Ocean Acidification
International
Coordination Centre
OA-ICC

4th International Workshop

Bridging the Gap between Ocean Acidification and Economic Valuation

15 - 17 October 2017

From Sciences to Solutions: Ocean Acidification Impacts on Ecosystem Services — Case Studies on Coral Reefs

Biographies of participants

SUMMARY

4th International Workshop

Bridging the Gap between Ocean Acidification and Economic Valuation

15 - 17 October 2017

From Sciences to Solutions: Ocean Acidification Impacts on Ecosystem Services — Case Studies on Coral Reefs

Ocean Acidification International Coordination Centre

IAEA OA-ICC

LIST OF THE PARTICIPANTS

		INT ORG & OTHERS	SOCIAL SCIENTISTS	NATURAL SCIENTISTS	NAME	ORGANIZATION	COUNTRY	EMAILS
	Red Sea							
FACILITATOR	1			x	ALLEMAND Denis	Scientific Centre of Monaco	Monaco	allemand@centrescientifique.mc
GROUP LEADER	2		x		CINAR Mine	Center International Business (Loyola Univ. Chicago)	USA	mcinar@luc.edu
GROUP LEADER	3			x	FINE Maoz	Interuniversity Institute for Marine Science, Eilat	Israël	maoz.Fine@biu.ac.il
FACILITATOR	4		x		HILMI Nathalie	Scientific Centre of Monaco	Monaco	hilmi@centrescientifique.mc
	5			x	KOTB Mohammed	Suez Canal University, Ismaïlia	Egypt	kotb13@gmail.com
	6			x	LAFFOLEY Dan	IUCN, WCPA	Switzerland	danlaffoley@btinternet.com
	7			x	RINKEVICH Baruch	National Institute of Oceanography, Haïfa	Israël	buki@ocean.org.il
	8		x		SAFA Alain	Skill Partners, Grasse	France	alain.safa@skillpartners.fr
	9	x			TAMELANDER Jerker	UN Environment, Bangkok	Thaïland	tamelander@un.org
	10			x	VOOLSTRA Christian	King Abdullah University, Jeddha	Saudi Arabia	christian.voolstra@kaust.edu.sa
	Indian Ocean and South-East Asia							
	1			x	CHAVANICH Suchana Apple	Chulalongkorn University, Bangkok	Thaïland	suchana.c@chula.ac.th
	2		x		DJOUNDOURIAN Salpie	Lebanese American University, Byblos	Lebanon	sdjndran@lau.edu.lb
	3			x	DUPONT Sam	BIOENV (University of Gothenburg)	Sweden	sam.dupont@bioenv.gu.se
	4	x			GAILL Françoise	Ocean Climate Platform, Paris	France	francoise.gaill@cnrs-dir.fr
GROUP LEADER	5			x	HALL-SPENCER Jason	Marine Institute (University of Plymouth)	UK	jason.hall-spencer@plymouth.ac.uk
	6	x			HOLZER Guillaume	Coral Guardian, Limours	France	g.holzer@coralguardian.org
	7	x			ISENSEE Kirsten	IOC-UNESCO, Paris	France	k.isensee@unesco.org
	8	x			KATUA Stephen	National Environment Management Authority (NEMA), Nairobi	Kenya	stephenkatua@yahoo.com
GROUP LEADER	9		x		LAM Vicky	University of British Columbia, Vancouver	Canada	v.lam@oceans.ubc.ca
	10	x			MARS Frank	Mars Symbioscience, Germantown	USA	miranda.perciavalle@mss.effem.com
FACILITATOR	11			x	METIAN Marc	IAEA	Monaco	m.metian@iaea.org
	French Pacific Islands							
GROUP LEADER	1		x		BAMBRIDGE Tamatoa	CRIOBE, Moorea	French Polynesia	tamatoa.bambridge@criobe.pf
	2		x		CHLOUS Frédérique	National Museum of Natural History, Paris	France	frederique.chlous@mnhn.fr
	3			x	CLAUDET Joachim	CRIOBE, Perpignan	France	joachim.claudet@gmail.com
	4			x	GATTUSO Jean-Pierre	CNRS - LOV - OOV, Villefranche sur mer	France	gattuso@obs-vlfr.fr
	5	x			MOORE Tommy	SPREP, Samoa	Western Polynesia	tommym@sprep.org
	6		x		PASCAL Nicolas	CRIOBE-EPHE, Perpignan	France	nicolas.pascal@criobe.pf
	7	x			RECUERO VIRTO Laura	French Railway & Road Regulatory Agency (ARAFER), Paris	France	laura.recuero-virto@arafer.fr
FACILITATOR	8			x	REYNAUD Stéphanie	Scientific Centre of Monaco	Monaco	sreynaud@centrescientifique.mc
GROUP LEADER	9			x	RODOLFO-METALPA Riccardo	IRD, Nouméa	New Caledonia	riccardo.rodolfo-metalpa@ird.fr
FACILITATOR	10			x	TAMBUTTE Sylvie	Scientific Centre of Monaco	Monaco	stambutte@centrescientifique.mc
	11	x			THOMASSIN Aurélie	French Ministry of Ecological & Solidarity Transition, Paris	France	aurelie.thomassin@developpement-durable.gouv.fr
	Australia							
GROUP LEADER	1			x	ALBRIGHT Rebecca	California Academy of Science, San Francisco	USA	ralbright@calacademy.org
	2	x			FLETCHER Steve	UNEP World Conservation Monitoring Centre, Cambridge	UK	steve.fletcher@unep-wcmc.org
FACILITATOR	3			x	GAZEAU Frédéric	CNRS - LOV - OOV, Villefranche sur mer	France	f.gazeau@obs-vlfr.fr
FACILITATOR	4			x	HANSSON Lina	IAEA	Monaco	l.hansson@iaea.org
GROUP LEADER	5		x		HARALDSSON Gunnar	Intellecon, Reykjavik	Iceland	gunnar@intellecon.com
	6			x	HOEGH-GULDBERG Ove	Global Change Institute (Univ. of Queensland), Brisbane	Australia	oveh@uq.edu.au
	7			x	JEFFREE Ross	Commission on Ecosystem Management, IUCN, Sydney	Australia	Ross.Jeffree@hotmail.co.uk
	8		x		MARSHALL Nadine	CSIRO, Townsville	Australia	nadine.marshall@csiro.au
	9	x			MARSHALL Paul	University of Queensland, Townsville	Australia	paul.marshall@reefecologic.org
	Caribbean and West Atlantic							
GROUP LEADER	1			x	ANDERSSON Andreas	SCRIPPS, University of California	USA	aandersson@ucsd.edu
	2			x	BAXTER John	Scottish Natural Heritage	UK	j.baxter4@btinternet.com
	3			x	CAMP Emma	University of Technology, Sydney	Australia	emma.camp@uts.edu.au
	4	x			COOLEY Sarah	Ocean Conservancy, Washington	USA	scooley@oceanconservancy.org
	5			x	GLEDHILL Dwight	NOAA, Ocean Acidification Program, Maryland	USA	dwight.gledhill@noaa.gov
	6	x			HOLTHUS Paul	World Ocean Council, Honolulu, Hawai'i	Hawaian Islands	paul.holthus@oceancouncil.org
	7			x	KOCH Marguerite	Florida Atlantic University, Florida	USA	mkoch@fau.edu
	8		x		MALIKI Samir	University of Tlemcen	Algeria	sb_maliki@mail.univ-tlemcen.dz
	9	x			MANFRINO Carrie	Central Carribbean Marine Institute, Little Cayman	Cayman Islands	manfrino@reefresearch.org
GROUP LEADER	10		x		PENDLETON Linwood	Duke Nicholas Institute, Durham	USA	linwood.pendleton@duke.edu
FACILITATOR	11			x	VENN Alexander	Scientific Centre of Monaco	Monaco	alex@centrescientifique.mc
	Non French Pacific islands							
	1		x		ACAR Sevil	Istanbul Altınbaş University, Istanbul	Turkey	sevil.acar@altinbas.edu.tr
FACILITATOR	2	x			CLAUDEL-RUSIN Astrid	Department for Environment	Monaco	aclaudelrusin@gouv.mc
GROUP LEADER	3			x	GATES Ruth	University of Hawai'i, Kaneohe	Hawaï	rgates@hawaii.edu
	4			x	GOLBUU Yimnang	Palau International Coral Reef Center, Koror	Palau	ygolbuu@picrc.org
	5			x	KURIHARA Haruko	University of the Ryukyus, Okinawa	Japan	harukoku@sci.u-ryukyu.ac.jp
GROUP LEADER	6		x		REHDANZ Katrin	University of Kiel	Germany	rehdanz@economics.uni-kiel.de
FACILITATOR	7			x	SWARZENSKI Peter	IAEA	Monaco	p.swarzenski@iaea.org
	8	x			TSUNODA Tomohiko	Sasakawa Peace Foundation, Tokyo	Japan	t-tsunoda@spf.or.jp

4th International Workshop

Bridging the Gap between Ocean Acidification and Economic Valuation

15 - 17 October 2017

From Sciences to Solutions: Ocean Acidification Impacts on Ecosystem Services — Case Studies on Coral Reefs

IAEA | Ocean Acidification International Coordination Centre OA-ICC

AGENDA

DAY 1 SUNDAY 15TH OCTOBER

08:30 - 09:00 ***Welcoming of the participants***

OPENING SESSION **Chair:** Dan Laffoley (IUCN)

09:00 Robert Calcagno (Oceanographic Institute, Director General): *Welcoming address*

09:05 David Osborn (IAEA-Environment Laboratories, Director): *Presentation of the IAEA-EL*

09:10 Denis Allemand (CSM, Scientific Director): *Presentation of the CSM*

09:15 Nathalie Hilmi and Peter Swarzenski (CSM/IAEA): *Objectives of the workshop*

KEY NOTE LECTURES **Chair:** Peter Swarzenski

09:30 *Ocean-based solutions to minimise impacts of climate-related changes* (Jean-Pierre Gattuso)

10:00 *A global assessment of ecosystem services and vulnerability of coral reefs to ocean acidification: connecting physical sciences with ecosystem services* – (Ove Hoegh-Guldberg, Linwood Pendleton)

10:30 *A solutions-based approach for coral reefs under ocean acidification: adaptation and mitigation* (Rebecca Albright, Sarah Cooley)

11:00 - 11:20 **Coffee-break (20 min)**

KEY NOTE LECTURES **Chair:** Nathalie Hilmi

11:20 *Harnessing Basic Science to Improve the Prognosis for Coral Reefs* (Ruth Gates)

11:40 *Sustainable tourism for coral reefs* (Jerker Tamelander)

12:00 *Reefs restoration: Coral community assisted solutions* (Guillaume Holzer)

12:20 *Translating sciences into policies* (Françoise Gaill)

12:40 - 13:30 **Lunch (50 min)**

KEY NOTE LECTURES **Chair:** Denis Allemand

13:30 - 13:50 *Practical Coral Reef Rehabilitation* (Frank Mars)

AGENDA

DAY 1 (CONT'D) SUNDAY 15TH OCTOBER

13:50 - 16:00 Break-out sessions (for workshop participants)

13:50 - 14:00 Guidance on what the WG will have to achieve: the aims and the outcomes of the workshop (Peter Swarzenski)

14:00 - 16:00 Discussion of the six working groups

16:00 - 16:20 Coffee-break (20 min)

16:20 - 18:00 Continued discussion of the six working groups

18:00 End of the First Day and Move to the Novotel

19:30 Cocktail at the Novotel (offered by the Monaco Government Tourist and Convention Authority)

DAY 2 MONDAY 16TH OCTOBER

9:00 - 11:00 Break-out sessions (Continued)

09:00 - 09:15 Help answer questions of the WG and reiterate the aims of the workshop (Marc Metian)

09:15 - 11:00 Continued discussion of the six working groups

11:00 - 11:20 Coffee-break (20 min)

11:20 - 11:50 Progress reports from working groups (5 min/group)
Chair: Sylvie Tambutté

11:50 - 13:00 Continued discussion of the six working groups

13:00 - 14:30 Lunch

14:30 - 16:00 Continued discussion of the six working groups

16:00 - 16:20 Coffee-break (20 min)

16:20 - 17:50 Six working groups: draft of the written conclusions

17:50 End of the Second Day

18:00 - 19:30 Visit of the CSM and the IAEA Environment Laboratories (by groups of 10 persons)

AGENDA

DAY 3 TUESDAY 17TH OCTOBER

9:00 - 11:00 **Break-out sessions (Continued)**

09:00 - 11:00 Six working groups: draft of the oral presentations and summary document for the policy recommendation brochure

11:00 - 11:20 **Coffee-break** (**20 min**)

11:20 - 13:00 General conclusions, **Chair:** David Osborn
Conclusions of the break-out sessions: Summaries of the discussions by the chairs (15 min + 5 min discussion for each group)

13:00 - 14:30 **Lunch**

14:30 - 15:00 **Plenary session**

14:30 - 15:00 Welcoming of the invitees

15:00 - 16:00 Recommendations for policy holders

Scientific and technical perspectives: **Chair:** Prof. Patrick Rampal, President of Centre Scientifique de Monaco

- Presentation of the Conclusions of the Workshop, CSM and IAEA Directors
- Conclusions-Ocean solutions, Jean-Pierre Gattuso
- International Reference User Group, iRUG, Dan Laffoley

Policy perspectives: **Chair:** HE Mr Bernard Fautrier, Vice-President - Chief Executive Officer Prince Albert II of Monaco Foundation

- Message from representative of France

Address by H.S.H. Prince Albert II

16:00 Refreshments

17:00 **End of the workshop**

CONCEPT NOTES

Oceanographic Museum of Monaco,

Principality of Monaco

15-17 October 2017

Introduction

What is ocean acidification (OA)? – Ocean acidification, often called "the other CO_2 problem", is a consequence of an increased release of anthropogenic carbon dioxide. Man-made CO_2 does not only accumulate in the atmosphere, it also dissolves readily in seawater to form bicarbonate ions, thereby releasing protons (H^+) and increasing seawater acidity. The acidity of the oceans has increased by about 30% since the beginning of the industrial era, and may increase by more than 150% by the end of the century. This increase in acidity impacts the lives and well-being of many marine organisms and can also disrupt coastal and marine ecosystems and the services they provide.

Climate change and other stressors (or drivers) should be also considered.

The importance of coral reefs and their vulnerability to OA

While coral reefs represent less than 0.2% of the total surface of the oceans, they have a major ecological importance as they provide habitats for over 30% of all marine fauna. Consequently, coral reefs provide essential ecosystem services, for example, a source of food/protein for human communities, a source of income from tourism, a promising source of bioactive substances, as well as coastal protection against erosion and storms. Even a small alteration in the ecological functions of coral reefs would have a major impact on human society. Coral reefs are very sensitive to environmental changes: rising seawater temperature may cause bleaching events that can impact large areas of reefs (e.g. about 90% of the Indian Ocean coral reefs were killed by a massive bleaching event in 1998; Hoegh-Guldberg, 1999). Furthermore, increased seawater acidity has been shown to alter the physiological functions of corals, causing among others, a decrease in growth rates (Wittmann and Pörtner, 2013;Tambuté et al, 2015).

Recent research shows that OA effects on fisheries and aquaculture seem to expand both in terms of geographical location and frequency of events (e.g. on the US West Coast, Red Sea, Florida, Chile). Some effects are direct (on species physiology, in particular growth, reproduction, and calcification), while others may be indirect (e.g. impact on food sources, habitat degradation, changes in the food chain structure, migration and replacement of certain species).

CONCEPT NOTES

The diagram below summarizes different categories and associated values of some ecosystem services:

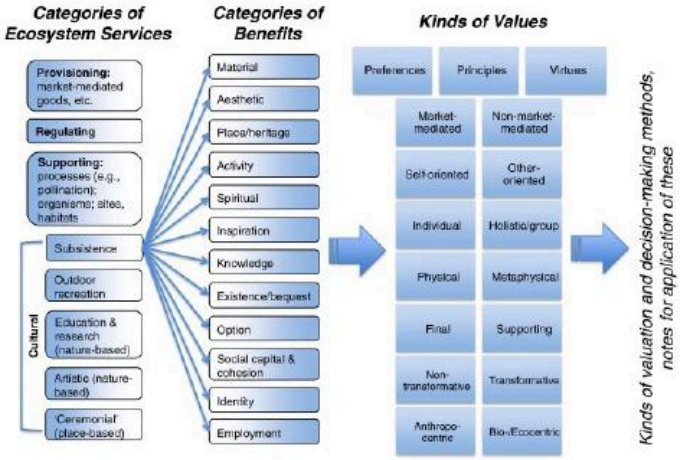


***Figure extracted* from Chan et al. (2012).**

Workshop objectives

The 4th workshop on the Economics of Ocean Acidification will continue the series initiated in 2010 and will build on the work developed by the previous editions in identifying and evaluating the socio-economic risks of OA, as well as the most vulnerable regions and areas of human activity. A series of recommendations for policy makers were developed as a result of the first three workshops, including:

What to do (1-3-6) and how to do (2-4-5-7) and other (8)

- systematic reduction of CO_2 emissions as the first-order objective for any sustainable solution;
- since adapting solutions (e.g. migration of populations, habitat restoration, coastal protection, changes in craft practices) can be quite costly, preference should be given to encouraging mitigation solutions (reducing CO_2 emissions) and including oceans in all international negotiations on climate change;
- promoting knowledge development, data collection platforms and information sharing;

How to do (2-4-5-7)

- reducing local threats and establishing Marine Protected Areas;
- increasing ecosystem and societal resilience through improved fisheries and aquaculture management practices; restoring fish stocks and biodiversity; empowering most vulnerable communities;
- searching for innovative sources of funding and including ocean acidification in the "green background climate";
- taking into account social aspects in the design of environmental solutions;
- promoting an interdisciplinary approach should be encouraged to be complementary to propose solutions to decision makers.

CONCEPT NOTES

In order to take these recommendations one step further, and respond to issues raised by policy makers and ecosystem management teams, the 4th workshop will be focused on discussions around potential solutions to OA and coral reefs. A springboard for discussion could start by the diagram developed by Gattuso et al. (2015) and shown below. The workshop will focus on the economically and socially important, but highly threatened, coral reefs ecosystems, using a case study approach.

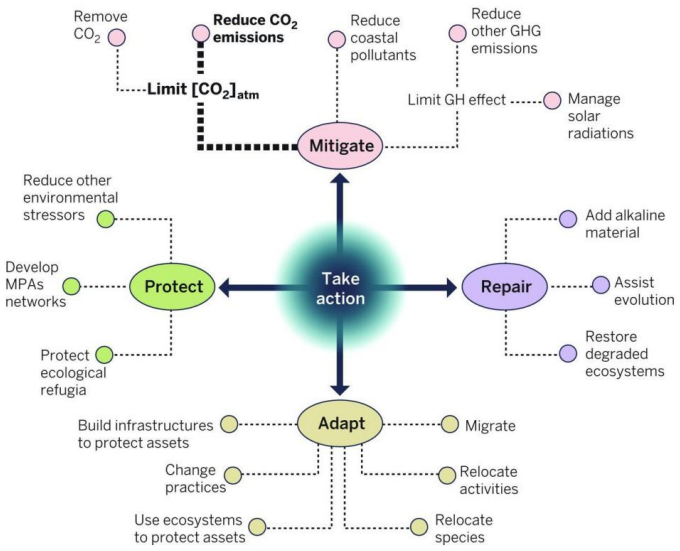


Figure extracted from Gattuso et al. (2015): Clusters of actions against Climate Change and Ocean acidification

The goal of the workshop will be to determine mitigation and adaptation solutions to OA impacts on coral reef ecosystems and the services they render, at several different scales and levels: chemistry (e.g. geo-engineering), economics (e.g. fisheries and selective aquaculture, tax incentives), sociology (cultural and anthropological,), biological (e.g. selection of resistant species, reef restoration), technological (e.g. development of sensors and monitoring systems), legal (e.g. creation of protected areas and coral parks, "blue carbon", governance and coastal waters law), communication sciences (e.g. new technologies) and psychology (e.g. behaviour of agents)...

A working group format, based on well-defined regions of study, is proposed in order to best take into account geographical heterogeneity, whether natural or social, and local initiatives. The six regions of reference are, as follows:

1. Red Sea
2. Indian Ocean and South-East Asia (e.g. Indonesia, Maldives, Micronesia, Seychelles, Mayotte, la Réunion, Madagascar)
3. French Pacific Islands: French Polynesia and New Caledonia
4. Australia: Great Barrier Reef
5. Caribbean and West Atlantic (e.g. Puerto Rico, Bahamas, Florida)
6. Non French Pacific Islands (e.g.Guam, Hawaii, Japan, Marshall Islands)

CONCEPT NOTES

In addition, thematic roundtable discussions will also be organized on interdisciplinary topics (to be defined in June thanks to the consultancy reports).

Workshop participants will consider potential short-, medium- and long-term solutions. Mitigation solutions (such as reducing CO_2 emissions) will probably aim at longer time frames compared to the considered adaptation measures. In addition, solutions will be differentiated according to the level of political decision (local, national, regional and international). Furthermore, the adaptation of identified solutions to the specifics of the study area (e.g. type of economy and level of development) will be discussed.

The workshop will be truly multidisciplinary in character, involving sciences such as biology, chemistry, economics, law, social and human sciences, communication and new technologies sciences, and psychology.

A group of 40 to 60 experts from the different disciplines mentioned above will contribute to the workshop discussions and outcome products. Participants will address the workshop topic through the lenses of their own disciplines, the challenge will consist in exploiting disciplines complementarities in order to highlight interconnections and propose comprehensive solutions.

Experts from leading NGOs (e.g. scuba-diving associations) and relevant international organizations (e.g. WTO, FAO, IMF, OECD, UNEP, IFRECOR, ICRI) will be invited to join the discussions.

Workshop products

- a general brochure of policy recommendations (and perhaps mini-formats focused on individual regions);
- a comprehensive research paper (and, perhaps, articles focused on the areas studied);
- press releases before and after the workshop and for each publication.

The scope of our messages will extend to several levels: local, national, regional, and international. They will target local, national, and international decision makers.

Online groups should be targeted to promote our publications.

Necessity to make an announcement of the Fourth workshop to promote it as an initiative, before the meeting.

References:

1. Chan K.M.A., Satterfield T. & Goldstein J., 2012. Rethinking ecosystem services to better address and navigate cultural values. *Ecological Economics* 74: 8-18.
2. Gattuso J.-P., Magnan A., Billé R., Cheung W. W.L., Howes E.L., Joos F., Allemand D., Bopp L., Cooley S., Eakin C. M., Hoegh-Guldberg O., Kelly R. P., Pörtner H.-O., Rogers A. D., Baxter J. M., Laffoley D., Osborn D., Rankovic A., Rochette J., Sumaila U. R., Treyer S. & Turley C., 2015. Contrasting futures for ocean and society from different anthropogenic CO_2 emissions scenarios. *Science* 349: 6243.
3. Hoegh-Guldberg O., 1999. Climate change, coral bleaching and the future of the world's coral reefs. *Marine and Freshwater Research* 50: 839-866.
4. Tambutté E., Venn A.A., Holcomb M., Segonds N., Techer N., Zoccola D., Allemand D. & Tambutté S., 2015. Morphological plasticity of the coral skeleton under CO_2-driven seawater acidification. *Nature Communications* 6: 7368.
5. Wittmann A.C., Pörtner, H.-O., 2013. Sensitivities of extant animal taxa to ocean acidification. Nature Climate Change 3(11): 995-1001.

BIOGRAPHIES OF PARTICIPANTS

Red Sea

- ALLEMAND Denis — *Facilitator*
- CINAR Mine — *Group Leader*
- FINE Maoz — *Group Leader*
- HILMI Nathalie — *Facilitator*
- KOTB Mohammed
- LAFFOLEY Dan
- RINKEVICH Baruch
- SAFA Alain
- TAMELANDER Jerker
- VOOLSTRA Christian

© J. van de Water (CSM)

FACILITATOR

ALLEMAND Denis

Scientific Director, Centre Scientifique de Monaco.
MONACO

allemand@centrescientifique.mc

Denis Allemand is a biologist, specialized in the physiology of marine organisms, more particularly reef-building corals. He has obtained his PhD in 1986 from the University of Montpellier II (France) in Pharmacological Sciences. He is a Professor of University and Scientific Director of the Centre Scientifique de Monaco. His main field of research is on comparative physiology of marine organisms (cnidarians, sea urchins). He is the co-author of 140-refereed papers and numerous book chapters. He has supervised 12 PhD students.
His is a specialist on Coral Physiology with a particular emphasis on both biomineralization and symbiosis. He is interested in the mechanism of formation of coral skeleton and more particularly on the physiology of skeletogenesis and effects of environmental changes such as ocean acidification. He is also interested in the mutual adaptation of both partners (animal host and zooxanthellae) of the coral symbiotic association to the symbiotic state, and more particularly to the physiological, molecular and genomic relationship between zooxanthellae and their host.
He is member of the Scientific and Technical Committee of the Foundation Prince Albert II, member of the Scientific Committee of the Oceanographic Institute - Foundation Prince Albert I, member of the Scientific Committee of the École Pratique des Hautes Études, member of the Scientific Committee of IFREMER, member of the Administration Council of the Observatoire Oceanologique de Villefranche/Mer, member of the European Academy of Arts, Sciences and Humanities. For a complete biography and list of publication see: www.centrescientifique.mc

RELEVANT PUBLICATIONS

- Gattuso, J. P., Magnan, A., Billé, R., Cheung, W. W., Howes, E. L., Joos, F., Allemand, D.... & Hoegh-Guldberg, O. (2015). Contrasting futures for ocean and society from different anthropogenic CO_2 emissions scenarios. Science, 349(6243), aac4722.
- Tambutté, E., Venn, A. A., Holcomb, M., Segonds, N., Techer, N., Zoccola, D., Allemand, D. & Tambutté, S. (2015). Morphological plasticity of the coral skeleton under CO_2-driven seawater acidification. Nature communications, 6.
- Hilmi, N., Allemand, D., Dupont, S., Safa, A., Haraldsson, G., Nunes, P. A., ... & Fine, M. (2013). Towards improved socio-economic assessments of ocean acidification's impacts. Marine biology, 160(8), 1773-1787.
- Tambutté, S., Holcomb, M., Ferrier-Pagès, C., Reynaud, S., Tambutté, É., Zoccola, D., & Allemand, D. (2011). Coral biomineralization: from the gene to the environment. Journal of Experimental Marine Biology and Ecology, 408(1), 58-78.
- Erez, J., Reynaud, S., Silverman, J., Schneider, K., & Allemand, D. (2011). Coral calcification under ocean acidification and global change. In Coral reefs: an ecosystem in transition (pp. 151-176). Springer Netherlands.

GROUP LEADER

CINAR Mine

Director at the Center for International Business & Professor at the Quinlan School of Business at Loyola University Chicago.
Chicago - USA

LOYOLA UNIVERSITY CHICAGO

mcinar@luc.edu

Dr Mine Cinar is a specialist in development economics, game theory and finance. She has a Bachelor of Arts degree from Robert College (now Bogazici University), Istanbul, Turkey, a Master of Arts degree in Economics from Vanderbilt University and a doctorate from Texas and M University.
She is a professor of Economics at the Quinlan School of Business at Loyola University Chicago and is the Director for Center for International Business.
She is the ex-President of Middle East Economic Association (MEEA) and is the main editor and publisher of the online proceedings journal of MEEA, Topics in Middle East and North African Economies at http://meea.sites.luc.edu/

RELEVANT PUBLICATIONS

- Hilmi, N., Safa, A., Sumalia, U. R., & Cinar, M. (2017). Coral reefs management and decision making tools. Ocean & Coastal Management, 146, 60-66.
- Cinar, M., Hienkel, T. & Horwitz, W. (2017). Comparative entrepreneurship factors between North and South Mediterranean countries. Loyola University Chicago Working Paper.
- Cinar, M. (2017). Editor, Topics in Middle East and North African Economies, Volume 19, No. 1, 2.
- Hilmi, N., Safa, A., Planas-Bielsa, V., Cinar, M. (2017). Look at the phenomenon of ocean acidification and what it could mean for MENA: is the environment of the MENA region already ruined? The Middle East in London, SOAS, Vol. 13, No. 2.
- Lacoue-Labarthe, T., Nunes, P. A., Ziveri, P., Cinar, M., Gazeau, F., Hall-Spencer, J. M., ... & Turley, C. (2016). Impacts of ocean acidification in a warming Mediterranean Sea: An overview. Regional Studies in Marine Science.
- Cinar, E. M., Johnson, J., & Palmer, A. (2013). Decision making: Fishing production and fishers in the Black Sea. Fisheries research, 147, 296-303.

GROUP LEADER

FINE Maoz

Associate Professor at the Mina and Everard Goodman Faculty of Life Sciences, Bar-Ilan University & The Interuniversity Institute for Marine Science in Eilat.
Eilat - ISRAEL

maoz.fine@biu.ac.il

- 1993-1996 B. Sc. at Faculty of Life Sciences, Tel Aviv University
- 1997-1998 M. Sc. at Department of Zoology, Tel Aviv University
- 1998-2003 PhD (Summa cum laude) at Department of Zoology, Tel Aviv University
- 2003-2005 Postdoctoral Research fellow at Center for Marine Studies University of Queensland, Australia

Fine earned his PhD from Tel Aviv University in 2003 (Department of Zoology) under the supervision of the renowned coral reef ecologist Yossi Loya.
He then moved to The University of Queensland, Centre for Marine Studies to take a Post-Doctorate position with Ove Hoegh-Guldberg a leading climate change scientist.
Since 2006, Maoz Fine is a professor of Marine Ecology at Bar-Ilan University, and the Interuniversity Institute for Marine Science in Eilat, Israel.
Fine's research focuses on the response of coral reef organisms to ocean acidification and climate change. The Fine laboratory uses a multi-stressor approach to examine how coral reefs and particularly these of the Red Sea are likely to change in the near future under environmental change.
In a series of studies, Fine's group has studied the high resilience of corals in the Gulf of Aqaba (GoA) to elevated temperatures and acidification, identifying the GoA as a unique coral refuge.

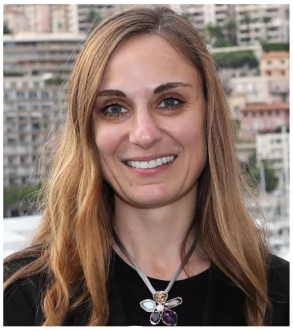
RELEVANT PUBLICATIONS

- Horwitz, R., Hoogenboom, M. O., & Fine, M. (2017). Spatial competition dynamics between reef corals under ocean acidification. Scientific reports, 7.
- Krueger, T., Horwitz, N., Bodin, J., Giovani, M. E., Escrig, S., Meibom, A., & Fine, M. (2017). Common reef-building coral in the Northern Red Sea resistant to elevated temperature and acidification. Royal Society Open Science, 4(5), 170038.
- Hazan, Y., Wangensteen, O. S., & Fine, M. (2014). Tough as a rock-boring urchin: adult Echinometra sp. EE from the Red Sea show high resistance to ocean acidification over long-term exposures. Marine biology, 161(11), 2531-2545.
- Fine, M., Gildor, H., & Genin, A. (2013). A coral reef refuge in the Red Sea. Global change biology, 19(12), 3640-3647.

FACILITATOR

HILMI Nathalie

Senior scientist in the Environmental Economics Department, Centre Scientifique de Monaco.
MONACO



hilmi@centrescientifique.mc

Dr Nathalie Hilmi is a specialist in Macroeconomics and International Finance. After doing research and giving lectures at the CEMAFI (Centre d'études en Macroeconomie et Finance Internationale), University of Nice-France, she obtained her PhD thesis entitled «The real dimension of the global and regional integrations process: the case of Turkey » with honours in 2000.

She then joined Allergan, a pharmaceutical American group, as a financial analyst and continued giving lectures in economics and management in private business schools. Subsequently she taught at EDHEC Business School and continued her research work with EDHEC Risk and Asset Management Research Centre. In 2006, she was employed at the International University of Monaco as Professor of Macroeconomics and Finance.

Her research work encompassed academic studies and conference presentations to develop the network of the Hedge Funds Research Institute (HFRI), and applied researches on investment strategies in Alpstar, a hedge fund in Geneva. She was responsible of research in Macroeconomics for HFRI and Alpstar, and was the head of external activities for HFRI.

She continued to teach in executive programs in EDHEC and a national training centre for banking executives. Concomitantly, she continued working at the CEMAFI, University of Nice-Sophia-Antipolis (France) as an associate researcher. She organized conferences for HFRI and UNSA: on "Bridging Mathematics, Social Sciences and Finance" and the "8th MEEA International Conference".

Dr Hilmi is a member of several international associations in economics and finance and she actively participates in the reviewing and editing of specialized publications. In 2010, she joined the Centre Scientifique de Monaco as section head of environmental economics and collaborated with IAEA's Environment Laboratories to initiate correlation studies between environmental sciences and economics to better evaluate the socioeconomic extent of impacts and costs of action versus inaction with regard to carbon emissions. On the basis of the outcomes of the workshop "Bridging the gap between ocean acidification impacts and economic valuation" held in Monaco the 16-18 November 2010; she was in charge of the coordination for the preparation and organization of the follow-up workshops in November 2012, January 2015 and October 2017.

RELEVANT PUBLICATIONS

- Hilmi, N., Safa, A., Sumalia, U. R., & Cinar, M. (2017). Coral reefs management and decision making tools. Ocean & Coastal Management, 146, 60-66.
- Hilmi N., Safa A., Planas-Bielsa V., Cinar M. (2017) Look at the phenomenon of ocean acidification and what it could mean for MENA: is the environment of the MENA region already ruined? The Middle East in London, SOAS, Vol. 13 , No. 2.
- Lacoue-Labarthe, T., Nunes, P. A., Ziveri, P., Cinar, M., Gazeau, F., Hall-Spencer, J. M., ... & Turley, C. (2016). Impacts of ocean acidification in a warming Mediterranean Sea: An overview. Regional Studies in Marine Science.
- Hilmi, N., Allemand, D., Kavanagh, C., Laffoley, D., Metian, M., Osborn, D., & Reynaud, S. (Eds.). (2015). Bridging the gap between ocean acidification impacts and economic valuation: regional impacts of ocean acidification on fisheries and aquaculture (Vol. 23). IUCN.
- Hilmi, N., Safa, A., & Reynaud, S. & Allemand, D. (2012). Coral Reefs and Tourism in Egypt's Red Sea. Topics in Middle Eastern and North African Economies, 14.

KOTB Mohammed M. A.

Professor of Marine Ecology (Coral Reef Ecology), Marine Science Department, Faculty of Science, Suez Canal University,
Ismaïlia- EGYPT

kotb13@gmail.com

Mohammed M. A. Kotb is a Professor of Coral Reef Ecology in the Marine Science Department, Suez Canal University, Ismailia, Egypt. He started his work in the field of coral reef ecology since his graduation in 1984, and most of his experience within the Red Sea and Gulf area. His work specialized in coral reef ecology, reef rehabilitation, artificial reefs, under water survey techniques, survey and monitoring, and scientific diving since then. In addition, he is working as freelance consultant since 1996.

Mohammed Kotb got his Ph.D. degree in 1997; the M.Sc. in 1990; the B.Sc. in 1984 from the Marine Science Department, Faculty of Science, Suez Canal University. He also is a Diving Instructor hold licences from IDEA, CMAS, EDLF, BSAC and PADI. Furthermore, he is Reef Check Ecodiver course director, and one of Egypt's Reef-Check Coordinators. He worked as regional coordinator of the Marine Protected areas and Biodiversity program in the Regional Organisation for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) between 2007 and 2011. He also is a member in the IUCN.

Mohammed Kotb coordinated few scientific projects in Egypt, Jordan, Saudi Arabia, Sudan, Djibouti, and Yemen dealing with: artificial reefs, coral transplantation, marine ecosystem rehabilitation, marine and coastal data-base survey, coral reef monitoring. He also participated as expert in several projects in Egypt and worked as Reef Recreation Manager in Egypt's GEF Project between 1996 and 1998. He participated with PERSGA in building capacity of the coral reef experts in the Red Sea and Gulf of Aden region; participated in the formulation of the coral reef National Action Plans for the countries of PERSGA Region, and the standardization of the underwater survey techniques at the regional level. In addition, he was leading many regional coral reef surveys in the Red Sea and Gulf of Aden region.

Mohammed Kotb currently based in Ismailia, Egypt as a university staff and he is the head for the Marine Science Department, at the faculty of Science, Suez Canal University. He is concerning about capacity building of the university students, Marine Park Rangers, and researchers in the field of marine underwater research.

RELEVANT PUBLICATIONS

- Kotb, M. M. A., Hanafy, M. H., Monir, T. (2017). Synchronized spawning and fecundity of Acropora species in the Red Sea. Indian Journal of Geo-Marine Science, (in press).
- Kotb, M. M. (2016). Coral translocation and farming as mitigation and conservation measures for coastal development in the Red Sea: aqaba case study, Jordan. Environmental Earth Sciences, 75(5), 439.
- Kotb, M. M. A., Attalla, T. M., Hanafy, M. H., Mohammed, S. Z. (2015). Resilience of coral reefs at the southern Egyptian coast of the Red Sea. Egypt. J. Aquat. Biol. & Fish., 19(4), 77-89.
- Attalla, T. M., Kotb, M. M. A., Hanafy, M. H., Mohammed, S. Z. (2015). Status of the fringing coral reefs in the southern Egyptian coast of the Red Sea. Egypt. J. Aquat. Biol. & Fish., 19(4), 51-67.
- Kotb, M. M., Alouran, N. M., Awali, A. A., & Hararah, M. A. (2015). Coral Translocation: Mitigating Adverse Impact of Development Along the Aqaba Coastline/Jordan. Biomedical & Pharmacology Journal, 8(1), 91-101.
- Kotb, M. M. A. (2013). Coral colonization and fish assemblages on an artificial reef off Hurghada, Red Sea, Egypt. Egypt. J. Aquat. Biol. & Fish., 17(4), 59-70.

LAFFOLEY Dan

Marine Vice Chair, IUCN's World Commission on Protected Areas.
Senior Advisor Marine Science and Conservation, IUCN's Global Marine and Polar Programme.
Gland - SWITZERLAND

danlaffoley@btinternet.com

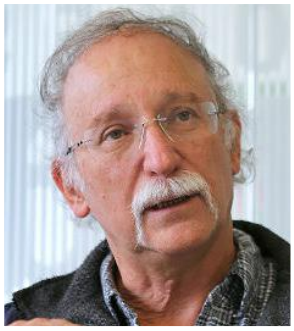
Dan is a well-respected world leader on Marine Protected Areas and ocean conservation. Scientist, communicator and conservationist, at IUCN he is Marine Vice Chair for IUCN World Commission on Protected Areas, and Senior Advisor on Marine Science and Conservation in the Global Marine and Polar Programme.
For over 30 years Dan has been responsible for the creation of many global, European and UK public and private sector partnerships, alliances and frameworks that underpin modern-day marine conservation. This work includes creating the concept of Blue Carbon, scaling up action on ocean warming, ocean acidification, and ocean deoxygenation and scaling -up work on marine World Heritage and conservation of the High Seas, and various global guidance on implementing MPAs and MSP.
For more information : www.danlaffoley.com

RELEVANT PUBLICATIONS

- Simard, F., Laffoley, D., & Baxter, J. M. (2016). Marine Protected Areas and Climate Change: Adaptation and Mitigation Synergies, Opportunities and Challenges. Gland, Switzerland: IUCN. 52 pp.
- Laffoley, D., & Baxter, J. M. (2016). Explaining ocean warming: Causes, scale, effects and consequences. Full report. Gland, Switzerland: IUCN, 27. 456 pp.
- Laffoley, D. d'A. & Baxter, J.M. (Eds). (2016). Where next with the science of ocean acidification? IUCN, Switzerland. 8pp.
- Hilmi, N., Allemand, D., Kavanagh, C., Laffoley, D., Metian, M., Osborn, D., & Reynaud, S. (Eds.). (2015). Bridging the gap between ocean acidification impacts and economic valuation: regional impacts of ocean acidification on fisheries and aquaculture (Vol. 23). IUCN. 136 pp.
- Laffoley, D. d'A. & Baxter, J.M. (Eds). (2015). The Monaco Ocean Acidification Action Plan. Heralding the next era of action on ocean acidification. 20 pp.

RINKEVICH Baruch

Professor at the Israel Oceanographic & Limnological Research (IOLR), National Institute of Oceanography, Haïfa - ISRAEL



Israel Oceanographic & Limnological Research

buki@ocean.org.il

- B.Sc.- Tel-Aviv University, Biology, 1969-1972.
- M.Sc.-Tel-Aviv University, Dept. of Zoology, 1972-1975 (with distinction).
- Teaching diploma- Tel-Aviv University, School of Education, 1979-1980.
- Ph.D.-Tel-Aviv University, Dept. of Zoology, 1976-1982.
- Post doctorate- Scripps Institution of Oceanography, La Jolla, CA, 08/1983 - 08/1984. Awarded by Rothschild Fellowships.
- Post doctorate- Stanford University School of Medicine, Department of Pathology, Stanford, CA, August 1985 - April 1988.

Positions

- Assistant Professor and Senior Scientist - Marine Biology Dept., Israel Oceanographic and Limnological Research, April 1988 - April 1991
- Associate Professor and Senior Scientist - Marine Biology Dept., Israel Oceanographic and Limnological Research, April 1991 - April 1994.
- Professor and Senior Scientist - Marine Biology Dept., Israel Oceanographic and Limnological Research, from April 1994.
- Head, MINERVA Center for «Invertebrate immunology and developmental biology», from 1995-2002.
- Prof., Dept. of Natural Resources & Environmental Management, Faculty of Social Sciences, University of Haifa, Feb–June 2002, Reef Management Course.
- Head, Department of Marine Biology and Biotechnology, National Institute of Oceanography, June 2002- March 2008.
- Professor, Ben-Gurion University in Beer-Sheva, Biology Department (from October 2006)
- Professor, Faculty of Science and Science Education, University of Haifa (from 2008)

Professional activities:

Reviewer for >70 journals; Evaluation of grant proposals for: NSF, GIF, BSF, BARD, USAID, Israel Academy of Sciences, Italian Ministry for Education, University and Research, European Community, Natural Environment Research Council, UK, Dutch National Science Foundation, French National Research Agency (ANR), Swiss National Science Foundation (SNSF), Hawai'i Sea Grant.

1989-1991; 1993-1994; 2001-2002: Member: Israel Academy of Sciences Review Board.

Member: European Community Review Board (2004, 2005, 2009, 2010, 2011).

RELEVANT PUBLICATIONS

- Rachmilovitz, E.N., Rinkevich, B. (2017). Tiling the reef - exploring the first step of an ecological engineering tool that may promote phase-shift reversals in coral reefs. Ecological Engineering 105, 150-161.
- Linden, B., Rinkevich, B. (2017). Elaborating of an eco-engineering approach for stock enhanced sexually derived coral colonies. Journal of Experimental Marine Biology and Ecology 486, 314–321.
- Rinkevich B. (2015) Climate change and active reef restoration—Ways of constructing the 'reefs of tomorrow'. Journal of Marine Science and Engineering 3, 111-127.
- Rinkevich, B. (2014). Rebuilding coral reefs: does active reef restoration lead to sustainable reefs? Current Opinion in Environmental Sustainability 7, 28–36.
- Shaish, L., Levi, G., Katzir, G., Rinkevich, B. (2010).Coral reef restoration (Bolinao, the Philippines) in the face of frequent natural catastrophes. Restoration Ecology 18, 285-299.

SAFA Alain

Manager and Consultant in Skill Partners.
Grasse - FRANCE

alain.safa@skillpartners.fr

Alain Safa PhD is specialized in macroeconomics and international finance.
He's a professor at the University of Nice Sophia-Antipolis and EDHEC Business School. He is the founder and manager of research and advisory structure «Skill Partners».
He works on the capacity of countries to adapt to major changes, Economic, Environmental and Social. He participates to European and international research projects. He focuses his studies on the integration of environmental considerations into national, regional and international governance. The exploration of ocean acidification and analysis of their economic and social impacts have become a central concern of his research today. As such, he has published several works and participated in three workshops about economic impact of ocean acidification which were held in Monaco in 2010, 2012 and 2015.
He is member of American Economic Association, Western Economic Association International and Middle East Economic Association.

RELEVANT PUBLICATIONS

- Hilmi, N., Safa, A., Sumalia, U. R., & Cinar, M. (2017). Coral reefs management and decision making tools. Ocean & Coastal Management, 146, 60-66.
- Hilmi, N. Safa, A. Planas-Bielsa, V. & Cinar, M. (2017). Look at the phenomenon of ocean acidification and what it could mean for MENA: is the environment of the MENA region already ruined? The Middle East in London, 13.
- Hilmi, N., Safa, A., Farahmand, S., Sameti, M., & Sasan, S. (2017). Energetic transition in Iran. Topics in Middle Eastern and North African Economies, 19.
- Hilmi, N. Safa, A. (2017). La mer et le littoral de Provence-Alpes-Côte d'Azur face au changement climatique. Les cahiers du GREC-PACA édités par l'Association pour l'innovation et la recherche au service du climat (AIR), 48 pp.
- Hilmi, N., Bambridge, T., Safa, A., Quinquis, B. & D'Arcy, P. (2016). Socio-economic significance of fisheries in the Small Island Developing States (SIDS) : Natural heritage or commodity ? in Fisheries in the Pacific: the Challenges of Governance and Sustainability. Pacific Credo Publications, 175-197.
- Lacoue-Labarthe, T., Nunes, P. A., Ziveri, P., Cinar, M., Gazeau, F., Hall-Spencer, J. M., Hilmi, N., Moschella, P., Safa, A., Sauzade, D. & Turley, C. (2016). Impacts of ocean acidification in a warming Mediterranean Sea: An overview. Regional Studies in Marine Science 5, 1-11.
- Hilmi, N., Safa, A., Teisserenc, B., & Peridy, N. (2015). Sustainable tourism in some MENA countries. Topics in Middle Eastern and North African Economies, 17.
- Hilmi, N., Safa, A., Reynaud, S. & Allemand, D. (2012). Coral Reefs and Tourism in Egypt's Red Sea. Topics in Middle Eastern and North African Economies, 14.

TAMELANDER Jerker

Head, Coral Reef Unit at United Nations Environment Programme / Coordinator a.i., COBSEA.
Bangkok - THAILAND

tamelander@un.org

Leads UN Environment's coral reef work, focusing on climate change resilience, ecosystem service values in public and private decision making, and assessment and reporting for ecosystem-based management.
Interim coordinator for the Regional Seas programme for the East Asian Seas (COBSEA). Advises UN Environment on nature-based adaptation and mitigation in coastal areas.
MSc in Marine Biology from Gothenburg University in Sweden, and 20 years of international experience in applied research, marine and coastal management and policy development, as an employee of the Government of Finland, the International Union for Conservation of Nature, and UN Environment. Based in Bangkok, Thailand.

RELEVANT PUBLICATIONS

- Van Hooidonk, R., Maynard, J., Tamelander, J., Gove, J., Ahmadia, G., Raymundo, L., ... & Planes, S. (2017) Coral Bleaching Futures - Downscaled projections of bleaching conditions for the world's coral reefs, implications of climate policy and management responses. United Nations Environment Programme (UNEP), Nairobi, Kenya
- Maynard, J.A., Marshall, P.A., Parker, B., Mcleod, E., Ahmadia, G., van Hooidonk, R., Planes, S., Williams, G.J., Raymundo, L., Beeden, R., Tamelander, J. (2017). A Guide to Assessing Coral Reef Resilience for Decision Support. UN Environment, Nairobi, Kenya
- Van Hooidonk, R., Maynard, J., Tamelander, J., Gove, J., Ahmadia, G., Raymundo, L., ... & Planes, S. (2016). Local-scale projections of coral reef futures and implications of the Paris Agreement. Scientific reports, 6, 39666.
- Anthony, K., Marshall, P. A., Abdulla, A., Beeden, R... Tamelander, J., Wachenfeld, D. & Green, A. (2015). Operationalizing resilience for adaptive coral reef management under global environmental change. Global change biology, 21(1), 48-61.
- Marshall, N. A., Marshall, P. A., Tamelander, J., Obura, D., Malleret-King, D., & Cinner, J. E. (2009). A framework for social adaptation to climate change: sustaining tropical coastal communitites and industries. Gland, Sitzerland, IUCN. 36pp.

VOOLSTRA Christian

Associate Professor of Marine Science
Associate Director Red Sea Research Center, KAUST University.
Thuwal - SAUDI ARABIA

جامعة الملك عبدالله للعلوم والتقنية
King Abdullah University of Science and Technology

christian.voolstra@kaust.edu.sa

Christian R Voolstra is a biologist and his research area is environmental genomics with a focus on acclimation and adaptation of marine invertebrates.
Dr. Voolstra studies coral metaorganism function combining ecological, environmental, microbial, and molecular approaches. Corals are metaorganisms composed of the coral host, intracellular photosynthetic dinoflagellate symbionts, and associated microbiota. Together these so-called coral holobionts form the keystone species of reef ecosystems.
His most recent research has particularly advanced knowledge of how the bacterial microbiome contributes to coral animal host acclimation and adaptation.
Dr. Voolstra has published over 100 peer-reviewed research papers, various book chapters, and holds patents related to bioactive lead structures from marine organisms. Dr. Voolstra is a Scientific Coordinator of the TARA Pacific consortium, a steering committee member of the Global Invertebrate Genomics Alliance (GIGA), and a KAUST representative of the Reef Future Genomics (ReFuGe) 2020 consortium.
Dr. Voolstra received his PhD at the Institute for Genetics in Cologne, Germany in 2006 and was a Postdoctoral scholar at the University of California, Merced from 2007-2009. He was appointed Assistant Professor of Marine Science at KAUST's Red Sea Research Center in 2009, and in 2015 was promoted to Associate Professor. In 2016, Dr. Voolstra became appointed Associate Director of the Red Sea Research Center at KAUST.

RELEVANT PUBLICATIONS

- Ziegler, M., Seneca, F. O., Yum, L. K., Palumbi, S. R., & Voolstra, C. R. (2017). Bacterial community dynamics are linked to patterns of coral heat tolerance. Nature Communications, 8, 14213.
- Roik, A., Röthig, T., Roder, C., Ziegler, M., Kremb, S. G., & Voolstra, C. R. (2016). Year-long monitoring of physico-chemical and biological variables provide a comparative baseline of coral reef functioning in the central Red Sea. PloS one, 11(11), e0163939.
- Roik, A., Roder, C., Röthig, T., & Voolstra, C. R. (2016). Spatial and seasonal reef calcification in corals and calcareous crusts in the central Red Sea. Coral Reefs, 35(2), 681-693.
- Hume, B. C., Voolstra, C. R., Arif, C., D'Angelo, C., Burt, J. A., Eyal, G., ... & Wiedenmann, J. (2016). Ancestral genetic diversity associated with the rapid spread of stress-tolerant coral symbionts in response to Holocene climate change. Proceedings of the National Academy of Sciences, 113(16), 4416-4421.
- Sawall, Y., Al-Sofyani, A., Hohn, S., Banguera-Hinestroza, E., Voolstra, C. R., & Wahl, M. (2015). Extensive phenotypic plasticity of a Red Sea coral over a strong latitudinal temperature gradient suggests limited acclimatization potential to warming. Scientific reports, 5.

BIOGRAPHIES OF PARTICIPANTS

Indian Ocean and South-East Asia

- CHAVANICH Suchana Apple
- DJOUNDOURIAN Salpie
- DUPONT Sam
- GAILL Françoise
- HALL-SPENCER Jason — *Group Leader*
- HOLZER Guillaume
- ISENSEE Kirsten
- KATUA Stephen
- LAM Vicky — *Group Leader*
- MARS Frank
- METIAN Marc — *Facilitator*

© C. Rottier (CSM)

CHAVANICH Suchana Apple

Associate Professor, Department of Marine Science, Faculty of Science, Chulalongkorn University, Bangkok - THAILAND

suchana.c@chula.ac.th

Dr. Suchana Apple Chavanich received her bachelor degree in Marine Science from Chulalongkorn University, Bangkok, Thailand. She then further pursued her master degree in Biology at Central Connecticut State University and her Ph.D. in Zoology at University of New Hampshire, USA. She has been diving in several places both in polar waters (as cold as -1°c) and tropical waters. Later on, she was certified as a scuba diving instructor.

In 2001, Dr. Chavanich began her academic career at the Department of Marine Science, Faculty of Science, Chulalongkorn University, Thailand. At present, she is an associate professor. She has a broad base of ecological research interests that involve the study of nearshore species from tropical to polar regions. In addition, her research focuses on conservation and restoration of marine ecosystems particular on coral reefs. Currently, Dr. Chavanich is also the project leader of Coral Reef Conservation under the UNESCO/IOC Sub-Commission for the Western Pacific, the leader of JSPS Asian CORE Program of Benthos, and serves as a Thailand Reef Check Coordinator. She has been actively promoting marine conservation knowledge by teaching local children, dive shop operators, and diving instructors in coastal areas. She is also the author of many articles and several books, including marine conservation, Antarctica, coral reefs, and scuba diving.

In Thailand, additional to her research work on coral reefs, she is considered to be Thailand's first female scientist to go and dive in Antarctica with the Japanese and Chinese Antarctic Research Expeditions. Her research work on coral reef and Antarctica has inspired Thai and young people on the value of marine and polar ecosystems and the importance of international collaborations between Thailand and other countries. In 2013, she was selected to be one of the 100 Most Inspiring People in Thailand and one of 17 Asia Power Women of Inspiration, selected by Her World Magazine in 2015.

RELEVANT PUBLICATIONS

- Thushari, G. G. N., Senevirathna, J. D. M., Yakupitiyage, A., & Chavanich, S. (2017). Effects of microplastics on sessile invertebrates in the eastern coast of Thailand: An approach to coastal zone conservation. Marine Pollution Bulletin. (in press).
- Chavanich, S., & Viyakarn, V. (2016). Conservation and Restoration of Coral Reefs Under Climate Change: Strategies and Practice. In The Cnidaria, Past, Present and Future (pp. 787-792). Springer International Publishing.
- Viyakarn, V., Lalitpattarakit, W., Chinfak, N., Jandang, S., Kuanui, P., Khokiattiwong, S., & Chavanich, S. (2015). Effect of lower pH on settlement and development of coral, Pocillopora damicornis. Ocean Science Journal, 50(2), 475-480.
- Chavanich, S., Viyakarn, V., Nomura, D., & Watanabe, K. (2015). Potential changes in feeding behavior of Antarctic fish, *Pseudotrematomus bernacchii* (Boulenger, 1902) on the East Ongul Island, Antarctica. Polar Science, 9(4), 389-392.
- Chavanich, S., Soong, K., Zvuloni, A., Rinkevich, B., & Alino, P. (2015). Conservation, management, and restoration of coral reefs. Zoology, 118(2), 132-134.

DJOUNDOURIAN Salpie

Associate Professor of Economics,
Lebanese American University.
Byblos - LEBANON

LAU Adnan Kassar School of Business

sdjndran@lau.edu.lb

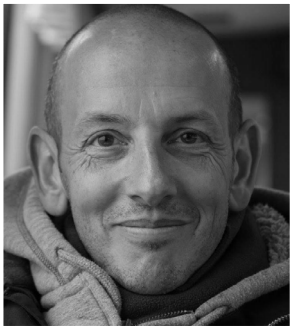
Salpie Djoundourian, an associate professor of Economics, is currently serving as the associate dean of the Adnan Kassar School of Business (AACSB accredited, May 2016) at the Lebanese American University, Byblos Campus.
Previously, she served as the chair of the Departments of Economics and Management in 2005-2008 and as the assistant dean of the School of Business 2008-2011.
Dr. Djoundourian holds a Bachelor of Science degree in International Trade and Finance (1985); a Masters of Science degree in Economics (1987); and a Doctor of Philosophy degree in Economics (1993), from Louisiana State University in Baton Rouge, Louisiana.
Her primary area of expertise is Applied Microeconomics with emphasis in Environmental and Natural Resource Economics and Public Finance and secondary area of expertise is Environmental Planning and Management.
She is actively involved in academic research and scholarly work as well as consultancy work for reputable organizations in both private and public sector.
Her research appeared in Public Choice, Family Business Review, Environment, Development and Sustainability, and Transportation Research D, among others.

RELEVANT PUBLICATIONS

- Djoundourian, S. (2011). Environmental movement in the Arab world. Environment, Development and Sustainability, 13(4), 743-758.
- Djoundourian, S. (2009). Environmental movement in Lebanon. Environment, development and sustainability, 11(2), 427-438.
- Djoundourian, S. (2007). The role of development in promoting environmental awareness: Evidence from Lebanon. Topics in Middle Eastern and North African economies, 9.
- Chaaban, F. B., Nuwayhid, I., & Djoundourian, S. (2001). A study of social and economic implications of mobile sources on air quality in Lebanon. Transportation Research Part D: Transport and environment, 6(5), 347-355.
- Djoundourian, S., Farber, S. (1994). Ecosystem Loss and Economic Development: A Case Study of Louisiana's Shrinking Wetlands, Report to the Governor's Commission for Coastal Activities in Louisiana.

DUPONT Sam

Associate Professor in marine Eco-physiology. Department of Biological & Environmental Sciences at the University of Gothenburg.
Göteborg - SWEDEN



UNIVERSITY OF GOTHENBURG

sam.dupont@bioenv.gu.se

Sam Dupont is an Associate Professor in Marine Eco-Physiology at the University of Gothenburg in Sweden. He was published in 150 publications in journals including Nature, PNAS and TREE. He is a member of the Advisory Board of the Ocean Acidification International Coordination Centre (OA-ICC), the Executive Council of the Global Ocean Acidification Observing Network (GOA-ON) and the Steering committee of the EuroMarine consortium. His main research topic is on the effect of global changes (e.g. ocean acidification, warming) on marine ecosystems. His work aims at revealing the mechanisms behind species and ecosystem responses (physiology, ecology, evolution) to environmental changes and at developing the needed unifying theory for large scale projections. He is also working on the development of innovative science communication and education strategies to tackle global challenges through his leading role in the Centre for Collective Action Research (CeCAR), the Nordic Centre of Excellence on Sustainable and Resilient Aquatic Production (SUREAQUA) and the Inquiry to Student Environmental Actions project (I2SEA). The third aspect of his work aims at evaluating and building capacities for marine science in developing countries.

RELEVANT PUBLICATIONS

- Vargas, C. A., Lagos, N. A., Lardies, M. A., Duarte, C., Manríquez, P. H., Aguilera, V. M., ... & Dupont, S. (2017). Species-specific responses to ocean acidification should account for local adaptation and adaptive plasticity. Nature Ecology & Evolution, 1, 0084.
- Osborn, D., Dupont, S., Hansson, L. & Metian, M. (2017) Ocean acidification – impacts and governance. In Svensson, L., Markandya, A., Kumar, P. & Nunes, P. (eds) Handbook on the Economics and Management for Sustainable Oceans. Edward Elgar Publishers & UNEP. pp 396-415.
- Dupont, S. & Fauville, G. (2017) Ocean literacy as a key toward sustainable development and ocean governance. In Svensson, L., Markandya, A., Kumar, P. & Nunes, P. (eds) Handbook on the Economics and Management for Sustainable Oceans. Edward Elgar Publishers & UNEP. pp. 519-537.
- Sunday, J. S., Fabricius, K. E., Kroeker, K. J., Anderson, K. M., Brown, N. E., Barry, J. P., Connell, S. D., Dupont, S., Gaylord, B., Hall-Spencer, J. M., Klinger, T., Milazzo, M., Munday, P. L., Russell, B. D., Sanford, E., Thiyagarajan, V., Vaughan, M. L. H., Widdicombe, S. & Harley, C. D. G. (2017) Ocean acidification can mediate biodiversity shifts by changing biogenic habitat. Nature Climate Change, 7(1): 81-85.
- Calosi, P., De Wit, P., Thor, P., & Dupont, S. (2016). Will life find a way? Evolution of marine species under global change. Evolutionary applications, 9(9), 1035-1042.

GAILL Françoise

Research Director Emeritus at the CNRS.
Coordinator of the scientific committee of the Ocean Climate Platform.
Paris - FRANCE

francoise.gaill@cnrs-dir.fr

Françoise Gaill is research director emeritus at the cnrs, vice chair of the ocean climate platform and scientific advisor of the Institute ecology and environment of the CNRS. This marine biologist has a solid background in the field of biodiversity and marine ecosystems. She took responsability at the CNRS scientific direction in the field of ecology and environmental sciences in a sustainable development context.
Françoise Gaill has an interdisciplinary background in natural sciences , from taxonomy to ecology, with a specific interested in biophysics and cell biology fields. She has the knowledge of working at sea with various vessels, developping technical aspects for monitoring in situ and in vivo the behaviour of marine organisms relative to their environment, and was working with some species of interest (Ascidians, Molluscs, and their associated microorganisms)
She was also acting with a similar transversal approach during the following years, when she was in charge of a cnrs department, focussed on environment and sustainable development, which was transformed in an interdisciplinary research institute, the institute of ecology and envrionment associating life, geo, eco and environmental human sciences. She is now involved in the french and international strategies relative to various aspects of the oceans (from the ocean climate platform to the Ocean and Climate Initative Alliance including the IOC Unesco).

RELEVANT PUBLICATIONS

- Van den Belt, M., Granek, E., Gaill, F., Halpern, B., Thorndyke, M., Bernal, P. (2016). Chapter 3. Scientific Understanding of Ecosystem Services. In Part III Assessment of Major Ecosystem Services from the Marine Environment (Other than Provisioning Services). The World Ocean Assessment, United Nations.
- Tasiemski, A., Jung, S., Boidin-Wichlacz, C., Jollivet, D., Cuvillier-Hot, V., Pradillon, F., ... & Hung, C. W. (2014). Characterization and function of the first antibiotic isolated from a vent organism: the extremophile metazoan Alvinella pompejana. PloS one, 9(4), e95737.
- Luque, G. M., Hochberg, M. E., Holyoak, M., Hossaert, M., Gaill, F., Courchamp, F. (2013) Ecological effects of environmental changes. Ecology Letters, 16: 1–3.
- Rombouts, I., Beaugrand, G., Fizzala, X., Gaill, F., Greenstreet, S. P. R., Lamare, S., ... & Percelay, J. (2013). Food web indicators under the Marine Strategy Framework Directive: from complexity to simplicity?. Ecological Indicators, 29, 246-254.
- Verna, C., Ramette, A., Wiklund, H., Dahlgren, T. G., Glover, A. G., Gaill, F., & Dubilier, N. (2010). High symbiont diversity in the bone-eating worm Osedax mucofloris from shallow whale-falls in the North Atlantic. Environmental microbiology, 12(8), 2355-2370.
- Pradillon, F., Shillito, B., Young, C. M., & Gaill, F. (2001). Deep-sea ecology: Developmental arrest in vent worm embryos. Nature, 413(6857), 698.

GROUP LEADER

HALL-SPENCER Jason

Professor of Marine Biology, School of Biological & Marine Sciences, University of Plymouth & Shimoda Marine Research Centre, University of Tsukuba.
Plymouth - UNITED KINGDOM

jason.hall-spencer@plymouth.ac.uk

Jason is Professor of Marine Biology at the University of Plymouth in the UK and at the University of Tsukuba in Japan. He conducts applied research to provide policy makers with the scientific information needed to best manage the marine environment. This research ranges from deep-sea benthos, fisheries, aquaculture, marine protected areas, invasive species and seamounts. He is primarily a field-based marine scientist with a focus on ensuring his research has impact on policy and in the media. This has included lasting protection for vulnerable marine ecosystems such as deep-sea coral reefs, maerl beds and flame-shell reefs. His is now working on natural analogues for ocean acidification in the EU and in Japan to help predict effects of ocean acidification due to rising carbon dioxide levels. His research group is also working on the efficacy of Ballast water treatment, on oyster physiology and on the effects of a lionfish invasion in the Mediterranean.

RELEVANT PUBLICATIONS

- Lemasson, A. J., Fletcher, S., Hall-Spencer, J. M., & Knights, A. M. (2017). Linking the biological impacts of ocean acidification on oysters to changes in ecosystem services: A review. Journal of Experimental Marine Biology and Ecology.
- Allen, R., Foggo, A., Fabricius, K., Balistreri, A., & Hall-Spencer, J. M. (2016). Tropical CO 2 seeps reveal the impact of ocean acidification on coral reef invertebrate recruitment. Marine pollution bulletin.
- Milazzo, M., Cattano, C., Alonzo, S. H., Foggo, A., Gristina, M., Rodolfo-Metalpa, R., ... & Hall-Spencer, J. M. (2016). Ocean acidification affects fish spawning but not paternity at CO_2 seeps. In Proc. R. Soc. B (Vol. 283, No. 1835, p. 20161021). The Royal Society.
- Smith, J. N., De'ath, G., Richter, C., Cornils, A., Hall-Spencer, J. M. & Fabricius, K. E. (2016). Ocean acidification reduces demersal zooplankton that reside in tropical coral reefs. Nature Climate Change 6, 1124-1129.
- Hall-Spencer, J. M., Rodolfo-Metalpa, R., Martin, S., Ransome, E., Fine, M., Turner, S. M., ... & Buia, M. C. (2008). Volcanic carbon dioxide vents show ecosystem effects of ocean acidification. Nature, 454(7200), 96-99

HOLZER Guillaume

Vice-President and Co-founder at Coral Guardian.
Limours - FRANCE

g.holzer@coralguardian.org

As a social entrepreneur, economist, explorer, photographer, and a graduate of a Master's Degree in Project Management in Australia.
Guillaume Holzer is an expert in developing innovative and sustainable economic models.
He coordinates Coral Guardian's development and projects management while participating actively in in situ programs.

ISENSEE Kirsten

Project Specialist - Ocean Carbon Sources and Sinks Intergovernmental Oceanographic Commission of UNESCO - Ocean Science Section.
Paris - FRANCE

k.isensee@unesco.org

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

Kirsten Isensee is a project specialist at the Intergovernmental Oceanographic Commission of UNESCO since 2012.
Her work focuses on Ocean Carbon Sources and Sinks, trying to distinguish the natural and anthropogenic influences on the marine environment.
She supports several activities and facilitates collaboration between scientist, policymakers and stakeholders, including networks like the Global Ocean Acidification Observing Network, the International Blue Carbon Initiative, the International Group for Marine Ecological Time Series and the Global Ocean Oxygen Network.
She received her diploma and her PhD in Marine Biology at the University of Rostock, Germany. During her studies, she specialized in the impact of Ocean Acidification and climate change on the marine environment.

RELEVANT PUBLICATIONS

- UNESCO (2017), Global Ocean Science Report—The current status of ocean science around the world, L. Valdés et al. (eds), UNESCO Publishing, Paris.
- O'Brien, T., Isensee, K., Lorenzoni, L., Valdes, L. (eds.) (2017). What are Marine Ecological Time Series telling us about the ocean? A status report. IOC Technical Series Report 129
- Baxter, J., Laffoley, D., Isensee, K., Herr, D., Martinez, C. (2016). Marine Protected Areas and climate change mitigation: how MPAs can contribute to the reduction of greenhouse gas emissions? In F. Simard, D. Laffoley, J. Baxter (eds), 2016. Marine Protected Areas and Climate Change: Adaptation and Mitigation Synergies, Opportunities and Challenges. Gland, Switzerland: IUCN. 52 pp.
- Magnan, A., Turley, C. M., Al-Moghrabi, S., Celliers, L., Hall-Spencer, J. M., Holthus, P., ... & Recuero-Virto, L. (2015). Governance, Governments and Legislation. In Ocean Acidification Impacts on Coastal Communities.
- Isensee, K., Levin, L., Breitburg, D., Gregoire, M., Garçon, V., Valdes, L. (2015). The Ocean is Losing its Breath. In Ocean and Climate Scientific Notes.

KATUA Stephen

Deputy Director Coastal, Marine and Freshwaters at the National Environment Management Authority (NEMA).
Nairobi - KENYA

stephenkatua@yahoo.com

My names are Stephen Katua. I am Deputy Director Coastal, Marine and Freshwaters at the National Environment Management Authority (NEMA) in charge of development and implementation of Coastal, Marine and Freshwater environmental management activities and programmers in Kenya.
I am also the National Focal Point of regional programmes on Management of Transboundary aquatic ecosystems. These include the Indian Ocean Commission Coastal biodiversity project funded by EU, the Monitoring for Environment and Security in Africa (MESA) Marine and Coastal management . I am also the desk officer for the Nairobi Convention on Protection, management and Development of Western Indian Ocean region.
In Kenya I have coordinated development and implementation on national policies, strategies, guidelines and action plans on Conservation and Sustainable Use of Kenya's Coastal and Marine ecosystems and their resources. These include the National Wetlands Policy; National Wetlands Strategy; National ICZM Policy; National ICZM Action Plan 2011-2015 (new action plan being developed); Kenya State of the Coast Report; Kenya Shoreline Management Strategy; and Coastal Zone Pollution Prevention Guidelines.

GROUP LEADER

LAM Vicky

Program Manager & Research Associate at the Nereus Program, The Nippon Foundation – University of British Columbia.
Vancouver - CANADA

v.lam@oceans.ubc.ca

Dr. Vicky W.Y. Lam is a Fisheries Economist and Program Manager at the Nereus Program at the University of British Columbia (UBC). She dedicates herself to a broad range of fisheries related researches.
One of Vicky's research interests is to focus on understanding the socio-economic impacts of global change on marine resources, fisheries and human well-beings.
She has studied the extent of economics impact of climate change on global fisheries in terms of change in economic variables; and the socio-economic implication of the impacts of projected climate change and ocean acidification on marine resources in some regions, which are highly vulnerable to the change in climate, such as West Africa and the Arctic region.
She is experienced in studying the vulnerability and adaptation of coastal countries, communities and fishers to global change.
She is interested in understanding spatial dynamic of fishing effort and how the change in fishers' behavior would affect the harvest under climate change by using modeling approach.
Vicky also studied and analyzed the potential policies and measures for mitigating and adapting to these global changes.

RELEVANT PUBLICATIONS

- Cheung, W. W., Jones, M. C., Lam, V. W., D Miller, D., Ota, Y., Teh, L., & Sumaila, U. R. (2017). Transform high seas management to build climate resilience in marine seafood supply. Fish and Fisheries, 18(2), 254-263.
- Lam, V. W., Cheung, W. W., Reygondeau, G., & Sumaila, U. R. (2016). Projected change in global fisheries revenues under climate change. Scientific reports, 6, 32607.
- Lam, V. W., Cheung, W. W., & Sumaila, U. R. (2016). Marine capture fisheries in the Arctic: winners or losers under climate change and ocean acidification?. Fish and Fisheries, 17(2), 335-357.
- Sumaila, U. R., Lam, V., Le Manach, F., Swartz, W., & Pauly, D. (2016). Global fisheries subsidies: An updated estimate. Marine Policy, 69, 189-193.
- Cheung, W. W., Jones, M. C., Reygondeau, G., Stock, C. A., Lam, V. W., & Frölicher, T. L. (2016). Structural uncertainty in projecting global fisheries catches under climate change. Ecological Modelling, 325, 57-66.
- Lam, V. W., Cheung, W. W., Swartz, W., & Sumaila, U. R. (2012). Climate change impacts on fisheries in West Africa: implications for economic, food and nutritional security. African Journal of Marine Science, 34(1), 103-117.

MARS Frank

Global President of Mars Symbioscience.
Germantown - USA

MARS

Miranda.Perciavalle@mss.effem.com

Frank Mars is a member of the Board of Directors of Mars, Incorporated, and until most recently, the Global President of Mars Symbioscience. Pioneering some of the most innovative and breakthrough fundamental scientific research, and with sustained funding from Mars, Incorporated, Frank led the creation of Mars Symbioscience in 2005 as an internal technology-based health and life sciences venture area to develop and commercialize new products and services supported by evidence-based science. Through June 2017, he and his team successfully incubated, introduced, and transitioned five technology platforms in the areas of food, plant, biomedical and life sciences, including Wisdom Panel®, a range of complex canine genetic tests for breeders and veterinarians and consumers, and CocoaVia®, a revolutionary new cocoa flavanol extract-based dietary supplement that promotes healthy blood flow from head to toe and thus ultimately supports cardiovascular health in people.

Building on the work started in Mars Symbioscience, in his new role as Vice President of Mars Sustainable Solutions, Frank will be leading effort to deliver the new Mars Sustainable Solutions mission: to enable future, scalable solutions proven to increase the resilience and sustainability of the core tropical ecosystems Mars depends on, including developing next generation agroforestry-based sustainable cocoa farming models and solutions. In addition, recognizing the critical role that healthy coral/coastal ecosystems play locally (protein) and globally (climate) in both the nurturing and continual production of blue biomass and as well storage of blue carbon (seagrass and mangroves), Mr. Mars will be working to expand the use globally of a novel low-cost method of coral reef rehabilitation (increases coral cover from 10% to 60% in one year) developed within Mars Symbioscience.

Frank Mars is a new IUCN Patron of Nature. Additionally, both he and his wife Susan are dedicated supporters of several local and International Humanitarian/Conservation Organizations including CARE, Médecins Sans Frontières, World Wildlife Fund, the Smithsonian's National Zoo and Conservation Biology Institute's, as well as the Smithsonian Tropical Research Institute in Panama. Susan and Frank have been instrumental in supporting (via SCBI) the efforts of the Panama Amphibian Rescue and Conservation project along with IUCN/SSC Conservation Breeding Specialist Group (CBSG), and the IUCN/SSC Amphibian Specialist Group (ASG).

FACILITATOR

METIAN Marc

Research Scientist at the Radioecology Laboratory, International Atomic Energy Agency, Environment Laboratories.
MONACO

m.metian@iaea.org

IAEA
International Atomic Energy Agency

Marc Metian is researcher at the Environment Laboratories of the International Atomic Energy Agency (Monaco). He is a radioecologist, holds a degree in bioengineering from the Free University of Brussels, Belgium (2003) and a PhD in Biological Oceanology and Marine Environment from the University of La Rochelle, France (2007). He is a multidisciplinary scientist with experience in environmental and sustainability-oriented research. He is got a solid background in marine ecotoxicology, physiology and trophic transfer of essential and non-essential elements in marine organisms and a keen interest in seafood safety, seafood security, the aquaculture world and its future challenges.
His current work consists of realizing experiments on marine organisms to respond to key questions (contamination, physiology, ocean acidification) by using nuclear techniques (radiotracers) and also providing technical assistance to Member States on the use of nuclear techniques for similar purposes.
For more info on his work: https://www.researchgate.net/profile/Marc_Metian

RELEVANT PUBLICATIONS

- Osborn, D., Dupont, S., Hansson, L. & Metian, M. (2017) Ocean acidification: impacts and governance. In Nunes P. A. L. D., Svensson L. E. & Markandya A. (Eds.), Handbook on the Economics and Management of Sustainable Oceans, Edward Elgar Publishing, pp. 396-415.
- Jacob, H., Pouil, S., Lecchini, D., Oberhänsli, F., Swarzenski, P. & Metian, M. (2017) Trophic transfer of essential elements in the clownfish Amphiprion ocellaris in the context of ocean acidification. PLoS ONE 12(4): e0174344.
- Hédouin, L., Metian, M., Teyssié, J-L., Oberhansli, F., Ferrier-Pagès, C. & Warnau, M. (2016) Bioaccumulation of 63Ni in the scleractinian coral Stylophora pistillata and isolated Symbiodinium using radiotracer techniques. Chemosphere 156: 420–427.
- Belivermiş, M., Warnau, M., Metian, M., Oberhänsli, F., Teyssié, J-L. & Lacoue-Labarthe, T. (2016) Limited effects of increased CO_2 and temperature on metal and radionuclide bioaccumulation in a sessile invertebrate, the oyster Crassostrea gigas. ICES Journal of Marine Science 73(3): 753-763.
- Kavanagh, C., Hansson, L., Metian, M., Osborn, D. & Warnau, M. (2014) Case study: The impact of ocean acidification in Washington State, USA. in: How oceans- and seas-related measures contribute to the economic, social and environmental dimensions of sustainable development: Local and regional experiences. (UNDESA, UN-DOALOS/OLA, IAEA, IMO, IOC-UNESCO, UNDP, UNEP, UNWTO) Online publication. pp. 21-29.
- Tacon, A. G. J., Metian, M. & De Silva, S. S. (2010) Climate change, food security and aquaculture: Policy implications for ensuring the continued green growth & sustainable development of a much needed food sector (Chapter 2) in: Proceeding of the Workshop on Advancing the aquaculture agenda: policies to ensure a sustainable aquaculture sector, French Ministry for Food, Agriculture and Fisheries and OECD (15- 16 April 2010), pp 109-120.

BIOGRAPHIES OF PARTICIPANTS

French Pacific Islands

- BAMBRIDGE Tamatoa — *Group Leader*
- CHLOUS Frédérique
- CLAUDET Joachim
- GATTUSO Jean-Pierre
- MOORE Tommy
- PASCAL Nicolas
- RECUERO VIRTO Laura
- REYNAUD Stéphanie — *Facilitator*
- RODOLFO-METALPA Riccardo — *Group Leader*
- TAMBUTTE Sylvie — *Facilitator*
- THOMASSIN Aurélie

© L. Courtial (CSM)

GROUP LEADER

BAMBRIDGE Tamatoa

Research director at the National Center for Scientific Research (CNRS), PSL Research University: EPHE-UPVD-CNRS, USR 3278 CRIOBE.
Moorea - FRENCH POLYNESIA

tamatoa.bambridge@criobe.pf

A scientist with training in legal anthropology, Dr. Tamatoa Bambridge is a research director at the National Center for Scientific Research (CNRS) working in a laboratory of marine biology in Moorea since 2007.
He has more than twenty years of field research experience in many archipaelagoes of French Polynesia, within the Polynesian triangle.
Much of his work deals with land and marine tenure as he started his field work in the Austral archipaelago working on kinship and land.
He focusses his current work on land and sea governance and their impacts on adaptation and resilience, using anthropological methods of long term presence on the field, language and uses as ways of expressing people's engagement and desagreement about space and time governance. His long term comitment to the understanding of polynesian traditional management of ressources has lead to a publication of « The rahui » in 2016 at the Australian National University Press.
Dr. Bambridge is an expert in local empowerment of capacity development as more and more situation encountered have to deal with legal pluralism issues within lagoon governance.
Dr Bambridge teaches at the Ecole Pratiques des Hautes Etudes (EPHE), at the University of french Polynesia and the University of New Caledonia at research master level.
He is the president of the scientific comite of the Unesco Man and Biospere reserve of Fakarava in the Tuamotu archipaelago.
Projects: Dr. Bambridge's current primary research is focused on the intersection between biodiversity, culture, and languages and the factors influencing resilience and hybrid governance.
He also uses tools such as modelisation and actor participation for elucidating spatially explicit strategies on lagoon and reefs.
At the EPHE, he has Phs students working on communiities, biodiversity and governance in Latin america and Oceania.

RELEVANT PUBLICATIONS

- Pierre, L., Vanessa, S., Nicolas, P., Nikolaus, P. W., Annie, A., Tamatoa, B., ... & Bernard, S. (2017). Exploring social-ecological dynamics of a coral reef resource system using participatory modeling and empirical data. Marine Policy, 78, 90-97.
- Bambridge, T. (2016). The Rahui: Legal pluralism in Polynesian traditional management of resources and territories. Australian National University press.
- Bambridge, T. & Latouche, J.-P. (2016). Les atolls du Pacifique face au changement climatique. Une comparaison Tuamotu-Kiribati. Editions Karthala.
- Salvat, B., Bambridge, T., Tanret, D., Petit, J. (2015). Environnement marin des îles Australes (Polynésie française). Editions : The Pew Charitable Trusts, Institut des Récifs Coralliens de l'EPHE. 341 p.
- Bambridge T. (2009). La terre dans l'archipel des îles Australes. Etude du pluralisme juridique et culturel en matière foncière. Institut de Recherche pour le Développement (IRD) et Aux Vents des îles, 412 p.

CHLOUS Frédérique

Professor of Anthropology, Director of the Department Man and Environment
Muséum national d'Histoire naturelle .
Paris - FRANCE

frederique.chlous@mnhn.fr

Her research interests include relations between Man and Environment, more spécifically Man and marine and coastal environment. She studies local knowledge, know-how, social représentations of the environment but also arrangements of the governance wich included stakeholders. As part of interdisciplinarity, cross-sectoral researchs, participatives procedures are experienced and analysed. For exemple companion modelling or participatory mapping are been implemented. Two resarchs have been conducted in French Polynesia : one is a thesis about social-ecological vulnerability wich focused on small-scale fishing in Moorea) island. The other one is about Partipatory mapping in the Marquesas archipelago : the project involves research about protection and management of cultural heritage relating to the sea.

RELEVANT PUBLICATIONS

- Thiault, L., Marshall, P., Gelcich, S., Collin, A., Chlous, F., & Claudet, J. (2017). Mapping social□ecological vulnerability to inform local decision making. Conservation Biology..
- Thiault, L., Collin, A., Chlous, F., Gelcich, S., & Claudet, J. (2017). Combining participatory and socioeconomic approaches to map fishing effort in small-scale fisheries. PloS one, 12(5), e0176862.
- Chlous, F. (2017). Méthodologie participative : négociations et reconfiguration des relations entre partenaires. Participations, 1: 67-87.
- Ritschard, L., Gourmelon, F. & Chlous F. (2017). Différencier les représentations spatiales selon leurs statuts : de l'inscription, à l'objet intermédiaire et à l'actant. Revue Internationale de Géomatique, 27, n°1: 1-5.
- Legrand M. & Chlous F. (2016). Différencier les représentations spatiales selon leurs statuts : de l'inscription, à l'objet intermédiaire et à l'actant. Environmental development.
- Chlous, F. (2015). Des liens pluriels et intimes à la mer dans l'archipel des Marquises (Polynésie française). La construction d'une patrimonialisation. La mer et les hommes, Territoires, pratiques et identités, Revue Internationale d'ethnographie.

CLAUDET Joachim

Research scientist at National Center for Scientific Research (CNRS), CRIOBE.
Perpignan - FRANCE

joachim.claudet@gmail.com

Joachim Claudet specializes in marine protected area (MPA) evaluations and linked coastal social-ecological research at the land-sea interface, using place-based case studies to inform management or meta-analyzes to impact policy. He is interested in research that helps implement appropriate monitoring designs and management plans, develop indicators and decision-making tools.
He currently leads as PI two inter-disciplinary projects on linked social-ecological resilience of coastal systems (ACRoSS, ANR; INTHENSE, Fondation de France) and one on the use of MPA networks to reach sustainable fisheries in the Mediterranean Sea (SafeNet, EC DG MARE), and, among others, is WP leader in projects on ecosystem resilience and ecosystem services valuation.
Expert on MPAs for PISCO and WWF, he is also involved in IPBES regional assessments and several scientific councils and is the president of the scientific committee of MedPAN, the network of Mediterranean MPA managers. Joachim Claudet recently edited a book on MPAs at Cambridge University Press.
For more information see: www.joachimclaudet.com

RELEVANT PUBLICATIONS

- Claudet, J. (2017). Six conditions under which MPAs might not appear effective (when they are). ICES Journal of Marine Science.
- Thiault, L., Kernaléguen, L., Osenberg, C. W., & Claudet, J. (2017). Progressive-Change BACIPS: a flexible approach for environmental impact assessment. Methods in Ecology and Evolution, 8(3), 288-296.
- Horta e Costa, B., Claudet, J., Franco, G., Erzini, K., Caro, A., & Gonçalves, E. J. (2016). A regulation-based classification system for Marine Protected Areas (MPAs). Marine Policy, 72, 192-198.
- Grorud-Colvert, K., Claudet, J., Tissot, B. N., Caselle, J. E., Carr, M. H., Day, J. C., ... & Walsh, W. J. (2014). Marine protected area networks: assessing whether the whole is greater than the sum of its parts. PloS one, 9(8), e102298..
- Claudet, J., Osenberg, C. W., Benedetti-Cecchi, L., Domenici, P., García-Charton, J. A., Pérez-Ruzafa, Á., ... & Culioli, J. M. (2008). Marine reserves: size and age do matter. Ecology letters, 11(5), 481-489.

GATTUSO Jean-Pierre

Research Professor at the National Center for Scientific Research (CNRS), laboratory of Oceanography of Villefranche.
VIllefranche/Mer - FRANCE

gattuso@obs-vlfr.fr

Jean-Pierre Gattuso is a Research Professor at the Centre National de la Recherche Scientifique (CNRS, France) and is based at the Laboratoire d'Océanographie de Villefranche, a marine station operated by the Université Pierre-et-Marie Curie (Paris 6) in Southern France.
He is also Associated Scientist at the Institute for Sustainable Development and International Relations (Sciences Po, Paris). His research interests are related to: (1) the carbon and carbonate cycles in coastal ecosystems; and (2) the response of marine organisms and ecosystems to global environmental changes.
He was the Scientific Coordinator of the FP7 large-scale integrated project EPOCA (European Project on Ocean Acidification) which aimed at advancing the understanding of the biological, ecological, biogeochemical, and societal implications of ocean acidification. The EPOCA consortium comprised more than 160 researchers from 32 institutes and 10 European countries.
Jean-Pierre Gattuso is the Founding chair of the SOLAS-IMBER Ocean Acidification Working Group, led the launch of the Ocean Acidification International Coordination Center and co-edited the first book on ocean acidification.
He is also the Founding President of the European Geosciences Union Biogeosciences Division, Founding editor-in-chief of the journal Biogeosciences, President of the Monegasque Association on Ocean Acidification and a past member of the IMBER Scientific Steering Committee.
Jean-Pierre Gattuso is a member of the European Academy of Sciences.

RELEVANT PUBLICATIONS

- Magnan, A. K., Colombier, M., Billé, R., Joos, F., Hoegh-Guldberg, O., Pörtner, H. O., ... & Gattuso, J. P. (2016). Implications of the Paris agreement for the ocean. Nature climate change, 6(8), 732-735.
- Gattuso, J. P., Magnan, A., Billé, R., Cheung, W. W., Howes, E. L., Joos, F., ... & Hoegh-Guldberg, O. (2015). Contrasting futures for ocean and society from different anthropogenic CO_2 emissions scenarios. Science, 349(6243), aac4722.
- Riebesell, U., & Gattuso, J. P. (2015). Lessons learned from ocean acidification research. Nature Climate Change, 5(1), 12.
- Gattuso, J.-P., Brewer, P., Hoegh-Guldberg, O., Kleypas, J. A., Pörtner, H.-O. & Schmidt, D. (2014). Ocean acidification. In: Field C. B. et al. (Eds.), Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, pp. 129-131. Cambridge, UK and New York, NY, USA: Cambridge University Press.
- Gattuso J.-P., Hoegh-Guldberg O. & Pörtner H.-O. (2014). Coral reefs. In: Field C. B. et al. (Eds.), Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, pp. 97-100. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
- Turley, C., & Gattuso, J. P. (2012). Future biological and ecosystem impacts of ocean acidification and their socioeconomic-policy implications. Current opinion in environmental sustainability, 4(3), 278-286.
- Gattuso J.-P. & Hansson L. (Eds.) (2011). Ocean acidification, 326 p. Oxford: Oxford University Press.

MOORE Tommy

PI-GOOS Coordinator and NZ Pacific Partnership on Ocean Acidification project manager; Secretariat of the Pacific Regional Environment Programme.
Samoa - WESTERN POLYNESIA

tommym@sprep.org

Dr Tommy Moore is the Pacific Islands Global Ocean Observing System (PI-GOOS) Coordinator at the Secretariat of the Pacific Region Environmental Programme (SPREP), a regional intergovernmental organization based in Apia, Samoa, where he also serves as the Project Manager for the NZ Pacific Partnership on Ocean Acidification. Dr. Moore is SPREPs focal point on ocean acidification and works to support SPREPs 21 Pacific island country and territory members on issues related to the impacts of ocean acidification and climate change on the marine environment.

Dr Moore's areas of expertise include ocean acidification and climate change impacts on the marine environment, ocean observing, marine instrumentation, marine chemistry and biogeochemistry, air-sea gas exchange, and biogeochemical modelling. Dr Moore earned his PhD from the University of Delaware, where his studies focused on biological productivity and nutrient in the lower Delaware Bay. Following his PhD he worked with Dr Mike DeGrandpre at the University of Montana as a Post-Doctoral Fellow on autonomous pH and pCO_2 sensor design and air-sea gas exchange. Dr Moore then worked with Carlos Duarte IMEDEA in Esporles, Spain, where work focused on studying small-scale pH variability in seagrass meadows. His current work focuses on providing technical and advisory support to SPREPs Pacific island country and territory members, project design and management, and working to build the Pacific Partnership on Ocean Acidification project into a full regional programme of work.

PASCAL Nicolas

Associate researcher for the CRIOBE (USR 3278): Insular Research Center and Environment Observatory from EPHE and CNRS.
Perpignan - FRANCE

nicolas.pascal@criobe.pf

Nicolas is the founder and director of the United Nations Environment «Blue finance» project. Nicolas' expertise combines marine science, economics, finance and policy; all aimed at protecting marine ecosystems.
On the marine side, his more than 50 economic studies, scientific publications and technical reports on ecosystem services of coral reefs, have been used globally, to inform and convince policy makers.
On the business side, Nicolas' former positions include investment director and project developer for multinational companies as well as founder and CEO of a B2B company. These dual skill sets now inform marine conservation, inspiring alternatives and new approaches.
Blue finance is dedicated to the implementation of joint partnerships between the public and private sectors for sustainable management of Marine Protected/Management Areas. At present, the project staff is working with key partners in the Eastern Caribbean, to help protect >1000km2 of critical coral reef habitats, while expanding to new countries.
He is also the coordinator of the project "MERCI-Cor" from IFRECOR, French Initiative for Coral reefs to calibrate compensation offsets of impacts on coral reef, mangrove and seagrass ecosystems. 2016-2020.

RELEVANT PUBLICATIONS

- Pascal, N., Allenbach, M., Brathwaite, A., Burke, L., Le Port, G., & Clua, E. (2016). Economic valuation of coral reef ecosystem service of coastal protection: A pragmatic approach. Ecosystem Services, 21, 72-80.
- Pinault, M., Pioch, S., Pascal, N. (2016). Livret I – Guide pour les études d'impact environnemental en milieux corallien de France d'Outre-mer. Livret II – Mise en œuvre des mesures compensatoires et méthodes de dimensionnement MERCI-COR. Guide IFRECOR. 194 p.
- Pascal, N., Leport, G., Allenbach, M. &Marchand, C. (2016). Valeur économique des services rendus par les récifs coralliens et écosystèmes associés des Outre-mer français. Rapport technique pour l''Initiative Française pour les REcifs CORalliens (IFRECOR), 7 rapports, 460 pages.
- Leenhardt, P., Stelzenmüller, V., Pascal, N., Probst, W. N., Aubanel, A., Bambridge, T., Charles, M., Clua, E., Féral, F., Quinquis, B., Salvat, B. & Claudet, J. (2015). Exploring social-ecological dynamics of a coral reef resource system using participatory modeling and empirical data. Marine Policy, 78: 90-97.
- Marre, J. B., Brander, L., Thebaud, O., Boncoeur, J., Pascoe, S., Coglan, L., & Pascal, N. (2015). Non-market use and non-use values for preserving ecosystem services over time: A choice experiment application to coral reef ecosystems in New Caledonia. Ocean & Coastal Management, 105, 1-14.

RECUERO VIRTO Laura

Deputy head at the Railway Infrastructure Regulatory Unit, French Railway and Road Regulatory Agency (ARAFER).
Paris - FRANCE

laura.recuero-virto@arafer.fr

Laura Recuero Virto is currently deputy head of the Railway Infrastructure Regulatory Unit in the French Railway and Road Regulatory Agency.
She is also a research associate at the Museum National d'Histoire Naturelle in Paris, where she works on the relationship between marines resources and economic growth.
She was up to recently seconded to the Environment Directorate at the OECD to draft an issue paper on the potential contribution of the OECD to the indicators on the Sustainable Development Goal 14 "Conserve and sustainably use the oceans, seas and marine resources for sustainable development".
She has worked for the French Ministry of foreign affairs as head of unit on economic analysis and globalization and chief economist, as well as for the OECD, Télécom ParisTech, the World Bank Institute, Nortel Networks, le Centre National d'Etudes Spatiales and European Space Agency.
At Télécom ParisTech, Nortel Networks and the French and European space agencies, she worked on wave propagation R&D and operational projects. At the OECD, Laura contributed to the African economic outlook, covering recent developments in macroeconomic and structural issues, and participating in forecasting.
She has contributed to ministerial meetings on infrastructure (African Union, OECD-NEPAD) and has media appearances in Le Monde, Financial Times, Les Afriques, RFI, amongst others. She gives courses on environmental and natural resource economics at Mines ParisTech.
She holds a B.A. degree on telecommunications engineering, an MBA on international trade (Polytechnic University of Madrid), a PhD in economics (Toulouse School of Economics), and a PhD in environmental engineering with a focus on marine resources conservation (Polytechnic University of Madrid)
She has expertise on wave propagation, infrastructure and development economics, and marine resources conservation.

RELEVANT PUBLICATIONS

- Recuero Virto, L., Weber, J.L., Jeantil, M. (2018). Natural capital accounts and public policy decisions: Findings from a survey. Ecological Economics, 144.
- Recuero Virto, L., Couvet, D. (2017). The impact of renewable versus non-renewable natural capital on economic growth. Forthcoming FAERE working papers.
- Recuero Virto, L., Ducarme, F., Couvet., D. (2017). The determinants of economic growth in countries with marine biodiversity. Forthcoming FAERE working papers.
- Boateng, N., Gachassin, M. C., Gay, E., & Recuero Virto, L. (2014). Public Financial Management in Infrastructure in Africa. OECD Development Centre Working Papers 323, OECD Publishing
- Gasmi, F., Um, P. N., & Virto, L. R. (2009). Political accountability and regulatory performance in infrastructure industries: an empirical analysis. World Bank Economic Review, World Bank Group, vol. 23(3): 509-531

FACILITATOR

REYNAUD Stéphanie

Senior scientist in the Ecophysiology and Ecology team, Marine Biology Department, Centre Scientifique de Monaco.
MONACO

sreynaud@centrescientifique.mc

Dr. Stéphanie Reynaud is a Research Scientist at the Centre Scientifique of Monaco (Ecophysiology team) with more than 15 years of experience in ecophysiology and biogeochemistry. She has expertise on corals culture for calibration of proxies (stable isotopes and trace elements). She also carried out controlled experiments to investigate the response of reef-building corals to elevated pCO_2 and temperature. She has participated at different field trip, and especially one in Papua New Guinea where the responses of coral reefs naturally acclimatized to low pH (due to volcanic CO_2 seeps) were investigated.
She received a Ph.D. in Biogeochemistry in 2000 from the Université de Nice-Sophia Antipolis, and then received a 2 years postdoctoral grant from Columbia University's Lamont Doherty Earth Observatory.
For a complete biography and list of publication see www.centrescientifique.mc

RELEVANT PUBLICATIONS

- Houlbreque, F., Reynaud, S., Godinot, C., Oberhänsli, F., Rodolfo-Metalpa, R., & Ferrier-Pagès, C. (2015). Ocean acidification reduces feeding rates in the scleractinian coral Stylophora pistillata. Limnology and Oceanography, 60(1), 89-99.
- Hilmi, N., Allemand, D., Cinar, M., Cooley, S., Hall-Spencer, J. M., Haraldsson, G., ... & Reynaud, S. (2014). Exposure of Mediterranean countries to ocean acidification. Water, 6(6), 1719-1744.
- Hilmi, N., Allemand, D., Dupont, S., Safa, A., Haraldsson, G., Nunes, P. A., ... & Fine, M. (2013). Towards improved socio-economic assessments of ocean acidification's impacts. Marine biology, 160(8), 1773-1787.
- Erez, J., Reynaud, S., Silverman, J., Schneider, K., & Allemand, D. (2011). Coral calcification under ocean acidification and global change. In Coral reefs: an ecosystem in transition (pp. 151-176). Springer Netherlands.
- Reynaud, S., Hemming, N. G., Juillet-Leclerc, A., & Gattuso, J. P. (2004). Effect of pCO_2 and temperature on the boron isotopic composition of the zooxanthellate coral Acropora sp. Coral Reefs, 23(4), 539-546.
- Reynaud, S., Leclercq, N., Romaine-Lioud, S., Ferrier-Pagés, C., Jaubert, J., & Gattuso, J. P. (2003). Interacting effects of CO_2 partial pressure and temperature on photosynthesis and calcification in a scleractinian coral. Global Change Biology, 9(11), 1660-1668.

GROUP LEADER

RODOLFO-METALPA Riccardo

Research fellow at IRD (Institute of Research for Development) - UMR ENTROPIE (Ecologie marine tropicale des océans Pacifique et Indien). Nouméa - NEW CALEDONIA

riccardo.rodolfo-metalpa@ird.fr

Contribution to my field. I have a well-established track-record of laboratory and field studies into the effects of climate change on various life-stages of key-marine species such as algae, seagrasses, foraminiferans, sponges, corals, bryozoans and molluscs.

- In the framework of EPOCA (European Project on Ocean Acidification), I performed the first long-term laboratory study on the effect of OA on Mediterranean corals and found that the corals were surprisingly resilient to the pH levels projected for 2100 (Rodolfo-Metalpa et al. 2010).
- I have pioneered the use of submarine CO_2 vents to investigate the responses of benthic communities to lower pH conditions providing the first studies of the effect of ocean acidification on ecosystems. This study was published by Nature and quickly become a key-stone reference with natural CO_2 vents now frequently used to study the effects of OA.
- In 2009 I became a Prince Albert II Foundation independent PI based at the International Agency Atomic Energy (AIEA, Monaco). My project (http://www.fpa2.com/projet-bassin-mediterraneen-numero-63.html) characterized the effect of climate change on key-calcifying organisms such as corals, bryozoans, mussels and limpets exposed to CO_2 vents. This research (Rodolfo-Metalpa et al. 2011) revealed the mechanisms of resistance to OA across a range of taxa.
- I participated to the EU FP7 project MedSeA (Mediterranean Sea Acidification under a changing climate) helping to predict effect on habitats formed by macroalgae, deep-sea corals and vermetid gastropods.
- From 2013 I have been appointed for a permanent position (Research Scientist, first category) to IRD. For the first geographic assignment I chose New Caledonia, which is a French Territory. Here, among other research projects, I am using the CO_2 vent system of Papua New Guinea (Project CARiOCA) and extreme environments (Project SuperNatural) as a natural laboratories to study coral reef responses to ocean acidification.

RELEVANT PUBLICATIONS

- Camp, E. F., Nitschke, M. R., Rodolfo-Metalpa, R., Houlbreque, F., Gardner, S. G., Smith, D. J., ... & Suggett, D. J. (2017). Reef-building corals thrive within hot-acidified and deoxygenated waters. Scientific Reports, 7.
- Garilli, V., Rodolfo-Metalpa, R., Scuderi, D., Brusca, L., Parrinello, D... & Milazzo, M. (2015). Physiological advantages of dwarfing in surviving extinctions in high-CO_2 oceans. Nature Climate Change, 5(7), 678.
- Rodolfo-Metalpa, R., Montagna, P., Aliani, S., Borghini, M., Canese, S... & Houlbrèque, F. (2015). Calcification is not the Achilles' heel of cold-water corals in an acidifying ocean. Global change biology, 21(6), 2238-2248.
- Milazzo, M., Rodolfo-Metalpa, R., San Chan, V. B., Fine, M., Alessi, C., Thiyagarajan, V., ... & Chemello, R. (2014). Ocean acidification impairs vermetid reef recruitment. Scientific Reports, 4.
- Rodolfo-Metalpa, R., Houlbrèque, F., Tambutté, É., Boisson, F., Baggini, C... & Hall-Spencer, J. M. (2011). Coral and mollusc resistance to ocean acidification adversely affected by warming. Nature Climate Change, 1(6), 308.
- Martin, S., Rodolfo-Metalpa, R., Ransome, E., Rowley, S., Buia, M. C., Gattuso, J. P., & Hall-Spencer, J. (2008). Effects of naturally acidified seawater on seagrass calcareous epibionts. Biology letters, 4(6), 689-692.
- Hall-Spencer, J. M., Rodolfo-Metalpa, R., Martin, S., Ransome, E., Fine, M., Turner, S. M., ... & Buia, M. C. (2008). Volcanic carbon dioxide vents show ecosystem effects of ocean acidification. Nature, 454(7200), 96-99.

FACILITATOR

TAMBUTTE Sylvie

Research Director in the Physiology and Biochemistry team, Marine Biology Department, Centre Scientifique de Monaco.
MONACO

stambutte@centrescientifique.mc

Dr Sylvie Tambutté is Research Director and leader of the team of Coral Physiology in the Department of Marine Biology at the Centre Scientifique de Monaco. Her research activities concern the biology and physiology of marine organisms. She is particularly interested in studying the mechanisms of biomineralization/calcification in corals and the impacts of environmental parameters on this process.
She is working on the link between symbiosis and calcification, on the regulation of ionic transport and pH regulation for calcification, on the role of organic matrix in calcium carbonate precipitation, and on the effect of ocean acidification and other stressors on calcification. Her research activities spread from the genes to the cells and the organisms by combining biochemistry, microscopy and physiology approaches.
In 1996 she received her PhD in Oceanology at the Université de la Méditerranée, Aix-Marseille II on the epithelial properties of cnidarian tissues and then in 2008 her « Habilitation à diriger la recherche » at the Université de Nice-Sophia Antipolis on biomineralization in corals.
Since July 2015 she is the National Focal Point of the Principality of Monaco for the Pelagos Agreement; since June 2015 she is Vice-President of the French Society of Mineralized Tissues and since 2011 she is member of the Scientific Council of the French LABEX CORAIL.

RELEVANT PUBLICATIONS

- Raybaud, V., Tambutté, S., Ferrier-Pagès, C., Reynaud, S., Venn, A. A., Tambutté, É., ... & Allemand, D. (2017). Computing the carbonate chemistry of the coral calcifying medium and its response to ocean acidification. Journal of Theoretical Biology, 424, 26-36.
- Comeau, S., Tambutté, E., Carpenter, R. C., Edmunds, P. J., Evensen, N. R., Allemand, D., ... & Venn, A. A. (2017). Coral calcifying fluid pH is modulated by seawater carbonate chemistry not solely seawater pH. In Proc. R. Soc. B (Vol. 284, No. 1847, p. 20161669). The Royal Society.
- Edmunds, P. J., Comeau, S., Lantz, C., Andersson, A., Briggs, C., Cohen, A., ... & Muller, E. B. (2016). Integrating the effects of ocean acidification across functional scales on tropical coral reefs. BioScience, 66(5), 350-362
- Venn, A. A., Tambutté, E., & Tambutté, S. (2015). Plasticity of coral physiology under ocean acidification. Oncotarget, 6(21), 18248.
- Tambutté, E., Venn, A. A., Holcomb, M., Segonds, N., Techer, N., Zoccola, D., ... & Tambutté, S. (2015). Morphological plasticity of the coral skeleton under CO_2-driven seawater acidification. Nature communications, 6.
- Vidal-Dupiol, J., Zoccola, D., Tambutté, E., Grunau, C., Cosseau, C., Smith, K. M., ... & Tambutté, S. (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 analysis. PloS one, 8(3), e58652.
- Venn, A. A., Tambutté, E., Holcomb, M., Laurent, J., Allemand, D., & Tambutté, S. (2013). Impact of seawater acidification on pH at the tissue–skeleton interface and calcification in reef corals. Proceedings of the National Academy of Sciences, 110(5), 1634-1639.

THOMASSIN Aurélie

Marine biodiversity, coral reef and fisheries officer at French Ministry of Ecological and Solidary Transition.
Paris - FRANCE

aurelie.thomassin@developpement-durable.gouv.fr

2004 - 2006	Project officer, Marine Protected Area and Biodiversity Conservation, Institut de Recherche pour le Développement - La Réunion Collection of field data, Participatory mapping, Interview with local population, Logistics of field missions, Reporting to donors.
2007 - 2010	Lecturer in Statistics and methodology in Geography, La Réunion Island University
2007 - 2011	PhD student, Institut de Recherche pour le Développement (IRD) - La Réunion Collaborations in research projects, Project management, Fundraising, Logistics of field missions, Reporting to donors Purpose of the thesis: Building social acceptance indicators to monitor social dynamics in marine protected areas in the southwestern Indian Ocean.
2009 - 2012	Consulting in Social Sciences applied to Biodiversity Conservation (Géodesic) Socio-economic diagnostic, Evaluation of social impacts, Perceptions analysis, Measure of social acceptance, Governance study, Environmental consultation, Participatory management Experiences: - Feasibility study of implementing a Marine Protected Area on the southwest coast of Mauritius – Mauritius Marine Conservation Society (MMCS) - Methodological advice and support to the measurement of indicators for the dashboard of the Parc Naturel Marin d'Iroise (PNMI) - Agence Nationale des Aires Marines Protégées - Typology of tradional fishermen in the Natural Marine Reserve of La Reunion – GIP Réserve Naturelle Marine de La Réunion
2012 - Now	Project Manager in Marine biodiversity, coral reef and fisheries, French Ministry in charge of Ecology. Policy officer in charge of the French Initiative for Coral Reef (IFRECOR) and the International Initiative for Coral Reef (ICRI).

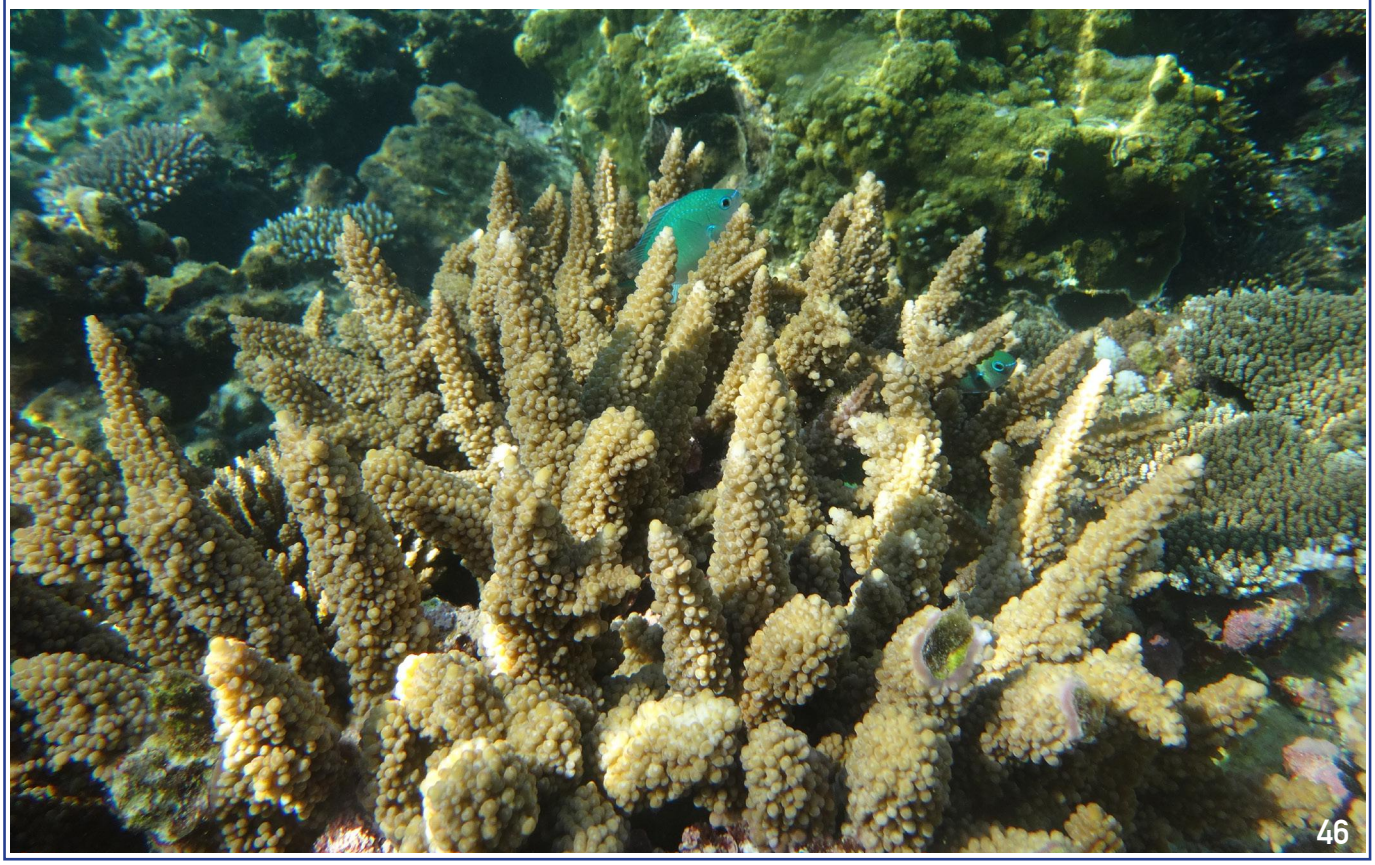
RELEVANT PUBLICATIONS

- Thomassin A., David, G. (2014). Elaboration d'une méthode pour construire des indicateurs d'acceptation sociale : application à la Réserve Naturelle Marine de La Réunion. In Espaces Protégés et Territoires. Conflits et acceptation. Gauchon C., Laslaz L., Duval-Massaloux M. et Heritier S., dir., Paris. 300p.
- Thomassin A., David, G., Duchêne, J., Bissery, C. (2011). Social acceptance of recreational fishermen in the Natural Marine Reserve of Reunion Island. Coastal Management, 39:4, p. 425-439. ISSN 0892-0753.
- Thomassin, A.,. White C., Stead S., David, G. (2010). Social acceptability of a Marine Protected Area: the case of Reunion Island, Ocean & Coastal Management, n°53, p.169-179. ISSN 0964-5691.
- David, G., Antona, M., Botta, A., Daré, W., Thomassin, A. (2010). Du satellite au décideur, la recherche action au service de la gestion intégrée du littoral de La Réunion. Les Cahiers d'Outre-Mer, n°248, p.549-570. ISSN 0373-5834.

BIOGRAPHIES OF PARTICIPANTS

Australia

- ALBRIGHT Rebecca — *Group Leader*
- FLETCHER Steve
- GAZEAU Frédéric — *Facilitator*
- HANSSON Lina — *Facilitator*
- HARALDSSON Gunnar — *Group Leader*
- HOEGH-GULDBERG Ove
- JEFFREE Ross
- MARSHALL Nadine
- MARSHALL Paul



© L. Courtial (CSM)

GROUP LEADER

ALBRIGHT Rebecca

Assistant Curator, Invertebrate Zoology
McCosker Chair, Aquatic Biology,
California Academy of Sciences.
San Francisco - USA

ralbright@calacademy.org

Rebecca Albright is a marine biologist with expertise in coral reef biology, ecology, and biogeochemistry.
She obtained her PhD in 2011 from the University of Miami's Rosenstiel of Marine and Atmospheric Science and is currently a Curator of Invertebrate Zoology at the California Academy of Sciences in San Francisco.
Her research focuses on the capacity of benthic marine organisms to cope with changing environmental conditions. She has devoted the last twelve years to understanding how coral reef organisms are impacted by changing seawater chemistry (ocean acidification), alone and in combination with warming.
She has led a variety of projects that address this central question at various scales ranging from single cells (gamete interactions and fertilization success) to individual organisms (perturbation experiments investigating the effects of ocean acidification on corals, calcareous algae, gorgonians, and sea urchins) and whole-of-reef processes (net ecosystem calcification and production).
For a complete biography and list of publications please see: www.rebecca-albright.com.

RELEVANT PUBLICATIONS

- Albright, R., Anthony, K. R., Baird, M., Beeden, R., Byrne, M., Collier, C., ... & Lough, J. (2016). Ocean acidification: Linking science to management solutions using the Great Barrier Reef as a case study. Journal of environmental management, 182, 641-650.
- Kwiatkowski, L., Albright, R., Hosfelt, J., Nebuchina, Y., Ninokawa, A., Rivlin, T., ... & Caldeira, K. (2016). Interannual stability of organic to inorganic carbon production on a coral atoll. Geophysical Research Letters, 43(8), 3880-3888.
- Albright, R., Caldeira, L., Hosfelt, J., Kwiatkowski, L., Maclaren, J. K., Mason, B. M., ... & Rivlin, T. (2016). Reversal of ocean acidification enhances net coral reef calcification. Nature, 531 (7594), 362-365.
- Albright, R., Benthuysen, J., Cantin, N., Caldeira, K., & Anthony, K. (2015). Coral reef metabolism and carbon chemistry dynamics of a coral reef flat. Geophysical Research Letters, 42(10), 3980-3988.
- Albright, R., Langdon, C., & Anthony, K. R. N. (2013). Dynamics of seawater carbonate chemistry, production, and calcification of a coral reef flat, central Great Barrier Reef. Biogeosciences, 10(10), 6747-6758.

FLETCHER Steve

Professor of Marine Policy. Head of Marine Programme, UNEP-WCMC.
Cambridge - UNITED KINGDOM

steve.fletcher@unep-wcmc.org

Steve is the Head of Marine Prgoramme at the UN Environment World Conservation Monitoring Centre in Cambridge, a member of the UN International Resource Panel and Professor in Marine Policy at Plymouth University.
He is an expert in global ocean governance and policy and has worked extensively in the field of marine spatial planning and integrated coastal management.
He is currently leads a substantial portfolio of ocean projects that contribute to international ocean policy including a UN Environment project to explore the links between coral management and sustainable development goals and the role of citizen behaviour change in coral conservation.
His research has been widely published in the principal sector journals and he has been an invited speaker at many national and global events.

RELEVANT PUBLICATIONS

- Weatherdon, L. V., Appeltans, W., Bowles-Newark, N., Brooks, T. M., Davis, F. E., Despot-Belmonte, K., ... & Juffe-Bignoli, D. (2017). Blueprints of effective biodiversity and conservation knowledge products that support marine policy. Frontiers in Marine Science, 4, 96.
- Lu, Y., Yuan, J., He, G., Visbeck, M. & Fletcher, S. (2016). Rate oceans' capital to help achieve SDGs. Nature 537, 34.
- Jefferson, R., McKinley, E., Capstick, S., Fletcher, S., Griffin, H., & Milanese, M. (2015). Understanding audiences: making public perceptions research matter to marine conservation. Ocean & Coastal Management, 115, 61-70.
- Börger, T., Beaumont, N. J., Pendleton, L., Boyle, K. J., Cooper, P., Fletcher, S., ... & Portela, R. (2014). Incorporating ecosystem services in marine planning: the role of valuation. Marine Policy, 46, 161-170.
- McKinley, E., & Fletcher, S. (2012). Improving marine environmental health through marine citizenship: a call for debate. Marine Policy, 36(3), 839-843.

FACILITATOR

GAZEAU Frédéric

CNRS research scientist, Group leader "Biodiversity and Biogeochemistry", Laboratoire d'Océanographie de Villefranche (LOV).
Villefranche/mer - FRANCE

f.gazeau@obs-vlfr.fr

Dr Frédéric Gazeau is a researcher at the Laboratoire d'Océanographie de Villefranche (LOV), a leading French oceanographic institution. This research unit is part of the CNRS and the Université Pierre et Marie Curie (UPMC) with a permanent staff of 30 scientists and 17 engineers/technicians.
Frédéric received his Ph.D. in Marine Biology from the Université Pierre et Marie Curie in 2004, focused on the metabolism (primary production, community respiration, net community production and calcification) of the coastal ocean and its role with respect to the air-sea CO_2 fluxes. During his post-doctoral stay at the Netherlands Institute of Ecology (NIOO-CEME, 2005-2008) and within the framework of his CNRS position (2009 onwards), he was involved in the European Project on Ocean Acidification (EPOCA; http://www.epoca-project.eu/), focusing on the effect of the ocean acidification on molluscs (adults and larvae, bivalves and pteropods). Beside the organization of two joint pelagic mesocosm experiments in the Northwestern Mediterranean Sea, in the frame of the European Mediterranean Sea Acidification in a changing climate project (MedSeA; http://medsea-project.eu), Dr. Gazeau was in charge of leading an experiment on the Mediterranean mussel: testing the effects of ocean acidification and warming on the growth and metabolism of this very important species.
Recently, Dr. Gazeau co-coordinated a project funded by the Foundation BNP-Paribas (eFOCE; http://efoce.eu/). The objectives of this project were to develop, validate and implement experimental systems that enable scientists to investigate the long-term effects of acidification in situ, on benthic marine communities – i.e. the organisms who live on or near the seabed. These experimental systems have been deployed over an 8-month period on a seagrass bed (Posidonia oceanica) in the Bay of Villefranche (NW Mediterranean Sea).
Dr. Gazeau is a scientific committee member of the "Initiative Structurante Ecosphère continentale et côtière - Action thématique Dynamique et Réactivité des Interfaces Littorales" (CNRS; EC2CO-DRIL), of the SOLAS-IMBER working group on Ocean Acidification (SIOA), and a member of the advisory board of the Ocean Acidification International Coordination Centre (OA-ICC).

RELEVANT PUBLICATIONS

- Maugendre, L., Gueiu, C., Gattuso, J. P. & Gazeau, F. (2017). Ocean acidification in the Mediterranean Sea: Pelagic mesocosm experiments. A synthesis. Estuarine, Coastal and Shelf Science 186, Part A: 1-10.
- Cox, T. E., Gazeau, F., Alliouane, S., Hendriks, I.E., Mahacek, P., Le Fur, A. & Gattuso, J.P. (2016). Effects of in situ CO_2 enrichment on structural characteristics, photosynthesis, and growth of the Mediterranean seagrass *Posidonia oceanica*. Biogeosciences 13(7): 2179-2194.
- Gazeau, F., Alliouane, S., Bock, C., Bramanti, L., López Correa, M., Gentile, M., ... & Ziveri, P. (2014). Impact of ocean acidification and warming on the Mediterranean mussel (*Mytilus galloprovincialis*). Frontiers in Marine Science, 1, 62.
- The MerMex Group (2011). Marine ecosystems' responses to climatic and anthropogenic forcings in the Mediterranean. Progress in Oceanography 91(2): 97-166.
- Gazeau, F., Quiblier, C., Jansen, J. M., Gattuso, J. P., Middelburg, J. J., & Heip, C. H. (2007). Impact of elevated CO_2 on shellfish calcification. Geophysical Research Letters, 34(7), L07603.

FACILITATOR

HANSSON Lina

Associate Project Officer of the Ocean Acidification International Coordination Centre (OA-ICC) at the International Atomic Energy Agency Environment Laboratories.
MONACO

l.hansson@iaea.org

IAEA
International Atomic Energy Agency

Lina Hansson holds a Master of Science in Biotechnology Engineering from Lund University, Sweden.
She was the project manager of the EU FP7 project EPOCA (European Project on Ocean Acidification) from 2008 to 2012. She is currently working as Associate Project Officer of the Ocean Acidification International Coordination Centre (OA-ICC), launched in 2012 and based at the IAEA Environment Laboratories in Monaco. The OA-ICC promotes global collaboration and facilitates a series of international activities of benefit to the wider ocean acidification research community and other stakeholders. These include strengthening scientific capability (particularly in developing Member States), helping to establish global and regional OA networks, supporting international ocean acidification data management, promoting the use of best practices, providing online resources and data bases, and communicating the science to non-scientists. Lina Hansson is co-editor of the EPOCA publication "Guide to Best Practices in Ocean Acidification Research and Data Reporting", a guidance document for the ocean acidification research community covering seawater carbonate chemistry, experimental design of perturbation experiments, measurements of CO_2-sensitive processes and data reporting and usage. The guide was published in 2010 and is freely available at www.iaea.org/ocean-acidification. She is also co-editor of the first book on the subject, "Ocean Acidification", published in 2011 by Oxford University Press (http://ukcatalogue.oup.com/product/9780199591091.do) and co-author of several articles on ocean acidification, EPOCA and OA-ICC activities in various journals, reports and newsletters.

RELEVANT PUBLICATIONS

- Osborn D., Dupont S., Hansson L. & Metian M. (2017). Ocean acidification: impacts and governance. In Nunes P. A. L. D., Svensson L. E. & Markandya A. (Eds.), Handbook on the Economics and Management of Sustainable Oceans, Edward Elgar Publishing, pp. 396-415.
- Yang, Y., Hansson, L., & Gattuso, J. P. (2015). Data compilation on the biological response to ocean acidification: an update. Earth System Science Data Discussions, 8(2), 889-912.
- Gattuso, J. P., & Hansson, L. (2011). Ocean acidification: background and history. Ocean acidification, 1-20. Oxford: Oxford University Press.
- Gattuso, J. P., & Hansson, L. (2011). Ocean acidification: background and history. In: Gattuso J.-P. & Hansson L. (Eds.), Ocean acidification. Oxford: Oxford University Press.
- Riebesell U., Fabry V. J., Hansson L. & Gattuso J.-P. (2010). Guide to best practices for ocean acidification research and data reporting, 260 p. Luxembourg: Publications Office of the European Union.

GROUP LEADER

HARALDSSON Gunnar

Independent economic consultant at Intellecon. Chairman of the Icelandic Fiscal Committee, Chairman of the Icelandic UNESCO Committee and Member of the Icelandic Science and Technology Policy Council.
Reykjavik - ICELAND

INTELLECON

gunnar@intellecon.com

Gunnar Haraldsson is an economist with wide ranging experience from working in academia, for the public and private sector as well as for international organizations.
Previous work experience includes working at the National Economic Institute in Iceland, economic advisor to the prime minister, specialist at the Icelandic Development Agency, associate professor of economics at Bifröst University, adjunct professor at the University of Iceland, and director of the Institute of Economic Studies at the University of Iceland, chairman of the Icelandic Financial Supervisory Authority and senior economist at the OECD Fisheries Commission from 2010-2012.
Regarding ocean related issues the main focus has been on the interplay between economic activities, such as fishing, and the oceanic environment. Concerning ocean acidification issues the main interests lie in the economic effects of OA, taking into consideration various socio-economic aspects. Apart from work related directly to ocean acidification, Gunnar has undertaken work on issues related to various environmental policy issues for Icelandic authorities.
Gunnar Haraldsson has taken part in various fisheries and ocean related international research projects such as BEMMFISH, SOCIOEC and currently the EU funded SUCCESS project.
Among other responsibilities he is currently the chairman of the Icelandic Fiscal Council as well as the Chairman of the Icelandic UNESCO Commission and member of the Icelandic Science and Technology Policy Council. He is the founder of Intellecon, an economic consultancy.
Gunnar Haraldsson holds a B.Sc. degree in economics from the University of Iceland, M.Sc. degree in Fisheries Science from the same university, as well as DEA and PhD degrees in economics from the Université de Toulouse 1.

RELEVANT PUBLICATIONS

- Haraldsson, G. (2017). The political economy of the ITQ system and resource rent tax in Icelandic fisheries. Chapter 6 in The Political Economy of Biodiversity Policy Reform, OECD Publishing, Paris.
- Arnason, R., Haraldsson, G. and Hannesson, R. (2016). The Icelandic social welfare system: Comparison with the other Nordic countries. Chapter in Nordic Ways, Simonyi, A. (author) and Cagan, D. Center for Transatlantic Relations. John Hopkins University, Washington, DC.
- Marchal, P., Andersen, J. L., Aranda, M., Fitzpatrick, M., Goti, L., Guyader, O., ... & Macher, C. (2016). A comparative review of fisheries management experiences in the European Union and in other countries worldwide: Iceland, Australia, and New Zealand. Fish and Fisheries, 17(3), 803-824.
- Andersen, J.L., M. Fitzpatrick, O. R. Eigard, G. Haraldsson, S. Mardle (2015). Economic gains from introducing international ITQs - the case of the mackerel and herring fisheries in the Northeast Atlantic. Marine Policy, 59, pp. 85-93.
- Hilmi, N., Allemand, D., Cinar, M., Cooley, S., Hall-Spencer, J. M., Haraldsson, G., ... & Reynaud, S. (2014). Exposure of Mediterranean countries to ocean acidification. Water, 6(6), 1719-1744.
- Hilmi, N., Allemand, D., Dupont, S., Safa, A., Haraldsson, G., Nunes, P. A., ... & Fine, M. (2013). Towards improved socio-economic assessments of ocean acidification's impacts. Marine biology, 160(8), 1773-1787.

HOEGH-GULDBERG Ove

Professor and Director, Global Change Institute, University of Queensland.
Brisbane - AUSTRALIA

oveh@uq.edu.au

Professor Dr Ove Hoegh-Guldberg (BScHons., Sydney; PhD., UCLA) is a physiological ecologist who has focused on marine systems and climate change over the past 30 years. He is currently the Director of the Global Change Institute (GCI), member of the Australian Academy of Science, and Professor of Marine Science at The University of Queensland, Brisbane, Australia. In his role as Director, Ove has also focused on bringing together the research capacity of UQ around some of the most pressing and serious challenges facing humanity worldwide, such as climate change, food security, clean energy and sustainable water.
In addition to directing the GCI, Prof Hoegh-Guldberg leads an active research group interested in the biology and ecology of coral reefs, particularly the impact of ocean warming and acidification. In addition to his work producing published science (>300 articles), Ove was the coordinating lead author for Chapter 30, (Oceans) for the fifth assessment report of the IPCC and the Deputy Director of the ARC Centre of Excellence for Coral Reef Studies. He is also the Chief Scientist of the Catlin Seaview Survey and the 50 Reefs Initiative. He is currently a Coordinating Lead Author for the Special IPCC Report on the 1.5oC target.
In 1999, he was awarded the Eureka Prize for his scientific research, and the Queensland Smart State Premier's Fellow (2008-2013). In 2012, he was awarded a Thomson Reuters Citation Award in recognition of his contribution to research and an Australian Research Council Laureate Fellowship. He received the Climate Change Prize from HSH Prince Albert II of Monaco in 2014 and the Banksia Foundational International Award in 2016.

RELEVANT PUBLICATIONS

- Bongaerts, P., Riginos, C., Brunner, R., Englebert, N., Smith, S. R., & Hoegh-Guldberg, O. (2017). Deep reefs are not universal refuges: Reseeding potential varies among coral species. Science Advances, 3(2), e1602373.
- Hansen, J., Kharecha, P., Sato, M., Masson-Delmotte, V., Ackerman, F., Beerling, D.J., Hearty, P.J., Hoegh-Guldberg, O... Rockstrom, J. (2016). Chapter 11. Assessing "Dangerous climate change": Required reduction of carbon emissions to protect young people, future generations and nature. In Pollution and the Atmosphere: Designs for Reduced Emissions (pp. 201-282). Apple Academic Press.
- González-Rivero, M., Beijbom, O., Rodriguez-Ramirez, A., Holtrop, T., González-Marrero, Y., Ganase, A., ... & Hoegh-Guldberg, O. (2016). Scaling up ecological measurements of coral reefs using semi-automated field image collection and analysis. Remote Sensing, 8(1), 30.
- Hoegh-Guldberg, O., Beal, D., Chaudhry, T., Elhaj, H., Abdullat, A., Etessy, P., & Smits, M. (2015). Reviving the ocean economy: the case for action—2015. Gland, Switzerland: WWF International.
- Hoegh-Guldberg, O., Cai, R., Poloczanska, E. S., Brewer, P. G., Sundby, S., Hilmi, K., Fabry, V. J. & Jung, S. (2015). Chapter 30. The Ocean in Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects, pages 1655-1731. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, United Kingdom & New York, NY, USA.

JEFFREE Ross

Adjunct Professor ar the School of Life Sciences, C3, University of Technology. Member of the IUCN's Commission on Ecosystem Management (CEM), Ecological Restoration Group.
Sydney - AUSTRALIA

ross.jeffree@hotmail.co.uk

Ross Jeffree is a founding member of the Monaco Environment & Economics Group (MEEG) which initiated the First "Bridging the Gap" International Workshop on Ocean Acidification in Monaco. He was Head of the IAEA Marine Radioecology Laboratory, Monaco (2004-2011) which also began a radiotracer experimental program on the effects of ocean acidification on marine organisms, in collaboration with the CNRS Laboratory, Villefranche-sur-Mer, France, and the Centre Scientifique de Monaco. Subsequently, he has been Adjunct Professor & Visiting Fellow, Life Sciences (C3), University of Technology, Sydney (2010-present) and a member of the IUCN's Commission for Ecological Management (CEM), Ecological Restoration Group.

Following his liberation from institutional employment broader environmental questions have been pursued into whether it is humanly possible to live sustainably and in peaceful co-existence with the natural world; OA is sadly but one of many examples of our increasingly dysfunctional relationship with nature. Glimmers of hope have been found in the metaphysical beliefs and environmental perceptions of some regional traditional societies (Traditional Australian Aboriginala and Bhutanese) in which the value they attribute to biodiversity underpins their decision-making, in ways which are environmentally successful steps beyond a purely economic rationalist valuation of nature.

At the regional level he is a contributing lecturer in IAEA Asia-Pacific capacity building projects in marine radioecology and a regular financial supporter of WWF's biodiversity programs in Australia and Borneo (Heart of Borneo Project). He is also a member of The Orangutan Project which supports conservation efforts within the UNESCO World Heritage Gunung Leusur National Park, northern Sumatra.

At the level of personal agency he is a member of his local BushCare group for the ecological restoration of Yeramba Lagoon, Georges River National Park, and a fan of the Frugal Hedonism movement (less consumption, more enjoyment) and its articulation of practical eco-ethical behaviours which reduce both material consumption and carbon emissions.

RELEVANT PUBLICATIONS

- Jeffree R. A. (2015). Traditional Aboriginal Values and Gamba Grass Invasion of the Remediated Rum Jungle Mine Site. IUCN CEM Community Booklet, Invasive Species and Indigenous Communities.
- Jeffree R. A. (2014). Repairing the mined environment in accordance with the values of traditional aboriginal owners. 14th Congress of the International Society of Ethnobiology- One Earth for All: Regenerating Biocultural Ecosystem Resilience, June 1-7, UWICE Bumthang, Bhutan.
- Jeffree R. A. (2013) Bhutan's environmental success is a pleasing paradox. The Conversation. http://theconversation.com/bhutans-environmental-success-is-a-pleasing-paradox-21338

MARSHALL Nadine

Social scientist at CSIRO, Land and Water.
Townsville - AUSTRALIA

nadine.marshall@csiro.au

Dr. Nadine Marshall is a senior social scientist with CSIRO, Land and Water, based in Townsville, Australia.
Her research focuses on the relationship between people and natural resources for the purposes of better understanding how strategies can be developed that protect environmental goals whilst minimising social impacts.
She advocates that a better integration of the human dimension into natural resource management is more likely to result in higher compliance, higher wellbeing and better opportunities for adaptive management.
She currently manages a portfolio of research projects on the human dimension of the Great Barrier Reef. They range from identifying indicators of aesthetic value to other values associated with the Reef, to leading the Social and Economic Long Term Monitoring for the Great Barrier Reef.
Key interests include social resilience, adaptive capacity, resource dependency, vulnerability and social and economic monitoring.

RELEVANT PUBLICATIONS

- Marshall, N. A., Bohensky, E., Curnock, M., Goldberg, J., Gooch, M., Nicotra, B., ... & Tobin, R. C. (2016). Advances in monitoring the human dimension of natural resource systems: an example from the Great Barrier Reef. Environmental Research Letters, 11(11), 114020.
- Cvitanovic, C., Marshall, N., Wilson, S., Dobbs, K., & Hobday, A. (2014). Perceptions of Australian marine protected area managers regarding the role, importance, and achievability of adaptation for managing the risks of climate change. Ecology and Society, 19(4).
- Marshall, N. A., Park, S., Howden, S. M., Dowd, A. B., & Jakku, E. S. (2013). Climate change awareness is associated with enhanced adaptive capacity. Agricultural Systems, 117, 30-34.
- Marshall, N. A., Marshall, P. A., Abdulla, A., Rouphael, T., & Ali, A. (2011). Preparing for climate change: recognising its early impacts through the perceptions of dive tourists and dive operators in the Egyptian Red Sea. Current Issues in Tourism, 14(6), 507-518.
- Marshall, N., & Marshall, P. (2007). Conceptualizing and operationalizing social resilience within commercial fisheries in northern Australia. Ecology and society, 12(1).

MARSHALL Paul

Director of Reef Ecologic and Adjunct Associate Professor with the Centre for Biodiversity and Conservation Science at University of Queensland.
Townsville - AUSTRALIA

paul.marshall@reefecologic.org

Dr Paul Marshall is Professorial Fellow at the Centre for Conservation and Biodiversity Science, University of Queensland, and Director of Reef Ecologic, an applied research service provider to government and NGOs.
He worked with Australia's Great Barrier Reef Marine Park Authority for 14 years, where he founded and led the first Climate Change Program for a marine World Heritage site.
Paul has over 20 years of experience working with researchers and marine ecosystem managers in Australia, the Caribbean, Pacific and Indian Ocean regions. He pioneered the application of climate change vulnerability assessments and adaptation planning to marine ecosystem management, and continues to combine innovative science with practical actions to help managers and policymakers address the major issues affecting marine systems.
Dr Marshall is a founding member of the IUCN Working Group on Climate Change and Coral Reefs and an advisor to major NGOs and national governments on coral reef management, coastal planning, ecosystem services assessment and the integration of social and ecological sciences for systems-approaches to coastal zone management.
He gained his PhD from James Cook University in 2000, and remains closely involved in applied research (ecological and social) as well as management and policy for reef conservation. He has over 2000 dives on coral reefs around the world.
Paul has over 70 peer-reviewed publications on applied coral reef management, climate change adaptation and resilience attracting over 3500 citations. These include the milestone references The Great Barrier Reef and Climate Change: A Vulnerability Assessment, A Reef Manager's Guide to Coral Bleaching and the recently released A Reef Manager's Guide to Fostering Community Stewardship

RELEVANT PUBLICATIONS

- Anthony, K., Marshall, P. A., Abdulla, A., Beeden, R., Bergh, C., Black, R., ... & Green, A. (2015). Operationalizing resilience for adaptive coral reef management under global environmental change. Global change biology, 21(1), 48-61.
- Anthony, K., Maynard, J. A., Diaz Pulido, G., Mumby, P. J., Marshall, P. A., Cao, L., & Hoegh-Guldberg, O. (2011). Ocean acidification and warming will lower coral reef resilience. Global Change Biology, 17(5), 1798-1808.
- Press, A. J., Hoegh-Guldberg, O., Marshall, P., & Roberts, D. (2011). The'evil twin'of climate change: Ocean acidification.
- Hoegh-Guldberg, O., Andréfouët, S., Fabricius, K. E., Diaz-Pulido, G., Lough, J. M., Marshall, P. A., & Pratchett, M. S. (2011). Vulnerability of coral reefs in the tropical Pacific to climate change. Vulnerability of tropical Pacific fisheries and aquaculture to climate change. Secretariat of the Pacific Community, Noumea, 251-296.
- Marshall, N. A., Marshall, P. A., Tamelander, J., Obura, D., Malleret-King, D., & Cinner, J. E. (2010). A framework for social adaptation to climate change: sustaining tropical coastal communitites [sic] and industries. IUCN.
- Marshall, P. A., & Johnson, J. E. (2007). The Great Barrier Reef and climate change: vulnerability and management implications. Climate change and the Great Barrier Reef. Great Barrier Reef Marine Park Authority and the Australian Greenhouse Office, Australia, 774-801.

BIOGRAPHIES OF PARTICIPANTS

Caribbean and West Atlantic

- ANDERSSON Andreas — *Group Leader*
- BAXTER John
- CAMP Emma
- COOLEY Sarah
- GLEDHILL Dwight
- HOLTHUS Paul
- KOCH Marguerite
- MALIKI Samir
- MANFRINO Carrie
- PENDLETON Linwood — *Group Leader*
- VENN Alexander — *Facilitator*

©A. Venn (CSM)

GROUP LEADER

ANDERSSON Andreas

Associate Professor, Geosciences Research Division, Scripps Institution of Oceanography, University of California San Diego.
California - USA

aandersson@ucsd.edu

SCRIPPS INSTITUTION OF OCEANOGRAPHY
UC San Diego

Andreas Andersson is an Associate Professor of Oceanography at Scripps Institution of Oceanography.
His research deals with global environmental change owing to both natural and anthropogenic processes, and the subsequent effects on the function, role, and cycling of carbon in marine environments. In particular, he studies the effect of ocean acidification in coral reefs and in near-shore coastal environments.
Andersson was born and grew up in Sweden, but moved to Hawaii to attend college when he was old enough to make his own decisions.
He holds a B.S. in marine biology from Hawaii Pacific University (he was valedictorian of the class of 2001), and a M.S. and a Ph.D. in chemical oceanography from the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii at Manoa.
Following completion of his Ph.D. in 2006, he joined the Bermuda Institute of Ocean Sciences (BIOS) as a post-doctoral researcher in 2007 and became Assistant Research Scientist in 2008.
In 2011, Andersson moved to San Diego and Scripps Institution of Oceanography at the University of California San Diego where he heads the Scripps Coastal and Open Ocean Biogeochemistry (SCOOBY) lab. He has authored or co-authored more than 50 scientific articles and one book on the topic of ocean acidification. He has also advised several NGOs and policy makers on this environmental issue.

RELEVANT PUBLICATIONS

- Yeakel, K. L., Andersson, A. J., Bates, N. R., Noyes, T. J., Collins, A., & Garley, R. (2015). Shifts in coral reef biogeochemistry and resulting acidification linked to offshore productivity. Proceedings of the National Academy of Sciences, 112(47), 14512-14517.
- Andersson, A. J., Kline, D. I., Edmunds, P. J., Archer, S. D., Bednaršek, N., Carpenter, R. C., ... & King, A. L. (2015). Understanding ocean acidification impacts on organismal to ecological scales. Oceanography, 28(2), 16-27.
- Andersson, A. J., Yeakel, K. L., Bates, N. R., & De Putron, S. J. (2014). Partial offsets in ocean acidification from changing coral reef biogeochemistry. Nature Climate Change, 4(1), 56.
- Eyre, B. D., Andersson, A. J., & Cyronak, T. (2014). Benthic coral reef calcium carbonate dissolution in an acidifying ocean. Nature climate change, 4(11), 969.
- Andersson, A. J., & Gledhill, D. (2013). Ocean acidification and coral reefs: effects on breakdown, dissolution, and net ecosystem calcification. Annual Review of Marine Science, 5, 321-348.

BAXTER John

Principal Adviser – Marine Scottish Natural Heritage.
Adviser – IUCN Global Marine and Polar Programme.
Scotland - UNITED KINGDOM

j.baxter4@btinternet.com

Professor John Baxter is a marine biologist who holds honorary professorships at St Andrews and Heriot Watt Universities in Scotland. He has worked for Scottish Natural Heritage (the Scottish Government's advisers on nature conservation) for 28 years as Principal Marine Adviser as well as acting as adviser to the IUCN Global and Polar Programme. He has worked on a range of issues relating to climate change and ocean acidification, and most recently blue carbon.
He is vice chair of the Ocean Acidification international Reference User Group and has co-edited the range of fact sheets that have been produced by the RUG. He is also chair of the expert review group for the UK Marine Climate Change Impacts Partnership and overseen the production of a range of report cards on the impacts of climate change that have been specifically designed to translate and communicate science to policy advisers.
He has co-edited a number of major IUCN reports including The Significance and Management of Natural Carbon Stores in the Open Ocean; Marine Protected Areas and Climate Change; and Explaining Ocean Warming: Causes, scale, effects and consequences. He is marine editor in chief of the international journal Aquatic Conservation: Marine and Freshwater Ecosystems. He is also coordinating a large research programme into blue carbon resources in Scotland that currently involves seven PhD studenships and a post-doctoral fellowship.

RELEVANT PUBLICATIONS

- Laffoley, D., & Baxter, J. M. (2016). Explaining ocean warming: Causes, scale, effects and consequences. Full report. Gland, Switzerland: IUCN, 27, 456pp.
- Gattuso, J. P., Magnan, A., Billé, R., Cheung, W. W., Howes, E. L., Joos, F., Allemand, D., Bopp, L., Cooley, S., Eakin, C. M., Hoegh-Guldberg, O., Kelly, R. P., Pörtner, H-O., Rogers, A. D., Baxter, J. M., Laffoley, D., Osborn, D., Rankovic, A., Rochette, J., Sumaila, U. U., Treyer, S., & Turley C. (2015). Contrasting futures for ocean and society from different anthropogenic CO_2 emissions scenarios. Science, 349(6243), aac4722.
- G. Haraldsson, S. Dupont, B. Avril, M. Barange, J. Baxter, R. Bellerby, C. Hough, H. Poertner, K. Rehdanz and S. Reynaud (2015). North Atlantic and Arctic Ocean. In: Hilmi, N., Allemand, D., Kavanagh, C., Laffoley, D., Metian, M., Osborn, D., & Reynaud, S. (Eds). Bridging the gap between ocean acidification impacts and economic valuation: regional impacts of ocean acidification on fisheries and aquaculture, Vol. 23, p. 49-55. IUCN.
- Laffoley, D. d'A., & Baxter, J. M. (Eds). (2015). The Monaco Ocean Acidification Action Plan. Heralding the next era of action on ocean acidification. 20pp.

CAMP Emma

Post-doctoral research associate at the University of Technology (UTS).
Sydney - AUSTRALIA

emma.camp@uts.edu.au

Currently I am working as a Postdoctoral Research Associate within the Future Reefs program at the University of Technology Sydney. I am a marine biogeochemist with a research focus on how coral survival within extreme and marginal habitats can provide insight into the future form and functioning of coral reefs.
My research interests are to:

1. use remote sensing technology to help assess the prevalence of these extreme coral systems;
2. use extreme coral systems to increase our understanding of the mechanisms corals can use to survive adverse conditions analogous to those predicted under climate change;
3. uncover the different traits holobiont members contribute to facilitating coral survival in these extreme systems;
4. understand the connectivity of extreme coral populations to adjacent reef environments; and
5. consider pro-active management opportunities that can utilise potentially hardier, stress resistant, colonies of extreme coral environments.

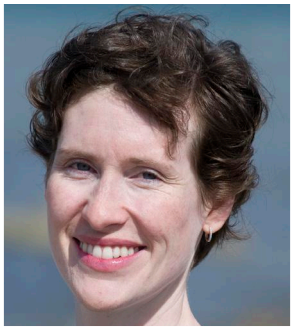
I have conducted research on extreme coral systems of the Great Barrier Reef, Seychelles, New Caledonia, Indonesia, Brazil and the Cayman Islands, supported by numerous programs including National Geographic, The Waitt Foundation, Fonds Pacifique, The Australian Department of Education and Training, The Womens Diving Hall of Fame, Earthwatch, Operation Wallacea and the Central Caribbean Marine Institute. I am currently funded through the Australian Research Council.
Alongside my research, I am a passionate communicator of science, writing regular science articles for popular media outlets such as Asian Geographic, Australia Geographic, and Asian Diver. I am also an ambassador for global biodiversity for the charity IBEX Earth. Prior to undertaking my PhD I was managing director of an Environmental Consultancy company in the United Kingdom.

RELEVANT PUBLICATIONS

- Camp, E. F., Nitschke, M. R., Rodolfo-Metalpa, R., Houlbreque, F., Gardner, S. G., Smith, D. J., ... & Suggett, D. J. (2017). Reef-building corals thrive within hot-acidified and deoxygenated waters. Scientific Reports, 7, 2434.
- Ainsworth, T. D., Fordyce, A. J., & Camp, E. F. (2017). The Other Microeukaryotes of the Coral Reef Microbiome. Trends in Microbiology.
- Camp, E. F., Dong, L. F., Suggett, D. J., Smith, D. J., Boatman, T. G., Crosswell, J. R., ... & Lawson, T. (2017). A novel membrane inlet-infrared gas analysis (MI-IRGA) system for monitoring of seawater carbonate system. Limnology and Oceanography: Methods, 15(1), 38-53.
- Camp, E. F., Smith, D. J., Evenhuis, C., Enochs, I., Manzello, D., Woodcock, S., & Suggett, D. J. (2016). Acclimatization to high-variance habitats does not enhance physiological tolerance of two key Caribbean corals to future temperature and pH. In Proc. R. Soc. B, Vol. 283, No. 1831, p. 20160442.
- Camp, E. F., Suggett, D. J., Gendron, G., Jompa, J., Manfrino, C., & Smith, D. J. (2016). Mangrove and seagrass beds provide different biogeochemical services for corals threatened by climate change. Frontiers in Marine Science, 3, 52.

COOLEY Sarah

Director of Ocean Acidification at Ocean Conservancy.
Washington - USA



scooley@oceanconservancy.org

Dr. Sarah Cooley received a B.S. in chemistry with a biochemistry concentration at Haverford College. She then studied inorganic carbon cycling in the Amazon River plume for her Ph.D. dissertation at University of Georgia. While a postdoctoral investigator, and later a research associate at Woods Hole Oceanographic Institution (WHOI), she studied projections of ocean acidification and their possible impacts on human communities from an interdisciplinary perspective. Sarah began to work at Ocean Conservancy in 2014. Now the director of the ocean acidification program there, her work at Ocean Conservancy focuses on how global ocean changes like ocean acidification affect human communities. She works to bring cutting-edge science into policy making using strategic communications, science synthesis, and legislative advocacy.

RELEVANT PUBLICATIONS

- Pendleton, L., Comte, A., Langdon, C., Ekstrom, J. A., Cooley, S. R., Suatoni, L., ... & Doherty, C. (2016). Coral Reefs and People in a High-CO_2 World: Where Can Science Make a Difference to People?. PloS one, 11(11), e0164699.
- Cooley, S. R., Ono, C. R., Melcer, S., & Roberson, J. (2016). Community-level actions that can address ocean acidification. Frontiers in Marine Science, 2, 128.
- Mathis, J. T., Cooley, S. R., Lucey, N., Colt, S., Ekstrom, J., Hurst, T., ... & Feely, R. A. (2015). Ocean acidification risk assessment for Alaska's fishery sector. Progress in Oceanography, 136, 71-91.
- Cooley, S. R., Lucey, N., Kite-Powell, H., & Doney, S. C. (2012). Nutrition and income from molluscs today imply vulnerability to ocean acidification tomorrow. Fish and Fisheries, 13(2), 182-215.
- Cooley, S. R., Kite-Powell, H. L., & Doney, S. C. (2009). Ocean acidification's potential to alter global marine ecosystem services. Oceanography, 22(4), 172-181.
- Cooley, S. R., & Doney, S. C. (2009). Anticipating ocean acidification's economic consequences for commercial fisheries. Environmental Research Letters, 4(2), 024007.

GLEDHILL Dwight

Deputy Director of National Oceanic and Atmospheric Administration (NOAA), Ocean Acidification Program.
Maryland - USA

dwight.gledhill@noaa.gov

Dr. Gledhill has served as the Deputy Director of the NOAA Ocean Acidification Program office in Silver Spring, MD since 2012. The program was created in 2011 in response to the U.S. Federal Ocean Acidification Research & Monitoring Act (2009) to advance and coordinate research and monitoring efforts within the agency in accordance with the Ocean Acidification Interagency Working Group strategic plan.
The program works to improve the nation's understanding of the risk posed by ocean acidification to the marine environment and dependent human communities. Previously Gledhill was an associate scientist with the UM/RSMAS Cooperative Institute of Marine & Atmospheric Sciences (CIMAS) with NOAA's Atlantic Oceanographic & Meteorological Laboratory Ocean Chemistry Division where he advanced ocean acidification research to better understand the process of ocean acidification within coral reef ecosystems.
He was instrumental in establishing two long-term ocean acidification monitoring stations: in La Parguera, Puerto Rico and another within the Florida Keys National Marine Sanctuary.
He also developed the first satellite-based ocean acidification synthesis product which mapped ocean acidification unfolding across Greater Caribbean Region. The model produces synoptic monthly fields of ocean acidification that can be used to track regional and seasonal dynamics.
Gledhill has also been contributor to numerous strategic planning efforts related to ocean acidification within NOAA, among other federal agencies, and with the international community. Gledhill received his M.S. and Ph.D. from the Department of Oceanography at Texas A&M University in 2005 where he primarily investigated carbonate mineral kinetics in complex electrolyte solutions as well the sediment biogeochemistry associated with methane clathrates in the Northern Gulf of Mexico.

RELEVANT PUBLICATIONS

- Pendleton, L., Comte, A., Langdon, C., Ekstrom, J. A., Cooley, S. R., Suatoni, L., ... & Doherty, C. (2016). Coral Reefs and People in a High-CO_2 World: Where Can Science Make a Difference to People?. PloS one, 11(11), e0164699.
- Gledhill, D. K., White, M. M., Salisbury, J., Thomas, H., Mlsna, I., Liebman, M., ... & Gobler, C. J. (2015). Ocean and coastal acidification off New England and Nova Scotia. Oceanography, 28(2), 182-197.
- Jiang, L. Q., Feely, R. A., Carter, B. R., Greeley, D. J., Gledhill, D. K., & Arzayus, K. M. (2015). Climatological distribution of aragonite saturation state in the global oceans. Global Biogeochemical Cycles, 29(10), 1656-1673.
- Manzello, D., Enochs, I., Musielewicz, S., Carlton, R., & Gledhill, D. (2013). Tropical cyclones cause CaCO3 undersaturation of coral reef seawater in a high-CO_2 world. Journal of Geophysical Research: Oceans, 118(10), 5312-5321.
- Andersson, A. J., & Gledhill, D. (2013). Ocean acidification and coral reefs: effects on breakdown, dissolution, and net ecosystem calcification. Annual Review of Marine Science, 5, 321-348.

HOLTHUS Paul

Founding President & Chief Executive Officer of the World Ocean Council (WOC).
Honolulu - HAWAIAN ISLANDS

paul.holthus@oceancouncil.org

Paul Holthus is the founding President and CEO of the World Ocean Council (WOC), the international, multi-sectoral ocean business leadership and collaboration in "Corporate Ocean Responsibility". He is leading the WOC overall, including developing the "Ocean Investment Platform" to foster and facilitate investment in sustainable ocean development and the growing ocean economy.

The WOC brings together leadership companies from fisheries, aquaculture, tourism, offshore renewables, seabed mining, shipping, oil and gas, ocean technology, finance and investment, and other ocean industries. The growing WOC global ocean business community includes WOC Members (70+ leadership companies from a wide range of ocean industries) and the WOC network (34,000+ ocean industry stakeholders from around the world).

Paul's experience ranges from working with the global industry associations and directors of UN agencies to fishers in small island villages. He has worked with companies, industry associations, UN agencies, international NGOs, foundations, governments and communities on coastal and marine sustainable development in over 30 countries in Asia, the Pacific, Europe, North America, Central America and Africa.

He has held senior positions with the United Nations Environment Programme (UNEP) and international environmental organisations, including as Deputy Director for the IUCN Global Marine Programme. While at The Nature Conservancy, he originated the "Coral Triangle", a successful large seascape approach to international ocean conservation and development.

Since 1998, Paul has worked primarily with the private sector to develop practical solutions for responsible ocean use. He is a frequent speaker at international business and ocean conferences. He is on the advisory board of the ocean conference of the Economist and the Arctic Circle Assembly, and was one of 5 people invited to be a member of the UN Secretary General's Expert Group on Oceans for the 2012 Rio+20 conference. At the 2017 UN Ocean Conference, he was invited to speak to the UN General Assembly on behalf of the ocean business community.

Paul grew up close to the ocean in the Philippines, Hawaii and California. His personal commitment to sustainable seas has been shaped by lifetime of surfing, diving, spear fishing, sailing and windsurfing. His professional qualifications for ocean sustainable development took place at the University of California and the University of Hawaii, through degrees in marine science, coastal resource management and international business.

RELEVANT PUBLICATIONS

- Holthus, P. F. (2016). The World Ocean Council, Corporate Ocean Responsibility and the Ocean Investment Platform. Journal of Sustainable Finance and Banking, Vol. 3, 4. May 2016, p 16-18.
- Holthus, P. F. (2015). Corporate Ocean Responsibility: Industry Leadership and Collaboration for Sustainable Development and the Blue Economy. pp 68-71 in, Climate Change. The New Economy, special G7 edition.
- Holthus, P. F. (2015). Ocean Industry Leadership and Collaboration in Sustainable Development of the Seas. Chapter 8, Pp 281-296 in: Governance of Seas and Oceans. Wiley. 302 pp.
- Holthus, P. F. (2012). Smart Ocean/Smart Industries: Scaling Up Of Ocean Data Collection By Industry. Integrated Ocean Observing System (IOOS) Summit. 5 pp.
- Holthus, P. F. (1999). Sustainable Development of Oceans and Coasts: The Role of the Private Sector. UN Natural Resources Forum Journal. Vol 23 (2): 169-176.

KOCH Marguerite

Professor, Biological Sciences Department, Florida Atlantic University. Florida - USA

FAU
FLORIDA ATLANTIC UNIVERSITY

mkoch@fau.edu

Dr. Marguerite Koch is a full professor in the Biological Sciences Department of Florida Atlantic University's Charles E. Schmidt College of Science. She was the assistant director of FAU's climate change program from 2010-2014.
Dr. Koch hosts an active research program in marine ecology. She received her Ph.D. in Marine Biology and Fisheries from the University of Miami's Rosentiel School of Marine and Atmospheric Science (RSMAS), an M.S. in Marine Science from Louisiana State University (LSU) through LSU's Center for Wetland Resources and Wetland Biogeochemistry Lab, and a B.S. in Biology from Tulane University in New Orleans, LA.
She also studied coral reef ecology at the Fairleigh Dickinson University's Laboratory in St. Croix, Virgin Islands, fisheries and estuarine ecology at the University of Washington in Seattle, and was a graduate exchange scholar at the University of Exeter in England investigating nutrient cycling in coastal marine ecosystems.
During Dr. Koch's 30 years as a marine ecologist, she has worked across a broad range of habitats from the Bering Sea, Alaska as a fisheries biologist, to studying the biogeochemistry of seagrass ecosystems in the Virgin Islands. Her primary research interest is in the sustainability and productivity of marine habitats, primarily tropical marine ecosystems, such as seagrass, mangroves, and coral reefs.
The majority of Dr. Koch's research over the last 20 years has focused on investigating stressors associated with tropical marine ecosystems living at the edge of stress tolerance to multiple parameters, such as high temperature and salinity. This focus on tropical stressors has led to Dr. Koch's keen interest in climate change effects on coastal marine ecosystems. Her present research focuses on biogeochemical changes in tropical marine ecosystems and ecophysiological responses of marine plants under a rapidly changing climate and increases in pCO_2, including thermal stress and ocean acidification.

RELEVANT PUBLICATIONS

- Peach, K. E., Koch, M. S., Blackwelder, P. L., & Manfrino, C. (2017). Calcification and photophysiology responses to elevated pCO_2 in six Halimeda species from contrasting irradiance environments on Little Cayman Island reefs. Journal of experimental marine biology and ecology, 486, 114-126.
- Hofmann, L. C., Koch, M., & de Beer, D. (2016). Biotic Control of Surface pH and Evidence of Light-Induced H+ Pumping and Ca2+-H+ Exchange in a Tropical Crustose Coralline Alga. PloS one, 11(7), e0159057.
- Bedwell-Ivers, H. E., Koch, M. S., Peach, K. E., Joles, L., Dutra, E., Manfrino, C., & Handling editor: Brock Woodson. (2016). The role of in hospite zooxanthellae photophysiology and reef chemistry on elevated pCO_2 effects in two branching Caribbean corals: Acropora cervicornis and Porites divaricata. ICES J Mar Sci, 74(4), 1103-1112.
- Dutra, E., Koch, M., Peach, K., & Manfrino, C. (2015). Tropical crustose coralline algal individual and community responses to elevated pCO_2 under high and low irradiance. ICES Journal of Marine Science, 73(3), 803-813.
- Koch, M. S., Coronado, C., Miller, M. W., Rudnick, D. T., Stabenau, E., Halley, R. B., & Sklar, F. H. (2015). Climate change projected effects on coastal foundation communities of the greater Everglades using a 2060 scenario: need for a new management paradigm. Environmental management, 55(4), 857-875.
- Koch, M., Bowes, G., Ross, C., & Zhang, X. H. (2013). Climate change and ocean acidification effects on seagrasses and marine macroalgae. Global change biology, 19(1), 103-132.

MALIKI Samir

Professor at the Faculty of Economics & Management at the University of Tlemcen.
Tlemcen - ALGERIA

جامعة أبو بكر بلقايد
UNIVERSITÉ DE TLEMCEN

sb_maliki@mail.univ-tlemcen.dz

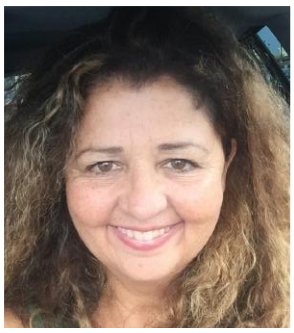
Dr. Samir Maliki has joined the Faculty of Economics and Management at University of Tlemcen (Algeria) as Assistant Professor of Economics in December 2002. He also served in academic position as Deputy Director of Tlemcen School of Management (2010-2015).
Maliki completed his PhD at Versailles Saint Quentin en Yvelines University in France, his Magister degree at University of Tlemcen (Algeria) and his undergraduate studies at the same university. Maliki's research interests lie in the areas of Applied Economics, Water Management, Innovation and Entrepreneurship and Economic Development in MENA region.
Currently, Dr.Maliki, is the Director of doctoral program on Economic Engineering and Enterprise at Tlemcen University, and also Head team research (Economic Engineering, Environment and Management of Enterprises) at Mecas laboratory in the same University.
Pr. Maliki has served also as member and Chair of a number of International conferences. He is an Economic Research Forum Fellow (Cairo, Egypt) and a member of the American Economic Association, Middle East Economic Association.
He published several papers in international scientific reviews such as International Journal of Economics and Business Research, International Journal for Innovation Education and Research, Economic Modeling, International Journal of Arts and Commerce, International Journal of Scientific Management and Development, etc.

RELEVANT PUBLICATIONS

- Estimation of Deprivation in Algerian Poor Households by Water factor: the case of Tlemcen region. Interdisciplinary Environmental Review, Forthcoming, 2017
- Dynamic Correlation between Oil Price and the Stock Markets: Evidence from some Developed and Emerging Countries. Int. J. of Economics and Business Research, Forthcoming, 2017, (with Si Mohammed K)
- Hemche, O., Jawadi, F., Maliki, S. B., & Cheffou, A. I. (2016). On the study of contagion in the context of the subprime crisis: A dynamic conditional correlation–multivariate GARCH approach. Economic Modelling, 52, 292-299.
- Reguig, M. K., & Maliki, S. (2014). Decision-making factors for purchasing a new car in Algeria: A Descriptive Analysis.
- Benmehaia M.A, Brabez F. & Maliki S. (2014). Corporate Governance and Agri-Food Innovation: Empirical Study of Algeria's Beverage Sector. International Conference on Innovation & Engineering Management (IEM-2014), Proceedings - © IPCO-2014, pp.86-92.

MANFRINO Carrie

President and Director of Coral Reef Research and Conservation, Central Caribbean Marine Institute.
Little Cayman - CAYMAN ISLANDS



manfrino@reefresearch.org

Carrie Manfrino is an oceanographer with a specialty in carbonate sedimentology. She is the President and Director of Research for the Central Caribbean Marine Institute, based in Princeton, NJ and with a facility on Little Cayman, in the Cayman Islands. In 2005, she designed and developed the Little Cayman Research Centre as the first model of sustainable development in the region and established the facility as her vision to advance the frontiers of coral reef science, conservation and education. She has worked as a Fulbright scholar in Sri Lanka exploring the potential for healthy coral reefs to mitigate the effects of rising sea level.
Her deep-rooted curiosity is in understanding the mechanisms that drive coral reef resilience. Her work includes promoting nature-based solutions as a strategy for reducing risks from climate change. She currently leads a diverse research and conservation program with collaborators simulating future climate scenarios to predict how ocean acidification and rising temperatures will impact coral reef organisms. She is a new member of the International Union on the Conservation of Nature (IUCN) World Commission on Protected Areas,

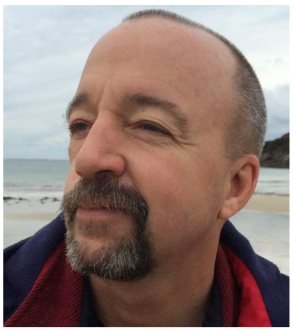
RELEVANT PUBLICATIONS

- Drury, C., Schopmeyer, S., Goergen, E., Bartels, E., Nedimyer, K., Johnson, M., Maxwell, K., Galvan, V., Manfrino, C. & Lirman, D. (2017) Genomic patterns in Acropora cervicornis show extensive population structure and variable genetic diversity. Ecol Evol. 1-13.
- Manfrino, C. (2017) Can we save coral reefs?, in Our Ocean. Our World, United Nations Chronicle, V. LIV N^{os} 1 & 2.
- Peach, K. E., Koch, M. S., Blackwelder, P. L. & Manfrino, C. (2017) Calcification and photophysiology responses to elevated pCO_2 in six *Halimeda* species from contrasting irradiance environments on Little Cayman Island reefs. J Exp Mar Biol Ecol 486: 114-126.
- Bedwell-Ivers, H. E., Koch, M. S., Peach, K. E., Joles, L., Dutra, E. & Manfrino, C. (2016) The role of *in hospite* zooxanthellae photophysiology and dynamic reef chemistry on elevated pCO_2 effects in two branching Caribbean corals: *Acropora cervicornis* and *Porites divaricata.* . ICES J Mar Sci, Special Theme: Towards a broader perspective on ocean acidification research, 74(4): 1103-1112.
- von Reumont, J., Hetzinger, S., Garbe-Schönberg, D., Manfrino, C. & Dullo, W.-Chr. (2016) Impact warming events on reef-scale temperature variability as captured in two Little Cayman coral Sr/Ca records. G-3, Geochemistry, Geophysics, Geosystems,17(3): 846-857.
- Camp, E., Suggett, D.J., Genderon, G., Jompa, J., Manfrino, C. & Smith, D.J. (2016) Mangrove and seagrass beds provide different biogeochemical services for corals threatened by climate change. Front Mar Sci.
- Crandall, J., Teece, M. A., Estes, B. A., Manfrino, C. & Ciesla, J. H. (2015) Nutrient acquisition strategies in mesophotic hard corals using compound specific stable isotope analysis of sterols. J Exp Mar Biol Ecol, 474: 133-141.
- Manfrino, C., Jacoby, C. A., Camp, E. & Frazer, T. K. (2013) A Positive Trajectory for Corals at Little Cayman Island. PLOS One 8(10): e75432.

GROUP LEADER

PENDLETON Linwood

Senior Scholar in the Ocean and Coastal Policy Program at Duke University's Nicholas Institute for Environmental Policy Solutions.
Durham - USA



linwood.pendleton@duke.edu

Linwood Pendleton is an interdisciplinary scientist. He is WWF's Global Ocean Lead Scientist and holds the International Chair of Excellence at the European Institute for Marine Studies, part of the Laboratory of Excellence in Brest, France. He is a Senior Fellow at Duke's Nicholas Institute for Environmental Policy Solutions (NIEPS), and the director of the Marine Ecosystem Services Partnership
Linwood was the Acting Chief Economist for the National Oceanic and Atmospheric Administration from 2011-2013, and is an Adjunct Associate Professor at the Duke University Marine Laboratory. He holds masters degrees in Public Administration from Harvard University and Ecology from Princeton University, and a doctoral degree in environmental economics from Yale University.

RELEVANT PUBLICATIONS

- Pendleton, L., & Edwards, P. (2017). Measuring the human 'so what'of large-scale coral reef loss?. Biodiversity, 18(1), 13-15.
- Pendleton, L., Comte, A., Langdon, C., Ekstrom, J. A., Cooley, S. R., Suatoni, L., ... & Doherty, C. (2016). Coral Reefs and People in a High-CO_2 World: Where Can Science Make a Difference to People?. PloS one, 11(11), e0164699.
- Pendleton, L. H., Hoegh-Guldberg, O., Langdon, C., & Comte, A. (2016). Multiple stressors and ecological complexity require a new approach to coral reef research. Frontiers in Marine Science, 3, 36.
- Pendleton, L. H., Thébaud, O., Mongruel, R. C., & Levrel, H. (2016). Has the value of global marine and coastal ecosystem services changed?. Marine Policy, 64, 156-158.
- Ekstrom, J. A., Suatoni, L., Cooley, S. R., Pendleton, L. H., Waldbusser, G. G., Cinner, J. E., ... & Wellman, K. (2015). Vulnerability and adaptation of US shellfisheries to ocean acidification. Nature Climate Change, 5(3), 207-214.

FACILITATOR

VENN Alexander

Senior scientist in the Physiology and Biochemistry team, Marine Biology Department, Centre Scientifique de Monaco.
MONACO

alex@centrescientifique.mc

Alexander Venn is a Senior Scientist in the Physiology Team at the Centre Scientifique de Monaco.
His research addresses the response of marine organisms to global environmental change, including climate change, ocean acidification and pollution.
His recent work has focused on reef-building corals and key mechanisms of ion and pH regulation that provide calcifying organisms with resilience against changes in their environment. This work has initiated several international collaborations with oceanographers, cell biologists, modelers and geochemists to improve understanding of how marine organisms and ecosystems respond to past and future environmental change.
He previously studied in the UK, gaining a BSc (Hons) in Marine Biology from the University of Wales, an MSc in Applied Marine Science from the University of Plymouth (with research carried out at the University of Sydney, Australia) and a Ph.D. from the University of York. He was subsequently a postdoctoral research fellow at the Bermuda Institute of Ocean Sciences, before joining the CSM.

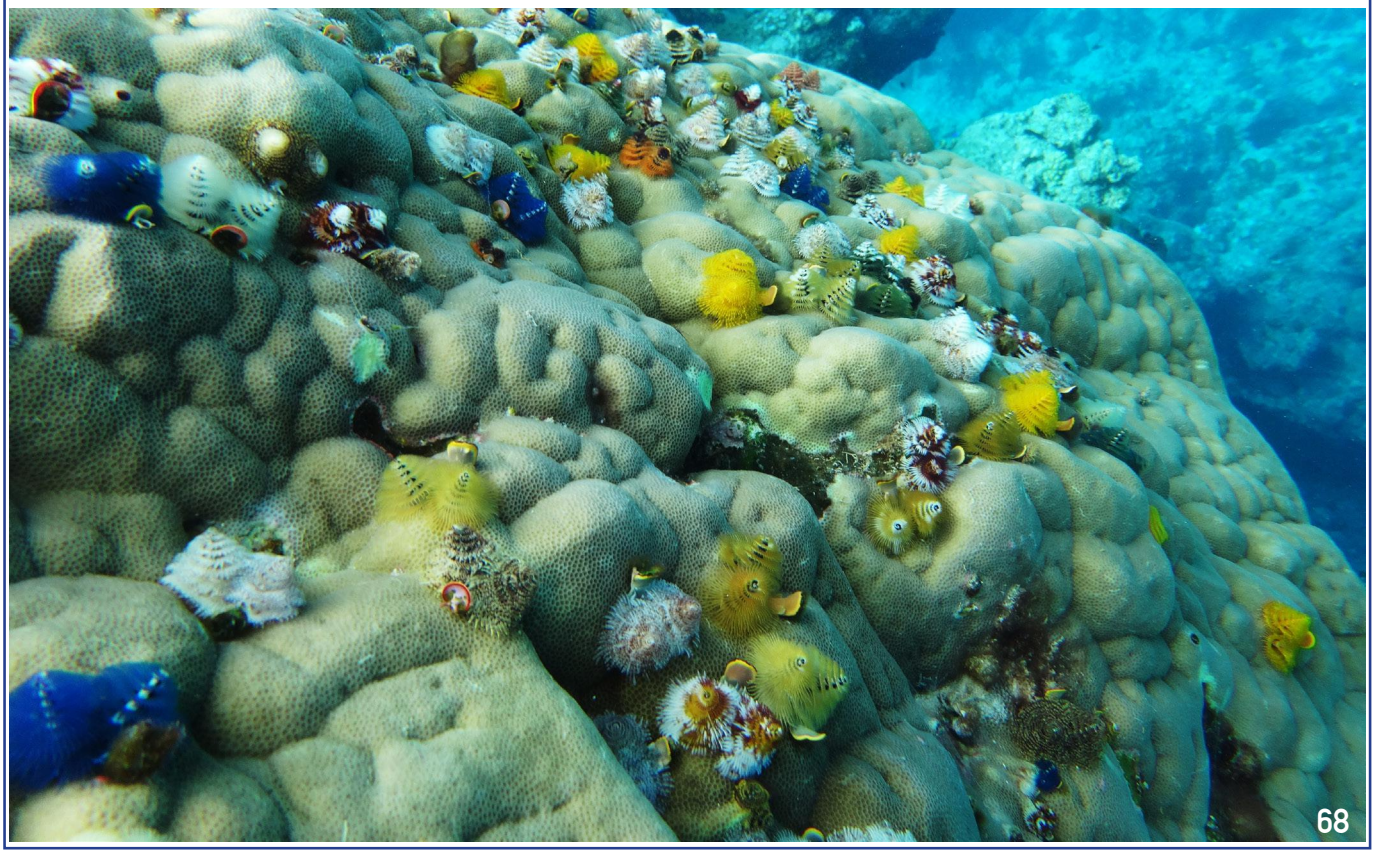
RELEVANT PUBLICATIONS

- Comeau, S., Tambutté, E., Carpenter, R. C., Edmunds, P. J., Evensen, N. R., Allemand, D., ... & Venn, A. A. (2017). Coral calcifying fluid pH is modulated by seawater carbonate chemistry not solely seawater pH. In Proc. R. Soc. B (Vol. 284, No. 1847, p. 20161669). The Royal Society.
- Venn, A. A., Tambutté, E., & Tambutté, S. (2015). Plasticity of coral physiology under ocean acidification. Oncotarget, 6(21), 18248.
- Tambutté, E., Venn, A. A., Holcomb, M., Segonds, N., Techer, N., Zoccola, D., ... & Tambutté, S. (2015). Morphological plasticity of the coral skeleton under CO_2-driven seawater acidification. Nature communications, 6.
- Barott, K. L., Venn, A. A., Perez, S. O., Tambutté, S., & Tresguerres, M. (2015). Coral host cells acidify symbiotic algal microenvironment to promote photosynthesis. Proceedings of the National Academy of Sciences, 112(2), 607-612.
- Venn, A. A., Tambutté, E., Holcomb, M., Laurent, J., Allemand, D., & Tambutté, S. (2013). Impact of seawater acidification on pH at the tissue–skeleton interface and calcification in reef corals. Proceedings of the National Academy of Sciences, 110(5), 1634-1639.
- Venn, A. A., Tambutté, E., Lotto, S., Zoccola, D., Allemand, D., & Tambutté, S. (2009). Imaging intracellular pH in a reef coral and symbiotic anemone. Proceedings of the National Academy of Sciences, 106(39), 16574-16579.

BIOGRAPHIES OF PARTICIPANTS

Non French Pacific Islands

- ACAR Sevil
- CLAUDEL-RUSIN Astrid — *Facilitator*
- GATES Ruth — *Group Leader*
- GOLBUU Yimnang
- KURIHARA Haruko
- REHDANZ Katrin — *Group Leader*
- SWARZENSKI Peter — *Facilitator*
- TSUNODA Tomohiko



©L. Courtial (CSM)

ACAR Sevil

Associate Professor, Chair Department of Economics at Istanbul Altınbaş University.
Istanbul - TURKEY

sevil.acar@altinbas.edu.tr

Sevil Acar is the Director of the Centre for Energy and Environment Research and the Chair of the Economics Department at Istanbul Altınbaş University.
Her research focuses on environmental and resource economics, particularly natural capital accounting, sustainable development indicators, climate change, and the resource curse.
From 2000 to 2005, Sevil Acar studied economics at Boğaziçi University.
She holds a Master's degree from Istanbul Technical University (2007) and a PhD degree in Economics from Marmara University (2011).
Previously she worked as a teaching assistant at Istanbul Technical University (2005-2010). Awarded with a Swedish Institute scholarship, she conducted research at the Centre for Environmental and Resource Economics (CERE), Umeå University, Sweden during her PhD studies.
She took part in several projects such as the estimation of historical accounts for Swedish sustainable and unsustainable development in the 20th century and analysis of carbon convergence across countries focusing on its driving forces and policy implications. In collaboration with the Global Subsidies Initiative (GSI-IISD), she investigated fossil fuel subsidies and renewable energy in Turkey.
She is a Lead Author for the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Regional Assessment for Europe and Central Asia. Her articles appeared in Structural Change and Economic Dynamics, Ecological Economics, International Review of Environmental and Resource Economics, Ecological Indicators, Energy Policy, and Journal of Environment & Development.

RELEVANT PUBLICATIONS

- Acar, S. (2017). The Curse of Natural Resources: A Developmental Analysis in a Comparative Context. Palgrave Macmillan US, Springer. ISBN 978-1-137-58722-0.
- Acar, S., Söderholm, P., Brännlund, R. (2017). Convergence of Carbon Dioxide Emissions: Implications and Meta-Analysis. Climate Policy.
- Acar, S., & Gultekin-Karakas, D. (2016). Questioning Turkey's "miracle" growth from a sustainability perspective. The Journal of Environment & Development, 25(2), 131-158.
- Acar, S., & Yeldan, A. E. (2016). Environmental impacts of coal subsidies in Turkey: A general equilibrium analysis. Energy Policy, 90, 1-15.
- Aşıcı, A. A., & Acar, S. (2016). Does income growth relocate ecological footprint?. Ecological Indicators, 61, 707-714.

FACILITATOR

CLAUDEL-RUSIN Astrid

Head of Section at the Department for Environment.
MONACO

Gouvernement Princier
PRINCIPAUTÉ DE MONACO

aclaudelrusin@gouv.mc

Astrid Claudel Rusin a rejoint l'Administration monégasque tout d'abord au sein de la Direction de l'Environnement, de l'Urbanisme et de la Construction en décembre 2001. Plusieurs missions lui incombaient dont le suivi du projet de Code de l'Environnement à la rédaction duquel elle avait participé dans le cadre de son mémoire de fin d'études.
Elle a suivi des études juridiques spécialisées en droit de l'environnement à L'Université de Droit de Nice Sophia Antipolis, études complétées avec un DESS en environnement de l'Université des Sciences de Nice Sophia Antipolis.
En 2008, elle a intégré l'équipe de la Direction de l'Environnement, nouvellement créée, dans la Division soutien-indicateurs-synthèse.
Ses missions sont dorénavant entièrement dévolues à la protection et à la valorisation de l'environnement tant au niveau national qu'international.
Notamment, elle participe à l'élaboration des inventaires de la biodiversité présente sur le territoire monégasque, elle est membre de la Commission Technique d'hygiène, de sécurité et de protection de l'environnement, elle contribue à l'internalisation des dispositions de textes internationaux.
Elle suit les travaux de conventions internationales comme la Convention sur la protection des Alpes ou la Convention de Berne relative à la conservation de la vie sauvage et du milieu naturel de l'Europe.
Elle est en charge de l'application de la Convention de Washington sur le commerce international des espèces de faune et de flore sauvages menacées d'extinction – CITES. Elle gère la délivrance des permis monégasques requis dans le cadre de cette convention.
Concernant les workshop sur l'acidification des océans, elle participe aux réunions préparatoires où elle représente le Gouvernement Monégasque depuis l'édition de 2012.

GROUP LEADER

GATES Ruth

Research Professor, Director of Hawaii Institute of Marine Biology at the University of Hawaii.
Manoa - HAWAI

rgates@hawaii.edu

UNIVERSITY of HAWAI'I MĀNOA

Ruth D. Gates is a marine biologist who focuses on the function of marine organisms, with an emphasis on coral reefs and reef corals. She attained her PhD from the University of Newcastle upon Tyne in England in 1990 and completed her postdoctoral training at the University of California at Los Angeles. She moved to the University of Hawaii at Manoa's Hawaii Institute of Marine Biology in 2003 and has built a globally recognized research group that focuses on the basic biology that underpins the variation in coral response to environmental stress. Leveraging advances in this basic research area, Ruth and her colleague Madeleine van Oppen won the 2012 Paul G Allen Ocean Challenge with their idea to assist the evolution of corals and develop capacity to stabilize reefs in the face of climate change.
She has published well over 100 scholarly articles and houses a dynamic and multifaceted training environment in her lab. She sits on the boards o of a variety of organizations and has been recognized with many awards, including the University of Hawaii Board of Regents Medal for Excellence in Research in 2014 and Honolulu Magazine's Islander of the Year for Science in 2016. Ruth is the elected President of the International Society for Reef Studies and a passionate communicator about coral reefs.

RELEVANT PUBLICATIONS

- Putnam, H. M., Barott, K. L., Ainsworth, T. D., & Gates, R. D. (2017). The vulnerability and resilience of reef-building corals. Current Biology, 27(11), R528-R540.
- van Oppen, M. J. H., Gates, R. D., Blackall, L. L., Cantin, N., Chakravarti, L. J., Chan, W. Y., Cormick, C., Crean, A., Damjanovic, K., Epstein, H., Harrison, P. L., Jones, T. A., Miller, M., Pears, R. J., Peplow, L. M., Raftos, D. A., Schaffelke, B., Stewart, K., Torda, G., Wachenfeld, D., Weeks, A. R. and Putnam, H. M. (2017), Shifting paradigms in restoration of the world's coral reefs. Global Change Biology, 23: 3437–3448.
- Ainsworth, T. D., & Gates, R. D. (2016). Corals' microbial sentinels. Science, 352(6293), 1518-1519.
- Putnam, H. M., & Gates, R. D. (2015). Preconditioning in the reef-building coral Pocillopora damicornis and the potential for trans-generational acclimatization in coral larvae under future climate change conditions. Journal of Experimental Biology, 218(15), 2365-2372.
- van Oppen, M. J., Oliver, J. K., Putnam, H. M., & Gates, R. D. (2015). Building coral reef resilience through assisted evolution. Proceedings of the National Academy of Sciences, 112(8), 2307-2313.

GOLBUU Yimnang

Chief Executive Officer at Palau International Coral Reef Center (PICRC).
Koror - PALAU

ygolbuu@picrc.org

Dr. Yimnang Golbuu is the CEO at the Palau International Coral Reef Center.
His research interests include Marine Protected Areas (MPAs), watersheds, and impact of climate change on coral reefs of Palau.
In 2012, he received a commendation by the Palau National Congress for his contributions to the sustainability of Palau's natural resources.
In 2013, he was awarded a Pew Fellowship in Marine Conservation.
He has served as board member of Palau Conservation Society, Chairman of the Northern Reef Management Planning Team and Chairman of the Protected Areas Network Technical Committee.
He is currently a Member of the Northern Reef Co-Management Committee, the Palau National Commission of UNESCO, The Palau National Marine Sanctuary Executive Committee and Vice President of the International Society for Reef Studies and Palau's Point of Contact (POC) for the US Coral Reef Task Force.

RELEVANT PUBLICATIONS

- Golbuu, Y., Gouezo, M., Kurihara, H., Rehm, L., & Wolanski, E. (2016). Long-term isolation and local adaptation in Palau's Nikko Bay help corals thrive in acidic waters. Coral Reefs, 35(3), 909-918.
- DeCarlo, T. M., Cohen, A. L., Barkley, H. C., Cobban, Q., Young, C., Shamberger, K. E., ... & Golbuu, Y. (2015). Coral macrobioerosion is accelerated by ocean acidification and nutrients. Geology, 43(1), 7-10.
- Barkley, H. C., Cohen, A. L., Golbuu, Y., Starczak, V. R., DeCarlo, T. M., & Shamberger, K. E. (2015). Changes in coral reef communities across a natural gradient in seawater pH. Science advances, 1(5), e1500328.
- Shamberger, K. E., Cohen, A. L., Golbuu, Y., McCorkle, D. C., Lentz, S. J., & Barkley, H. C. (2014). Diverse coral communities in naturally acidified waters of a Western Pacific reef. Geophysical Research Letters, 41(2), 499-504.
- Mcleod, E., Anthony, K., Andersson, A., Beeden, R., Golbuu, Y., Kleypas, J., ... & Smith, J. E. (2013). Preparing to manage coral reefs for ocean acidification: lessons from coral bleaching. Frontiers in Ecology and the Environment, 11(1), 20-27.

KURIHARA Haruko

Assistant Professor at the University of the Ryukyus, Department of Chemistry, Faculty of Science (Biology).
Okinawa - JAPAN

harukoku@sci.u-ryukyu.ac.jp

Dr. Haruko Kurihara is a specialist in Ocean acidification effects on marine biology and marine ecosystems. She got her PhD at Kyoto Univeristy in 2004 with the PhD thesis entitled [Effects of high CO_2 on marine invertebrates], and reported the affect of OA on the larval development of sea urchins. Thereafter, she has been working on several different marine invertebrate including oysters, mussels, shrimps and copepods, and indicated the importance of the effect of OA on different life stages of marine organisms. She conducted her post-doc in Nagasaki University, where she continue working on the OA effects on fisheries.
In 2010, she moved to University of the Ryukyus, and start working in coral reefs. There she starts working on eco-physiological studies using tank experiments for different coral reef organisms, combining with ecological works in the field. In 2012, she and her colleges start working in CO_2 vent found at Iwotorishima, Okinawa and found a potential phase-shift from hard to soft corals. She also starts working on different coral reef field including Okinawa, Philippines and in Palau to evaluate global and local stress impacts on the reef ecosystems.

RELEVANT PUBLICATIONS

- Golbuu, Y., Gouezo, M., Kurihara, H., Rehm, L., & Wolanski, E. (2016). Long-term isolation and local adaptation in Palau's Nikko Bay help corals thrive in acidic waters. Coral Reefs, 35(3), 909-918.
- Inoue, S., Kayanne, H., Yamamoto, S., & Kurihara, H. (2013). Spatial community shift from hard to soft corals in acidified water. Nature Climate Change, 3(7), 683.
- Kurihara, H. (2008). Effects of CO_2-driven ocean acidification on the early developmental stages of invertebrates. Marine Ecology Progress Series, 373, 275-284.
- Kurihara, H., & Shirayama, Y. (2004). Effects of increased atmospheric CO_2 on sea urchin early development. Marine Ecology Progress Series, 274, 161-169.

GROUP LEADER

REHDANZ Katrin

Professor for environmental and energy economics at the University of Kiel, Department of Economics and Regional Science, Environmental and Resource Economics.
Kiel - GERMANY

rehdanz@economics.uni-kiel.de

Katrin Rehdanz is professor for environmental and energy economics at the University of Kiel.
She holds a diploma and a PhD in economics from the University of Hamburg.
She has a strong background in environmental valuation and environmental-economy modeling. Her main areas of research are environmental impact assessment and climate policy analysis.
She was leading the young researchers group "Valuing the Ocean" within the German cluster of excellence initiative "The Future Ocean" funded by the German research foundation.
She has published various articles in international journals and has been principle investigator to a number of international and national third-party funded projects.
For more information see: https://www.e3.uni-kiel.de

RELEVANT PUBLICATIONS

- Braun, C., Rehdanz, K., & Schmidt, U. (2017). Exploring public perception of environmental technology over time. Journal of Environmental Planning and Management, 1-18.
- Narita, D., & Rehdanz, K. (2017). Economic impact of ocean acidification on shellfish production in Europe. Journal of Environmental Planning and Management, 60(3), 500-518.
- Hilmi, N., Allemand, D., Cinar, M., Cooley, S., Hall-Spencer, J. M., Haraldsson, G., ... & Reynaud, S. (2014). Exposure of Mediterranean countries to ocean acidification. Water, 6(6), 1719-1744.
- Bertram, C., & Rehdanz, K. (2013). On the environmental effectiveness of the EU Marine Strategy Framework Directive. Marine Policy, 38, 25-40.
- Brander, L. M., Rehdanz, K., Tol, R. S., & Van Beukering, P. J. (2012). The economic impact of ocean acidification on coral reefs. Climate Change Economics, 3(1), 1250002.
- Narita, D., Rehdanz, K., & Tol, R. S. (2012). Economic costs of ocean acidification: a look into the impacts on global shellfish production. Climatic Change, 113(3-4), 1049-1063.
- Maddison, D., & Rehdanz, K. (2011). The impact of climate on life satisfaction. Ecological Economics, 70(12), 2437-2445.

FACILITATOR

SWARZENSKI Peter

Section Head of the Radioecology Laboratory at the International Atomic Energy Agency,
MONACO

p.swarzenski@iaea.org

IAEA
International Atomic Energy Agency

Peter W. Swarzenski holds a PhD in Chemical Oceanography and is the Section Head of the Radioecology Laboratory, one of the IAEA Environment Laboratories in Monaco, where he oversees research on diverse impacts to coastal and marine ecosystems.
Prior to joining the IAEA, Swarzenski worked as a research oceanographer for the U.S. Geological Survey in Santa Cruz, California on biogeochemical processes in diverse coastal and marine environments. Recent projects addressed climate-change impacts to Pacific atolls, coastal groundwater, and Alaskan permafrost. Swarzenski applies a variety of tools and techniques in his research, including U/Th-series radionuclide tracers and electrical geophysical methods, and has published ~ 200 papers on topics that span Europe, Asia, Africa, and the Americas.

RELEVANT PUBLICATIONS

- Oberle, F. K., Swarzenski, P. W., & Storlazzi, C. D. (2017). Atoll Groundwater Movement and Its Response to Climatic and Sea-Level Fluctuations. Water, 9(9): 650.
- Taniguchi, M., Endo, A., Gurdak, J. J., & Swarzenski, P. (2017). Water-Energy-Food Nexus in the Asia-Pacific Region. Journal of Hydrology: Regional Studies 11(C):1-8.
- Befus, K. M., Kroeger, K. D., Smith, C. G. & Swarzenski, P. W. (2017). The magnitude and origin of groundwater discharges to eastern U.S. and Gulf of Mexico coastal waters. Geophysical Research Letters (Accepted).
- Prouty, N. G., Cohen, A., Yates, K. K., Storlazzi, C. D., Swarzenski, P. W. & White, D. (2017). Vulnerability of coral reefs to bioerosion from land-based sources of pollution. Journal of Geophysical Research – Oceans (Accepted).
- Johannesson, K. H., Palmore, C. D., Fackrell, J., Prouty, N. G., Swarzenski, P. W., Chevis, D. A., ... & Burdige, D. J. (2017). Rare earth element behavior during groundwater–seawater mixing along the Kona Coast of Hawaii. Geochimica et Cosmochimica Acta, 198: 229-258.
- Swarzenski P. W., Dulaiova, H., Kroeger, K. D., Smith, C. G., Dimova, N., Storlazzi, C. D., Prouty, N. G., Gingerich, S. B. & Glenn, C. R. (2017). Observations of offshore groundwater flow: Kahekili Beach Park submarine springs, Maui, Hawaii. Journal of Hydrology: Regional Studies, 11: 147-165.
- Cohen, A. S., Gergurich, E. L., Russell, J., Swarzenski, P. W., Simmons, J., McIntyre, P. & Kraemer, B. (2016). Declining fisheries, endemic biodiversity and climate warming at Lake Tanganyika, Africa. PNAS, 113: 9563–9568.

TSUNODA Tomohiko

Senior Research Fellow at Ocean Policy Research Institute (OPRI), Sasakawa Peace Foundation.
Tokyo - JAPAN

Promoting international exchange, international cooperation, international understanding.
THE SASAKAWA PEACE FOUNDATION

t-tsunoda@spf.or.jp

After finishing Master of Science at Center for Climate System Research, University of Tokyo, Mr. Tsunoda joined Mitsubishi Research Institute (MRI) in 1998. He held positions as Senior Researcher, leaving in 2015.
During his career in MRI, he was engaged in many national projects on ocean policy such as developing a marine cadaster prototype system and supporting the formulation of the 2nd Basic Plan on Ocean Policy in Japan.

Though his studies were focused mainly on physical oceanography, his research interests also include ocean policy and science-based information sharing. He is in charge of Ocean Acidification Project at OPRI.

RELEVANT PUBLICATIONS

- Tsunoda, T. (2017). Study on the Impacts of Ocean Acidification in the Pacific Islands States. Journal of Japan Society for Pacific Island Studies, 5. (in Japanese)
- Tsunoda, T. & Furukawa, K. (2016) Development of Communication Tools on Ocean Acidification. PICES 2016 Annual Meeting.
- Muto, M., Tsunoda, T., & Kumasaka, F. (2010). Development of Marine Spatial Data Infrastructure in Japan. In GSDI 12 World Conference.

4th International Workshop

Bridging the Gap between Ocean Acidification and Economic Valuation

15 - 17 October 2017

From Sciences to Solutions: Ocean Acidification Impacts on Ecosystem Services — Case Studies on Coral Reefs

FINANCIAL AND SCIENTIFIC SUPPORT

Centre Scientifique de Monaco

IAEA Ocean Acidification International Coordination Centre OA-ICC

Gouvernement Princier Principauté de Monaco

Fondation Prince Albert II de Monaco

Liberté • Égalité • Fraternité
République Française
Ministère de la Transition Écologique et Solidaire

Institut océanographique
Fondation Albert Ier, Prince de Monaco

Société Monegasque des Eaux

IUCN

Central Caribbean Marine Institute

AMAO
Association Monégasque sur l'Acidification des Océans

© A. Venn (CSM)

CENTRE SCIENTIFIQUE DE MONACO

8 Quai Antoine 1er
MC 98000 MONACO
Tél : +377 98 98 86 60
centre@centrescientifique.mc
www.centrescientifique.mc

CENTRE COLLABORATEUR DE L'OMS POUR LA SANTE ET LE DEVELOPPEMENT DURABLE

INTERNATIONAL ATOMIC ENERGY AGENCY

4 Quai Antoine 1er
MC 98000 MONACO
Tél : +377 97 97 72 72
mel@iaea.org
www.iaea.org

Ocean Acidification International Coordination Centre

OA-ICC

Photos © CSM
Octobre 2017

Création graphique : A. Dias Mota (CSM)
Document imprimé sur du papier issu de forêts gérées durablement.