

SPECIALISTS IN AQUATIC AND MARINE ECOLOGY

The scientific expertise within the CMB lies in the combined use of ecological and molecular approaches to gain insight into the function and health of marine and aquatic ecosystems. Based on deep and detailed knowledge, we evaluate the impacts of anthropogenic and natural stressors on the function and responses of organisms and ecosystems.

RESEARCH RESOURCES & EXPERTISE

- Experimental and restoration ecology
- Environmental surveys and impact assessments
- Environmental microbiology
- Microbial pathogen detection and characterisation
- Molecular analysis and bioinformatics
- Analytical chemistry
- Bioassay development
- Biofilm and biofouling characterisation
- Experimental design and biostatistics
- Environmental sampling and monitoring equipment
- Marine and microbiology laboratories
- Aquarium and controlled-environment facilities

RECENT AND CURRENT PROJECTS

- Diseases in marine seaweeds
- Responses and adaptation of sponges and corals to temperature stress
- Detection of microbial pathogens in aquaculture and the environment
- Development of biofilms in the marine environment
- Impact of ocean warming on species interactions
- Ecology of invasive species
- Restoration of underwater forests
- Coastal microbial observatories
- Kelp observing systems
- Resistance and resilience of ecologically and economically important seagrasses and oysters
- Antibiotic resistance in wastewater and marine systems

WHAT WE DO

We conduct research to understand how microorganisms and higher organisms interact in a productive way to perform essential ecosystem function in the marine and aquatic environment. We define how environmental stressors such as pollution or climate change impact these functions from the molecular scale all the way to broad-scale ecological interactions.

As study systems we focus on important habitat-forming or commercially valuable organisms, such as seaweeds, seagrasses, sponges, oysters and fish. We have expert knowledge on these system and capabilities to assess their performance and health.

We have successfully used our ecological knowledge and expertise to protect and restore ecosystems, in particular in the coastal, urbanized environment. Our environmental and ecological knowledge has also contributed to aquaculture policy and has assisted industry and state-government decision makers on aquaculture development.

We have extensive expertise in bioassay development, in particular for biofilm formation and biofouling on submerged structures in the aquatic and marine environment (e.g. pipes, nets, pylons etc.). We have developed effective and environmental-friendly technologies to prevent fouling based on a detailed mechanistic understanding of biofouling processes.

We have also initiated large-scale observation systems in the coastal environment that generate long-term data of biological and environmental health. Such data is crucial to provide benchmark information to assess the impact of future or proposed development on the coastal, urban environment. We are also investigating how sewage outflows impact marine and human health, in particular with respect to antibiotic resistance, spread of pathogens and disease in marine organisms.

We have an active outreach program that informs and trains the wider public and relevant interest groups about aquatic and marine ecology.

PARTNERSHIPS

We collaborate with state government agencies, federal government research agencies, other universities and industry-based organisations in Australia and overseas.

EXPERTS



Associate Professor Torsten Thomas is the Director of Marine Bio-Innovation. He is an environmental microbiologist and ecologist with over 20 years research experience. His current work focuses on how microorganisms influence the

function and health of a range of marine and aquatic ecosystem.



Dr Suhelen Egan is a Deputy Director of the Centre for Marine Bio-Innovation. She is a microbiologist with extensive experience in the areas of molecular biology, microbial symbiosis and marine

biotechnology. Her current research interests include understanding the role of microorganisms in the health and function of marine plants and animals. Suhelen also leads research in the area of natural product discovery from marine systems.



Dr Adriana Verges is Deputy Director of the Centre for Bio-Innovation. She is a quantitative field biologist with over 10 years experience in marine ecology and conservation. Adriana is a passionate science communicator

and leads outreach programs that engage communities with solutions-focused research while increasing public awareness of marine conservation issues.



Associate Professor Paul Gribben is an ARC Future Fellow and specialises in aquaculture, marine ecology and fisheries conservation science. He has contributed to aquaculture policy and has

worked with industry and state-government decision makers on aquaculture development.



Professor Peter Steinberg is Director and CEO of the multi-university Sydney Institute of Marine Science and a Visiting Professor at Nanyang Technological University in Singapore. He has 30 years

experience across a broad range of coastal marine ecosystems and organisms. His research interests include experimental marine ecology, environmental microbiology, biotechnology and restoration ecology.



Professor Staffan Kjelleberg is a microbial ecologist working on ecologically relevant complex microbial communities that form the default biofilm mode of life. His interdisciplinary approach encompasses the overall community structure, function

and performance of microbial biofilms as well as the mechanisms of their communication and micro-ecological interactions for biofilm control, from environmental engineering in the urban water cycle to public health and sustainable ecosystems