THE UNIVERSITY OF WESTERN AUSTRALIA

The Australian Research Landscape and its Place in the Global Innovation Sector

Professor Robyn Owens
Deputy Vice-Chancellor (Research)
The University of Western Australia

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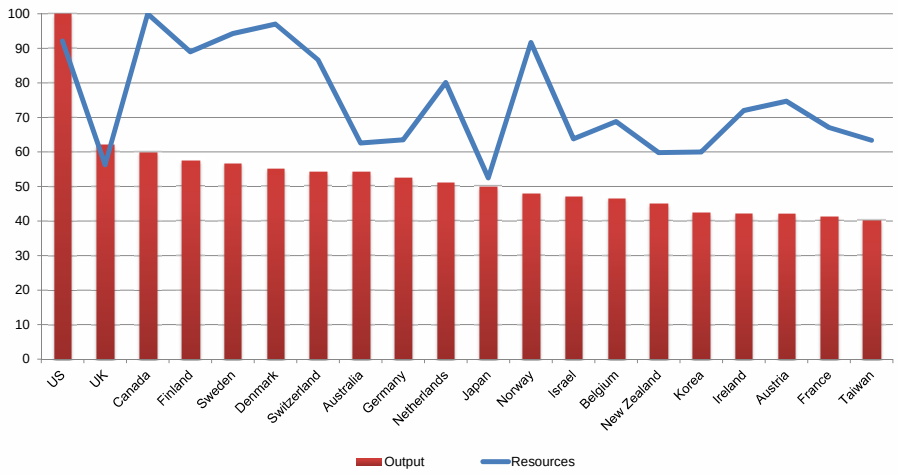
ACHIEVE INTERNATIONAL EXCELLENCE

- Australia is one of the world's powerhouses in terms of research production
- Over the past 10 years, we are ranked 12th globally in terms of total research output (Thomson-Reuters)
- Per capita, we are ranked 4th, with 13 papers per thousand people
- We are behind Switzerland, Sweden and The Netherlands.

National Output Compared to Resources



Data Source: U21 Ranking of National Higher Education Systems 2012

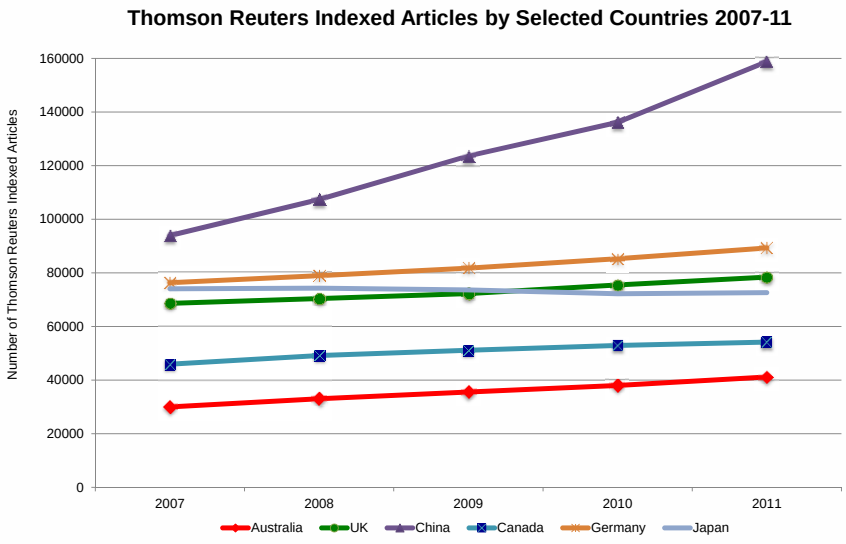
- The US produces 10 papers per thousand people and spends 3.5% GDP on research and development.
- Japan produces 6 papers per thousand people and spends 2.8% GDP on research and development.
- Australia produces 13 papers per thousand but only spends 1.6% on research and development – we are very efficient.
- Our research investment is about 3% of the global investment.

International Publications in 2011

Country	Articles	Country	Articles
USA	335,430	TAIWAN	26,647
PEOPLES R CHINA	158,796	TURKEY	22,992
GERMANY	89,359	SWITZERLAND	22,798
ENGLAND	78,474	IRAN	21,362
JAPAN	73,649	SWEDEN	20,124
FRANCE	63,002	POLAND	19,915
CANADA	54,222	BELGIUM	17,382
ITALY	50,463	DENMARK	12,637
SPAIN	47,507	SCOTLAND	12,261
INDIA	44,518	AUSTRIA	11,914
SOUTH KOREA	44,346	ISRAEL	11,613
AUSTRALIA	41,213	FINLAND	10,154
BRAZIL	33,610	NORWAY	10,152
NETHERLANDS	30,823	PORTUGAL	10,067
RUSSIA	28,068	MEXICO	9,939

Source: Thomson Reuters WoS (Articles in PY 2011)

Charting Global Research Output



Source: Thomson Reuters WoS (Articles in PY 2007-11)

Australia's Contribution to Global Research Output

	2007	2008	2009	2010	2011
Australia	2.93%	3.02%	3.14%	3.24%	3.34%
US	29.04%	28.29%	27.72%	27.71%	27.16%
UK	6.72%	6.45%	6.37%	6.43%	6.35%
China	9.19%	9.83%	10.89%	11.60%	12.86%
Canada	4.50%	4.50%	4.51%	4.51%	4.39%
Germany	7.47%	7.23%	7.20%	7.27%	7.23%
Japan	7.25%	6.80%	6.49%	6.15%	5.88%

Source: Thomson Reuters WoS (Articles in PY 2007-11)

Australia's top 40 fields of research 2007-11

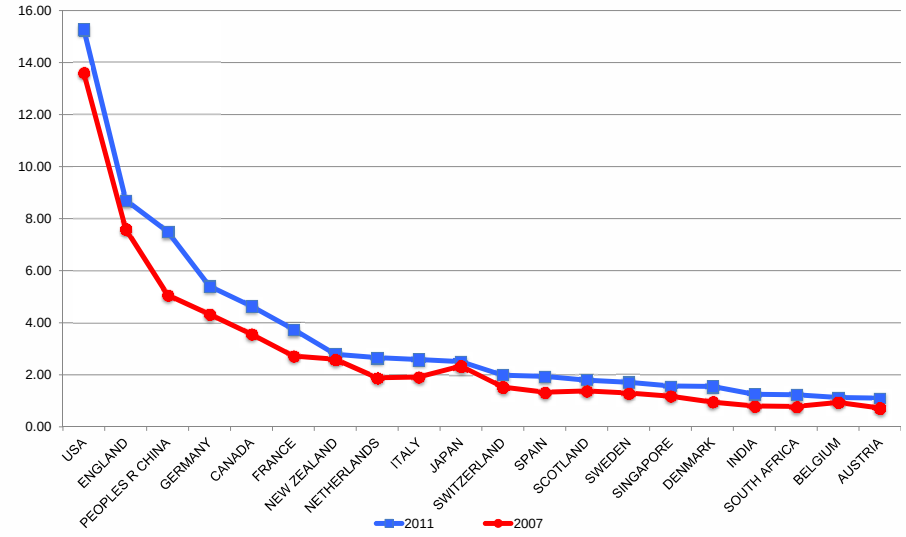
Top Twenty Australian Institutions by published Articles 2007-11

Institution	Records	% National Output
SYDNEY	20,125	11.32
MELBOURNE	20,008	11.25
UQ	17,635	9.92
MONASH	14,147	7.96
UNSW	14,086	7.92
ANU	10,515	5.91
UWA	10,255	5.77
CSIRO	10,242	5.76
ADELAIDE	8,013	4.51
NEWCASTLE	4,529	2.55
QUT	4,421	2.49
GRIFFITH	4,332	2.44
MACQUARIE	4,319	2.43
WOLLONGONG	4,204	2.36
CURTIN	3,873	2.18
TASMANIA	3,830	2.15
DEAKIN	3,442	1.94
LA TROBE	3,329	1.87
FLINDERS	3,304	1.86

Source: Thomson Reuters WoS (Articles in PY 2007-11)

- But increasing research investment is not the only thing we need to do
- We need to collaborate with the best in the world, bringing our expertise and strategic advantages to global problems
- We need to train the highest quality students to ensure a sustainable research future
- We need to ensure our work is at the highest levels and has the maximum impact

Top Twenty Countries Collaborating with Australian Authors in 2011 compared to 2007



Source: Thomson Reuters WoS (Articles in PY 2007 and 2011)

Current research policy framework

- ERA – Excellence in Research in Australia
- Impact
- Infrastructure
- Collaborations with key partners

ERA

- Designed to determine the quality of Australian research as measured against world average performance
- First run in 2010 and being repeated in 2012
- Looks at total research output of all Australian universities over a 6-year period
- Evaluates research submissions in Fields of Research units
- Provides a score of 1 to 5 (well below to well above world average)

- ERA10 showed that Australia is generating much research that is well above world average
- Particular strengths were shown in Physics, Chemistry, Earth Sciences, Environmental Sciences and Agriculture across the nation
- It is clear that from the perspectives of the various disciplines, Australia is producing world class research outputs
- ERA results will influence future university funding

Impact

- Are we confident that the research we produce is having a benefit for society?
- The ATN-Go8 universities are heading a Trial to determine the societal impact of our research
- For research impact, we are looking at Socio-economic outputs rather than Field of Research indicators
- The main broad areas of impact being tested are Defence, Economy, Society and Environment

- 12 universities will submit Case Studies to general (non-academic) panels, arguing the value and impact of work in the period 2007 – 2012, based on research that goes back 20 years
- Impact will be measured on intensity and spread, with scores from 1 to 5
- At this stage, case studies will be used to argue the value of research to Treasury, although in future impact is likely to be used in the allocation of funding to universities

Infrastructure

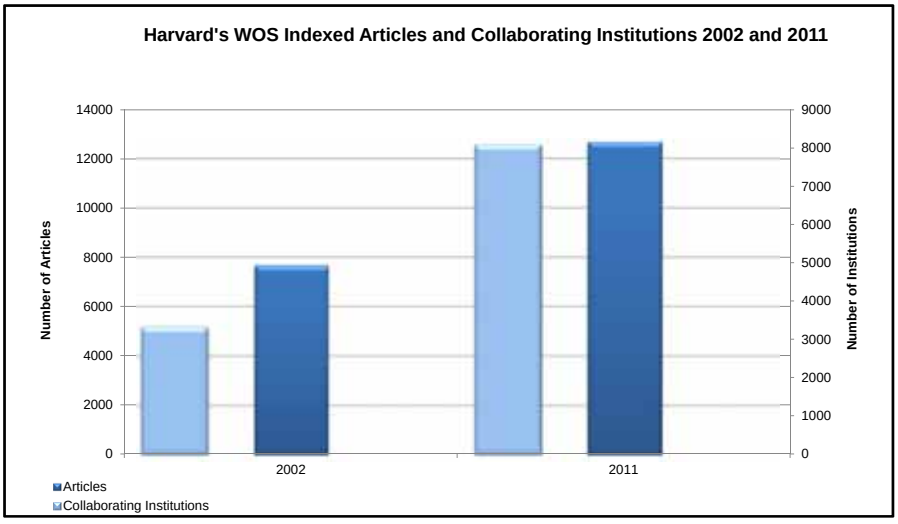
- Under the current Government's Superscience Framework, Australia has invested in major national research infrastructure that is used collaboratively across the nation
- Investments include Microscopy and Characterization, High Performance Computing, Genomics, Imaging, Marine Observation, Nano-fabrication etc
- Other major investments have included the SKA and Australian Synchrotron

- Australia is now well-positioned to participate in global research initiatives, and to bring to partners the strategic advantages that our global position offers:
  - Bio-diversity
  - Marine structures
  - Geosciences
  - Political positioning
  - Medical strengths
  - Agricultural technologies
  - Radio isolation etc.

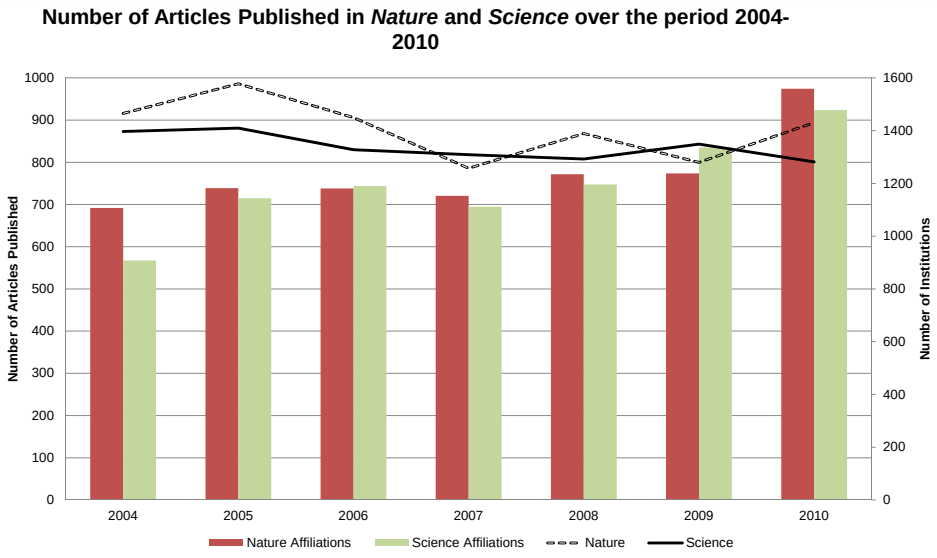
Collaboration

- Globally, research is being undertaken through more collaboration, and governments are promoting collaboration as a way of maintaining global relevance
- Australia has strategic partnerships with a number of emerging research giants, such as China and India, as well as traditional research partnerships with Europe and the US
- Collaboration facilitates progress on global issues of importance, such as adaptation to climate change, global health issues, and the globalization of culture and identity.

Case Study 1: Harvard University



Case Study 2: *Nature* and *Science*



So what does this mean for bushfire research?

- Australia has world-class strengths in key areas relating to bushfire mitigation and management:
  - Ecology
  - Environment
  - Physics
  - Engineering
  - Psychology
  - Economics etc

- Bushfire research provides a focal point for establishing high quality international collaborations
- Research that is problem-focused provides great opportunities for societal impact, in this case
  - Defence,
  - Economy,
  - Society, **and**
  - Environment

- Australian research results in this area are easily transferable to other countries
- Thus, by building strategic collaborations that use our natural comparative advantages, that exploit our research infrastructure, and that build on international networks, Australia can easily establish a globally pre-eminent position in bushfire research

Thank you!