

Title: A. Marine research infrastructure for Australia

Chair(s): Dr Barbara Musso, Facilities Program Director, Marine National Facility, Commonwealth Scientific and Industrial Research Organisation
Mr Tim Moltmann, Director, Integrated Marine Observing System

Contact(s): Dr Ben Arthur ben.arthur@csiro.au

Description: To effectively tackle the critical challenges of our growing blue economy Australia requires sustained effort and investment in our national marine science capability. Essential to this capability is world-class research infrastructure. In 2018 the Australian Government announced it will provide an additional \$1.9 billion for the Research Infrastructure Investment Plan and the National Collaborative Research Infrastructure Strategy (NCRIS), some of which will greatly benefit of marine research infrastructure. This infrastructure not only supports the study, observation and monitoring of our oceans, but can also help drive collaboration. As a community we must maximise coordination and utilisation of our infrastructure to ensure the best long-term return on investment. This symposium invites contributions highlighting the impact of research and collaborations enabled and supported by Australia's marine research infrastructure. This includes the Marine National Facility through RV Investigator, the Integrated Marine Observing System (IMOS), the Australian Antarctic Science Program, E-research infrastructure such as the IMOS Australian Ocean Data Network (AODN), and others; as well as contributions focussing on the current position and future opportunities for our national marine research infrastructure. The symposium will also welcome presentations of research which highlight success stories of collaborations between Australia's marine science research infrastructures.

Title: B. Marine megafauna, a “blue” resource: conservation of species and management of human activities to ensure a sustainable future

Chair(s): Dr Luciana Ferreira, Postdoctoral Fellow - Quantitative Scientist, Australian Institute of Marine Science

Dr Holly Raudino, Research Scientist, Department of Biodiversity, Conservation & Attractions

Dr. Ana Sequeira, Research Fellow, The University of Western Australia

Dr. Sabrina Fossette-Halot, Research Scientist, Department of Biodiversity, Conservation and Attractions

Dr. Olaf Meynecke, Adj. Research Fellow, Griffith University

Dr Carol Palmer, Senior Scientist, NT Government Marine Ecosystems, Flora and Fauna Division

Dr Kelly Waples, Principal Research Scientist, Department of Biodiversity, Conservation and Attractions

Contact(s): Dr Luciana Ferreira l.ferreira@aims.gov.au

Dr Holly Raudino holly.raudino@dbca.wa.gov.au

Dr. Ana Sequeira ana.sequeira@uwa.edu.au

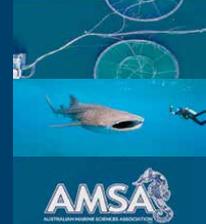
Dr. Sabrina Fossette-Halot sabrina.fossette@gmail.com

Dr. Olaf Meynecke o.meynecke@griffith.edu.au

Dr Carol Palmer carol.palmer@nt.gov.au

Dr Kelly Waples kelly.waples@dbca.wa.gov.au

Description: The rapid development of the coastal environment has resulted in severe modifications of coastal and marine ecosystems in Australia. These developments and associated activities commonly overlap with critical habitats of several marine megafauna species, including many that are endangered and vulnerable to extinction. The integration of science into management remains a challenge for the conservation of marine megafauna, particularly marine mammals and turtles. The exchange of knowledge between researchers and managers, including traditional owners, and how to interpret research findings into a language accessible to all, is integral to overcoming the challenge of integration of knowledge into management. We will discuss how this knowledge can help guide scientists, managers and industry to work together to ensure a sustainable future where the inevitable growth in human activities that affect the marine environment can be accompanied by resilient marine megafauna populations. Case studies will be presented where research on marine megafauna can be used to benefit management.



Title: C. The impact of artificial structures in marine ecosystems

Chair(s): Dr Dianne McLean, Research Assistant Professor, The University of Western Australia

Contact(s): Dr Dianne McLean d.mclean@aims.gov.au

Description: Artificial or anthropogenic structures are prevalent in our oceans and include sunken ships, purpose-built artificial reefs and infrastructure to support significant offshore oil and gas industries (pipelines, platforms, wells) and marine renewable energy generation. Structures are often rapidly colonised by a diverse range of epifauna/flora which in turn attracts mobile invertebrates, fish, and top predators. Artificial structures can impact marine ecosystems in positive (e.g. shelter, biodiversity) and negative (e.g. invasive species, contaminants) ways. This symposium highlights new research that is providing critical contribution to an understanding of the impacts that these structures have in our oceans.

Title: D. Unlocking the mysteries of Australia's deep ocean

Chair(s): Dr Dianne McLean, Research Assistant Professor, The University of Western Australia

Contact: Dr Dianne McLean d.mclean@aims.gov.au

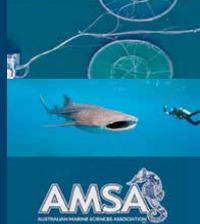
Description: There are more than 8 million square kilometres of deep sea in Australian oceans yet we know very little about this region, including how they are being impacted by climate change, pollution, fishing and mining. Emerging technologies and utilisation of deep-sea industries (fishing, oil and gas) in data collection are yielding scientific discoveries. This symposium session highlights recent discoveries in our deep ocean, identifies critical knowledge gaps and provides strategies for expanding our deep ocean observing community to benefit all elements of the blue economy.

Title: E. Mesophotic ecosystems for a blue economy

Chair(s): Dr Joel Williams, Fisheries Scientist, NSW Department of Fisheries
Dr Tom Bridge, Senior Research Fellow, James Cook University
Mr Joe Turner, PhD Candidate, The University of Western Australia
Dr Gal Eyal, Postdoctoral Research Fellow, The University of Queensland

Contact(s): Dr Joel Williams Joel.Williams@dpi.nsw.gov.au
Dr Tom Bridge thomas.bridge@jcu.edu.au
Mr Joe Turner joseph.turner@research.uwa.edu.au
Dr Gal Eyal gal4596@gmail.com

Description: There is increasing evidence that mesophotic ecosystems are unique and have large economic, social and environmental importance. It is therefore imperative that researchers gain appropriate knowledge of these systems to allow for resource management and spatial planning in these regions of the continental shelf. Mesophotic ecosystems are in the middle-low light range, often between 40-150 m in depth. With the advent of new technologies, such as, multibeam sonar, remote/autonomous operate vehicles and baited video systems, the mesophotic zone is becoming more accessible to scientific research. This symposium aims to bring researchers from all disciplines, working in both temperate and tropical regions, to present current findings and discuss future projects and collaborations. If there is sufficient interest we will organise a workshop to follow this symposium.



Title: F. Seafloor Mapping in Australia – Progress, Discoveries, Applications

Chair(s): Dr Iain Parnum, Research Fellow, Curtin University
Mr Aero Leplastrier, Marine Scientist, Geoscience Australia
Mr Ralph Talbot-Smith, Manager Cartographic Services, Coastal Infrastructure, Western Australia
Department of Transport

Contact(s): Dr Iain Parnum, I.Parnum@curtin.edu.au
Mr Aero Leplastrier, Aero.Leplastrier@ga.gov.au
Mr Ralph Talbot-Smith, Ralph.Talbot-Smith@transport.wa.gov.au

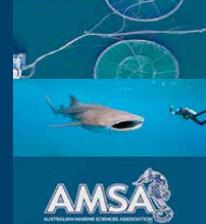
Description: Seabed mapping is crucial for understanding and effectively managing Australia's vast marine estate. It provides the preliminary assessment of the underwater topography, geology and potential biology of seafloor habitats. This information is essential for informing safe navigation, environmental monitoring, impact assessment, hazard modelling, and developing informed policy. Currently less than 15% of the Australian Marine Jurisdiction and less than 5% of the global ocean floor is mapped at adequate resolution for these purposes. Mapping the remainder of the ocean requires a large collaborative effort and this symposium aims to provide a platform to connect data users and collectors while facilitating information sharing for the benefit of the discipline. We welcome contributions on all aspects of seabed mapping that report on (i) recent co-ordination and collaboration initiatives, (ii) mapping efforts and discoveries in support of marine science, and (iii) the application of new or novel methods and technology.

Title: G. Earth Observation in Aquatic Environments

Chair(s): Dr Charlotte Robinson, Research Associate, Curtin University
Dr Adam Lewis, Head of National Earth and Marine Observations, Geoscience Australia

Contact(s): Dr Charlotte Robinson charlotte.robinson@curtin.edu.au
Dr Adam Lewis Adam.Lewis@ga.gov.au

Description: Earth Observation of freshwater, estuarine, coastal, coral reef and ocean environments is rapidly evolving and critical for the monitoring and safe-guarding of marine environments. Detection monitoring and assessments of the water quality and biogeochemistry of inland, estuarine, deltaic, near coastal and oceanic waters as well as mapping of macrophytes, macro-algae, sea grasses and coral reefs, and shallow water bathymetry are now possible. Through National programmes such as IMOS, TERN, Digital Earth Australia and the Australian Copernicus Programme Data Hub and international collaborations such as the bio-Argo program and the NASA-sponsored CEOS Ocean Variables Enabling Research and Applications for GEO (COVERAGE), observation-derived information will become increasingly operational. This special session is intended to provide an update on the state of the art in each of these areas of research, ultimately leading to management relevant applications of earth observation for aquatic ecosystems. This symposium invites presentations on all aspects of earth observation for aquatic ecosystems, from the theoretical to applied to operational methods. The session will conclude with coordinated "Australian Aquatic Community" discussion to identify needs across the community to be presented at national and international fora, and to drive activities in national facilities.



Title: H. Observing and modelling the oceanography and biogeochemistry of Australia's coastal and shelf regions

Chair(s): Dr Paul Thomson, Senior Research Fellow, The University of Western Australia
Professor Charitha Pattiaratchi, Professor, The University of Western Australia
Dr Simone Cosoli, Senior Research Fellow, The University of Western Australia

Contact(s): Dr Paul Thomson paul.thomson@uwa.edu.au
Professor Charitha Pattiaratchi chari.pattiaratchi@uwa.edu.au
Dr Simone Cosoli simone.cosoli@uwa.edu.au

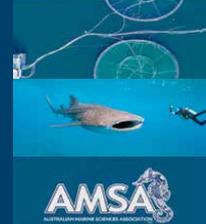
Description: Australia's coastal and shelf seas underpin our blue economy, which can be defined as the sustainable use of the oceans for economic growth, improved livelihoods and jobs, and ocean ecosystem health. The oceans are central to our way of life, whether it be directly through socio-economic needs such as providing food through fisheries or aquaculture, employment, transport, recreation, and energy or indirectly by modulating our climate. In this symposium, we invite submissions on how oceanographic and biogeochemical observations and modelling are benefiting Australia's blue economy through understanding our oceans. We welcome submissions utilising data from all regions of Australia.

Title: I. Science, knowledge and management of the Swan Canning Estuarine System: how can long-term datasets, knowledge and understandings inform future management of this urban waterway?

Chair(s): Dr Kerry Trayler, Principal Scientist, Rivers & Estuaries Science, Department of Biodiversity, Conservation & Attractions
Dr Fiona Valesini, Senior Research Fellow, Murdoch University
Mr Malcolm Robb, Branch Manager, Aquatic Science, Department of Water & Environmental Regulation
Professor Glenn Hyndes, Professor, Edith Cowan University

Contact(s): Dr Kerry Trayler Kerry.trayler@dbca.wa.gov.au

Description: The Swan Canning Estuary is Western Australia's number one heritage icon and has long held the fascination of indigenous and non-indigenous naturalists and scientists. As such, there is a wealth of information in artefacts, stories, and grey and scientific literature. This special session is intended to bring together collective knowledge and understanding of the system detailing its physical environment, water quality, aquatic and peripheral flora, aquatic fauna, avifauna, changing management, and indigenous, social and economic values. The intent is to build a collective understanding of a changing system and how understandings of the past can influence how we manage and balance social, environmental and economic factors into the future.



Title: J. Estuaries as hotspots of the Blue Economy – thrivers or just survivors?

Chair(s): Mr Malcolm Robb, Branch Manager, Aquatic Science, Department of Water & Environmental Regulation

Professor Michele Burford, Dean Research Infrastructure, Office of the Senior Deputy Vice Chancellor, and Professor, Australian Rivers Institute, Griffith University

Contact(s): Dr Frances D'Souza frances.d'souza@dwer.wa.gov.au

Description: Estuaries form a vital link between rivers and the sea and historically their sheltered waters and productive foodwebs largely determined their role as preferred places to settle. Thus, in Australia over 80% of the population resides near coasts and estuaries, embedding them in our culture and our Blue Economy. This major contribution of estuaries to the Blue Economy in terms of agriculture on fertile flood plains, irrigation, industry, housing and commercial fishing comes with challenges as the impacts of these activities compete with their role as vital natural environments. Estuarine environments provide food, shelter, nursery and spawning habitats for birds, fish and other fauna including commercial species. They help filter waterborne pollutants and protect shores from erosion and flooding. Providing these ecosystem services is juxtaposed against the response of estuaries to a changing climate. This symposium brings together the science, management and restoration needed to support thriving instead of surviving estuaries.

Title: K. Marine Science Communication Platforms

Chair(s): Miss Emily Jateff, Curator, Ocean Science and Technology, Australian National Maritime Museum

Contact(s): Miss Emily Jateff, ejateff@anmm.gov.au

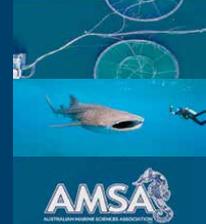
Description: The Australian National Marine Science Plan (2015-2025) outlines the '*critical need to engage and communicate with the Australian Community*'. In response, this session explores the way in which we share marine science with the public. It presents best practice for raising awareness of the marine environment and illustrating the importance of marine science via exhibitions, programs, popular publications, events, installations and digital outreach. It identifies opportunities to forge connections between new and established communities to better connect marine science and technology to the public.

Title: L. 'Blue Restoration' - Collaborative Marine and Coastal Restoration in Australia

Chair(s): Ms Jemma Purandare, Coordinator, Australian Coastal Restoration Network

Contact(s): Ms Jemma Purandare jemma.purandare@gmail.com

Description: The Symposium will provide an opportunity for an update on the growing number of blue restoration projects occurring across Australia, including coral reef, shellfish reef, seagrass, mangrove, saltmarsh and kelp, as well as living shorelines projects. The Symposium will provide a link between ecosystem-specific restoration, examine some of the known barriers to restoration, present examples of solutions, discuss feasibility and scalability, and introduce socio-economic and cultural drivers for successful blue restoration.



Title: M. Appreciating the value of marine and coastal ecosystems: what we know and future directions.

Chair(s): Dr Simon Reeves, Mapping Ocean Wealth Coordinator, The Nature Conservancy

Contact(s): Dr Simon Reeves simon.reeves@tnc.org

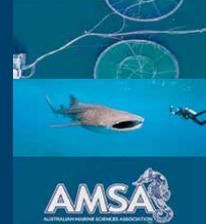
Description: Australia as a maritime nation is increasingly looking to the ocean as a major source of economic growth. Often this means that the needs of society and nature compete, resulting in coastal and marine ecosystems being highly threatened ecosystems. In the past, the benefit of protecting, conserving or restoring nature has been communicated in a language of 'biodiversity' and 'species', a language which is difficult to understand or value in normal economic terms. As a result of this language barrier, the value of nature often gets overlooked, despite the wealth of economic, social and cultural benefits it provides. In this symposia, we will explore the wealth of benefits provided by marine and coastal ecosystems and how these are being measured and communicated. We will examine what we presently know and look to the future to consider how a better understanding of the value of marine and coastal ecosystems can be used to sustain the use of Australia's blue natural capital.

Title: N. Ecological research that informs management decisions in Australian marine conservation reserves

Chair(s): Dr Simone Strydom, Research Scientist, Department of Biodiversity, Conservation and Attractions

Contact(s): Dr Simone Strydom simone.strydom@dbca.wa.gov.au

Description: Ecological assets often underpin the social and economic values of marine parks and Commonwealth reserves Australia wide. For example, healthy limestone reefs in proximity to seagrass meadows support the highest grossing fishery in Australia – the western rock lobster. Research that focuses on impacts and responses of habitat-forming ecosystems (coral reefs, macroalgae reefs, seagrasses) and how they influence subsequent ecosystem services is becoming highly critical in the face of our changing climate. This symposium will facilitate sharing interstate knowledge among scientists dedicated to conducting world-class research that focusses on informing management regarding these key habitats within these commercially and recreationally valuable areas. We believe that this symposium will be of interest to numerous ecologists, biologists, physiologists and remote-sensing scientists across a range of government, industry and academic institutions; who would benefit immensely from having an appropriate platform to share their work and gain new insights from other marine scientists.



Title: O. Ocean Stewardship - Active Earth-Keeping for our Blue Planet

Chair(s): Mr John Turnbull, PhD Candidate, The University of New South Wales

Contact(s): Mr John Turnbull john.turnbull@unsw.edu.au

Description: The human footprint is now so great that we are in the position of stewards of earth – whether we like it or not. Researchers call on an urgent need for active stewardship of earth systems, yet stewardship is poorly understood and operates on a range of scales, from backyard to planet, individual to institution. Stewardship activities include advocacy, education, preservation, restoration, sustainability, monitoring and compliance and are relevant in topical domains such as citizen science, community engagement, marine debris and protected areas. This symposium will bring together researchers and their ideas to progress the stewardship of ocean systems. It aims to integrate social, ecological and economic perspectives to highlight the ways we can actively care for our oceans, for a sustainable future.

Title: P. Perspectives on Dredging

Chair(s): Dr Luke Twomey, CEO, Western Australian Marine Science Institution

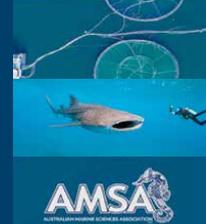
Dr Ross Jones, Dredging Science Node Leader, Western Australian Marine Science Institution, Senior Research Scientist, Australian Institute of Marine Science

Dr Jim Stoddart, Principal Marine Scientist, MScience Pty Ltd

Mr Ian Le Provost, Principal, Le Provost Environmental Pty Ltd

Contact(s): Dr Luke Twomey Luke.Twomey@WAMSI.org.au

Description: Australia has experienced unprecedented levels of dredging over the last two decades and recently there has been a focus on dredging research in Western Australia. As a result, there have been some incredible advances in our understanding of impacts to the marine environment from dredging and how to better predict, monitor and manage dredging programs (i.e. WAMSI DSN). The “Perspectives on Dredging” AMSA symposium is open to scientists, regulators, resource managers, industry and consultants – anyone with practical experience of dredging practices in the marine environment. The session will focus on impact prediction, monitoring and the lessons learnt from implementing the vast range of dredging programs ranging from those associated recent mega-projects in Western Australian and Queensland, to small maintenance dredging programs in coastal waterways. “Perspectives on Dredging” will provide an opportunity for dredging professionals to demonstrate their contemporary practical experience and how the impacts of dredging on the marine environment are predicted, managed and monitored in real-world scenarios.



Title: Q. The South Coast of Western Australia: research for management

Chair(s): Dr Jenny Shaw, Research Director, Western Australian Marine Science Institution

Contact(s): Ms Aleta Johnston aleta.johnston@wamsi.org.au

Description: The economic, social and environmental dimensions of the waters off the isolated south coast of Western Australia are poorly understood. This symposium aims to uncover previous and current research being conducted off the south coast and to bring the south coast to the attention of the wider marine science community and government bodies. Knowledge gaps identified by researchers and the impacts the south coast faces under a changing climate will help to develop a strong case for a future Western Australian Marine Science Institution (WAMSI) research program to support marine management in this region. This symposium session is open to all researchers working off the south coast of Western Australia and welcomes collaborative input into informing management with good science..

Title: R. Marine Extremes and their Impacts

Chair(s): Dr Gabriela Semolini Pilo, Research Associate, Institute for Marine and Antarctic Studies, University of Tasmania

Associate Professor Jochen Kaempf, Associate Professor, Flinders University

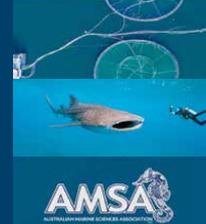
Dr Andrew Marshall, Senior Research Scientist, Bureau of Meteorology

Contact(s): Dr Gabriela Semolini Pilo gabriela.semolinipilo@utas.edu.au

Associate Professor Jochen Kaempf jochen.kaempf@flinders.edu.au

Dr Andrew Marshall andrew.marshall@bom.gov.au

Description: Extreme ocean temperatures are becoming more frequent and intense with a changing climate. These marine extremes can permanently change the abundance and distribution of biological communities, affect fishing and harvesting practices, and impact the profit and product quality of marine farms. The increase of marine extreme events is unavoidable. However, we can prepare our response to future events. Therefore, next steps in marine extremes studies are to better understand their drivers, and to predict such events. This session will invite observational and modelling studies on marine extremes, focusing on their drivers, teleconnections, and impacts. The goal of the session is to stimulate the discussion and collaboration between the several branches of marine scientists. We expect this collaboration to result in a list of the most pressing issues related to marine extremes that need to be addressed when moving towards a blue economy.



Title: S. Sustainable Growth of Aquaculture

Chair(s): Dr Glenn Shiell, BMT Oceanica

Contact(s): Dr Glenn Shiell, Glenn.Shiell@bmtglobal.com

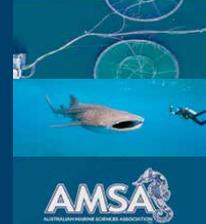
Description: Aquaculture is widely anticipated to grow rapidly in the coming decade to fill a worldwide protein gap; however, its growth must not be at the expense of the marine environment, and governments and industry are now more than ever (due to public pressure) compelled to find sustainable solutions. In this symposium, we are encouraging papers on observations / studies of aquaculture environmental interactions, policy, monitoring and management, and forecasting techniques, such as the use of integrated models to determine environmental carrying capacity.

Title: T. The evolving view of the role of plankton in marine ecosystems

Chair(s): Dr Anthony Richardson, Research Team Leader, The University of Queensland & Commonwealth Scientific and Industrial Research Organisation
Dr Kerrie Swadling, Research Fellow, Institute for Marine and Antarctic Studies, University of Tasmania, Antarctic Climate and Ecosystems Cooperative Research Centre

Contact(s): Dr Anthony Richardson anthony.richardson@csiro.au

Description: At AMSA in Adelaide in 2009, plankton researchers met to discuss the state-of-the-art of plankton research at that time. Ten years on, this symposium will highlight our evolving view of the role and importance of plankton. We envisage an inclusive symposium covering all areas of plankton research, and here are some examples, though naturally others are welcome. A large-scale view of changes in plankton around Australia is now provided by >10 years of IMOS data. A switch from krill to salps has been hypothesised in the Southern Ocean under climate change, which could have profound impacts on higher trophic levels. Changes in plankton over the past 60 years are being studied during the Indian Ocean Expedition. Recent field work has suggested that large quantities of zooplankton could be killed during acoustic surveys for oil and gas. Being able to capture, maintain and transport planktonic stages of corals could be key to reef restoration. Modelling work has suggested that changes in phytoplankton and zooplankton functional groups are key to understanding energy transfer to fish. And the aquaculture industry in several states continues to be plagued by periodic harmful algal blooms. This is an exciting time for plankton research in Australia and it is hoped that this symposium will showcase some of this ground-breaking research.



Title: U. Identifying and Managing Environmental Risk in the Blue Economy

Chair(s): Dr David Horn, Senior Technical Director, GHD

Contact(s): (TBC)

Description: Utilising the marine environment for economic purposes comes with a myriad of environmental risks which pose a challenge and responsibility for regulators, industry and beneficiaries of the blue economy. Risks to the marine environment include oil spill from shipping and petroleum activities, impacts from exploration (seismic) and decommissioning strategies, introduced marine species, direct and indirect habitat loss, over-fishing, pollutants affecting water and sediment quality and the global issue of plastic pollution. This session will provide a platform for marine scientists within government, industry and academia to demonstrate how these risks are being identified, prioritised and managed to protect our marine environment.

Title: V. Collaborations between traditional owners and scientists: Synergistic approaches

Chair(s): Mr Dean Mathews, Senior Project Officer Land & Sea, Nyamba Buru Yawuru Ltd
Dr Cass Hunter, Indigenous social ecological researcher, Commonwealth Scientific and Industrial Research Organisation Oceans & Atmosphere

Contact(s): Mr Dean Mathews dean.mathews@yawuru.org.au
Dr Cass Hunter Cass.Hunter@csiro.au

Description: It seems that the future of both marine and terrestrial conservation in Australia will be based on the joint management of reserves with the traditional owners of the land and water. Joint management approaches have been embraced by the commonwealth and state governments, for nearly two decades, and aims to undertake the management these reserves to both western science and aboriginal traditional values. Existing models still seem to place emphasis on developing acceptable patterns of use of the ecological values of “country” and not on recognition of social and spiritual values of land to aboriginal people. This session would like to focus on existing collaborative projects with traditional owners and scientists in science research and natural asset monitoring. Of particular interest would be the approaches used, the projects and the ongoing relationships that have been forged. It is important to present the synergy in both aboriginal and non-aboriginal perspectives



Title: W. AI and deep learning for Australian marine science

Chair(s): Professor Mohammed Bennamoun, Winthrop Professor, The University of Western Australia

Contact(s): Dr Lyndon Llewellyn L.Llewellyn@aims.gov.au

Description: To bridge the gap between the vastness and complexity of Australia's marine territories and the capacity of Australia's marine science community to explore and understand it, many are developing new technologies that can multiply the effort individual scientists and teams can apply to key challenges. But this step change in the technologies we use will also produce an explosion of data that may overwhelm us. The likely answer to this dilemma is an increased use of artificial intelligence and deep learning techniques to undertake the laborious steps in the pipeline from data gathering to knowledge creation. Digital systems also have the advantage of being able to work 24/7, 365 days of the year increasing the speed with which knowledge can be created and delivered to those that need it. It can also reduce the time spent by Australia's marine scientists gathering and checking data allowing more time for analysis and interpretation. But we need to adopt these technologies in a measured way so that we do not lose the quality of the science derived from having experts in every step of the "data to knowledge" pipeline. This session will focus on innovative ways we can analyse the rapidly growing marine data holdings throughout Australia using artificial intelligence and deep learning technologies and the QA/QC techniques that will give comfort to Australian marine science stakeholders that the science being created remains of the highest standard building on long term knowledge.

Title: X. Improved understanding of coastal and nearshore processes to inform management of Australia's coastal estate

Chair(s): Dr Jeff Hansen, Senior Lecturer, School of Earth Sciences, The University of Western Australia
Professor, Ryan Lowe, Professor, Oceans Graduate School, The University of Western Australia
Dr Mick O'Leary, Senior Lecturer, School of Earth Sciences, The University of Western Australia

Contact(s): Dr Jeff Hansen jeff.hansen@uwa.edu.au
Professor Ryan Lowe ryan.lowe@uwa.edu.au
Dr Mick O'Leary mick.oleary@uwa.edu.au

Description: Australia's vast coastline plays a vital part in the nation's economy by providing a conduit for a range of direct economic activity, is a major draw for domestic and international tourism, and is a fundamental part of the Australian identity and lifestyle. However, these factors have also resulted in considerable, and increasing, pressures on the coast that will be exacerbated by climate change. As a result, understanding the physical processes operating in the coastal zone is critical to manage the coast as a national resource, as well as mitigate the coastal impacts and hazards that will undoubtedly result from rising sea levels. We invite abstracts related to a broad range of processes that operate in the nearshore and coastal zone, including (but not limited to) wave, current, and sediment dynamics, water quality, and coastal evolution. We particularly encourage abstracts that relate to understanding coastal hazards, evolution, and management based on a range of methodologies from field and numerical techniques to paleo studies that inform modern and longer term coastal evolution.



Title: Y. New insights into the Indian Ocean

Chair(s): Dr Jessica Bentyusan, Research Scientist, Sustainable Coastal Ecosystems and Industries in Tropical Australia program, Australian Institute of Marine Sciences
Professor Lynnath Beckley, Professor, Environmental and Conservation Sciences, Murdoch University
Ms Danielle Su, PhD Candidate, The University of Western Australia

Contact(s): Dr Jessica Bentyusan j.benthuisen@aims.gov.au
Professor Lynnath Beckley L.Beckley@murdoch.edu.au

Description: Though the Indian Ocean is poorly studied relative to the rest of the world's oceans, the ongoing second International Indian Ocean Expedition (IIOE-2) is enabling new insights into this dynamically complex region. This symposium invites presentations that focus on the Indian Ocean, particularly those covering recent observational data, process understanding and oceanographic, climate, bio-geochemical and ecosystem modelling. Though not limited to formal IIOE-2 projects, presentations pertaining to the six themes (human impacts and benefits; boundary current dynamics and ecosystem impacts; monsoon variability and ecosystem response; circulation, climate variability and change; extreme events; and discovery of unique physical, geological, biogeochemical and ecological features of the Indian Ocean) are encouraged. These research themes have strong links to coastal systems and society.

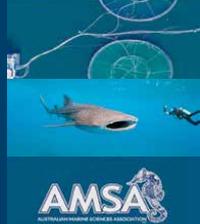
Title: Z. Ports and coastal marine science and management challenges for a Blue Economy

Chair(s): Associate Professor Michael Rasheed, Principal Research Scientist, James Cook University
Professor Chris Frid, Professor, Griffith University
Dr Nathan Waltham, Principal Research Officer, James Cook University
Associate Professor Odette Paramor, Acting Head of Department of Geographical Sciences, University of Nottingham Ningbo, China

Contact(s): Associate Professor Michael Rasheed michael.rasheed@jcu.edu.au
Professor Chris Frid c.frid@griffith.edu.au
Dr Nathan Waltham nathan.waltham@jcu.edu.au
Associate Professor Odette Paramor Odette.PARAMOR@nottingham.edu.cn

Description: Recent advances in the science underpinning effective management of port marine environments has the potential to allow economic development to sit alongside environmental protection and biodiversity conservation. There are many examples from Australia and around the world where the development of innovative applied solutions are resulting in the protection and effective management of critical marine habitats in ports while allowing the essential trade to continue. Protecting and managing the marine environment within ports and shipping lanes presents significant challenges. Global trade continues to grow near exponentially and shipping remains the most carbon efficient means of transporting goods, so global shipping and the expansion of ports is set to continue to increase in the near to medium term. The resulting increase of activities around ports creates a range of issues for managers, including potential impacts to sensitive receptor habitats such as coral, seagrasses, mangroves, coastal wetlands and intertidal flats which often occur in the sheltered coastal environments where ports are located. In addition ports and shipping activity brings a risk of marine pest introduction, waste disposal, atmospheric/air quality, underwater noise, dredge spoil disposal, land reclamation and impacts to water quality. This symposium highlights the excellent results that can be achieved when scientists partner with management agencies, port authorities and industry, to develop direct applied outcomes benefiting the marine environment within ports and pose the question - How can science further contribute to the development of 'sustainable' ports?

We invite participants of the session to submit their articles for an intended special edition of Marine and Freshwater Research on the topic, edited by the session conveners.



Title: ZA. Fish and Fisheries

Chair(s): Dr Brett Molony, Senior Principal Research Scientist, Commonwealth Scientific and Industrial Research Organisation Oceans & Atmosphere
Dr James Tweedley, Postdoctoral Research Fellow, Murdoch University

Contact(s): Dr Brett Molony Brett.Molony@csiro.au
Dr James Tweedley J.Tweedley@murdoch.edu.au

Description: Commercial, recreational and indigenous fisheries are fundamental to the blue economy, providing a sources of protein, employment and enjoyment. They are multidimensional, with successful management requiring biological, social and economic information. This session is seeking presentations on 'fish' (vertebrate and invertebrate) biology and ecology, fisheries management, social and/or economic dimensions of all types of fishing from estuaries and coastal waters to shelf and deep-water environments in Australia and elsewhere. Topics that could be addressed in the session include the sustainability of small-scale fisheries; balancing ecological, economic, and social outcomes; assessments of data-poor fisheries; new methods for stock assessment; bycatch mitigation; aquaculture-based enhancement, regulation, reporting and certification; social-licence to operate, spatial planning and marine protected areas; and conservation.

Title: ZB. Benthic communities and primary producers supporting food webs for a healthy ocean

Chair(s): Dr Rachel Przeslawski, Senior Benthic Ecologist, Geoscience Australia and Theme and Project Leader, Marine Biodiversity Hub, National Environmental Science Program
Dr Alexandra Campbell, Lecturer in Bioscience, University of Sunshine Coast

Contact(s): Dr Rachel Przeslawski Rachel.Przeslawski@ga.gov.au
Dr Alexandra Campbell acampbe1@usc.edu.au

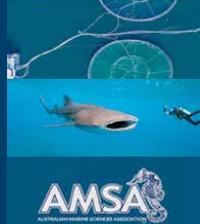
Description: Benthic communities and primary producers are essential for maintaining the health of ecosystems through a variety ecological services such as food supply, diverse habitats and refuge for vulnerable life stages. In this session we invite presentations on the biology and ecology of benthic communities and primary producers including but not limited to corals, seagrasses, microphytobenthos, pelagic phytoplankton, sponges, molluscs and crustaceans.

Title: ZC. Renewables

Chair(s): Dr Dirk Rijnsdorp, Research Associate, The University of Western Australia
Dr Jana Orszaghova, Research Fellow, The University of Western Australia

Contact(s): Dr Dirk Rijnsdorp dirk.rijnsdorp@uwa.edu.au
Dr Jana Orszaghova jana.orszaghova@uwa.edu.au

Description: Australia has a wealth of renewable ocean energy resources, including, but not limited to, wind, wave and tidal. The emerging ocean renewable energy industry in Australia is an important element of Australia's burgeoning blue economy. This symposium aims to show how marine science can support the sustainable development of clean energy from the power of the ocean.



Title: ZD. Marine fundamentals

Chair(s): Ms Kate Dodds, PhD Student, Macquarie University and Living Seawalls Project, Sydney Institute of Science

Dr Penny Berents, Senior Fellow, Australian Museum Research Institute

Contact(s): Ms Kate Dodds, kate.dodds@mq.edu.au

Dr Penny Berents Penny.Berents@austmus.gov.au

Description: Talks in this session will cover a broad range of topics that are not covered in other symposia: marine ecology, marine biology, marine chemistry, marine geology and oceanography.