



Member's report on activities related to ICRI

Reporting period July 2012 - October 2013

NOTE: TO CHECK A BOX DOUBLE CLICK ON IT AND TICK 'CHECKED' UNDER 'DEFAULT VALUE' IN THE POP UP WINDOW

1. **General Information** (note that this information will be posted on the ICRI website in your member page: <http://www.icriforum.org/about-icri/members-networks>)

Are you an ICRI Member?	YES
Member type (Country / Organization):	COUNTRY (MONACO)
Focal Point 1:	
<i>Name:</i>	SE M. Patrick Van Klaveren
<i>Organization:</i>	Délégation Permanente auprès des Organismes Internationaux à caractère Scientifique, Environnemental et Humanitaire
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Focal point 2:	
<i>Name:</i>	Dr. Florence Descroix-Comanducci
<i>Organization:</i>	Centre Scientifique de Monaco
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Last meeting attended:	GM26 (La Réunion)
Related website(s)	www.centrescientifique.mc

2. **Updates on your activities** (new initiatives/programs/projects of your government /organization which will be of interest to the ICRI Members). Examples include MPA declarations, World Heritage sites status, economic valuation of reefs, policy changes in relation to coral reefs etc.

Research on coral reef ecosystems: The Centre Scientifique de Monaco (CSM) has been pursuing the development of fundamental research aiming at establishing the biological basis of the sensitivity/resilience of the coral ecosystems regarding the impacts of climate changes, and more particularly of ocean acidification. These processes are studied from the gene to the human society levels through an effective multidisciplinary approach.

In this framework, research scientists of the CSM have established the physiological basis of the coral resistance to ocean acidification (Venn et al, 2013). These discoveries help explain the differences in the resistance of different coral reef species. Ocean acidification also affects nutrients absorption processes (Houlbrèque et al, 2012). Even if it looks uneasy, the next step will be to integrate these biological impacts in terms of socio-economic impacts. Methodologies are under development to address this issue (Hilmi et al, 2013).

Evaluation of the economic value of coral reefs: In the framework of the International Research Group (GDRI) on Biodiversity and Coral Reefs, the Centre Scientifique de Monaco is participating in the European project BEST. The objective is to understand the relations between the four ecosystem services (habitat protection, production, cultural and regulation) in order to anticipate future decisions made through governance scenarios. It represents the major contribution to the sciences-politics interface and to the evaluation of public policies implemented or planned in the framework of global change issues.

Tools for decision making for coral reef management: Work is in progress at the Centre Scientifique de Monaco on this topic. Based on the Nobel prize Elinor Ostrom, economist,

estimates that if users decide to cooperate, following-up of the use of resources and applying management rules they can avoid being a drain on limited resources, the, a cooperative approach is the key of success when common resources are used as a frame for solving environmental problems. The private sector cannot solve alone global problems like climate change. Decision must be taken at different levels. Therefore, the “Game Theory” is an appropriate mathematic tool to structure and analyse problems of strategic choices in an interactive environment (Hilmi et al. 2012, ICRI Cairns).

It should be noted that a group of 12 persons of the Centre Scientifique de Monaco participated in the 12th International Coral reef Symposium » (Cairns, Australia, July 2012) and conducted 3 mini Symposia on Coral Physiology and energetics, Mechanisms of calcification and Economic valuation and market-based conservation.

Governmental actions: The Government of the Principality of Monaco is supporting the organization of side events by ICRI at the International Marine Protected Areas Congress, 21-27 October 2013, Marseille, France

3. Contribution to the ICRI GM

Your responses to the following questions will assist the Secretariat in assessing contributions towards the major themes of the current ICRI action plan and objectives of the general meeting.

a. Community-based monitoring

Are you engaged in, or support community-based monitoring in your marine areas? **NO**

If so, think about what works and what doesn't with it to be prepared for workshop discussions on this topic. The discussions will revolve around:

- The benefit of community-based monitoring for management and reporting
- Way forward and how countries could support each other through a network of persons involved in monitoring and an online database.

b. Co-management

Do you have co-management arrangements in place for your marine reserves? **NO**

If so, start thinking about what they are, and what works for you in preparation for workshop and field trip discussions on this topic. There will be some interactive exercises to help guide your thinking and possible way forward.

4. Is there any other topic you would like to raise during the meeting?

YES NO

If yes, please indicate which topic and the reason why you would like to raise it:

[Insert text here]

5. Please list relevant publications, reports you have been released since the last meeting.

Title (incl. author and date)	Type of publication (Paper, report etc.)
Bayer T, Arif C, <u>Ferrier-Pagès C</u> , Zoccola D, Aranda M, Voolstra CR (2013) Bacteria of the genus <i>Endozoicomonas</i> predominate the microbial communities of the Mediterranean gorgonian soft coral <i>Eunicella cavolini</i> .	Mar. Ecol. Prog. Ser. 479: 75-84
<u>Béraud É</u> , Gevaert F, <u>Rottier C</u> , <u>Ferrier-Pagès C</u> (2013) The response of the scleractinian coral <i>Turbinaria reniformis</i> to thermal stress	Journal of Experimental Biology. in press

depends on the nitrogen status of the coral holobiont.	
<u>Bertucci</u> , A., <u>A. Moya</u> , <u>S. Tambutté</u> , <u>D. Allemand</u> , <u>C.T. Supuran</u> , <u>D. Zoccola</u> (2013). Carbonic anhydrases in anthozoan corals : A review.	Bioorganic & Medicinal Chemistry. 21: 1437- 1450.
<u>Chow A</u> , <u>Béraud É</u> , <u>Ferrier-Pagès C</u> , <u>Brown I.</u> (2012). Hsp60 protein pattern in coral is altered by environmental changes in light and temperature. <i>Comparative Biochemistry and Physiology</i>	<i>Molecular and Integrative Physiology</i> 161A: 349-353. doi:10.1016/j.cbpa.2011.12.004
<u>Cocito S</u> , <u>Ferrier-Pagès C</u> , <u>Cupido R</u> , <u>Rottier C</u> , <u>Meier-Augenstein W</u> , <u>Kemp H</u> , <u>Reynaud S</u> , <u>Peirano A</u> (2013) Nutrient acquisition in four Mediterranean gorgonian species.	Mar. Ecol. Prog. Ser. 473: 179-188.
<u>Davy S.K.</u> , <u>Allemand D.</u> , <u>Weis V.M.</u> (2012) The cell biology of cnidarian-dinoflagellate symbiosis.	<i>Microbiol. Mol. Biol. Rev.</i> 76(2): 229 – 261.
<u>Debreuil</u> , J., <u>É. Tambutté</u> , <u>D. Zoccola</u> , <u>E. Deleury</u> , <u>J.M. Guigonis</u> , <u>M. Samson</u> , <u>D. Allemand</u> , <u>S. Tambutté</u> (2012). Molecular cloning and characterization of first organic matrix protein from Sclerites of Red Coral, <i>Corallium rubrum</i> .	<i>J. Biol. Chem.</i> 287: 19367-19376.
<u>Dissard D</u> , <u>Douville E</u> , <u>Reynaud S</u> , <u>Juillet-Leclerc A</u> , <u>Montagna P</u> , <u>Louvat P</u> , <u>McCulloch M.</u> (2012) Light and temperature effects on ¹¹ B and B/Ca ratios of the zooxanthellate coral <i>Acropora</i> sp: Results from culturing experiments.	<i>Biogeoscience</i> , 9 :4589-4605
<u>Ezzat L</u> , <u>Merle P-L</u> , <u>Furla P</u> , <u>Buttler A</u> , <u>Ferrier-Pagès C</u> (2013). The response of the Mediterranean gorgonian <i>Eunicella singularis</i> to thermal stress is independent of its nutritional regime.	<i>PLoS ONE</i> vol 8 (5): 64370
<u>Ferrier-Pagès C</u> , <u>Gevaert F</u> , <u>Reynaud S</u> , <u>Béraud É</u> , <u>Menu D</u> , <u>Janquin M-A</u> , <u>Cocito S</u> , <u>Peirano A</u> (2013). In situ assessment of the daily primary production of the temperate symbiotic coral <i>Cladocora caespitosa</i> .	<i>Limnology and Oceanography</i> , in press
<u>Godinot C</u> , <u>Ferrier-Pagès C</u> , <u>Sikorski S</u> , <u>Grover R</u> (2013) Alkaline phosphatase activity of reef-building corals.	<i>Limnology and Oceanography</i> 58(1): 227–234. doi:10.4319/lo.2013.58.1.0227
<u>Godinot C</u> , <u>Tribollet A</u> , <u>Grover R</u> , <u>Ferrier-Pagès C.</u> (2012) Bioerosion by euendoliths decreases in phosphate-enriched skeletons of living corals.	<i>Biogeosciences</i> 9 :2377-2384. doi:10.5194/bg-9-2377-2012.
<u>Hilmi N.</u> , <u>Safa A.</u> <u>Cinar M.</u> (2012). Decision making tools for natural resources protection: Coral reefs management.	Proceedings of the 12th International Coral Reef Symposium, Cairns, Australia, 9-13 July 2012, Mini-symposium 22D “Economic valuation and market-based conservation ».
<u>Hilmi N.</u> , <u>Safa A.</u> , <u>Reynaud S.</u> , <u>Allemand D.</u> (2012). Coral Reefs and Tourism in Egypt's Red Sea.	http://www.luc.edu/orgs/meea/volume14/meea14.html
<u>Hoogenboom M</u> , <u>Campbell DA</u> , <u>Beraud E</u> ,	<i>PLoS ONE</i> 7 (1): 1-14

DeZeeuw K, <u>Ferrier-Pagès C.</u> (2012) Combined effects of light, food availability and temperature stress on the function of photosystem II and photosystem I of coral symbionts.	doi:10.1371/journal.pone.0030167
Houlbrèque F, Rodolfo-Metalpa R, Jeffrey R, Oberhänsli F, Teyssié J.L., Boisson F, Al-Trabeen K, <u>Ferrier-Pagès C.</u> (2012) Effect of Increased pCO ₂ on zinc uptake and calcification in the tropical coral <i>Stylophora pistillata</i> .	Coral Reefs 31 :101-109 DOI 10.1007/s00338-011-0819-2
<u>Laurent, J.</u> , <u>S. Tambutté</u> , <u>É. Tambutté</u> , <u>D. Allemand</u> , <u>A. Venn</u> (2013). The influence of photosynthesis on host intracellular pH in scleractinian corals.	J. Exp. Biol. 216: 1398-1404.
Naumann M. S, Orejas C, Ferrier-Pagès C. (2013) High thermal tolerance of two Mediterranean cold-water coral species maintained in aquaria.	Coral Reefs, in press
Pretet C, Samankassou E, Felis T, <u>Reynaud S</u> , <u>Böhm F</u> , <u>Ferrier-Pagès C</u> , <u>Gattuso J-P</u> , <u>Eisenhauer A</u> , <u>Camoin A.</u> (2013) Constraining calcium isotope fractionation ($\delta^{44}/^{40}\text{Ca}$) in modern and fossil scleractinian coral skeleton.	Chemical Geology, 340: 49-58, doi: 10.1016/j.chemgeo.2012.12.006.
<u>Tambutté, É.</u> , <u>S. Tambutté</u> , <u>N. Segonds</u> , <u>D. Zoccola</u> , <u>A. Venn</u> , <u>J. Erez</u> , <u>D. Allemand</u> (2012). Calcein labelling and electrophysiology: Insights on coral tissue permeability and calcification.	Proc. Royal Society B. 279 (1726) : 19-27
<u>Tremblay P</u> , <u>Ferrier-Pagès C</u> , <u>Maguer J-F</u> , <u>Rottier C</u> , <u>Legendre L</u> and <u>Grover R</u> (2012). Controlling Effects of Irradiance and Heterotrophy on Carbon Translocation in the Temperate Coral <i>Cladocora caespitosa</i> .	PLoS ONE 7(9): e44672. doi:10.1371/journal.pone.0044672.
<u>Tremblay P</u> , <u>Grover R</u> , <u>Maguer J-F</u> , <u>Legendre L</u> , <u>Ferrier-Pagès C.</u> (2012) A new model of photosynthate translocation and carbon budget in the coral-zooxanthellae symbiosis.	Journal of Experimental Biology 215: 1384-1393. doi:10.1242/jeb.065201
<u>Tremblay P</u> , <u>Naumann MS</u> , <u>Sikorski S</u> , <u>Grover R</u> , <u>Ferrier-Pagès C.</u> (2012) Experimental assessment of organic carbon fluxes in the scleractinian coral <i>Stylophora pistillata</i> during a thermal and photo stress event.	Marine Ecology Progress Series 453: 63-77. doi: 10.3354/meps09640
<u>Venn, A.A.</u> , <u>É. Tambutté</u> , <u>M. Holcomb</u> , <u>J. Laurent</u> , <u>D. Allemand</u> , <u>S. Tambutté</u> (2013). Impact of seawater acidification on pH at the tissue-skeleton interface and calcification in reef corals.	Proc. Natl. Acad. Sci USA. 110: 1634-1639
<u>Vidal-Dupiol J.</u> , <u>Zoccola D.</u> , <u>Tambutté É.</u> , <u>Grunau C.</u> , <u>Cosseau C.</u> , <u>Smith K.M.</u> , <u>Freitag M.</u> , <u>Dheilly N.M.</u> , <u>Allemand D.</u> , <u>Tambutté S.</u> (2013) Genes Related to Ion-Transport and Energy Production Are Upregulated in Response to CO ₂ -Driven pH Decrease in Corals: New Insights from Transcriptome	PLoS ONE. 8(3): e58652 (doi:10.1371/journal.pone.0058652).

Analysis.	

6. Please indicate upcoming coral reef-related meetings you or your organisation will attend

2nd Global Conference on Land - Ocean Connections (GLOC-2) October 2- 4 2013, Montego Bay, Jamaica

17th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the Convention on Biological Diversity (SBSTTA-17), 14-18 October 2013 Montreal, Canada

2nd Global Marine World Heritage Site Managers Conference, 17-20 October 2013, Corsica, France

International Marine Protected Areas Congress, 21-27 October, Marseille, France

9th Pacific Island Conference on Nature Conservation and Protected Areas, 2-6 December, Suva, Fiji

Other: [\[Insert text here\]](#)