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Coral Reef InitiativeS for the Pacific
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CRISP Coordinating Unit

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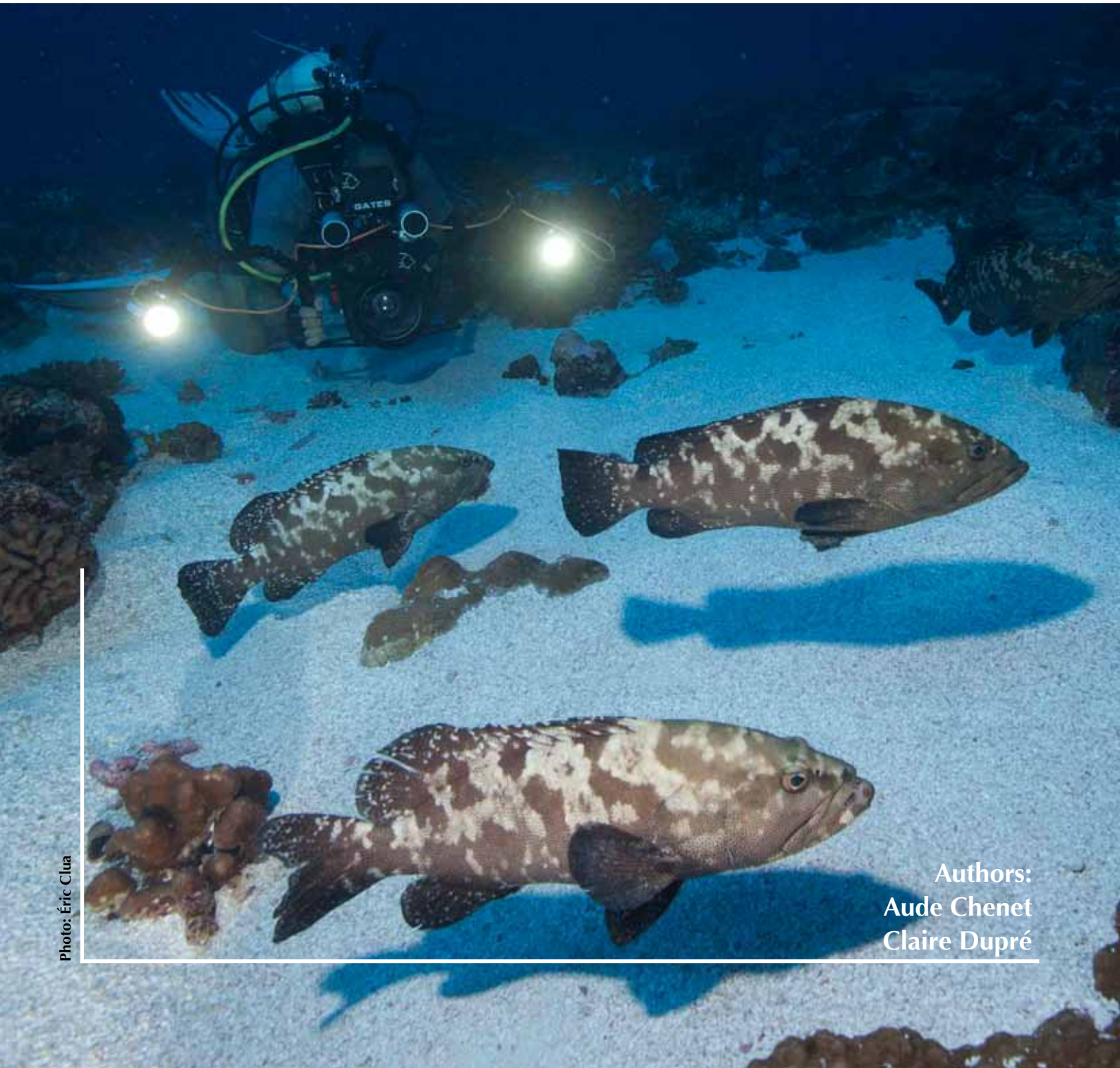

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CRISP HIGHLIGHTS AS OF MID-2009 TO END-2010

▶ THE REGIONAL CONFERENCE ON PACIFIC MARINE MANAGED AREAS

Regional conference on Pacific MMAs: In partnership with IUCN and the French Agency for MPA, the CRISP program has been supporting the regional conference on Pacific MMA, funding the attendance of Pacific Islanders; this workshop held in Moorea (French Polynesia) (15-19 november 2009) has been an occasion for major stakeholders from Pacific Island communities, government bodies and CROP agencies to exchange experience and strengthen links and partnership in the overall objective of Marine Managed Areas Management. Facilitated by specialists in this field, one major focus of the workshop was a governance session that led to valuable outcomes, based on discussions between many stakeholders and people involved into the management of MMAs. .

▶ CRISP ECONOMIC WORKSHOP

The final CRISP Economic Workshop "Investing in coral reef: is it worth it?" took place from the 22nd to the 26th of December 2010. Coorganized by SPC, IUCN, SPREP and IRCP, it was attended by 20 experts in the field of Economics, targeting at (i) validating the methodologies of past economic valuation made in the Pacific (ii) improving the adequacy between economic studies and need for decision making processes in the Pacific and, (iii) and finally evaluating potential mechanisms for coral reef ecosystem services payment and their appropriate management.

CRISP Economic workshop participants at SPC headquarters in Noumea, New Caledonia

Global Change Biology

Extreme climatic events reduce ocean productivity and larval supply in a tropical reef ecosystem

▶ SCIENTIFIC PUBLICATION: EXTREME CLIMATIC EVENTS REDUCE OCEAN PRODUCTIVITY AND LARVAL SUPPLY IN A TROPICAL REEF ECOSYSTEM

In the context of global warming, this major publication from the CNRS-EPHE, CRIOBE and university of Perpignan study published in Global Change Biology, funded under the CRISP programme, is focusing on climatic event evolution and its impact over environmental conditions and effect over coral reef fishes population.

Reference: Lo-Yat A., Simpson S.D., Meekan M., Lecchini D., Martinez E. & R. Galzin, 2010. Extreme climatic events reduce ocean productivity and larval supply in a tropical reef ecosystem. Global Change Biology doi: 10.1111/j.1365-2486.2010.02355.x.

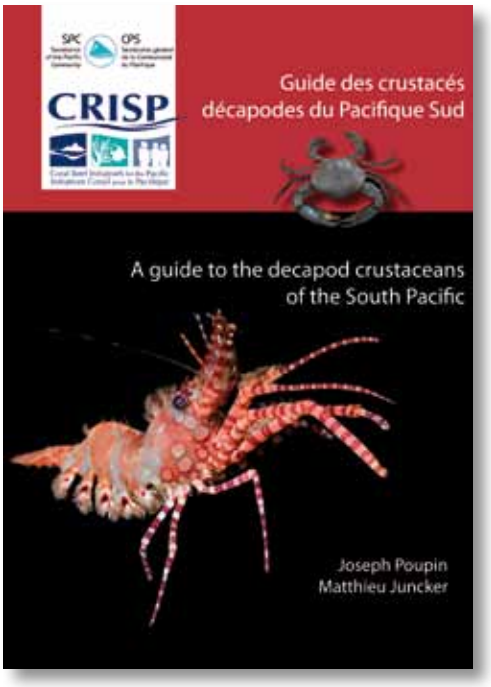
▶ SPREP-SPC JOINT BIODIVERSITY SURVEY IN CHESTERFIELD REEFS - CORAL SEA

In August 2010, a scientific expedition took place in the northest part of New Caledonian lagoon. This field trip has been a major event to gain quantitative and qualitative data and knowledge over an unknown resource into a very strategic area for New Caledonia. Indeed, in March 2010, the New Caledonian government has been signing an agreement with the French as well as Australian government to establish collaborations over the management of the Coral Sea. This study therefore contributes to this collaboration through the acquisition of knowledge.

Reference: Clua E., Gardes L., McKenna S., Vieux C. (eds), 2011. Contribution à l'inventaire biologique et à l'évaluation des ressources des récifs de Chesterfields : contribution to the biological inventory and resource assessment of the Chesterfield reefs. –Apia, Samoa : SPREP. 264 p.

▶ POST-LARVAL CAPTURE AND CULTURE: THE MOVIE

CRISP major development axis: PCC remains a major topic for the CRISP programme. After several research studies conducted on this topic on technical as well as economics aspects, this technique was further implemented in French Polynesia, New Caledonia and in the Federated States of Micronesia. Work focused on the improvement of the technique itself but also on the development of PCC products trade in the region. Further funding from FFEM will be until 2012 allocated to support the sustainable development of a PCC trade in the region.mainly within Pacific Island countries, in both the private and public sector. A TV movie was edited to promote this sustainable technique amongst a wide public which includes aquarium hobbyists (see cover DVD hereby).



▶ CRUSTACEAN GUIDE BOOK

Crustaceans, even when common species, are sometimes hard to identify in the field. This is the reason why, capitalizing on previous studies and publications on crustaceans, carried out in New Caledonia and Wallis and Futuna, Poupin and Juncker have been publishing a scientific guide book for general public as well specialists in this field (Poupin and Juncker 2010). This project has been possible with co-funding from the French Pacific Funds, the New-Caledonian Southern and Islands Provinces, and the Environment Observatory. More than 220 species of decapods crustaceans are described through identification cards covering their biology, ecology and geographic distribution. More than 250 copies of this guidebook have already been disseminated within the entire Pacific region in 25 countries' library and appropriate public services to be widely used.

A 318-page document published by CRISP and dispatched in several Pacific libraries in order to support the use of reef crustacean ressources in the South Pacific. Contact: Ericc@spc.int

OVERALL SITUATION

CRISP's highlight for 2010 are logically associated with the wrapping up of the programme and the preparation of the future.

The last general steering committee of the programme (CAC2009) was held in Moorea in November 2009 right after the Regional conference on MPAs which was co-organized with the French agency of MPAs and the SPREP. It was an opportnity for the several technical partners to get their final action plans approved, allowing the closure of most of the AFD funding conventions by 2010.

Technical partners involved in components 1A (Conservation International) and 3A (Secretariat of the Pacific Regional Environment Programme) were the most active during 2010.As planned, and in addition to 1) ensure the continuity of CCU, 2) provide support to Conservation International (CI) for coordinating Component 1, the additional funding of EUR 2 million from the AFD provided to SPC in 2008, was used to significantly support i) the development of coral reefs economics, ii) the management of vulnerable reef species and iii) develop sustainable alternate activities (e.g. post-larval capture and cultivation -PCC). In this context, three other sub-components (3C, 3D and 3E) were created for a better description and monitoring of the programme (see programme dashboard hereby).

After a first economic workshop held in May 2008 in Fiji, a second International CRISP economic workshop was organized in New Caledonia in November 2010. Critical informations were put together in order to better involve economics in the sustainable management of coral reefs. Regarding vulnerable species, the emphasis was put on sharks, through a partnership between SPC and the Griffith University in Australia and the CRIOBE in French Polynesia, and the conservation of spawning agregations, through a partnership with the Society for the Conservation of Reef Fish Agregation (SCRFA) and the International Coral Reef Initiative (ICRI), supported by the French government. Late but not least, the support to PCC was conducted both under the AFD funding with a complementary support from the French Global Environment Facility (500,000 KEUR). It allowed the emergence of private companies that are exporting sustainable products from this ecofriendly technique in Solomon islands, Federated States of Micronesia, Kiribati and French Polynesia, mainly in connection with US professionnals from Hawaii.

In the context of the programme ending, the editing by a French consultant of a report on "CRISP Outvomes and lessons learned" was funded by AFD by July 2010; the final product should be released in early 2011. This approach only focusing on positive outputs is complementary to the *ex-post* evaluation of the programme to be conducted during the second semester of 2011, that will also include the potential gaps of the programme. This capitalization report will be a critical tool for implementing the CRISP final round tables in as many Pacific coutries as possible. This strategy to develop in-countries roundtables was prefered to the one based on organizing a general final CRISP meeting in Noumea, not only for financial reasons, but mainly in order for the Pacific stakeholders to get a better idea about the CRISP achievements in their own country instead of a more general but less understandable vision of the outputs of the programme. Nowaday, and based on the CRISP objectives (including the promotion of links between French and English-speaking territories), four countries appear as a priority for the implementation of these roundtables by 2011: Fiji, Vanuatu, French Polynesia and New Caledonia.

In parallel of the preparation of the in-countries roundtables, the CCU will be focusing on the setting up of the final synthesis products such as a CRISP interactive DVD (see p. 28 of this report), but also on the raising of new fundings for insuring the continuation of, at least, some activities undertaken under the CRISP auspices and deserving to be followed up. The European Development Fund and other potential funding (e.g. French Global Environment Facility), represent the best potential partners in this process.

This report provides a topical overview of CRISP's recent and past gains as of end-2010, along with a synopsis of the programme's nature and effectiveness.

The CCU produces regular standardised progress reports on its different partnership. Activities are assessed using indicators quantifying the level of success both in terms of implemented means (IM) by the different technical partners and the obtained results (OR). These indicators, expressed as averages, are classified into percentage ranges: 0, 20, 40, 60, 80 and 100%. For ease of reading, the following colour coding is used (see opposite page)

AVERAGE PERFORMANCE PER PROJECT FROM EARLY Mid-2009 to End of 2010

Component	Agencies	Project	Description	Implementing agencies	Project evaluation	Component evaluation
1A	CI	1A1	Marine conservation planning	WWF, CI, SPE PF, AAMP		IM
		1A2	Support to marine protected areas	WWF, CI, FSPI, PROSCIENCE ASMPA, IFRECOR		
		1A3	Capacity building, networking, lessons learnt	CI, FSPI		OR
		1A4	Integrated coastal management	IRD, FSPI, SPREP, EPHE		
		1A5	Coordination	CI		
2A	CNRS-EPHE	2A1	Postlarval capture and culture	EPHE, UNC, USP, ECOCEAN		IM
		2A2	Reef fisheries management	IRD, USP		
		2A3	Monitoring of coral reefs	EPHE, USP, IRD		
		2A4	Extension	IRD, EPHE		OR
		2A5	CO_2 and ecotourism	EPHE, USP, TMOTM		
2B		2B1	Pilot sites (Fiji and Tuvalu)	GINGER, FSPI		IM
		2B2	Restoration guide	GINGER, FSPI, CRTR		OR
3A	UNEP	3A1	Institutional strengthening	SPREP		IM
		3A2	Support to integrated governance	SPREP, IRD		
		3A3	Economic evaluation	SPREP, IUCN, CCU, IRD		
		3A4	Access to knowledge and technologies	SPREP, WFC		OR
		3A5	Dissemination of CRISP products	SPREP		
		3A5	Development of Coremo sofware	ARVAM		
3B	SPC-CCU	3B1	Coordination, monitoring and evaluation	SPC/CCU		IM
		3B2	Promotion and communication			
		3B3	Development of the programme			OR
		3B4	Support to UNESCO			
3C		3C2	PCC in Kiribati	ECOCEAN, HSL		IM
		3C3	PCC Tropical eel in French Polynesia	CRIOBE		
		3C4	PCC in FSM	HSL, MERIP		
		3C5	PCC Tonga live rocks	SPC		
		3C6	Tahiti Eco Clam project	TEC		
		3C7	PCC: Stomatopods in French Polynesia	BEF		
		3C8	New PCC techniques	CRIOBE		OR
		3C9	Develoment of crustacean collectors	IRD, Fisheries Vanuatu		
		3C10	Marine Aquarium trade in Kiribati	SPC, Fisheries Kiribati		
		3C11	Rabittfishes in Solomon	SPC, WFC		
		3C12	Lobsters in New Caledonia	Aquaterra		
		3C13	Marine ornementals in Solomon	WFC		
3D		3D1	Shark vulnerability and conservation	EPHE, GRIFFITH, SPC		IM
		3D2	Management of spawning agregations	SCRFA, SPC		
		3D3	Coral diseases in New Caledonia	IRD		
		3D4	Coral reef vulnerability	CRIOBE		OR
		3D5	Management of Chesterfield reef resources	SPREP, SPC, AAMP		
3E		3E1	Economic studies	CRIOBE		IM
		3E2	Economic workshops	SPC, IUCN, SPREP		
		3E3	Economic publication	IDDRI		OR

Level	Color code
Very good	80-100%
Good	60-80%
Medium	40-60%
Mediocre	20-40%
Poor	0-20 %

Note: Grey colour indicates not completed projects; components such as C2C and C2D that were finalized in early 2009 are not included in this table

APPLIED ECOSYSTEM MANAGEMENT

BACKGROUND

This area covers work related to conservation and pursues four objectives:

- **Improving our understanding of marine biodiversity** and assessing its vulnerability by conducting three eco-regional analyses (ERAs): two sub-regional analyses, carried out by World Wildlife Fund (WWF) in the New Caledonian and Polynesian (French Polynesia and Cook Islands) eco-regions; and a Pacific regional analysis conducted by Conservation International (CI), which is also providing biodiversity planning support to Palau in partnership with The Nature Conservancy.
- **Providing significant financial support to marine protected areas** (MPAs) as a coral ecosystem conservation and sustainable management tool. In addition to direct support for MPAs in Samoa, the programme also supports the Foundation of the Peoples of the South Pacific (FSPI) in setting up MPAs in four Pacific island countries (Vanuatu, Solomon Islands, Tuvalu and Kiribati) and the French Coral Reef Initiative (IFRECOR) in French Polynesia and Wallis and Futuna for the development of marine area management plans. MPA support is also being provided to the Cook Islands in partnership with WWF and in Kiribati with CI.
- **Setting up a governance process** working towards integrated coastal management by combining watershed and marine area management. IRD is undertaking 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 the French consultancy firm GINGER and FSPI, setting up pilot sites in Fiji and Tuvalu.

RECENT PROGRESS AND FUTURE PROSPECTS

The ERA process led to a number of actions in New Caledonia, Polynesia and the Cook Islands. Mainly dealt with by WWF under the CRISP program, the process included consultation with local communities for the priorities in terms of biodiversity conservation and management planning. Management committees have been created and are at the stage of applying management plans designed. In New Caledonia, this overall process was initiated in New Caledonian Northern province (Mont Panié, Diahot). In the Cook Island, much of the work has been carried out by the association Proscience, producing in 2010 a document synthetising an environmental diagnostic of Aitutaki coral atoll (Egretaud 2010).

Through a technical collaboration between the French MPA Agency and WWF, the French Polynesia Eco-regional analysis was conducted between 2008 and 2009. This process was based on three thematic: a/ The functional analysis of ecosystem, mainly focusing on the ecological process, b/ the study of the natural environment, looking at habitats and species, and c/ the study of the uses and pressures, mainly over marine areas. Process steps a/ and b/ were conducted throughout a period from April 2008 until February 2009. Uses and pressures were studies during phase 2 from March 2009 until October of the same year. Finally, phase 3 consisting into a synthesis of results led to a Workshop that was held in November 2009 in Tahiti (Brugneaux et al. 2010).

Still in French Polynesia, the association of Marine Management Plan of Mooréa has been created in 2007, aiming at the sustainable management of marine resources. In 2009, United Nation Funds through SPREP was funding a study to support this association facing financial issues. An economic evaluation of the management was therefore undertaken to assess possibilities for sustaining this management plan in the future (Charles et al. 2010).

At a regional level, CI has been setting up the world largest MPA in Kiribati a 410,500 km^2 MPA: Phoenix Island protected Area (PIPA), as sister site relationship with Papahanaumokuakea Marine National Monument from North western Hawaiian Islands. Combined, those two sites encompass 25% of all MPAs on Earth. The coral reefs and bird populations of the islands are highly unique and virtually untouched by humans. Managers for both sides met in November 2009, in French Polynesia, to formalize

the agreement (NOAA 2009). It became the world's largest and deepest UNESCO World Heritage site in 2010 (Miller Taei, 2011).

FSPI has been the leader organisation in the establishment and support of community based-coastal management processes in Tuvalu, Vanuatu, Kiribati and Solomon Islands. As stated in the logical framework, the primary objective of the project conducted was to empower communities to effectively protect and manage coastal marine biodiversity and help them achieve sustainable use of marine resources to sustain Pacific coral reefs. Hugh Govan from LMMA network has been carrying some actions in partnership as part of the SPREP activities: the SLOPIC (Supplementary Livelihoods Options for Pacific Islands Communities) project led to several reports published for the communities, mainly related to natural resources management throughout an integrated island management (Govan 2011).

Again as part of the Capacity for integrated governance of coastal and marine resources project coordinated by SPREP, "With the emerging challenges posed by climate change and the need for ecosystem wide and integrated approaches, a national debate on the most effective approaches to implementation is urgently needed" (Govan et al. 2011) Based on a case study in Lau, Malaita, Solomon Islands, M. Govan then worked in collaboration with the WFC on the development and implementation of cost-effective and integrated approach to resource management along nation policy and needs.

In Samoa, Safata MPA in Samoa is managed by a local communities committee ensuring that the MPA management is following Samoan traditions (Govan 2009). The creation of a trust fund and alternatives income generation activities (tourism) allowed the MPA to be sustained financially. However, the tsunami encountered in Samoa in September 2009 affected these MPAs where much rehabilitation work had to be undertaken (MNRE 2009).

Julie Petit from the CRIOBE also contributed to increase knowledge on MPA, publishing a comprehensive bibliography on MPA in French Polynesia, Providing an overview of studies focusing on Marine Protected Areas in French Polynesia and improving access to literature produced as a result of these studies (Petit 2008). In French Polynesia, M. Petit from TMOTM (Te Mana Ao Te Moana) has been working on the adaptation of an ecotourism guide for lodges in the country originally designed through an initiative from USP Fiji (Gorchakova 2010).

The GERSA project which had been conducting most of its work under the CRISP in Vanuatu and French Polynesia, compiling information gathered on watershed dynamics and hydrological modelling as well as cultural and socio-economic value. Training of students has been and important part of this component, with Romain Gueyte and then Alban Diguer who worked respectively in 2008 and 2009 on catchment erosion (Gueyte 2008) and onto the development of Environmental Integration System for the Vanuatu department of fisheries (Diguer 2009). That information combined, the overall challenge remains to get a better knowledge of what complexity remains in each sites studied, a balance between scientific and social aspects (Herrenschmidt JB. Oral com.)

Regarding reef restoration, 17 coral reef restoration specialists were involved into the design and writing of a Reef Rehabilitation manual, downloadable into www.gefcoral.org website (Edwards et al. 2010). This manual based on case studies around the world is trying to propose several protocols to evaluate whether reef restoration is the appropriate methodology for a degraded site, and if yes, ensure the success of reef restoration (Porcher et al. 2010). In the same direction of a worldwide approach, Clive Wilkinson has been recently publishing a book based on case studies within the region on the interaction between watershed catchment and coral reefs. Based on experience of coastal managers around the world, this book as part of the GCRMN is trying to solve problems that flow from nearby catchment (watershed) areas to downstream areas, especially when coral reefs (Wilkinson et al. 2011).

The COWRIE project started under GERSA project started early 2010, with the overall objective of targeting few sites in Fiji and Vanuatu, and work with communities on the design and implementation of an integrated community based management of watershed. James Comley from USP Institute of Marine Research has been leading this project with already a fair number of training activities as well as disseminated material to raise community awareness on the impact of human on watershed (Comley et al. 2010) and their potential involvement into the process of rehabilitation (Eckert 2010) as well as management of sites (Buliruarua et al. 2010). In Fiji, in collaboration with the Fiji department of Forestry, two training manuals were developed on the importance of watershed and techniques for soil conservation (Aalbersberg 2011a) (Aalbersberg 2011b). Finally field guides related to watershed management and forestry activities were published as part of the COWRIE programme activities (Tuivawa et al. 2010a), (Tuivawa et al. 2010b), (Fenemor et al. 2010)

In the field of ecosystem community based management, PhD student Ambroise Breunier has been in 2009 conducting his research on the relevance of participatory approach for ecosystem and coral reef fisheries monitoring, conducting his work in pilots sites located in French Poly-

nesia and Madagascar trying to created a standardised methodology for developing countries (Breunier 2009).

PhD student Haizea Jimenez also supported under the CRISP started her research in 2008 on invertebrates' exploitation with an ecosystem approach to fishing. She recently took part into the publication of an article on the taxonomic sufficiency approach to detect community response to a disturbance such as anthropogenic exploitation of marine resources. Results showing that detecting changes due to anthropogenic exploitation requires different taxonomic resolutions depending on the considered habitat (Jimenez et al. 2010).

In partnership with IUCN and the French Agency for MPA, the CRISP program has been supporting the regional conference on Pacific MMA in September 2009; this workshop has been an occasion for major stakeholders from Pacific Island communities, government bodies and CROP agencies to exchange experience and strengthen links and partnership in the overall objective of Marine Managed Areas Management. One major focus of the workshop was a governance session that led to valuable outcomes, based on discussions between many stakeholders and people involved into the management of MMAs (AAMP 2010). Sessions were facilitated by specialists in this field, Hugh Govan, author of the Status and potential of Locally-Managed Marine areas in the South Pacific,

Etika Rupeni from FSPI, and Jean-Brice Herrenschmidt from IRD, who have been working in the field of governance for a long time and developed an expertise in this area. Following this conference on MPA, a workshop on participatory approach for French speaking countries has been an occasion to exchange experience from PICTs involved in LMMAs to French countries. Trained workshop participants from territorial to provincial institutions are now fully proficient into the development of participative management plan (Vieux 2009).

An international multidisciplinary training on governance of MPA in the Pacific region was conducted under the CRISP, in September 2010 in Moorea (Feral 2010). This event was an opportunity to strengthen capacity building and networking between environmental, fishing and planning related institutions.

A grant agreement signed between the ARC, Center of Excellence in Australia and SPC aimed at supporting Philippa Cohen's PhD candidate at James Cook University in Townsville, Australia. Working in the Pacific for the last six years, her professional experience and network in Solomon Islands allowed her to develop, commencing in 2009, a research project that is highly significant to the current reef science and management landscape in Solomon Islands. Funding from CRISP was provided for one component of her research that relates to the networking and information sharing relationships of several CRISP partners. Pip aims to provide Solomon Islands reef science and management stakeholders with recommendations to strengthen and maximise networking relationships to optimise future efforts to manage reef systems (Cohen 2011).

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IMPROVING SCIENTIFIC KNOWLEDGE

▶ BACKGROUND

CRISP is a development programme, and as such is not intended to focus exclusively on science research. Research projects are funded, however, when they focus on one of the following objectives:

- **Objective 1:** increasing our knowledge of coral ecosystem **biodiversity**;
- **Objective 2:** improving our understanding of coral ecosystems **functioning**, which is essential for developing appropriate and efficient management tools;
- **Objective 3:** broadening our comprehension of certain **resources** (their nature, mechanisms of renewal and accessibility) in order to achieve sustainable economic development.

The scientific side of the CRISP has been conducted under the supervision of two renowned scientific advisers: Bernard Salvat (EPHE) and Clive Wilkinson (Reef and Rainforest Research Centre). These experts helped in first instance identifying research themes, monitor research outputs quality, and promote results internationally. A first scientific report of the programme was compiled in 2008 (Wilkinson 2008).


Bioorganic & Medicinal Chemistry

New bioactive halenaquinone derivatives from South Pacific marine sponges of the genus *Xestrospongia*

■ BRIEF REVIEW

Post Larval Capture and Culture has been a topic the CRISP has been focusing on. Peer reviewed publication started be released in mid 2007, mainly originated from EPHE at University of Perpignan (Lecchini et al. 2006). During the same year, the IRD team also produced scientific publications on reef fish larvae (Lecchini et al. 2007), adding on information related to PCC development, and precisely onto the understanding of reef fish reproduction (Almany et al. 2007).

In 2008 and 2009, more research was carried out leading to publications on PCC related to reef fish larvae settlement (Irisson and Lecchini 2008) and connectivity in fish populations (Planes et al 2009), while Bell et al. were compiling a review of PCC of fish and invertebrates for the aquarium trade to assess the ecological impact of this technique.

Regarding bioprospection and Active Marine Substances identification (AMS), results on isolation of molecule and algae taxonomy also started being published in 2007 on genus Turbinaria and Rodophytes (Lann et al. 2007) (N'Yeurt et al. 2007a,b). Work carried out on bioprospection not only aimed at gaining information on marine substances, but also focused on supporting legal framework in country where research was carried out, e.g. in Fiji, Vanuatu and Solomon Islands (Beurier 2007). In New Caledonia, research on coral taxonomy has been a key tool in the context of New Caledonia's lagoon world heritage listing (Lasne 2007). Publications in bioprospection focused on marine sponges and their potential against inflammatory process and against cancer throughout the region (De Marino et al. 2009), some of them especially in Solomon Islands (Festa et al. 2009) (Gabant et al. 2009). Work on AMS from Pacific sponges was also conducted by Appenzeller during this year, focusing on Benzosceptrins skeletons. 2009 also led to publications on algae, such as the taxonomic revision and geographic distribution of the subgenus Sargassum species in New Caledonia

(Mattio L., Payri C.E., 2009), and in the Western and Central Pacific (Mattio et al. 2009) (Mattio et al. 2010). Finally taxonomic research contributed to the discovery of new species of Rhodophyceae algae from Fiji, Polynesia and Vanuatu (N'Yeurt A.D.R., Payri C.E. 2009).
The IRD has been designing Fisheye database partially funded under the programme (http: //fisheye.ird.nc) compiling biological data, videos. It should eventually be adapted to general public but also scientists' needs, linked to other existing scientific database such as Fishbase and CoReMo.

RECENT PROGRESS AND FUTURE PROSPECTS

One of the CRISP scientific topics on shark research led to several scientific papers published on lemon shark identification (Buray et al. 2009), their response to underwater feeding (Clua et al. 2010), as well as their economic value (Clua et al. in press). As a major location for shark population, research on shark in New Caledonia led to several publications on its role of tropical wintering ground for white shark (clua et al. 2010), and on the understanding for shark attack (Clua et al. 2010). Several tagging field trips conducted around New Caledonia waters helped at assessing microsatellites analyses of reef sharks populations as a need for conservation strategies (Vignaud et al. in press). Jonathan Werry, post doc student from Griffith University has been supported by the programme to conduct his research, one of his major topic being the connectivity of Tiger (Galeocerdo cuvier) and other large shark species in the South Pacific with a focus on Australia and New Caledonia populations (Werry 2009).


Genetic diversity loss associated to high mortality and environmental stress during the recruitment stage of a coral reef fish

On the topic of coral reef taxonomy, Coralcal field trips co-funded by the CRISP and IRD Nouméa from 2007 to 2010 allowed to conduct an inventory of algae and seaweeds as well as scleractinian corals in northern New-Caledonian lagoon. This study, again completing the ERA, allowed the discovery of 11 new species of scleractinian corals, leading to the combined number of 401 corals species identified in New Caledonia (Lasne 2010). In 2009 was published the RAP led by CI between Koumac and Yandé during 2007. This survey provided data on select species of biological and commercial importance, as well as the health of habitats sampled (Mc Kenna et al. 2009). This was recently followed in November 2010 by a scientific expedition that took place in the Chesterfields Island, aiming at both tagging shark and assessing marine species using Rapid Assessment Methods (Clua et al. 2011). Biodiversity was also a major topic for the Tuvalu Marine Life project conducted by the coral specialist Sandrine JOB in 2009. Major targets were gathering existing information on Tuvalu Marine biodiversity and identify gaps in the knowledge (Job 2009). This work constituted the first phase of a larger project: Biodiversity in Tuvalu Marine Life and will eventually be part of a comprehensive book on Tuvalu biodiversity, published by the NGO Alofa Tuvalu who conceived the project originally.
Following up on the listing of New Caledonia lagoon as a UNESCO heritage, a joint project with Unité UR 103 Camelia of IRD Nouméa was initiated early 2010 to assess coral and coralline algae diseases, being the two major coral reef frame builders (Tribollet et al, 2011). In partnership with the University of Hawaii where such research was already carried out, this project not only aimed at assessing coral diseases existing in New Caledonia, but also focused on raising awareness of local communities about coral diseases and threats due to climatic event or human activities (Pannetier 2010).
Currently , the IRD centre in Polynesia continues its work towards the sponge taxonomy with a structure elucidation of Stylissa carteri (Patel et al. 2010). The CRISP through a IRD_SPC grant agreement is supporting the 4rth and final year of Luke Mani's PhD focusing on antimalarial compounds of sponges originating from Solomon Islands (Al-Mourabit 2010). Luke Mani's PhD thesis was presented on the 16th of December and should be published in a short while.
The EPHE team in collaboration with other Universities (Liège, Edimburg) contributed to studies on invertebrates habitat selection (Lecchini et al. 2010), acoustic behaviour (Parmentier et al. 2010), and finally sounds production in four damselfish species through a Parmentier et al. study, to further on increase knowledge for PCC development. The CNRS also contributed to increase knowledge over PCC for invertebrates with a research conducted under the program onto the potential for exploiting Polynesian commercial species of tropical eels (Grousseau 2009). Finally Eric Clua with other marine biology specialists have been conducting a short study to assess the potential for ornamental fish trade development in Marquesas Islands (French Polynesia) based on Post Larval Captured and Cultured fish (Clua et al. 2010). Meanwhile, larval dispersal and fish connec-

tion in the context of MPA was assessed by Planes et al. in 2010 and fish connectivity in marine populations at different spatial scales was estimated by Saen-Agudelo in 2009. In the context of climate change, study on extreme climatic events impact on ocean productivity and larval supply in a tropical ecosystem was conducted under the CRISP by Lo-Yat et al. (in press). At IRD Nouméa, Jimenez conducted a study on taxonomic resolution to

Business partner or simple catch? The economic value of the sicklefin lemon shark in French Polynesia

describe invertebrate assemblages to detect harvesting effect on coral reef ecosystems (Jimenez et al. 2010).

2009 and 2010 have also been an interesting years in terms of crustaceans decapods scientific publications with the report from Juncker and Poupin on New Caledonia decapods and stomatopods (Juncker et al. 2009), feeding into a regional identification manual for crustaceans from the same authors in 2010 (Poupin et al. 2009).

He same unit of IRD has been working on the development of a methodological guide on both coral reef and coastal fisheries status. This guidebook is made of 20 worksheets on methodology and indicator outlining the work carried out by USP, IRD and EPHE throughout the Pacific region. This guide should be finalized shortly and accessible online from the CRISP website (Ferraris et al. 2011)

Focusing on the South Pacific fish biodiversity, Michel Kulbicki, renowned IRD researcher has been working on the compilation of an exhaustive list of Pacific coastal fish, capitalizing on lists already existing. This study is mainly targeting commercial/ foodfish species and will provide major information on their taxonomy, biology, ecology and major life history traits for each described species (more than 6 000 in total). This database should be eventually linked to Fishbase so that all information existing can be accessed (Kulbicki et al. 2011).

Adding on information regarding fish biodiversity, the CCU programme has started working with an IT specialist from the SPC Coastal Fisheries division on the development of a web-based database named: "Learn Fish ID". The objective of this database is to allow an audience from fisheries officers to experts, collaborators as well general public to access a wide range of information (from biological data to pictures movies etc.) on reef fish species. This database will be an online platform which experts and specialists will have an access to and be able to enter or modify directly information onto the database under a specific login, ensuring that the database remains up to date.

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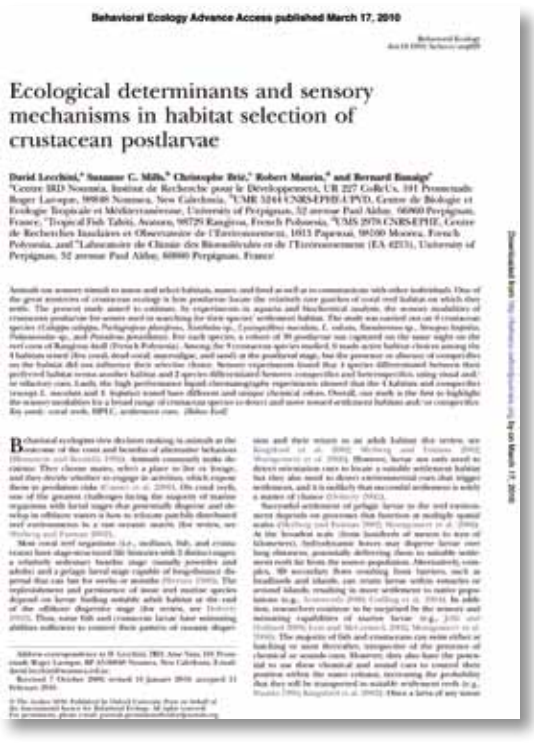
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Ecological determinants and sensory mechanisms in habitat selection of crustacean postlarvae

DEVELOPMENT OF REEF RESOURCES

▶ BACKGROUND

With the overall objective of setting up industries based on the sustainable use of reef resources, the CRISP has been focusing on two major objectives: 1/ the development and promotion of alternative fishing methods and techniques based on the catchment and grow out of fish and invertebrates post-larvae (including the development of an ecolabel), and 2/ the sampling and identification of Marine Actives Substances from Pacific coral ecosystems.

To cover the first objective, Post Larval Capture and Culture (PCC) research were first driven by the EPHE-CNRS (Ecole des Hautes Etudes Pratiques, Centre National pour la Recherche Scientifique) in French Polynesia, Fiji and to a lesser extend Wallis and Futuna. The programme therefore focused on releasing information on fish biology (cf section improving scientific knowledge). Few guidelines on larvae identification were published as well as a post larval breeding manual (Vermond 2007).Further technical and economic feasibility studies for the development of this activity were then conducted in the region, leading a series of publications as well as progress report. The aspect of ecolabel was also targeted and studied by USP student in Fiji, and by te Mana o Te Moana in French Polynesia, those for ecotourism purposes (Gorchakova 2010). Matthieu Petit from this same organisation also worked onto the publication of a consolidated report about the development of PCC as a sustainable, focusing on Bora EcoFish, one company that has been highly active in this field. The report not only focus onto technical aspects but on the development of strategic plans for the promotion of this methodology as both ecological and ecotouristic tools for French Polynesia (Petit 2009).

On side of fish post-larvae consideration, crustaceans group was also studied, especially by M. Poupin and Juncker, who worked in Wallis and Futuna first, and then throughout the overall Pacific region.

The second objective on Active Marine Substances was mainly tackled by the IRD UR152 in collaboration with the Universities from France and Pacific region (USP mainly). The main asset for this component of the CRISP programme was the involvement of research students from the Pacific region for the isolation and identification of AMS. It therefore contributed to the development of scientific skills within the region, but also to the development and revision of AMS legal framework, especially in Vanuatu, Fiji, and Solomon Islands (Beurier et al. 2009) (Debitus et al. 2008). Nouméa IRD Centre also contributed to this component through several studies on marine substances from echinoderms, ascidians, sponges and algae through a major report based on a field trip carried out in Fiji in 2007 (Payri et al. 2009).

Based on a high potential of endemic species, a prospective survey fon marine ornemental products to be exported from Marquesas islands (French Polynesia) was conducted in 2010.

■ CURRENT SITUATION AND FUTURE PORSPECTS

Cofundings with the fisheries divisions of French Polynesia led to several projects targeting PCC development, some of them in French Polynesia. Bora Ecofish has been conducting experiments to assess the aquaculture potential of two species of commercial species

What is PCC?

PCC stands for post-larval capture and culture, or "grow-out". Post-larvae are a developmental stage that reef fish and crustaceans undergo prior to settlement in the lagoon. The majority of animals start their developmental cycle with a pelagic stage that lasts roughly one to three months, after which fish and crustaceans settle in the lagoon (in numbers that vary from the hundreds to many millions). Approximately one in a million individuals will reach the adult stage, with most juveniles being eaten by predators. Using innovative techniques, post-larvae can be captured and bred for trade to three potential markets: aquaculture (for food purposes); reseeding into ecosystems (to boost biodiversity and fish density for fishing purposes or tourism); and the (lucrative) aquarium fish trade. Despite their impressive numbers, captured animals account for a very small proportion of the larval flow, and therefore have only a slight impact on the ecosystem compared with techniques involving the capture of adults and mature individuals. This makes PCC an eco-friendly tool for the conservation and maintenance of reef population biodiversity (Moana Initiative 2007).

of manta shrimps captured at a larval stage. Results from this experiment demonstrated that the species considered are not adapted to aquaculture development, requiring a very long time before reaching a commercial size, and also a large amount of human involvement.

The development of PCC as an economic activity was mainly targeted through a joint venture established between Hawaiian Sea Life and Ecocean, and later on with the MERIP (Marine and Environment Research Institute of Pohnpei) from the Federated States of Micronesia. The main objective of these partnerships is the development of a market based on PCC products from PICs for the American and European markets. Both of these projects allowed staff and fishermen to be proficient in the use of different kinds of PCC traps, including the CARE trap and crest net. In addition, MERIP staff is now proficient at identifying larvae to family level, Artemia hatching, weaning and husbandry techniques, and shipping techniques for PCC products. In effect, HSL and MERIP are now mostly equipped to take advantage of PCC as a complimentary trade activity. The later project helped in the accurate study of the main hindrances to economic viability, which are the cost of freight per fish, the way in which the fish are marketed, the existing technology and the cost of husbandry and handling during capture and rearing (Ellis 2011).

Three other projects related to PCC took place during 2009 and 2010, one led by IRD team UR CoReUs, on the recruitment process of invertebrates post-larvae in New Caledonia and Vanuatu (Dumas, 2010), and on the development of new PCC techniques, based on chemical and sound attraction (Bonhomme 2010). This project also included research on the settlement of larvae (Peyrusse, 2010), and onto the evidence of an original scale development during the settlement phase of a coral reef fish (Acanthurus triostegus) (Frederich et al. IN PRESS) as well as sensory abilities and anatomy of coral reef fish larvae (Lanyon 2010). The second project was coordinated by a Aquaterra involved in a project based on Maré from Loyalties Islands onto the recruitment process for lobster larvae. This community-based project is one of the key development basis for few villages in Maré, and results could be later on used in combination with the one obtained on such activities on New Caledonia main land to reach conclusions about the validity of this type of crustaceans post-larvae capture and culture.

the CRISP coordinator also contributed directly into disseminating information on that topic throughout several international events such as the ICRI meeting in Phuket (Clua 2009), while René Galzin from EPHE was presenting PCC research outcomes during the meeting of the European Union of Aquarium Curators, 28 October – 01 November 2009 in Valencia, Spain. Eric Clua also got an opportunity to present PCC related activities during the marine ornamental Workshop that took place in Nouméa en of 2008 (Kinch et al. 2008), and recently in collaboration with M. Galzin during Tahiti aquaculture congress that took place in Papeete in 2010.

Again in French Polynesia, M. Clua in collaboration with Serge Plane from CRIOBE/EPHE and M. Xié from Hawaiian Sea Life have been conducting a quick evaluation of the potential for ornamental fish species postlarvae trade in Marquesas, French Polynesia (Clua et al. 2010).

Because transport is one major issue for ornamental trade, the fisheries division of FP and the CRISP programme have been since 2009 supporting Tahiti Eco Clam Aquaculture company to conduct a technico-economic feasibility study for the development of ornamental clam trade

(TEC 2009). Work is still ongoing due to logistics delays. However, results of this study should be shortly released. The CRISP contribution to the OIE workshop that took place in Fiji on animal disease was as well an opportunity to gain knowledge on a major topic being the legal frame for the trade of ornamental products (SPC 2010).

The World Fish Centre in Solomon Island has been also targeting the issue of ornamental trade through a project mainly by promoting the demand and increasing the supply of Solomon Island sustainably maricultured ornamentals (World Fish Center 2011). The culture of marine ornamentals is a small but growing industry in Solomon Islands. There is a government and non-government support to expand sustainable marine ornamental trade. The CRISP project therefore led to the development of several promotion supports such as website www.solomonseasustainable.com, as well as a coral identification guide (Warren et al, 2011).

The CRISP programme coordinator also attended the Tahiti aquaculture symposium in December 2010 were session on PCC were conducted throughout oral presentation from the major CRISP programme scientific partners on the sustainable exploitation from capture and culture of post-larvae based on mantis shrimps example (Santos et al. 2010).

The FGEF grant that has been allocated to the CRISP for the continuation of this component of the programme will be an opportunity to further on fund projects aiming at the sustainable development of this trade within the region.

For research on Marine active substances, the IRD Centre from French Polynesia has been conducting research along with IRD Nouméa centre according to the original logical framework designed at the launch of the CRISP Programme. During 2009, a major event took place in French Polynesia (Pacific Scientific Inter-congress 2009) during which 50 or more researchers got an opportunity to present research outcomes and outputs during the CRIP programme. The audience during the congress made of managers from PICs, this occasion has been a fundamental one to discuss legal framework and get an overview of what this programme allowed in terms of scientific outcomes.

2010 has been a year spent on promoting the CRISP programme results of this component. This led to a high communication throughout taxonomists' network, and with partners involved during the entire process (e.g. Ghent University for the work carried out on green algae). It has also been a restitution year for this component in Fiji, with the delivery of phycological collections duplicate at USP Suva. Overall during the entire CRISP programme, The IRD has been sampling over 2283 specimen of algae, allowing 235 species to be identified in Fiji and 184 in the Solomon Islands. As for the invertebrates, out of the 212 sampled collected in both Fiji and Solomon Islands, the number of species identified was 169. Out of this impressive sampling numbers, several AMS have been identified and studied for their potential chemical characteristics against malaria, against bacterial infection or against inflammation (Patel 2010), (Béasse 2009).

What are active marine substances?

AMSs 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 (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 (e.g. for potentially anti-inflammatory or anti-malarial properties) before considering their use on an industrial scale, which can be achieved only some 12–15 years after the organisms have been originally harvested. For these reasons, in addition to providing support to reef organism harvesting and marketing, CRISP places importance on improving the legal framework in 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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NETWORKS, INSTITUTIONAL LINKS AND PARTNERSHIPS

▶ BACKGROUND

Partnership with Australia continued to gain strength through the CRISP programme in 2009 and 2010, especially in regard to two areas. (1) Discussions on a potential partnership between France, New Caledonia and Australia regarding the need for improving the management of the Coral Sea. (2) With CRISP support, a partnership was established between the 5244 EPHE-CNRS research unit based in Moorea and Griffith University in Queensland. This new collaboration provides a great opportunity to implement a study on biological connectivity between the Great Barrier Reef Marine Park and New Caledonia (two World Heritage sites) for large shark species (such as tiger sharks), which play a critical role in the resilience of these high-value reef ecosystems.

■ LATEST PROGRESS

In May 2009, the Australian government confirmed its willingness for action regarding the setting of a management plan for the Coral Sea., through an official press release from the Australian Minister for the Environment, Mr. SE Peter Garret. On the French side, the idea was raised, and the coordination between the State and New Caledonia was slowly being set up over this topic.

In March 2010, a "declaration of intention between France and Australia for the Coral Sea sustainable management" was signed by the presidents of the New Caledonian government and the three provinces as well as by the French state and the Australian Minister for the Environment. This document identified strategies for cooperation for Coral Sea coastal and high seas ecosystems management as well as the support of an integrated knowledge. It is now a reference for the development of an operational cooperation through the creation of a transnational steering committee.

In August 2010, a joint mission SPREP-SPC was implemented under the CRISP auspices to contribute to a better knowledge of the biodiversity and ressource level of the Chesterfield Reefs (see cover of the report available online). Part of the expedition was focusing on large shark connectivity as a model to better define the role of these coral reefs in the overall resilience of the Coral Sea.

Through a partnership between SPC and RRRC in Australia, supported by the French Agency for MPAs, a side event on the Coral Sea is planned during the upcoming 12th ICRS meeting to be held in Perth in July 2012.

DISSEMINATION OF KNOWLEDGE AND EXPERIENCE

Part 1: International meetings

▶ BACKGROUND

One of the four main objectives of the CRISP programme is the dissemination of information and knowledge. To this end, two major approaches have been chosen: the first one is the participation of the CRISP partners to international event (workshops, conferences or symposium) and the second is a communication via new IT technology e.g. Reefbase portal or CRIP website. The later has been a major one to ensure that any public, from researchers to general public have access to information related to the CRISP programme activities, along their own area of interest.

One of the major task at the CRISP Coordinating Unit for the person in charge of CRISP outputs dissemination was therefore to update as much as possible the CRISP website so that every result of the programme could be accessed online.

■ BRIEF REVIEW

From the beginning of the programme, efforts were made by the CRISP programme coordinator to take part in a wide range of meetings to communicate on the programme and set up partnership throughout the overall region. He personally attended seven ICRI meetings, the CRISP obtaining a permanent seat from 2007. During the 2009 ICRI meeting in Phuket, M. Clua was invited to present work done by SPC on climate change and its effects over fisheries (Bell et al. 2009). This meeting led to another presentation at the scientific Centre of Monaco in France on the effect of climate change over reef fisheries.

CRISP partners also played a major role in the dissemination of the programme outcomes. In 2009, many scientific partners from IRD, CRIOBE, USP, WWF, took part and contributed to the 11th Pacific Science Inter-Congress in Tahiti, where three side-events took place, focusing on governance, bio-prospection and regional cooperation (Dupré 2009). One IRD PhD student, Lydiane Mattio was also financially supported through the programme to participate to the 9th Phycological Congress in Japan, and present some results of her PhD on the classification of the Sargassum subgenus Sargassum(Phaeophyceae, Fucales) (Mattio et al. 2009).

The second International Marine Protected Areas Congress was attended by Eric Clua and Ambroise Brenier, respectively presenting sociological and governance aspects of both MPAs (Herrenschmidt et al. 2009)and fisheries management (Brenier 2009).

PCC topic that was presented and discussed at several occasions in 2008, the EPHE team through René Galzin supported to attend the 26th meeting European Union Aquarium curators in Valencia, and present work carried out on Post Larval Capture and Culture (Galzin 2009). Finally, James Comley from USP presented during the Fiji Conservation Science Forum in Suva overall preliminary results from the CPUE study carried out in Fiji (Comley 2009).

■ LATEST PROGRESS

Thanks The International conference on Marine Managed Area has been an opportunity for many partners working under the programme to contribute with their experience and knowledge to discussions over this topic from several perspectives, ranging from governance issue to monitoring or scientific knowledge (AAMP 2010). To follow on governance issues, an international meeting M. Nicolas PASCAL, CRISP Economic Task Force coordinator, took part into the IIFET International Institute for Fisheries Economics and Trade in Montpellier, presenting part of his work on the Effects of MPA on small scale reef fisheries and communities: evidence from Vanuatu (South Pacific) (Pascal 2010)

In 2010, part of the team working on shark tagging contributed to SIC Shark International Symposium in Cairns, Australia, presenting the economic value of sicklefin Lemon shark in French Polynesia (Clua et al.2010), as well as to the International White Shark Symposium in Honolulu, Hawaii, where the CRISP Coordinator presented

some elements of ecology of the Great White Shark (Carcharodon carcharias) in New Caledonia (Clua et al. 2010). Finally a mini symposium took place in Nouméa in August 2010 to present results and facts related to coastal reef sharks conservation (Clua 2010).

Finally, PCC has been presented and discussed widely during the 2010 Tahiti Aquaculture 2010, partly funded by the CRISP programme, and at a stage where a French GEF grant was agreed for the further support and development of the PCC component of the programme, this symposium has been a key event for the programme extension.

Details on CRISP partners are listed on pages 32-33.

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Eric CLUA with his colleagues from Australia Jonathan Werry (right) and New-Zealand Clinton Duffy (left) during the International White Shark conference in Hawaii (February 2010).

General attendance at the International White Shark conference in Hawaii (February 2010).

INTERNATIONAL SYMPOSIA WITH A CRISP CONTRIBUTION (Mid-2009 to End of 2010)

SYMPOSIUM	Support	TITLE	AUTHORS
Tahiti Aquaculture Papeete (French Polynesia) 06/12/2010 – 11/12/2010	PPT	Le CRISP et l'aquaculture	Clua E.
	Poster	Preliminary results on the potential use of eels for aquaculture in French Polynesia	Sasal P.
	PPT	Developing efficiency of capture methods of coral reef fish larvae in the South Pacific	Clua E., Lecchini D., Galzin R.
	PPT	Development of mantis shrimps (Lysiosquillina maculate and L. Sulcata): sustainable exploitation from capture and culture of post-larvae	Santos R., Brié C., et al.
	PPT	Scientific knowledge on postlarvae capture and culture	Galzin R.
ICRI General Meeting Apia (Samoa) 08/11/2010 – 12/11/2010	PPT	CRISP 2005–2010: Lessons learned and next steps	Clua E.
	PPT	Pacific institutions involved in Reef conservation & management: A brief overview	Clua E.
	PPT	Reef Fisheries Session: Report and Agenda	Clua E.
International Institute for Fisheries Economics and Trade (IIFET) Montpellier (France) 13/07/2010 – 16/07/2010	PPT	Effects of MPA on small scale reef fisheries and communities: evidence from Vanuatu (South Pacific).	Pascal N., Clua E., Govan H.
Sharks International Conference 06/06/2010 – 11/06/2010	PPT	Business partner or simple prey? The economic value of the sicklefin lemon shark (Negarpion acutidens) in French Polynesia	Clua E., Buray N., Mourier J., Planes S.
INTERPRAEVENT International Symposium in Pacific Rim Taipei (Taiwan) 26/04/2010 –30/04/2010	Ext. Abst.	Assessment of soil erosion using USLE model and GIS for integrated watershed and coastal zone management in the South Pacific Islands	Dumas P., Printemps J.
International White Shark Symposium (IWSS) Honolulu (Hawaii) 07/02/2010 –10/02/2010	PPT	Elements of ecology of the Great White Shark (Carcharodon carcharias) in New Caledonia(South West Pacific)	Clua E., Seret B.
ICRI General Meeting Monaco (Principauté de Monaco) 12/01/2010 – 15/01/2010	PPT	Reef sharks: Why should they be protected?	Clua E.
Pacific regional Conference on MMAs Moorea (French Polynesia) 15/11/2009 – 19/11/2009	PPT	Past, present and future of MMAs	Clua E.
	PPT	Monitoring in the LMMA network	Comley J.
	PPT	Locally Managed Marine Areas in the Pacific	Govan H., Rupeni E.
	PPT	Presentation of Emua MMA (North Efate) – Sharing experiences	Lango K.
	PPT	Implementation of a marine protected areas network on the North-East coast of New Caledonia	Faninoz S.
	PPT	Initiatives dans le Pacifique	Renoux R., Heaps L.
	PPT	Enhancing MPA Effectiveness how far is Economic Analysis Effective?	Rojat D.
	PPT	Le PGEM de Moorea	Monier C.
	PPT	Les Aires marines protégées de Moorea – Six années de suivi : 2004 – 2009	Kernaleguen L., et al.
	PPT	Capacity Enhancement Project for Coral Reef Monitoring: a partnership of Palau International Coral Reef Center (PICRC) and Japan International cooperation Agency (JICA)	Shingo T.
	PPT	Scientific information and tools developed by OFP–SPC to design, monitor and assess oceanic and high seas MPAsin western and central Pacific Ocean	Allain V.
26th Meeting of the European Union of Aquarium curators Valence (Spain) 28/10/2009 – 01/11/2009	PPT	Recherches sur les larves de poissons dans le Pacifique Sud	Galzin R.

World Aquaculture 2009 Veracruz (Mexico) 25/09/2009	PPT	Post-larval marine fish collection technology or how to significantly increase the tank raised marine species list for the marine aquarium trade	Lecaillon G., Vermond S., Galzin R.
GDRI Colloque Inaugural Monaco (Principauté de Monaco) 01/09/2009 – 03/09/2009	PPT	Contribution potentielle du CRISP au GDRI (Groupement de Recherche International « Biodiversité des Récifs Coralliens »)	Clua E.
Fiji Conservation Science Forum Suva (Fiji) 05/08/2009 – 07/08/2009	PPT	Catch per unit effort (CPUE) survey of Fiji: Preliminary results	Comley J.
9th International Phycological Congress Tokyo (Japan) 02/08/2009 – 08/08/2009	PPT	New insights on the classification of the Sargassum subgenus sargassum (phaeophyceae, fucales) from a three-DNA markers phylogeny and morphological analyses	Mattio L., Payri C., Verlaque M., De Reviers B.
18th IMACS World Congrees MODSIM 09 Cairns (Australia) 13/07/2009 – 17/07/2009		Tools for soil erosion mapping and hazard assessment: application to New Caledonia, SW Pacific	Rouet I., Allenbach M., et al.
2nd international Marine Protected Areas Congress (IMPAC2) Washington (USA) 19/05/2009 – 24/05/2009	PPT	Relevance of participatory approaches for ecosystemic monitoring of reef fisheries	Brenier A.
	PPT	Culture and updated traditional management tools for serving ownership in locally-managed marine areas.	Clua E.
	WKSP	Contribution of communities to marine conservation in the Pacific	Govan H.
ICRI General Meeting Phuket (Thailand) 20/04/2009 – 23/04/2009	PPT	Fish, food security, climate change	Bell J., Clua E.
Congrès Bourse Clam 2009 Montpellier (France) 28/03/2009 – 29/03/2009	PPT	Comment la PCC peut répondre à la problématique de durabilité de l'aquariologie marine ?	Lecaillon G., Galzin R.
Cooperation In Science and Education in the Pacific (PSI Side-event) Papeete (French Polynesia) 02/03/2009 – 06/03/2009	PPT	Le CRISP et la coopération régionale	Clua E.
	PPT	Information systems to support science and education cooperation in the Pacific	Morris C.
	PPT	Cooperation for Science 2 Action in the Pacific	Martel F.
	PPT	The Foundation of the Peoples of the South Pacific International	Rupeni E.
Governance Workshop (PSI Side-event) Papeete (Polynésie française) 02/03/2009 – 06/03/2009	PPT	Le CRISP et la gestion intégrée	Clua E.

Participants to the steering committee of the CRISP programme (CAC2009) that was held in Moorea after the Regional conference on MPAs.

Access and Benefit Sharing (ABS) Workshop (PSI Side-event) Papeete (French Polynesia) 02/03/2009 – 06/03/2009	PPT	Droit de la protection et de l'utilisation durable de la biodiversité marine en Mélanésie – Étude de cas : Fidji, Salomon, Vanuatu	Beurier J.-P.
	PPT	Le CRISP et les substances actives marines	Clua E.
	PPT	Le droit international des biotechnologies et ses relations avec la biodiversité	Guilloux B.
	PPT	Le droit applicable à la bioprospection marine en Mélanésie : l'exemple des Iles Fidji, Salomon et du Vanuatu	Guilloux B.
	PPT	Traditional ecological knowledge and intellectual property – The Pandora box?	Martinez C.
	PPT	Access and Benefit Sharing in non-commercial research	Schindel D.
	PPT	ABS aspects of the Moorea Biocode Project – Case study: French Polynesia	Brels S.
	PPT	Access and Benefit Sharing: Experiences from the Philippines, A megadiverse developing country	Ong P. S.
	PPT	IP issues associated with genetic resources and natural product development	Tom J.
	PPT	Current Issues in International Intellectual Property Law	Uhlir P. F.
11th Pacific Science Inter-Congress (PSI2009) Papeete (French Polynesia) 02/03/2009 – 06/03/2009	Poster	Analyse écorégionale marine de la Nouvelle-Calédonie	Gabrié C. et al.
	Poster	Anti-plasmodial activity and chemotaxonomy of Pacific Dysidea sponges	Chandra M., et al.
	Poster	Études comportementales et de vulnérabilité de la population de requins citron (Negaprion acutidens) sur le site de « feeding » d'Opunohu à Moorea, Polynésie française	Buray N., Clua E., Mourier J., Planes S.
	Poster	"A cause for optimism": Identification of threats and resiliency on Pacific reefs through establishment of a long term reef monitoring network in Fiji: The Fiji Coral Reef Monitoring Network (FCRMN)	Sykes H., Lovell E.
	Poster	2008 Status of coral reefs in the South West Pacific (Fiji, New Caledonia, Samoa, Solomon Islands, Tuvalu and Vanuatu)	Morris C., Mackay K.
	Poster	Spatio-temporal structure of harvested tropical reef invertebrates: A case study on New Caledonian reef flats	Jimenez H., Dumas P., Ferraris J.
	PPT	Mapping potential soil erosion in the Pacific Islands: A case study of Efate Island (Vanuatu)	Dumas P., Fossey M.
	PPT	Live coral fishery for aquaria in Fiji: Sustainability and management	Lovell E., Morris C.
	PPT	Spatio-temporal structure and functioning of harvested intertidal marine invertebrates: application to New Caledonian reef flats	Jimenez H., Dumas P., Ferraris J.
	PPT	Toward appropriate indicators to assess the impact of coastal fisheries on reef fish communities in New Caledonia	Guillemot N., et al.
	PPT	Analyzing spatial structure of recreational coastal reef fisheries in New Caledonia for management purposes	Jollit I.
	PPT	Heritage: the New Cultural and Institutional Challenge of Environmental Governance in the Pacific Islands	Herrenschmidt J.-B.
	PPT	Analyse écorégionale marine de Polynésie française	Lagouy E., et al.
	PPT	Reef Check Polynesia Coral reef monitoring network	Lagouy E., Clua E., Aubanel A.
	PPT	High definition video systems for monitoring biodiversity in marine protected areas	Pelletier D., et al.
	PPT	Recurrent large-scale disturbances, recovery trajectories, and resilience or coral assemblages on a coral reef in the South-Central Pacific	Adjeroud M., et al.
	PPT	Behavior and vulnerability of the sicklefin lemon shark, Negaprion acutidens, on a shark-feeding site in Moorea, French Polynesia	Buray N., Clua E., Mourier J., Planes S.
	PPT	Sarasinosides of the sponge Amorphinopsis excavans from Solomon Islands	Partel K.

DISSEMINATION OF KNOWLEDGE AND EXPERIENCE

Part 2: Multimedia

▶ BACKGROUND

Reefbase Pacific internet portal, cofunded by AFD and UNF, developed and implemented by the World Fish Center, has been a major « actor » for the dissemination of data, information, and knowledge in support of research and management of coral reef resources. Aiming at researchers to managers or wider public, this Pacific version of Reefbase.org allows an easy access to literature related to coral reef. It is quite important to notice that this portal provides access to a grey literature representing a large source of documents scanned, referenced and put online (www.reefbase.org/pacific). After producing the Atlas of Papua New Guinea (Andrefouet et al. 2006), the atlas of the Pacific has been a major target for Reefbase Pacific, and today the entire Pacific region has been covered by IRD team led by Dr. Serge Andrefouet (except Fiji still on standby)to provide a free access a Pacific Coral Reef Atlas with data layers, reef geomorphology that can be integrated into geographical Information System. The Atlas is now accessible online and through the CRISP final DVD (Andrefouet et al. 2010)

■ BRIEF REVIEW

Reefbase Pacific being more and more visited, two DVDs were printed and disseminated regionally with up to date versions of the website. Reefbase Pacific DVD version 1 was designed in 2008. Already allowing an access to a large number of references, Version 2 of the DVD developed in 2009 is providing an access to about 10 000 documents (over 2 000 in French language), to 2 500 reef associated species profiles, 150 project summaries and the detail of 130 organisations. This DVD also provides information on coral reef monitoring which includes 103 MPA sites, 254 coral bleaching records. One particularity of this DVD is the possibility to update it online thanks to new IT features. The CRISP Coordinating Unit has also been working on the development of a CRISP website to allow the public an access to all programme publications, progress reports etc. The history of this website starts in mid-2005 when the programme was officially launched. The website was then hosted by SPC, to be later on transferred to an American host site. This move has been beneficial for the increase of the website accessibility and traffic statistics. Access to the CRISP website was also provided from a number of partners' sites (such as ICRI, www.icriforum.org)

Screen capture of the CRISP website homepage showing the product section organisation according to nine key themes. Between 2007 and f 2008 www.crisponline.net recorded more than 10,000 visits and 50,000 downloads. ***The number of connections for the past two years 2009 and 2010 was > 160,000 !***

RECENT PROGRESS

The CCU recently developed a Survey on Reefbase Pacific to get feedbacks onto the use of Reefbase Pacific Portal. Results from this Survey came from scientists for 44% of answers, and decision makers for 14% of total answers. Answers originated from Europe to PICs such as Guam, Fiji, Vanuatu up to Japan: 85% of people surveyed used the Reefbase Pacific database for their current position portal online, versus 20% for the Reefbase DVD. The utilization of the database is quite heterogeneous, 36% of people surveyed using it on a monthly basis. This survey also showed that 50% of person surveyed find the database to contain valuable information. The main suggestion for the improvement of the database is the need to update it regularly so that relevant information can be accessed all the time.

The IRD UR CoReUs has been working onto the development of alternative dissemination methods. An interactive DVD was developed in 2008 for French speaking PICs, focusing on New Caledonian coral reef ecosystem and associated marine species. Recently, an educational kit was designed and tested in New Caledonia and Vanuatu in 2010 (Ferraris et al. 2010). This kit contains 3 board games aiming at increasing coral reef knowledge and conservation throughout the Pacific region.

Over the past two years, the CRISP website has been a major focus for Claire Dupré, CRISP communication officer at the CCU. As created by the programme coordinator, M. Clua, all items found onto the CRISP website were referenced into nine transversal themes: Biodiversity knowledge and conservation, bioprospection, integrated coastal management, PCC, reef knowledge and monitoring, socioeconomics and economics of coral reefs, stakeholders and public awareness, and finally monitoring and evaluation. This website is now accessible in both French and English languages, containing more than 200 publications. The combined statistical record for 2009 and 2010 showed around 160 000 visits for the CRISP website (www.crisponline.net).

Several movies have been designed with the support from the CRISP Coordinating Unit, displayed on French public channels, distributed as DVD. This encompasses three 26 minutes documentary movies on the economic value of coral reefs (« Coral Reef: a bankable investment »), on sustainable fisheries for aquarium fish trade (« dollar-fish island ») and PCC development (« grow grow little fish »), co produced and displayed by France television (see DVDs covers hereby). Another 26 minutes documentary over CRISP activities in New-Caledonia was produced with the support from AFD, displayed on TV5. Finally, two more documentaries, 52 minutes, have also been presenting CRISP activities, one over French Polynesia (« An ocean, Island and Men/RFO) and one over scientific expedition in the Chesterfield Islands("Chesterfield , oasis of the coral sea »/ARTE).

FUTURE PROSPECTS

The CRISP programme ending at the end of March 2011, the CCU has been working on a final CRISP DVD to be released by the end of programme, containing major information related to the programme. This will included all publications, scientific articles, reports, press releases, but also programme partners and contribution to international events as well as local events. This DVD currently developed by the World Fish Centre will be a bilingual DVD.

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A total of 130 documents are available on www.crisponline.net. and will be included in the final CRISP DVD (see below)

A final CRISP DVD gathering all CRISP products (>800) is under construction with World Fish Center. It will be released in 2011 and allow the access to these hundreds of products with a search engine allowing the use of key-words linked with thematics, implementing agencies, geography of action, authors, etc.

CORAL REEF AND RESOURCE MONITORING

▶ BACKGROUND

Reef status monitoring is one of the focuses of the CRISP programme. The purpose is to contribute to the setting up of appropriate standardized methodologies for the monitoring of data including habitats as well as associated resources. For this purpose the programme has been financially supporting specific projects (such as CoReMo, Fisheye, etc.) but mainly the GCRMN throughout two nodes: the Melanesian node (Including Fiji, New Caledonia, Samoa, Solomon Islands, Tuvalu and Vanuatu) managed by USP in Fiji. The Institute of Marine Resources (IMR) of the University of the South Pacific has been coordinating the South West Pacific Node of the GCRMN since 2000 through monitoring activities, training facilitation and capacity building, this to ensure monitoring and documentation of the status of these critical habitats are possible into the future (IMR 2009).

The Polynesian node (including Cook Islands, French Polynesia, Niue, Kiribati, Tonga, Tokelau and Wallis and Futuna) was managed by the CRIOBE in Moorea. The monitoring has been implemented in each node through the development of training for the development of this activity throughout the region. In 2005, the first activity for the support of the Polynesian node from the programme involved the monitoring and training of fisheries officers to be conducted those monitoring in the long term in Niue, Tokelau and Kiribati.

■ BRIEF REVIEW

The SPREP has been for a while supporting the development of the French software CoReMo by the Agence Française pour la Recherche et la Valorisation Marine, aiming at coral reef monitoring with interactive protocols adapted to local operators' level of expertise, from basic to expert. This common database is for all stakeholders in charge of monitoring activities. It aims at being able to enter data, then export and analyse them adequately, thanks to interoperability with international databases such as Fishbase and Reefbase (www.CoReMo3.com). The World Fish Center, in charge of the ReefBase Pacific portal was involved into this process for the dissemination of the software, such as what has been done for the dissemination of the GCRMN reports.

USP has been playing a major role into the conductance of workshops for a wide audience from students to communities on monitoring for the region (Yakub 2008), and also studies for monitoring the impact of natural disasters such as in Solomon Islands (Morris 2008), as well as measuring the impact of MPAs on fisheries and comparing methodologies to assess resources (Comley 2007).

The IRD has also been progressing in this field, conducting research on methodologies for assessing underwater resources (Leopold and Chabanet 2006), as well as using video methodologies (Langlois and Chabanet 2006; Guilpart 2008; Pelletier and Leleu 2008). Research also focused on the identification of indicators (Leopold 2007) and habitat as a marine resource and ecosystem for fish (Saladrau, 2008; De Mazières 2008).

IRD and USP jointly organized a training in Suva (Fiji) in September 2008 focusing on the ecology of coral reef and the definition of assessment methods for the sampling of marine resources (Lecchini et al. 2008). Similarly, a community-based monitoring workshop was organized by IRD UR CoReUs in Vanuatu early 2009 (Dumas et al. 2009).
The CRISP also supported the Polynesian node in collaboration with the technical partner CRIOBE through a joint project cofounded by DIREN Polynésie, EPHE, INSU, CNRS, BIOCODE and AAMP for the collection of environmental data using high quality loggers located in several PICs. This project in the context of climate change throughout the Pacific region is somehow very desirable, also because it should eventually aim at training local institutions from countries involved for the study of their own environmental parameters, therefore allowing them to adopt the techniques and be able to use the data obtained for future environmental management (Planes 2010)
As for publication on coral reef monitoring, a second "Status of the coral reefs of the World" was being released in 2008, including two chapters on both Polynesian and Melanesian nodes (Wilkinson 2008).

RECENT PROGRESS

Within the GCRMN led by ICRI, France via French Polynesia has been trying to get as much information as possible on coral reef health. The CRISP programme has been since 2009 supporting the development of the first observatory within the Pacific region by the CRIOBE. This is the first time hydrological, climatic, chemical as well as biological data will be collected using several types of logs to get as much data as possible and therefore have a comprehensive understanding of the evolution of coral reef in the context of physical and chemical modifications of the environment.
Similarly, this project as part of the Polynesia mana network (set up in 1998), is assessing information in Eastern and Central Pacific region, from Cook, Kiribati, Niue, Tonga, Tuvalu and Wallis et Futuna. Preliminary data have been assessed (Planes 2010), however long term monitoring should bring more consolidated knowledge of coral reef health.
In 2009, an additional support was provided from UNEP funds through SPREP for the GCRMN throughout the development of CoReMo software version 3. This led to a workshop held in September 2009 in Samoa, at SPREP office, for the training of officers involved into the utilization of CoReMo as well as other stakeholders from the region.
The CRISP has been continuing further on its support to CoReMo throughout the funding of the modification of the database based on the recommendations made during the workshop held at SPREP in September 2009 (Quod et al. 2010).
Along the development of FLMMA network in Fiji, the SPREP has been conducted a study on the ability of this network to protect species listed onto the IUCN endangered species list, this throughout the identification of species of global biodiversity conservation significance (Anderson 2010).
After an 18 months monitoring report about reef restoration in Tuvalu on Funafuti atoll, one of the CRISP specialist about coral restoration, Sandrine JOB, has been continuing her work in 2009 in Tuvalu, focusing this time onto the assessment of the coral and fish biodiversity of Tuvalu marine life. Under a global project named: Biodiversity in Tuvalu Marine Life originated by Alofa Tuvalu and supported by UNESCO, IUCN and Total foundation, this work done in collaboration with locals to assess major biodiversity asset of Tuvalu and help defining conservation areas as well as publishing a comprehensive book on marine biodiversity from this country (Fisk et al. 2010).

Another project related to coral reef monitoring was conducted in New Caledonia after listing of the lagoon onto the UNESCO heritage list. New Caledonia coral reef is very important for several reasons: not only corals represent a major biodiversity, but their endemism is very high, and this world largest barrier represents an excellent protection against erosion. The CSI manual (Crime Scene Investigation) guidebook was therefore translated into French aiming at developing a rigorous methodology for human damage over coral reefs, based on police investigation (Gulko et al. 2009). This guide is developing throughout several chapters the way investigations are to be conducted from the discovery to the terrestrial and marine evaluations, data analysis and finally the design of a report. This work also involved a presentation of this tool to New Caledonian institutional stakeholders and should in a near future be helpful for the integration of such investigation in the current legislation applied.
In 2010 was initiated a new project in collaboration with the fisheries division of the Kiribati and SPC Live Reef Fish Trade adviser. This project mainly aims at assessing the reef fish resources and also the process used to fish to achieve sustainability on a long term-term basis.
The CRISP programme coordinator therefore conducted a field trip to Kiritimati Island where the Live Reef Fish trade is mainly taking place, joined by Being Yeeting and 2 fisheries officers as well as a Video team. This project should in fine lead to 1/ a movie made on fishing methods used and resources monitoring and 2/ a management plan designed for the benefit of this activity and communities depending on it (Yeeting 2009).
Finally, in August 2010, a scientific expedition took place in the Chesterfields Islands of New Caledonia, archipelago located in the coral sea, half way between New Caledonia and Australia. Those sites were chosen thanks to the high variety of environmental ecosystems represented. A RAP was conducted during the mission by five experts who identified coral taxonomy (Gregory Lasne), invertebrates (Jeff Kinch and Caroline Vieux from SPREP) and commercial reef fishes (Noel Wanganu and Schannelle Von Di-

jken from CI). They conducted underwater visual surveys to identifiy the species diversity in the mentioned taxa. During this scientific expedition, 218 scleractinian coral species were counted and 189 identified at species level, as well as four Millepora species (non-scléractinian). Species identified are combined into 61 scleractinian genus groups and represent 53% of species identified in New-Caledonia (Lanes 2010).

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DECISION-MAKERS AND STAKEHOLDERS AWARENESS

▶ BACKGROUND

Raising awareness on coral reef conservation has been a major task for the CRISP programme. Through different types of communication, and resource materials, both the CRISP Coordinating Unit and SPREP, regional leader in this field, have been promoting and disseminating major outcomes of the programme. Similarly, the IRD has also been working on the design of innovative public awareness methodologies.

Other technical stakeholders in various programme components are also dealing with this topic. For example, IRD has set up a subcomponent-2A project to test innovative general public awareness methods, and subcomponent 3B05 project is also focussing on assessing the economic value of MPAs.

■ BRIEF REVIEW

Several socio-economic studies related to the environmental conservation of coral reef were conducted in this field, to support the decision making process. In this direction, the first study on this topic under the CRISP programme was conducted by a team of geographers (David et al. 2007) on the social and economic value of Pacific Islands coral reefs, while our institutional partner USP was conducting an economic study of the Navakavu MPA (O'Garra 2007) and an economic assessment of the economic potential of Fijian traditional fishing areas (qoliqoli) for the tourism industry (Korovulavula et al. 2007). Similarly, the SPREP has been supporting the development of MPA socio-economic monitoring as a Pacific-adapted package designed in collaboration with NOAA, which was initially tested in Papua New Guinea in 2007 (Vieux 2008a).

An important awareness campaign started through SPREP by the launching of the "Pacific Year of the Reef", part of an ICRI worldwide action plan for the region to reverse the degradation of the coral reef and build their resilience to climate change (Vieux 2008b).

The IRD also took place into the dissemination of information for technical and scientific stakeholders through e.g. a feedback trip to Honiara in March 2008, after the completion of a sampling campaign in 2005 and further research in 2006 and 2007, for the collection of marine invertebrates both for taxonomy and isolation of Active Marine Substances (Debitus et al. 2008). In the meantime, the UR 128 of the IRD was working on the completion of a DVD on coral ecosystem for the Francophone general public partly under AFD funds.

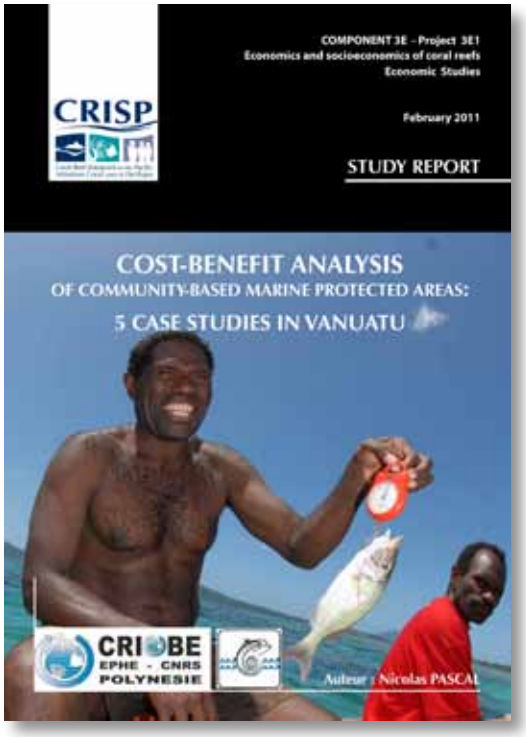
Finally, a key report on the utilization of fishermen perception in participative resource management was translated in English for broad dissemination (Hubert 2007).

■ RECENT PROGRESS

In 2009, requested by the French Development Agency in preparation of the 2009 United Nations Climate change Conference in Copenhagen, a review of the ocean acidification on coral reefs was conducted by one of the CRISP scientific advisors, Bernard Salvat from EPHE, in collaboration with Denis Lallemand from the Oceanographic Museum of Monaco. The review was produced in English and translated into French and Spanish for a large diffusion (Salvat 2009).

Approaching the final phase of the programme, a scientific report was compiled by both scientific advisers, Bernard Salvat and Clive Wilkinson to summarize major scientific knowledge gained throughout the duration of the programme. This report was included into a programme wide consolidated report compiled by Me Catherine GABRIE (Gabrié 2011). This report built on the outcomes of the CRISP programme is as mentioned into its title looking at six years for the conservation, management and development of coral reefs in the Pacific.

In 2008, a workshop was held in Suva on the economics of Marine Managed Areas of the South-Pacific. Attended by key stakeholders involved in economics and marine conservation in the Pacific, it led the creation of Terms of reference for a CRISP Economic Task Force. This task force aimed at discussing the use of economics tools in coral reef management in Pacific countries and Territories, and more specifically at supporting the design and management of marine protected areas (MPAs) (Pascal et al. 2008). Since this date, Nicolas Pascal (EPHE-CNRS)has been in charge of the CETF trying to coordinate several projects and actions conducted under the programme on



the topic of coral reef environmental economic. In Vanuatu specifically, Nicolas has been working on the economic valuation of MPA, this in northern Efate, Emua village (Pascal 2011). Similarly, regarding marine managed area, in French Polynesia, the association of Marine Management Plan of Mooréa has been created for the sustainable management of marine resources. In 2009, the United Nation Funds through SPREP was funding an economic evaluation of the management plan to assess possibilities for sustaining this management plan in the future (Charles et al. 2010).

Regionally, IUCN HQ is currently conducting a project under the CRISP programme to review the status of coastal resources and associated ecosystems in PICTs, such as those described in a range of reports including the 'Voices from the Village' report and ongoing SPREP research into LMMAs in Fiji; This project should as well according to the definition of the terms of reference review the effectiveness of different management approaches used in the PICTs from an economic perspective, and finally will work on producing guidelines for coastal management agencies and donors in PICTs identifying prerequisites for implementing different management approaches to assist in achieving sustainable coastal resource management.

After writing the status and potential of Locally-Managed Marine Areas in 2009 already focusing on sustainable livelihoods (Govan 2009), Hugh Govan, a key person in the field of Socio-economy and MMAs has been leading the SLOPIC project phase 2 on Supplementary Livelihood Opportunities for Pacific Islands Countries, implemented through FSPI, contracted by SPREP. This project is currently focusing on developing tools and skills for communities and support agencies to improve approaches to supplementary livelihoods. It is being implemented several stages. After evaluating community livelihoods options, tools will be developed to enable community to assess these options and build capacity on the formulation of sustainable livelihood projects as well as producing policies for all stakeholders (NGO to government) (Govan 2009).

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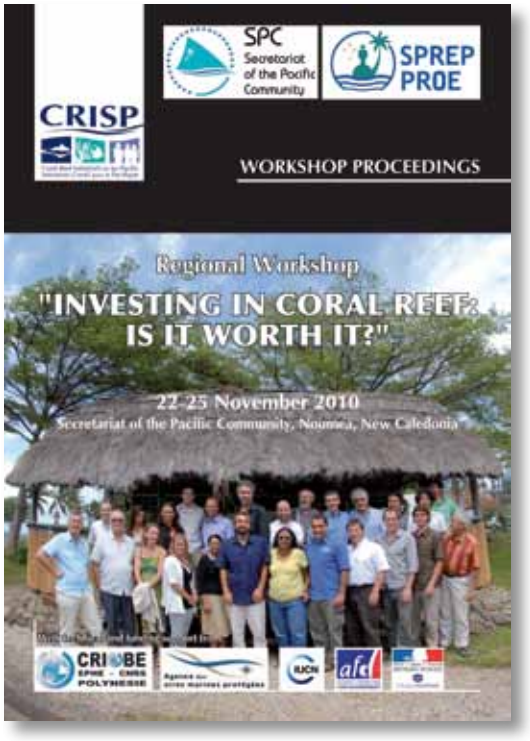

TRAINING AND INSTITUTIONAL STRENGTHENING

▶ BACKGROUND

One targeted outcome of the CRISP programme has been the training and institutional strengthening of Pacific islanders in particular. Training has been mainly done through students exchanges so that Pacific islanders would be trained in Francophone institutions, and vice versa French students be trained in Anglophone ones, especially USP. Technical training and institutional strengthening for Pacific Island nationals have been supported through workshops funded or co-funded under the programme.

Below is the table synthetising all students' training taking place from 2005 to 2010 throughout the duration of the programme, with number of participants for each one. It is important to note that most training took place in collaboration with USP Fiji, this leading to a Framework agreement signed between the University of Perpignan administering EPHE programme and USP. Majority of students trained at USP were Pacific Islanders, on a wide variety of topics of the programme, from Post Larval Capture and Culture to bioprospection, coral reef fisheries, and utilization of coral reef ecosystem.

Looking at numbers, a total of 88 students were trained during the entire duration of the programme (cf table below), 25 of them from PICs, out of which 18 originally from Fiji. 14 students completed their PhD, 47 students their master degree. In the entire pool of trainees, all levels combined, a similar repartition was observed into the transversal theme studied, around 25% of students working on Bioprospection, 25% on integrated coastal management, 25% on reef knowledge and monitoring, and finally 25% on Post larval capture and culture methodologies.

■ TECHNICAL TRAINING

The majority of technical training took place in Fiji, and more than 500 people have been involved from 2009 until the end of 2010..

COREMO3 WORKSHOP, 09-11 SEPTEMBER, 2009

This training programme was implemented by SPREP in collaboration with technical partner ARVAM under AFD and NOAA funding. A workshop was held in September 2009 in Samoa, at SPREP office, for the training of officers involved into coral reef monitoring throughout the Pacific region. This database is already used for the monitoring of Coral reef using standardised methodology in Caribean and la Réunion Island. Recently, a new version has been adapted to the Pacific region. The purpose of this training was therefore to assess the way CoReMo could be adapted to monitoring methods used in the PICs and how methods and protocols can fits into CoReMo software. It was also an occasion for participants to understand the way this software could benefit their countries and reef monitoring, and assess what could be their involvement into the process of CoReMo development at a regional level (Quod et al. 2008).

SPAWNING AGGREGATION WORKSHOP, 07-10 OCTOBER, 2009

Cofunded by AFD, SPC, SCRFA, Mc Arthur and Packard Foundations, Reef fish spawning aggregations (FSAs) commonly occur in the Pacific region. With the increasing population and the increasing demand for food security and cash income earning opportunities, these reef fish spawning aggregations are increasingly being targeted especially for the Live Reef Food Fish Trade (LRFFT), thus threatening the aggregating reef fish species with overfishing and compromising the fishery. The workshop was designed to help participants understand the major issues in coastal fisheries, in general, and in particular with respect to reef fish spawning aggregations which are formed by many of the most valuable reef fish species.

The importance and relevance of monitoring of fisheries was discussed and novel methodologies for simply and efficiently surveying reef fish in aggregations and estimating annual catches, among other things, were also presented. To highlight the reality of the problems and issues of monitoring spawning aggregations in the field, hands-on experience was presented and shared from work in Palau and Fiji by invited keynote speakers (Yeeting et al. 2009).

TRAINING FOR PARTICIPATORY APPROACH FOR FRANCOPHONE PACIFIC ISLANDS COUNTRIES, 23-26 NOVEMBER 2009.

Organized by SPREP within IFREMER office, this workshop on participatory approach for French speaking countries has been an occasion to exchange experience from PICTs involved in LMMAs to French countries. Participants from territorial and provincial institutions got an opportunity to gain knowledge on the development of participative management plan, progressing throughout the workshop on the understanding of adequate tools and facilitations necessary for participatory planning. This technical workshop was mainly conducted through role playing (Vieux 2010).

OIE WORLD ORGANISATION FOR ANIMAL HEALTH WORSKHOP, 21-25 JUNE 2010.

In the context of the CRISP supporting the development of PCC for fish ornamental species, it somehow seems appropriate for the CRISP coordinator to support the OIE WAHIS workshop. OIE's web-based World Animal Health Information System (WAHIS) is the standard system for reporting a country's terrestrial and aquatic animal health status. This workshop on using WAHIS and animal health reporting procedures was organised for relevant fisheries, quarantine and animal health staff. The main intention was to ensure that countries currently exporting aquatic ornamentals are able to comply with OIE reporting procedures and can make regular reports. The workshop also provided an opportunity to discuss the possible scope and functions of regional animal health information systems, specifically for the Pacific Islands region, to pinpoint constraints in implementing systems like WAHIS or the Transboundary Animal Disease Information System (TADinfo) in Pacific island countries, and to develop strategies to address these constraints (SPC 2010).

TIKINA NAKOROTUBU NURSERY TRAINING; 31 MAY- 04 JUNE, 2010.

A five-day training was organized through the COWRIE project in partnership with the Department of Forestry and the Land-Use section within the Ministry of Agriculture of Fiji. The main aim of this training was to empower communities with the necessary knowledge and skills to implement restoration activities using native tree species with minimum external assistance. The Land-Use section personnel were also engaged during that week on the development of a land-use map for the Nakorotubu sub-district. Objectives of the training included: to provide information and hands-on training on the following, building of a basic community nursery maximizing the use of existing resources and finally the collection and propagation of Native species seed and fruit tree species (USP 2010).

REEFS AT RISK, PACIFIC REGIONAL WORKSHOP, 16–18 MARCH 2009, SUVA, FIJI

USP's Institute of Marine Resources, in collaboration with the World Resources Institute (WRI) and ICRAN, hosted a three-day workshop on the Reefs at Risk Revisited project (www.wri.org/project/reefs-at-risk). Partially funded by CRISP, the workshop brought together 32 experts from 20 local and regional organisations in the Pacific, including government agencies, NGOs, universities, trade associations, and consulting companies.

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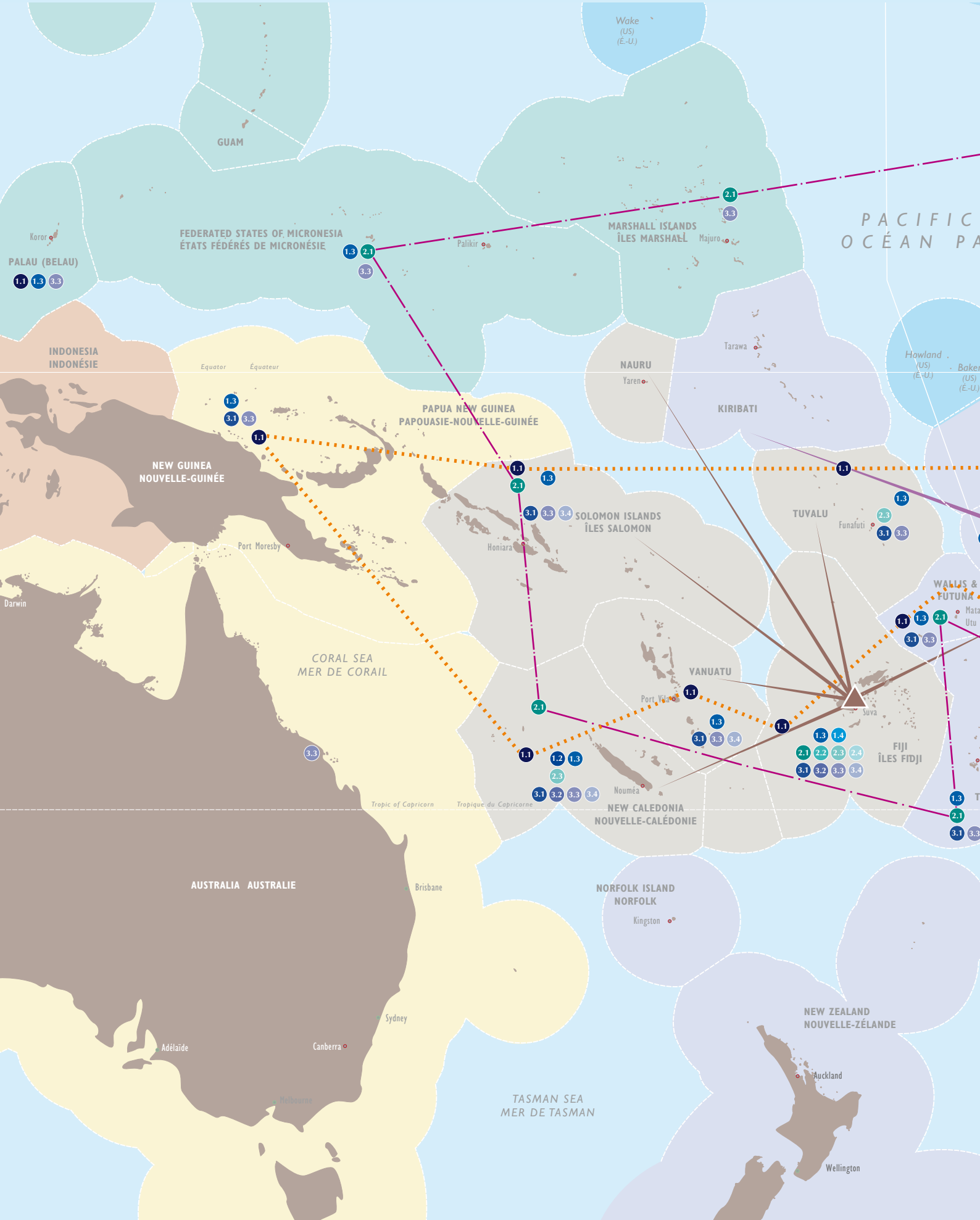
SYNTHESIS OF STUDENT TRAINING 2009-2010

LEV	Y	C	TITLE	STUDENTS	COUNTRY	INSTITUTION
ACTIVE MARINE SUBSTANCES (AMS)						
PhD	2009	2CA	Etude de la biodiversité des Sargassaceae (Fucales, Phaeophyceae) en milieu tempéré et tropical : écologie, chimiotaxonomie et source de composés bioactifs	Klervi Le Lann	France	UBO
	2009	2C4	Phylogénie des Corallinales (Rhodophyta) et analyse de leur diversité génétique dans le Pacifique Sud	Lucie Bittner	France	MNHN (IRD Noumea)
	2009	2C4	Phylogénie et biogéographie des morphotypes du genre Laurencia (Ceremiales, Rhodomelaceae)	Julie Martin Lescanne	France	MNHN
	2010	2C4	Extraction de métabolites bioactifs d'éponges marines du Pacifique Sud	Kirti Patel	Fiji	MNHN (ICSN–CNRS/IRD)
	2010	2C4	Produits naturels marins antipaludiques des Iles Salomon	Luke Mani	Solomon Islands	UPS Toulouse 3 (IRD)
	2010	2C1	Les aspects juridiques de l'utilisation des ressources biogénétiques marines	Bleuenn Guilloux	France	CDMO–Univ. Nantes
	2011	2C1	La protection de la biodiversité marine en droit international	Karolina Zakovska	France	CDMO–Univ. Nantes
Master 2	2009	2C4	Chemosystematics and molecular phylogeny of Cribrochalina sponges	Mereoni Degei Gonelevu	Fiji	USP (Queensland Museum)
Master 1	2006	2C4	Variations interspécifiques des composés phénoliques chez des sargasses des Iles Salomon et test de leur activité antibactérienne	Marie Lhuillery	France	UBO–IUEM (LEBHAM)
	2009	2C4	Secondary metabolites composition and geographical distribution of marine sponges of the genus Dysidea	Mayuri Chandra	Fiji	USP (IRD/UPVD/USP)
	2009	2C4	Expression of secondary metabolites by the Fiji Islands Ascidia: Diazona fungia and Polyandrocarpa polypore	Housnat Saldou	France	UPVD–LCBE
CAPTURE AND CULTURE OF POSTLARVAE (PCC)						
Master 2	2009	2A2	Variation de la production de sons chez Dascyllus flavicaudus	Loic Kever	France	Univ. Liège (CRIOBE)
	2009	2A1	Larval recruitment of the economically important pearl oyster, Pinctada margaritifera: effects of conspecifics, predation and environmental factors	Martin Ubertini	France	UPMC Paris VI (Serv. Perliculture de Takapoto PF/ EPHE–CNRS-UPVD)
	2010	3C8	Etude des capacités auditives des poissons au stade larvaire lors des phases de colonisation et d'installation dans les récifs coralliens	Baptiste Bonhomme	France	UPPA (IRD/CRIOBE)
Master 1	2009	2A1	Etude des traits de vie (survie, condition et charge parasitaire) des juvéniles de poissons lors de leur phase d'installation dans les récifs coralliens (Rangiroa, Polynésie française)	Laurent Burgy	France	UPPA (Serv. Perliculture Rangiroa PF/CRIOBE)
	2010	3C3	Etude du recrutement et des populations des anguilles polynésiennes	Julie Grousseau	France	UPVD
	2010	3C8	Etude de patron de colonisation larvaire par poissons récifaux	Moana Le Rohellec	France	UPVD (CRIOBE/IRD)
	2010	3C8	Capture and identification of coral reef fish larvae (French Polynesia)	Lindon Havimana	Fiji	USP (IRD)
	2010	3C8	Sensory abilities and brain anatomy of coral reef fish at larval stage	Rynae Greta Lanyon	fIJI	USP (IRD)
	2010	3C8	Phase de colonisation larvaire et Prévalence parasitaire des poissons de récifs coralliens	Kévin Peyrusse	France	UBO – IUEM (CRIOBE/IRD)
Master pro	2009	2A1	Capture, identification and culture techniques for coral reef fish larvae	Viliame Pita Waqalevu	Fiji	USP (CRIOBE)

Post grad	2009	2A1	Evaluation of CARE net method in reef fish larval capture over a lunar month in Laucala Bay, Fiji	Viliame Pita Waqalevu	Fiji	USP (CRIOBE)
ECOLOGY AND MANAGEMENT OF FISH AND INVERTEBRATES						
PhD	2011	2A2	Structure et fonctionnement des populations d'invertébrés benthiques des platiers du Lagon Sud-Ouest de Nouvelle-Calédonie et du nord d'Efate au Vanuatu	Haizea Jimenez	France	IRD
WATERSHEDS MANAGEMENT						
Master 1	2010	1A4	Digitalisation de l'occupation des sols au Nord Viti Levu (Fidji)	Jonathan Gony	New Caledonia	Univ. Denis Diderot–Paris VII (IRD Noumea–UR Espace)
Engineer degree	2010	1A4	Détection de changements sur une série d'images satellites haute résolution : comparaison de méthodologies	Glenn Judeau	France	Institut supérieur de l'Electronique et du Numérique (IRD Noumea–UR Espace)
	2010	1A4	Développement sous logiciel libre (R) d'outils génériques d'estimation et de spatialisation de l'érosion hydrique des sols	Loïc Bellon	France	INP Toulouse- ENSEEIHT (IRD Noumea – UR Espace)
	2010	1A4	Mise en place d'un module de modélisation hydrologique sous un logiciel SIG libre	Clément Berlon	France	Ecole nationale des Géomètres et Topographes (IRD Noumea–UR Espace)
	2010	1A4	SVM algorythm and Voronoi tessellation	Mickael Barotin	France	INP Toulouse–ENSEEIHT (IRD Noumea–UR Espace)
MONITORING OF CORAL REEFS AND RESOURCES						
PhD	2010	1A4	Développement méthodologique en matière de perception et de représentation de la valeur totale de l'environnement (cas d'étude dans la zone de VKP)	Matthias Kowasch	Germany	Univ. Heidelberg–Univ. Montpellier II (IRD Noumea–UR Espace)
	2009	2A2	The relevance of participatory approaches in ecosystem-based reef fishery monitoring	Ambroise Brenier	France	UPMC–Univ. Tulear (IRD/EPHE–CNRS–UPVD/CRIOBE)
Engineers degree	2009	2A2	Guide méthodologique pour la mise en oeuvre et l'analyse des stations vidéo rotatives	Nicolas Guilpart	France	IRD (IFREMER)
Misc.	2010	1A4	Saisie et pré-traitement d'une enquête socioéconomique dans le nord d'Efate (Vanuatu)	Malcom Xenie	New Caledonia	UNC (IRD Noumea–UR Espace)
CONSERVATION, MARINE PROTECTED AREAS (MPAs)						
Master 2	2010	2A2	Quantifying the gross financial effect of having Marine Protected Areas (MPAs) in three qoliqolis that use Locally-Managed Marine Area (LMMA) Network management tools	Rusiate Ratuniata	Fiji	USP
VULNERABILITY OF REEF ECOSYSTEMS - OTHERS						
Post doc	2010	3D1	Connectivity of tiger (Galeocerdo cuvier) and other large shark species in the South Pacific: A focus on inter-connectedness of Great Barrier Reef Marine	Jonathan Werry	Australia	Griffith University (SPC/CRIOBE)
Master 2	2010	1A4	Outil d'aide à la gestion des littoraux récifaux dans le Pacifique – Cas de la Presqu'île de Tahiti	Arnaud Campaner	France	Univ. Strasbourg (IRD Noumea–UR Espace)
Master 1	2010	3D1	Mark-recapture of Tiger shark (Galeocerdo cuvier) in New Caledonia: A photo-identifi cation approach	Tyffen Read	New Cal/Australia	Griffith University (SPC)
Eng	2009	1A4	SIE (Système d'information environnemental) Vanuatu	Alban Diguer	France	Ecole supérieure d'Ingénieurs de Luminy (IRD UR Espace)
Misc.	2010	3D1	La microflore dans des coraux présentant différents types de lésions ou maladies (Lagon néocalédonien)	Pauline Pannetier	France	IUT de Brest–UBO (IRD–UR Camelia)

MAP OF CRISP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Darwin
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AUSTRALIA AUSTRALIE
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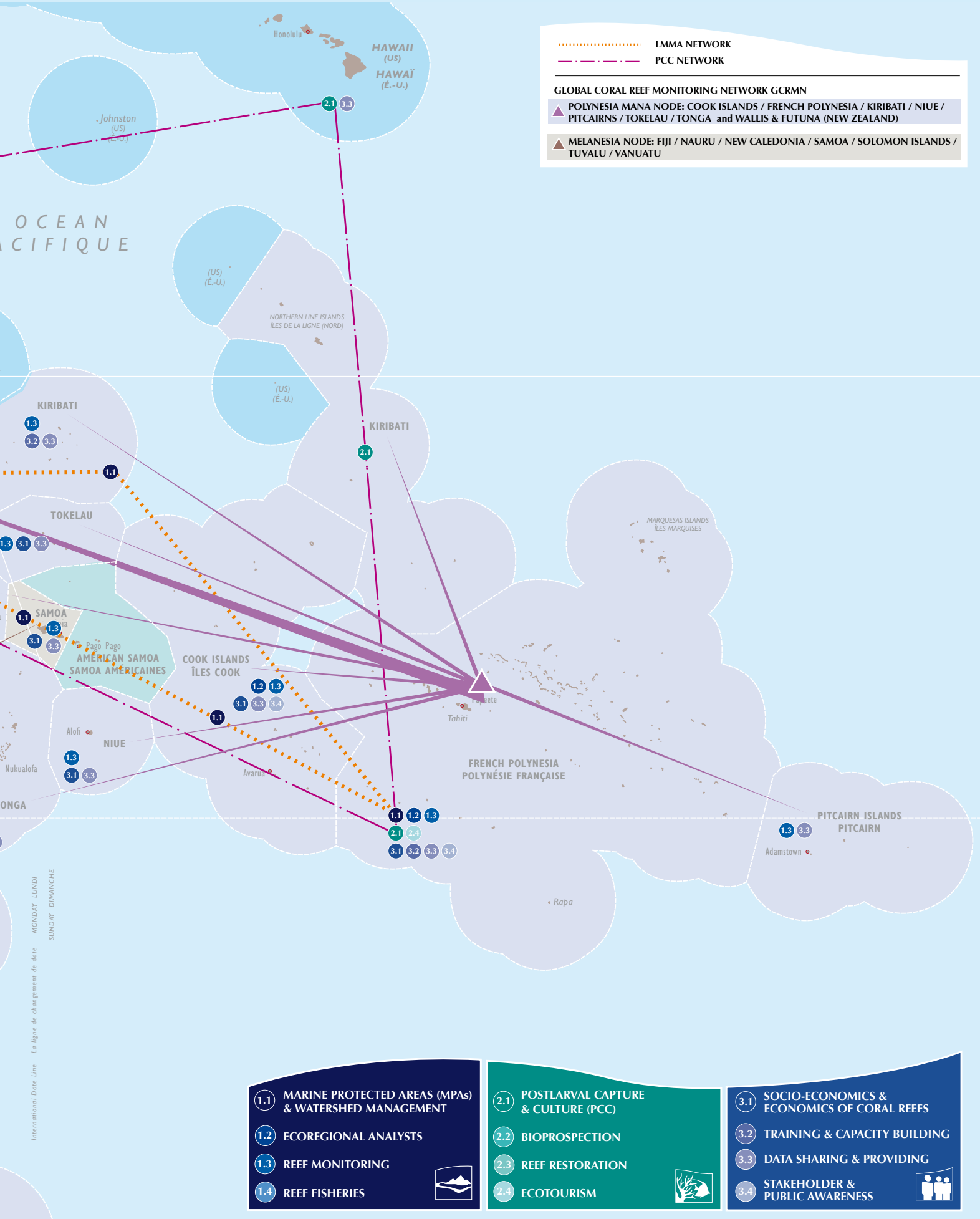
LMMA NETWORK
PCC NETWORK
GLOBAL CORAL REEF MONITORING NETWORK GCRMN
POLYNESIA MANA NODE: COOK ISLANDS / FRENCH POLYNESIA / KIRIBATI / NIUE / PITCAIRNS / TOKELAU / TONGA and WALLIS & FUTUNA (NEW ZEALAND)
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1.1 MARINE PROTECTED AREAS (MPAs) & WATERSHED MANAGEMENT
1.2 ECOREGIONAL ANALYSTS
1.3 REEF MONITORING
1.4 REEF FISHERIES
2.1 POSTLARVAL CAPTURE & CULTURE (PCC)
2.2 BIOPROSPECTION
2.3 REEF RESTORATION
2.4 ECOTOURISM
3.1 SOCIO-ECONOMICS & ECONOMICS OF CORAL REEFS
3.2 TRAINING & CAPACITY BUILDING
3.3 DATA SHARING & PROVIDING
3.4 STAKEHOLDER & PUBLIC AWARENESS

MAIN TECHNICAL PARTNERS OF THE PROGRAMME

PROTECTED MARINE AREAS AND WATERSHEDS

COMPONENT 1A

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

KNOWLEDGE, MANAGEMENT AND USE OF REEF ECOSYSTEMS

COMPONENT 2

Objective: improve knowledge, monitoring, management capacity and ecosystem resource development to reinforce coral reefs sustainable development.

IMPROVEMENT OF KNOWLEDGE, MONITORING AND MANAGEMENT OF CORAL REEF ECOSYSTEMS

COMPONENT 2A

RESTORATION OF CORAL REEF ECOSYSTEMS

COMPONENT 2B

Objective: contribute to concrete coral reef restoration techniques and their dissemination in order to promote healthy fonctionning and lasting production.

VALORISATION DES SUBSTANCES ACTIVES MARINES

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

COMPONENT 2C

DEVELOPMENT OF REEFBASE PACIFIC

Objective: promote the access to information and its dissemination as a tool for better management and coral reef ecosystem conservation strategy.

COMPONENT 2D

INSTITUTIONAL AND TECHNICAL SUPPORT, CAPITALISATION and DISSEMINATION

COMPONENT 3

COMPONENT 3A

Objective: Institutional and technical Strengthening to programme technical partners, integration, capitalisation, and dissemination of information (Data, methodology, know how) gain during the CRISP programme.

COORDINATION, MONITORING AND EVALUATION of the PROGRAMME

COMPONENT 3B

SUPPORT TO ALTERNATIVE LIVELIHOODS

COMPONENT 3C

VULNERABLE MARINE SPECIES and ECOSYSTEM RESILIENCE

COMPONENT 3D

CORAL REEF ECONOMIC STUDIES

COMPONENT 3E

Implementing agencies	AFD (K€)	Co-funding (K€)	Matching agencies	Comp.	Output	Description	Main Implementing agencies
CI	2140	2734	CI, NZAID, NEAq, NC, PN, NC PS, Packard Foundation, MacArthur Foundation, IFRECOR, RNHP, IRD 140	1A	1A1	Marine conservation planning	WWF, CI, SPE PF, AAMP
					1A2	Support to marine protected areas	WWF, CI, FSPI, ProScience ASMPA, IFRECOR
					1A3	Capacity building, networking, lessons learnt	CI, FSPI
					1A4	Integrated coastal management	IRD, FSPI, SPREP, EPHE
					1A5	Coordination	CI
CNRS-EPHE	1000	286	CNRS, Ecocéan, IRD, EPHE, USP	2A	2A1	Postlarval Capture and Culture	EPHE, UNC, USP, Ecocéan
					2A2	Reef fisheries management	IRD, USP
					2A3	Monitoring of coral reefs	EPHE, USP, IRD
					2A4	Extension	IRD, EPHE
					2A5	CO_2 and ecotourism	EPHE, USP, TMOTM
					2A6	Coordination	EPHE, USP, IRD 128
	300	43	GINGER SPI-INFRA, FSPI	2B	2B1	Pilot sites (Fiji and Tuvalu)	GINGER SPI-INFRA, FSPI
					2B2	Restoration guide	GINGER SPI-INFRA, FSPI, CRTR
IRD	500	2337	IRD	2C	2C1	Legal framework improvement	IRD, CDMO-Nantes UNIV.
					2C2	Algae and sponges taxonomy	IRD, USP
					2C3	Collection and screening	IRD
					2C4	Institutional strengthening	IRD
UNF	400	1297	UNF, SPREP	2D	2D1	ReefBase nodes	WFC, IRD
					2D2	ReefBase Pacific database	
					2D3	Information products	
					2D4	Dissemination of products	
	500			3A	3A1	Institutional strengthening	SPREP
					3A2	Support for integrated governance	SPREP, IRD
					3A3	Economic valuation	SPREP, IUCN, CCU, IRD
					3A4	Access to knowledge and technologies	SPREP, WFC
					3A5	Dissemination of CRISP products	SPREP
SPC-CCU	300	850	MAE, French Pacific Fund	3B	3B1	Coordination, monitoring and evaluation	SPC/CCU
					3B2	Promotion and communication	
	450				3B3	Development of the programme	
	910	200	NZAID, USAID		3B4	Complementary project	
	500	58	SPE PF, SPC, WFC, Ecocéan, MFMR	3C	3C01 to 3C12	Support to Capture and culture of postlarvae in Pacific courntries	Ecocéan, HSL, BEF, SPC, MERIP, CRIOBE
						Diversification of PCC techniques	
						Promotion of PCC industry	
	60	190	AAMP, DIREN PF, BIOCODE, AIMS, Griffith UNIV.	3D	3D01 to 3D04	Shark and reef fish vulnerability	EPHE, Griffith Univ, NIWA, SPC
	20	170	CRIOBE, USP, IRD			Coral reef vulnerability	CRIOBE, IRD, Univ of HAwaii
	50	_		3E	3E 01	Economic task force	SPC, CRIOBE, IUCN, SPREP
Total	**7130**	**8165**					

SUMMARY OF PROGRAMME FUNDING, 31 DECEMBER 2010

CRISP

Coral Reef InitiativeS for the Pacific
Initiatives Corail pour le Pacifique

The CRISP Coordinating Unit (CCU) was integrated into the Secretariat of the Pacific Community in April 2008 to insure maximum coordination and synergy in work relating to coral reef management in the region.

SPREP/PROE

The CRISP Programme is implemented as part of the policy developed by the Secretariat of the Pacific Regional Environment Programme to contribute to the 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 established by the French Development Agency (AFD), is part of an inter-ministerial project that began in 2002. CRISP aims to develop a vision for the future of these unique ecosystems 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. CRISP also, has a role in fostering greater integration in this area 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 networking 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 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 established on the basis of a call for proposals to all institutions and networks.

This approach is articulated through a series of thematic objectives:

Objective 1: Improved knowledge of the biodiversity, status and functioning of coral ecosystems.

Objective 2: Protection and management of coral ecosystems on a significant scale.

Objective 3: Development of the economic potential represented by the use values and biodiversity of coral ecosystems.

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

The CRISP Programme comprises three major components:

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 ecosytems
- 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 the CRISP programme
- 3C: Support to alternative livelihoods
- 3D: Vulnerability of ecosystems and species
- 3E: Economic task force

SPC
Secretariat
of the Pacific
Community

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AFD Agence Française de Développement · FFEM · Liberté • Égalité • Fraternité République Française Fonds Pacifique · WWF · United Nations Foundation · Conservation International · IFRECOR

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Summary

In regards to **applied ecosystem management**, the ERA process regionally and locally conducted under the CRISP led to several synthesis documents that should benefit the region for planning biodiversity conservation. FSPI has been the leader organization in the establishment and support of community based coastal management process in Micronesia and Melanesia, this especially as part of the LMMA network. While scientists such as Clive Wilkinson recently published on the topic of watershed management, the COWRIE project of GERSA reached in Fiji excellent results in watershed rehabilitation and management under the coordination of USP. Following the Regional Marine Managed Area conference in November 2009, SPREP has coordinated a French territories governance workshop in French Polynesia in the field of participative management.

Improvement of **scientific knowledge** continued with research on sharks implemented by SPC and CRIOBE in French Polynesia and in New Caledonia in collaboration with Griffith University, focusing on the connectivity between Australia and New Caledonia for large shark species. In the context of improving biodiversity knowledge, main research projects were conducted in Tuvalu and New Caledonia. The Institute for Research and Development contributed throughout projects focusing on New Caledonian reef coral diseases, then compiling work on fisheries biodiversity indicators throughout a 20 page guidebook outlining USP, IRD and EPHE work in the region on coral reefs and coastal fisheries.

Post-Larval Capture and Culture (PCC), a major focus for the programme at this stage, has been experimented during the last 2 years in various areas of the region. Projects carried out included studies about the market potential as well as on the process itself. The market development was therefore studied in French Polynesia for clam and crustaceans species, in Solomon Islands for coral and molluscs throughout the World Fish Centre, and in FSM for reef fish species thanks to MERIP Research Center and Hawaiian Sea Life company. Research on species recruitment continued in New Caledonia and Vanuatu on crustaceans and molluscs thanks to IRD UR CoReUs and SPC aquaculture section. The French GEF programme should continue support to this PCC process market development, based on the multiple and various studies conducted under the programme.

Dissemination of knowledge and lessons learned has occurred about various topics of the programme. N. Pascal, from the CRISP Economic Task Force, has been widely involved into the presentation of his socio-economic study about small-scale fisheries, carried out in Vanuatu. He attended the MPA regional conference in Mooréa in 2009 and also the IIFET symposium (International Institute for Fisheries and Economic) in France. Shark tagging was presented during the International white shark conference in Hawaii and during a mini symposium held at SPC Nouméa. The Tahiti Aquaculture conference, partly funded by the programme also led to a wide presentation of PCC throughout the region.

As for **multimedia development**, Reefbase Pacific portal has been and will remain a major tool of the programme, to access to all sorts of documents related to coral reef, from grey literature to scientific reports. CRISP has therefore been printing in 2008 and 2009 DVD versions of this portal and widely disseminated those. Today, the atlas of the Pacific made by Serge Andrefouet and IRD team was referenced onto the Reefbase portal. E. Clua has been involved into the design and realization of several movies related to coral reef and reef resources conservation issues during the past two years to raise public awareness. In addition, the major CRISP product is a final programme interactive DVD that is currently being finalized, where all documents referenced onto the CRISP website, developed by the CCU, will be referenced and available under a searh engine.

Monitoring of coral reef resources is continuing through the support of the Polynesian and Melanesian Nodes of the Global Coral Reef Monitoring Network. Threatened species has been a common topic during the last two years with SPREP looking at reef species, and the support to CSI (Crime Scene Investigation), focusing on damage to coral reef in case of human damage. Marine resources have been a main topic for the programme with several reef resources assessment field trips e.g in Kiritimati and Chesterfield archipelago of New Caledonia.

In terms of **raising decision-maker and stakeholder awareness**, after writing the status and potential of Locally-Managed Marine Areas in 2009 already focusing on sustainable livelihoods, H. Govan has been Leading the SLOPIC project phase 2 on Supplementary Livelihood Opportunities for Pacific Islands Countries, implemented through FSPI, contracted by SPREP. Finally, a major event took place in Nouméa related to one of the programme component on Economy. The Workshop held with economists brought an opportunity to draw conclusions about a major question: "Investing in coral, is it worth it?".

Finally, the majority of **technical training** took place in Fiji, and more than 500 people in total have been trained from 2009 until the end of 2010.