THE UNIVERSITY OF WESTERN AUSTRALIA

UWA OCEANS INSTITUTE

The UWA Oceans Institute

ANNUAL REPORT 2013

IMAGE/ JOAN COSTA

CONTENTS

OCEAN SOLUTIONS

A focus on solution science

The ocean is a source of vital human resources that must be delivered in a safe and sustainable manner to meet the needs of a rapidly increasing, worldwide population.

The UWA Oceans Institute continues to use its strengths in marine science and technology excellence to seek delivery of ocean-based solutions for humanity's grand challenges; the safe and sustainable provision of food, water, energy and bioresources. The concept of ocean-based solutions is a recent development and provides an immense scope for innovation and growth of new industries and associated businesses to address these challenges.

Our goal is to integrate community engagement with the vision of Ocean Solutions and we strive to engender an Oceans Community to provide effective stewardship of our oceans' resources. Through encouraging broader debate on marine science, addressing concerns about the marine environment and promoting the research and activities of the UWA Oceans Institute we are in a strong position to develop oceans solution strategies and tools to continue to pursue this vision.

OCEANS INSTITUTE DIRECTOR,
WINTHROP PROFESSOR CARLOS DUARTE

DIRECTOR'S EXECUTIVE SUMMARY

Forging Partnerships

The fourth year in the life of The UWA Oceans Institute has been paved by the forging of partnerships, both nationally and internationally. The Indian Ocean Marine Research Partnership, a research partnership bringing together the CSIRO, the Australian Institute of Marine Sciences, and the Department of Fisheries of Western Australia with The UWA Oceans Institute, came to life with the signing of the deeds conducive to the development of the Indian Ocean Marine Research Centre (IOMRC) and is likely the most ambitious partnership for marine sciences in Australia to-date.

The IOMRC is a high-power interdisciplinary partnership to further our knowledge on the Indian Ocean, the capacity of society to sustainably derive wealth from the Indian Ocean and to achieve enhanced conservation outcomes for the fragile ecosystems and biodiversity in the Indian Ocean.

This partnership was enhanced by the development of two key international partnerships. The first, with Zhejiang University, one of China's leading universities, drawing on the long history of successful engagement with The University of Western Australia and the second with Woods Hole Oceanographic Institute (WHOI), Massachusetts, USA, arguably the leading marine research organisation in the world.

The partnership with Zhejiang University draws on the opportunity created by their decision to build an impressive Ocean College that mirrors the mix of disciplines and research areas that characterises the UWA Oceans Institute. Our joint research program with Zhejiang University will focus on delivering the knowledge required to propel the Blue Economy and the development of wealth from innovative ocean-based activities. This will require interdisciplinary research extending all the way from marine governance and resource economics, to marine sciences and engineering, a mix of competences exemplifying the UWA Oceans Institute.

The partnership with WHOI will focus, firstly, on the professional advancement of staff in charge of marine environmental management within industry, with a particular focus on oil and gas industries. Environmental concerns play an increasingly important role in the licensing and operations of industry, and providing an appropriate knowledge base to industry staff is essential to improve industry operations while advancing the staff involved in their professional development.

These national and international partnerships represent the onset of a broad approach to the cooperative research required to achieve the mission of the UWA Oceans Institute. An additional partnership is being developed with the Universiti Malaysia Terengganu, and partnerships are being explored across the Indian Ocean, with a particular focus on island states.

STRATEGIC DIRECTIONS

Strategic Objective

The UWA Oceans Institute aims to explore ocean-based solutions to safely and sustainably provide critical resources for human development, water, food, energy and bioresources. At the same time, we are focused on protecting the underlying biodiversity and ecosystems that support these resources.

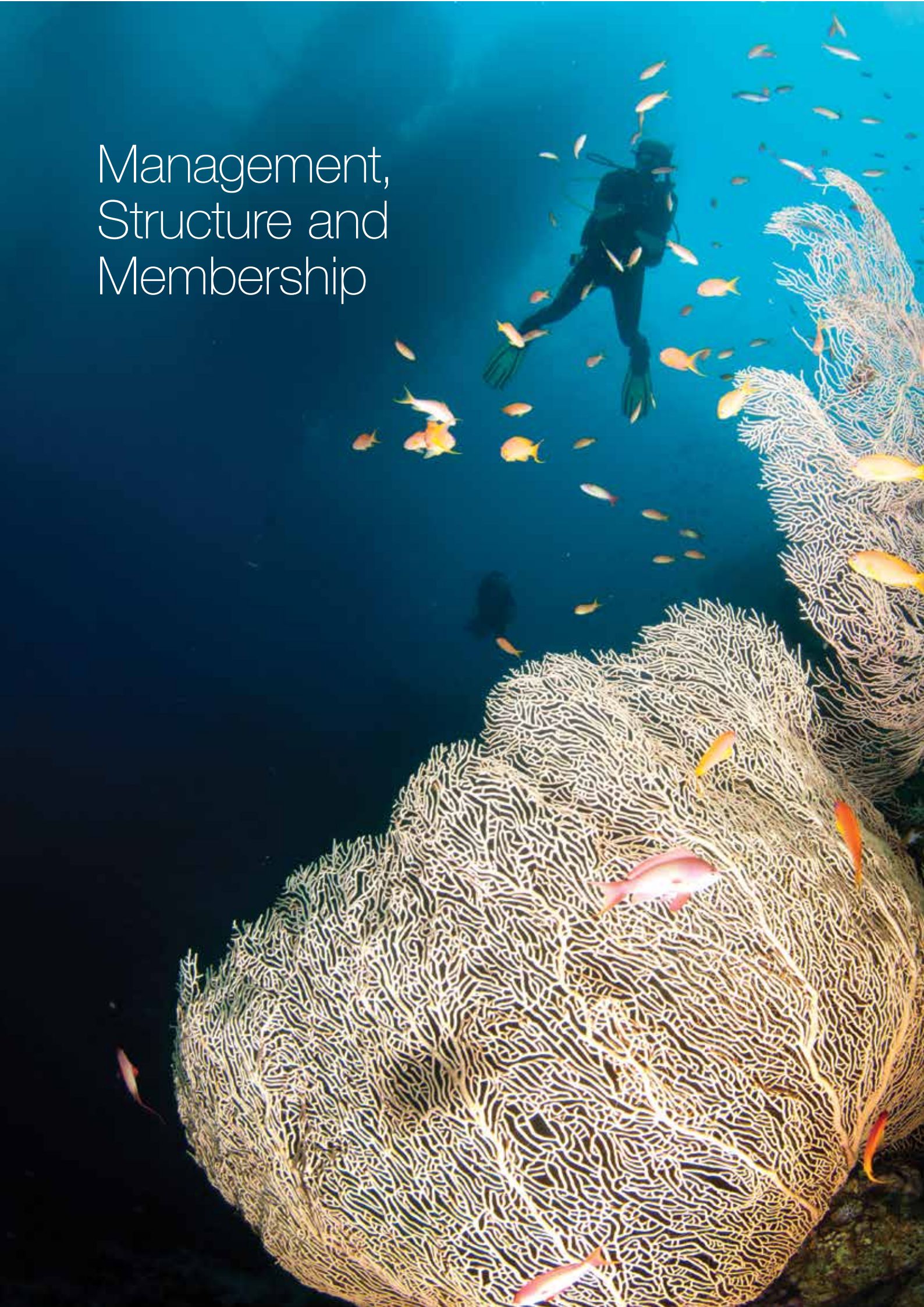
The strategic objective is not to develop these elements separately, but to explore and devise approaches to connect them; which maximise the delivery of outcomes while minimising effort, cost and environmental impacts.

Underpinned by excellence in research, the deliberate exploration of Ocean Solutions can generate great opportunities for innovation, providing a competitive advantage to the industry partners collaborating with us to deliver this vision.

Operational Priorities

- Further the frontiers of knowledge in ocean science and technology;
- Foster and promote interdisciplinary marine-related research across traditional science, engineering, social and policy boundaries;
- Provide excellence and leadership in ocean science and technology at the regional, national and international levels;
- Provide a focal point for quality training of post-graduate students in ocean research;
- Become a resource to address the needs of Australian society, government and industry for safely operating in the marine environment;
- Promote innovative collaborative opportunities in marine science and technology in Western Australia;
- Articulate a science-based, intelligent and innovative use of marine resources to create opportunities for human and economic development; and
- Generate the knowledge needed to reconcile the sustainable use of ocean resources with the conservation of its biodiversity.

Management, Structure and Membership



GOVERNANCE STRUCTURE

UWA OCEANS INSTITUTE ADVISORY BOARD

Dr Ian Poiner
Advisory Board Chair

Professor Lyn Beazley, AO, FTSE
Chief Scientist of Western Australia

Dr Larry Madin
Executive Vice President and Director of Research, Woods Hole Oceanographic Institution

Mr Michael Wood
Director, WA Office of the Department of Foreign Affairs and Trade

Dr Tom Hatton, PSM
(Incoming member)
Principal, Thomas Hatton Environmental Consulting

W/Professor Carlos Duarte
UWA Oceans Institute Director

W/Professor Shaun Collin
UWA Oceans Institute Deputy Director

Ms Tracy Parker
(Executive Officer)
UWA Oceans Institute General Manager

UWA OCEANS INSTITUTE BOARD

Professor Robyn Owens
Deputy Vice-Chancellor, Research (Chair)

W/Professor Peter Davies
Pro Vice-Chancellor, Research

W/Professor Carlos Duarte
UWA Oceans Institute Director

W/Professor Shaun Collin
UWA Oceans Institute Deputy Director

W/Professor Tony O'Donnell
Dean of Science

W/Professor John Dell
Dean of Engineering, Computing and Mathematics

Professor Erika Techera
Dean of Law

Ms Tracy Parker
UWA Oceans Institute General Manager

Ms Liza Roger
PhD Student Representative

BUSINESS TEAM

W/Professor Carlos Duarte
UWA Oceans Institute Director

W/Professor Shaun Collin
UWA Oceans Institute Deputy Director

Ms Tracy Parker
UWA Oceans Institute General Manager

Ms Lauren White
UWA Oceans Institute Executive Assistant

Ms Kim Wee
UWA Oceans Institute Accounts Officer

Ms Guiomar Duarte Agusti
UWA Oceans Institute Communications Officer

The UWA Oceans Institute Strengthens its Leadership Team

Winthrop Professor Shaun Collin of the UWA Oceans Institute and School of Animal Biology, was appointed Deputy Director for the next 5 years. This strengthens the leadership team and further enhances the longer term sustainability of the Institute.

"Shaun is a welcome addition to the leadership team, building on his long association with the Institute," says the UWA Ocean Institute's Director, Winthrop Professor Carlos Duarte. "We have already seen a strong impact on the achievement of the UWA Oceans Institute's international goals by having Shaun drive the collaboration with Zhejiang University and China."

Shaun will maintain his world leading research in comparative neuroecology and vision with the School of Animal Biology.

OCEANS INSTITUTE DEPUTY DIRECTOR, WINTHROP PROFESSOR SHAUN COLLIN (PHOTO/ JOAN COSTA)

EXTERNAL ADVISORY BOARD

DR IAN POINER (CHAIR)

Dr Ian Poiner has over 60 science papers and 53 major industry reports of original research. Until the end of 2011, Dr Poiner was the Chief Executive Officer of the Australian Institute of Marine Science (AIMS) and is now appointed as an AIMS Associate. He has also recently been appointed as Chair of the Integrated Marine Observing System (IMOS) Board.

Dr Poiner has significant experience in strategic development and planning of science, both as a practicing scientist and at the organisational level. His key focus is on large-scale, multi-disciplinary research projects and the establishment of national and international research programmes to support the sustainable use, conservation and management of marine ecosystems. He currently serves on a number of national and international committees, and in 2008, was appointed a Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE).

PROFESSOR LYN BEAZLEY AO FTSE

Professor Lyn Beazley was honoured to be Chief Scientist of Western Australia from 2006 to 2013, advising the WA Government on science, innovation and technology as well as acting as an Ambassador for science locally, nationally and internationally. After graduating from Oxford and Edinburgh Universities, Professor Beazley built an internationally renowned research team in Neuroscience that focused on recovery from brain damage, with much of her investigations undertaken as Winthrop Professor at The University of Western Australia.

In 2009 Professor Beazley was awarded Officer of the Order of Australia and elected a Fellow of the Australian Academy of Technological Sciences and Engineering later that year. She was inducted into the inaugural Western Australian Women's Hall of Fame in 2011, followed by being elected a Fellow of the Australian College of Educators and a Companion of Engineers Australia. In 2012 she became the second recipient of the Governor's Award for Giving, in recognition of her enthusiastic philanthropy and in 2014 is to be inducted into the West Australian Science Hall of Fame.

DR LARRY MADIN

Dr Larry Madin is the Executive Vice President and Director of Research, and a Senior Scientist, at the Woods Hole Oceanographic Institution (WHOI) in Woods Hole, MA. Previously Dr Madin was Chair of the WHOI Biology Department, and Director of the WHOI Ocean Life Institute. He received his AB degree from the University of California, Berkeley and his PhD from UC Davis, and has been at WHOI since 1974.

His principal research interests are in the biology of oceanic and deep-sea zooplankton and fishes, with special emphasis on medusae, siphonophores, ctenophores and pelagic tunicates. Dr Madin was among the first biologists to use SCUBA and submersibles for the *in-situ* study of the oceanic plankton. He has participated in over 70 research cruises, serving as Chief Scientist on nearly half of them.

Holding an adjunct appointment at the Monterey Bay Aquarium Research Institute, Dr Madin is a member of AGU, ASLO, and Sigma Xi, and serves on several advisory and steering committees.

MR MICHAEL WOOD
Michael Wood is Director of the Western Australian office of the Department of Foreign Affairs and Trade (DFAT). He leads DFAT's engagement with the WA State Government and local business.

He is an experienced Australian diplomat who has worked extensively in Australia and overseas in government relations, public affairs and communications, policy development and negotiation. Between 1996 and 2012, Michael held roles in Hong Kong, Singapore, Japan, and India.

His broad experience in multilateral, regional and bilateral trade negotiations in particular has led to a strong understanding of business needs and motivations and he is a highly credible economic interlocutor. His track record as an advocate of government policies is based on strong networking and communication skills.

DR TOM HATTON (INCOMING IN 2014)
Dr Tom Hatton is Principal of *Thomas Hatton, Environmental Consulting*, providing high-level translation of science into policy, strategic planning, building Research and Development partnerships, performance reviews, environmental assessment and compliance, and communicating environmental science and policy. He chairs the Western Australian Marine Parks and Reserves Authority, and is on scientific advisory boards for UWA and the Department of Water. Dr Hatton maintains a high public profile as a leading spokesperson on energy, marine and water related matters, and serves on numerous external initiatives, foundations and committees.

Dr Hatton retired from the Australian Public Service in 2014 as CSIRO's Group Executive, Energy. He previously directed the CSIRO *Wealth from Oceans Flagship* (2009-2012), Australia's largest marine research portfolio and the CSIRO *Water for a Healthy Country Flagship* (2006-2009), the largest water research effort in Australia. During his 25 years with CSIRO, he chaired the several committees and sat on the Boards of the *Western Australian Institute of Marine Science*, the *Western Australian Energy Research Alliance* and the *National Centre for Groundwater Research and Training*.

INTERNAL ADVISORY BOARD

WINTHROP PROFESSOR CARLOS M. DUARTE
Oceans Institute Director

WINTHROP PROFESSOR SHAUN P. COLLIN
Oceans Institute Deputy Director

MS TRACY PARKER (EXECUTIVE OFFICER)
UWA Oceans Institute General Manager

MEMBERS
across Schools and Centres

Prof Susana Agusti
School of Plant Biology

Asst/Prof Bryan Boruff
School of Earth and Environment

Dr Anne Brearley
School of Plant Biology

Prof Michael Burton
Agriculture and Resource Economics

Ms Lauren Butterly
Law School

Dr Marion Cambridge
School of Plant Biology

W/Prof Mark Cassidy
Centre for Offshore Foundation Systems

Asst/Prof Julian Clifton
School of Earth and Environment

Assoc/Prof Peta Clode
Centre for Microscopy, Characterisation & Analysis

W/Prof Shaun Collin
School of Animal Biology

Assoc/Prof Wayne Davies
School of Animal Biology

Asst/Prof Scott Draper
Centre for Offshore Foundation Systems

W/Prof Carlos Duarte
UWA Oceans Institute

Prof Christophe Gaudin
Centre for Offshore Foundation Systems

Assoc/Prof Anas Ghadounai
School of Civil, Environmental and Mining Engineering

Assoc/Prof Atakelty Hailu
School of Agriculture and Resource Economics

Assoc/Prof Nathan Hart
School of Animal Biology

Assoc/Prof Euan Harvey
School of Plant Biology

Assoc/Prof Jan Hemmi
School of Animal Biology

Assoc/Prof Matthew Hipsey
School of Earth and Environment

Assoc/Prof Muhammad Hossain
Centre for Offshore Foundation Systems

W/Prof David Hunt
School of Animal Biology

W/Prof Greg Ivey
School of Civil, Environmental and Mining Engineering

Asst/Prof Nicole Jones
School of Civil, Environmental and Mining Engineering

W/Prof Gary Kendrick
School of Plant Biology

Professor Ryan Lowe
School of Earth and Environment

W/Prof Malcolm McCulloch
School of Earth and Environment

Prof Jessica Meeuwig
Centre for Marine Futures

Asst/Prof Nicola Mitchell
School of Animal Biology

Assoc/Prof Kimberly van Niel
School of Earth and Environment

W/Prof David Pannell
School of Agriculture and Resource Economics

W/Prof Chari Pattiaratchi
School of Civil, Environmental and Mining Engineering

Asst/Prof Natasha Pauli
School of Earth and Environment

Dr Jane Prince
School of Animal Biology

Emeritus Prof Alistair Robertson
School of Plant Biology

Assoc/Prof Elizabeth Sinclair
School of Plant Biology

Assoc/Prof David Sutton
School of Chemistry and Biochemistry

Professor Erika Techera
Law School

Asst/Prof Julie Trotter
School of Earth and Environment

Prof Anya Waite
School of Civil, Environmental and Mining Engineering

Asst/Prof Thomas Wernberg
School of Plant Biology

Dr Barbara Wueringer
School of Animal Biology

Asst/Prof Kara Yopak
School of Animal Biology

Associate Members

W/Prof Mohammed Bennamoun
School of Computer Science & Software Engineering

Dr Petra Buergelt
Centre for Social Impact

Dr Pauline Grierson
School of Plant Biology

Prof Alistair Paterson
School of Social Sciences – Archaeology

Dr Ingrid Ward
School of Social Sciences

Post Doctoral / Research Associate

Asst/Prof Belinda Cannell
School of Animal Biology

Dr Peter Coulsen
Centre for Marine Futures

Asst/Prof Jim Falter
School of Earth and Environment

Dr Monica Gagliano
Centre for Microscopy, Characterisation & Analysis

Dr Ivan Haigh
School of Civil, Environmental and Mining Engineering

Dr Jean-Paul Hobbs
School of Plant Biology

Mr Ben Hollings
School of Civil, Environmental and Mining Engineering

Dr Renae Hovey
School of Earth and Environment

Asst/Prof Flo Kaempf
School of Civil, Environmental and Mining Engineering

Dr Tim Langlois
UWA Oceans Institute

Dr Bonnie Laverock
School of Plant Biology

Asst/Prof Tom Letessier
Centre for Marine Futures

Dianne McLean
School of Plant Biology

Dr Cordelia Moore
School of Earth and Environment

Dr Ylva Olsen
School of Plant Biology

Asst/Prof Adam Rountrey
Centre for Marine Futures

Dr Ana Sequiera
School of Animal Biology

Dr Oscar Serrano Gras
UWA Oceans Institute / School of Plant Biology

Mr Dennis Stanley
School of Civil, Environmental and Mining Engineering

Dr John Statton
School of Plant Biology

Asst/Prof Michael Stat
Centre for Microscopy, Characterisation & Analysis

Dr Paul Thomson
School of Civil, Environmental and Mining Engineering

Dr Michele Thums
School of Civil, Environmental and Mining Engineering

Dr Sarath Wijeratne
School of Civil, Environmental and Mining Engineering

Asst/Prof Jens Zinke
School of Earth and Environment

Adjunct Appointments

Dr Tim Cooper
BHP Billiton

Dr Martial Depczynski
AIMS

Dr Paul Erftemiejer
SKM

Dr Stuart Field
Department of Parks and Wildlife

Dr Rebecca Fisher
AIMS

Dr Kim Friedman
Department of Parks and Wildlife

Dr James Gilmour
AIMS

Dr Ivan Haigh
University of Southampton

Dr Nick Hardman-Mountford
CSIRO

Andrew Heyward
AIMS

Dr Ross Jones
AIMS

Dr Mark Meekan
AIMS

Dr Jamie Oliver
AIMS

Ben Radford
AIMS

Dr Tyrone Ridgeway
Oceanica

Dr Stephen Rogers
AIMS

Dr Michael Rule
Department of Parks and Wildlife

Christine Schoenberg
AIMS

Dr Oscar Serrano Gras
ECU

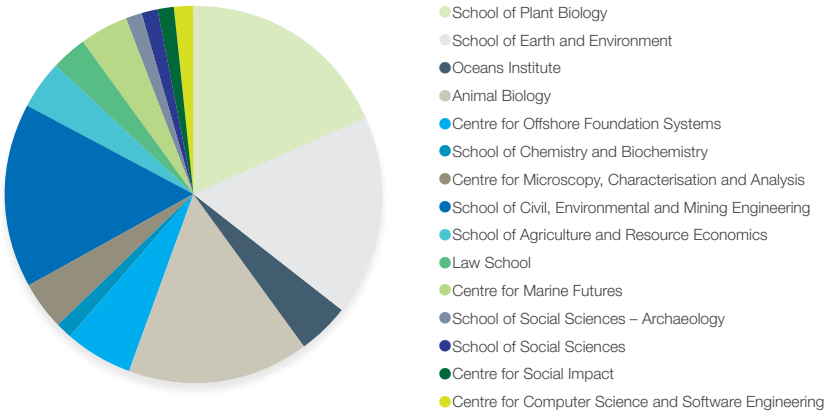
Dr Luke Smith
Woodside

Dr Jim Underwood
AIMS

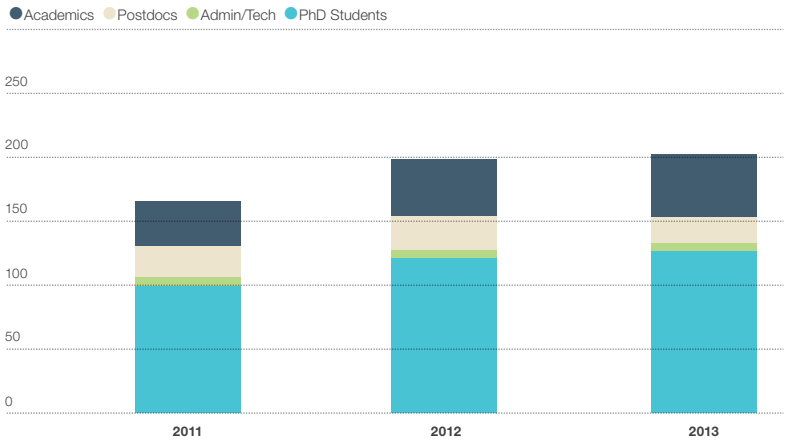
Fred Wells
Consultant

Dr Shaun Wilson
Department of Parks and Wildlife

Distribution of members across Schools and Centres



Members Growth ❶



❶ Total number of members and students in 2011, 2012 and 2013

PhD STUDENTS

Animal Biology
Shanta Barley JM
Phil Bouchet JM
Janelle Braithwaite JM
Luciana Cerqueira Ferreira JM
James Hehre JM
Beverly Oh JM
Joyce Ong JM
Issam Rasadi JM
Jamie Tedeschi NM
Dave Tickler JM
Gabriel Vianna JM

Animal Biology – Neuroecology
Audrey Appudurai SC
Lucille Chapuis SC
Joao Coimbra NH
Fanny de Busserolles SC
Marcin Falkowski JH
Eduardo Garza Gisholt SC
Ryan Kempster SC
Anton Kuhar SC
Nicolas Nagloo NH
Amy Newman SC
Laura Ryan NH
Carlos Salas SC
Rachael Warrington SC

Centre for Offshore Foundation Systems
Anthony Blake CO
Santiram Chatterjee DW
Steven Cheng MC
Michael Cocjin SG
Cathal Colreavy CO
Youkou Dong MR
Dengfeng Fu CG
Wen Go DW
Indranil Guha DW
Chao Han MC
James Hengesh DW
Pan Hu MC
Omid Kohan MC
Hening Mohr DW
Kai Xiang Koh SH
Simon Leckie DW
Xiaojun Li CG
Jiayue Liu MK
Huiting (Rachel) Liu AF
Chengcai Luo LC
Hongliang Ma YH
Jiajia Ma MR
Divya S.K.Mana SG
Jalal Mirzadehniasa MK
Henning Mohr DW
John Morton CO
Shah Neyamat Ullah YH
Colm O'Briene CO
Lucile Queau MK
Raffaele Ragni BB
Amin Rismanchian DW
Somaye Sadeghian DW
Fauzan Sahdi DW DW
Stefanus Safinus SH
Zack Westgate DW
Beau Whitney DW
Yue Yan DW
Fan Yang LC
Youhu Zhang BB
Ehssan Zargar MK
Qin Zhang SD
Jingbin Zheng SH

Plant Biology
Bijo Arackal TW
Jake Asher EH
Scott Bennett TW
Napo Cayabyab RL
Samantha Childs GK
Katherine Cure EH
Jean-Philippe Dumas TL
Adrian Ferguson EH
Ben Ford EH
Matthew Fraser GK
Jordan Goetze EH
Steve Lindfield EH
Peter Michael TW
Margie Mohring TW
Jillian Ooi GK
David Rivers GK
Julia Santana Garcon EH
Tiffany Simpson TW
Brian Strehlow GK
Luke Thomas GK
Chenae Tuckett TW
Sam Whitehead MR

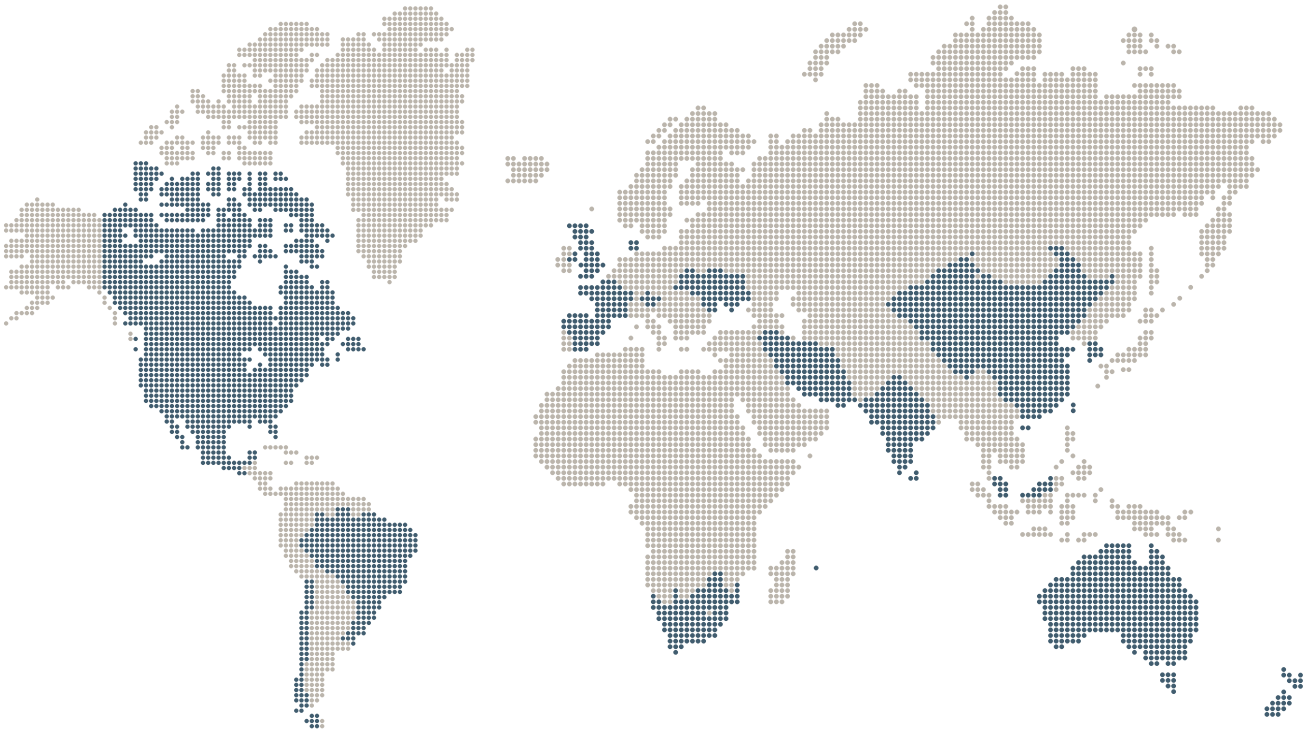
School of Earth and Environment
Mark Buckley RL
Napo Cayabyab RL
Michael Cuttler RL
Sana Dandan MM
Gayan Lakendra Delkandura Arachchige RV
Edwin Drost RL
Taryn Foster MM
Lucy Georgiou MM
Renee Gruber RL
Gayan Gunaratne RV
Xu Jiangtao GI
Jessie Short MM
Yu Li MH
Andrew Pomeroy RL
Liza Roger MM
Ana Ruibal MH
Leonardo Ruiz Montoya RL
Laura Elena Segura RL
Gundula Winter RL

School of Civil, Environmental and Mining Engineering
Cyprien Bosserelle CP
Paul Branson GI
Shari Gallop CP
Yasha Hetzel CP
Saskia Hinrichs AW
Martin James McLaughlin CP
Conor Mines GI
Wandres Moritz CP
Jennifer Penton CP
Eric Raes AW
Julia Reisser CP
Sarik Salim CP
Taj Sarker MG
Darshani Thotagamuwage CP
Lei Tien GI
Asha de Vos CP
Thisara Welhena CP
Jiangtao Xu GI

Centre for Microscopy Characterisation and Analysis
Pia Bessell-Browne CP
Kim Lema CP
Gerard Ricardo CP

Faculty of Law
Simon Allison ET
Damna Alzahrani ET
Caroline Coombs ET
Stephanie Price ET

School of Social Sciences
Polzer Mark AP



IMAGE/ JOAN COSTA

KEY

- AP Alistair Paterson
- AF Andy Fourie
- AW Anya Waite
- BB Britta Bienen
- CP Chari Pattiaratchi
- CG Christophe Gaudin
- CO Con O'Loughlin
- DW Dave White
- ET Erika Techera
- EH Euan Harvey
- GK Gary Kendrick
- GI Greg Ivey
- JH Jan Hemmi
- JM Jessica Meeuwig
- LC Liang Cheng
- MG Marco Ghisalberti
- MM Malcolm McCulloch
- MC Mark Cassidy
- MR Mark Randolph
- MH Matthew Hipsey
- MK Mehrdad Kimiaei
- NH Nathan Hart
- NM Nicola Mitchell
- PC Peta Clode
- RL Ryan Lowe
- RV Ryan Vogwill
- SD Scott Draper
- SC Shaun Collin
- SH Shazzad Hossain
- SG Susie Gourvenec
- TW Thomas Wernberg
- TL Timothy Langlois
- YH Yuxia Hu

Highlights

IMAGE/ JOAN COSTA

CORAL MAKES CLOUDS TO KEEP CLIMATE SWEET

A study published in *Nature* in 2013 proved for the first time that an animal (coral) has been identified as a DMSP producer. Previously, it was assumed that the large concentrations of DMSP emitted from coral reefs come solely from their symbiotic algae.

Associate Professor Peta Clode, a member of the UWA Oceans Institute, was one of the team whose findings are published in *Nature*.

The team discovered that coral produces an important sulphur molecule, dimethylsulphoniopropionate (DMSP), with many properties. Also, the researchers revealed that the molecule, (DMSP), and its production increases when corals are subjected to water temperatures causing thermal stress.

However, the scientists have warned that if coral numbers decline, there could be a major decrease in production of these vital sulphur molecules (DMSP), and this will in turn, impede cloud formation. These sulphur molecules are also important as they serve as nuclei for the formation of water droplets in the atmosphere – and hence help to create clouds.

Cloud production, especially in the tropics, is an important regulator of climate – because clouds shade the Earth and reflect much of the sun's heat back into space. If fewer clouds are produced, less heat will be reflected – which ultimately will lead to warmer sea surface temperatures.

The team, led by researchers from the Australian Institute of Marine Science, also included Associate Professor Clode at UWA, and researchers from the Australian Research Council Centre of Excellence for Coral Reef Studies at James Cook University, Murdoch University, and the Australian National University.

Raina JB, Tapiolas DM, Forêt S, Lutz A, Abrego D, Ceh J, Seneca FO, **Clode PL**, Bourne DG, Willis BL, Motti CA (2013) DMSP biosynthesis by an animal and its role in coral thermal stress response. *Nature*, 502(7473): 677-680, doi: 10.1038/nature12677

IMAGE/ JOAN COSTA

REMOTE REEFS CAN BE TOUGHER THAN THEY SEEM

The study '*Recovery of an isolated coral reef system following severe disturbance*', published in *Science* on April 2013, challenges the assumption that isolated reefs were more vulnerable to disturbance because they were thought to depend on recolonisation from other reefs.

Instead, the study conducted by a team of researchers including Dr James Gilmour and Dr Andrew Heyward, both from the Australian Institute of Marine Science and adjuncts to the UWA Oceans Institute, found that the isolation of the reefs allowed surviving corals to rapidly grow and propagate in the absence of human interference.

Scott Reef is some 250km from the remote coastline of north Western Australia. Prospects for the reef looked gloomy when in 1998 it lost around 80% of its coral following a catastrophic mass bleaching. Data collected over 15 years shows how the few remaining corals provided low numbers of new recruits to the reef. On that basis recovery was projected to take decades, but within 12 years the reef had largely recovered.

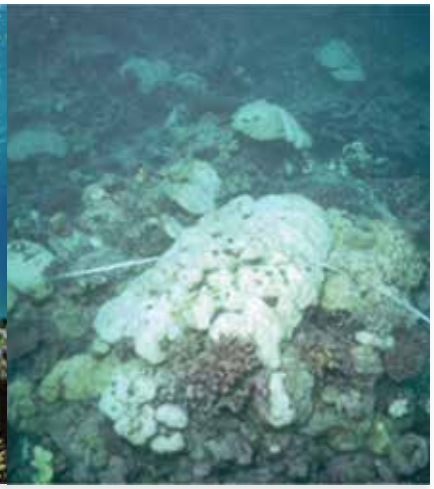
First author of the study, Dr James Gilmour says, "The initial projections for Scott Reef were not optimistic, given the negligible supply of new corals from other reefs in the region. However, the few small corals that did settle at Scott Reef had very high rates of survival and growth, given the favourable conditions"

In their publication, the team also draw attention to the effects of climate change in the longer-term prospects for coral reefs, noting that the recovery at Scott Reef still took over a decade.

The study highlights that by preventing illegal fishing and enhancing water quality we give coral reefs a greater capacity to recover from major disturbances.

"*Recovery of an isolated coral reef system following severe disturbance*", by J. P. Gilmour, L. D. Smith, A. J. Heyward, A. H. Baird and M. S. Pratchett is published in the journal *Science* 340, 69-71

Gilmour JP, **Smith LD**, **Heyward AJ**, Baird AH, Pratchett MS (2013) Recovery of an isolated coral reef system following severe disturbance. *Science* 340(6128): 69-71, doi: 10.1126/science.1232310



FAR LEFT/ DESPITE THE VERY LOW RECRUITMENT AND SLOW RECOVERY FOLLOWING THE MASS BLEACHING, BY 2012 THE CORAL COMMUNITIES HAD LARGELY RETURNED TO THEIR PRE-BLEACHING STATE.

LEFT/ THE MASS BLEACHING AT SCOTT REEF IN 1998 KILLED AROUND 80% OF THE SHALLOW-WATER CORALS. THE MORE SUSCEPTIBLE BRANCHING CORALS WERE AMONG THE FIRST TO BLEACH AND DIE, WHEREAS THE MASSIVE *PORITES* CORALS WERE SLOWER TO BLEACH AND SURVIVED BETTER.

AUSTRALIAN WATERS POLLUTED BY HARMFUL TINY PLASTICS

Each square kilometre of Australian sea surface water is contaminated by around 4,000 pieces of tiny plastics that could affect humans as well as marine life.

A study published in November 2013 in the international journal *PLoS ONE* reported the plastic particles were mostly a result of the breakdown of disposable packaging and fishing gear made of polyethylene and polypropylene. These two polymers are commonly used to make everyday items, such as water bottles and plastic cups.

Lead author and PhD student Julia Reisser, from UWA's Oceans Institute, said the plastics detected during the at-sea surveys could contain hazardous materials as well as pollutants absorbed from surrounding waters.

"There is increasing evidence that marine animals, ranging from plankton to whales, ingest large amounts of plastics loaded with pollutants, which may then be incorporated into the food chain," Ms Reisser said.

Previous studies have detected microplastics in the stomachs of southern bluefin tuna captured close to Tasmania and destined for human consumption. This means marine plastic pollution may be harmful to humans too.

The study provided the first map of the distribution of floating marine plastics in Australian waters. Winthrop Professor Charitha Pattiaratchi, who supervised Ms Reisser, said hotspots of plastics had been found offshore near highly populated areas as well as in regions where ocean currents converged.

Ms Reisser said results of the study demonstrated it was vital to take action to reduce marine pollution.

"We need to decrease plastic waste and toxicity, regulate plastic disposal on land at an international level, and better enforce the laws prohibiting dumping plastics at sea."

Ms Reisser's PhD surveys were conducted aboard the vessels Southern Surveyor (CSIRO Marine National Facility), Solander (Australian Institute of Marine Science) and Comac Enterprise (Austral Fisheries). Article: *Marine Plastic Pollution in Waters around Australia: Characteristics, Concentrations and Pathways, PLoS ONE*. **Reisser J**, Shaw J, Wilcox C, Hardesty BD, Proietti M, **Thums M**, **Pattiaratchi C** (2013) Marine plastic pollution in waters around Australia: Characteristics, concentrations, and pathways. PLoS ONE 8: e80466, doi: 10.1371/journal.pone.0080466

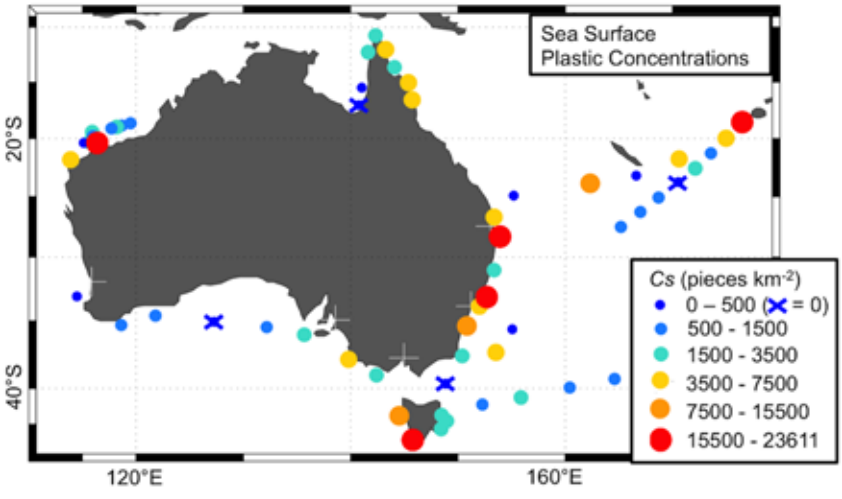


FIGURE: MEAN SEA SURFACE PLASTIC CONCENTRATION (CS) AT THE 57 NET STATIONS.

IMAGE/ JOAN COSTA

MARINE MEGAFAUNA

The ocean is a microbial ecosystem, where single-celled organisms dominate the cycling of organic matter and other key processes. Yet, giants, marine megafauna, play a key role in this ocean of microbes. Marine megafauna refers to the large (for human standards) vertebrate species that populate the oceans.

These include all marine mammals, seabirds, and reptiles, as well as large fish, including sharks, tunids, groupers and moon fish, among others. These organisms have large home ranges, which often extend across entire ocean basins and have been hunted or fished down by humans, and have relatively long life spans. As a consequence they are vulnerable and their populations have been compromised in many areas of the ocean, and as such they have been adopted as indicators of ocean health.

Marine megafauna captivate the public imagination and exert a strong appeal to society. Because of the strong public interest in marine megafauna, their vulnerability and their compromised status, they are a key target for conservation efforts. On the other hand, the status and threats to and from sharks have raised an issue of great significance at the state, national and international level, generating demands for research understanding their status, behaviour, movements and conservation. In fact, much of the requirements around the licensing of industry operations in the marine environment revolve around possible impacts on marine megafauna.

The UWA Oceans Institute along with its Indian Ocean Marine Research partners, CSIRO, the Australian Institute of Marine Science and the WA Department of Fisheries, have conducted research on marine megafauna, however these efforts have not been articulated as a coherent research area as yet. As exemplified by the 2013 research highlights, the research effort is already significant and this has led the UWA Oceans Institute to launch a new research area on Marine Megafauna to be developed in 2014.

COASTAL CARBON CLUSTER

Marine and Coastal Carbon Biogeochemistry

TOP/ MANGROVE FOREST IN MORETON BAY (QUEENSLAND). IMAGE/OSCAR SERRANO
BOTTOM/ VIBRO-CORING IN SEAGRASS ECOSYSTEMS TO STUDY BLUE CARBON (PEEL-HARVEY ESTUARY; WESTERN AUSTRALIA). IMAGE/ OSCAR SERRANO

CSIRO's Coastal Carbon Cluster is providing vital scientific research to strengthen our low carbon economy and prevent future excessive greenhouse gas emissions by quantifying the relevance of coastal vegetated ecosystems – mangrove forests, seagrass meadows and tidal salt marshes – as carbon dioxide pollution filters and sinks.

Over the past 18 months, the Cluster team has been studying the carbon storage capacity of multiple habitats along the coast of Australia, encompassing different plant species and a variety of ecosystems across biogeographic regions. The data gathered is essential to determine how much carbon is being absorbed and stored and its potential movement of the resource into a carbon trading market.

UWA Oceans Institute members Winthrop Professors Carlos Duarte and Gary Kendrick, and Dr Oscar Serrano Gras are participating in the publication of several research articles, including the first global estimate of the carbonate stock in the sediment of seagrass meadows; and the quantification of the loss of carbon stores after seagrass meadow disturbance at Cockburn Sound and Rottnest Island.

Masters candidate Radhiyah from UWA has been engaged in the Cluster project since 2013 with the aim of determining the loss of carbon stores due to mooring activities in Perth's metropolitan waters.

Several members of the Coastal Carbon Cluster team will be holding a special session entitled 'Understanding the past and changing the future of blue carbon' at the Australian Marine Science Association (AMSA) annual conference in Canberra.

WAVE ENERGY

A research collaboration with Carnegie Wave Energy Ltd

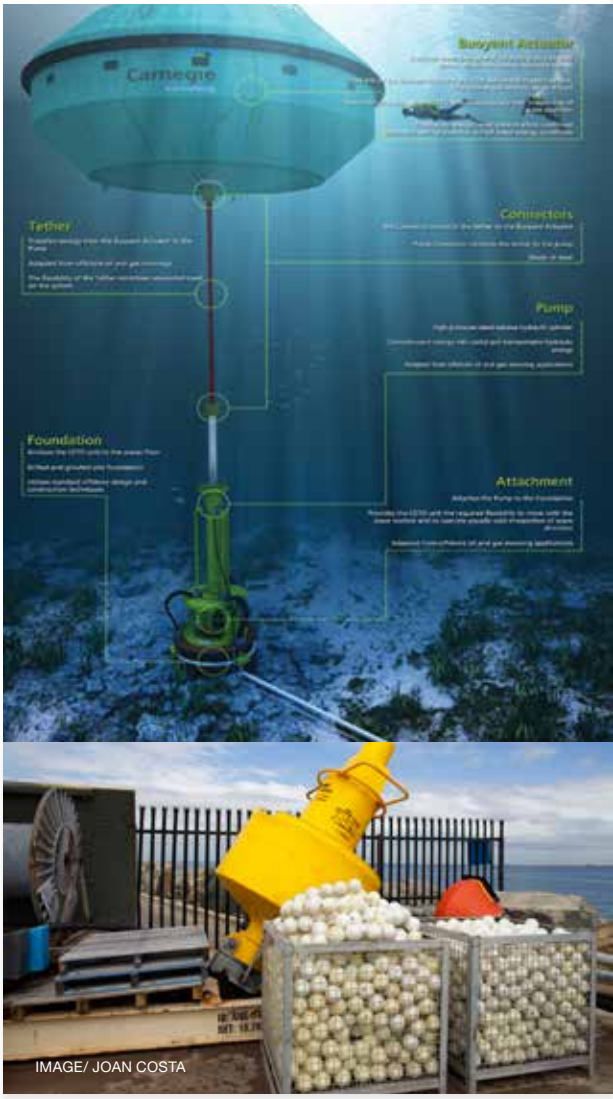
In November 2013, a research and collaboration agreement was signed between The UWA Oceans Institute and Carnegie Wave Energy Ltd (CWE) to investigate the science associated with the installation and operation of the wave energy converter developed by CWE.

Two projects were initiated, following the signature of the agreement, related to foundation systems and nearshore hydrodynamics and beach morphodynamics of rocky coastal reef systems.

The first project aims at developing an economical and reliable foundation for the CETO 5 and CETO 6 wave energy converters. Prof Christophe Gaudin, Dr Scott Draper and A/Prof Conleth O'Loughlin, assisted by PhD Student Minh Tri Duong are investigating both the hydrodynamics of the wave energy converter to minimise the loads applied on the foundation and the mechanics associated with cyclic degradation of anchoring systems. The project involves numerical analysis and centrifuge tests to assess the performance of a selected range of foundation solutions, relevant to the soil conditions typically encountered at the water depth of interest, and capable of sustaining the unusual multidirectional tensile cyclic loading generated by the motion of the wave energy converter.

The second project is led by Prof Ryan Lowe and Asst Prof Jeff Hansen who collaborate with CWE on the nearshore hydrodynamics and beach morphodynamics of rocky coastal reef systems, utilizing the CWE lease area on the west side of Garden Island as a study site to investigate these dynamics.

This broad research program is supporting two UWA Oceans Institute PhD students: Ms Gundula Winter and Ms Laura Elena Segura. Ms Winter is leading research into how rocky reef structures influence the dynamics of wave transformation, and in turn, the circulation and flushing of the surrounding nearshore zone. Ms Segura is investigating the role that fringing rocky reefs play in regulating the seasonal erosion and accretion cycle of adjacent sandy beaches, including their response to large winter storm wave events. A long term beach monitoring program commenced in late-2013 with an intensive field study planned for the winter of 2014.



IMAGE/ JOAN COSTA

TOP/ THE CETO WAVE ENERGY CONVERTER DEVELOPED BY CARNEGIE WAVE ENERGY LTD (COURTESY OF CWE)

IMAGE/SCOTT BENNETT

OPTIMISING

systematic marine conservation planning in Australia's North West marine region

In December 2013, UWA Oceans Institute member and Indian Ocean Marine Research Centre (IOMRC) postdoctoral fellow Dr Cordelia Moore led a synthesis workshop to examine how representative were the state and Commonwealth marine reserves networks in the north west of Australia.

The synthesis, jointly funded by the IOMRC partners, aimed to address challenges for optimising and integrating systematic marine conservation planning in Australia's North West. The workshop included representatives from universities, state and federal government and industry.

Australia's North West supports some of the world's most pristine and biologically diverse marine ecosystems while also supporting internationally significant oil and gas reserves. With gas production expected to quadruple by 2035, finding the right balance between biodiversity conservation and industry interests is difficult.

During the workshop they examined how representative were the current and proposed strict no-take areas. The most vulnerable section of our marine region is the continental shelf (less than 200m depth), where threats to biodiversity are concentrated. Despite this, they found that the majority (75%) of the proposed no-take areas were focussed on the abyssal plain (3,000-6,000m).

To address this they ran their own cost benefit analysis to find a more representative solution while minimising the impact on industry. With multiple institutions involved they had the advantage of compiling a more comprehensive set of data for the region. The final analysis included more than 800 species distribution models derived from combined datasets, fisheries catch and effort data, oil and gas prospectivity and oceanographic models.

With this more comprehensive data for the region they were able to employ an advanced spatial planning tool (Marxan) to investigate where marine protected areas could be expanded to improve level of representation while also accommodating socio-economic interests.

MARINE LIFE ON THE MOVE AS OCEANS WARM

IMAGE/ JOAN COSTA

According to a three-year international study published in Nature Climate Change, warming oceans are impacting the breeding patterns and habitat of marine life, which rearranges the broader marine landscape as species adjust to a changing climate.

The international team included 19 researchers from Australia, USA, Canada, UK, Europe and South Africa. The team was led by CSIRO's Climate Adaptation Flagship and University of Queensland marine ecologists Elvira Poloczanska and Anthony Richardson and included co-author Winthrop Professor Carlos Duarte from the UWA Oceans Institute.

The study found that marine species are shifting their geographic distribution poleward and doing so much faster than their land-based counterparts. Despite the ocean having absorbed 80 per cent of the heat added to the global climate system, the ocean's thermal capacity has led to surface waters warming three times slower than air temperatures over land.

"The rapid poleward shift of marine life tracks the poleward migration of isotherms across the ocean, and represents an effort of marine life to keep within the thermal regimes they are adapted to, avoiding warmer waters and those experiencing heat waves impacting on marine life," said Professor Duarte.

The research team also considered changes in the species' life cycle, such as breeding times, to find that these are also changing as seas warm. Although the study reported global impacts, there is strong evidence of change in the Australian marine environment.

"The analysis presented provides a basis to predict shifts in the distribution of marine life and can help design dynamic marine reserve systems, able to track the species they are designed to conserve, and help the fishing industry anticipate shifts in target species that could otherwise cause economic collapse."

ARC LAUREATE FELLOWSHIPS 2013

Winthrop Professor Mark Cassidy, Director of UWA's Centre for Offshore Foundation Systems (COFS) and a member of the Oceans Institute, was successful in receiving one of 17 Australian Research Council Laureate Fellowships awarded, with funding of more than $3 million for the project "*New frontiers in offshore geotechnics: securing Australia's energy future*".

PROFESSOR MARK CASSIDY, DIRECTOR OF CENTRE FOR OFFSHORE SYSTEMS

"Offshore gas lies at the heart of Australia's prosperity with $120 billion of infrastructure under construction," Professor Cassidy said. "But the future of offshore gas requires new technology to safely build offshore foundations in our weak and problematic soils. This project will provide engineers with science-based tools to unlock the natural gas 'stranded' in our deep oceans."

Professor Cassidy's research interests are in offshore geotechnics and engineering, predominantly developing wave-structure-soil interaction models for the analysis of oil and gas platforms, mobile drilling rigs and pipelines. COFS' achievements and innovative research are examples of UWA's Oceans Institute finding ocean solutions for humanity's grand challenges.

A third 10m diameter centrifuge ordered by COFS will be specially housed in the new Indian Ocean Marine Research Centre (IOMRC) building on the UWA campus. The placement of the centrifuges – within the IOMRC co-housed alliance of Australian Institute of Marine Science, the CSIRO Wealth from Ocean Flagship and the UWA Oceans Institute – will also entrench COFS and the research of this Laureate Fellowship in the heart of Australia's world leading marine science capabilities and will foster collaboration between world-leading experts.

The ARC's Laureate Fellowships scheme supports excellence in research at Australian universities by attracting world-class researchers and research leaders to key positions.

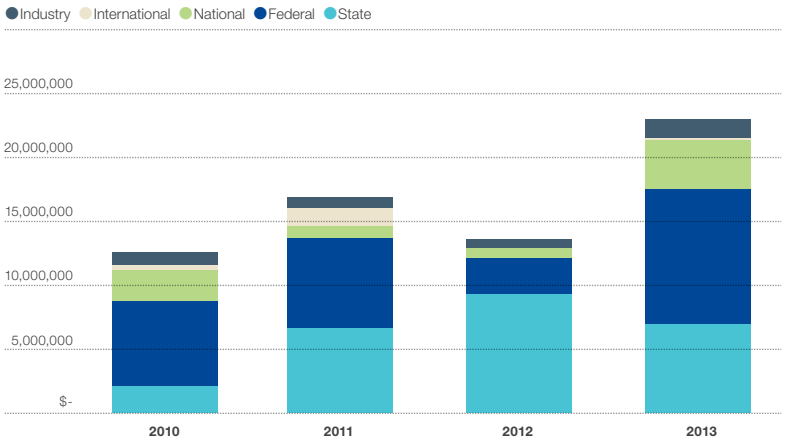
Impact

IMAGE/ JOAN COSTA

FUNDING SOURCES

Funding for the UWA Oceans Institute increased in 2013 with a substantial growth in funding from all sources. Research funding from State sources was once again a significant contributor of research income, particularly from the Pilbara Marine Conservation Partnership and Federal funding increased with the ARC award to continue the COE Coral Reef Health.

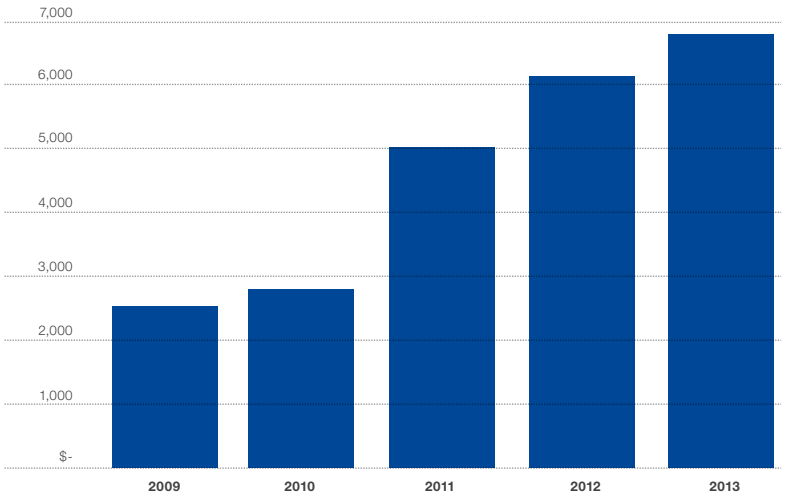
Sources of Funding
This figure represents funding from Oceans Institute members' research grants for research pertaining to the marine environment.



Sources of funding for the Oceans Institute over 2010, 2011, 2012, and 2013 and total funding for that year. Includes the ARC award to continue the COE Coral Reef Health

CITATIONS

The number of cites received by UWA Oceans Institute members continue to grow, at rates much faster than the growth in members. This provides evidence of the growing impacts of the research conducted by the UWA Oceans Institute.



Total citations for peer-reviewed journal articles by Oceans Institute members.

Collaborations

IMAGE/ JOAN COSTA

NATIONAL COLLABORATIONS

Industry and Government connection is vital to the UWA Oceans Institute. It provides a mechanism for many outreach activities and further proves the relevance and impact of our research and initiatives such as the Ocean Solutions Dialogue Series.

The UWA Oceans Institute continues to focus on growth and development of their collaborations with industry and government, leading to many multi-dimensional relationships. In 2013 our members published scientific papers in collaboration with 59 national institutions (up from 41 national institutions in 2012).

IMOS GLIDER, L. DENNIS STANLEY, W/PROF CHARI PATTIARATCHI

The Ocean Institute's national collaborative partners include:

- Antarctic Climate & Ecosystems CRC
- Aquaculture Council Western Australia
- Australian Fisheries Management Authority
- Australian Government Department of Foreign Affairs and Trade (DFAT)
- Australian Institute of Marine Science (AIMS)
- Australian National Environmental Research Program (NERP)
- Australian Petroleum Production and Exploration Association (APPEA) Ltd.
- Australian Research Council (ARC)
- Carnegie Wave Energy Ltd.
- Chevron
- Cocks Macnish
- Commonwealth Department of Climate Change
- Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC)
- Conservation Council of Western Australia
- Conservation International
- Fisheries Research and Development Corporation (FRDC)
- Change to Integrated Marine Observing System (IMOS)
- National Environmental Research Program (NERP) Marine Biodiversity Hub
- Ocean Nourishment Corporation
- Parsons Brickehoff
- Pew Environment Group
- Rio Tinto Iron Ore
- Shell Australia
- Shire Exmouth
- Sinclair Knight Merz
- South West Catchment Corporation
- Southseas Abalone Ltd.
- The Aquarium of Western Australia (AQWA)
- The Commonwealth Scientific and Industrial Research Organisation (CSIRO)
- The Water Corporation
- UNESCO Intergovernmental Oceanographic Commission
- WA Department of Commerce
- WA Department of Environment and Conservation
- WA Department of Fire and Emergency Services (DFES)
- WA Department of Fisheries
- WA Department of Indigenous Affairs
- WA Department of State Development
- WA Department of Transport
- West Australian Integrated Marine Observation System
- Western Australia Energy Research Alliance (WA:ERA)
- Western Australian Fishing Industry Council Inc. (WAFIC)
- Western Australian Marine Science Initiative (WAMSI)
- Western Australian Museum
- Woodside
- Worley Parsons
- WWF

In addition, the Oceans Institute continues to support the work of the Integrated Marine Observing System (IMOS) by leading research utilising state-of-the-art IMOS facilities. The Australian Facility for Ocean Gliders (ANFOG) is responsible for the deployment, operation and maintenance of the ocean glider fleet across Australia providing strong capabilities for ocean and coastal modeling. Showcasing these capabilities to the Oceans Institute's national and international partners and visitors creates a wide recognition of the opportunities in ocean science and technology that IMOS provides.

INTERNATIONAL COLLABORATIONS

In 2013, our members published scientific papers in collaboration with 257 international institutions (up from 186 international institutions in 2012), twenty five percent more than the number of research partners we had in 2012. Of all scientific publications, more than half involved international collaboration in total with 44 different countries (up from 37 countries in 2011). USA, the United Kingdom, Spain and Germany represented the Oceans Institute's strongest international links.

The Ocean Institute's international collaborative partners include:

ARGENTINA
- Instituto Nacional de Investigación y Desarrollo Pesquero

AUSTRIA
- University of Vienna
- Vienna University of Technology

BELGIUM
- Université catholique de Louvain
- Universite Libre de Bruxelles
- Vrije Universiteit Brussel

BERMUDA
- Bermuda Institute of Ocean Sciences

BRAZIL
- Fundação Pró-Tamar
- Núcleo de Educação e Monitoramento Ambiental
- Universidade Estadual de Campinas
- Universidade Federal de Santa Catarina
- Universidade Federal do Rio Grande

BULGARIA
- Bulgarian Academy of Science

CANADA
- Institut des sciences de la mer (ISMER), Université du Québec à Rimouski
- Pêches et Océans Canada
- Université Laval
- Université de Montréal
- University of Alberta
- University of British Colombia
- University of Manitoba
- University of Saskatchewan
- University of Toronto
- Wilfrid Laurier University
- York University

CHILE
- Pontificia Universidad Católica de Chile
- Universidad Santo Tomas

CHINA
- Changjiang Water Resources Commission
- Chinese Academy of Sciences
- Hohai University
- State Key Laboratory of Estuarine and Coastal Research
- Zhejiang University

DENMARK
- Aarhus University
- Orbicon
- Technical University of Denmark
- University of Roskilde
- University of Southern Denmark

ECUADOR
- Charles Darwin Foundation

ESTONIA
- University of Tartu

FIJI
- Secretariat of the Pacific Community (SPC)

FINLAND
- Finnish Environment Institute

FRANCE
- Institut de recherche pour le développement (IRD)
- Aix-Marseille University
- Institut Français de Recherche pour l'Exploitation de la Mer
- Laboratoire de Géologie de Lyon
- Laboratoire d'Océanographie de Villefranche-sur-Mer, CNRS-INSU
- Laboratoire des Sciences du Climat et de l'Environnement, UVSQ-CNRS-CEA
- Laboratoire Interactions et Dynamique des Environnements de Surface (IDES), CNRS-Université Paris
- Soil Agro and HydroSystem Research Unit
- Université de La Rochelle
- Université Montpellier
- Université Pierre et Marie Curie-Paris
- University of South Toulon Var

GERMANY
- Brandenburg University of Technology
- Geologisches Institut
- GEOMAR Helmholtz Centre for Ocean Research Kiel
- Leibniz Institute for Research on Evolution and Biodiversity
- Max Planck Institute of Colloids and Interfaces
- Ruhr-Universität Bochum
- Technische Universität Braunschweig
- Senckenberg am Meer
- Universität Erlangen-Nürnberg
- Universität Heidelberg
- University of Bremen
- University of Duisburg-Essen
- University of Kiel
- University of Siegen

GREECE
- National Agricultural Research Foundation
- University of Athens

ICELAND
- Marine Research Institute

INDIA
- Ashoka Trust for Research in Ecology and the Environment
- National Institute of Oceanography, Council of Scientific and Industrial Research (CSIR)

INDONESIA
- Hasanuddin University
- Lembaga Ilmu Pengetahuan Indonesia (LIPI)
- Wetlands International
- Wildlife Conservation Society

ISRAEL
- Bar-Ilan University

ITALY
- Georisk Engineering
- Institu di Scienze (SIMAR), Consiglio Nazionale delle Ricerche (CNR)
- Istituto Superiore per la Protezione e la Ricerca Ambientale
- Museo delle Scienze
- Università di Pavia
- University of Bolga
- University of Salento
- University of Tuscia

JAPAN
- Hiroshima University
- University of Tokyo

MADAGASCAR
- Wildlife Conservation Society

MALAYSIA
- Sultan Idris Education University
- Universiti Kebangsaan Mmalaysia

MEXICO
- Universidad Nacional Autónoma de México

NETHERLANDS
- Delft University of Technology
- Deltares
- Royal Netherlands Institute for Sea Research
- UNESCO-IHE Institute for Water Education
- University of Amsterdam
- Vrije Universiteit Amsterdam
- Wageningen University
- Wetlands International

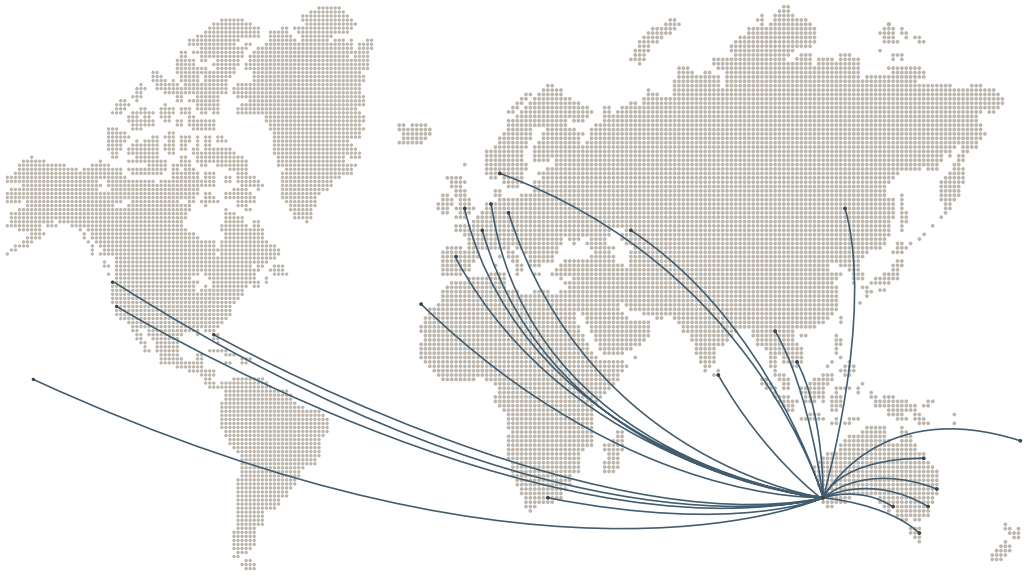
NEW ZEALAND
- Massey University
- National Institute of Water and Atmospheric Research
- The Cawthron Institute
- University of Auckland
- University of Canterbury
- University of Otago
- Victoria University of Wellington

NORWAY
- Bioforsk Soil and Environment
- Fram Centre
- Institute of Marine Research
- NIVA
- Norwegian Polar Institute
- Norwegian Institute for Water Research
- University Centre on Svalbard
- University of Tromsø

PERU
- Instituto del Mar del Perú

POLAND
- University of Wroclaw

PORTUGAL
- Instituto Português do Mar e da Atmosfera



- Instituto Superior de Psicologia Aplicada
- Universidade de Lisboa
- University of Aveiro
- University of Azores
- University of Coimbra
- University of Évora
- University of Algarve

RUSSIA
- Lomonosov Moscow State University
- Russian Academy of Sciences

SAUDI ARABIA
- King Abdulaziz University

SINGAPORE
- Nanyang Technological University
- National University of Singapore

SEYCHELLES
- Indian Ocean Tuna Commission
- Seychelles Fishing Authority
- Seychelles National Parks Authority
- The Centre for Environment and Education

SLOVENIA
- National Institute of Biology

SRI LANKA
- University of Ruhuna

SOUTH AFRICA
- Ethekwini Municipality
- Nelson Mandela Metropolitan University
- Rhodes University
- Sustainable Development Projects CC
- University of Cape Town
- University of KwaZulu-Natal
- University of Witwatersrand

SPAIN
- Autónoma de Barcelona
- AZTI-Tecnalia
- Biodiversity Research Institute
- Centro de Estudios Avanzados de Blanes, Consejo Superior de Investigaciones Científicas (CSIC)
- Centro Oceanográfico de A Coruña
- Centro Oceanográfico de Baleares
- Institut de Ciencies del Mar, Consejo Superior de Investigaciones Científicas (CSIC)
- Instituto Andaluz de Ciencias de la Tierra, Consejo Superior de Investigaciones Científicas (CSIC)
- Instituto Español de Oceanografía, Consejo Superior de Investigaciones Científicas (CSIC)
- Instituto Mediterraneo De Estudios Avanzados, Consejo Superior de Investigaciones Científicas (CSIC)
- Museo Nacional Ciencias Naturales, Consejo Superior de Investigaciones Científicas (CSIC)
- Spanish Oceanographic Institute
- Universidad de Cantabria
- Universidad de Málaga
- Universidad De Las Islas Baleares
- Universidad de Las Palmas de Gran Canaria
- Universidad de Sevilla
- Universidad de Valencia
- Universidad de Vigo
- Universitat de Barcelona

SWEDEN
- Lund University
- Swedish Meterological and Hydrological Institute
- University of Gothenburg
- Uppsala University

SWITZERLAND
- Ecole Polytechnique Fédérale de Lausanne
- Swiss Federal Institute of Technology
- University of Benn

TAIWAN
- National Taiwan Ocean University
- National Taiwan University

UNITED ARAB EMIRATES
- International Union for the Conservation of Nature/Species Survival Commission Reintroduction Specialist Group

UK
- Aberystwyth University
- Bangor University
- British Antarctic Survey
- Durham University
- Hospital for Children
- Marine Biological Association of the United Kingdom
- Marine Scotland Science
- Moorfields Eye Hospital
- National Oceanography Centre
- Newcastle University
- National Oceanography Centre
- Oxford Eye Hospital
- Plymouth Marine Laboratory
- UCL Institute of Ophthalmology
- Scottish Association for Marine Sciences
- Scottish Oceans Institute
- The University of Edinburgh
- University College London
- University of Aberdeen
- University of Bristol
- University of Cambridge
- University of Essex
- University of Exeter
- University of Hull
- University of Kent
- University of Manchester
- University of Oxford
- University of Sheffield
- University of Southampton
- University of St Andrews
- Zoological Society of London

USA
- Argonne National Laboratory
- California Institute of Technology
- College of William & Mary
- Columbia University
- Conservation International
- Cornell University
- Dauphin Island Sea Laboratory
- Duke University
- Farallon Institute for Advanced Ecosystem Research
- Florida International University
- John Hopkins University
- Marine Mammal Commission
- Massachusetts Institute of Technology
- Medical College of Wisconsin
- Met Office
- Monterey Bay Aquarium Research Institute
- National Aeronautics and Space Adminstration
- National Center for Ecological Analysis and Synthesis
- National Oceanic and Atmospheric Administration
- Oberlin College
- Oregon State University
- Pacific Coastal and Marine Science Center
- Scripps Institution of Oceanography
- Smithsonian Environmental Research Center
- Stanford University
- Temple University
- The Santa Fe Institute
- The University of North Carolina at Chapel Hill
- Tulane University of Medical School
- United States Geological Survey Pacific Science Center
- University of Arizona
- University of Oregon
- University of California
- University of Chicago
- University of Florida
- University of Hawaii
- University of Illinois at Urbana-Champaign
- University of Louisiana
- University of Maryland
- University of New Hampshire
- University of North Carolina
- University of South Alabama
- University of Southern California
- University of South Florida
- University of Southern Mississippi
- University of Texas at Austin
- University of Washington
- Utah State University
- Vassar College
- Virginia Commonwealth University
- Western Washington University
- Wildlife Conservation Society
- Woods Hole Oceanographic Institution
- Yale University

THE INDIAN OCEAN MARINE RESEARCH CENTRE

UWA is developing new state-of-the-art marine research facilities to enable critical research into the sustainable use of marine resources, environmental protection and climate change.

With the vision to *drive global knowledge of the Indian Ocean marine environment and its sustainable management*, the Indian Ocean Marine Research Centre (IOMRC) will be a leading marine science partnership in the southern hemisphere and the largest marine research capability in the Indian Ocean rim. IOMRC will build Australia's international marine research status through stimulating innovative, collaborative research and the teaching and training of next generation researchers.

The IOMRC development consists of two projects: the construction of a new $62 million facility on UWA's Crawley campus, and an $11 million upgrade to the Department of Fisheries' Watermans Bay Marine Centre.

The facilities are being developed as part of collaboration between The Australian Institute of Marine Science (AIMS), CSIRO, UWA and the Department of Fisheries WA. The construction of the Indian Ocean Marine Research Centre is supported by a $34 million grant from the Australian Government and contributions from the partner organisations.

A science and research strategy for IOMRC will be developed between all of the collaborating partners as construction on the facilities progresses. The focus of the strategy will be on facilitating research on the most important drivers of innovation in the marine sector. The strategy will provide guidance for the development of integrated and multi-pronged research programs to address these drivers as well as defining key research objectives for the implementation of these programs.

Construction of the $62 million IOMRC at UWA's Crawley campus has commenced and the new facility is anticipated to be operational in 2016. Upon completion, the facilities will bring together 240 world-leading researchers working across a broad range of subjects, extending from oceanography to marine ecology, fisheries, geochemistry, governance, marine technologies and engineering.

Refurbishment of the Department of Fisheries' Waterman Bay Marine Centre recently commenced, with occupancy expected in 2015. The facility will undergo significant refurbishment including upgrades to the internal laboratories, offices and marine cultural facilities, with direct access to quality seawater.

Recognising the importance of local partnerships in the construction of IOMRC, the Oceans Institute continues to foster these connections, linking with the WA Marine Science Institution (WAMSI) and its scientific partners to support marine research that is focused on the pressing needs of Western Australia. Partners involved in IOMRC aspire to extend beyond the achievement of scientific excellence to become a resource providing ocean-based solutions to address these needs, locally, and to the international community around the Indian Ocean.

LEFT/ FUTURE IMPRESSION, CRAWLEY FACILITY

PILBARA MARINE CONSERVATION PARTNERSHIP

The Pilbara/Ningaloo bioregions are characterised by reef systems of great complexity and comprise globally significant fringing coral reef ecosystems. These ecosystems are unique because of their location on an arid coast that receives very little terrestrial runoff, thereby facilitating high coral growth exceptional for a continental margin.

The Gorgon Joint Venture is building a liquefied natural gas facility and a domestic gas plant on Barrow Island off the Pilbara coast. Approximately 1090 hectares of seabed and associated biodiversity values will be affected by the Gorgon development. The Pilbara Marine Conservation Partnership (PMCP) between The University of Western Australia's Oceans Institute and CSIRO's Wealth from Oceans Flagship will receive $7.19 million funding over five years (2012 – 2017) from the venture, through the State, to offset this loss. Over nine scientists from the Oceans Institute are playing a key role in this collaborative research, contributing to the PMCP's unique position through its access to data and through the breadth and depth of its expertise. Researchers have embarked on field work and are optimising and integrating data on biodiversity and conservation assets from a range of new and existing data sources, and modelling environmental pressures on fish and coral reef health to provide the basis for improved outcomes in conservation planning and management across the Ningaloo/Pilbara region.

MARINE ENVIRONMENT MONITORING

The role of science in responding to ocean disasters

Woods Hole Oceanographic Institution (WHOI), in USA, is arguably the world's leading oceanographic institution. Their extended experience and capacity in deep-sea research was instrumental in responding to the Deep Horizon blowout in the Gulf of Mexico.

This response led to the development of a series of courses for professionals in the oil and gas industry. Their activities converge with one of the actions stemming from the Ocean Solutions Dialogue on "*the role of science in responding to disasters in the ocean*", namely providing opportunities for the professional development of industry staff on marine environmental monitoring.

WHOI and the UWA Oceans Institute have agreed to jointly organise a course on marine environmental monitoring to be offered before the end of the year. In addition, the partners are exploring the opportunity to provide the course online in 2014.

This agreement was reached over meetings in February 2013 in Perth between UWA Oceans Institute staff and Dr Larry Maden, Executive Vice President and Director of Research at WHOI, and a follow up meeting in April at Woods Hole.

DELEGATION L–R/ ASST/PROF SCOTT DRAPER, PROF RYAN LOWE, W/PROF GREG IVEY, TRACY PARKER, ASST/PROF JIM FALTER, ASST/PROF ZHENLIN ZHANG, PROFESSOR ERIKA TECHERA, W/PROF SHAUN COLLIN.

EXPANDING POSSIBILITIES

UWA Oceans Institute and Zhejiang University (ZJU)

The relationship between the UWA Oceans Institute and the Ocean College at Zhejiang University (ZJU) in China was greatly enhanced in 2013, heralding many exciting possibilities for the future.

The close links between the University of Western Australia (UWA) and ZJU – both highly ranked universities – has been built on strong and sustained support from the Western Australian and Zhejiang Governments through a Sister-State relationship that is arguably the closest relationship between any Australian and Chinese university. This collaboration reflects a common purpose with complementary expertise and a joint vision to drive economic growth in oceans and marine development in both China and Australia, while ensuring sustainable biodiversity.

UWA and ZJU are currently developing a joint five-year plan that will articulate targets and strategies that will be adopted to ensure that the UWA-ZJU partnership continues to prosper and maintains its standing as the benchmark in Australian-Chinese university partnerships.

Five delegations were exchanged in 2013; two at ZJU (May and October) in Hangzhou and three at UWA (September, October and November). A number of Agreements were signed, formally recognising our commitment to explore opportunities to establish joint research programs and laboratories, participate in the International Indian Ocean Expedition-2, jointly supervise MSc and PhD students to establish closer research links between scientists, explore opportunities to develop joint online training programs, establish mechanisms for sharing of facilities once the Zhoushan campus (ZJU) and the Indian Ocean Marine Research Centre (UWA) are completed and facilitate a new Masters Program in Marine Studies. All of these important ways forward were discussed during the 1st Workshop on Ocean Sciences and Engineering held in November 2013.

The UWA Oceans Institute and the current Department of Ocean Science and Engineering and allied Departments and Colleges at ZJU are all focussed on good governance of our oceans, sensory pollution, the use of marine organisms in regenerative medicine, the impacts of extreme environmental conditions, offshore hydraulics, marine energy, biogeochemical fluxes, coastal circulation, sediment transport and climate change.

We look forward to growing this alliance in the years to come.

Outreach

IMAGE/ JOAN COSTA

CELEBRATING 2013 OCEANS INITIATIVES

In November 2013, the UWA Oceans Institute, in partnership with The Oceans Community and the Institute of Advanced Studies (IAS), created an event addressed to the broader community of Perth to better understand marine issues in Western Australia and how to contribute in some way to the marine environment.

During the event that took place at the Western Australian Marine Maritime Museum three UWA Oceans Institute researchers gave a short introduction on their significant projects:

- PhD Julia Reisser, 'Marine Plastic Pollution in Waters Around Australia'
- Dr Scott Draper, 'Placing Wind Turbines Underwater'
- Winthrop Professor Malcolm McCulloch, 'Coral Resilience to Ocean Acidification'.

Conjointly, IAS and the UWA Oceans Institute organised a public lecture for the day that was given by Professor Michael Crawford, Director of the Institute of Brain Chemistry and Human Nutrition at Imperial College of London. Professor Crawford spoke about food, evolution and how nutrition is shaping life in the future, highlighting the links between poor nutrition and modern degenerative diseases.

Finally, and to close the event, a $5,000 award sponsored by Southseas Abalone Ltd. was given to the Broome Lynbya Taskforce in recognition for 'bringing together the community to discover the role of nutrient inputs in the proliferation of noxious algae in Roebuck Bay (Broome)'. The taskforce, made up of local and indigenous volunteers working with The University of Western Australia and other bodies, was spurred into action by recurrent noxious algal blooms in the area.

OCEAN SOLUTIONS WENT GLOBAL
thanks to UWA's first MOOC

In April 2013, The University of Western Australia and the UWA Oceans Institute organised its first free massive open online course (MOOC) 'Ocean Solutions'.

The UWA Oceans Institute Director, Winthrop Professor Carlos Duarte and co-author Aisling Fontanini, showed over 900 students from around the globe how the ocean can play an important role in tackling humanity's grand challenges.

The course promoted a sustainable use of the oceans to relieve the pressures on food, water and energy supplies, without threatening biodiversity or contributing to global climate change.

The course ran for 6 weeks with students from around the globe receiving lectures, readings and quizzes each week through the University's Class2Go platform, managed by Associate Professor David Glance.

The MOOC was a great success and received such good feedback from the students, that a second edition of the course took place in October 2013 by W/Prof Carlos Duarte and teaching assistant Elizabeth Myers.

A third edition is planned for 2014, now in partnership with online education platform Coursera.

OCEAN SOLUTIONS DIALOGUE SERIES

Following the success of the inaugural Ocean Solutions Dialogue Series workshops in 2012, The UWA Oceans Institute held a further two Dialogues in 2013.

'*The role of the ocean as a source of sustainable food*' discussed the role Australia can play in the future of marine food production, including a discussion on what it will take for Australia to contribute $10 billion to the GDP and become the main source of marine food in the nation. Opening this workshop were presentations by the UWA Oceans Institute, WA Department of Fisheries and international researcher, Professor Michael Crawford, Director of the Institute of Brain Chemistry and Human Nutrition at Imperial College, London.

The second workshop held in 2013 examined '*Effective marine monitoring*', and started with presentations by the Australian Institute of Marine Science, Institute of Marine Science and NOPSEMA to set the scene for the discussion. Participants went on to address two key issues; 1) What marine monitoring programs are maintained in Western Australia?; and 2) What capacities for effective marine monitoring need to be deployed in Western Australia?

The workshops were well attended by researchers, government and industry stakeholders, generating broad discussions on potential initiatives and resources that could be developed to deliver ocean-based solutions.

The series has now held four dialogues on important marine issues:

- The role of science in the response to disasters in the marine environment;
- Marine spatial planning for a safe and sustainable operation in the marine environment;
- Efficient marine monitoring; and
- The oceans as a source of food.

IMAGE/ JOAN COSTA

PARTNERING
with The Institute of Advanced Studies

The Institute of Advanced Studies (IAS) at UWA serves as a focus for the wide dissemination of ideas and research at The University of Western Australia. Throughout the year the Institute hosts visits from distinguished scholars, public intellectuals and artists. As part of their annual program the Institute hosts public lectures, postgraduate masterclasses and symposia to share knowledge and research, and to engage community discussion on contemporary issues.

Since its inception in 2000, IAS has been an active foundation for the intellectual life of the community. In 2013, IAS co-sponsored different visitors, and organised the following public lectures and master classes in conjunction with the UWA Oceans Institute:

- 'Abrupt Climate Change in the Arctic – Why should we care', public lecture by Winthrop Professor Carlos Duarte
- 'Plastic Pollution in the Global Ocean: Where has all the plastic gone?', public lecture by Winthrop Professor Carlos Duarte
- 'Food, evolution and the future', public lecture by Professor Michael Crawford (Imperial College London).
- 'Are seagrasses drowning or being poisoned? Worldwide diebacks of seagrass ecosystems', public lecture by Ole Pedersen, University of Copenhagen and 2013 IAS Professor-at-Large
- 'Blue Forests for Climate Change Mitigation and Adaptation', public lecture by Dr Núria Marbà, Spanish National Research Council (CSIC), Institut Mediterrani d'Estudis Avançats (UIB-CSIC) and 2013 Gledden Visiting Senior Fellow with the OI.
- 'Ecophysiology of Submerged Plants', postgraduate masterclass by Ole Pedersen, University of Copenhagen and 2013 IAS Professor-at-Large
- 'High quality images: missed opportunities to strengthen outreach', postgraduate masterclass by Joan Costa, Artist in Residence
- 'Impact of climate change on marine coastal ecosystems', postgraduate masterclass by Núria Marbà, Department of Global Change Research, Institut Mediterrani d'Estudis Avançats IMEDEA (CSIC-UIB)

More information about the IAS can be found at: **ias.uwa.edu.au** – Twitter @IAS_UWA

IMAGE/ JOAN COSTA

JOAN COSTA
2013 IOMRC Artist in Residence

Spanish photographer Joan Costa (Word Press Photo Awardee 2012) was invited to join the UWA Oceans Institute in 2013 as an Artist in Residence, with funding secured from the UWA Oceans Institute, the Institute of Advanced Studies, The Australian Institute of Marine Science and CSIRO.

Whereas many photographers focus on marine life, Joan's own uniqueness is that he specialises in capturing research as its being done. During the three months that Joan spent here, he focused on documenting, with beautiful images, science as a practice, including the people who execute the research, the instruments they use, and the environments where they work.

During his visit, Joan travelled around Western Australia's coasts capturing the UWA Oceans Institute members working on their fieldwork; from Shark Bay to Exmouth, or the Albrolhos Islands. Joan spent time on-board the research vessel Solander, and at The University of Western Australia to document the scientists working in the laboratory, or meetings and conferences organised by the UWA Oceans Institute.

PHOTO/ ANGELA ROSSEN

Sharing the ideas that make our minds tick and our hearts beat

In February 2013, UWA Oceans Institute members and students gathered together at a retreat in the University's Kurrajong Lecture Theatre. The retreat offered scientists the opportunity to share the ideas that they find most stimulating and was followed by a forum to discuss these ideas with colleagues.

During the day, 22 scientists from different schools and research areas gave brief presentations on a range of topics. New ideas for ocean observations, RNA in the ocean, sensory strategies for protecting biodiversity, the vulnerability of marine organisms to Global Change and multiple stressors, seagrass resilience and how to create master minds were some of the topics that scientists discussed at the retreat.

IMAGE/ W/PROF GARY KENDRICK

ANGELA ROSSEN
Artist in Residence: Seagrass Project

The UWA Oceans Institute Artist in Residence Seagrass Project is a collaboration between Winthrop Emeritus Professor Di Walker and the Artist, Angela Rossen.

In 2013 Angela Rossen worked on the development of a series of artworks exploring and communicating the diversity, beauty and fragility of seagrass meadows and related marine and coastal communities. These artworks, still in progress, will form a multimedia exhibition at the Lawrence Wilson Art Gallery in 2016 to delight, inform and engage the community in coastal biodiversity and a range of conservation issues.

Angela was also involved in the *Environmental Science Art Workshops*. This outreach into primary schools involves talking with students about marine research undertaken at the UWA Oceans Institute and how that science shapes our understanding of the world. During the workshop, through a process of field observation and documentation, students created a comprehensive biodiversity survey of their beach, which was expressed collaboratively as a large painting.

Also, in September 2013, Angela released *The Ocean is full of Wonderful Things:* A picture book with photos and children's paintings of marine life with short descriptions for anyone who wants to know what lives in the south Western Australian near coast marine environment.

ANGELA ROSSEN, ARTIST IN RESIDENCE
(PHOTO/ JOAN COSTA)

VISITING SCHOLARS

The Oceans Institute Visitors Program continued in 2013, furthering opportunities for collaborations between members and highly regarded researchers to share knowledge and enhance the international reputation of the Institute.

In the second year of the Oceans Institute Visitors Program, the Institute awarded four visitors grants; Dr Tim McClanahan, Professor Pere Masqué, Dr Dolors Vaqué and Dr Paolo Montagna.

Professor Pere Masqué

Pere Masqué is a Professor at the Department of Physics, and the Institute of Environmental Science and Technology at the Universitat Autònoma de Barcelona (Spain) where he leads the Environmental Radioactivity Laboratory. His research group uses both natural and artificial radioactive isotopes as tracers of environmental processes, mostly in the oceans.

Prof Masqué spent three weeks at the Oceans Institute to discuss data recently obtained in the frame of the on-going Coastal Carbon Cluster, focusing on the evaluation of the capacity of seagrass meadows as sinks of carbon.

His primary contribution was to provide the geochronology at decadal and centennial time-scales in sediments collected at various sites around Australia. Prof Masqué also gave an Ocean Solutions Seminar in early 2014 and a talk about the impact of the Fukushima Dai-ichi nuclear accident in the ocean.

Prof Masqué has been awarded a 2014 Gledden Visiting Fellowship, which will allow him to undertake collaborative research for one year at the Oceans Institute.

Dr Tim McClanahan

Dr Tim McClanahan, a world leader in coral reef and fisheries science from the Wildlife Conservation Society based in Kenya, spent 5 days with the Oceans Institute.

During his visit, Dr McClanahan gave a public lecture on 'Social-ecological adaptation to climate and human resource use along the African coastline', interacted with a number of researchers and participated in a roundtable discussion organised by his hosts Assistant Professor Jens Zinke and Assistant Professor Michael Stat, who both collaborate with Dr McClanahan on a variety of projects.

The roundtable included researchers from the Oceans Institute, Fisheries, AIMS and the Department of Parks and Wildlife. Potential pathways towards developing collaborative research focusing on Indian Ocean-wide synthesis of coral reef science and effective planning of marine protected areas was discussed.

Dr Núria Marbà

Visiting Scientist Dr Núria Marbà is a Senior Scientist of the Research Council of Spain (CSIC) at the Institute of Mediterranean of Advanced Studies in Mallorca (Spain) conducting research on the effects of Global Change on marine vegetation and the role of these ecosystems for climate change mitigation and adaptation.

During her 3 month visit hosted by Winthrop Professor Carlos M. Duarte, Dr Marbà participated in the Carbon Cluster project, through the collaboration with Oceans Institute scientists quantifying carbon burial and stocks in WA seagrass meadows and assessing the potential of seagrass revegetation to restore natural carbon sinks.

Dr Marbà, a Gledden Fellow 2013 of UWA's Institute of Advanced Studies, also gave a one-day master class on 'Impacts of climate change on coastal marine ecosystems', and a public lecture on 'The role of marine vegetation on climate change mitigation and adaptation'.

Dr Dolors Vaqué

Dr Dolors Vaqué from the Marine Science Institute at the Spanish Council for Scientific Research in Barcelona visited the Oceans Institute for a further three weeks hosted by Dr Susana Agustí.

The internationally renowned biological scientist shared some of her expertise in the role of viruses in the ocean at a seminar and workshop and discussed future collaborations on marine microbial ecology with Professor Susana Agustí and Oceans Institute Director Professor Carlos M. Duarte.

Dr Vaqué had the opportunity to interact and discuss scientific issues dealing with marine microbial ecology with Oceans Institute PhD and masters students as well as with Post-docs and senior scientists. This visit was significant as the beginning of future interactions and collaborations with the Oceans Institute.

Dr Paolo Montagna

Paolo Montagna, a leading Research Scientist from the Institute of Marine Science (ISmAR-CnR) in Bologna, Italy, spent two months at the Oceans Institute working closely with Dr Julie Trotter and Professor Malcolm McCulloch to undertake some novel geochemical experiments using boron isotopes in both shallow and deep-water corals. Dr Montagna specialises in the development and application of geochemical proxies to address fundamental problems in paleooceanography and paleoclimatology.

Studies were undertaken on a unique collection of deep-water coral samples collected using an ROV as well as laboratory specimens cultured under different pCO2 conditions, addressing the critically important question of how marine calcifiers are responding to the ongoing effects of ocean acidification. His research in oceans chemistry is complimentary to the research that will be undertaken by Professor McCulloch's team at the new Indian Ocean Marine Research Centre Waterman's Bay facility.

Media and Communications

IMAGE/ JOAN COSTA

2013 MEDIA SUMMARY

In 2013, scientists from the UWA Oceans Institute featured in two different documentaries: National Geographic's 'Australia's Deadliest Shark Coast' (screened in over 100 countries), and ABC's 'The Search for the Ocean Super Predator'.

Also, in 2013 the UWA Oceans Institute published three newsletters and the University released 31 media statements focusing on UWA Oceans Institute members and their scientific publications. This resulted in more than 200 media stories in international, national, state and local news media, including stories in The Guardian, ABC, and The Huffington Post.

Website oceans.uwa.edu.au

The Oceans Institute website is the first port of call for information on research and development and the strategic focus and objectives for the Institute. The website is updated with information about Oceans Institute events and links to other relevant webpages, enabling visitors to explore the activities of the Institute in depth.

In 2013, the Oceans Institute's website saw over 70,000 webpage views at relatively consistent levels throughout the year. While 55% of users were returning users to the site over 44% of these were new visitors, demonstrating the need for relevant, timely and succinct information to be made available on the Oceans Institute website.

Social Media

The UWA Oceans Institute created an inaugural social media strategy for 2013, with a strong focus on promoting its work and engaging with a broader online audience. The UWA Oceans Institute created a Twitter account and improved the Ocean Institute's Facebook by posting relevant and newsworthy information regularly.

As a result of this strategy, the number of total page likes on Facebook increased from 886 in January to 1,370 in December 2013 and the number of people engaged in conversations and talking about the UWA Oceans Institute on Facebook doubled since 2012.

Finally, following the objective to reach a wider international audience, the UWA Oceans Institute created its Twitter account @uwaoceans in April 2013. By December the account had gained 250 followers, including domestic and international scientists, students, NGO's, journalists and politicians.

Newsletter

The Oceans Institute Newsletter is an important channel through which the Institute promotes its activities, research and collaborations as well as the achievements of its students and staff to members, alumni, industry, funding bodies and research institutions.

The Newsletter is published three times a year and represents one of the key tools to engage and enhance the Institute's strong connection with its stakeholders. The publication is circulated widely in both electronic and printed formats. Besides providing information on the latest research activities in marine research and related areas at UWA through feature articles links to online information and outreach activities, the Newsletter also serves as a valuable reference through its list of new publications, visitors and research projects.

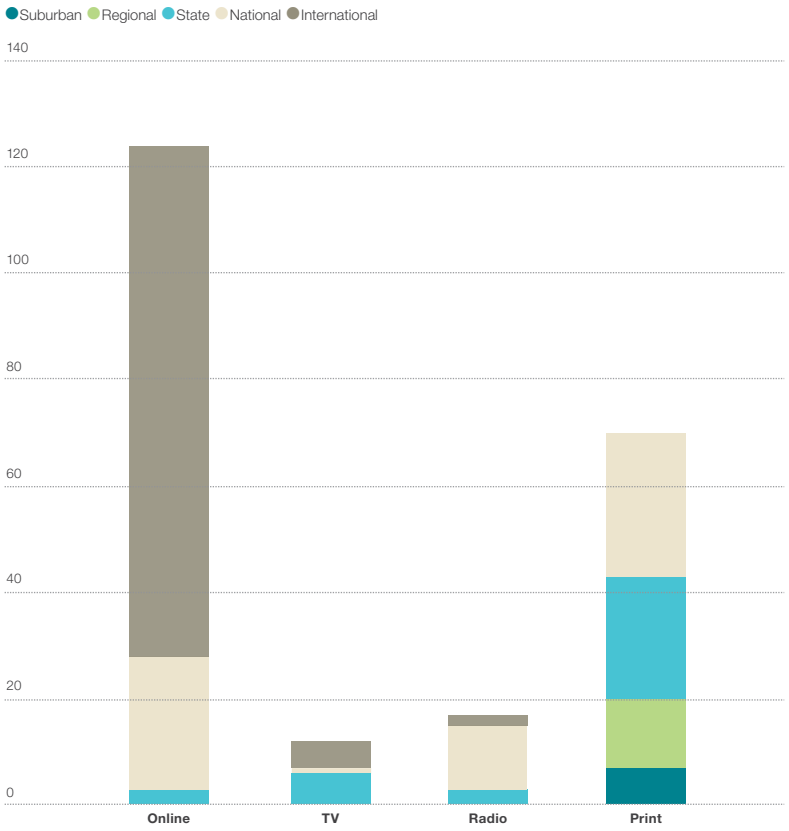
E-Bulletin

The Oceans Institute E-Bulletin is the regular communication tool for the Institute, providing a weekly update of upcoming events and key information relevant to the Institute's stakeholders. Since its launch, engagement with the E-Bulletin has steadily increased represented by the percentage of users that open the email to view the content as well as link to further information. Content is often provided by the Institute's members, staff and students. In 2013, 52 E-Bulletins were circulated providing subscribers with a consistent update on the week ahead relevant to members' interests and research focus.

PHOTO/ JOAN COSTA

Media Summary

The Oceans Institute appeared in more than 200 news stories in 2013 with a strong media focus on the impacts of plastic pollution and on sharks. Online media was the highest source for articles on Oceans Institute research, particularly in the international arena, however there was an increase in TV coverage given the documentaries featuring Oceans Institute scientists that screened this year.



Research Funding

IMAGE/ JOAN COSTA

RESEARCH GRANTS 2013

Project Title	Funding Period	Funding Body	Amount	Researchers
Investigation of PLET Foundation Under Cyclic Horizontal & Torsional Loadings for Wheatstone Development	2013	Advanced Geomechanics	$116,750	Gaudin, C. O'Loughlin, C.
Present and future impacts of climate change on calcification of coral reefs and crustose coraline algae	2013	Western Australian Marine Science Institute	$75,712	Van Niel, K. Hovey, R.
Technology Centre – Prediction of spudcan penetration on sand-over-clay with potential for rapid leg run or punch-through	2013	Keppel Offshore & Marine Ltd	$4,000	Hossain, M.
Advanced numerical and physical modelling of dynamically penetrating anchors for deep water oil and gas developments	2013	ARC Discovery Early Career Researcher Awards	$394,020	Hossain, M.
A case of mistaken identity? Why do sharks attack humans?	2013	Sea World Research and Rescue Foundation	$11,000	Hart, N. Hemmi, J. Collin, S. Ryan, L.
Round 2 (2013): A case of mistaken identity? Discovering the sensory cues that trigger shark attacks	2013	WA Office of Science Applied Research Program ARP Shark Hazard Mitigation	$284,620	Hart, N. Collin, S. Kempster, R.
Terrestrial Ocean Linkages – the Role of Rivers & Estuaries in Sustaining Marine Productivity in the Kimberley	2013	CSIRO	$155,040	Jones, N. Hipsey, M. Lowe, R.
Browse LNG Development 1-g Axial Pipe Soil Interaction Tests	2013	Advanced Geomechanics	$130,000	O'Loughlin, C. Gaudin, G. White, D.
Improving the Global Governance of Sharks: Obstacles, Options and Opportunities	2013	Macquarie University	$50,500	Techera, E. Klein, N.
Assessment of carbon partitioning and storage in seagrass ecosystems using mathematical models validated across multiple latitudes and species. (UQ Led)	2013	UWA UQ Bilateral Research Collaboration Award	$15,000	O'Brien, K. Kendrick, G. Adams, M. Hovey, R. Hipsey, M. Bruce, L. Lowe, R.
Key Biological Indices Required to Understand & Manage Nesting Sea Turtles Along the Kimberley Coast	2013	WA Department of Environment and Conservation	$45,000	Whiting, S. Mitchell, N. Berry, O.
Range Contraction of Kelp Forests and Tropicalisation of Australias Temperate Marine Environments	2013	Hermon Slade Foundation	$84,000	Wernberg, T. Bennett, S.
Transcriptome sequencing and functional characterisation of craniate non-visual sensory systems and their adaptation to diverse light environments	2013	ARC Discovery Projects	$380,000	Davies, W. Hunt, D. Carter, K. Hemmi, J. Partridge, J.
Margaret Middleton Fund – Characterising the diversity of mobile ocean predators in a biological hotspot and proposed marine reserve, the Perth Canyon	2013	Australian Academy of Science	$14,950	Bouchet, P. Meeuwig, J.
Researcher in Business RiB – Carnegie Wave Energy – CETO 5 Virtualisation – Leo Hyde	2013	Carnegie Wave Energy Ltd	$82,682	Draper, S.

Investigation of Sediment Transport, Geotechnics and Pipeline Structural Response	2013	Western Australian Energy Research Alliance WA:ERA	$10,725	Draper, S. White, D.
Green House Gas (GHG) Emissions in Aquatic Systems: Development of a collaborative framework for strategic research (UWA Led)	2013	UWA UQ Bilateral Research Collaboration Award	$18,000	Ghadouani, A. Yuan, Z. Ghisalberti, M. Ni, B.J. Reichwaldt, E. Keller, J. Sharma, K.
How do molluscs get calcium to their shells? (UQ Led)	2013	UWA UQ Bilateral Research Collaboration Award	$19,967	Degnan, B. Clode, P. Shaw, J. Drennan, J
Community Monitoring of Reef Fish Assemblages, Albany	2013	South Coast Natural Resource Management Inc (NHT)	$9,565	Harvey, E.
Effects of Dredging-Related Pressures on Critical Ecological Processes for Finfish – Theme 8	2013	Western Australian Marine Science Institute	$69,345	Harvey, E. McLean, D. Saunders, B.
Population ecology and genetic diversity of endemic tuskfishes in Western Australia: an investigation of biogeography and evolution	2013	ANZ Philanthropy Partners Holsworth Wildlife	$4,000	Harvey, E. Chams, K.C.
Characterising the ecological role of nursery areas for the protection of two coastal shark species at Ningaloo Reef, Western Australia	2013	ANZ Philanthropy Partners Holsworth Wildlife	$7,500	Meeuwig, J. Oh, Z.
Building Research Capacity Scheme	2013	Curtin University	$40,000	McCulloch, M.
Present and future impacts of climate change on calcification of coral reefs and crustose coraline algae	2013	Western Australian Marine Science Institute	$200,000	McCulloch, M. Falter, J. Trotter, J.
Benthic community production and response to environmental forcing	2013	Western Australian Marine Science Institute	$114,994	Lowe, R. Falter, J.
Predicting & Measuring the Characteristics of Sediment Plumes Due to Dredging Operations	2013	CSIRO	$382,412	Lowe, R. Ghisalberti, M.
Wave transformation and coastal processes in Krirbati – Bonriki Inundation Vulnerability Assessment BIVA Project	2013	Secretariat of the Pacific Community	$25,000	Lowe, R. Pequignet, A.C.
Wave dynamics in topographically-complex coastal reef systems	2013	ARC Discovery Projects	$360,000	Lowe, R. Roelvink, J. Dongeren, A.V.
A National Facility for In Situ Testing of Soft Soils	2013	University of Newcastle	$80,000	Sloan, S. Randolph, M. Carter, J. Sheng, D. Cassidy, M. Indraratna, B. White, D. Khalili, N. Stanier, S. O'Loughlin, S
Pilbara Marine Conservation Project	2013	CSIRO	$3,449,707	Collin, S. Babcock, R.
Impact of global stressors on the metabolic balance of the coastal Indian Ocean	2013	ARC Discovery Projects	$185,000	Agusti-Requena, S. Duarte Quesada, C. Arrieta, J.
Biogeochemical processes supporting productivity of Kimberley coastal	2013	Western Australian Marine Science Institute	$163,852	Waite, A.

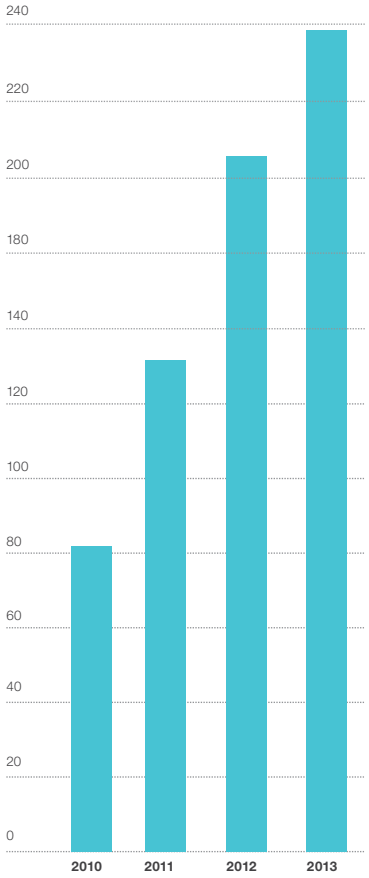
A Transportable Containerised Laboratory for Rapid Cell Sorting & High Resolution Bioimaging of Living Aquatic Microbes in Field Locations	2013	University of Technology Sydney	$50,547	Waite, A. Doblin, M. Seymour, J. Ralph, P. Vigneswaran, S. Whitchurch, C. Suthers, I. Steinberg, P. Brown, M.
Marine Virtual Laboratory MARVL	2013	University of Tasmania	$56,152	Pattiaratchi, C.
Seagrass Wrack Movement & Coastal Sediment Transport Assessment for the Two Rocks Marina Re Development	2013	WA Department of Transport	$72,901	Pattiaratchi, C.
Development of Tidal Software using MATLAB	2013	WA Department of Transport	$54,500	Pattiaratchi, C.
Western Australian Zebrafish Facility	2013	ARC Linkage Infrastructure Equipment Facilities	$612,000	Hunt, D. Martins, R. Verdile, G. Laws, S. Lister, R. Collin, S. Pavlos, N. Davies, W.
Western Australian Zebrafish Facility	2013	Edith Cowan University	$70,000	Hunt, D. Martins, R. Verdile, G. Laws, S. Lister, R. Collin, S. Pavlos, N. Davies, W.
Effects of Dredging-Related Pressures on Critical Ecological Processes for other Organisms (Including Potential to Facilitate The Establishment of Invasive Species) – Theme 9	2013	Western Australian Marine Science Institute	$77,095	Kendrick, G. Fromont, J. Huisman, J. Keesing, J. Lavery, P. McLean, D.
Benthic primary productivity: Production and herbivory of seagrasses, microalgae and macroalgae	2013	Western Australian Marine Science Institute	$370,000	Kendrick, G. Vanderklift, M. Sawstrom, C.
Defining Thresholds and Indicators of Primary Producer Response to Dredging Related Pressures – Theme 5	2013	Western Australian Marine Science Institute	$616,598	Kendrick, G. Lavery, P. Vanderklift, M.
The role of internal wave-driven near-bed turbulent dynamics in coastal ocean sediment mobilisation	2013	ARC Discovery Projects	$466,600	Ivey, G. Jones, N. Fringer, O. Nash, J. Kelly, S.
Physical oceanograhic dynamics in the Kimberley	2013	Western Australian Marine Science Institute	$70,000	Ivey, G. Brinkman, R. Lowe, R. Jones, N.
R2D3 – STABLEpipe JIP Phase 3'	2013	WA Energy Research Alliance WA:ERA	$449,081	Cheng, L. Draper, S. An, H. White, D.
Response of Piles and Pile groups under Cyclic Loading	2013	Group of Eight Daad German Research Cooperation	$17,600	Cassidy, M. Reul, O. Tian, Y.
Project B2.2: Planning, design and management to protect and restore receiving waters	2013	UWA UQ Bilateral Research Collaboration Award	$406,354	Davies, P. Ghadouani, A.

Publications

PHOTO/ JOAN COSTA

Total peer-reviewed journal articles published by Oceans Institute members

Peer-reviewed journal articles❶



❶ Total number of peer-reviewed journal articles published by The UWA Oceans Institute members.

Journal Articles

Abecasis RC, Longnecker N, Schmidt L, **Clifton J** (2013) Marine conservation in remote small island settings: Factors influencing marine protected area establishment in the Azores. *Marine Policy* **40**(1): 1-9.

Abecasis RC, Schmidt L, Longnecker N, **Clifton J** (2013) Implications of community and stakeholder perceptions of the marine environment and its conservation for MPA management in a small Azorean island. *Ocean and Coastal Management* **84**: 208-219.

Agawin NSR, Tovar-Sánchez A, De Zarruk KK, **Duarte CM**, **Agustí S** (2013) Variability in the abundance of Trichodesmium and nitrogen fixation activities in the subtropical NE Atlantic. *Journal of Plankton Research* **35**(5): 1126-1140.

Agustí S, **Duarte CM** (2013) Phytoplankton lysis predicts dissolved organic carbon release in marine plankton communities. *Biogeosciences* **10**(3): 1259-1264.

Aires T, Serrão EA, **Kendrick GA**, **Duarte CM**, Arnaud-Haond S (2013) Invasion Is a Community Affair: Clandestine Followers in the Bacterial Community Associated to Green Algae, *Caulerpa racemosa*, Track the Invasion Source. *PLoS ONE* **8**(7): e68429

Alcaraz M, Almeda R, Saiz E, Calbet A, **Duarte CM**, **Agusti S**, Santiago R, Alonso A (2013) Effects of temperature on the metabolic stoichiometry of Arctic zooplankton. *Biogeosciences* **10**(2): 689-697.

Alou-Font E, Mundy CJ, Roy S, Gosselin M, **Agustí S** (2013) Snow cover affects ice algal pigment composition in the coastal Arctic Ocean during spring. *Marine Ecology Progress Series* **474**: 89-104.

Arns A, Wahl T, **Haigh ID**, Jensen J, **Pattiaratchi CB** (2013) Estimating extreme water level probabilities: A comparison of the direct methods and recommendations for best practise. *Coastal Engineering* **81**: 51-66.

Aslam SA, **Davies WIL**, Singh MS, Issa PC, Barnard AR, Scott RAH, MacLaren RE (2013) Cone photoreceptor neuroprotection conferred by CNTF in a novel in vivo model of battlefield retinal laser injury. *Investigative Ophthalmology and Visual Science* **54**(8): 5456-5465.

Barrington DJ, **Ghadouani A**, **Ivey GN** (2013) Cyanobacterial and microcystins dynamics following the application of hydrogen peroxide to waste stabilisation ponds. *Hydrology and Earth System Sciences* **17**(6): 2097-2105.

Bellchambers LM, Evans SN, **Meeuwig JJ** (2013) Assessing the effectiveness of two methods of habitat characterisation for understanding species habitat relationships, using the western rock lobster (*Panulirus cygnus* George). *Fisheries Research* **139**: 5-10.

Bentley BP, **Harvey ES**, Newman SJ, Welch DJ, Smith AK, Kennington WJ (2013) Characterization of 13 polymorphic microsatellite loci for the dogtooth tuna *Gymnosarda unicolor*. *Conservation Genetics Resources* **5**(3): 693-695.

Bienen B, **Cassidy MJ** (2013) Set up and resulting punch-through risk of jack-up spudcans during installation. *Journal of Geotechnical and Geoenvironmental Engineering* **139**(12): 2048-2059.

Biswas H, Bandyopadhyay D, **Waite AM** (2013) Copper addition helps alleviate iron stress in a coastal diatom: Response of Chaetoceros gracilis from the Bay of Bengal to experimental Cu and Fe addition. *Marine Chemistry* **157**: 224-232.

Bluteau CE, **Jones NL**, **Ivey GN** (2013) Turbulent mixing efficiency at an energetic ocean site. *Journal of Geophysical Research C: Oceans* **118**(9): 4662-4672.

Bonnet S, Tovar-Sánchez A, Panzeca C, **Duarte CM**, Ortega-Retuerta E, Sañudo-Wilhelmy SA (2013) Geographical gradients of dissolved Vitamin B12 in the Mediterranean Sea. *Frontiers in Microbiology* **4**(JUN): 126.

Borsa P, Arlyza IS, Chen WJ, Durand JD, **Meekan MG**, Shen KN (2013) Resurrection of New Caledonian maskray *Neotrygon trigonoides* (Myliobatoidei: Dasyatidae) from synonymy *with N. kuhlii,* based on *cytochrome-oxidase* / gene sequences and spotting patterns. *Comptes Rendus – Biologies* **336**(4): 221-232.

Bradshaw CJA, Field IC, McMahon CR, Johnson GJ, **Meekan MG**, Buckworth RC (2013) More analytical bite in estimating targets for shark harvest. *Marine Ecology Progress Series* **488**: 221-232.

Butterly L (2013) Watch this (sea) space: native title, fisheries legislation and marine management *Australian Environment Review* **28**(9): 756-760.

Calleja ML, **Duarte CM**, Álvarez M, Vaquer-Sunyer R, **Agustí S**, Herndl GJ (2013) Prevalence of strong vertical CO_2 and O_2 variability in the top meters of the ocean. *Global Biogeochemical Cycles* **27**(3): 941-949.

Camilieri-Asch V, **Kempster RM**, **Collin SP**, Johnstone RW, Theiss SM (2013) A comparison of the electrosensory morphology of a euryhaline and a marine stingray. *Zoology* **116**(5): 270-276.

Campbell SJ, Kartawijaya T, Yulianto I, Prasetia R, **Clifton J** (2013) Co-management approaches and incentives improve management effectiveness in the Karimunjawa National Park, Indonesia. *Marine Policy* **41**: 72-79.

Cariglia N, **Wilson SK**, Graham NAJ, *Fisher R*, Robinson J, Aumeeruddy R, Quatre R, Polunin NVC (2013) Sea cucumbers in the Seychelles: effects of marine protected areas on high-value species. *Aquatic Conservation-Marine and Freshwater Ecosystems* **23**(3): 418-428.

Cassidy MJ, Uzielli M, *Tian Y* (2013) Probabilistic combined loading failure envelopes of a strip footing on spatially variable soil. *Computers and Geotechnics* **49**: 191-205.

Claes JM, Dean MN, Nilsson DE, **Hart NS**, Mallefet J (2013) A deepwater fish with 'lightsabers' – Dorsal spine-associated luminescence in a counterilluminating lanternshark. *Scientific Reports 3***:** 1308

Clifton J (2013) Compensation, conservation and communities: An analysis of direct payments initiatives within an Indonesian marine protected area. *Environmental Conservation* **40**(3): 287-295.

Clifton J (2013) Refocusing conservation through a cultural lens: Improving governance in the Wakatobi National Park, Indonesia. *Marine Policy* **41**: 80-86.

Coimbra JP, **Hart NS**, **Collin SP**, Manger PR (2013) Scene from above: Retinal ganglion cell topography and spatial resolving power in the giraffe (*Giraffa camelopardalis*). *Journal of Comparative Neurology* **521**(9): 2042-2057.

Coletti JZ, Hinz C, Vogwill R, **Hipsey MR** (2013) Hydrological controls on carbon metabolism in wetlands. *Ecological Modelling* **249**: 3-18.

Collin SP (2013) [Book Review] Evolution's witness: how eyes evolved by AU – Ivan R Schwab Oxford: PB – Oxford University Press , 2012 306 pages. *Clinical and Experimental Optometry* **96**(4): 440-440.

Condon RH, **Duarte CM**, Pitt KA, Robinson KL, Lucas CH, Sutherland KR, Mianzan HW, Bogeberg M, Purcell JE, Decker MB, Uye SI, Madin LP, Brodeur RD, Haddock SHD, Malej A, Parry GD, Eriksen E, Quinõnes J, Acha M, Harvey M, Arthur JM, Graham WM (2013) Recurrent jellyfish blooms are a consequence of global oscillations. *Proceedings of the National Academy of Sciences of the United States of America* **110**(3): 1000-1005.

Cox MJ, **Letessier TB**, Brierley AS (2013) Zooplankton and micronekton biovolume at the Mid-Atlantic Ridge and Charlie-Gibbs Fracture Zone estimated by multi-frequency acoustic survey. *Deep-Sea Research Part II: Topical Studies in Oceanography* **98**: 269-278.

Cummins N, Bartlett CA, Archer M, Bartlett E, **Hemmi JM**, Harvey AR, Dunlop SA, Fitzgerald M (2013) Changes to mitochondrial ultrastructure in optic nerve vulnerable to secondary degeneration in vivo are limited by irradiation at 670 nm. *BMC Neuroscience* **14:** 98.

Cvitanovic C, **Wilson SK**, Fulton CJ, Almany GR, Anderson P, Babcock RC, Ban NC, Beeden RJ, Beger M, Cinner J, Dobbs K, Evans LS, Farnham A, **Friedman KJ**, Gale K, Gladstone W, Grafton Q, Graham NAJ, Gudge S, Harrison PL, **Holmes TH**, Johnstone N, Jones GP, Jordan A, Kendrick AJ, Klein CJ, Little LR, Malcolm HA, Morris D, Possingham HP, Prescott J, Pressey RL, Skilleter GA, Simpson C, Waples K, Wilson D, Williamson DH (2013) Critical research needs for managing coral reef marine protected areas: Perspectives of academics and managers. *Journal of Environmental Management* **114**: 84-91.

de Bettignies T, **Wernberg T**, Lavery PS (2013) Size, not morphology, determines hydrodynamic performance of a kelp during peak flow. **Marine Biology 160**(4): 843-851.

de Bettignies T, **Wernberg T**, Lavery PS, Vanderklift MA, **Mohring MB** (2013) Contrasting mechanisms of dislodgement and erosion contribute to production of kelp detritus. *Limnology and Oceanography* **58**(5): 1680-1688.

de Busserolles F, Fitzpatrick JL, Paxton JR, Marshall NJ, **Collin SP** (2013) Eye-Size Variability in Deep-Sea Lanternfishes (Myctophidae): An Ecological and Phylogenetic Study. *PLoS ONE 8*(3): e58519

de Santana CN, Rozenfeld AF, Marquet PA, **Duarte CM** (2013) Topological properties of polar food webs. *Marine Ecology Progress Series* **474**: 15-26.

De Vos A, Christiansen F, Harcourt RG, **Pattiaratchi CB (**2013) Surfacing characteristics and diving behaviour of blue whales in Sri Lankan waters. *Journal of Experimental Marine Biology and Ecology* **449**: 149-153.

Depczynski M, **Gagliano M** (2013) Natural-born con artists and counterfeiters. *Communicative and Integrative Biology* **6**(4): e24586

Depczynski M, **Gilmour JP**, **Ridgway T**, Barnes H, **Heyward AJ**, **Holmes TH**, Moore JAY, **Radford BT**, Thomson DP, **Tinkler P**, **Wilson SK** (2013) Bleaching, coral mortality and subsequent survivorship on a West Australian fringing reef. *Coral Reefs* **32**(1): 233-238.

Di Nitto D, **Erftemeijer PLA**, van Beek JKL, Dahdouh-Guebas F, Higazi L, Quisthoudt K, Jayatissa LP, Koedam N (2013) Modelling drivers of mangrove propagule dispersal and restoration of abandoned shrimp farms. *Biogeosciences* **10**(7): 5095-5113.

D'Olivo JP, **McCulloch MT**, Judd K (2013) Long-term records of coral calcification across the central Great Barrier Reef: Assessing the impacts of river runoff and climate change. *Coral Reefs* **32**(4): 999-1012.

Dromph KM, **Agusti S**, Basset A, Franco J, Henriksen P, Icely J, Lehtinen S, Moncheva S, Revilla M, Roselli L, Sørensen K (2013) Sources of uncertainty in assessment of marine phytoplankton communities. *Hydrobiologia* **704**(1): 253-264.

Duarte CM, Borja A, Carstensen J, Elliott M, Krause-Jensen D, Marbà N (2013) Paradigms in the Recovery of Estuarine and Coastal Ecosystems. *Estuaries and Coasts*.

Duarte CM, Hendriks IE, Moore TS, **Olsen YS**, Steckbauer A, Ramajo L, Carstensen J, **Trotter JA**, **McCulloch MT** (2013) Is Ocean Acidification an Open-Ocean Syndrome? Understanding Anthropogenic Impacts on Seawater pH. *Estuaries and Coasts* **36**(2): 221-236.

Duarte CM, Kennedy H, Marbà N, Hendriks I (2013) Assessing the capacity of seagrass meadows for carbon burial: Current limitations and future strategies. *Ocean and Coastal Management* **83**: 32-38.

Duarte CM, Losada IJ, Hendriks IE, Mazarrasa I, Marbà N (2013) The role of coastal plant communities for climate change mitigation and adaptation. *Nature Climate Change* **3**(11): 961-968.

Duarte CM, Pitt KA, Lucas CH, Purcell JE, Uye SI, Robinson K, Brotz L, Decker MB, Sutherland KR, Malej A, Madin L, Mianzan H, Gili JM, Fuentes V, Atienza D, *Pages F*, Breitburg D, Malek J, Graham WM, Condon RH (2013) Is global ocean sprawl a cause of jellyfish blooms? *Frontiers in Ecology and the Environment* **11**(2): 91-97.

Duarte CM, Regaudie-De-Gioux A, Arrieta JM, Delgado-Huertas A, **Agustí S** (2013) The oligotrophic ocean is heterotrophic. *Annual Review of Marine Science* **5**: 551-569.

Duarte CM, Sintes T, Marbà N (2013) Assessing the CO_2 capture potential of seagrass restoration projects. *Journal of Applied Ecology* **50**(6): 1341-1349.

Dumas JP, **Langlois TJ**, Clarke KR, **Waddington KI** (2013) Strong preference for decapod prey by the western rock lobster *Panulirus cygnus*. *Journal of Experimental Marine Biology and Ecology* **439**: 25-34.

Espinosa-Gayosso A, Ghisalberti M, **Ivey GN**, **Jones NL** (2013) Particle capture by a circular cylinder in the vortex-shedding regime. *Journal of Fluid Mechanics* **733**: 171-188.

Fabina NS, Putnam HM, Franklin EC, **Stat M**, Gates RD (2013) Symbiotic specificity, association patterns, and function determine community responses to global changes: defining critical research areas for coral-Symbiodinium symbioses. *Global Change Biology* **19**(11): 3306-3316.

Falter JL, **Lowe RJ**, **Zhang Z**, **McCulloch MT** (2013) Physical and Biological Controls on the Carbonate Chemistry of Coral Reef Waters: Effects of Metabolism, Wave Forcing, Sea Level, and Geomorphology. *PLoS ONE* **8**(1): e53303

Fang JKH, Mello-Athayde MA, **Schönberg CHL**, Kline DI, Hoegh-Guldberg O, Dove S (2013) Sponge biomass and bioerosion rates increase under ocean warming and acidification. *Global Change Biology* **19**(12): 3581-3591.

Fang JKH, **Schönberg CHL**, Kline DI, Hoegh-Guldberg O, Dove S (2013) Methods to quantify components of the excavating sponge *Cliona orientalis* Thiele, 1900. *Marine Ecology* **34**(2): 193-206.

Ferguson AM, **Harvey ES**, Taylor MD, Knott NA (2013) A Herbivore Knows Its Patch: Luderick, *Girella tricuspidata*, Exhibit Strong Site Fidelity on Shallow Subtidal Reefs in a Temperate Marine Park. *PLoS ONE* **8**(5): e65838

Fitzpatrick C, **McLean DL**, **Harvey ES** (2013) Using artificial illumination to survey nocturnal reef fish. *Fisheries Research* **146**: 41-50.

Forehead H, Thomson P, **Kendrick GA** (2013) Shifts in composition of microbial communities of subtidal sandy sediments maximise retention of nutrients. *FEMS Microbiology Ecology* **83**(2): 279-298.

Gagliano M, **Depczynski M** (2013) Spot the Difference: Mimicry in a Coral Reef Fish. *PLoS ONE* **8**(2): e55938

Gallop SL, **Bosserelle C**, Eliot I, **Pattiaratchi CB** (2013) The influence of coastal reefs on spatial variability in seasonal sand fluxes. *Marine Geology* **344**: 132-143.

García R, Holmer M, **Duarte CM**, Marbà N (2013) Global warming enhances sulphide stress in a key seagrass species (NW Mediterranean). *Global Change Biology* **19**(12): 3629-3639.

Gilmour JP, **Smith LD**, **Heyward AJ**, Baird AH, Pratchett MS (2013) Recovery of an isolated coral reef system following severe disturbance. *Science* **340**(6128): 69-71.

Goetze JS, **Fullwood LAF** (2013) Fiji's largest marine reserve benefits reef sharks. *Coral Reefs* **32**(1): 121-125.

González-Rivero M, Ereskovsky AV, **Schönberg CHL**, Ferrari R, Fromont J, Mumby PJ (2013) Life-history traits of a common Caribbean coral-excavating sponge, *Cliona tenuis* (Porifera: Hadromerida). *Journal of Natural History* **47**(45-46): 2815-2834.

Granados-Cifuentes C, Bellantuono AJ, **Ridgway T**, Hoegh-Guldberg O, Rodriguez-Lanetty M (2013) High natural gene expression variation in the reef-building coral *Acropora millepora*: Potential for acclimative and adaptive plasticity. *BMC Genomics* **14**(1): 228

Grove CA, Brummer GJA, Kasper S, **Zinke J**, Pfeiffer M, Garbe-Schonberg D (2013) Confounding effects of coral growth and high SST variability on skeletal Sr/Ca: Implications for coral paleothermometry. *Geochemistry Geophysics Geosystems* **14**(4): 1277-1293.

Grove CA, **Zinke J**, Peeters F, Park W, Scheufen T, Kasper S, Randriamanantsoa B, **McCulloch MT**, Brummer GJA (2013) Madagascar corals reveal a multidecadal signature of rainfall and river runoff since 1708. *Climate of the Past* **9**(2): 641-656.

Hardinge J, **Harvey ES**, **Saunders BJ**, **Newman SJ** (2013) A little bait goes a long way: The influence of bait quantity on a temperate fish assemblage sampled using stereo-BRUVs. *Journal of Experimental Marine Biology and Ecology* **449**: 250-260.

Harvey ES, Cappo M, **Kendrick GA**, **McLean DL** (2013) Coastal fish assemblages reflect geological and oceanographic gradients within an Australian zootone. *PLoS ONE* **8**(11): e80955

Hassell NS, Williamson DH, **Evans RD**, Russ GR (2013) Reliability of Non-Expert Observer Estimates of the Magnitude of Marine Reserve Effects. *Coastal Management* **41**(4): 361-380.

Hendriks IE, Tenan S, Tavecchia G, Marbà N, Jordà G, Deudero S, Álvarez E, **Duarte CM** (2013) Boat anchoring impacts coastal populations of the pen shell, The largest bivalve in the Mediterranean. *Biological Conservation* **160**: 105-113.

Hetzel Y, **Pattiaratchi CB**, **Lowe RJ** (2013) Intermittent dense water outflows under variable tidal forcing in Shark Bay, Western Australia. *Continental Shelf Research* **66**: 36-48.

Hinrichs S, **Patten NL**, Allcock RJN, Saunders SM, **Strickland D**, **Waite AM** (2013) Seasonal variations in energy levels and metabolic processes of two dominant *Acropora* species (*A. spicifera* and *A. digitifera*) at Ningaloo Reef. *Coral Reefs* **32**(3): 623-635.

Hinrichs S, **Patten NL**, **Feng M**, **Strickland D**, **Waite AM** (2013) Which Environmental Factors Predict Seasonal Variation in the Coral Health of *Acropora digitifera* and *Acropora spicifera* at Ningaloo Reef? *PLoS ONE* **8**(4): e60830

Hinrichs S, **Patten NL**, **Waite AM** (2013) Temporal Variations in Metabolic and Autotrophic Indices for *Acropora digitifera* and *Acropora spicifera* – Implications for Monitoring Projects. *PLoS ONE* **8**(5): e63693

Hobbs JPA (2013) Obligate corallivorous filefish (*Oxymonacanthus longirostris*) switches diet from *Acropora* to *Pocillopora* corals following habitat loss. *Marine Biodiversity* **43**(3): 175-176.

Hobbs JPA, Frisch AJ, **Ford BM**, **Thums M**, Saenz-Agudelo P, Furby KA, Berumen ML (2013) Taxonomic, Spatial and Temporal Patterns of Bleaching in Anemones Inhabited by Anemonefishes. *PLoS ONE* **8**(8): e70966

Hobbs JPA, Herwerden LV, Jerry DR, Jones GP, Munday PL (2013) High genetic diversity in geographically remote populations of endemic and widespread coral reef angelfishes (genus: *Centropyge*). *Diversity* **5**(1): 39-50.

Hodder MS, White DJ, **Cassidy MJ** (2013) An effective stress framework for the variation in penetration resistance due to episodes of remoulding and reconsolidation. *Geotechnique* **63**(1): 30-43.

Holding JM, **Duarte CM**, Arrieta JM, Vaquer-Suyner R, Coello-Camba A, Wassmann P, **Agustí S** (2013) Experimentally determined temperature thresholds for Arctic plankton community metabolism. *Biogeosciences* **10**(1): 357-370.

Holmer M, **Kendrick GA** (2013) High Sulfide Intrusion in Five Temperate Seagrasses Growing Under Contrasting Sediment Conditions. *Estuaries and Coasts* **36**(1): 116-126.

Holmes TH, **Wilson SK**, **Travers MJ**, **Langlois TJ**, *Evans RD*, Moore GI, Douglas RA, Shedrawi G, **Harvey ES**, **Hickey K** (2013) A comparison of visual- and stereo-video based fish community assessment methods in tropical and temperate marine waters of Western Australia. *Limnology and Oceanography: Methods* **11**(JULY): 337-350.

Jaiteh V, Allen S, Loneragan N, **Meeuwig JJ** (2013) Combining in-trawl video with observer coverage improves understanding of protected and vulnerable species bycatch in trawl fisheries [Accepted for publication]. *Marine and Freshwater Research*.

Jaiteh VF, Allen SJ, **Meeuwig JJ**, Loneragan NR (2013) Subsurface behavior of bottlenose dolphins (*Tursiops truncatus*) interacting with fish trawl nets in northwestern Australia: Implications for bycatch mitigation. *Marine Mammal Science* **29**(3): E266-E281.

Johansson CL, Bellwood DR, **Depczynski M**, Hoey AS (2013) The distribution of the sea urchin *Echinometra mathaei* (de Blainville) and its predators on Ningaloo Reef, Western Australia: The implications for top-down control in an intact reef system. *Journal of Experimental Marine Biology and Ecology* **442**: 39-46.

Johansson CL, van de Leemput IA, **Depczynski M**, Hoey AS, Bellwood DR (2013) Key herbivores reveal limited functional redundancy on inshore coral reefs. *Coral Reefs* **32**(4): 963-972.

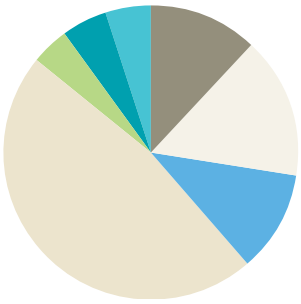
Jordà G, Marbà N, **Duarte CM** (2013) Climate warming and Mediterranean seagrass. *Nature Climate Change* **3**(1): 3-4.

Kelly SM, **Jones NL**, Nash JD (2013) A coupled model for Laplace's tidal equations in a fluid with one horizontal dimension and variable depth. *Journal of Physical Oceanography* **43**(8): 1780-1797.

Kelly SM, **Jones N***L*, Nash JD, Waterhouse AF (2013) The geography of semidiurnal mode-1 internal-tide energy loss. *Geophysical Research Letters* **40**(17): 4689-4693.

Kempster RM, **Garza-Gisholt E**, **Egeberg CA**, **Hart NS**, **O'Shea OR**, **Collin SP** (2013) Sexual dimorphism of the electrosensory system: A quantitative analysis of nerve axons in the dorsal anterior lateral line nerve of the blue-spotted fantail stingray (*Taeniura lymma*). *Brain, Behavior and Evolution* **81**(4): 226-235.

Publications by research area



Ocean engineering	30
Marine resources and governance❶	39
Climate impacts❷	28
Marine biology and ecology	118
Marine observation❸	10
Blue water oceanography	13
Coastal processes	12
TOTAL	250

❶ Marine biological resources, management, governance and conservation
❷ Impacts of climate change in the marine environment
❸ Marine observation, monitoring and risk management

Kempster RM, **Hart NS**, **Collin SP** (2013) Survival of the Stillest: Predator Avoidance in Shark Embryos. *PLoS ONE* **8**(1): e52551

Kempster RM, **Hunt DM**, Human BA, **Egeberg CA**, **Collin SP** (2013) First record of the mandarin dogfish *Cirrhigaleus barbifer* (Chondrichthyes: Squalidae) from Western Australia. *Marine Biodiversity Records* **6**: e25

Kennedy EV, Perry CT, Halloran PR, Iglesias-Prieto R, **Schönberg CHL**, Wisshak M, Form AU, Carricart-Ganivet JP, Fine M, Eakin CM, Mumby PJ (2013) Avoiding coral reef functional collapse requires local and global action. *Current Biology* **23**(10): 912-918.

Knott B, **Davies WIL**, Carvalho LS, Berg ML, Buchanan KL, Bowmaker JK, Bennett ATD, **Hunt DM** (2013) How parrots see their colours: Novelty in the visual pigments of *Platycercus elegans*. *Journal of Experimental Biology* **216**(23): 4454-4461.

Koh W, **Clode PL**, Monis P, Thompson RA (2013) Multiplication of the waterborne pathogen *Cryptosporidium parvum* in an aquatic biofilm system. *Parasites & Vectors* **6**(1): 270

Kong V, **Cassidy MJ**, **Gaudin C** (2013) Experimental study of effect of geometry on reinstallation of jack-up next to footprint. *Canadian Geotechnical Journal* **50**(5): 557-573.

Kroeker KJ, Kordas RL, Crim R, Hendriks IE, Ramajo L, Singh GS, **Duarte CM**, Gattuso JP (2013) Impacts of ocean acidification on marine organisms: Quantifying sensitivities and interaction with warming. *Global Change Biology* **19**(6): 1884-1896.

Lamborg CH, Swarr G, Hughen K, **Jones RJ**, Birdwhistell S, Furby K, Murty SA, Prouty N, Tseng CM (2013) Determination of low-level mercury in coralline aragonite by calcination-isotope dilution-inductively coupled plasma-mass spectrometry and its application to Diploria specimens from Castle Harbour, Bermuda. *Geochimica Et Cosmochimica Acta* **109**: 27-37.

Lara E, Arrieta JM, Garcia-Zarandona I, Boras JA, **Duarte CM**, **Agustí S**, Wassmann PF, Vaqué D (2013) Experimental evaluation of the warming effect on viral, bacterial and protistan communities in two contrasting Arctic systems. *Aquatic Microbial Ecology* **70**(1): 17-32.

Lasternas S, Piedeleu M, Sangra P, **Duarte CM**, **Agusti S** (2013) Forcing of dissolved organic carbon release by phytoplankton by anticyclonic mesoscale eddies in the subtropical NE Atlantic Ocean. *Biogeosciences* **10**(3): 2129-2143.

Laverock B, Kitidis V, Tait K, Gilbert JA, Osborn AM, Widdicombe S (2013) Bioturbation determines the response of benthic ammonia-oxidizing microorganisms to ocean acidification. *Philosophical Transactions of the Royal Society B-Biological Sciences* **368**(1627): UNSP 20120441

Laverock B, Tait K, Gilbert JA, Osborn AM, Widdicombe S (2014) Impacts of bioturbation on temporal variation in bacterial and archaeal nitrogen-cycling gene abundance in coastal sediments. *Environmental Microbiology Reports* **6**(1): 113-121.

Lavery PS, Mateo MA, **Serrano O**, Rozaimi M (2013) Variability in the Carbon Storage of Seagrass Habitats and Its Implications for Global Estimates of Blue Carbon Ecosystem Service. *PLoS ONE* **8**(9): e73748

Lécuyer C, Amiot R, Touzeau A, **Trotter JA** (2013) Calibration of the phosphate ^{18}O thermometer with carbonate-water oxygen isotope fractionation equations. *Chemical Geology* **347**: 217-226.

Lee KK, **Cassidy MJ**, **Randolph MF** (2013) Bearing capacity on sand overlying clay soils: Experimental and finite-element investigation of potential punch-through failure. *Geotechnique* **63**(15): 1271-1284.

Lee KK, **Randolph MF**, **Cassidy MJ** (2013) Bearing capacity on sand overlying clay soils: A simplified conceptual model. *Geotechnique* **63**(15): 1285-1297.

Lesser MP, **Stat M**, Gates RD (2013) The endosymbiotic dinoflagellates (*Symbiodinium* sp.) of corals are parasites and mutualists. *Coral Reefs* **32**(3): 603-611.

Letessier TB, Kawaguchi S, King R, **Meeuwig JJ**, Harcourt R, Cox MJ (2013) A Robust and Economical Underwater Stereo Video System to Observe Antarctic Krill (*Euphausia superba*). *Open Journal of Marine Science* **3**(3): 148-153

Letessier TB, **Meeuwig JJ**, Gollock M, **Groves L**, **Bouchet PJ**, **Chapuis L**, **Vianna GMS**, Kemp K, Koldewey HJ (2013) Assessing pelagic fish populations: The application of demersal video techniques to the mid-water environment. *Methods in Oceanography* [Article in Press]

Li Y, **Waite AM**, Gal G, **Hipsey MR** (2013) An analysis of the relationship between phytoplankton internal stoichiometry and water column N: P ratios in a dynamic lake environment. *Ecological Modelling* **252**(1): 196-213.

Llabrés M, **Agustí S**, Fernández M, Canepa A, Maurin F, Vidal F, **Duarte CM** (2013) Impact of elevated UVB radiation on marine biota: A meta-analysis. *Global Ecology and Biogeography* **22**(1): 131-144.

Lunt ID, Byrne M, Hellmann JJ, **Mitchell NJ**, Garnett ST, Hayward MW, Martin TG, McDonald-Maddden E, Williams SE, Zander KK (2013) Using assisted colonisation to conserve biodiversity and restore ecosystem function under climate change [Review]. *Biological Conservation* **157**: 172-177.

Maina J, de Moel H, **Zinke J**, Madin J, McClanahan T, Vermaat JE (2013) Human deforestation outweighs future climate change impacts of sedimentation on coral reefs. *Nature Communications* **4**.

Marbà N, Krause-Jensen D, Alcoverro T, Birk S, Pedersen A, Neto JM, Orfanidis S, Garmendia JM, Muxika I, Borja A, Dencheva K, **Duarte CM** (2013) Diversity of European seagrass indicators: Patterns within and across regions. *Hydrobiologia* **704**(1): 265-278.

Massa SI, Paulino CM, Serrão EA, **Duarte CM**, Arnaud-Haond S (2013) Entangled effects of allelic and clonal (genotypic) richness in the resistance and resilience of experimental populations of the seagrass *Zostera noltii* to diatom invasion. *BMC Ecology* **13**.

Mazarrasa I, **Olsen YS**, Mayol E, Marbà N, **Duarte CM** (2013) Rapid growth of seaweed biotechnology provides opportunities for developing nations. *Nature Biotechnology* **31**(7): 591-592.

McClements M, **Davies WI***L*, Michaelides M, Carroll J, Rha J, Mollon JD, Neitz M, MacLaren RE, Moore AT, **Hunt DM** (2013) X-linked cone dystrophy and colour vision deficiency arising from a missense mutation in a hybrid L/M cone opsin gene. *Vision Research* **80**: 41-50.

McClements M, **Davies WIL**, Michaelides M, Young T, Neitz M, MacLaren RE, Moore AT, **Hunt DM** (2013) Variations in opsin coding sequences cause X-linked cone dysfunction syndrome with myopia and dichromacy. *Investigative Ophthalmology and Visual Science* **54**(2): 1361-1369.

Mennis J, Mason MJ, *Cao Y* (2013) Qualitative GIS and the visualization of narrative activity space data. *International Journal of Geographical Information Science* **27**(2): 267-291.

Mines CH, **Ghadouani A**, Legendre P, Yan ND, **Ivey GN** (2013) Examining shifts in zooplankton community variability following biological invasion. *Limnology and Oceanography* **58**(1): 399-408.

Mohring MB, **Kendrick GA**, **Wernberg T**, **Rule MJ**, Vanderklift MA (2013) Environmental Influences on Kelp Performance across the Reproductive Period: An Ecological Trade-Off between Gametophyte Survival and Growth? *PLoS ONE* **8**(6): e65310

Mohring MB, **Wernberg T**, **Kendrick GA**, **Rule MJ** (2013) Reproductive synchrony in a habitat-forming kelp and its relationship with environmental conditions. *Marine Biology* **160**(1): 119-126.

Montanari A, Young G, Savenije HHG, Hughes D, Wagener T, Ren LL, Koutsoyiannis D, Cudennec C, Toth E, Grimaldi S, Blöschl G, Sivapalan M, Beven K, Gupta H, **Hipsey MR**, Schaefli B, Arheimer B, Boegh E, Schymanski SJ, Di Baldassarre G, Yu B, Hubert P, Huang Y, Schumann A, Post DA, Srinivasan V, Harman C, Thompson S, Rogger M, Viglione A, McMillan H, Characklis G, Pang Z, Belyaev V (2013) "Panta Rhei-Everything Flows": Change in hydrology and society-The IAHS Scientific Decade 2013-2022. *Hydrological Sciences Journal* **58**(6): 1256-1275.

Montanari SR, Gardner MG, **Hobbs JPA**, Pratchett MS, Bay LK, van Herwerden L (2013) Isolation and characterization of twenty microsatellite markers for the study of hybridization in butterflyfish of the genus *Chaetodon*. *Conservation Genetics Resources* **5**(3): 783-786.

Mudersbach C, Wahl T, **Haigh ID**, Jensen J (2013) Trends in high sea levels of German North Sea gauges compared to regional mean sea level changes. *Continental Shelf Research* **65**: 111-120.

Nash KL, Graham NAJ, **Wilson SK**, Bellwood DR (2013) Cross-scale Habitat Structure Drives Fish Body Size Distributions on Coral Reefs. *Ecosystems* **16**(3): 478-490.

Neo ML, **Erftemeijer PLA**, van Beek JKL, van Maren DS, Te SLM, Todd PA (2013) Recruitment Constraints in Singapore's Fluted Giant Clam (*Tridacna squamosa*) Populations – A Dispersal Model Approach. *PLoS ONE* **8**(3): e58819

Newman AS, Marshall JN, **Collin SP** (2013) Visual Eyes: A Quantitative Analysis of the Photoreceptor Layer in Deep-Sea Sharks. *Brain Behavior and Evolution* **82**(4): 237-249.

Nivison-Smith L, **Collin SP**, Zhu Y, Ready S, Acosta ML, **Hunt DM**, Potter IC, Kalloniatis M (2013) Retinal Amino Acid Neurochemistry of the Southern Hemisphere Lamprey, *Geotria australis*. *PLoS ONE* **8**(3): e58406

Olsen YS, Fox SE, Hofmann L, Valiela I (2013) Benthic community composition and faunal stable isotopic signatures differ across small spatial scales in a temperate estuary. *Marine Environmental Research* **86**: 12-20.

O'Shea OR, Braccini M, McAuley R, **Speed CW**, **Meekan MG** (2013) Growth of Tropical dasyatid Rays Estimated Using a Multi-Analytical Approach. *PLoS ONE* **8**(10): e77194

O'Shea OR, **Thums M**, van Keulen M, **Kempster RM**, **Meekan MG** (2013) Dietary partitioning by five sympatric species of stingray (Dasyatidae) on coral reefs. *Journal of Fish Biology* **82**(6): 1805-1820.

Pannell DJ, Roberts AM, Park G, Alexander J (2013) Designing a practical and rigorous framework for comprehensive evaluation and prioritisation of environmental projects. *Wildlife Research* **40**(2): 126-133.

Pannell DJ, Roberts AM, Park G, Alexander J (2013) Improving environmental decisions: A transaction-costs story. *Ecological Economics* **88**: 244-252.

Park G, Roberts A, Alexander J, McNamara L, **Pannell DJ** (2013) The quality of resource condition targets in regional natural resource management in Australia. *Australasian Journal of Environmental Management* **20**(4): 285-301.

Parmesan C, Burrows MT, **Duarte CM**, Poloczanska ES, Richardson AJ, Schoeman DS, Singer MC (2013) Beyond climate change attribution in conservation and ecological research. *Ecology Letters* **16**: 58-71.

Paterson H, **Heel K**, **Waite AM** (2013) A warm-core eddy linking shelf, Leeuwin Current and oceanic waters demonstrated by near-shelf distribution patterns of *Synechococcus* spp. and *Prochlorococcus* spp. in the eastern Indian Ocean. *Marine and Freshwater Research* **64**(11): 1011-1021.

Pitt KA, **Duarte CM**, Lucas CH, Sutherland KR, Condon RH, Mianzan H, Purcell JE, Robinson KL, Uye SI (2013) Jellyfish Body Plans Provide Allometric Advantages beyond Low Carbon Content. *PLoS ONE* **8**(8): e72683

Poloczanska ES, Brown CJ, Sydeman WJ, Kiessling W, Schoeman DS, Moore PJ, Brander K, Bruno JF, Buckley LB, Burrows MT, **Duarte CM**, Halpern BS, Holding J, Kappel CV, O'Connor MI, Pandolfi JM, Parmesan C, Schwing F, Thompson SA, Richardson AJ (2013) Global imprint of climate change on marine life. *Nature Climate Change* **3**(10): 919-925.

Priede IG, Bergstad OA, Miller PI, Vecchione M, Gebruk A, Falkenhaug T, Billett DSM, Craig J, Dale AC, Shields MA, Tilstone GH, Sutton TT, Gooday AJ, Inall ME, Jones DOB, Martinez- Vicente V, Menezes GM, Niedzielski T, Sigurdsson T, Rothe N, Rogacheva A, Alt CHS, Brand T, Abell R, Brierley AS, Cousins NJ, Crockard D, Hoelzel AR, Høines Å, **Letessier TB**, Read JF, Shimmield T, Cox MJ, Galbraith JK, Gordon JDM, Horton T, Neat F, Lorance P (2013) Does Presence of a Mid-Ocean Ridge Enhance Biomass and Biodiversity? *PLoS ONE* **8**(5): e61550

Prouty NG, Goodkin NF, **Jones RJ**, Lamborg CH, Storlazzi CD, Hughen KA (2013) Environmental assessment of metal exposure to corals living in Castle Harbour, Bermuda. *Marine Chemistry* **154**: 55-66.

Raguragavan J, **Hailu A**, **Burton MP** (2013) Economic valuation of recreational fishing in Western Australia: Statewide random utility modelling of fishing site choice behaviour. *Australian Journal of Agricultural and Resource Economics* **57**(4): 539-558.

Raina JB, Tapiolas DM, Forêt S, Lutz A, Abrego D, Ceh J, Seneca FO, **Clode PL**, Bourne DG, Willis BL, Motti CA (2013) DMSP biosynthesis by an animal and its role in coral thermal stress response. *Nature* **502**(7473): 677-680.

Regaudie-de-Gioux A, **Duarte CM** (2013) Global patterns in oceanic planktonic metabolism. *Limnology and Oceanography* **58**(3): 977-986.

Reichwaldt ES, Song H, **Ghadouani A** (2013) Effects of the Distribution of a Toxic Microcystis Bloom on the Small Scale Patchiness of Zooplankton. *PLoS ONE* **8**(6): e66674

Reisser J, Proietti M, Sazima I, Kinas P, Horta P, Secchi E (2013) Feeding ecology of the green turtle (*Chelonia mydas*) at rocky reefs in western South Atlantic. *Marine Biology* **160**(12): 3169-3179.

Reisser J, Shaw J, Wilcox C, Hardesty BD, Proietti M, **Thums M**, **Pattiaratchi CB** (2013) Marine plastic pollution in waters around Australia: Characteristics, concentrations, and pathways. *PLoS ONE* **8**(11): e80466

Rogers AA, **Cleland JA**, **Burton MP** (2013) The inclusion of non-market values in systematic conservation planning to enhance policy relevance. *Biological Conservation* **162**: 65-75.

Rogers AA, Kragt ME, Gibson FL, **Burton MP**, Petersen EH, **Pannell DJ** (2013) Non-market valuation: Usage and impacts in environmental policy and management in Australia. *Australian Journal of Agricultural and Resource Economics* **57**: 1-15.

Rohling EJ, **Haigh ID**, Foster GL, Roberts AP, Grant KM (2013) A geological perspective on potential future sea-level rise. *Scientific Reports* **3:** 3461.

Rossi V, Feng M, **Pattiaratchi CB**, Roughan M, **Waite AM** (2013) Linking synoptic forcing and local mesoscale processes with biological dynamics off Ningaloo Reef. *Journal of Geophysical Research C: Oceans* **118**(3): 1211-1225.

Rossi V, Feng M, **Pattiaratchi CB**, Roughan M, **Waite AM** (2013) On the factors influencing the development of sporadic upwelling in the Leeuwin Current system. *Journal of Geophysical Research C: Oceans* **118**(7): 3608-3621.

Rout TM, McDonald-Madden E, Martin TG, **Mitchell NJ**, Possingham HP, Armstrong DP (2013) How to Decide Whether to Move Species Threatened by Climate Change. *PLoS ONE* **8**(10): e75814

Rozaimi M, **Serrano O**, Lavery PS (2013) Comparison of carbon stores by two morphologically different seagrasses. *The Journal of the Royal Society of Western Australia* **96**(2): 81-83.

Ruppert JLW, **Travers MJ**, **Smith LL**, Fortin MJ, **Meekan MG** (2013) Caught in the Middle: Combined Impacts of Shark Removal and Coral Loss on the Fish Communities of Coral Reefs. *PLoS ONE* **8**(9): e74648

Saunders BJ, **Harvey ES**, **Kendrick GA** (2013) Nesting behaviour of a temperate damselfish (*Parma mccullochi*) and its influence on algae. *Marine and Freshwater Behaviour and Physiology* **46**(3): 169-182.

Schick RS, New LF, Thomas L, Costa DP, Hindell MA, McMahon CR, Robinson PW, Simmons SE, **Thums M**, Harwood J, Clark JS (2013) Estimating resource acquisition and at-sea body condition of a marine predator. *Journal of Animal Ecology* **82**(6): 1300-1315.

Schwarz JA, Mitchelmore CL, **Jones R**, O'Dea A, Seymour S (2013) Exposure to copper induces oxidative and stress responses and DNA damage in the coral *Montastraea franksi*. *Comparative Biochemistry and Physiology – C Toxicology and Pharmacology* **157**(3): 272-279.

Sequeira AMM, Mellin C, Delean S, **Meekan MG**, Bradshaw CJA (2013) Spatial and temporal predictions of inter-decadal trends in Indian Ocean whale sharks. *Marine Ecology Progress Series* **478**: 185-195.

Sequeira AMM, Mellin C, **Meekan MG**, Sims DW, Bradshaw CJA (2013) Inferred global connectivity of whale shark Rhincodon typus populations. *Journal of Fish Biology* **82**(2): 367-389.

Serhadlioğlu S, Adcock TAA, Houlsby GT, **Draper S**, Borthwick AGL (2013) Tidal stream energy resource assessment of the Anglesey Skerries. *International Journal of Marine Energy* **3-4**: e98-e111

Serrano O, Martínez-Cortizas A, Mateo MA, Biester H, Bindler R (2013) Millennial scale impact on the marine biogeochemical cycle of mercury from early mining on the Iberian Peninsula. *Global Biogeochemical Cycles* **27**(1): 21-30.

Shanks ME, Downes SM, Copley RR, Lise S, Broxholme J, Hudspith KAZ, Kwasniewska A, **Davies WIL**, Hankins MW, Packham ER, Clouston P, Seller A, Wilkie AOM, Taylor JC, Ragoussis J, Németh AH (2013) Next-generation sequencing (NGS) as a diagnostic tool for retinal degeneration reveals a much higher detection rate in early-onset disease. *European Journal of Human Genetics* **21**(3): 274-280.

Sinang SC, Reichwaldt ES, **Ghadouani A** (2013) Spatial and temporal variability in the relationship between cyanobacterial biomass and microcystins. *Environmental Monitoring and Assessment* **185**(8): 6379-6395.

Sinclair EA, Verduin J, Krauss SL, Hardinge J, Anthony J, **Kendrick GA** (2013) A genetic assessment of a successful seagrass meadow (*Posidonia australis*) restoration trial. *Ecological Management and Restoration* **14**(1): 68-71.

Smale DA (2013) Multi-scale patterns of spatial variability in sessile assemblage structure do not alter predictably with development time. *Marine Ecology Progress Series* **482**: 29-41.

Smale DA, **Wernberg T** (2013) Extreme climatic event drives range contraction of a habitat-forming species. *Proceedings of the Royal Society B: Biological Sciences* **280**(1754): 20122829.

Smale DA, **Wernberg T** (2013) Population structure of the purple sea urchin *Heliocidaris erythrogramma* along a latitudinal gradient in south-west Australia. *Journal of the Marine Biological Association of the United Kingdom*. **94**(5): 1033-1040.

Smolka J, Raderschall CA, **Hemmi JM** (2013) Flicker is part of a multi-cue response criterion in fiddler crab predator avoidance. *Journal of Experimental Biology* **216**(7): 1219-1224.

Smith A, Guastella LA, Mather AA, Bundy SC, **Haigh ID** (2013) KwaZulu-Natal coastal erosion events of 2006/2007 and 2011: A predictive tool? *South African Journal of Science* **109**(3-4): 0025.

Speed CW, Babcock RC, Bancroft KP, Beckley LE, Bellchambers LM, **Depczynski M**, **Field SN**, **Friedman KJ**, **Gilmour JP**, **Hobbs JPA**, Kobryn HT, Moore JAY, Nutt CD, Shedrawi G, Thomson DP, **Wilson SK** (2013) Dynamic Stability of Coral Reefs on the West Australian Coast. *PLoS ONE* **8**(7): e69863

Speed CW, **O'Shea OR**, **Meekan MG** (2013) Transmitter attachment and release methods for short-term shark and stingray tracking on coral reefs. *Marine Biology* **160**(4): 1041-1050.

Stat M, Pochon X, Franklin EC, Bruno JF, Casey KS, Selig ER, Gates RD (2013) The distribution of the thermally tolerant symbiont lineage (*Symbiodinium* clade D) in corals from Hawaii: Correlations with host and the history of ocean thermal stress. *Ecology and Evolution* **3**(5): 1317-1329.

Statton J, **Cambridge ML**, Dixon KW, **Kendrick GA** (2013) Aquaculture of *Posidonia australis* Seedlings for Seagrass Restoration Programs: Effect of Sediment Type and Organic Enrichment on Growth. *Restoration Ecology* **21**(2): 250-259.

Sutherland BR, Barrett KJ, **Ivey GN** (2013) Shoaling internal solitary waves. *Journal of Geophysical Research C: Oceans* **118**(9): 4111-4124.

Sutton TT, **Letessier TB**, Bardarson B (2013) Midwater fishes collected in the vicinity of the Sub-Polar Front, Mid-North Atlantic Ocean, during ECOMAR pelagic sampling. *Deep-Sea Research Part II: Topical Studies in Oceanography* **98**: 292-300.

Tait K, **Laverock B**, Shaw J, Somerfield PJ, Widdicombe S (2013) Minor impact of ocean acidification to the composition of the active microbial community in an Arctic sediment. *Environmental Microbiology Reports* **5**(6): 851-860.

Techera EJ, Klein N (2013) The role of law in shark-based eco-tourism: Lessons from Australia. *Marine Policy* **39**(1): 21-28.

Temple SE, Manietta D, **Collin SP** (2013) A comparison of behavioural (Landolt C) and anatomical estimates of visual acuity in archerfish (*Toxotes chatareus*). *Vision Research* **83**: 1-8.

Thamo T, Kingwell RS, **Pannell DJ** (2013) Measurement of greenhouse gas emissions from agriculture: Economic implications for policy and agricultural producers. *Australian Journal of Agricultural and Resource Economics* **57**(2): 234-252

Thomas L, **Bell JJ** (2013) Testing the consistency of connectivity patterns for a widely dispersing marine species. *Heredity* **111**(4): 345-354.

Thompson SE, Sivapalan M, Harman CJ, Srinivasan V, **Hipsey MR**, Reed P, Montanari A, Blöschl G (2013) Developing predictive insight into changing water systems: Use-inspired hydrologic science for the anthropocene. *Hydrology and Earth System Sciences* **17**(12): 5013-5039.

Thomsen MS, Staehr PA, Nejrup L, Schiel DR (2013) Effects of the invasive macroalgae *Gracilaria vermiculophylla* on two co-occurring foundation species and associated invertebrates. *Aquatic Invasions* **8**(2): 133-145.

Thums M, Bradshaw CJA, Sumner MD, Horsburgh JM, Hindell MA (2013) Depletion of deep marine food patches forces divers to give up early. *Journal of Animal Ecology* **82**(1): 72-83.

Thums M, **Meekan MG**, Stevens J, Wilson S, Polovina J (2013) Evidence for behavioural thermoregulation by the world's largest fish. *Journal of the Royal Society Interface* **10**(78): 20120477.

Thums M, Whiting SD, **Reisser JW**, Pendoley KL, **Pattiaratchi CB**, Harcourt RG, McMahon CR, **Meekan MG** (2013) Tracking sea turtle hatchlings – A pilot study using acoustic telemetry. *Journal of Experimental Marine Biology and Ecology* **440**: 156-163

Thyrring J, Thomsen MS, **Wernberg T** (2013) Large-scale facilitation of a sessile community by an invasive habitat-forming snail. *Helgoland Marine Research* **67**(4): 789-794.

Tian Y, **Cassidy MJ** (2013) Equivalent absolute lateral static stability of on-bottom offshore pipelines. *Australian Geomechanics Journal* **48**(4): 59-70.

Tian Y, **Gaudin C**, **Cassidy MJ**, **Randolph MF** (2013) Considerations on the design of keying flap of plate anchors. *Journal of Geotechnical and Geoenvironmental Engineering* **139**(7): 1156-1164.

Tisnérat-Laborde N, Montagna P, **McCulloch MT**, Siani G, Silenzi S, Frank N (2013) A high-resolution coral-based $\Delta^{14}C$ record of surface water processes in the western Mediterranean Sea. *Radiocarbon* **55**(2-3): 1617-1630.

Trueman M, Hobbs RJ, **Van Niel K** (2013) Interdisciplinary historical vegetation mapping for ecological restoration in Galapagos. *Landscape Ecology* **28**(3): 519-532.

Ullmann JFP, Calamante F, **Collin SP**, Reutens DC, Kurniawan ND (2013) Enhanced characterization of the zebrafish brain as revealed by super-resolution track-density imaging. *Brain Structure and Function*.

Underwood JN, **Wilson SK**, Ludgerus L, **Evans RD** (2013) Integrating connectivity science and spatial conservation management of coral reefs in north-west Australia. *Journal for Nature Conservation* **21**(3): 163-172.

van der Meer MH, Gardner MG, Berumen ML, **Hobbs JPA**, van Herwerden L (2013) Identification of seventeen microsatellite loci for conservation genetic studies of the endemic wrasse *Coris bulbifrons*. *Conservation Genetics Resources* **5**(2): 363-366.

van der Meer MH, Horne JB, Gardner MG, **Hobbs JPA**, Pratchett M, van Herwerden L (2013) Limited contemporary gene flow and high self-replenishment drives peripheral isolation in an endemic coral reef fish. *Ecology and Evolution* **3**(6): 1653-1666.

Van Dongeren A, **Lowe RJ**, Pomeroy A, Trang DM, Roelvink D, Symonds G, Ranasinghe R (2013) Numerical modeling of low-frequency wave dynamics over a fringing coral reef. *Coastal Engineering* **73**: 178-190.

Vance TR, Davidson AT, **Thomson PG**, Levasseur M, Lizotte M, Curran MAJ, Jones GB (2013) Rapid DMSP production by an Antarctic phytoplankton community exposed to natural surface irradiances in late spring. *Aquatic Microbial Ecology* **71**(2): 117-129.

Vaquer-Sunyer R, **Duarte CM** (2013) Experimental Evaluation of the Response of Coastal Mediterranean Planktonic and Benthic Metabolism to Warming. *Estuaries and Coasts* **36**(4): 697-707.

Vaquer-Sunyer R, **Duarte CM**, Holding J, Regaudie-de-Gioux A, Garcia-Corral LS, Reigstad M, Wassmann P (2013) Seasonal patterns in Arctic planktonic metabolism (Fram Strait – Svalbard region) *Biogeosciences* **10**(4): 1451-1469.

Vianna GMS, **Meekan MG**, **Meeuwig JJ**, **Speed CW** (2013) Environmental Influences on Patterns of Vertical Movement and Site Fidelity of Grey Reef Sharks (*Carcharhinus amblyrhynchos*) at Aggregation Sites. *PLoS ONE* **8**(4): e60331.

Vianna GMS, **Meekan MG**, **Pannell DJ,** Marsh SP, **Meeuwig JJ** (2013) [Letter] Valuing individual animals through tourism: Science or speculation? – Reply to Catlin et al. (2013). *Biological Conservation* **166**: 301-302.

Vihtakari M, Hendriks IE, Holding J, Renaud PE, **Duarte CM**, Havenhand JN (2013) Effects of ocean acidification and warming on sperm activity and early life stages of the mediterranean mussel (*Mytilus galloprovincialis*). *Water (Switzerland)* **5**(4): 1890-1915.

Villanueva K, Pereira G, Knuiman M, Bull F, Wood L, Christian H, Foster S, **Boruff BJ**, Beesley B, Hickey S, Joyce S, Nathan A, Saarloos D, Giles-Corti B (2013) The impact of the built environment on health across the life course: Design of a cross-sectional data linkage study. *BMJ Open* **3**(1): e002482.

Wadey MP, Nicholls RJ, **Haigh ID** (2013) Understanding a coastal flood event: The 10th March 2008 storm surge event in the Solent, UK. *Natural Hazards* **67**(2): 829-854.

Wahl T, **Haigh ID**, Dangendor S, Jensen J (2013) Inter-annual and long-term mean sea level changes along the North Sea coastline. *Journal of Coastal Research* (SPEC. ISSUE 65): 1987-1992.

Wahl T, **Haigh ID**, Woodworth PL, Albrecht F, Dillingh D, Jensen J, Nicholls RJ, Weisse R, Woppelmann G (2013) Observed mean sea level changes around the North Sea coastline from 1800 to present. *Earth-Science Reviews* **124**: 51-67.

Waite AM, Rossi V, Roughan M, Tilbrook B, Thompson PA, Feng M, Wyatt ASJ, **Raes EJ** (2013) Formation and maintenance of high-nitrate, low pH layers in the eastern Indian Ocean and the role of nitrogen fixation. *Biogeosciences* **10**(8): 5691-5702.

Wakefield CB, Lewis PD, Coutts TB, Fairclough DV, **Langlois TJ** (2013) Fish Assemblages Associated with Natural and Anthropogenically-Modified Habitats in a Marine Embayment: Comparison of Baited Videos and Opera-House Traps. *PLoS ONE* **8**(3): e59959.

Walther BD, Kingsford MJ, **McCulloch MT** (2013) Environmental Records from Great Barrier Reef Corals: Inshore versus Offshore Drivers. *PLoS ONE* **8**(10): e77091.

Wang D, **Gaudin C**, Randolph MF (2013) Large deformation finite element analysis investigating the performance of anchor keying flap. *Ocean Engineering* **59**: 107-116.

Wang D, Merifield RS, **Gaudin C** (2013) Uplift behaviour of helical anchors in clay. *Canadian Geotechnical Journal* **50**(6): 575-584.

Wen CKC, Almany GR, Williamson DH, Pratchett MS, Mannering TD, **Evans RD**, Leis JM, Srinivasan M, Jones GP (2013) Recruitment hotspots boost the effectiveness of no-take marine reserves. *Biological Conservation* **166**: 124-131.

Wernberg T, **Smale DA**, Tuya F, **Thomsen MS**, **Langlois TJ**, **De Bettignies T**, **Bennett S**, Rousseaux CS (2013) An extreme climatic event alters marine ecosystem structure in a global biodiversity hotspot. *Nature Climate Change* **3**(1): 78-82.

Wernberg T, **Thomsen MS**, Connell SD, Russell BD, Waters JM, Zuccarello GC, Kraft GT, Sanderson C, West JA, Gurgel CFD (2013) The footprint of continental-scale ocean currents on the biogeography of seaweeds. *PLoS ONE* **8**(11): e80168.

Wernberg T, Thomsen MS, Kotta J (2013) Complex plant-herbivore-predator interactions in a brackish water seaweed habitat. *Journal of Experimental Marine Biology and Ecology* **449**: 51-56.

White JR, McCormick MI, **Meekan MG** (2013) Syndromes or flexibility: Behavior during a life history transition of a coral reef fish. *PLoS ONE* **8**(12): e84262.

White JR, **Meekan MG**, McCormick MI, Ferrari MCO (2013) A Comparison of Measures of Boldness and Their Relationships to Survival in Young Fish. *PLoS ONE* **8**(7): e68900.

Wilson SK, **Fisher R**, Pratchett MS (2013) Differential use of shelter holes by sympatric species of blennies (Blennidae). *Marine Biology* **160**(9): 2405-2411.

Winterwerp JC, **Erftemeijer PLA**, Suryadiputra N, van Eijk P, Zhang LQ (2013) Defining Eco-Morphodynamic Requirements for Rehabilitating Eroding Mangrove-Mud Coasts. *Wetlands* **33**(3): 515-526.

Wisshak M, **Schönberg CHL**, Form A, Freiwald A (2013) Effects of ocean acidification and global warming on reef bioerosion-lessons from a clionaid sponge. *Aquatic Biology* **19**(2): 111-127.

Wong PY, Cheng KY, Kaksonen AH, **Sutton DC**, Ginige MP (2013) A novel post denitrification configuration for phosphorus recovery using polyphosphate accumulating organisms. *Water Research* **47**(17): 6488-6495.

Woolgar L, Trocini S, **Mitchell NJ** (2013) Key parameters describing temperature-dependent sex determination in the southernmost population of loggerhead sea turtles. *Journal of Experimental Marine Biology and Ecology* **449**(Nov 2013): 77-84.

Wyatt ASJ, **Lowe RJ**, Humphries S, **Waite AM** (2013) Particulate nutrient fluxes over a fringing coral reef: Source-sink dynamics inferred from carbon to nitrogen ratios and stable isotopes. *Limnology and Oceanography* **58**(1): 409-427.

Xavier JC, Barbosa A, **Agustí S**, Alonso-Sáez L, Alvito P, Ameneiro J, Ávila C, Baeta A, Canário J, Carmona R, Catry P, Ceia F, Clark MS, Cristobo FJ, Cruz B, **Duarte CM**, Figuerola B, Gili JM, Gonçalves AR, Gordillo FJL, Granadeiro JP, Guerreiro M, Isla E, Jiménez C, López-González PJ, Lourenço S, Marques JC, Moreira E, Mota AM, Nogueira M, Núñez-Pons L, Orejas C, Paiva VH, Palanques A, Pearson GA, Pedrós-Alió C, Peña Cantero TL, Power DM, Ramos JA, Rossi S, Seco J, Sañé E, Serrão EA, Taboada S, Tavares S, Teixidó N, Vaqué D, Valente T, Vázquez E, Vieira RP, Viñegla B (2013) Polar marine biology science in Portugal and Spain: Recent advances and future perspectives. *Journal of Sea Research* **83**: 9-29.

Xiao R, Su S, **Ghadouani A**, Wu J (2013) Spatial analysis of phytoplankton patterns in relation to environmental factors across the southern Taihu basin, China. *Stochastic Environmental Research and Risk Assessment* **27**(6): 1347-1357.

Xu J, **Lowe RJ**, **Ivey GN**, **Pattiaratchi CB**, **Jones NL**, Brinkman R (2013) Dynamics of the summer shelf circulation and transient upwelling off Ningaloo Reef, Western Australia. *Journal of Geophysical Research C: Oceans* **118**(3): 1099-1125.

York PH, **Gruber RK**, Hill R, Ralph PJ, Booth DJ, Macreadie PI (2013) Physiological and Morphological Responses of the Temperate Seagrass Zostera muelleri to Multiple Stressors: Investigating the Interactive Effects of Light and Temperature. *PLoS ONE* **8**(10): e76377.

Youssef BS, **Cassidy MJ**, **Tian Y** (2013) Application of Statistical Analysis Techniques to Pipeline On-Bottom Stability Analysis. *Journal of Offshore Mechanics and Arctic Engineering* **135**(3): 031701-031701.

Youssef BS, **Tian Y**, **Cassidy MJ** (2013) Centrifuge modelling of an on-bottom pipeline under equivalent wave and current loading. *Applied Ocean Research* **40**: 14-25.

Zhang Z, Bienen B, **Cassidy MJ** (2013) Development of a combined VHM loading apparatus for a geotechnical drum centrifuge. *International Journal of Physical Modelling in Geotechnics* **13**(1): 13-30.

Zhang Z, **Falter JL**, **Lowe RJ**, **Ivey GN**, **McCulloch MT** (2013) Atmospheric forcing intensifies the effects of regional ocean warming on reef-scale temperature anomalies during a coral bleaching event. *Journal of Geophysical Research C: Oceans* **118**(9): 4600-4616.

Zottl M, **Chapuis L**, Freiburghaus M, Taborsky M (2013) Strategic reduction of help before dispersal in a cooperative breeder. *Biology Letters* **9**(1): 20120878

Books

Clifton J, Unsworth RKF, Smith DJ (2013) Marine research and conservation in the Coral Triangle. New York, USA Nova Science Publishers, Inc; p: 1-258.

Book Chapters

Alongi DM, Bouillon, **Duarte CM**, Ramanathan A (2013) Carbon and Nutrient fluxes across tropical river-coastal boundaries. In: Bianchi T, Allison M, Cai W-J, editors. Biogeochemical Dynamics at Major River-Coastal Interfaces: Linkages with Global Change. Cambridge University Press, London, pp 373-396.

Clifton J (2013) Achieving congruence between conservation and community: The Bajau ethnic group and marine management within the Wakatobi and south-east Asia. In: Marine Research and Conservation in the Coral Triangle. Nova Science Publishers, Inc, New York, USA, pp: 209-224.

Clifton J (2013) Marine protected area networks in the Coral Triangle: Implications for conservation and communities. In: Marine Research and Conservation in the Coral Triangle. Nova Science Publishers, Inc New York, USA, pp: 237-250.

Clifton J, Unsworth RKF (2013) Future directions for marine conservation in the Coral Triangle. In: Marine Research and Conservation in the Coral Triangle. Nova Science Publishers, Inc, New York, USA, pp: 251-258.

Hobbs JPA, van Herwerden L, Pratchett MS, Allen GR (2013) Hybridisation among Butterflyfishes. In: Pratchett MS, Berumen ML, Kapoor BG, editors. Biology of Butterflyfishes. CRC Press, pp: 48-69.

Hunt DM (2013) Color Blindness. In: Maloy S, Hughes K, editors. Brenner's Encyclopedia of Genetics (Second Edition). Academic Press, San Diego, pp: 94-96.

Hunt DM, **Hart NS**, **Collin SP** (2013) Sensory Systems. In: Trischitta F, Takei Y, Sébert P, editors. Eel Physiology. CRC Press, pp: 118-159

Sheppard CRC, Graham NAJ, Pratchett MS, McClanahan TR, **Wilson SK** (2013) The Status of Coral Reef Fish Assemblages in the Chagos Archipelago, with Implications for Protected Area Management and Climate Change. In: Sheppard CRC, editor. Coral Reefs of the United Kingdom Overseas Territories. Springer, Netherlands, pp: 253-270.

Souza AJ, Burchard H, Eden C, **Pattiaratchi CB**, van Haren H (2013) Coastal Ocean Turbulence and Mixing. In: Craig P, Mooers CNK, editors. Coupled Coastal Wind-Wave-Current Dynamics. Cambridge University Press.

Uzielli M, Mayne PW, **Cassidy MJ** (2013) Probabilistic assignment of design strength for sands from in-situ testing data. In: Modern Geotechnical Design Codes of Practice: Implementation, Application and Development. pp: 214-227.

Wood LJ, **Boruff BJ**, Smith HM (2013) When disaster strikes ... how communities cope and adapt: A social capital perspective. In: Social Capital: Theory, Measurement and Outcomes. Nova Science Publishers, Inc, New York, USA, pp: 141-169.

Conference Papers

Erftemeijer PLA, Jury MJ, Gabe B, Dijkstra JT, Leggett D, Foster TM, Shafer DJ (2013) Dredging, port-and waterway construction near coastal plant habitats. Coasts and Ports 2013: 21st Australasian Coastal and Ocean Engineering Conference and the 14th Australasian Port and Harbour Conference Sydney.
Gaudin C, O'Loughlin CD, **Hossain MS**, Zimmerman EH (2013) The performance of dynamically embedded anchors in calcareous silt. ASME 2013 32nd International Conference on Ocean, Offshore and Arctic Engineering, OMAE 2013 Nantes.

Kohan O, Bienen B, **Cassidy MJ**, **Gaudin C** (2013) Centrifuge experiments to study extraction of a deeply embedded spudcan using top jetting. ASME 2013 32nd International Conference on Ocean, Offshore and Arctic Engineering, OMAE 2013 Nantes.

Mathis R, I. M, **Jones NL**, **Ivey GN** (2013) Coupling a boundary layer wall shear-stress model with field experiments in a shallow tidal river. Eighth International Symposium on Turbulence and Shear Flow Phenomena; 28-30 August 2013; Poitiers, France.

McSweeney NJ, Franzmann PD, Tilbury AL, Nyeboer HJ, McKinnon AJ, **Sutton DC**, Kaksonen AH (2013) Characterisation of a novel genus of oxalate-degrading beta- Proteobacteria isolated from a full-scale bioreactor treating Bayer liquor organic wastes. 20th International Biohydrometallurgy Symposium, IBS 2013; Antofagasta; Chile; 8 October 2013 through 11; 8 October 2013 through 11 October 2013.

O'Loughlin CD, Blake AP, Wang D, **Gaudin C**, Randolph MF (2013) The dynamically embedded plate anchor: Results from an experimental and numerical study. ASME 2013 32nd International Conference on Ocean, Offshore and Arctic Engineering, OMAE 2013 Nantes.

Pasternak E, Dyskin A, **Pattiaratchi CB**, Pelinovsky E (2013) Coastal protection using topological interlocking blocks. EGU General Assembly; 7-12 April 2013; Vienna, Austria.

Shortis MR, Ravanbakhsh M, Shafait F, **Harvey ES**, Mian A, Seager JW, Culverhouse PF, Cline DE, Edgington DR (2013) A review of techniques for the identification and measurement of fish in underwater stereo-video image sequences. SPIE Optical Metrology: Videometrics, Range Imaging, and Applications XII; and Automated Visual Inspection; 14 - 15 May 2013; Munich.

Tian Y, **Cassidy MJ**, Uzielli M (2013) Probabilistic assessment of the bearing capacity of shallow strip footings on stiff-over-soft clay. 18th International Conference on Soil Mechanics and Geotechnical Engineering Paris.

Uzielli M, **Cassidy MJ** (2013) Advanced characterization and random field analysis of piezocone and T-bar data for the Laminaria offshore site. 4th International Symposium of Geotechnical Safety and Risk (ISGSR2013); 4-6 December 2013; Hong Kong.

Wang D, Han C, **Gaudin C** (2013) Effect of roughness on keying of plate anchors. International Conference on Installation Effects in Geotechnical Engineering, ICIEGE 2013 Rotterdam.

THE UNIVERSITY OF WESTERN AUSTRALIA

The UWA Oceans Institute
The University of Western Australia
M470, 35 Stirling Highway
Crawley WA 6009
Tel: +61 8 6488 8116
Fax: +61 8 6488 7278
Email: oceans@uwa.edu.au
oceans.uwa.edu.au

facebook.com/
UWAOceansInstitute

@uwaoceans

CRICOS Provider Code: 00126G

UniPrint 111685