

SPC ACTIVITIES

REEF FISHERIES OBSERVATORY

Staff of the coastal component of the EU-funded Pacific Regional Oceanic and Coastal Fisheries Development Programme (PROCFish/C) and the Coastal Fisheries Development Programme (CoFish) concluded fieldwork in the Cook Islands. The annual PROCFish/C and CoFish Advisory Committee meeting was held in Noumea on 28 October 2007. The first of several scheduled socioeconomic workshops was also held. In addition, the Live Reef Fisheries Specialist was involved in several projects during the second half of 2007.

Fieldwork and surveys in the Cook Islands

Finfish, invertebrate and socioeconomic surveys were conducted in two locations in the Cook Islands (Mangaia and Rarotonga) in October 2007 (see Fig. 1). The PROCFish/C and CoFish team comprised Emmanuel Tardy and Ferral Lasi (invertebrates), Ribanataake Awira and Pierre Boblin (finfish), and Mecki Kronen (socioeconomics). The PROCFish/C and CoFish team acknowledges and thanks the following people who assisted and/or worked with the team at one or both locations: Ian Bertram, Secretary for Fisheries; Koroa Raumea, Head of Coastal Fisheries Section; counterparts from the Cook Islands Ministry of Marine Resources, Ngatamaroa Makikiriti and Dorothy Solomona; boat operators and guides at both locations; Jo Akroyd, Cook Islands Marine Resource Institutional Strengthening Project; the Island Secretary and Mayor of Mangaia; and the elders, community members, fishers and people from the two sites surveyed.

MANGAIA

Mangaia is 194 km southeast of Rarotonga and is the southernmost of the Cook Islands, situated on the border with French Polynesia. After Rarotonga, Mangaia is the second largest island, at nearly 52 km² in area. Surrounding Mangaia is an ancient raised coral reef that rises steeply from the shore before dropping sharply to the island's interior. Because it is a raised limestone island, Mangaia has only one reef type, the outer fringing reef, which surrounds the island. Mangaia has three main villages: Ivurua on the east-

ern side, Tamarua on the southern side and Oneroa on the north-western side of the island. The island administration centre is based in Oneroa where the main hospital and port are located.

On Mangaia, finfish fieldwork concentrated on the northern, western and southern parts of the island. The team was unable to work on the eastern (windward) side of the island due to strong winds and rough seas, and because of the small size of the workboat, which was unsafe to use in these weather conditions. The Secretary of Marine Resources asked the survey team to include the Mangaia port area as one of the survey stations in order to provide an ecological profile of the site for their harbour expansion project.

The finfish survey covered the outer fringing reef and included

18 transect dive stations. Coral coverage was very poor on the outer reef, and the number of sea urchins on the western side of the island was very high, exposing clean coral slabs to heavy grazing. The benthic profile of all dive stations on the western side of the island showed that the level of encrusting algae and turf was very low and the rock slabs were just bare rocks. Coral coverage ranged from 2–5% on the western side, with encrusting corals being the predominant type at most stations. Coral coverage slowly increased to 10–20% from the southern to the eastern part of the island.

The same trend was also observed with fish density, which was very low on the western side and gradually increased when moving around the southern point towards the eastern side of the island. This

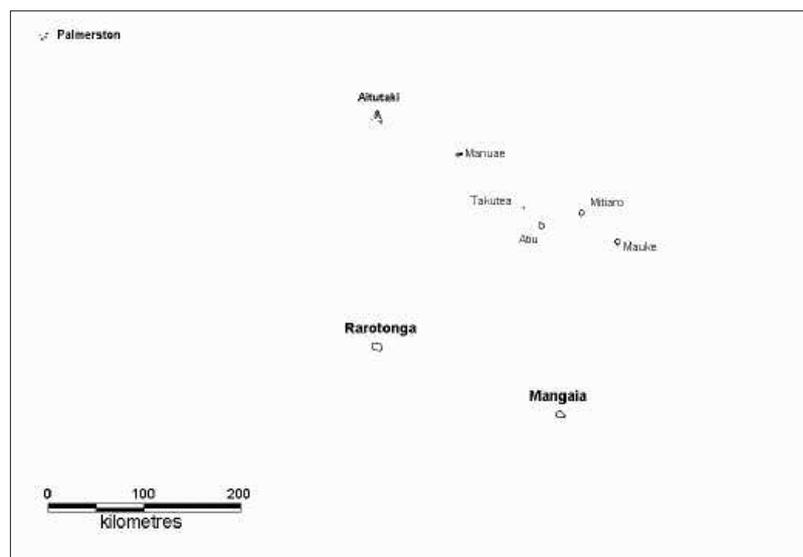


Figure 1: The two survey locations, Mangaia and Rarotonga in the southern Cook Islands.

might be attributed to the fact that the western side of the island is more exposed to heavy fishing than the eastern side. As with fish density, the size ratio was very low with respect to sought-after fish species such as snappers, groupers and emperors. However, fish species such as some acanthurids and scarids (e.g. *Ctenochaetus striatus*, *C. hawaiiensis* and *Scarus forsteri*) were quite large compared with other sites surveyed in the region. The most common fish species observed at all stations were from the surgeonfish and parrotfish families, with *Acanthurus leucopareus* being the dominant fish species encountered. Overall, fish density as well as diversity was poor, especially in areas that were more accessible to spearfishing. This was noted by the fleeing behaviour of parrotfish encountered on the western side of the island.

Socioeconomic surveys were conducted with 39 households on Mangaia. Initial results indicate that the lifestyle of Mangaia's population is very much determined by the island's size and geographical isolation, small population, and limited options for generating income. Thus, it is no surprise that 92% of all households surveyed are involved in some kind of fishing activity. On average, each household has about two members who fish or collect marine resources on a regular basis. Mangaia has a very small lagoon and an accessible outer reef system that directly leads into the open ocean. Mangaia's reef resources are not affected by ciguatera.

Although the island has some agricultural potential, seafood consumption on Mangaia is rela-

tively high with an annual average per capita consumption of 65.7 kg of fresh fish and 7.7 kg of invertebrates. The island's isolation and the high transportation and marketing cost make it impossible to export agricultural or fisheries products to Rarotonga. Past agricultural projects, including pine forestation, pineapple plantations and ostrich farming have all failed, mainly due to transport costs. Primary production on the island is, to a great extent, subsistence oriented and the exchange among community members and families is often non-monetary. Thus, government jobs (Fig. 2) and a limited number of tourist activities are the major income sources on the island.

On Mangaia, fishing activities are limited to the island's own demand, as there is no commercial export from the island to Rarotonga or any other market place. Although most fishing activities are subsistence oriented, some fish and invertebrates are sold locally. The limited involvement in commercial fishing is also indicated in the low average annual catch per fisher of 120–130 kg. Based on fisheries survey respondents and households interviews, there may be 45 fishers who target the very small lagoon habitat, and 162 fishers fishing at the outer reef from the island's 180 households. Gillnets, spears, bamboo rods (Fig. 3) and cast rods, handlines and castnets all are used.

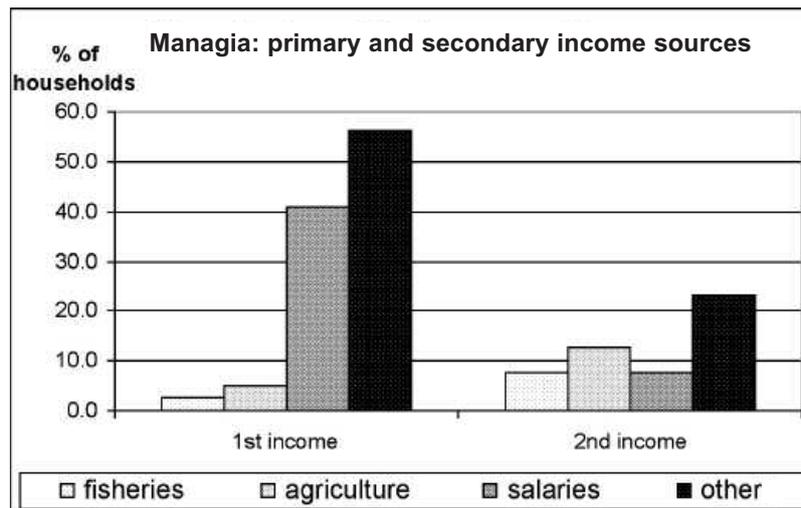


Figure 2 (top): Primary and secondary income sources (%) for households on Mangaia.

Figure 3 (bottom): Young man fishing with pole and line inside reef pool.

Tiotio (*Kyphosus cinerascens*) is the most targeted species in the lagoon area, while tiotio, paoro (*Thalassoma* spp.), marao (*Myripristis* spp.), karakarao (*Epinephelus merra*) and patuki (*Epinephelus hexagonatus*) are major target species of outer reef fishers. It should be noted that the subsistence catch of reef and lagoon fish on Mangaia does not meet the island's subsistence demand. The balance is met by the catch of a few pelagic fishers.

About 25 fishers exclusively target lobsters, and almost 200

fishers collect invertebrates on the island's reeftop. Reeftop gleaners target mainly maturori (*Holothuria* spp.), paua (*Tridacna maxima*), ungakoa (*Dendropoma* spp.), atuke (*Heterocentrus mammillatus*), several species of sea urchins and crabs, octopus, and the seaweed rimu.

Mangaia's particular geomorphology forced the invertebrate team to adapt their techniques. The reef benthos transect, which is usually made by snorkelling, was instead done by walking on the reef at low tide. Likewise,

many reef front searches were made by walking along the reef crest and the close back reef instead of swimming in the breakers. Manta techniques were all made outside the reef on the shallowest portion of the reef slope.

Seven species of sea cucumbers that are used for commercial or subsistence purpose were recorded: *Actinopyga mauritiana*, *Holothuria atra*, *H. cinerescens*, *H. nobilis*, *H. leucospilota*, *Stichopus monotuberculatus* and *Thelenota ananas*. The high value species, *Holothuria nobilis*, was recorded once, while all other species were recorded at moderate to high densities. The red surf fish, *Actinopyga mauritiana*, was abundant and could be harvested under strict control to prevent overfishing within the small reef area.

Giant clams are a heavily targeted resource on Mangaia, and only two species were recorded: the elongated clam, *Tridacna maxima*, and the fluted clam, *Tridacna squamosa*. At the deep station, large (310 mm) fluted clams were recorded in low densities. Elongated clams were recorded all around Mangaia, on the reef flat and on the outer slope, but on the reef flat, the average size was very small (50 mm), due to fishing pressure. On the outer slope, an average size of 158 mm was recorded, but this was limited to a small population.

Trochus niloticus, the commercial gastropod introduced in the early 1980s and reintroduced in early 2000, was recorded only a few times and is not a commonly found resource. Two other species of gastropods (*Turbo setosus* and *Dendropoma maxima*) are the favourite target of fishers (Fig. 4). *Turbo setosus* is found in low densities all



Figure 4: Typical aggregation of *Dendropoma maxima* (top) and a women fishing for this species on the reef flat (bottom).

around the island, while *Dendropoma maxima* is abundant to very abundant, especially on the outer part of the reef, where they become large.

All sea urchin species recorded at Mangaia were abundant. Even the targeted pencil sea urchin (*Heterocentrotus trigonarius*) was recorded in high densities on the reef crest away from villages. The edible sea urchin *Tripneustes gratilla* was found in very high densities on the outer slope at unusual depth (20–32 m). This species has never been recorded at this depth by the PROCFish/C invertebrate teams at any of the site/countries surveyed.

A broken specimen of the rare *Conus gaugini* was found during a deep dive (around 25 m). This discovery is interesting as it extends the range of the species, which has been recorded only in French Polynesia until now.

RAROTONGA

At 67 km², Rarotonga has the largest land area in the Cook Islands, and is located in the southwestern region of the southern group, near the centre of the Cook-Austral chain of seamounts. The oval-shaped island measures 11 km in length (east to west) and has a maximum width of 8 km (north to south). It is the main population and administrative centre of the Cook Islands. According to the 2001 census report, Rarotonga is the only island in the country with a positive increase in population, while the rest of the islands show a decrease.

A larger workboat was available for finfish surveys, although the team could not survey the windward side of the island (northeast) due to a very strong easterly wind. On this island the team identified and surveyed two distinct habitats, the outer fringing reef and a small lagoon area in the southeastern part of

the island (Fig. 5). For the outer reef habitat, nine dive stations were surveyed, with eight lagoon dive stations surveyed.

Most reef fish around Rarotonga are ciguatoxic, and so are not caught or eaten. The most heavily affected area is the eastern and southeastern part of the island where almost all fish species are ciguatoxic. As a consequence, unlike Mangaia, fish density on the outer reef was very high and fish were large. As observed by the team, some parrotfish were larger than normal (more than their recorded maximum length), including *Scarus globiceps*, *S. altipinnis*, *S. psittacus*, *S. schlegeli* and *Chlorurus frontalis*. Benthic coverage was similar to that at Mangaia, where coral slabs covered with turfs and encrusting algae comprised the dominant benthic profile. Coral coverage was dominated by encrusting and massive corals with coverage ranging between 15% and 25%.

Coral coverage on the lagoon intermediate reef was dominated by branching, massive and digitate corals. Schools of mullet, trevallies, parrotfish and

goatfish were common in lagoon areas, especially in closed or protected areas.

Socioeconomic surveys covered 59 households at the two selected communities on Rarotonga. The survey at Ngatangia and Titikaveka villages on Rarotonga (referred to together as Rarotonga in the following discussion) revealed that only 44% of all households are engaged in some kind of fishing, and only every second household on Rarotonga has a household member who fishes or collects invertebrates more or less regularly. There are two possible explanations for the low fishing activity level. First, these communities, as with others on Rarotonga, enjoy a rather urban lifestyle. Agricultural production and fishing activities compete with other chores and responsibilities. Second, Rarotonga's reef and lagoon resources are potentially ciguatoxic, explaining why very few people fish in the island's reef and lagoon system. Some households on Rarotonga, however, have access to a motorised boat and so are able to fish along the outer reef where ciguatera risks are reduced, or troll specif-

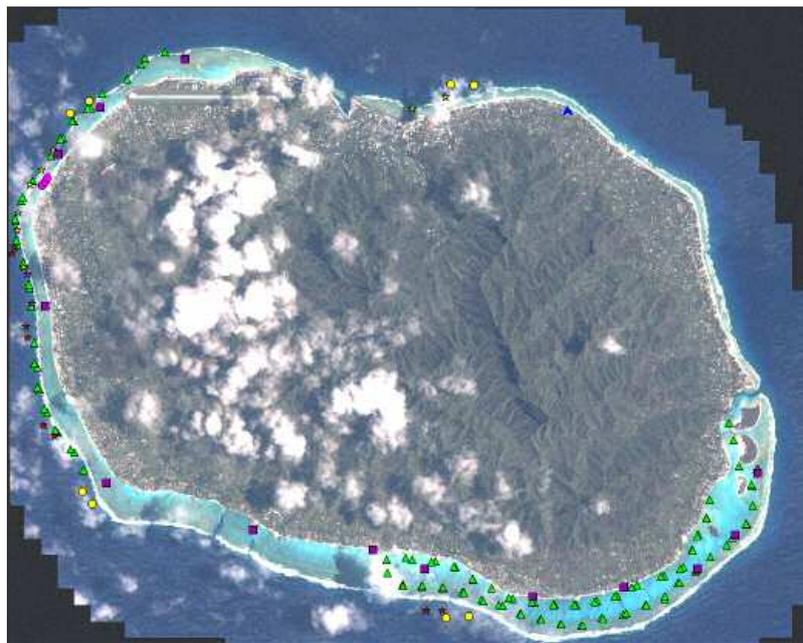


Figure 5: Invertebrate dive stations around Rarotonga.

ically for pelagic fish. Some people collect invertebrates infrequently. Imported chicken and other alternative protein sources are easily available and relatively cheap in local stores. This may explain why the per capita consumption of both fresh fish and invertebrates is relatively low (i.e. 31.7 kg of fresh fish and 1.4 kg of invertebrates).

Although Rarotongans have a variety of income-earning activities, little income is generated from agriculture, and nothing from fisheries (Fig. 6). Salaries are the main income source; other sources include income from private business and (to a great extent) social and retirement payments.

Rarotonga's lagoon is not very extensive and the likelihood of contracting ciguatera from lagoon resources is high, drastically limiting the involvement of Rarotongan people in reef and lagoon fisheries. About 90 fishers out of a surveyed population of 508 households still go fishing, mostly invertebrate collecting, in Rarotonga's lagoon habitat. Most (i.e. about 130 fishers) claim to fish at the outer reef where the risk of ciguatera is reduced. Techniques most used include gillnetting, spear diving, and cast netting. Fish species targeted include koma (*Mulloidichthys flavolineatus*), ature

(*Selar crumenophthalmus*), morava (*Siganus argenteus*), pipi (*Kyphosus cinerascens*), marao (*Myripristis* spp.), pipi nanue (*Kyphosus bigibbus*), ume (*Naso unicornis*) and patuki (*Epinephelus hexagonatus*).

About 17 invertebrate fishers on Rarotonga specialise in lobster diving. Reeftop and seagrass collection may involve an additional 60–80 fishers. While lobster diving is an exclusive activity of men, gleaning is done by both men and women. The most targeted invertebrates for consumption include matuori (*Holothuria* spp.), paua (*Tridacna maxima*), vana (*Echinothrix diadema*), avake (*Tripneustes gratilla*), kina (other sea urchins), kai (*Asaphis violascens*), octopus, trochus and ungakoa (*Dendropoma* spp.).

Reef finfish are never sold on Rarotonga. The annual catch per fisher is low (on average ranging between 65 kg and 100 kg). The total extrapolated finfish catch on Rarotonga covers only ~7% of the annual subsistence fish demand.

Rarotonga's barrier reef is larger than Mangaia's, extending 900 m from the shore to the crest at some locations. The small lagoon was large enough to make a few manta surveys, so typical invertebrate survey techniques were used. Eight species of sea cucumbers used for commercial

or subsistence purpose were recorded: *Actinopyga mauritiana*, *Holothuria atra*, *H. cinerascens*, *H. nobilis*, *H. leucospilota*, *Stichopus chloronotus*, *S. monotuberculatus* and *Thelenota ananas*. The high value species, *Holothuria nobilis*, was only recorded four times, while all other species were recorded in medium to high densities.

The giant clam family was only represented by the elongate clam (*Tridacna maxima*) on Rarotonga. The fluted clam may be present, but in such low densities that they cannot be detected by the survey. Even the elongate clam was scarce and found in low densities, with only 122 specimens recorded during the survey. The overall average size observed was higher (91 mm) than at Mangaia, but those inside the lagoon are much smaller (81 mm) than those outside the lagoon (146 mm).

Trochus niloticus was introduced to Rarotonga between 1981 and 1983. The survey recorded the density of this important commercial species to be high to very high, with some sites peaking at 1.5 specimens per m². The average density (calculated through transect techniques), is 857 specimen per hectare, which is among the highest densities recorded during PROCFish/C surveys in the region. The population here has a very singular pattern, with two distinct sub-populations. One is living on the reef crest and back reef area, while the other is living on the outer slope from 10 m to over 25 m. The spears and grooves area close to the breakers, a usual habitat for this species, is not colonised. The average sizes measured were quite different, with 96 mm for the inner population and 123 mm for the deeper pop-

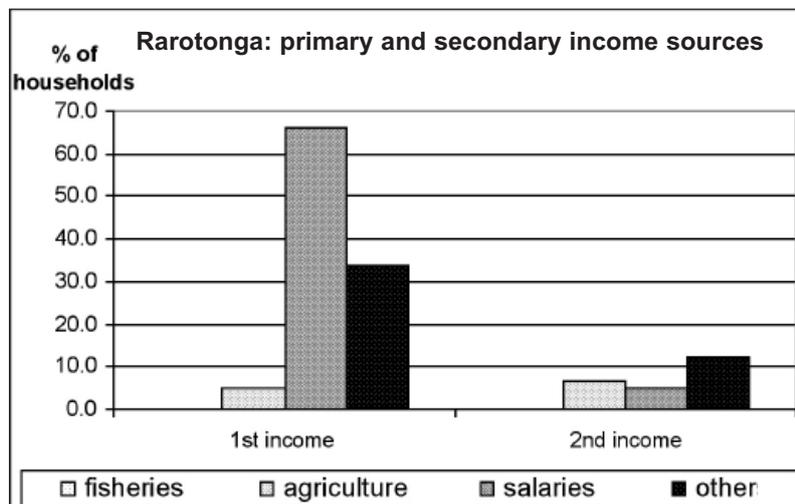


Figure 6: Primary and secondary income sources (%) for households on Rarotonga.

ulation. The deepest trochus ever observed during a PROCFish/C survey, a 135 mm specimen, was found on the south shore of Rarotonga at a depth of 30.1 m.

On Rarotonga, all sea urchin species were abundant. The pencil sea urchin (*Heterocentrotus trigonarius*) was recorded in high densities in the breakers zone. *Tripneustes gratilla* was found in moderate densities inside the

southern part of the lagoon, especially on the outer side, close to the back reef. *Echinotrix diadema* and *Echinometra mathaei* were very abundant.



Fifth PROCFish/C and CoFish Advisory Committee meeting

The fifth PROCFish/C and CoFish Advisory Committee meeting was held in Noumea, New Caledonia on 28 October 2007. Representatives from 15 out of 17 participating countries and territories attended. In addition, there were observers from Australia, New Caledonia, the University of the South Pacific (USP), the South Pacific Applied Geoscience Commission (SOPAC), and, SPC. SPC's Coastal Fisheries Programme Manager, Lindsay Chapman, chaired the meeting.

Project objectives, workplan and outcomes of 4th Advisory Committee meeting

The PROCFish/C Manager reported on the outcomes of the fourth Advisory Committee meeting (1 April 2006). He stated that the two-year, no-cost extension had been granted for the PROCFish/C project and that the extension of the CoFish project had been agreed to. The new logframe (recommended by the mid-term review) for donor reporting has been implemented, and has made reporting easier and clearer against the workplan and project objectives. Timely reporting to countries on the results of survey work has greatly improved, and capacity building has been ongoing as part of the PROCFish/C and CoFish fieldwork.

Progress to date on project objectives, and the workplan for the remaining 16 months of the project, were also discussed. All substantive fieldwork has been completed with the final sites in the

Cook Islands completed in October 2007. Data entry and cleaning is underway and should be finalised by February 2008. Around half of the site reports (89) were done and returned to respective countries, with the remaining reports to be completed and distributed by June 2008. Three country reports have been compiled and cleared by respective governments. An editor will be hired on a short-term basis to assist with compiling the country reports so that all are finalised before the end on the project (28 February 2009).

Once all of the data are entered and cleaned by February 2008, the project will focus on two objectives: 1) conducting a region-wide comparative assessment of the status of reef fisheries, and 2) developing a set of indicators/proxies, or fishery status reference points. A statistician or consultant will be contracted to assist PROCFish/C staff with the assessments. The PROCFish/C manager noted that: With the two-year extension, PROCFish/C will be able to fully meet all of its objectives; all site and country reports will be completed and cleared by countries before the project ends. The work conducted by the PROCFish/C and CoFish teams would not have been possible without the support and collaboration of the fisheries departments and local communities in the 17 participating countries and territories. The PROCFish/C staff thanks everyone involved over the last six years.

Country representatives provided comments during the meet-

ing. The delegate from Palau stated that he had received good feedback from staff, and noted that immense capacity transfer had taken place. The PROCFish/C team approached communities in a professional way and befriended community members, who wanted them to stay longer. The delegate also said that the PROCFish team had done a good job and he wished this to be conveyed to SPC's Director-General. The delegate from the Cook Islands was involved in almost all the work done in his country. He said that the work that had been done was very good and noted that community response regarding the attitudes of team members was positive.

The representative from French Polynesia noted that work in his country was not finished, but had gone extremely well so far. He also said that it was important for each country to develop capacity, and that there should be emphasis on the transfer of skills to national department staff. Vanuatu's representative noted that his country was the third one to be surveyed, and that only two people had been attached for training, and now one working for the PROCFish/C project. The representative from Tonga noted that there had been three or four representatives involved in the project steering committee since it started. The current delegate was one of the local staff involved in the 2004 survey. He also noted that a management plan was developed based on PROCFish work, and they

would be seeking additional input. The representative from the Federated States of Micronesia thanked the PROCFish/C and CoFish teams for the survey work.

Staff presentations on preliminary results and trends

Project staff presented some of the early findings and trends, although not all countries and territories were represented in these initial results, as data from the last several countries had not been fully entered into the database. All comparisons made were based on individual sites, and not on countries. This is because the site data for many countries were so small compared with the size

of the country that it was not representative, and therefore could not be extrapolated to the country level. After each staff presentation, representatives asked many questions.

Meeting outcomes

There were no actual outcomes from this meeting, although several points were made.

- Countries accepted the proposed timetable for data entry (by February 2008), the completion of site reports (by June 2008), and the completion of country reports for clearance (before the end of the project February 2009);

- Capacity building is an important issue for countries and territories, and representatives stated they wanted training in data analysis and interpretation, in addition to the upcoming socioeconomic workshops.
- Several countries were seeking additional assistance from PROCFish/C and this would need to be addressed on a case-by-case basis, depending on funds and staff availability.



Annual GIS/RS Pacific Users Conference

The yearly GIS/RS Pacific Users conference was held at USP (Suva) from 4–7 December 2007, bringing together practitioners of geographic information systems and remote sensing from Pacific Island countries, the South

Pacific Applied Geoscience Commission (SOPAC), SPC and USP as well as representatives from GIS/RS software and services, and GPS equipment companies.

The PROCFish/C Database Manager, Franck Magron, presented PROCFish/C activities with regards to shallow water bathymetry, using multispectral imagery (Figs. 7 and 8) and neural networks. He also dis-

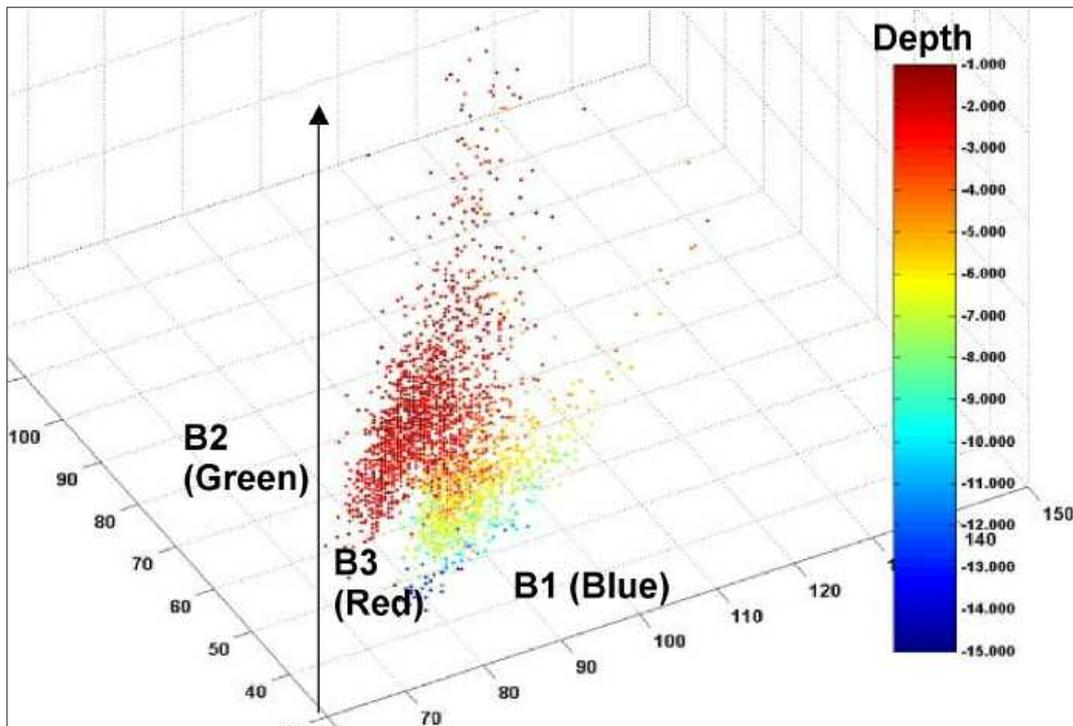


Figure 7: Depths and corresponding visible bands values for Landsat 7 sample points.

cussed the current aquaculture project that is determining suitable sites for freshwater aquaculture using GIS, with a pilot study in Viti Levu (Fiji).

SOPAC presented its new high precision RTK GPS that can be used to establish three dimensional beach profiles and follow coastline erosion in PICTs. The organisation stressed the necessity to rectify geo-referenced, high-resolution images using geo-positioned ground features that can be recognised on the satellite image. It was proposed to establish an online database of Rectification Images Points (RIP) shared among satellite image users.

Finally it was proposed to create a fictitious Pacific Island called "Atlantis" that would be used for training purposes, for which, case

studies and GIS layers corresponding to the needs of PICTs, such as management of reef fisheries will be developed.



Figure 8: Shaded bathymetry overlaying the original Landsat 7 image.

PROCFish/C and CoFish training workshop on socioeconomic fisheries surveys

The first PROCFish/C and CoFish training workshop on conducting socioeconomic fisheries surveys in Pacific Island countries and territories, was held at SPC's headquarters in Noumea, New Caledonia from 10–14 December 2007. The purpose of the workshop was to help communities and managers to improve reef fisheries management techniques. The methodology used has been developed over the past four years of the PROCFish project, and focuses on collecting a minimum dataset that answers 10 major subject areas, which have been jointly identified by the fisheries services in most SPC member countries. A manual that outlines the methodology has been developed and is complemented by software called SEMCoS. The manual is mainly aimed at fisheries officers and staff working in governmental and non-governmental organisations and institutions. Both the manual and the software follow the same structure and make linkages between the manual, data entry and data retrieval.

Participants from six countries attended the first workshop (Fig. 9). Participants learned the objectives and background of planning and conducting socioeconomic fisheries surveys, and were taught how to collect data. They also learned about the

manual's 10 major subject areas, how to calculate and interpret some of the data extrapolations and calculations, how to develop survey questionnaires, and where to find background information. A detailed introduction to SEMCoS software was pro-



Figure 9: Workshop participants and tutors, from left to right: Mandie Finau (Tonga), Franck Magron (PROCFish), Mecki Kronen (PROCFish), Teitioma Ukenio (Kiribati), Olofa Tuaeopepe (Samoa), Jamal Talagi (Niue), Tataua Alefai (Tuvalu), Shalendra Kumar Singh (Fiji).

vided, along with the steps for installation, de-installation, database backup, and data export and import. Participants learned to establish the hierarchical order of a survey, taking into account country, region, island, village and survey properties. Several exercises focused on teaching participants how to enter data from questionnaire forms for household, finfisher and invertebrate interviews, in order to access, design, and run queries.

Participants were provided a complete dataset on two villages that would be used as case studies. Three groups (two participants each) accessed the database in order to run a set of proposed queries, retrieve the generated output, place the results into table or graph format, and interpret results for fisheries management advice at both the community and governmental institution level.

Finally, a session was dedicated to demonstrating and explain-

ing the export of raw data entered into Excel (or other software package), to allow of the analysis of statistical or other data other than those automatically prompted by SEMCoS.

The second training workshop (in English) was held at SPC, Noumea from 21–25 January 2008. The third training workshop for participants from the three French territories is scheduled to take place at SPC, Noumea from 31 March–4 April 2008.



Update on Live Reef Fisheries Trade (LRFT) activities

SPC's Live Reef Fisheries (LRF) Specialist, Being Yeeting, was involved in several projects in the second half of 2007. These activities included drafting the Nauru Marine Aquarium Trade Resource Assessment, participating in Fiji's second Reef Fisheries Workshop, developing LRFT's monitoring database, and surveying work in Kosrae (Federated States of Micronesia) to examine the potential for marine aquarium fish exports.

NAURU MARINE AQUARIUM TRADE RESOURCE ASSESSMENT

A survey of Nauru's marine aquarium fish resources was made in March 2007. This was followed by a three-week attachment training at SPC Noumea for Nauru's Coastal Fisheries Officer, Delvin Thoma. Delvin was trained in entering and cleaning survey data, and making queries using the Reef Fisheries Observatory RFID software. Delvin, with the assistance and guidance of the LRF Specialist, was able to analyse and interpret survey results and later incorporate the information into a technical report that he completed at the end of his attachment. He was able to take the report back to Nauru and submit it to the government (Nauru Fisheries Authority) for review and consideration.

Survey results, as reported on in the technical report, showed a moderate abundance of several important marine aquarium fish trade species, which has triggered significant interest by Nauru's government to consid-

er developing this industry. One month after receiving the report, the Nauru government submitted a formal request to SPC for assistance in developing the marine aquarium trade industry in the country.

SPC's LRF Specialist has been searching for potential funding sources to assist with Nauru's request. After a meeting with the Forum Secretariat Private Sector Development Program, it became apparent that it may be possible to use some Forum Secretariat funding to assist Forum's Pacific Island member countries. Funding, however, can only be granted to Pacific countries upon a submission of their formal request and project proposals. After discussions with the Nauru Fisheries Authority, it was agreed that 1) the LRF Specialist would develop the project proposal and budget for activities in the second phase of developing the marine aquarium trade industry in Nauru, and 2) Nauru would submit the proposal formally. SPC will be the partner organisation in implementing the project. The

project proposal is being finalised and will be submitted to the Forum Secretariat in early January 2008, targeting June 2008 for the project to start.

PARTICIPATION IN FIJI'S SECOND REEF FISHERIES WORKSHOP

The LRF Specialist took part in a workshop entitled "Reef Fisheries Workshop – Now and the Future Part II". The first workshop was held last year. The workshop was jointly organised by the Fiji Fisheries Department and the Society for the Conservation of Reef Fish Aggregations (SCRFA). SPC's LRF Specialist attended as part of the collaborative partnership between SCRFA and SPC to assist Pacific Island countries in reef fisheries management issues, especially in relation to reef fish spawning aggregations. The workshop examined and discussed the relevant approaches and activities to take to address the main problems and issues that were highlighted in the first workshop.

The workshop also provided an opportunity for the presenta-

tion of a collaborative study between SCRFA, the University of British Columbia (Canada), Fiji Fisheries, USP and SPC, to look at the social and economic value of reef fish exports from the Pacific, using Fiji as a case study. The study will begin in early 2008 and will attempt address the lack of knowledge on the value of reef resources, which was one of the important issues that emerged from last year's workshop.

LRFT MONITORING DATABASE DEVELOPMENT WORK BEGINS

The development of an LRFT database for recording export data and LRFT trade data (among other information), began in September 2007. Three countries — Fiji, Vanuatu and Tonga — have been selected as pilot countries for the initial development of the database framework. The LRF Specialist visited Fiji in September and Vanuatu in December, meeting with industry people, such as live fish trade companies, divers and collectors and relevant government departments involved in the monitoring of the fishery (e.g. the Ministry of Fisheries, as well as the Customs and Quarantine Department). The information collected will be used to verify and refine data forms required in monitoring the LRFT, as well to understand how the dataflow should be designed for effective use and application. Meetings will be held in Tonga in early 2008.

In addition, the LRF Specialist assessed the existing in-country capacity to support and implement the monitoring programme. This provided valuable information to be used in the future for designing the project's implementation phase.

The project is aiming at developing the basic database framework by the middle of 2008, when it would be trialled in the

three countries. SPC will assist in its implementation. If successful, the database will then be extended to other countries that have live reef fisheries.

FSM LOOKS AT THE POTENTIAL OF EXPORTING MARINE AQUARIUM FISH FROM KOSRAE STATE

Following a formal request for assistance from the Federated States of Micronesia (FSM) in

October 2007, the LRF Specialist visited Kosrae to assist in assessing the state's marine aquarium fish resources and the potential for starting a fish-based marine aquarium trade (in addition to their current ongoing export of cultured giant clams).

As with other Pacific Island countries, FSM lacks local expertise in conducting field assessments. Training for local



Figure 10 (top): Underwater visual census training.

Figure 11 (bottom): Initial substrate training conducted on the reef flats.

field workers was done before the actual survey. Nine local field researchers from different agencies (government, non-government and private sector) attended the training, which consisted of classroom sessions and underwater exercises, and included learning how to conduct an underwater visual census (Fig. 10). Fish identification and recognising different bottom substrates (Fig. 11) was also an important component of the training. Following the training and after mastering the methodology, participants conducted a survey off Kosrae, which included 30 sites around the island.

In addition to the survey, the LRF Specialist organised a workshop about the marine aquarium trade for the general public. Twenty-two participants

from various public sectors attended. Presentations included background information describing the marine aquarium trade; biological, social and economic implications of the marine aquarium trade in the Pacific in general; and managing the marine aquarium trade sustainably. Presentations were intentionally made simple so that all members of the public could understand.

Trainees were given the opportunity to present the project to the public. These presentations consisted of an introduction about the project's mission and objectives; another describing the methodology and the data being collected with an explanation on how the data would be used; and field observations, noting the common species seen

that may be of value to the marine aquarium trade. These presentations were well received by the public and allowed for a quick assessment of trainees' understanding of survey methodology and data use. The same presentations were also made in Pohnpei to government officials.

Following survey work, an attachment is planned for one trainee to come to SPC Noumea and learn about cleaning data, processing and analysis. The FSM government will send a second attachment at their own expense. A three to four-week training session is scheduled for March 2008.

