

CRISP Coordinating Unit

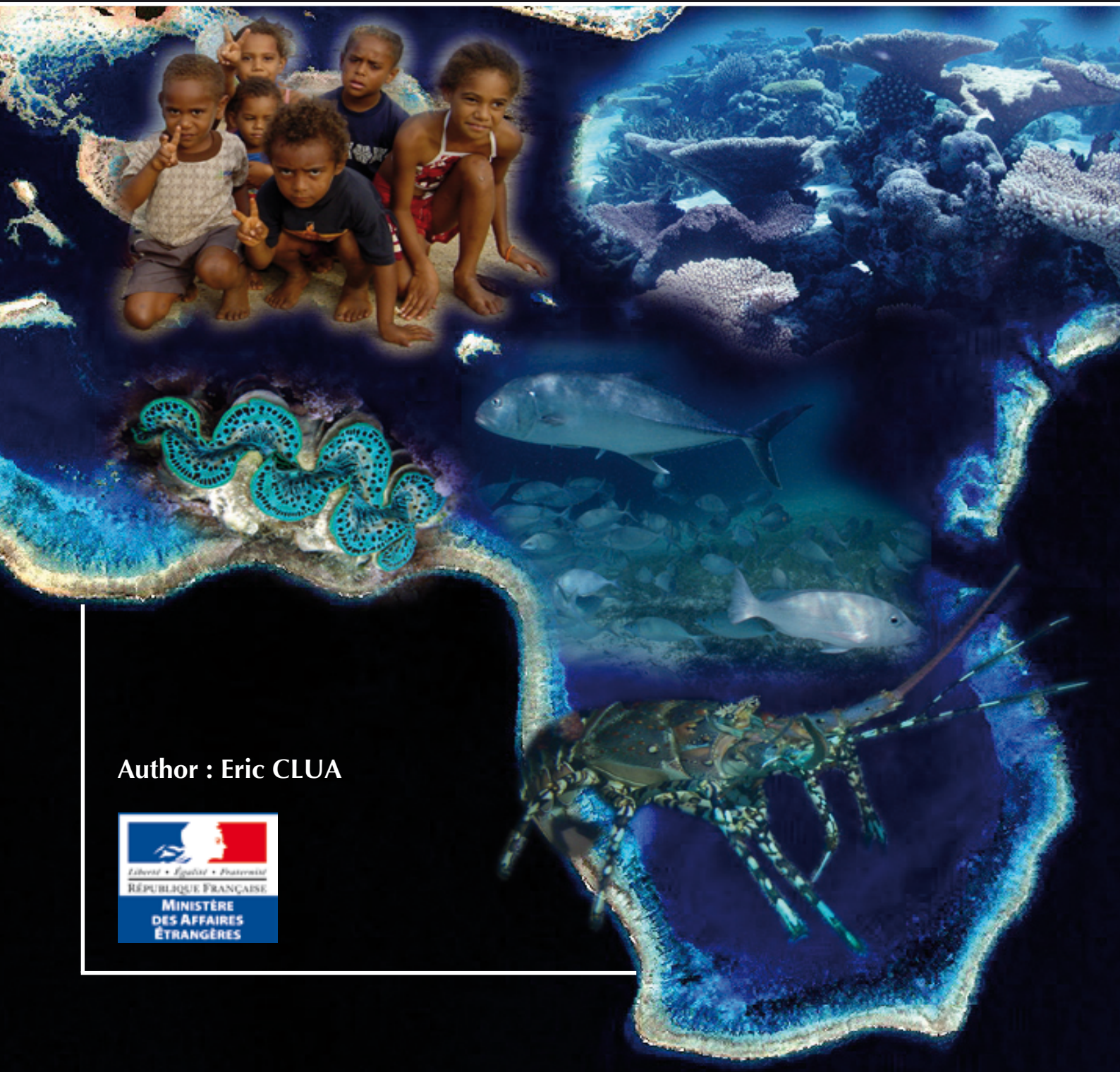
May 2008

CRISP



Coral Reef InitiativeS for the Pacific
Initiatives Corail pour le Pacifique

MID TERM REPORT



Author : Eric CLUA



CRISP



Coral Reef InitiativeS for the Pacific
Initiatives Corail pour le Pacifique



The CRISP programme is implemented as part of the policy developed by the Secretariat of the Pacific Regional Environment Programme for a contribution to conservation and sustainable development of coral reefs in the Pacific

The Initiative for the Protection and Management of Coral Reefs in the Pacific (CRISP), sponsored by France and prepared by the French Development Agency (AFD) as part of an inter-ministerial project from 2002 onwards, aims to develop a vision for the future of these unique eco-systems and the communities that depend on them and to introduce strategies and projects to conserve their biodiversity, while developing the economic and environmental services that they provide both locally and globally. Also, it is designed as a factor for integration between developed countries (Australia, New Zealand, Japan, USA), French overseas territories and Pacific Island developing countries.

The initiative follows a specific approach designed to:

- associate network activities and fieldwork projects;
- bring together research, management and development endeavours;
- combine the contributions of a range of scientific disciplines, including biology, ecology, economics, law and the social sciences;
- address the various land and marine factors affecting coral reefs (including watershed rehabilitation and management);
- avoid setting up any new body but supply financial resources to already operational partners wishing to develop their activities in a spirit of regional cooperation. This is why the initiative was prepared on the basis of a call for proposals to all institutions and networks.

CRISP Coordinating Unit (CCU)

Programme manager : Eric CLUA

SPC - PoBox D5

98848 Noumea Cedex

New Caledonia

Tel : (687) 26 54 71

Email : ericc@spc.int

www.crisponline.net



SPC

Secretariat
of the Pacific
Community

This approach is articulated through a series of thematic objectives, which are:

Objective 1: Improve knowledge of the biodiversity, status and functioning of coral eco-systems.

Objective 2: Protection and management of coral eco-systems on a significant scale.

Objective 3: Develop the economic potential represented by the use values and biodiversity of coral eco-systems.

Objective 4: Dissemination of information and knowledge; capacity-building and leadership with local, national and international networks.

The CRISP Programme comprises three major components, which are:

Component 1A: Integrated Coastal Management and watershed management

- 1A1: Marine biodiversity conservation planning

- 1A2: Marine Protected Areas

- 1A3: Institutional strengthening and networking

- 1A4: Integrated coastal reef zone and watershed management

Component 2: Development of Coral Ecosystems

- 2A: Knowledge, beneficial use and management of coral ecosystems

- 2B: Reef rehabilitation

- 2C: Development of active marine substances

- 2D: Development of regional data base (ReefBase Pacific)

Component 3: Programme Coordination and Development

- 3A: Capitalisation, value-adding and extension of CRISP Programme activities

- 3B: Coordination, promotion and development of CRISP Programme

CRISP is funded by the following partners :



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| SI | AFD /FGEF | Co-funding .000 euros | | Compo nents | Outputs | Brief description of actions | .000 euros | IA |
|--------------|-------------|--------------------------|--|----------------|-------------------------|--|---------------|--|
| CI | 2000 | 2734 | CI, Nzaid, NEAq, NC PN, NC PS, Pakard Foundation McArthur Foundation, IFRECOR, RNHP, IRD140 | 1 | 1A1 | Planification of marine conservation strategy | 660 | WWF, CI |
| | | | | | 1A2 | Support to MPAs | 2278 | WWF, CI, FSPI, ASMMA, IFRECOR |
| | | | | | 1A3 | Networking | 297 | FSPI |
| | | | | | 1A4 | Integrated Coastal Management | 1080 | IRD140 |
| | | | | | 1A5 | Coordination | 218 | CI |
| CNRS | 1000 | 286 | CNRS | 2A | 2A1 | Postlarvae Capture and Culture | 210 | EPHE, USP |
| | | | | | 2A2 | Reef Fisheries management | 245 | IRD128, USP |
| | | | | | 2A3 | Monitoring of coral reefs | 150 | EPHE, USP |
| | | | | | 2A4 | Extension | 240 | IRD128 |
| | | | | | 2A5 | CO2 and ecotourism | 55 | EPHE, USP |
| | | | | | 2A6 | Coordination | 100 | EPHE, USP, IRD128 |
| | 300 | 43 | SPI-INFRA | 2B | 2B1 | Pilot sites (Fidji et Tuvalu) | 200 | SPI, FSPI |
| | | | | | 2B2 | Restoration guide | 85 | SPI, CRTR |
| | | | | | 2B3 | Coordination | 15 | EPHE, SPI |
| IRD | 500 | 2337 | IRD | 2C | 2C1 | Legal framework | 2837 | IRD152 |
| | | | | | 2C2 | Taxonomy | | IRD152, USP |
| | | | | | 2C3 | Collection and screening | | IRD152 |
| | | | | | 2C4 | Capacity building | | IRD152, USP |
| UNF | 400 | 1297 | UNF, SPREP | 2D | 2D1 | Elaboration et renseignement base | 800 | WFC, EPHE, SPREP |
| | | | | | 2D2 | Mise en œuvre de REEFBASE SP | | |
| | | | | | 2D3 | Dissémination of CRISP products | | |
| | 500 | | | 3A | 3A1 | Capacity builing | 597 | SPREP |
| | | | | | 3A2 | Pilot studies | 350 | |
| | | | | | 3A3 | Extension of CRISP products | 200 | |
| SPC | 1250 | 850 | MAE, Fonds Pacifique | 3B | 3B1 | Coordination, monitoring and evaluation | 4050 | CCU, SPC, EPHE, CNRS, IUCN, IRD, WFC |
| | | | | | 3B2 | Promotion/communication | | |
| | | | | | 3B3 | Development of programme | | |
| | 1050 | 200 | Nzaid, AUSaid | | 3B4 | Complementary projects | | |
| Total | 7000 | 7547 | Total programme | | 14 547 000 euros | | | |

SYNOPTIC TABLE OF THE PROGRAMME, 30TH OF JUNE 2008



Symposium organizing team (from left to right): R. Reichelt (GBRM-PA), Margaret Johnson (Australia Gvt), M. Thibier (French Embassy), C. Wilkinson (RRRC), J. Veytayaki (USP) and E. Clua (CRISP).

► **EVENT: Partnership with Australia**

The implication of Australia in a partnership within CRISP programme became a reality with the co-organisation of a symposium held in Townsville (Queensland-Australia) in September 2007. On the French side, the CRISP and the French Embassy in Canberra provided technical assistance with the financial support of the Pacific Fund. On the Australian side, the Environment Department, the James Cook University and the Townsville RRRC participated with AUSAID funding. This symposium aiming to promote better sustainable coral reef management gathered 12 Island Nations of the Pacific.

REEFBASE DVD ►

Thanks to CRISP support, World Fish Center, in charge of the implementation of the Reefbase Pacific data meta-base, produced a DVD compiling a vast quantity of information relative to the coral reefs of the Pacific. This product will be distributed starting from June 2008, before to be integrated to the internet database expected to be operational before the end of 2008.



► **2008: the year of coral reefs in the Pacific.**

The year 2008 has been labelled the "International Year of the Reef" by ICRI, and specific campaigns to increase public and stakeholders awareness have been programmed worldwide. The Year of the Reefs in the Pacific (PYOR2008), financed by CRISP up to 45,000 Euros, was officially launched by SPREP in Vanuatu, with the support of the local French diplomatic representation.



PYOR2008 launching organizing team (from left to right): Eric Clua (CRISP), Caroline Vieux (SPREP), Touasi Tiwok (Vanuatu Gvt) and Jean-François Marini (French Embassy in Port-Vila).



OVERALL SITUATION

The beginning of 2008 was marked by the implementation of a mid term review assessment of the CRISP programme, financed by its two main funding agencies: AFD, the French Agency for the Development and FFEM, the French Fund for the Worldwide Environment. This evaluation was conducted by the French independent consulting agency Oréade-Brèche, chosen after an international call for tenders. The job of interviews, collection and analysis of information took place between February and May 2008 and will result in a report available at the end of July 2008.

If the CRISP programme was initially planned to end in December, 2008, the delays necessary to formalize all the partnerships, which make the originality of this programme, have caused a postponement of all the funding agreements to a *minima* June 30th 2009, for the majority of partners, and sometimes to December 31st 2009. The necessary endorsements were signed in the first semester 2008. These new deadlines entirely justify the term

«mid-course» used to qualify the assessment, especially considering the fact that the conclusions of this work will be inserted in the annual meeting of the programme, which will take place from the 22nd to the 26th of September 2008 in Apia (Samoa). This «great» piloting committee will gather for a week all the CRISP actors, in order to plan actions to come before the end of the programme, which will probably stretch over 2010, the deadline of December 2009 signifying only the end of the financial transactions and not of the actions which should continue beyond this date. Besides taking into account the recommendations of the mid-course review, both on objectives and modalities of implementation of the actions, this meeting in Apia will be an opportunity to catalyze the living forces of the programme on definite objectives, such as the collaboration between the different components of the programme to reach an exemplary integrated approach concerning reef resource management issues



in the Pacific, and focusing on priority themes such as economy and governance too. Mid-2008, the number of Marine Protected Areas (MPA) either created or developed by the CRISP programme is nearing forty, in 12 different countries. One of the challenges of the programme is its capacity to prove the interest of the MPAs as management tools, both in terms of economy and improvement of the governance. The second axis is particularly important in the Pacific where governments, with their limited means, tend to delegate ecosystems management to the users and local populations as much as possible, giving the concept of «Governance» its reason to be. The distinctive identity of the Pacific brings us to promote the use of the term «Marine Managed Area» (MMA), literally translated into French as «Aires Marines Gérées (AMG), instead of the usual term MPA, referring to a management model conceived in the developed countries, and requiring huge financial and human means (set up of infrastructures such as buoys, moorings, supervisors' wages, etc). This distinction is not insignificant, when presenting a situation necessitating to «Invent» modalities of management to face the reduction of resource and the increase of human pressures, modalities which should give a first role to the direct users as main administrators, with a minimal involvement of the authorities. Besides this thematic of coral ecosystems applied management, this synthetic report, different compared to the previous ones which had a more «technical» approach per component, presents the contributions of the programme in the term of scientific advancement, monitoring of coral reef state of health, development of new markets, information dissemination, awareness of users and political decision-makers, training of students and technicians and, at last, creation of institutional links. This presentation is motivated by the constant worry to make the results, which production increases exponentially, as available as possible.

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PROGRAMME DASHBOARD

The CRISP coordination unit synthesizes every semester the standardized progress reports of the different partners. Activities are assessed using indicators quantifying the level of success both in terms of means implemented by the different technical partners and the obtained results. Those indicators turned into averages are classified into boxes included in the 6 following markers: 0, 20, 40, 60, 80 and 100%. To ease the reading, colors are affected to each box as follows:

| | | | | | |
|------------|-----|----------|--------|------|-----------|
| Level | Bad | Mediocre | Medium | Good | Very good |
| Color code | | | | | |

AVERAGE PERFORMANCE PER PROJECT FOR THE FOUR SEMESTERS 2006-2007

| Component | Agencies | Project (Output) | Simplified Description | Implementing Agencies | Project Evaluation | Component Evaluation |
|-----------|-----------|------------------|---|--------------------------------|--------------------|----------------------|
| 1A | CI | 1A1 | Marine Conservation Planning | WWF, CI | | |
| | | 1A2 | Support to Marine Protected Areas | WWF, CI, FSPI, ASMMPA, IFRECOR | | |
| | | 1A3 | Capacity building, Networking and Lessons Learned | CI, FSPI | | |
| | | 1A4 | Integrated Coastal Management | IRD | | |
| | | 1A5 | Coordination | CI | | |
| 2A | CNRS-EPHE | 2A1 | Postlarvae Capture and Culture | EPHE, UNC, USP | | |
| | | 2A2 | Reef Fisheries Management | IRD, USP | | |
| | | 2A3 | Monitoring of Coral Reefs | EPHE, USP | | |
| | | 2A4 | Extension | IRD | | |
| | | 2A5 | CO2 and Ecotourism | EPHE, USP | | |
| 2B | | 2B1 | Pilot Sites (Fiji and Tuvalu) | SPI, FSPI | | |
| | | 2B2 | Restoration Guide | SPI | | |
| 2C | IRD | 2C1 | Legal Framework Improvement | IRD | | |
| | | 2C2 | Algae and Sponges Taxonomy | IRD, USP | | |
| | | 2C3 | Collection and Screening | IRD | | |
| | | 2C4 | Institutional Strengthening | IRD, USP | | |
| 2D | UNDP | 2D1 | ReefBase Nodes | WFC, EPHE, SPREP | | |
| | | 2D2 | ReefBase Database | | | |
| | | 2D3 | Information Products | | | |
| | | 2D4 | Dissemination of Products | | | |
| 3A | UNDP | 3A1 | Institutional Strengthening | SPREP | | |
| | | 3A2 | Support to Integrated Governance | | | |
| | | 3A3 | Economic Valuation | | | |
| | | 3A4 | Access to Appropriate Knowledge and Technologies | | | |
| | | 3A5 | Dissemination of CRISP Outputs | | | |
| 3B | MFA-SPC | 3B1 | Coordination, Monitoring and Evaluation | CCU | | |
| | | 3B2 | Promotion and Communication | | | |
| | | 3B3 | Development of Programme | | | |



MID TERM REPORT

APPLIED ECOSYSTEM MANAGEMENT

► BACKGROUND

This area covers work related more to resource conservation than marketing or biodiversity, which are dealt with elsewhere, even though these aspects are closely interconnected under the Programme. There are four objectives under CRISP:

- **Improving our understanding of marine biodiversity** and the hazards faced by it. It is intended to achieve this objective by conducting three ecoregional analyses (ERAs). Two subregional analyses are being carried out by WWF in the New Caledonian and Polynesian (French Polynesia and Cook Islands) ecoregions. Another analysis is being conducted at Pacific regional level by CI. At the same time, CI is also providing support to Palau in partnership with the TNC NGO in planning the country's biodiversity conservation.
- **Providing a major contribution towards setting up and strengthening marine protected areas (MPAs)** as a coral ecosystem conservation and sustainable management tool. Both the Aleipata and Safata MPAs in Samoa receive direct support from CRISP for consolidation purposes, FSPI for setting up MPAs in 4 Pacific countries (Vanuatu, Solomon Islands, Tuvalu and Kiribati) and IFRECOR in French Polynesia and Wallis & Futuna for setting up and strengthening Marine Area Management Plans there. MPA support is also being provided to the Cook Islands in partnership with WWF. It should also be noted that, as part of its contribution to CRISP, CI is providing financial support for setting up the largest MPA in the world in Kiribati's Phoenix Islands, known as PIPA or the Phoenix Island Protected Area Project.
- **Setting up a governance process** towards integrated coastal management combining watershed and marine areas. IRD is the main driver behind these projects on Efate Island, Vanuatu, Vanua Levu, Fiji and Moorea, French Polynesia.
- **Developing appropriate reef restoration techniques for the Pacific** through a partnership with

French consultancy firm SPI-INFRA and FSPI who are setting up pilot sites in Fiji on Motoriki and in Tuvalu on Funafuti Atoll.

■ BRIEF REVIEW

Regarding ERAs, a workshop on New Caledonian marine biodiversity mapping and site prioritisation was held in August 2005 by WWF in partnership with IRD Noumea (Gabri  et al 2005). The biodiversity threat and hazard identification and assessment stage took place during 2006 and a report was produced in early 2007 (Juncker and Bouvet 2006). CI started information gathering activities at regional level in partnership with SPREP by recruiting a geographical information system expert who began compiling existing regional data.

In terms of MPA support, the FSPI NGO received direct financial support from CRISP in mid-2005 to develop a dozen community-based marine management projects in Vanuatu, the Solomon Islands, Tuvalu and Kiribati (as from late 2006). The Aleipata and Safata MPAs set up with World Bank funding early in the millennium also received financial support as bridging from their original funding that ended in 2005. At the same time, a marine area management plan setup process was started on Wallis and Futuna based on a methodology that had been used in French Polynesia and a French Polynesian consultancy that had assessed the local situation (Verducci and Juncker 2007). WWF Pacific undertook groundwork for supporting the Cook Islands in eventually setting up an MPA on Aitutaki Island. Using its own funds under the auspices of CRISP and in collaboration with the New England Aquarium, CI funded the preliminary reporting required to set up the world's most extensive MPA in the Phoenix Islands, Kiribati.

In terms of integrated coastal management, 2006 and 2007 were used by IRD to start carrying out preparatory work with the authorities and institutions and implementing the project on Efate Island, Vanuatu. Preliminary studies were conducted on the practical application of governance based on the "Ridge to Reef" concept. They centred, *inter alia*, on assessing



land use (Despinoy 2007) and compiling potential erosion control methods (Bati and Deprataere 2007). Implementation work on the pilot community reef restoration site project began in 2005 on Motoriki Island and continued in 2006 with monitoring work on the restored site (Fisk *et al* 2006a). Work commenced in 2006 on the second pilot site, ie on Funafuti Atoll, Tuvalu, where a preparatory study on low-cost transplant operations was undertaken (Fisk *et al* 2006b). At the same time, the Soproner (an Spi-infra partner company) resource person worked with a world-class expert on the World Bank restoration manual publication project. CRISP Programme case studies were incorporated in the product which was posted on line (Edwards *et al* 2007a).

■ LATEST PROGRESS

An action plan was finalised for the Polynesian ERA in late 2007 (Mapeti and Gabrié 2007) and the analysing process was launched beginning with the Cook Islands. Early in 2008, the process was extended to French Polynesia where co-ordination was required to identify institutional and subject-area synergies between the WWF-managed ERA, the environmental status assessment set up by the French Polynesian government and the French Development Agency MPA support process. Also under biodiversity conservation planning, CI implemented the CRISP strategy for support to Palau and the Micronesian Challenge (Martel and Miller 2007).



Concerning management implementation, the MPAs supported by FSPI made significant progress with a total of more than twenty MPAs in 2008, distributed in decreasing order in the Solomon Islands, Vanuatu, Tuvalu and Kiribati. Initial contact was made with Tonga to continue this participatory management process. In Samoa, when the special conditions of the agreement between CI and AFD (French Development Agency) had been met, a budget of nearly K€ 100 was injected into the trust fund that ensures the Aleipata and Safata

MPAs in Samoa can remain functioning. Also, the 410,500-km² Phoenix Island, Kiribati, MPA received resounding worldwide media coverage when it was legally registered. With regard to work on marine area management plans, the second French Polynesian consultancy took place on Wallis & Futuna to finalise the environmental diagnosis (PTPU 2007).

Progress was achieved on the reef restoration front with implementation of the transplant and quarterly site-monitoring phases on the Tuvalu site (Fisk *et al* 2007). The reef restoration manual was translated into French through a partnership between CRISP and the French Coral Reef Initiative (IFRECOR) (Edwards *et al* 2007b).

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Edwards A. and E. Gomez, S. Job (2007b). «Restauration récifale - concepts et recommandations : faire des choix raisonnés dans un environnement indécis»

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Gabrié, C., Cros, A., Downer, A. et C. Chevillon (2005). «Analyse Ecorégionale de Nouvelle-Calédonie. Identification des zones prioritaires à protéger». Rapport atelier de Nouméa 10-11 août 2005. Rapport CRISP. 96 pp.

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Matepi M., Gabrie C. (2007). «East Polynesia Ecorégion: Cook Islands & French Polynesia - objectives 1.1a & 1.2a & b». CRISP report. 22 pp

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MID TERM REPORT



IMPROVED SCIENTIFIC UNDERSTANDING

► BACKGROUND

It should be noted that CRISP is a development programme and, as such, does not treat research as a major priority. Research is carried out, however, whenever it appears useful to do so with one of the following aims in mind:

- **Aim 1:** improving our understanding of coral ecosystem biodiversity, the underlying rationale being that a heritage can be better protected if it is properly understood;
- **Aim 2:** improving our understanding of how coral ecosystems function, which is the *sine qua non* for developing appropriate and efficient management tools;
- **Aim 3:** improving our understanding of the nature and renewal mechanisms of and access pathways to particular ecosystem resources so as to identify sustainable economic applications for them.

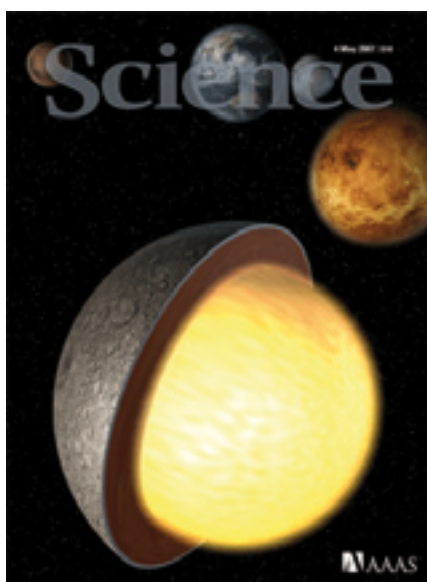
The Programme receives support from two world-class scientific advisers, ie Professor Bernard Salvat of EPHE (Ecole Pratique des Hautes Etudes, an advanced institute for applied tertiary studies), France and Dr Clive Wilkinson working at the Reef and Rainforest Research Centre (RRRC), Townsville, Australia. These experts assist in selecting the areas to be researched, monitor research quality and contribute to promoting the Programme's research work at international level. They provided a detailed scientific report for the Programme's mid-term review during the first half of 2008.

■ BRIEF REVIEW

Publication in a peer-reviewed journal is usually achieved after three years of experimentation, writing and publishing. As the Programme could at best be said to have started in mid-2005, the number of scientific products that had to go through this process, particularly a peer review prior to publication, was naturally almost nil until mid-2007. In the first half of 2007, however, a bibliography synopsis relating to Aim 1 and two articles relating to Aims 2 and 3 were published. The bibliography summary covered

validated scientific knowledge on the specific diversity of New Caledonia's hard coral. These scientific achievements are particularly relevant against the backdrop of the UNESCO World Heritage listing application. The first article dealt with improving our biological understanding of reef fish larvae (Lechini *et al* 2007b) which can be applied to selective capturing of high value-added species, particularly in terms of PCC (Postlarval Capture and Cultivation) development for supplying the aquarium market (cf section on reef resource marketing). The second article

was published in the prestigious Science journal (Almany *et al* 2007) and dealt with improving our biological understanding of reef fish reproduction, particularly the self-recruitment rate, which can have direct applications, particularly with regard to the sizing of marine protected areas, on which it has a major bearing.





■ LATEST PROGRESS

Whilst another article appeared in the second half of the year on the biological settlement of reef fish larvae following on from the previous article (Lechini *et al* 2007a), this period also saw several articles being produced under Aims 1 and 3 on algal taxonomy and the isolation of active marine substances (AMSs).



Knowledge of algal taxonomy was enriched by an article on genus *Turbinaria* algae description (Lann *et al* 2007) and two articles on *Rhodophytes* (N'Yeurt *et al* 2007a, N'Yeurt *et al* 2007b). A further article dealt with

isolating two AMSs using a sponge species (Vergne *et al* 2007). Programme sub-component 2C went even further and published a chapter on legal protection measures for marine biodiversity by Prof Jean-Pierre Beurrier (Beurrier 2007). This contribution ties in with efforts to improve the legal framework in two Pacific countries involved in marketing AMSs through CRISP, namely Fiji and the Solomon Islands (cf section on reef resource marketing).

■ FUTURE PROSPECTS

Contributions to the three main scientific aims should both continue and increase over the next few months, whether in terms of marine invertebrate taxonomy through Programme sub-component 2C, ecosystem functioning and management with indicator validation through sub-component 2A (Aim 2) or sustainable management of particular reef resources through sub-components 2A (postlarval) and 2C (AMSs) under Aim 3.

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MID TERM REPORT



DEVELOPMENT OF REEF RESOURCES

► BACKGROUND

This is among the Programme's key areas, if not the most important. Setting up sustainable industries based on the controlled use of reef resources is the best means of ensuring the Programme has a substantial and lasting effect. Three areas receive CRISP support, ie (i) sustainable alternative fishing technique promotion (particularly methods based on grow-out reef fish or crustacean postlarvae – cf inset opposite); (ii) optimising the potential sharing of profits derived from the discovery of active marine substances (AMSs) isolated in organisms taken from Pacific coral ecosystems; and (iii) ecocertification development support for Pacific hotels contributing tourist-based revenue to their countries.

■ BRIEF REVIEW

PCC development operations were driven by EPHE-CNRS in French Polynesia, Fiji and, to a lesser extent, Wallis and Futuna. In pure research terms, the CRISP Programme led to several publications on improving our knowledge of reef fish biology that could contribute to improved postlarva capturing techniques, particularly in terms of specific characteristics (cf section on the Programme's scientific contributions). The Programme also facilitated the assignment of a French student to the University of the South Pacific, based in Fiji, who is preparing a thesis with

the co-supervision of Perpignan University, France. His research deals with postlarva re-seeding techniques into ecosystems as a spin-off from breeding for aquarium purposes. Through this support, an aquafarm has been set up at the University and several resource people trained who will prove valuable in developing a potential PCC industry in this country. Following on from the research, emphasis was placed on research-development with various larva identification tools (Maamaatuaiahutapu et al 2006, Juncker 2007) and a postlarva breeding manual (Vermond 2007) being produced.

In terms of AMS marketing, the Programme facilitated the sifting of substances harvested in the Solomon Islands in 2005 and a fresh harvesting campaign in Fiji in 2007. IRD, through its UR152 research unit, was very actively involved in training Pacific students, as two students preparing a master's and postdoctoral thesis respectively are taking part in the Programme. The University of Nantes, France, through the efforts of Professor Jean-Pierre Beurrier and two thesis students, also significantly contributed to reporting on the AMS marketing legal framework (Guilloux et al 2007a 2007b) with the team conducting legal prospecting missions to Fiji (2005), Solomon Islands (2006) and Vanuatu (2007).

The University of the South Pacific supported ecotourism development and commissioned a Fijian consultant who





What is PCC?

PCC stands for Postlarval Capture and Culture or “grow-out”. Postlarvae are a development stage in reef fish and crustaceans prior to settlement in the lagoon and adulthood. The vast majority of animals start their development cycle with an ocean phase lasting one to three months, after which the fish and crustaceans re-enter the lagoon in hundreds of millions.

Approximately one in a million individuals only will reach adult stage, with most juveniles being eaten by predators. Using innovative techniques, postlarvae can be captured and bred for sale to three potential markets, ie



aquaculture for food purposes; reseeded into ecosystems to boost biodiversity and fish density for fishing purposes or simply for viewing by tourists; and the (lucrative) aquarium market. Despite their impressive numbers, the captured animals only account for a very small portion of the larval flow, hence the very slight impact on the ecosystem compared to techniques involving the capture of adults with large quantities of mature males.

This makes PCC a potentially ecofriendly industry. Material promoting these industries was published using CRISP funding support (Moana Initiative 2007).

produced several reports in 2006 and 2007 on defining hotel ecocertification specifications, which were trialled in Fiji starting mid-2007, before being proposed to other Pacific countries.

■ LATEST PROGRESS

Whilst development work centred on fish postlarvae at the beginning of the Programme, crustaceans were also investigated during 2007. A consultancy to Wallis and Futuna was conducted in late 2007 by Matthieu Juncker (a CRISP consultant) and Joseph Poupin (Naval College) to investigate crustacean biodiversity in these islands based on adults described in situ and postlarvae. Another study was undertaken on grow-out crustacean marketing, particularly regarding the “varo” squillid, a high-value crustacean, on Rangiroa, French Polynesia, and overseen by Tropical Fish Tahiti who produced a report (TFT 2007). In the meantime, a scientific consultancy was carried out on the French Polynesian atoll to examine the relationship between successful larva colonisation and the degree of coral habitat damage (Mills et al 2007), which was used as support material for a University of Brittany master degree student’s industry placement. A Fijian student also produced a report on the description of the zooplankton from which the larvae originated (Pratap 2007), which provided useful information for a better understanding of phenomena occurring prior to capture. The Programme also examined the inherent economic and legal issues of industry development. Two study reports were produced, one in French Polynesia on an overall strategy for the territory to ensure that the latter plays a major role in the regional-level development



Hoa netting in French Polynesia, adapted to post-larvae capture..

MID TERM REPORT



DEVELOPMENT OF REEF RESOURCES (contd)

process (Lipchitz 2007) and another in Fiji essentially examining the legal restrictions so as to come up with a proposal for adjusting the legislation, which currently prohibits postlarva exports (Manoa 2007a and 2007b). Finally a PCC progress report as produced by René Galzin's team at presented by him at the Townsville Forum in September 2007 (Galzin et al 2007).

With regard to AMS marketing, the organisms collected in Fiji (Payri et al 2008) were sorted and the University of the South Pacific's phycology (seaweed) collection was expanded by several dozen previously unclassified

specimens. After completing an in-country investigation, Professor Beurrier and his team produced a report on Vanuatu's legal framework and published it on line (Guilloux et al 2007c). He also wrote an in-depth article on marine biodiversity legal protection that, owing to its worldwide relevance, far surpassed CRISP's terms of reference (Beurrier 2008).

What are AMSs?

Active marine substances are active ingredients that can be isolated in various marine organisms and used for therapeutic purposes. Isolating AMSs is a slow, complex process involving (i) harvesting the organisms in situ (basically seaweed and sponges under the CRISP Programme); (ii) sorting and identifying them; (iii) extracting and sifting the substances; and (iv) conducting activity tests on the substances (eg for potentially anti-inflammatory or anti-malarial properties, as in the case of CRISP) before considering their use on an industrial scale, which cannot be achieved until 12 to 15 years after the organisms have been harvested. For these reasons, in addition to providing support to reef organism harvesting and marketing, CRISP places importance on improving the legal framework in the countries that own this natural heritage to ensure the financial benefits are equitably shared, particularly where long lead-in times apply.





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KNOWLEDGE AND EXPERIENCE DISSEMINATION

Part 1: International meetings

► BACKGROUND

CRISP aims at integrating sustainable coral reef projects that, although based on Pacific field work, may have regional and, if possible, global spin-offs. For this reason, the Programme accesses a number of dissemination avenues for the knowledge and experience it acquires. Dissemination is achieved first and foremost through involving a large number of Programme stakeholders in international symposiums and workshops related to coral reefs. The second means is Internet, whether through the Pacific Reefbase portal or the CRISP website on which documents, particularly concerning methodology tools developed under the Programme, are regularly posted and made available to the general public and professionals. Finally, the Programme develops specific tools stored on various media (manuals, CDs, DVDs, etc) or circulated through different networks, depending on the circumstances.

■ BRIEF REVIEW

CRISP took part in international meetings as from mid-2005, essentially through the Programme Manager who attended the first International Marine Protected Area Congress in Geelong, Australia, in October 2005, the World Marine Technology Conference (WMTC) in London, UK, in March 2006 and the GECOREV (collaborative natural resource and environment management) symposium in Saint Quentin, France, in June 2006. The Programme Manager also took part in International Coral Reef Initiative (ICRI) meetings held in April 2005 in Mahe, Seychelles, November 2005 in Koror, Palau and October 2006 in Cozumel, Mexico. This perseverance was rewarded with an independent seat on ICRI, as a French satellite entity, and ICRI "network" status on a par with ICRAN and GCRMN (Global Coral Reef Monitoring Network). The first significant attendance by CRISP partners (ie

CRIOBE [French island research centre and environmental observatory] USP, FSPI, IFRECOR and SPREP) at an international meeting occurred at the 3rd International Tropical Marine Ecosystem Management Symposium (ITMEMS3) in Cozumel, Mexico in October 2006. It is also worthwhile noting CRISP's contribution to the French Pacific research symposium (PERF2006) in Papeete, French Polynesia, in October 2006, the BIODEC symposium in Noumea, New Caledonia, in November 2006 and the French-American-Japanese island biodiversity conservation workshop held on Moorea, French Polynesia in December 2006 under the auspices of CRISP. In January 2007, CRISP took part in the Sea of Islands regional forum organised in Hawaii, USA, by UNESCO in order to strengthen MPA development in the Pacific and the World Heritage listing of these areas.



■ LATEST PROGRESS

During the second half of 2007, a regional forum co-hosted by France and Australia was held in Townsville, Australia from 3 to 7 September to reinforce the co-operation effort towards sustainable development of coastal resources in the Pacific. In addition to the representatives of these countries, the forum was mainly attended by 12 Pacific countries, the CRISP Programme and James Cook University (JCU). The forum was structured so that the island countries could express their needs and then the French and Australian experts could suggest various possible solutions for common issues. Four areas were discussed, ie (i) marine protected areas; (ii) integrated coastal management; (iii) sustainable industries; and (iv) governance. CRISP partner presentations are listed in table opposite and the other presentations as well as the Forum recommendations, which several on-going projects in the Pacific should adopt, can be downloaded from the CRISP website, ie www.crisp-online.net.



The European Conference on Marine Natural Products was held in Naples, Italy, from 16 to 21 September 2007 and no fewer than five results from CRISP Programme Sub-Component 2C were presented through IRD.

At least three CRISP partners attended the European Symposium on Marine Protected Areas in Murcia, Spain and presented the Programme's contributions through 6 different presentations (cf table opposite for details of all the above-mentioned projects).

It should also be mentioned that work was conducted on remote sensing by a Fijian student from the University of the South Pacific as part of a workshop held in Suva, Fiji, from 4 to 7 December 2007.

■ FUTURE PROSPECTS

In international meeting terms, CRISP's next major en-

agement is undeniably the 11th International Coral Reef Symposium (ICRS) which is scheduled to take place in Florida, USA, from 7 to 11 July 2008. The CRISP Programme was identified as an event sponsor after undertaking to raise 20,000 euros to support the attendance of a dozen researchers who contribute to the Programme. CRISP will share a stall with the Secretariat of the Pacific Regional Environment Programme (SPREP), at which it will be promoting a number of products, including the South Pacific coral reef atlas currently being finalised.

On the symposium sidelines, CRISP will be taking part in the US and Mexico subsecretariat's first meeting which is scheduled to convene in Washington, USA, in January 2008.



| Symposium | Lieu | Pays | Dates | Titre de l'exposé | Auteurs | Comp. |
|---|------------|-----------|------------------------|---|---|-------|
| Forum on the sustainable development of Pacific Coastal Resources | Townsville | Australie | 3-7 Sept. 2007 | Three experiences of post larval capture and culture (PCC) in the Indo-Pacific: technical, ecological and socio-economical observations | Galzin, R., Lecellon, G., Lipchitz, A., Majot, E., Miller, P. | C2A1 |
| | | | | Live Rock and Live Coral Trade in Fiji, Culture vs. Wild harvest, financial assessment, issues and ways forward. | C. Weus | C3A1 |
| | | | | Securing Community Livelihoods through strengthening community based fisheries management, and coral reef restoration Solomon Islands, Tivoli and Vanuatu | E. Kupeni et al. | C1A2 |
| | | | | Conserving our hidden gems | L. Heaps | C1A2 |
| | | | | Experiences of community-based PCC and coral culture in the Pacific | Tettebaum, A. | C2A1 |
| | | | | Technology and Community-based Management: Dilemma or Challenge? | JB Hemenschmidt | C1A4 |
| | | | | The CRISP programme | E. Clua | C3B3 |
| European conference on marine natural products | Naples | Italy | 16-21 sept. 2007 | Non brominated pyrrole-2 amino-imidazoles alkaloids from the Pacific marine sponge <i>Agelas</i> sp. | J. Appenzeller, C. Debitus, M.T. Martin, M.T. Adeline, J.F. Gallard, E. Tran Huu Dau, A. Zapanucha, A. Al-Mourabit | C2C3 |
| | | | | Agelasines J and K from the Solomon Islands Marine Sponge <i>Agelas</i> sp. | Appenzeller, Adeline, Martin, Gallard, Boury-Esnault, Petek, Valentin, Zapanucha, Al-Mourabit, Debitus | C2C3 |
| | | | | Pyridocidine alkaloids within purple morphs of <i>Cystodites</i> spp. (Ascidacea : Polyclonidae) | R. Bonifemp-Subielle, A. Simon-Leverot, S. Lopez-Logentil, B. Baraise | C2C3 |
| | | | | Potent anti-inflammatory active compounds from marine brown algae (Sargassaceae, Fucales) | Le Lann, Bourguet-Kordacki, Longeon, Iannou, Bousis, Payri, Debitus, Stiger-Pourreau | C2C3 |
| | | | | New non brominated pyrrole-2-amino-imidazole alkaloids from <i>Agelas</i> <i>G. mauritiana</i> Pacific sponge (conference programme) | J. Appenzeller, M.T. Martin, M.T. Adeline, J.F. Gallard, N. Boury-Esnault, J. Hooper, A. Zapanucha, C. Debitus and A. Al-Mourabit | C2C3 |
| European MPA symposium | Murcia | Espagne | 25-28 sept. 2007 | A bioeconomic approach to assess the implementation of bioeconomic approach to assess the implementation of small size marine protected areas and fishery small size marine protected areas and fishery management strategies using the ISIS management strategies using the ISIS-Fish model: the Fish model: the case of Tikehau (French Polynesia) commercial fishery: case of Tikehau (French Polynesia) commercial fishery. | Nicolas Pascal, Nicolas Mahota, Jocelyne Feraud | C2A2 |
| | | | | Contribution to the design of new marine protected areas using the Isia-Fish bioeconomic model: the case of <i>Solea vulgaris</i> and <i>Lithognathus mormyrus</i> fisheries in Gernat (Spain, NW Mediterranean) | Nicolas Pascal, Francois Maynou, Dominique Pelletier & Jocelyne Feraud | C2A2 |
| | | | | Assessing the initial state of fish assemblages to adapt monitoring protocol for managers in a network of coral reef Marine Protected Areas: the example of Moorea (French Polynesia) | Ether Emmanuelli, Jocelyne Feraud, Thierry Lion de Lama, Craig W. Deenbergh & René Galzin | C2A3 |
| | | | | Video-based observation techniques for monitoring fish and habitat in Marine Protected Areas | Pelletier D., Chabanet P., Leleu K., Langlois T., Hervé G. & Guillemot N. | C2A3 |
| | | | | A bioeconomic approach to assess the design and impacts of the creation of small size MPA using the ISIS-Fish model with NPV approach | Pascal, N., Maynou, F., Pelletier, D., Mahevas, S., Ferraris, J. | C2A2 |
| | | | | Assessing the initial state of fish assemblages to adapt monitoring protocol for managers in a network of MPAs | Emmanuelli, E. et al. | C2A3 |
| Pacific Island Countries GIS/RS User Conference | Suva | Fidji | 4th -7th December 2007 | Habitat mapping of the Coral Coast reefs, Fiji Islands | Jeanne-de Mozieres | C2A3 |



KNOWLEDGE AND EXPERIENCE DISSEMINATION Part 2: Internet

► BACKGROUND

The CRSIP Programme is co-funding the Pacific Reefbase Internet portal in equal shares with the United Nations Foundation (UNF). The portal is the regional version of the worldwide Reefbase (www.reefbase.org). The aim of the portal, developed and managed by the World Fish Centre (WFC), is to make information on coral reefs accessible to the various stakeholders, from scientific managers through to the general public. The Pacific project is special in that it capitalises on an entire so-called “grey” bibliography, ie not as yet available in the libraries of several Pacific organisations in hard-copy form, and publishes it on line. In order to achieve this, thousands of documents are being scanned, indexed, classified and posted on line. Other crucial activities involve integrating reef fishery data, which up until now have not been part of Reefbase products, and creating an on-line Pacific coral reef atlas with unprecedented resolution and accuracy. Professionals will be able to download the data layers free of charge with reef geomorphology and these can be integrated into geographical information systems. On the sidelines of the Reefbase portal, the CRSIP Programme aims at providing public access to the CRISP website, so that members of the public will be able,

among other things, to download a variety of products as the Programme advances.

■ BRIEF REVIEW

The CRISP website was created in mid-2005 after the project was launched by the January Noumea Workshop and hosted, at the time, by SPC. It was then improved and transferred to the USA in 2006 without any attempt to improve public access. The move was



followed by a spectacular increase in visits. With regard to Reefbase Pacific, the project got off to a late start due to the need to officialise a financial partnership between AFD (French Development Agency) and the United Nations Foundation (UNF). It nevertheless made significant progress in early 2007 with two further staff being recruited in Fiji and



French Polynesia to help carry out the document scanning operations. At the same time, the project manager engaged with the Pacific partners so as both to identify the major information gaps and avoid duplication with similar processes (SPC, PIMRIS and other databases). Partnerships were entered into in the shape of agreements so as to create synergies and manage intellectual property with all the organisations likely to supply information to the metadatabase.

LATEST PROGRESS

The CRISP website areas that provide online products sorted by a coordination unit after the six-monthly progress reports have been consolidated, have had the highest number of visits with no fewer than thirty downloadable documents. In addition, a growing number of websites belonging to partner organisations or projects or simply to entities conducting related activities are providing links to the site (eg www.icriforum.org). The Reefbase project has completed an initial product that will be available on line as well as distributed

shortly on a CD-ROM entitled Pacific Reefbase Version 1.0 (cf opposite). The CD offers a considerable amount

information, ie 2405 publications (2135 in English and 232 in French), 232 photos, 694 pilot site descriptions, 77 project descriptions, 177 resource person referrals, 84 organisation referrals, 2021 coral area profiles and 22 country profiles. A flyer promoting the product was printed (cf opposite) and widely distributed throughout the Pacific.



FUTURE PROSPECTS

The CRISP website will be expanding with fresh products from the second 2007 six-monthly progress reports provided by partners early in 2008 and access to information on Programme activities based on a country interface will shortly be improved. Regarding Pacific Reefbase, the main 2008 objective will be to provide on-line access to products, particularly the Pacific Coral Reef Atlas produced by Serge Andréfouët's team at IRD, which will be completed by mid-2008 with extra funding from the CRISP Programme.



MID TERM REPORT



CORAL REEF AND RESOURCE HEALTH MONITORING

► BACKGROUND

The issues related to this area are, firstly, methodological (developing techniques that are both reliable and user-friendly), secondly, related to using information on habitat (coral reef) health status to advantage and, third, linked to the associated resources, ie fish and invertebrates for consumption. The reef-health monitoring segment is essentially carried out by assisting the Global Coral Reef Monitoring Network (GCRMN) that has two data collecting and capitalisation nodes for underwater information gathered from Melanesia and Polynesia, the latter being commonly dubbed "Polynesia Mana". The first node is managed by USP from Fiji and the second by CRIIBE from Moorea with both receiving financial support from CRISP earmarked for training and practical monitoring work. In addition to the financial support provided directly to these organisations, SPREP receives funding under the AFD-UNF partnership to support GCRMN, particularly for extension work with the Coremo software package selected to standardise the simplest to the most complex undersea monitoring data, regardless of the methods used. Finally, the World Fish Centre, which oversees Reefbase Internet portal implementation, is also a stakeholder in developing Coremo and posting GCRMN results on line. Applied research into reef fishery management is being implemented by USP and IRD's UR 128 CoreUs research unit.

■ BRIEF REVIEW

Since 2005, CRISP financial support has strengthened the Polynesia Mana network with consultancies by the CRIIBE officer to Tokelau, Niue and Kiribati (Vieux 2006a 2006b 2006c). A workshop was held at CRIIBE in 2006 for the widely scattered officers from the Polynesia Mana countries who also received underwater cameras to improve their monitoring performance. At the Melanesian node, the funding was used to enable USP to produce a summary of capitalised monitoring

data as at 31 December 2004 and a quarterly newsletter (cf opposite). In 2006, a coral health assessment was conducted in Fiji (Sykes 2007), as well as temperature data collection so as to improve understanding of the effects of water warming on coral bleaching (Khan 2006). A minor study was also carried out on reef health off the Suva area (Tuxson 2006a).

With regard to resource monitoring, IRD concentrated in 2006 on improving fish counting techniques during dives (Leopold and Chabannet 2006) and the possible use of videos for the same purposes (Langlois and Chabannet 2006). A USP student produced a study on subsistence fishing in

the Fiji group (Tuxson 2006b). Both these research institutions organised a joint workshop to compare the various fish-counting methods so as better to observe the positive effects of MPAs on Fiji's fishery resources (Joint 2007).





■ LATEST PROGRESS

With regard to reef monitoring, all the data capitalised at both nodes were transmitted to the GCRMN officer in late 2007, who then incorporated them into the worldwide report on coral reefs to be published in 2008. The last exercise of this nature was conducted in 2004. At the Melanesian hub, a training workshop was organised by USP in November 2007 involving the Solomon Islands, Samoa and Tuvalu (Yakub 2008). The University also conducted a consultancy to the Solomon Islands as part of a damage assessment exercise following the latest tsunami (Morris 2008).

The resource management support area also made progress, publishing several studies on indicator identification (IRD, Leopold 2007), improved perception of coral habitat characteristics (USP, Roelfsema 2007) and the relationship between fish within the habitat (USP, Saladrau 2008). At the same time, a French student began work at IRD on a thesis covering both New Caledonia and Vanuatu and aimed at improving understanding of the environmental impact of invertebrate harvesting (IRD, Jimenez 2008). USP also began a partly CRISP-funded survey on an unprecedented scale involving a questionnaire covering 1500 households to measure the catch per unit of effort in subsistence fishing.

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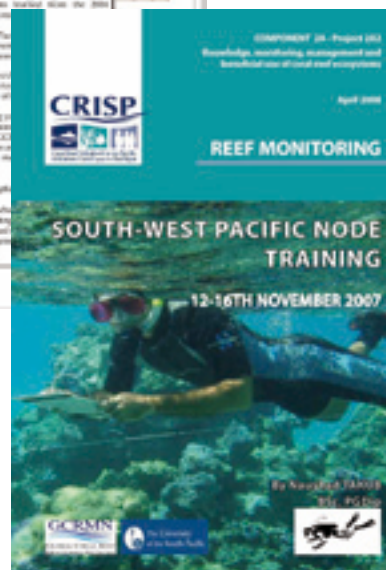
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MID TERM REPORT



DECISION-MAKERS AND STAKEHOLDERS AWARENESS

► BACKGROUND

Awareness of all coral reef conservation stakeholders is a major area for the Programme, which provides substantial financial support to a partner that has been clearly identified as a leader in the field, namely SPREP. As stakeholders vary in nature, the messages and resource materials should be specifically tailored to needs. Although standard awareness approaches for the general public should be used, issues relating the coral reef economy also need to be dealt with, as audiences such as political leaders and donors would generally be more attentive to the financial aspects than to simple environmental considerations. SPREP is therefore relying on designing and extending MPA social and economic monitoring in a Pacific-adapted package known as SEM-Pasifika, developed in partnership with NOAA, an American agency. Although SPREP is undeniably a leader in the field, this does not exempt the other technical stakeholders in the various Programme components from their contractual obligation to communicate and return information themselves. IRD has, therefore, specifically set up a subcomponent-2A project to test innovative general public awareness methods.

■ BRIEF REVIEW

As the methodology fine-tuning and study implementation phases required some time to carry out, results concerning the social and economic value of coral reefs were not reported on until late 2006. An initial methodology report dealing with the issue was produced by a team of IRD geographers (David *et al* 2007). It aroused such international interest that the co-ordination unit plans to translate it into English

to make it available to as many people as possible. At the same time a USP, Fiji, environmental economist produced a study on the TEV (total economic value) of the Navutulevu MPA located on the outskirts of the Suva area (O'Garra 2007). Partly funded by CRISP, USP also produced a report on the economic potential of traditional fishing areas (*Iqoliqoli* in Fijian) in tourism (Korovulavula *et al* 2007) in response to the Fijian government's concern to complete legislation for the harmonious co-existence of the holiday industry and traditional coastal resource management. It should be noted that this study is complementary to CRISP's main emphasis on ecocertification (cf section on reef resource marketing).

■ LATEST PROGRESS

In late 2007, the SPREP officer took part in an *in situ* test on a PNG SEM-Pasifika methodology site (Vieux 2008a). Economic considerations remain central to





the Programme and, during the first half of 2008, the co-ordination unit produced the terms of reference for a CRISP Economic Task Force that will meet for the first time in May 2008 during a workshop dealing with MPA economies (Pascal *et al* 2008). The workshop will seek to define a methodology and select sites for conducting economic studies so as to, at least partially, respond to questions raised with regard to MPAs' economic effectiveness. Following a sampling campaign in 2005 and a valuation exercise in 2006-2007 involving the marine invertebrates collected, in terms of both taxonomy and the potential isolation of active marine substances (AMSs), IRD's UR 152 research unit organised an information feedback mission to Honiara in March 2008 (Payri *et al* 2008). In the meantime, the IRD UR 128 research unit has almost completed a DVD for the general public, partly with CRISP funding, on how coral ecosystems function,. The highlight in this area is, however, SPREP's launching of Pacific Year of the Reef (PYOR2008) as part of an ICRI worldwide campaign (Vieux 2008b). SPREP raised USD 50,000 for the event, which is being co-funded by AFD (USD 30,000) and UNF (USD 20, 000). The campaign was officially launched in Vanuatu in March 2008 with logistic and institutional support from the French Embassy in Port Vila. The SPREP-run campaign consists of a regional junior and senior secondary school contest for all Pacific countries with the juniors competing to produce a comic strip and the seniors to

suggest reef conservation measures, some of which will be funded after the contest.

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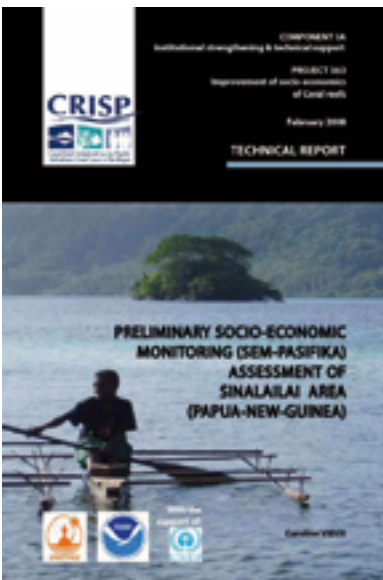
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MID TERM REPORT



NETWORKS, INSTITUTIONAL LINKS AND PARTNERSHIPS

► BACKGROUND

CRISP's very philosophy is based on mobilising existing stakeholders and providing them with the financial ability to undertake joint projects and establish partnerships. The objective appears quite innovative on the Pacific scene, where the French-speaking world needs to open up to its English-speaking neighbours. In addition to overcoming these language-based issues, CRISP endeavours to promote unique synergies between institutions, including NGOs, research organisations, technical government agencies and private consultancy firms. This partnership-oriented approach, driven by France, extends to the region's developed countries, such as Australia and New Zealand first and foremost, but also to a lesser extent Japan and the USA. It also involves aid donors with the Programme co-ordination unit being tasked with identifying financial partnerships. As it is regional in its scope, the Programme covers both English and French-speaking countries and territories. The Programme's legitimate institutional window onto Pacific countries and territories is SPREP. With regard to French territories, IFRECOR's local committees are special partners for the Programme and, conversely, CRISP acts as a valuable go-between for these committees and the outside, English-speaking world. Also, SPREP receives specific UNF funding to strengthen this inter-government body's activities within French territories.

■ BRIEF REVIEW

With regard to CRISP's stated aim of entering into international partnerships, joining ICRI immediately after the Programme's inception in 2004 proved a valuable asset. Attached to the French delegation up until late 2005, the Programme attained the special status

of an "ICRI-label network" in 2006, achieving international recognition. As the Programme Manager regularly attended ICRI's biannual meetings, discussions were initiated with other institutions and partnerships were set up. Most of these involve the World Bank's CRTR project for reef restoration (cf section on reef ecosystem management), the international Reefcheck network for coral reef monitoring with a network being set up in French Polynesia (Lagouy 2006 and 2007) and the American government agency, NOAA, for the



France-Australia bilateral meeting during the Washington ICRI reunion in January 2008. From left to right: E. Clua (CRISP), D. Souter (RRRC-Australia), R. Reichelt (GBRMPA-Australia), SE P. Vimont (French Ambassador in Washington).

social and economic monitoring of the SEM-Pasifika MPA (cf section on stakeholder awareness). CRISP also undeniably owes Australia's plan to contribute to the Programme, announced in 2005 and implemented in late 2007 after a French-Australian mission to Noumea in January 2007, to its involvement in ICRI.



In addition to the co-ordination unit's efforts, CRISP's technical stakeholders entered into partnerships within their specialised areas that gave priority to ventures between French and English-speaking entities, as specified in tenders called by AFD in 2003, as well as to Pacific small island countries who are the only states eligible for French government grants. As a result EPHE and IRD worked closely with USP, leading, for example, to permanent joint thesis supervision arrangements between USP and the University of Perpignan, France. In late 2006, these two stakeholders organised a workshop on island biodiversity un-

was a useful time of discussion and stocktaking, particularly for aid donors (Clua 2008). The Forum also provided an opportunity for collaboration between countries and technical partners that are gradually bearing fruit, particularly with a funding application to WEF through the ADB for approximately M\$ 4.5 for 5 Western Pacific countries, ie Palau, FSM, Solomon Islands, PNG and Vanuatu to fund integrated coastal management projects with joint technical support from CRISP and Australia's RRRRC. Both bodies met with a team of ADB consultants who were in Vanuatu in March 2007



Franco-Australian symposium in Townsville – September 2007

der the auspices of CRISP and in partnership with the University of the Ryukyus, Japan, and the University of California, Berkeley Campus, USA, foreshadowing scientific partnerships.

The MPA implementation area (Programme Component 1) gave rise to several partnerships, particularly between the French IFRECOR committees and other Pacific countries. One of the projects of this component managed by the FSPI regional NGO received funding of 300,000 euros specifically for exchanges between countries. An initial exchange in late 2007 involved a trip by Solomon Island resource people to Mystery Island, Vanuatu.

Finally, the officer in charge of implementing CRISP projects within SPREP travelled to three French overseas countries and territories and undertook work funded by CRISP.

■ LATEST PROGRESS

The highlight of this area has undeniably been the 2007 Townsville Forum on sustainable coastal resource management in the South Pacific co-funded by Australia and France (cf section on international meetings). The forum provided an opportunity to a dozen island countries to set their priorities in this area. This

as part of the design phase for this project that will be picking up on current CRISP endeavours in these countries and possibly extending them to the other countries involved.

ICRI's latest meeting in Washington in January 2008 received the special attendance of Mr Christian Estrosi, the French Minister of Overseas Countries and Territories who came to express France's particular concern for coral reefs, as signalled, inter alia, by New Caledonia's current application for UNESCO heritage listing, and France's interest in taking part in the ICRI Secretariat after the US-Mexican joint tenure, which is set to expire in mid-2009. The meeting was an opportunity for the CRISP Programme Manager, who had been invited by the Australian delegation to a bilateral meeting with the French delegation, to bring the quality of CRISP's involvement and the role it played internationally in the Pacific region to the Minister's attention.

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TRAINING AND INSTITUTIONAL STRENGTHENING

► BACKGROUND

Training and institutional strengthening are a priority for the CRISP programme, in order to answer to the strong pressure for permanence and persistence of actions after the end of financings. Two strong axis must be differentiated:

- on one hand, **technical trainings** and institutional strengthening for Pacific countries nationals through workshops held as part of the programme, on proper funding, but also and often through co-funding.
- on the other hand, the **training of students**, by favouring exchanges allowing French students to be trained in English-speaking structures, especially the University of South Pacific (USP), and students from the Pacific to be trained into French-speaking structures, often in mainland France.

This chapter describes preferentially the second axis, knowing that technical trainings targeting in priority technicians more than students are treated further down, depending on the themes addressed (for instance the monitoring of coral reefs state of health which is particularly dynamic in terms of trainings offered).

■ BRIEF REVIEW

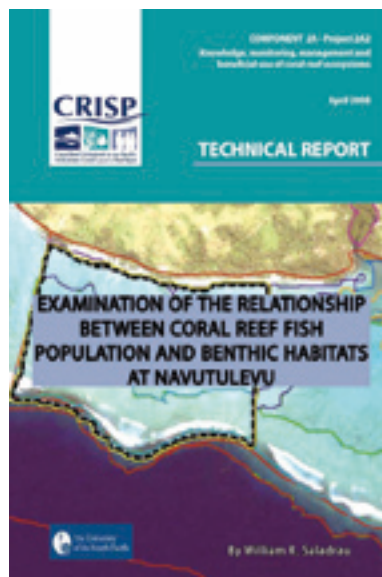
The synoptic chart (opposite) synthetizes all the students trainings ran between 2005 and the beginning of 2008. In 2006-2007, 18 students were formed as part of programme. Eight of them were French-speaking, while 10 came from English-speaking countries of the Pacific, Fiji being the most frequent origin.

Among these trainings, 3 thesis, which are long and costly trainings (3 years) deserve special mention. A French student from EPHE has been positioned at USP to accomplish a job on the optimization of re-sowing methods of reef fish post-larvae in their natural environment (to compensate for the fall in grown-up fish populations). A framework agreement was signed between USP and the University of Perpignan, to which the EPHE student depends administratively, in order for the degree to be simultaneously recognized by both institutions. This anchoring of EPHE within USP allowed in addition the realization of several Master training courses of French students, made possible thanks to the partnership between EPHE, IRD (UR128) and USP within the component 2A of the CRISP programme. The component 2C implemented by IRD (UR152) is also the other very active provider of crossed trainings, to the main benefit of the Pacific countries students. Hence, two USP students are accomplishing a thesis since 2007 in mainland France, thanks to CRISP funding, supplemented by co-funding from IRD and the Embassy of France in Fiji. A post-doc, 3 masters and a professional training are

also to be credited to component 2C between 2005 and 2007.

■ LAST PROGRESS

CRISP funding allowed the creation of ten new trainings in 2008, one of which is the thesis of a French student working, within component 2A and under IRD (UR128) supervision, on the impact of reef invertebrate exploitation both in New Caledonia and Vanuatu.



SYNOPTIC TABLE OF THE STUDENTS TRAINED WITHIN THE CRISP PROGRAMME FRAMEWORK (up to the 31st of January 2008)



| Diploma | Year | Comp. | Title | Student | Country |
|---------------------|------|--|---|--------------------|---------|
| Post-doc | 2006 | 2C4 | Taxonomie des algues de Santo (Vanuatu) | Antoine N'Yeurt | USP |
| PhD | 2006 | 2A1 | Coral reef fish post-larvae stock enhancement in South Pacific | Julien Grignon | France |
| | 2007 | 2C4 | Antimalaria alkaloids from a solomon island Haliclona sponge | Luke Mani | USP |
| | 2007 | 2C4 | Isolement de métabolites secondaires marins bioactifs à partir des éponges des îles Salomon | Kirti Patel | USP |
| | 2008 | 2A2 | Impacts écologiques de l'exploitation des invertébrés marins dans le Pacifique sud: approche écosystémique de la pêche à pied des récifs coralliens | Jimenez | France |
| Master 2 | 2006 | 2A3 | Suivi des Aires Marines Protégées de Moorea: mise en place d'un protocole de suivi impliquant des volontaires | Esther Emmanuelli | France |
| | 2006 | 2A3 | Rotuma Coral Reef Conservation Project III | Teri Tuxson | USP |
| | 2006 | 2C3 | Recherche de nouveaux principes actifs antipaludiques dans des spongiaires des Iles Salomons | Vincent Suau | France |
| | 2006 | 2C3 | Connaissance chimiotaxonomique du genre Turbinaria et Etude des composés de défense de différentes espèces de Sargassacées des Iles Salomon (Pacifique Sud) | Klervi Le Lann | France |
| | 2007 | 1A4 | Création d'un SIG permettant l'analyse croisée des données spatialisées à Efate (Vanuatu) | Nicolas Hans | France |
| | 2007 | 1A4 | Comparison of classification methods (SPOT images) for land cover mapping in Efate (Vanuatu) | Valérie Laurent | France |
| | 2007 | 1A4 | Développement méthodologique et spatialisation du risque hydrique à Efate (Vanuatu) | Maxime Fossey | France |
| | 2007 | 2A1 | Determination of the distribution of coral reef fish larvae versus the distribution of zooplankton in Laucala Bay | Arpana Pratap | USP |
| | 2007 | 2A1 | Development of multispecific post-larval fish rearing approach in aquariums | Sophie Vermond | France |
| | 2007 | 2A3 | Determining Thermal stress using indices: sea surface temperature anomalies, degree heating days and heating rate to allow for-casting of coral bleaching risk | Zahidah Afrin Nisa | USP |
| | 2007 | 2A5 | Impact de la pêche sur les agrégations de ponte pour la vulnérabilité des stocks de poissons récifaux | Shital Swarup | USP |
| | 2008 | 2A2 | Quantifying the gross financial effect of having Marine Protected Areas (MPAs) in three i qoliqolis that use Locally Managed Marine Area (LMMA) Network management tools. | Rusiate Ratuniata | USP |
| | 2008 | 2A3 | Examination of the relationship between coral reef fish population and benthic habitats at Navutulevu | William Saladrau | USP |
| | 2008 | 2A3 | Modelling spatial patterns of coral reef fish community: case study of the Coral Coast, Fiji Islands | Jeanne de Mazières | USP |
| | 2008 | 2A4 | Elaboration d'un système d'information sur les récifs coralliens accessible sur internet, Réalisation des modules d'import et d'export des données | Bargetto Julie | France |
| | 2008 | 2C3 | Recherche et caractérisation de molécules potentiellement antiinflammatoires chez l'éponge marine Xestospongia Cf testudinaria | Mélanie Roue | France |
| 2008 | 2C4 | Pharmacochimie et chemotaxonomy of marine sponges of the Dysidea species | Mayuri Chandra | USP | |
| Master 1 | 2006 | 2C3 | Variations interspécifiques des composés phénoliques chez des sargasses des îles Salomon (Pacifique Sud) et test de leur activité antibactérienne | Marie Lhuillery | France |
| | 2007 | 2A2 | Spatial Modelling Of Reef Fish Community Features Of Four Fijian Reefs Regions : The Coral Coast, Northen Kadavu, The Great Sea Reef And Lau Group | Jeanne de Mazieres | USP |
| | 2007 | 2A2 | Utilisation de la perception des pêcheurs dans la gestion participative des ressources : étude du cas de Navakavu | Antonin Hubert | France |
| | 2007 | 2A3 | Integrating Traditional Knowledge and High Tech Geographical System – Using Qoliqoli resource owners' knowledge to demarcate habitat boundaries in their own Custodian Areas | William Saladrau | USP |
| Professional Master | 2006 | 2A2 | Apport des systèmes d'information géographique pour une gestion spatialisée des écosystèmes coralliens; Cas de la pêche au crabe de palétuvier dans la zone de Voh (Nouvelle-Calédonie) | Jérémy Bailleul | France |
| | 2008 | 2A5 | Impact du CO2 anthropique sur les coraux, Master «Environnements Méditerranéens et Développement durable» | Anne-Cécile Naudan | France |
| Short Training | 2006 | 2C4 | Taxonomie des algues des îles Salomon | Reuben John Sulu | USP |



Component 1A

Marine Protected Areas and coastal Integrated Coastal Management



Component IA1: Marine conservation strategy planning



Component IA2: Marine Protected Areas



Component IA3: Networking and institutional strengthening



Component IA4: Integrated coastal management and watersheds



HAWAII (US)
HAWAÏ (É.-U.)

Johnston (É.-U.)



Component 2 Knowledge, restoration, management and development of coral reef ecosystems



Component 2A: Knowledge, development and management of coral reef ecosystems



Component 2B: Coral reef restoration



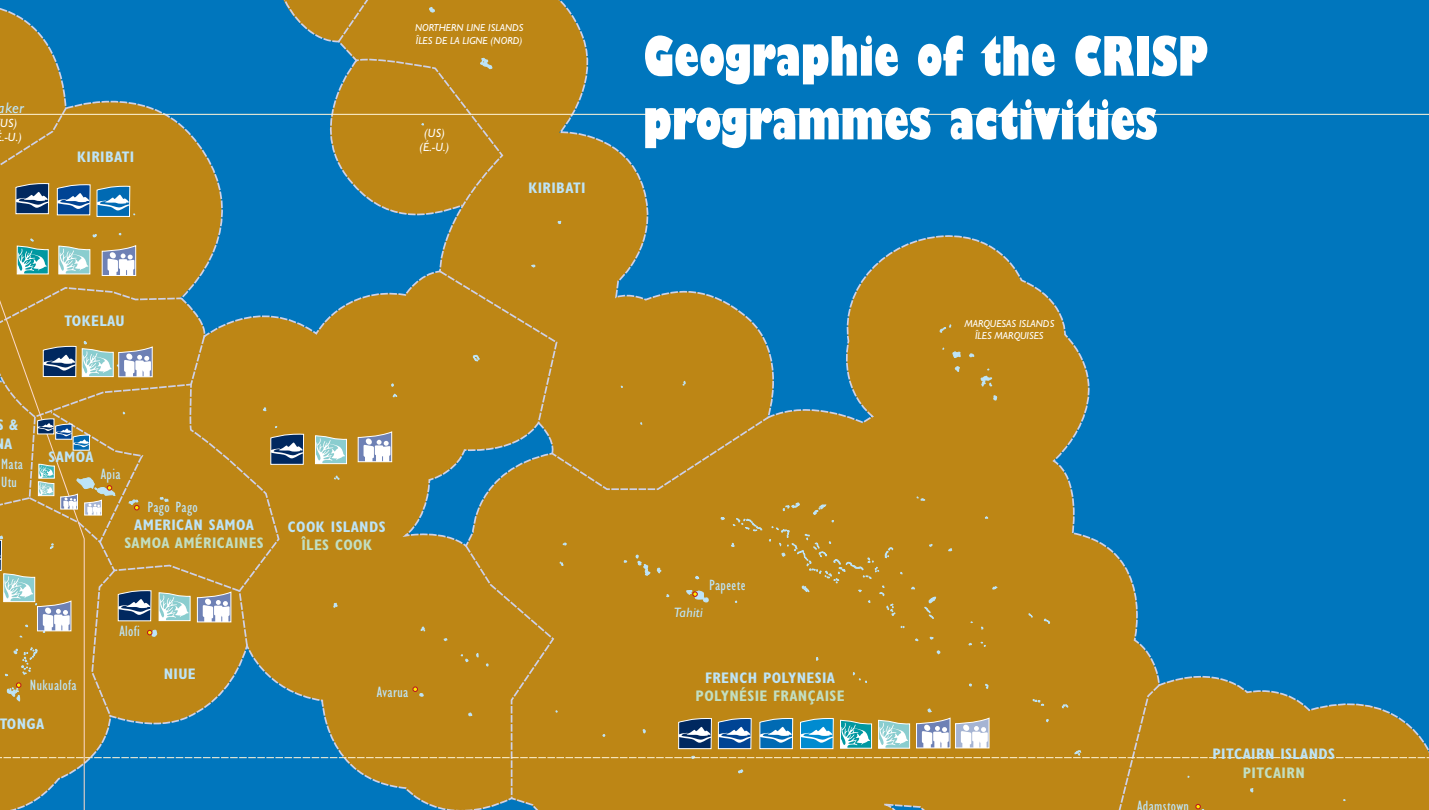
Component 2C: Development of Marine Active Substances



Component 2D: Implementation of a regional database (Reefbase Pacific)

PACIFIC OCEAN
PACIFIQUE

Geographie of the CRISP programmes activities



Component 3 Coordination and Promotion of the Programme



Component 3A: Lessons learned, development and dissemination of the CRISP programme outputs



Component 3B: Coordination, promotion and development of the CRISP programme

International Date Line - La ligne de changement de date
MONDAY LUNDI
SONDAY DIMANCHE



MAIN TECHNICAL PARTNERS OF THE PROGRAMME



PROTECTED MARINE AREAS AND WATERSHEDS



Goal: to associate community based management, strategic analysis of marine resource conservation and integrated coastal management to reinforce the sustainable development of coral reefs in the South Pacific.

- Financial partners : AFD, FFEM, CI, WWF- France, IFRECOR, French Pacific fund.
- Direct technical partners : CI, WWF-France, WWF-South Pacific, FSPI, CIRAD-Forêt, IRD, IFRECOR PF, ASMPA (Samoa), Pro-Science.
- Indirect technical partners : users and local populations, Environment Service (W&F), PTPU, UPF, PF Gouvernement, Provinces, DTSI (NC)


MARTEL François
 Conservation International
 SPREP, PO Box 240 - Apia
 Samoa Occidentales
 Tel : (685) 21593
 Fax : (685) 21593
 fmartel@conservation.org

INSTITUTIONAL AND TECHNICAL SUPPORT, LESSONS LEARNED AND DISSEMINATION




COMPONENT 3A



Goal : institutional and technical support to the programme technical partners, integration, lessons learned and dissemination of the information (data, approaches, methods and know-how) obtained within the programme.

- Financial partners : AFD, UNF
- Direct technical partners : UNEP, SPREP
- Main collaborators : ICRAN, WFC, CPS, EPHE-CRIOBE, USP, South Pacific governments and populations.


VIEUX Caroline
 SPREP/PROE APIA
 PO Box 240, Apia - Samoa
 Tel : (685) 21929
 Fax : (685) 20231
 carolinev@sprep.org

KNOWLEDGE, MANAGEMENT AND USE OF REEF ECOSYSTEMS



COMPONENT 2A



COMPONENT 2

Objet : Améliorer la connaissance, le suivi, la capacité à gérer et la valorisation des ressources des écosystèmes afin d'assurer un développement durable des récifs coralliens.

- Financial partner : AFD
- Direct technical partners : EPHE-CNRS, IRD, USP
- Main collaborators : CPS, ECOCEAN, ENSAR, French Polynesia Fisheries, Islands resorts, users and local populations.

GALZIN René
UMR 5244 CNRS-EPHE-UPVD
52 av. Paul Alduy - F 66 860
Perpignan
Tel : (33) 4 68 66 20 55
Fax : (33) 4 68 50 36 86
galzin@univ-perp.fr



RESTORATION OF CORAL REEF ECOSYSTEMS

COMPONENT 2B

Goal : to contribute to concrete coral reef ecosystem restoration techniques and their dissemination in order to promote healthy functioning and lasting production.

- Financial partner : AFD
- Direct technical partners : SPI-INFRA, FSPI, PCDF
- Main collaborators : users and local populations.

Sandrine JOB
SOPRONER-GINGER
Imm. «Oregon», 1 rue de la République
BP 3583 - 98 846 Nouméa Cedex, N-C
Tel : (687) 28 34 80 • Fax (687) 28 83 44
sandrine.job@soproner.nc

DEVELOPMENT OF MARINE ACTIVE SUBSTANCES

COMPONENT 2C



Goal : to contribute to the knowledge and use of coral reef ecosystem benthic invertebrates possibly source of marine active substances with pharmaceutical potential.

- Financial partners : AFD, IRD
- Direct technical partners : IRD UMR 152 (sites de Nouméa et Toulouse), et UMR 7138 (site de Nouméa)
- Main collaborators : USP (Suva), Queensland Museum (J. Hooper), CNRS (ICSN, Gif-sur-Yvette), Nantes, Brest and Perpignan Universities.

DEBITUS Cécile
IRD - UMR152 - Univ. P. Sabatier, Toulouse III
Faculté des sciences pharmaceutiques
31062 Toulouse cedex 9 - France
tel : 00 33 (0)5 62 25 98 11
fax : 00 33 (0)5 62 25 98 02
cecile.debitus@ird.fr

DEVELOPMENT OF REEFBASE FOR THE PACIFIC

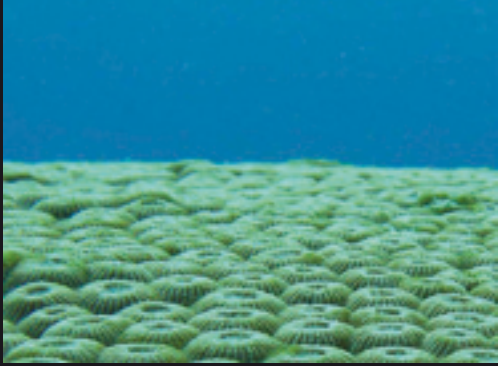
COMPONENT 2D

Goal : REEFBASE PACIFIC database. Promote the access to information and its dissemination as a tool for a better management and coral reef ecosystem conservation strategy.

- Financial partners : AFD, UNF
- Direct technical partners : UNEP, WFC
- Main collaborators : ICRAN, GCRMN, SPC, PROE, EPHE-CRIOBE, USP, IRD

TEWFIK Alexander
CGIAR/WFC
Jalan Bahu Mangg, Bahu Mangg,
Bayan lepas 11960 Penang, Malaysia
Tel : (60) 4 6261606
Fax : (60) 4 6265530
a.tewfik@cgiar.org





Summary

This mid-course report evaluates the results obtained within the programme by regrouping them according to eight distinct themes which are:

- Enhancement of scientific knowledge
- Coral reef ecosystems applied management
- Economic use of reef resource
- Dissemination of knowledge and lessons learned
- Monitoring of coral reef state of health and resource
- Increasing awareness of stakeholders and users
- Creation of institutional links and networks
- Training and institutional strengthening

In terms of **scientific progress**, a report was produced by the two scientific advisers of the CRISP programme, online on the Internet site: www.crisponline.net.

Concerning **ecosystems applied management**, the CRISP programme either contributed to the set up or the support of around thirty Marine Protected Areas (MPA), in 12 different countries, one of which is the worldwide biggest MPA (460,000 km²) in Phoenix Islands archipelago (Kiribati). At the same time, two eco-regional analysis aiming to identify the zones to be protected in priority, were launched in New Caledonia, French Polynesia (ongoing) and at a regional scale (ongoing). Two pilot sites of reef restoration work were created in Motoriki Island (Fiji) and Funafuti Island (Tuvalu), and a technical manual on transplant methods was published in partnership with a World Bank project. A process of applied governance was launched in Vanuatu, involving all the social actors and combining land and marine actions, to serve as an example for the rest of the Pacific.

The **use of reef resource** has been supported through two strong axis of the programme. The first one concerns the installation of alternative sustainable fisheries markets based on the capture and culture of reef fish post-larvae (PCC) re-usable for the re-sowing of lagoons, aqua-farming or else the lucrative aquarium market, as a supplement to the products originating from the capture of adult fish. The second one concerns bioprospection, based on the collect of invertebrates gathered in the Solomon Islands and Fiji, from which Active Marine Substances (AMS) with potential therapeutic properties are extracted. If the programme contributed to isolate several promising molecules, it also allowed notable progress in taxonomy with the identification of several new kinds of seaweeds and the writing of proposals to modify legal texts in three countries of the Pacific (Solomon Islands, Vanuatu and Fiji), in order to improve the distribution of the potential benefits generated by this

applied research, knowing that dividends await between 12 and 15 years, from the date of collect in situ.

The **dissemination of knowledge and lessons learned** by the programme happened in two ways: through the participation to international conferences and symposia, on one hand, and the development of an internet site, on the other hand.

The year 2007 saw an important recrudescence of scientific **communications in scientific symposia** worldwide, from Okinawa (Japan) in June with the Pacific Sciences Congress, to Murcia (Spain) in September, where was held a European symposium on Marine Protected Areas, via Naples (Italy) who welcomed the "European Conference on Marine Natural Products" at about the same period. In the meantime, the programme coordinator regularly participated to the meetings of ICRI (International Coral Reef Initiative), where he promoted CRISP in its "middle-man" role between France and Australia during the meeting of January, 2008 in Washington (USA).

On the internet front, the programme site recorded a growing interest proportional to the number of products put online.

Monitoring of coral reefs state of health continued through the support to both nodes, respectively Polynesian and Melanesian, of the global monitoring network (GCRMN). This support allowed the regular publication of a newsletter by the University of South Pacific, as well as several technicians training workshops on underwater monitoring methods.

Hence, the programme will greatly contribute to the quality of the **information relative to the Pacific**, included in the 2008 synthesis of the manual "Status of coral reefs of the world" published by the Australian Clive Wilkinson.

In terms of **stakeholders and users awareness**, the accent was put on the production of economic data proving the interest of MPAs as reef ecosystems management tools. PROE launched the year of the coral reefs in the Pacific (PYOR2008), entirely funded by CRISP.

In the **institutional links** chapter, a Franco-Australian collaboration materialized through the co-organization of a forum on coral reef resources sustainable management, Townsville (Australia), in September 2007, to which 12 countries of the Pacific participated.

Concerning **training and university exchanges**, a total of 28 students, 15 originating from the Pacific and 13 from France, have followed a curriculum leading to a degree since 2005 (4 of whom were PhD thesis).