

Global Coral Reef Monitoring Network
(GCRMN) Fiji Review and Planning Meeting

WWF Coral Bleaching Rapid Response
Communications Meeting

6th- 7th March 2006

PIMD Senate Room, University of the South Pacific, Suva Fiji

CRISP



Coral Reef Initiative for the South Pacific
Initiative Corail pour le Pacifique Sud

Meeting report

Compiled by
Dilpreet Kaur¹ and Shital Swarup²

Edited by
Ken MacKay³ and Cherie Morris⁴

¹CRISP Programme Coordinator, School of Marine Studies, USP

²Scientific Officer, Institute of Marine Resources, USP

³Director, Institute of Marine Resources, USP

⁴Training Officer, Institute of Marine Resources, USP



The University
of the South Pacific

Table of Contents		Page
1.0	Acknowledgements	4
2.0	Executive Summary	5
3.0	Background	7
4.0	Introduction	7
5.0	Opening Addresses and Welcome	8
5.1	Summary of Address by Dean of the Faculty of Island and Oceans, Dr. Pa'olelei Luteru	8
5.2	Summary of Address by Professor Rene Galzin, University Of Perpigon, France	10
5.3	Participant Introductions and Expectations	10
6.0	Proceedings of the GCRMN Fiji Review and Panning Meeting	11
6.1	An Overview of the GCRMN Southwest Pacific Node <i>by Kenneth MacKay</i>	13
6.2	Overview: Coral Reef Biological Monitoring In Fiji <i>by Ed Lovell and Helen Sykes</i>	13
6.3	Reasons for Monitoring: Examples From Fiji	14
6.3.1	Using The Marine Aquarium Trade for Coral Reef Monitoring (MAQTRAC) Method in Assessing Organisms Collected for the Aquarium Trade in Fiji <i>by Cherie Whippy Morris</i>	14
6.3.2	Measuring the Effectiveness of Locally Managed Marine Areas (LMMAs) <i>by Alifereti Tawake</i>	16
6.3.3	Assessing the Effectiveness of MPAs and Other Local Management Actions: Coral Reef Monitoring in Korolevu-I-Wai/Koroinasau Qoliqoli <i>by Victor Bonito</i>	17
6.3.4	Kubulau Coral Bleaching Project <i>by Thomas Tui</i>	19

6.3.5	Coral Reef Community Education in Rotuma <i>by Monifa Fiu</i>	20
6.4	Panel Discussion on Coral Reef Monitoring Methods <i>Panelists: Ed Lovell, Helen Sykes, Semisi Meo and Randy Thaman</i>	22
6.5	Group Discussion on Monitoring Methods <i>Chair: Kenneth MacKay and Monifa Fiu</i>	23
6.6	Key Points from Day One Discussions <i>by Ed Lovell</i>	27
6.7	Ensuring Data Quality <i>by Zaidy Khan</i>	27
6.8	Panel Discussion on Reefbase, Data Input, Storage and Analysis <i>Panelists: Kenneth MacKay, Giliane Brodie, Conway Pene, David Fisk</i>	29
6.8.1	CRISP Component 2D Reefbase Pacific <i>by Kenneth MacKay</i>	29
6.8.2	GIS and Remote Sensing for Coral Reef Monitoring <i>by Conway Pene</i>	30
6.8.3	The Role of PACINET <i>by Giliane Brodie</i>	32
6.8.4	The LMMA Database <i>by Ron Vave</i>	33
6.8.5	The Importance of Data Presentation <i>by David Fisk</i>	33
7.0	Proceedings of the WWF Coral Bleaching Rapid Response Communications Meeting	34
7.1	Friends of the Reef <i>by Monifa Fiu</i>	34
7.2	Group Discussion on Strengthening the Rapid Response Communications Network	36
7.2.1	Local Communities	37
7.2.2	GCRMN Rapid Response for Fiji	37
7.2.3	General Public/Media	38

7.3	Group Discussion on Needs and the Way Forward	40
8.0	Conclusion	44
9.0	Recommendation	45
10.0	Annex 1	46
11.0	Annex 2	48

List of Figures

Figure 1	Meeting Participants	11
Figure 2	Fiji Monitoring Site Locations	13
Figure 3	Rotuma Monitoring Site Locations	20
Figure 4	Rotuma Community Outreach Model	21
Figure 5	FLAMMA Data Flow Diagram	33
Figure 6	Management Strategy for Reef Resistance and Resilience to Bleaching	34
Figure 7	International Rapid Response Mechanism	37
Figure 8	Information Flow for Rapid Response	38
Figure 9	Proposed GCRMN Organization Structure	45

List of Tables

Table 1	Group 1 – Monitoring Methods, Strengths, Weaknesses and Bleaching Monitoring	24
Table 2	Group 2 – Community and Tourist Participation	25
Table 3	Group 3 – Indicators: Coral Coring, Butterfly Fishes, Invertebrates and Larval Fish	26
Table 4	Group Discussion Points on the Way Forward	41

1.0 Acknowledgements

The Coordinators of the meeting are grateful to all the participants (especially the international ones) who generously shared their time, experiences and information. In addition, the forum was honored with the presence of Professor Rene Galzin from the University of Perpignon in France.

Special thanks goes to the organizations, which provided funds for this two-day meeting namely, Coral Reef Institution in the South Pacific (CRISP), Canada South Pacific Ocean Development Program (C-SPOD), World Wide Fund for Nature (WWF) and Institute of Marine Resources (IMR).

2.0 Executive Summary

The overall aim of GCRMN is to improve management and sustainable conservation of coral reefs for people by assessing the status and trends in the reefs and how people use and value the resources.

The Director of the Institute of Marine Resources (IMR) at the Faculty of Islands and Oceans, University of the South Pacific in Suva is the Coordinator of the GCRMN South West Pacific Node, which comprises seven member countries. These are Fiji, Nauru, New Caledonia, Samoa, Solomon Islands, Tuvalu and Vanuatu.

The overall strategy of the GCRMN is to involve monitoring experts in each of the GCRMN nodes to train trainers in participating countries, to gather data on trends in the health of coral reefs and develop skills. Experienced marine institutes will assist in training, establishing of databases and problem resolution. Essentially, two types of Coral Reef Monitoring is conducted – Ecological and Socioeconomic.

In March 2006, 45 participants representing Institutions, Non-Governmental Organizations, and Government came together for a meeting, which had two components to it. The GCRMN Fiji Review Planning Meeting was the first component, which focused on the strategies that the Coordinator could use to effectively coordinate and collate coral reef monitoring data from the various stakeholders. The World Wide Fund for Nature (WWF) Coral Bleaching Rapid Response Communications Meeting was the second component and was dedicated to determining ways of strengthening communications within the network and information and dissemination to the wider public.

The overall meeting objectives were as follows:

1. Review current methods and approaches to biological monitoring of coral reefs in Fiji;
2. Discuss the strengths and weaknesses of the various approaches and identify problems or gaps;
3. Review current status of existing mechanism in reporting of coral reef monitoring including bleaching within the network and awareness of the general public;
4. Discuss the potential gaps and opportunities within the information flow starting from the physical collection of data, through to storage analysis and the dissemination of information to the local and international community, the network and the public for awareness; and

5. Strengthen and enhance networking amongst partners collecting coral reef data and formalizing the network amongst researchers, managers, communicators and community members in Fiji.

Coral reefs contribute significantly to national economies of Pacific Islands, from the commercial and subsistence fisheries, tourism and recreation, coral and sand extraction, and shoreline protection. Coral reefs around the world continue to decline from increasing human pressures (24% of the world's reefs are under imminent risk of collapse and a further 26% are under a longer term threat of collapse) . Coral bleaching is a major threat to coral reefs and increased frequency of such events may not allow recovery to many of the world's coral.

Over the past 10 years, destructive events such as bleaching, Crown of Thorns Starfish infestation, disease and cyclones have generated a greater awareness of the need to conserve coral reefs. Lovell et al (2004), concludes that ongoing monitoring surveys need financial support and are only useful if they are tied to relevant issues such as over fishing, MPA establishment and coral reef management.

Several Non-Government Organizations, Government (Fisheries) and Institutions within the University of the South Pacific have coral reef monitoring projects. The initial monitoring methods used were based on Reef Check. However, modifications to this method were made depending on the type of information needed. Types of monitoring included, baseline surveys of coral, fish and invertebrates, Line Intercept Transect (LIT), Point Intercept Transect, Temperature Logger, Timed Swims and Video Recording. Some of the key issues of coral reef monitoring in Fiji include:

- Crown of Thorn (COT) starfish predation on coral reefs is one of the major contributing factors of coral bleaching besides rising sea surface temperature
- Knowledge gaps in finfish data exists
- There is no standard monitoring method
- More frequent monitoring is needed to determine changes

The outcome of the two-day meeting identified the need for more effective networking amongst stakeholders and for a centralized database with a coordinator who collected data from stakeholders, managed it and disseminated the information on trends and status of coral reefs including rapid response reporting. The purpose of this information would be to allow for improvement in the management and sustainable conservation of coral reefs at the local and regional level. In addition, the meeting concluded that in order for the GCRMN to work effectively, certain requirements such as clear objectives, strategic work plan, equipment, committed partners, personnel and funding had to be met.

Finally, an organizational structure was proposed outlining the ideal situation for the GCRMN to operate in order to strengthen and enhance networking amongst

partners collecting coral reef data and formalizing the network amongst all relevant stakeholders in Fiji.

3.0 Background

The Director of the Institute of Marine Resources (IMR) at the Faculty of Islands and Oceans, University of the South Pacific in Suva is the Coordinator of the GCRMN South West Pacific Node, which comprises seven member countries. These are Fiji, Nauru, New Caledonia, Samoa, Solomon Islands, Tuvalu and Vanuatu. The Institute of Marine Resources has administered the node activities since 2001 and has trained and provided assistance to the seven country coordinators to establish permanent reef monitoring sites.

The South West Pacific GCRMN Node was able to continue its networking and activities throughout the region following the success in securing of funds in late 2005 after the C-SPOD funding ended. Also in late 2005, saw the appointment of the new IMR Director, Dr. Kenneth MacKay and hence the new South West Pacific Node GCRMN Coordinator.

4.0 Introduction

In early 2006, it was realized that there was a need to bring together the Fiji GCRMN stakeholders for a review and planning meeting. It was envisaged that since IMR would be part of the Pacific Reefbase, it would be important to determine what resources were available and how a coordinated approach could be achieved in order for the GCRMN to achieve its goals.

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- Review current status of existing mechanism in reporting of coral reef monitoring including bleaching within the network and awareness of the general public
- Discuss the potential gaps and opportunities within the information flow starting from the physical collection of data, through to storage analysis and the dissemination of information to the local and international community, the network and the public for awareness; and
- Strengthen and enhance networking amongst partners collecting coral reef data and formalizing the network amongst researchers, managers, communicators and community members in Fiji.

5.0 Opening Addresses and Welcome

5.1 Summary of the Address by Dean of the Faculty of Islands and Oceans, Dr. Pa'olelei Luteru

Dr. Luteru welcomed everyone to the University of the South Pacific. He commended such a forum, which brought together people from varied backgrounds to discuss a common vision of how to better manage coral reefs for the future.

In his address, Dr Luteru highlighted the following issues on the importance of coral reefs, the current status of coral reefs and the threats:

- 30 per cent of the world's reefs are seriously damaged and an estimated 60 per cent could be lost by 2030
- The economic value of reefs have been estimated at between FJ\$200 000 to 1 million per km² per year
- Coral reefs contribute significantly to national economies of Pacific Islands, from the commercial and subsistence fisheries, tourism and recreation, coral and sand extraction, and shoreline protection
- Coral reefs around the world continue to decline from increasing human pressures (24% of the world's reefs are under imminent risk of collapse and a further 26% are under a longer term threat of collapse)
- Coral bleaching is a major threat to coral reefs and increased frequency of such events may not allow recovery to many of the world's coral
- Over-fishing and use of destructive fishing methods, threatens the normal functioning of coral reef ecosystems; reduces populations of key reef

organisms; lowers coral reef productivity; and, along with pollution, shifts the advantage towards macro-algae

- Mining for corals for use as building materials can eliminate, or reduce to rubble, large areas of reef. Collection of coral for the curio trade and live rock in Fiji also may lead to potential habitat loss
- In addition to coastal development, construction activities inland, agriculture and deforestation, and poor management contribute to increased sedimentation
- Increased nutrification contributes to a shift in coral to macro-algae
- Increasing sea surface temperatures and carbon dioxide concentrations provide clear evidence of global climate change
- Current predictions are that the extreme coral bleaching events will become more common in the next 50 years and may result in shorter recovery times for coral
- Degraded reefs can no longer provide their full ecological services and this has implications for coastal communities in terms of food security. In addition, implications also exist for the tourism industry in terms of loss of export earnings
- Reefs can themselves be damaged by strong winds and waves, and so their buffering capacity is a balance between their resilience and their vulnerability
- On the positive side coral reefs in the Southwest Pacific are generally in good condition and have shown reasonably good recovery from the 2000-2002 coral bleaching events
- Most importantly has been the increased participation of governments, NGOs, scientists, volunteers and local communities in coral reef monitoring and resource management including the GCRMN initiative
- However, these initial investments and initiatives could be seriously compromised without continued collective efforts. Monitoring surveys are only useful if they are conducted on a regular basis and tied to relevant issues such as over-fishing, MPA establishment and coral reef management
- There is a critical need for continued monitoring, management and communication of results to people at all levels- from the communities to the decision makers

5.2 Summary of Address by Professor Rene Galzin

In his address, Professor René Galzin, from the University of Perpignan, France, highlighted the importance of coral reef monitoring and gave an introduction to the status of coral reefs in the region as follows:

- 3% coral reefs are dead, 7% are at high risk of dying and 19% at medium risk
- Apart from parts of Micronesia and PNG, other countries in the region have good monitoring programs
- Major threats to coral reefs on the global scale can be grouped as:
 1. Global change threats such as coral bleaching, rising levels of CO₂, disease, plaques and invasives
 2. Direct human pressures such as overfishing, trawling, sedimentation, nutrification, chemical pollution, coastal development
 3. Governance, awareness and political will such as poor management capacity, growing populations and rising poverty, low political will
- Monitoring data has been collected in the Tiahura area in French Polynesia from 1987 to 2004 (18 years)
- What can we do about these threats? We can develop global initiatives, integrated coastal management and oceans governance
- Some conservation recommendations include, integrated catchment and coastal management, build stronger partnerships, need more MPA's , networks and training

5.3 Participant Introductions and Expectations

Participants introduced themselves and their roles in represented organizations, relevance of the work towards the coral reef monitoring and role in the network. In addition to this they expressed their expectations from this planning meeting. These included:

- Better collaboration and cooperation between partner organizations
- A need for continuity in coral reef monitoring
- Importance of documenting flora and fauna before they are lost
- Learning opportunity through networking
- Increased participation by resort representatives in monitoring efforts
- To find out what the existing programs and monitoring efforts exist



Fig. 1. Meeting Participants

6.0 Proceedings of the GCRMN Fiji Review and Planning Meeting

6.1 An Overview of the Global Coral Reef Monitoring Network (GCRMN) South West Pacific Node *by Kenneth MacKay*

Chair: Milika Naqasima-Sobey

The overall aim of GCRMN is to improve management and sustainable conservation of coral reefs for people by assessing the status and trends in the reefs and how people use and value the resources.

The core objectives of GCRMN are:

- To link existing organizations and people to monitor ecological and social, cultural and economic aspects of coral reefs within interacting regional networks
- To strengthen the existing capacity to examine reefs by providing a consistent monitoring program, that will identify trends in coral reefs and discriminate between natural, anthropogenic, and climatic changes
- To disseminate results at local, regional, and global scales on coral reef status and trends, to assist environmental management agencies implement sustainable use and conservation of reefs

GCRMN Strategy and Approach

The overall strategy of the GCRMN is to involve monitoring experts in each of the GCRMN nodes to train trainers in participating countries, to gather data on trends in the health of coral reefs and develop skills. Experienced marine institutes will assist in training, establishing of databases and problem resolution. Essentially, two types of Coral Reef Monitoring is conducted.

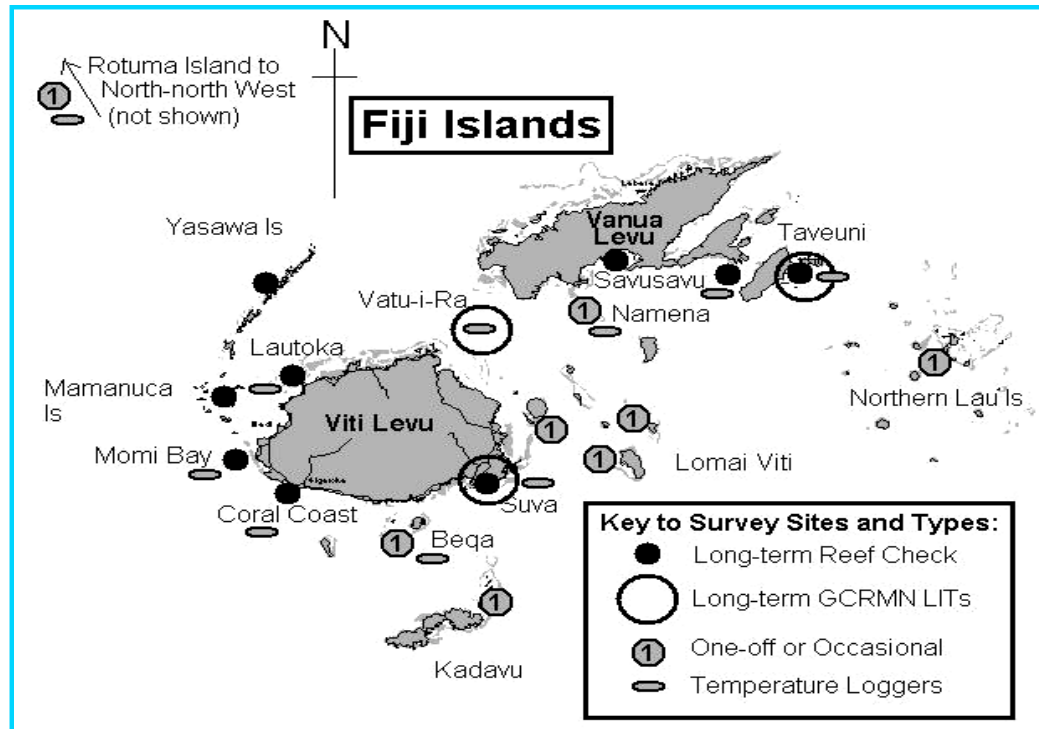
- **Ecological Monitoring:** A range of reef types will be monitored along line transects, assessing easily recognizable lifeforms and total fish counts, with specific counts of 'target' fish of commercial or recreational value. As people gain more experience, monitoring will be upgraded using the same methods, but to species level. Training starts with Reef Check methods before progressing to GCRMN level methods.
- **Socioeconomic Monitoring:** Local communities will be questioned on their use and knowledge of reef resources and how management may be improved. A major focus is on training people in the use of the Socioeconomic Manual for Coral Reef Management.

Monitoring data will be accumulated in each node within a specialized database for distribution within the region and to ReefBase (The WorldFish Center). These will be combined into biannual reef status summaries and disseminated to international forums, organizations and the media.

The 2004 report on the status of the Coral Reefs of the Southwest Pacific by Lovell, E. et al (2004), indicated that coral reefs in the region were in generally good condition despite the extensive coral bleaching during 2000-2002. Since then, there have been variable rates of coral recovery. According to Lovell et al, (2004), the greatest threats to coral reefs in the region continue to be human activities and cyclones. Over the past 10 years, destructive events such as bleaching, Crown of Thorns Starfish infestation, disease and cyclones have generated a greater awareness of the need to conserve coral reefs. Lovell et al (2004), concludes that ongoing monitoring surveys need financial support and are only useful if they are tied to relevant issues such as over fishing, MPA establishment and coral reef management.

6.2 Overview: Coral Reef Biological Monitoring in Fiji

by Ed Lovell and Helen Sykes



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Fig. 2. Fiji Monitoring Site Locations

Types of Monitoring include:

- baseline surveys of coral, fish and invertebrates
- Line Intercept Transect (LIT)
- Point Intercept Transect
- Temperature Logger
- Timed Swims
- Video Recording

The percentage live hard coral cover during the period 1999-2004, ranged from 21-34% on deeper reefs and from 22-24% on shallower reefs. The non-*Acropora* hard corals were dominant from 2000 until 2004 when the *Acropora* species dominated and soft coral cover increased.

The average algae cover peaked at about 10% in 2003 after an initial decline to about 1% in 2000 and gradual increase thereafter. A total of 476 fish species were monitored and these were dominated by wrasses (56%) and damsels (50%).

The main threats to Fiji's coral reefs were:

- Eutrophication
- Temperature related bleaching

- Coral predation and disease
- Over fishing

Some of the key issues of coral reef monitoring in Fiji were:

- Data loggers usually placed at 3-6m and 9-12m on a reef slope to monitor changes in seawater temperature
- There are some errors in Status of the Coral Reefs report 2004 for Fiji (pg.340). The percentages given for recovery with coral recruitment for the different depths are much higher than stated. These errors have been corrected in the online version
- Crown of Thorn (COT) predation on coral reefs is one of the major contributing factors of coral bleaching besides rising sea surface temperature. The Mamanuca Group has a huge Crown of Thorns (COTS) outbreak at present and in some areas, this has contributed to further bleaching
- Knowledge gaps in finfish data exists. No full biodiversity data is available on finfish. Current data presently available isn't good enough. Reef Check methods count fish on group level with only a few identified to species, which does not represent the biodiversity of fish. Therefore a more comprehensive method than Reef check is needed. Good fish indicator species needed for coral health such as smaller fish species commonly found at shallower inshore areas. Some areas may not have the common indicator species that is monitored
- There is no standard monitoring method and different groups use different methods. Data needs to be comparable at some level and for this surveying methods need to be standardized. This standardized method needs to be as simple as possible
- More frequent monitoring will enable us to spot changes that would go unnoticed if only annual monitoring is done- that is more detailed monitoring is needed. If only annual monitoring is done we may miss out on major events that occur in between

6.3 Reasons for Monitoring: Examples from Fiji

Chair: Sarah Grimes

6.3.1 Using the Marine Aquarium Trade for Coral Reef Monitoring (MAQTRAC) Method in Assessing Organisms Collected for the Aquarium Trade in Fiji by Cherie Whippy-Morris

- The Marine Aquarium Council (MAC) is a non-government, independent, multi-stakeholder institution specializing in developing and coordinating

efforts to ensure the fishery and international trade in marine ornamentals is responsible and achieved compliance with MAC Standards

- Being the world body responsible for developing and certifying sustainable ways of harvesting coral reef species for the tropical marine aquarium industry, MAC has a vital role to play in enabling the marine aquarium trade in Pacific Island Countries to be based on best practices
- In order to monitor the effects of the certified marine aquarium trade, a set of scientific protocols were developed for use by independent groups. This was named the Marine Aquarium Trade Coral Reef Monitoring Protocol (MAQTRAC)
- The MAQTRAC survey methodology was derived from that of Reef Check although it focused on marine aquarium species and included some socio-economic data
- This monitoring program was used to:
 - Conduct a baseline survey of reefs harvested for those seeking MAC Certification
 - Determine the effects of collection on reef condition and the abundance of reef organisms
 - Regularly survey reefs harvested by MAC certified operations – monitoring
 - Compare the health of the reefs where collection occurs with reefs where no known harvesting is occurring
- Reef Check carried out data analysis and interpretation of data although this was never done for survey data from the Pacific since insufficient data was collected
- The most challenging aspects of applying MAQTRAC to Pacific Island situations were:
 - determining what levels of catch was sustainable
 - what abundance reduction was ecologically significant
- However, MAQTRAC surveys did provide the baseline assessment which in turn provided a way forward towards recommending quotas for each consignment area
- Data from MAQTRAC surveys were included in the Collection Area Management Plans (CAMPs) which was a requirement for the MAC Standard covering the management of the collection area
- The ultimate intention of the CAMP was to help local communities and/or governments establish and implement management plans for sustainable extraction of marine ornamentals based on resource-based quotas

Discussion, questions and comments

Q: Is there a red list for corals under IUCN?

A: No. They are only protected under CITES but not the IUCN. However, there is some concern as to where and how corals/live rock is collected because of the sustainability issue. There are guidelines for collection formulated by MAC. There are assessment of amount and area where corals are collected. Capacity building is required to study in detail resource assessment of live rock and live coral. Assessment of long term effects is also required.

Comment: Not much Taxonomic work and species identification has been done. There are many knowledge gaps so how can this be called a sustainable industry. Need to be firm in carrying out assessment before anything is removed/collected and aquarium traders should pay for these assessments.

6.3.2 Measuring the Effectiveness of Locally Managed Marine Areas (MPAs) by Alifereti Tawake

What is a Locally Managed Marine Area (LMMA)?

LMMA is a Strategy that *advocates active participation of communities and other local stakeholders in developing, implementing and evaluating their marine area management plans through adaptive management approaches:*

- Categories
 - Community-based marine area management initiatives.
 - Collaborative management (national, NGOs, institutions and resource owners/users) of marine resources
- LMMA Tools (3 types):
 - No take areas, MPA, marine reserves, sanctuaries. (temporary or permanent)
 - Species specific harvest refugia
 - Restriction of Fishing or harvesting effort.
- Due to the socio-cultural issues permanent tabu areas may not be effective.
- LMMA Network Objectives
 - Promote the community-based LMMA approach to marine conservation .

- Develop resource management policies where these projects are working.
 - Promote Learning Locally and Globally About the LMMA
 - Enhance Capacity of Institutions in the Region
- Partners in the Fiji LMMA network include, custodians, NGO's institutions, private sector and government departments
 - The trend of FLAMMA is that the higher the community participation the higher the chance of it being successful. To cite an example of a successful LMMA in Fiji is that of Ucuivanua Village in Verata where a mudflat clam species increased in numbers tenfold over 6 years in a protected (tabu) area
 - Key Questions:
 - How big should an MPA or tabu area be?
 - How effective are temporary tabu areas?
 - Are tabu areas (imposed based on socio-cultural criteria) contributing to biodiversity and fisheries sustainability?

6.3.3 Assessing the Effectiveness of MPAs and Other Local Management Actions: Coral Reef Monitoring in Korolevu-I-Wai / Koroinasau Qoliqoli by Victor Bonito

Objectives:

- Improve the success of marine conservation efforts in Tikina Korolevu-I-Wai / Koroinasau & Fiji
- Further support FLMMA efforts in the Tikina by bringing together local and international partners with complementary skills and interests
- Gather detailed information about reef fauna and the state of the reef and reef resources for management planning and assessments
- Develop tools and assess existing tools available for resource management planning and assessment
- Establish rigorous baselines for future assessments

- Broaden the data available and provide forums for management planning and assessment efforts
- Improve local awareness of and knowledge about marine conservation issues and participation in conservation efforts

The Current project partners are:

- Mike's Diver's / Victor Bonito
- Votua, Vatu-O-Lalai, Tagaqe, and Namada villages and stakeholders of Korolevu-I-Wai / Koroinasau *Qoliqoli*
- The University of the South Pacific (USP) – IAS and MSP
- The Florida Museum of Natural History (Gainesville, FL)
- The National Marine Fisheries Marine Protected Areas Center Science Institute (Santa Cruz, CA)

The research projects are mainly focused on biological and environmental monitoring. These include:

- Monitoring coral community responses to thermal regimes
- Biodiversity studies
- Macrobiodiversity studies (Fishes, Hard and soft corals, Gorgonians, Echinoderms, Mollusks, Crustaceans, Flatworms, sponges, ascideans, hydroids, polychaetes, bryozoans, and other invertebrates)
- Acoustic tagging of reef fishes
- Better understand the diurnal movement and home range size of targeted reef fishes
- Target reef fish of cultural & ecological importance
- Target reef fish of cultural & ecological importance
- Fisheries catch studies
- Water quality studies

These projects will address relevant management questions such as:

- How well do existing MPA boundaries protect reef fishes?
- Does MPA effectiveness vary with specific, predictable design characteristics?
- How decisions concerning the placement of MPAs influence their ability to achieve their objectives?

Summary

- All research and monitoring efforts will involve local participation
- Results from all studies will be presented to local communities in educational and resource management planning forums
- Transferable products and lessons learned from these projects will be shared with FLMMA partners
- Seeking further funding for these and other projects
- Looking to expanding projects into other areas in Fiji

- Glad to involve/work with other partners

Discussion, questions and comments

Comment: Interesting to note that the effect of temperature fluctuations on coral communities in each area were being looked at

Q: Why are MPAs created in the name of conservation if they will be exploited later?

A: MPAs are for enhancement of fish stock and not so much for pure conservation. In addition, they are also used to attract tourists.

Comment: There are no MPA legislations in Fiji. In the Philippines, LMMA groups carry out coastal surveys on the locality of MPAs.

6.3.4 Kubulau Coral Bleaching Project by Thomas Tui

The project was initiated during a national bleaching alert when the first indication of bleaching was observed outside Beqa in 2005.

Major Objectives were:

- 1) to examine the effect of an established reserve (i.e. Namena) to resilience to coral bleaching
- 2) to compare the rate of bleaching of coral inside and outside reserve
- 3) to observe the changes in zooxanthellae during the coral bleaching period

The research team comprised Dr Davey Kline (Research Coordinator) from SCRIPPS Institute, San Diego, Wayne Moy (Technical Expert) and Field staff, Alex Patrick, Loraini Sivo and Thomas Tui.

Methodology

- Two depth ranges: Deep (15-18)m and Shallow (8-12)m
- 50m transects with some permanent
- Targeted coral species: 3 species from the genus *Acropora* (*A. formosa*, *A. nobilis*, and one other), one species *Diploastrea* (*D. heliotora*), two species of Genus *Pocillopora* (*P. damnicornis*, *P. eydouxii*)
- There was also an attempt to monitor the Genus *Montipora* but there were none found
- Tagging of target species
- Taking photos of target species with colour card (standard white balance)
- Noting temperature, targeted coral species health with percentage coral coverage
- Tag a minimum of six of each species of each transect

- Six sites in Namena MPA with another six sites outside the MPA
- Coral collection on DNA for zooxanthallae analysis

Monitoring

- Every two weeks
- Zooxanthallae samples taken at the beginning and the end of the bleaching period (two samples)

Discussion, questions and comments

Comment: It has been noticed that coral bleaching occurs at depth above 5m in areas that have been surveyed whereas the two depths that WCS are monitoring for coral bleaching are Deep (15-18)m and Shallow (8-12)m.

6.3.5 Coral Reef-Community Education in Rotuma by *Monifa Fiu*

Objectives:

- To provide a biological baseline survey of Rotuma's coral reefs using Reef Check methods to assess reef health
- To interpret these survey results for island community purposefully for coral reef education and awareness
- To explore potential marine resource use issues

Rotuma Island

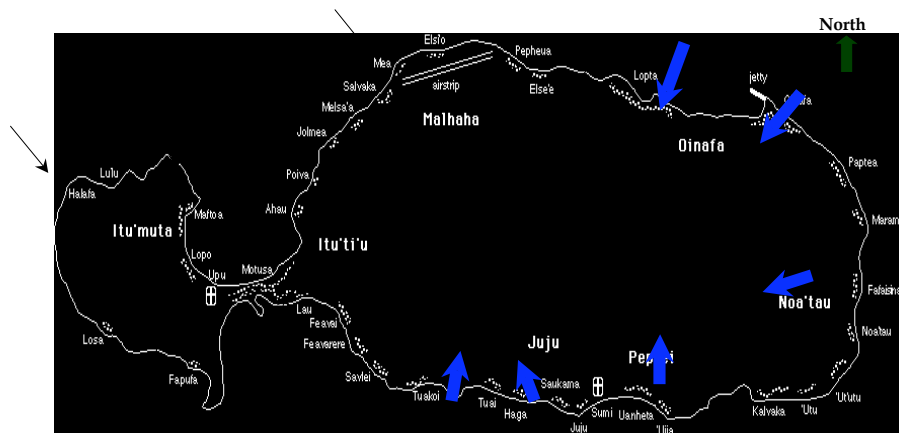


Fig. 3. Rotuma Monitoring Site Locations (6 new sites)

Monitoring Survey Methods

- Annual monitoring: 2003 and 2004
- AIMS substrate & lifeform categories

- Fish list included both the commercial indicator species and smaller fish species

Concerns affecting marine resource use:

- Kama - proliferation of the hard coral species-*Pavona*, which caused the fringing reef area to become shallow. As a result, fishers had to go into deeper water to fish and the reef was not an effective barrier from oceanic waves
- Less smaller size fish
- Irresponsible coastline dumping
- Poison used for fishing
- Coastline erosion
- Perceived climate change impacts-warmer drier weather- changing local seasonal calendar
- A decline in the diversity of invertebrates was noted during survey

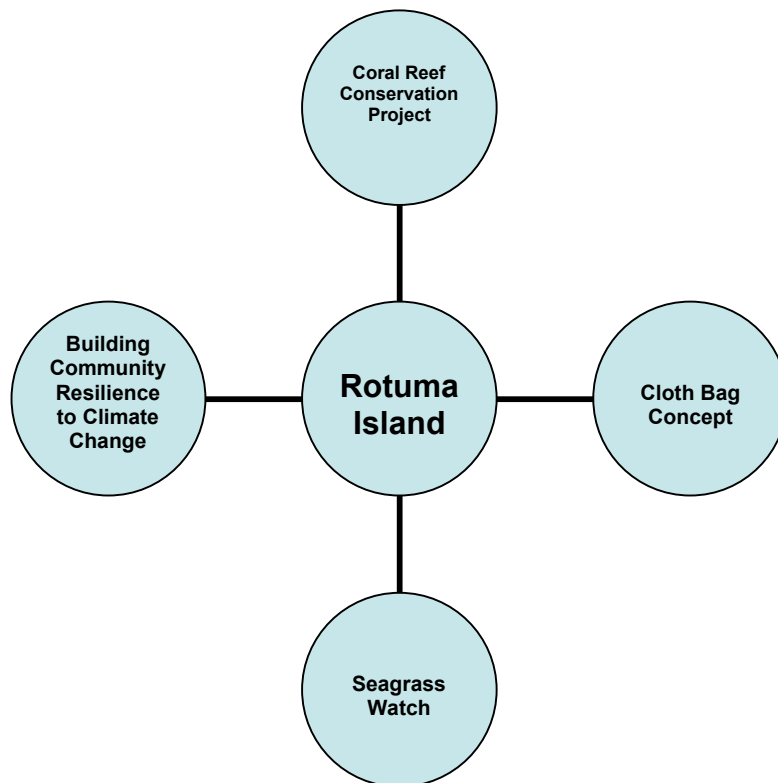


Fig. 4 Rotuma Community Outreach Model

Opportunities:

- GCRMN Network
- FLMMA Network

- Natural resources management approach integrated into Rotuma Council governing policies
- Enhanced capacity of local community members & network

6.0 Panel Discussion on Coral Reef Monitoring Methods

Panelists: Ed Lovell, Helen Sykes, FLMMA- Semisi Meo, and Randy Thaman

Chair: Dave Fisk

- ❖ Summary of Discussion Points
- ❖ Analysis of data should be taken further to take most out of the data. GCRMN publishes status of coral reefs report and this involves the collection of data for various reasons. This may be to satisfy community interests and questions plus provide data to the database for final reporting.
- ❖ A wide variety of methodologies are used to monitor corals. Different groups have different reasons for monitoring and use wide variety of monitoring methods. Reef Check method does not allow much statistical analysis and also isn't detailed (doesn't cover everything). It only gives snapshots in time. Reef Check was the initial method and FLMMA has a suite of methodologies. The methods should be standardized for comparison's sake. This can also allow comparison of results between countries. For example the 2000 bleaching event highlighted the need to have meaningful comparisons There should be a baseline method.
- ❖ There are 410 *qoliqoli*'s in Fiji. FLMMA has transects per habitat types (6). Some categories used by FLMMA for monitoring coral reefs include mangrove, seagrass beds, outer reefs and reef flat. This is a broad approach that covers the main marine ecosystems. These are LIT, belt transect and timed swim for fish and quadrats. The drawback of using Reef Check fish list is that it has a limited number of fish that can be identified.

Discussion, questions and comments

Comment:

1. We should first identify which questions we are trying to address before we formulate methodologies. Danger of this approach is a Shifting baseline.
2. One factor would be to assess coral cover using the PIT method. For instance in the Caribbean, resource management is done in a way that people collect data using a standard method but allows little modifications. The key is to keep modification at a minimum.

3. Manta tow method used primarily as a descriptive tool and not a monitoring tool to assess the type of area you will be surveying. Following this you can use a more specific methodology.
4. Bleaching event –communities want to know what is happening and if this will be a problem % cover of bleaching is only useful to such networks as GCRMN.
5. Reef Check has been utilized well in almost all areas. The method is flexible enough to correct off field.
6. SOPAC is in the process of establishing an ocean data server. We need to discuss how all these different databases can complement each other.

Q: What question should we be asking ourselves from the data gathered?

A: The Fiji government endorsed 30% protection of its marine areas. Basic information, data on resources is vital to prioritize areas for protection. Sites where vital information exists should be mapped out first. There is no centralized database. So the question arises- what is the compatibility between ReefBase and FLMMA database.

6.5 Group Discussion on Monitoring Methods (Strengths, Weaknesses plus Bleaching Monitoring), Community and Tourist Participation and Indicators (Coral Coring, Butterflyfish, Invertebrates, Larval Fish)

Chair: Kenneth MacKay and Monifa Fiu

The participants were asked to break up into three groups and each group was asked to discuss and answer specific questions.

Table 1. Group 1 - Monitoring Methods, Strengths, Weaknesses + Bleaching Monitoring

Appropriate Survey Methods	How to Access Coral Bleaching	Objectives of Survey & Monitoring	How to Communicate Bleaching & Coral Survey Results		
			Community	Public	Network
Most methods are based on Reef Check (RC) but RC isn't detailed	Using LIT and PIT methods to measure coral reef health	To pass on knowledge to community to inform them of what's happening and why	Through extension Officers, schools, Tikina meetings, Health Centers	Mainstream media – newspapers, TV, radio, magazines	Need a centralized network which could be the central contact
An appropriate method should allow for comparison of results between countries	Remote sensing - via plane; gives a broad view of the overall situation but may be costly	To see changes in reef health over time	Radio reports in different languages	Caution! - need quality control of information released	Email link
	Manta tow – low cost technique which covers large area. This technique can be used for site selection of detailed survey	To show the status of the reef at a particular time	Through community workshops using visual aids		Collaboration with SEAWEB
	Video and digital photography, though expensive, is good investment for record keeping	To allow stakeholders to manage resources in a sustainable way & participate in monitoring			Information needs some verification by scientists and follow up actions
		Monitoring provides record of bleaching events			
		Water temperatures are currently being monitored			
		Know which areas are being monitored once areas are mapped			24

Table 2. Group 2 – Community and Tourist Participation

How much practical data from tourism/community	How do we motivate data collection teams	How can we make data collection useful to the collector
Possibly a small tourism sector can be developed directed at specific or detailed monitoring and evaluation e.g. Coral Cay, Greenforce, Earthwatch, International programs.	Good training and role model	Add questions of local relevance to survey methodologies during training programmes (specific to community and tourism users)
	Regular reporting requirement	Day tours from resorts to community conservation projects – presentation of monitoring results at that time – monitoring and evaluation interactive.
	Financial gain (direct participation in monitoring through tourism)	

Table 3. Group 3 Indicators – Coral Coring, Butterfly Fishes, Invertebrates and Larval fish

Characteristics of a good indicator
Has constant density through the year
Easily identified
Popular food item
Invertebrates which are relatively immobile) are better than fish, which are mobile
Price of the fish and historical price (demand and supply) eg. Niue invert.
High school children-surveys (Eg. Samoa FAO Project)
Fisher surveys – different products, different fishers
Market surveys – biological & socio-economic

6.6 Key Discussion Points from Day One *by Ed Lovell*

- The sort of information we want will end up as a report which is possible only after a program is established put together a realistic (funding wise) program to bring all partners together
- A simple standard method should be used by all for monitoring so that it is user friendly, comparable, and results are easy to feed into database
- After this workshop individuals should continue with their monitoring and surveying and link up their data with others. A central coordinator is required to collate all data and write the report.
- We need a database coordinator who collects all data from the different monitors and surveyors
- Need more replication therefore need to purchase more loggers. Some resorts such as Hideaway are willing to invest into loggers. Therefore a resort program should be established where resort staff assist in deploying and retrieving of loggers
- Temperature is only one of the parameters that can be measured to monitor bleaching
- SOPAC may be able to assist in monitoring bleaching although they do not have any data recording device for Fiji
- All data should be organized and analyzed with an objective in mind
- We need to ensure that the data that is collected will be useful to the public and community. Issues related to Intellectual property rights such as in the LMMA Database needs to be addressed

6.7 Ensuring Data Quality *by Zaidy Khan*

Coral Reef Restoration Program

- Restoration of fisheries resources - is more related to food security and community prosperity than to biodiversity-driven approach
- To determine whether Coral reef restoration techniques and efforts can be used as coastal management tool for local communities

Restoration technique involves coral transplanting

Monitoring techniques for Coral reef Restoration:

- Line intercept – substrate in control and restoration plots
- Fish surveys – belt transect
- Invertebrate surveys – belt transect
- Attachment and mortality survey

Proposed Temperature logger project

- Aim: to provide fine scale and accurate temperature data from different sites along Fiji islands
 - Which can correlated with temperature –related problems such as coral bleaching
 - Used for monitoring global trends
 - Used by other researchers and managers for a wide range of other projects.
 - Data collection
 - Data analysis
 - Data transformation on the GIS map
 - Data quality assurance

Current Status of the program

- Temperature logger – most sites along Fiji islands have been covered.- focus is Yasawa groups.
- Downloading of last year recordings
- Past year data records exist with Ed for some sites.
- Working toward a database
- Integrating logger program with GCRMN database.

Discussion, questions and comments

Comments:

- (i) How does remote sensing affect you on the ground? Satellite recordings are at macro-scales. This method picks up the reflected infrared temperature i.e. just gives the surface temperature. There are anomalies in hot spots and this may be because of the limitations in remote sensing. Often there is a lot of variation in bleaching in one area.
- (ii) It was always GCRMN's intention to have temperature loggers in specific areas but the depths at which the loggers should be placed was never considered. When a logger is removed it should be replaced with another. If this is not done there will be a gap in data.

Alternatively, more than one temperature logger should be deployed at different depths so that there is one logger in the water at all times. This is to ensure a complete data set.

- (iii) Temperature loggers are more reliable to record accurate data in comparison to a swimming pool thermometer. This is because all temperature loggers have a standard reading scale whereas the scale of different thermometers varies.
- (iv) Temperature related bleaching requires accurate data. This can only be obtained from temperature loggers. Using swimming pool thermometer, immediate information on temperature at different sites can be obtained but this data shouldn't be used for analysis purposes.
- (v) Temperatures recorded from dive computers aren't very accurate because from her experience different dive computers give varying readings during the same dive. They can vary as much as 3 degrees Celsius. Dive computers aren't necessarily standardized as they give you approximate temperature.
- (vi) After analyzing data, a feedback should be given to communities.

Q: Does FLMMA record temperature during surveys?

A: It is optional.

Q: How is temperature recorded?

A: Temperature data is recorded by the villagers who use their dive computers.

These are then fed into the FLMMA database.

6.8 Panel Discussion on ReefBase, Data Input, Storage, Analysis, Presentation and Reporting

Panelists: Kenneth MacKay, Gilianne Brodie, Dave Fisk, Pene Conway

Chair: Leon Zann

6.8.1 CRISP Component 2D ReefBase Pacific by Kenneth MacKay

- Reefbase is a global source of Information for coral reefs. It has a large and useful bibliography. GCRMN database will be a portal within ReefBase. It is important that grey literature gets captured. This can be done by PIMRIS as they already exist.
- Project partners:

- WorldFish Center (Malaysia)
 - Project Leader: Marco Noordeloos
 - WorldFish Center (New Caledonia)
 - Regional Coordinator (currently being advertised)
 - Project Assistant (currently being advertised)
 - IMR (Fiji)
Ken MacKay/Shital Swarup
 - CRIOBE (French Polynesia)
René Galzin/ Caroline Viex
 - SPREP (Samoa)
Dominique Benzaken
Research Assistant (to be advertised)
- Approach
 - Active, collaborative, region-wide network of coral reef professionals
 - Unprecedented knowledge-base on coral reef resources and their monitoring, conservation and management
 - Create an effective, easily accessible information system for managers, researchers, and reef users
- Outputs
 - Collaborating network of coral reef professionals sharing data and information in the Pacific region
 - Enhanced capacity in the region in information management relevant to coral reefs
 - A series of credible data and information summaries on key coral reef topics

6.8.2 GIS and Remote Sensing for Coral Reef Monitoring *by Conway Pene*

- The use of GIS and RS tools for coral reef monitoring have an established history in the field.
 - GIS is usually used to provide a spatially-reference data management tool, to support the collection and management of geographically located data.
 - Remote sensing provides an alternative source of data, based on interpretation and feature identification from satellite and other aerial images.

- While much of the use of GIS in this field tends to be in the form of supporting field data collection and management, there is also a substantial and growing pool of spatial data collected and managed as part of the on-going operations of a variety of government departments, research organizations and NGOs. In Fiji, reef boundaries and other marine features from the 1:50,000 scale topographic map series is available in digital form, together with traditional fishing boundaries.
- The major challenge for users of GIS and RS in this field in the region is to enhance and extend the availability of spatial data.
- The real power of GIS comes from using the technology to combine multiple data sets to enhance analysis and support decision making. At present, much valuable work is being carried out to build comprehensive data sets, but more needs to be done to make these data sets more widely available and useable to interested community.
- A variety of mechanisms exist to facilitate this process of disseminating and discovering data. Technical solutions such as web map services and on-line spatial data catalogues allow data to be served and searched over computer networks.
- The limited digital connectivity in the Pacific region puts certain limitations on the effectiveness of these technical solutions in this environment, but there are alternative, manual dissemination and discovery mechanisms.
- The Fiji Land Information System provides an over the counter service for spatial data, and is being developed as a central distribution hub for Fiji GIS data.

Discussion, questions and comments

Comments:

- (i) GIS allows capture of digital data. It is an extremely useful tool that will allow ReefBase data to be geo-referenced. It is recommended to get consultation from GIS experts before going out to the sites to carry out surveys.
- (ii) Remote sensing image provider is SOPAC.
- (iii) Place annually collected data from a database onto a site map which can be used by tourists to reference temperature data.

- (i) Currently MSP is collaborating with geography department in mapping inshore resources so that the Fisheries and Agricultural Department can create a database.
- (ii) Funding is available to train Fisheries staff in GIS via M. Sc. Projects.

6.8.3 The Role of PACINET by Gilianne Brodie

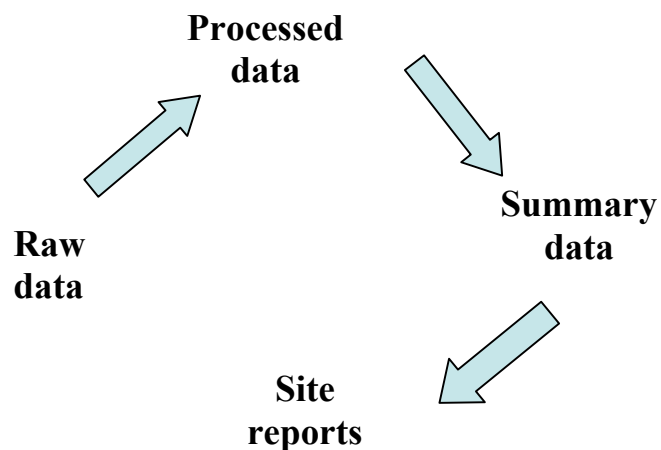
Dr Gilianne Brodie, the Program Coordinator for PACINET explained the role PACINET and how it could fit into the existing programs.

- PACINET is the subregion of the “BioNET-International” global network for taxonomy, a non profit initiative to promote taxonomy “in the biodiversity rich but economically poorer countries of the world”
- The objective of “BioNET” is to raise awareness of the relevance of taxonomy to tackling conservation and sustainable development. PACINET works within this framework but focuses on Pacific Island priorities
- PACINET was formed in March 2000 by a formal agreement among 21 Pacific Island member countries and operates like other BioNET-International sub-regions (eg. ASEANET and SACNET) in having a steering committee made up of Locally Organized and Operated Partnerships (LOOP)
- The Secretariat of the Pacific Community (SPC) in partnership with USP, SPREP and the Pacific Biodiversity Information Forum (PBIF) are the core supporting PACINET LOOP institutions
- The program operates under the CBD and will contribute to achievement of the objectives of the Global Biodiversity Information Forum (PBIF) and the Global Taxonomic Initiative (GTI)
- Overall, PACINET aims to further develop the region’s capability to name and understand the roles and relationships of the organisms that constitute its biodiversity
- Their vision is to facilitate and strengthen links between modern (scientific) taxonomy and local (vernacular or traditional) taxonomy as a foundation for improving the conservation, sustainable use and equitable sharing of eth benefits of biodiversity in the Pacific region
- Problems exist for environmental scientist due to the lack of skills in identifying plants and animals.

6.8.4 The LMMA Database *by Ron Vave*

- Objective: To share information on the LMMA database
- Some key questions:
 - What is the optimum MPA size?
 - What is the optimum time for MPA closure for sufficient recovery (could be indicator specific)?
 - What is the effect of rotational harvesting?
 - Effects on LMMA success?
- Main Functions of database
 - Store data & information
 - Production of site reports
 - Enable data sharing and collation > Lessons learning at country and network level.

Fig. 5. FLAMMA Data Flow Diagram



6.8.5 The Importance of Data Presentation *by Dave Fisk*

- It is important to acknowledge authors in reports while reporting
- Terminology is critical when addressing a target audience
- Visual presentation such as graphs are good to summarize the data. Graphical representation and use of colorful maps are most useful in disseminating information

- For maps it is important to use local names for places/locations and species names wherever possible
- Fisheries department should be kept in the loop by all parties about current and proposed monitoring activities

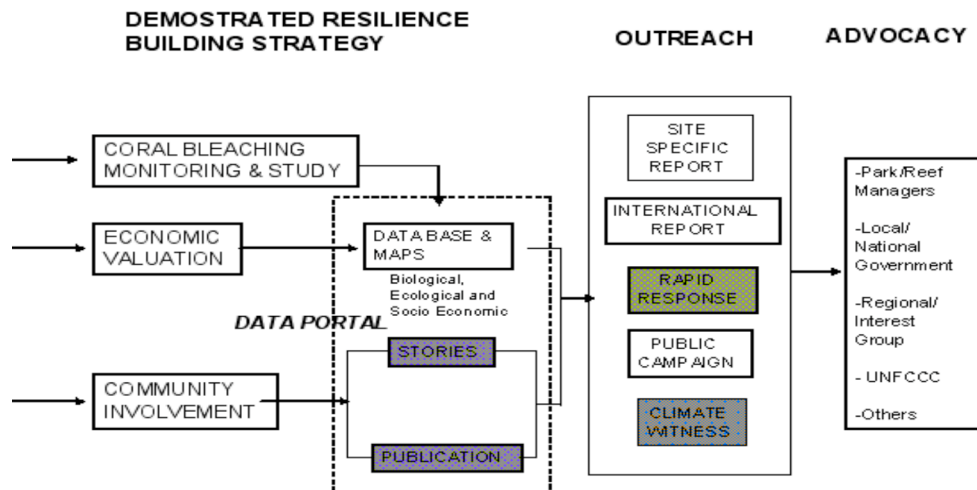
7.0 Proceedings of WWF Coral Bleaching Rapid Response Communications Meeting

7.1 Friends of the Reef by Monifa Fiu

Objectives:

- Increase the knowledge & identify strategies on how to maintain & restore resistance & resilience of reefs to the effects of coral bleaching (in AP region)
- Develop impact stories, reporting on extent & severity of ecological impact resulting from coral bleaching

Fig. 6. Management Strategy for Maintenance of Reef Resistance and Resilience to Bleaching



Monifa Fiu (WWF), Elizabeth Neeley (SEAWEB), Ashwini Prabha (WWF) gave a group presentation on their proposed Rapid Response Mechanism. They highlighted the following points:

- One of the objectives of this meeting – is to look at how to disseminate information from our projects to a wider audience
- WWF field personnel carry out community level work and biological Monitoring on ground. WWF South Pacific Programme Communications Coordinator takes information from the field, and disseminates this both regionally, and internationally (select target group) as well as media contacts. SEAWEB, a recent partner for WWF, assists in feeding information and results to the wider media networks. They also translate the information into more media friendly form
- .Science objectives:
 - Increase knowledge and identify strategies
 - Develop impact stories, reporting on extent and severity
- The first phase is to demonstrate resilience building strategies, followed by outreach programs for local communities. The second phase aims to share this information to a wider audience
- Share the observations of locals with the international community. This approach is used by other sectors eg. forestry (carving of tanoa), water issues, climate impacts
- With communications, we are now moving into advocacy
- It is necessary to discuss communication tools that we can use to promote our work
- Climate Witness is used to capture real life impact stories. Lessons learned from the experiences of the climate witness often captures the types of information required for donors, media target audiences etc. as it is based on actual experiences in coastal communities
- Different levels of engagement at each site – but we also need to formalize a reporting system, and to develop effective communications systems, to share not only data, but also information, to share our data and results with target groups
- Rapid Response – if anything happens, in terms of an environmental crisis, need to react quickly and get this information to the media in a timely manner e.g. mass coral bleaching situation
- The questions which arise are :

- How can a system be established to coordinate this large network?
 - What system can be in place to inform all stakeholders in a timely manner without causing a panic?
 - How to ensure that the information is credible
- In a recent seminar for journalists it was pointed out that environmental news has to be reported in a interesting manner, while not using too many scientific jargon to make it “reader friendly”.
 - Communication is a piece of science that is often only thrown on in the end.
 - One of the major hurdles is finding ways of presenting scientific information that is clear and appealing.
 - Educational work is not sufficient alone. SEAWEB focuses on changing behaviors.
 - SEAWEB can help frame the message
 - What exactly is it that we want people to do when they find out about coral bleaching. Reporting doesn't necessarily have to be negative.
 - Be “smart” about what it is that we want people to do with the information.
 - Need to identify who the target audience is.
 - The main audience for coral bleaching would be rural communities, general public, mainstream media, and scientific experts within the network. A different strategy may be needed for each of these audiences. Each group requires different messages, information and outputs.

7.2 Group Discussion on Strengthening the Rapid Response Communications Network

- The participants were divided into three groups and were asked to discuss ways in which each group could communicate critical information in a quick and effective manner
- WWF presented the model below as a proposed channel of communication:

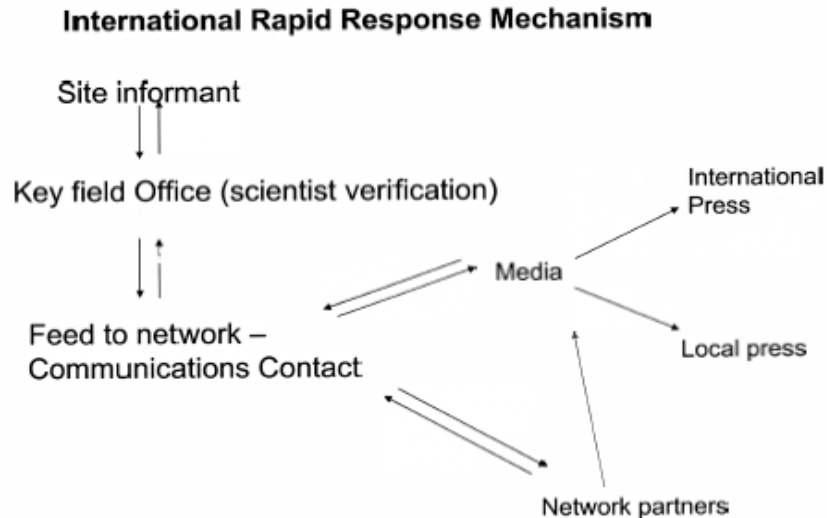


Fig. 7. International Rapid Response Mechanism

7.2.1 Local Communities

- Spread information through local government facilities such as health centres, extension officers, provincial offices, schools, tikina meetings
- Identify liason officers: Respected community members who can work with local communities and key scientific officers
- Radio reports – for areas without newspaper or electricity (remote locations)
- Visual Aid – such as posters (lots of photos less text), flyers. These should be placed in community halls, resorts, government offices/centers for maximum dissemination of information. These posters should be in local languages/dialects to be effective
- Key Community Members (well respected within the community such as chiefs and elders) – speaking with people across the community. ‘coconut wireless’
- Drama groups that involves youth top create awareness within younger generations
- Schools: Direct education through education to the whole community

7.2.2 GCRMN Rapid Response for Fiji

A. National Contact Point (NCP coordinator)



Science support for data verification (e.g. SOPAC, WWF, IMR-MSP)

B. GCRMN – Links with E-mails e.g. list server

C. USP – They can have links of e-mails, phone and fax with collaborations with SEAWEB.

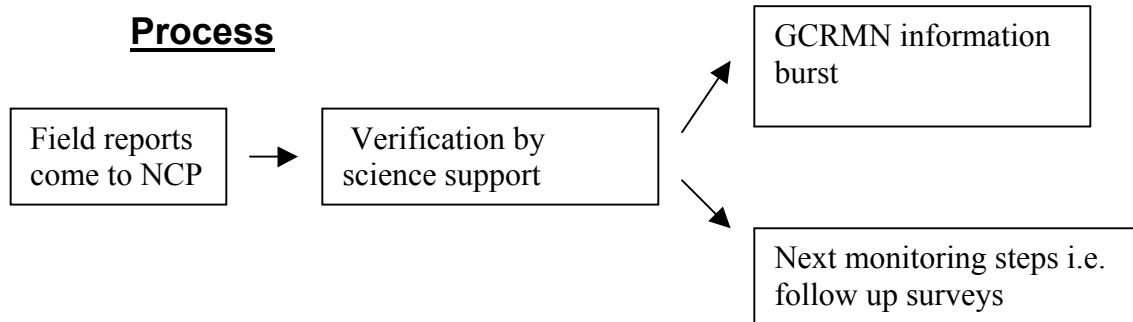


Fig. 8. Information Flow for Rapid Response

- Verification is an important role – need to ensure that we have knowledgeable people in the verification role first.

7.2.3 General Public/Media

- Who needs to be involved in communicating this? Whom should we report to? The international community or locally?
 - Mainstream media, dive magazines, newspapers, radio, television, student journalists (the lonely planet has information on bleaching and is a good example of how this can be communicated- need general awareness).
 - Move away from focus on the crisis to what can I do? (ACTION).
 - There is a need for filters between the links “Feed to network communications contact “ and “Network partners” and “media”.

- Important to identify purpose of communication – clear output
- Ensure there is a “what you can do”/ “advice element” with every report that goes out. There should be some sort of action plan.
- Note stages of needing to know information, for example: early signs of bleaching need to be communicated to the aquarium traders as this would have an impact on their industry. However, the general public may not need to be warned, i.e. prioritize who should be informed first. There may be some conflicts of interest as some involved may be affected directly by negative reporting. In addition, there may be some groups who would want to be the “first ones to report” a crisis event.
- Widespread dissemination of the wrong kind of message can be harmful socio-economically.
- Tourism sector
 - Should be supplies interpretive materials. This can be general information and not necessarily time specific.
 - Support for research in Fiji can be initiated for e.g. incorporate into diving fee.
- GCRMN and key organizations including the Government would be included as “Network partner”.
- Need for centralized network - GCRMN coordinator could be the central contact person so that there is some control mechanism in place.
- Annual and crisis reporting should exist.
- Need to control quality of information/data into database.
- Apart from releasing information on crisis situations success stories should also be reported. Also information on other threats like sedimentation etc.
- Press statements - be wary as to what is released to local media as this can be picked up by international press and exaggerated. This could have negative impacts on the tourism industry.

7.3 Group Discussion on Needs and the Way Forward

The participants were asked to divide into three groups and discuss questions relating to what each organization could contribute to GCRMN, what the network needed to operate and the way forward. The discussion points from the three groups have been pooled and entered into a table.

Table 4. Group Discussion Points on the Way Forward

Expectation for Global Coral Reef Monitoring Network (GCRMN)	Individual or organizational contribution	Needs from network	Needs for network to function?	Way forward/Next steps
To provide information on monitoring and disturbance/crisis that occurring on reefs around the country+region	FLMMA - training videos on monitoring, learning framework, data from project sites, data analysis assistance	Support to integrate GCRMN priorities into FLMMA & FSPI community monitoring	Independent National coordinator (not assoc. with GCRMN partners)	Need for clearly stated goals and objectives
Periodic reporting	FSPI - data "3 countries", capacity building materials	Training in GCRMN protocol	Standardized reporting - need for a template	Standardized methods for basic data collection and reporting to database
	Peace Corp - labour, data from new sites	Equipment - GIS software and computer -Temperature loggers: 2 x permanent sites (deep and shallow water) - Logger down loading program – 1 per project	Clearly stated goals for network	Processes and protocol for reporting from the database
Responsibility towards capacity building on monitoring priorities	WCS - data, assistance with data analysis & tools for capacity building	Training - Finfish identification training - Database use - Journalism/ press release writing	Clear roles and responsibilities for National Coordinator	Commitments from organizations - data and personnel
Information on who/what/where reef research in the region	SEAWEB could provide media/ press release writing, communications training and assist with translation of science _ popular news and filtration of press releases/ quality	Suggested methods -Network contribution asked to utilize a standard descriptive method as a baseline Statement of minimum standard monitoring	Sharing of equipments: (1) temperature loggers, (2) GPS, (3) Monitoring gears (masks, snorkels, tapes, SCUBA tanks)	Equipments (GPS, temp loggers)

Goals/Expectation for Global Coral Reef Monitoring Network (GCRMN)	Individual or organizational contribution	Needs from network	Needs for network to function?	Way forward/Next steps
	Awareness materials in local languages, possible GIS/data analysis in future from Department of Fisheries	Data storage - Fulltime data management, storage and GCRMN data needed - Address data security – log in code? Pin? Who can access this and use it?	Data to a minimum standard - Central Coordinator _ field survey manager ↳ Liason/media - Mission Statement - what we are about, how - Strategic Plan - we intend to go about it	Define tasks, mission, science etc. Define partner requirements, roles etc. Define contributions. Value of networks.
	Taxonomy, identification training and quality control of data from USP, Reef Support, other fisheries consultants	Feedback - Annual reports - Regular updates on webpage	Identify organizations or groups who are involved in coral reef monitoring work (CCC, Greenforce, Peace Corp)	
	Monitoring Data from WWF, Reef Support, Fisheries Dept., Peace Corps, Resort Network, MAC	- Direct communication with Partners in Rapid Response - Record of all enquires - E- newsletter (not printed)	Cohesive proposal writing – bring in \$\$\$ Communications/ travel budget for coordinator	
	MSP- transect work (training, incorporate into education system) Geography Department – GIS mapping/training and database assistance Student research		All network partners must be committed to active participation	

Goals/Expectation for Global Coral Reef Monitoring Network (GCRMN)	Individual or organizational contribution	Needs from network	Needs for network to function?	Way forward/Next steps
	FLMMA-Effective community liaison Information bridge Analytical services (water quality)	Directions/prioritization Status report- current and previous Monitoring – framework/protocol -Strategy/inventory	Money Commitment/regular contact – meetings	
	IMR-Coordination- regional - funding/databasing Newsletter/publications (campus/media), website	Identified training needs Story ideas (SEAWEB) and spokesperson	Accountable proactive leader role/driver * Team – “close follow-up”	
	MAC- Aquarium trade survey summary (Region) Network (MAC) contacts	Open communication and commitment by network members	Rotational volunteer coordinator (committee) for Fiji network Small coordinating committee	
	SOPAC- monitoring work (Robert Smith) (region) (EDF) - Ocean database and ICT staff	Aquarium resource assessments Feedback to ALL stakeholders	Paid full-time coordinator part-time	
	SOPAC: PI-GOOS Programme - Networks and media (ocean website) regional - GIS/Remote sensing information and support/products	Data storage/processing (“analysis”)/ synthesis, dissemination		

8.0 Conclusion

During the two-day meeting, the highlights of discussions were as follows:

- Current methods and approaches to biological monitoring in Fiji were, in most cases, based on the Reef Check Methodology and the data collected was intended for mainly coastal communities and hotel operators
- Reef Check was not detailed enough and covered a limited number of fish species. However, it had been utilized well in most areas and was flexible enough to correct off-field
- Ideally, a standard method which allowed comparison of data locally and regionally was needed and could be used by all for monitoring
- A database coordinator was needed to collect all data from the different monitors and surveyors. Currently, each organization carried out all the steps themselves from data collection, data analysis and dissemination of information to the local community and others. There was no collaboration amongst stakeholders with regards to information flow
- Considering all the above points, it was clear that to enable the network to work effectively, there was a need for a clear objectives, strategic work plan, equipment, committed partners, personnel and funding

9.0 Recommendation

Based on the two-day discussion and presentations, an organizational structure was proposed outlining the ideal situation for the GCRMN to operate in order to strengthen and enhance networking amongst partners collecting coral reef data and formalizing the network amongst all relevant stakeholders in Fiji.

It was envisaged that through this network, communication and information dissemination would be enhanced to allow for improvement in the management and sustainable conservation of coral reefs in Fiji.

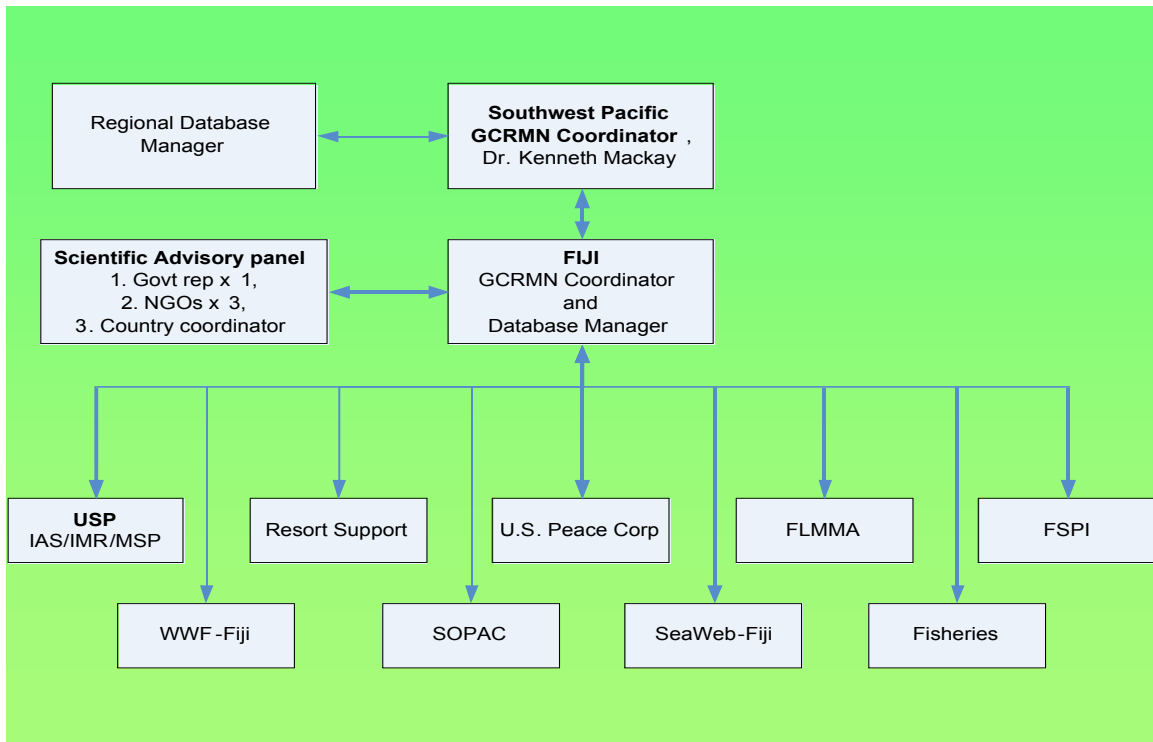


Fig. 9. Proposed GCRMN Organization Structure

Annex 1 : Workshop Schedule

GCRMN-Fiji Review of Coral Reef Monitoring and Planning for Future Actions.

6-7th March 2006

University of the South Pacific, PIMD Senate Room

Time	AGENDA	Facilitator	Chair
Day 1 6th March		Facilitator	Chair
8:30 am 9:00-9:30am	Registration of participants. Opening ceremony - Prayer - Opening or workshop by the Dean of Faculty of Islands and Oceans, USP - Opening remarks by Professor René Galzin	Kenneth Mackay	
9.30-10:00am	MORNING TEA		
10:00-11:00am	Welcome and Roundtable introductions by participants Please note that participants discuss also: <ul style="list-style-type: none"> • Roles in represented organizations • Relevance of the work towards the coral reef monitoring;& role in the network • Expectations of this planning meeting 	Kenneth Mackay, Monifa Fiu	
11:00-11:30am	GCRMN Overview Presentation		Milika Sobey
11:30-12:00pm	Overview Coral Reef Biological monitoring in Fiji (Ed Lovell and Helen Sykes)		Milika Sobey
12:00-1:15pm	Fiji Country Examples – reasons for monitoring (15mins per presentation) P1: Sustainable aquarium fishery (Cheri Whippy-Morris) P2: Measuring effectiveness of MPAs I (Alifereti Tawake-FLMMA) P3: Measuring effectiveness of MPAs II (Victor Bonito)		Sarah Grimes
1:15-2:15pm	LUNCH		
2:00-2:15pm	Fiji Country Examples (continued) P4: Kubulau Coral Bleaching Experiemnt (Thomas Tui) P5: Community Education (Monifa Fiu)		
2:15- 3:15	Panel Discussion Coral Reef Monitoring methods (Ed Lovell, Helen Sykes, FLMMA- Semisi Meo, Randy Thaman)	Dave Fisk	

3:15-4:30pm	Break out in groups for discussion. Each group will complete a map of reef survey sites and receive questionnaire on coral reef monitoring to be completed as meeting progresses. G1: Monitoring methods, strengths, weaknesses + Bleaching monitoring	Ed Lovell	
	G2: Community and tourist participation	Monifa Fiu	
	G3: Potential Indicators a. Coral coring : Leon Zann b. Butterfly fishes: Kenneth Mackay c. Invertebrates: Victor Bonito d. Larval Fish: Julian Grignon	Kenneth MacKay	
4:30-5:00	Report back group discussion	Monifa Fiu, Kenneth Mackay	
5:30- 8:00 pm	Reception – Seafood Village, MSP (Drinks, Yaqona, BBQ)		
Day 2 7th Marh			
9:00-9:30am	RECAP Ed Lovell		
9:30-10:00pm	Ensuring Data Quality-- Zaidy Khan		
10:00-10:15am	MORNING TEA	Alifereti Tawake	
10:15- 11:15	Panel Discussion ReefBase, Data input, storage, analysis, presentation and reporting (Kenneth MacKay, Gilianne Brodie, Ron Vave. Dave Fisk, Pene Conway)		Leon Zann
11:15-1:00pm	Rapid Response for coral bleaching-strengthening communications within the network and information dissemination to the wider public Monifa Fiu, Ashwini Prabha, Elizabeth Neeley		
1.00-2.00pm	LUNCH	Professor Leon Zann	
2:00-3:00pm	Communications and strengthening networking Monifa Fiu, Kenneth Mackay		
4:00-4:45pm	Group discussion: Needs—training, equipment, network, & recommendations		
4:45--5:00	Closing Remarks Professor Zann		
6pm	Closing Reception-Dinner WWF – Fiji Programme Office		

Annex 2: Participant List

Organization	Representative	E-mail
International & Regional Agencies		
USP	Leon Zann	zann_l@usp.ac.fj
	Ed Lovell	lovell_e@usp.ac.fj
	Kenneth Mackay	mackay_k@usp.ac.fj
	Randy Thaman	thaman_r@usp.ac.fj
	Johnson Seeto	seeto_j@usp.ac.fj
	Craig Morley	morley_c@usp.ac.fj
	Milika Naqasima-Sobey	milika.naqasimasobey@usp.ac.fj
	Dilpreet Kaur	kaur_d@usp.ac.fj
	Shital Swarup	swarup_s@usp.ac.fj
	Fiu Manueli	manueli_f@usp.ac.fj
	Patricia Kailola	pkailola@ozemail.com.au
	Conway Pene	pene_c@usp.ac.fj
	Julian Grignon	julien.grignon@univ-perp.fr
	Teri Tuxson	ttuxson@yahoo.com
	Ron Simpson	ronsimp@yahoo.com
	Arpana Pratap	pratap_arpana@yahoo.com
	Jeanne de Matières	jeannedm@hotmail.com
	Zaidy Khan	zaidy.khan@fspj.org.fj
	Sophia Shah	s95007888@student.usp.ac.fj
PACINET	Gilianne Brodie	brodie_q@usp.ac.fj
CRISP	René Galzin	galzin@univ-perp.fr
Centre of Maritime and Oceanic Law, University of Nantes, France	Karolina Zakovska	karolina.zakovska@email.cz
	Bleuenn Guilloux	bleuenn_guilloux@hotmail.com
SOPAC	Sarah Grimes	sarahg@sopac.org
Government of Fiji		
DOF	Priti Singh	psingh004@fisheries.gov.fj
NGOs		
WWF Fiji Programme	Monifa Fiu	mfiu@wwfpacific.org.fj
	Jyotishma Rajan	inaicker@wwfpacific.org.fj
	Ashwini Prabha	aprabha@wwfpacific.org.fj

	Diane McFadzien	dmcfadzien@wwfpacific.org.fj
WWF South Pacific Programme	Louise Heaps	lheaps@wwfpacific.org.fj
FLMMA	Alifereti Tawake	tawake_a@usp.ac.fj
	Ron Vave	ron@Immanetwork.org
	Semisi Meo	meo_s@usp.ac.fj
WCS	Naushad Yakub	shada_yaks@yahoo.com
	Thomas Tui	tomtui_05@yahoo.com.au
Consultant	Dave Fisk	davefisk@gmail.com
MAC	Cherie Whippy-Morris	cheriemorris@connect.com.fj
Resort Support	Helen Sykes	resortsupport@connect.com.fj
	Chinnamma Reddy	reddy_chanda@yahoo.com
	Brian Kelly	bhkelly8@yahoo.com
Peace Corps	Katie Moses	vulaqari@yahoo.com
Jean-Michelle Cousteau Resort	Johnny Singh	jsingh@coral.org
Marine Biologist (Mike's Divers)	Victor Bonito	staghorncoral@hotmail.com
Journalists		
Seaweb	Amelia Makutu	fleur@connect.com.fj
	Elizabeth Neeley	eneeley@seaweb.org

