



# CARM NEWS *August 2017*

## RECENT IMPACT



In an important recent development, **Dr Wen-Hsi Yang** and **Professor Kaye Basford** worked closely with the fisheries stock assessment team from the Department of Agriculture and Fisheries to identify the current status of saucer scallop to respond to concerns about declining catches of legal-sized saucer scallop. Indeed, Wen-Hsi was a co-author of an authoritative quantitative assessment report which alerted decision makers to the urgency of the inferred decline in the saucer scallop stock. This was reflected in a press release, on November 18, 2016, by the Minister for Agriculture and Fisheries and Minister for Rural Economic Development, The Honourable Bill Byrne. The latter called for Fisheries Queensland officers to hold urgent meetings with commercial operators to discuss strategies to protect the sustainability of the scallop fishery. The Queensland scallop fishery is currently closed.

Reference: Yang, W.H., Wortmann, J., Robins, J.B., Courtney, A.J., O'Neill, M.F., Campbell, M.J. (2016). Quantitative assessment of the Queensland saucer scallop (*Amusium balloti*) fishery. Technical Report. Department of Agriculture and Fisheries, Queensland.

## NEW PROJECTS

FRDC Project titled, **“Stock predictions and spatial population indicators for Australia's east coast saucer scallop fishery”** joint with M.F. O'Neill, A.J. Courtney, G. Leigh., M.M. Campbell (DAF) W-H, Yang., J. Filar (CARM).

This project will undertake high spatial resolution analyses of fishing and environmental influences on the scallop population. Improvements to the scallop assessment model will be carried out to produce better predictions for management of the stock.

AFMA funded project led by CSIRO titled, **“Harvest strategies for the Torres Strait Finfish fishery”**. Joint with T. Hutton (CSIRO); M.F. O'Neill, G. Leigh (DAF); A. Tobin (Tobin Fish Tales); K. Basford, J. Filar and M. Holden (CARM).

The project will contribute to defensible and robust management decisions including the potential mechanisms for fishery expansion. It will assist in a development of a sustainable harvest strategy that is ratified by management agencies and Islanders.



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## WELCOME



CARM welcomes **Professor Jerzy Filar**, the Director for CARM. A Fellow of the Australian Mathematical Society, Jerzy is a broadly trained applied mathematician with research interests spanning a wide spectrum of both theoretical and applied topics in Operations Research, Applied Probability, Environmental Modelling, Optimisation, Game Theory and Perturbation Analysis. He spent the first thirteen years of his academic career in the US, which included appointments at the University of Minnesota, The Johns Hopkins University and the University of Maryland and long-term consulting for the Environmental Protection Agency in Washington, DC. He returned to Australia in 1992 where he first worked at the University of South Australia and later at Flinders. He is the editor-in-chief of Springer's Environmental Modelling and Assessment and serves on editorial boards of several other journals including the Journal of Mathematical Analysis and Applications. He has supervised, or co-supervised, to completion 23 PhD students who are working in various universities, industries and research institutions in Australia, USA, Canada, UK, China, Morocco and France.



CARM welcomes **Dr Matthew Holden** who joins CARM as a lecturer. Matthew also holds a Postdoctoral Research Fellow position at the Centre of Excellence for Environmental Decisions. Matthew leads a research program integrating the fields of mathematics, theoretical ecology, fisheries management, and conservation, and teach undergraduate and graduate level courses for the School of Mathematics and Physics. Matthew is an applied mathematician using dynamic models and decision theory to improve conservation planning when conservation benefits depend on how humans modify their behaviour in response to policy. He earned his PhD in Applied mathematics at Cornell University, winning a National Science Foundation Graduate Research fellowship to work on optimization problems in fisheries management, invasive species control, and sustainable agriculture. He received his bachelor's degree from the University of California, Davis, where he won the University Medal, working on the effect of habitat fragmentation on species persistence.



CARM also welcomes **Roxanne Jemison** as the Centre Administrative Officer who can be contacted on [carm@maths.uq.edu.au](mailto:carm@maths.uq.edu.au) for any enquiries between 1:20pm and 5pm Monday to Friday. Roxanne has held positions throughout UQ in the Schools of Medicine, Economics and the Biomedical Sciences and is also the current UQ Node Administrator for the Australian Research Council Centre for Excellence in Integrative Brain Function, where she works in the mornings. Roxanne has just completed her Graduate Certificate in Business Administration and is continuing in the MBA program.



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## WELCOME CARM AFFILIATES for 2017

### **UQ School of Maths and Physics**

Associate Professor Diane Donovan, Reader Mathematics

Professor Dirk Kroese, Professor of Mathematics and Statistics

Professor Geoffrey McLachlan, Professor of Mathematics

Dr Yoni Nazarathy, ARC DECRA Fellow and Senior Lecturer

Professor Phil Pollett, Professor of Mathematics

Dr Thomas Taimre, Lecturer in Mathematics and Statistics

Dr Cecilia Gonzalez Tokman, ARC DECRA Fellow

### **UQ School of Biomedical Sciences**

Associate Professor Jennifer Ovenden, Principal Research Fellow

### **The Nature Conservancy, Virginia, USA**

Professor Hugh Possingham, The Chief Scientist

### **Queensland Department of Agriculture and Fisheries**

Dr Tony Courtney, Principal Fisheries Biologist

Dr George Leigh, Fishery Resource Assessment Scientist

Dr Warwick Nash, Science Leader

Dr Michael O'Neill, Principal Fisheries Scientist

Dr Joanne Wortmann, Senior Fisheries Scientist

## R WORKSHOPS

Successful R Workshops were held on the 13th- 15th June 2017 and 20th -22nd February 2017 with the June Workshop seeing the return of the popular Advanced Workshop with Bill Venables.

The next R Workshops will be held on the 5th – 7th February 2018 at Lucia Campus. Please email [carm@uq.edu.au](mailto:carm@uq.edu.au) to place your name on the notification list for registrations and further information.

### **Introduction to R:**

**5th February 2018** (Associate Professor Anthony J. Richardson and Associate Professor Dave Schoeman)

### **Intermediate to R:**

**6th – 7th February 2018** (Associate Professor Anthony J. Richardson and Associate Professor Dave Schoeman)

### **Advanced R:**

**5th – 7th February 2018** (Dr. Bill Venables)



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## Workshop on Applications in Natural Resource Mathematics

**NOTICE THAT REGISTRATIONS WILL OPEN IN THE NEXT TWO WEEKS**

Workshop on Applications in Natural Resource Mathematics (WANRM)

Global Change Institute, Level 2, Rooms 275 and 273, University of Queensland, St Lucia  
3-5th October, 2017



Centre for Applications in Natural Resource Mathematics



Keynote Speakers	Organising Committee
<ul style="list-style-type: none"> <li>• Richard Barker, University of Otago</li> <li>• Michel De Lara, École des Ponts ParisTech</li> <li>• Deborah (Dvora) Hart, NOAA, Woods Hole</li> <li>• John Norbury, Oxford University</li> <li>• Roger Cropp, Griffith University, Nathan</li> <li>• Trevor Hutton, CSIRO, CMAR</li> <li>• George Leigh, DAF, Brisbane</li> <li>• Eva Plaganyi, CSIRO CMAR</li> <li>• Jason Sharples, UNSW</li> </ul>	<ul style="list-style-type: none"> <li>• Clare McGrory, Conference Director</li> <li>• Jerzy Filar, Director of CARM</li> <li>• John Hearne, RMIT</li> <li>• Joshua Ross, University of Adelaide</li> <li>• Wen-Hsi Yang, Research Fellow CARM</li> <li>• Sharon Lee, University of Queensland</li> <li>• Matthew Holden, Research Fellow, CARM</li> </ul>

In recent years growing numbers of mathematical scientists have been working to develop and apply mathematical and statistical theory to produce tools that will have a direct impact in the management of fisheries, forestry, water security, conservation, pest and disease management, and adaptation to global changes. Their efforts have already had major impact on our understanding of important phenomena such as dynamics of ecosystems, sustainable fisheries, wildlife trafficking and bushfires. This workshop aims to bring together many of the leading Australian researchers in these areas with three eminent international experts, early career researchers and PhD and Honours students to report their latest findings and exchange ideas on future developments. It will also provide early career researchers with a valuable forum to showcase and obtain feedback on their work from leading researchers in their field and gain insights into the open challenges within the broader area of natural resource mathematics.

Registration details to be released shortly. Please email CARM at [carm@maths.uq.edu.au](mailto:carm@maths.uq.edu.au) for any further information. <https://www.smp.uq.edu.au/CARM/conferences-and-workshops>  
This event is supported by AMSI and CARM.



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## PUBLICATIONS 2017

Arief, V., DeLacy, I., **Basford, K.**, Dieters, M. (2017). Application of a dendrogram seriation algorithm to extract pattern from plant breeding data. [Euphytica](#). 213:85

Blanchard, J., Heneghan, R.H., Everett, J.D., Trebilco, R., **Richardson, A.J.** (2017). From bacteria to whales: Using functional size spectra to model marine ecosystems. [Trends in Ecology & Evolution](#). 32:3: 174-186

Bennett, M.B., Coman, F., Townsend, K.T., Couturier, L.I.E., Jaine, F.R.A., **Richardson, A.J.** 2017. A historical and contemporary consideration of the diet of the reef manta ray, *Manta alfredi*, from the Great Barrier Reef, Australia. [Marine and Freshwater Research](#). 68:993-997.

Ejov, V., **Filar, J.**, Roddick, J., Rossomakhine, S. (2017). A note on using the resistance-distance matrix to solve Hamilton Cycle Problem. *Annals of Operations Research*. DOI 10.1007/s10479-017-2571-7

Everett, J., Baird, M.E., Buchanan, P., Bulman, C., Davies, C., Downie, R., Griffiths, C., **Henegan, R.**, Kloser, R., Laiolo, L., Lara-Lopez, A., Lonzana-Montes, H., Matear, R., McEnnulty, F., Robson, B., Rochester, W., Skerratt, J., Smith, J., Strzelecki, J., Suthers, I., Swadling, K., van Ruth, P., **Richardson, A.** (2017). Modeling what we sample and sampling what we model: Challenges for zooplankton model assessment. *frontiers in Marine Science*. 4(77)

Rohner, C., Burgess, K., Rambahiniarison, J., Stewart, J., Ponzo, A., **Richardson, A.** (2017). Mobulid rays feed on euphausiids in the Bohol Sea. [R. Soc. open sci.](#) 4 161060

**Holden, M.**, Butt, N., Chauvenet, A., Plein, M., Stringer, M., Chades, I. (2017). Academic conferences urgently need environmental policies. *Nature Ecology & Evolution*, 1-2 Correspondence paper