

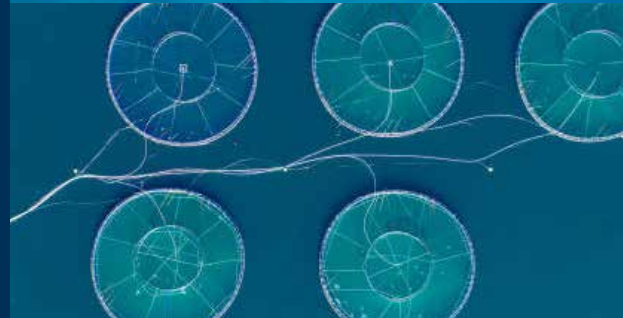
AMSA 2019

MARINE SCIENCE FOR A BLUE ECONOMY

7-11 July 2019
Fremantle, Perth

Program Handbook

**Australian Marine Sciences
Association Inc. 2019 Conference**
Esplanade Hotel Fremantle by Rydges
amsa19.amsa.asn.au



PRESIDENT'S WELCOME ADDRESS



It is a great pleasure to welcome delegates, sponsors and exhibitors to AMSA 2019, the 56th Annual AMSA Conference 'Marine Science for a Blue Economy'. Fremantle, a port city nestled between the Swan River and the Indian Ocean, is the perfect setting for our conference theme exploring the link between marine science and the blue economy. I have happy memories of the last AMSA conference in Fremantle in 2011 and the excellent social and conference facilities provided by this same venue, the Esplanade Hotel.

The Scientific Committee have assembled a wonderful selection of keynote speakers, drawing on some of Australia's preeminent marine scientists to bring their perspective to the challenges presented to marine science by Australia's developing blue economy. We will hear from Tim Moltmann, Dr Peter Macreadie, Dr Cass Hunter, Dr Pia Winberg and Professor Graham Edgar about aspects of the blue economy from climate science to sustainability in fisheries and aquaculture, to blue carbon and indigenous knowledge. Dr Ana Parma from Argentina will bring a global perspective to issues of sustainability in fisheries.

I will have the very pleasant task of presenting the Jubilee Award for 2019 to Emeritus Professor Helene Marsh from James Cook University in recognition of her contribution to research, teaching and the conservation biology of dugongs and other cetaceans. The Jubilee Award was first given in 1988 to recognize an active marine scientist who has made an outstanding contribution to marine research in Australia during his or her career. We will also acknowledge Brett Loudon, the winner of the 2019 Technical Award and hear a presentation from Kate Dodds, the winner of the Allen Award. The Joe Baker Poster session will honour Joe Baker's contribution to AMSA and marine science while providing a casual setting to check out interesting posters presented by colleagues and students.

Looking at the program I realise there will be very little down time with 29 symposia, 12 workshops, social events, the AMSA Annual General Meeting, the conference dinner and a public lecture on Wednesday about ocean plastic pollution. Thank you to the local Organising Committee and Scientific Committee for putting together such a varied and interesting program. Good luck to all those competing for one of the many student prizes. AMSA is a truly multi-disciplinary conference, so make the most of this opportunity to hear about marine science outside your immediate research interest. The conference is a great opportunity for the next generation of marine scientists to mix with the current generation in both formal and social settings. I urge students to make new contacts with other students and talk with professionals from a range of disciplines... and most of all, have fun!

Regards

Dr Penny Berents

AMSA President

WELCOME FROM ORGANISING CHAIR



On behalf of the organising committee, welcome to the AMSA 2019 'Marine Science for a Blue Economy' Conference!

We hope all the delegates find the program to be diverse and engaging. The Organising and Scientific Committees were filled with those who have great conference experience and you'll see we have incorporated a lot of different ideas to maximise the delegate experience.

We have strived to make the conference appealing to researchers, consultants and managers alike by including symposia and workshops on traditional marine science themes as well as industry and management related themes. We have also tried to allow time for discussion among symposium presenters and have offered some optional free panels and workshops for you engage in during some of the breaks.

Your social calendar is all sorted for your week in Fremantle, with the Welcome Reception, Poster Function and Conference Dinner being ideal functions for re-connecting with colleagues and expanding your networks. There's an additional opportunity for students to network during their Student Night and for all to get schooled on how to live a more plastic free life for the benefit of our oceans during the 'Plastic Free July: thinking globally, acting locally' Public Lecture given by Rebecca Prince-Ruiz, Founder and Director of the Plastic Free July Foundation.

On the topic of plastic, we have done our best to make the AMSA19 Conference as plastic free as possible, from asking the venue to not provide plastic pens and individually wrapped mints to having plastic free name badges and GO2CUP for those who need coffee and tea! We are proud of our efforts and we hope our delegates support and share our values.

I would like to extend a warm welcome to our sponsors and exhibitors. Your contributions and presence at the conference have contributed to an exciting program and what, we hope, is a memorable conference experience for all delegates.

For those of you joining us from interstate and overseas, and to those joining us from the strong WA marine science community, we hope you enjoy AMSA19 and are inspired to forge ahead with new ideas to safeguard the health of our oceans and marine life while sustaining the economic and societal needs that accompany a growing nation.

Regards

Dr Alicia Sutton
Organising Chair

WELCOME FROM SCIENTIFIC CHAIR



On behalf of the Scientific Committee it gives me great pleasure to welcome you to the 56th Annual AMSA Conference, 'Marine Science for a Blue Economy'.

Australia is privileged to have such a vast and diverse marine environment surrounding its shores which provides us with a variety of services of economic, environmental and social benefit. The Scientific Committee have created a science program which highlights science that can help us to better understand and sustainably manage our priceless marine estate and we are excited to share it with you. We are looking forward to hearing about the linkages between marine science and the blue economy in a variety of disciplines including

marine megafauna, artificial structures in marine environments, earth observation, port management, fisheries, coastal oceanography, estuarine science and marine conservation reserves, just to name a few. A number of symposia emphasise the collaborative nature of our marine science community and the number of discussion workshops planned through the program demonstrate the importance of the AMSA conference in bringing the Australian marine science community together to foster those collaborations and review and plan for the next advances in marine science.

We are thrilled to host Mr Tim Moltmann, Associate Professor Peter Macreadie, Dr Cass Hunter, Dr Pia Winberg, Dr Ana Parma and Professor Graham Edgar as plenary speakers and warmly thank them for their commitment to our program.

The Scientific Committee has worked tirelessly to shape the science program and I sincerely thank them for their time, ideas and commitment to a multitude of tasks, not just creating submission guidelines, reviewing symposia and workshop proposals and abstracts, and planning plenaries. The symposium chairs have been fantastic in providing abstract reviews and reviewing speaker order lists and we extend our gratitude to them all.

The overwhelming response of submitted abstracts for this conference suggests the community is already enthused by the scientific program on offer, and we hope that your enthusiasm and interest grow with each day. The Scientific Committee had an underlying goal to embrace and showcase the diversity of marine science and marine scientists in the Australian community and we hope that shows through the selection of speakers and the symposium, workshop and panel topics on offer. Thank you for joining us and contributing as we celebrate and share the latest advances in marine science in Australia.

Regards

Charlotte Robinson

Scientific Committee Chair

CONFERENCE APP

1. Search for 'The Event App' on the App or Google Play Store

2. Download 'The Event App by EventsAIR'

3. Open the App and enter the code 'AMSA2019'

4. Then sign in using your email and PIN which will be emailed to you in your final registration letter

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LOCAL ORGANISING COMMITTEE



**Dr Alicia Sutton -
Conference Chair**

WA Branch President, AMSA
Director, Principal Scientist,
Carijoa



Ms Charlotte Birkmanis

PhD candidate, School of
Biological Sciences and Oceans
Institute, The University of
Western Australia
WA Branch Secretary and
Student Representative, AMSA



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Research Scientist,
Department of Biodiversity,
Conservation and Attractions,
Marine Science Program



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DNA Lab, Curtin University



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Murdoch University



Dr Andrew Hosie

Curator (Crustacea & Worms)
Department of
Aquatic Zoology,
Western Australian Museum



Dr Matthew Harvey

Director, Ocean Vision
Environmental Research
Pty. Ltd.



Robert Pemberton

Business Support Manager,
Oceans Institute,
The University of
Western Australia

SCIENTIFIC COMMITTEE



Dr Charlotte Robinson - Chair

Research Associate, Remote Sensing & Satellite Research Group, Curtin University



Dr Jennifer Verduin - Co-Chair

Senior Lecturer, Oceanography and Marine Pollution, Environmental and Conservation Sciences, Murdoch University, Centre for Sustainable Aquatic Ecosystems, Harry Butler Institute, Murdoch University



Dr Frances D'Souza

Senior Environmental Officer, Department of Water and Environmental Regulation



Dr Indi Hodgson-Johnston

Assistant Director, Integrated Marine Observing System



Dr. Lyndon Llewellyn

Lead, Science Impact and Stakeholder Development, Australian Institute of Marine Science



Professor Anthony Richardson

Centre for Applications in Natural Resource Mathematics, School of Mathematics and Physics, University of Queensland and CSIRO Oceans and Atmosphere



Dr Alicia Sutton

Conference Chair & WA Branch President, AMSA
Director, Principal Scientist, Carijoa



Dr James Tweedley

Lecturer of Animal Biology, School of Veterinary and Life Sciences, Centre for Sustainable Aquatic Ecosystems, Harry Butler Institute, Murdoch University



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Adjunct Professor Centre of Marine Socioecology, University of Tasmania



Kevin Bancroft

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Honorary Research Associate, School of Biological Sciences, The University of Western Australia



Jo Buckee

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PhD Candidate, Environmental and Conservation Sciences, Murdoch University
Centre for Sustainable Aquatic Ecosystems, Harry Butler Institute, Murdoch University



Associate Professor Nicole Jones

Ocean Graduate School and The UWA Oceans Institute, Affl. School of Civil, Environmental and Mining Engineering, The University of Western Australia



Dr Ana Parma

Center for the Study of Marine Systems, CONICET (National Scientific and Technical Research Council)

Dr. Ana Parma is a Principal Researcher of CONICET – the Argentine Council for Science & Technology, based at the National Patagonic Center in Puerto Madryn, Argentina. She earned her Ph.D. in Fisheries Science in 1989 from the University of Washington, and worked as an assessment scientist at the International Pacific Halibut Commission until 2000, when she returned to Argentina, her home country. She has worked on different aspects of fisheries modelling, assessment and management, covering a diverse range of fisheries, from artisanal coastal fisheries targeting benthic shellfish to large-scale international fisheries targeting tunas. The main focus of her research has been on the evaluation and design of harvesting strategies that can achieve sustainability in the face of the diverse technical and institutional challenges posed by these fisheries. She has always work at the interface between science and management, being involved in several scientific and policy advisory boards and review panels both at the national and international levels. Currently she is a member of the Science Council and Global Board of The Nature Conservancy, and an advisor for the Commission for the Conservation of Southern Bluefin Tuna, where she chairs the technical group in charge of the management strategy evaluation for rebuilding the southern bluefin tuna stock.



Professor Graham Edgar

Institute for Marine and Antarctic Studies, University of Tasmania

Graham Edgar's major current interests include ongoing development of the citizen science Reef Life Survey program, and demonstration that field studies with broad generality can be conducted across very large spatial, temporal and taxonomic scales at low cost. Ecological and conservation topics addressed over 40 years also include interactions between seagrasses and associated fauna, taxonomy of crustaceans and fishes, clarification of metabolic-based regularities in communities, and assessment of the magnitude of different threats to marine biodiversity. Graham's career history includes periods as Director of Marine Research at the Charles Darwin Research Station (Galapagos Islands), Senior Fulbright Fellow in Washington (USA), and JSPS Fellow in Amakusa (Japan). He has been awarded the AMSA Silver Jubilee Award (2011), the Eureka Prize for Environmental Research (2014), and was the 2017 Tasmanian STEM Researcher of the Year.



Dr Pia Winberg

CEO & Chief Scientist – Venus Shell Systems Pty. Ltd.

CEO – PhycoHealth Pty. Ltd.

Honoary Fellow – School of Medicine, University of Wollongong

Pia has worked across sustainable marine industry development and academia for the past 20 years. Her focus has gone from research to applied technology development in integrating marine food production systems with the environment, to deliver potent nutritional benefits to society. Nutrition and food is a key opportunity for a transition to a more sustainable future, and the oceans are a platform that can deliver on that if approached wisely. Seaweed is the biggest aquaculture crop globally and has a value of close to \$12B. Integrating seaweed and marine systems ecology into industrial processes is an opportunity for sustainability and nutritional outcomes that are aligned with the United Nations Sustainability Development Goals. Added to our mainstream food chain, seaweed could contribute significantly to reducing malnutrition in impoverished countries, as well as chronic diseases related to western diets, including obesity which now rivals starvation. I will present the case for marine food production including seaweed, in contributing to our basic food intake in the west... for everyone... every day.

Thursday, 11 July 2019

08.30 - 16.00 Registration Open					
08.30 - 08.35	Welcome Day 4				
08.35 - 08.40	AMSA Conference 2020 introduction				
08.40 - 09.00	Allen Award Winner Stakeholder perceptions of Living Seawalls Kate Dodds, PhD Candidate, Macquarie University				
09.00 - 09.30	The roles of science and politics in setting fisheries sustainability targets: when field survey and modelling frameworks collide Professor Graham Edgar, Institute for Marine and Antarctic Studies, University of Tasmania				
09.30 - 10.00	Progress and challenges in attaining global fisheries sustainability Dr Ana Parma, Center for the Study of Marine Systems				
10.00 - 10.40	Fisheries Panel Q&A with invited guests				
09.00 - 13.30 Indigenous Workshop Session 2 (Invite Only) – Abrohlos Room					
10.40 - 11.30 MMorning Tea / 10.50 Promoting Women in Marine Science Panel – Rottneest Room					
	ZA. Fish and fisheries - 2	B. Marine megafauna, a blue resource: conservation of species and management of human activities to ensure a sustainable future - 3 Tracking Focus	ZD. Marine fundamentals - 1	F. Seafloor mapping in Australia – progress, discoveries, applications - 1 Sponsored by Geoscience Australia	C. The impact of artificial structures in marine ecosystems - 1
ROOM:	Pleiades	Orion	Rottneest	Garden	Carnac
11.30 - 11.45	Combined effects of ecosystem complexity and connectivity on functional diversity Sarah Thackwray , University of the Sunshine Coast	Satellite and acoustic telemetry reveal high residency of reef manta rays (<i>Mobula alfredi</i>) to the Amirante Island Group, Seychelles Lauren Peel , The University of Western Australia	Can crustose coralline algae growing on nearshore intertidal limestone platforms allow these features to keep pace with sea level rise? Melissa Capill , BMT	100% of the world ocean floor mapped by 2030 – progress of the Nippon Foundation-GEBCO Seabed 2030 initiative Kevin Mackay , NIWA	Should it stay or should it go? Informing decommissioning decisions through the National Decommissioning Research Initiative Andrew Taylor , National Energy Resources Australia (NERA)
11.45 - 12.00	Assessing seabed status in 24 trawled regions of the world Dr. C. Roland Pitcher , Commonwealth Scientific and Industrial Research Organisation Oceans and Atmosphere	Investigating links between vertical and horizontal movement patterns of whale sharks Lucy Arrowsmith , Indian Ocean Marine Research Centre	Stable patterns in ocean wildlife in an offshore marine park Andrew Forrest , The University of Western Australia	Following in Captain Cook's wake: seafloor mapping Tonga and Niue in the 21st Century Dr. Elizabeth Johnstone , iXblue	The Exmouth Integrated Artificial Reef: fish assemblages Prof. Euan Harvey , Curtin University
12.00 - 12.15	Relative influence of marine reserves in determining fish assemblages in a multi-species fishery Eva McClure , James Cook University	The bio-physical drivers of the 3D movements of whale sharks at Ningaloo Reef Dr. Michele Thums , Australian Institute of Marine Science	Chronic toxicity of two pesticides in <i>Aurelia aurita</i> polyps and their metabolite profile Carolina Olguin Jacobson , Griffith University	AusSeabed: Collaborating to maximise Australia's seabed mapping efforts Kim Picard , Geoscience Australia	Offshore oil and gas platforms as novel ecosystems Sean Van Elden , The University of Western Australia

Progress and challenges in attaining global fisheries sustainability

Ana M. Parma¹

¹ Center for the Study of Marine Systems

Global data on fish stock status are showing a turning of the tide in many fisheries, with marked reductions in fishing-induced mortality, followed in many cases by stock biomass recovery. These positive outcomes have resulted from stronger legal mandates to maintain fishing pressure at or below the levels that maximize long-term yields, and to implement rebuilding plans for overfished stocks. By in large these results provide empirical support to some basic principles of fisheries science that predict how fish abundance will change in response to fishing pressure controls. However, optimism in our ability to achieve fisheries sustainability targets globally needs to be tempered by the fact that these outcomes have been mainly documented for industrial fisheries in regions where there are effective management systems in place, able to: (i) collect and analyze data to assess stock status, (ii) adjust harvest controls in response to changes in abundance, and (iii) implement and enforce regulations. Such command-and-control approaches cannot be expected to work in small-scale fisheries and/or in regions with weak governance systems. While much attention has been focused on the fact that small-scale fisheries are typically data-limited, data limitations tend to go hand in hand with resource and capacity limitations that hamper all three components of the management system. More encompassing assessment and management frameworks have been proposed, but no quick fixes exist and approaches that have potential are highly context dependent. Thus, local successes cannot be scaled up simply by replication. Sustained efforts need to be allocated to building local capacity to collect and analyze information, and to identify strategies that may work given the specific constraints of each fishery. Tools and processes are being developed to support such engagements and to foster communities of practice that accelerate learning.

Seasonal Dynamics of Plastic on the South Coast of WA and its Impact on Flesh-footed Shearwaters

Harriet Paterson¹ and Jaynie Wolyjen¹

¹ Centre of Excellence in Natural Resource Management, UWA, Albany, WA, 6330

Over the last few years the consequences of our dependence on disposable products, including plastic, has resulted in an emerging problem for the worlds aquatic environments. Plastics have a detrimental effect on animals, including sea birds, as it can cause entanglement, intestinal blockages, and leachates can disrupt chemical processes of the body. Plastic debris of varying size is found in all oceans and on many beaches around the world. Australia is impacted by three major oceans, each with their own plastic dynamics. The South Coast of Western Australia is influenced by the Indian Ocean and the Southern Ocean, and the Indian Ocean Garbage Patch which is located east of South Africa. Although this coast is remote, it is predicted to become one of the most polluted regions of the world by the Transboundary Water Assessment Programme. The research presented here is intended to provide the first detailed information on the distribution of plastic on beaches from the South Coast of Western Australia and plastic ingestion by the Flesh-footed Shearwaters from the region.