Review of operations

Research

Goal: to concentrate the University's research effort and achieve national and international distinction in ways that advance University priorities

Mobilise research capacity and infrastructure around regional engagement and sustainability themes

Provide increased levels of financial, human and infrastructural research support for research conducted in the two designated research themes and in collaboration with external research partners

The Research Management Committee has, as a result of an extensive consultation process, endorsed Sustainability and Regional Engagement as themes under which the University focuses its research effort.

Sustainability is defined as the enhancement of communities into the indefinite future without impinging on the intrinsic value of natural systems.

Regional Engagement is defined as the process of building mutually beneficial relationships within and between regions to foster, inspire and activate communities to achieve sustainable outcomes.

The University has established two new research groups that conduct research under these themes: the Genecology Research Group and the Regional Sustainability Research Group. 2008 was the first full year of operation of these two research groups.

In 2008 the University provided a base operating budget for each of the research groups and granted other financial assistance, for instance for the purchase of equipment. In addition, the University provided targeted support for grant applications, project management, infrastructure acquisition, research training scholarships and memberships of key organisations, as well as advice and support for strategic planning.

Research activities

Research activities conducted in 2008 by the new research groups and other USC staff around the sustainability and regional engagement themes included:

Ecological Risks to Burnett Mary Sandy Foreshores: A Pilot Project to Assess Pressures from Recreational Activities

This project, led by Associate Professor Thomas Schlacher and funded through the Burnett Mary Regional Group for Natural Resource Management (BMRG), aims to identify key risk activities and quantify key aspects of ecological impacts caused by direct human impacts, such as recreational activities including four wheel driving, fishing, camping and other shore-based tourism. The research should be completed mid-2009.

Smart Forests Alliance Queensland

This $5.5 million forestry project, awarded in 2008 to commence in 2009, is being led by Associate Professor Helen Wallace and Dr Stephen Trueman. The success of the application follows a significant investment both in the application process and the long term commitment to the relationship with the partners. The project will tackle climate change by using biotechnology to speed production of carbon-absorbent trees. Potential benefits include climate change mitigation, forestry investment in Queensland, and building rural and regional industries. The University will be partnering with CSIRO, Queensland Department of Primary Industries and Fisheries, the Northern Territory Department of Primary Industries, Fisheries and Mines, Integrated Tree Cropping Pty Ltd and Forest Enterprises Australia Ltd and will receive $1.9 million in funding from the Queensland Government.

Community Based Governance Arrangements for Water Resource Management in Western Australia

USC regional and urban planning lecturer, Dr Claudia Baldwin, and two New South Wales researchers, Mark Hamstead and Vanessa O'Keefe of Hamstead Consulting Pty Ltd, produced a 528-page report (published in April) on Australian water planning practices after winning a competitive tender from the National Water Commission last year. Outcomes include Commission funding for relevant postgraduate programs and establishment of an evaluation system for continuing improvement.

Teacher Education for Sustainability

Led by Lisa Ryan from USC's Regional Sustainability Research Group in collaboration with the Eidos Institute, this project represents Stage II of an Australian Research Institute in Education for Sustainability (ARIES) research report completed in 2006. The report examined a variety of models for professional development within teacher education and recommended a systemic model as the most effective for mainstreaming environmental education for sustainability within teacher education. Stage II of the project encompasses a Queensland-based participatory action research approach with the aim of mainstreaming environmental education for sustainability within pre-service teacher education courses, through a systemic approach to change to improve opportunities for trainee teachers to develop knowledge and competence in this area.

Building Local Government Resilience through Scenario Planning

The objective of this Burnett Mary Regional Group for Natural Resource Management (BMRG) funded project is to better equip coastal councils to deal with key emerging environmental concerns such as climate change, sea level rise, storm surge, tourism development and managing changing land use. The project is led by Associate Professor Peter Waterman and Dr Neil Tindale from the School of Science and Education.

Fighting the Invader—Weed Management on Fraser Island World Heritage Area

This Burnett Mary Regional Group for Natural Resource Management (BMRG) funded project is being led by Dr Alison Shapcott and is a continuation of the Fraser Island Weeds Project completed in 2007. The research focuses on planning, prevention and strategic, practical on-ground action to the invasive weed issues on Fraser Island.

Being Safety Smart

Being Safety Smart is a free-to-use online educational gaming environment providing abduction prevention strategies for children aged 6 to 8 years. Led by Professor Pam Dyer and Dr Christian Jones, the project is designed to increase the awareness of children to situations which might impact upon their personal safety. Being Safety Smart has been developed by the University of the Sunshine Coast for the Queensland Police Service in partnership with Education Queensland and the Crime and Misconduct Commission, and supported by the Daniel Morcombe Foundation. The initiative will be launched to schools early in 2009 and integrated into school curricula.

HMAS Brisbane

The wreck of the ex-HMAS Brisbane off Mooloolaba represents one of the most significant nearshore assets in South East Queensland. Since the ship was scuttled in 2006 it has played a significant role in underpinning marine-based tourism on the Sunshine Coast, attracting large numbers of divers and creating a 'wreck-based' diving industry.

The Environmental Protection Authority (Queensland Parks and Wildlife) provided funding of $40,000 to continue work commenced in 2007 by Associate Professor Thomas Schlacher and expand to include the PhD work of Vikki Schaffer. The monitoring work will include reassessment of encrusting biota, fish and larger invertebrates. In addition the project will include an evaluation of the economic and social values of the ex-HMAS Brisbane.

Provide increased support service to researchers in attempting to attract or secure research grants and other research income from external sources

Provide increased support service to researchers in developing regional, national and international research collaborations

In 2008 the University's reported external research income increased from $1,023,803 to $2,049,559—a 100 percent increase. Key research collaborations were greatly advanced with the Queensland Department of Primary Industries and Fisheries, CSIRO, and the Queensland Government, particularly through its Smart State program, the Sunshine Coast Regional Council, Paspaley Pearls, the Queensland EPA, and Queensland Health.

Review of operations

Research

Investment in research collaborations included:

The National Climate Change Adaptation Research Facility

The University is a partner in the Commonwealth funded National Climate Change Adaptation Research Facility hosted at Griffith University. The facility will lead the research community in a national interdisciplinary effort to generate the information needed by decision-makers in government and in vulnerable sectors and communities to manage the risks of climate change impacts.

The Queensland Smart Water Research Facility

The University is also a partner in the Griffith University-hosted SmartWater Research Facility. The Facility will enhance research undertaken into sustainable water supplies, safeguarding water quality and exploring alternative water sources. The research program will bring together experts from across the research institutions, water supply authorities and water technology companies.

Other partners include CQ University, Gold Coast City Council, Wide Bay Water, International Water Centre Pty Ltd and Aqua Diagnostics Pty Ltd.

Seafood Cooperative Research Centre

The Seafood CRC aims to provide comprehensive seafood-related research and development and industry leadership on a national basis. Current USC research activity sits within the Production Innovation Research Program around pre-harvest activities. This research program aims to create a substantial increase in the production and profitability of selected wild-harvest and aquaculture species.

The University is in receipt of over $400,000 funded by the Seafood CRC for several projects led by Professor Abigail Elizur, such as the 'Southern Bluefin Tuna Maturation and Sexing: Development and application of new technologies'; 'The development of a genetic management and improvement strategy for temperate marine finfish', and 'The advancement of reproductive development in Southern bluefin tuna using hormonal manipulations of kisspeptin, the gatekeepers of puberty'. A PhD scholarship and Masters scholarship have also been funded by the Seafood CRC.

In performance planning and management of T&R staff, increase emphasis on research performance, output, quality and impact especially in the two designated research themes

The full reporting of 2008 income and publications will take place during 2009, however, initial indications are that in 2008 the amount of research income derived from National Competitive Grants rose from $611,970 to $866,985.

The full publications collection has not taken place for 2008 but again the current indications are promising with increasing percentages of publications in higher ranked journals including some 25 percent of current publications in A* or A ranked journals. These higher quality and impact research outcomes and outputs all advanced the University's reputation for research related to sustainability and regional engagement.

Research contributing to these outcomes and outputs included:

Farming in the South Pacific

Funded through the Australian Centre for International Agricultural Research (ACIAR) for $651,774 from 2008 to 2010, this project, Processing of Canarium Indicum Nuts: Adapting and Refining Techniques to Benefit Farmers in the South Pacific, is led by Associate Professor Helen Wallace from the Genecology Research Group with Dr Jennifer Carter from the Regional Sustainability Research Group.

The project brings together international partners Hidden Valley Plantations, Papua New Guinea; National Agricultural Research Institute, Vanuatu and the Department of Forests. The aim of this project is to develop post-harvest processes and techniques for Melanesian C. indicum nuts that can be optimally used by small-scale, block and plantation farmers. Anticipated community impact includes economic impacts, social impacts and environmental impacts.

This project will enable the development and expansion of the Canarium nut industry to domestic and eventually export markets. This is likely to improve the financial status of smallholders, women, and communities. In partner countries this project will enhance participation in the cash economy, expand opportunities for paid work, and reduce crop losses through spoilage. Impacts on developing processing knowledge and expertise are expected within five years of project completion.

Pearling and sustainable fishing

The challenge of this project is to respond to, and take advantage of, increased demand for seafood and for recreational and customary fishing experiences; to maintain and improve the management and use of aquatic natural resources to ensure their sustainability.

The researchers will commence a pearl oyster genetic selection program and base it on international best practice in quantitative and molecular genetics, and hatchery biology that will maximise investment returns, cost:benefit ratios, and speed of selection response. This will secure and sustain commercial advantage for Australian pearling companies and enhance pearl industry profitability.

The outcome will be a more profitable, competitive and resilient pearling industry, using genetic technologies to withstand competitive commercial pressures from the region. This addresses specifically the need with respect to international competition and to increase revenue for pearling companies and export revenue for Australia.

The Fisheries, Research & Development Corporation (FRDC via Paspaley) has awarded Dr Lesley Brooker $285,919 for her project, Shell Biomineralisation. This project will investigate the cellular structure of pearl sacs from different production stages and for pearls of varying quality along with the structure of the resultant pearls.

The extension of knowledge generated through this project, augmented by information from other research programs will enable development of strategies and appropriate biotechnologies to improve pearl quality.

This project will benefit the majority of the Australian pearling industry. Improvements in production processes achieved by Paspaley as a result of this project will be passed on to the company's joint venture partners within the Australian pearling industry.

Going forward USC is well placed to continue the trend of increasing income from National Competitive Grants with the following awards made in 2008 for Australian Research Council (ARC) Linkage Projects commencing in 2009.

ARC Linkage Grants

The Australian Research Council recently awarded a project grant for two years for the project 'From postbox to policy powerhouse: The history and politics of the Department of the Prime Minister and Cabinet 1911-2010'. This project is led by Associate Professor Joanne Scott with USC researcher Dr Bron Stevens and colleagues from Griffith University (Professor Patrick Weller) and University of Queensland (Dr Ross Laurie).

The Department of the Prime Minister and Cabinet is the core department that advises Prime Ministers. Its centenary on 1 July 2011 provides an opportunity to chart its history, explore its development, understand its dilemmas and assess its performance. As the first analytical study of this Department, the project will develop an historical narrative and thematic analyses to show how the Department has flexibly and creatively supported the priorities and prerogatives of Prime Ministers. Through the prism of the Department the researchers will also illuminate the changes to the Australian Public Services more generally. The outcomes will include a scholarly book, series of articles and photographic exhibition.

The University's Associate Professor Brendan Burkett is a Chief Investigator on an ARC Linkage grant gained by Griffith University entitled 'Development and application of wearable micro technologies for the assessment of swimming performance and activity'. Over a three-year period the group of researchers will receive $195,000.

Australia's sporting performance at a national and international level is ingrained in the psyche of everyday Australians. It encourages sporting activity at every level of our society contributing to our well being and the development of tomorrow's athletes. This research project will develop important tools for the assessment and servicing of our nations elite athletes, including those in regional areas. These tools will encompass the very latest in wearable technology and allow athletes to be measured under performance conditions rather than in the laboratory. Assessment of human motion is also desirable as we seek to assess and aid a progressively aging population and a growing epidemic of obesity in our children.

Increase the number of higher degree by research enrolments

Develop and implement comprehensive development and training programs for higher degree by research candidates, supervisors and potential supervisors

In 2008 higher degree by research EFTSL increased from 75.88 in 2007 to 87.00. This improved performance resulted mainly from stronger promotion of research opportunities, including those linked to the themes of sustainability and regional engagement, and the higher profile of USC's researchers and their greater capacity to attract candidates.

In 2008, as part of the research development strategy, the University reinvigorated its approach to the quality of research training, including supervision and the provision of additional educational opportunities for candidates. This was achieved through the following actions:

- emphasis on quality of research training in the new Research and Research Training Plan 2009-2011;
- work through the Research Degrees Committee to draw together a range of policy-documents into a consolidated Research Training Policy and associated procedures; and
- joint development by the Research Management Committee and Research Degrees Committee of a plan for professional development for researchers and supervisors.

The Graduate Centre was fully completed in 2008 and registered high levels of occupancy. Candidates continued to report satisfaction with the arrangements in the Graduate Centre, including provision of a workshop and seminar program.

In 2008 research candidates were involved in a range of projects advancing the University's key research themes, a large number of which were funded by scholarships through external research grants as well as the University. Examples of projects being undertaken by our Doctor of Philosophy candidates include:

- Tissue culture of tropical plantation eucalypts (Hung Cao, Principal Supervisor Dr Stephen Trueman).
- Improving crustacean aquaculture production efficiencies through development of monosex population using endocrine and molecular manipulations (Vijay Mareddy, Principal Supervisor Professor Abigail Elizur).
- The effect of temperature on reproductive development in maiden and repeat spawning farmed Atlantic salmon: understanding the molecular basis for improved egg quality survival (Kelli Anderson, Principal Supervisor Professor Abigail Elizur).
- Assessment of planning support system based growth efficiency modelling through contrast with fiscal impact models (Scott Lieske, Principal Supervisor Professor Tim Smith).
- An integrated approach for the management of Bioenergy Systems (Robert Mangoyana, Principal Supervisor Professor Tim Smith).
- Facilitating effective education for sustainability with primary and secondary schools (Michael Duggan, Principal Supervisor Professor Tim Smith).
- Engaging with climate change mitigation opportunities in Australia (Noni Keays, Principal Supervisor Professor Tim Smith).
- Emotion, Engagement and Technological Attraction: Modelling the Human Interactive Experience (Matthew Willis, Principal Supervisor Dr Christian Jones).

Review of operations

Research

Key performance indicators

Research publications

There has been a steady increase in quality research publications over the past few years reflecting the increased focus on research.

Research income

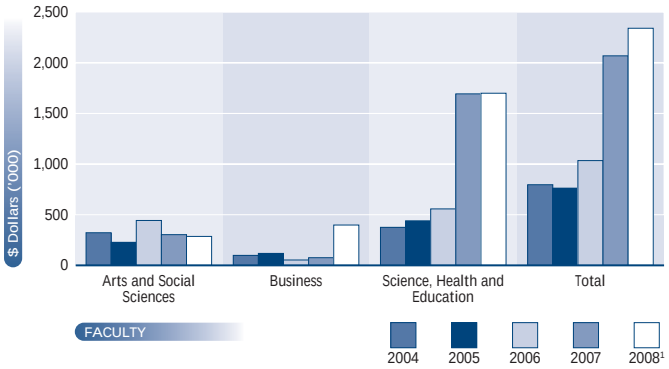
Total research income has increased over 200 percent from $0.7 million in 2005 to just over $2.3 million in 2008. An annual increase in total research income has been achieved in each of the last three years.

There have been a number of major funding announcements during the second half of 2008 which will positively impact research income over the coming three years and should see the trend of an annual increase in total research income continue.

Number of completing higher degree by research (HDR) students

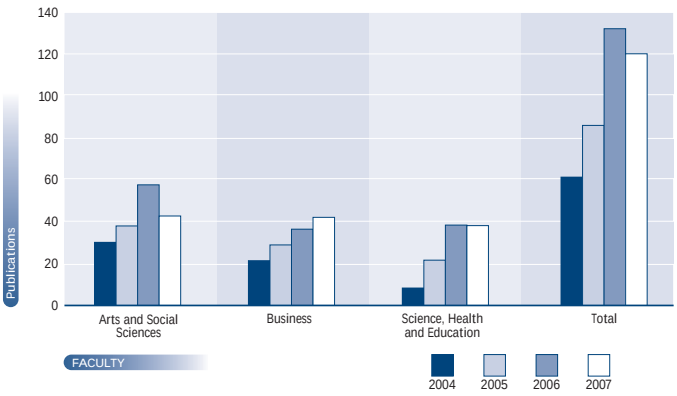
Higher degree by research completions have fluctuated a little in the past but are now on a steady upward trend, reflecting increases in enrolments.

Total research grant income ($ '000) by faculty and year

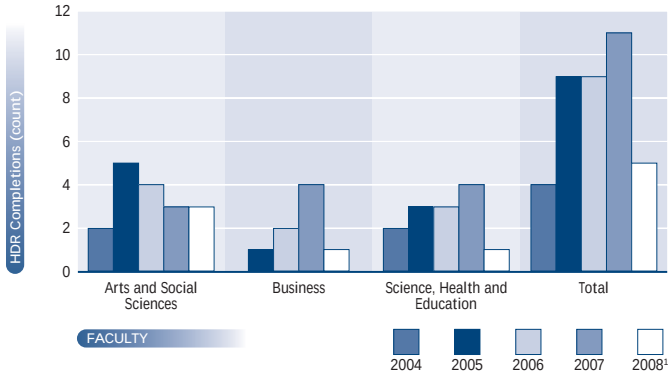


[1] The 2008 data is unaudited and may be subject to change.

Publications by faculty by year

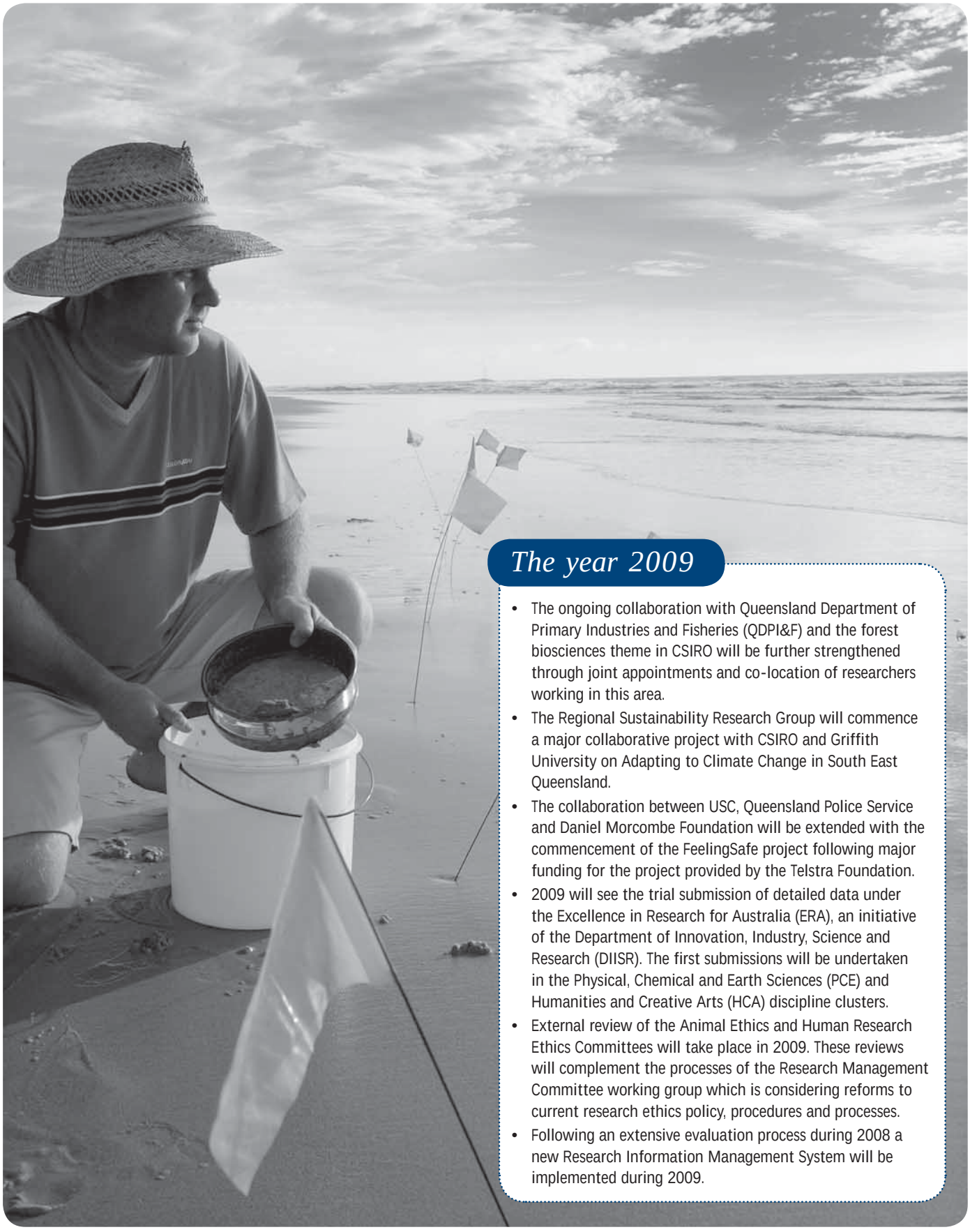


Higher Degree by Research (HDR) completions by faculty (Reported to DEEWR)



[1] The 2008 data is at 31 January 2009 and is subject to change, HDR Completions data is finalised at 30 April each year.

Research



The year 2009

- The ongoing collaboration with Queensland Department of Primary Industries and Fisheries (QDPI&F) and the forest biosciences theme in CSIRO will be further strengthened through joint appointments and co-location of researchers working in this area.
- The Regional Sustainability Research Group will commence a major collaborative project with CSIRO and Griffith University on Adapting to Climate Change in South East Queensland.
- The collaboration between USC, Queensland Police Service and Daniel Morcombe Foundation will be extended with the commencement of the FeelingSafe project following major funding for the project provided by the Telstra Foundation.
- 2009 will see the trial submission of detailed data under the Excellence in Research for Australia (ERA), an initiative of the Department of Innovation, Industry, Science and Research (DIISR). The first submissions will be undertaken in the Physical, Chemical and Earth Sciences (PCE) and Humanities and Creative Arts (HCA) discipline clusters.
- External review of the Animal Ethics and Human Research Ethics Committees will take place in 2009. These reviews will complement the processes of the Research Management Committee working group which is considering reforms to current research ethics policy, procedures and processes.
- Following an extensive evaluation process during 2008 a new Research Information Management System will be implemented during 2009.