RESEARCH UNIT NAME: Centre for Ecosystem Management

RESEARCH UNIT LEVEL (tick):

- Level I Research Group*
- Level II Research Centre
- Level III Research Institute Centre of Excellence

Research Group may not be able to address questions with an asterisk below

REPORTING YEAR: 2013

BRIEF OVERVIEW AND HIGHLIGHTS (Outline major activities conducted in past year)
In 2013, CEM member research activities have resulted in an increase in research income with 17 new projects totalling more than $2.7 million, including 3 Category 1 projects (totalling >$1.5 million). Research outputs have been maintained with 45 publications, including 5 books/book chapters, 25 peer-reviewed papers, 5 conferences papers and 10 reports.

Events/Achievements
A major highlight for 2013 was the substantial engagement activities undertaken by members to promote CEM and ECU research outcomes and expertise. A total of 33 engagement activities with state, national international entities were undertaken.

Other highlights included a half- day research symposium. This was held during the ECU Research Week and was well attended. The symposium topic, Ecosystem Management in a Drying Landscape, was of particular interest to over 90 research collaborators from outside the university. The outcome of the research day has already led to new collaborative projects and we hope that such partnerships continue to grow into the future.

MEMBERSHIP (Full Title of Researchers, including staff, research students, adjuncts in the past year)

Director
Professor Ray Froend

Management Committee
Professor Will Stock
Associate Professor Andrea Hinwood
Associate Professor Mark Lund

Academic Staff
Dr Mary Boyce
Dr Robert Davis
Professor Pierre Horwitz
Dr Annette Koenders  
Dr Kristina Lemson  
Dr Clint McCullough  
Dr Eddie van Etten  
Dr Magda Wajrak  

Post Doctoral Research Fellows  
Dr Melanie Blanchette  
Dr Anna Callan  
Dr. Caroline Canham  
Dr. Jason Coughran  
Dr Megan Huggett  
Dr Bea Sommer  
Dr Amanda Wheeler  

Honorary Research Associates  
Professor David Goodall  

Adjunct Staff  
Dr Allan Burbidge  
Associate Professor Rod Giblett  
Associate Professor Adrianne Kinnear  
Dr Alan Needham  
Dr Naresh Radhakrishnan  
Emeritus Professor Harry Recher  
Dr. Pascal Scherrer  
Ms Esmee Webb  

Research Staff  
Ms Muriel Davies  
Dr Simon Judd  
Ms Colleen Lindberg  
Ms Michelle Newport  
Ms Jennifer Wilson  
Ms Lorraine Wyse  

Research Students  

PhD  
Mr David Blake  
Mr John Bunn  
Mr Quinton Burnham  
Ms Kelly Chapman  
Mr Timothy Doherty  
Mr Kwasi Frimpong  
Mr Chatchai Intatha  
Mr. Aaron P. Jenkins  
Ms Umme Kalsoom  
Ms Patcharasorn Karatna  
Mr Christopher Kavazos  
Ms Karunia Fatien MacDonald  
Mr Shaun Molloy  
Ms Ana Muler  
Mr Craig Pentland
Mr Rylan Shearn
Ms Katesuda Sitthisuntikul
Ms Meenu Vitarana

**MSc**
Ms Gemma Broderick
Mr Marcus Cosentino
Ms Natasha Dunham
Ms Lauren Hibbird
Ms Teagan Johnston
Mr Justin King
Ms Megan Ladbrook
Peter Malanczak
Ms Michelle Newport
Mr Michael Pezzaniti
Mr William Phelps
Ms Maria Ramirez Caro
Mr Justin Reynolds
Ms Heather Salomons
Ms Alice Sedgman
Ms Megan Stalker
Mr Badin Thornton
Ms Joyleen Unno
Ms Sharon Zuiddam
Ms Katesuda Sitthisuntikul
Ms Meenu Vitarana

**NEW GRANTS**

(Identify Funding Body, Value of grant, Years funded, Chief Investigator, collaborators, title)

<table>
<thead>
<tr>
<th>Chief Investigator</th>
<th>Title of Grant/Project</th>
<th>Value of Grant</th>
<th>Funding Body</th>
<th>Years Funded</th>
<th>Collaborators</th>
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<tr>
<td>BLANCHETT E, Melanie</td>
<td>Microbial metagenomics: A next-generation DNA sequencing approach to improving river condition assessment</td>
<td>$13,450</td>
<td>Edith Cowan University</td>
<td>1</td>
<td>A/Prof. Mark LUND, A/Prof. Richard ALLCOCK (UWA), Prof. Andrew WHITELEY (UWA)</td>
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<td>BLANCHETT E, Melanie</td>
<td>Mining for microbes: The application of next-generation DNA sequencing technology to mine lake remediation.</td>
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<td>A/Prof. Mark LUND, A/Prof. Richard ALLCOCK (UWA), Prof. Andrew WHITELEY (UWA)</td>
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<td>Name</td>
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<td>CANHAM, Caroline</td>
<td>Resistance is useful: Characterising plant resistance to water stress in a drying landscape</td>
<td>$16,877</td>
<td>Edith Cowan University</td>
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<td>Davis, Robert</td>
<td>Impacts of fire on semi-arid shrubland birds</td>
<td>$20,000</td>
<td>Gundawa Regional Conservation Association</td>
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<td>DOHERTY, Tim</td>
<td>Understanding the trophic ecology and impact of feral cats in Australia’s rangelands</td>
<td>$6,500</td>
<td>ANZ Executors and Trustee Company Limited</td>
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<td>DUNN, Hugh</td>
<td>Pilot Malting Australia - Commercial Validation Project</td>
<td>$478,803</td>
<td>Grains Research &amp; Development Corporation</td>
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<td>DUNN, Hugh</td>
<td>Australian Export Grains Innovation Centre – Financial Assistance Agreement</td>
<td>$460,000</td>
<td>Australian Export Grains Innovation Centre</td>
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<td>FROEND, Ray</td>
<td>BHP Billiton Iron Ore (BHPBIO) Ecological Water Asset Project - Regional Ecohydrology Monitoring Network</td>
<td>$266,342</td>
<td>BHP Billiton</td>
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<td>FROEND, Ray</td>
<td>Environmental Monitoring and Investigations for the Gnangara and Jandakot Mounds – Wetland Vegetation Monitoring</td>
<td>$58,037</td>
<td>Department of Water (WA)</td>
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<td>FROEND, Ray</td>
<td>Provision of Ecohydrological Study of Riparian Vegetation</td>
<td>$64,700</td>
<td>Department of Parks and Wildlife WA</td>
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<td>FROEND, Ray</td>
<td>Ecohydrological States on the Gnangara Mound</td>
<td>$441,000</td>
<td>UWA CSIRO</td>
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<td>HORWITZ, Pierre</td>
<td>Environmental Monitoring and Investigations for the Gnangara and Jandakot Mounds - Macroinvertebrate and Water Quality Monitoring</td>
<td>$41,615</td>
<td>Department of Water (WA)</td>
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<td>Name</td>
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<td>HORWITZ, Pierre</td>
<td>Foundational aspects for a research consortium on health, water and landscapes: a database and a learning network</td>
<td>$37,252</td>
<td>Edith Cowan University</td>
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<td>HORWITZ, Pierre</td>
<td>Rottnest Island Salt Lakes – Feasibility of a Ramsar Site Nomination</td>
<td>$5,000</td>
<td>Rottnest Island Authority</td>
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<td>HORWITZ, Pierre</td>
<td>Foundational aspects for a research consortium on health, water and landscapes: a database and a learning network</td>
<td>$80,624</td>
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<td>LUND, Mark; BLANCHETT E, Melanie</td>
<td>Coal pit lake closure by river flow-through: Risks and opportunities</td>
<td>$631,715</td>
<td>Australian Coal Association</td>
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<td>VAN ETTEN, Eddie</td>
<td>Topsoil Assessment for Roy Hill Project Area</td>
<td>$56,875</td>
<td>Roy Hill</td>
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<td>WAJRAK, Magda</td>
<td>Evaluation of Dewatech Water Treatment Plant - Laboratory Tests to Evaluate the Adsorption Capacity of DM165</td>
<td>$32,226</td>
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**PUBLICATIONS, REFERRED BOOKS, CHAPTERS, JOURNAL ARTICLES, CONFERENCE PAPERS, REPORTS**

**Books**


**Book Chapters**

**Froend R.**, Davies M. and Martin M (2013) A shift in ecohydrological state of groundwater dependent vegetation due to climate change and groundwater drawdown on the Swan Coastal Plain of Western

**Journal Articles**


**Conference Papers**


**Reports**


**CEM Reports**


**PERFORMANCE AGAINST ANNUAL OBJECTIVES**

CEM initiatives according to the Centre Business Plan (ongoing and specific to 2013):

- In association with SoNS and CMER the CEM will continue to organise a weekly seminar series for members, postgraduate students and visitors on topics related to the activities of the CEM.
- The Centre will organise an annual one-day postgraduate seminar for its affiliated postgraduate students.
  - CEM organised a series of seminars under the theme ‘Ecosystem Management in a Drying Landscape’ during research week 2013, which involved a number of postgraduate presenters and guest speakers, covering recent research on ecosystems affected by drying climate, land use change and increased water resource use.
- The CEM will continue to foster post-doctoral appointments to promote early career researchers at ECU.
  - The CEM contributed to ongoing post-doc appointments and provided research funds to support purchase of capital items and travel to conferences.
- The CEM will continue to support visiting scholars and speakers.
  - Support for visiting fellows (in conjunction with Faculty Scheme) was provided through the CEM Member Research Support scheme.
- Members of the CEM will continue to strengthen research links, collaborations and engagement with government agencies, industry and non-governmental organizations active in the environmental field.
  - CEM members achieved ongoing success in securing research funds from nationally competitive grant schemes, government agencies and industry partners.
- The CEM will, funding permitting, initiate a staff small grants scheme to promote the research of early career academic staff.
  - The CEM has established a CEM Member Research Support scheme since 2010 and in 2013 over $30,000 was committed to supporting staff applications for capital items, travel, sample analysis costs.
- The CEM will contribute to ERA FOR codes (ranks for 2012):
  - 0501 Ecological Applications – Not Assessed.
COMMERCIAL ACTIVITIES*  
n/a

HIGHER DEGREE BY RESEARCH LOAD (list name of candidate and degree type)

David Blake - PhD  
Gemma Broderick, MSc  
John Bunn - PhD  
Quinton Burnham - PhD  
Kelly Chapman - PhD  
Marcus Cosentino - MSc  
Timothy Doherty - PhD  
Natasha Dunham - MSc  
Kwasi Frimpong - PhD  
Lauren Hibbird - Msc  
Chatchai Intatha - PhD  
Aaron P. Jenkins - PhD  
Teagan Johnston - MSc  
Umme Kalsoom, PhD  
Patcharasorn Karatna - PhD  
Christopher Kavazos - PhD  
Megan Ladbrook, MSc  
Karunia MacDonald - PhD  
Peter Malanczak, MSc  
Shaun Molloy - PhD  
Ana Muler - PhD  
Craig Pentland - PhD  
Michael Pezzaniti - MSc  
William Phelps - MSc  
Maria Ramirez Caro – MSc  
Justin Reynolds, MSc  
Heather Salomons - MSc  
Rylan Shearn - PhD  
Katesuda Sitthisuntikul - PhD  
Megan Stalker - MSc  
Joyleen Unno - MSc  
Meenu Vitarana - PhD  
Sharon Zuiddam - MSc

HIGHER DEGREE BY RESEARCH COMPLETIONS (List name, degree, title of thesis)

HDR Graduations

Teagan Johnston, MSc., Food resource availability for Carnaby's cockatoo Calyptorhynchus latiostris on the Swan Coast Plain
Dave Blake, PhD, Inorganic hydrogeochemical responses to fires in wetland sediments on the Swan Coastal Plain, Western Australia

Robert Campbell, MSc., Understanding and disrupting institutional settings: using networks of conversations to re-imagine future farming lives

Kelly Chapman, PhD, Complexity & creative capacity: reformulating the problem of knowledge transfer in environmental management.

Belinda Delaney, MSc., Verticordia micropropagation through direct ex vitro rooting

David Galeotti, MSc., Metapopulation theory explains Black-stripe Minnow (Pisces: Galaxiidae, Galaxiella nigrostriata) distribution in seasonal wetlands in south-west Western Australia

Chatchai Intatha, PhD, Factors Influencing The Capacity Of Communities To Respond To Coastal Erosion In The Upper Gulf Of Thailand.

Katesuda Sitthisuntikul, PhD, The Relationship Between The Meaning Of After And Sense Of Place: A Grounded Theory Study From Northern Thailand.

Meenu Vitarana, PhD, Lichens as a biomonitoring tool for detecting heavy metal air pollution associated with industrial activities in Collie, south-western Australia

HDR Submissions

Shaun Molloy, PhD, Applying the principles of spatial modelling to the management of biodiversity in the fragmented landscapes of south-western Australia

Craig Pentland, PhD, Behaviour and population dynamics of translocated populations of the black-flanked rock wallaby, Petrogale lateralis lateralis.

VISITORS AND COLLABORATIONS AND OTHER ENGAGED ACTIVITIES (List the organisation’s name and short summary of the nature of the collaboration. Separate into local, national and international)

Visitors

A/Prof. Anssi Laurila from Uppsala University visited under an ECU Visiting Researcher grant to work with Robert Davis on scoping an amphibian research project

Prof. Koen Martens and Prof. Isa Schoen, Royal Belgian Institute of Natural Sciences, Brussels visited ECU. Biodiversity of WA ostracods from temporary water bodies. Collaborative research and supervision of SoNS PhD student – Annette Koenders

Other Engaged Activities

Tim Doherty - Online opinion piece for The Conversation: 15/02/13 Feral felines: managing their impact on native fauna.

Ray Froend - Invited presentation titled ‘Gnangara vegetation change and ecohydrological states’ to Dept of Environment and Conservation staff at the WA office, 21/02/13.

Pierre Horwitz - Attended the Ramsar STRP Meeting, 23/02/13.
Hugh Dunn  -  Crafty brewers see off big boys - West, Australian Business News - 05/03/13.

Hugh Dunn  -  Gave a talk at Badgingarra Crop - Central Midlands & Coastal Advocate, Morra WA - Industry engagement. 14/03/12.

Tim Doherty  -  Video interview with The Weekend Australian Magazine ‘Wild Australia: natural selection’ 16/03/2013.

Rob Davis  -  Birdlife Australia Board Meeting, Melbourne, 22/03/13.

Meenu Vitarana  -  Lichen measures atmospheric heavy-metal levels in Collie, Article on Science Network WA. 22/03/2013.

Kristina Lemson  -  Earth Day Presentation to students - 04/04/13.

Pierre Horwitz  -  Earth Day Presentation to students - 04/04/13.

Annette Koenders  -  Australian endangered species: Hairy Marron, article for The Conversation. 04/04/2013.

Magda Wajrak  -  Joondalup at Risk students - Early April 2013 Chemistry Prac for Year 11 and 12.

Rob Davis  -  Attended NIEF mid-west tour (Non-government organisation and Industry Environment Forum) at Charles Darwin Reserve and promoted ECU research. 11/04/13

Ray Froend  -  Invited presentation to the Wildflower Society, Northern Branch, on Drought mortality of vegetation in the Southwest – 23/04/13.

Annette Koenders  -  Interview by ABC AM Program from Bunbury on the Conservation of Hairy Marron - 24/04/13.

Eddie van Etten  -  Interview with The West Australian on rangeland ownership and management – article ‘Miners take over grazing land’. 01/05/13

Hugh Dunn  -  ABC Landline on television - Filming of the pilot malting plant as part of a larger story on the Australian Export Grain Innovation Centre (AEGIC) - 05/05/13.

Eddie van Etten  -  Interview with ABC Rural for Rural and Resources Report, WA Country Hour and WA Rural News. Pastoral land ownership changes in WA. 22/05/13.

Rob Davis  -  Re-elected to Board of Directors, Birdlife Australia at AGM in Melbourne. 25/05/13.

Rob Davis  -  Invited speaker on ecological linkages for Quinns Rock Environment Group/Perth Biodiversity Project workshop on northern Swan Coastal Plain linkages. 15/06/13.

Caroline Canham  –  Article on Science Network WA. 29/06/13.

Hugh Dunn  -  Science Week presentation: Science in the pub.

Tim Doherty  -  Magazine article with Australian Geographic ‘Satellites spy on feral cats’ July-August issue

Annette Koenders, Pierre Horwitz & Quinton Burnham  -  Australian endangered species: Margaret River burrowing crayfish, article for The Conversation. 18/07/13.
Hugh Dunn and Jon Luff - Pilot Malting Australia hosted the Australian Export Grains Innovation Centre training day for Cooperative Bulk Handling staff. The day included lectures and tours of the malting and brewing facilities. 12/08/13.


Caroline Canham - Article on ABC Radio National Science Show discussing vegetation response to drying climate. 26/10/13.


Amanda Wheeler - Attendance at the Centre for Air Quality and Health Research and Evaluation workshop.

Amanda Wheeler - Member of Department of Health's Air Pollution Health Network.
FINANCIAL REPORT (Include report on how the Faculty/University/School contributions were used)

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<th>INCOME</th>
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<td>Research expenses</td>
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Income - Expenditure                        $0

PRIORITIES FOR THE FOLLOWING YEAR*

CEM initiatives according to the Centre Business Plan (ongoing and specific to 2013):

- In association with SoNS and CMER the CEM will continue to organise a weekly seminar series for members, postgraduate students and visitors on topics related to the activities of the CEM.
- The Centre will organise an annual one-day seminar event for its members and collaborators.
- The CEM will continue to foster post-doctoral appointments to promote early career researchers at ECU.
- The CEM will continue to support visiting scholars and speakers.
- Members of the CEM will continue to strengthen research links, collaborations and engagement with government agencies, industry and non-governmental organizations active in the environmental field.
- The CEM will, funding permitting, initiate a staff small grants scheme to promote the research of early career academic staff.
- The CEM will contribute to ERA FOR codes (future ERA Assessment)