FRDC
FISHERIES RESEARCH & DEVELOPMENT CORPORATION

Building economic capability to improve the management of marine resources in Australia

Final Report

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Finally, Sarah Jennings (Project Investigator) would like to thank Professors Colin Buxton and Stewart Frusher for their persistence and enthusiasm in helping develop the initial project proposal, and Jo-Anne Ruscoe (FRDC People Development Program Manager) for her support and patience.

Abbreviations

AARES – Australian Agriculture and Resource Economics Society

AFMA – Australian Fisheries Management Authority

ABARE – Australian Bureau of Agricultural and Resource Economics

AAD – Australian Antarctic Division

CMS – Centre for Marine Socioecology

CRC – Cooperative Research Centre

CSIRO – Commonwealth Scientific and Industrial Research Organisation

FRDC - Fisheries Research and Development Corporation

GRT – Graduate Research Training

IMAS – Institute for Marine and Antarctic Studies

NSW DPI – New South Wales Department of Primary Industry

SSRCP – Social Sciences Research and Coordination Program

SSERCP – Social Sciences and Economics Research and Coordination Program

DPIPWE - Department of Primary Industries, Parks, Water and Environment

UTAS – University of Tasmania

QUT – Queensland University of Technology

UofA – University of Adelaide

Executive Summary

Objectives

1. To build Australia's capability in fisheries resource economics through graduate training
2. To address identified high priority applied fisheries economics research needs of both State and Commonwealth marine resource through PhD research projects
3. To develop and deliver a range of fisheries resource economic training opportunities for marine scientists, industry and managers through a short course program
4. To develop an ongoing national focus in the area of applied fisheries resource economics that can address the long term research and training needs of both State and Commonwealth marine resource sectors

Summary

FRDC project *2008/306 Building economic capability to improve the management of marine resources in Australia* was developed and approved in response to the widespread recognition and acknowledgement of the importance of incorporating economic considerations into marine management in Australia and of the persistent undersupply of suitably trained and qualified individuals capable of providing this input. The need to address this shortfall received broad based support and following widespread stakeholder consultation and building on previous unsuccessful State-based initiatives, a collaborative, cross-jurisdictional cross-institutional capability building model was developed. The resulting project sits within the People Development Program as part of FRDC's 'investment in RD&E to develop the capabilities of the people to whom the industry entrusts its future', and has addressed its objectives largely through three core activities:

1. **The Fisheries Economics Graduate Research Training Program** which provides research training in fisheries/marine economics through enrolment in postgraduate higher degree studies at the three participating Universities;
2. **The Fisheries Economics Professional Training Program** which aims to improve the economic literacy of non-economist marine sector stakeholders and was implemented in collaboration with the Seafood Cooperative Research Centre through the Future Harvest Masterclass in Fisheries Economics; and,
3. **The Australian Fisheries Economics Network (Fishecon)** which aims to strengthen research in the area of fisheries economics by creating a forum in which fisheries economists, fisheries managers and Ph.D. students can share research ideas and results, as well as news of upcoming research opportunities and events.

These activities were undertaken by a core Project team, comprising economic researchers and teachers from each of the four participating institutions (namely the University of Tasmania, the University of Adelaide, Queensland University of Technology and the Commonwealth Scientific and Industrial Research Organisation), spanning three States and the Commonwealth. The Project team reported to and was guided by a project Steering Committee. Commensurate with the long term nature of the project objectives and some of its activities the project was extended (without additional resources) in 2012 to 30th June 2015.

Outcomes achieved to date

The Building Economic Capability Project has made a substantial contribution to developing human capital in fisheries economics and the profile of fisheries economics in Australia. It has also raised the profile of Australian fisheries economists internationally. Key outcomes of the project to date include:

- A total of 14 students have been engaged in the Graduate Research Training program, undertaking 17 individual research higher degree thesis projects. At the time of writing this report, 11 thesis projects have been successfully completed and students awarded their degrees.

- To date, students have published over twenty papers in referred journals, with as many more again expected to arise. These cover a wide range of topics, many of which have direct implications for marine resource management in Australia. In many cases the results of this research has also been showcased/disseminated through conference/workshop/seminar presentations.

- Short course training has been delivered to over 120 individuals representing a wide range of stakeholder groups through the Graduate Fisheries Economics short course and the Future Harvest Masterclass in Fisheries Economics with the resources available for the further delivery of these products.

- There is now a strong network of practising fisheries/marine economists within Australia with a regular newsletter and social media presence, and a recognised forum for annual face-to-face interactions.

Ensuring project legacy

Achieving a continuing legacy and prolonged impact of the FRDC's investment to date requires a sustained commitment of financial and other resources. This is being achieved through the transfer of responsibility for economics within the FRDC to the recently established 2015-300 Social Science and Economics Research Coordination Program (SSERCP). Inclusion of economics in the SSERCP will provide a formal, funded structure for supporting the continuation of the Building Economic Capability Project's core components and will provide the platform for achieving greater integration between economics and the social sciences, and between these and the biological and physical sciences.

Keywords

Fisheries economics, capability building, graduate research training, professional training, network, Fishecon

Introduction

In 2007, at the time of this project's inception, there was already a general recognition and acknowledgement of the importance of incorporating economic considerations into marine management in Australia. In the case of fisheries management for instance, the Commonwealth had an explicit objective to maximise the net economic returns to the Australian community through the appropriate use of fish resources under its jurisdiction and the process of actively reducing fishing capacity to improve economic performance in some fisheries had already begun. There was also recognition of the need for economic analysis to identify impacts and tradeoffs associated with the implementation of Commonwealth conservation initiatives aimed at protecting values associated with marine species and habitats, such as through marine protected areas. At the same time, intensified competition for resources in inshore waters (such as that between commercial and recreational fishing) and growing pressures on the coastal zone (such as those caused by growth in population and urbanisation) underpinned recognition of the need for economic input into issues of resource allocation and to maintaining the profitability of marine resource dependent sectors, such as commercial fisheries, in State jurisdictions.

The increasing demand for economic input into fisheries (including aquaculture) management and other marine resource issues acted to highlight the shortage of appropriate economic capability within Australia. Economists with the necessary skills were relatively few in number and were spread thinly across institutions and geographically. Furthermore, most were fully committed and unable to keep pace with the growing demand. The problem of persistent undersupply was further exacerbated by the attraction of economics/business graduates to careers offering higher salaries; a lack of postgraduate training opportunities in the area of marine resource economics, including scholarship support; and limited training opportunities for existing fisheries managers.

The need to address the shortfall in economic capability was widely discussed at various forums, and while research needs and priorities differed across jurisdictions and user groups, commitment to incorporating economics into marine management was increasingly reflected in research plans at all levels, including that of the FRDC (FRDC Research and Development Plan 2005-10). Following widespread stakeholder consultation, and building on previous unsuccessful State-based initiatives, a collaborative, cross jurisdictional capability building model was developed. This lead to the development and submission of an FRDC project proposal and culminated in approval of *FRDC project 2008/306 Building economic capability to improve the management of marine resources in Australia* (hereafter referred to as the Building Economic Capability Project or the Project). The Project was initially granted for the period 1st October 2008 – 30th June 2013. A project extension was approved to 30th June 2015 in late 2012 to accommodate the timelines of particular project components.

Objectives

1. To build Australia's capability in fisheries resource economics through graduate training
2. To address identified high priority applied fisheries economics research needs of both State and Commonwealth marine resource through PhD research projects
3. To develop and deliver a range of fisheries resource economic training opportunities for marine scientists, industry and managers through a short course program
4. To develop an ongoing national focus in the area of applied fisheries resource economics that can address the long term research and training needs of both State and Commonwealth marine resource sectors

Project structure and operation

The Building Economic Capability Project was funded through the FRDC's People Development Program as part of FRDC's'investment in RD&E to develop the capabilities of the people to whom the industry entrusts its future'. The Project was structured around the activities of a core Project team, comprising economic researchers and teachers from each of the participating institutions, namely the University of Tasmania, the University of Adelaide, Queensland University of Technology and the Commonwealth Scientific and Industrial Research Organisation.

The core Project team comprised the following:

- Sarah Jennings – University of Tasmania (UTAS)
- Louisa Coglan – Queensland University of Technology (QUT)
- Sean Pascoe –Commonwealth Scientific and Industrial Research Organisation (CSIRO)
- Stephanie McWhinnie – University of Adelaide (UofA)
- John Tisdell – University of Tasmania (UTAS)

Sarah Jennings was PI and Louisa Coglan, Sean Pascoe and Stephanie McWhinnie CI's on the Project, with John Tisdell joining the team following his appointment as Chair of Natural Resources at UTAS in February 2010, a position that was jointly funded by the Project and UTAS for the duration of the Project. The Project team met regularly via phone conference approximately every two months during the initial term of the project, and less frequently during the project extension stage (see below). Informal communication between Project team members on a range of matters between these meetings was also common. While Sarah Jennings (PI) provided overall leadership for the Project, other team members provided impetus and assumed a leading role for various activities and events during the Project.

The Project team reported to and was supported by a Steering Committee, constituted in accordance with the Steering Committee Terms of Reference as agreed with FRDC (Appendix A). Table 1 shows Steering Committee membership and member affiliation for the period 1/10/2008 – 30/6/2015:

Table 1: Steering Committee Membership

Position	Name	Term
Independent Chair	Ian Cartwright	10/2008 – 06/2015
Member (FRDC People Development Program Manager)	Jo-Anne Ruscoe	10/2008 – 06/2015
Member (Recreation)	Alistair McIlgorm John Diplock	10/2008 -04/11 05/12 - 06/15
Member (AFMA)	David Galeano Beth Gibson Diarmid Mather	10/2008 – 12/2012 12/2012 – 05/2014 05/2014 – 06/2015
Member (Industry)	Neil Stump	10/2008 – 06/2015
Member (Seafood CRC)	Caleb Gardner	10/2008 – 06/2015
Member (Project PI)	Sarah Jennings	10/2008 – 06/2015

Project team members Sean Pascoe and John Tisdell, and Project CI Stewart Frusher (IMAS) were retained as permanent observers/advisors to the Steering Committee.

The Steering Committee met a total of seven times in Hobart on the following dates:

22nd April 2009; 28th May 2010; 14th April 2011; 19th June 2012; 19th December 2013; 15th August 2014; 9th April 2015.

The Chair (Ian Cartwright) conducted all meetings in accordance with standard meeting protocols, with an agenda and papers distributed prior to all meetings and minutes circulated for amendment following the meeting. On a number of occasions matters were dealt with between meetings by the Steering Committee through the Chair and via email.

The Project team and Steering Committee were both supported by a part-time Executive Officer (EO) who was located in Hobart and responsible to the PI. In addition to assisting with general project administration and reporting, the EO provided specialised support for specific activities such as training courses and FishEcon network events.

The following individuals held the EO role: Nikki Rogers; Emily Ogier; Sophie Hall-Aspland; Elsa Gartner. Angela Fletcher provided some website support during late 2012/early 2013 and Sue Abel (UTAS) provided a small amount of general support for the Project over the period March 2015 – June 2015.

Project reporting

In addition to milestone reporting, thirteen comprehensive reports on Project and related activities were provided to the Steering Committee and to the FRDC.

Project extension

The Project was initially granted for the period 1st October 2008 – 30th June 2013. A project extension was approved to 30th June 2015 in late 2012 to accommodate the higher degree research programs of FRDC students and the Project team's involvement in IIFET 2014. No additional funds were sought for this extension.

Project activities and outputs

The Building Economic Capability Project objectives were met largely through three core activities:

1. The Fisheries Economics Graduate Research Training Program
2. The Fisheries Economics Professional Training Program
3. The Fisheries Economics Network (FishEcon)

1. Graduate Research Training Program

The central pillar of the Building Economic Capability Project has been the Graduate Research Training (GRT) program which provides research training in fisheries/marine economics through enrolment in postgraduate higher degree studies at the three participating Universities (UTAS, QUT and UofA).

Consideration for FRDC scholarship support through the Project occurred once students had been accepted into the degree program at their selected University, and had hence demonstrated the necessary entry qualifications for such study. Recruitment into the GRT program was by application to the Steering Committee, who sought the advice of at least two Project team members (who were not directly involved in the applicant's supervision) as to the academic rigour of the research proposal and its alignment with the graduate research themes as agreed by the Steering Committee and the FRDC (Appendix B).

While the initial funding model for the Project allowed for a total of six research higher degree candidates enrolled across the three Universities, a combination of leveraging-off alternative competitive scholarship funding sources (such as Australian Postgraduate Awards, UTAS Elite Scholarships and Australian International Postgraduate Scholarships) and the inclusion in the GRT program of non-scholarship students based on the involvement of Project team members in research supervision, resulted in a program comprising thirteen individual candidates.

Recruitment of students into the Program occurred over the period 2010 – 2015, and included two non-scholarship Honours students (Rust and Nichols) both of whom subsequently were awarded FRDC scholarship support for PhD studies.

Table 2 lists the FRDC Building Economic Capability GRT students, their degree and degree status (as at the time of reporting), thesis title, the University they were/are enrolled at, and nature of FRDC scholarship support. Appendix C (available online at http://frdc.com.au/research/social_and_economic_research/Pages/Fisheries-Economics.aspx) includes detailed reports for each student including research project abstracts, details of supervisory committees, publications, awards and other communication/extension activities undertaken. Note that where students have been involved in multiple degree programs (e.g. Rust, Parades and Nichols), reports are included for each program separately.

Table 2: Summary of FRDC Building Economic Capability Graduate Research Training Program Students

Name	Degree	Project title	Institution	Status	FRDC Scholarship
Kofi Otumawu-Apreku	PhD	Matters of Management, Sustainability and Efficiency: Essays in Fisheries	University of Adelaide	Awarded	Full
Peggy Schrobback	PhD	Economic analyses of Australia's Sydney rock oyster industry	QUT	Awarded	Top-up
John-Baptiste Marre	PhD	Quantifying economic values of coastal and marine ecosystem services and assessing their use in decision-making: applications in New Caledonia and Australia	QUT (cotutelle)	Awarded	Top-up
Samantha Parades	MA	The role of offsets in compensating for damage in the coastal and marine environments	QUT	Awarded	Full
Caleb Gardner	MA	An economic evaluation of management strategies for the Tasmanian rock lobster fishery	UTAS/TSBE	Awarded	-
Giles Austen	PhD	A dialectical basis for consilience in marine resource management	UTAS/TSBE	Awarded	Top-up
Sophie Gourguet	PhD	Ecological and economic viability for the sustainable management of mixed fisheries	UTAS/TSBE/IMAS (cotutelle)	Awarded	Top-up
Mohottala Gedara Kularatne (Kule)	PhD	Optimal Allocation Of Water In Village Irrigation Systems Of Sri Lanka	QUT	Awarded	-
Steven Rust	Hon	A Contingent Valuation of Recreational Fishing in Tasmania	UTAS/TSBE	Awarded	-
Steven Rust	PhD	Excess capacity in regulated and unregulated fisheries	UTAS/TSBE	Thesis under examination	Top-up
Rachel Nichols	Hon.	An economic analysis of access agreements in the WCP tuna fishery	UTAS/TSBE	Awarded	-
Anna Farmery	PhD	An assessment of the environmental performance of selected fisheries and the implications for food security	UTAS/IMAS	Continuing	Top-up
Tim Emery	PhD	Assessing the costs and benefits of individual transferable quota management in the Tasmanian southern rock lobster fishery, Australia	UTAS/IMAS	Awarded	-
Rafael Leon	PhD	The effect of catch shares strength on management of marine resources	UTAS/IMAS	Awarded	-
Stewart Sinclair	PhD	Computing optimal and viable harvesting strategies for Queensland's East Coast Trawl Fishery	QUT	New enrolment	Top-up
Samantha Parades	PhD	The value of local fisheries for the coastal community and tourism	QUT	New enrolment	Top-up
Rachel Nichols	PhD	Fishing behaviour and habitat quality linkages between Marine Protected Areas and fisheries	UTAS/TSBE	New enrolment	Top-up

Of particular note are:

- A total of 17 thesis projects were/ are being undertaken by the 14 students, with three students completing either Honours or Masters projects prior to enrolling in a PhD;
- Of the 17 thesis projects, two are at the Honours level; two at the Masters level; and thirteen are at the PhD level;
- At the time of writing this report, 11 thesis projects have been successfully completed with students being awarded their degrees; 2 thesis projects are currently under examination; 1 project is in the late stage of completion (with the student, Farmery, having transferred to a part-time enrolment basis); and 3 thesis projects are in the early stages of development (with Parades, Nichols and Sinclair having enrolled and been awarded Project support in 2015);
- The Project has supported both domestic and international candidates, with 5 international students, two of whom enrolled under a cotutelle arrangement, completing part of their candidatures in France and part in Australia.
- Student projects span a wide range of topic areas including fisheries management (commercial and recreational), marine management, climate change, environmental performance of seafood production, and access agreements. Projects also cover empirical and theoretical work, and demonstrate a wide range of analytical techniques including bioeconomic modelling; qualitative analysis; experimental economics; econometric analysis; viability analysis and non-market valuation. Thesis projects also reflect both orthodox and heterodox perspectives, and vary in terms of the extent to which they draw on single or multiple disciplines.
- In all cases, student projects have, in addition to theses, resulted in publication of findings in the peer-reviewed academic literature, with research also being showcased through conference presentations, seminars, and in some cases through reports, articles and the media. The outputs to date are presented in a later section of this report (Project Communication), but given the generally lengthy process of journal publication, the final list of thesis-related research outputs is anticipated to grow substantially.
- Despite generally tight job market conditions across the university, government and industry sectors, graduating students have generally been successful in securing employment. Of the 10 graduates who have completed their studies, 8 have secured employment, including positions with the Queensland Department of Agriculture, Forestry and Fisheries, IMAS (UTAS), University of Kelenaiya (Sri Lanka), IFREMER (France) and the Secretariat of the Pacific Community. Two students are currently pursuing the opportunity for post-doctoral research positions.
- The overall high quality of student research has been acknowledged through the following student awards:
    - Sophie Gourguet was awarded the 2015 PhD Award of the Monaco Oceanographic Institute for the work she carried out as part of her cotutelle PhD. This Award is given once a year to a young researcher for his/her PhD research in marine science and the publications produced based on this research.
    - Tim Emery received a commendation for his oral presentation at the World Fisheries Congress 2012, Edinburgh, Scotland, *Do catch shares really promote resource stewardship?*

- Tim Emery received a merit award for his presentation at ICES Annual Science Conference 2013, Reykjavik-Iceland, *Changes in quota market of a rock lobster fishery at times of decrease and increase in stock abundance.*
- Kofi Otumawu-Apreku was awarded a University of Adelaide Dean's Commendation for Doctoral Thesis Excellence.
- Peggy Schrobback received a commendation for at IIFET 2014 for her presentation *Economic capacity and capacity utilisation of Queensland's Sydney rock oyster industry.*
- Sophie Gourguet and Jean-Baptiste Marre were both awarded their PhD's from French universities with *cum laude,* the highest accolade possible.
- Mohottala Gedara Kularatne (Kule) received an award for the Best Aquaculture Paper at IIFET, 2012 for his paper *Reservoir Water Re-allocation and Community Welfare.*
- Steven Rust was awarded the Jenny Milne Memorial Prize for the best honours dissertation in economics for 2009.

Graduate Course in Fisheries Economics

Formal course work requirements vary across the three Universities involved in the Building Capability Project. The fisheries/marine economics research training of participating FRDC students was complemented through a graduate-level course. While targeted at fisheries economics research higher degree students, the course was made available to a broader audience of researchers and was promoted through distribution of a course flier and through the AFMA, ABARES, NSW DPI and the Tasmanian DPIPWE.

The course, which ran for a week between 30th January-3rd February 2012 at the School of Economics and Finance (now Tasmanian School of Business and Economics), University of Tasmania, Hobart, was attended by 12 students from a range of undergraduate backgrounds and included 9 higher degree research students (7 of whom were FRDC students), 2 ABARE employees and an environmental consultant. The cost of attending the course for FRDC students was met by the Project.

The graduate course program comprised the following topics:

- Fisheries economics and management: an introduction
- Applied bioeconomic modelling
- Productivity and efficiency analysis
- Economics of recreational fishing
- Non market valuation
- Modelling fisher behaviour
- Experimental economics

The course included formal lectures, workshops, and lab-based modelling and experiments. Course instructors included all core Project team members, plus Dr Satoshi Yamazaki (UTAS) and Dr Darla Hatton-Macdonald (CSIRO).

As well as introducing students to a range of contemporary skills and techniques, the course offered students the opportunity to engage with fisheries/marine economists beyond their own research supervision teams and to interact with their peers. A brief course evaluation survey indicated that the course had met the needs of the participants. The range of topics selected was rated as good to excellent with relevant content. The information and content covered met the course objectives with a range of appropriate topics included. The course duration of one week was also seen as appropriate, as were the teaching methods and concepts used. Students also indicated that the course materials were easy to understand, the quality of materials was good, that delivery was effective and lecturers provided good examples. Students also recognised the valuable networking opportunities provided by the course.

Two students (Steven Rust and Anna Farmery) were granted credit status for the course towards their Certificate in Graduate Research, a requirement for all PhD students at UTAS.

Other student support

Students were encouraged to apply for research-related operating expenses associated with their studies from a variety of sources, including their own Universities and from other projects with which their research was associated. For example, components of both Samantha Parades and Jean-Baptiste Marres research were supported through the Marine Biodiversity National Environmental Research Program (NERP). The Project however also contributed some funding for students to attend conferences, purchase software and data and meet survey expenses.

Following a call for applications, financial support was also provided to an early career researcher, Dr James Innes (CSIRO) to attend the North American Association of Fisheries Economists (NAFFE) 6th Forum at the University of Hawaii, where he presented the following paper: *How Optimal is Optimal: Do Behavioural Adaptations by Fishers Affect the Costs of Marine Reserves?*

In most cases, formal supervision of student research extended beyond the Project team, and included both national and international expertise in a variety of fields. Non-project team supervision included Professor Reg Watson (UTAS), Dr Bridget Green (UTAS), Dr Caleb Gardner (UTAS), Dr Jeff Dambacher (CSIRO), Dr Satoshi Yamazaki (UTAS), Dr Ingrid van Putten (CSIRO), Dr Clevo Wilson (QUT), Dr Tim Robinson (QUT), Dr Dmitriy Kvasov (UofA), professor Christopher Findlay (UofA), Dr Jean Boncour (Universite de Bretagne Occidentale), Dr Olivier Thebaud (UMR Amure), Dr Luc Doyen (CNRS, France), Dr Rich Little (CSIRO), Dr Klaas Hartmann (UTAS).

In some instances, students also received informal support/mentoring from Project team members beyond these formal supervision arrangements.

2. Professional Training Program

A second core component of the Building Economic Capability Project has been the Professional Training program aimed at improving the economic literacy of non-economist marine sector stakeholders. The results of an online survey of 56 managers, industry representatives, and researchers within the seafood industry and conducted in early 2010, indicated a high level of demand for short course training in fisheries economics (100% of respondents). The highest level of interest was for a basic, introductory course in fisheries economics of 1-2 days duration. Interest was also expressed at this time in online delivery.

The Professional Training component of the Project was delivered as a collaboration with the Australian Seafood Cooperative Research Centre (CRC), with the Seafood CRC providing financial and administrative support initially through *Project 2010-714 The Future Harvest Master Class.*

The resulting one-day course targeted seafood industry members in representative roles (fishers, post-harvest, managers, research, NGOs) and had as its objectives to:

- Challenge participants thinking about the role of fisheries management and the use of economics

- Learn how economics contributes to decisions on the sustainable management of the fishery
- Gain experience in using economic tools to explore how to achieve optimal future harvests
- Understand how economics can help inform debates about resource allocation in fisheries

Training resources for the Masterclass were developed by Project team members, and reviewed by Dr Caleb Gardner (UTAS). An activity providing hands-on experience in the use of bioeconomic models to inform decision-making processes for wild capture fisheries was developed as an integral part of the class. The model was based on software developed by Dr Klaas Hartmann for the purposes of the Masterclass. Participants were provided with access to netbooks to undertake the activity.

A pilot class was offered in Hobart, Tasmania, in September 2010. Eight further classes were run in Hobart, Adelaide, Melbourne, Brisbane (2); Sydney; and, Perth (2) between September and December 2010. Project team members, as well as Dr Klaas Hartmann, Dr Alistair MacIlgorm and Dr Seamus McElroy were involved in the delivery of the classes. In most cases, more than one instructor was present for the module in which the bioeconomic model was used. Operating costs associated with these classes were *Project 2010-714 The Future Harvest Master Class.* Seafood CRC participants were charged a fee of $50 per person while non-Seafood CRC participants paid $150 per person. The CRC provided substantial administrative support.

Overall 121 participants completed the class. In two cases, classes were delivered to teams consisting solely of fisheries managers. In all other cases the classes comprised participants from industry, management and research backgrounds.

The results of formal feedback gathered from a total of seventy-seven participants indicated that the Masterclass was successful in meeting participant expectations and in improving participants' understanding of fisheries economics and its role in management (see Table 3. below).

Table 3. Future Harvest Fisheries Economics Masterclass participant satisfaction

Question	**Participant responses**					
How well did the Class meet your expectations?	*Exceeded*	*Achieved*	*Mostly*	*Partially met*	*Not met*	*No answer*
	18%	55%	19%	7%	0%	1%
Will you recommend the Class to others?	*Definitely*	*Probably*	*Possibly*	*Probably not*	*Would not*	*No answer*
	55%	30%	13%	1%	0%	1%
Did the Class improve your understanding of the role of fisheries economics in future harvest decisions?	*Definitely*	*Yes*	*Some what*	*Very little*	*Not at all*	*No answer*
	27%	57%	12%	3%	0%	1%

Materials developed for the first round of the Masterclass have subsequently been used by Caleb Gardner to support delivery of a day on economics with the Quantitative Marine Science postgraduate students at UTAS.

Based on the success of the initial round of Masterclasses and following the recommendation of a Future Harvest legacy report commissioned by the Seafood CRC by Ian Cartwright, a proposal for an extension to the original grant was submitted, resulting in *Project 2013/748 Seafood CRC Future Harvest Master Class in Fisheries Economics - Revision & Extension.*

Revisions to the initial Masterclass included development of a new module on the use of benefit-cost analysis in fisheries management, materials for which were developed by Professor Harry Campbell, and development of a second fishery case study for the bioeconomic simulation model. An expanded suite of resources to support face-to-face delivery are also now available including questions and answers and an instructor guide. The Masterclass has also been extended to offer an online delivery option supported by videoed lectures, hands-on activities and tutorials. The online course will be hosted on the FRDC website with responsibility for delivery lying with the new 2015-300 Social Science and Economics Research Coordination Program (see **Ensuring Project legacy** for further details).

Other Professional Training activity

Individual project team members have also engaged in Professional Training activities during the course of this Project. These include:

- The Project co-hosted a three-day workshop on Multi-criteria Decision-making in Hobart in March 2010. The aim of the workshop was to enable participants to develop analytical skills and tools for incorporating multidisciplinary approaches (including fisheries economics) into marine and climate change research. The workshop was coordinated by Sarah Jennings and Gretta Pecl (IMAS), was delivered by Sean Pascoe and Wendy Proctor (CSIRO) and attended by 24 researchers.

- John Tisdell delivered a presentation entitled *Individual Tradeable Quota – A Fishy Story* to AFMA staff in Canberra on 20th July, 2013.

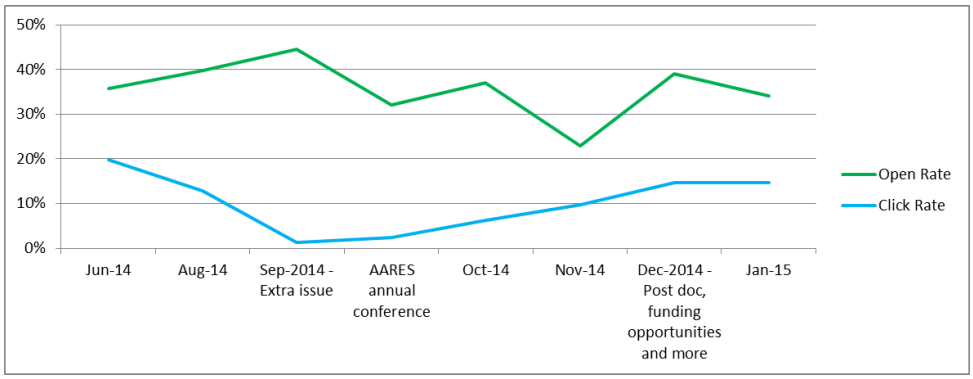
3. Fisheries Economics Network (FishEcon)

The third core component of the Building Capability Project was to establish and support a network of fisheries economists. Launched in February 2010, the Australian Fisheries Economics Network (and its associated brand Fishecon) has a membership of approximately seventy, including practicing fisheries economists and non-economists. The aim of the network is to strengthen research in the area of fisheries economics by creating a forum in which fisheries economists, fisheries managers and Ph.D. students can share research ideas and results, research opportunities, as well as well as news of upcoming events.

Communication between the Project and Network members has gone through two distinct phases during the course of the Project. Over the initial stages of the Project the main forum for the network was the dedicated Fishecon website (http://www.fishecon.org/) through which information can also be shared by the network members. The second communication phase (2011 – present) was based on distribution via email of a Fishecon network newsletter (http://us8.campaign-archive2.com/?u=9650b6ca231a67f76036de77b&id=36b11c8026&e=d844b1c598). Membership of the Network, and hence access to the newsletter, can be through either of Fishecon's Linkedin https://www.linkedin.com/groups?trk=nmp_rec_act_group_name&gid=5001299 or Facebook accounts https://www.facebook.com/pages/Australian-Fisheries-Economics-Network/168229646685365.

The communication strategy of the Australian Fisheries Economics Network is currently under review to ensure maximum relevance and reach (see **Ensuring Project legacy**).

Figure 1: Newsletter distribution report



The Australian Fisheries Economics Network and the AARES Conference

The small number of economists specialising in fisheries economics in Australasia meant that, prior to the Building Capability Project, there was not a regular face-to-face forum for researchers, practitioners and students to present their work for peer review and feedback, or to network with colleagues and collaborators. Although the Fisheries Economic Network is not formally affiliated with the Australian Agricultural and Resource Economics Society (AARES), the AARES annual conference now provides a platform for the development of an annual meeting of fisheries economists. Project team member, Stephanie McWhinnie, has worked with the annual organising committees of the conference to organise the fisheries sessions since 2010 and has the support of AARES executive members to continue to play this role for future conferences. This will ensure that Australasian fisheries economists have a local, focal conference point for the foreseeable future.

A brief description of the history of Project-related activity at AARES is given below:

2010 (Adelaide): A Fisheries Economics mini-symposium was organised by Stephanie McWhinnie and Sean Pascoe. The theme was *Australian fisheries management: Priorities and Modelling Rebuilding* and included presentations by Project Steering Committee member David Galeano (AFMA), Project team members Sean Pascoe, Stephanie McWhinnie and Sarah Jennings, and U.S.-based fisheries economist Sherry Larkin. In addition, 16 contributed papers were presented across 4 dedicated fisheries economics sessions.

The Mini-symposium was used as the platform to officially launch the Australian Fisheries Economics Network and the FishEcon website. The Project hosted a social event for network members which was attended by about thirty people.

2011(Melbourne): A dedicated Fisheries Economics stream of sessions was again scheduled as part of the conference program with 15 contributed papers. Project team members and FRDC students were active participants. DPI Victoria hosted a mini-symposium focusing on improving community benefit from fisheries resources. About 25 network members and guests attended the FishEcon social event.

2012 (Perth): Five dedicated fisheries economics contributed paper sessions were scheduled. Several project team members presented papers and chaired sessions. FRDC students, Kofi Otumawu-Apreku and Peggy Schrobback also presented papers on their research. A FishEcon social event was held and provided a networking opportunity for about 40 members.

2013 (Sydney): A pre-conference symposium on marine offsets will be co-hosted with the CSIRO and the Marine Biodiversity NERP, along with contributed papers sessions. The Network hosted its annual social function in conjunction with the conference.

2014 (Port Macquarie): This year's conference saw a smaller fisheries economics presence in light of the Project's commitment to the 2014 IIFET conference (see below). Nevertheless, two of the FRDC students (Steven Rust and Peggy Schrobback) presented papers on their work.

2015 (Rotorua): In the wake of IIFET 2014 (see below) and given constraints on funding of international conference travel, there was again a smaller fisheries economics and network presence at the New Zealand conference. Samantha Parades gave an oral presentation on her work, with Stephanie McWhinne also in attendance.

2016 (Canberra): see **Ensuring Project Legacy and Recommendations**

IIFET 2014

IIFET is the principal international association for fisheries economics, and the biennial conference is widely recognised as an opportunity for the best fisheries economists in the world to meet and share their ideas. Strong existing ties between Project team member Sean Pascoe and the IIFET executive ensured early engagement between the Project and IIFET, resulting in a bid led by the CSIRO, and including QUT, UofA and UTAS, to host the International Institute of Fisheries Economics and Trade Conference (IIFET) 2014 Conference. Project team members played pivotal roles in the organization and execution of the Conference. The FRDC was also the major sponsor for the conference.

Over a 3 ½ day period in July 2014, 270 participants from 39 countries benefitted from some 243 oral and 27 poster presentations, 5 plenary addresses, plus a variety of discussion panels, in 53 regular (submitted abstract) sessions, 8 special pre-organised sessions, and 4 plenary sessions.

A total of 63 Australians participated in the conference, coving all states and territories. Two thirds of these were from research institutions, with the remainder from industry and management authorities. Many of the FRDC research students participated in the conference, presenting their results,

A comprehensive conference report, covering organisation and planning, participation and program and awards and prizes is available in Pascoe, S., Coglan, L., Shriver, A., Jennings, S. and McWhinnie, S. *International Institute of Fisheries Economics and Trade Conference (IIFET) 2014 Conference Report*, Brisbane December 2014, available at http://frdc.com.au/research/Final_reports/2013-412-DLD.pdf.

4. Other activities and contributions

In addition to the three core Project activities described above the Building Capability Project has acted as a catalyst for increased activity in the area of marine resource economics in general both within and across the participating institutions. A non-exhaustive list of some of these activities follows:

- There has been substantial growth in capability in the area of natural resource economics in general, and fisheries economics in particular, at UTAS over the period of the Project. In addition to the appointment of Project team member Professor John Tisdell as Chair of Natural Resource Economics, several other appointments have strengthened the capacity Tasmanian School of Business and Economics (TSBE) in the area: Dr Satoshi Yamazaki, Dr Sayed Ifteker (2011 – 2013), Dr Dugald Tinch and Dr Clint Levitt. The impending appointment of Dr Darla Hatton-MacDonald to the position of Associate Professor Natural Resources will further strengthen capacity. The commitment of UTAS to a greater integration of economics into marine economics is also evidenced by the growth in economic expertise and activity within IMAS under the leadership of Caleb Gardner, with the joint appointment of Dr Eriko Hoshino (2011-2015) bridging the two institutions within UTAS.

- The TSBE at UTAS has also shown a commitment to ensuring the legacy of the Building Capability Project by offering two PhD scholarships in Marine Economics http://www.utas.edu.au/research/graduate-research/future-students/scholarships-and-fees/new-

other-scholarships . Scholarships and post-doctoral positions available through the newly formed CMS (a joint initiative between UTAS, CSIRO and the AAD) provide further opportunities for integrating economics into interdisciplinary research in the marine context http://www.utas.edu.au/research/graduate-research/future-students/scholarships-andfees/new-other-scholarships .

- Under the leadership of John Tisdell UTAS now has an Experimental Economics Laboratory facility http://www.utas.edu.au/economic-experiments/. Experimental economics is an important and growing field and the UTAS Lab allows researchers to evaluate the theory and application of economics to environmental and resource issues. Experiments have been conducted in fisheries management, including by two FRDC students (Tim Emery and Rafael Leon) as part of their thesis projects.

- There has been growth in the participation of economists in a number of key research processes. For example, Project team members are now involved in several State and Commonwealth level Research Advisory Groups including the GABRAG, TTRAG, TRL RAG, and Slope RAG.

- The greater connectedness of Project team members with colleagues both within Australia and internationally has resulted in increased research and professional service activities in the field of fisheries economics through activities such as editorial and reviewer roles for journals, thesis examination, contract research, grants and research collaborations.

Ensuring project legacy

The Building Economic Capability Project has made a substantial contribution to developing human capital in fisheries economics and the profile of fisheries economics in Australia. However, ensuring a continuing legacy and prolonged impact of the investment to date requires a sustained commitment of financial and other resources.

The Steering Committee discussed possible models to ensure Project legacy at meetings #6 and #7 and after consideration of a verbal presentation from Dr Emily Ogier (meeting #6), agreed to recommend to FRDC that overall responsibility for economics following the cessation of the Building Economic Capability Project be incorporated into the Social Science Research Program (SSRP). This resulted in the approval of the 2015-300 Social Science and Economics Research Coordination Program (SSERCP). In addition to the economics component, this program represents a continuation of the two previous Social Science Research Coordination Programs, and is led by Dr Emily Ogier (IMAS, UTAS). The new phase of the SSERCP commenced in March 2015 and aims to:

a. Support the FRDC to meet relevant objectives as outlined in its 2015-2020 RD&E Plan and the National Fishing and Aquaculture RD&E Strategy, as well as other needs arising from FRDC's existing programs and projects.

b. Collaborate with the industry and managing agencies to identify emerging issues in wild harvest, aquaculture, post harvest, recreational and indigenous fishery sectors and the associated key social science and economics research needs.

c. Co-ordinate and undertake the communication of key social science and economic research needs to the research community and research outcomes of the Program to fishers and management agencies.

d. Provide program management for social science and economics projects to ensure quality and relevance by undertaking evaluation and review of project proposals, and milestone and final reports.

e. Build further capability in fisheries social sciences and economics research to meet the needs of industry and managing agencies in addressing emerging issues in wild harvest, aquaculture, post harvest, recreational and indigenous fishery sectors.

Inclusion of economics in the SSERCP provides two clear benefits. These are:

1. A formal, funded structure for supporting the continuation of the Building Economic Capability Project's core components. More specifically:

    a. *Graduate Research Training Program* - a final round of three FRDC top-up scholarships were approved by the Steering Committee and allocated in April 2015. The successful candidates (Stuart Sinclair (QUT), Samantha Parades (QUT), and Rachel Nichols (UTAS)) will provide progress reports to FRDC via the SSRECP Steering Committee, and will continue to receive the (non-financial) support and supervision that previous students have enjoyed. This will clearly continue to contribute to the initial Project aim of providing research training in fisheries economics, and will provide research outputs directly in the areas of their studies; namely harvest strategies for Queensland's East Coast Trawl Fishery; valuing local fisheries for the coastal community and tourism, and; fishing behaviour and habitat quality linkages between Marine Protected Areas and fisheries. Graduate research outputs will continue to be promoted through the SSERCP.

b. *Professional Training Program* - the SSRECP will have responsibility for the promotion and administration of the Future Harvest Masterclass in Fisheries Economics, including face-to-face and online modes and in accordance with the Business model developed as part of *Project 2013/748 Seafood CRC Future Harvest Master Class in Fisheries Economics - Revision & Extension.*

c. *Australian Fisheries Economic Network* –the network will continue to provide a platform for communication and extension to FRDC major stakeholders and researchers. The network will also continue to recruit members through one or both of the below:

Join our LinkedIn group:

https://www.linkedin.com/groups?trk=nmp_rec_act_group_name&gid=5001299

Sign up for our bi-monthly newsletter:

http://fishecon.us8.list-manage1.com/subscribe?u=9650b6ca231a67f76036de77b&id=631e395648

The newsletter will be augmented to include a social science stream, allowing recipients to easily view only economics or social science news, or to view both. There is a strong commitment to retaining the FishEcon brand within the new SSERCP.

The SSERCP will continue to work with Stephanie McWhinnie to promote and support a strong fisheries economics presence at the annual AARES conference. This is already in train for the 2016 conference (2nd-5th February, Canberra) with an Invited Paper Session entitled "The Future of Marine Resources" scheduled. Project PI, Sarah Jennings has been asked to be an Invited Speaker along with Professor Clare Armstrong (IIFET President- Elect) and Helen Scarborough (Deakin University) at this session, so we look forward to a prominent position of fisheries and marine resources within AARES 2016.

2. The new structure will provide the platform for achieving greater integration between economics and the social sciences, and between these and the biological and physical sciences. While substantial progress has been made to date in promoting and facilitating the inclusion of both economic and social science considerations in FRDC research projects, the challenges of interdisciplinary and transdisciplinary research remain. The scope for progressing this will be enhanced through the involvement of Project team members Sarah Jennings, Sean Pascoe and Stewart Frusher (Director-CMS), and SSERCP leader Emily Ogier, in the newly formed Centre for Marine Socioecology (CMS).

The Project Steering Committee was initially concerned that there may be a loss of momentum (and legacy) under a combined social and economics programme. These concerns were allayed by a commitment to retain the separately identity and branding of the former Building Capability Project legacy activities within the SSERCP. In addition, strong connections between this Project and the new SSRECP already exist with Emily Ogier having acted as Executive Officer to the Project (2009-2011) and Sarah Jennings having served as a member of the SSRCP Steering Committee (2012-2015). The Economic leadership in the SSERC Program will be provided by a consultant to the FRDC. In addition, Sean Pascoe has accepted an invitation to act as a member of the SSERCP Steering Committee. Migration of core activities and responsibilities from this Project to the Program has already begun.

Conclusion

The Building Economic Capability Project has to date made substantial progress towards meeting its objectives and the arrangement for the continuation and extension of core activities through the SSERCP, will ensure that this contribution will continue to grow.

Key Project contributions to date include:

- A total of 14 students have been engaged in the Graduate Research Training program, undertaking 17 individual research higher degree thesis projects. At the time of writing this report, 11 thesis projects have been successfully completed and students awarded their degrees.

- To date, students have published over twenty papers in referred journals, with as many more again expected. These cover a wide range of topics, many of which have direct implications for marine resource management in Australia. In many cases the results of this research has also been showcased/disseminated through conference/workshop/seminar presentations.

- Short course training has been delivered to over 100 individuals representing a wide range of stakeholder groups through the Graduate Fisheries Economics short course and the Future Harvest Masterclass in Fisheries Economics with the resources available for the further delivery of these products.

- There is now a strong network of practising fisheries/marine economists within Australia with a regular newsletter and social media presence, and a recognised forum for annual face-to-face meetings.

Australia's position as a leader in the integration of economic considerations into marine resource management, in particular fisheries management, is now well cemented, with biology and economics being considered together in most fisheries management regimes. While maintaining this position requires sustained investment, there is an emerging imperative to build capacity among fisheries managers and other stakeholders in the area of integrated, triple bottom line, EBM approaches to management. Economic ways of thinking and methods of analysis, particularly as they relate to the characterisation and measurement of stakes and values, and the analysis of tradeoffs (between sectors and types of benefits), will be of central importance in meeting these challenges and must be reflected in future research priorities and investment in initiatives such as the Centre for Marine Socioecology (UTAS/CSIRO/AAD).

Recommendations

As described in this report, the Building Economic Capability Project has made substantial progress towards meeting its objectives and its legacy has been assured through the transfer of responsibility for economics, including components of the three core activities, to the recently funded *2015-300 Social Science and Economics Research Coordination Program (SSERCP)*. Nevertheless, the Steering Committee and Project team make the following recommendations:

1. The Project has acted as a catalyst for growth in the level of activity of researchers and teachers in the participating Universities and CSIRO, and has galvanised the linkages between them. Future initiatives should build on these existing nodes of strength, which also provide a strong platform for supporting and coordinating ongoing activities across other research and training-focussed institutions both in Australia, but also in the broader Australasian region.

2. The Australian Fisheries Economics Network newsletter and the Network's annual presence at the AARES Conference will continue beyond the life of the current Project. It is timely to formally acknowledge the latter through the establishment of an FRDC sponsored Best Student Marine Economics Paper Prize. This would act to encourage, reward and celebrate student achievement in this area and to make more visible FRDC's contribution in this area.

3. The Graduate Short Course in Fisheries Economics was offered only once during the Project's life. The FRDC-funded collaborative model, drawing teaching expertise and students from various institutions, enabled the Project to offer a graduate-level course in a specialised area, where low enrolments at any one university would otherwise prevent this occurring. It is clear from the CRC Future Harvest Project and other feedback that there is considerable, but geographically dispersed, need for such a course. A budget model that does not rely on FRDC funding for offering the course on a regular basis and in a way that is accessible and affordable to both degree and non-degree students from multiple institutions should be explored.

4. The budget model recommended for the Fisheries Economics Masterclass relies on offering the class on a fee-paying face-to-face basis to subsidise the provision of support for the online offering. It is recommended that a small amount of seed funding be allocated to initially promote the class and possibly also to fund the courses initial offering. New Zealand MAF has expressed an interest in the course and there is also likely to be interest from the wider Australasian region. Reliance on grant funding (FRDC) through the SSERCP will provide continuity for the life of that project. For a true legacy to be achieved, a source of core funding should be actively sought. One possible source may be UTAS, in recognition of the value of the activities of the Project to student recruitment and extension and promotion of Alumni achievements.

Communication

General project

Presentations/media coverage:

February 2010: The Weekend Australian and The Mercury cover the launch of the Australian Fisheries Economics Network, as well as radio interview with Sarah Jennings for Local ABC Radio 936.

17th March 2010: Presentation of the Project by Sarah Jennings at the TasFRAB Social Sciences Research Needs Meeting,

April 19th 2010: Presentation of the Project by Sarah Jennings at the TAFI Research Overview.

March 15th 2015: Presentation of Project highlights to the FRDC Board by Sarah Jennings, Hobart.

Articles:

"Calling Economists to Look to the Sea" *Fishing Today* (April/May 2010 Volume 23 Number 2)

http://catalogue.statelibrary.tas.gov.au/item/?id=914638

"Follow the money: building fisheries economic expertise" *FISH* (Mar 2013 Volume 21 Number 1)

http://www.frdc.com.au/knowledge/publications/fish/Pages/21-1_articles/Follow-the-money-building-fisheries-economic-expertise.aspx#sthash.6ivPyTYc.dpuf

"Economics vital to fisheries health check" *FISH* (June 2014 Volume 22 Number) - Reprinted in the AMSA Bulletin, 2015

http://www.frdc.com.au/knowledge/publications/fish/Pages/22-2_articles/12-Economics.aspx

"Expanding Yield Perspectives" *FISH* (September 2014 Volume 22 Number 3)

http://frdc.com.au/knowledge/publications/fish/Pages/22-3_articles/6-Expanding-yield.aspx

A final article featuring the outputs and outcomes of the Capability Building project is scheduled to be featured in a forthcoming edition of FISH.

Student projects

A key element of graduate research training at all participating Universities is for students to subject their research to peer review by presenting work at conferences/workshops/symposia/seminars and to ultimately publish their findings in the peer reviewed academic literature. Individual student reports (Appendix C) indicate that students were active in making oral and poster presentations of their work at a large number of national and international conferences.

Impressively, in aggregate, the students have already published over twenty articles directly related to their thesis projects, with many more either submitted, under revision for resubmission or in press. Given the lengthy process involved in publication in the peer-reviewed literature, a large number of additional publications are anticipated. Publications arising from thesis projects to date can be accessed at Appendix D (available online at http://frdc.com.au/research/social_and_economic_research/Pages/Fisheries-Economics.aspx).

In addition, several students were co-authors on other publications during the term of their candidature. These are listed in individual student reports in Appendix C.

Individual student projects (Kofi Otumawu-Apreku and Peggy Schrobback) also received coverage in:

"Follow the money: building fisheries economic expertise" *FISH* (March 2013 Volume 21 Number 1)

http://www.frdc.com.au/knowledge/publications/fish/Pages/21-1_articles/Follow-the-money-building-fisheries-economic-expertise.aspx#sthash.6ivPyTYc.dpuf

In an exciting recent initiative, the FRDC Building Capability Project partnered with the Bookend Trust (http://www.bookendtrust.com/home-link) to produce a video production showcasing the work of our students and promoting the role of economics in fisheries management.

The production features the research of five FRDC students (Anna Farmery, Samantha Parades, Peggy Schrobback, Tim Emery and Rafael Leon) and includes a short umbrella piece that acknowledges the FRDC's commitment, and positions the student's projects within the Building Economic Capability Project. The video can be accessed at Appendix E (available online at http://frdc.com.au/research/social_and_economic_research/Pages/Fisheries-Economics.aspx).

Appendix A: Steering Committee Terms of Reference

1. Introduction

As is common practice with major national projects, the Project Document specifies that a steering Committee be established to support the implementation of the Building Economic Capability in Fisheries FRDC project.

2. Project Purpose

The FRDC-funded project consists of a suite of initiatives aimed at developing human capital in the understanding, knowledge and skills required to apply sound economic principles to the way in which marine resources are allocated, managed and used.

Objectives of the project include:

1. To build Australia's capability in fisheries resource economics through graduate training;
2. To address identified high priority applied fisheries economics research needs of both State and Commonwealth marine resource sectors through PhD research projects;
3. To develop and deliver a range of fisheries resource economics training opportunities for marine scientists, industry and managers through a short course program; and
4. To develop an ongoing national focus in the area of applied fisheries resource economics that can address the long term research and training needs of both State and Commonwealth marine resource sectors.

The project consists of three components:

1. Fisheries Economics Graduate Research Training Program
2. Fisheries Economics Professional Training Program
3. Fisheries Economics Network, or FishEcon

3. Steering Committee Role

The two primary roles of the Steering Committee, as specified in the Project Document are to:

- identify research needs and student projects; and
- review project progress.

In addition, the Steering Committee will:

- monitor project against milestones and recommend changes that would be beneficial to project outcomes.
- develop performance indicators for training courses e.g. enrolments.
- monitor project benefits to ensure they are enjoyed nationally.
- provide stakeholder input into curriculum development.

- work with project team members to ensure the continuation of economic capability building initiative beyond the end of the project; and
- oversee and foster the interaction of other organisations and project/programs with the economic capability building project.

4. Membership

4.1 Members

The project document requires six members and representation from *some* of the following: AFMA, CDA, State Fisheries, Recreational Fishing, DEWHA and Research. The first meeting of the Project Steering Committee agreed that the Committee would consist of:

- Mr Ian Cartwright (Independent Chairperson)
- People Development Program Manager (FRDC)
- Alistair McIlgorm (RecFish)
- Dave Galeano (AFMA)
- Neil Stump (Industry rep – TSIC)
- Caleb Gardner (Seafood CRC); and
- Sarah Jennings (Principal Investigator).

Project team members Stuart Frusher and Sean Pascoe will remain as permanent observers/advisors to the Steering Committee.

4.2 Alternate Members

Each member may nominate an alternate member for each member nominated to the Group.

4.3 Term of Appointment

Members (or alternate members) remain members of the Group for the duration of the project

4.4 Committee Member Remuneration

(a) Chairperson

The Chairperson will be entitled to a sitting fee. These costs are to be borne by the project

(b) other members

Other members will not receive a sitting fee, but will be reimbursed for travelling expenses.

4.5 Observers and Advisers

The Steering Committee welcomes observers and advisers with the prior approval of the Chairperson.

Persons wishing to attend Steering Committee meetings should state their reasons for attending and which the issues they wish to bring to the attention of the FRAG.

5. Steering Committee Operations

The FCRSC will normally meet annually in May.

The draft agenda will to be developed by the Principal Investigator in collaboration with the Chair. The Principal Investigator will send the agenda out to Steering Committee members in advance of the meeting and incorporate feedback. The agenda will be finalised at the meeting.

Members should anticipate that agendas and papers for meetings will be circulated at least one week prior to the meeting.

The Chair will manage each meeting and determine the pace and length of deliberations on agenda items. The Chair will seek to ensure that every member has adequate opportunity to participate in the discussions on each item. Minutes will be kept of every meeting and circulated for comment before being formally adopted at the next meeting.

The Principal Investigator will ensure that data are available in sufficient detail and timeliness for required analysis and evaluation.

Advice on progress with the project will be provided by the Chair to the FRDC Secretariat

Appendix B: FRDC Graduate Research Training (GRT) Research Themes

Background

A key component of the FRDC Building Capability in Fisheries Economics Project is the Graduate Research Training (GRT) program. This initiative involves directly supporting a number of Research Higher Degree (RHD) candidates in the area of fisheries economics. Candidates will be enrolled initially at one of three tertiary institutions; namely the University of Tasmania, University of Adelaide and the Queensland University of Technology. The aim of the GRT program is to increase the supply of university graduates with RHD training in fisheries economics. Research topics undertaken by students as part of this initiative must be approved by the project Steering Committee as being consistent with industry and government research priorities and having the potential to increase the value of Australia's marine resources. To this end, research topics must fall within at least one of the following GRT research themes:

Theme 1: Resource Allocation in Fisheries

Research that contributes to improvement in the allocation of marine resources between competing uses through the development and/or application of economic valuation, impact and allocation principles. This includes the allocation of resources to competing sectors, such as indigenous, recreational and commercial fishers, and the allocation of marine resources to conservation. Development of parsimonious management processes and methods and on practical approaches to re-allocation of access rights will be emphasised. It also includes research that explores the roles for development of wild fisheries and aquaculture.

Theme 2: Fisheries Management and Governance Systems

Research that analyses the economic performance of existing and novel fisheries management approaches under various conditions including climate change. This includes evaluation of alternative harvest strategies, input controls, ITQs, spatial and seasonal management, marine reserves and novel approaches such as translocation and reseeding. Research Theme 2 also includes management of indigenous and recreational fishing and the economic implications of alternative fisheries governance arrangements, including co-management and self-management.

Theme 3: Integrated Assessment and Decision-support Tools

Research that focuses on the development of fishery resource assessment models which integrate economic with ecological, social and biological considerations, and on the development of marine decision support tools. This theme includes the development of bio-economic models (particularly in fisheries where these are not yet available) and of spatially explicit agent-based models of fisher behaviour. It also includes research that leads to the development of approaches and techniques that can underpin decision-making in complex, uncertain, ecological/human systems and can be integrated with regional/coastal resource management systems.

Theme 4: Productivity and Market Analysis

Research that analyses fisher and fleet level efficiency, capacity and productivity in specific fisheries. Market analysis, including demand studies and supply chain analysis. Theme 4 also includes the economic evaluation of trade, regulatory and environmental policies as they relate to both wild fisheries and aquaculture.

Appendix C: Individual FRDC Student Reports

PhD students:

Giles Austen
Tim Emery
Anna Farmery
Sophie Gourguet
Mohottala Gedara Kularatne (Kule)
Rafael Leon
John-Baptiste Marre
Rachael Nichols
Kofi Otumawu-Apreku
Samantha Parades
Steven Rust
Peggy Schrobback
Stewart Sinclair

Masters students:

Caleb Gardner
Samantha Parades

Honours students:

Rachel Nichols
Steven Rust

Individual reports are available at
http://frdc.com.au/research/social_and_economic_research/Pages/Fisheries-Economics.aspx

Appendix D: Student Publications in Peer Reviewed Journals

Student Publications are available at
http://frdc.com.au/research/social_and_economic_research/Pages/Fisheries-Economics.aspx

Appendix E: Student Project Videos

Student project videos are available at
http://frdc.com.au/research/social_and_economic_research/Pages/Fisheries-Economics.aspx

Appendix F: FRDC Final Report Checklist

Project Title:	Building economic capability to improve the management of marine resources in Australia		
Principal Investigators:	Sarah Jennings,		
Project Number:	2008/306		
Description:			
Published Date:	Not applicable	**Year:**	Not applicable
ISBN:	Not applicable	**ISSN:**	Not applicable
Key Words:	Fisheries economics, capability building, research training, professional training, network, Fishecon		

Please use this checklist to self-assess your report before submitting to FRDC. Checklist should accompany the report.

	Is it included (Y/N)	**Comments**
Foreword (optional)	N	
Acknowledgments	Y	
Abbreviations	Y	
Executive Summary	Y	
– **What the report is about**		
– **Background – why project was undertaken**		
– **Aims/objectives – what you wanted to achieve at the beginning**		
– **Methodology – outline how you did the project**		
– **Results/key findings – this should outline what you found or key results**		
– **Implications for relevant stakeholders**		
– **Recommendations**		
Introduction	Y	
Objectives	Y	
Methodology		Replaced by Project structure and operation
Results		Replaced by Project activities and outputs
Discussion	N	
Conclusion	Y	
Implications	N	
Recommendations	Y	

Further development		Replaced by Ensuring Project legacy
Extension and Adoption		Replaced by Communication
Project coverage	N	
Glossary	N	
Project materials developed	N	
Appendices	Y	Student reports, publications and videos available online at http://frdc.com.au/research/social_and_economic_research/Pages/Fisheries-Economics.aspx