Brisbane Convention and Exhibition Centre
18 May 2011

Cooperative Research Centres Association

ERA Roundtable: Something for Everyone

Professor Margaret Sheil
CEO, Australian Research Council
Objectives of ERA

• Establish an evaluation framework;

• Provide a national stock take of discipline-level research;

• Identify excellence across the full spectrum of research performance;

• Identify emerging research areas and opportunities for further development;

• Allow for comparison of Australia’s research nationally and internationally for all discipline areas.
ERA Process Overview

<table>
<thead>
<tr>
<th>Volume &amp; Activity</th>
<th>Ranked Outlets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citation Analysis</td>
<td>Esteem</td>
</tr>
<tr>
<td>Research Income</td>
<td>Applied Measures</td>
</tr>
</tbody>
</table>

Peer Review

International Benchmarks

Research Evaluation Committees
ERA approach = one size does NOT fit all
Why a matrix approach to indicators?

• Not all indicators are suitable for all disciplines

• Pick and choose what is right for each discipline

• The indicator suite must ensure comparable quality across a range of indicator types

• Journal Rankings are not THE indicator
# Examples of the matrix of applied-research disciplines

## ENGINEERING & ENVIRONMENTAL SCIENCES

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Citation Analysis</th>
<th>Ranked Journals only</th>
<th>Patents</th>
<th>Research Commercialisation Income</th>
<th>Citations Analysis</th>
<th>Ranked Journals</th>
<th>Conferences</th>
<th>Patents</th>
<th>Research Commercialisation Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical and Electronic Engineering (0906)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Resources Engineering and Extractive Metallurgy (0914) and Materials Engineering (0912)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

## BIOLOGICAL SCIENCES & BIOTECHNOLOGY

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Citation Analysis</th>
<th>Ranked Journals only</th>
<th>Patents</th>
<th>Research Commercialisation Income</th>
<th>Citations Analysis</th>
<th>Patents</th>
<th>Plant Breeder’s Rights</th>
<th>NHMRC-Endorsed Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop and Pasture Protection (0703)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

## PUBLIC & ALLIED HEALTH SCIENCES

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Citation Analysis</th>
<th>Ranked Journals</th>
<th>Membership of a Statutory Committee</th>
<th>Patents</th>
<th>NHMRC-Endorsed Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing (1110)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Web: arc.gov.au  |  Email: info@arc.gov.au
Scale of ERA 2010

- All 41 eligible institutions submitted data
- Over 330,000 research outputs and 55,000 researchers represented
- 2,435 units of evaluation assessed at the two- and four-digit level
- 149 Research Evaluation Committee (REC) members and 500+ Peer Reviewers contributed evaluations
- All aggregated data presented in the *ERA 2010 National Report*. 
ERA 2010 at a glance

❌ Averages and Rankings
❌ Sciences v. Social Sciences & Humanities

✅ ERA does *not* evaluate individuals
✅ ERA does *not* evaluate individual outputs
✅ Ranked Journals do *not* drive ERA ratings
✅ ERA evaluations utilised metrics and peer review moderated by expert judgement
## The ERA 2010 Rating Scale

<table>
<thead>
<tr>
<th>Rating</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>The Unit of Evaluation profile is characterised by evidence of outstanding performance <strong>well above world standard</strong> presented by the suite of indicators used for evaluation.</td>
</tr>
<tr>
<td>4</td>
<td>The Unit of Evaluation profile is characterised by evidence of performance <strong>above world standard</strong> presented by the suite of indicators used for evaluation.</td>
</tr>
<tr>
<td>3</td>
<td>The Unit of Evaluation profile is characterised by evidence of average performance <strong>at world standard</strong> presented by the suite of indicators used for evaluation.</td>
</tr>
<tr>
<td>2</td>
<td>The Unit of Evaluation profile is characterised by evidence of performance <strong>below world standard</strong> presented by the suite of indicators used for evaluation.</td>
</tr>
<tr>
<td>1</td>
<td>The Unit of Evaluation profile is characterised by evidence of performance <strong>well below world standard</strong> presented by the suite of indicators used for evaluation.</td>
</tr>
</tbody>
</table>
Strengths in Australian universities

- Astronomical and Space Sciences
- Optical Physics
- Quantum Physics
- Macromolecular & Materials Chemistry
- Physical & Structural Chemistry
- Geology
- Ecology
- Evolutionary Biology
- Plant Biology
- Zoology
- Clinical Sciences

- Electrical and Electronic Engineering
- Historical Studies
- Cardiovascular Medicine and Haematology
- Human Movement and Sports Science
- Immunology
- Oncology and Carcinogenesis
- Pharmacology and Pharmaceutical Sciences
- Medical Physiology
Gaps

- Agriculture, Land and Farm Management
- Automotive Engineering
- Maritime Engineering
- Engineering Design
- Complementary and Alternative Medicine

Pockets

- Classical Physics
- Aerospace Engineering
- Transportation and Freight

Strong Applied Research

- Electrical and Electronic Engineering
- Crop and Pasture Protection
- Resources Engineering
- Materials Engineering
- Extractive Metallurgy
- Nursing
### Reading the national results

86% of assessed UoEs received a rating at or above world standard (i.e. rating of 3 or above).

Of all assessed UoEs at the four-digit FoR code level (58 UoEs), the average rating is 3.4. See Section 1 for two-digit FoR code average rating.

#### Mathematical, Information and Computing Sciences

<table>
<thead>
<tr>
<th>01 Mathematical Sciences</th>
<th>FTEs</th>
<th>Esteem count(s)</th>
<th>Patent(s)</th>
<th>Research commer. income $</th>
</tr>
</thead>
<tbody>
<tr>
<td>% assessed UoEs rated at or above world standard</td>
<td>86%</td>
<td>106</td>
<td>1</td>
<td>22,368,469</td>
</tr>
<tr>
<td>Research outputs</td>
<td>8,659</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research income $</td>
<td>104,624,740</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UoEs assessed</td>
<td>58</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rating</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution</td>
<td>1</td>
<td>7</td>
<td>25</td>
<td>16</td>
<td>9</td>
<td>58</td>
</tr>
</tbody>
</table>

A total of 58 UoEs were assessed for Mathematical Sciences at the four-digit FoR code level.

There were seven UoEs which received a rating of 2.
Where is the best place to publish?
Where your research will receive the most appropriate exposure!

<table>
<thead>
<tr>
<th>Discipline</th>
<th>FoR</th>
<th>A*</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunology</td>
<td>1107</td>
<td>7%</td>
<td>14%</td>
<td>24%</td>
<td>55%</td>
</tr>
<tr>
<td>Plant Biology</td>
<td>0607</td>
<td>3%</td>
<td>8%</td>
<td>14%</td>
<td>74%</td>
</tr>
<tr>
<td>Ecology</td>
<td>0602</td>
<td>9%</td>
<td>18%</td>
<td>36%</td>
<td>37%</td>
</tr>
<tr>
<td>Zoology</td>
<td>0608</td>
<td>1%</td>
<td>7%</td>
<td>18%</td>
<td>73%</td>
</tr>
<tr>
<td>Historical Studies</td>
<td>2103</td>
<td>6%</td>
<td>22%</td>
<td>32%</td>
<td>38%</td>
</tr>
<tr>
<td>Electrical and Electronic</td>
<td>0906</td>
<td>6%</td>
<td>16%</td>
<td>28%</td>
<td>49%</td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macromolecular and Materials</td>
<td>0303</td>
<td>14%</td>
<td>19%</td>
<td>31%</td>
<td>36%</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ERA 2010 Ratings by Cluster

- Public and Allied Health Sciences
- Mathematical, Information and Computing Sciences
- Biomedical and Clinical Research
- Engineering and Environmental Sciences
- Biotechnology and Biological Sciences
- Physical Chemical and Earth Sciences
- Humanities and Creative Arts
- Social, Behavioural and Economic Sciences

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ERA 2010 Rating by Cluster - at, above, or well above world standard (i.e. 3s, 4s, & 5s)

- Public and Allied Health Sciences
- Mathematical, Information and Computing Sciences
- Biomedical and Clinical Research
- Engineering and Environmental Sciences
- Biotechnology and Biological Sciences
- Physical Chemical and Earth Sciences
- Social, Behavioural and Economic Sciences
- Humanities and Creative Arts

0 50 100 150 200 250 300 350 400
3&4
5
Patent family (2006-2008) by de-identified institution

* Some letter combinations used for the de-identified institutions may be repeated within a graph, even though they represent different institutions.

** The Sum of percentage is the sum of the apportioned count (not whole count).
Cooperative Research Centre income (HERDC Cat. 4) (2006-2008)
by de-identified institution

[Bar chart showing income distribution by de-identified institution]
Research income by discipline cluster (2006-2008)
Top 20 Category 2 income disciplines (2006-2008) and ERA 2010 rating

Millions

1117  1103  1109  0601  1112  0502  0604  1402  1701  0602  1110  1605  1303  0906  1107  0607  1115  0703  0801  1114

1 & 2  3  4  5
Top 20 Category 3 (Australian) income disciplines (2006-2008) and ERA 2010 rating

[Bar chart showing the distribution of income disciplines and ERA ratings.]
Top 20 Category 3 (International A & B) income disciplines (2006-2008) and ERA 2010 rating

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Summary

• Many examples of units of evaluation with high levels of CRC income that performed above world standard.

• More detailed mapping would be required to trace the precise impact of individual CRCs.

• Many areas of interest to end-users have performed strongly in ERA.

• End-users are also focused on quality.