Social science for sustainable marine futures

CSIRO marine socio-ecological systems research is focussed on a range of marine problems including: developing sustainability indicators for Australia's fisheries and seafood sector; supporting responsible innovation and the co-production of knowledge; identifying low conflict pathways for marine-based industries; and improving the marine literacy of the broader community.

Our social research strategies

- **Integration research**

Integration research is focussed on improving the understanding of real-world problems by bringing together relevant knowledge from diverse disciplines and stakeholders. Interdisciplinary approaches integrate these disciplines into the research process, while transdisciplinary approaches bring together diverse knowledge and non-research participants.
https://research.csiro.au/integration/

- **Knowledge co-production**

Knowledge co-production covers different modes of collaboration that can be integrated in research projects (i.e. Co-3D or co-design, co-development, and co-delivery). CSIRO provides clarity around these approaches and their use in the research process.
https://research.csiro.au/integration/co-3d/

- **Games to explore socio-ecological change**

Interactive games are a novel and powerful tool to engage stakeholders in complex problems affecting marine social-ecological systems and explore future options. Our transdisciplinary researchers and social scientists are leading the development of interactive games to support innovative research.
https://research.csiro.au/vsfsp/conference-game-on-for-csiro-at-pax-aus-2023/

- **Models of social attitudes and conflict**

Network models can be used to represent the changing attitudes of diverse stakeholders as they exchange views and are exposed to broadcast media. Our modelers are using data from stakeholder surveys to validate these tools and test alternative communications and operations strategies.

Sustainability in fisheries and seafood

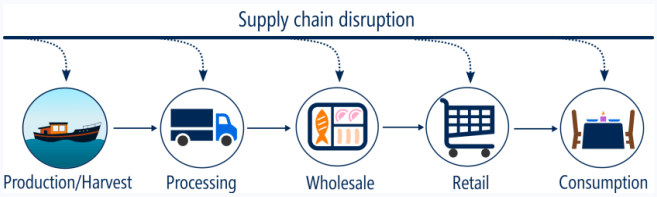
- **Healthcheck for Australian Fisheries**

Australian fisheries priorities have expanded beyond catching fish to ensuring a sustainable industry and managing broader societal perceptions and expectations. Working in conjunction with industry, research institutions and communities, the CSIRO has developed the Australian Fisheries Healthcheck. This database provides information on the performance of Australia's commercial fisheries in four categories (biological, economic, governance and social) using a total of 32 indicators. This information is used by a broad range of stakeholders, including the fishing industry, media, seafood certification schemes, NGOs, government agencies with non-regulatory interests, and communities.
https://research.csiro.au/cor/research-domains/fisheries-domestic/australian-fisheries-healthcheck/

- **Resilient and sustainable seafood supply chains**

Food supply systems are increasingly impacted by climate change (e.g. marine heatwaves), global pandemics and market disruptions. Remaining resilient under disruption, while also being sustainable, is essential for continued seafood supply in a changing world. But what does it mean to be resilient and how can we build future resilience across the supply chain?

Building on CSIRO's capability in socio-ecological systems modelling, our social scientist are co-developing new methods, tools and indicators to evaluate the resilience of seafood supply chains to economic and environmental shocks, and the longer-term implications for sustainability of the sector.



https://doi.org/10.1007/s11160-11023-09788-11161.

Low conflict pathways for marine-based industries

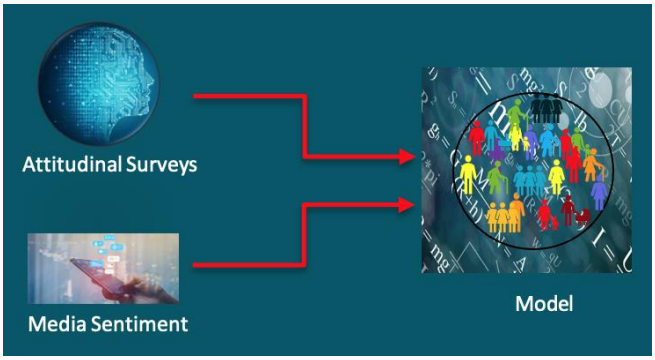
- **Reducing social conflict**

Polarisation of community attitudes is hindering Australia's ability to address many critical marine and coastal issues. The CSIRO has developed novel methods to address this problem by combining representative stakeholder surveys, media sentiment analysis based on AI technology, and dynamic stakeholder-based models to evaluate strategies aimed at reducing community conflict.

- **Social network modelling**

These models can assist decision making by pre-testing options for improving communication strategies, industry practices, or government policy. Model results project likely attitudinal changes across all stakeholder groups in the population, thereby allowing the social risks of alternative strategies to be compared.

This work is enabling managers and policy makers to understand how community attitudes are formed and evolve through time, including the concepts of attitudinal certainty, social acceptability, and polarised conflict.



https://www.nature.com/articles/s41598-022-26570-8
https://doi.org/10.1016/j.marpol.2024.106211

Climate change pathways and adaptation options for fisheries and aquaculture

- **Humans as part of the fishery system**

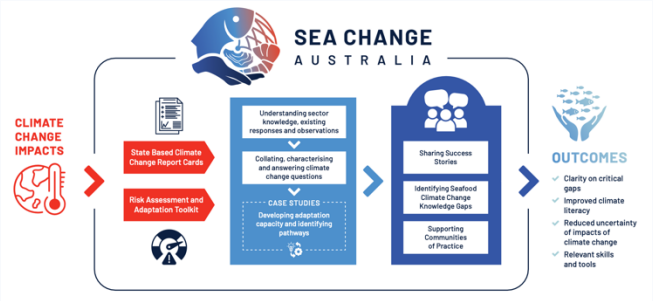
Our social researchers have co-developed a number of vulnerability assessment frameworks to investigate opportunities for adaptation and intervention in Australia's commercial fishing and aquacultural industries. Recent work includes forecasting marine heatwaves and assisting industry to reduce risk, build resilience and enhance their management response.
https://doi.org/10.1016/j.dsr2.2023.105276

- **Recreational fishing and climate change**

CSIRO is investigating the attitudes of recreational fishers to climate change. In particular, how 'behavioural nudges' could be used as an alternative to government regulation.
http://dx.doi.org/110.1016/j.marpol.2016.1011.1034

- **Facilitating knowledge exchange to support climate change adaptation in fisheries and aquaculture**

Our research group is collaborating with the Centre for Marine Socioecology to develop pathways and climate adaption options for fisheries and aquaculture. This includes creating practical solutions for local regions and specific sectors to build climate ready communities and boost economic resilience.



As Australia's national science agency and innovation catalyst, CSIRO is solving the greatest challenges through innovative science and technology.

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Centre for Marine Socioecology (CMS)

CSIRO is a partner in CMS, which brings together disciplinary expertise in physics, law, economics, biology, sociology, psychology, human health, media, philosophy and governance. CMS uses this expertise to focus on the complex issues that are developing in the management of the marine estate.

https://marinesocioecology.org/