



Australian Government
Australian Research Council

2015

2016

State of Australian
University Research
Volume 2 Institutional Insights

ISBN 978-0-9943687-1-3

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ABBREVIATIONS

ACU	Australian Catholic University
ADE	The University of Adelaide
ANU	The Australian National University
BAT	Batchelor Institute of Indigenous Tertiary Education
BON	Bond University
CAN	University of Canberra
CDU	Charles Darwin University
CQU	Central Queensland University
CSU	Charles Sturt University
CUT	Curtin University of Technology
DIV	University of Divinity
DNK	Deakin University
ECU	Edith Cowan University
FED	Federation University Australia
FLN	Flinders University
GRF	Griffith University
JCU	James Cook University
LTU	La Trobe University
MEL	The University of Melbourne
MON	Monash University
MQU	Macquarie University
MUR	Murdoch University
NDA	The University of Notre Dame Australia
NEW	The University of Newcastle
NSW	The University of New South Wales
QLD	The University of Queensland
QUT	Queensland University of Technology
RMT	RMIT University
SCU	Southern Cross University
SWN	Swinburne University of Technology
SYD	The University of Sydney
TAS	University of Tasmania (incorporating Australian Maritime College)
UNE	The University of New England
USA	University of South Australia
USC	The University of the Sunshine Coast
USQ	University of Southern Queensland
UTS	University of Technology, Sydney
UWA	The University of Western Australia
UWS	University of Western Sydney
VIC	Victoria University
WOL	University of Wollongong

GUIDE TO THE REPORT

Volume 1 of the *State of Australian University Research 2015–16* presented a comprehensive assessment by discipline of the quality of research activity conducted in Australia's higher education institutions based on the data and outcomes for ERA 2015. It provided information on the discipline-specific research activity of each eligible Australian higher education institution (see *Appendix 1: Eligible Institutions*), and the contribution of each discipline to the national landscape.

With three rounds of Excellence in Research for Australia (ERA) now complete, the ERA dataset covers all Australian university research outputs, staffing and activity from 2003 to 2013, and research income and research application data from 2006 to 2013. It is now possible to analyse this longitudinal data.

The *State of Australian University Research 2015–16: Volume 2 Institutional Insights* looks at some selected topics to provide further understanding of the state of Australian university research.

The Introduction provides an overview of the ERA framework and methodology. The topics covered in this report are:

- › **ERA Ratings** shows the distribution of ERA ratings across all universities; the distribution of ratings across ERA rounds and the improvement in ratings over the three ERA rounds
- › **Gender and the Research Workforce** analyses headcount by gender by employment level and provides an analysis of four-digit FoR codes where the headcount of females researchers exceeds male researchers
- › **Open Access** reports on the percentage of open access outputs reported in ERA 2015 by two-digit FoR code and by institution
- › **Volume of Submitted Outputs in ERA 2015** displays the volume of outputs submitted by institutions in two-digit FoR codes, and for each two-digit FoR code the share of the volume of outputs relative to the institution itself and the discipline as a whole
- › **Percentage Contribution to the National Landscape** shows the research activity attributed to two-digit FoRs as a proportion of total research activity submitted to all FoR codes in ERA 2015, ERA 2012 and ERA 2010 for research outputs, research income, staff (full-time equivalent (FTE)), esteem, patents granted and research commercialisation income.

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The background of the slide is a solid teal color. Overlaid on this background is a subtle, light-colored pattern of leaf veins, resembling a microscopic view of plant tissue or a detailed botanical illustration. The veins are most prominent in the top and bottom sections of the slide, framing the central text area.

Introduction

In 2015, the Australian Research Council (ARC) conducted the third full Excellence in Research for Australia (ERA) evaluation. The evaluation collected data regarding the quality of research activity undertaken at all eligible higher education research institutions¹ within the ERA 2015 reference period. These data were then evaluated by eight Research Evaluation Committees (RECs), established at a discipline cluster level, and comprised of distinguished and internationally-recognised researchers with expertise in research evaluation.²

This Report provides some additional information at the institutional level on the ERA 2015 evaluation data and outcomes.

Objectives of ERA

ERA aims to identify and promote excellence across the full spectrum of research activity, including both discovery and applied research, within Australian higher education institutions.

The objectives of ERA are to:

1. establish an evaluation framework that gives government, industry, business and the wider community assurance of the excellence of research conducted in Australia's higher education institutions
2. provide a national stocktake of discipline-level areas of research strength and areas where there is opportunity for development in Australia's higher education institutions
3. identify excellence across the full spectrum of research performance
4. identify emerging research areas and opportunities for further development
5. allow for comparisons of Australia's research nationally and internationally for all discipline areas.

Use of Information from ERA

ERA provides Government, universities, industry, and prospective students with valuable information about research performance in Australian universities. For example, ERA data and outcomes:

- › inform a range of advice to Government across the various portfolios of Government
- › assist universities with strategic planning
- › inform funding allocations for Sustainable Research Excellence in Universities (SRE) block grants
- › specifically inform the development of research policy in Government and the wider sector, including:
 - › Research Engagement for Australia: Measuring Research Engagement between Universities and End Users (Australian Academy of Technological Sciences and Engineering)
 - › Mapping Australia's Science and Research Priorities (Department of Industry and Science)
 - › Mapping the Humanities, Arts and Social Sciences in Australia (Australian Academy of the Humanities)
 - › Development of the Defence Trade Controls Act (Department of Defence)
 - › Draft National Strategy for International Education (Department of Education and Training).

¹ See Appendix 1 for a list of eligible institutions.

² A list of clusters and the ERA 2015 REC members is available at: arc.gov.au/era-2015-research-evaluation-committee-rec-members

Definition of Research

For the purposes of ERA, research is defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies, inventions and understandings. This could include synthesis and analysis of previous research to the extent that it is new and creative.

Institutions must ensure that all research outputs submitted to ERA meet this definition of research. Outputs that do not meet this definition may be excluded from submissions during the ERA submission process or, where they are not excluded from submissions, their inclusion may adversely affect the quality rating assigned by RECs during the evaluation process.

Fields of Research (FoR) Codes

For the purposes of ERA, disciplines are defined as two- and four-digit Fields of Research (FoR) codes as identified in the Australia and New Zealand Standard Research Classification (ANZSRC) 2008 released by the Australian Bureau of Statistics and Statistics New Zealand. The ANZSRC provides 22 two-digit FoR codes, 157 four-digit FoR codes, and an extensive range of six-digit codes.

The FoR codes as used in ERA 2015 are listed in **Appendix 2**. ERA undertakes evaluation at both the two- and four-digit FoR code level. Institutions submitted data to ERA at the four-digit level and these were aggregated to form the two- and four-digit Units of Evaluation (UoEs).

The two-digit FoR code is the highest level of the ANZSRC hierarchy; it relates to a broad discipline field, for example, Physical Sciences (02) or History and Archaeology (21). A two-digit FoR code consists of a collection of related four-digit FoR codes.

The four-digit FoR code is the second level of the ANZSRC hierarchy and relates to a specific discipline field of a two-digit FoR code. For example, Astronomical and Space Sciences (0201) or Archaeology (2101).

ERA 2015 Reference Periods

Data for the following reference periods was collected for ERA 2015:

Data Type	Reference Period	Years
Research Outputs	1 January 2008 — 31 December 2013	6
Research Income	1 January 2011 — 31 December 2013	3
Applied Measures	1 January 2011 — 31 December 2013	3
Esteem Measures	1 January 2011 — 31 December 2013	3
Staff Eligibility Period	As at 31 March 2014	Census Date

ERA 2015 Evaluation Process

Evaluation of data submitted for ERA 2015 was undertaken by eight Research Evaluation Committees (RECs)³, broadly representative of eight discipline clusters. The ERA 2015 Research Evaluation Committees were comprised of 155 individual distinguished and internationally recognised researchers from Australia and overseas, with expertise in their fields and in research evaluation.

Further details concerning the ERA 2015 evaluation process, including moderation and conflict of interest procedures, can be found in the *ERA 2015 Evaluation Handbook*.⁴

ERA 2015 Indicators

ERA is based on the principle of expert review informed by indicators. The ERA 2015 evaluations undertaken by RECs were informed by four broad categories of indicators:

1. Indicators of research quality

Research quality was considered on the basis of a publishing profile, citation analysis, ERA peer review, and peer reviewed Australian and international research income

2. Indicators of research activity

Research activity is considered on the basis of research outputs, research income and other research items within the context of the profile of eligible researchers

3. Indicators of research application

Research application is considered on the basis of research commercialisation income, patents, Plant Breeder's Rights, registered designs, and National Health and Medical Research Council (NHMRC) endorsed guidelines. Some other measures, such as publishing behaviour and some other categories of research income, can also provide information about research application

4. Indicators of recognition

Research recognition was considered on the basis of a range of esteem measures.

More detailed information about each of the ERA indicators is available in the *ERA 2015 Evaluation Handbook*.

The ERA indicators are underpinned by the ERA Indicator Principles. The ERA Indicator Principles were developed by the ARC in accordance with international best practice and informed by the ERA Indicator Development Group with analytical testing of data from the Australian higher education sector.

The ERA indicator suite was developed to align with the research behaviours of each discipline. For this reason, there are differences in the selection of indicators. The indicators that apply to each discipline (as defined by two- or four-digit FoRs) are shown in the *ERA 2015 Discipline Matrix*.⁵

³ See arc.gov.au/era-2015-research-evaluation-committee-rec-members for a list of REC members.

⁴ The ERA 2015 Evaluation Handbook is available from: arc.gov.au/era-2015-key-documents

⁵ The ERA 2015 Discipline Matrix is available at: arc.gov.au/era-2015-key-documents

Unit of Evaluation

The Unit of Evaluation for ERA is the research discipline for each institution as defined by FoR codes.

Evaluations occurred at the two- and four-digit FoR code levels for UoEs that met the low volume threshold.

UoEs do not correspond to named disciplines, departments or research groups within an institution.

National-level profiles of disciplines aggregated across institutions at the two- and four-digit FoR code level include information from all submitting institutions, including from those which did not meet the low volume threshold and were therefore not assessed.

Low Volume Threshold

Two- and four-digit UoEs were only assessed where there was a meaningful level of data to be evaluated. An institution is only evaluated in ERA in a two- or four-digit discipline if the number of research outputs submitted reaches the low volume threshold.

For disciplines where citation analysis was used, the low volume threshold was 50 apportioned indexed journal articles. No evaluation was conducted for the FoR at a given institution if the submitted number of apportioned indexed journal articles over the six-year research outputs reference period was fewer than 50 in any two- or four-digit FoR.

For disciplines where peer review was used, the low volume threshold was 50 apportioned weighted outputs. For these disciplines, books were given an effective weighting of 5:1 compared with other research outputs. Books were weighted only for the purposes of determining the low volume threshold; in every other instance they were regarded as a single research output. Portfolios of works were counted as one output for the purposes of determining the low volume threshold. No evaluation was conducted for an FoR at a given institution where, over the six-year research outputs reference period, there were less than the equivalent of 50 apportioned weighted research outputs submitted.

For some FoRs at some institutions, there was insufficient research volume to undertake a valid analysis at the four-digit FoR level, but sufficient research volume at the two-digit FoR level. In these instances, evaluation took place at the two-digit FoR level only.

Where the low volume threshold was not met, the UoE for a given institution was automatically treated as 'not assessed due to low volume', and is reported as 'n/a'. This means that data submitted on research outputs, research income, applied measures and esteem measures for the relevant two- or four-digit FoR for that institution was collected but not evaluated under ERA 2015. The institution, therefore, was not considered as research active for that discipline for the purposes of ERA 2015. However, the data submitted still contributed to the construction of the ERA benchmarks and all ERA data was aggregated for national-level reporting irrespective of whether any FoRs within a specific institution met the low volume threshold.

ERA Rating Scale

ERA utilises a five-point rating scale. The rating scale is broadly consistent with the approach taken in research evaluation processes in other countries to allow for international comparison.

Rating	Descriptor
5	The Unit of Evaluation profile is characterised by evidence of outstanding performance well above world standard presented by the suite of indicators used for evaluation.
4	The Unit of Evaluation profile is characterised by evidence of performance above world standard presented by the suite of indicators used for evaluation.
3	The Unit of Evaluation profile is characterised by evidence of average performance at world standard presented by the suite of indicators used for evaluation.
2	The Unit of Evaluation profile is characterised by evidence of performance below world standard presented by the suite of indicators used for evaluation.
1	The Unit of Evaluation profile is characterised by evidence of performance well below world standard presented by the suite of indicators used for evaluation.
n/a	Not assessed due to low volume. The number of research outputs does not meet the volume threshold standard for evaluation in ERA.

Notes on the Rating Scale

- › ‘World Standard’ refers to a quality standard. It does not refer to the nature or geographical scope of particular subjects, or to the locus of research nor its place of dissemination.
- › Each point within the rating scale represents a quality ‘band’. For example, one UoE might be rated highly within the ‘4’ band and another rated lower within the same band, but the rating for both will be a ‘4’. Only whole ratings are given (not 4.2, 4.5 etc).
- › The ‘banding’ of quality ratings assists RECs in determining a final rating. If, for example, a Unit of Evaluation has a preliminary rating at the top margin of the ‘4’ band based on the assessment of the quality of the research outputs, other indicators (e.g. income or esteem measures) may be sufficient to raise the rating into the ‘5’ band. The lack of such indicators will not, however, be used to lower a rating.
- › The ERA evaluation measures research quality, not scale or productivity. Volume information is presented to the RECs for the purposes of providing context to the research.
- › The methodology and rating scale allow for UoEs with different volumes of output to achieve the same rating. So, for example, a UoE with a small number of outputs can achieve a rating of 5 where the UoE meets the standard for that rating point, similar to a UoE with a large number of outputs.
- › Each UoE is assessed against the absolute standards of the rating scale, not against other UoEs. One of the key objectives of ERA is to identify excellence across the full spectrum of research performance.
- › RECs exercise their knowledge, judgment and expertise to reach a single rating for each UoE. In reaching a rating, RECs take account of all of the supporting evidence which is submitted for the UoE. RECs do not make comment about the contributions of individual researchers.
- › The rating for each UoE reflects the REC’s expert and informed view of the characteristics of the UoE as a whole. In all cases the quality judgments relate to all of the evidence, including the entire indicator suite, and the ERA rating scale. In order to achieve a rating at a particular point on the scale, the majority of the output from the UoE will normally be expected to meet the standard for that rating point. Experience has demonstrated that there is normally a variety of quality within a UoE.

Further details concerning the ERA evaluation process can be found in the *ERA 2015 Evaluation Handbook*.

Key ERA 2015 Documents

There are several documents that provide more detailed information about various aspects of the ERA 2015 evaluation. These include:⁶

- › *ERA 2015 Submission Guidelines* — provides guidance to institutions about ERA 2015 submission rules and components
- › *ERA 2015 Discipline Matrix* — shows the indicators that apply to each FoR code
- › *ERA 2015 Evaluation Handbook* — provides detailed information about the ERA 2015 indicators, evaluation approach and process
- › *ERA 2015 Submission Journal List, Submission Conference List and Submission Publisher List* (copies of these lists were supplied to participating universities in July 2014).

Further information about ERA is available on the [ARC website](#).

Use of the State of Australian University Research report

The *State of Australian University Research* presents data submitted as part of a comprehensive assessment by discipline of the research quality and research activity within Australia's higher education institutions. ERA retrospectively evaluates the quality of research conducted within the specific reference periods (as shown above).

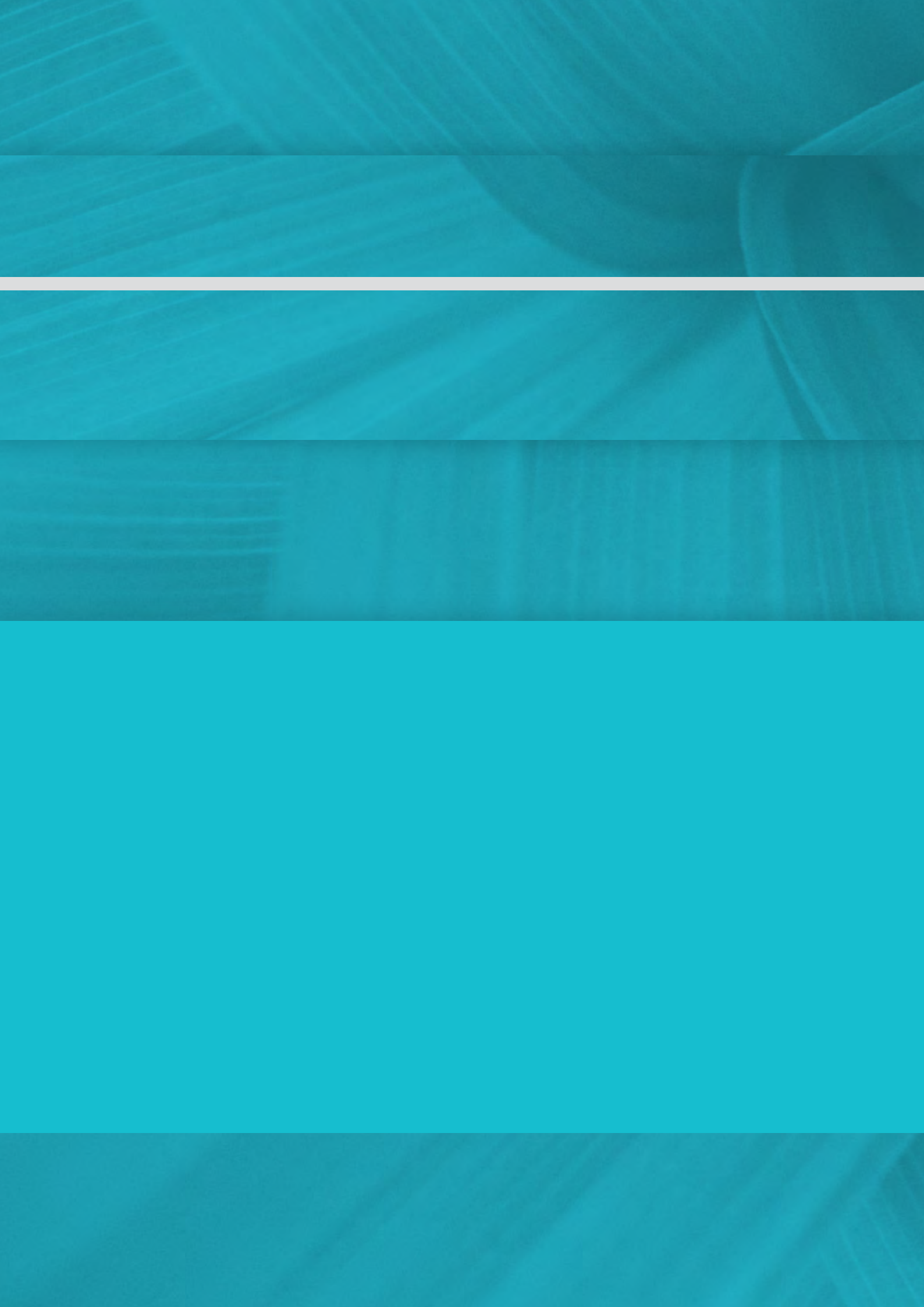
Each UoE is assessed against the ERA rating scale. As no comparisons are made between UoEs, ERA ratings cannot be used as a ranking device. Further, as each ERA rating point might include a range of performances, and the gap between rating points is not defined, it is not appropriate to average ratings even within disciplines.

ERA has been designed to provide flexibility for, and recognition of, discipline-specific research behaviours at both the two- and four-digit FoR levels. ERA evaluations are conducted by discipline experts interpreting the indicators for each UoE in the context of their own expert knowledge of the discipline. Different indicators apply to each discipline, as outlined in the *ERA 2015 Discipline Matrix*. For this reason it is not appropriate to make productivity statements about or comparisons between disciplines.

In addition, since the ERA 2015 research outputs reference period ended on 31 December 2013, the quality of the research produced by Australian universities may have changed since that time.

Please note institutional data potentially contains duplicate data submitted by multiple institutions.

⁶ ERA 2015 key documents are available at: arc.gov.au/era-2015-key-documents



SECTION 1

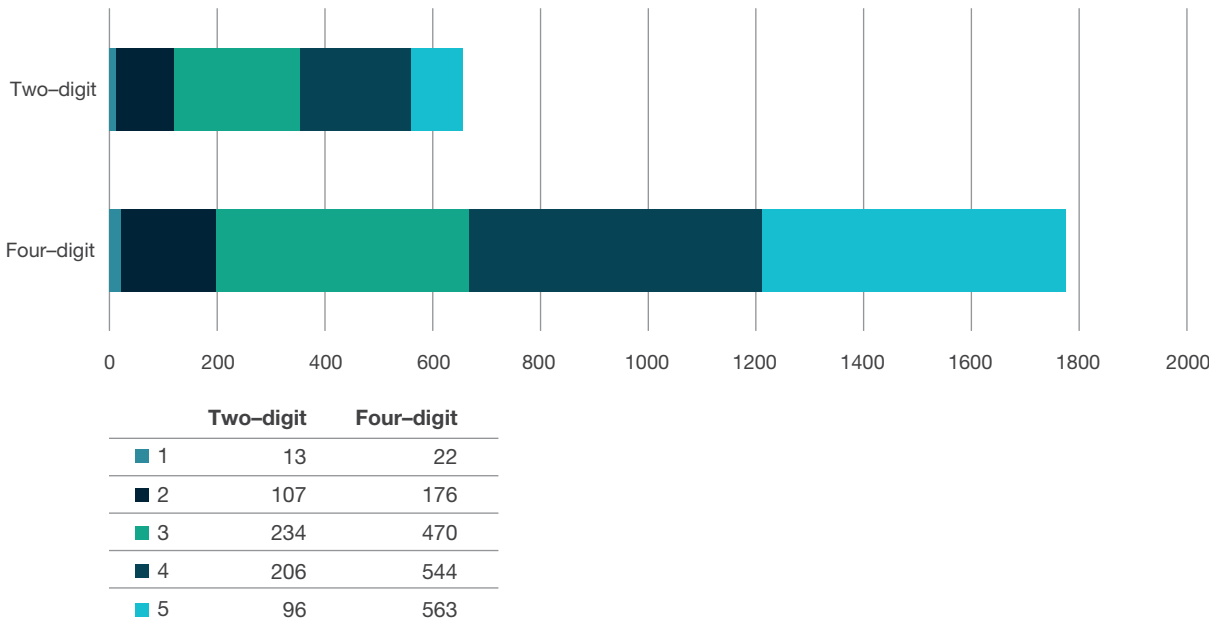
ERA Ratings

This section shows rating results for ERA 2015 and also some comparative data for previous ERA rounds.

Distribution of the ERA 2015 Ratings attained across all Australian Universities

The chart below summarises the distribution of rating results for two- and four-digit ratings for all Units of Evaluation (UoEs).

**NATIONAL ERA 2015 RATINGS — NUMBER OF ASSESSED UNITS BY RATING
TWO- AND FOUR-DIGIT FOR CODES**



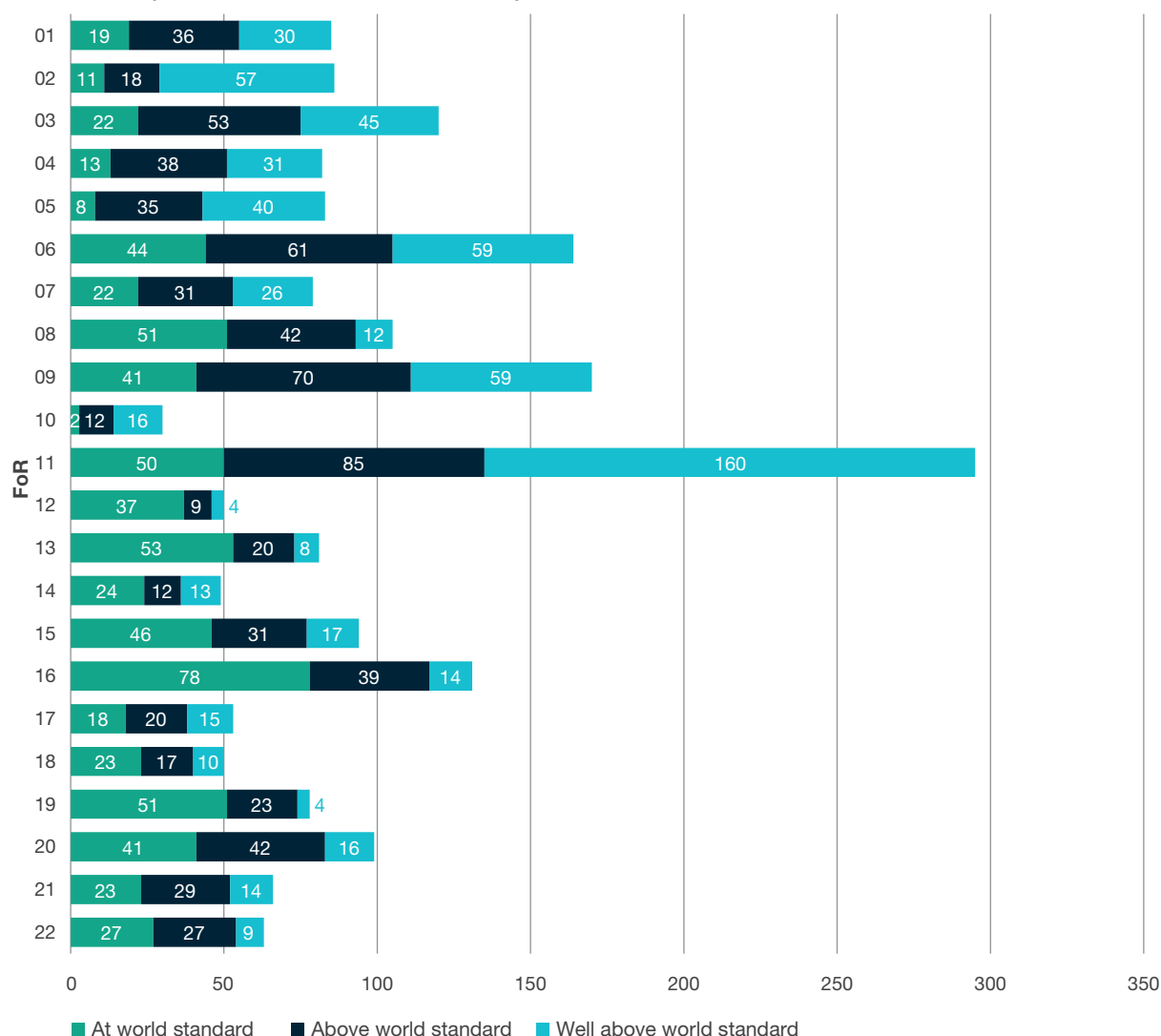
Note: In addition, there were two two-digit and 27 four-digit UoEs that were assessed but not rated.

Number of UoEs with Ratings at or above World Standard ERA 2015, ERA 2012 and ERA 2010

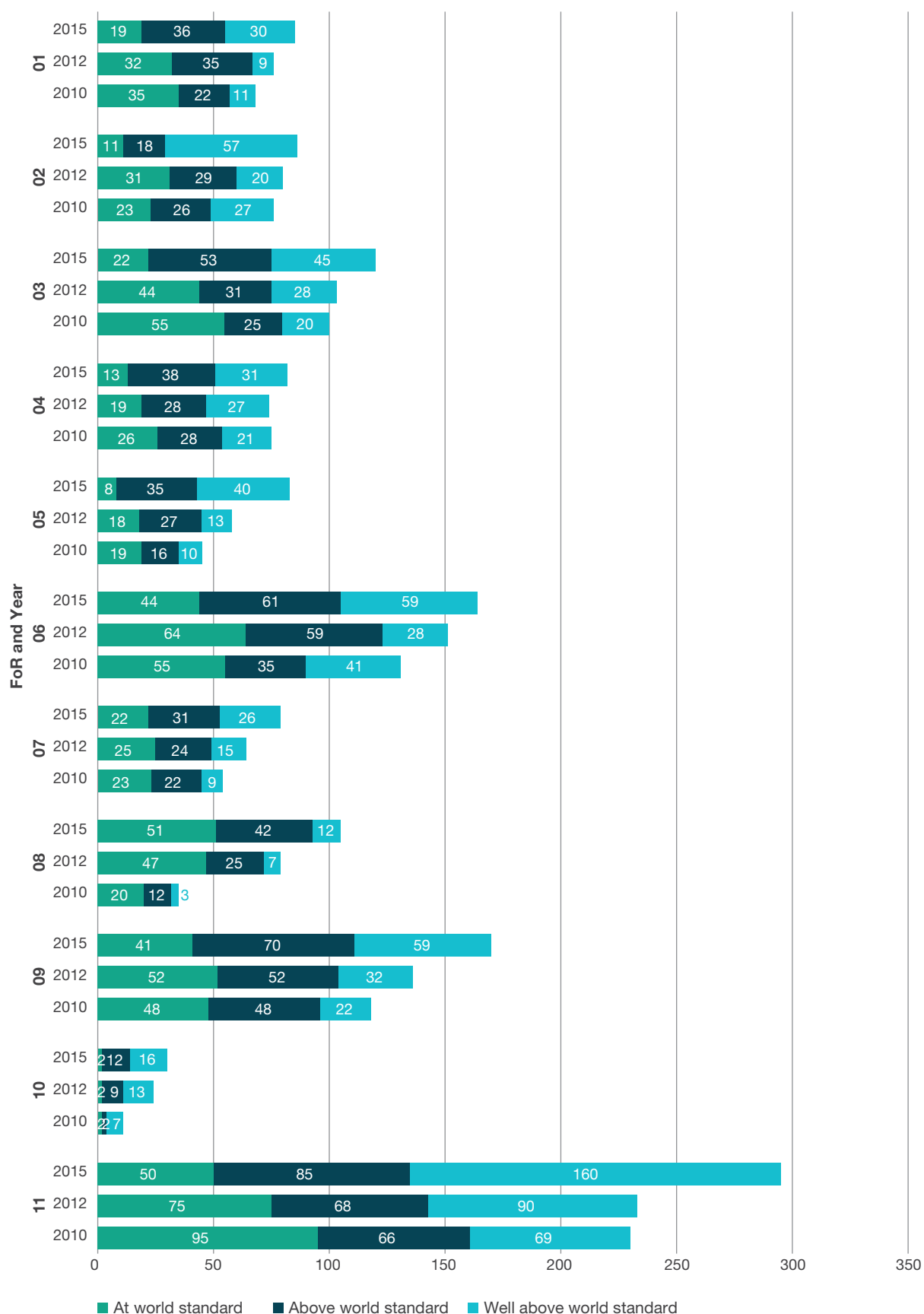
The first chart shows the number of UoEs with ratings 3,4, or 5 for all two-digit and four-digit FoRs grouped by two-digit code in ERA 2015. The next two charts present the same information for the three ERA rounds.

See **Appendix 2** for a full description of the ANZSRC Fields of Research (FoR) codes.

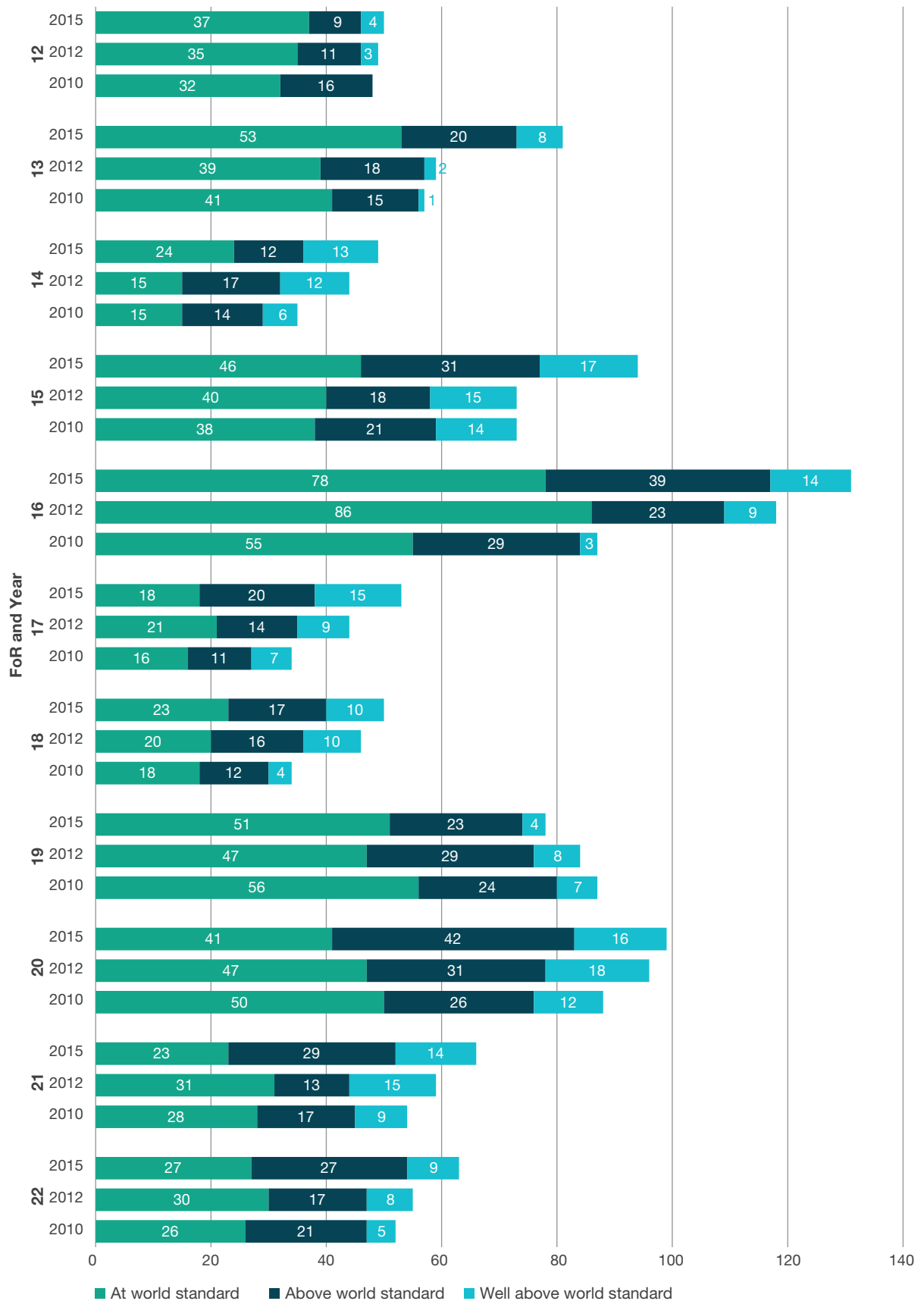
NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN TWO- AND FOUR-DIGIT FOR CODES IN ERA 2015 (GROUPED BY TWO-DIGIT CODE)



NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN TWO- AND FOUR-DIGIT FOR CODES IN ERA 2015, ERA 2012, ERA 2010 – FOR CODES 01–11 (GROUPED BY TWO-DIGIT CODE)

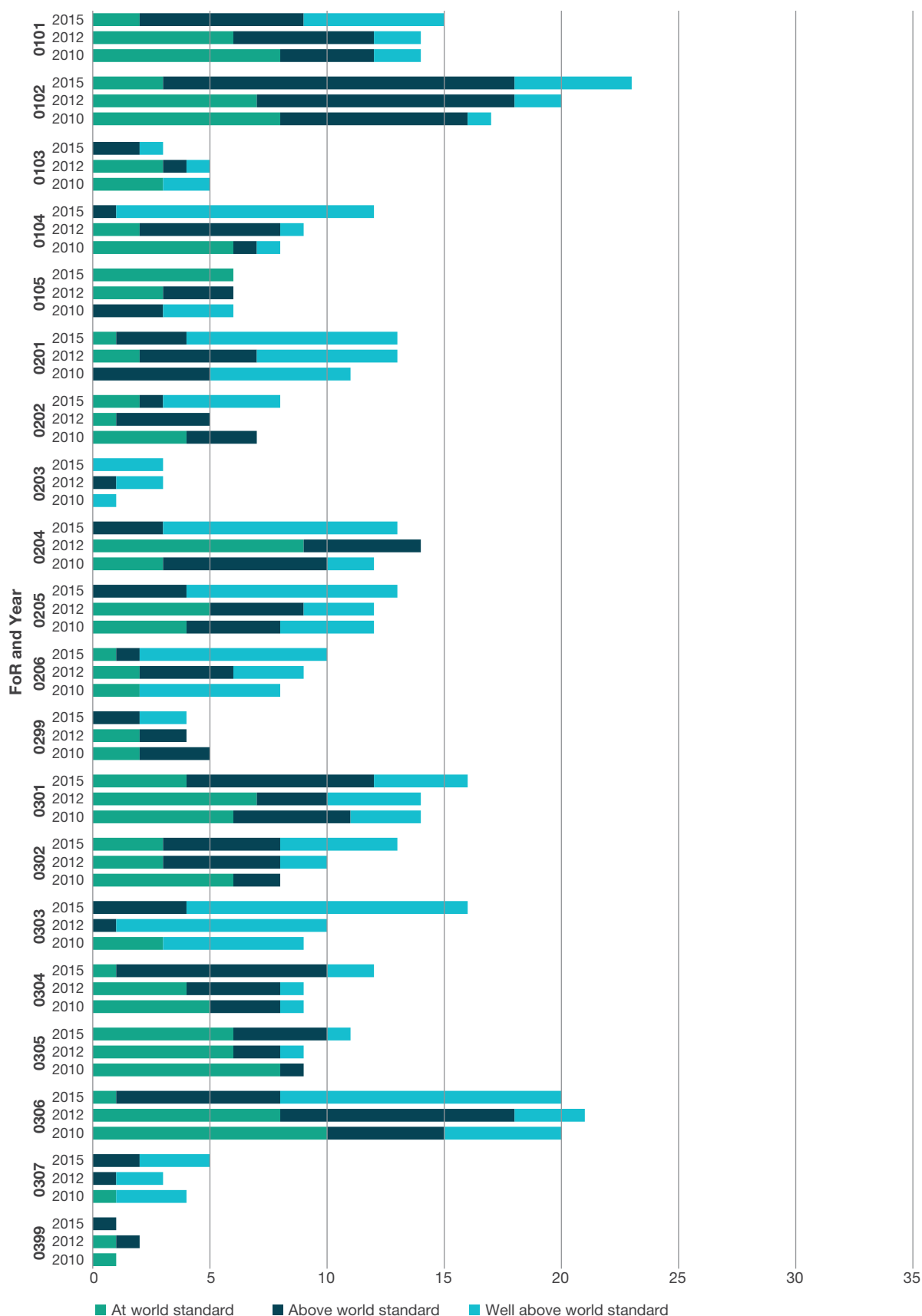


NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN TWO- AND FOUR-DIGIT FOR CODES IN ERA 2015, ERA 2012, ERA 2010 – FOR CODES 12-22 (GROUPED BY TWO-DIGIT CODE)



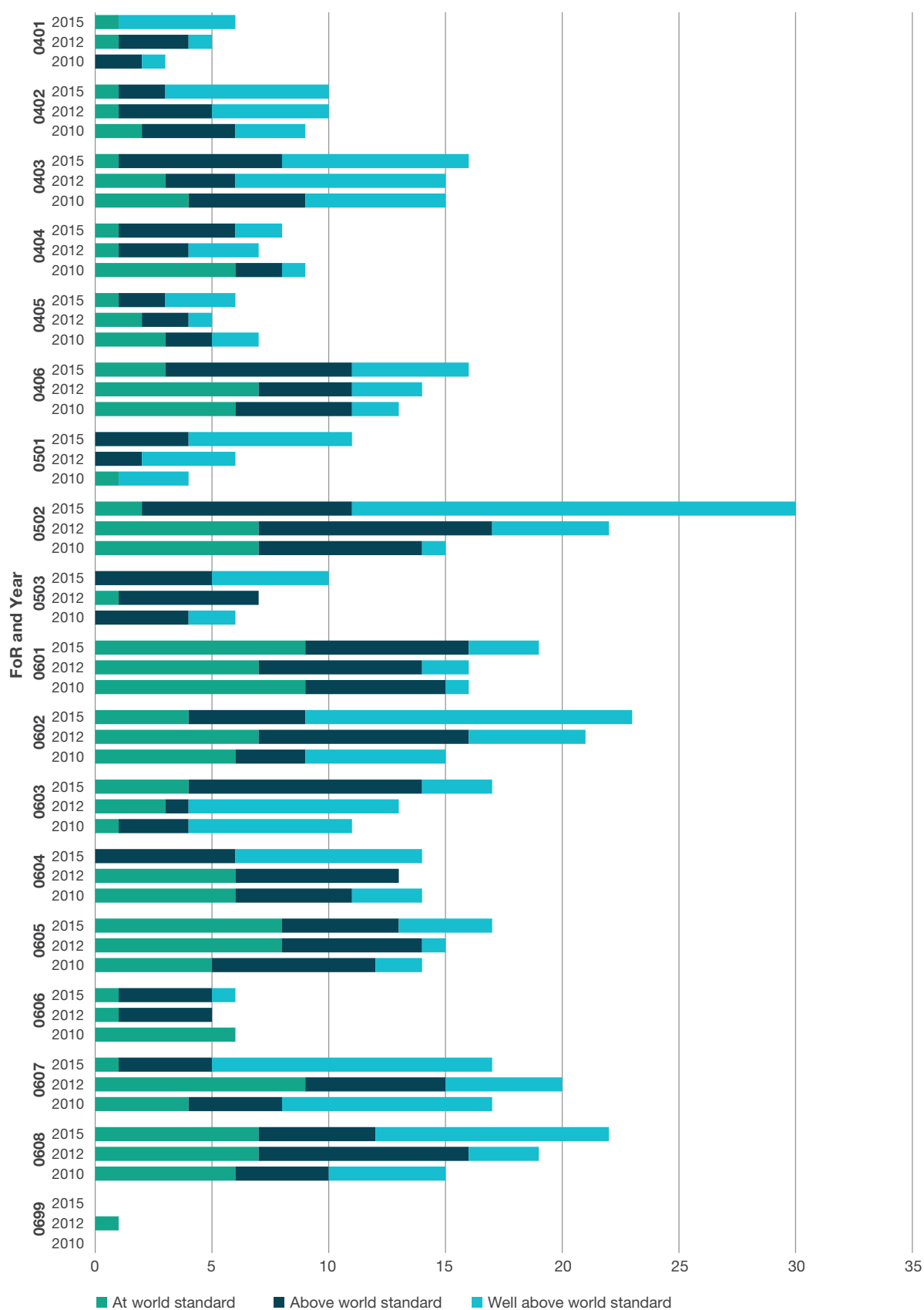
The following set of charts show the UoEs rated at or above world standard in four-digit FoR codes for the three ERA rounds.

NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN ERA 2015, ERA 2012, ERA 2010 – FOR CODES 0101–0399



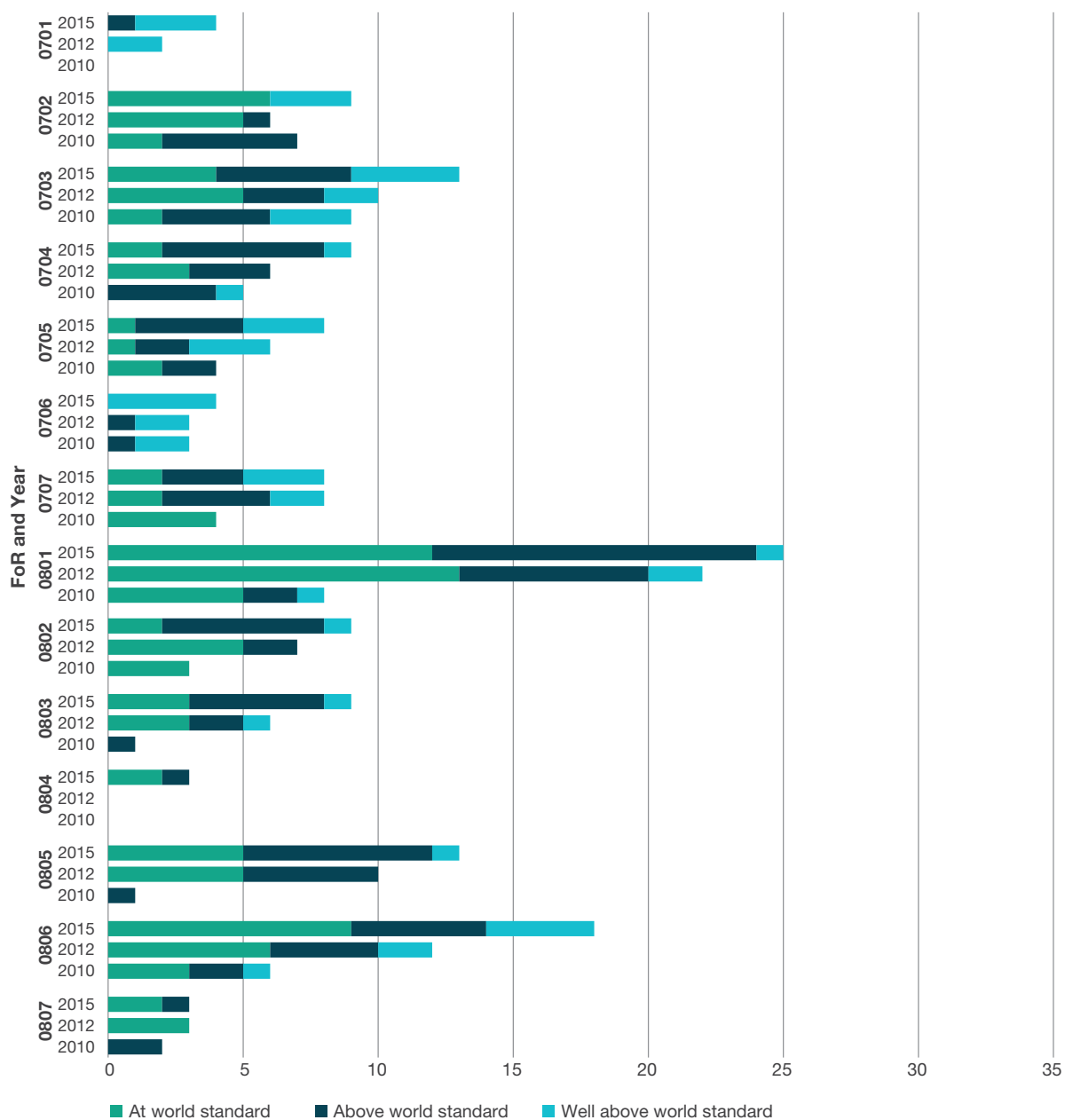
Note: There were no UoEs in FoR code 0199 that were rated at or above world standard in any ERA rounds.

**NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN
ERA 2015, ERA 2012, ERA 2010 — FOR CODES 0401–0699**



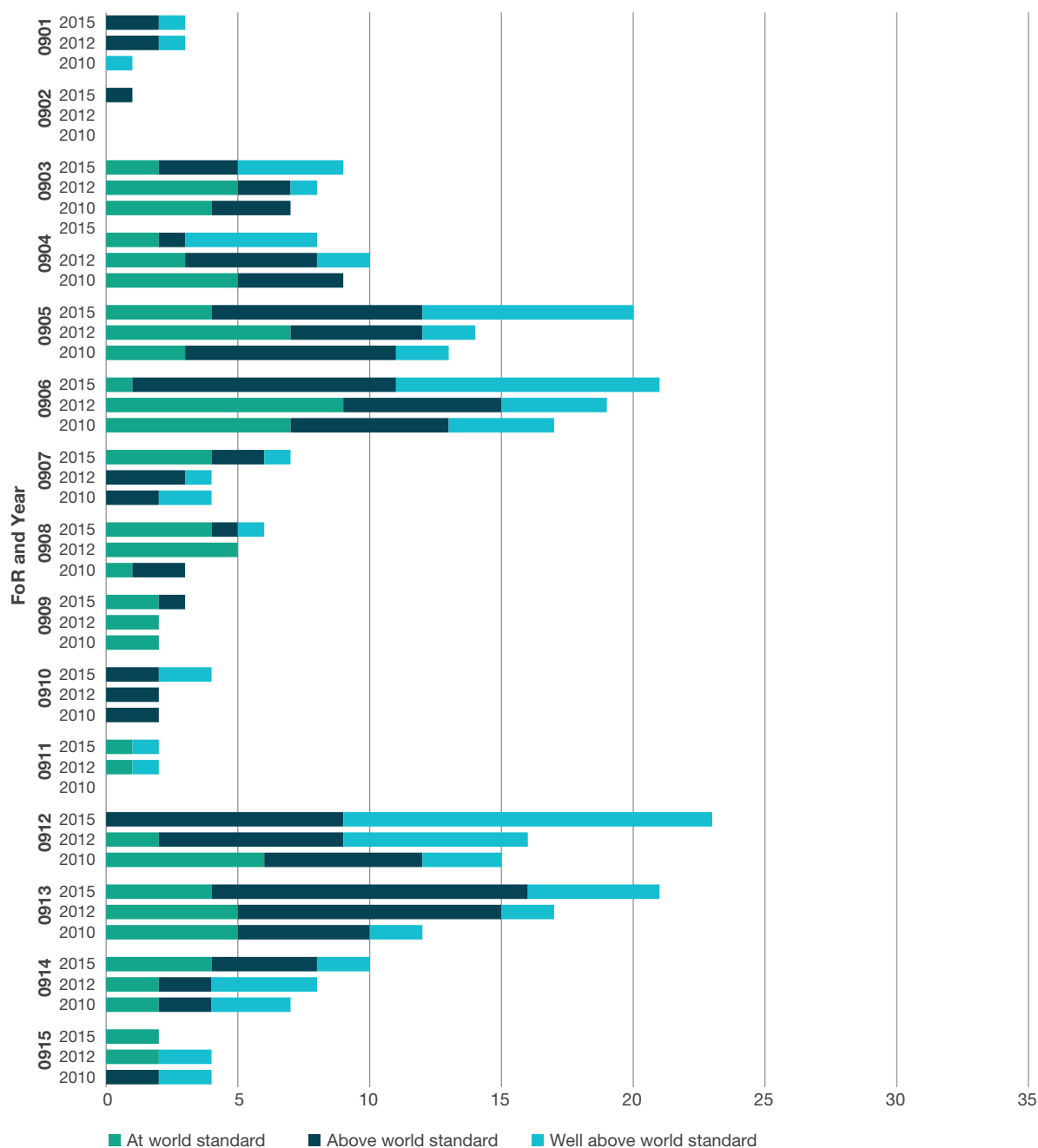
Note: There were no UoEs in FoR codes 0499 and 0599 that were rated at or above world standard in any ERA rounds.

NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN ERA 2015, ERA 2012, ERA 2010 – FOR CODES 0701–0899



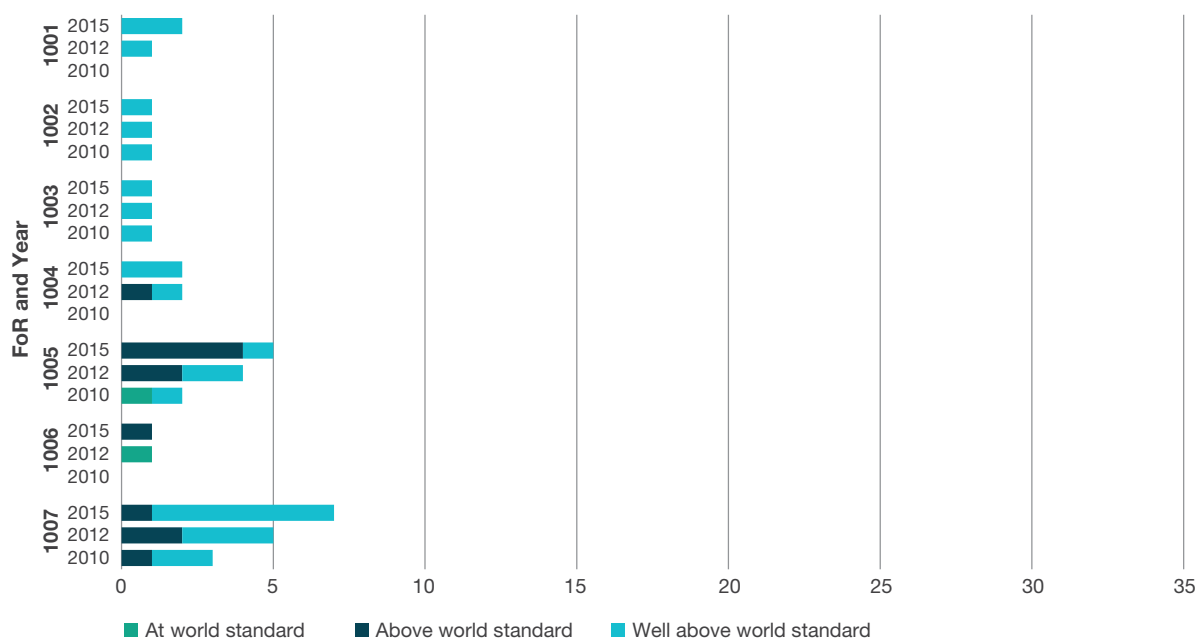
Note: There were no UoEs in FoR codes 0799 and 0899 that were rated at or above world standard in any ERA rounds.

**NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN
ERA 2015, ERA 2012, ERA 2010 — FOR CODES 0901–0999**



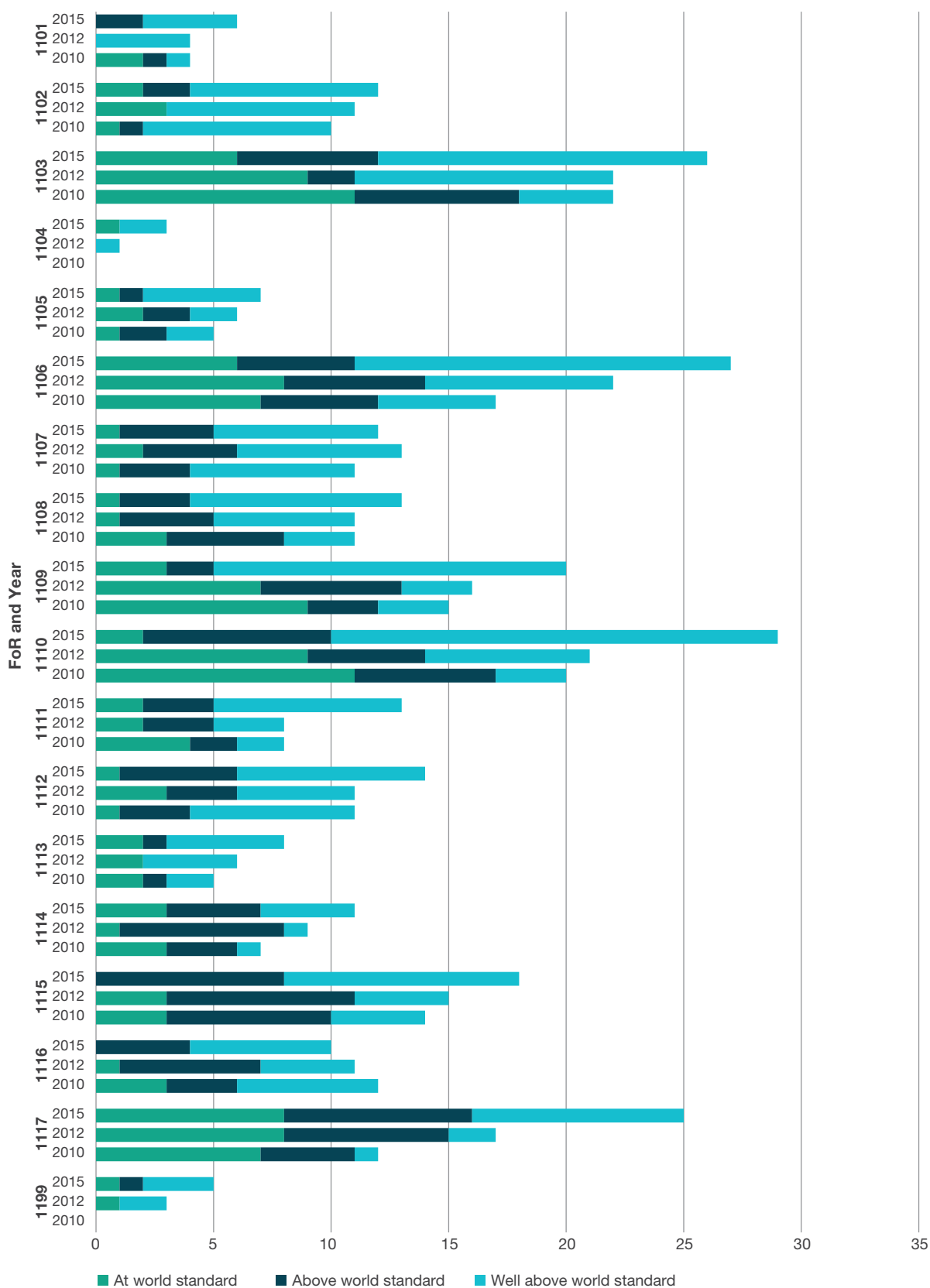
Note: There were no UoEs in FoR code 0999 that were rated at or above world standard in any ERA rounds.

NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FoR CODES IN ERA 2015, ERA 2012, ERA 2010 – FOR CODES 1001–1099

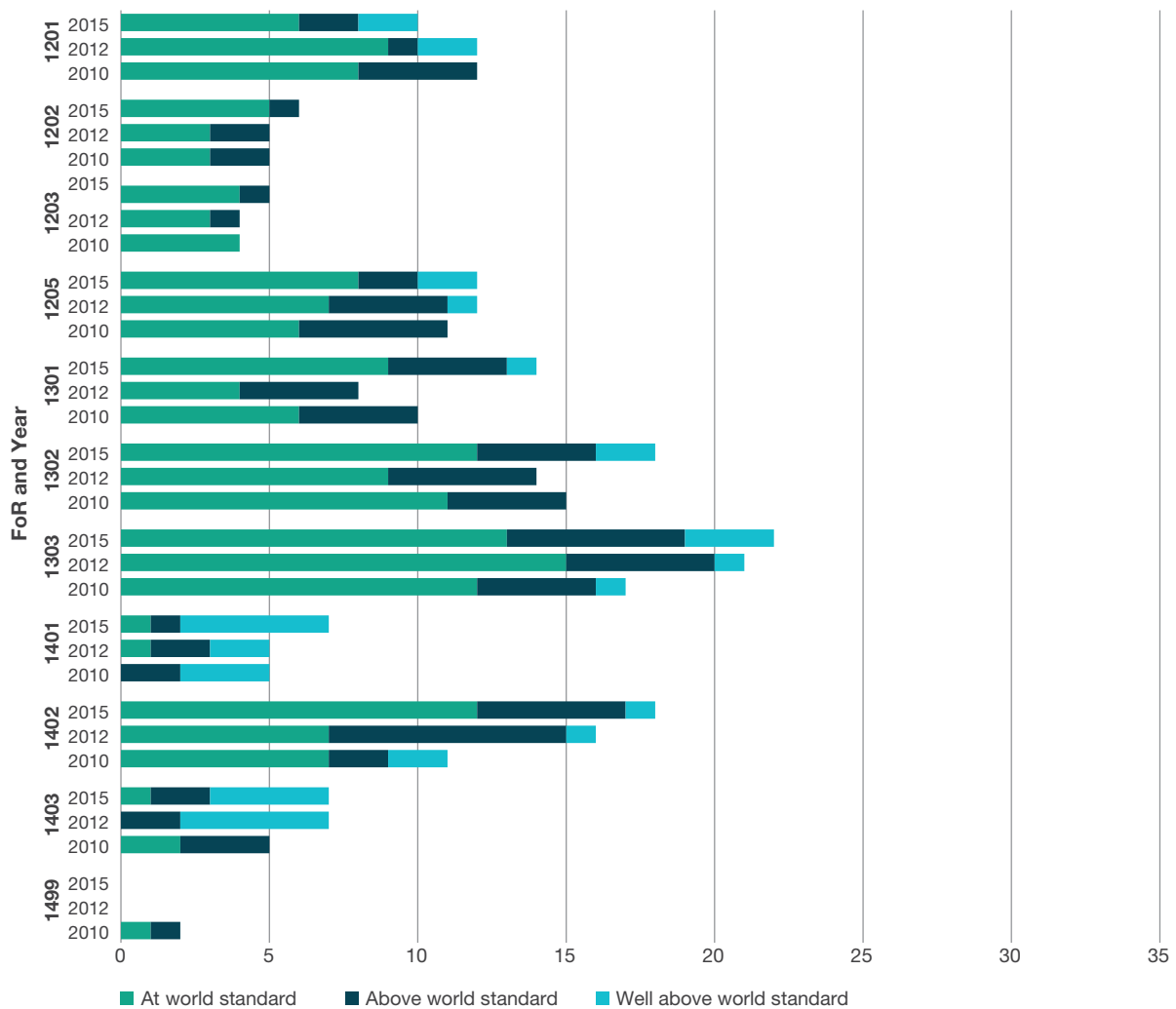


Note: There were no UoEs in FoR code 1099 that were rated at or above world standard in any ERA rounds.

**NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN
ERA 2015, ERA 2012, ERA 2010 — FOR CODES 1101–1199**

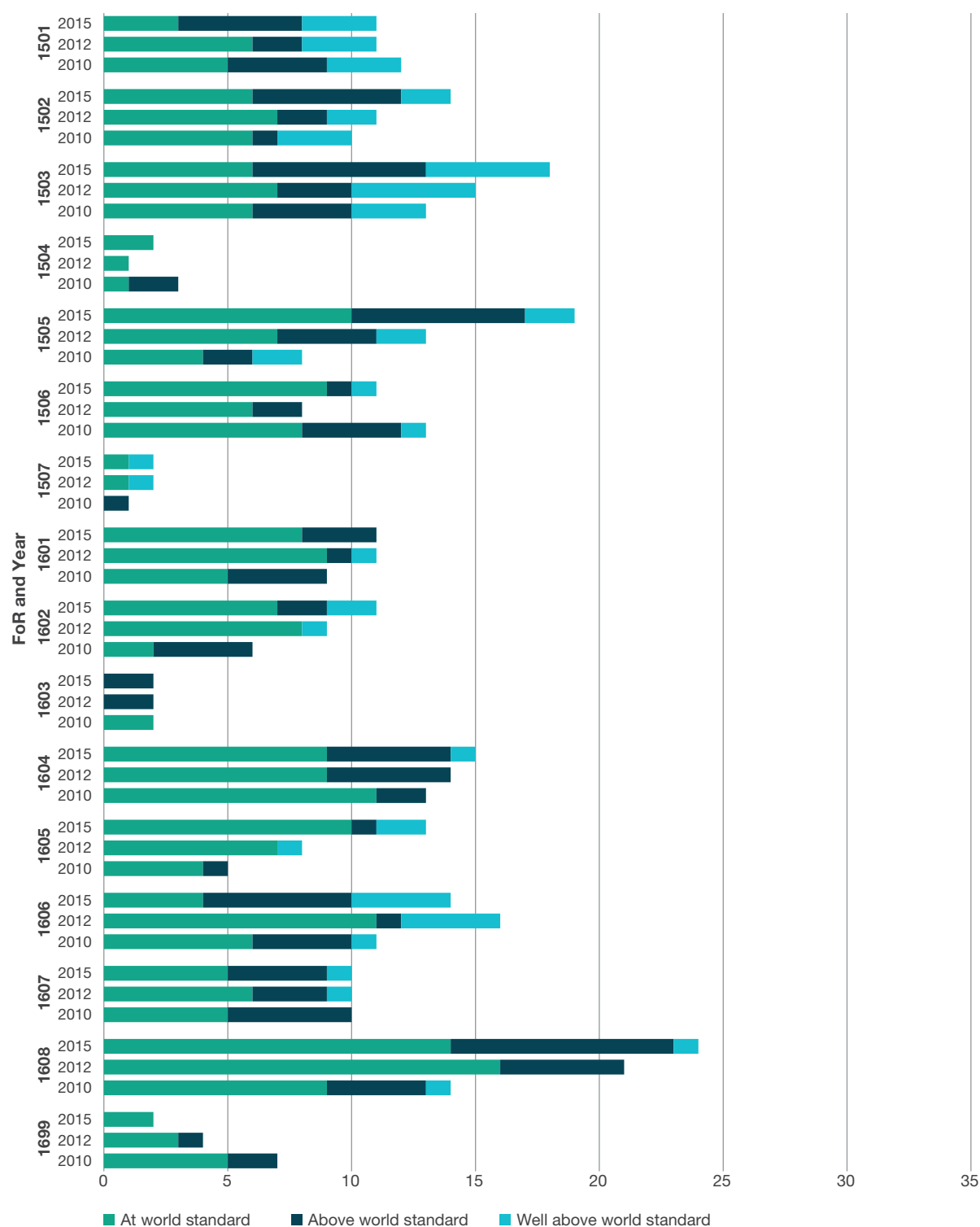


NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN ERA 2015, ERA 2012, ERA 2010 – FOR CODES 1201–1499



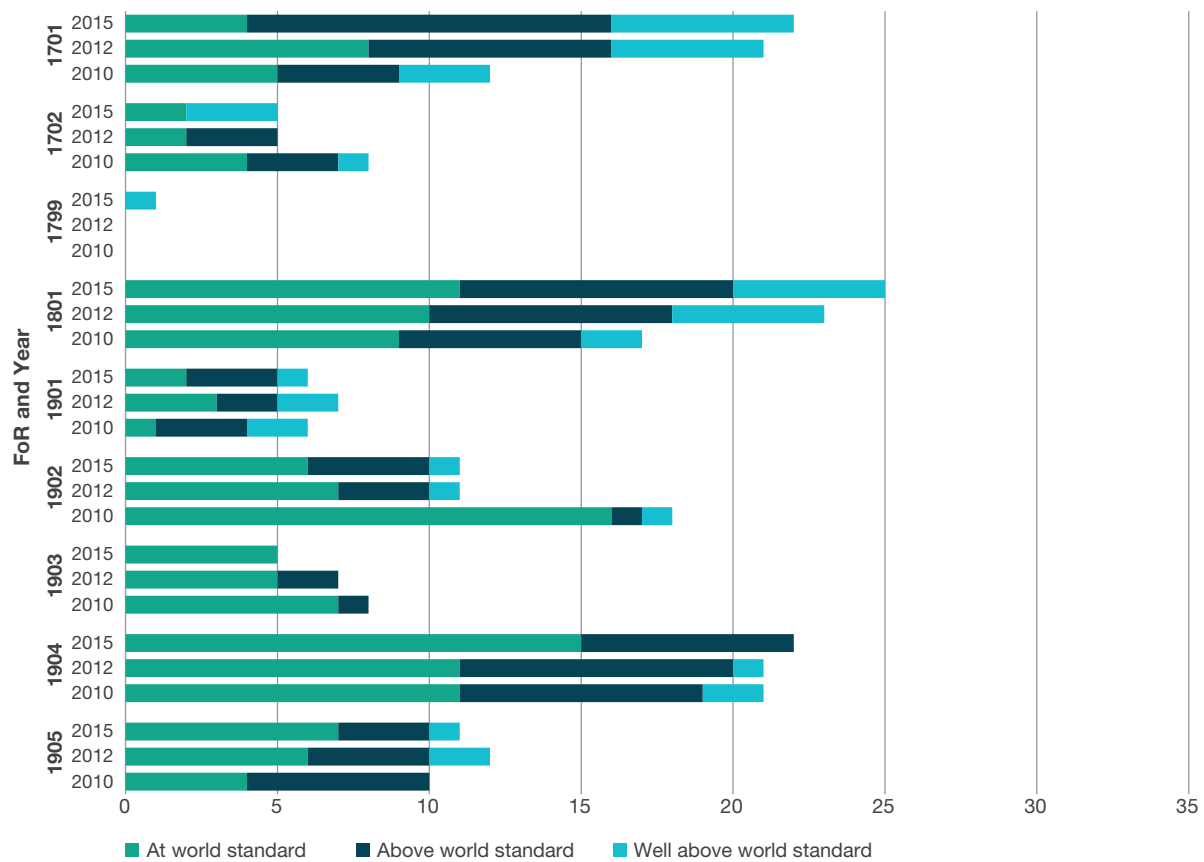
Note: There were no UoEs in FoR codes 1299 or 1399 that were rated at or above world standard in any ERA rounds.

**NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN
ERA 2015, ERA 2012, ERA 2010 – FOR CODES 1501–1699**



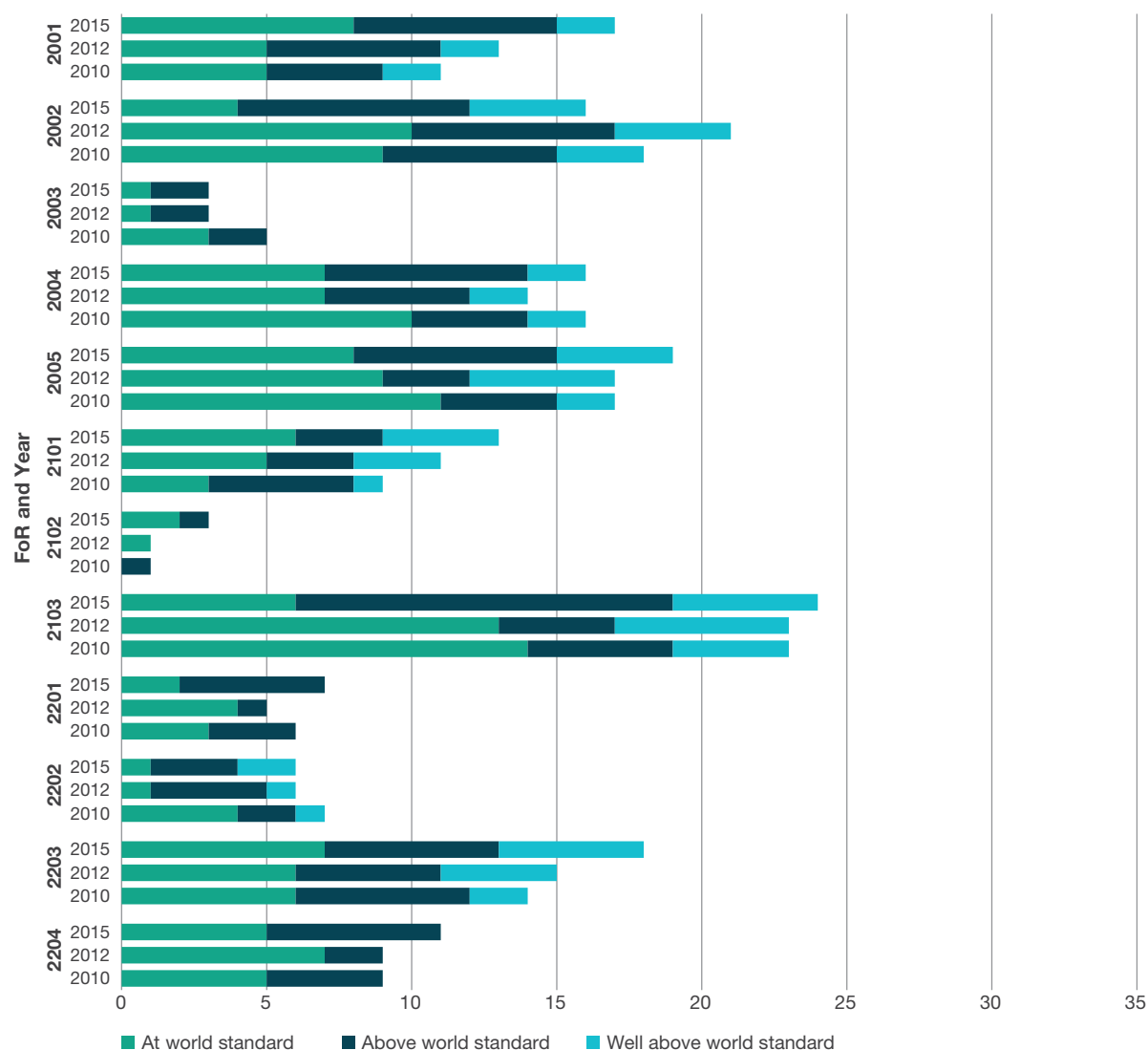
Note: There were no UoEs in FoR code 1599 that were rated at or above world standard in any ERA rounds.

NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN ERA 2015, ERA 2012, ERA 2010 – FOR CODES 1701–1999



Note: There were no UoEs in FoR codes 1802, 1899 or 1999 that were rated at or above world standard in any ERA rounds.

**NUMBER OF UOES RATED AT AND ABOVE WORLD STANDARD IN FOUR-DIGIT FOR CODES IN
ERA 2015, ERA 2012, ERA 2010 — FOR CODES 2001–2299**

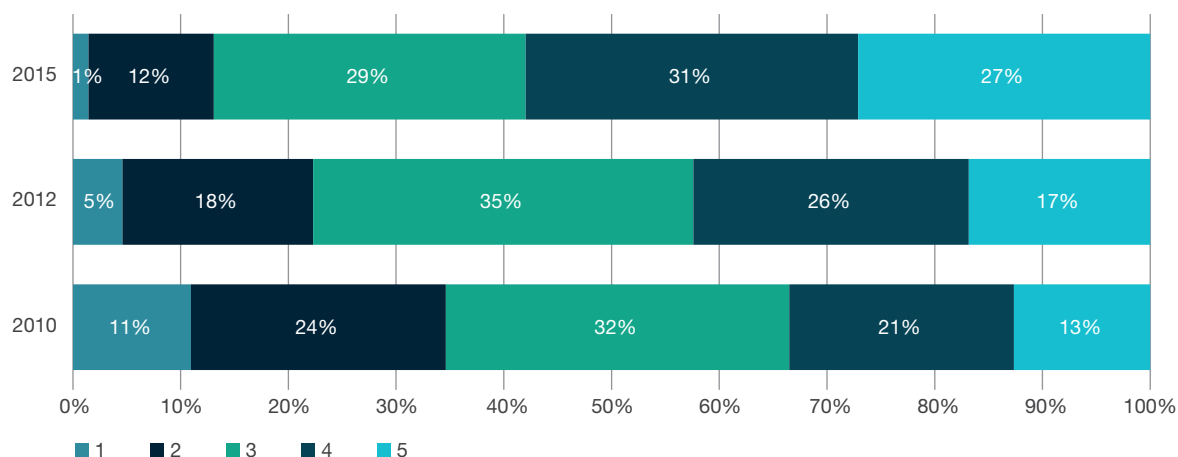


Note: There were no UoEs in FoR codes 2099, 2199 or 2299 that were rated at or above world standard in any ERA rounds.

Distribution of Ratings across all UoEs in the Three ERA Rounds

The chart shows changes in the distribution of ratings for ERA 2015, ERA 2012 and ERA 2010.

DISTRIBUTION OF RATINGS ACROSS ALL TWO- AND FOUR-DIGIT UOES



Note: The total number of UoEs evaluated changes between each ERA round. There were 2,435 UoEs assessed in ERA 2010, 2,323 UoEs assessed in ERA 2012 and 2,460 assessed ERA 2015.

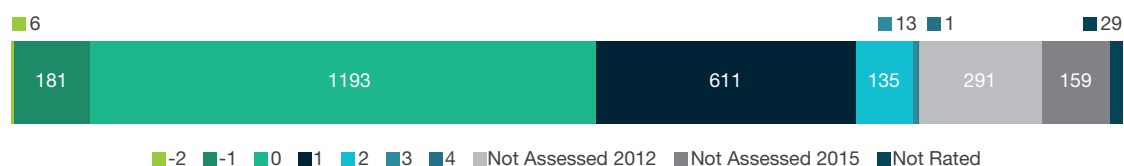
Improvement in Ratings between ERA 2015, ERA 2012 and ERA 2010

ERA 2015 outcomes show Australia's universities continue to produce high-quality research across a wide range of disciplines. Overall research quality is improving and reflects ERA's role in focussing universities on research quality. The ERA results show an extraordinary breadth of outstanding research performance in Australia. As well as a significant increase in the number of UoEs rated at 4 and 5, the outcomes also show a significant level of stability across the system. Of the UoEs assessed in both ERA 2015 and the previous ERA 2012 round (i.e. 2,140 UoEs), 56 per cent of these maintained the same rating, while 29 per cent improved their rating by one.

When comparing the results of individual UoEs in the two ERA rounds in 2012 and 2015 (see chart below), analysis shows that out of 2,619 UoEs that were assessed either in ERA 2012 or ERA 2015:

- › 1,193 UoEs that were assessed in ERA 2015 retained their original rating from 2012
- › 611 UoEs received a rating that was one rating higher in 2015
- › 291 UoEs that were assessed in 2015 were not assessed in 2012
- › 159 UoEs were assessed in 2012 but not in 2015.

RATING CHANGES BETWEEN ERA 2012 AND ERA 2015



Note: In addition, there were 29 UoEs that were assessed but not rated in 2015.

For comparison the rating changes between ERA 2010 and ERA 2012 are shown in the following chart:

- › 1,090 UoEs that were assessed in ERA 2012 retained their original rating from 2010
- › 563 UoEs received a rating that was one rating higher in 2012
- › 280 UoEs that were assessed in 2012, were not assessed in 2010
- › 345 UoEs were assessed in 2010 but not in 2012.

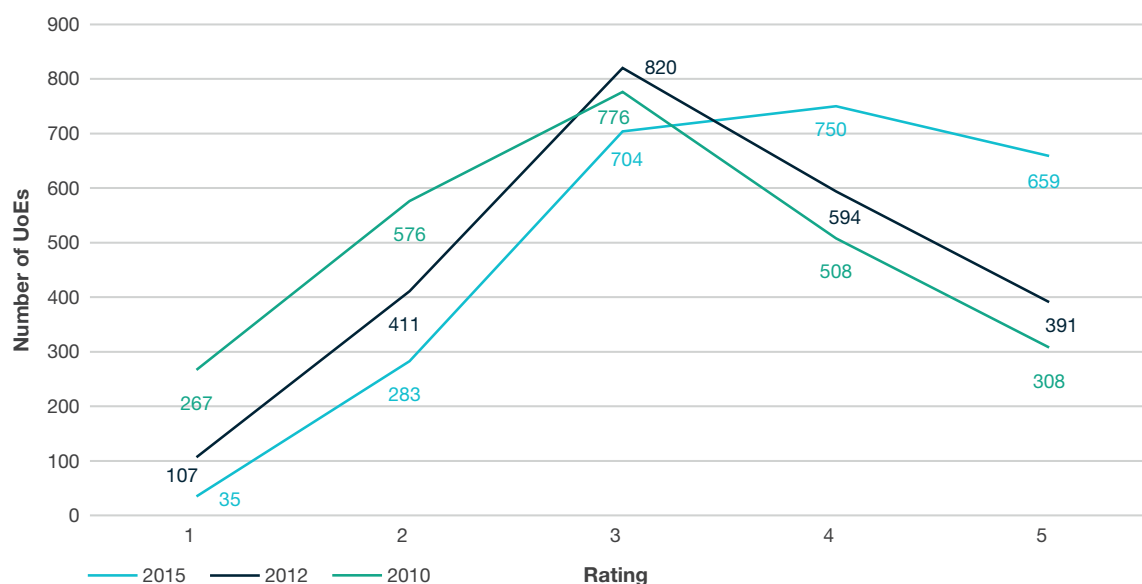
RATING CHANGES BETWEEN ERA 2010 AND ERA 2012



Note: In ERA 2010 committees had different Fields of Research codes assigned to them compared with ERA 2012 and ERA 2015. Where a code was split and rated twice in two different committees, the higher rating was chosen for the above table (this resulted in 2,388 unique UoEs out of the total number of 2,435 in ERA 2010).

The ERA 2015 research quality assessment has revealed a significant improvement for the research conducted in Australian universities within the six year reference period. The chart below shows that the number of UoEs rated at above and well above world standard (i.e. ratings 4 and 5) has increased from 985 two- and four-digit UoEs in ERA 2012 to 1,409 UoEs in ERA 2015. At the same time, the number of UoEs receiving a rating of one, two or three fell from 1,338 two- and four-digit UoEs in ERA 2012 to 1,022 UoEs in ERA 2015. This change is greater than the marginal improvement between 2010 and 2012 assessment, bearing in mind that the gap between ERA 2012 and ERA 2015 was three years apart whereas the gap between ERA 2010 and ERA 2012 was only two years apart.

DISTRIBUTION OF THE NUMBER OF UOES BY RATING (TWO- AND FOUR-DIGIT FORs)





The background of the entire page is a marbled paper pattern, featuring swirling, organic shapes in various shades of teal, blue, and white. A solid teal horizontal band runs across the middle of the page, serving as a backdrop for the section header.

SECTION 2

Gender and the Research Workforce

In the ERA 2015 evaluation round, gender data was collected for the first time. Institutions were required to submit gender data for each eligible researcher. The gender of the eligible researcher was reported as either 'male', 'female', or 'other'. Gender data was used for aggregate reporting and analysis purposes only. This data was not made available to peer reviewers or Research Evaluation Committees (RECs) and did not form part of the evaluation process. The gender data that was reported by eligible institutions is shown in the tables in this section and will provide a baseline for analysis in future rounds.

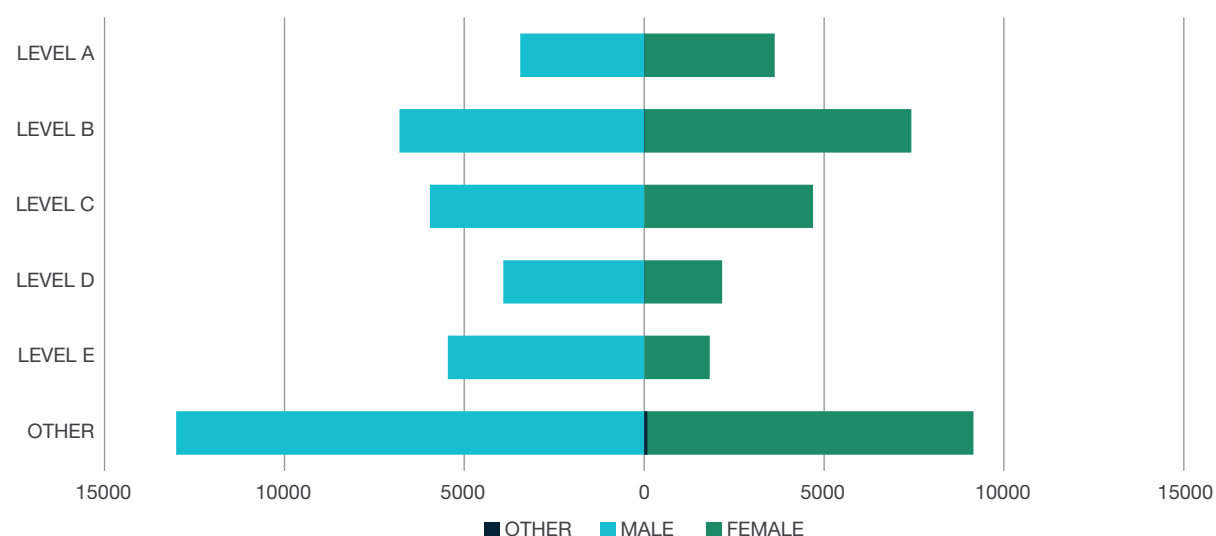
The total number of researchers by headcount reported to ERA 2015 was 67,579 researchers, the majority of the researchers were males which made up 57.12% (38,598 researchers) compared to females which made up 42.74% (28,880 researchers) and the remaining reported as other gender 0.15% (101 researchers). However, when examining the specific Fields of Research (FoR) codes, in some disciplines there was a greater share of female researchers.

Headcount by Gender by Employment Level (Two-digit FoRs)

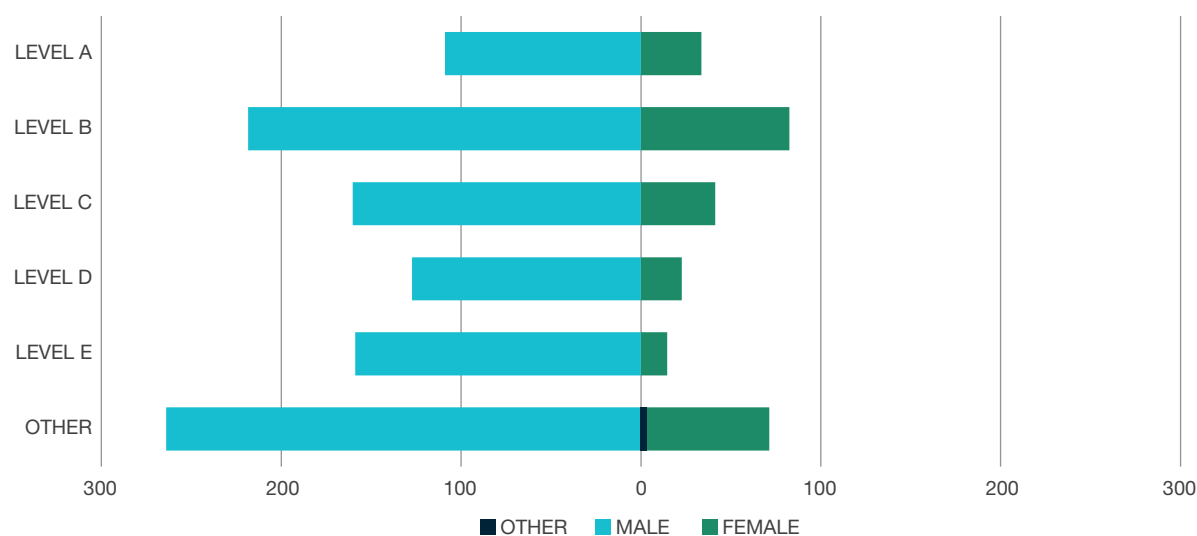
The following charts show the headcount of staff by gender and include the employment levels collected for ERA purposes, academic levels A–E and 'other' employment level:

- › Level A – Tutor/Associate Lecturer
- › Level B – Lecturer
- › Level C – Senior Lecturer
- › Level D – Reader/Associate Professor
- › Level E – Professor
- › 'Other', as an employment level, represents staff members who are eligible researchers but cannot be assigned to one of the Levels A–E (e.g. general staff and academics occupying management positions).

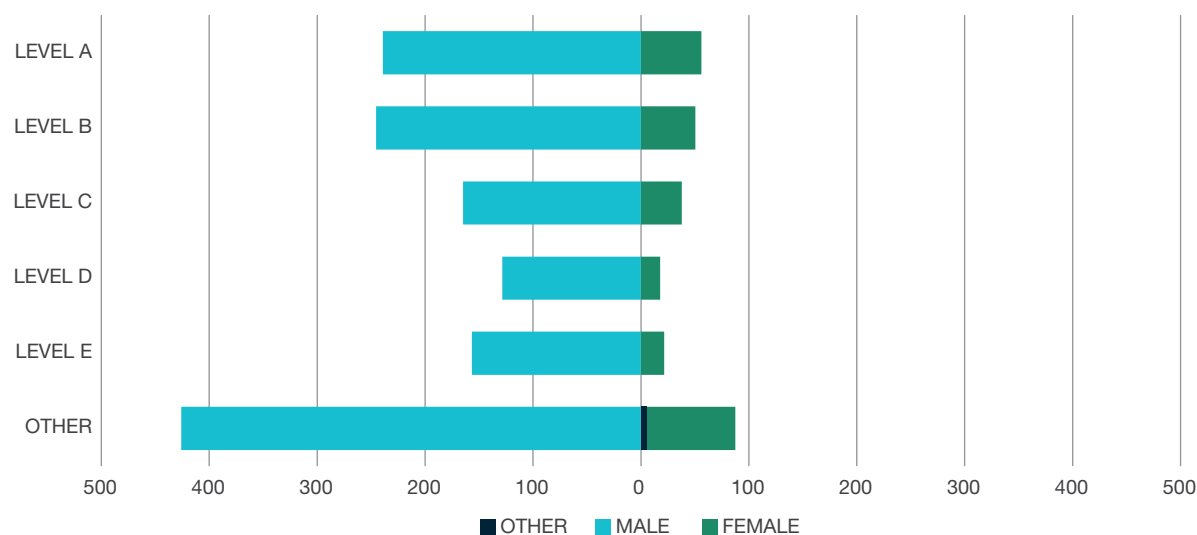
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL – ALL DISCIPLINES



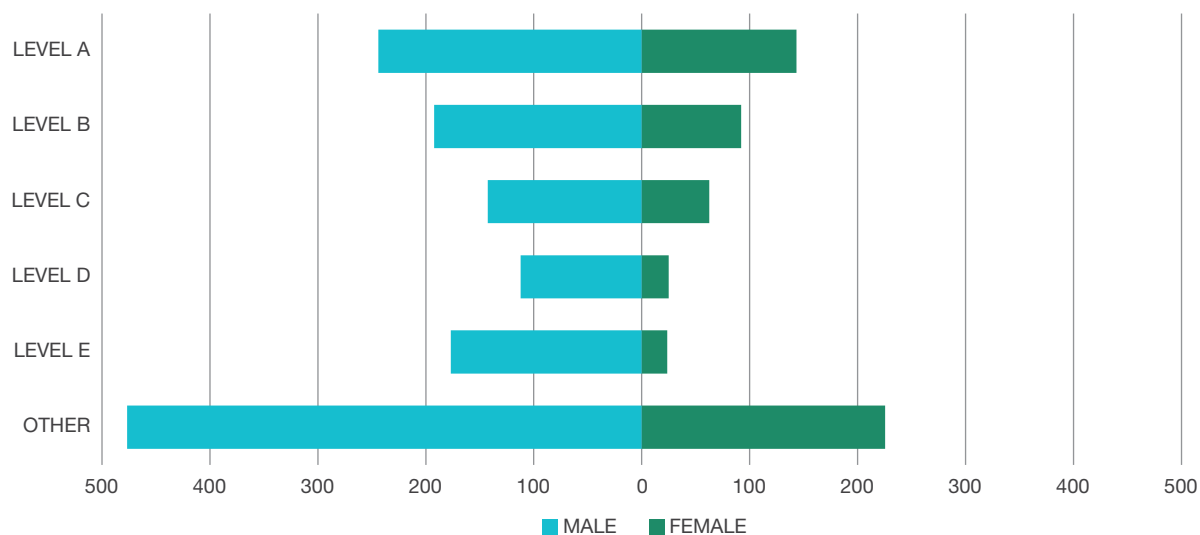
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 01 MATHEMATICAL SCIENCES



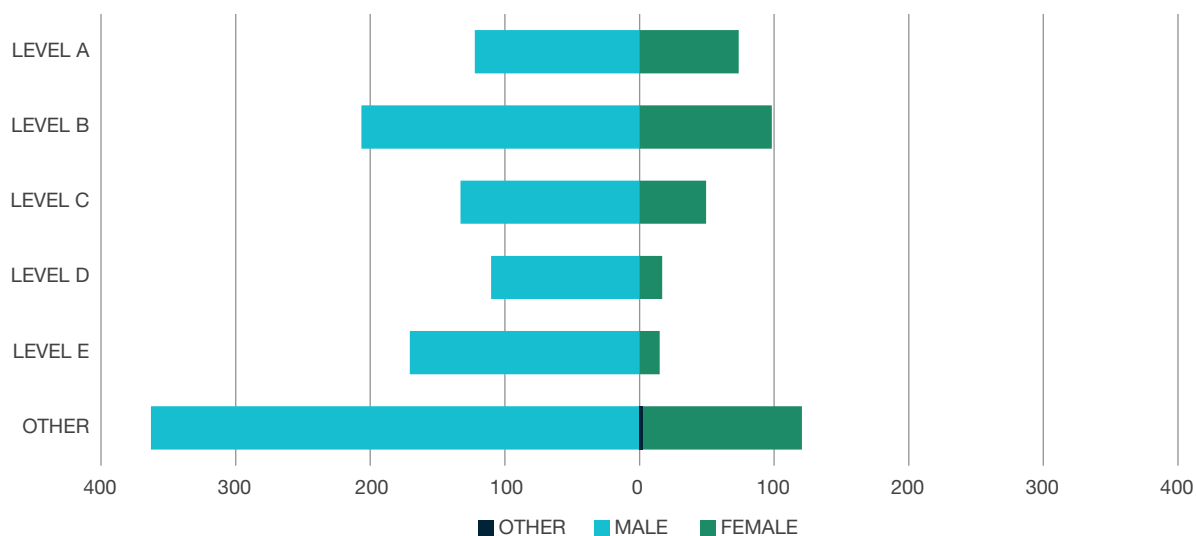
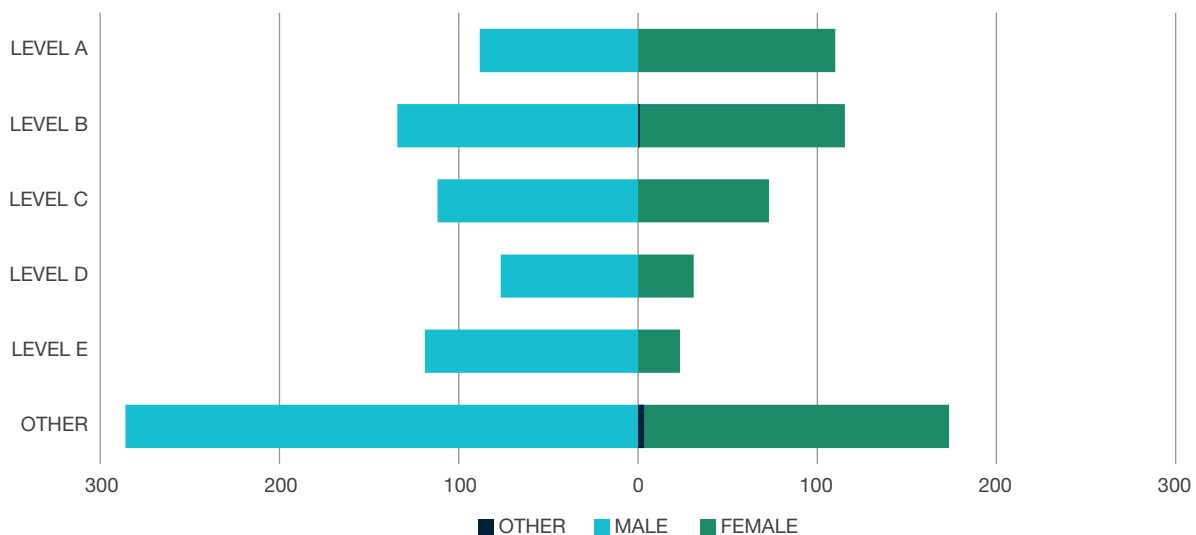
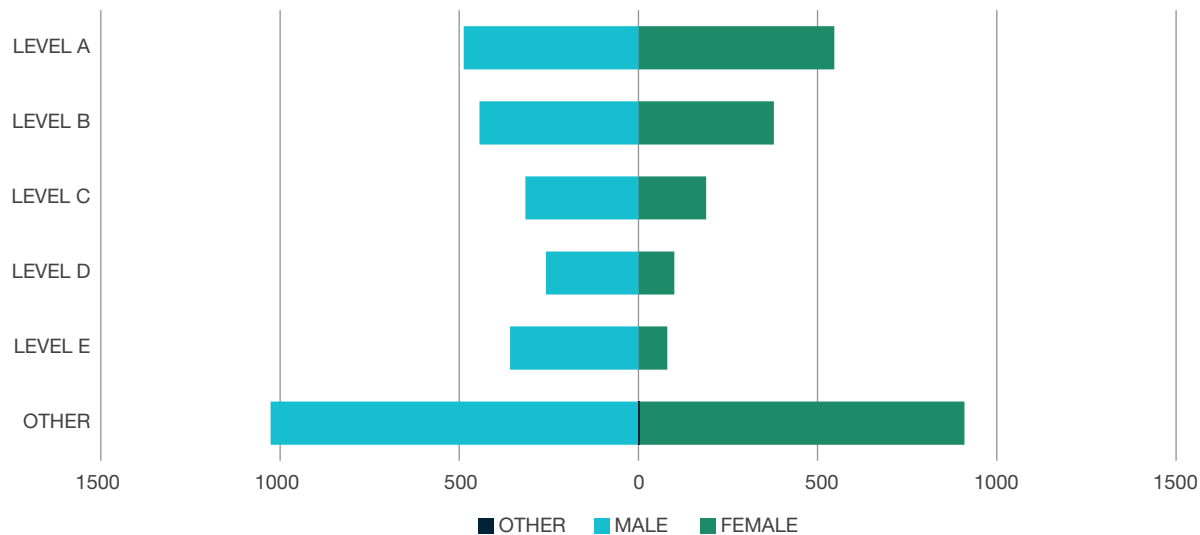
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 02 PHYSICAL SCIENCES



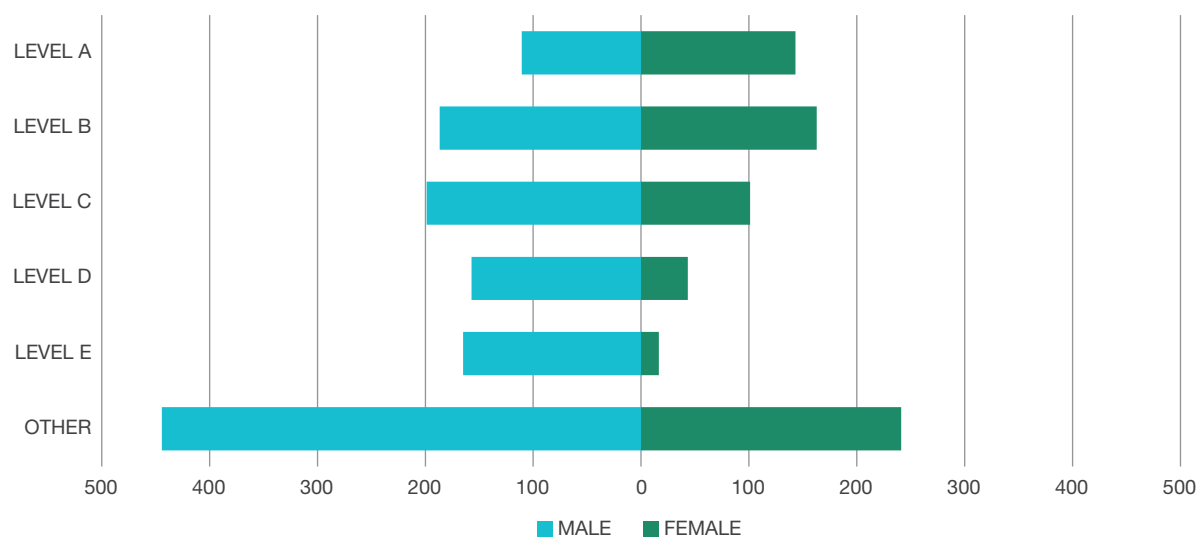
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 03 CHEMICAL SCIENCES



Note: there were no researchers reported as 'Other' for gender in this FoR.

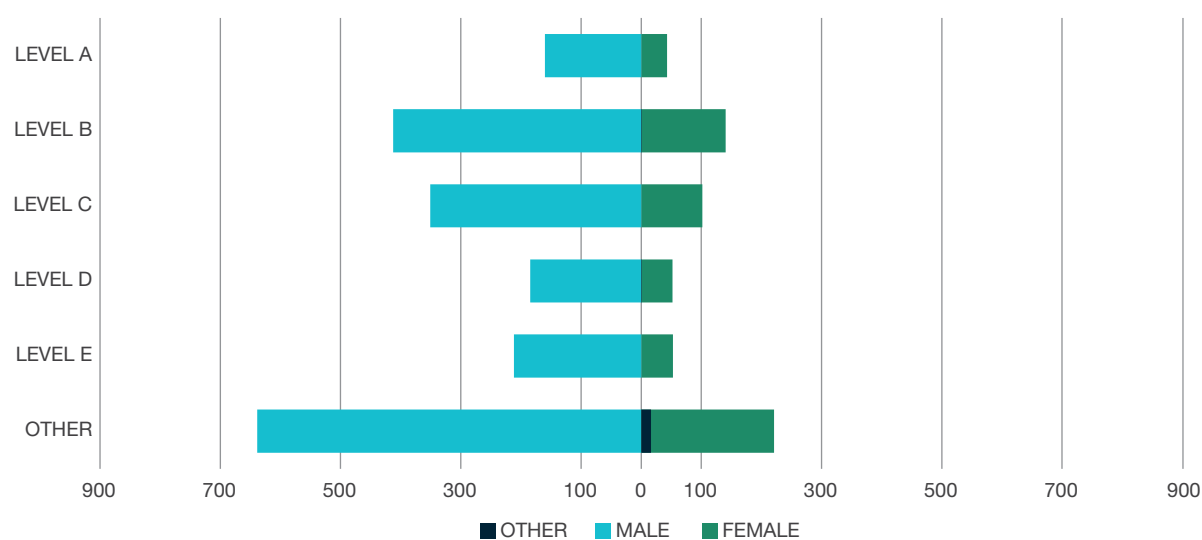
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 04 EARTH SCIENCES**HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 05 ENVIRONMENTAL SCIENCES****HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 06 BIOLOGICAL SCIENCES**

HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 07 AGRICULTURAL AND VETERINARY SCIENCES

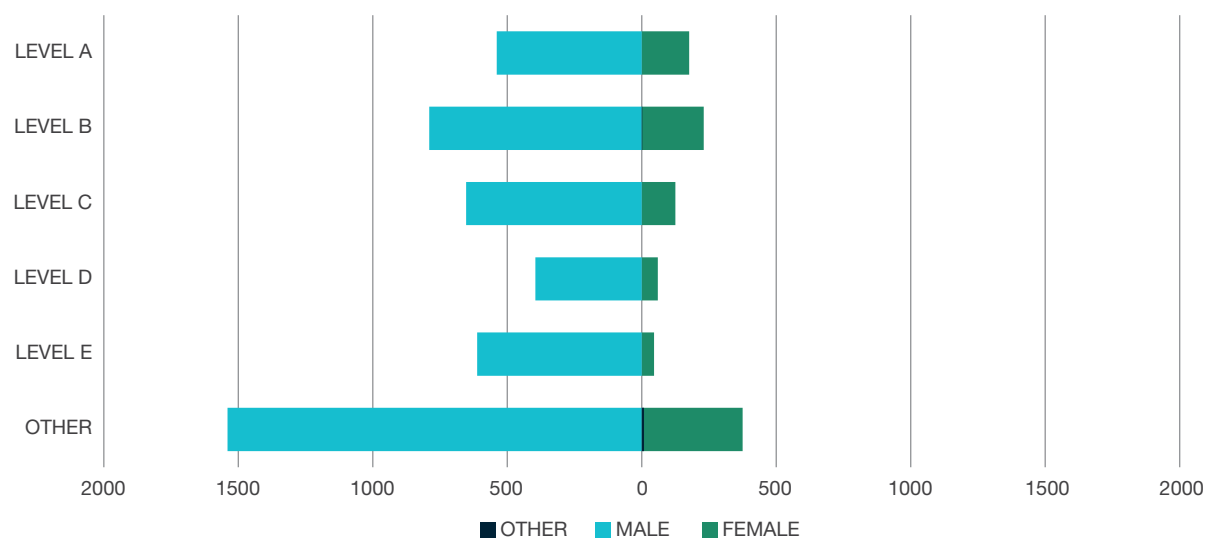


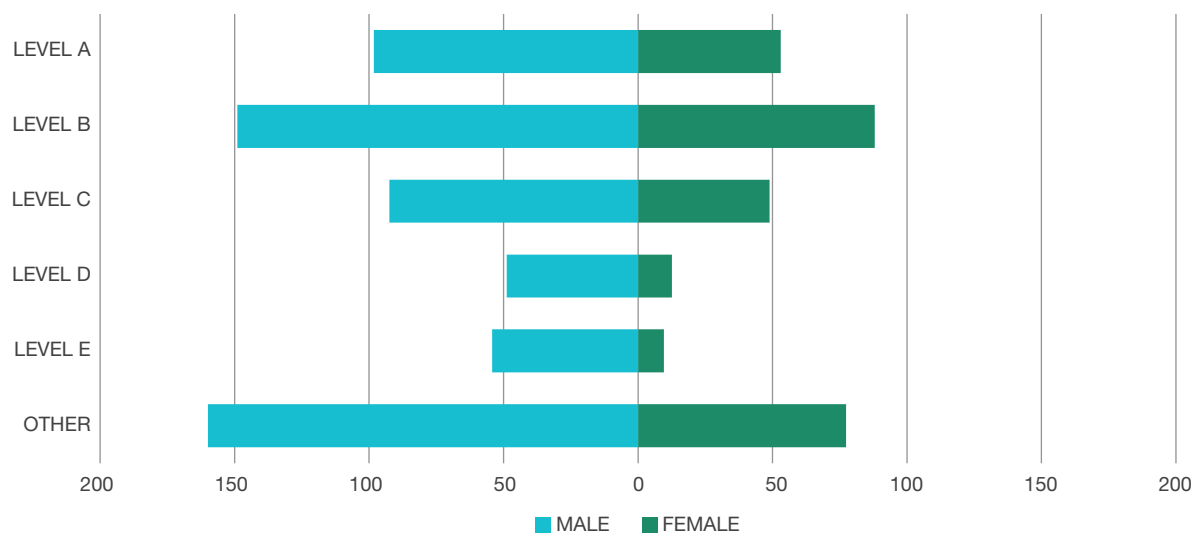
Note: there were no researchers reported as 'Other' for gender in this FoR.

HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 08 INFORMATION AND COMPUTING SCIENCES

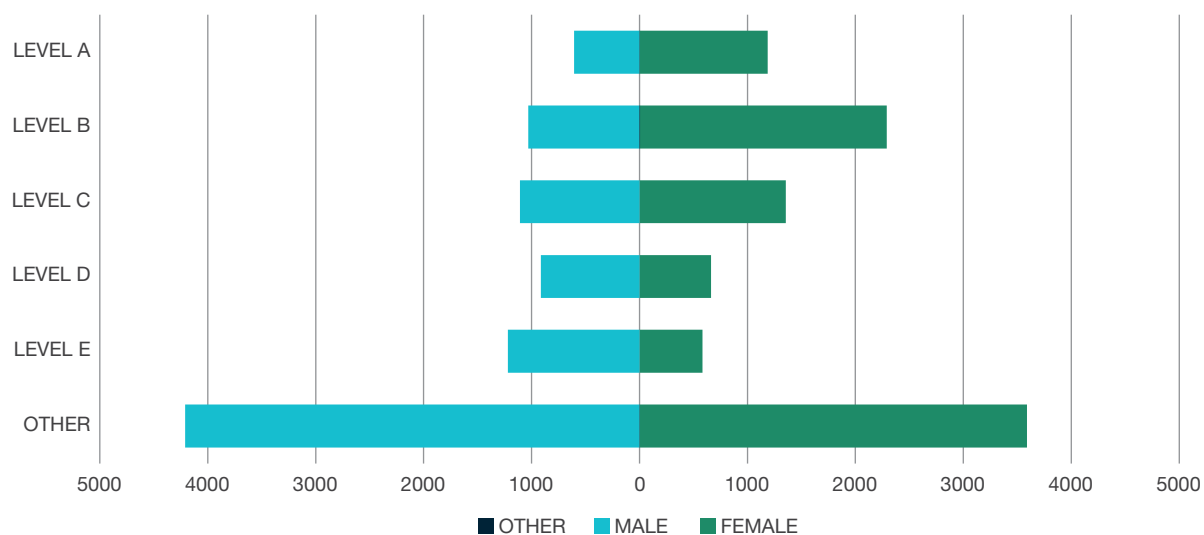
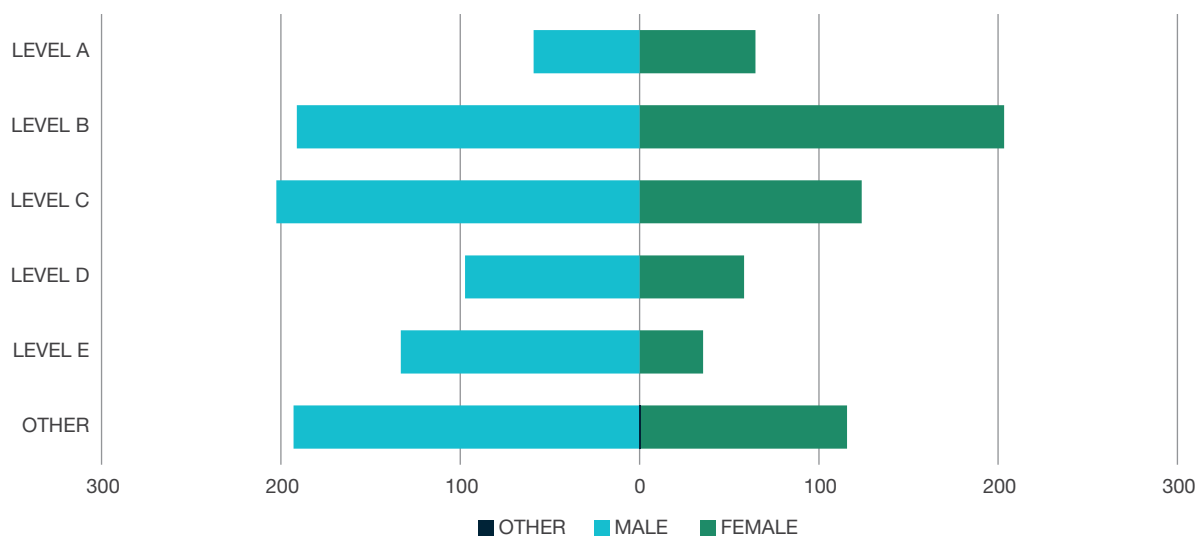


HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 09 ENGINEERING

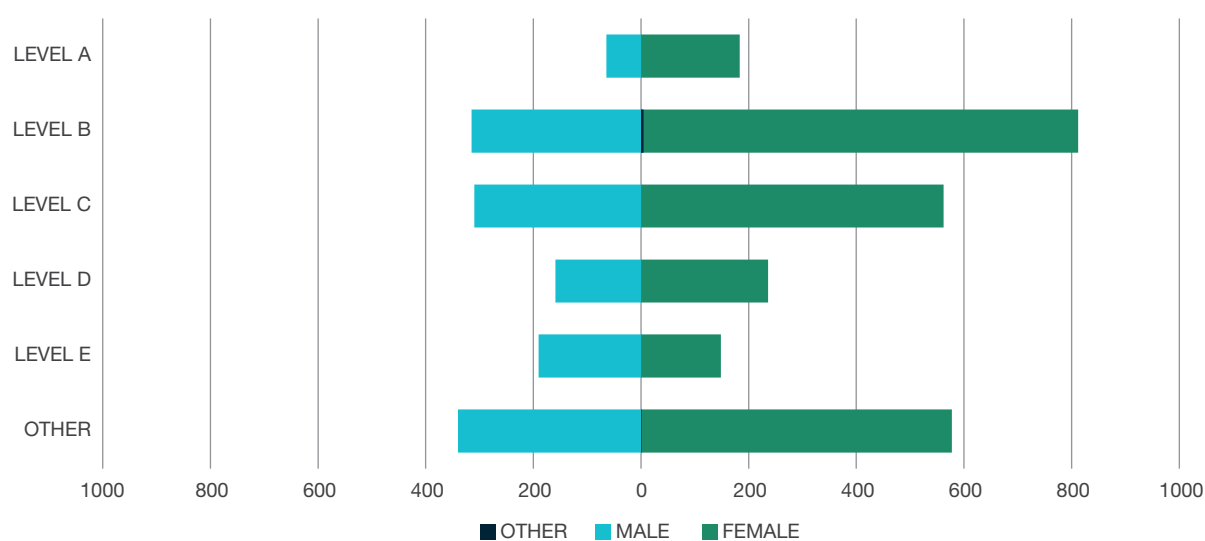


HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 10 TECHNOLOGY

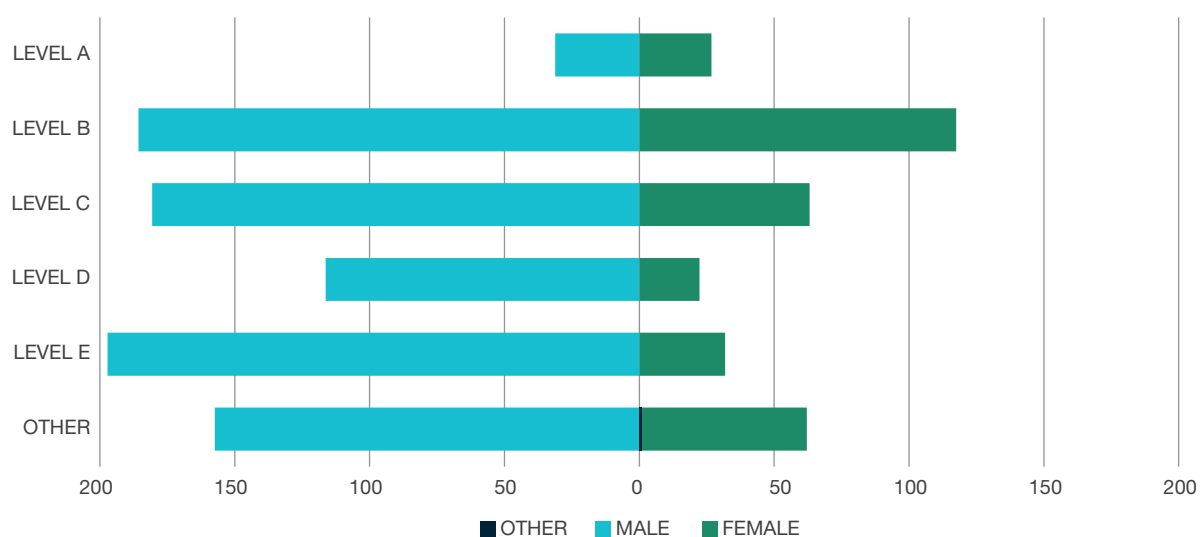
Note: there were no researchers reported as 'Other' for gender in this FoR.

HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 11 MEDICAL AND HEALTH SCIENCES**HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 12 BUILT ENVIRONMENT AND DESIGN**

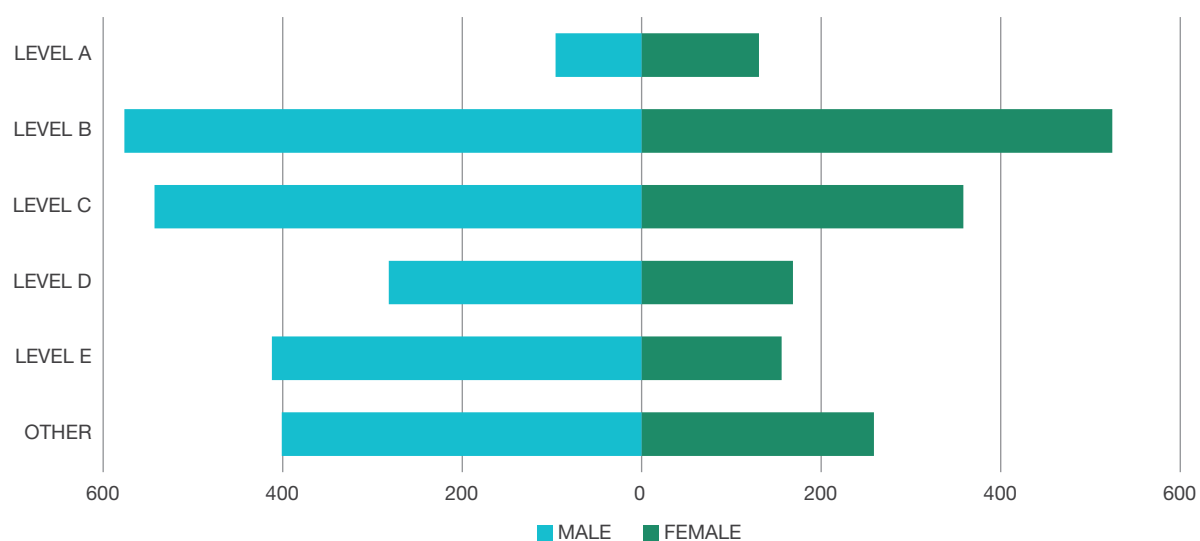
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 13 EDUCATION



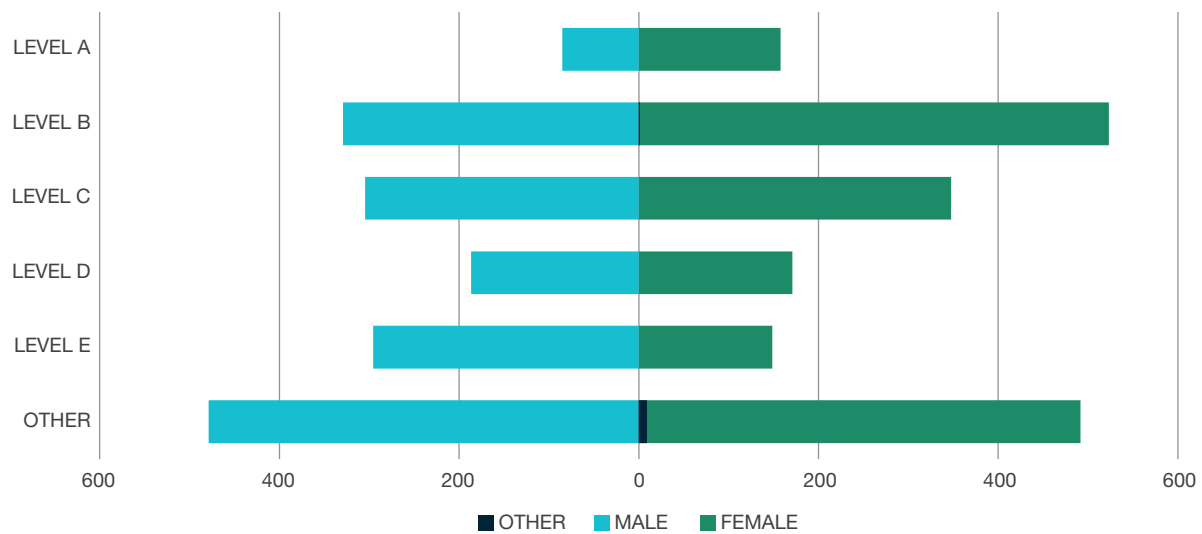
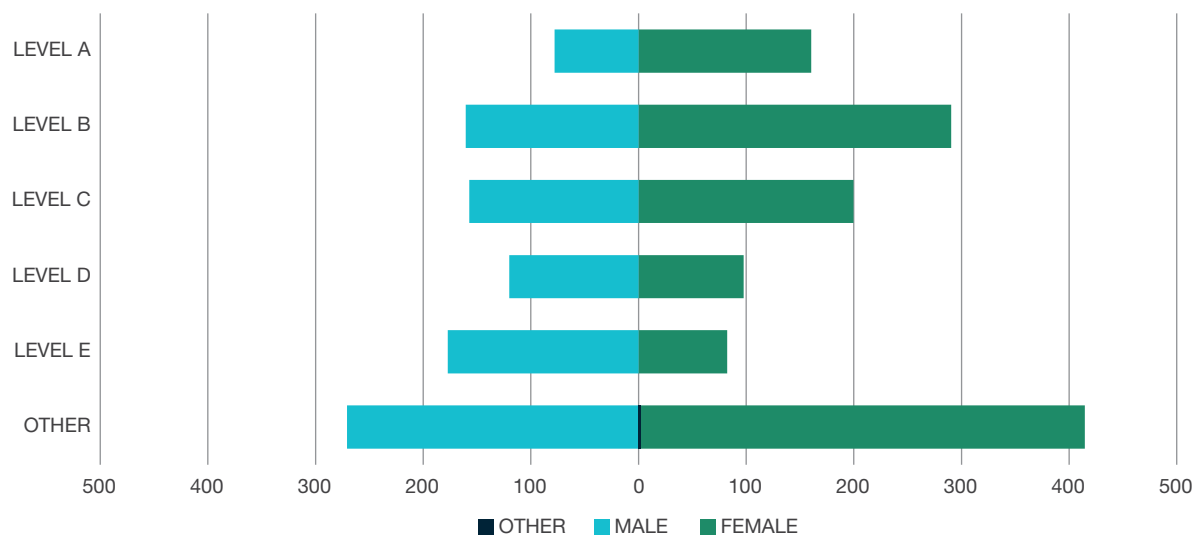
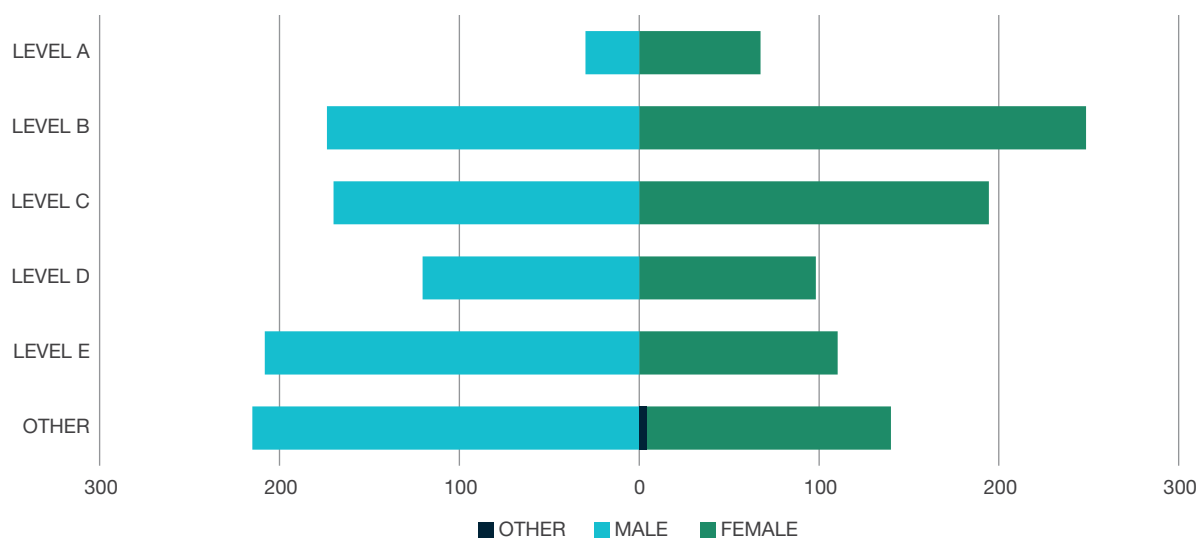
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 14 ECONOMICS



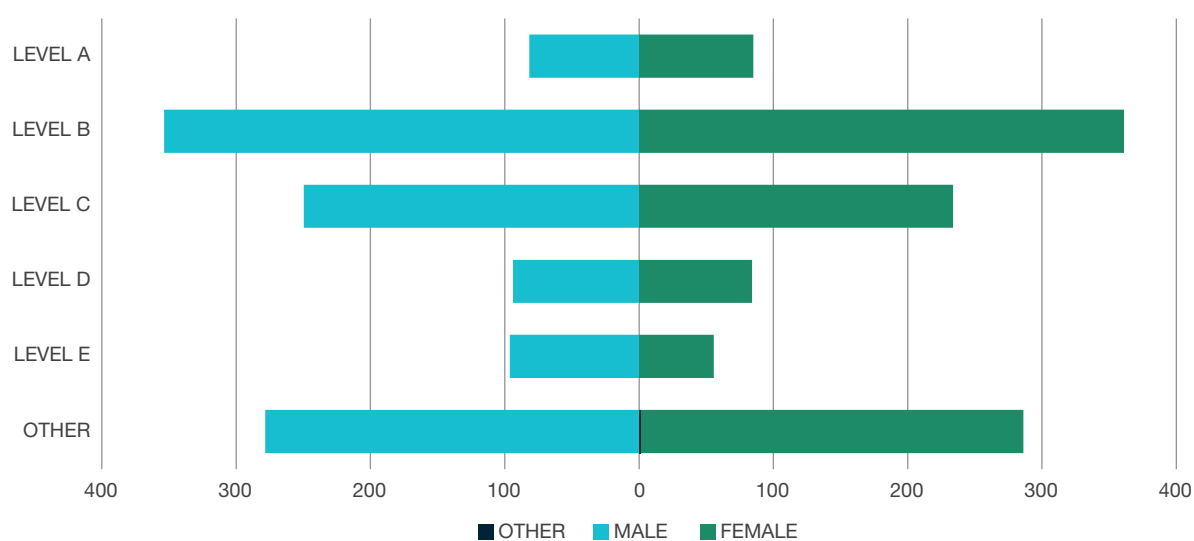
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 15 COMMERCE, MANAGEMENT, TOURISM AND SERVICES



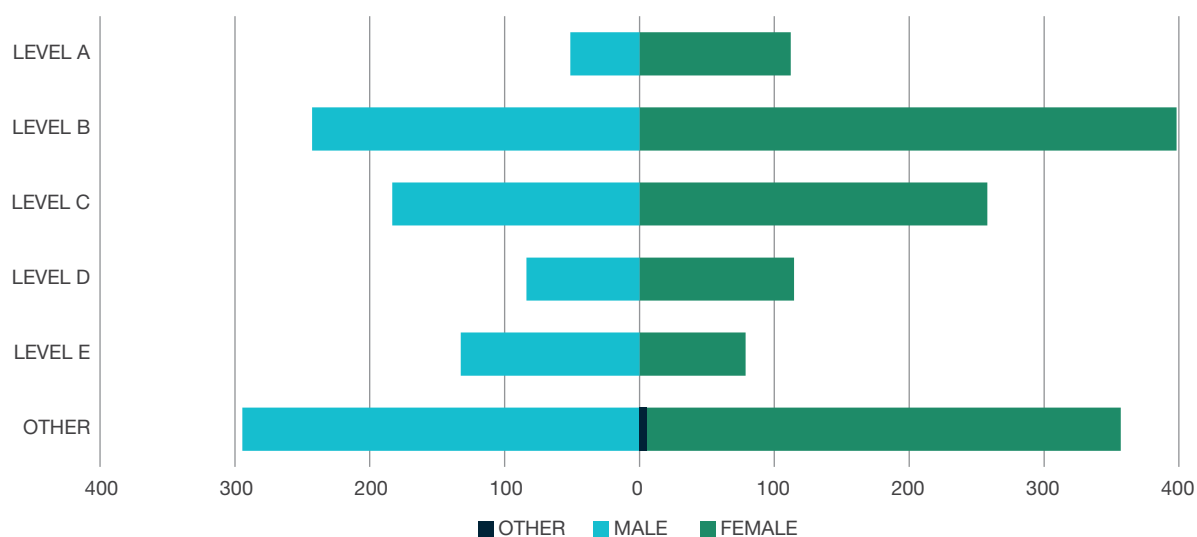
Note: there were no researchers reported as 'Other' for gender in this FoR.

HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 16 STUDIES IN HUMAN SOCIETY**HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 17 PSYCHOLOGY AND COGNITIVE SCIENCES****HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 18 LAW AND LEGAL STUDIES**

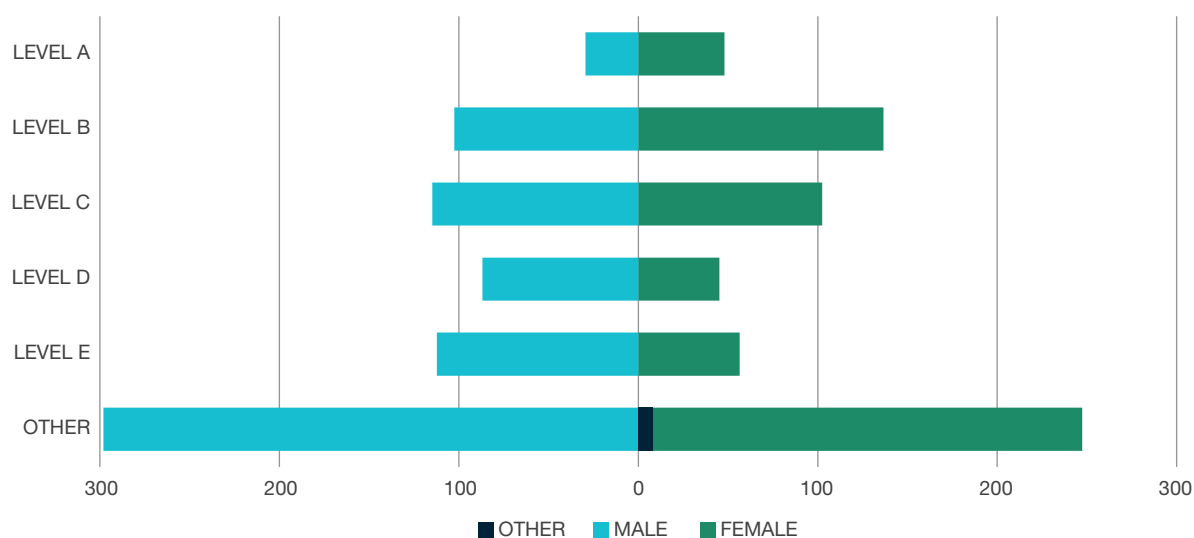
HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 19 STUDIES IN CREATIVE ARTS AND WRITING

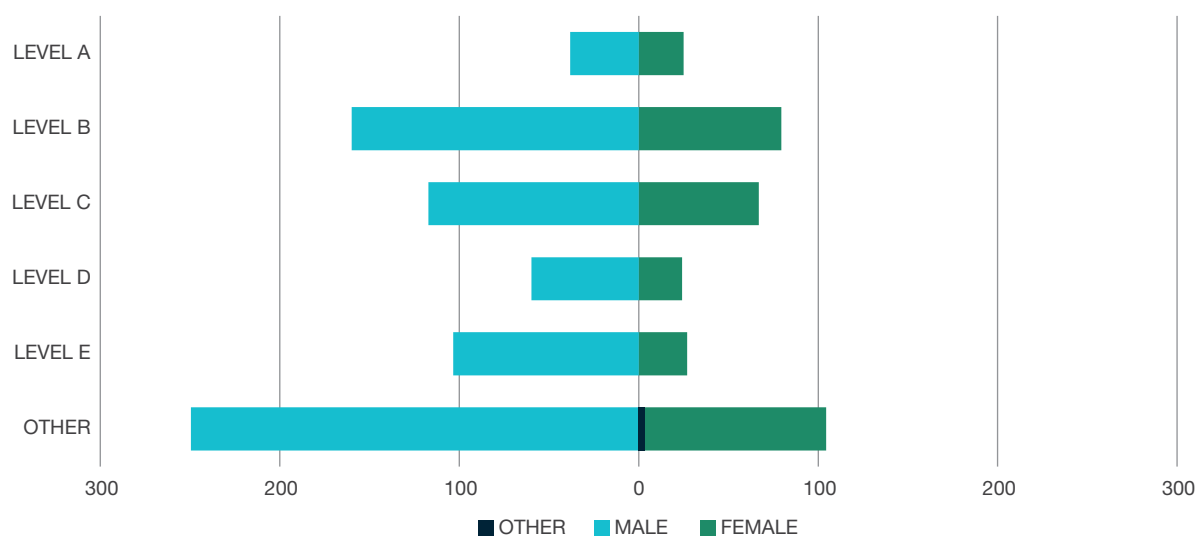


HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 20 LANGUAGE, COMMUNICATION AND CULTURE



HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 21 HISTORY AND ARCHAEOLOGY

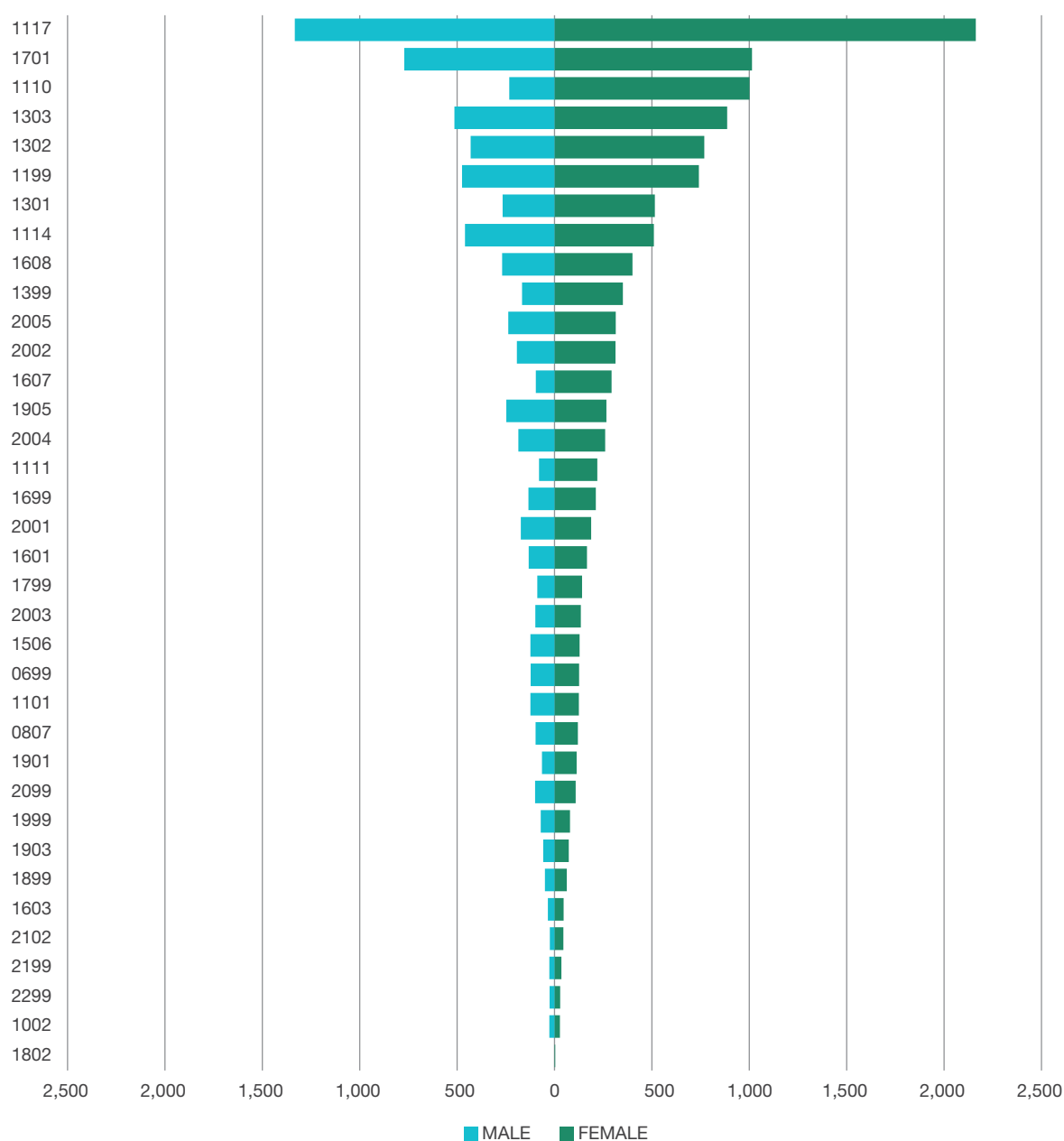


HEADCOUNT BY GENDER BY EMPLOYMENT LEVEL — 22 PHILOSOPHY AND RELIGIOUS STUDIES

Four-digit FoR codes where Headcount of Female Researchers exceeds Male Researchers

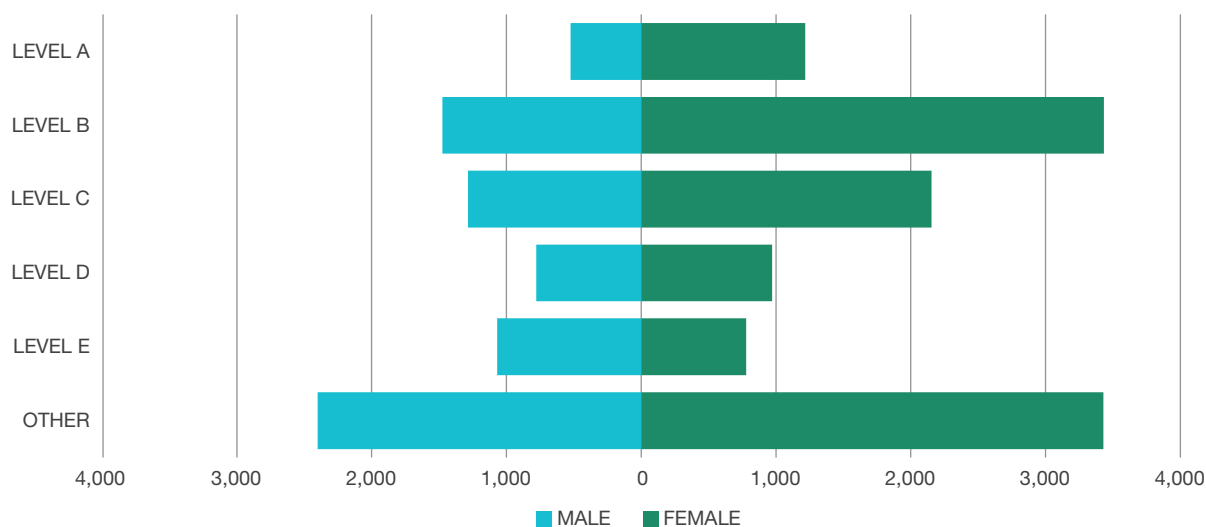
The following gender chart identifies the Fields of Research (FoR) codes that have more female than male researchers. Out of a possible 157 codes there are 35 FoR where more than half of the researchers in the Fields of Research are female. The FoR codes with largest number of female researchers are 1117 Public Health and Health Services with 2,163.5 female researchers from the total of 3,498.3 researchers followed by 1701 Psychology with 1,013.3 female researchers from the total of 1,784.5 researchers. The total number of researchers included in these FoR codes is 19,514.8, with 11,982.9 female researchers, and 7,531.9 are male researchers. (Note: There are also 22.6 researchers in these FoR groups who identified their gender as 'Other' that are excluded from the following three charts).

FOUR-DIGIT FORS WITH A GREATER NUMBER OF FEMALE THAN MALE RESEARCHERS



The following chart shows the headcount of staff by gender by academic level and includes the levels collected for ERA purposes, academic levels A–E and ‘Other’ employment level.

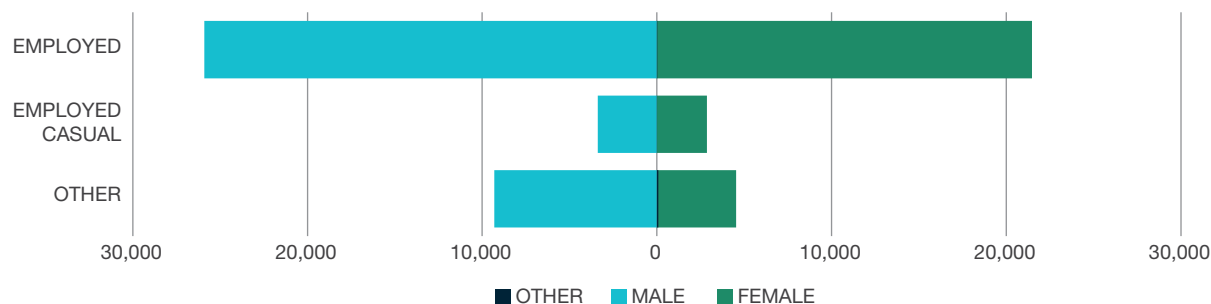
The chart shows the 19,514.8 researchers (in the FoR codes that have greater number of female researchers) by employment level. The number of female researchers are greater in all categories from Level A to ‘Other’ level with the exception of Level E, where the number of female researchers drops below the number of male researchers.

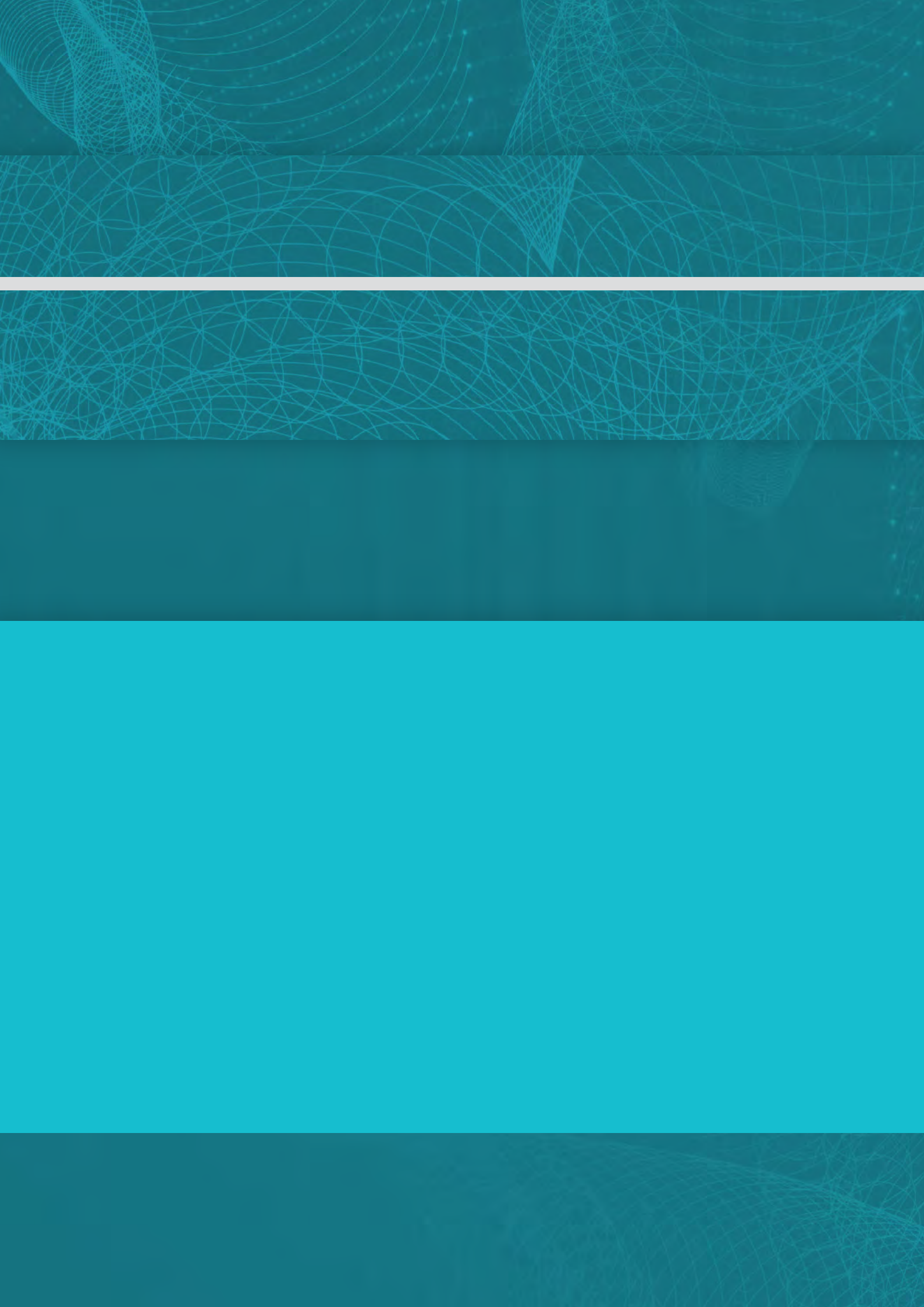
HEADCOUNT OF STAFF BY ACADEMIC LEVEL (IN FORS WITH FEMALES > MALES)

The data for the same group of researchers can also be examined by their employment status. The chart below shows that there are more female researchers in full-time or fractional full-time group than the number of researchers employed in a casual capacity. However, the number of male researchers in the 'Other' employment status group are greater. The 'Other' employment status includes visiting fellows, exchange, seconded and unpaid staff.

HEADCOUNT OF STAFF BY EMPLOYMENT TYPE (IN FORS WITH FEMALES > MALES)

For comparative purposes only, the headcount of staff by employment type for all disciplines is shown below.

HEADCOUNT OF STAFF BY EMPLOYMENT TYPE (ALL DISCIPLINES)



The background of the entire page is a deep teal color. It features a complex, abstract pattern of thin, light teal lines and dots. These elements form concentric circles, spirals, and other geometric shapes that create a sense of depth and movement. The pattern is most prominent in the top and bottom sections of the page.

SECTION 3

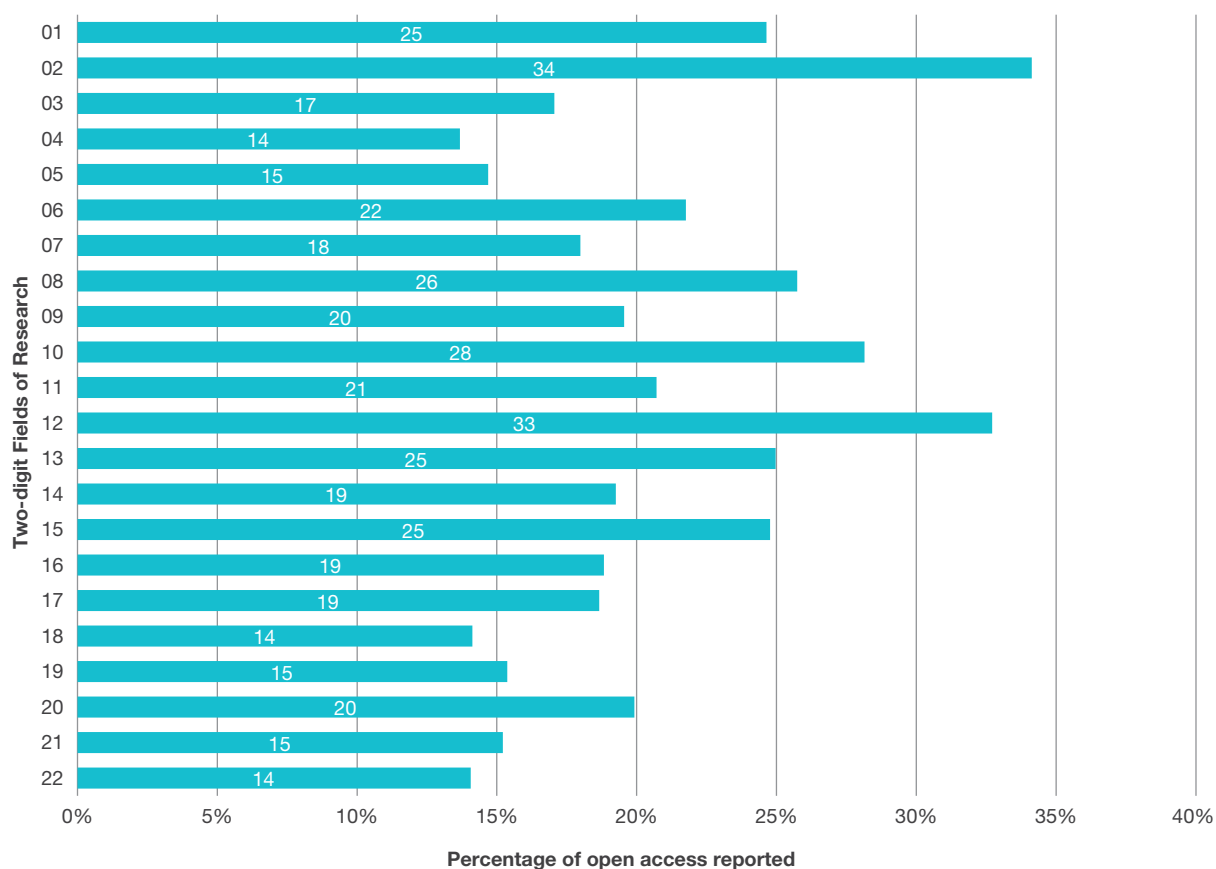
Open Access

As part of the ERA 2015 submission process, institutions were required to indicate whether a research output submitted to ERA had been made available in an open access repository. Eligible institutions were required to answer 'yes' or 'no' to this new and mandatory data requirement.

This open access data requirement will give the ARC some insight into the open access publishing trends in eligible institutions. However, open access data did not form part of the evaluation process and was not made available to peer reviewers or Research Evaluation Committees (RECs).

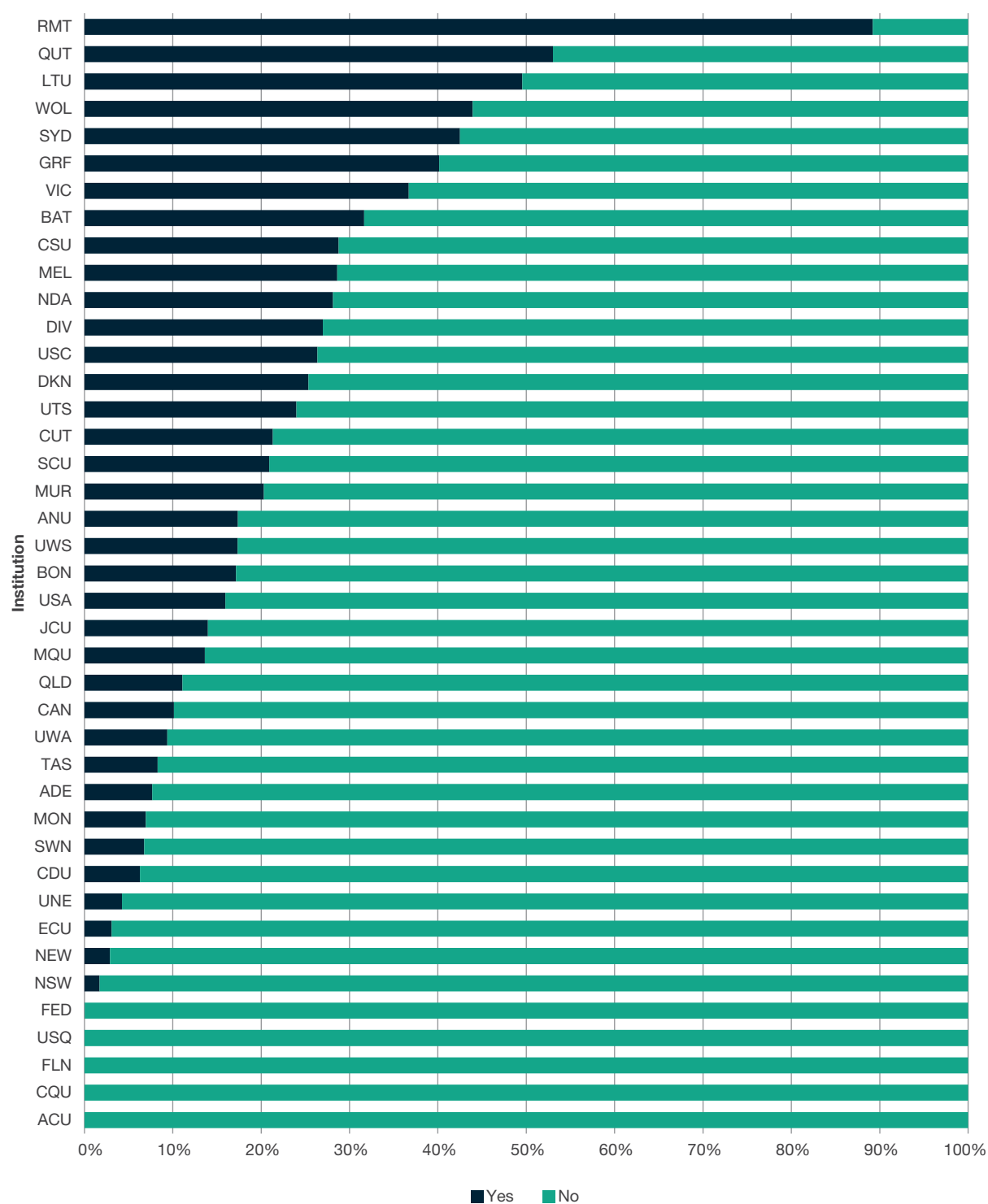
Since the supply of information on open access by institutions was a data requirement for ERA 2015 subsequent to the collection of the research outputs by institutions, in many cases the institutions had to retrospectively answer this question. Institutions were asked to provide as accurate information as was possible. Therefore, the information should be treated with caution and will only form a baseline for more accurate reporting in any future rounds.

PERCENTAGE OF SUBMITTED OUTPUTS IDENTIFIED AS OPEN ACCESS IN ERA 2015

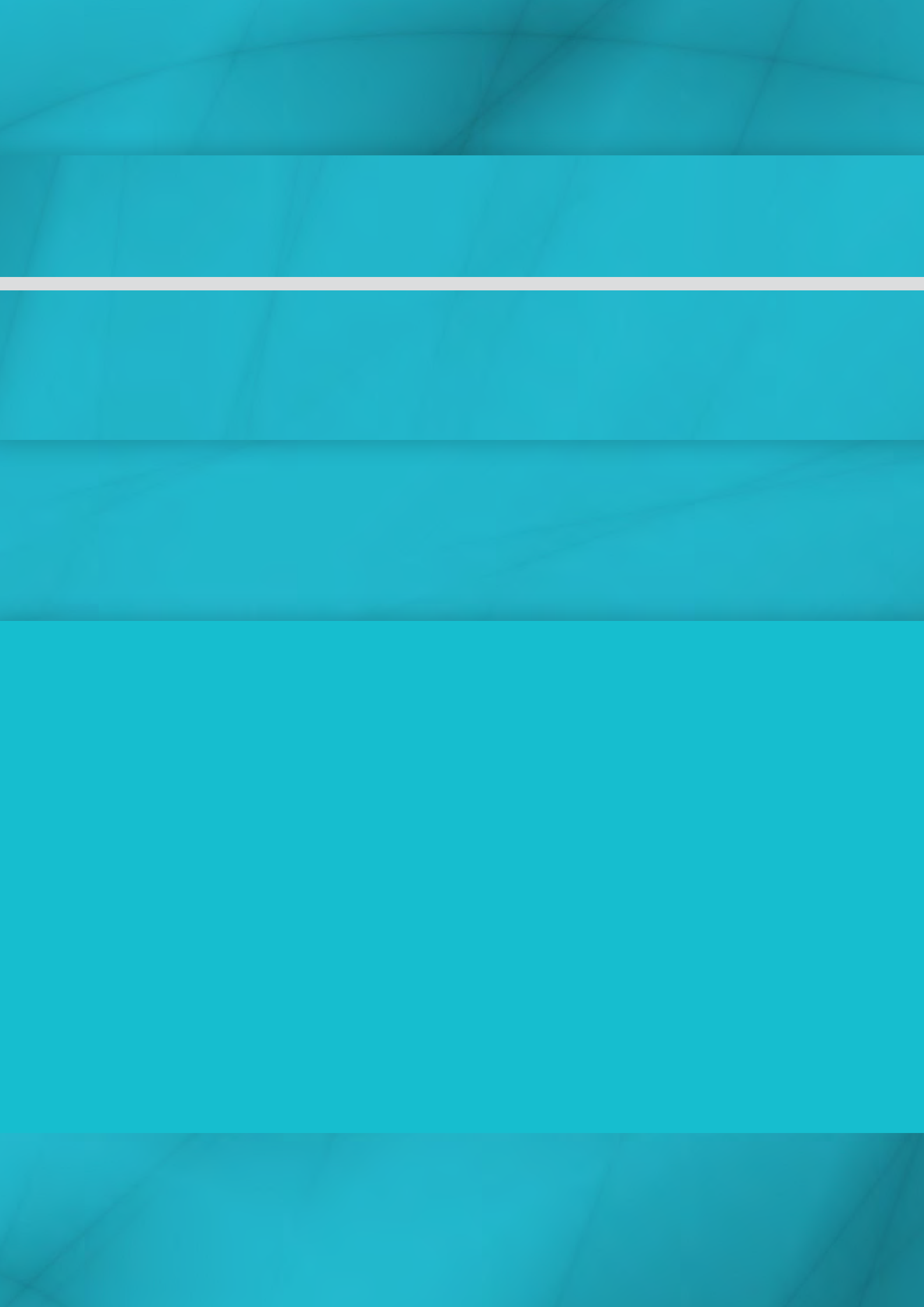


Note: the total of submitted outputs excludes portfolios

PERCENTAGE OF OPEN ACCESS REPORTED BY INSTITUTIONS ERA 2015



Note: the total of submitted outputs excludes portfolios.



SECTION 4

Institutions and Volume of Submitted Outputs in ERA 2015

All 41 eligible higher education institutions submitted research outputs for evaluation to ERA 2015.

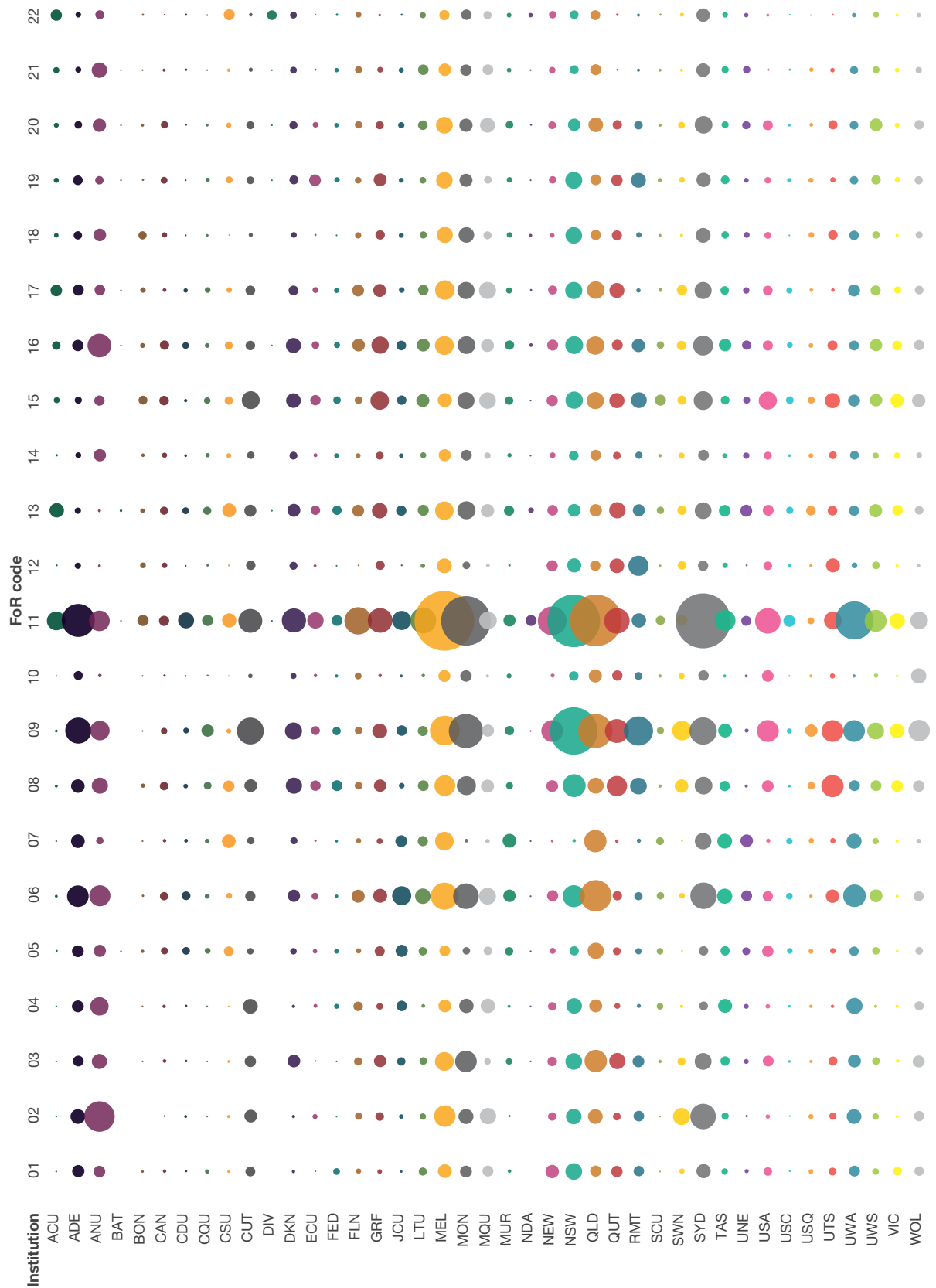
Over 430,000 outputs across 157 four-digit fields of research (FoR) codes were submitted.

Volume of Submitted Outputs

The first chart shows the volume of submitted outputs by two-digit FoR for each eligible institution in ERA 2015.

The size of the dots represents the relative volume of outputs, for example, 11 Medical and Health Sciences has a larger volume of outputs within most institutions, and University of Melbourne has a larger volume of outputs relative to some of the other institutions. The greatest volume of outputs appears in 11 Medical and Health Sciences, followed by 09 Engineering and 06 Biological Sciences.

VOLUME OF SUBMITTED OUTPUTS IN ERA 2015 BY INSTITUTION



Share of Volume of Outputs Relative to Institution and Discipline

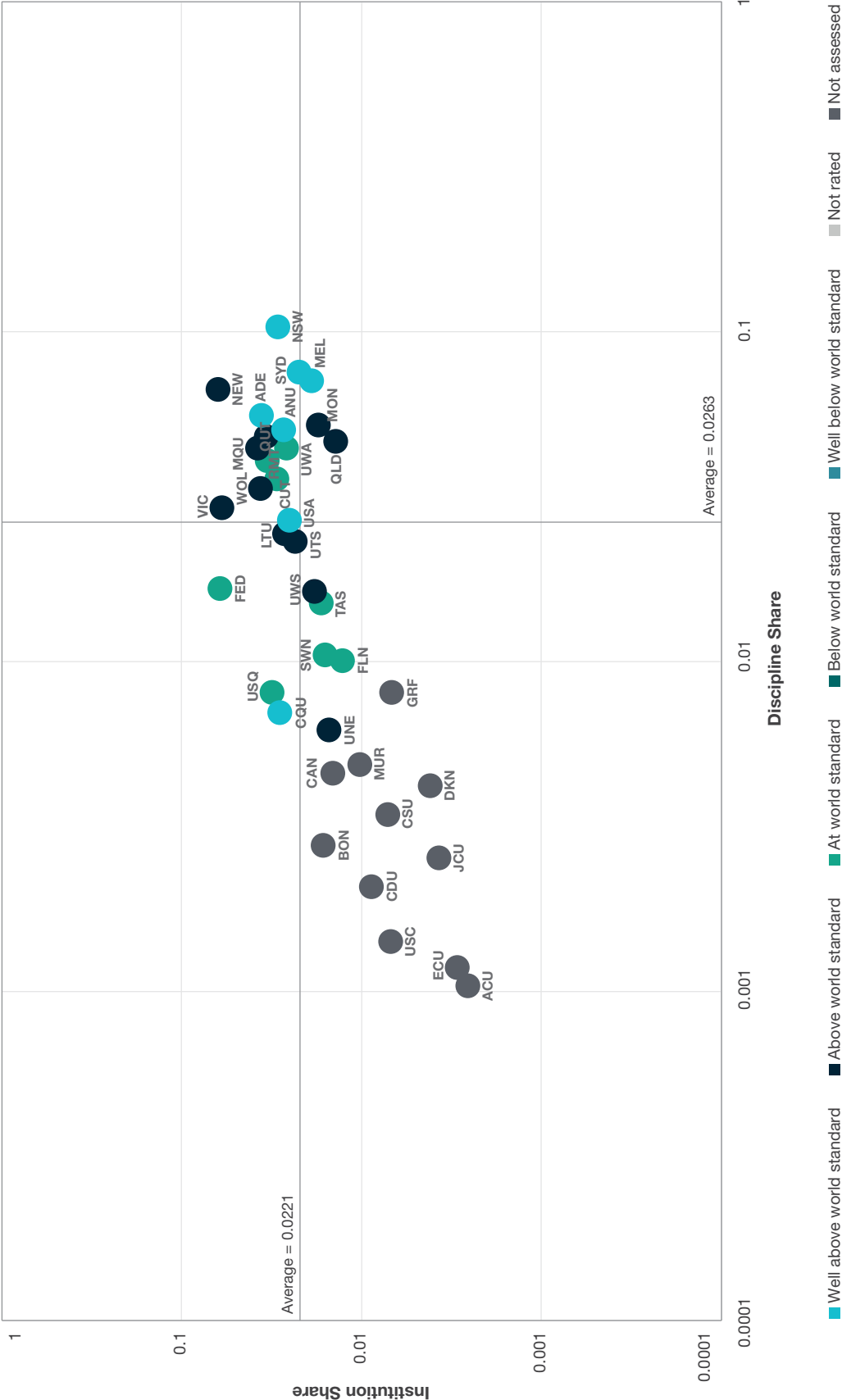
The next series of charts plot the volume of outputs using logarithmic scales on both the horizontal and vertical axes. The idea here in using the log–log axes is so that we can more easily see details for small values as well as large values for volume of outputs. Each dot point on these charts shows the share of outputs within the institution itself (i.e. the institution share, shown on the vertical axis), and share relative to all eligible institutions (i.e. the discipline share, shown on the horizontal axis). The rating for assessed units is also indicated by the colour of the dot point. In addition, the UoEs where no rating was available, i.e. the units that were below the low volume threshold ('n/a'), are shown in dark grey on the charts. In some cases UoEs were not rated ('n/r') by Research Evaluation Committees (RECs) due to coding issues, these are shown in light grey on the charts.

The volume of outputs by institution and discipline share are shown for all 22 two-digit FoR codes. Each chart also shows the average institutional share and the average for the discipline share for each two-digit FoR.

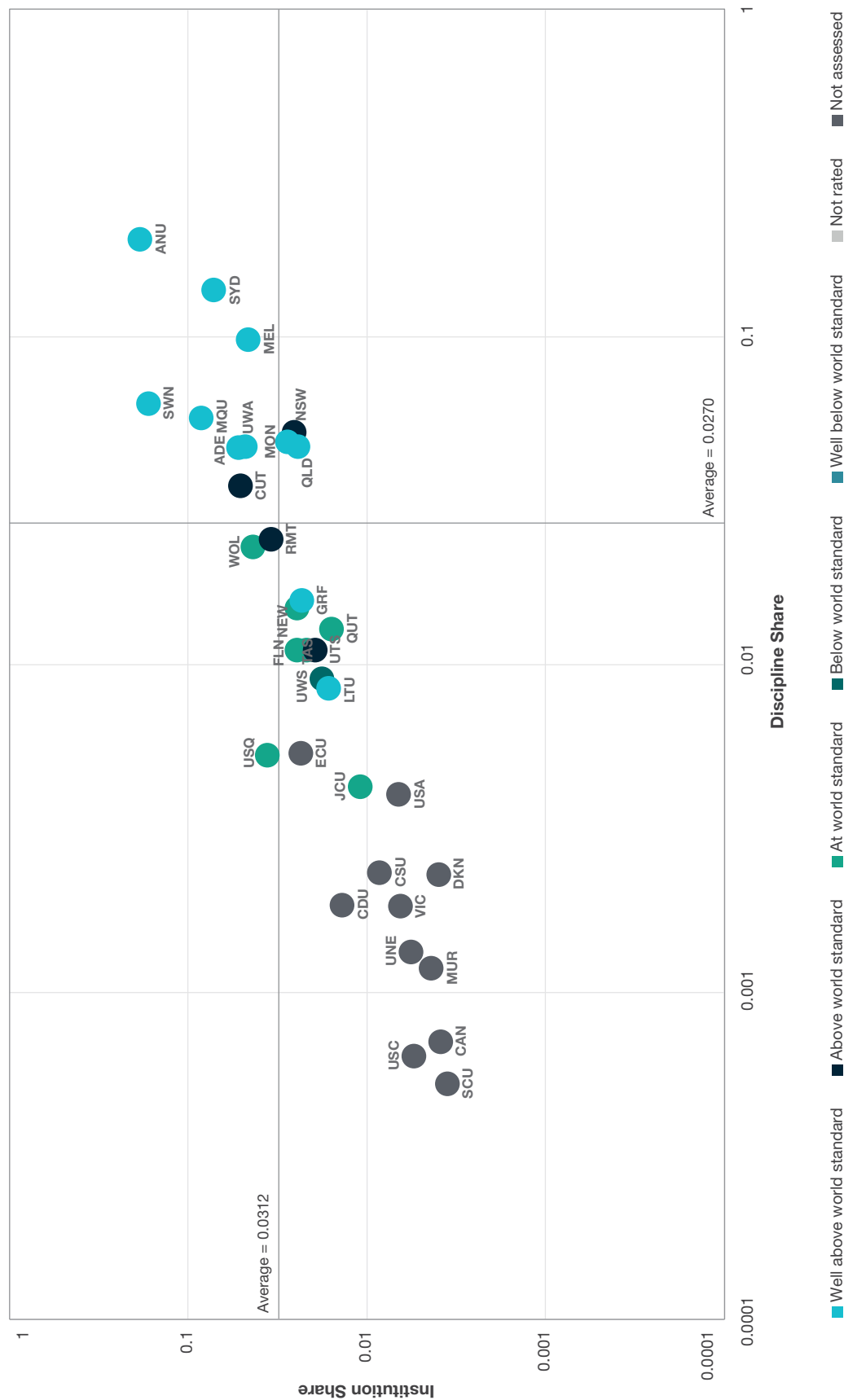
For example, the following chart shows information relating to UoEs in 01 Mathematical Sciences, UoEs in the top right hand quadrant of the chart have a relative high discipline share and relatively high volume of their total outputs in that code within their institution.

Note: A number of eligible institutions do not appear on the following log-log charts where they are not assessed and have an institution or discipline share less than 0.0001.

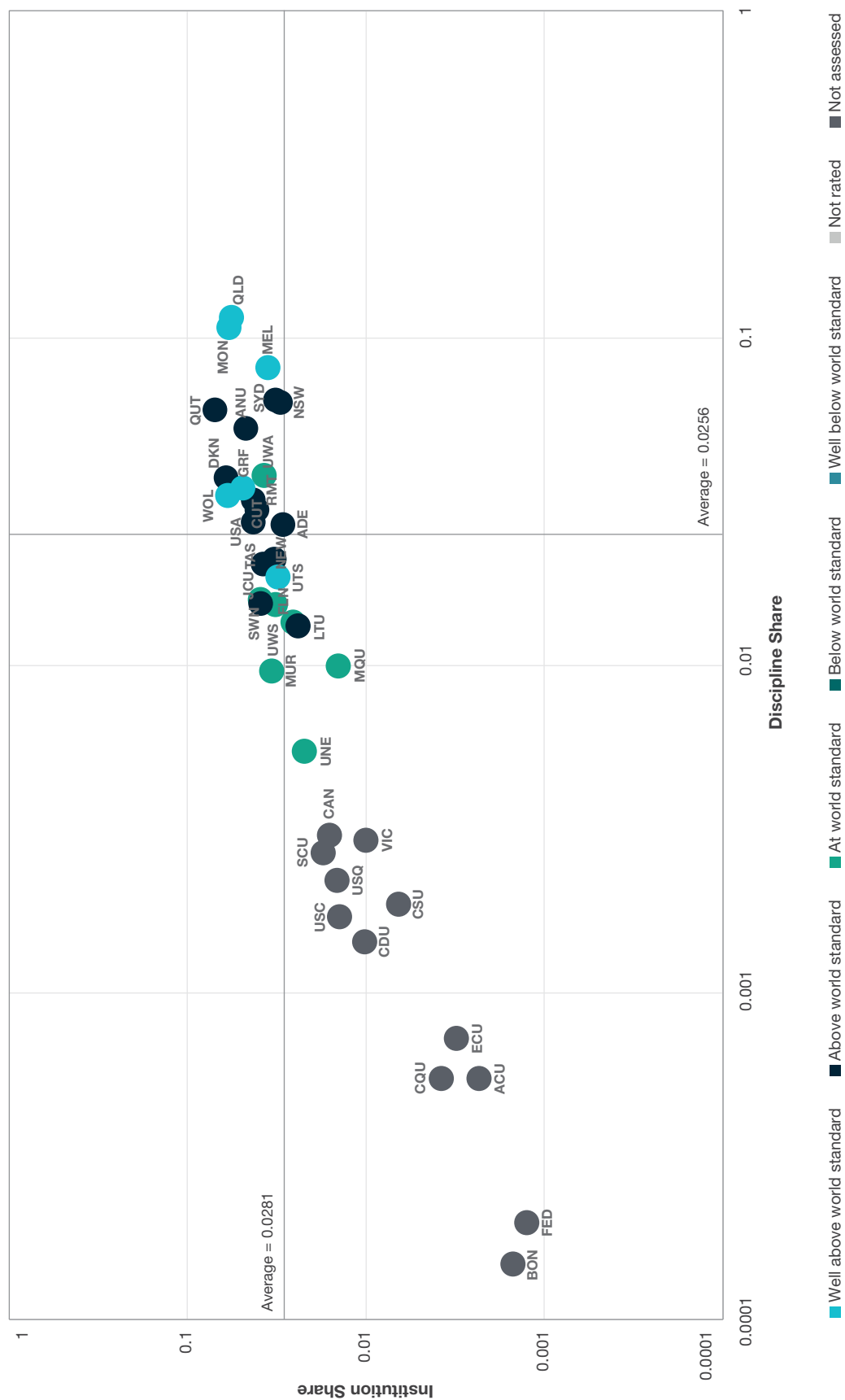
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
01 MATHEMATICAL SCIENCES



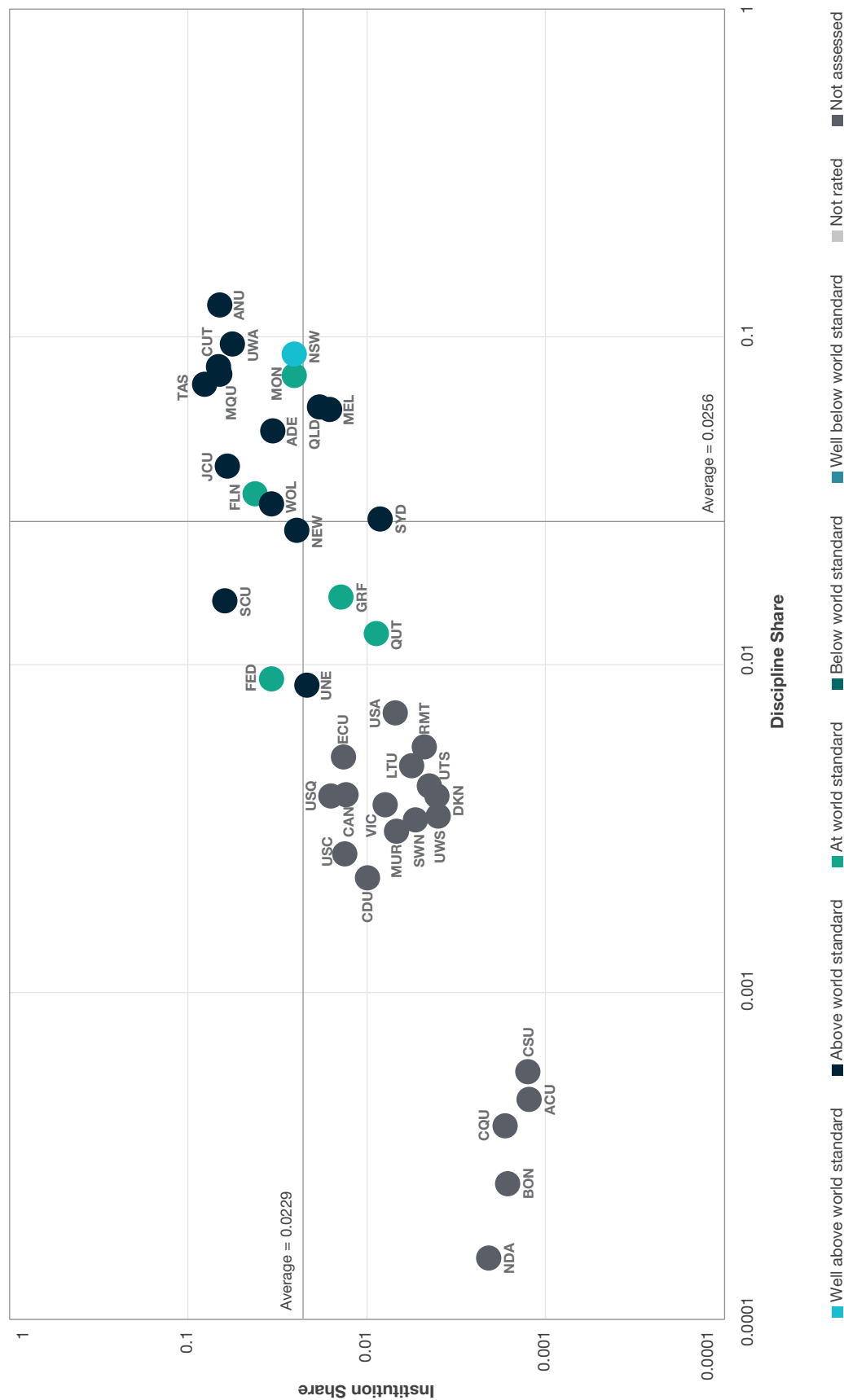
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE —
02 PHYSICAL SCIENCES



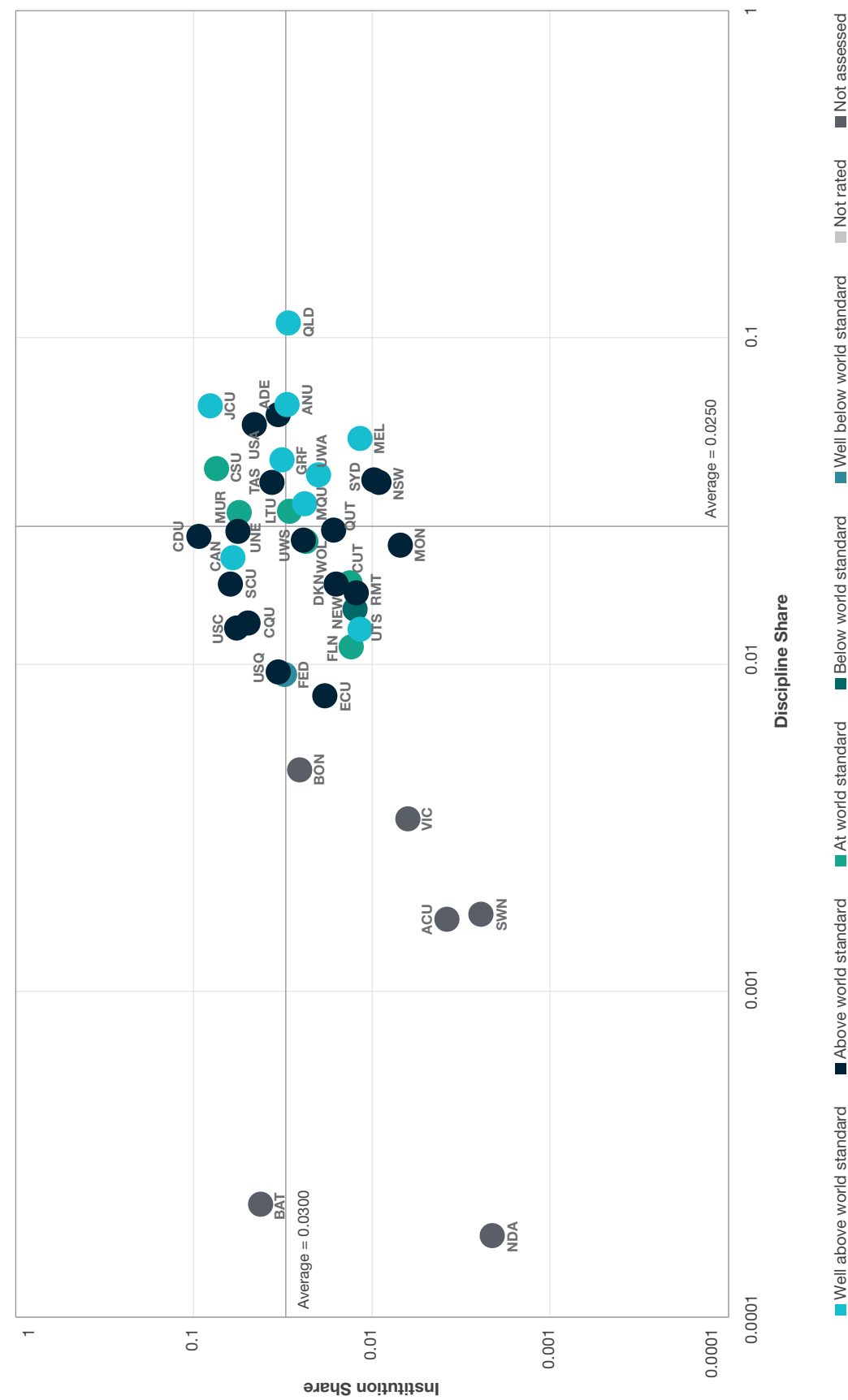
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE – 03 CHEMICAL SCIENCES



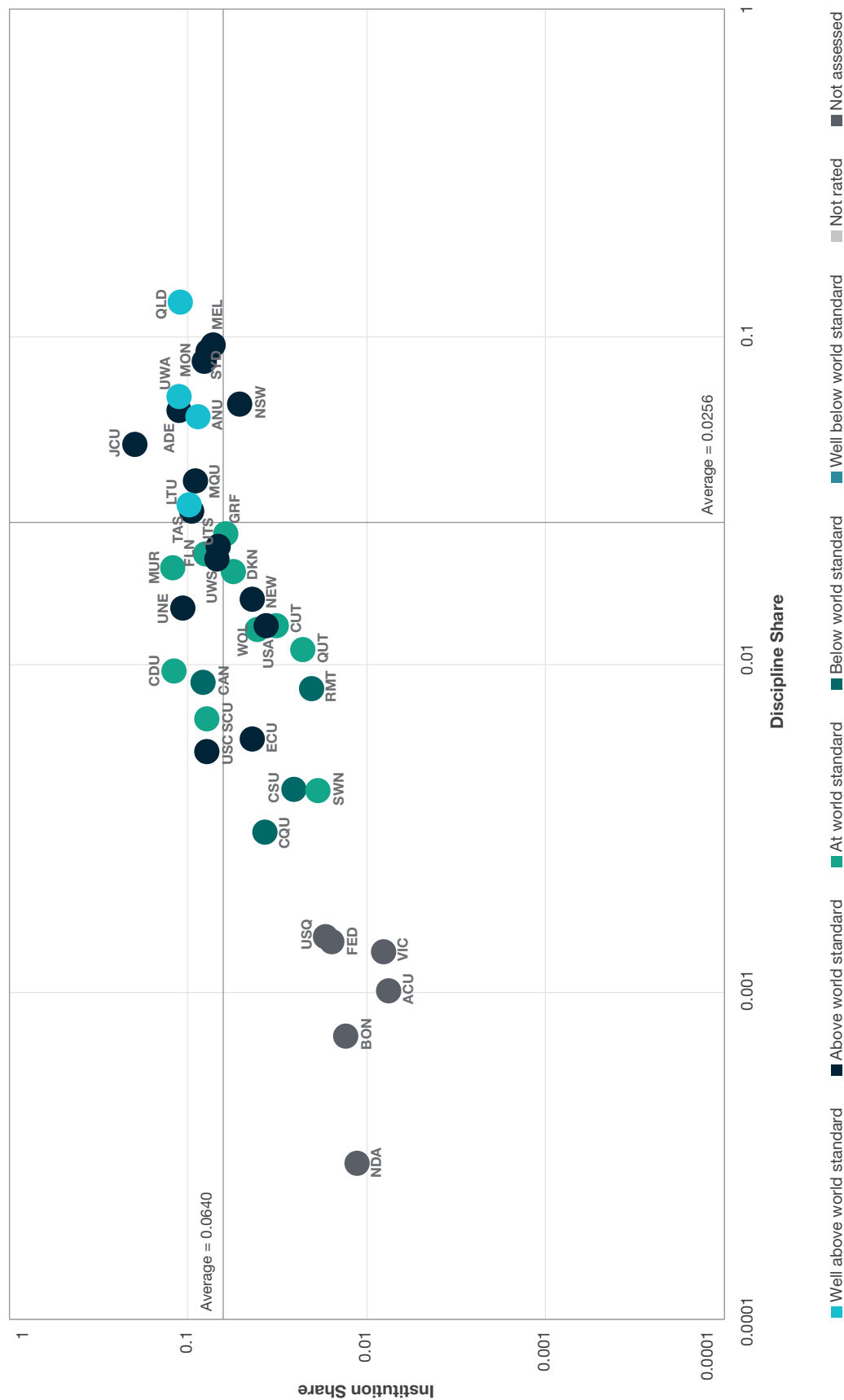
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE —
04 EARTH SCIENCES



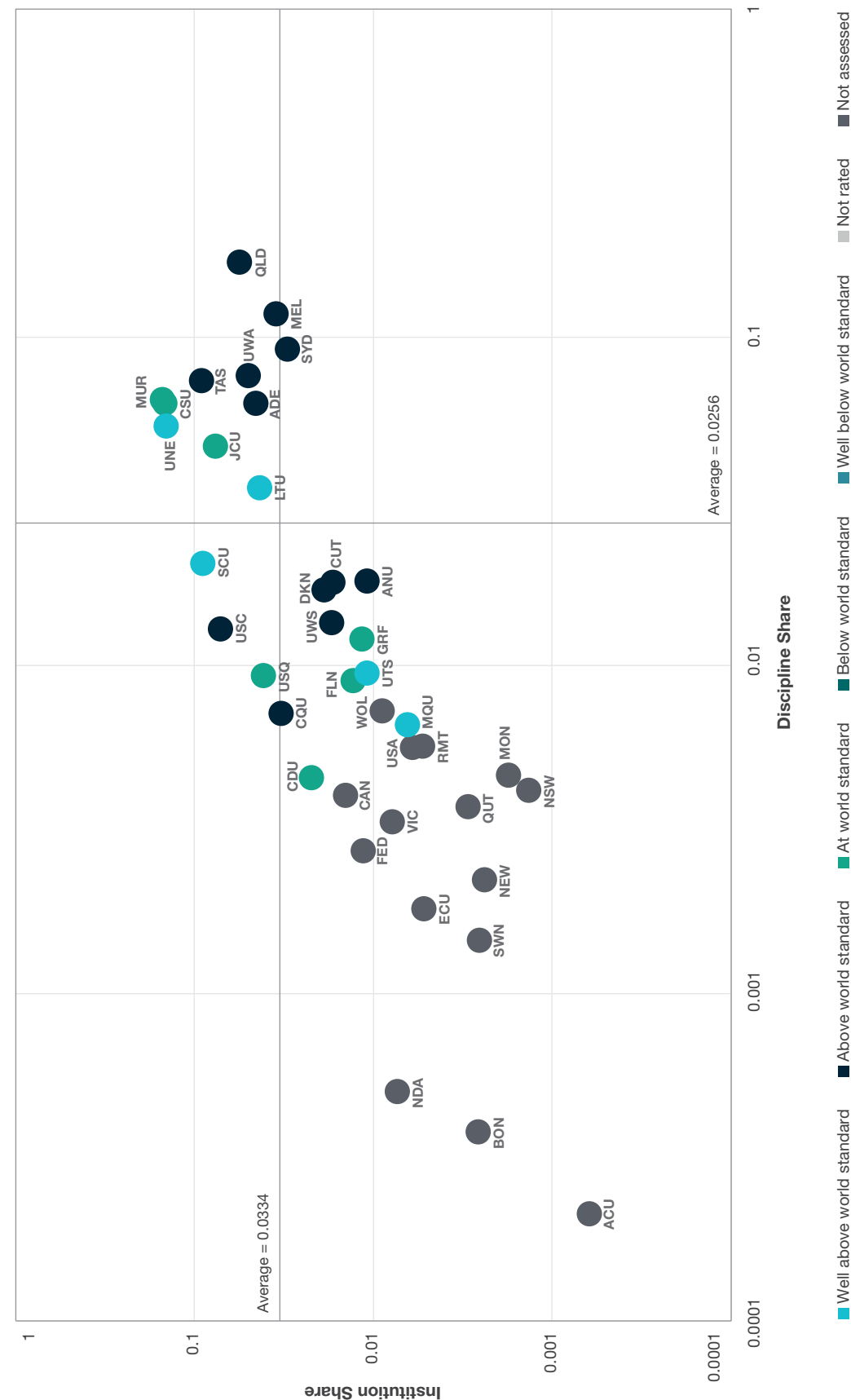
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
05 ENVIRONMENTAL SCIENCES



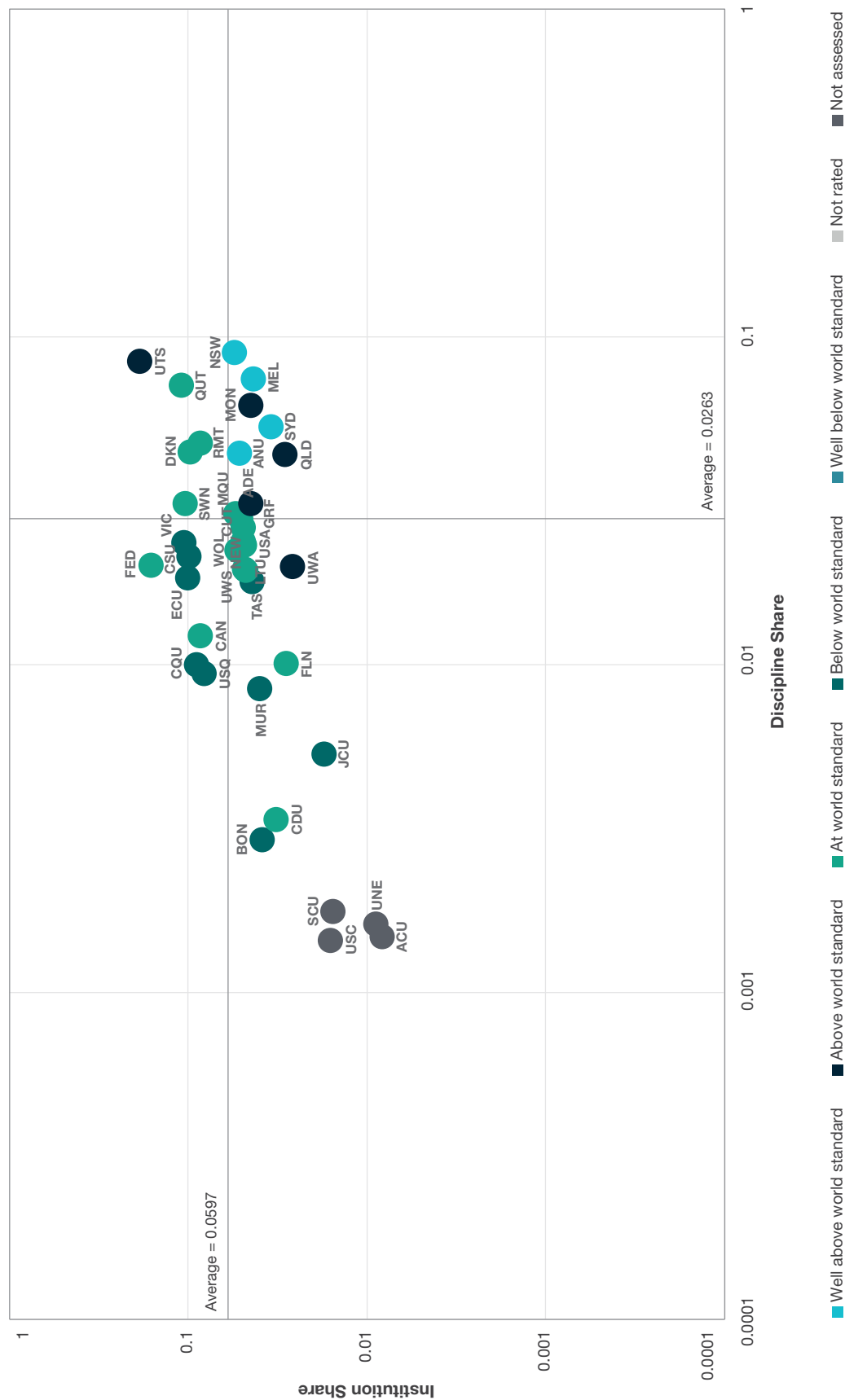
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE —
06 BIOLOGICAL SCIENCES



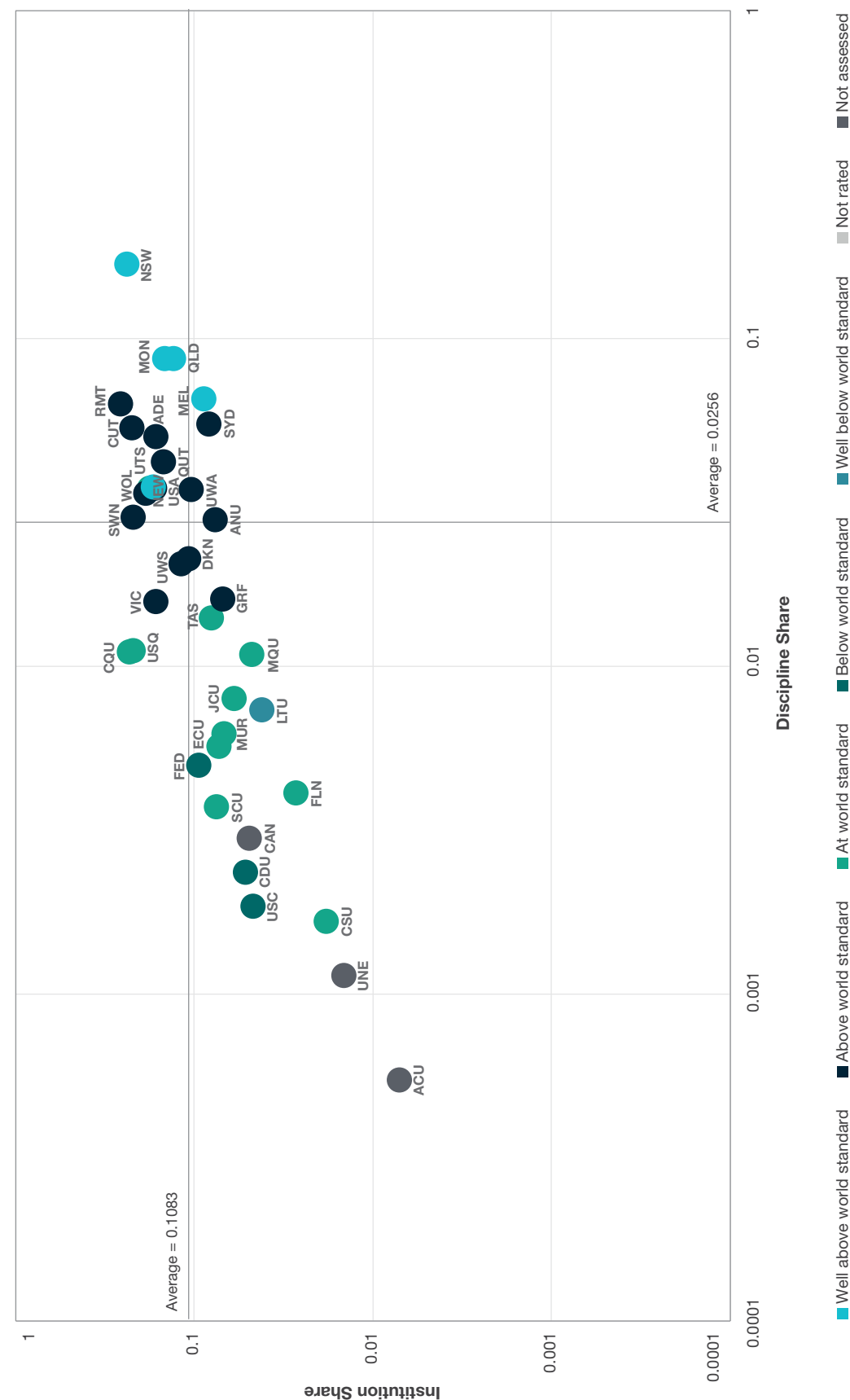
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
07 AGRICULTURAL AND VETERINARY SCIENCES



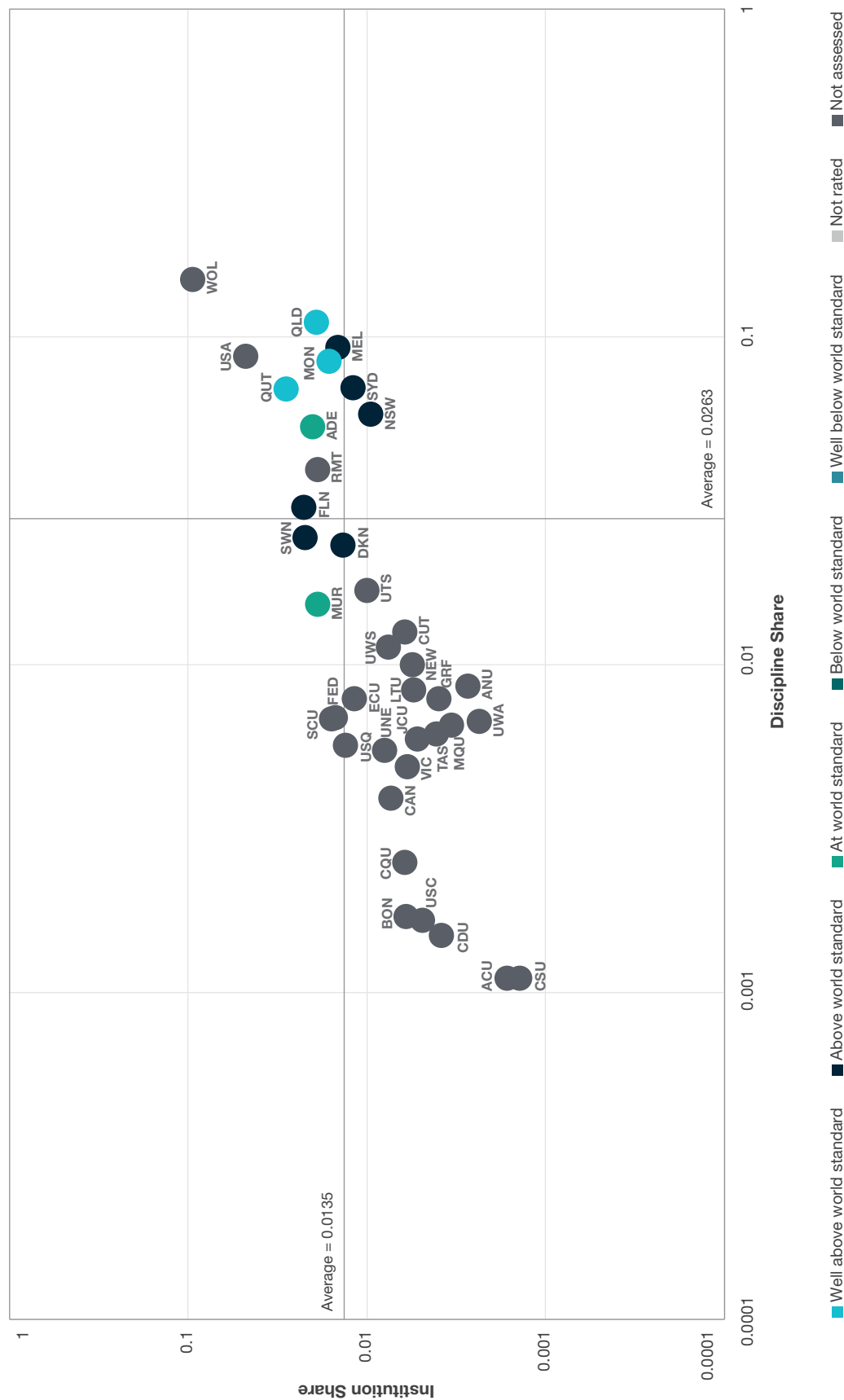
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE —
08 INFORMATION AND COMPUTING SCIENCES



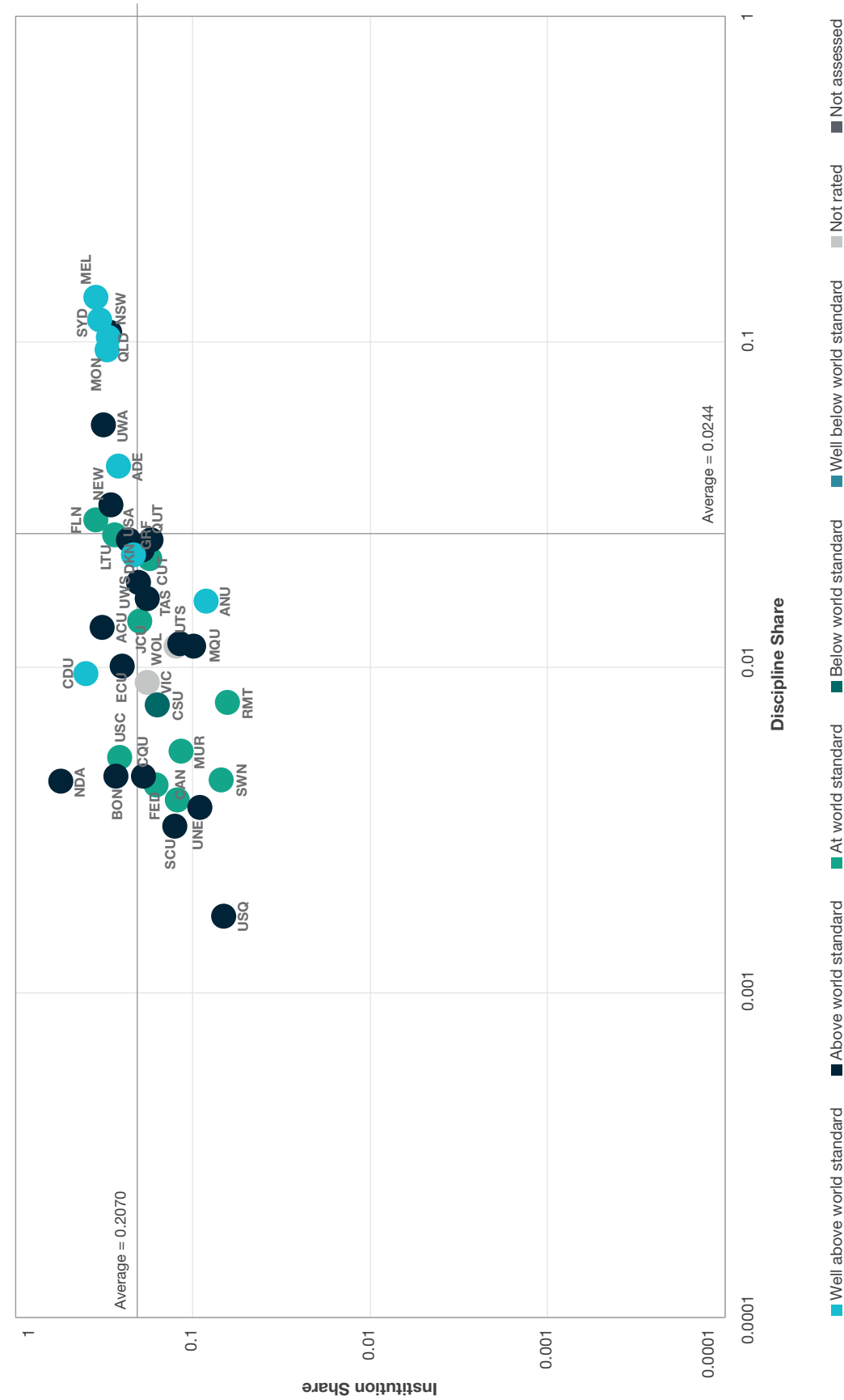
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
09 ENGINEERING



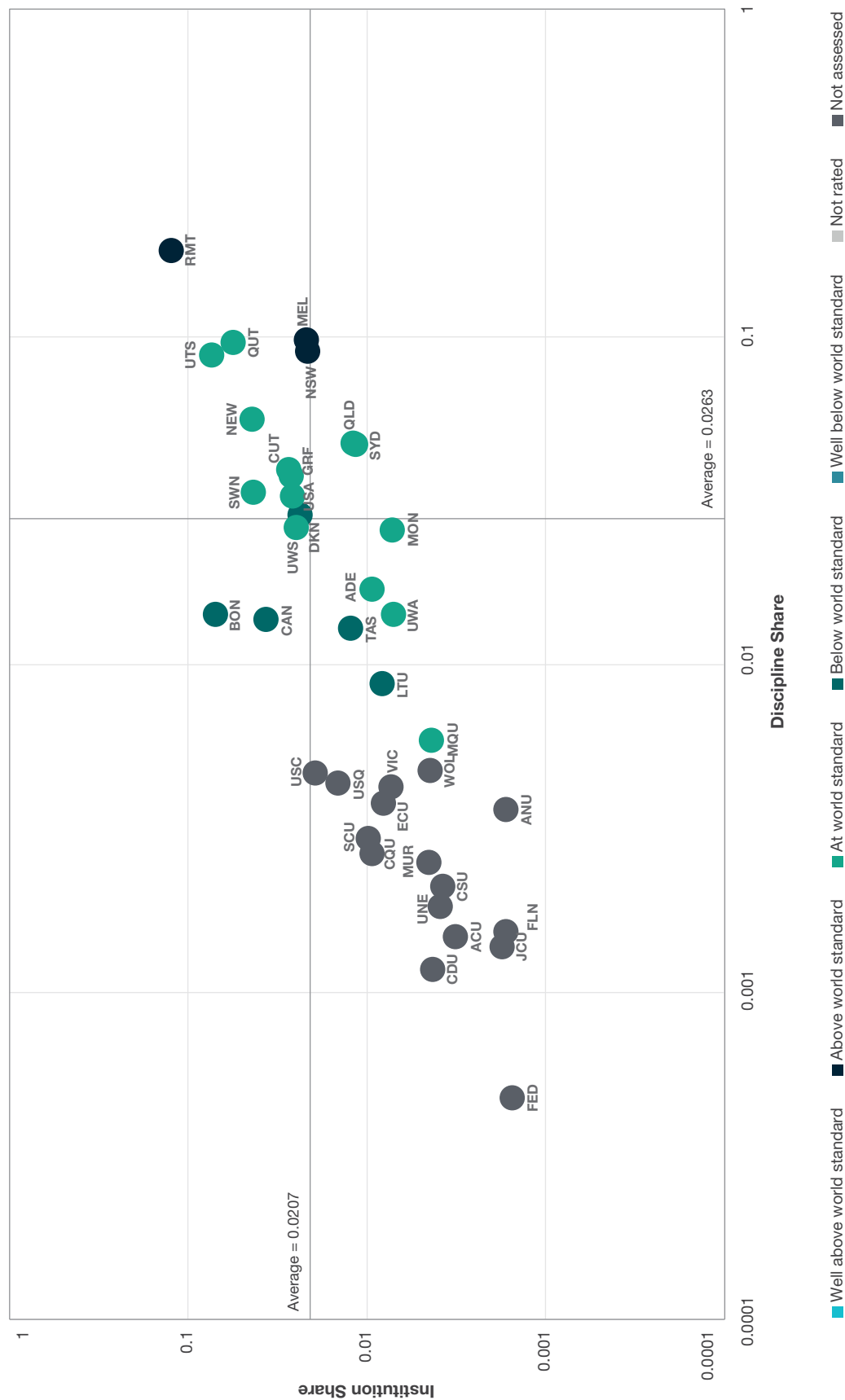
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE —
10 TECHNOLOGY



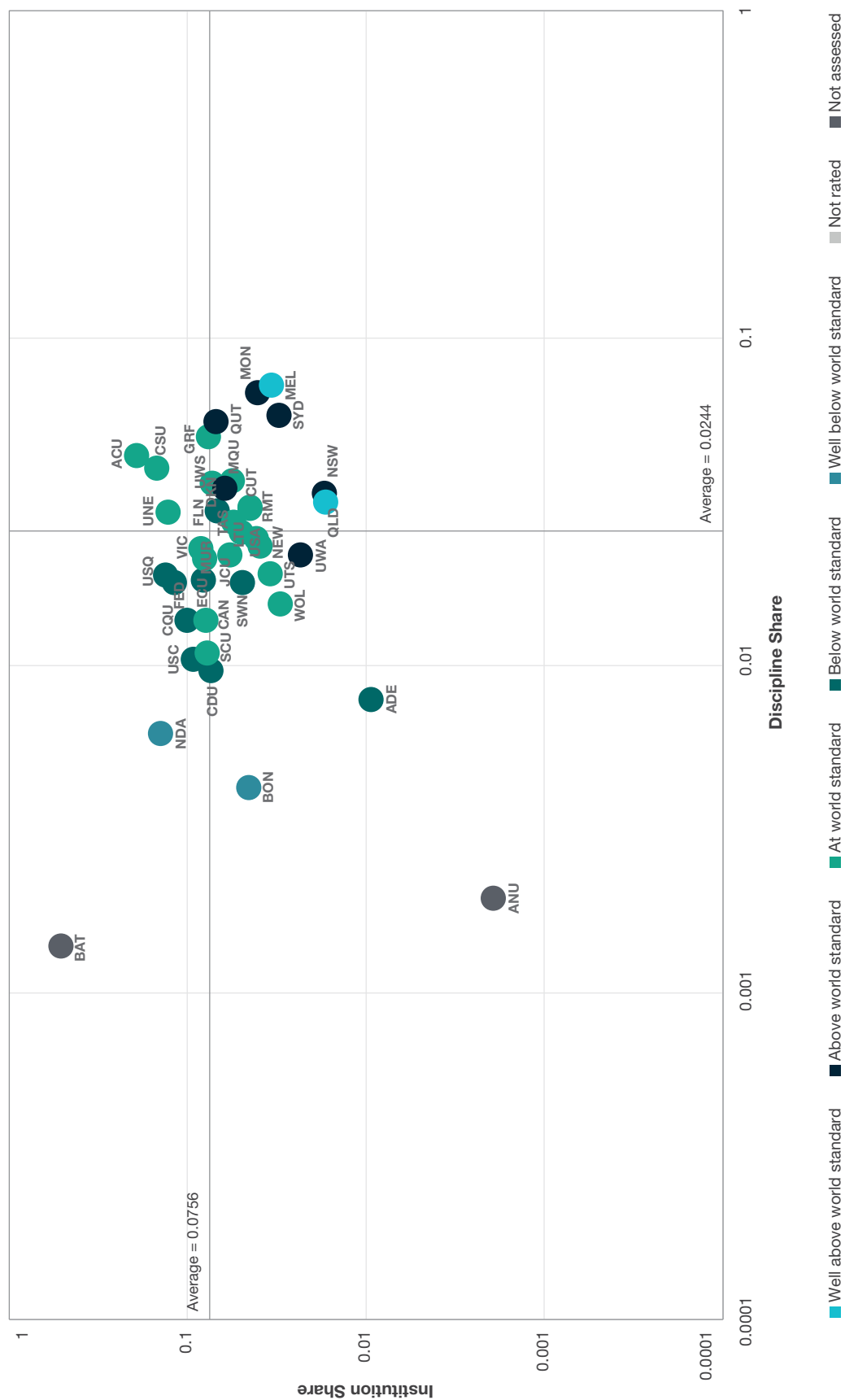
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
11 MEDICAL AND HEALTH SCIENCES

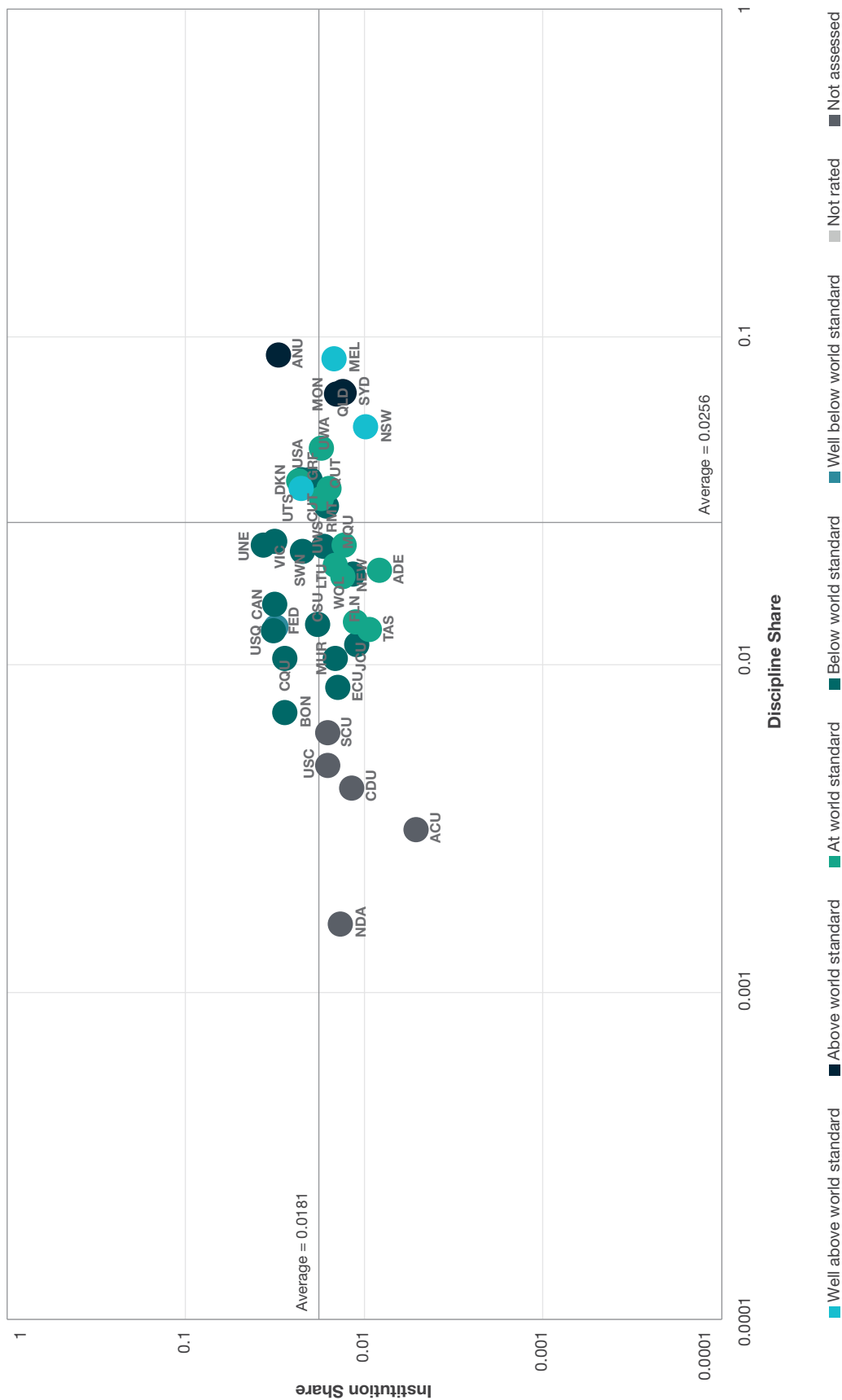


ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
12 BUILT ENVIRONMENT AND DESIGN

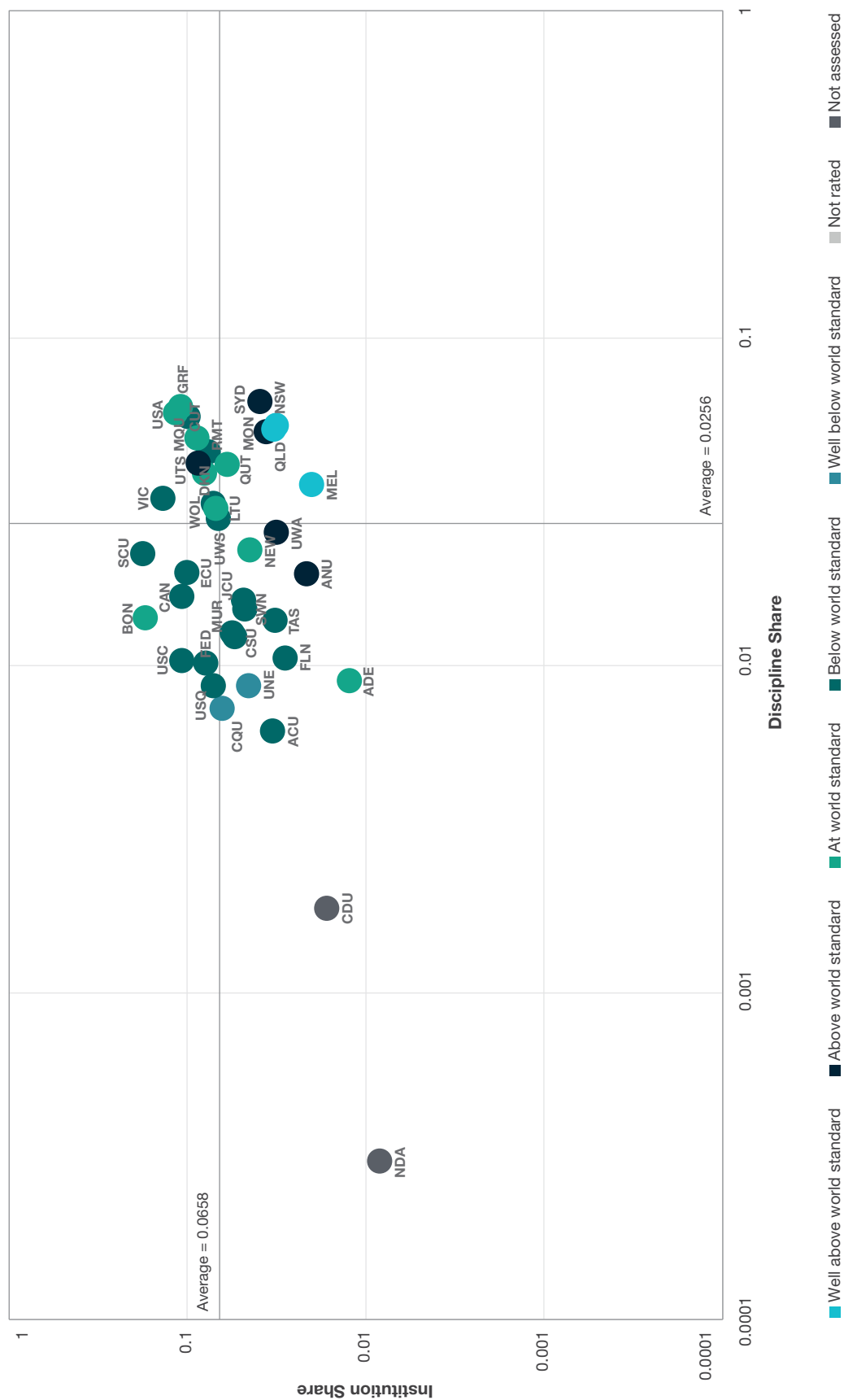


ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE – 13 EDUCATION

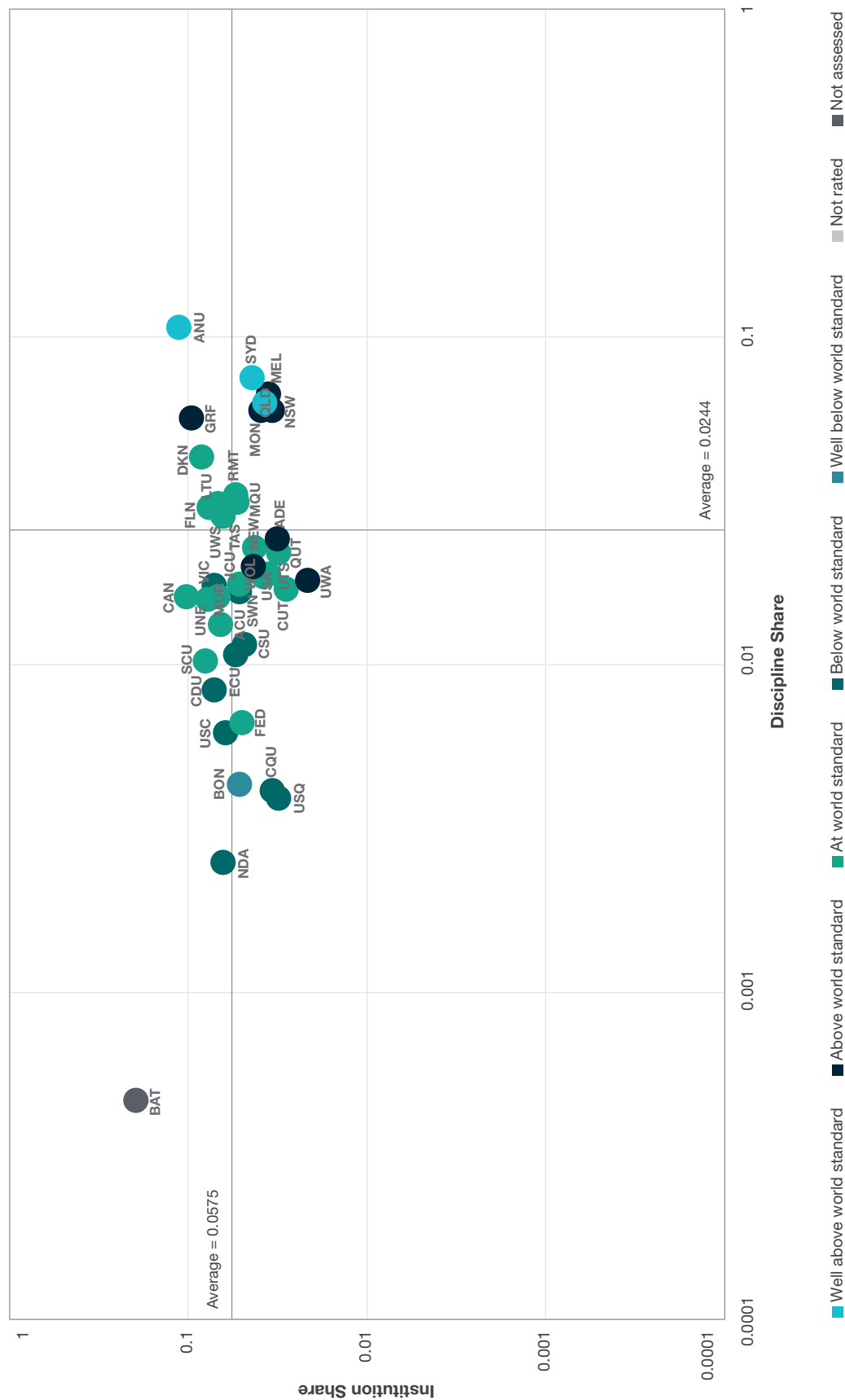


ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
14 ECONOMICS

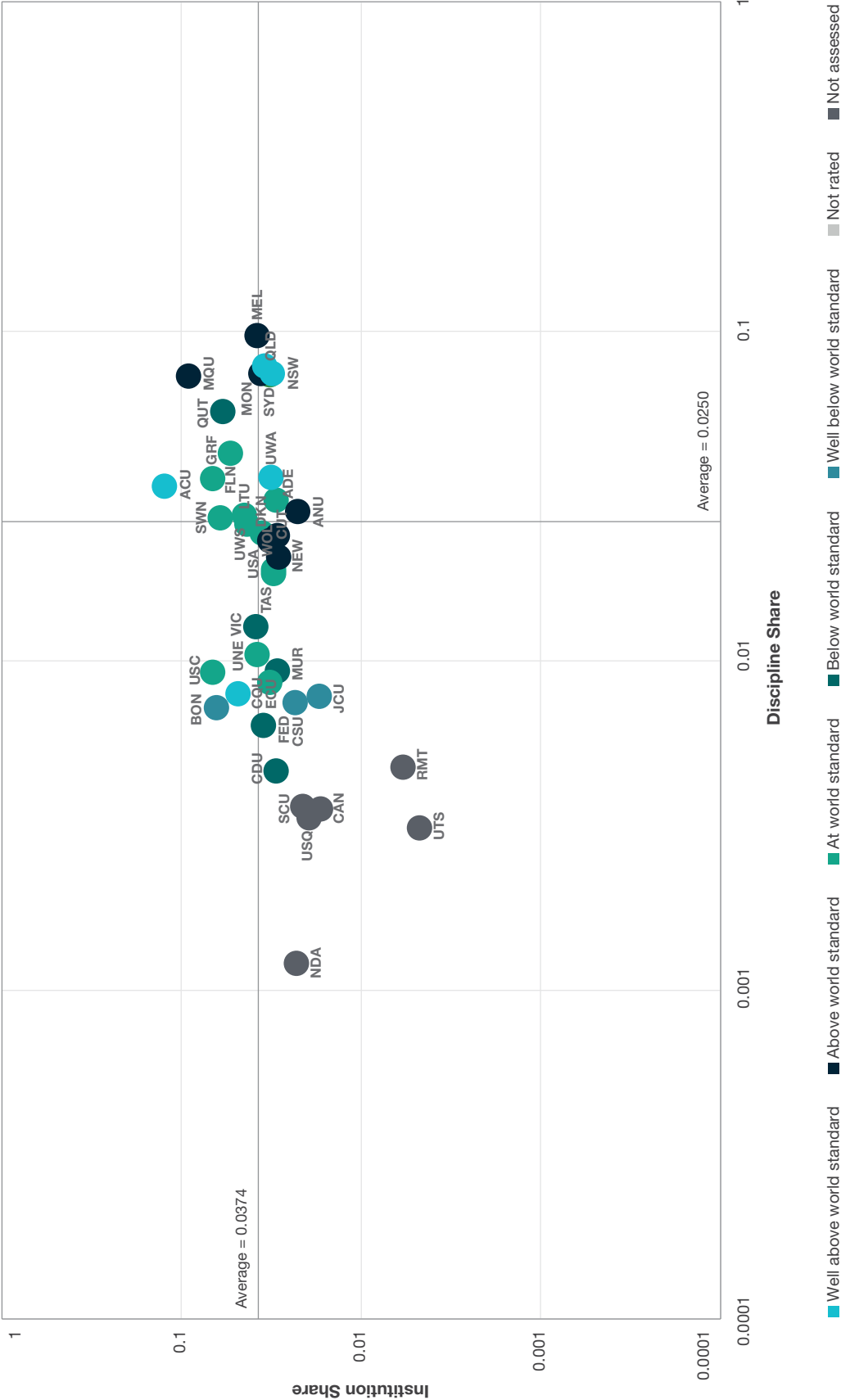
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE – 15 COMMERCE, MANAGEMENT, TOURISM AND SERVICES



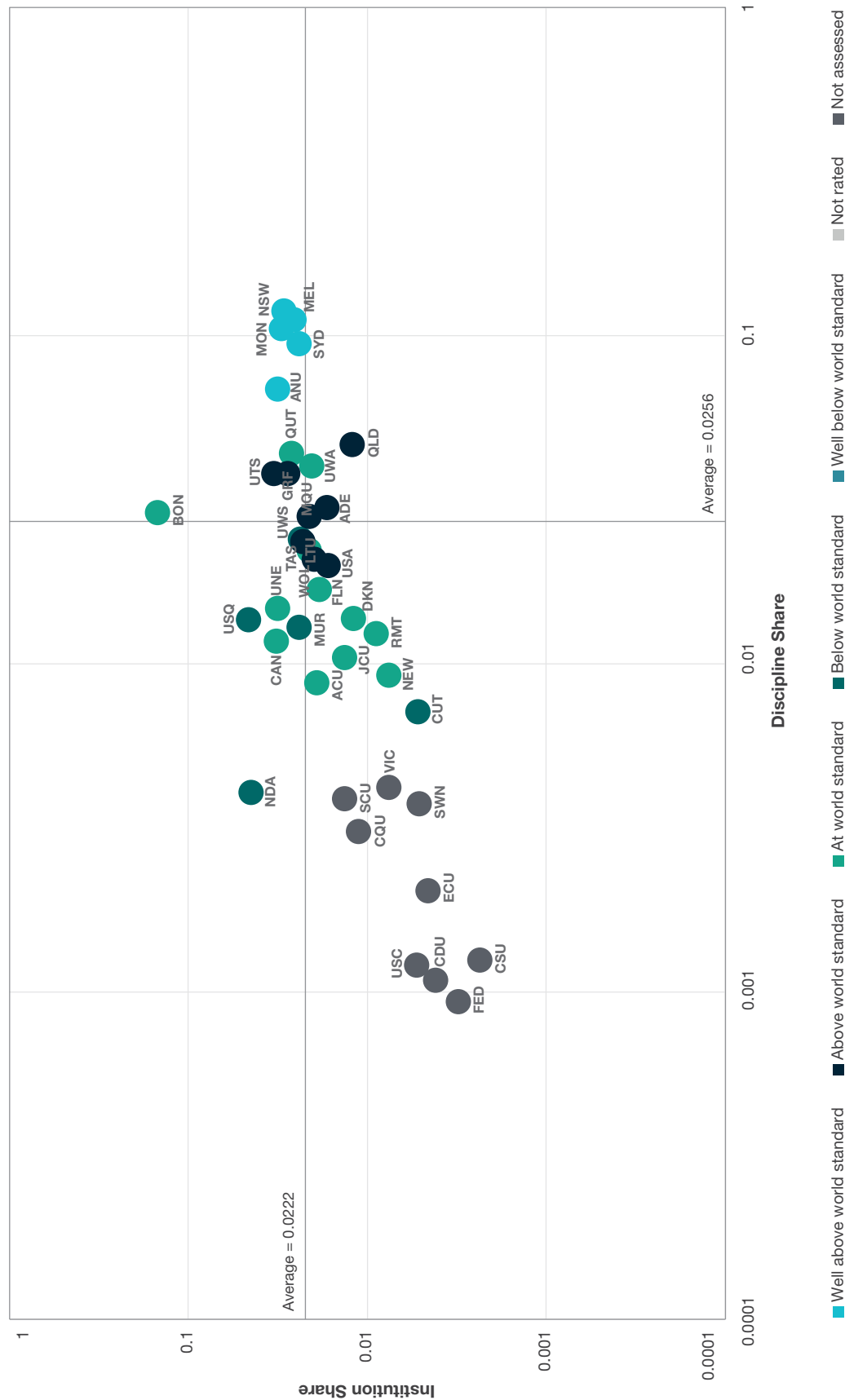
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE —
16 STUDIES IN HUMAN SOCIETY



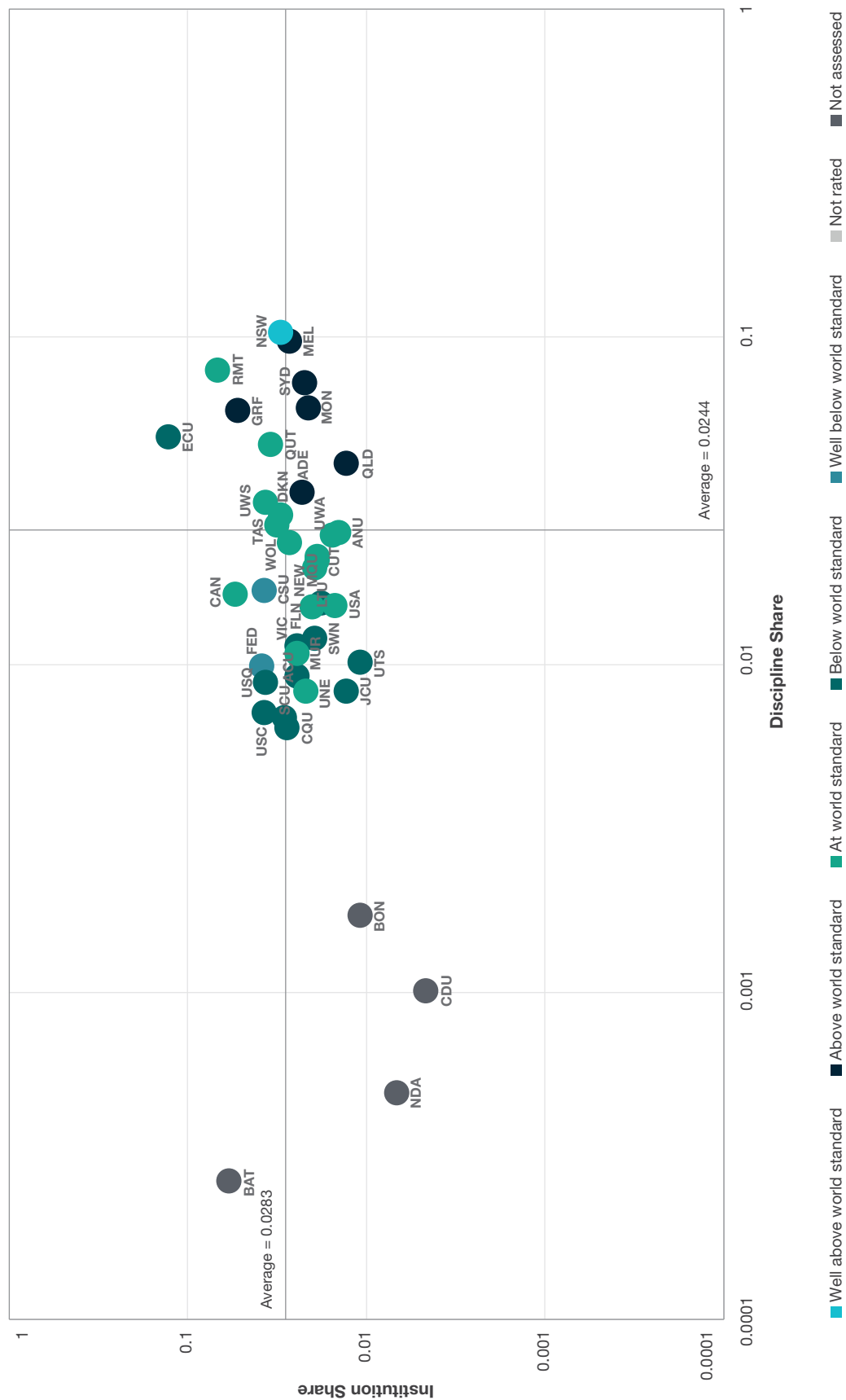
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
17 PSYCHOLOGY AND COGNITIVE SCIENCES



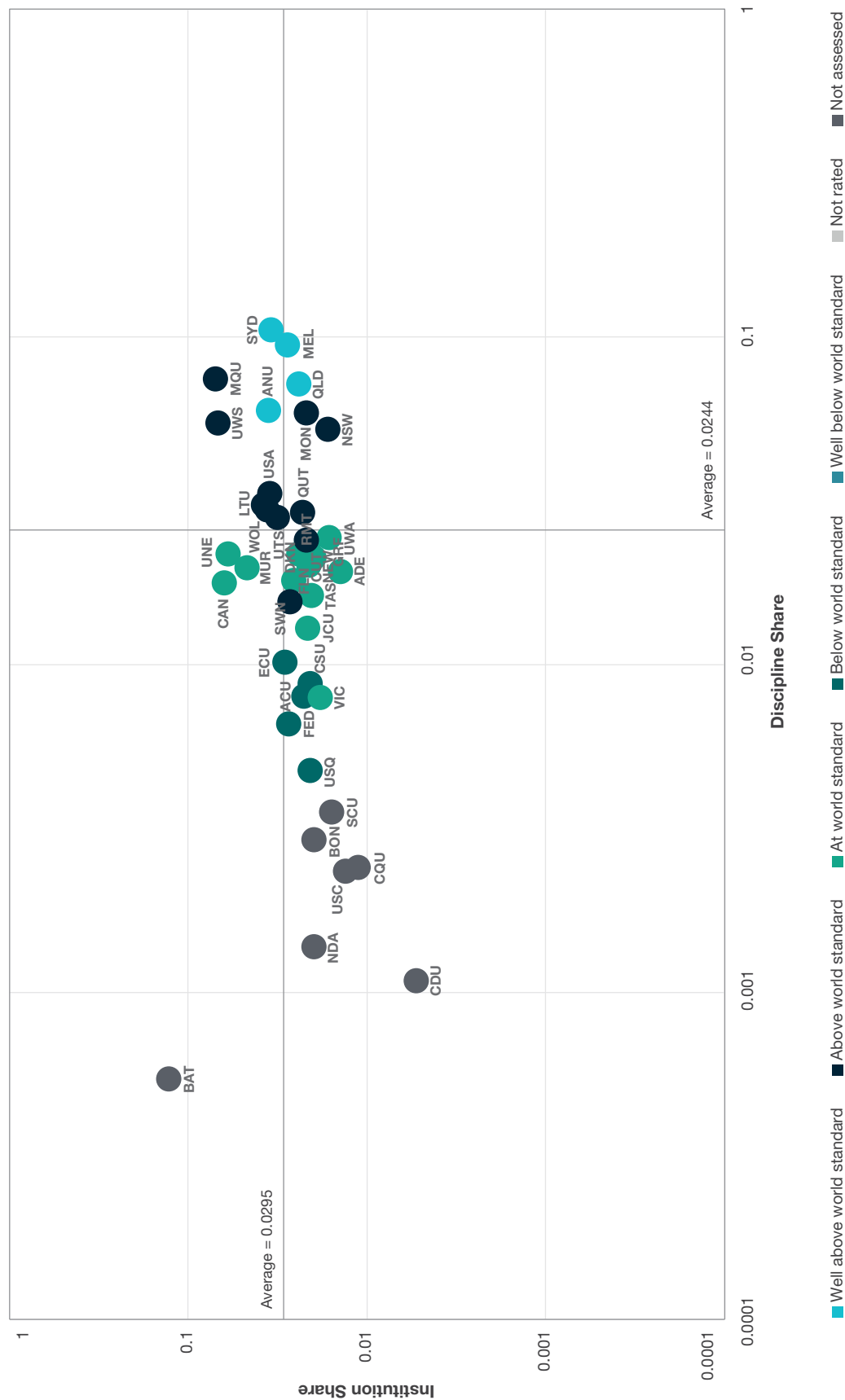
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE —
18 LAW AND LEGAL STUDIES



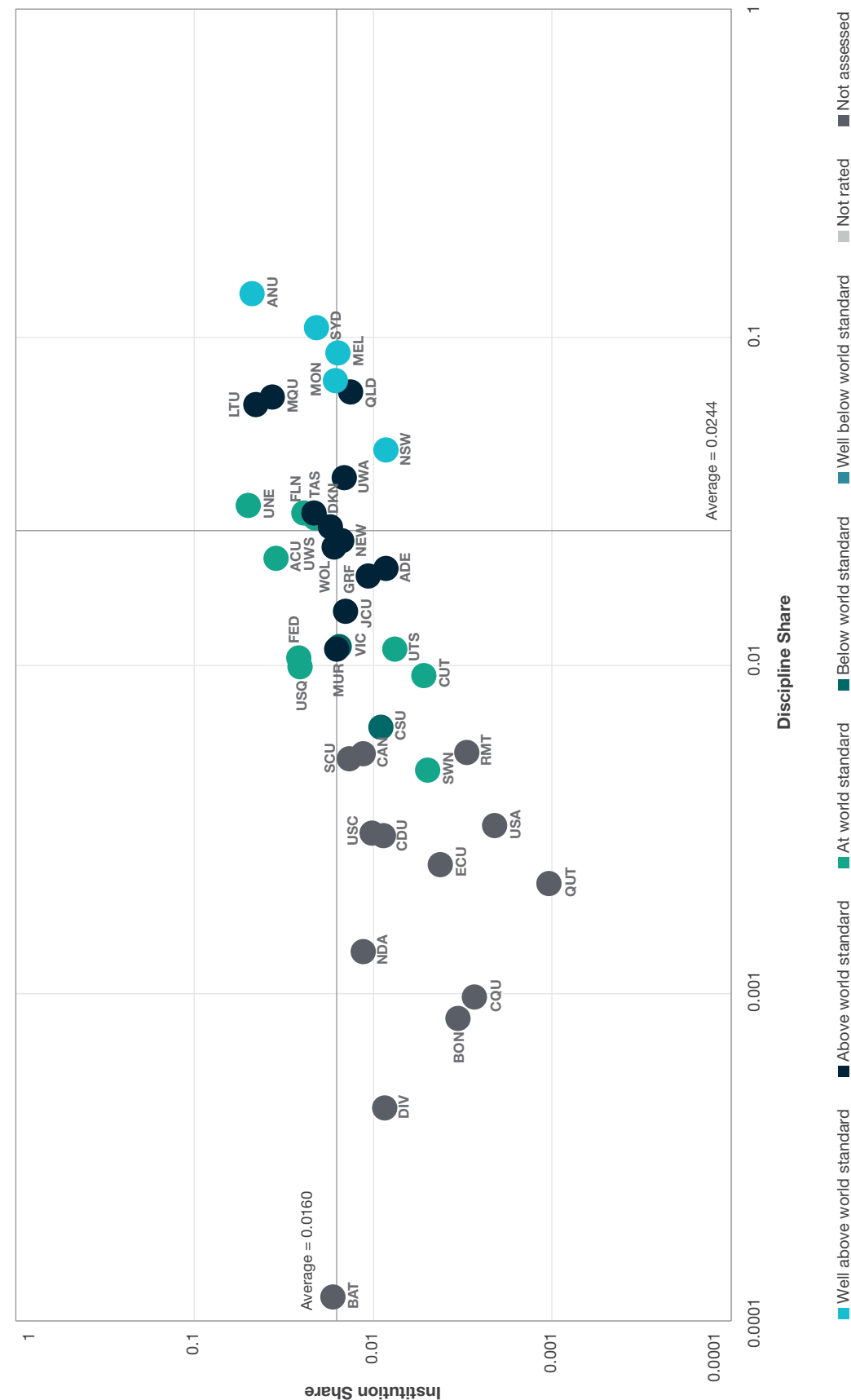
**ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
19 STUDIES IN CREATIVE ARTS AND WRITING**



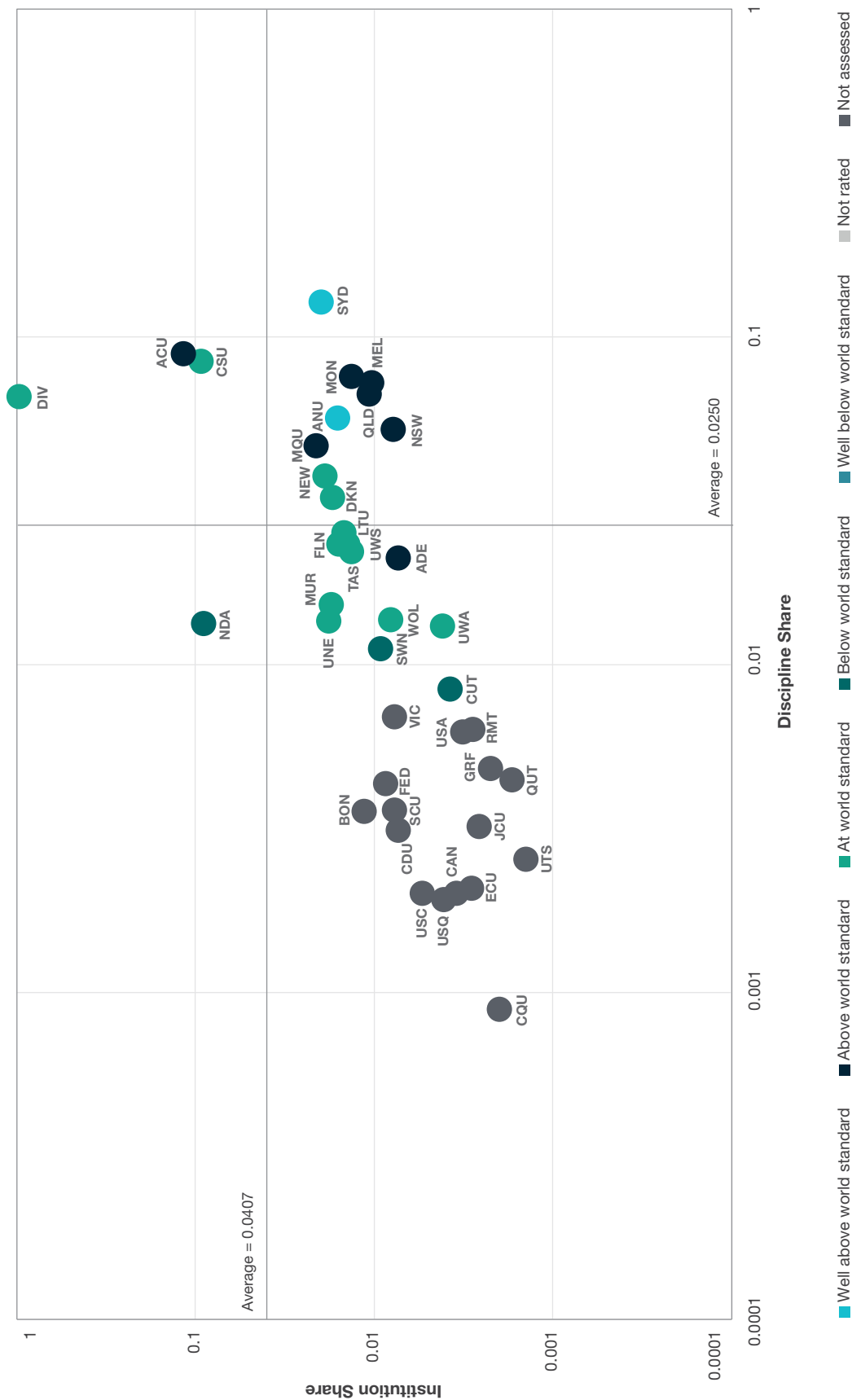
ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
20 LANGUAGE, COMMUNICATION AND CULTURE

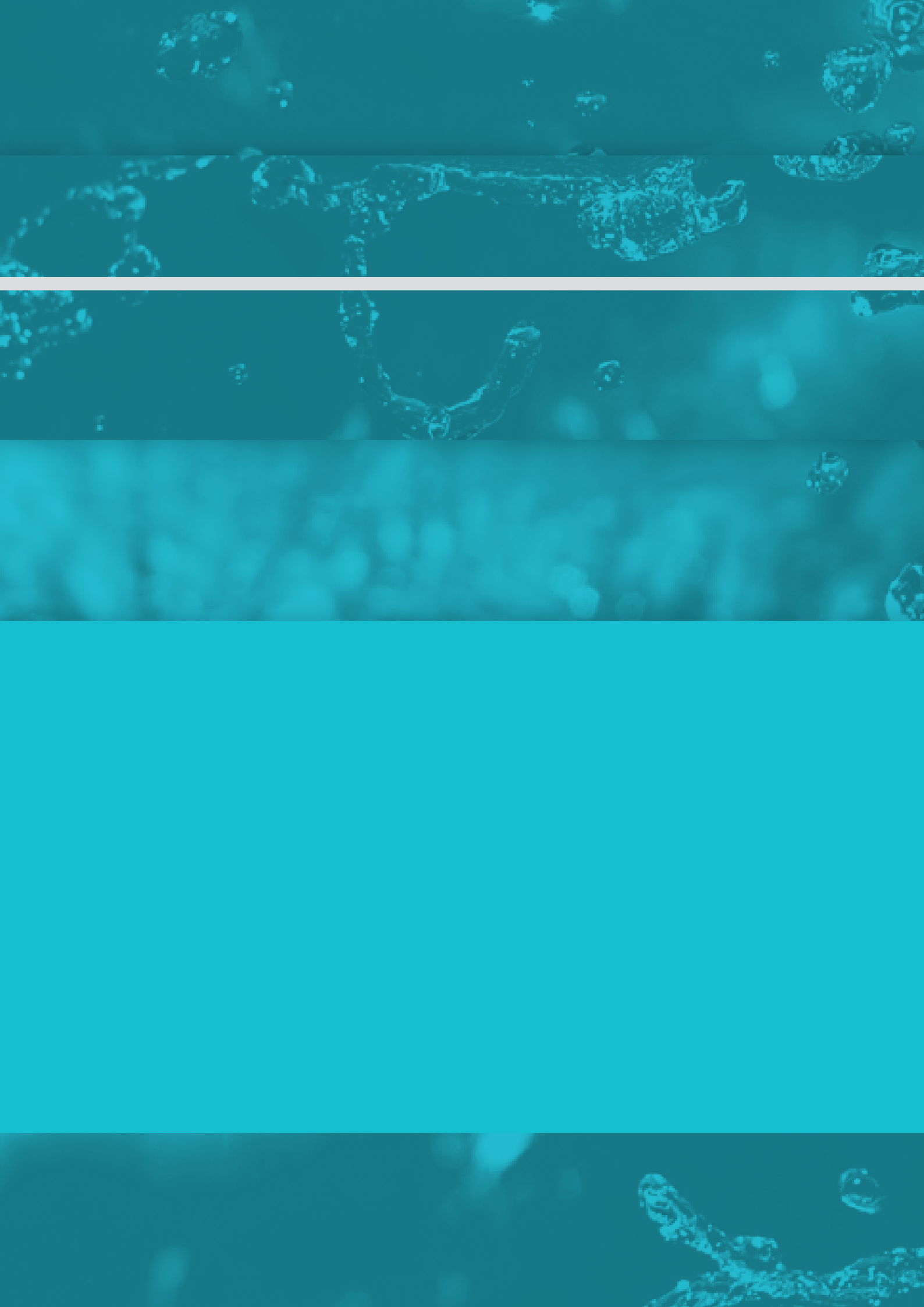


ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
21 HISTORY AND ARCHAEOLOGY



ERA 2015 VOLUME OF OUTPUTS, INSTITUTION AND DISCIPLINE SHARE –
22 PHILOSOPHY AND RELIGIOUS STUDIES





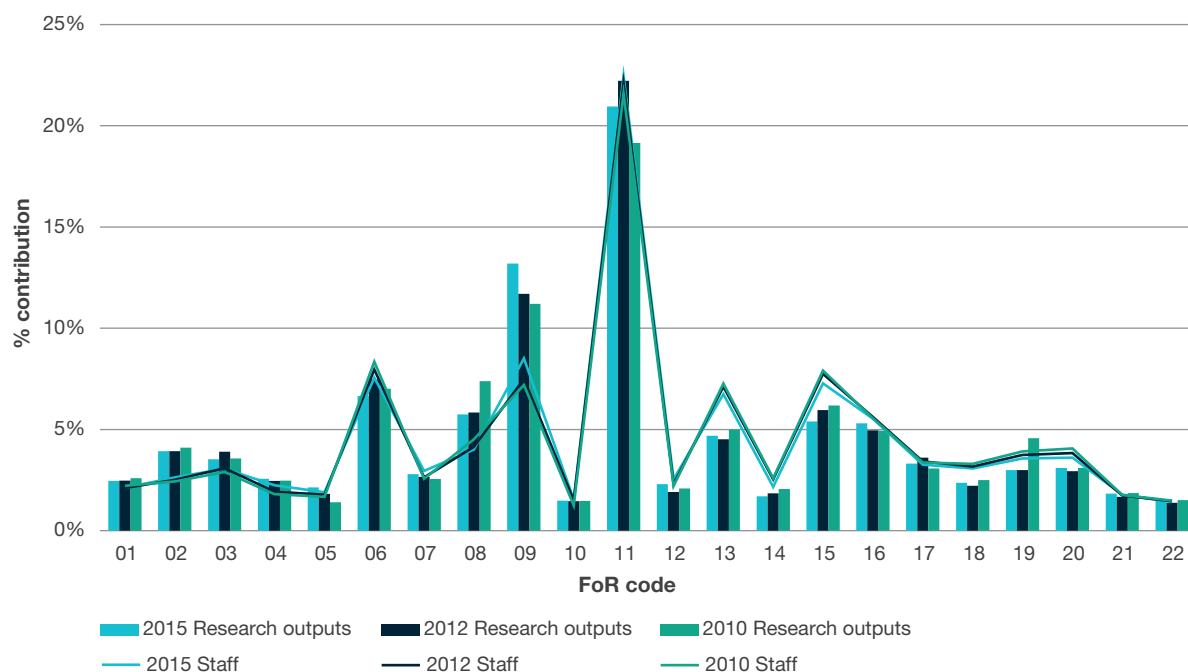
The background of the entire page is a teal color with a subtle pattern of water droplets and bubbles, giving it a fresh, aquatic feel.

SECTION 5

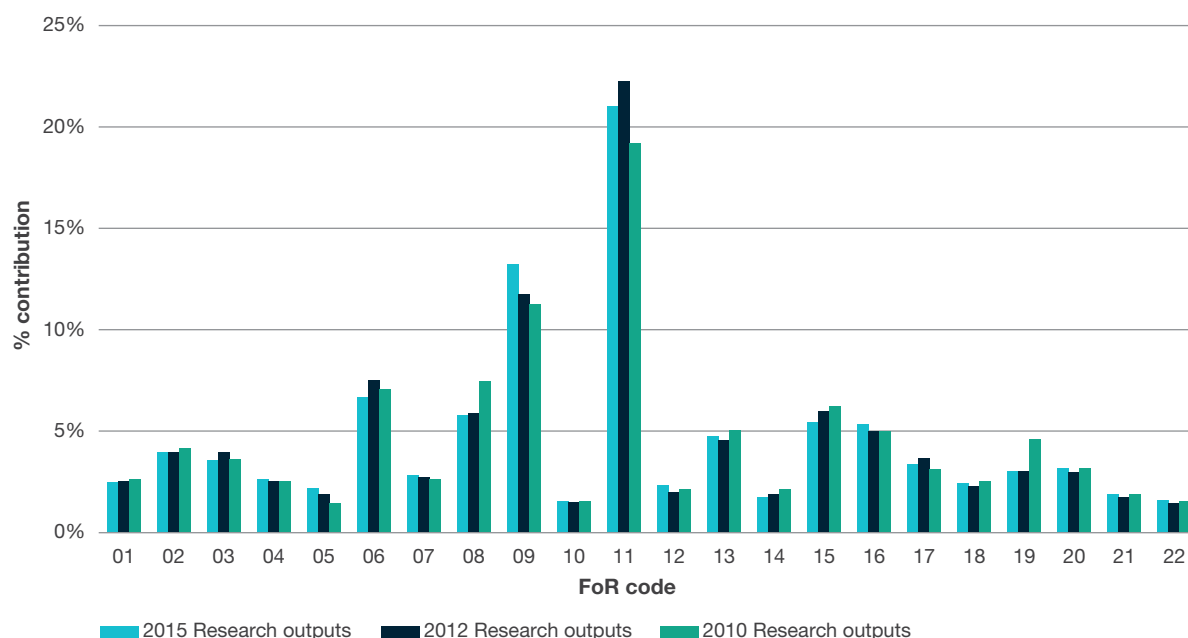
Changes in the Percentage Contribution to the National Landscape

The following charts show the research activity attributed to two-digit FoRs as a proportion of total research activity submitted to all FoR codes in each ERA round for research outputs⁷, staff (full-time equivalent (FTE)), research commercialisation income, patents granted, esteem and research income.

RESEARCH OUTPUTS AND STAFF (FTE) ERA 2015, ERA 2012 AND ERA 2010 – TWO-DIGIT FOR CODES

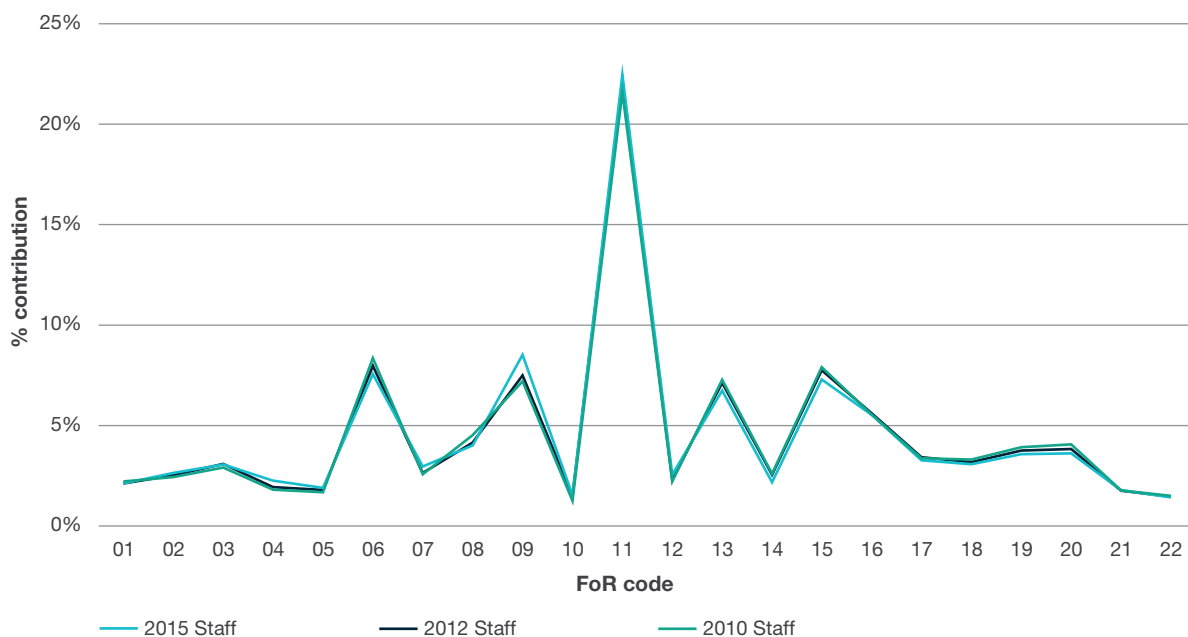


RESEARCH OUTPUTS ERA 2015, ERA 2012 AND ERA 2010 – TWO-DIGIT FOR CODES

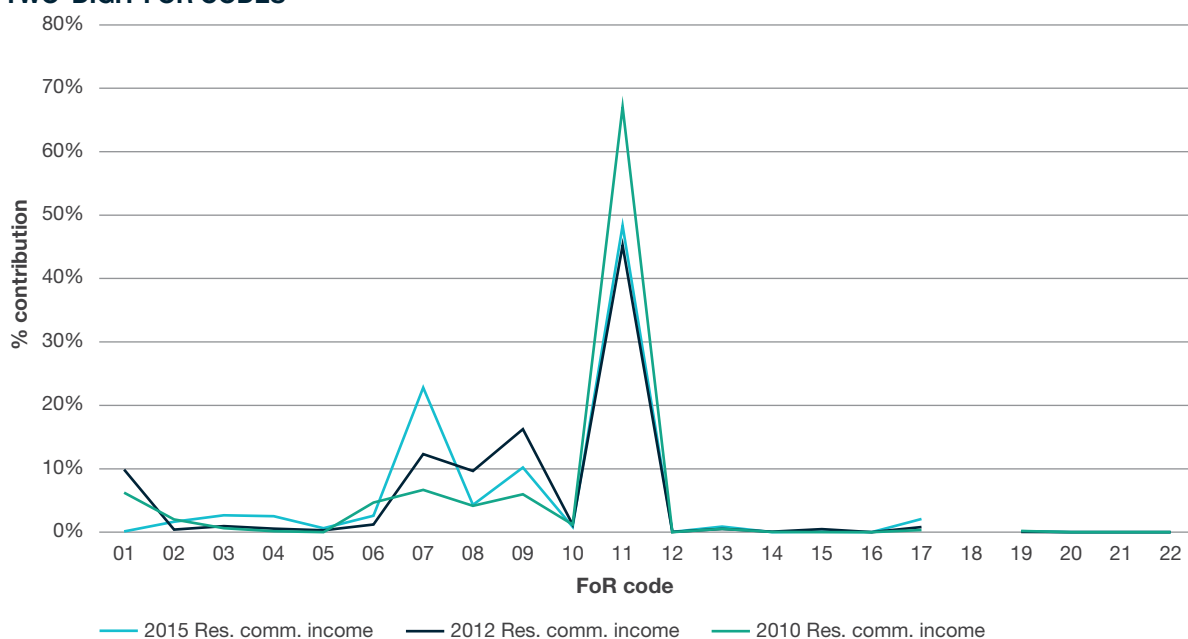


⁷ Note: research output data for this section has been de-duplicated.

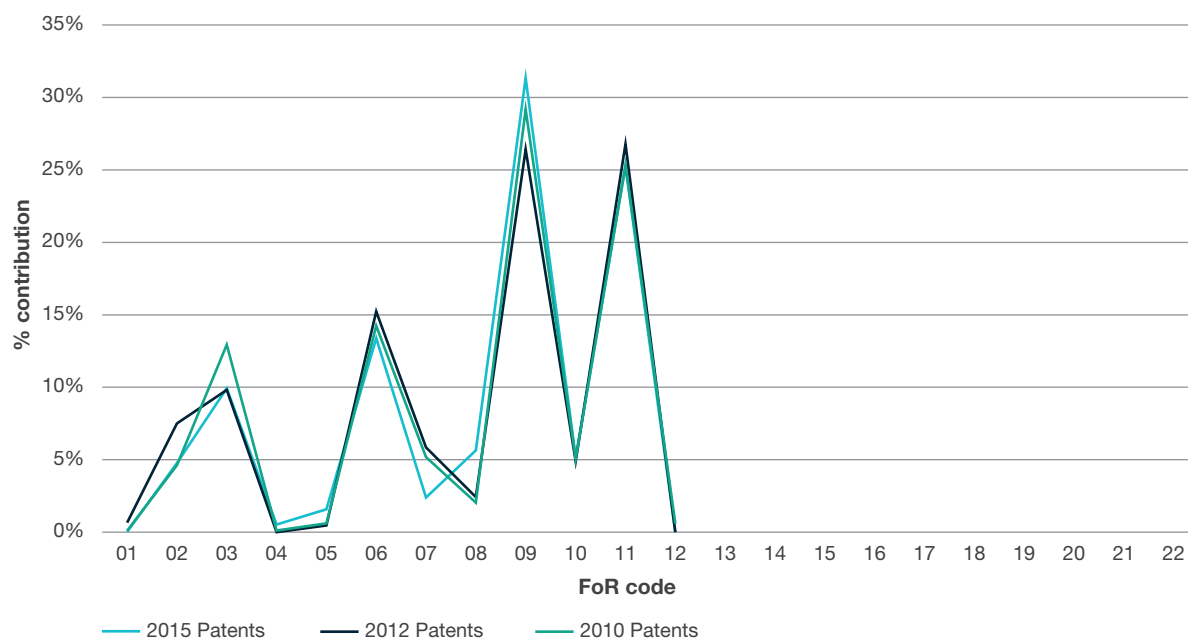
STAFF (FTE) ERA 2015, ERA 2012 AND ERA 2010 — TWO-DIGIT FOR CODES



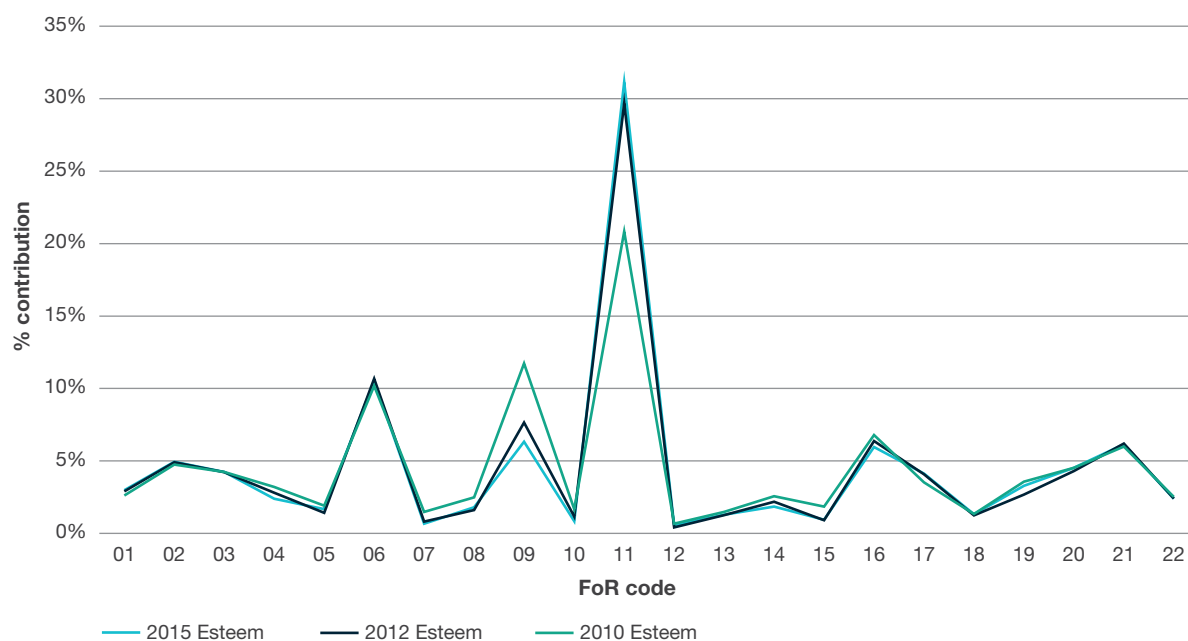
RESEARCH COMMERCIALISATION INCOME ERA 2015, ERA 2012 AND ERA 2010 — TWO-DIGIT FOR CODES



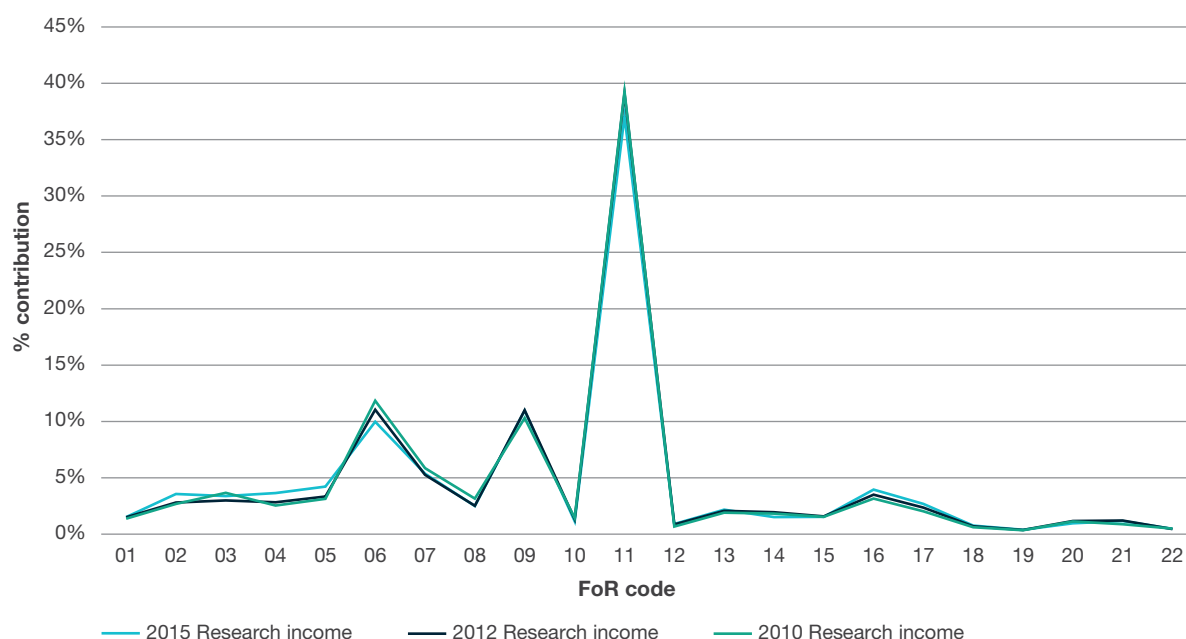
Note: In ERA 2015, ERA 2012 and ERA 2010 two- and four-digit FoR codes for Law and Legal Studies (18) did not use research commercialisation income as an applied measure nor did some underlying four-digit codes in Medical and Health Sciences (11). For more details see the ERA 2015 Discipline Matrix available at: arc.gov.au/era-2015-key-documents.

PATENTS ERA 2015, ERA 2012 AND ERA 2010 – TWO-DIGIT FoR CODES

Note: In ERA 2015, ERA 2012 and ERA 2010 two- and four-digit FoR codes in 13, 14, 15, 16, 17, 18, 20, and 22 did not use patents as an applied measure nor did some underlying four-digit codes in History and Archaeology (21). For more details see the ERA 2015 Discipline Matrix available at: arc.gov.au/era-2015-key-documents.

ESTEEM ERA 2015, ERA 2012 AND ERA 2010 – TWO-DIGIT FoR CODES

HERDC INCOME CATEGORIES 1–4 ERA 2015, ERA 2012 AND ERA 2010 — TWO-DIGIT FOR CODES



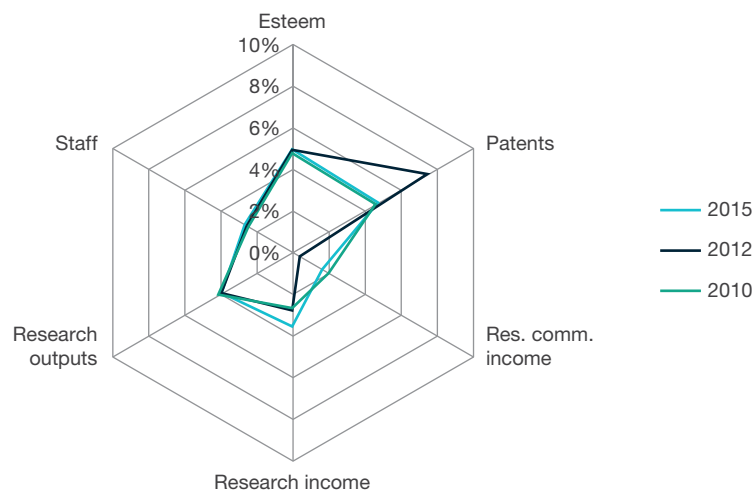
Each chart in the next section shows how much of the total national share is contributed by the two-digit codes to each of the indicators that form part of the ERA evaluation in 2015, 2012 and 2010. For example in ERA 2012, 01 Mathematical Sciences account for just over a two per cent share of the national total of research outputs, a two per cent share of the national total of research income, a two per cent share of the national total of staff (FTE), a three per cent share of national total of esteem measures, a one per cent share of the national total of patents granted and a 10 per cent share of the national total of research commercialisation income. In ERA 2015 these contributions were similar with the exception of patents which fell to less than one per cent of the total national share, and research commercialisation income fell to less than one per cent of the national share.

Note: In following charts for ERA 2015, ERA 2012 and ERA 2010 patent and research commercialisation income are not used as applied measures in every two- and four-digit FoR code. For details of specific codes see the ERA 2015 Discipline Matrix available at: arc.gov.au/era-2015-key-documents.

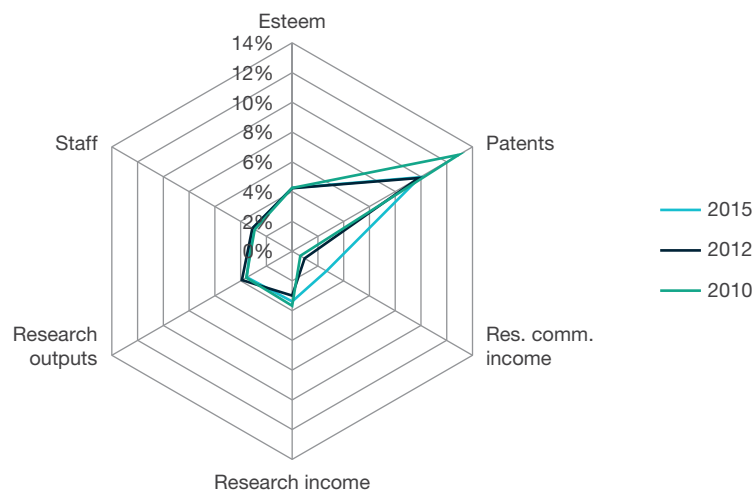
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 01 MATHEMATICAL SCIENCES



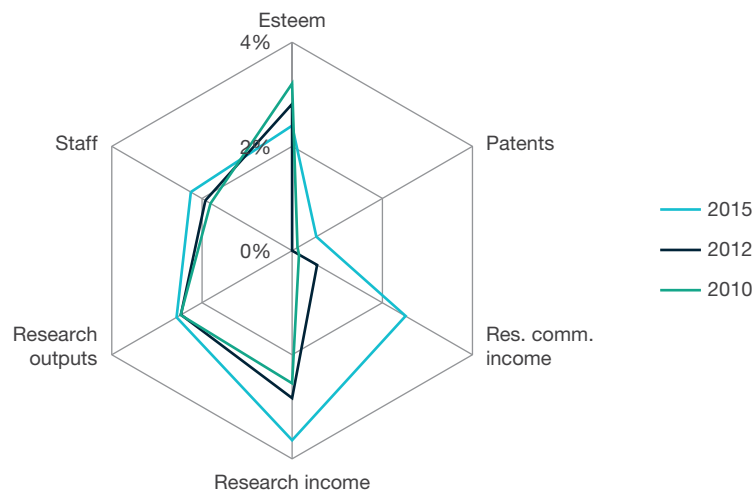
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 02 PHYSICAL SCIENCES



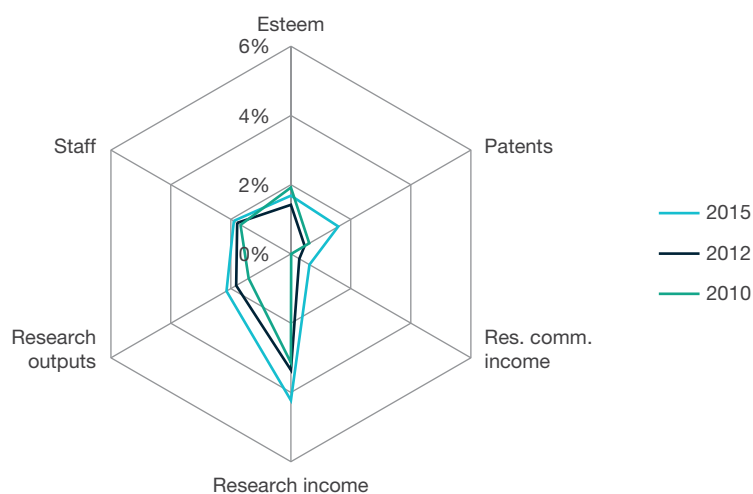
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 03 CHEMICAL SCIENCES



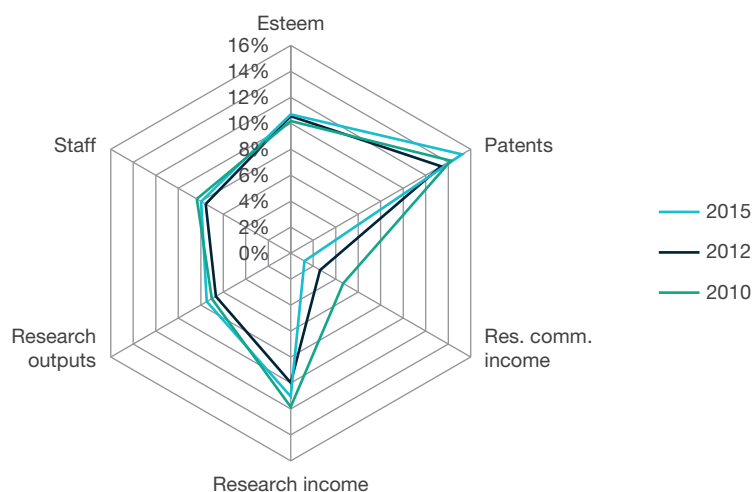
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 04 EARTH SCIENCES



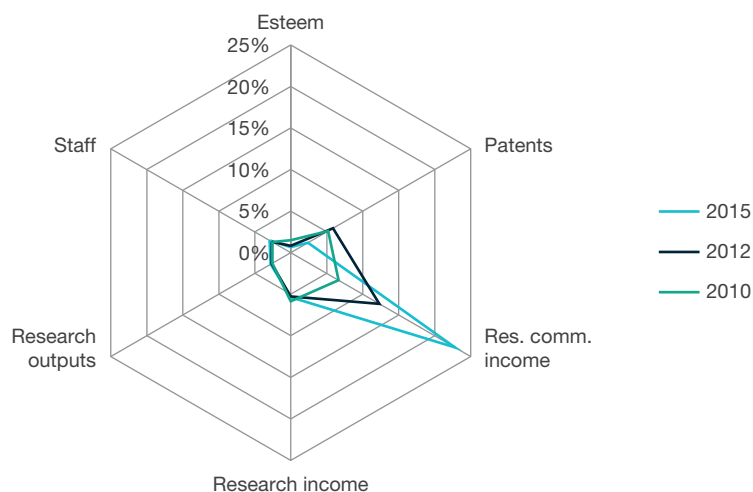
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
05 ENVIRONMENTAL SCIENCES**



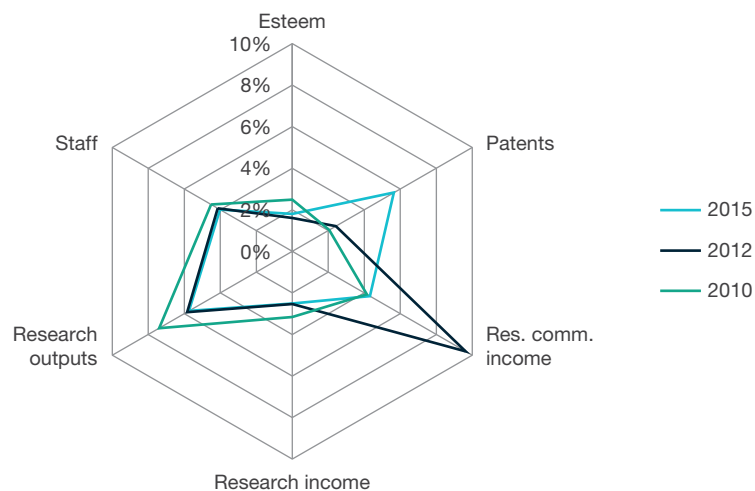
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
06 BIOLOGICAL SCIENCES**



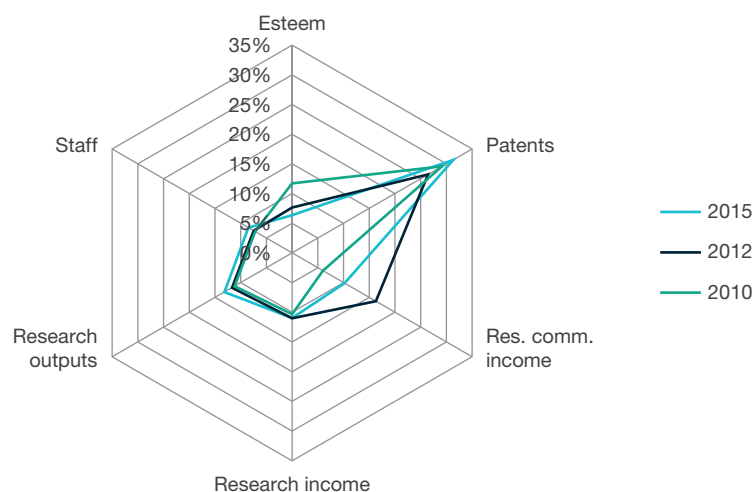
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
07 AGRICULTURAL AND VETERINARY SCIENCES**



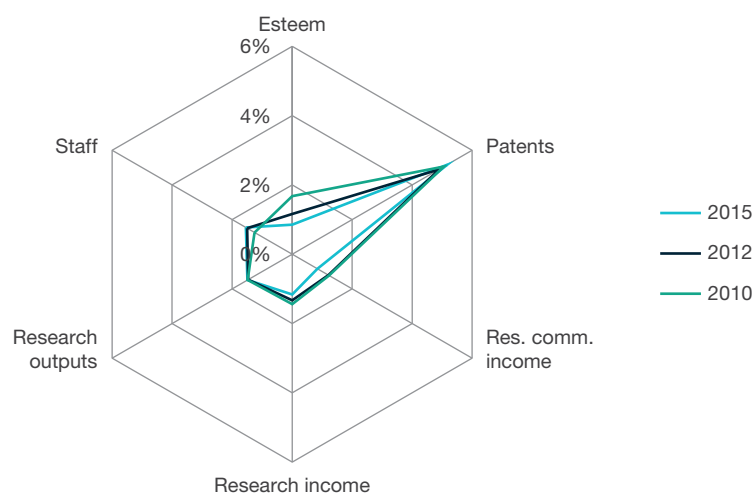
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 08 INFORMATION AND COMPUTING SCIENCES



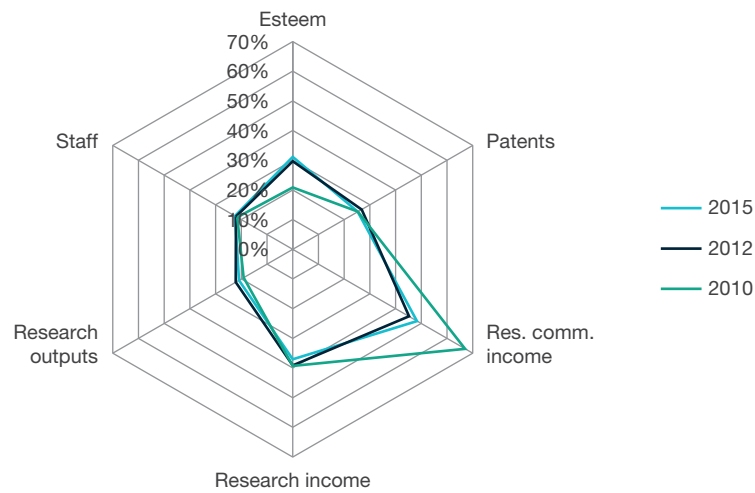
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 09 ENGINEERING



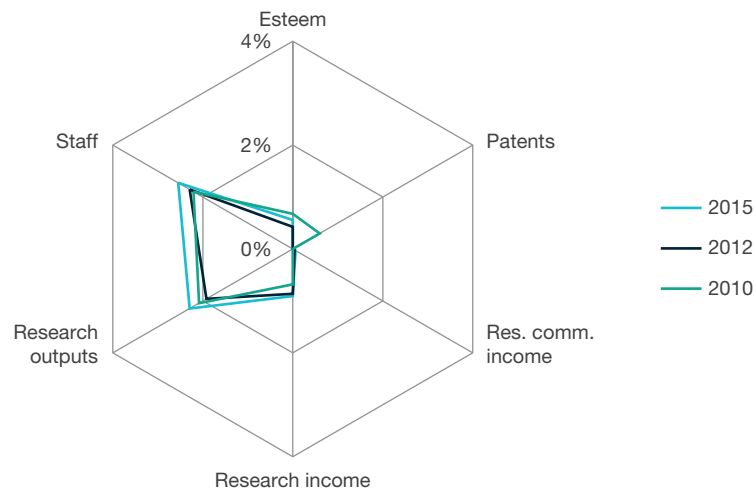
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 10 TECHNOLOGY



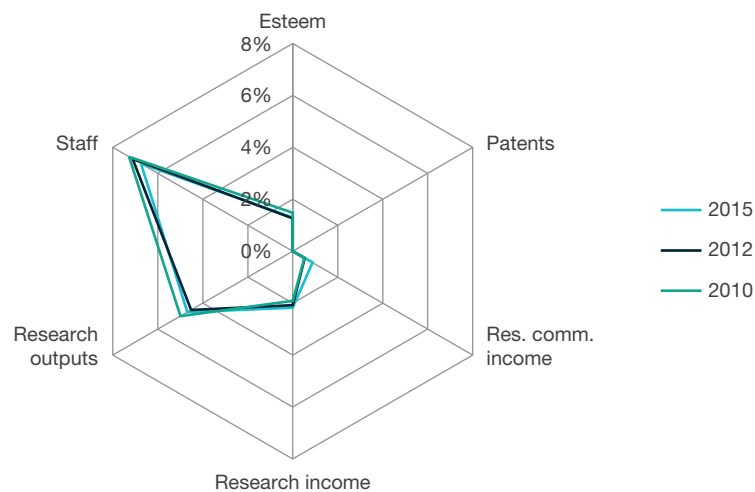
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
11 MEDICAL AND HEALTH SCIENCES**



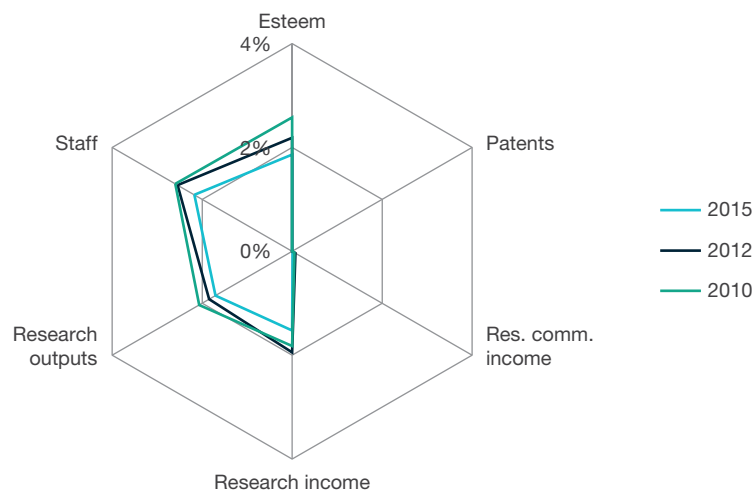
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
12 BUILT ENVIRONMENT AND DESIGN**



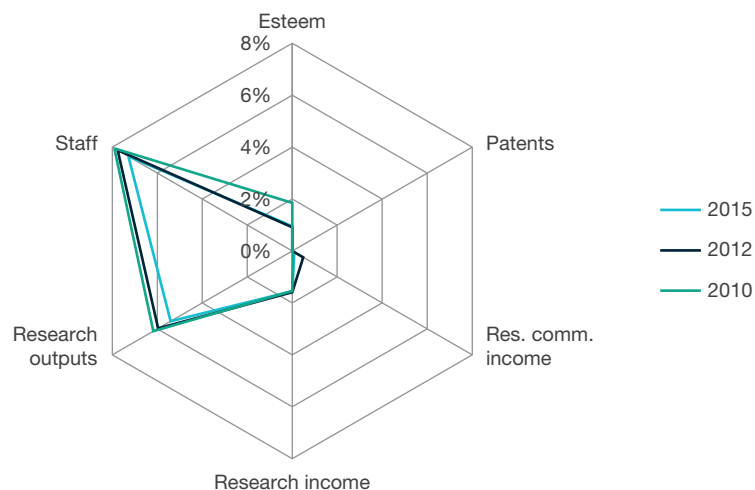
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
13 EDUCATION**



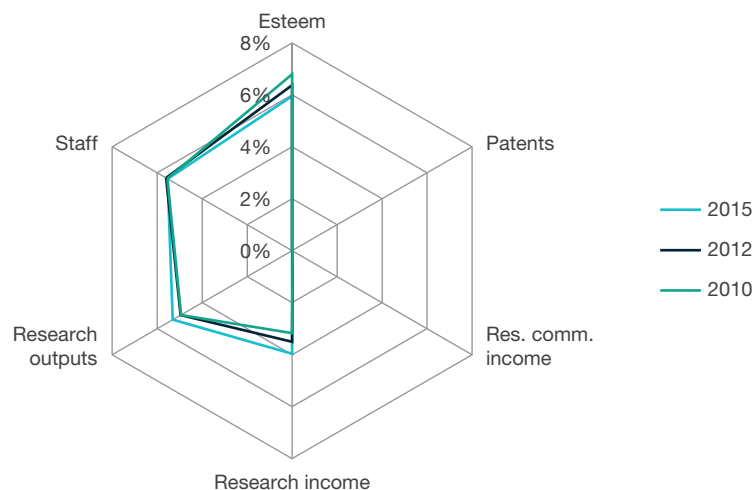
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 14 ECONOMICS



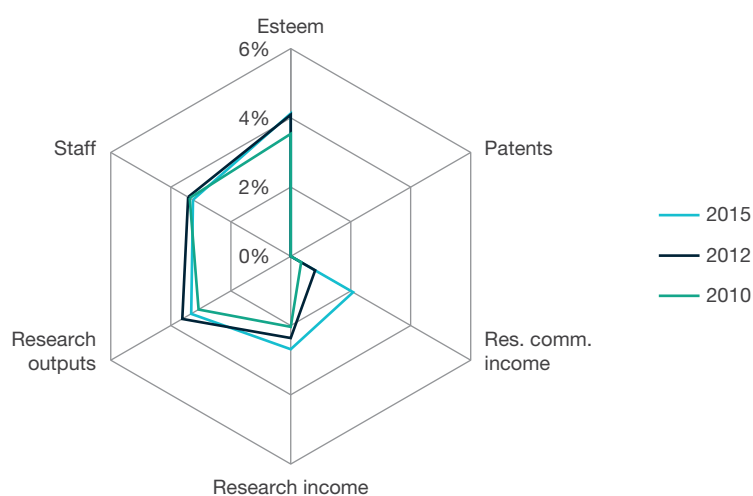
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 15 COMMERCE, MANAGEMENT, TOURISM AND SERVICES



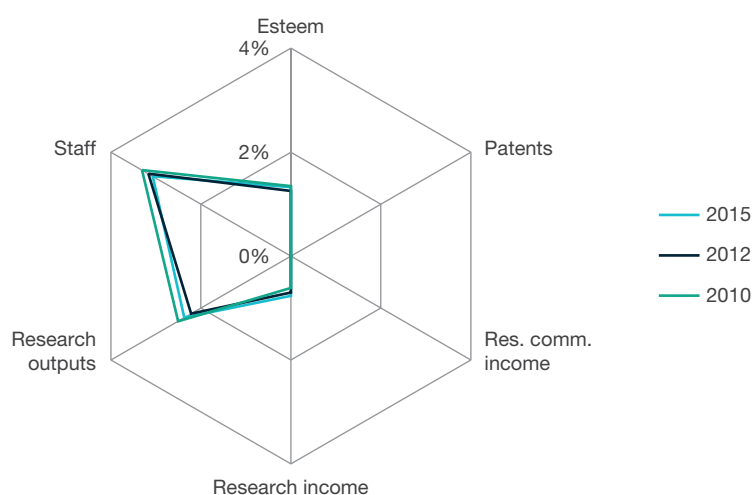
PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 — 16 STUDIES IN HUMAN SOCIETY



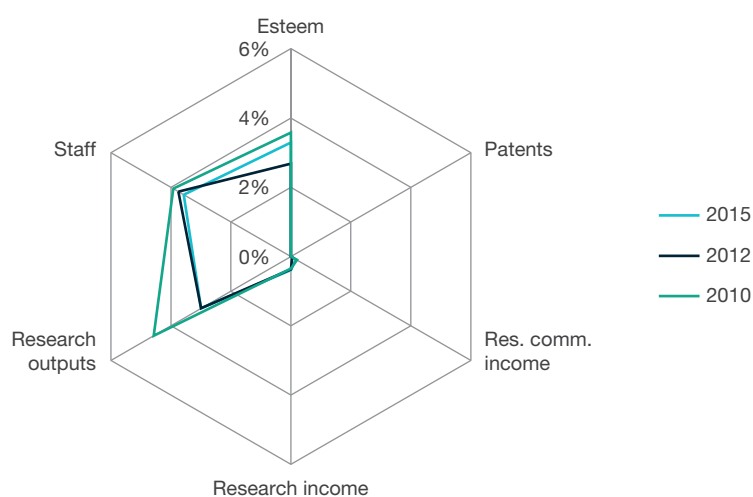
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
17 PSYCHOLOGY AND COGNITIVE SCIENCES**



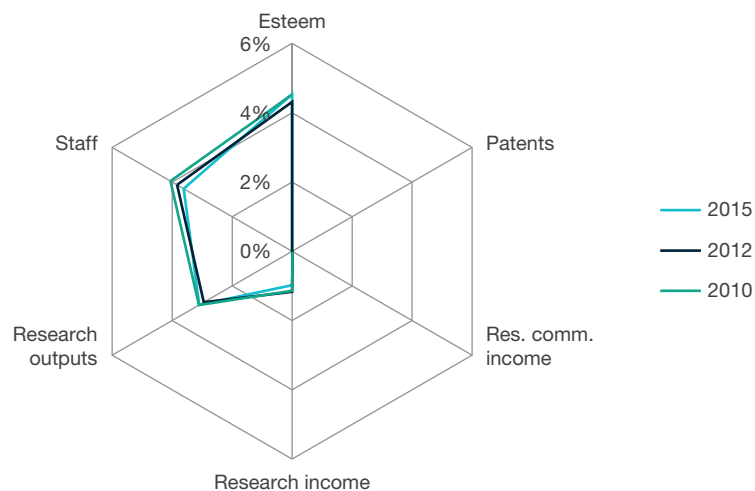
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
18 LAW AND LEGAL STUDIES**



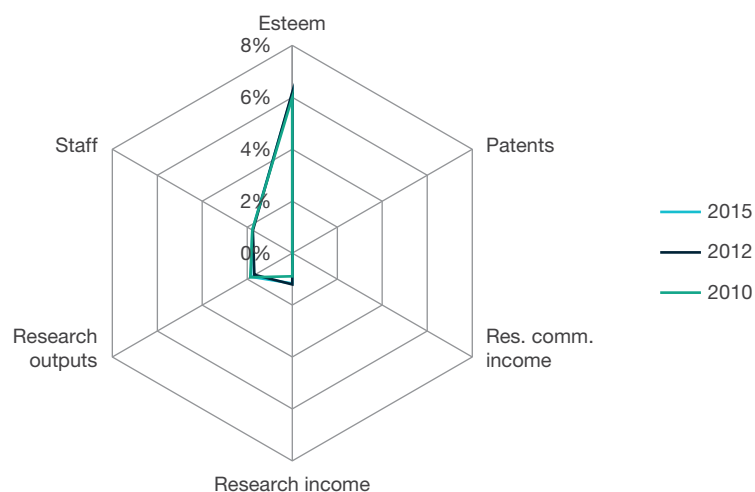
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
19 STUDIES IN CREATIVE ARTS AND WRITING**



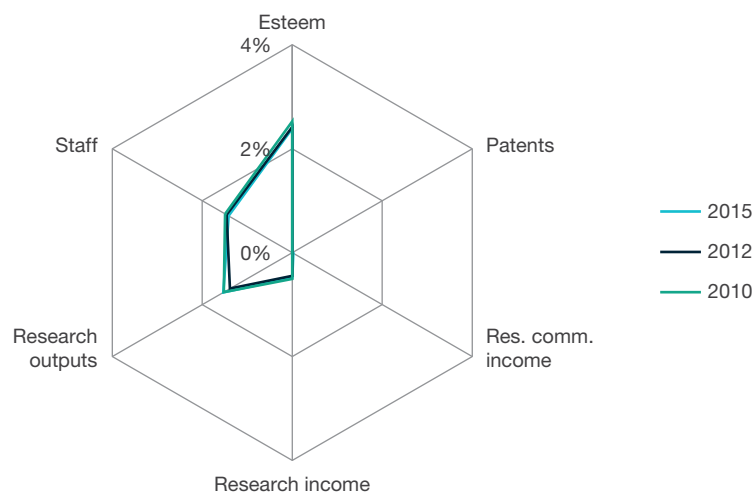
**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
20 LANGUAGE, COMMUNICATION AND CULTURE**

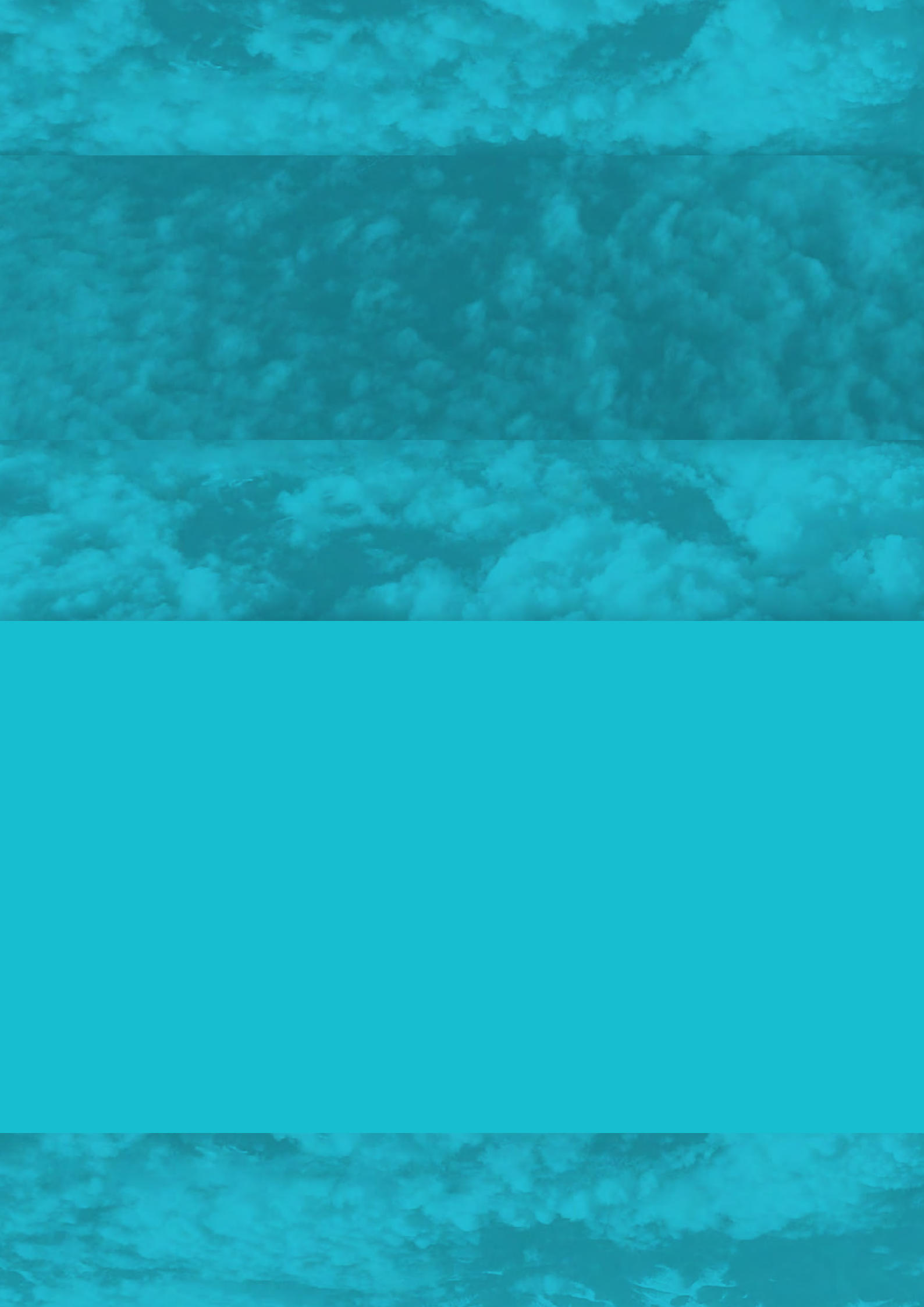


**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
21 HISTORY AND ARCHAEOLOGY**



**PERCENTAGE CONTRIBUTION TO THE NATIONAL LANDSCAPE ERA 2015, ERA 2012 AND ERA 2010 —
22 PHILOSOPHY AND RELIGIOUS STUDIES**







Glossary and Appendices

GLOSSARY

Applied measures	Applied measures for ERA 2015 include patents granted; registered designs; Plant Breeder's Rights; NHMRC endorsed guidelines and research commercialisation income.
Apportioned (count)	Institutions could apportion percentages of a research output submitted to ERA 2015 between one and three four-digit codes, to a total of 100 per cent. The minimum that an output could be apportioned to an FoR code was 20 per cent.
Australia Council grant or fellowship	Australia Council grants and fellowship programmes are an ERA esteem measure. They are characterised by a strong element of peer review, are open to applicants from any State or Territory, require a minimum tenure of two years full-time equivalent and are awarded to an individual.
Discipline	For the purposes of ERA 2015, disciplines were defined as two- or four-digit Fields of Research (FoR) codes, as identified in the <i>Australian and New Zealand Standard Research Classification (ANZSRC) 2008</i> . List of ANZSRC codes .
Discipline Matrix	The <i>ERA 2015 Discipline Matrix</i> specifies which ERA indicators apply to which disciplines. ERA 2015 Discipline Matrix .
Eligible institutions	Australian higher education providers eligible to participate in ERA, defined as Table A and B providers listed in the <i>Higher Education Support Act 2003</i> . A list of eligible institutions is provided at Appendix 1 to this report.
Eligible researcher	A researcher who met the criteria specified at section 5.3.1 of the <i>ERA 2015 Submission Guidelines</i> . ERA 2015 key documents .
Employed	For ERA 2015 purposes, the term 'employed' is used in the same sense as in the <i>Higher Education Staff Data Collection (HESDC) Specifications</i> . It is used to describe the status of an eligible researcher (as 'employed' or 'employed on a casual basis').
Employee	For ERA purposes, the term 'employee' is used in the same sense as in the <i>Higher Education Staff Data Collection (HESDC) Specifications</i> .
ERA 2015 Submission Journal List	A list of journals eligible for institutions' ERA 2015 submissions. Each journal is assigned to one or more disciplines defined by FoR code(s).
ERA peer review	Review conducted of a sample of research outputs by Research Evaluation Committees (RECs) and ERA peer reviewers as part of the ERA evaluation process.
ERA peer reviewer	Independent expert who undertakes ERA peer review of a sample of research outputs as part of the ERA evaluation process.
Esteem measures	Esteem measures indicate that a researcher is held in particularly high regard by their peers or other qualified parties. Eligible esteem measures for ERA 2015 included: editor of a prestigious work of reference; membership of a learned academy and membership of Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS); recipient of a nationally competitive research fellowship; membership of a statutory committee; and recipient of an Australia Council Grant or Australia Council Fellowship. See Section 5.7 of the <i>ERA 2015 Submission Guidelines</i> for further details. ERA 2015 key documents .

Fields of Research (FoR)	<p>A hierarchical classification of research disciplines as set out in the Australian Bureau of Statistics <i>Australian and New Zealand Standard Research Classification (ANZSRC) 2008</i>. The term ‘Fields of Research’ or ‘FoR’ applies to all three ANZSRC levels (two–digit, four–digit and six–digit). Only two– and four–digit FoR codes are used for the purposes of ERA.</p> <p>List of ANZSRC codes.</p>
Four–digit FoR	<p>The middle level of the three hierarchical levels within the Australian Bureau of Statistics <i>Australian and New Zealand Standard Research Classification (ANZSRC) 2008</i>. An example of a four–digit FoR code is ‘0206 Quantum Physics’. List of ANZSRC codes.</p>
Full-time equivalent (FTE)	<p>FTE staffing profile based on academic salary classification, as used in HESDC. Includes Levels A–E and ‘Other’.</p>
Higher Education Research Data Collection (HERDC)	<p>The Higher Education Research Data Collection is an annual data collection exercise undertaken by the Department of Education and Training.</p>
HERDC Category 1 (income)	<p>The type of research income addressed in HERDC research income Category 1, that is, grants listed on the Australian Competitive Grants Register (ACGR). See section 5.5.3.1 of the <i>ERA 2015 Submission Guidelines</i> for further details.</p>
HERDC Category 2 (income)	<p>The type of research income addressed in HERDC research income Category 2, that is, public sector research income other than Australian Competitive Grants. See section 5.5.3.3 of the <i>ERA 2015 Submission Guidelines</i> for further details.</p>
HERDC Category 3 (income)	<p>The type of research income addressed in HERDC research income Category 3, which consists of industry and other research income. For ERA purposes this income is disaggregated into the following three sub–categories:</p> <ul style="list-style-type: none"> i. Australian ii. International A (competitive, peer reviewed) iii. International B (other international income). <p>See section 5.5.3.5 of the <i>ERA 2015 Submission Guidelines</i> for further details.</p>
HERDC Category 4 (income)	<p>The type of research income addressed in HERDC research income Category 4. It comprises research income received by Cooperative Research Centres (CRCs) in which the relevant institution is a core participant (i.e. a signatory to the CRC’s Commonwealth Agreement). See section 5.5.3.7 of the <i>ERA 2015 Submission Guidelines</i> for further details.</p>
Higher Education Staff Data Collection (HESDC)	<p>The annual staff data collection exercise that was undertaken by the Department of Education and Training.</p>
Indexed journal articles	<p>For ERA purposes, ‘indexed journal articles’ refers to articles published in journals listed in the <i>ERA 2015 Submission Journal List</i> that were indexed by the ERA 2015 citation data supplier, SciVerse Scopus.</p>

Low volume threshold	Each discipline within an institution is only subject to ERA evaluation if a certain volume of research outputs has been submitted. For disciplines where citation analysis was used, the low volume threshold was 50 apportioned indexed journal articles. For disciplines where peer review was used, the low volume threshold was 50 apportioned research outputs. In peer review disciplines, for the purpose of calculating the low volume threshold only, books were given an effective weighting of 5:1 compared with other research outputs. See Section 3.6 of the <i>ERA 2015 Submission Guidelines</i> for more information.
Nationally Competitive Research Fellowship	Refers to a fellowship held during the esteem measures reference period, by an eligible researcher under a Category 1 programme listed on the Australian Competitive Grants Register (ACGR). Such fellowships are characterised by: <ul style="list-style-type: none"> › a highly competitive process open to applicants from any Australian State or Territory › a strong element of peer review › a minimum tenure of two years full-time equivalent. Further details can be obtained from section 5.7.2.5 of the <i>ERA 2015 Submission Guidelines</i> .
NHMRC Endorsed Guidelines	Guidelines endorsed by the National Health and Medical Research Council (NHMRC) including those on population health, clinical practice and ethics. They may be produced by groups external to the NHMRC, or else developed by the NHMRC with the assistance of expert working groups. See section 5.6.2.9 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Non-traditional research outputs	Research outputs which do not take the form of traditional research books, book chapters, journal articles or conference publications. See section 5.4.9 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Not assessed – low volume (n/a)	The unit of evaluation was not assessed because it did not have a sufficient volume of eligible research outputs to meet the low volume threshold.
Not rated (n/r)	Not rated due to coding issues.
Original Creative Works	A type of non-traditional research output, including visual art work, design/architectural work and textual work. See section 5.4.9.3 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Other International (patents)	Patents that were granted in a country or region other than Australia, the United States, Europe or Japan.
Other Level	Where an eligible researcher cannot be assigned to one of the Full-Time Equivalent (FTE) levels A–E the researcher is classified as ‘Other’ level. This includes general staff and academics occupying management positions.
Patent	As defined in relevant legislation, a patent is a right granted for any device, substance, method or process which is new, inventive and useful. It is legally enforceable and gives the owner the exclusive right to commercially exploit the invention for the life of the patent. ERA 2015 applied measures include Australian standard patents (but not Australian innovation patents) and equivalent patents issued overseas. See section 5.6.2.3 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Peer review	See ‘ERA peer review’.

Plant Breeder's Rights (PBRs)	As defined in relevant legislation, Plant Breeder's Rights (PBRs) are proprietary rights held by breeders of certain new varieties of plants and fungi. Such rights are legally enforceable and give exclusive commercial rights to market a new variety or its propagating material for the duration of the PBR. For ERA 2015 purposes, PBRs were those granted under the <i>Plant Breeder's Rights Act 1994 (Cth)</i> or their international equivalents. See sections 5.6.2.1 and 5.6.2.2 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Portfolio	A collection of individual items that are derived from the same underlying research endeavour but do not in themselves constitute a research output, which together constitute a single non-traditional research output. The portfolio must be able to demonstrate coherent research content. See section 5.4.9 of the <i>ERA 2015 Submission Guidelines</i> for further information.
Prestigious work of reference	A work of reference which is recognised as one of the best in its field or sub-field, and characterised by a rigorous refereeing process and high scholarly standards. Editor of a prestigious work of reference is an esteem measure for ERA 2015. See section 5.7.2.1 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Reference periods	The set time period during which research outputs were required to have been published, research income reported under HERDC etc., in order to be eligible for inclusion in ERA submissions. ERA 2015 reference periods vary according to the type of data being collected. ERA 2015 reference periods are listed in the introduction to this report.
Registered design	A registered design is an applied measure for ERA 2015. A registered design is a design registered under the Designs Act 2003 (where 'design' refers to the overall appearance of the product including the shape, configuration, pattern and ornamentation, which, when applied to a product, give it a unique visual appearance). See section 5.6.2.5 and 5.6.2.6 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Research	For the purposes of ERA, research is defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies, inventions and understandings. This could include synthesis and analysis of previous research to the extent that it is new and creative. For more information, see section 3.1 of the <i>ERA 2015 Submission Guidelines</i> .
Research Commercialisation Income	Institutions may provide information on research commercialisation income, which includes income resulting from licences, options and assignments (LOAs), including running royalties, cashed in equity and other types of income. Under ERA 2015, research commercialisation income is treated as an 'applied measure' rather than 'research income'. See section 5.6.2.7 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Research Evaluation Committees (RECs)	The cluster-specific committees which undertook the ERA 2015 evaluations. Each committee included internationally-recognised members with expertise in research evaluation and broad discipline expertise. List of ERA 2015 REC members .
Research output	Research outputs include books, journal articles, book chapters, conference papers and non-traditional research outputs.
Staff census date	For a researcher to be eligible for ERA, the researcher must have been employed by an eligible institution at the staff census date. The staff census date for ERA 2015 was 31 March 2014.

Status	This term describes the basis on which a researcher is considered affiliated with an institution for ERA purposes, and may be 'Employed', 'Employed on a Casual Basis', or 'Other Status'. See section 5.3.2.7 of the <i>ERA 2015 Submission Guidelines</i> for more information.
Statutory committee	Membership of recognised statutory committees is an ERA esteem measure for certain disciplines. Statutory committees are recognised by Commonwealth Government agencies, including the National Health and Medical Research Council, and The United Nations, including the World Health Organization. See section 5.7.2.7 of the <i>ERA 2015 Submission Guidelines</i> for further details.
Traditional research outputs	Research outputs in the form of published research books, book chapters, journal articles or conference papers.
Triadic patents	Triadic patents are patents that are a series of corresponding patents filed at the European Patent Office (EPO), the United States Patent and Trademark Office (USPTO) and the Japan Patent Office (JPO), for the same invention by the same applicant or inventor.
Two-digit FoR	The highest of the three hierarchical levels as identified in the Australian Bureau of Statistics <i>Australian and New Zealand Standard Research Classification (ANZSRC) 2008</i> . An example is '02 Physical Sciences'. List of ANZSRC codes .
Unit of Evaluation (UoE)	A discipline, as defined by a two- or four-digit FoR code, for a specific eligible institution. In some contexts, the term refers to the package of associated ERA information (including submission data, indicators and evaluation outcomes). See section 3.3 of the <i>ERA 2015 Submission Guidelines</i> for further details.
UoEs assessed	Units of Evaluation (UoEs) that have met the low volume threshold and have been assessed by Research Evaluation Committees (RECs).
Weighted research outputs	For the purposes of determining the low volume threshold for peer review disciplines, books were given an effective weighting of 5:1 compared with other research outputs (such as journal articles).
Whole (count)	The ERA methodology provided both apportioned and whole counts of research outputs, i.e. an output apportioned 20 per cent to an FoR code would have an apportioned count of 0.2 and a whole count of 1 in that FoR code.

APPENDIX 1 — ELIGIBLE INSTITUTIONS

Australian higher education institutions eligible to participate in ERA 2015 are defined as Table A and B providers listed in the *Higher Education Support Act 2003*.

Australian Catholic University	The Australian National University
Batchelor Institute of Indigenous Tertiary Education	The University of Adelaide
Bond University	The University of Melbourne
Central Queensland University	The University of New England
Charles Darwin University	The University of New South Wales
Charles Sturt University	University of Newcastle
Curtin University of Technology	The University of Notre Dame Australia
Deakin University	The University of Queensland
Edith Cowan University	The University of Sydney
Flinders University	The University of the Sunshine Coast
Griffith University	The University of Western Australia
James Cook University	University of Ballarat ⁹
La Trobe University	University of Canberra
Macquarie University	University of South Australia
MCD University of Divinity ⁸	University of Southern Queensland
Monash University	University of Tasmania (incorporating Australian Maritime College)
Murdoch University	University of Technology, Sydney
Queensland University of Technology	University of Western Sydney
RMIT University	University of Wollongong
Southern Cross University	Victoria University
Swinburne University of Technology	

⁸ Currently known as the University of Divinity

⁹ Currently known as Federation University

APPENDIX 2 — ANZSRC FIELDS OF RESEARCH (FOR) CODES

FoR Code	FoR Name
01	Mathematical Sciences
0101	Pure Mathematics
0102	Applied Mathematics
0103	Numerical and Computational Mathematics
0104	Statistics
0105	Mathematical Physics
0199	Other Mathematical Sciences
02	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
03	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

Continued

FoR Code	FoR Name
04	Earth Sciences
0401	Atmospheric Sciences
0402	Geochemistry
0403	Geology
0404	Geophysics
0405	Oceanography
0406	Physical Geography and Environmental Geoscience
0499	Other Earth Sciences
05	Environmental Sciences
0501	Ecological Applications
0502	Environmental Science and Management
0503	Soil Sciences
0599	Other Environmental Sciences
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

Continued

FoR Code	FoR Name
07	Agricultural 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
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
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

Continued

FoR Code	FoR Name
10	Technology
1001	Agricultural Biotechnology
1002	Environmental Biotechnology
1003	Industrial Biotechnology
1004	Medical Biotechnology
1005	Communications Technologies
1006	Computer Hardware
1007	Nanotechnology
1099	Other Technology
11	Medical and Health Sciences
1101	Medical Biochemistry and Metabolomics
1102	Cardiovascular Medicine and Haematology
1103	Clinical Sciences
1104	Complementary and Alternative Medicine
1105	Dentistry
1106	Human Movement and Sports Science
1107	Immunology
1108	Medical Microbiology
1109	Neurosciences
1110	Nursing
1111	Nutrition and Dietetics
1112	Oncology and Carcinogenesis
1113	Ophthalmology and Optometry
1114	Paediatrics and Reproductive Medicine
1115	Pharmacology and Pharmaceutical Sciences
1116	Medical Physiology
1117	Public Health and Health Services
1199	Other Medical and Health Sciences
12	Built Environment and Design
1201	Architecture
1202	Building
1203	Design Practice and Management
1204	Engineering Design
1205	Urban and Regional Planning
1299	Other Built Environment and Design

Continued

FoR Code	FoR Name
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
1699	Other Studies in Human Society
17	Psychology and Cognitive Sciences
1701	Psychology
1702	Cognitive Sciences
1799	Other Psychology and Cognitive Sciences
18	Law and Legal Studies
1801	Law
1802	Maori Law
1899	Other Law and Legal Studies

Continued

FoR Code	FoR Name
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, Communication 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



