

SPECIALISTS IN SUSTAINABLE AQUACULTURE

Sustainable aquaculture has emerged as one of the key activities to address food and income security, and to reduce pressure on the wild fisheries of the world. Our specialists are experienced in freshwater, brackishwater and marine-based aquaculture in Australia and the Asia-Pacific. We specialise in research on the culture of molluscs, finfish, crustaceans and seaweed.

RESEARCH RESOURCES & EXPERTISE

- Nuclear technologies for nutrition studies and elemental analyses at our laboratories at UNSW and ANSTO
- Experimental design and statistical analysis
- Capacity in cutting-edge microbial and molecular analysis
- Environmental sampling and monitoring equipment
- Earthen ponds for fish growout research in partner countries
- Marine and microbiology laboratories
- Aquarium and controlled-environment facilities

RECENT AND CURRENT PROJECTS

- Land capability assessment for land-based aquaculture in Indonesia
- Technical and research capacity building of fisheries staff in Aceh, Indonesia
- Phenotypic diversity and survivorship of Sydney rock oysters
- Improving inland aquaculture production in Papua New Guinea
- Improving the sustainability of rice-shrimp farming systems in Vietnam
- Diversification of aquaculture commodities in Indonesia (with University of Sydney)
- Evaluation of potential for new aquaculture species in Australia
- Cause of molt death syndrome during the production of Australian lobster
- Analysis of fish gut microbiomes and processes
- Detection of microbial aquaculture pathogens
- Improving lobster farming technologies in Indonesia (with James Cook University)
- Growing a profitable, innovative and collaborative yellowtail kingfish industry (with NSW Department of Primary Industries)

WHAT WE DO

We conduct research on improving site selection criteria and land capability assessment, pond and cage array designs and engineering, improving broodstock management and fingerling production, disease management, nutrition, and animal husbandry.

Our research projects have focussed on oyster, prawn, lobster and fish production under different farming systems and utilising different farming practices.

Our aquaculture nutrition work involves improving fish feed quality, reducing the dependency on expensive and unsustainable sources of fishmeal, and improving assimilation of nutrients in formulated feed and natural food sources using modified gut micro-biomes. In developing countries we are investigating low-cost replacement fish feed ingredients, and improving fish feeding strategies to reduce waste and increase farm profitability.

Our team uses cutting-edge nuclear technologies to understand nutrition pathways in aquaculture systems, and to improve the quality of fish feed and fish health. Similarly, our microbiologists are at the cutting-edge of research on fish gut microbiomes.

Capacity building activities are built into our research projects, particularly in developing countries where we provide research and extension training to partner agency staff. We also train farmers, NGOs and extension officers in the application of better management practices.

Our expertise extends into social impact assessment, economic evaluation of aquaculture, value chain analysis and other aspects of the socio-economics of sustainable aquaculture. We also have experience in aquaculture policy formulation, SWOT Analysis of aquaculture sectors, Sustainable Livelihood Analysis, environmental impact assessment, and aquaculture-related risk assessment and management.

PARTNERSHIPS

We collaborate with state government agencies, federal government research agencies, other universities and industry-based organisations in Australia. We also collaborate with government agencies, non-government organisations, universities and aquaculture industries in the Asia-Pacific. Many of our international projects are co-funded by Australian and partner-country agencies.

OUR EXPERTS



Associate Professor Jesmond Sammut is a Deputy Director for the Centre for Ecosystem Science. He has over 20 years of research experience in aquaculture production in the Asia-Pacific. He has worked on

oysters, prawns, fish, seaweed and spiny lobsters, as well as rice-shrimp farming systems. He also specialises in building aquaculture research capacity in partner agencies and training farmers. He has established research teams and laboratories in developing countries.



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 ecosystems.



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 Debashish Mazumder is an Adjunct Senior Lecturer in the Centre for Ecosystem Science, and a Senior Research Scientist at ANSTO. His area of expertise

includes application of nuclear and isotopic techniques and modelling to quantify food and nutrient requirements for cost-effective aquaculture production. His expertise also includes the application of nuclear techniques for food traceability and to reduce environmental footprints in aquaculture. He worked with the WorldFish Centre to improve the production and management of aquaculture in a range of systems including integrated farming.



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.



Angela Liu is the Stakeholder Engagement Manager for the UNSW Aquaculture Research Group and the Research Support Manager for ACIAR projects in Vietnam, Indonesia and PNG. In addition to her research support duties, she conducts research on oysters, salmon, tilapia and kingfish nutrition, and specialises in the application of nuclear technologies to oyster and fish nutrition research.



Associate Professor Paul Gribben is an ARC Future Fellow and specialises in aquaculture, marine ecology and fisheries conservation science. He has contributed to the successful development of new species for aquaculture and aquaculture policy, and has worked with industry and state-government decision makers on aquaculture development.