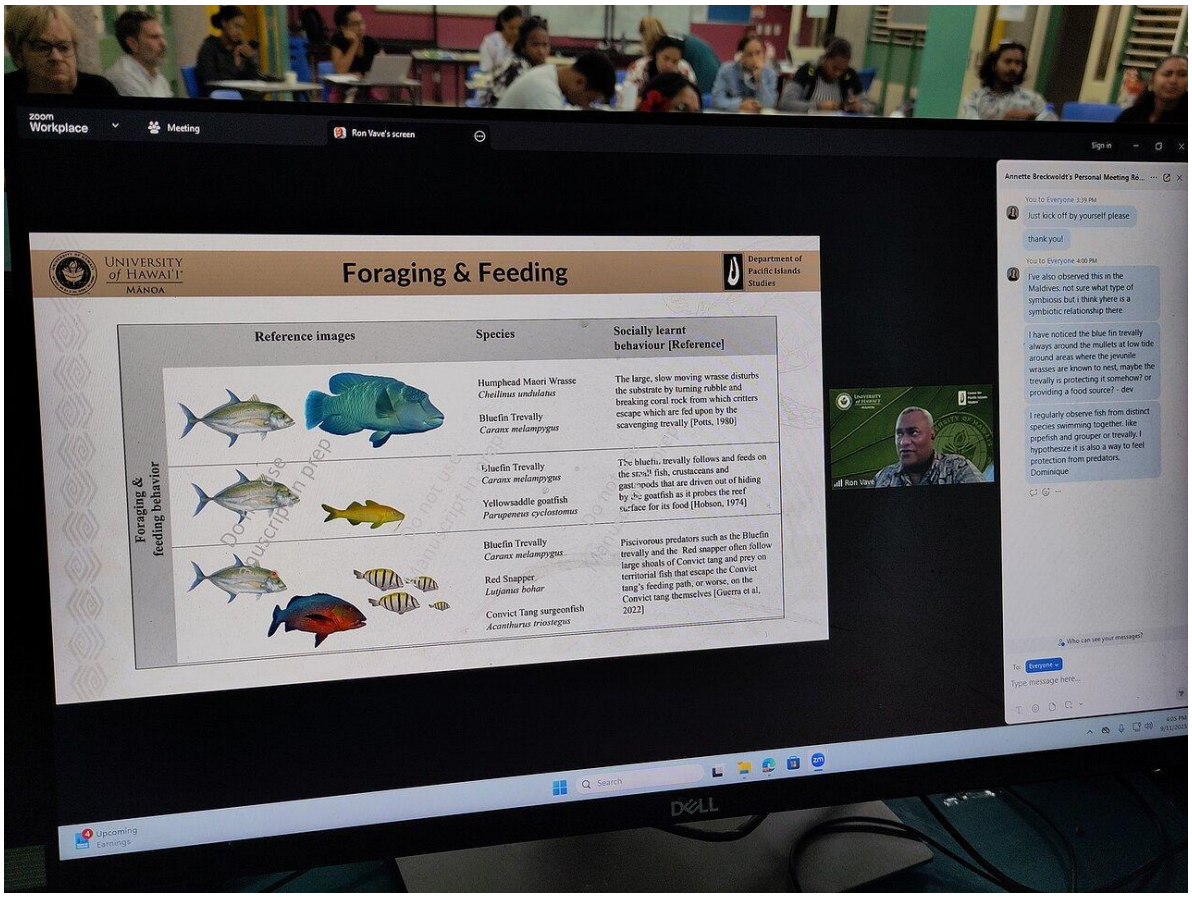
The participants were divided into two groups. The exercise was also divided into two parts.

In the first session the participants were given images of different types of fish and told to choose a species, write down everything known about the species from their culture, common name and traditional uses of the species based on their knowledge.

For the second part of the activity, the participants were then to use the internet and search for the scientific information.

Session 20: Two ways of knowing: Scientific and local insights into the cultural lives of reef fishes

Facilitator: Ron Vave



Across different countries, communities maintain sacred totem animals that hold cultural and spiritual significance, such as the freshwater gobi in Tiliva village, Bua Province, Fiji, and the shark in Hawaii. Traditional beliefs also shape practices, with some communities holding that if a woman fishes during her monthly cycle, the gobi will disappear. When conducting community interviews, it is essential to talk less and listen more, while remaining mindful of biases that can arise when comparing traditional knowledge with scientific knowledge.

Effective problem-solving often begins with local solutions, especially for issues rooted in community contexts, and awareness can be raised through stories and dialogue. To create meaningful and sustainable outcomes, knowledge systems must be woven together, drawing on the wisdom of elders who often hold deeper insights. Social science plays a vital role in guiding respectful engagement with communities, while policymakers, who tend to rely heavily on published papers, must recognize that many of these works lack the contextual richness of traditional knowledge.

Session 21: Tides of change: Reflective and practical skills for the next generation of marine researchers (intro to a new special issue)

Facilitators: Annette Breckwoldt & Salanieta Kitolelei

The session emphasized creating supportive pathways for young researchers to publish, collaborate, and influence both academic and policy discussions, ensuring diverse voices are included in marine science and conservation.

21.1 Bridging research and policy

Knowledge brokers play an important role in translating scientific research into policy-relevant messages. Early career researchers (ECRs) often struggle to choose between academic, interdisciplinary, or applied paths and need guidance to navigate these options.

21.2 Special Issue in Ocean & Society Journal

A new special issue will focus on connecting science, society, and policy through interdisciplinary marine research. It aims to support ECRs by offering case studies, perspectives, reviews, and commentaries. Contributions are welcomed in multiple formats, with inclusivity emphasized, particularly through fee waivers or support for researchers from the Pacific and Global South. [Submit Abstract to Issue: Tides of Change: Reflective and Practical Skills for the Next Generation of Marine Researchers | Cogitatio App]

21.3 Opportunities for Early Career Researchers

ECRs are encouraged to publish reflections on their experiences, including:

- Stereotypes in research (gender, cultural, disciplinary).
- Practical vs. theoretical learning in Pacific universities.
- Challenges in science communication and collaboration.

- Safety in fieldwork, especially from a gender perspective.

21.4 Encouragement and Inclusion

Senior researchers emphasized that publishing is not only for career advancement but also for ensuring Pacific voices are visible internationally. Writing collectively can build confidence before publishing individually.

21.5 Challenges for Pacific Researchers

Publishing is vital for influencing policy, yet Pacific researchers face barriers such as high fees and limited guidance on the distinction between reports and manuscripts. This highlights the need for clearer support structures and accessible publishing opportunities.

Comments from a participant

With the way information was condensed, transferred and comprehended in this summer school, so much was learnt in such little time yet in a very efficient way. Can this be done to reshape and retell the education system in the Pacific Islands? You learn so much in a few days than years spent at a university.

Social event

In this session, we held a *talanoa* with several experts in their fields: Mr. Filimone Mate from the Kaibu Foundation, Ms. Suzanne Turaganiwai from POLYP, Dr. Shubha Singh from IUCN, Ms. Alumita Sekinairiai from iTaukei Women's Conservation, and Mrs. Laura Williams, a current PhD student under the Norway–Pacific Ocean–Climate (NPOC) Scholarship.

During the *talanoa* session, the invited experts first introduced themselves and shared their professional backgrounds. Mr. Filimone Mate highlighted his work with the Kaibu Foundation, particularly their innovative coral reef insurance program. Ms. Suzanne Turaganiwai spoke about her POLYP initiative, using creativity and "artivism" to promote waste management. Dr. Shubha Singh discussed her role with IUCN, focusing on coastal fisheries management. Ms. Alumita Sekinairiai shared her advocacy efforts with iTaukei Women in Conservation, emphasizing community engagement. Mrs. Laura Williams presented her PhD research on chlorophyll and plankton under the NPOC Scholarship. Following their introductions, the speakers reflected on how their respective fields connect to reef passages and concluded by offering words of advice and encouragement to the students in attendance.

Day 5 - Friday 12th September 2025

Session 22: Interviews - introduction and design of an interview guide, practical exercise, and group debriefing

Facilitator: Elodie Fache

This session was designed as an introduction to interviews as a key data production method in ethnoecology, and emphasized differences between interviews and questionnaires, as well as culturally aware and flexible interview practices, ethical responsibility and good practices, and the value of local knowledge in marine research. It also gave a few tips to conduct and transcribe an interview.

Activity 8

During this first session, the students were asked to prepare an interview framework in groups of 2-3, to later interview a member of SOCPacific2R's team.

Research question:
What are the team members of SOCPacific2R's views of, and relationships with, reef passages in this early phase of the project?

Research objective:
Inclusion of the team members of SOCPacific2R among the various stakeholders considered in the project, in order to:
(1) compare their views of, and relationships with, reef passages with those of other stakeholders;

(2) possibly study the evolution of their insights over the course of the project.

Types of administration

A. Questionnaire	**B. Interview**
Self-administration whereby people fill in the form themselves (paper based or online) or face to face whereby a researcher asks the questions and notes the answers. Types of questions: - Factual - Opinion - Open ended A questionnaire with mostly open-ended questions in a face-to-face form resembles an interview.	Structured interviews are based on a fixed list of questions, and are therefore close to questionnaires. Semi structured interviews are conversational, but with key topics in mind, whereas unstructured interviews address broad topics and involve a free discussion. Interviews are usually based on an interview guide or interview framework. An interview guide organizes beforehand the questions one asks and is not far from a questionnaire or an interrogation. An interview framework is a personal "memory jogger"; all it does is help the researcher to remember important topics, without disrupting the internal dynamics of an ordinary discussion; mind maps are a useful tool to create an interview framework. In all cases, an interview is an interaction, not a mining operation for extracting data. The researcher can ask and record the answers during an interview. However, it is always good to take notes because technical difficulties or unforeseen accidents can occur.

Method choice:

- Depends on research objectives, research questions and context.
- Methods can be combined.
- Sample size and statistics: Large sample allows statistical analysis, small sample allows a qualitative analysis (e.g. thematic content analysis).
- Mixed Methods:
  - Combining qualitative and quantitative is possible and useful.

- Social scientists are developing ways to integrate qualitative insights into models alongside natural science.

Philosophy of interviewing:

- Interviews should be treated as real interactions with mutual exchange.
- They are shaped by both researchers' objectives and participants' expectations.

It is very important to state which type of interview method is used so paper does not get rejected.

During the interview:

- Listen carefully and try to understand the response behind opinions.
- If asked for your opinion, remain neutral/sensitive.
- Appropriateness check if the method is suitable, consult first if unsure.
- Note taking during or immediately after the interview.
- Record setting, atmosphere highlights, difficulties and questions raised.
- If doing multiple interviews in one day, write notes for the first before starting the second if possible.

The recording of the interviews depends on a few factors:

- physical context (background noise)
- social context (appropriate or not)
- team for the study (to help write notes while others lead the interview)
- need of the study
- interviewee's consent (if they fully and willingly agree)

Activity 9

For this activity, the participants were divided into groups. A few groups stayed at the location, USP Marine Campus, in different places to interview a few facilitators which were Jasha Dehm, Salanieta Kitolelei and Dominique Pelletier. A single group headed to Talanoa Consulting to interview Sangeeta Manubhai and Kimberly Samson.

Activity 10

The activity was meant for the participants to gauge the different points of view on the research based on reef passages.

Comments / advice

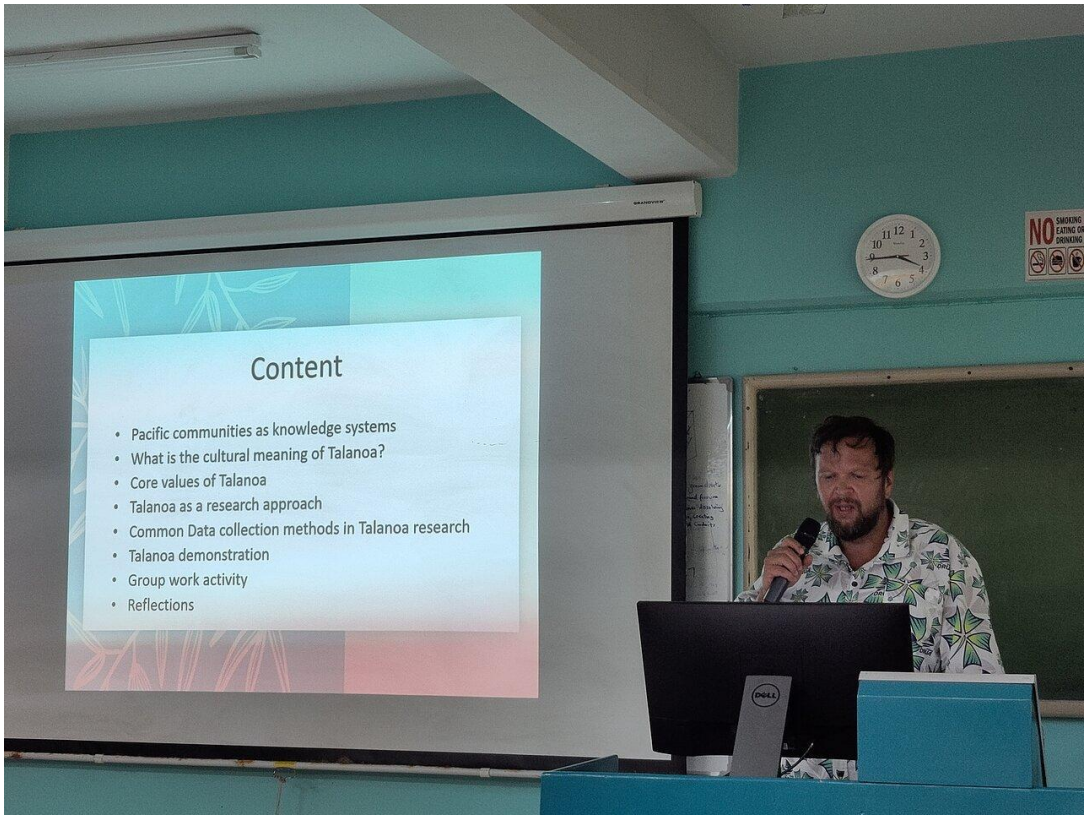
- The consent forms must be given straight away.
- You need to build trust before you can start recording.
- Consider the issue of personal data protection during and after the interview (including by keeping the recorder in a safe place and the recording confidential; by using pseudonyms and anonymity; etc.).
- Wrap up the interview nicely.

Session 23: Talanoa as a research method

Facilitators: Malakai Kaitani, Salanieta Kitolelei, Andreas Kopf & Eferemo Kubunavanua

Research in Pacific communities relies on *talanoa*, respect for customs, and sensitivity to knowledge systems (open, closed, negotiated). Ethical approval, inclusivity, and adaptability to community life are essential. Combining traditional ecological knowledge with science through participatory approaches leads to stronger, community-owned conservation outcomes.

Pacific communities hold authentic knowledge rooted in cultural logic, expressed through systems of **open knowledge** (shared widely, e.g., language), **closed knowledge** (restricted to families or clans, e.g., fishing and navigation), and **negotiated knowledge** (shared with outsiders through protocols such as *sevusevu*).

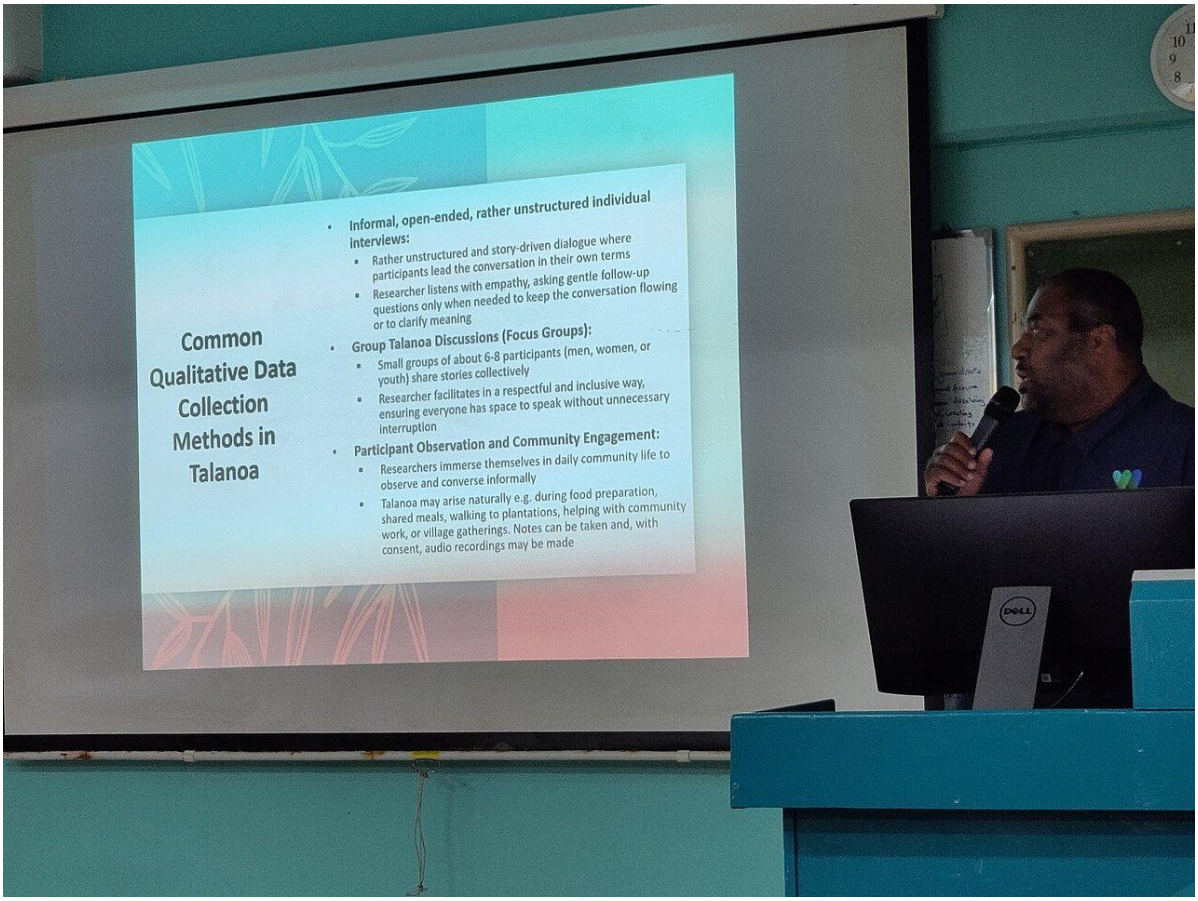


Talanoa is a traditional storytelling method that emphasizes empathy, respect, humility, reciprocity, and trust. It is qualitative, open-ended, and informal, often conducted in small groups. Results must be shared back with communities to demonstrate gratitude and respect. While *talanoa* is informal, *veivosaki* represents more formal dialogue.

As a research methodology, *talanoa* can take the form of open-ended interviews, focus groups, or participant observation, fostering deeper community engagement. Ethical approaches require strict IRB approval, consent from individuals and traditional structures, and mechanisms to protect both communities and researchers.

Community engagement through *talanoa* builds trust and helps resolve conflicts, but power dynamics must be acknowledged. Usually, outsiders or in-laws may not be permitted to speak on resource issues. Respecting customs such as ceremonies, sacred areas, kinship ties, and joking relationships is essential.

Lessons from practice highlight the need to balance theory with lived experience, sometimes "unlearning" rigid academic frameworks. Collaboration between academics and practitioners strengthens conservation outcomes. For example, WCS developed 11 ecosystem-based management plans through participatory methods that blend traditional and scientific knowledge. Emotional interviews require sensitivity, pausing, listening, and offering comfort while inclusivity can be ensured by engaging village headman (*turaga-ni-koro*) to identify participants with relevant expertise.



In the context of Pacific indigenous research, ***Talanoa*** utilizes qualitative data collection methods that prioritize relational harmony and natural, story-driven communication over rigid academic structures. These methods include **informal individual interviews**, where participants lead the narrative while researchers listen with empathy; **group discussions** (similar to focus groups), which allow for collective storytelling in a respectful, inclusive environment; and **participant observation**, where researchers immerse themselves in daily community life. By engaging in organic activities such as sharing meals or assisting with village chores, researchers can gather authentic insights through spontaneous dialogue, documenting these experiences through field notes or consented audio recordings to ensure the community's voice is captured in its most natural form.

Social event

For the final session, participants were asked to complete an online form evaluating the quality of the summer school. The students' feedback has been detailed in Appendix D.

Conclusion

The IRD summer school demonstrated the critical importance of integrating scientific methodologies with traditional ecological knowledge (TEK) to advance social-ecological understanding of the environment, in particular of reef passages, and resource management practices and policies. Through interdisciplinary and ethnoecological/ethnobiological approaches, participants acquired practical skills and conceptual insights necessary to address complex environmental and social challenges. The program emphasized ethical considerations in research involving Indigenous peoples and local communities, while also foregrounding principles of gender equity, disability inclusion, and social justice in conservation practice. Hands-on activities such as participatory mapping and qualitative methods provided valuable opportunities to apply theoretical knowledge in culturally grounded contexts, reinforcing the relevance of TEK in contemporary marine research.

Participant feedback confirmed the success of the program, with all attendees rating the overall experience as excellent. Facilitators were consistently described as engaging and informative, and sessions that emphasized applied, culturally embedded practices, particularly those on TEK, mapping, and storytelling were identified as the most impactful. Group activities, *talanoa* dialogues, and cultural exchanges fostered meaningful dialogue for strengthened community engagement. The workshop influenced participants across personal, professional, and community dimensions: enhancing cultural sensitivity and communication, advancing transdisciplinary research and fisheries management, and encouraging stewardship through the revival of traditional practices. Suggestions for future events included increased field-based activities, improved pacing, and stronger integration of TEK into policy frameworks.

The summer school created a safe and inclusive space for exchange, establishing a collaborative network that participants expressed willingness to sustain through co-designed publications and follow-up initiatives. Moving forward, it is essential to consolidate these foundations by promoting interdisciplinary approaches, prioritizing equity and inclusivity, and embedding TEK within scientific and policy frameworks. By maximizing experiential learning and sustaining collaborative engagement, such efforts will contribute to more effective conservation strategies and strengthen the resilience of reef ecosystems and the communities that depend upon them.

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Appendices

Appendix A: List of participants

SOCPacific
A Sea of Connections

Summer School
Training in Inter-Disciplinary and Ethnobiological Studies of Reef Passages
8th to 12th September 2025
Suva, Fiji
Participant Attendance List

	Full name (A-Z)	Affiliation	8-Sep	9-Sep	10-Sep	11-Sep	12-Sep
1	Amandine Aiglehoux-Bornet	UNC	Y	Y	Y	Y	Y
2	Anuata Tetuanui	EPHE/CRIOBE	Y	Y	Y	Y	Y
3	Devavrat Bishwa	USP	Y	Y	Y	Y	Y
4	Dimateisuva Tuivanuaso	USP	Y	Y	Y	Y	Y
5	Elijah Tenene	UNC	Y	Y	Y	Y	Y
6	Eseta Drova	USP	Y	Y	Y	Y	Y
7	Maisha Mohamed	USP	Y	Y	Y	Y	Y
8	Malakai Kaitani	USP	Y	Y	Y	Y	Y
9	Matina Kaitapu	USP	Y	Y	Y	Y	Y
10	Reine Wadieno	UNC	Y	Y	Y	Y	Y
11	Sarah-Fina Manulevu	USP	Y	Y	Y	Y	Y
12	Simonne Rawaico-Tawake	USP	Y	Y	Y	Y	Y
13	Viniana Baleibualagi	USP	Y	Y	Y	N	N
14	Watesoni Nata	USP	Y	Y	Y	Y	Y

Y = attended sessions; N = did not attend session

Appendix B: Program – TIDES Summer School

Program of the summer school TIDES - Training in InterDisciplinary and Ethnoecological Studies of reef passages					
	08-Sept	**09-Sept**	**10-Sept**	**11-Sept**	**12-Sept**
8:00-8:30	Welcome & Getting started: - Icebreakers (Ika Bula Consultants) - Quick intro to SOCPacific2R + Rules & values for the week (Elodie Fache)	Summary of the previous day by students + Introduction to the day by trainers	Summary of the previous day by students + Introduction to the day by trainers	Summary of the previous day by students *(15 min)* Annette Breckwoldt *(15 min)* Short intro to the day, focused on "Reefs as living libraries: Ethnobiology of coral reef systems and their fish"	Summary of the previous day by students + Introduction to the day by trainers
8:30-10:00	Annette Breckwoldt *(45 min, incl. questions/discussions)* Why inter- and transdisciplinarity matter? How can people from different disciplines and from non-academic backgrounds co-produce knowledge? Simonne Pauwels & Kelly Brown *(45 min,*	Elodie Fache, Annette Breckwoldt & Salanieta Kitolelei Research ethics	Auréa Pottier Spatial approaches and tools for ethnoecology research	Catherine Sabinot *(30 min, incl. questions/discussions)* Transformative change assessment (IPBES) Simonne Pauwels *(60 min, incl. questions/discussions)* Balolo, calendar, rituals and cosmology in Fiji (east and west)	Elodie Fache Interviews: introduction and design of an interview guide

	incl. questions/discussions) Presentation of an example focused on balolo in Fiji: Fish is the sign, but fertility is the real issue				
10:00-10:30	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
10:30-12:00	Elodie Fache (+ other training team members as observers) Workshop on reef passages (1/3)	Sangeeta Mangubhai & Kimberly Samson Gender Equity, Disability, Social Inclusion (or GEDSI) approaches	Jasha Dehm Participatory mapping exercice and examples	Dominique Pelletier *(45 min, incl. questions/discussions)* Facets of biodiversity in coral reefs and associated ecosystems - Science for monitoring and supporting conservation Amanda Ford *(45 min, incl. questions/discussions)* Reef ecology, impacts and monitoring	Elodie Fache (+ other training team members as interviewees) Interviews: Practical exercise
12:00-13:30	Lunch	Lunch	Lunch	Lunch	Lunch
13:30-15:00	Elodie Fache (+ other training team members as observers) Workshop on reef passages (2/3)	Elodie Fache & Annette Breckwoldt Participant observation	Elodie Fache *(45 min, incl. questions/discussions)* A practical exercise on mental maps Auréa Pottier *(45 min, incl.*	Salanieta Kitolelei Using TEK and natural science for identification of fisheries resources	Elodie Fache Interviews: Group summary and collective debriefing

			questions/discussions) Participatory mapping vs priorietary mapping: OpenStreetMap and Google compared		
15:00-15:30	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
15:30-17:00	Observers *(30 minutes)* Workshop on reef passages (3/3) Elodie Fache & Sebastian Ferse *(60 min, incl. questions/discussions)* A very brief introduction to ethnoecology + Important basics to get on the same wavelength	Jokim Kitolelei Boundaries, activities, rules, practices and markets which govern resource use in fishing spaces	Salanieta Kitolelei *(60 min, incl. questions/discussions)* Presentation of the paper "Spatial use of marine resources in a rural village: A case study from Qoma, Fiji" Auréa Pottier & Elodie Fache *(30 min, incl. questions/discussions)* Launch of SOCPacific2R's webmap of reef passages	Ron Vave *(45 min, incl. questions/discussions)* Two ways of knowing: Scientific and local insights into the cultural lives of reef fishes Annette Breckwoldt & Salanieta Kitolelei *(45 min, incl. questions/discussions)* Tides of change: Reflective and practical skills for the next generation of marine researchers (intro to a new special issue)	Malakai Kaitani, Salanieta Kitolelei & Andreas Kopf Talanoa as a research method
17:00-18:30	Ika Bula Consultants Social event: Kava session + games to get to know each other	Ika Bula Consultants Social event: Facilitated mid-event debriefing	Ika Bula Consultants Social event: Arts & Sciences	Ika Bula Consultants Social event: Talanoa with guest professionals	Ika Bula Consultants Social event: Facilitated final debriefing & training assessment

Appendix C: Q&A

Question 1: How can pictures/drawings change attitude or interfere with point of view?

- Annette: Always choose notes over drawings when the time comes.
- Elodie: For some people, as soon as they see a camera, they pose for it. This changes their attitude and shifts the dynamic, making the observer into a photographer rather than a participant.
- Jasha: Taking photos of notes every day can be useful. Smartphones automatically record the date and place (geotagged), which helps with organization and recall.

Question 2: Complex thoughts cannot always be noted down as it can be time-consuming. What are some ways to efficiently write notes that capture everything?

- Elodie: Writing notes is only the first step. They may be messy, but it is important to write everything as it comes to mind. Notes can always be rewritten later. Do not judge based on time; focus on the quality of the data collected.
- Annette: Do not expect perfection. Use bullet points, and if you cannot remember something, skip it and return later. Keep revisiting your notes to fill in gaps and refine them

Question 3: Who has ownership?

- Ownership is split between legal rights (government) and customary claims (clans).
- Marine resources are therefore jointly claimed.

Question 4 (Annette): Are there any changes to boundaries after a tsunami?

- Jokim: Not sure.

Question 5 (Elodie): Are reef passages included in qoliqoli?

- Salanieta & Jokim: Reef passages can be part of a shared qoliqoli, an area managed by villages and the wider community.

Question 6 (Anuata): Why is it important for researchers to understand the local Fisheries Act?

- In Pacific Island Countries, fisheries are central to livelihood and culture.
- Understanding the Fish Act ensures inclusive and culturally appropriate management strategies.

Question 7 (Devavrat, Watesoni, Simonne): How does this knowledge benefit marine conservation efforts?

- Helps communities select fishing methods suited to local contexts (e.g., coconut husk net in Tonga).
- Enables control and monitoring of fishing gear use.

Question 8 (Devavrat): Why are only some LMMA sites active?

- Jokim: Challenges include inactive organizations and temporary designations of LMMA. Ultimately,

effectiveness depends on leadership and continuity.

Question 9 (Simonne): Are the traditional taboos (vanua taboos) as effective?

Jokim: It mostly depends on the leadership. People are slowly going away from traditional methods. The younger generation no longer have general respect as opposed to the past generations. In comparison between traditional and government taboos, some people respect the traditional taboos more because of the spiritual ties. The people believe their stock will be in more abundance if they follow the traditional taboo compared to the national taboo.

Question 10 (Simonne): Why did the men know more than the women?

Salanieta: Only fisherwomen were interviewed. Some women came but they were not interviewed. Most of the fisherwomen were not local as well, they married into the village.

Question 11 (Elijah): How do you choose who to interview?

Salanieta: We do not choose who to interview, the fisherwomen volunteer to be interviewed.

Question 12 (Eseta): Does your data go back to the villages?

Salanieta: Before leaving the village, a Powerpoint presentation is usually given to the villagers.

Question 13 (Anuata): What are the differences between indigenous and traditional knowledge?

Salanieta: Indigenous knowledge is from people who are Indigenous and who have become colonized. Traditional knowledge belongs to everyone and stays with them wherever they go. Local knowledge is knowledge about a specific space or territory.

Question 14 (Anuata): Which method is more effective?

Salanieta: *Talanoa* because they share more with you. When conducting interviews in a group setting, the people cannot always talk (culturally).

Question 15 (Elodie): What ID books did you use?

Salanieta: The ones from the USP bookshop. Buy a new version when available.

Question 16 (Maeesha): How did you categorize the species?

Salanieta: After identifying the species, they rank the species. Based on what they find most important. Women ranked based on fish food with the most popular in the market.

Question 17 (Maeesha): With the islands in the middle of East and West (Ovalau, Moturiki) are there balolo?

Simonne: In Moturiki, yes, but in others to my knowledge, no.

Question 18 (Elodie): Reef passages are important for balolo calling, how far are the reef passages in here?

Simonne: The reef is generally not far from the coast. Unclear if balolo is on the other side of the reef. Sometimes the balolo could be blown from the wind.

Question 19 (Matina) - Since it is bad luck to talk about the balolo before it comes, how do you teach the younger generations?

Simonne: You can talk about it the whole year until 40 days before the balolo comes.

Question 20 (Matina): Do younger boys help in preparation?

Simonne: When attracting balolo only the women partake.

Question 21 (Devavrat): Would you recommend measuring the water flow in tides through the passage and into the lagoon?

Amanda: Yes, definitely but no current research to quantify the impact to inshore.

Question 22 (Reine): Are the corals resilient to climate change?

Amanda: The more sensitive species may be lost.

Question 23 (Matina): Are you planning to create a dictionary with all the information you have collated?

Salanieta: Yes but it will take some time.

Question 23 (Elodie): There is already a list of endangered species but do you perhaps have a list of your own?

Salanieta: Yes.

Question 24 (Elodie): The kids in the islands know more compared to the children in the city, do you plan to involve them?

Salanieta: Yes, we are already in talks with the iTaukei student association to share information in schools through children's books.

Appendix D: Participant Feedback

Overall Experience The event was highly successful in terms of participant satisfaction and perceived value.

Ratings: Every participant rated the overall experience 5.0 (Excellent).

Relevance: Most found the workshop very relevant to their interests/studies, with a few noting "somewhat relevant."

Facilitators: Universally described as engaging and informative.

Standout Presentations Participants valued applied, culturally grounded, and interactive sessions over purely theoretical ones.

1. Traditional Ecological Knowledge (TEK): Frequently mentioned as the most impactful theme (Salanieta's presentations, TEK links to reef passages, shark calling, species naming).

2. Mapping & Qualitative Methods: Practical sessions (mind mapping, interview processes, *talanoa*, group activities) stood out for their hands-on learning.

3. Storytelling & Narratives: Cultural stories (Balolo, sharks, turtle calling, totem species) resonated deeply.

Desired Future Topics There's demand for practical, community-linked, and interdisciplinary approaches in future for SOCPACIFIC 2R events.

Topics for consideration in the future:

1. TEK integration with policy and science

2. Youth and children's roles in conservation

3. Practical activities related to reef passages and coastal communities.

Interaction & Networking The event successfully created a safe, inclusive space for exchange.

*Satisfaction***:** Consistently "very satisfied."

Dialogue: Participants strongly agreed the workshop encouraged meaningful dialogue and knowledge sharing.

Meaningful Moments: Group activities, *talanoa*, mapping, interviews, and cultural exchanges were highlighted as impactful.

Organisational Feedback Logistics were strong but pacing and balance between intensity and relaxation could be refined.

Venue, materials, communication: Mostly rated Excellent.

Time management: Some noted sessions were too short or long; suggested better time allocation.

Other improvements suggested:
1. More field trips (reefs, coastal communities, ocean activities).
2. Extra microphones for smoother discussions.
3. Recreational/cultural outings mid-week to balance intensity.

Key Takeaways The workshop influenced participants at three levels, personal growth, professional development, and community engagement.

Personal/Academic

importance of TEK
interdisciplinary approaches
systematic methods
cultural sensitivity
listening
simplicity in communication

Professional

transdisciplinary research
integrating TEK with science
fisheries management
geospatial science

Community:

reviving traditional practices
transferring knowledge
creating local resources
encouraging stewardship

Strategic Insights

Participants consistently connect TEK to policy, science, and community.

Hands-on and cultural activities are the most memorable and future events should maximize experiential learning.

Balance intensity with reflection as it helps pacing and recreational breaks could improve participant wellbeing.

Follow-up engagement is promising and participants are open to co-designing and contributing to publications through this strong collaborative network.

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Appendix E: Summary of Activity

Activity 1: Participatory workshop on reef passages

Part 1:

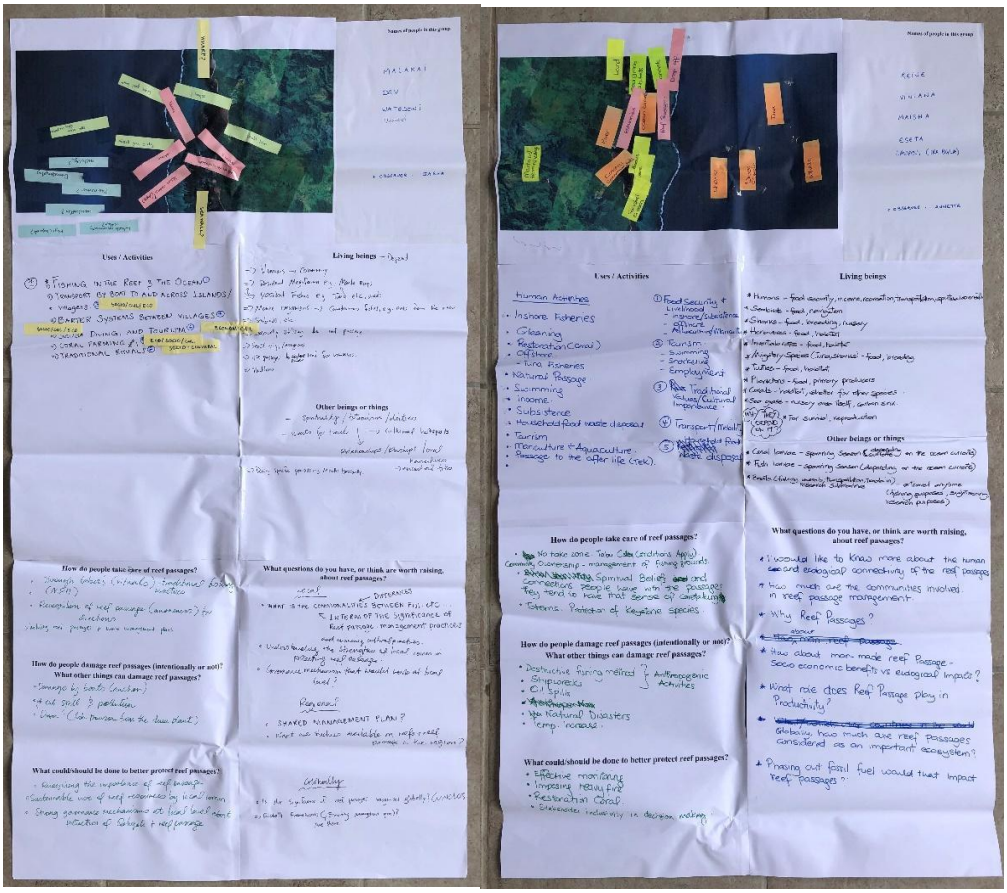
The exercise began with students analyzing a coastal image and identifying key features of the land–sea environment in their own words. Most groups labeled the mountains, river or channel, coastal villages, and the Vanua. They were then asked to list and rank human uses and activities associated with the reef passage. Five main uses emerged: fishing, recreation (e.g., surfing and tourism), traditional rituals, navigation, and waste disposal. Fishing was consistently ranked as the most important activity, reflecting its central role in sustaining coastal livelihoods, while waste disposal was considered least important due to its damaging impact on reef health.

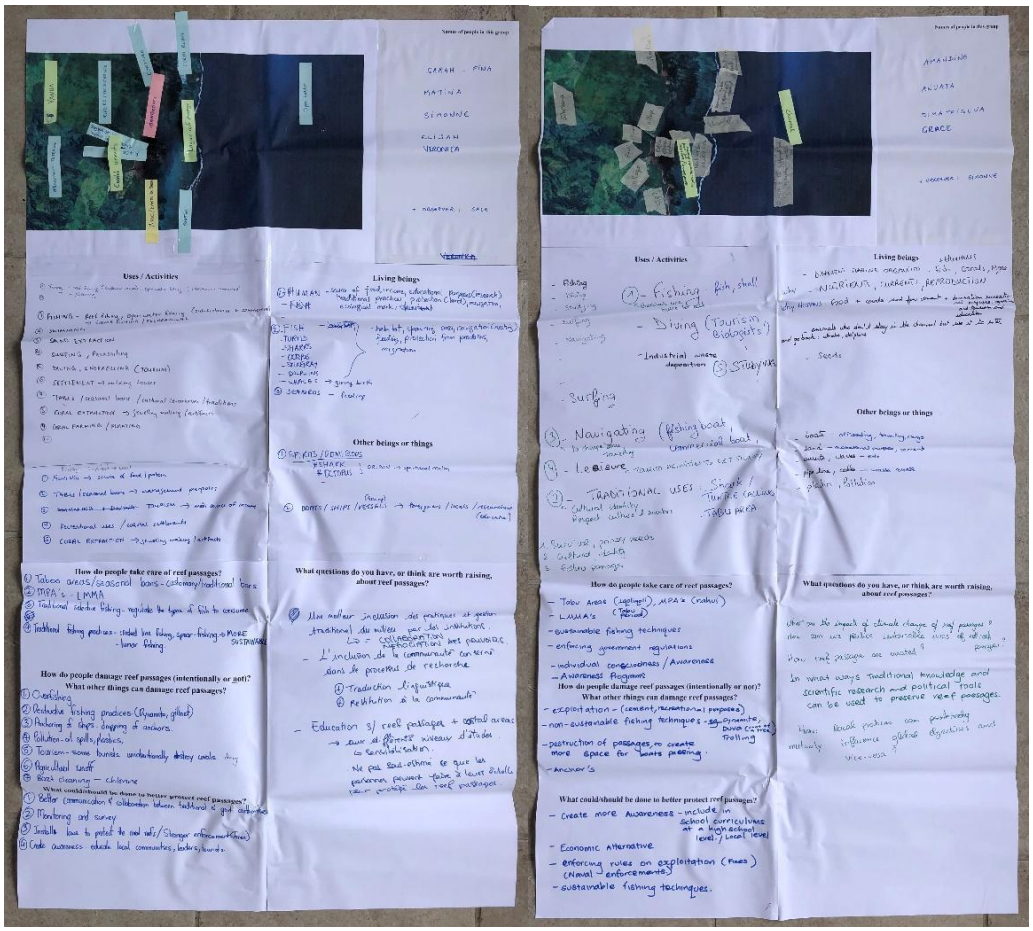
Participants next identified living beings that depend on the reef passage, including humans, marine organisms, and seeds of various flora and fauna. They also noted entities that pass through the passage, such as nutrients, pollutants, boats, seabirds, and migratory species like manta rays and sea turtles. Discussions then focused on how reef passages are cared for and damaged in the South Pacific. Protective measures include establishing marine protected areas (MPAs), enforcing taboo zones, and practicing sustainable fishing methods such as traditional line fishing. Damage occurs both intentionally through anchors, destructive fishing methods like dynamite, and pollution, and unintentionally, for example when tourists harm corals while swimming.

To strengthen reef passage protection, participants emphasized the need for collaboration between villages and government, consistent monitoring and surveying, and stronger enforcement of conservation measures. Overall, the activity highlighted the ecological, cultural, and social importance of reef passages, while underscoring both the threats they face and the community-driven strategies required for their sustainable management.

As a final question, the different participants had to note down whether some questions were worth raising about reef passages based on country of origin such as in Fiji, New Caledonia and French Polynesia.

The questions raised focus on understanding the impacts of climate change on reef passages, the need for education and awareness about their importance, and the comparative management approaches in Fiji, New Caledonia, and French Polynesia. They highlight concerns around strengthening local governance, exploring whether regional or shared Pacific management plans are needed, and how local practices can connect with international frameworks. Other questions examine whether reef passages are recognized globally, their role in ecosystem productivity, and the trade-offs of man-made passages between socio-economic benefits and ecological impacts. Finally, there is emphasis on the extent of community involvement, the strengths of local communities, and how traditional knowledge, scientific research, and policy tools can be combined to preserve reef passages while aligning local and global objectives.


Uses / Activities
Living beings
How do people take care of reef passages?
How do people damage reef passages (intentionally or not)? What other things can damage reef passages?
What could/should be done to better protect reef passages?
What questions do you have, or think are worth raising, about reef passages?
Other beings or things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What could/should be done to better protect reef passages?
What questions do you have, or think are worth raising, about reef passages?
Other beings or things

Part 2

The participants visit a rural village in Fiji to explore local uses, views, values, caring practices, and vision for the future relating to a specific reef passage:

To what extent can this workshop proposal be used for this purpose:

What do you think could be taken up and why?

Mental maps could be used so the team gets an idea of how the people view their own reef passage.

What needs to be changed and how?

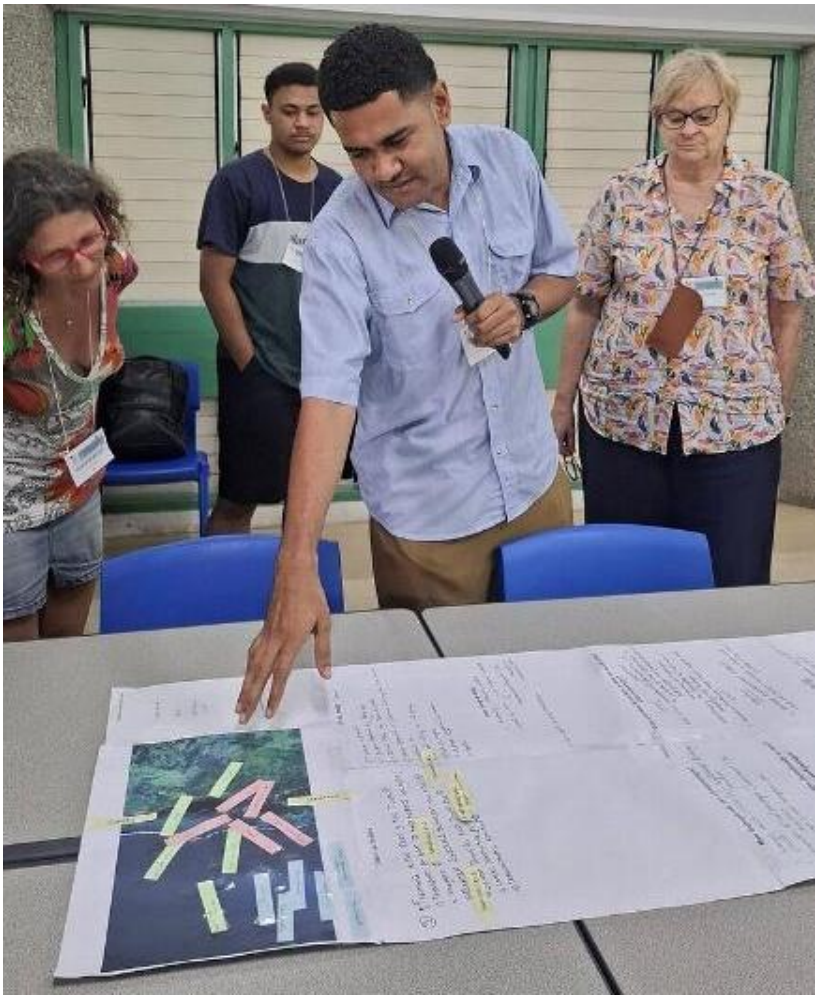
Translation may be an issue. There would be difficulties in writing down on paper, it would be better to record and have someone else write down the content of the conversations.

Target audience:

Need to personally invite the elders and the young fishers. Need to make sure that a few people are present from all demographics especially in terms of age.

What must be added?

The use of visual aids such as PowerPoint presentations or general videos.



Activity 2: Research ethics

This activity was conducted during presentations by facilitators with participants.

Activity 3a: Power walk or privilege walk

Relations shape who we become, what opportunities we can access, and the actions we are able to take in our lives. When power is unevenly distributed, it can result in discrimination and exclusion, limiting participation and voice. Reflecting on our own social identities is therefore essential, as it helps us recognize both privilege and barriers, and consider how we can design and carry out research projects in ways that are equitable, inclusive, and responsive to diverse experiences.

Activity 3b: Gender stereotypes

For the males the challenge is more on the part that they are supposed to be tough and not show any emotion. Another challenge is the thought that men should not know how to cook as that is the role of women and that they should not have long hair.

For the females, it was more on the theory that they are supposed to be quiet, and nurturing compared to males who are more capable leaders. The females are supposed to stay home and look after the children and household, cooking and cleaning instead of joining male dominated fields such as marine studies. Being a female, they are not supposed to have any body or facial

hair and must have a sense of style. One mentioned that as a female, you are not supposed to be a gamer and that you can only progress in your studies for example do your PhD if you are single.

Activity 4: Participant observation

The exercise highlighted the importance of attention, focus, and deliberate choices in documentation, particularly noting the need to record place, time, and duration. Key challenges included deciding what details to prioritize and how to begin writing. A common gap observed was that participants often omitted essential contextual information such as the date, location, and length of time spent.

Additional Remarks from Facilitators

Annette emphasized that the camera could serve both as a connection and a barrier, since the presence of recording equipment may influence the attitudes of interviewees. She reminded participants that gathering data within communities can be uncertain, particularly for those entering from outside, but encouraged them to stay positive and persistent.

Salanieta highlighted that active participation such as engaging directly in activities like fishing helps with memory retention because you are learning by doing.

Simonne advised that during observations, unexpected questions often arise, and it is important to note them down for future reference.

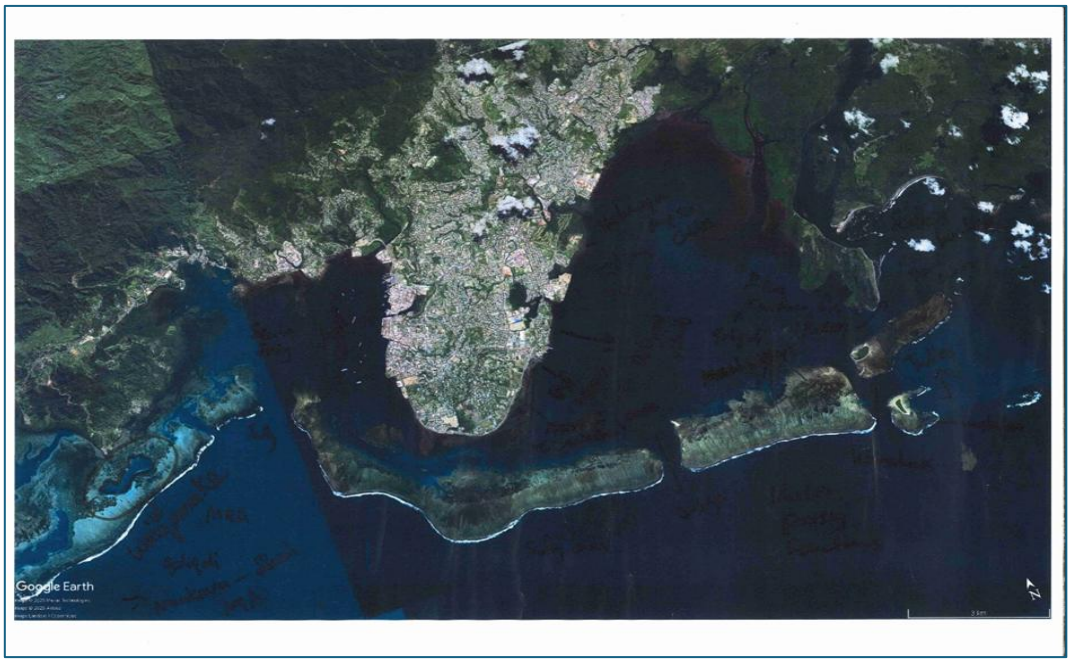
Jasha suggested that taking photos of notes with a smartphone at the time and place of observation provides an additional record of context, including time and location.

Elodie stressed that participant observation should be judged not by the length of time spent, but by the depth and quality of the data produced. She also noted that there is no such thing as an "informal" interview, i.e. every interaction is part of participation and observation.

The main takeaway from the activity was that the focus points for everybody were different. No gender was mentioned, no focus on place and time, specific interactions were mentioned instead of the whole activity. It was also difficult to balance description as some people focussed on specific details while some focussed on the big picture. All the different points of view added up to the full picture. This activity challenges the memory.

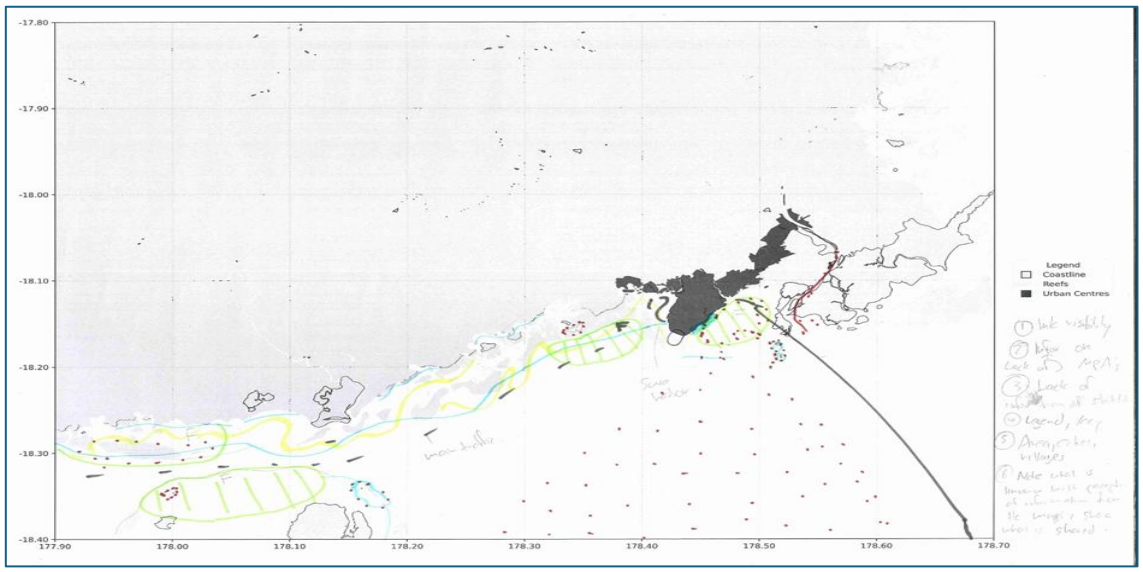
Activity 5: Participatory mapping

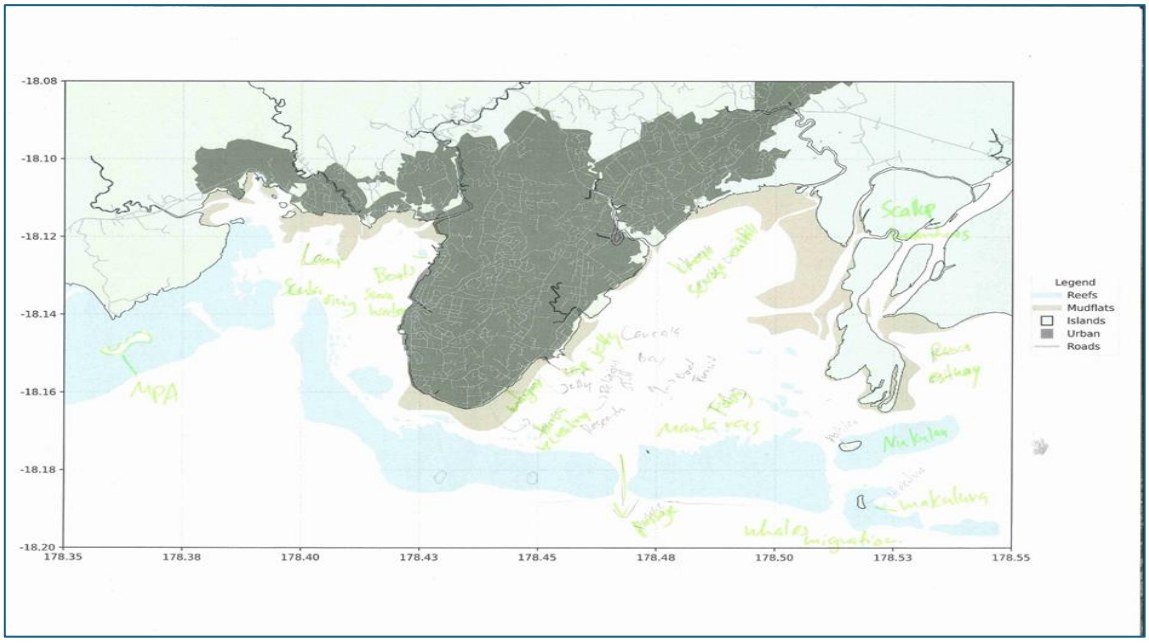
The activity positioned the facilitator as a coastal zone management practitioner, simulating the process of gathering stakeholder input to support Fiji's 30x30 marine protection goals. The mapping exercise was conducted in three stages. Initially, students mapped general coastal uses with minimal guidance. In the second stage, participants identified and labeled specific areas such as fishing grounds, gleaning sites, sand mining locations, sacred or culturally significant zones, tabu/MPA areas, tourism and recreation sites, ports, anchorages, habitats, marine infrastructure, and reef health zones. The third stage introduced additional resources, varied map scales, and color-coded pens with sticky notes to differentiate categories (green for fishing/resource use, blue for cultural/recreational sites, black for infrastructure, red for conservation/critical habitats). This progression demonstrated how guidance, resources, and mapping tools significantly influence the detail and accuracy of participatory mapping outcomes.



Clear guiding questions helped structure the activity, though the first maps relied heavily on participants' personal knowledge and assumptions. With improved scales and resources,

subsequent maps presented issues more clearly and accurately. Limitations included inconsistent use of legends and uneven familiarity with the area, which affected labeling accuracy. Overall, the exercise highlighted the importance of clear legends, adequate resources, and guiding questions to ensure objectives are met.





Discussions emphasized how guiding questions, map scales, and available resources shaped outcomes, while challenges included reliance on knowledgeable individuals, unfamiliarity with certain areas, and resource constraints. Participants reflected on the need for clear language, inclusivity, and creativity in participatory mapping, recognizing its value in capturing both community perceptions and environmental threats. Although validation was not conducted, methods such as range voting and composite mapping were identified as useful for ensuring accuracy. Tools like Marine Atlas and SeaSketch were noted for their potential to compile data, develop marine spatial plans, and support collaborative decision-making.

Activity 6: Mental maps

Participants produced different mental maps depending on their familiarity with the areas, with some choosing to represent features using vectors, lines, and building shapes. Variations in scale also emerged, largely due to vague instructions; places that held personal importance were often drawn in greater detail and at a larger scale. Ultimately, the final maps reflected the information and resources available, as well as each participant's perspective, knowledge, and feelings, highlighting the subjective nature of mental mapping. Another example is if an older man was requested to map the traditional fishing grounds, it would be completely different. It can be either drawn as a base map or be followed up by an interview to further clarify the map.

Activity 7: Traditional knowledge and natural science

This activity was conducted during presentations by facilitators with participants.

Activity 8: Interviews - Design

This activity was conducted during presentations by facilitators with participants.

Activity 9: Interviews - Practical

The interviews revealed diverse perspectives shaped by the interviewees' roles and experiences. In the first group, emotions were more evident, as the participant lived near a reef passage and highlighted the variation in policies across countries. A mental map was suggested as a useful tool to provide clearer imagery and spatial context. The second group interviewed a practitioner focused on community engagement and trust-building rather than direct involvement in reef passage projects. This required students to adapt their questioning approach once they realized her role was more peripheral. The third interviewee drew on personal experiences of living in Levuka, emphasizing the importance of transmitting traditional knowledge to younger generations. The fourth interviewee was directly engaged in reef management, traditional knowledge, and reef ecology, offering insights grounded in project involvement.

Participants faced several challenges during the activity. Explaining consent forms and managing recordings proved difficult, highlighting the need for better preparation and clearer communication. Social skills, teamwork, and question phrasing required improvement, with interviews needing to resemble *Talanoa* (open, relational dialogue) rather than rigidly structured formats. Additionally, fatigue led to lapses in attention, underscoring the importance of active listening and sustained engagement. Overall, the exercise demonstrated the value of adaptive interviewing, cultural sensitivity, and preparation in eliciting meaningful insights from diverse stakeholders.

Activity 10: Interviews-- Point of views

This activity was conducted during presentations by facilitators with participants.