Research as a Public Resource
Changing ways in which academic research is used and measured

Denise Meredyth
Executive Director, Humanities and Creative Arts
Australian Research Council
The ARC

National Competitive Grants Program
$884.0 M in 13-14

Discovery & Fellowships
$569.3 M

Linkage & Centres
$314.7M

Evaluation and Policy
Excellence in Research for Australia

- Statutory Agency established 2001
- Mission: to deliver policy and programs that advance Australian research and innovation globally and benefit the community
- Fund direct costs to Universities and partners
- All disciplines except clinical medicine and dentistry
The Australian Research Council

The ARC is within the Australian Government’s Education portfolio.

The ARC’s main responsibilities are:

• evaluating the quality of research in universities under Excellence in Research for Australia (ERA);
• providing funding for research through the competitive funding schemes of the National Competitive Grants Program (NCGP);
• providing policy advice on research matters to Government; and
• together with the National Health and Medical Research Council (NHMRC), administering the Australian Research Integrity Committee (ARIC).
National Competitive Grants Program

**Discovery Projects**

- Laureate Fellowships: 5%
- Future Fellowships: 16%

**Linkage Projects**

- Centres of Excellence: 7%
- Co-Funded & SRI
- ITRP
- LIEF

Discovery Projects: 41%

Linkage Projects: 18%

5 year averages
Federal Investment in R&D 2013-14

- ARC: 10.2%
- NHMRC: 9.9%
- Block Funding to Higher Ed: 21.9%
- Other Higher Ed R&D Support: 0.9%
- Rural: 3.9%
- CRCs: 1.7%
- Other Government R&D (inc ANSTO): 7.4%
- DSTO: 4.9%
- CSIRO: 8.8%
- Multisector Science Support: 2.4%
- Energy and the Environment: 2.4%
- Industry R&D Tax Measures: 19.4%
- Other Industry R&D Support: 0.1%
- Other Innovation Support: 5.0%
- Other Health: 1.0%
Strategic Research Priorities

The SRPs fit beneath an overarching framework of five societal challenges:

• Living in a Changing Environment
• Promoting Population Health and Wellbeing
• Managing our Food and Water Assets
• Securing Australia’s Place in a Changing World
• Lifting Productivity and Economic Growth
The Research Community Opens Up

- Open Access to publications
  - Starting in January 2013, it is mandated by ARC funding rules that completed projects must make their publications available on an open access repository
    
  - Implementation – first pubs expected in 2014

- Open Data

- Open Innovation
What are the guiding principles of Open Access?

- Societal benefit
- Research benefit
- Individual benefit
Colliding Worlds

Grey Literature

Web

Traditional Publishing
A New Publishing Model

Web

- Government, NGO
- Archives
- Online Reports
- Online Library or Repository
- University
- Journals
  - Green Journal
  - e-Books
- Traditional Publishing
  - Books

Dark web?
How do we identify value?

- The comforts of tradition – books, traditional publishers, but this is waning
- Commodifying prestige
  - The challenge of the monograph system
  - Measuring impact?
  - A new kind of peer review?
  - altmetrics or similar system?
ERA 2010 & 2012 National Reports
What is ERA?

- ERA is a *retrospective evaluation* of research performance: 2005-2010 for research outputs, 2008-2010 for other data.
- The outcomes (ratings) are determined and moderated by *committees of distinguished researchers*, drawn from Australia and overseas.
- The *ERA unit of evaluation* (UoE) is the discipline within the institution, not individual researchers or institutional units.
- ERA does not rank institutions or units; each UoE is evaluated on its merits against the rating scale.
Objectives of ERA

- Establish an *evaluation framework* that gives government, industry, business and the wider community assurance of the excellence of research conducted in Australia’s institutions;

- 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.
# The ERA 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 well above world standard 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 above world standard 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 at world standard 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 below world standard 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 well below world standard presented by the suite of indicators used for evaluation.</td>
</tr>
</tbody>
</table>
The Peer Review Process

- 30% sample which is intended to be ‘representative’
- Peer reviewers are assigned for expertise and to take account of workload
- Minimum of two peer reviewers per UoE and each peer reviewer is assigned at least two UoEs
- Peer reviewers only get access to outputs – not other ERA data
- Peer reviewers read outputs and report on the unit of evaluation – not individual outputs
- Peer reviewer reports are advice to the REC members
- REC members also conduct peer review and have access to other ERA data
ERA Process Overview

<table>
<thead>
<tr>
<th>Citation Analysis or Peer Review</th>
<th>Journal Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume and Activity</td>
<td>Research Income</td>
</tr>
<tr>
<td>Applied Measures</td>
<td>Esteem</td>
</tr>
</tbody>
</table>

Note - There are no weightings

The **ERA 2012 National Report** presents data submitted as part of a comprehensive assessment by discipline of the research quality and research activity within Australia’s higher education institutions.
ERA 2012 at a glance

• All 41 eligible institutions submitted data

• Over 413,000 unique research outputs and 60,000 researchers represented

• 2,323 units of evaluation assessed at the two- and four-digit level

• 147 Research Evaluation Committee (REC) members and 886 Peer Reviewers contributed evaluations

• All aggregated data presented in the ERA 2012 National Report (on ARC website)
ERA 2012: Two Digit FoR codes

No. of Universities rated at world standard or higher

- 01 Mathematical Sciences: 11
- 02 Physical Sciences: 10
- 03 Chemical Sciences: 15
- 04 Earth Sciences: 4
- 05 Environmental Sciences: 10
- 06 Biological Sciences: 15
- 07 Agricultural and Veterinary Sciences: 9
- 08 Information and Computing Sciences: 12
- 09 Engineering: 9
- 10 Technology: 4
- 11 Medical and Health Sciences: 13
- 12 Built Environment and Design: 13
- 13 Education: 11
- 14 Economics: 7
- 15 Commerce, Management, Tourism and Services: 5
- 16 Studies In Human Society: 17
- 17 Psychology and Cognitive Sciences: 11
- 18 Law and Legal Studies: 10
- 19 Studies In Creative Arts and Writing: 15
- 20 Language, Communication and Culture: 15
- 21 History and Archaeology: 12
- 22 Philosophy and Religious Studies: 12

Legend:
- World standard
- Above world standard
- Well above world standard
Variation at Four-digit Level: STEM v HASS

Mathematical Studies (01) and Language, Communication and Culture (20)
Number of Universities Rated at World Standard or Higher

- 0101-Pure Mathematics - 2012: At World Standard 6, Above World Standard 6, Well Above World Standard 2
- 0103-Numerical and Computational Mathematics - 2012: At World Standard 3, Above World Standard 1, Well Above World Standard 1
- 0104-Statistics - 2012: At World Standard 2, Above World Standard 6, Well Above World Standard 1
- 0105-Mathematical Physics - 2012: At World Standard 3, Above World Standard 3, Well Above World Standard 1

- 2003-Language Studies - 2012: At World Standard 1, Above World Standard 2, Well Above World Standard 1
Quality is multidimensional

• Quality in ERA is multidimensional
• Publishing profile, income sources, background statements and applied measures all contribute to understanding the UoE
• Applied/researcher-led research is recognised in ERA
• Quality underpins evaluation across the spectrum of research activity
ERA is multidimensional

- Citation data
- Peer assessment
- HERDC Category income 2-4
- Research Commercialisation income
- Patents
- Plant breeder’s rights
- NHMRC endorsed guidelines
- Non-traditional research outputs (extended trial in ERA 2012)
2010 to 2012: Growth

Bigger and more productive

↑ research publications/outputs (413,477, up 24%)
↑ researchers and related staff (60,668, up 9%)
↑ patents (781, up 16%) and esteem measures (4485, up 11%)
↑ Competitive grant ($3.75 billion, up 18%) and other public sector income ($2.39 billion, up 25%)
Growth in outputs

Difference in number of outputs by type: ERA 2012 compared to ERA 2010

* Actual NTROs % increased, but are included in Portfolios
Research Outputs by two-digit FoR code

Based on ERA 2012 data
Number of non-traditional outputs, 2010-2012

- 12 Built Environment and Design
  - 2010: 1,000
  - 2012: 1,500
- 13 Education
  - 2010: 500
  - 2012: 1,000
- 14 Economics
  - 2010: 200
  - 2012: 1,000
- 15 Commerce, Management, Tourism and Services
  - 2010: 500
  - 2012: 1,000
- 16 Studies In Human Society
  - 2010: 500
  - 2012: 1,000
- 18 Law and Legal Studies
  - 2010: 500
  - 2012: 1,000
- 19 Studies In Creative Arts and Writing
  - 2010: 3,000
  - 2012: 10,000
- 20 Language, Communication and Culture
  - 2010: 500
  - 2012: 1,000
- 21 History and Archaeology
  - 2010: 500
  - 2012: 1,000
- 22 Philosophy and Religious Studies
  - 2010: 500
  - 2012: 1,000

Legend:
- Curated or Exhibited Event
- Live Performance
- Original Creative Work
- Recorded or Rendered Work
- Portfolio
Output types in Studies in Creative Arts and Writing (%)
Output types in Built Environment and Design (%)
<table>
<thead>
<tr>
<th>Subject</th>
<th>Count of Original Creative Work</th>
<th>% of Total Research Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1401 Economic Theory</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1402 Applied Economics</td>
<td>41.9</td>
<td>0.8</td>
</tr>
<tr>
<td>1403 Econometrics</td>
<td>10.0</td>
<td>1.2</td>
</tr>
<tr>
<td>1499 Other Economics</td>
<td>9.3</td>
<td>1.3</td>
</tr>
<tr>
<td>1601 Anthropology</td>
<td>3.0</td>
<td>0.2</td>
</tr>
<tr>
<td>1602 Criminology</td>
<td>10.4</td>
<td>0.7</td>
</tr>
<tr>
<td>1603 Demography</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1604 Human Geography</td>
<td>5.0</td>
<td>0.3</td>
</tr>
<tr>
<td>1605 Policy and Administration</td>
<td>43.4</td>
<td>1.5</td>
</tr>
<tr>
<td>1606 Political Science</td>
<td>6.0</td>
<td>0.1</td>
</tr>
<tr>
<td>1607 Social Work</td>
<td>4.7</td>
<td>0.3</td>
</tr>
<tr>
<td>1608 Sociology</td>
<td>7.9</td>
<td>0.2</td>
</tr>
<tr>
<td>1699 Other Studies in Human Society</td>
<td>3.5</td>
<td>0.3</td>
</tr>
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</table>
A simple impact model

Academic activity

Impact

TRANSLATION

New Government Policy
New Research Paradigm
Spin-off Project

Papers

Books

Salaries
researchers
technicians

Buy
equipment,
books, ICT

$\$
Case 1:

Case 2:

Case 3:
Grey Literature: quality + impact?

- Impact is all about capturing the diversity of research outputs, especially the ‘non-traditional’.

**But be ready..**

Impact systems may be pressed to:
- disentangle contributions
- cope with negative impacts
- quantify prestige
- tell a story

.... Advocates for open research, open data and open innovation can get ready for this
Thank You