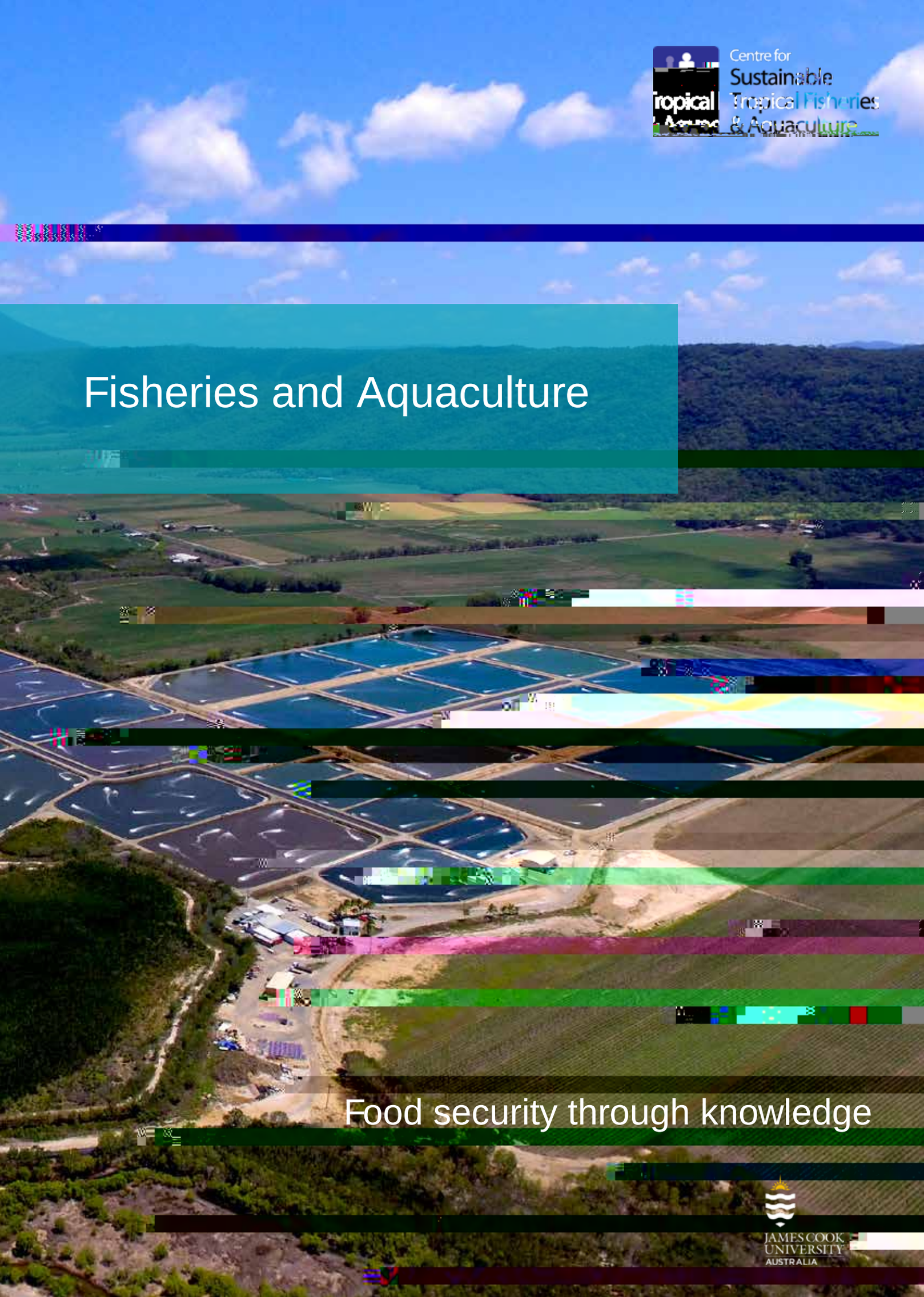
Centre for
Sustainable
Tropical Fisheries
& Aquaculture
Fisheries and Aquaculture
Food security through knowledge
JAMES COOK
UNIVERSITY
AUSTRALIA

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Tropical Fisheries and Aquaculture JCU

James Cook University is the premier provider for sustainable tropical sheries and aquaculture research globally. Our team provides world class, multidisciplinary, solutions-focussed research for local, state, federal and international resources managers, both in government and the private sector.

Get in touch today to discuss your research needs.

Jan Strugnell,
Director

Contents

Aquaculture & Fisheries at JCU

Tropical regions of the world face unprecedented challenges due to population growth and an associated demand for high-quality seafood. This population expansion will continue to pressure wild sheries resources and dictate ever higher e ciencies from aquaculture production.

Capitalising on its location, James Cook University (JCU) specialises in the sustainable exploitation of tropical aquatic species and is Australia's leading university in Tropical Fisheries Science including Aquaculture. JCU is dedicated to creating a brighter future for life in the tropics world-wide, through graduates and discoveries that make a di erence. Our research activities in aquaculture and sheries are ensuring this goal.

The university o ers a teaching and industry-outcome R&D portfolio delivered by internationally renowned experts. With a comprehensive undergraduate o ering in aquaculture and sheries sciences, through to graduate coursework and higher degree research options, JCU trains the next global leaders in aquatic food production. Through the Centre for Sustainable Tropical Fisheries and Aquaculture (CSTFA), JCU also partners with industry, NGOs, and government to tackle grand challenges associated with sustainable production of seafood. Our research is world- class, as evidenced by the Excellence in Research for Australia evaluations, where JCU was the highest ranked Australian university receiving rankings of research "well above" and "above" world average".

43

Professional and Tehcnical Sta 43

362

total publications from 2016 - 2019

34

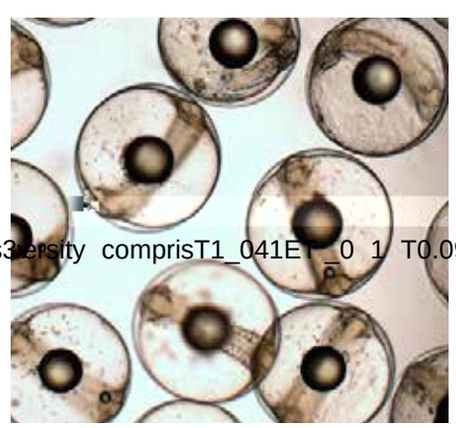
Research Collaborators

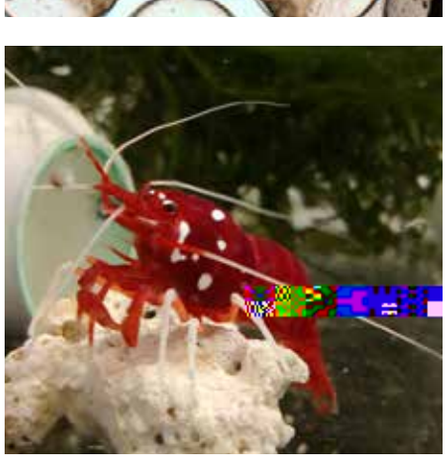
$6.3M

Competitive research grant income

$15.2M

Total funding income





Facilities

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Nutrition

Research Capacity

James Cook University is a global leader in aquaculture nutrition, physiology and post-harvest technology. The Nutrition, Physiology and Post-Harvest Technology Group has been in uential in developing and implementing applied solutions across these elds for several important tropical

Research Capacity

James Cook University is globally recognized for its research strength on seafood consumption and subsequent reactions with the human health system. The molecular investigation of seafood has in uenced the development of novel and improved diagnostics and detection systems for speci c seafood proteins, including barramundi, salmon, tuna, basa, cod, crabs, oyster and ve prawn species from the Asia-Paci c region. Furthermore, the health e ects of puri ed components are investigated

Macroalgae Research

Research Capacity

James Cook University is internationally renowned for its innovative industry and outcome driven research and development in macroalgae. The integrated production and application of macroalgae has been a focus of research at James Cook University, with the institution responsible for development of the core knowledge base leading to the productive and pro table aquaculture of freshwater and marine macroalgae(seaweed).

Research and Development

James Cook University has been a world leader in the research and development of macroalgae for more than 15 years and over this period has been a leading international source of high-quality research for the integrated production of macroalgae for the bioremediation of wastewaters. The institution is a recognised leader in biology, chemistry and production research, including the use of biomass in products ranging from human food and food ingredients (phycocolloids) through to nutraceuticals, animal feeds, fertilisers, biochar and bioenergy.

Industry Engagement

James Cook University is heavily engaged with the aquaculture and wastewater treatment industries in Australia and internationally through direct partnerships and research and training based on-campus and on-farms. The exemplar of this industry engagement is with Paci c Biotechnologies, a long-term partnership with substantial and ongoing collaboration in the development and implementation of the bioremediation of wastewaters, and the pro table use of the end-product biomass. Some collaborative multidisciplinary project work has been done also with CSIRO. In addition, the macroalgal team has a world-class international presence in the South Paci c and SE Asia.

Facilities

Research on macroalgae is centred around a purpose-built modern, world-class research and development facility on-campus. The facility is speci cally designed for industry research and development and includes pilot-scale commercial production for marine and freshwater macroalgae.

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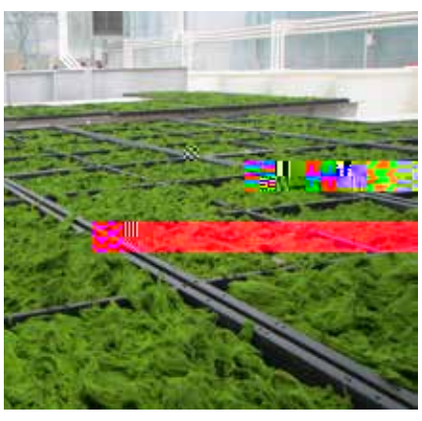

Marine Ornamentals

Research Capacity

The aquarium trade is a multi-billion dollar industry worldwide, and it is growing at a rapid pace. How ever, unlike freshwater ornamentals, of which 98% are captive bred, it is estimated that currently over 95% of marine ornamental s are collected directly from the wild, mainly from coral reefs, a practice that negatively impacts biodiversity of the fragile reef ecosystems. Moreover, in developing countries where the bulk of marine ornamentals are sourced, the collection is often done via reef damaging methods, e.g. using explosives and cyanide, which contributes to reef destruction.

In order to be sustainable, highly sought-after marine aquarium species must be bred in captivity to supply the trade and to further expand the industry. The Marine Ornamentals Captive Breeding Group are developing captive breeding techniques for a range of popular marine ornamentals, including crustaceans and sh. The Group have so far successfully bred more than 30 species, several of which are world rsts, and work on multiple other species is ongoing.

Research and Development

The aquaculture department at JCU is a world-leader for the research and development of captive breeding techniques for various marine ornamental sh and crustaceans, as well as intensive culture methods for tropical copepods, the key prey for larviculture of many marine ornamentals. The data and knowledge generated through R&D are being used to improve the economic and environmental sustainability of the multi-billion dollar marine ornamental trade industry while fostering an emerging marine ornamental aquaculture industry.

Facilities Overview

The Marine Ornamentals Captive Breeding Group utilizes both outdoor and indoor purpose-built modern research and development aquarium facilities on-campus, including several large dedicated temperature and environmental controlled saltwater recirculation systems. These systems are speci cally designed for conducting experiments to improve culture techniques for marine ornamentals focusing on key aspects such as achieving captive spawning of broodstock and improving reproductive output and larval quality, optimisation of larval feeding regime, nutrition and culture conditions, as well as designing species-speci c culture systems to enhance breeding success and culture productivity.

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Fisheries Science

Research Capacity

James Cook University is a world leader in Fisheries Science. JCU sta and students work closely with the shing industry and management agencies to provide relevant science-based advice on improving the management of sheries in the tropical world.

Research and Development

JCU is a global leader in sheries research, especially in relation to tropical systems such as coral reefs. Research is conducted not only in Australia, but through much of Southeast Asia and globally; and is designed to inform improved management. Research includes biology of shed species, ecosystem e ects of shing, sheries assessment, stock assessment, ecological risk assessment and socio-economic assessment and monitoring. JCU's research strength is recognised by its ranking as Well Above World Standard in the recent Excellence in Research for Australia exercise.

Industry Engagement

JCU researchers work closely with commercial, recreational, charter and indigenous shers, and provide advice on management of shed resources to relevant management agencies locally, nationally and internationally. JCU sta hold key positions on national and international advisory panels and management bodies actively advising policy and management. JCU's location provides for close links with world leading marine and sheries research and management agencies, and with shing industry groups.

Facilities

High calibre facilities including eld (Orpheus Island Research Station, research vessels), laboratory and computing infrastructure support our research.

Sharks and Rays

Research Capacity

James Cook University is globally recognised for its research strength in sharks and rays, being the top ranked university for publications in the last ve years. In addition, JCU sta are listed within the top ten shark and ray researchers worldwide (Google Scholar).

Research and Development

Research is especially designed to inform the management and conservation of sharks and rays at local, national and international scales. This includes work on the spatial ecology of sharks, stock structure

Research Capacity

James Cook University is internationally recognised for its strength in interdisciplinary research that improves the lives of people living in the tropics through the e ective management and conservation of coastal and marine environments. The sustainable use and production of aquatic resources can only occur if emerging biophysical and technological knowledge is e ectively translated into management action. Resilient, adaptive, and receptive societies are essential for achieving this goal. Understanding the broader social context, including how people perceive, value, and use aquatic resources is therefore key to ensuring sustainability through the e ective uptake of new science and technology.

Research and Development

The CSTFA human dimensions team collaborate closely with sta from other themes to implement interdisciplinary research aimed at improving the lives of people through e ective management and conservation of coastal and marine resources. Topics include the sustainability of shers, producers, industries and communities involved in aquatic food production; how to deal with change in sheries and aquaculture to ensure aquatic food security; and identi cation of adaptation strategies in coastal communities. Research projects span Australia, Melanesia, Southeast Asia and South America.

Industry Engagement

Sta on the human dimensions team work directly with individuals, communities, and decision-making bodies to provide targeted advice and research to support use, management and conservation needs. These include commercial, recreational, charter and indigenous shers both nationally and internationally, and key agencies such as the Great Barrier Reef Marine Park Authority of Australia, Queensland's Department of Agriculture and Fisheries, the National Fisheries Authority of Papua New Guinea, and the Galapagos Science Centre in Ecuador. JCU human dimensions sta hold key positions on national and international advisory panels such as the World Commission on Protected Areas and the International Council for the Exploration of the Seas' Study Group on the Socio-economic Dimensions of Aquaculture.

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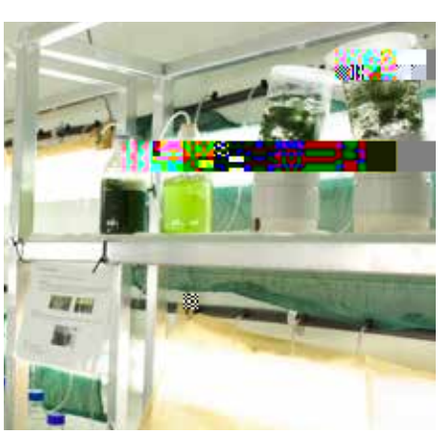
Aquaculture Science and Technology

Increased global demand has driven a rapid expansion of aquaculture food and resource production. James Cook University



Notes

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This publication was designed by Melissa Joyce for the Centre for Sustainable Tropical Fisheries and Aquaculture. This publication is intended as a general introduction to Fishereis and Aquaculture at JCU. Information is correct at the time of printing. Prospective domestic students and all international applicants should contact the University to con rm admission requirements and the availability of courses. The University reserves the right to alter any admission requirement or degree included in this publication without prior notice. CRICOS Provider Code 00117J