

# Aquaculture Environment

## SARDI AQUATIC SCIENCES

The Aquaculture Environment subprogram conducts environmental research underpinning the sustainable development of aquaculture.

### Overview

The Aquaculture Environment subprogram works closely with the Aquaculture Program of SARDI and has strong collaborations with the aquaculture industry, various research institutions, PIRSA Fisheries & Aquaculture and other science program areas within SARDI.

The primary task of the Aquaculture Environment subprogram is to undertake research related to the interaction between the environment and aquaculture, thus ensuring sustainable development of aquaculture.

The group has had a close involvement with the now completed Aquafin CRC - examining the wastes produced by tuna farming, and how nutrients cycle through the environment, developing methods for regional-scale assessments of aquaculture, developing genetic techniques for determining local impacts, and developing an integrated hydrodynamic and biogeochemical model of the tuna farming area. In addition, several projects are being conducted in conjunction with PIRSA Fisheries & Aquaculture to undertake an environmental audit of the industry and enhance existing models of finfish carrying capacity.

We have recently completed and/or are working on several projects to provide PIRSA Fisheries & Aquaculture the information they require to develop new aquaculture zones and establish carrying capacities within zones and leases. The group also conducts the annual Tuna Environmental Monitoring Program and have now extended the DNA-based system for this monitoring to the Finfish Environmental Monitoring Program for yellowtail kingfish aquaculture.

Another recently commenced project is a feasibility study

for Integrated Multitrophic Aquaculture in SA. This will focus on examining the potential to grow seaweeds around finfish cages so as to both reduce the amount of nutrients released into the environment and provide farmers with an additional income stream.

### Recent Publications

Loo, M. G. K., Wiltshire, K., Rodda, K., Mantilla, L., Hoare, S., Nichols, J. and Theil, M. (2011). Zone Investigations Project Phase II: Technical Investigation of Lower Eyre Peninsula Region - Lincoln Offshore (outer) Sector and Point Bolingbroke Zone. SARDI Aquatic Sciences.

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Tanner J.E. and Rodda K. (2009). Survey of Abundance and Size to Estimate the Biomass of Abalone in the Seacages of Australian Bight Abalone Pty Ltd, prepared for ABA Pty Ltd. SARDI Aquatic Sciences.

Tanner, JE & JK Volkman. 2009. Aquafin CRC – Southern Bluefin Tuna Aquaculture Subprogram: Risk and Response – Understanding the Tuna Farming Environment. SARDI Aquatic Sciences.

Cheshire, A. C. and Loo, M. G. K. (2008). OXYTUNA - A model for the oxygen dynamics in a southern bluefin tuna sea-cage system. Aquafin CRC/FRDC.

Fernandes M & JE Tanner. 2008. Modelling of nitrogen loads from the farming of yellowtail kingfish *Seriola lalandi* (Valenciennes, 1833). Aquaculture Research. 39: 1328-1338.





Tanner, J. E. and Bryars, S. (2007). Innovative Solutions for Aquaculture Planning and Management – Project 5, Environmental Audit of Marine Aquaculture Developments in South Australia. FRDC.

Tanner, J. E. (Ed.) (2007). Aquafin CRC – Southern Bluefin Tuna Aquaculture Subprogram: Tuna environment subproject - Development of regional environmental sustainability assessments for tuna sea-cage aquaculture. Technical report, Aquafin CRC/FRDC.

Fernandes, M., Lauer, P., Cheshire, A., Svane, I., Putro, S., Mount, G., Angove, M., Sedawie, T., Tanner, J. E., Fairweather, P., Barnett, J. and Doonan, A. (2007). Aquafin CRC – Southern Bluefin Tuna Aquaculture Subprogram: Tuna Environment Subproject - Evaluation of Waste Composition and Waste Mitigation. Technical Report. Aquafin CRC/FRDC.

Tanner, J.E., Clark, T.D., Fernandes, M. and Fitzgibbon, Q. (2007) Innovative solutions for aquaculture: Spatial impacts and carrying capacity - further developing, refining and validating existing models of environmental effects of finfish farming. Technical report, FRDC.

Fernandes, M.B., Angove, M.J., Sedawie, T. and Cheshire, A. (2007) Dissolved nutrient release from solid wastes of southern bluefin tuna (*Thunnus maccoyii*, Castelnau) aquaculture. Aquaculture Research 38, 388-397.

Fernandes, M., Lauer, P., Cheshire, A. and Angove, M. (2007) Preliminary model of nitrogen loads from southern bluefin tuna aquaculture. Marine Pollution Bulletin 54, 1321-1332.

Loo, M. G. K., Ophel-Keller, K. and Cheshire, A. C. (2006). Final Report - Development of novel methodologies for cost effective assessment of the environmental impact of aquaculture. Aquafin CRC/FRDC.

Fernandes, M., Cheshire, A. and Doonan, A. (2006). Sediment geochemistry in lower Spencer Gulf, South Australia: implications for southern bluefin tuna farming. Australian Journal of Earth Sciences 53(3): 421-432.

## Staff

Dr Maylene Loo  
Subprogram Leader

Dr Loo received a PhD from the University of Adelaide. Prior to joining SARDI, she had worked in the tropics on various marine ecological research projects, which included coral reefs, mangroves and soft-sediment benthic ecosystems, gaining extensive experience and a good knowledge of sampling and monitoring techniques for carrying out coral reef and benthic community surveys.

She has also a good knowledge of data management and statistical analysis of large data sets. The projects were in collaboration with many ASEAN countries.

Current research interest involves projects in aquaculture environment such as the development of novel methodologies (molecular techniques) for cost effective assessment of environmental impacts and net fouling management to enhance water quality for aquaculture.

## Contacts

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