

# CENTRE FOR MARINE SOCIOECOLOGY RESEARCH THEMES



CENTRE FOR MARINE SOCIOECOLOGY



**VISION** A WORLD-LEADING CENTRE TO SUPPORT INFORMED AND SUSTAINABLE MANAGEMENT OF MULTIPLE-USES IN MARINE AND COASTAL SYSTEMS

**MISSION** TO PROVIDE EXCELLENCE IN RESEARCH AND RESEARCH TRAINING THAT UNDERPINS THE SUSTAINABLE DEVELOPMENT OF THE MARINE DOMAIN FOR ALL USERS AND BUILDS THE NECESSARY CAPACITY TO PROVIDE SKILLS AND SOLUTIONS FOR INDUSTRY, GOVERNMENT AND THE COMMUNITY



# WHO WE ARE

We bring together disciplinary expertise in physics, law, economics, biology, sociology, psychology, human health, art, media, philosophy and governance from the UTAS's Institute for Marine and Antarctic Studies, the College of Arts, Law and Education, the Discipline of Geography and Spatial Sciences, the College of Health and Medicine, the Tasmanian School of Business and Economics, the School of Technology, Environments and Design, the CSIRO, the AAD, and from selected partners around the world.

CMS was created out of a common desire to provide the knowledge needed to support the current and future use of our marine coasts and oceans. We bridge research excellence in physical, natural, social sciences and humanities to inform future sustainable development of individual sectors such as food production, energy generation, transport, recreational and cultural value.

CMS embraces the extensive knowledge of the traditional owners of Australia, working collaboratively with Indigenous scientists, Elders and knowledge holders to collectively enhance our understanding of our oceans and coasts.

*We acknowledge and pay respect to the traditional owners and custodians of sea country all around Australia, in particular lutruwita (Tasmania), and recognise their collective wisdom and knowledge of our oceans and coasts.*





# WHAT WE DO

Marine socioecology is a challenging new area of research that combines multidisciplinary, interdisciplinary and transdisciplinary components to support integrated systems perspectives. The approach recognises that humans are part of marine systems, and that considering social and ecological components separately cannot deliver the knowledge needed to support healthy sustainable marine systems, and the human communities that depend on them.



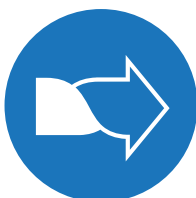
The demands of a growing human population have necessarily triggered rapid and ongoing 'blue' growth. However, marine ecosystems cannot support ongoing growth without transformational change in their use and governance as well as innovative solutions towards improved understanding, monitoring and protection. To meet the challenge of sustainable oceans, a coordinated, interdisciplinary and transdisciplinary approach is needed. The Centre for Marine Socioecology was created out of a common desire to provide the knowledge needed to support the current and future use of our marine coasts and oceans. We bridge research excellence in physical, natural, social sciences and humanities to inform future sustainable development of individual sectors such as food production, energy generation, transport, recreational and cultural values. Our work is actively working towards solutions across five key themes:



**Coastal  
& Marine  
Governance**



**Sustainable  
Futures &  
Planetary Health**



**Environmental  
Change &  
Adaptation**



**Knowledge  
Production**



**Science  
Engagement  
& Impact**

CHALLENGES

RESEARCH APPROACH

## OUR RESEARCH DELIVERS:

- Understanding of socioecological systems and the interactions that characterise them
- Research integration, synthesising understanding of socioecological challenges and how to effectively meld perspectives from multiple disciplines, working in partnership with a range of stakeholders including practitioners, managers, policy makers and the public to co-produce knowledge
- Technical expertise and tools around qualitative and quantitative approaches to inform management of multiple uses in our coastal and marine domains.



## WAYS OF WORKING

We bring together an extraordinary diversity of disciplinary expertise, and consider multiple knowledge systems. We work together in active multi-disciplinary, inter-disciplinary and trans-disciplinary collaborations to directly address both the theoretical and applied aspects of marine socioecological systems, at local, regional and global scales.



### INTRA-DISCIPLINARY

– working within a single discipline



### CROSS-DISCIPLINARY

– viewing one discipline from the perspective of another



### MULTI-DISCIPLINARY

– people from different disciplines working together, each drawing on their disciplinary knowledge



### INTER-DISCIPLINARY

– integrating knowledge and methods from different disciplines, using a genuine synthesis of approaches



### TRANS-DISCIPLINARY

– creating a unity of intellectual frameworks beyond the disciplinary perspectives, often including stakeholders, (i.e. a person or group that has an investment, share or interest in the outcome of the research)





# Coastal & Marine Governance



Pressing coastal and marine issues, such as climate change, overfishing, biodiversity loss and marine pollution are, in many ways, governance problems. Coastal and marine governance involves formal and informal arrangements (e.g., policy, regulations, economic incentives, and social and cultural norms) that mediate how humans interact with the environment and its resources. These arrangements may pertain to multiple levels of governance from local to global. Their design, implementation and enforcement involve, in addition to government, diverse actors from the private sector and civil society. At CMS, we investigate novel and forward-looking governance approaches and methods to underpin the sustainable management of marine social-ecological systems whilst also considering evolving social expectations.

## Research foci include, but are not limited to:

- Indigenous and local knowledge
- integrated ecosystem management
- marine law and policy
- human behaviour
- coastal conflict

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### A Practical Framework for Integrated Management of Marine Activities



Integrated Management (IM) provides solutions for the major deficiencies of sector-based management:

- Management of diverse activities by different agencies using different approaches.
- Management primarily focused on ecological objectives that do not properly evaluate social, cultural, economic or institutional objectives.
- No mechanisms to evaluate or advise on trade offs among activities in relation to objectives.
- No mechanisms to evaluate the cumulative effects of all managed activities.
- Insufficient management to deal with changing climate.

Stephenson et al. 2019. *Ocean and Coastal Management*  
doi: 10.1016/j.ocecoaman.2019.04.008



Stephenson et al 2019

# Sustainable Futures and Planetary Health



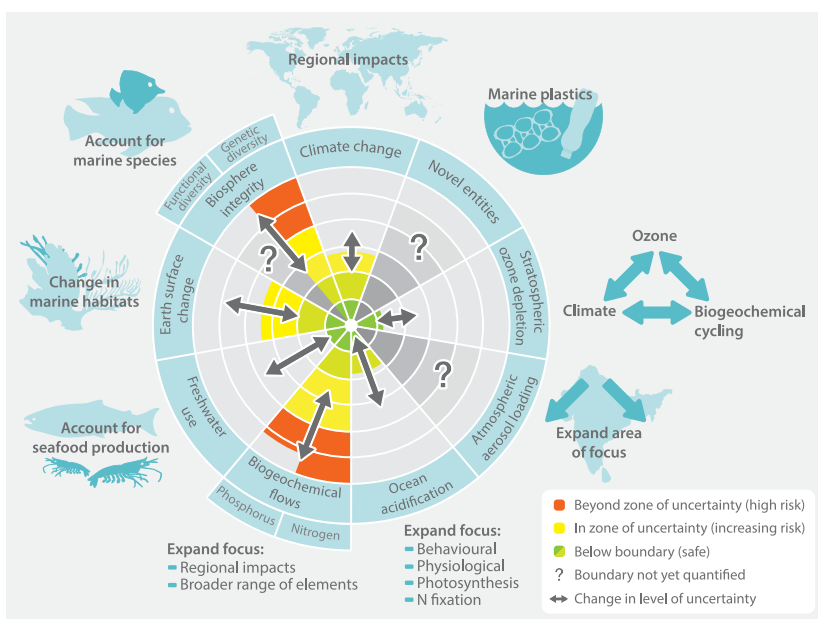
Human society's increasing use of the oceanic realm has brought with it new problems and opportunities; due to both the unprecedented growth of existing industries, such as fisheries, transport and tourism, and the rapid expansion of new industries including mariculture, seabed mining, and energy generation. Simultaneously, there has been an escalation in data collection on ocean state and processes, and how humans use and impact the oceans.

Now, the challenge is to find tools that can utilize available data and transform it into knowledge that will guide development of the oceans that is equitable and supportive of social, economic and ecological systems. It is critical to develop an understanding of the ocean's biophysical limits, and how to support human wellbeing while staying within these limits, as this will inform societal discussion around acceptable levels of environmental change within the oceans.

The UN Sustainable Development Goals and the UN Decade of Ocean Science for Sustainable Development both provide a structuring opportunity to progress the interdisciplinary science needed to deliver this fundamental knowledge and propose potential pathways to sustainability. The work we are doing in this domain encompasses defining planetary boundaries, food and nutrition security research, sustainable development of marine industries, and socioecology.

## Example research projects include

- Modelling socioecological thresholds: predicting a safe and just operating space for humanity in the global ocean <http://marinesocioecology.org/1-modelling-socioecological-thresholds-predicting-a-safe-and-just-operating-space-for-humanity-in-the-global-ocean/> (post doc)
- Fisheries and the Sustainable Development Goals: working towards a comprehensive framework <http://marinesocioecology.org/9-fisheries-and-the-sustainable-development-goals-working-towards-a-comprehensive-framework/> (PhD)



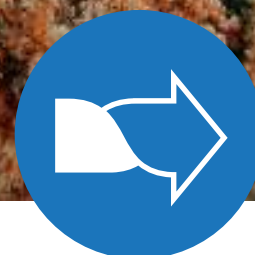
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Nash et al 2017, Nature Ecology and Evolution



# Environmental Change and Adaptation

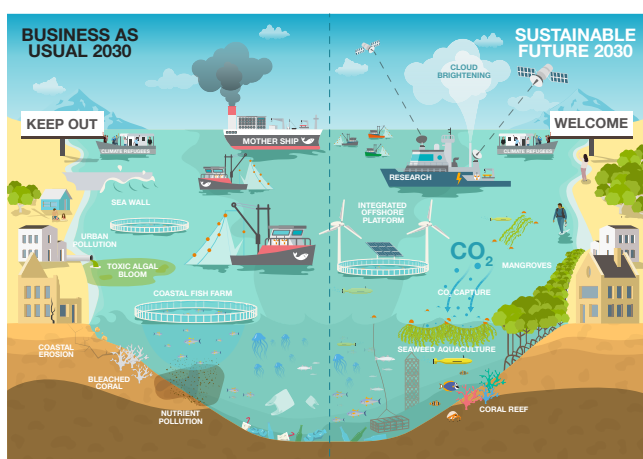


Social-ecological systems worldwide are grappling with un-precedented changes at local, regional and global scales. Climate is a major driver of these changes and climate-driven pressures often combine with other drivers and pressures to create cumulative impacts on ecosystems and dependent human communities and cultures. Understanding the resulting landscape of hazards, risks and vulnerabilities, and developing strategies for mitigation and adaptation are multi-dimensional problems.

Research under this theme aims to provide clear understanding of how humans influence natural systems, but equally, of how biophysical processes – including climate and other ocean change – affects people, communities and societies. Understanding motivations and barriers to adaptive behaviours and identifying key priority areas is central to our work (in terms of temporal and spatial scales for solutions and adaptations). This understanding is contributing to collaborative industry-government-researcher-community efforts to address topics spanning cumulative impacts, hazard analysis and risk assessment, multiple drivers of change, thresholds and tipping points, and integrated monitoring and assessment methods.

**Recognising the importance of specialist knowledge and exceptional disciplinary, as well as interdisciplinary approaches, we encourage a focus on the following key research areas:**

- Strategies to support adaptive capacity and influencing adaptive behaviour;
- Integrated approaches for social-ecological risk assessment, hazard and vulnerability analysis;
- Methods for understanding cumulative impacts and risks to support mitigation and adaptation strategies, including the design and implementation of integrated monitoring and assessment systems;
- Understanding of social-ecological thresholds and tipping points;
- Spatially relevant responses to minimize impact over time and take advantage of emerging opportunities;



## CONTACTS

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*An example of one of the draft graphical depictions of the business-as-usual vs. optimistic-but-technically-achievable futures for ocean social-ecological systems, being developed for the key Future Seas challenge "Warming world, changing ocean: mitigation and adaptation to support resilient marine systems" led by Rowan Trebilco.*



# Knowledge Production



This theme focuses on the role of knowledge co-production in achieving sustainability outcomes for marine socioecological systems. Knowledge co-production involves a dynamic interaction between researchers and stakeholders that connects science/research, policy, practice and community. How this dynamic interaction works and can be strengthened for sustainability outcomes is a field of research in its own right. The CMS aims for this theme are to:

- Bring together CMS members working in, or wanting to learn about, inter- and transdisciplinary research approaches (including knowledge co-production) for marine socioecological systems;
- Strengthen the connections of CMS science to policy and practice; and to
- Build an informal community of practice around knowledge exchange, knowledge co-production and participatory processes.



## Example research and activities includes:

- Engagement of traditional and Indigenous knowledge holders in the CMS led Future Seas project <https://futureseas2030.org/>
- Summer school for early career researchers on interdisciplinary skills for social-ecological systems research
- Seminars on recent research on knowledge co-production, eg "How can we work effectively with stakeholders, doing meaningful knowledge co-production to enhance science impact? What approaches work when engagement is online not in-person?" <https://www.youtube.com/watch?v=fTbXvxq3jt0&feature=youtu.be>

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**FAR LEFT** Dr Tero Mustonen of the Snowchange Initiative, chairing a workshop session on 'Perspectives from Traditional and Indigenous Knowledge holders' at the start of the Future Seas workshop.

**LEFT** Sutej Hugu performing a praise song in the traditional Tao tune of 'anood' at the start of the November workshop, recognising the "pioneering dialogues between scientists and Indigenous heritage keepers seeking a brave new planet governance starting from the oceans".

# Science Engagement & Impact



CMS recognises the increasing importance of engagement and communication across all facets of marine socioecological research. Globally, public perceptions and understanding of scientific research influence uptake and application of this research in practice. Our efforts within this theme focus on improving communication and engagement with marine stakeholders, policy-makers and the wider community. We aim to increase understanding of achieving engagement and science impact in practice, as well as work to identify the potential for activities, including citizen science and knowledge brokering, that can improve ocean literacy, marine citizenship and research uptake - ultimately, to develop pathways to impact for the timely and socially-relevant work and research we are conducting within the Centre.

## Key research questions under this theme

- How can we present our research to be relevant to the widest range of audiences?
- How do we identify/engage the needs of the marine stakeholders (including marine management, industry, recreation, conservation, etc.) and local communities in relation to our research questions?
- How can we monitor and maximise interaction with (and input to) our research?

## Example activities

- CMS Annual Showcase
- Curious Climate <https://curiousclimate.org.au/>

## Current projects include

- “Are We Getting Through? Evaluating the Success and Impact of Science Communication and Engagement Activities”
- “Does the Medium Matter: The effect of music and science on attitudes and behaviours towards climate change”
- “How does Understanding the Effect of Climate Change Impacts on the Lives and Livelihoods of Tasmania’s East Coast Communities Affect their Adaptation Response?”

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