



Australian Government
Australian Research Council

ERA INDICATORS CONSULTATION PAPER

Consultation



Excellence in Research for Australia (ERA) Initiative

September 2009

RESEARCH in the national interest - enabling the future

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Introduction

In 2008, the ARC released the *ERA Indicator Principles* which established the general principles for the inclusion of an indicator as a measure of research quality in the Excellence in Research for Australia (ERA) initiative. The indicator development process was underpinned by extensive consultation with institutions and other interested parties, by analytical testing of the validity and robustness of proposed indicators, and with the objective of minimising the burden of collection on institutions.

An indicator will only be used in ERA where it can be clearly demonstrated to be a valid and robust measure of research quality for a discipline, and where it is consistent with the following principles, as outlined in the *ERA Indicator Principles*:

- quantitative;
- internationally recognised;
- comparable to indicators used for other disciplines;
- able to be used to identify excellence;
- research relevant;
- repeatable and verifiable;
- time-bound; and
- behavioural impact.

The development of indicators for the 2009 trial of ERA was informed by advice from discipline experts and consultation more broadly with institutions and other interested parties. The final lists were included with the *ERA Submission Guidelines* as part of the Discipline Matrices.

In 2009, the ARC also consulted with experts broadly representative of the disciplines for clusters 3–8 in a series of workshops. The focus of the workshops was the development of a draft list of discipline-specific indicators for each cluster, consistent with the *ERA Indicator Principles*, for general release to assist with the development of the full ERA process for 2010.

One category of indicators that had been proposed for the 2009 trial was research esteem. In response to concerns about the scope of esteem data to be collected and verified, the Minister for Innovation, Industry, Science and Research, Senator Kim Carr, excluded the collection of esteem indicators for the 2009 ERA trial and asked the ARC to further investigate their collection for inclusion in future ERA evaluations. Accordingly, the ARC convened an Esteem Indicators Group in June 2009 to undertake this work. The report of that Group is included in this consultation paper.

Following the discipline workshops and the work of the Esteem Indicators Group, this consultation paper outlines the indicators proposed for inclusion in ERA and seeks views from institutions, researchers and other relevant stakeholders on specific issues.

In cases where institutions will be required to collect data against indicators which were not utilised in the 2009 ERA trial, a description of these indicators is provided below.

Discipline-Specific Indicators

The discipline-specific indicators listed in the Draft Matrix for each Cluster were developed in consultation with leading researchers in their own fields. They are consistent with the *ERA Indicator Principles*, and are considered to be a robust and sufficient set of indicators for each of the disciplines for the purposes of evaluation. The ARC seeks feedback about the nominated indicators in each Matrix. These indicators are summarised below.

Volume and Activity

Volume and activity indicators are common across all disciplines in ERA.

Ranked Outlets

Journals are listed as ranked outlets across all disciplines in ERA. Ranked conferences represent an important research publication outlet for a small number of disciplines. To be eligible for inclusion on any ERA ranked conference list, the conference papers must be fully peer reviewed (i.e. not just the abstracts reviewed). The specific Field of Research (FoR) codes, from consultation with institutions and other interested parties, which will use ranked conferences, are identified in the Discipline Matrix for each Cluster.

Citation Analysis

Citation analysis is listed as an indicator category for those disciplines where at least half of the total output of the discipline (including non-journal articles) is indexed by the citation information supplier.

Income

Income indicators are common across all disciplines in ERA.

Applied Indicators

A range of applied indicators have been identified in consultation with discipline experts for use in ERA. The proposed use of indicators varies between the clusters and in some instances (such as Registered Designs) varies within a cluster.

In addition to the three categories within this indicator group that were utilised for the 2009 ERA trial (i.e. patents, registered designs and research commercialisation income), it is proposed that institutions be required to submit information for the following:

- 1. Plant breeders' rights***

A plant breeder's right, or plant variety right, gives the owner exclusive commercial rights over the new variety of plant. This right is granted for the development of a new variety of plant where it can be demonstrated that the new variety is: distinct, uniform and stable; and identifiably different from any other variety.

Institutions will be required to identify plant breeders' rights granted in Australia for eligible researchers during the reference period. The indicator will be apportioned according to the four-digit FoR code(s) assigned to the relevant researcher.

- 2. National and international standards***

Standards are published documents setting out specifications and procedures designed to ensure products, services and systems are safe, reliable and effective.

Institutions will be required to submit information regarding eligible researchers' authorship of standards endorsed during the reference period. The indicator will be apportioned according to the four-digit FoR code(s) assigned to the relevant researcher.

3. *Nationally-endorsed guidelines*

Nationally-endorsed guidelines are clinical practice guidelines endorsed by the National Health and Medical Research Council (NHMRC). These guidelines are recognised in Australia and internationally as representing best practice in health and medical knowledge and practice.

Institutions will be required to submit information regarding eligible researchers' authorship of national guidelines endorsed by the NHMRC during the reference period. The indicator will be apportioned according to the four-digit FoR code(s) assigned to the relevant researcher.

Peer Review

Peer review is listed as an indicator for those disciplines in ERA where citation analysis is not considered to be a robust indicator. Peer review has been identified both for whole clusters (e.g. Humanities and Creative Arts) and for some disciplines within clusters (e.g. Social, Behavioural and Economic Sciences).

The percentage of outputs tagged for peer review is relatively uniform at 20 per cent across the disciplines identified for peer review.

1. Please provide comments regarding the collection and verification of data for any of the specified indicator categories for the full ERA evaluations from an institutional perspective.
2. Please identify any discipline(s) where the proposed use of ranked conferences or citation analysis is likely to not be supported by a broad consensus in the discipline(s). Please provide a short justification for adding or removing the discipline(s) in the indicator category.
3. For applied indicators, as well as peer review indicator categories, please identify any discipline(s) in the Matrix for each Cluster where there is likely to be broad consensus that the proposed use of the indicator is not useful or valid.
4. For the peer review indicator, please comment on: any additional output type(s) which could be included in this category, including a short justification for their inclusion; and any issues which significantly impact on the tagging of outputs for peer review.
5. Are there specific publishing behaviours which may affect the attribution of publications to the most relevant FoR code using the ERA journal FoR assignments? How would you suggest that the ERA approach might overcome this issue to ensure that research outputs are correctly attributed to the correct FoR code?

Esteem Indicators

ERA will include a number of indicators of esteem that constitute recognition of the research quality of eligible researchers and indicate that a researcher is held in particularly high regard by peers in their discipline and/or by other well-qualified parties.

Esteem indicators for ERA must embody a measure of prestige and be recognised by experts within the discipline as a highly-desired, highly-regarded form of accolade or acknowledgement. To be included in ERA, esteem indicators must also be linked to research quality rather than esteem that is based on teaching or engagement.

As with research outputs, esteem indicators will follow the researcher if, as of the staff census date, they have moved to a different institution from where the esteem was attained. The exception to this is nationally-competitive research fellowships (see below).

The proposed esteem indicators for ERA are:

- editorial role (senior editorial role, excludes member of editorial board) of A* or A ranked journals;
- editor of a prestigious work of reference;
- contribution to a ranked conference;
- membership of a learned academy;
- recipient of a nationally-competitive research fellowship;
- membership of a statutory committee; and
- recipient of an Australia Council Grant or Australia Council Fellowship.

There were a number of items which were considered by the Esteem Indicators Group but ultimately not included as esteem indicators. This was based on a number of considerations, including the challenges associated with collecting and verifying information, acceptance of certain indicators within disciplines, and the value that the indicators add to the evaluation of research quality.

The items not included are:

- awards and prizes;
- membership of international advisory boards;
- membership of ARC College of Experts nor roles in the evaluation of category 1 grants;
- plenary addresses;
- membership of statutory committees (except for Public and Allied Health disciplines); and
- contributions to internationally endorsed standards.

Further details on esteem indicators are provided below.

Proposed Implementation of Esteem Indicators

Editorial role of A* or A ranked journals

Specified roles (i.e. senior editor, editor, associate editor) will be articulated in the ERA Submission Guidelines. The FoR codes(s) for an eligible editorial role will be attributed based on the FoR code(s) of the journal as identified in the ERA journal ranking lists. Journals must be ranked A* or A on the appropriate journal list that will be published on the ARC website.

Institutions will be required to identify the kind of editorial role held by eligible researchers.

Editor of a prestigious work of reference

A prestigious work of reference is defined as one of the best in its field or subfield, characterised by a rigorous refereeing process and high-scholarly standards that are equivalent to an A* or A ranked journal. Collectively, the work is expected to be recognised as one of the best sources of references for the field or subfield. Examples may include the *Australian Dictionary of Biography*, the Oxford or Cambridge Companions, and encyclopaedias in various humanities and social sciences disciplines.

The specified role (i.e. editor) and a list of eligible works of reference will be articulated in the ERA Submission Guidelines. The esteem indicator will be apportioned according to the four-digit FoR code(s) assigned to the relevant researcher.

Institutions will be required to identify the role held by eligible researchers and information regarding pages, series, etc. to be collected for verification purposes.

Contribution (Technical Program Chair or General Chair) to a Ranked Conference (A ranked conference)

In certain disciplines, such as Information and Computing Sciences, conferences are an important outlet for disseminating research. For these disciplines, conferences will be used as a ranked outlet indicator alongside journals. Key leadership roles at these conferences, such as Technical Program Chair or General Chair, will be included as an esteem indicator.

A ranked conference list will be provided in the ERA Submission Guidelines. The esteem indicator will be apportioned according to the four-digit FoR code(s) assigned to the relevant researcher.

Institutions will be required to identify the role held by eligible researchers.

Membership of a learned academy

Institutions will be required to submit details regarding eligible researchers' fellowship or membership of the following learned academies: Academy of the Social Sciences in Australia; Australian Academy of the Humanities; Australian Academy of Science; Australian Academy of Technological Sciences and Engineering; and Australian Institute of Aboriginal and Torres Strait Islander Studies.

On the advice of the ARC Advisory Council, collection of data for this indicator will not be restricted to fellowship/membership election that occurred during the reference period. In their submission, institutions will therefore be required to identify for eligible researchers:

1. researchers' election to the specified academies that occurred during the reference period; and
2. researchers' ongoing membership/fellowship of the specified academies held during the reference period.

The esteem indicator will be apportioned according to the four-digit FoR code(s) assigned to the relevant researcher.

Recipient of a Nationally-Competitive Research Fellowship

Nationally-competitive research fellowship refers to a fellowship awarded to an individual researcher under a program listed on the Australian Competitive Grants Register during the reference period. Such fellowships are characterised by: a highly-competitive process open to applicants from any state or territory; a strong element of peer review; and a minimum tenure of two years full time equivalent. Direct appointments to fellowships in the absence of an open application process or information about international fellowships will not be included as an esteem indicator.

Institutions will be required to submit details regarding eligible fellowships awarded to a unit of evaluation for which they have been administering/host organisations at any time during the reference period (regardless of the researcher's place of employment as at the census date), taking into account the following possibilities:

- a researcher's commencement of a new fellowship in the year immediately after the completion of another (both hosted at the same institution); or
- a researcher's relocation to a different institution mid-fellowship.

Example: Under the following scenario, University of Z can count two fellowships for the eligible researcher, whilst University of A can count one.

Date	Fellowship Type held by Dr X	Administering/Host Organisation
Jan 2006–Dec 2007	Australian Postdoctoral Fellowship	University of Z
Jan 2008	Australian Research Fellowship	University of Z
Nov 2008	Australian Research Fellowship	University of A (post-award variation: researcher decides to relocate)
Census date	Australian Research Fellowship	University of A

Membership of statutory committees

Membership of statutory committees recognised for ERA is an important indication of research expertise in areas of Public and Allied Health. Institutions will be required to submit information about eligible researchers' membership of statutory committees, with the esteem indicator apportioned according to the four-digit FoR code(s) assigned to the relevant researcher.

For the purposes of ERA, eligible committees are specified as being those which are recognised by the Australian Government, National Health and Medical Research Council, United Nations and World Health Organisation, and will be articulated in the ERA Submission Guidelines.

Recipient of an Australia Council Grant or Australia Council Fellowship

Australia Council grants support new research, experimentation, production and presentation of artwork. They are characterised by a highly competitive selection process incorporating peer assessment, and are held in high regard within the creative arts and writing field.

The highly competitive Australia Council fellowships are the most prestigious Australia Council grants, providing support to individual artists to engage in research and experimentation for the development of a new work. Eligible fellowship programs are characterised by a strong element of peer review, open to applicants from any state or territory, a minimum tenure of two years full time equivalent and are awarded to individuals.

Institutions will be required to submit information about the following Australia Council grants and fellowships held by eligible researchers during the reference period, with the esteem indicator apportioned according to the four-digit FoR code(s) assigned to the relevant researcher:

- Fellowships—Aboriginal and Torres Strait Islander Arts, Dance, Literature, Music, Theatre and Visual Arts;
- Project Fellowships—Music;
- Residencies—Literature, Inter-Arts;
- Residency ABC National Radiophonic—Music;
- Residency Albers Foundation—Aboriginal and Torres Strait Islander Arts;
- Skills and Arts Development Studio Residencies—Visual Arts;
- ArtLab—Inter-Arts;
- Synapse—Inter-Arts; and
- Research Programs—Research and Strategic Analysis.

There will be a maximum count of one per institution for each grant awarded during the reference period to an eligible researcher, regardless of the number of researchers from within the institution involved in the funded grant. In cases where a grant involves a group of individuals from a number of institutions, each institution may only count the grant once, regardless of the number of eligible researchers from the institution involved.

6. Please provide comments regarding the collection and verification of data for any of the specified indicator categories for the full ERA evaluations from an institutional perspective.
7. Please provide comments regarding specified roles articulated in any of the indicator categories.
8. What titles should be included as prestigious works of reference? Please note that the list should be restricted to a small number of works (maximum 10 per discipline) representing the highest scholarly standards.
9. Please provide suggestions for the list of statutory committees.
10. Please provide comments on the suggested method for counting nationally competitive research fellowships and Australia Council grants and fellowships.

Proposed Creative Arts Research Outputs that includes Esteem Indicators

In addition to esteem indicators, the Esteem Indicators Group recommended the adoption of a framework for the collection of non-publication outputs (particularly those in creative and performing arts, and architecture and design) that includes limited information about esteem indicators connected to the output.

Under this approach, the existing four sub-categories of Creative Arts outputs as outlined in the 2009 *ERA Submission Guidelines* will be retained for the full ERA process. However, it is proposed that additional information be provided for items nominated for peer review.

In order to provide esteem information that is related directly to a research output submitted to cluster two (Humanities and Creative Arts), institutions may opt to provide the following:

- Place of Publication—the venue(s) and/or format in which the output was first made publicly available whether performance, exhibition, broadcast, publication or recording. This may be a reference like International Standard Music Number (ISMN).
- Media—the medium in which the output was made publicly available (e.g. oil on canvas, DVD, stainless steel, etc.)
- Extent—this may be number of art works, dimensions, time, pages etc.
- Peer assessed input (optional)—information regarding any peer assessed input that caused the output to be created. For example, a commission or an Australia Council New Work Grant.
- Peer assessed output (optional)—information regarding any peer assessment of the output. For example, whether it was presented and/or exhibited by a recognised organisation listed in the ERA Submission Guidelines.
- Subsequent manifestation (optional)—bibliographic details of any subsequent manifestation of the output. For example, a reinterpretation of a work within a different context, citation in a legal judgment. No more than two subsequent manifestations should be submitted.
- Additional documentation (optional)—bibliographic details of any additional documentation that illustrates the quality of the output. No more than two pieces of additional information should be submitted.
- Research content—a brief 100 word statement on the research content of the output (replaces the 250 word statement from the ERA trial).

11. Please provide comment on the proposed revision to the creative arts research outputs that allows the inclusion of some esteem information directly connected to the research output.

INDICATOR MATRICES

Cluster One: Physical, Chemical and Earth Sciences

		Esteem			Applied	
		Editorial role A and A* journal	Membership of learned academy	Category 1 research fellowships	Patents	Research commercialisation income
2	Physical Sciences					
0201	Astronomical and Space Sciences	✓	✓	✓	✓	✓
0202	Atomic, Molecular, Nuclear, Particle and Plasma Physics	✓	✓	✓	✓	✓
0203	Classical Physics	✓	✓	✓	✓	✓
0204	Condensed Matter Physics	✓	✓	✓	✓	✓
0205	Optical Physics	✓	✓	✓	✓	✓
0206	Quantum Physics	✓	✓	✓	✓	✓
0299	Other Physical Sciences	✓	✓	✓	✓	✓
3	Chemical Sciences					
0301	Analytical Chemistry	✓	✓	✓	✓	✓
0302	Inorganic Chemistry	✓	✓	✓	✓	✓
0303	Macromolecular and Materials Chemistry	✓	✓	✓	✓	✓
0304	Medicinal and Biomolecular Chemistry	✓	✓	✓	✓	✓
0305	Organic Chemistry	✓	✓	✓	✓	✓
0306	Physical Chemistry (incl. Structural)	✓	✓	✓	✓	✓
0307	Theoretical and Computational Chemistry	✓	✓	✓	✓	✓
0399	Other Chemical Sciences	✓	✓	✓	✓	✓
4	Earth Sciences					
0401	Atmospheric Sciences	✓	✓	✓	✓	✓
0402	Geochemistry	✓	✓	✓	✓	✓
0403	Geology	✓	✓	✓	✓	✓
0404	Geophysics	✓	✓	✓	✓	✓
0405	Oceanography	✓	✓	✓	✓	✓
0406	Physical Geography and Environmental Geoscience	✓	✓	✓	✓	✓
0499	Other Earth Sciences	✓	✓	✓	✓	✓

Cluster One: Physical, Chemical and Earth Sciences

		Citation Analysis			HERDC Research Income			
		Relative Citation Impact	Centile Analysis	Dist. of papers against relative citation rate bands	Category 1	Category 2	Category 3	Category 4
2	Physical Sciences							
0201	Astronomical and Space Sciences	✓	✓	✓	✓	✓	✓	✓
0202	Atomic, Molecular, Nuclear, Particle and Plasma Physics	✓	✓	✓	✓	✓	✓	✓
0203	Classical Physics	✓	✓	✓	✓	✓	✓	✓
0204	Condensed Matter Physics	✓	✓	✓	✓	✓	✓	✓
0205	Optical Physics	✓	✓	✓	✓	✓	✓	✓
0206	Quantum Physics	✓	✓	✓	✓	✓	✓	✓
0299	Other Physical Sciences	✓	✓	✓	✓	✓	✓	✓
3	Chemical Sciences							
0301	Analytical Chemistry	✓	✓	✓	✓	✓	✓	✓
0302	Inorganic Chemistry	✓	✓	✓	✓	✓	✓	✓
0303	Macromolecular and Materials Chemistry	✓	✓	✓	✓	✓	✓	✓
0304	Medicinal and Biomolecular Chemistry	✓	✓	✓	✓	✓	✓	✓
0305	Organic Chemistry	✓	✓	✓	✓	✓	✓	✓
0306	Physical Chemistry (incl. Structural)	✓	✓	✓	✓	✓	✓	✓
0307	Theoretical and Computational Chemistry	✓	✓	✓	✓	✓	✓	✓
0399	Other Chemical Sciences	✓	✓	✓	✓	✓	✓	✓
4	Earth Sciences							
0401	Atmospheric Sciences	✓	✓	✓	✓	✓	✓	✓
0402	Geochemistry	✓	✓	✓	✓	✓	✓	✓
0403	Geology	✓	✓	✓	✓	✓	✓	✓
0404	Geophysics	✓	✓	✓	✓	✓	✓	✓
0405	Oceanography	✓	✓	✓	✓	✓	✓	✓
0406	Physical Geography and Environmental Geoscience	✓	✓	✓	✓	✓	✓	✓
0499	Other Earth Sciences	✓	✓	✓	✓	✓	✓	✓

Cluster One: Physical, Chemical and Earth Sciences

		Volume and Activity Analysis			Ranked outlets
		Eligible researchers profiled by level	Research outputs by type	Proportion of total research outputs activity	Journals
2	Physical Sciences				
0201	Astronomical and Space Sciences	✓	✓	✓	✓
0202	Atomic, Molecular, Nuclear, Particle and Plasma Physics	✓	✓	✓	✓
0203	Classical Physics	✓	✓	✓	✓
0204	Condensed Matter Physics	✓	✓	✓	✓
0205	Optical Physics	✓	✓	✓	✓
0206	Quantum Physics	✓	✓	✓	✓
0299	Other Physical Sciences	✓	✓	✓	✓
3	Chemical Sciences				
0301	Analytical Chemistry	✓	✓	✓	✓
0302	Inorganic Chemistry	✓	✓	✓	✓
0303	Macromolecular and Materials Chemistry	✓	✓	✓	✓
0304	Medicinal and Biomolecular Chemistry	✓	✓	✓	✓
0305	Organic Chemistry	✓	✓	✓	✓
0306	Physical Chemistry (incl. Structural)	✓	✓	✓	✓
0307	Theoretical and Computational Chemistry	✓	✓	✓	✓
0399	Other Chemical Sciences	✓	✓	✓	✓
4	Earth Sciences				
0401	Atmospheric Sciences	✓	✓	✓	✓
0402	Geochemistry	✓	✓	✓	✓
0403	Geology	✓	✓	✓	✓
0404	Geophysics	✓	✓	✓	✓
0405	Oceanography	✓	✓	✓	✓
0406	Physical Geography and Environmental Geoscience	✓	✓	✓	✓
0499	Other Earth Sciences	✓	✓	✓	✓

Cluster Two: Humanities and Creative Arts

		Peer Review					% of outputs tagged for peer review
		Journal articles	Books	Book Chapters	Conference Publications	Creative works	
12	Built Environment and Design						
1201	Architecture	✓	✓	✓	✓	✓	20%
1203	Design Practice and Management	✓	✓	✓	✓	✓	20%
1205	Urban and Regional Planning	✓	✓	✓	✓	✓	20%
1299	Other Built Environment and Design	✓	✓	✓	✓	✓	20%
18	Law and Legal Studies						
1801	Law	✓	✓	✓	*	✓	20%
1802	Maori Law	✓	✓	✓	*	✓	20%
1899	Other Law and Legal Studies	✓	✓	✓	*	✓	20%
19	Studies in Creative Arts and Writing						
1901	Art Theory and Criticism	✓	✓	✓	*	✓	20%
1902	Film, Television and Digital Media	✓	✓	✓	*	✓	20%
1903	Journalism and Professional Writing	✓	✓	✓	*	✓	20%
1904	Performing Arts and Creative Writing	✓	✓	✓	*	✓	20%
1905	Visual Arts and Crafts	✓	✓	✓	*	✓	20%
1999	Other Studies in Creative Arts and Writing	✓	✓	✓	*	✓	20%
20	Language, Communication and Culture						
2001	Communication and Media Studies	✓	✓	✓	*	✓	20%
2002	Cultural Studies	✓	✓	✓	*	✓	20%
2003	Language Studies	✓	✓	✓	*	✓	20%
2004	Linguistics	✓	✓	✓	*	✓	20%
2005	Literary Studies	✓	✓	✓	*	✓	20%
2099	Other Language, Literature and Culture	✓	✓	✓	*	✓	20%
21	History and Archaeology						
2101	Archaeology	✓	✓	✓	*	✓	20%
2102	Curatorial and Related Studies	✓	✓	✓	*	✓	20%
2103	Historical Studies	✓	✓	✓	*	✓	20%
2199	Other History and Archaeology	✓	✓	✓	*	✓	20%
22	Philosophy and Religious Studies						
2201	Applied Ethics	✓	✓	✓	*	✓	20%
2202	History and Philosophy of Specific Fields	✓	✓	✓	*	✓	20%
2203	Philosophy	✓	✓	✓	*	✓	20%
2204	Religion and Religious Studies	✓	✓	✓	*	✓	20%
2299	Other Philosophy and Religious Studies	✓	✓	✓	*	✓	20%

Cluster Two: Humanities and Creative Arts

		Esteem						Applied		
		Editorial Role A and A* journals	Editor Prestigious Works of Reference	Membership of learned academy	Category 1 research fellowships	Australia Council Grants	Australia Council Fellowships	Patents	Registered designs	Research Commercialisation income
12	Built Environment and Design									
1201	Architecture	✓	✓	✓	✓	*	*	✓	✓	✓
1203	Design Practice and Management	✓	✓	✓	✓	*	*	✓	✓	✓
1205	Urban and Regional Planning	✓	✓	✓	✓	*	*	✓	✓	✓
1299	Other Built Environment and Design	✓	✓	✓	✓	*	*	✓	✓	✓
18	Law and Legal Studies									
1801	Law	✓	✓	✓	✓	*	*	*	*	✓
1802	Maori Law	✓	✓	✓	✓	*	*	*	*	✓
1899	Other Law and Legal Studies	✓	✓	✓	✓	*	*	*	*	✓
19	Studies in Creative Arts and Writing									
1901	Art Theory and Criticism	✓	✓	✓	✓	*	*	✓	✓	✓
1902	Film, Television and Digital Media	✓	✓	✓	✓	*	*	✓	✓	✓
1903	Journalism and Professional Writing	✓	✓	✓	✓	*	*	✓	✓	✓
1904	Performing Arts and Creative Writing	✓	✓	✓	✓	✓	✓	✓	✓	✓
1905	Visual Arts and Crafts	✓	✓	✓	✓	✓	✓	✓	✓	✓
20	Language, Communication and Culture									
2001	Communication and Media Studies	✓	✓	✓	✓	*	*	*	*	✓
2002	Cultural Studies	✓	✓	✓	✓	*	*	*	*	✓
2003	Language Studies	✓	✓	✓	✓	*	*	*	*	✓
2004	Linguistics	✓	✓	✓	✓	*	*	*	*	✓
2005	Literary Studies	✓	✓	✓	✓	*	*	*	*	✓
2099	Other Language, Literature and Culture	✓	✓	✓	✓	*	*	*	*	✓
21	History and Archaeology									
2101	Archaeology	✓	✓	✓	✓	*	*	*	*	✓
2102	Curatorial and Related Studies	✓	✓	✓	✓	*	*	✓	✓	✓
2103	Historical Studies	✓	✓	✓	✓	*	*	*	*	✓
2199	Other History and Archaeology	✓	✓	✓	✓	*	*	*	*	✓
22	Philosophy and Religious Studies									
2201	Applied Ethics	✓	✓	✓	✓	*	*	*	*	✓
2202	History and Philosophy of Specific Fields	✓	✓	✓	✓	*	*	*	*	✓
2203	Philosophy	✓	✓	✓	✓	*	*	*	*	✓
2204	Religion and Religious Studies	✓	✓	✓	✓	*	*	*	*	✓
2299	Other Philosophy and Religious Studies	✓	✓	✓	✓	*	*	*	*	✓

Cluster Two: Humanities and Creative Arts

		Citation Analysis				HERDC Research Income			
		Relative Citation Impact	Centile analysis	Dist. of papers against relative citation rate bands	Cites in legal judgements	Category 1	Category 2	Category 3	Category 4
12	Built Environment and Design								
1201	Architecture	*	*	*	*	✓	✓	✓	✓
1203	Design Practice and Management	*	*	*	*	✓	✓	✓	✓
1205	Urban and Regional Planning	*	*	*	*	✓	✓	✓	✓
1299	Other Built Environment and Design	*	*	*	*	✓	✓	✓	✓
18	Law and Legal Studies								
1801	Law	*	*	*	✓	✓	✓	✓	✓
1802	Maori Law	*	*	*	✓	✓	✓	✓	✓
1899	Other Law and Legal Studies	*	*	*	✓	✓	✓	✓	✓
19	Studies in Creative Arts and Writing								
1901	Art Theory and Criticism	*	*	*	*	✓	✓	✓	✓
1902	Film, Television and Digital Media	*	*	*	*	✓	✓	✓	✓
1903	Journalism and Professional Writing	*	*	*	*	✓	✓	✓	✓
1904	Performing Arts and Creative Writing	*	*	*	*	✓	✓	✓	✓
1905	Visual Arts and Crafts	*	*	*	*	✓	✓	✓	✓
1999	Other Studies in Creative Arts and Writing	*	*	*	*	✓	✓	✓	✓
20	Language, Communication and Culture								
2001	Communication and Media Studies	*	*	*	*	✓	✓	✓	✓
2002	Cultural Studies	*	*	*	*	✓	✓	✓	✓
2003	Language Studies	*	*	*	*	✓	✓	✓	✓
2004	Linguistics	*	*	*	*	✓	✓	✓	✓
2005	Literary Studies	*	*	*	*	✓	✓	✓	✓
2099	Other Language, Literature and Culture	*	*	*	*	✓	✓	✓	✓
21	History and Archaeology								
2101	Archaeology	*	*	*	*	✓	✓	✓	✓
2102	Curatorial and Related Studies	*	*	*	*	✓	✓	✓	✓
2103	Historical Studies	*	*	*	*	✓	✓	✓	✓
2199	Other History and Archaeology	*	*	*	*	✓	✓	✓	✓
22	Philosophy and Religious Studies								
2201	Applied Ethics	*	*	*	*	✓	✓	✓	✓
2202	History and Philosophy of Specific Fields	*	*	*	*	✓	✓	✓	✓
2203	Philosophy	*	*	*	*	✓	✓	✓	✓
2204	Religion and Religious Studies	*	*	*	*	✓	✓	✓	✓
2299	Other Philosophy and Religious Studies	*	*	*	*	✓	✓	✓	✓

Cluster Two: Humanities and Creative Arts

		Volume and Activity Analysis			Ranked outlets	
		Eligible researchers profiled by level	Research outputs by type	Proportion of total research outputs activity	Journals	Conference publications
12	Built Environment and Design					
1201	Architecture	✓	✓	✓	✓	✓
1203	Design Practice and Management	✓	✓	✓	✓	✓
1205	Urban and Regional Planning	✓	✓	✓	✓	✓
1299	Other Built Environment and Design	✓	✓	✓	✓	✓
18	Law and Legal Studies					
1801	Law	✓	✓	✓	✓	✘
1802	Maori Law	✓	✓	✓	✓	✘
1899	Other Law and Legal Studies	✓	✓	✓	✓	✘
19	Studies in Creative Arts and Writing					
1901	Art Theory and Criticism	✓	✓	✓	✓	✘
1902	Film, Television and Digital Media	✓	✓	✓	✓	✘
1903	Journalism and Professional Writing	✓	✓	✓	✓	✘
1904	Performing Arts and Creative Writing	✓	✓	✓	✓	✘
1905	Visual Arts and Crafts	✓	✓	✓	✓	✘
1999	Other Studies in Creative Arts and Writing	✓	✓	✓	✓	✘
20	Language, Communication and Culture					
2001	Communication and Media Studies	✓	✓	✓	✓	✘
2002	Cultural Studies	✓	✓	✓	✓	✘
2003	Language Studies	✓	✓	✓	✓	✘
2004	Linguistics	✓	✓	✓	✓	✘
2005	Literary Studies	✓	✓	✓	✓	✘
2099	Other Language, Literature and Culture	✓	✓	✓	✓	✘
21	History and Archaeology					
2101	Archaeology	✓	✓	✓	✓	✘
2102	Curatorial and Related Studies	✓	✓	✓	✓	✘
2103	Historical Studies	✓	✓	✓	✓	✘
2199	Other History and Archaeology	✓	✓	✓	✓	✘
22	Philosophy and Religious Studies					
2201	Applied Ethics	✓	✓	✓	✓	✘
2202	History and Philosophy of Specific Fields	✓	✓	✓	✓	✘
2203	Philosophy	✓	✓	✓	✓	✘
2204	Religion and Religious Studies	✓	✓	✓	✓	✘
2299	Other Philosophy and Religious Studies	✓	✓	✓	✓	✘

Cluster Three: Engineering and Environmental Sciences

		Esteem				Applied			
		Editorial role A and A* journals	Technical or General Chair ranked conference	Category 1 research fellowship	Membership of learned academy	Patents	Research Commercialisation income	Plant Breeders' Rights	National and international Standards
05	Environmental Sciences								
0501	Ecological Applications	✓	*	✓	✓	✓	✓	✓	✓
0502	Environmental Science and Management	✓	*	✓	✓	✓	✓	✓	✓
0503	Soil Sciences	✓	*	✓	✓	✓	✓	✓	✓
0599	Other Environmental Sciences	✓	*	✓	✓	✓	✓	✓	✓
09	Engineering								
0901	Aerospace Engineering	✓	✓	✓	✓	✓	✓	*	✓
0902	Automotive Engineering	✓	*	✓	✓	✓	✓	*	✓
0903	Biomedical Engineering	✓	*	✓	✓	✓	✓	*	✓
0904	Chemical Engineering	✓	*	✓	✓	✓	✓	*	✓
0905	Civil Engineering	✓	*	✓	✓	✓	✓	*	✓
0906	Electrical and Electronic Engineering	✓	✓	✓	✓	✓	✓	*	✓
0907	Environmental Engineering	✓	*	✓	✓	✓	✓	*	✓
0908	Food Sciences	✓	*	✓	✓	✓	✓	*	✓
0909	Geomatic Engineering	✓	*	✓	✓	✓	✓	*	✓
0910	Manufacturing Engineering	✓	✓	✓	✓	✓	✓	*	✓
0911	Maritime Engineering	✓	✓	✓	✓	✓	✓	*	✓
0912	Materials Engineering	✓	*	✓	✓	✓	✓	*	✓
0913	Mechanical Engineering	✓	✓	✓	✓	✓	✓	*	✓
0914	Resources Engineering and Extractive Metallurgy	✓	*	✓	✓	✓	✓	*	✓
0915	Interdisciplinary Engineering	✓	✓	✓	✓	✓	✓	*	✓
0999	Other Engineering	✓	*	✓	✓	✓	✓	*	✓
12	Built Environment and Design								
1202	Building	✓	✓	✓	✓	✓	✓	*	✓
1204	Engineering Design	✓	✓	✓	✓	✓	✓	*	✓

Cluster Three: Engineering and Environmental Sciences

		HERDC Research Income			
		Category 1	Category 2	Category 3	Category 4
05	Environmental Sciences				
0501	Ecological Applications	✓	✓	✓	✓
0502	Environmental Science and Management	✓	✓	✓	✓
0503	Soil Sciences	✓	✓	✓	✓
0599	Other Environmental Sciences	✓	✓	✓	✓
09	Engineering				
0901	Aerospace Engineering	✓	✓	✓	✓
0902	Automotive Engineering	✓	✓	✓	✓
0903	Biomedical Engineering	✓	✓	✓	✓
0904	Chemical Engineering	✓	✓	✓	✓
0905	Civil Engineering	✓	✓	✓	✓
0906	Electrical and Electronic Engineering	✓	✓	✓	✓
0907	Environmental Engineering	✓	✓	✓	✓
0908	Food Sciences	✓	✓	✓	✓
0909	Geomatic Engineering	✓	✓	✓	✓
0910	Manufacturing Engineering	✓	✓	✓	✓
0911	Maritime Engineering	✓	✓	✓	✓
0912	Materials Engineering	✓	✓	✓	✓
0913	Mechanical Engineering	✓	✓	✓	✓
0914	Resources Engineering and Extractive Metallurgy	✓	✓	✓	✓
0915	Interdisciplinary Engineering	✓	✓	✓	✓
0999	Other Engineering	✓	✓	✓	✓
12	Built Environment and Design				
1202	Building	✓	✓	✓	✓
1204	Engineering Design	✓	✓	✓	✓

Cluster Three: Engineering and Environmental Sciences

		Volume and Activity Analysis			Ranked outlets		Peer Review
		Eligible researchers by level	Research outputs by type	Proportion of total research outputs activity	Journals	Conferences	Journals
05	Environmental Sciences						
0501	Ecological Applications	✓	✓	✓	✓	✘	✘
0502	Environmental Science and Management	✓	✓	✓	✓	✘	✘
0503	Soil Sciences	✓	✓	✓	✓	✘	✘
0599	Other Environmental Sciences	✓	✓	✓	✓	✘	✘
09	Engineering						
0901	Aerospace Engineering	✓	✓	✓	✓	✓	✓
0902	Automotive Engineering	✓	✓	✓	✓	✘	✘
0903	Biomedical Engineering	✓	✓	✓	✓	✘	✘
0904	Chemical Engineering	✓	✓	✓	✓	✘	✘
0905	Civil Engineering	✓	✓	✓	✓	✘	✘
0906	Electrical and Electronic Engineering	✓	✓	✓	✓	✓	✓
0907	Environmental Engineering	✓	✓	✓	✓	✘	✘
0908	Food Sciences	✓	✓	✓	✓	✘	✘
0909	Geomatic Engineering	✓	✓	✓	✓	✘	✘
0910	Manufacturing Engineering	✓	✓	✓	✓	✓	✓
0911	Maritime Engineering	✓	✓	✓	✓	✓	✓
0912	Materials Engineering	✓	✓	✓	✓	✘	✘
0913	Mechanical Engineering	✓	✓	✓	✓	✓	✓
0914	Resources Engineering and Extractive Metallurgy	✓	✓	✓	✓	✘	✘
0915	Interdisciplinary Engineering	✓	✓	✓	✓	✓	✓
0999	Other Engineering	✓	✓	✓	✓	✘	✘
12	Built Environment and Design						
1202	Building	✓	✓	✓	✓	✓	✓
1204	Engineering Design	✓	✓	✓	✓	✓	✓

Cluster Four: Social, Behavioural and Economic Sciences

		Peer Review					
		Journal articles	Books	Book Chapters	Conference Publications	Non-print research output	% of outputs tagged for peer review
13	Education						
1301	Education Systems	*	✓	✓	✓	✓	20
1302	Curriculum and Pedagogy	*	✓	✓	✓	✓	20
1303	Specialist Studies in Education	*	✓	✓	✓	✓	20
1399	Other Education	*	✓	✓	✓	✓	20
14	Economics						
1401	Economic Theory	*	✓	✓	*	*	20
1402	Applied Economics	*	✓	✓	*	*	20
1403	Econometrics	*	✓	✓	*	*	20
1499	Other Economics	*	✓	✓	*	*	20
15	Commerce, Management, Tourism and Services						
1501	Accounting, Auditing and Accountability	*	*	*	*	✓	20
1502	Banking, Finance and Investment	*	*	*	*	✓	20
1503	Business and Management	*	✓	✓	*	✓	20
1504	Commercial Services	*	✓	✓	*	✓	20
1505	Marketing	*	✓	✓	*	✓	20
1506	Tourism	*	✓	✓	✓	✓	20
1507	Transportation and Freight Services	*	✓	✓	✓	✓	20
1599	Other Commerce, Management, Tourism and Services	*	✓	✓	*	✓	20
16	Studies in Human Society						
1601	Anthropology	✓	✓	✓	*	✓	30
1602	Criminology	✓	✓	✓	*	*	20
1603	Demography	✓	✓	✓	*	*	20
1604	Human Geography	✓	✓	✓	*	*	20
1605	Policy and Administration	✓	✓	✓	*	*	30
1606	Political Science	✓	✓	✓	*	*	30
1607	Social Work	✓	✓	✓	✓	✓	30
1608	Sociology	✓	✓	✓	*	*	30
17	Psychology and Cognitive Sciences						
1701	Psychology	*	✓	✓	*	*	20
1702	Cognitive Science	*	✓	✓	✓	*	20
1799	Other Psychology and Cognitive Science	*	✓	✓	*	*	20

Cluster Four: Social, Behavioural and Economic Sciences

		Esteem				Applied
		Editorial role A* and A journals	Editor prestigious work of reference	Category 1 research fellowships	Membership of learned academy	Research Commercialisation income
13	Education					
1301	Education Systems	✓	✓	✓	✓	✓
1302	Curriculum and Pedagogy	✓	✓	✓	✓	✓
1303	Specialist Studies in Education	✓	✓	✓	✓	✓
1399	Other Education	✓	✓	✓	✓	✓
14	Economics					
1401	Economic Theory	✓	✓	✓	✓	✓
1402	Applied Economics	✓	✓	✓	✓	✓
1403	Econometrics	✓	✓	✓	✓	✓
1499	Other Economics	✓	✓	✓	✓	✓
15	Commerce, Management, Tourism and Services					
1501	Accounting, Auditing and Accountability	✓	*	✓	✓	✓
1502	Banking, Finance and Investment	✓	*	✓	✓	✓
1503	Business and Management	✓	✓	✓	✓	✓
1504	Commercial Services	✓	*	✓	✓	✓
1505	Marketing	✓	✓	✓	✓	✓
1506	Tourism	✓	✓	✓	✓	✓
1507	Transportation and Freight Services	✓	✓	✓	✓	✓
1599	Other Commerce, Management, Tourism and Services	✓	✓	✓	✓	✓
16	Studies in Human Society					
1601	Anthropology	✓	✓	✓	✓	*
1602	Criminology	✓	✓	✓	✓	*
1603	Demography	✓	✓	✓	✓	*
1604	Human Geography	✓	✓	✓	✓	✓
1605	Policy and Administration	✓	✓	✓	✓	✓
1606	Political Science	✓	✓	✓	✓	✓
1607	Social Work	✓	✓	✓	✓	✓
1608	Sociology	✓	✓	✓	✓	✓
17	Psychology and Cognitive Sciences					
1701	Psychology	✓	✓	✓	✓	✓
1702	Cognitive Science	✓	✓	✓	✓	✓
1799	Other Psychology and Cognitive Science	✓	✓	✓	✓	✓

Cluster Four: Social, Behavioural and Economic Sciences

		Volume and Activity Analysis			Ranked outlets	
		Eligible researchers profiled by level	Research outputs by type	Proportion of total research outputs activity	Journals	Conferences
13	Education					
1301	Education Systems	✓	✓	✓	✓	*
1302	Curriculum and Pedagogy	✓	✓	✓	✓	*
1303	Specialist Studies in Education	✓	✓	✓	✓	*
1399	Other Education	✓	✓	✓	✓	*
14	Economics					
1401	Economic Theory	✓	✓	✓	✓	*
1402	Applied Economics	✓	✓	✓	✓	*
1403	Econometrics	✓	✓	✓	✓	*
1499	Other Economics	✓	✓	✓	✓	*
15	Commerce, Management, Tourism and Services					
1501	Accounting, Auditing and Accountability	✓	✓	✓	✓	*
1502	Banking, Finance and Investment	✓	✓	✓	✓	*
1503	Business and Management	✓	✓	✓	✓	*
1504	Commercial Services	✓	✓	✓	✓	*
1505	Marketing	✓	✓	✓	✓	*
1506	Tourism	✓	✓	✓	✓	*
1507	Transportation and Freight Services	✓	✓	✓	✓	*
1599	Other Commerce, Management, Tourism and Services	✓	✓	✓	✓	*
16	Studies in Human Society					
1601	Anthropology	✓	✓	✓	✓	*
1602	Criminology	✓	✓	✓	✓	*
1603	Demography	✓	✓	✓	✓	*
1604	Human Geography	✓	✓	✓	✓	*
1605	Policy and Administration	✓	✓	✓	✓	*
1606	Political Science	✓	✓	✓	✓	*
1607	Social Work	✓	✓	✓	✓	✓
1608	Sociology	✓	✓	✓	✓	*
17	Psychology and Cognitive Sciences					
1701	Psychology	✓	✓	✓	✓	*
1702	Cognitive Science	✓	✓	✓	✓	*
1799	Other Psychology and Cognitive Science	✓	✓	✓	✓	*

Cluster Four: Social, Behavioural and Economic Sciences

		Citation Analysis			HERDC Research Income			
		Relative Citation Impact	Centile analysis	Dist. of papers against relative citation rate bands	Category 1	Category 2	Category 3	Category 4
13	Education							
1301	Education Systems	✓	✓	✓	✓	✓	✓	✓
1302	Curriculum and Pedagogy	✓	✓	✓	✓	✓	✓	✓
1303	Specialist Studies in Education	✓	✓	✓	✓	✓	✓	✓
1399	Other Education	✓	✓	✓	✓	✓	✓	✓
14	Economics							
1401	Economic Theory	✓	✓	✓	✓	✓	✓	✓
1402	Applied Economics	✓	✓	✓	✓	✓	✓	✓
1403	Econometrics	✓	✓	✓	✓	✓	✓	✓
1499	Other Economics	✓	✓	✓	✓	✓	✓	✓
15	Commerce, Management, Tourism and Services							
1501	Accounting, Auditing and Accountability	✓	✓	✓	✓	✓	✓	✓
1502	Banking, Finance and Investment	✓	✓	✓	✓	✓	✓	✓
1503	Business and Management	✓	✓	✓	✓	✓	✓	✓
1504	Commercial Services	✓	✓	✓	✓	✓	✓	✓
1505	Marketing	✓	✓	✓	✓	✓	✓	✓
1506	Tourism	✓	✓	✓	✓	✓	✓	✓
1507	Transportation and Freight Services	✓	✓	✓	✓	✓	✓	✓
1599	Other Commerce, Management, Tourism and Services	✓	✓	✓	✓	✓	✓	✓
16	Studies in Human Society							
1601	Anthropology	✓	✓	✓	✓	✓	✓	✓
1602	Criminology	✓	✓	✓	✓	✓	✓	✓
1603	Demography	✓	✓	✓	✓	✓	✓	✓
1604	Human Geography	✓	✓	✓	✓	✓	✓	✓
1605	Policy and Administration	✓	✓	✓	✓	✓	✓	✓
1606	Political Science	✓	✓	✓	✓	✓	✓	✓
1607	Social Work	✓	✓	✓	✓	✓	✓	✓
1608	Sociology	✓	✓	✓	✓	✓	✓	✓
17	Psychology and Cognitive Sciences							
1701	Psychology	✓	✓	✓	✓	✓	✓	✓
1702	Cognitive Science	✓	✓	✓	✓	✓	✓	✓
1799	Other Psychology and Cognitive Science	✓	✓	✓	✓	✓	✓	✓

Cluster Five: Mathematical, Information and Computing Sciences

		Peer Review						
		Contribution to Internationally endorsed Standards	Journal articles	Books	Book Chapters	Conference Publications	non-print research outputs	% of outputs tagged for peer review
01	Mathematical Sciences							
0101	Pure Mathematics	*	*	*	*	*	*	*
0102	Applied Mathematics	*	*	*	*	*	*	*
0103	Numerical and Computational Mathematics	*	*	*	*	*	*	*
0104	Statistics	*	*	*	*	*	*	*
0105	Mathematical Physics	*	*	*	*	*	*	*
0199	Other Mathematical Sciences	*	*	*	*	*	*	*
08	Information and Computing Sciences							
0801	Artificial Intelligence and Image Processing	✓	*	*	*	*	✓	*
0802	Computation Theory and Mathematics	✓	*	*	*	*	✓	*
0803	Computer Software	✓	*	*	*	*	✓	*
0804	Data Format	✓	*	*	*	*	✓	*
0805	Distributed Computing	✓	*	*	*	*	✓	*
0806	Information Systems	✓	*	*	*	*	✓	*
0807	Library and Information Studies	✓	*	*	*	*	✓	*
0899	Other Information and Computing Sciences	✓	*	*	*	*	✓	*
10	Technology							
1005	Communications Technologies	✓	*	*	*	*	✓	*
1006	Computer Hardware	✓	*	*	*	*	✓	*
1007	Nanotechnology	✓	*	*	*	*	*	*
1099	Other Technology	✓	*	*	*	*	✓	*

Cluster Five: Mathematical, Information and Computing Sciences

		Esteem				Applied			
		Editorial role A* and A journals	Technical/ General Chair of an A Ranked conference	Category 1 research fellowships	Membership of learned academy	Patents	Registered designs	Research Commercialisation income	National and International Standards
01	Mathematical Sciences								
0101	Pure Mathematics	✓	✖	✓	✓	✓	✖	✓	✖
0102	Applied Mathematics	✓	✖	✓	✓	✓	✖	✓	✖
0103	Numerical and Computational Mathematics	✓	✖	✓	✓	✓	✖	✓	✖
0104	Statistics	✓	✖	✓	✓	✓	✖	✓	✖
0105	Mathematical Physics	✓	✖	✓	✓	✓	✖	✓	✖
0199	Other Mathematical Sciences	✓	✖	✓	✓	✓	✖	✓	✖
08	Information and Computing Sciences								
0801	Artificial Intelligence and Image Processing	✓	✓	✓	✓	✓	✓	✓	✓
0802	Computation Theory and Mathematics	✓	✓	✓	✓	✓	✓	✓	✓
0803	Computer Software	✓	✓	✓	✓	✓	✓	✓	✓
0804	Data Format	✓	✓	✓	✓	✓	✓	✓	✓
0805	Distributed Computing	✓	✓	✓	✓	✓	✓	✓	✓
0806	Information Systems	✓	✓	✓	✓	✓	✓	✓	✓
0807	Library and Information Studies	✓	✓	✓	✓	✓	✓	✓	✓
0899	Other Information and Computing Sciences	✓	✓	✓	✓	✓	✓	✓	✓
10	Technology								
1005	Communications Technologies	✓	✓	✓	✓	✓	✓	✓	✓
1006	Computer Hardware	✓	✓	✓	✓	✓	✓	✓	✓
1007	Nanotechnology	✓	✖	✓	✓	✓	✓	✓	✓
1099	Other Technology	✓	✓	✓	✓	✓	✓	✓	✓

Cluster Five: Mathematical, Information and Computing Sciences

		Citation Analysis			HERDC Research Income			
		Relative Citation Impact	Centile analysis	Dist. of papers against relative citation rate bands	Category 1	Category 2	Category 3	Category 4
01	Mathematical Sciences							
0101	Pure Mathematics	✓	✓	✓	✓	✓	✓	✓
0102	Applied Mathematics	✓	✓	✓	✓	✓	✓	✓
0103	Numerical and Computational Mathematics	✓	✓	✓	✓	✓	✓	✓
0104	Statistics	✓	✓	✓	✓	✓	✓	✓
0105	Mathematical Physics	✓	✓	✓	✓	✓	✓	✓
0199	Other Mathematical Sciences	✓	✓	✓	✓	✓	✓	✓
08	Information and Computing Sciences							
0801	Artificial Intelligence and Image Processing	✓	✓	✓	✓	✓	✓	✓
0802	Computation Theory and Mathematics	✓	✓	✓	✓	✓	✓	✓
0803	Computer Software	✓	✓	✓	✓	✓	✓	✓
0804	Data Format	✓	✓	✓	✓	✓	✓	✓
0805	Distributed Computing	✓	✓	✓	✓	✓	✓	✓
0806	Information Systems	✓	✓	✓	✓	✓	✓	✓
0807	Library and Information Studies	✓	✓	✓	✓	✓	✓	✓
0899	Other Information and Computing Sciences	✓	✓	✓	✓	✓	✓	✓
10	Technology							
1005	Communications Technologies	✓	✓	✓	✓	✓	✓	✓
1006	Computer Hardware	✓	✓	✓	✓	✓	✓	✓
1007	Nanotechnology	✓	✓	✓	✓	✓	✓	✓
1099	Other Technology	✓	✓	✓	✓	✓	✓	✓

Cluster Five: Mathematical, Information and Computing Sciences

		Volume and Activity Analysis			Ranked Outlets	
		Eligible researchers profiled by level	Research outputs by type	Proportion of total research outputs activity	Journals	Conferences
01	Mathematical Sciences					
0101	Pure Mathematics	✓	✓	✓	✓	∞
0102	Applied Mathematics	✓	✓	✓	✓	∞
0103	Numerical and Computational Mathematics	✓	✓	✓	✓	∞
0104	Statistics	✓	✓	✓	✓	∞
0105	Mathematical Physics	✓	✓	✓	✓	∞
0199	Other Mathematical Sciences	✓	✓	✓	✓	∞
08	Information and Computing Sciences					
0801	Artificial Intelligence and Image Processing	✓	✓	✓	✓	✓
0802	Computation Theory and Mathematics	✓	✓	✓	✓	✓
0803	Computer Software	✓	✓	✓	✓	✓
0804	Data Format	✓	✓	✓	✓	✓
0805	Distributed Computing	✓	✓	✓	✓	✓
0806	Information Systems	✓	✓	✓	✓	✓
0807	Library and Information Studies	✓	✓	✓	✓	✓
0899	Other Information and Computing Sciences	✓	✓	✓	✓	✓
10	Technology					
1005	Communications Technologies	✓	✓	✓	✓	✓
1006	Computer Hardware	✓	✓	✓	✓	✓
1007	Nanotechnology	✓	✓	✓	✓	∞
1099	Other Technology	✓	✓	✓	✓	✓

Cluster Six: Biological and Biotechnological Sciences

		Esteem			Applied		
		Editorial role A* and A journals	Category 1 research fellowships	Membership of learned academy	Patents	Plant Breeders' Rights	Research Commercialisation income
06	Biological Sciences						
0601	Biochemistry and Cell Biology	✓	✓	✓	✓	*	✓
0602	Ecology	✓	✓	✓	✓	*	✓
0603	Evolutionary Biology	✓	✓	✓	✓	*	✓
0604	Genetics	✓	✓	✓	✓	✓	✓
0605	Microbiology	✓	✓	✓	✓	*	✓
0606	Physiology	✓	✓	✓	✓	*	✓
0607	Plant Biology	✓	✓	✓	✓	✓	✓
0608	Zoology	✓	✓	✓	✓	*	✓
0699	Other Biological Sciences	✓	✓	✓	✓	*	✓
07	Agriculture and Veterinary Sciences						
0701	Agriculture, Land and Farm Management	✓	✓	✓	✓	*	✓
0702	Animal Production	✓	✓	✓	✓	*	✓
0703	Crop and Pasture Production	✓	✓	✓	✓	✓	✓
0704	Fisheries Sciences	✓	✓	✓	✓	*	✓
0705	Forestry Sciences	✓	✓	✓	✓	✓	✓
0706	Horticultural Production	✓	✓	✓	✓	✓	✓
0707	Veterinary Sciences	✓	✓	✓	✓	*	✓
0799	Other Agricultural and Veterinary Sciences	✓	✓	✓	✓	*	✓
10	Technology						
1001	Agricultural Biotechnology	✓	✓	✓	✓	✓	✓
1002	Environmental Biotechnology	✓	✓	✓	✓	✓	✓
1003	Industrial Biotechnology	✓	✓	✓	✓	✓	✓
1004	Medical Biotechnology	✓	✓	✓	✓	*	✓

Cluster Six: Biological and Biotechnological Sciences

		Citation Analysis			HERDC Research Income			
		Relative Citation Impact	Centile analysis	Distribution of papers against relative citation rate bands	Category 1	Category 2	Category 3	Category 4
06	Biological Sciences							
0601	Biochemistry and Cell Biology	✓	✓	✓	✓	✓	✓	✓
0602	Ecology	✓	✓	✓	✓	✓	✓	✓
0603	Evolutionary Biology	✓	✓	✓	✓	✓	✓	✓
0604	Genetics	✓	✓	✓	✓	✓	✓	✓
0605	Microbiology	✓	✓	✓	✓	✓	✓	✓
0606	Physiology	✓	✓	✓	✓	✓	✓	✓
0607	Plant Biology	✓	✓	✓	✓	✓	✓	✓
0608	Zoology	✓	✓	✓	✓	✓	✓	✓
0699	Other Biological Sciences	✓	✓	✓	✓	✓	✓	✓
07	Agriculture and Veterinary Sciences							
0701	Agriculture, Land and Farm Management	✓	✓	✓	✓	✓	✓	✓
0702	Animal Production	✓	✓	✓	✓	✓	✓	✓
0703	Crop and Pasture Production	✓	✓	✓	✓	✓	✓	✓
0704	Fisheries Sciences	✓	✓	✓	✓	✓	✓	✓
0705	Forestry Sciences	✓	✓	✓	✓	✓	✓	✓
0706	Horticultural Production	✓	✓	✓	✓	✓	✓	✓
0707	Veterinary Sciences	✓	✓	✓	✓	✓	✓	✓
0799	Other Agricultural and Veterinary Sciences	✓	✓	✓	✓	✓	✓	✓
10	Technology							
1001	Agricultural Biotechnology	✓	✓	✓	✓	✓	✓	✓
1002	Environmental Biotechnology	✓	✓	✓	✓	✓	✓	✓
1003	Industrial Biotechnology	✓	✓	✓	✓	✓	✓	✓
1004	Medical Biotechnology	✓	✓	✓	✓	✓	✓	✓

Cluster Six: Biological and Biotechnological Sciences

		Volume and Activity Analysis			Ranked outlets
		Eligible researchers profiled by level	Research outputs by type	Proportion of total research outputs activity	Journals
06	Biological Sciences				
0601	Biochemistry and Cell Biology	✓	✓	✓	✓
0602	Ecology	✓	✓	✓	✓
0603	Evolutionary Biology	✓	✓	✓	✓
0604	Genetics	✓	✓	✓	✓
0605	Microbiology	✓	✓	✓	✓
0606	Physiology	✓	✓	✓	✓
0607	Plant Biology	✓	✓	✓	✓
0608	Zoology	✓	✓	✓	✓
0699	Other Biological Sciences	✓	✓	✓	✓
07	Agriculture and Veterinary Sciences				
0701	Agriculture, Land and Farm Management	✓	✓	✓	✓
0702	Animal Production	✓	✓	✓	✓
0703	Crop and Pasture Production	✓	✓	✓	✓
0704	Fisheries Sciences	✓	✓	✓	✓
0705	Forestry Sciences	✓	✓	✓	✓
0706	Horticultural Production	✓	✓	✓	✓
0707	Veterinary Sciences	✓	✓	✓	✓
0799	Other Agricultural and Veterinary Sciences	✓	✓	✓	✓
10	Technology				
1001	Agricultural Biotechnology	✓	✓	✓	✓
1002	Environmental Biotechnology	✓	✓	✓	✓
1003	Industrial Biotechnology	✓	✓	✓	✓
1004	Medical Biotechnology	✓	✓	✓	✓

Cluster Seven: Biomedical and Clinical Health Sciences

		Esteem				Applied				
		Editorial role A* and A journals	Technical/ General Chair of an A Ranked Conference	Category 1 research fellowships	Membership of learned academy	Patents	Registered designs	Plant Breeders' Rights	Nationally endorsed Guidelines	Research Commercialisation income
10	Technology									
1004	Medical Biotechnology	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	Medical and Health Sciences									
1101	Medical Biochemistry and Metabolomics	✓	*	✓	✓	✓	✓	✓	✓	✓
1102	Cardiovascular Medicine and Haematology	✓	*	✓	✓	✓	✓	✓	✓	✓
1103	Clinical Sciences	✓	*	✓	✓	✓	✓	✓	✓	✓
1105	Dentistry	✓	*	✓	✓	✓	✓	✓	✓	✓
1107	Immunology	✓	*	✓	✓	✓	✓	✓	✓	✓
1108	Medical Microbiology	✓	*	✓	✓	✓	✓	✓	✓	✓
1109	Neurosciences	✓	*	✓	✓	✓	✓	✓	✓	✓
1112	Oncology and Carcinogenesis	✓	*	✓	✓	✓	✓	✓	✓	✓
1113	Ophthalmology and Optometry	✓	*	✓	✓	✓	✓	✓	✓	✓
1114	Paediatrics and Reproductive Medicine	✓	*	✓	✓	✓	✓	✓	✓	✓
1115	Pharmacology and Pharmaceutical Sciences	✓	*	✓	✓	✓	✓	✓	✓	✓
1116	Medical Physiology	✓	*	✓	✓	✓	✓	✓	✓	✓

Cluster Seven: Biomedical and Clinical Health Sciences

		Citation Analysis			HERDC Research Income			
		Relative Citation Impact	Centile analysis	Dist. of papers against relative citation rate bands	Category 1	Category 2	Category 3	Category 4
10	Technology							
1004	Medical Biotechnology	✓	✓	✓	✓	✓	✓	✓
11	Medical and Health Sciences							
1101	Medical Biochemistry and Metabolomics	✓	✓	✓	✓	✓	✓	✓
1102	Cardiovascular Medicine and Haematology	✓	✓	✓	✓	✓	✓	✓
1103	Clinical Sciences	✓	✓	✓	✓	✓	✓	✓
1105	Dentistry	✓	✓	✓	✓	✓	✓	✓
1107	Immunology	✓	✓	✓	✓	✓	✓	✓
1108	Medical Microbiology	✓	✓	✓	✓	✓	✓	✓
1109	Neurosciences	✓	✓	✓	✓	✓	✓	✓
1112	Oncology and Carcinogenesis	✓	✓	✓	✓	✓	✓	✓
1113	Ophthalmology and Optometry	✓	✓	✓	✓	✓	✓	✓
1114	Paediatrics and Reproductive Medicine	✓	✓	✓	✓	✓	✓	✓
1115	Pharmacology and Pharmaceutical Sciences	✓	✓	✓	✓	✓	✓	✓
1116	Medical Physiology	✓	✓	✓	✓	✓	✓	✓

Cluster Seven: Biomedical and Clinical Health Sciences

		Volume and Activity Analysis			Ranked outlets	
		Eligible researchers profiled by level	Research outputs by type	Proportion of total research outputs activity	Journals	Conferences
10	Technology	✓	✓	✓		
1004	Medical Biotechnology	✓	✓	✓	✓	✓
11	Medical and Health Sciences	✓	✓	✓		
1101	Medical Biochemistry and Metabolomics	✓	✓	✓	✓	sc
1102	Cardiovascular Medicine and Haematology	✓	✓	✓	✓	sc
1103	Clinical Sciences	✓	✓	✓	✓	sc
1105	Dentistry	✓	✓	✓	✓	sc
1107	Immunology	✓	✓	✓	✓	sc
1108	Medical Microbiology	✓	✓	✓	✓	sc
1109	Neurosciences	✓	✓	✓	✓	sc
1112	Oncology and Carcinogenesis	✓	✓	✓	✓	sc
1113	Ophthalmology and Optometry	✓	✓	✓	✓	sc
1114	Paediatrics and Reproductive Medicine	✓	✓	✓	✓	sc
1115	Pharmacology and Pharmaceutical Sciences	✓	✓	✓	✓	sc
1116	Medical Physiology	✓	✓	✓	✓	sc

Cluster Eight: Public and Allied Health

		Esteem				Applied	
		Editorial role A* and A journals	Category 1 research fellowships	Membership of learned academy	Membership of Statutory committees	Patents	Nationally endorsed Guidelines
11	Medical and Health Sciences						
1104	Complementary and Alternative Medicine	✓	✓	✓	✓	✓	✓
1106	Human Movement and Sports Science	✓	✓	✓	✓	✓	✓
1110	Nursing	✓	✓	✓	✓	✓	✓
1111	Nutrition and Dietetics	✓	✓	✓	✓	✓	✓
1117	Public Health and Health Services	✓	✓	✓	✓	✓	✓
1199	Other Medical and Health Sciences	✓	✓	✓	✓	✓	✓
1105	Dentistry	✓	✓	✓	✓	✓	✓

Cluster Eight: Public and Allied Health

		Citation Analysis			HERDC Research Income			
		Relative Citation Impact	Centile analysis	Dist. of papers against relative citation rate bands	Category 1	Category 2	Category 3	Category 4
11	Medical and Health Sciences							
1104	Complementary and Alternative Medicine	✓	✓	✓	✓	✓	✓	✓
1106	Human Movement and Sports Science	✓	✓	✓	✓	✓	✓	✓
1110	Nursing	✓	✓	✓	✓	✓	✓	✓
1111	Nutrition and Dietetics	✓	✓	✓	✓	✓	✓	✓
1117	Public Health and Health Services	✓	✓	✓	✓	✓	✓	✓
1199	Other Medical and Health Sciences	✓	✓	✓	✓	✓	✓	✓
1105	Dentistry	✓	✓	✓	✓	✓	✓	✓

Cluster Eight: Public and Allied Health

		Volume and Activity Analysis			Ranked outlets
		Eligible researchers profiled by level	Research outputs by type	Proportion of total research outputs activity	Journals
11	Medical and Health Sciences				
1104	Complementary and Alternative Medicine	✓	✓	✓	✓
1106	Human Movement and Sports Science	✓	✓	✓	✓
1110	Nursing	✓	✓	✓	✓
1111	Nutrition and Dietetics	✓	✓	✓	✓
1117	Public Health and Health Services	✓	✓	✓	✓
1199	Other Medical and Health Sciences	✓	✓	✓	✓
1105	Dentistry	✓	✓	✓	✓

Report of the ERA Esteem Indicators Group

Membership:

Professor Peter Ebeling, University of Melbourne

Professor Noel Frankham, University of Tasmania

Professor Stephen Garton, University of Sydney

Professor Andrew Parfitt, University of South Australia (Chair)

Professor Andrew Schultz, University of New South Wales

Professor Howard Wiseman, Griffith University

B.1 Background

When the Minister for Innovation, Industry, Science and Research, Senator Kim Carr, announced the Excellence in Research Australia (ERA) timeframe on 23 February 2009 he excluded the collection of esteem indicators for the 2009 ERA trial. This was in response to sector concerns about the scope of the esteem data to be collected which was seen as difficult to collect and verify. The Minister asked the Australian Research Council (ARC) to further investigate the collection of esteem indicators for inclusion in future ERA evaluations. In response the ARC convened the Esteem Indicators Group to undertake this work.

The concept of ‘esteem’ as a research quality indicator is explored in detail in the discussion paper in Appendix 1. In the development of the ERA initiative, esteem indicators have been included among the non-bibliometric indicators to provide:

- supporting evidence to complement the range of indicators for disciplines where the range of indicators are already sufficiently rich to form the primary basis for a decision on research quality, or
- evidence as part of a range of indicators for disciplines where bibliometric or other indicators are not available or reliable.

Esteem indicators have been proposed by the Indicator Development Group and in discipline cluster workshops convened by the ARC. The purpose of the Esteem Indicators Group is to examine the feasibility of the range of proposed esteem indicators within and across clusters and to recommend the value and viability of their use in the ERA initiative.

B.2 Esteem indicator framework

Taking into account the indicator attributes referred to in the *ERA Indicator Principles* document (19 December 2008), the Esteem Indicators Group considered each of the proposed indicators against the following attributes:

- The potential of the indicator to add value to the evaluation process based on its intrinsic capacity to act as a proxy for research quality and in relation to the suite of other indicators available to each Research Evaluation Committee.
- The viability of the indicator to be collected, including ease of collection, verifiability and the need for there to be no requirement for explanatory text.
- The credibility of the indicator in a research quality exercise, both within the discipline and by academic peers across disciplines.

Any esteem indicators, as with all ERA indicators, also need to be time-bounded and attributable within the relevant reference period.

The Esteem Indicators Group considered each indicator against the ERA indicator principles and the attributes described above. The Group subsequently recommended each indicator’s use in either all discipline clusters or in particular discipline clusters where the indicator was considered to be necessary to enhance the richness of the information available to the Research Evaluation Committee. In some cases where indicators were rejected, alternatives were proposed to maintain that richness of information.

For the purpose of consideration of the esteem indicators that follows:

- **believable** means that the indicator is likely to be accepted by the wider academic community as a proxy indicator for research quality;
- **accepted within discipline** means that within the discipline there will be agreement that the indicator is a recognised indicator of research quality;
- **proxy measure of peer assessed research quality** means that the measure can reliably be associated with the research quality of the discipline and reasonably dissociated with other characteristics such as professional standing or personal reputation;
- **manageable** means that from the perspective of Higher Education Institutions the data on the indicator can be readily collected and verified without the need for extensive text based explanations; and
- **adds value to dashboard** means that from the perspective of information already available to the Research Evaluation Committee from other bibliometric or non-bibliometric data, the indicator usefully adds additional information of relevance to the evaluation of research quality.

B.3 Consideration of individual esteem indicators

3.1. Editorial roles

The Group considered editorial roles in some detail for three esteem indicators proposed by the Indicators Development Group and discipline cluster workshops.

3.1.1. Editorial roles for A* or A ranked journals

A* and A ranked journals count for up to 20 per cent of all ranked journals (over 4000) that will be considered in the ERA initiative. A journal rankings list will be created for all disciplines. Both Australian and international journals will be included in this list. The number of editorial roles, although readily identifiable from the journal outlets, will be large.

In addition, the number of editorial roles, and specific responsibilities associated with these roles, differ between disciplines and even within disciplines, making it difficult to readily attribute the editorial role as a proxy measure of peer assessed research quality. Availability, administrative capability, reputation and professional standing will all impact on an individual being asked to undertake an editorial role.

In disciplines where journal rankings or bibliometric analysis is used as a primary means of research quality evaluation, it is also not clear that information on roles on editorial boards will add value beyond the evaluation of the research output of the discipline.

However, a more clearly defined suite of roles—senior editor, editor or associate editor (the exact terminology depending on the journal and discipline)—can be readily attributed to academic leadership, and would provide a useful esteem indicator.

It is recommended that, for disciplines where journal publications are recognised as a research output for ERA, a role as senior editor, editor or associate editor of A* or A ranked journals should be included as an esteem indicator for ERA.

3.1.2. Editor of prestigious works of reference

Prestigious works of reference have a narrowly defined meaning within the humanities and creative arts. The Esteem Indicators Group recommends that only a small number of widely-acknowledged high-quality works of reference be considered in this context. Principal examples include the Australian Dictionary of Biography, the Dictionary of National Biography, Oxford or Cambridge companions or encyclopaedias in various humanities and social sciences.

Editorship of such works of reference from within a well defined list of such works may be viewed as being equivalent to editorship of an A* or A journal in terms of prestige and should therefore be retained as an esteem factor.

Where they draw on research, contributions to prestigious works of reference, in contrast, should be considered to be research outputs and treated accordingly. A means of including such contributions in research outputs is therefore preferred over its inclusion as an esteem indicator.

A similar distinction might be considered for the discipline of law, where contributions to major volumes of legal opinion may form the basis of a research output while a role as an editor of such a legal volume might be comparable to the above as an esteem indicator. The Group notes that citations in legal judgments has been recommended for inclusion as a bibliometric indicator, and if this is accepted then the editor role identified above for the law discipline would be an acceptable esteem indicator.

It is recommended that, where contributions to prestigious works of reference are recognised as a valid research output, the editor role of the narrowly defined prestigious works of reference be included as an esteem indicator for ERA.

3.1.3. Technical or general chair of a ranked conference

In those disciplines (for example Information and Computing Science) where ranked lists of conferences and, potentially, citations of those conference outputs are used as primary indicators of research quality, it may be appropriate to consider the technical or general chair role to be equivalent to the editor role as an esteem indicator. Given the nature of these conferences it is difficult to ascribe the key research esteem to one or other of these roles, so both would need to be allowed.

It is therefore recommended that if a discipline does use ranked conferences as part of its research quality evaluation it might also include a related esteem indicator. For reasons of scale, similar to those given to journal editorship, only technical program or general chair roles at conferences with the attributes that make them internationally regarded should be considered, and a more refined list than the A ranked conference list may therefore be needed.

It is recommended that, where conference publications are recognised as a valid research output, a role as technical program or general chair of an A ranked conference be included as an esteem indicator for ERA.

3.2. Membership of Learned Academies

Membership of Learned Academies has been widely proposed as an esteem indicator for all ERA clusters. There appears to be general acceptance that knowledge of memberships of Learned Academies would add some value to the research quality evaluation. However, it is noted that not all disciplines (or sub-disciplines) are equally represented in memberships to Learned Academies and some disciplines do not have recognised Learned Academies. Various

lists of organisations have been proposed as equivalent to the established four Australian Learned Academies, but these do not have widespread acceptance.

While it is recognised that Learned Academy memberships within academia are reasonably regarded as an esteem indicator associated with research quality, and are easily determined and verified, there are issues associated with the historical nature of membership and how this relates to the reference period for ERA. To overcome this it is recommended that elections to Learned Academies during the reference period should be used as a more current esteem indicator.

There still remain some difficulties in arriving at a recognised list as to what constitutes a Learned Academy and a reliable means of ensuring that election is on the basis of research excellence. For this reason it is recommended that the indicators of membership and election used in ERA be restricted to those of the four Australian Learned Academies. It is noted that there are clearly other very prestigious Academies for which membership is highly regarded (for example, the Royal Society). In such cases, it is recommended that this information be provided in the four-page background statement for the two-digit FoR of the unit of evaluation. For Learned Academies that are considered highly prestigious, the Research Evaluation Committee will be in a position to determine the value of such membership(s) in the overall evaluation of the unit.

It is recommended that election to one of the four Australian Learned Academies during the reference period be included as an esteem indicator for ERA.

3.3. Category 1 Fellowships

Category 1 Fellowships have also been widely proposed as an esteem indicator for all ERA clusters, on the basis that while the income would be identified as an indicator, the number and type of Fellowships would also contribute to an evaluation of the quality of the unit of evaluation.

A count of Category 1 Fellowships awarded to the unit of evaluation during the reference period was considered by the Esteem Indicators Group as an alternative indicator, since evidence of the award of a fellowship (or even those taken up) may relate more directly to the reputation of the discipline during the reference period. However, on balance the Group concluded that a count of all Category 1 Fellowships held during the reference period would be an appropriate esteem indicator.

It is recommended that all Australian Category 1 Fellowships, which can be reliably identified from Category 1 funding sources, be included in ERA as a count of those held during the reference period, with underlying data relating to the type of fellowship award (QE2, APF, ALF etc.).

In the case of other significant international fellowships, it is likely that validating the relevance of the selection criteria and ensuring that they are appropriately reported will impose an undue burden on institutions. Accordingly, those international fellowships that are of particular note will need to be provided in the background statement and not as an esteem indicator.

It is recommended that all Australian Category 1 Fellowships held by the unit of evaluation during the reference period be included as an esteem indicator in ERA.

3.4. Awards and prizes

Awards and prizes have been widely proposed as an esteem indicator for all ERA clusters. However, the Esteem Indicators Group agreed with the conclusion, outlined in the *ERA Indicator Principles* document, that the range of awards and prizes that might be considered is very large, with the associated difficulty of unambiguously identifying those awards and prizes awarded principally on the basis of research excellence. The scale of the exercise, together with the underlying issue of attribution, makes the use of awards and prizes in general an unmanageable exercise for ERA.

Where a particularly prestigious award or prize has been received by a member of a unit of evaluation, it might be expected to be provided in the background statement in a manner that would convince the Research Evaluation Committee of its importance in establishing the quality of the unit of evaluation.

It is recommended that awards and prizes not be included as an esteem indicator for ERA.

3.5. International advisory roles

International Advisory Roles have been identified by some clusters as an esteem indicator. While in some cases these might be considered to be a proxy for research quality it is not clear how this is readily validated, giving rise to the question of their acceptance within and across disciplines. Moreover, given the number of such roles and the difficulty of tracking and identifying them, such an indicator is unmanageable for ERA.

In addition, for the clusters that identified this esteem indicator as potentially useful in ERA there are already sufficient indicators available to the REC for this not to add any useful additional information.

It is recommended that international advisory roles not be included as an esteem indicator for ERA.

3.6. Membership of the ARC College of Experts or role in evaluation of Category 1 grants

Membership of the ARC College of Experts (or other comparable national or international panels including the corresponding NHMRC panel) was considered to be based not only on research expertise but also availability and capacity to exercise sound judgment and is therefore not considered to be an appropriate esteem indicator for ERA.

Similarly, a role in assessing competitive grants is, of itself, not an indication of research quality, given that it is in some cases an obligation of holding a grant. In addition, there are issues of privacy that would need to be resolved.

It is recommended that membership of the ARC College of Experts and roles in the evaluation of Category 1 Grants not be included as an esteem indicator for ERA.

3.7. Plenary addresses

Plenary addresses in some cases reflect the quality of research of a unit of evaluation and in others the esteem of an individual researcher in their discipline. Since the basis on which an invitation to give a plenary address is varied, however, and the mechanism by which selections are made and invitations communicated equally diverse, it is difficult to see how it can be used

reliably in ERA. There are significant issues with the manageability of gathering data around plenary addresses that would make it impractical for institutions to submit verifiable data.

Significant addresses/orations can be provided in the background statement where relevant.

It is recommended that plenary addresses not be included as an esteem indicator for ERA.

3.8. Membership of statutory committees

Membership of statutory committees was suggested for inclusion as an esteem indicator in the Public and Allied Health cluster. Given that:

- there are relatively few A and A* journals in these disciplines for there to be a reliable discriminator of research quality from the indicator of ranked journals
- there are relatively few other indicators that can be reliably used for research quality in these disciplines
- membership on the panels is likely to be on the basis of research expertise as well as professional judgment
- there are a relatively small number of recognised statutory committees in Australia (principally recognised by the Australian Commonwealth, the NHMRC, United Nations (UN) or World Health Organisation (WHO)).

It is recommended that for the Public and Allied Health Cluster only, membership of a limited number of specified statutory committees (National Health and Medical Research Council; World Health Organisation; and United Nations related) be included in ERA as an esteem indicator.

3.9. Contribution to internationally endorsed standards

This indicator was suggested by the Engineering and Environmental Sciences (EES) and Mathematics, Information and Communication Science (MIC) clusters on the basis that work embodied in international standards represents considerable research contributions from academics in a way that is not currently captured in research outputs.

The key difficulty with using this indicator for esteem is one of attribution and timing. In addition, if these difficulties can be overcome to make the data easy to collect and verifiable, it may be appropriate to view it as an applied indicator rather than an esteem indicator. It is therefore recommended that this indicator not be used for esteem in ERA, but that if the relevant disciplines can demonstrate its value in measuring research quality it be included in the suite of applied indicators for EES and MIC.

It is recommended that contributions to internationally endorsed standards not be included as an esteem indicator for ERA, but that consideration be given for including such contributions, where directly attributable to a unit of evaluation, as an applied indicator.

3.10. Curation of significant events

This indicator was originally proposed for Cluster Two on the basis that exhibitions and significant events, that are the product of substantial research, were not captured elsewhere. However, since that time exhibitions and significant events have been included in ERA as a

valid research output, and it is therefore recommended that it now be deleted from the list of esteem indicators.

It is recommended that curation of significant events be removed as an esteem indicator for ERA on the basis that it is now considered to be a research output.

3.11. Other Cluster Two indicators

Given the paucity of research indicators for the humanities and creative arts, and the fact that several esteem indicators identified previously for this cluster have been recommended to be removed, the Esteem Indicators Group considered several other indicators that might add value for the Research Evaluation Committee in these disciplines.

3.11.1. Acquisitions

Acquisition of visual artworks by prestigious public collecting institutions recognises the long-term contribution artworks make to the development of knowledge within communities and culture. Understandably, such acquisition is highly valued within the discipline as an indication of the standing and contribution to cultural knowledge of both the artwork and the artist. Artworks are not proposed for such acquisition until they have achieved a high level of peer regard. That regard is confirmed by independent expert appraisal prior to being considered by an institution's curatorial committee. The committee will consider the work in terms of its provenance, condition, appropriateness within institutional collection, research and educational policies and priorities before being proposed to a senior decision-making body, usually a board of statutorily appointed trustees. Acquisitions by national and state collecting institutions enjoy full discipline acceptance, undergo a rigorous peer process, and can be reported and verified. Their standing confirms that they are a valid proxy measure for research quality.

The acquisition of an artwork that meets the definition of research demonstrates the significance of a researcher's contribution to the field and to the community. Since acquisitions cannot be recognised elsewhere within ERA they could be considered as an esteem indicator. In order to be certain that the highest standards of peer review underpin acquisition processes, only acquisitions by national and state collecting institutions are proposed for inclusion as esteem indicators within ERA. Those institutions are listed in Appendix 1.

The number of acquisitions from a unit of evaluation over the ERA reference period could be reported as an esteem indicator in ERA.

3.11.2. Subsequent performance or exhibition of a creative work

Main authorship or lead/solo role in the subsequent performance of a creative work with a research rationale may also be considered an indicator of esteem. Performance would need to be by a state or national performing arts company (one which receives program funding from the Australia Council through the Major Performing Arts Board or triennial program funding from the Music, Dance or Theatre Boards of the Australia Council), and presented in one of the national venues in Appendix 1. Exhibition would need to be at one of the state or national galleries in Appendix 1. Although attribution is complex, subsequent performance or exhibition might, on the one hand, be considered to be equivalent to a citation of a published work, or alternatively viewed as a measure of the value of the original creative work by virtue of its recreation in another forum.

If creative works are to be widely accepted as a research output, subsequent performances or exhibitions as an indicator of esteem should also be considered in some way by ERA to ensure consistency across disciplines.

3.11.3. International competitions

Although not widely used in Australia, international competitions are often used in architecture or design disciplines to stimulate the creation of research output. A typical example would be a competition to produce an architectural design. Many of these creations, even after winning or being short listed by a jury, are not actually realised in final construction, exhibited or published. In order to capture any significant research contributions from this type of activity in ERA an esteem indicator has been proposed. The Esteem Indicators Group considered this a valid argument for its potential inclusion in ERA since such an esteem indicator potentially guides an evaluation of the research quality of the unit of evaluation, is readily verifiable and is widely recognised within the relevant disciplines as an indicator of esteem.

3.11.4. Commissions

Commissions are widely regarded among creative and performing arts, architecture and design as an indicator of esteem, often recognising the broad contributions of the creator to a field. While the work itself might qualify as a research output if it is subsequently publicly exhibited or performed, many commissioned works may not satisfy the strict definition of a research output and will therefore not be represented in ERA. The number, and potentially value, of commissions in the reference period might therefore provide a supporting indicator of the quality of a unit of evaluation not elsewhere identified in ERA.

3.11.5. Prizes and shortlisting for major prizes

The Esteem Indicators Group revisited the issue of prizes and shortlisting for prizes in this discipline area since prizes for literature, architecture and design as well as other creative and performing arts are recognised, even among researchers, in these disciplines as among the most prestigious indicators of the quality of their output. Nonetheless, it was still regarded as problematic for the same reasons as the broader awards and prizes, and major awards to academics and researchers could be identified in the background statement for the discipline.

3.11.6. Australia Council grants

Available for a broader range of creative endeavours than Fellowships, the 'general' Australia Council grants awarded to academics within the creative arts disciplines are not recognised within the Higher Education Research Data Collection (HERDC) Category 1. However, they are highly sought after, universally respected within the discipline, peer assessed, reportable and verifiable. As with Fellowships, Australia Council grants support new research, experimentation, production and presentation of artwork and they are held in high regard within the creative arts field. Not acknowledged elsewhere within ERA, Australia Council grants are therefore a valid esteem indicator.

3.11.7. Australia Council fellowship grants

The highly competitive Australia Council Fellowship grants are the most prestigious support available to academic artists for the development of new work. They provide time and resources for research and experimentation and the creation of art work in preparation for publication, production, presentation or exhibition. The grant applications are considered through a peer review process in accordance with Australia Council legislation and policies. Where such fellowships are awarded to academic researchers, they would typically be recognised as being

awarded for activities consistent with the broad ERA definition of research. However the grants are not recognised within the HERDC Category 1, Nationally Competitive Grants and therefore will not appear under the research income indicator in ERA.

It is recommended that consideration be given to including some or all of the esteem indicators 3.11.1 to 3.11.4 in ERA for the HCA cluster, but only if an alternative view of HCA indicators (outlined in Section 4 below) cannot be adopted.

It is not recommended that prizes and shortlisting for prizes (indicator 3.11.5) be included as an esteem indicator for consistency with the broader awards and prizes indicator recommendation above.

It is recommended that Australia Council Grants and Australia Council Fellowships (indicators 3.11.6 and 3.11.7) be included in ERA as an esteem indicator for the HCA cluster.

B.4 An alternative view of the Cluster Two indicators

The Esteem Indicators Group, at its second meeting, considered in detail the range of HCA indicators identified in Section 3.11 above. It was recognised that the large range of esteem indicators needed to adequately represent the disciplines in the HCA cluster presents a challenge from the point of view of robustness, consistency with other clusters and collectability of data. With the exception of 3.11.6 and 3.11.7 which are associated with properly acknowledging the role that the Australia Council plays in creative and performing arts research, an alternative approach to recognising the research quality associated with the other indicators would be highly desirable.

The Group postulated that if a robust and systematic metadata collection process was used for each non-publication based output in the HCA cluster (either for all outputs or only for those submitted for peer review in the ERA process, noting that it will only be for the items actually selected for peer review that the data will likely be accessed) then many of the esteem indicators could be embedded in the data collection. Example outputs would include those in the creative and performing arts, as well as in architecture and design. This alternative approach also has the merit that it provides uniform guidance to institutions submitting non-publication based outputs that would also assist in determining the relative standing of the outputs, and the validity of the output as equivalent to a peer reviewed item.

A framework for non-publication output metadata that satisfies the indicator principles and does not require extensive textual material follows:

- Author—name, role and date of creation.
- Title—name of work, genre/media.
- Size of Work—duration, word length, dimensions etc. as relevant.
- Peer assessed input—commission or Australia Council New Work grant.
- Peer assessed output—presentation/exhibition by a recognised organisation (see Appendix 1).

- Publication in the public domain—details of date, place and reference (eg. International Standard Music Number) of initial publication, whether performance, exhibition, broadcast, publication or recording.
- Subsequent significant manifestations of work in the reference period—bibliographic reference (no more than two suggested).
- Additional scholarly or critical documentation in reference period—bibliographic reference (no more than two suggested).
- One sentence rationale for research content—100 words recommended to replace existing 250 word statement.

Only a few of the fields could be made mandatory, to assist in the ease of historical data collection.

The metadata could be largely populated by numerical data and drop down boxes where relevant, making collection of the data relatively straightforward. Much of the data would need to be collected in any case if the esteem indicators 3.11.1 to 3.11.4 were adopted, as would likely be necessary for a full research evaluation in the absence of the proposed framework. Refinements of this framework could be considered by an additional Cluster Two reference group.

The use of the above framework would significantly improve the use of esteem indicators in ERA, removing the need for an extensive and specialised list particularly for the HCA cluster and minimising the need for a significantly larger list of unique esteem indicators for HCA.

It is recommended that the use of the above framework, or an alternative rigorously defined framework, be considered for ERA to limit the need for specialised esteem indicators in the HCA disciplines, principally to Australia Council Grants and Fellowships. Depending on the complexity of the data collection, the framework could be used either for all creative work research outputs or just for those being submitted for peer review.

B.5 Summary of esteem indicator attributes

Table 1 summarises the outcomes of the deliberations and the basis on which an esteem indicator was recommended for consideration.

Indicator	Cluster	Believable	Accepted within Discipline	Proxy Measure for Research Quality	Manageable	Adds value to dashboard
3.1.1	All	Y	Y	M	Y	Y
3.1.2	HCA, SBE	Y	Y	M	Y	Y
3.1.3	MIC	M	Y	M	Y	Y
3.2	All	Y	Y	Y	Y	Y
3.3	All	Y	Y	Y	Y	Y
3.4	All	M	M	M	N	N
3.5	PCE/others	N	N	M	N	N
3.6	PCE/others	N	N	N	N	N
3.7	All	N	N	M	N	N
3.8	PCA	M	Y	M	Y	Y
3.9	EES, MIC	Consider as Applied Indicator				
3.10	HCA	Now considered as Research Output				
3.11.1-4 **	HCA	M	Y	M	Y	Y
3.11.6	HCA	Y	Y	M	Y	Y
3.11.7	HCA	Y	Y	M	Y	Y

Notes: Y = Yes, N = No, M = Maybe under certain conditions/constraints

** Not required if alternative view of HCA indicators in Section 4 is adopted

B.6 Recommended esteem indicators by discipline cluster

Table 2 summarises the recommended esteem indicators for ERA and in which discipline clusters they might be used.

	PCE	HCA	EES	SBE	MIC	BBS	BCH	PAH
3.1.1	Y	Y	Y	Y	Y	Y	Y	Y
3.1.2		Y						
3.1.3					Y (1)			
3.2	Y	Y	Y	Y	Y	Y	Y	Y
3.3	Y	Y	Y	Y	Y	Y	Y	Y
3.8								Y
3.9			Applied		Applied			
3.10		Output						
3.11.1-4		Y (2)						
3.11.6		Y						
3.11.7		Y						

Notes: 1. Provided that conference outputs are considered in research outputs

2. Visual and creative arts and architecture and design, only if alternative model not adopted

B.7 Summary

The Esteem Indicators Group considered in detail the range of indicators that had been proposed for use in each discipline cluster for ERA, as well as some additional indicators relevant to the HCA cluster.

The Group has recommended the use of a limited range of broad indicators on the basis that in most cases the other bibliometric and non-bibliometric indicators already available to a Research Evaluation Committee would be sufficient to determine the research quality for a unit of evaluation. In the limited cases where those indicators are either not robust or there is a paucity of reliable indicators, a small number of additional esteem indicators have been retained.

In the case of the HCA cluster, the Group considered in detail a number of additional esteem indicators that might be considered to be useful supplementary information to a Research Evaluation Committee, given the relatively incomplete and underdeveloped range of indicators in this discipline. Since the adoption of all of these indicators would create an imbalance in the number of indicators across discipline clusters, with the consequential result that other clusters might appear underrepresented in esteem indicators, the Group considered a methodology for attaching data to research outputs that included reference to the relevant attributes. It is believed that such a methodology satisfies all of the indicator attributes (predominantly quantitative, non-descriptive, verifiable and relatively easy to collect) and could provide a consistent basis for the reporting of research outputs in the HCA disciplines.

Creative and Performing Arts—nationally significant venues

This appendix provides a draft list of venues that might be considered where esteem measures require the presentation of creative works or performances in venues of national significance for the purpose of acquisition or subsequent exhibition/performance.

National collecting institutions¹

National Film and Sound Archive
National Museum of Australia
National Archives of Australia
National Gallery of Australia
Australian War Memorial
National Library of Australia
Australian National Maritime Museum
National Portrait Gallery

State and territory collecting institutions²

Queensland Art Gallery
Queensland Museum
State Library of Queensland
Art Gallery of South Australia
South Australian Museum
State Library of South Australia
National Gallery of Victoria
Museum of Victoria
State Library of Victoria
Art Gallery of Western Australia
Western Australian Museum
State Library of Western Australia
Tasmanian Museum and Art Gallery
State Library of Tasmania
Art Gallery of New South Wales
Museum of Contemporary Art
Powerhouse Museum
Australian Museum
State Library of New South Wales
Canberra Museum and Gallery
Museums and Art Galleries of the Northern Territory
Northern Territory Library

Performing arts venues

Queensland Performing Arts Centre
Sydney Opera House
Sydney Theatre
Sydney Recital Hall
Carriage Works Sydney
Melbourne Southbank Arts Centre
Melbourne Recital Hall
Melbourne Town Hall
Malthouse Theatre Melbourne
Adelaide Town Hall
Adelaide Festival Theatre
Federation Hall Hobart
Playhouse Perth
Her Majesty's Theatre Perth
Perth Concert Hall

¹ It is implied that acquisition of creative works are by the research collection of these institutions and subject to appropriate peer review.

² As above.