

Working Paper 2011/17

New Zealand
Universities:
Research activities,
commercialisation
and international
benchmarking

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New Zealand Universities: Research activities, commercialisation and international benchmarking

Wendy McGuinness, Lucy Foster and Diane White

1. Purpose

The purpose of this working paper is to document the research capabilities of the eight universities in New Zealand by detailing the governing legislation, their faculties and colleges, students and staff numbers, and the research activities that occur within each.

An analysis of the information presented in this working paper will be completed in *Project 2058's* Report 9: *Government-funded Science under the Microscope*. It is relevant to the report given the amount of public funding universities receive and their legislated role to advance research in New Zealand. This analysis will inform our conclusions on the state of government-funded science in New Zealand in Report 9; to help identify the opportunities and challenges that our government-funded science system faces both presently and in the future.

The strategic aim of *Project 2058* is to promote integrated long-term thinking, leadership and capacity-building so that New Zealand can effectively seek and create opportunities, and explore and manage risks, over the next 50 years. In order to achieve this aim, the *Project 2058* team will work to:

1. Develop a detailed understanding of the current national planning landscape, and in particular the government's ability to deliver long-term strategic thinking;
2. Develop a good working relationship with all parties that are working for and thinking about the 'long-term view';
3. Recognise the goals of iwi and hapū, and acknowledge te Tiriti o Waitangi;
4. Assess key aspects of New Zealand's society, asset base and economy in order to understand how they may shape the country's long-term future, such as government-funded science, natural and human-generated resources, the state sector and infrastructure;
5. Develop a set of four scenarios to explore and map possible futures;
6. Identify and analyse both New Zealand's future strengths and weaknesses, and potential international opportunities and threats;
7. Develop and describe a desirable sustainable future in detail, and
8. Prepare a *Project 2058* National Sustainable Development Strategy. (SFI, 2009: 3)

Report 9 contributes to meeting the fourth objective of *Project 2058*. In particular, it provides a context for understanding the current government-funded science system with a view to assessing its appropriateness in relation to delivering a sustainable future.

Wendy McGuinness is the founder and chief executive of the Sustainable Future Institute. Originally from the King Country, Wendy completed her secondary schooling at Hamilton Girls' High School and Edgewater College. She then went on to study at Manukau Technical Institute (MIT) (gaining an NZCC), Auckland University (BCom) and Otago University (MBA), as well as completing additional environmental papers at Massey University. As a Fellow Chartered Accountant (FCA) specialising in risk management, Wendy has worked in both the public and private sectors. In 2004 she established the Sustainable Future Institute as a way of contributing to New Zealand's long-term future. Wendy also sits on the Boards of the New Zealand Futures Trust and the Katherine Mansfield Birthplace.

Lucy Foster has recently completed a Bachelor of Commerce (Economics) at the University of Otago, and will complete a Bachelor of Arts (Art History) at the end of 2011, on exchange at the University of Glasgow. She has worked at the Sustainable Future Institute on a part-time basis for the past five years.

Diane White recently completed a Bachelor of Laws from Victoria University of Wellington. She also holds a Bachelor of Arts (English Literature and International Relations) from the same university. She spent a period studying at Uppsala University in Sweden, and went on to live in Stockholm, Sweden. She now resides in Wellington and works as a research analyst for the Sustainable Future Institute. She is also involved in a number of community law projects, with specific interests in employment and environmental law.

The Institute would like to acknowledge Jonathan Hughes, Principal Advisor at Universities New Zealand, for reviewing this paper and providing feedback. This paper has benefited greatly from his insights and suggestions.

2. Methodology

2.1 Data collection

All research is gathered from publicly accessible information and this paper has been externally reviewed to ensure there are no gaps or errors in the overall content. This working paper aims to meet the above purpose by undertaking research in the following two areas:

1. Review and summarise all relevant legislation (see Section 3).
2. Review and summarise the purpose, structure and degree of commercialisation of the eight universities and their faculties, colleges and research centres (see Section 4).
3. Review and summarise Higher-Education Research and Development (HERD) funding and expenditure (see Section 5).
4. Analyse the performance of New Zealand's universities in the QS Global University Rankings (see Section 6).

3. Governing Legislation

3.1 Establishing a Body of Education

Institutions for education in New Zealand must be established by the Governor-General at the recommendation of the Minister under s 162(2) of the Education Act 1989, which states:

The Governor-General may, by Order in Council made on the written recommendation of the Minister, establish a body as a college of education, a polytechnic, a specialist college, a university, or a wānanga, as the Governor-General considers appropriate.

3.2 Bodies of Education

When the Minister makes a recommendation to the Governor-General that such a body be established, the Minister will make the application based on the following legislated definitions as provided for in s 162(4)(b) of the Education Act 1989 that:

- i. A college of education is characterised by teaching and research required for the pre-school, compulsory and post-compulsory sectors of education, and for associated social and educational service roles:
- ii. A polytechnic is characterised by a wide diversity of continuing education, including vocational training, that contributes to the maintenance, advancement, and dissemination of knowledge and expertise and promotes community learning, and by research, particularly applied and technological research, that aids development:
- iii. A specialist college is characterised by teaching and (if relevant) research of a specialist nature that maintains, enhances, disseminates, and assists in the application of knowledge and expertise:
- iv. A university is characterised by a wide diversity of teaching and research, especially at a higher level, that maintains, advances, disseminates and assists the application of, knowledge, develops intellectual independence, and promotes community learning:
- v. A wānanga is characterised by teaching and research that maintains, advances, and disseminates knowledge and develops intellectual independence, and assists the application of knowledge regarding ahuatanga Māori (Māori tradition) according to tikanga Māori (Māori custom).

3.3 Definition of a University

Under s 162 of the Education Act 1989, universities in New Zealand are required to have all of the following characteristics. Note that any other type of educational institution as discussed above must have at least one of these characteristics:

- i. they are primarily concerned with more advanced learning, the principal aim being to develop intellectual independence:
- ii. their research and teaching are closely interdependent and most of their teaching is done by people who are active in advancing knowledge:
- iii. they meet international standards of research and teaching:
- iv. they are a repository of knowledge and expertise:
- v. they accept a role as a critic and conscience of society.

It is within this legislative framework that this paper explores our universities.

3.4 Academic Freedom

Universities are founded on a belief in truth and reason, and their purpose is to spread, uphold and, where necessary, defend understanding and knowledge. Academic freedom is fundamental to achieving this purpose and guarantees universities the freedom to ‘hold any belief and espouse it in an appropriately academic manner’ (Barrow, 2009: 178). Within New Zealand, universities are required by s 161 of the Education Act 1989 to preserve and enhance academic freedom, which means acting as autonomous institutions independent of government. This section defines academic freedom as:

- (a) the freedom of academic staff and students, within the law, to question and test received wisdom, to put forward new ideas and to state controversial or unpopular opinions:
- (b) the freedom of academic staff and students to engage in research:
- (c) the freedom of the institution and its staff to regulate the subject matter of courses taught at the institution:
- (d) the freedom of the institution and its staff to teach and assess students in the manner they consider best promotes learning:
- (e) the freedom of the institution through its chief executive to appoint its own staff.

3.5 Universities in New Zealand

Universities in New Zealand must be established (and likewise, disestablished) by legislation. The following Acts provide for the eight universities in New Zealand: Auckland University of Technology (Establishment) Order 1999; Lincoln University Act 1961; Massey University Act 1963; University of Auckland Act 1961; University of Canterbury Act 1961; University of Otago Ordinance 1869; University of Waikato Act 1963; and Victoria University of Wellington Act 1961. A brief historical overview of universities in New Zealand is outlined below to provide context for this working paper.

The University of Otago, New Zealand’s first university, was established in 1869 and officially opened in July 1871. In 1870 the University of New Zealand was established by the New Zealand University Act to become the ‘examining and degree-granting body for all New Zealand university institutions’ (Universities NZ, 2009). The University of Otago, having already been established, became an affiliated college of the University of New Zealand in 1874 (University of Otago, n.d.[d]). Further, Canterbury College, Auckland College and Victoria University College were established as part of the University of New Zealand between 1873 and 1897. These became universities in their own right on the January 1, 1962, following the disestablishment of the University of New Zealand the previous year. Massey University and the University of Waikato were established the following year. Note that prior to 1963, Massey University was called the New Zealand Agricultural College, established in 1926, and became Massey Agricultural College in 1927 (ibid.).

Like Massey University, Lincoln University has existed for longer than suggested by the date of the Lincoln University Act. It was founded as the School of Agriculture in 1878, and became a constituent of the University of Canterbury through legislation in 1961. Lincoln formally separated to become its own university in 1990 (Lincoln University, 2010b). Although now known as the Lincoln University Act 1961, it was originally enacted as the Lincoln College Act 1961.

4. Eight Universities

4.1 Overview of the Universities

Tables 1–8 provide detail on each of New Zealand’s eight universities including the establishment date; relevant legislation; the university constitution; student and staff numbers; schools or faculties; research centres and Centres of Research Excellence, and the commercialisation entity. The tables also include the vision of each university, as documented in recent strategy documents, to illustrate the university's present day interpretation of the legislation and right to academic freedom. Where there was no vision available, a mission or mission statement has been included instead.

Within each university, teaching and research are spread across a number of faculties, colleges or schools. Most faculties, colleges or schools comprise a series of departments for individual subject areas, which exist alongside other supporting services such as the library, careers services, accommodation services and management and financial operations. This paper does not document these other supporting services.

4.2 Research Centres, Centres of Research Excellence and Commercialisation Entities

Overview

Research is one of the primary functions of universities and takes place within research centres (including specific Centres of Research Excellence) and commercialisation entities, as well as within faculties and colleges. Given the importance of research to individual universities and to New Zealand in a broader sense, there have been efforts to encourage and reward excellent research in the tertiary sector through the Performance-Based Research Fund (see Section 4.3). This section details the research and commercialisation activities of universities and this is expanded further in Tables 1–8.

Table 9 provides a snapshot of the research activities currently undertaken by New Zealand universities, by field. The table divides all research into nine broad categories: Architecture, Design and Building Science; Commerce and Administration; Education; Engineering; Humanities and Social Sciences; Information Technology; Law and Public Policy; Medical and Health Science; and Science. Some of these categories are further subdivided to provide a more detailed picture of where research is occurring. Each research body is categorised according to its predominant area of research. However, many research bodies are by nature multidisciplinary and cover a number of research fields. In recognising the limitations inherent in this method of categorisation, this table is intended only to present a broad overview of the fields of research occurring within each university. Further, this table only documents the research activities of separate research centres and does not categorise the activities of commercialisation entities or individual faculties and colleges as set out in Tables 1–8.

Research Centres

Research centres exist within each university for specified research projects. These projects tend to be interdisciplinary and may incorporate staff and research students across multiple departments. However, the majority of centres are hosted by a single department for financial reasons, as the centre then becomes a budget line in the host department’s budget. It is unusual for a centre to exist without being aligned to a department.

The form and functions of research centres varies between universities. The University of Auckland, University of Otago and Auckland University of Technology all provide specific definitions for their research centres.

The University of Auckland states: ‘All centres have research as their main focus, and consist of a group of academic and research staff drawn from one or more departments, schools and/or faculties. A centre implies commitment to develop a programme in broader fashion than a single research project’ (University of Auckland, n.d.[b]).

The University of Otago describes the designation of research centres and themes as formal recognition of outstanding research. Further, they outline four criteria which must be met in order to be defined by the University as a research area:

- (1) In which the University enjoys national leadership and international recognition for excellence;
- (2) In which the University is likely to remain a major contributor in the next several years;
- (3) Which might involve active research groups or individuals from more than one Department, School or Division;
- (4) Which have demonstrated ability to attract significant additional funding from outside the University. (University of Otago, n.d[c])

The Auckland University of Technology (AUT) specifies three aims for its research centres/institutes, stating each must strive to:

- (1) Ensure that resources are concentrated in areas that AUT has capability;
- (2) Be the key concentration of research activity;
- (3) Provide an education, mentoring and training role for postgraduate students. (AUT, 2010b)

Listing the research centres in this working paper provides an inventory of the current projects being undertaken, and research fields being explored in New Zealand. The list pertains specifically to present projects and a future review may show a shift in focus.

Centres of Research Excellence

Centres of Research Excellence (CoREs) are inter-institutional research networks, which allow researchers from different organisations and institutions to work together on commonly agreed work programmes. They are funded by the CoREs Fund, which was established in 2001 to encourage the development of collaborative, strategically-focussed research (TEC, 2009b). There are now eight CoREs in New Zealand, 'covering a diverse range of research areas ranging from bio-protection to materials and nanotechnology' (aCoRE, n.d.). Each CoRE is hosted by a university, as listed under the relevant host university in Tables 1–8, and they comprises a number of partner organisations including other universities, Crown Research Institutes, wānanga, and the wider community relating to the particular field of research (TEC, 2009b).

The current eight CoREs are:

- The Allan Wilson Centre for Molecular Ecology and Evolution
- The Bio-Protection Research Centre
- The MacDiarmid Institute for Advanced Materials and Nanotechnology
- Maurice Wilkins Centre for Molecular Biodiscovery
- National Research Centre of Growth and Development (NRCGD)
- New Zealand Institute of Mathematics and its Application
- Ngā Pae o te Māramatanga
- Riddet Institute (aCoRE, n.d.)

The CoRE Fund is administrated by the Tertiary Education Commission, which in the 2006/2007 funding round awarded six years of funding for seven CoREs. In this funding round the TEC also created a new CoRE, the Riddet Institute. The Institute of Mathematics and its Application was unsuccessful in the application for funding in this round but will receive transitional funding until 2011 (TEC, 2006; TEC, 2009c).

The Association of Centres of Research Excellence (aCoRE) is the umbrella body for CoREs, and seeks to 'further promote and connect research and educational excellence' (aCoRE, n.d.). This body is currently chaired and led by the Bio-Protection Research Centre of Lincoln University.

Commercialisation Entities

Each university also has a commercialisation entity, which is the body responsible for actively commercialising the intellectual property developed within the university and in the research centres. In some cases, this is a wholly owned subsidiary of the university. Universities New Zealand reports that the combined activities of the eight commercialisation entities are worth \$350 million annually (Universities New Zealand, 2010). The commercialisation entities of all eight universities are connected through the University Commercialisation Offices of New Zealand (UCONZ, 2011). This body was founded in 2005 to bring together the commercialisation offices of the eight universities and to establish closer links with commercial research partners (UCONZ, 2011). The newly established Ministry of Science and Innovation (MSI) is to set up a National Network of Commercialisation Centers, as announced in the May 2010 Budget. In seeking to generate greater benefit to New Zealand from investment in research and development, the Government envisages an approach to commercialisation that ensures ‘those involved in commercialisation activities work together to create scale, enhance capacity and improve collaboration’ (FRST, 2010: 5).

4.3 Performance-Based Research Fund

The Performance-Based Research Fund (PBRF) was established in 2003, as a way to ensure that excellent research in the tertiary education sector is encouraged and rewarded. This involves assessing the research performance of the participating Tertiary Education Organisation (TEO) and then funding them on the basis of their performance. Funding is allocated on the basis of an established formula centred around three elements: Quality Evaluation, Research Degree Completions, and External Research Income (TEC, 2009a). Decisions on funding are to be submitted to the Tertiary Education Commission Board for consideration and approval (TEC, 2011b: 21). In 2010 the fund was set at \$250 million a year (TEC, 2011a: 5).

Quality Evaluation accounts for 60 per cent of the fund and is determined through a periodic assessment of the research performance of staff at participating TEOs by expert peer review panels. Peer reviewers evaluate researcher performance across three dimensions: the quality of research output, the esteem with which the researcher is held by their peers, and their contribution to the research environment (Smart, 2009). Research Degree Completion accounts for 25 per cent of the fund and is a yearly measurement of the number of PBRF eligible postgraduate research-based degrees completed at the TEO. External Research Income makes up the final 15 per cent of the fund and is a yearly measurement of the amount of income received by the TEO from external sources for research purposes (TEC, 2009a).

The increased scrutiny the PBRF has placed on the research activities of New Zealand’s eight universities has been associated with a significant increase in research productivity at most universities (Smart, 2009). Further, high ratings under the PBRF bring reputational benefits and possible multiplier effects for the top-ranked universities (Curtis and Matthewman, 2005: 9). However, given that there are significant financial gains for a TEO having high-performing researchers on their staff, this funding model can result in a ‘reallocation of academics’ time between teaching and research’ (Smart, 2005: 12). This may lead to the best researchers spending less time teaching and this will be explored further in the analysis within Report 9.

5. Higher-education Research and Development: Funding and Expenditure

5.1 Overview

This section outlines the funding and expenditure of Higher-Education Research and Development (HERD) in New Zealand. For the purpose of this section the higher-education sector includes the eight universities listed at Section 3.5 and the research and commercialisation entities contained within each university as detailed in Tables 1–8. Research and Development (R&D) is defined according to the Statistics New Zealand definition, based on OECD guidelines as, ‘Any creative work undertaken on a systematic basis in order to increase the stock of knowledge. Any activity classified as R&D is characterised by originality. Investigation is a primary objective’ (Statistics NZ, 2011: 14). In the context of HERD, R&D is further divided into pure-basic research, targeted-basic research, applied research, and experimental development.

Section 5.2 details the source and funding for all HERD. Section 5.3 documents how these funds are spent in regards to the type of R&D; the type of expenditure; and the expenditure by socio-economic objective. These sections compare figures from 2008 and 2010 as to inform further analysis in Report 9.

The figures used in this analysis are based on the recent Statistics New Zealand analysis of R&D in New Zealand, *Research and Development in New Zealand: 2010* (Statistics NZ, 2011). It should be noted that 2010 was the first year in which the commercial arms of universities were included in higher education sector figures. Prior to 2010, these commercial entities were included under the business sector.

5.2 Funding

The total expenditure on HERD in New Zealand in 2010 was \$802 million, up from \$653 million in 2008 (Statistics NZ, 2011: 49).

In 2008, the main source of this expenditure was the New Zealand government, which funded 62 per cent of total expenditure on HERD (Statistics NZ, 2011: 93). More specifically, 40 per cent of the overall total expenditure came from government research contracts and 22 per cent of expenditure was from the government-funded Tertiary Education Commission. Further, 27 per cent of expenditure was sourced from universities themselves, including through student fees. The remainder of the funding came from the private sector (five per cent), overseas entities (three per cent) and other sources (three per cent) (Statistics NZ, 2011: 93).

The main source of this expenditure in 2010 was also the New Zealand government, but this increased to 65 per cent of total expenditure on HERD (Statistics NZ, 2011: 93). More specifically, 41 per cent of the overall total expenditure in 2010 came from government research contracts and 24 per cent of expenditure was from the government-funded Tertiary Education Commission. In 2010, expenditure sourced from universities themselves decreased to 24 per cent. The remainder of the funding from the private sector, overseas entities, and other sources remained unchanged from 2008 (Statistics NZ, 2011: 93).

5.3 Expenditure

The \$653 million expenditure on HERD in 2008 represented 30 per cent of all expenditure on R&D in New Zealand (Statistics NZ, 2011: 49). It also equated to 0.36% of New Zealand's GDP (Statistics NZ, 2011: 50). Of this \$653 million, 59 per cent of expenditure went to wages and salaries; 30 per cent went to other current expenditure; and ten per cent was spent on capital expenditure, which included the purchases of land, buildings, plant equipment, machinery, vehicles, capitalised software and other assets (Statistics NZ, 2011: 92). In terms of the type of HERD, 30 per cent of expenditure was in the field of pure basic research; 23 per cent was targeted basic research; 28 per cent was for applied research; and 19 per cent was experimental development research (Statistics NZ, 2011: 93).

In 2010, the \$802 million of expenditure on HERD represented 33 per cent of all expenditure on R&D – up three per cent from 2008 (Statistics NZ, 2011: 49). This equated to 0.43% of New Zealand's GDP (Statistics NZ, 2011: 50). The distribution of overall expenditure remained much the same as in 2008: 58 per cent went to wages and salaries; 28 per cent went to current expenditure; and 14 per cent was spent on capital expenditure (Statistics NZ, 2011: 92). The distribution of funding by the type of R&D showed significant changes: 20 per cent of expenditure was in the field of pure basic research (down 10 per cent from 2008); 28 per cent was targeted basic research (up five per cent); 36 per cent was for applied research (up eight per cent); and 16 per cent was experimental development research (down three per cent) (Statistics NZ, 2011: 93). It should be noted that the expenditure in all four areas increased, even where the percentage of overall expenditure decreased.

This working paper seeks to explore how this overall expenditure is allocated in terms of the purpose and socio-economic objectives of HERD in New Zealand. Using statistics from the recent Statistics New Zealand analysis of R&D in New Zealand, *Research and Development in New Zealand: 2010*, Figure 1 categorises the R&D undertaken within New Zealand higher-education bodies (as defined above). The purpose of this table is to highlight the main socio-economic objectives of research within New Zealand universities and identify the areas of New Zealand's economy benefiting from HERD. It can be read with Table 9, which more broadly categorises the research activities of all universities under nine broad headings. It should be noted that Figure 1 is categorised by the sector that ultimately benefits from the results of the R&D, rather than

the actual nature of the R&D. Instead, Table 9 seeks to highlight the nature of the research predominantly carried out by each research entity and is not focused on the end-use of the research activities.

Figure 1: HERD expenditure by socio-economic objective

Source: Statistics NZ, 2011: 53

Socio-economic objective	2008		2010	
	\$(million)	Percent	\$(million)	Percent
Plant production and plant primary products	12	2	21	3
Animal production and animal primary products	29	4 R	26	3
Mineral resources (excluding energy)	10	2	4	0
Energy	21	3	18	2
Manufacturing	30 R	5	40	5
Construction	9	1	C	C
Transport	7	1	C	C
Information and communication services	38 R	6	C	C
Commercial services and tourism	29 R	4	16	2
Health	149 R	23	254	32
Education and training	71 R	11	72	9
Law, politics, and community services	27	4	29	4
Cultural understanding	43	7	65	8
Economic framework	40	6	21	3
Environment	40	6	52	6
Defence	5	1	C	C
Knowledge general	84 R	13	117	15
Other	8	1	C	C
Total	653 R	100	802	100

Note: R = Revised

6 Global Rankings

6.1 Overview of global rankings

Higher education has become a domain for global competition – especially in the field of research performance. This increased competition has created a demand for comparative information on universities and contributed to the prominence of ranking systems. Rankings enable universities to be judged by where they stand in global terms: prospective students use the rankings when choosing where to study and universities themselves use the rankings in setting targets and determining advertising and branding strategies (Hazelkorn, 2009: 1). Further, given the role of higher-education and academic research as drivers of economic growth and innovation in the wider national science system, rankings are used by politicians and governments as indicators of international competitiveness and strength (Hazelkorn, 2009: 1).

However, these ranking systems are subject to varied criticism. The global ranking of universities has ‘cemented the notion of a world university competition or market capable of being arranged in a single “league table” for comparative purposes and given a powerful impetus to intranational and international competitive pressures in the sector’ (Marginson & van der Wende, 2007: 308). Like any system of ranking, university ranking systems are based on normative assumptions and values, as reflected by the chosen methodology of comparison and calculation. The question to be asked is whose assumptions and values underlie this view of success; the traditional strength of English-language research universities suggests the ranking system is biased towards an anglicised view of academic success (Marginson & van der Wende, 2007: 308).

In trying to construct a method of global comparison, ranking systems have had to focus on the one model of institution sufficiently widespread to enable global comparisons: ‘that of the comprehensive research-intensive university’ (Marginson & van der Wende, 2007: 308). This has led to criticism that ranking systems over-emphasise particular types of research and traditional outputs. Rankings are said to value research in particular fields – namely bio-sciences and related disciplines – over research in areas such as the arts, humanities and social sciences (Hazelkorn, 2009: 9). With rankings being broken into separate disciplines, interdisciplinary and inter-institutional collaboration is not encouraged: ‘rankings... continue to focus on narrow definitions of research, ignore interdisciplinarity and fail to give adequate recognition to social and economic impact, and effectively reward classical conceptions of knowledge conducted by elites in selected institutions’ (Hazelkorn, 2009: 9).

6.2 QS Ranking System

Universities are increasingly recognising the need to succeed within the terms set by global ranking systems in order to acquire and maintain an international reputation, attract international students and researchers, and maintain national credibility. In light of this reality, this working paper references the international rankings of each university as deemed by the QS Ranking System (known as the Times QS Ranking System prior to 2009). The data is compiled using a methodology that accounts for: academic reputation as determined by global survey (40%); faculty student ratio (20%); citations per faculty according to SciVerse Scopus (20%); employer reputation as determined by global survey (10%); the proportion of international students (5%); and the proportion of international faculty (5%) (QSIU, n.d.).

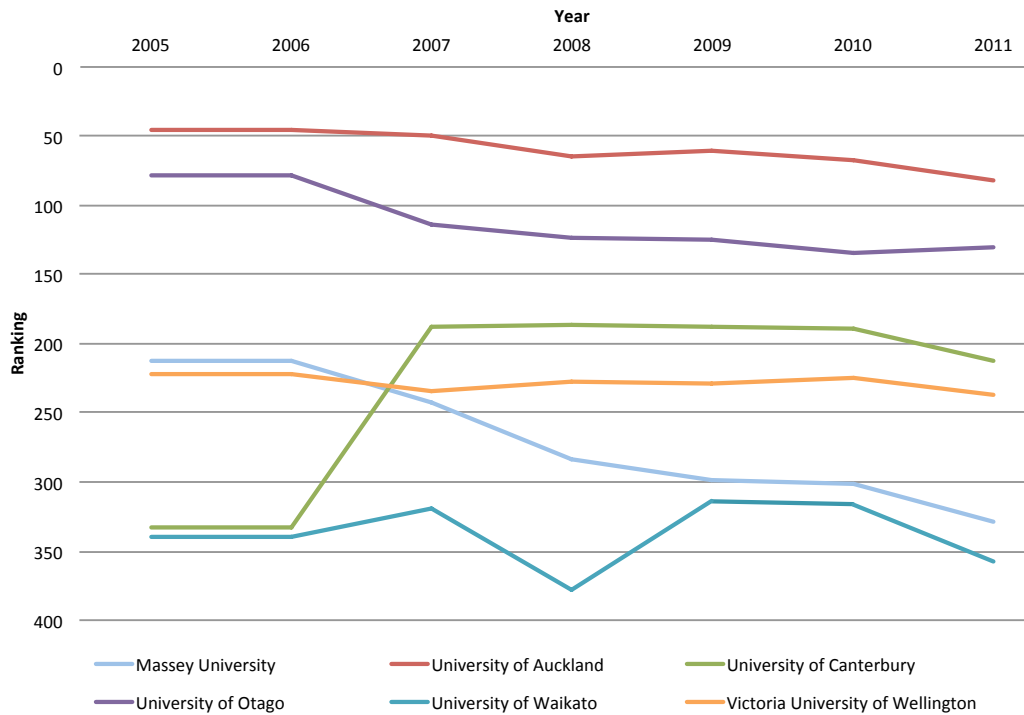
This methodology attempts to measure the broader activities of universities, but research still forms the bulk of a university’s score; arguably about 60 per cent given that peer appraisal is essentially a reputational calculation based on research standing (Hazelkorn, 2009: 2). Universities are ranked according to these individual criteria and these rankings account for a university’s overall ranking. Further, universities are ranked by faculty: Arts and Humanities; Engineering and Technology; Life Sciences and Medicine; Natural Sciences; and Social Sciences and Management. The University of Cambridge, Harvard University and Massachusetts Institute of Technology are currently the three highest overall ranked universities under the QS Rankings (QSTU, n.d.[a]).

6.3 QS World University Rankings of New Zealand Universities

Source: QSTU, n.d.[b]; QSTU, n.d.[c]; QSTU, n.d.[d]; QSTU, n.d.[e]; QSTU, n.d.[f]; QSTU, n.d.[g]; QSTU, n.d.[h]; QSTU, n.d.[i]

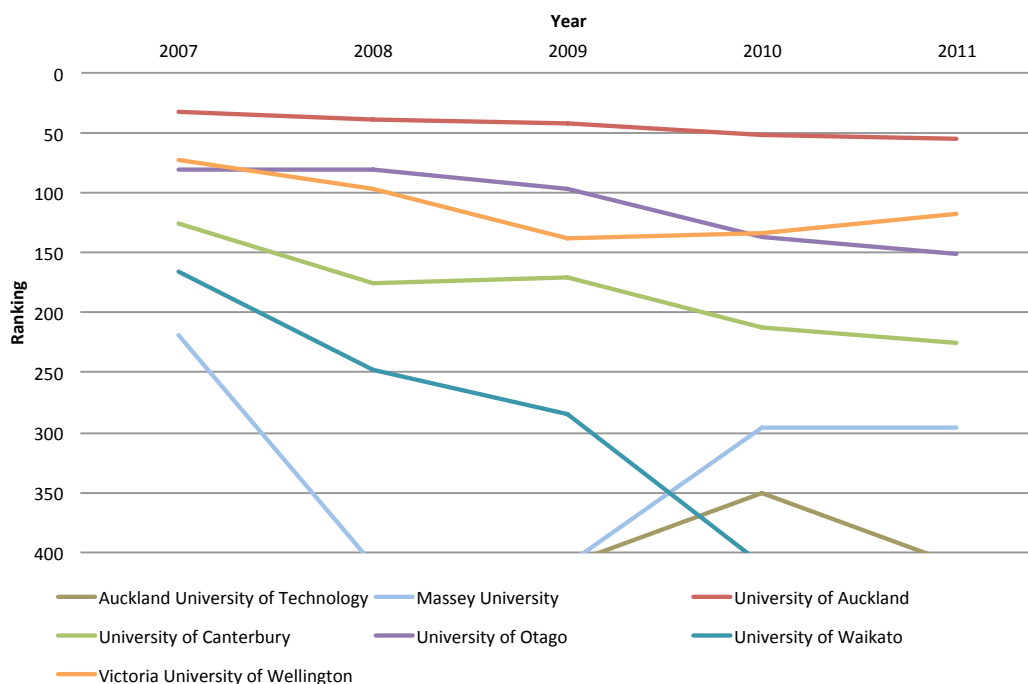
Note: The points at which data drops below the base line show that the university failed to achieve a ranking in that year. The gradient by which the line drops below the baseline is not indicative of how much the university dropped in the rankings, and simply seeks to reflect that the university ranked below what the QS Ranking System measures.

Figure 2: QS World University Ranking of New Zealand Universities 2005–2011: Overall



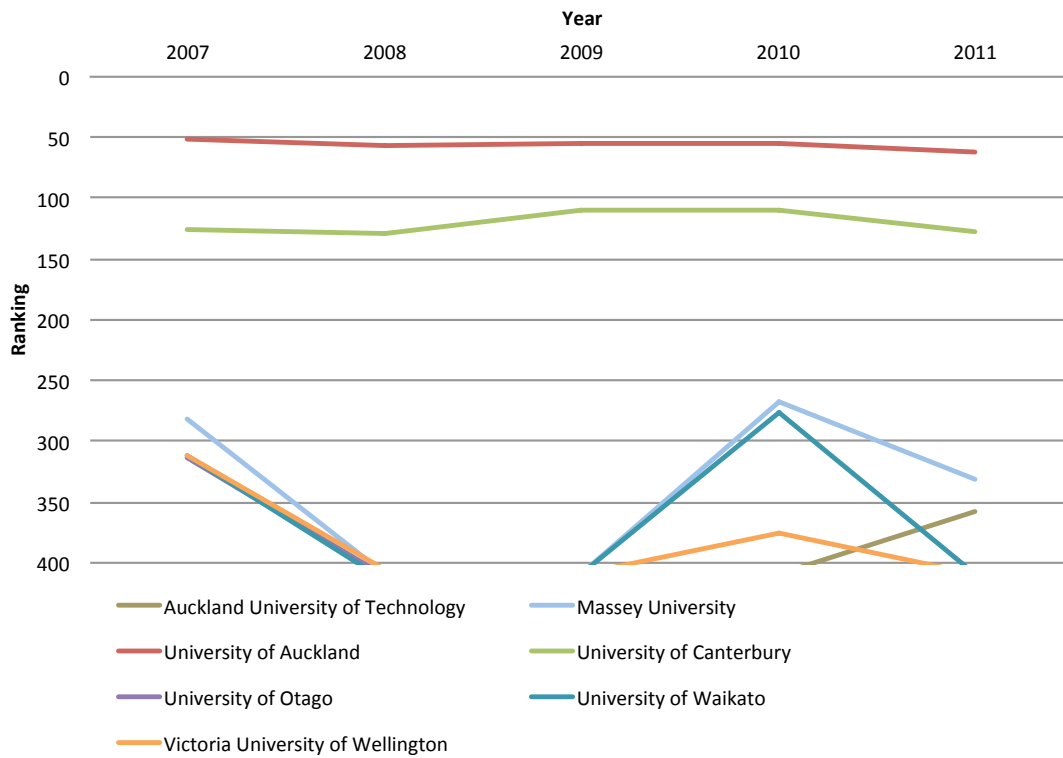
Note: Auckland University of Technology and Lincoln University have never been included in QS World University Overall Rankings.

Figure 3: QS World University Ranking of New Zealand Universities 2007–2011: Arts and Humanities



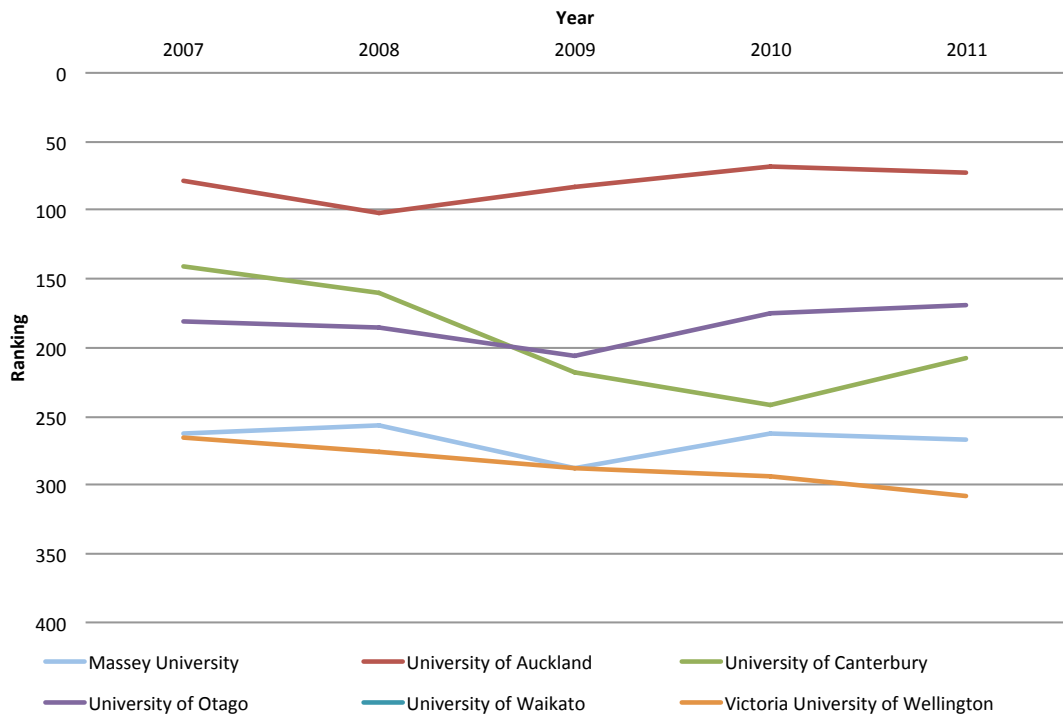
Note: Lincoln University has never achieved a QS World University Ranking in the discipline of Arts and Humanities.

Figure 4: QS World University Ranking of New Zealand Universities 2007–2011: Engineering and IT



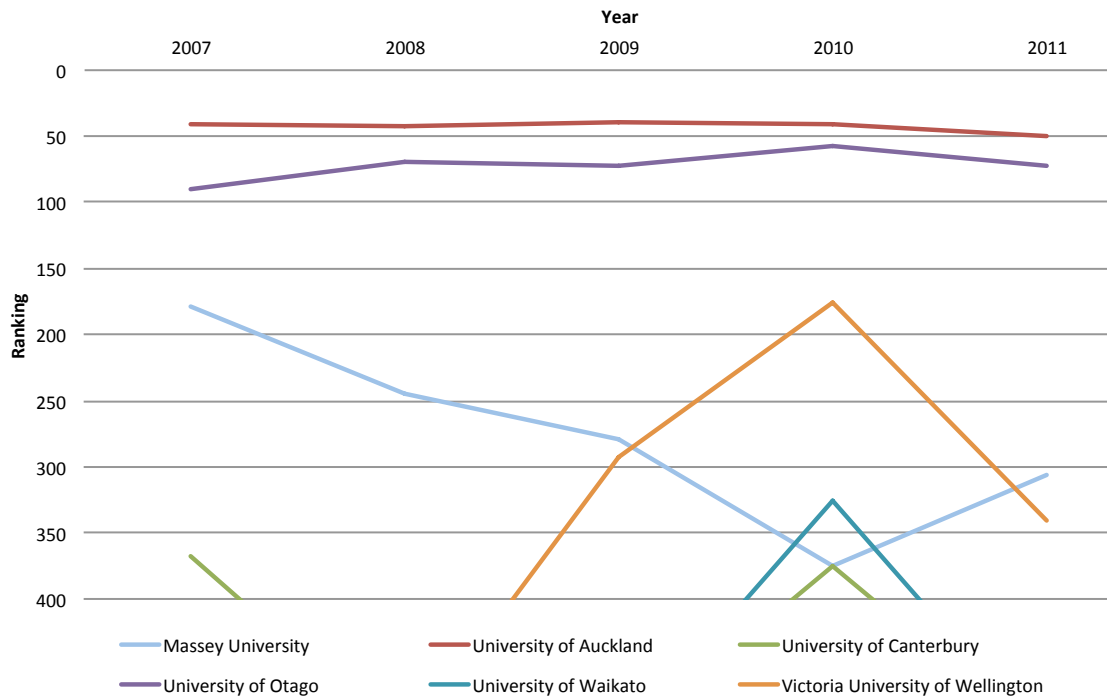
Note: Lincoln University has never achieved a QS World University Ranking in the discipline of Engineering and IT. The ranking for Victoria University of Wellington for 2010 was 351–400 but has been plotted as 375 for the purposes of this graph.

Figure 5: QS World University Ranking of New Zealand Universities 2007–2011: Natural Sciences



Note: Auckland University of Technology and Lincoln University have never achieved QS World University Rankings in the discipline of Natural Sciences. In 2007, University of Waikato received a QS World University Ranking of 406. However, this data set is concerned only with rankings in the top 400.

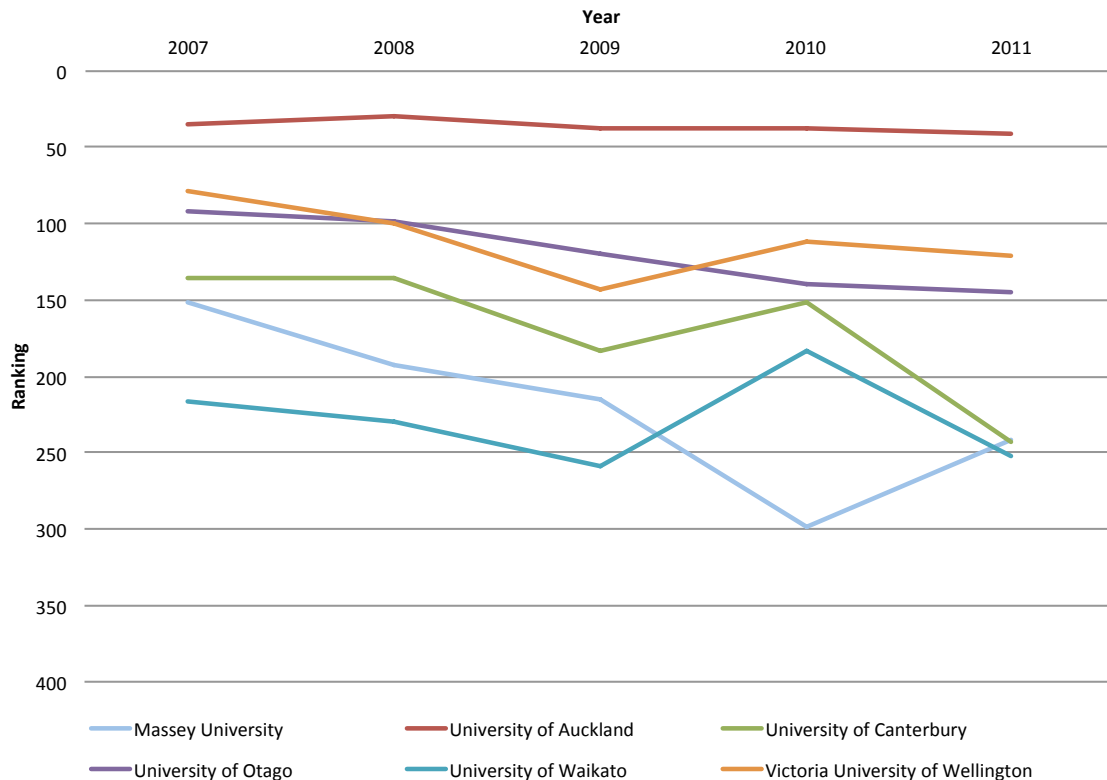
Figure 6: QS World University Ranking of New Zealand Universities 2007–2011: Life Sciences



Note: Auckland University of Technology and Lincoln University have never achieved QS World University Rankings in the discipline of Life Sciences.

The QS World University Rankings for both Massey University and University of Waikato for 2010 were 351–400 and 301–350 respectively, but these have been plotted as 375 and 325 respectively for the purposes of this graph. In 2007, Victoria University of Wellington received a QS World University Ranking of 472. However, this data set is concerned only with rankings in the top 400.

Figure 7: QS World University Ranking of New Zealand Universities 2007–2011: Social Sciences



Note: Auckland University of Technology and Lincoln University have never achieved QS World University Rankings in the discipline of Social Sciences.

As demonstrated in Figure 2: *QS World University Rankings of New Zealand Universities 2005 – 2011: Overall*, rankings for all but the University of Canterbury have fallen since 2005. In 2011 the University of Otago was the only New Zealand university that did not fall in the QS World University Overall Rankings. The University of Auckland is consistently New Zealand's best performing university in these rankings but has seen a steady decline each year since 2005, going from an overall ranking of 46 in 2005 to 82 in 2011 (see Figure 2). Figures 3–7 look at the QS World University Rankings of New Zealand universities over the five disciplines. The University of Auckland ranks highest over all five disciplines but has generally dropped in the QS World University Rankings across these five disciplines.

The overall decline in QS World University Rankings for New Zealand universities since 2005 is especially problematic given that globally many other universities have remained steady. In 2010, the release of the QS World University Rankings raised questions in the media over New Zealand's investment in teaching resources, as faculty to student ratios had dropped across the sector – one of the key indicators in determining the rankings (NZ Herald, 2011). Further questions have been raised in 2011, with the citations per faculty dropping for all six New Zealand universities currently featured in the overall rankings (NZ Herald, 2011).

While these rankings may not necessarily represent a decline in the standard of education and research within New Zealand universities, the largely declining rankings across New Zealand universities have wide-spread implications for individual universities, the broader science system and New Zealand's economy. If New Zealand hopes to encourage the best research talent and the best local and international students to study here, declining rankings need to be addressed. Further, continued declining performance in international rankings may drive the brightest New Zealand talent overseas to study at higher-ranked universities. New Zealand could become a less desirable destination for top researchers, not only affecting the quality of teaching and research but, given the bias ranking systems have towards research (see Section 6.1), contributing to continued decline in global rankings.

With New Zealand experiencing persistent downward trends in global rankings, questions must be raised over the future role and structure of New Zealand universities. As each university diversifies and attempts to expand into new fields, resources and talent become less concentrated. There could be merit in specialisation within the wider university system to allow for greater concentration of skill and expertise at particular universities. However, if this idea was to be progressed, the system would need to foster strong integrated thinking across all spheres of knowledge so to avoid operating in silos.

Table 1. Auckland University of Technology (AUT)

	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Date established 1999</p>	<p>Faculty of Applied Humanities Faculty of Business and Law Faculty of Design and Creative Technologies Faculty of Health and Environmental Sciences</p>	<p>Research Centres Biotechnology Research Institute (KODE Biotech) Centre for Artificial Intelligence Research (CAIR) Creative Industries Research Institute (CIRI)</p>
<p>Legislation Auckland University of Technology (Establishment) Order 1999, s 2 This was accompanied by a notice in the <i>New Zealand Gazette</i>, 28 October 1999 (DIA, 1999)</p>	<p>Te Ara Poutama (Faculty of Māori Development) (AUT, 2011a)</p>	<p>Earth and Oceanic Sciences Research Institute (EOS) Engineering Research and Innovation Cluster (ERIC) Geoinformatics Research Centre (GRC) Health and Rehabilitation Research Institute (HRRi) Institute for Information Technology Research (IITR) Institute for Radio Astronomy and Space Research (IRASR) Institute of Biomedical Technologies (IBTec) Institute of Culture, Discourse and Communication (ICDC) Institute of Public Policy (IPP)</p>
<p>Constitution A constitution for the University Council was outlined in the <i>Gazette</i> notice. This determines the composition of the Council and rules pertaining to Council membership, but is not a constitution for the University itself and does not resemble the constitutions of other universities.</p>	<p>Commercialisation Entity AUT Enterprises Ltd: A wholly owned subsidiary of Auckland University of Technology. (AUT, n.d.)</p>	<p>Knowledge Engineering and Discovery Research Institute (KEDRI) National Institute for Public Health and Mental Health Research (NIPHMHR) National Institute for Stroke and Applied Neurosciences (NISAN) New Zealand Tourism Research Institute (NZTRI) New Zealand Work and Labour Market Institute (NZWALMI) Sport Performance Research Institute New Zealand (SPRINZ) (AUT, 2010b)</p>
<p>Mission Foster excellence, equity and ethics in learning, teaching, research and scholarship and, in so doing, serve our regional, national and international communities. (AUT, 2007:3)</p>		
<p>Equivalent Fulltime Students (EFTS) and Staff Fulltime Equivalent (FTE) 2010 18,952 EFTS (AUT, 2011b) 1,916 FTE (AUT, 2010a: 30)</p>		
<p>2011 World University Overall Ranking: N/A (QSTU, n.d.[b])</p>		

Table 2. Lincoln University

	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Date established 1961</p>	<p>The delivery of teaching and research is the responsibility of the University's three faculties and the Foundation Studies and English Language Centre. The three faculties are: Agricultural and Life Science Faculty Commerce Faculty Environment, Society & Design Faculty (Lincoln University, 2010c)</p>	<p>Research Centres The Agribusiness and Economics Research Unit (AERU) Centre for Advanced Computational Solutions (C-FACS) Centre for Land, Environment and People (LEaP) Centre for Soil and Environmental Research (CSER) Centre for Viticulture and Oenology (V&O) Isaac Centre for Nature Conservation (ICNC) Lincoln University Centre for International Development (LUCID)</p>
<p>Constitution of University (1) For the advancement of knowledge and the dissemination and maintenance thereof by teaching and research there shall be a University to be called Lincoln University. (2) The University shall consist of the Council, the professors emeriti, the professors, lecturers, Registrar and librarian of the University for the time being in office, the graduates and undergraduates of the University, the graduates of the University of New Zealand or of the University of Canterbury who studied at Canterbury Agricultural College or Lincoln College, the holders of diplomas granted by Lincoln College before the commencement of this section or by the University after that commencement, and such other persons and classes of persons as the Council may from time to time determine. (3) The University shall be a body corporate with perpetual succession and a common seal, and may hold real and personal property, and sue and be sued, and may suffer all that bodies corporate may do and suffer. (4) The University established by this section is the same institution as the institution of the same name that existed immediately before the commencement of this section. (Lincoln University Act 1961, s 3)</p>	<p>Commercialisation Entity Lincoln University Research and Commercialisation Office</p>	<p>Centre of Research Excellence Bio-Protection Research Centre (Lincoln University, 2011)</p>
<p>Vision The vision of Lincoln University is to provide the national and international leadership in research and teaching that will contribute to ensuring a sustainable environmental, social and economic future for New Zealand. (Lincoln University, 2003:2)</p>		
<p>Equivalent Fulltime Students (EFTS) and Staff Fulltime Equivalent (FTE) 2010 2,654 EFTS 652 FTE (Lincoln University, 2010a: 79–80)</p>		
<p>2011 World University Overall Ranking: N/A (QSTU, n.d.[c])</p>		

Table 3. Massey University

	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Date established 1963</p>	<p>Massey University's teaching and research departments are divided into five colleges: College of Business College of Creative Arts College of Education College of Humanities & Social Sciences College of Sciences (Massey University, 2011a)</p>	<p>Research Centres Animal Welfare Science and Bioethics Centre Centre for Affective Product Design Centre for Agribusiness Policy and Strategy Centre for Banking Studies Centre for Energy Research Centre for Environmental Technology and Engineering Centre for Ergonomics, Occupational Safety and Health Centre for Excellence for Research in Mathematics Education Centre for Guitar Studies Centre for Industrial Management & Innovation Centre for Mathematics in Industry Centre for Mobile Computing Centre for Organisational Excellence Research Centre for Parallel Computing Centre for Public Health Research Centre for Public Policy Evaluation Centre for Research in Analogue and VLSI Microsystem Design Centre for Social and Health Outcomes Research and Evaluation Centre for Structural Biology Centre for Theoretical Chemistry and Physics Centre of Excellence for Research in Inclusive Education Ecological Economics Research New Zealand EpiCentre Equine Parentage and Animal Genetics Services Centre, New Zealand Fertilizer and Lime Research Centre Joint Centre for Disaster Research Microscopy and Imaging Centre, Manawatu National Centre for Tertiary Teaching Excellence New Zealand Biochar Research Centre New Zealand Centre for Precision Agriculture</p>
<p>Legislation Massey University Act 1963 No 7</p> <p>Constitution of the University (1) For the advancement of knowledge and the dissemination and maintenance thereof by teaching and research there shall be a University to be called Massey University. (2) The University shall consist of the Council, the professors emeriti, the professors, lecturers, junior lecturers, Registrar, and librarian of the University for the time being in office, the graduates and undergraduates of the University, the graduates of the University of New Zealand whose names are for the time being on the books of the University, the persons whose names are for the time being on the register of the Court of Convocation of the University, and such other persons and classes of persons as the Council may from time to time determine. (3) The University shall be a body corporate with perpetual succession and a common seal, and may hold real and personal property, and sue and be sued, and do and suffer all that bodies corporate may do and suffer. (4) The University established under this Act is hereby declared to be the same institution as the institution, known as the Massey University College of Manawatu, existing immediately before the commencement of this Act under the Massey University College of Manawatu Act 1962. (5) Unless the context otherwise requires, every reference in any enactment or document to Massey College or the Massey University College of Manawatu or the branch of the Victoria University of Wellington at Palmerston North (however they may be described) shall hereafter be read as a reference to Massey University. (Massey University Act 1963, s 3)</p>	<p>Commercialisation Entity Massey University Research Management Services</p>	

Mission Statement	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Mission Statement By 2020 Massey University will be acknowledged as New Zealand's defining university and a world centre of tertiary learning. (Massey University, 2010:3)</p> <hr/> <p>Equivalent Fulltime Students (EFTS) and Staff Fulltime Equivalent (FTE) 2010 20,119 EFTS (Massey University, 2010: 25) 1,976 FTE (Massey University, 2010: 101)</p> <hr/> <p>2011 World University Overall Ranking: 329= (QSTU, n.d.[d])</p>		<p>New Zealand Centre for Small and Medium Enterprise Research New Zealand Centre for Women and Leadership New Zealand Institute of Advanced Study New Zealand Lifestyle Management Centre New Zealand Social Innovation and Entrepreneurship Research Centre Roof Water Research Centre Sleep Wake Research Centre Te Au Rangahau (Maori Business Research Centre) Te Mata o Te Tau Te Ropu Whariki Wildlife Health Centre New Zealand</p> <p>Centres of Research Excellence Allan Wilson Centre for Molecular Ecology and Evolution Riddet Institute (Massey University, 2011b)</p>

Table 4. University of Auckland

	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Date established 1882</p>	<p>Faculty of Arts Business School Faculty of Education Faculty of Engineering Faculty of Law Faculty of Medical and Health Sciences Faculty of Science Liggins Institute Auckland Bioengineering Institute (The University of Auckland, n.d.[a])</p>	<p>Research Centres <u>Departmental/School Units and Centres</u> Centre for Asian Health Research and Evaluation Centre for Biodiversity and Biosecurity Centre for Child and Family Research Centre for Gambling Studies Centre for Health Services Research and Policy Centre for Mathematical Social Sciences Centre for Supply Chain Management Clinical Trials Research Unit Dan Walls Centre for Pure and Applied Optics Energy and Fuels Research Unit Energy Centre Experimental Analysis of Behaviour Research Unit Industrial Information and Control Centre Islamic Studies Research Unit New Zealand Centre for Latin American Studies New Zealand Governance Centre Pacific French Research Centre Regional Research Unit Research Centre for Cognitive Neuroscience Research Centre for Germanic Connections with New Zealand and the Pacific Research Centre for Reproductive Medicine University of Auckland Centre for Earthquake Engineering Research Werry Centre for Child and Adolescent Mental Health Yacht Research Unit</p>
<p>Legislation University of Auckland Act 1961 No. 50</p> <p>Constitution of the University (1) For the advancement of knowledge and the dissemination and maintenance thereof by teaching and research there shall be a University to be called the University of Auckland. (2) The University shall consist of the Council, the professors emeriti, the professors, lecturers, junior lecturers, Registrar, and librarian of the University for the time being in office, the graduates and undergraduates of the University, the graduates of the University of New Zealand whose names are for the time being on the register of the Court of Convocation of the University of Auckland, and such other persons and classes of persons as the Council may from time to time determine. (3) The University shall be a body corporate with perpetual succession and a common seal, and may hold real and personal property, and sue and be sued, and do and suffer all that bodies corporate may do and suffer. (4) The University established under this Act is hereby declared to be the same institution as the institution of that name existing immediately before the commencement of this Act under the University of Auckland Act 1954 (as amended by the University of Auckland Amendment Act 1957), which institution was originally established under the name of the Auckland University College under the Auckland University College Act 1882. (University of Auckland Act 1961, s 3)</p>	<p>Commercialisation Entity Auckland UniServices Ltd: A wholly owned company of the University of Auckland.</p>	<p><u>Faculty Centres</u> Auckland Cancer Society Research Centre Bioinformatics Institute Centre for Advanced Composite Materials Centre for Archaeological Research Centre for Brain Research Centre for Digital Enterprise Centre for Discrete Mathematics and Theoretical Computer Sciences Centre for Mental Health Research Policy and Service Development Centre of Methods and Policy Application in the Social Sciences (COMPASS)</p>
<p>Mission To be 'a research-led, international university, recognised for excellence in teaching, learning, research, creative work, and administration, for the significance of its contributions to the advancement of knowledge and its commitment to serve its local, national and international communities (University of Auckland, 2003).'</p>		

Equivalent Fulltime Students (EFTS) and Staff Fulltime Equivalent (FTE) 2010	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>32, 655 EFTS 4,725 FTE (University of Auckland, n.d.[c])</p> <hr/> <p>2011 World University Overall Ranking: 82 (QSTU, n.d.[e])</p>		<p>Mira Szász Research Centre for Māori and Pacific Economic Development New Zealand Centre for Environmental Law New Zealand National Eye Centre Research Centre for Business Law Research Centre for Medieval and Early Modern European Studies South Pacific Centre for Marine Studies Transportation Research Centre Woolf Fisher Research Centre <u>Education Centres</u> Goodfellow Unit Centre for Medical and Health Sciences Education Centre for New Zealand Art and Research Discovery <u>University Centres and Institutes</u> Centre for e-Research Centre for Longitudinal Research – He Ara ki Mua Institute for Earth Science and Engineering Institute for Innovation in Biotechnology James Henare Māori Research Centre Light Metals Research Centre New Zealand Asia Institute New Zealand Leadership Institute Polymer Electronics Research Centre The Europe Institute Wine Industry Research Centre <u>Facility Centres</u> Biomedical Imaging Research Unit Centre for Advanced Magnetic Resonance Imaging Centre for Genomics and Proteomics Research Centre for Surface and Materials Science Survey Research Institute Centres of Research Excellence National Research Centre for Growth and Development Nga Pae o te Māramatanga The Maurice Wilkins Centre for Molecular Bio-Discovery New Zealand Institute of Mathematics and its Applications (NZIMA) (University of Auckland, n.d.[b])</p>

Table 5. University of Canterbury

	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Date established 1873</p>	<p>College of Arts College of Business & Economics College of Engineering College of Science College of Education School of Law (University of Canterbury, n.d.[a])</p>	<p>Research Centres Biomathematics Research Centre Biomolecular Interaction Centre Centre for Atmospheric Research (UCAR) Centre for Bioengineering Centre for Integrated Research in Biosafety (INBI) Centre of Excellence in Aquaculture and Marine Ecology (CEAME) Electric Power Engineering Centre (EPECentre) Gateway Antarctica Geospatial Research Centre Health Sciences Centre Human Interface Technology Lab NZ Macmillan Brown Centre for Pacific Studies National Centre for Research on Europe Natural Hazards Research Centre New Zealand Institute of Language, Brain and Behaviour (NZILBB) NZ Centre for Human-Animal Studies NZ Australia Research Centre NZ South East Asia Centre Product Innovation Centre Te Awaatea Violence Research Centre Te Puna Puoru National Centre for Research in Music Education and Sound Arts Wireless Research Centre Wood Technology Research Centre (University of Canterbury, n.d.[a])</p>
<p>Legislation University of Canterbury Act 1961 No. 49</p> <p>Constitution of the University (1) For the advancement of knowledge and the dissemination and maintenance thereof by teaching and research there shall be a University to be called the University of Canterbury. (2) The University shall consist of the Council, the professors emeriti, the professors, lecturers, Registrar, and librarian of the University for the time being in office, the graduates and undergraduates of the University, the graduates of the University of New Zealand whose names are for the time being on the register of the Court of Convocation of the University of Canterbury, and such other persons and classes of persons as the Council may from time to time determine. (3) The University shall be a body corporate with perpetual succession and a common seal, and may hold real and personal property, and sue and be sued, and do and suffer all that bodies corporate may do and suffer. (4) The University established under this Act is hereby declared to be the same institution as the institution of that name existing immediately before the commencement of this Act under the University of Canterbury Act 1933 (as amended by the University of Canterbury Amendment Act 1957), which institution was originally established under the name of the Canterbury College under the Canterbury College Ordinance 1873. (University of Canterbury Act 1961, s 3)</p>	<p>Commercialisation Entity Canterbury Research and Innovation: Provide end-to-end services which facilitate and support all stages of research and innovation development. (University of Canterbury, n.d.[b])</p>	
<p>Vision People prepared to make a difference (University of Canterbury, 2011)</p> <p>Equivalent Fulltime Students (EFTS) and Staff Fulltime Equivalent (FTE) 2010 15, 468 EFTS 1, 604 FTE (University of Canterbury, n.d.[c])</p> <p>2011 World University Overall Ranking: 212 (QSTU, n.d.[f])</p>		

Table 6. University of Otago

	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Date established 1869</p>	<p>Academic Departments and Schools at the University of Otago are divided into four academic divisions:</p> <p>School of Business</p> <p>Division of Health Science</p> <p>Division of Humanities</p> <p>Division of Sciences (University of Otago, n.d.[a])</p>	<p>Research Centres</p> <p>AIDS Epidemiology Group</p> <p>Bioethics Centre</p> <p>Brain Health and Repair Research Centre</p> <p>Campbell Microanalytic Laboratory</p> <p>Cancer Genetics Laboratory</p> <p><i>Cancer Society</i> Social & Behavioural Research Unit</p> <p>Cardioendocrine Research Centre</p> <p>Centre for Applications of Statistics and Mathematics (CASM)</p> <p>Centre for Bioengineering and Nanomedicine</p> <p>Centre for International Health</p> <p>Centre for Neuroendocrinology</p> <p>Centre for Nutrition, Activity and Health</p> <p>Centre for Reproduction and Genomics (CRG)</p> <p>Centre for Research on Children and Families</p> <p>Centre for Research on National Identity (CRNI)</p> <p>Centre for the Study of Agriculture, Food and the Environment (CSAFE)</p> <p>Centre for Translational Cancer Research</p> <p>Centre for Translational Research in Chronic Diseases</p> <p>Christchurch Health and Development Study</p> <p>Chromosome Structural and Development Group</p> <p>Clothing and Textiles Centre</p> <p>Development Biology Laboratory</p> <p>Disease Research Laboratory</p> <p>Dunedin Multidisciplinary Health and Development Research Unit</p> <p>Ecology and Health Research Centre, Wellington School of Medicine</p> <p>Edgar National Centre for Diabetes Research</p> <p>Genetics Otago</p> <p>Housing and Health Research Programme</p> <p>Hugh Adam Cancer Epidemiology Unit</p> <p>Injury Prevention Research Unity (IPRU)</p> <p>Jack Dodd Centre for Quantum Technology</p> <p>Mental Health and Addiction Research Centre</p> <p>National Centre for Lifecourse Research</p> <p>National Centre for Peace and Conflict Studies</p> <p>National Poisons Centre</p> <p>New Zealand Census-Mortality Study (NZCMS)</p>
<p>Legislation</p> <p>University of Otago Ordinance 1869 (O) No 280 and University of Otago Amendment Act 1961 No 48</p> <p>Constitution of the University</p> <p>A University shall be established at Dunedin aforesaid and when duly constituted and appointed according to the provisions of this Ordinance shall be a body corporate by the name of the University of Otago and by that name shall have perpetual succession and shall adopt and have a common seal and shall by the same name sue and be sued, plead and be impleaded, answer and be answered unto in all Courts of New Zealand, and shall be capable in law to receive, purchase, and hold all goods, chattels, and personal property whatsoever and shall also be able and capable in law to receive, purchase, and hold for ever not only such lands, buildings, hereditaments, and possessions as may from time to time be exclusively used and occupied by the said University for its immediate requirements but also any other lands, buildings, hereditaments, and possessions whatsoever situate in the said Province or elsewhere, and shall be able and capable in law to grant, demise, alienate, or otherwise dispose of all of any of the property, real, or personal, belonging to the said University, and also to do all other matters and things incidental or appertaining to a body corporate.</p> <p>(University of Otago Ordinance 1869, s 1)</p>	<p>Commercialisation Entity</p> <p>Otago Innovation Ltd: A wholly owned subsidiary of the University of Otago (Otago Innovation, n.d.)</p>	

Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>The University</p> <p>3. The University –</p> <p>(1) The University of Otago established by the principal Ordinance shall consist of the Council, the professors emeriti, the professors, lecturers, assistant lecturers, Registrar, and librarian of the University for the time being in office, the graduates and under-graduates of the University, the graduates of the University of New Zealand whose names are for the time being on the register of the Court of Convocation of the Otago University District, and such other persons and classes of persons as the Council, after considering a recommendation from the Senate, may from time to time determine.</p> <p>(2) The object of the University shall include the diffusion of arts, sciences, and learning, the provision of liberal, professional, and technological education, and the advancement of knowledge by research.</p> <p>Cf. Principal Ordinance, s 1</p> <p>(University of Otago Amendment Act 1961, s 3)</p> <hr/> <p>Vision</p> <p>A research-led University with an international reputation for excellence (University of Otago, 2006)</p> <hr/> <p>Equivalent Fulltime Students (EFTS) and Staff Fulltime Equivalent (FTE) 2010</p> <p>19, 918 EFTS 3,751 FTE</p> <p>(University of Otago, n.d.[b])</p> <hr/> <p>2011 World University Overall Ranking:</p> <p>130 (QSTU, n.d.[g])</p>	<p>New Zealand Centre for Sustainable Cities</p> <p>New Zealand Child and Youth Epidemiology Service</p> <p>New Zealand Paediatric Surveillance Unit</p> <p>New Zealand Pharmacovigilance Centre</p> <p>Ngai Tahu Māori Health Research Unit</p> <p>Oceans and Climate Change Research Centre</p> <p>Otago Energy Research Centre</p> <p>Otago Genomics Facility</p> <p>O-Zone Research Group</p> <p>Product Development Research Centre</p> <p>Royal New Zealand College of General Practitioners Research Unit</p> <p>Sensory Science Research Centre</p> <p>Sir John Walsh Institute for Oral Health</p> <p>Spatial Information Research Centre (SIRC)</p> <p>Virus Research Unit</p> <p>Webster Centre for Infectious Disease</p> <p>Wellington Asthma Research Group (WARG)</p> <p>Women's Health Research Centre (WHRC)</p> <p>(University of Otago, n.d.[c])</p>

Table 7. University of Waikato

	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Date established 1963</p>	<p>Faculty of Arts & Social Sciences Faculty of Computing and Mathematical Sciences Faculty of Education Te Piringa – Faculty of Law School of Māori and Pacific Development Faculty of Science & Engineering Waikato Management School (University of Waikato, 2011)</p>	<p>Research Centres Centre for Biodiversity and Ecology Research Centre for Māori and Pacific Development Research Centre for Open Software Innovation Honey Research Unit International Centre for Terrestrial Antarctic Research International Global Change Centre Management Research Centre Mediarena Centre for Research Māori and Psychology Research Unit Population Studies Centre Public History Research Unit Text and Translation Research Unit Thermophile and Microbial Biochemistry and Biotechnology Unit Waikato Applied Statistics Unit Waikato Centre for Advanced Materials</p>
<p>Legislation University of Waikato Act 1963 No 8</p>	<p>Commercialisation Entity WaikatoLink Ltd: A wholly owned subsidiary of the University of Waikato. (WaikatoLink, 2006)</p>	<p>Research Institutes Institute for Business Research (IBR) National Institute of Demographic and Economic Analysis (NIDEA) Wiif Malcolm Institute of Educational Research (WMIER)</p>
<p>Constitution of the University (1) For the advancement of knowledge and the dissemination and maintenance thereof by teaching and research there shall be a University to be called the University of Waikato. (2) The University shall consist of the Council, the professors emeriti, the professors, lecturers, Registrar, and librarian of the University for the time being in office, the graduates and undergraduates of the University, the persons whose names are for the time being on the register of the Court of Convocation of the University, and such other persons and classes of persons as the Council may from time to time determine. (3) The University shall be a body corporate with perpetual succession and a common seal, and may hold real and personal property, and sue and be sued, and do and suffer all that bodies corporate may do and suffer. (University of Waikato Act 1963, s 3)</p>		<p>Research Groups Traffic and Road Safety Research Group WAND Network Research Group</p>
<p>Vision We will:</p> <ul style="list-style-type: none"> • Deliver a world-class education and research portfolio; • Provide a full and dynamic university experience which is distinctive in character; • Pursue strong international linkages to advance knowledge. <p>The overarching themes of the vision are:</p> <ul style="list-style-type: none"> • Excellence • Distinctiveness • International Connectedness <p>(University of Waikato, 2009)</p>		<p>Institutes to be formalised in 2011 Environmental Research Institute (ERI) Te Kotahi Research Institute for Innovation, Well-being and Inspiration (IWI)</p>
<p>Equivalent Fulltime Students (EFTS) and Staff Fulltime Equivalent (FTE) 2010 12, 642 EFTS 1,536 FTE (University of Waikato, 2010a)</p>		<p>Specialist Research Facilities Coastal Marine Group Electron Microscope Facility Mass Spectrometry Facility Stable Isotope Research Facilities Waikato Centre for Applied Statistics Waikato DNA Sequencing Facility Waikato Radiocarbon Dating Laboratory (University of Waikato, 2010b; University of Waikato, 2010c)</p>
<p>2011 World University Overall Ranking: 357 (QSTU, n.d.[h])</p>		

Table 8. Victoria University of Wellington

Date established	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>1897</p> <hr/> <p>Legislation</p> <p>Victoria University of Wellington Act 1961 No 51</p> <hr/> <p>Constitution of the University</p> <p>(1) For the advancement of knowledge and the dissemination and maintenance thereof by teaching and research there shall be a University to be called the Victoria University of Wellington.</p> <p>(2) The University shall consist of the Council, the professors emeriti, the professors, lecturers, Registrar, and librarian of the University for the time being in office, the graduates and undergraduates of the University, the graduates of the University of New Zealand whose names are for the time being on the register of the Court of Convocation of the University, and such other persons and classes of persons as the Council may from time to time determine.</p> <p>(3) The University shall be a body corporate with perpetual succession and a common seal, and may hold real and personal property, and sue and be sued, and do and suffer all that bodies corporate may do and suffer.</p> <p>(4) The University established under this Act is hereby declared to be the same institution as the institution of that name existing immediately before the commencement of this Act under the Victoria University of Wellington Act 1933 (as amended by the Victoria University of Wellington Amendment Act 1957), which institution was originally established under the name of the Victoria College under the Victoria College Act 1897.</p> <p>(Victoria University of Wellington Act 1961, s 3)</p>	<p>Victoria University has eight faculties:</p> <p>Faculty of Architecture & Design</p> <p>Faculty of Commerce & Administration</p> <p>Faculty of Education</p> <p>Faculty of Engineering</p> <p>Faculty of Graduate Research</p> <p>Faculty of Humanities & Social Sciences</p> <p>Faculty of Law</p> <p>Faculty of Science</p> <p>(Victoria University, 2011a)</p> <hr/> <p>Commercialisation Entity</p> <p>Viclink: Victoria University's commercialisation company (Viclink, 2010)</p>	<p>Research Centres</p> <p>Antarctic Research Centre</p> <p>Asian Studies Institute</p> <p>Centre for Accounting, Governance and Taxation Research</p> <p>Centre for Applied Cross-Cultural Research</p> <p>Centre for Biodiscovery</p> <p>Centre for Biodiversity and Restoration Ecology</p> <p>Centre for Building Performance Research</p> <p>Centre for Logic, Language and Computation</p> <p>Centre for Marine Environmental & Economic Research</p> <p>Centre for Strategic Studies: New Zealand</p> <p>Centre for the Study of Leadership</p> <p>Competitive Advantage New Zealand</p> <p>Crime and Justice Research Centre</p> <p>English Language Institute</p> <p>He Parekerekere – Institute for Research and Development in Māori Education</p> <p>Health Services Research Centre</p> <p>Industrial Relations Centre</p> <p>Institute for Early Childhood Studies</p> <p>Institute of Geophysics</p> <p>Institute of Policy Studies</p> <p>International Institute of Modern Letters</p> <p>Irish Scottish Studies Programme</p> <p>Jessie Hetherington Centre for Educational Research</p> <p>Magnetic Resonance Materials Laboratory</p> <p>Malaghan Institute of Medical Research</p> <p>New Zealand Centre for Public Law</p>

Mission	Faculties & Colleges	Research Centres & Centres of Research Excellence
<p>Victoria University of Wellington plays a leading role in shaping New Zealand's future by:</p> <ul style="list-style-type: none"> • Adding significantly to the knowledge and understanding of natural phenomena, society, culture and technology through research, teaching, and interdisciplinary perspectives • Engaging with local, national and international communities in creating, disseminating and applying knowledge that has scholarly or societal impact • Developing graduates with skills in leadership, communication, and critical and creative thinking. <p>(Victoria University, 2008:5)</p> <hr/> <p>Equivalent Fulltime Students (EFTS) and Staff Fulltime Equivalent (FTE) 2009 17,350 EFTS 1,884 FTE (Victoria University, 2011b)</p> <hr/> <p>2011 World University Overall Ranking: 237 (QSTU, n.d.[i])</p>		<p>New Zealand Centre of International Economic Law New Zealand Climate Change Research Institute New Zealand Contemporary China Research Centre New Zealand Dictionary Centre New Zealand Electronic Text Centre New Zealand Institute for Research on Ageing New Zealand Institute for the Study of Competition and Regulation Radiation Imaging and Detection Group Raman Laboratory Roy McKenzie Centre for the Study of Families Stout Research Centre Treaty of Waitangi Research Unit University Teaching Development Centre Victoria Institute for Links with Latin America Victoria University Coastal Ecology Lab Wai-te-ata Press</p> <p>Centre of Research Excellence The MacDiarmid Institute for Advanced Materials and Nanotechnology (Victoria University, 2011c)</p>

Table 9. Areas of research conducted within universities

Area of research	Scope of research	Research centres conducting research in this area, by university
<p>Architecture, Design and Building Science</p>		<p>AUT: Creative Industries Research Institute (CIRI)</p> <p>Massey University: Centre for Affective Product Design</p> <p>University of Auckland: Light Metals Research Centre</p> <p>University of Otago: Clothing and Textiles Centre</p>
<p>Commerce and Administration</p>		<p>AUT: New Zealand Tourism Research Institute (NZTRI) New Zealand Work and Labour Market Institute (NZWALMI)</p> <p>Lincoln University: The Agribusiness and Economics Research Unit (AERU)</p> <p>Massey University: Centre for Agribusiness Policy and Strategy Centre for Banking Studies Centre for Organisational Excellence Research Ecological Economics Research New Zealand New Zealand Centre for Small and Medium Enterprise Research New Zealand Social Innovation and Entrepreneurship Research Centre Te Au Rangahau (Maori Business Research Centre)</p> <p>University of Auckland: Centre for Supply Chain Management</p> <p>University of Waikato: Institute for Business Research (IBR) Management Research Centre National Institute of Demographic and Economic Analysis (NIDEA)</p> <p>Victoria University of Wellington: Centre for Accounting, Governance and Taxation Research Competitive Advantage New Zealand Industrial Relations Centre New Zealand Institute for the Study of Competition and Regulation</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
<p>Education</p>		<p>Massey University: Centre of Excellence for Research in Inclusive Education Centre for Excellence for Research in Mathematics Education National Centre for Tertiary Teaching Excellence</p> <p>University of Auckland: Woolf Fisher Research Centre</p> <p>University of Waikato: Wilf Malcolm Institute of Educational Research (WMIER) Victoria University of Wellington: Jessie Hetherington Centre for Educational Research University Teaching Development Centre</p>
<p>Engineering</p>		<p>AUT: Engineering Research and Innovation Cluster (ERIC) Knowledge Engineering and Discovery Research Institute (KEDRI)</p> <p>Massey University: Centre for Industrial Management & Innovation</p> <p>University of Auckland: Centre for Advanced Composite Materials Industrial Information and Control Centre Polymer Electronics Research Centre Research Centre for Surface and Materials Science Transportation Research Centre University of Auckland Centre for Earthquake Engineering Research Yacht Research Unit</p> <p>University of Canterbury: Electric Power Engineering Centre (EPECentre) Geospatial Research Centre Wireless Research Centre Wood Technology Research Centre</p> <p>Victoria University of Wellington: Centre for Building Performance Research</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
<p>Information Technology</p>		<p>AUT: Centre for Artificial Intelligence Research (CAIR) Institute for Information Technology Research (IITR)</p> <p>Lincoln University: Centre for Advanced Computational Solutions (C-fACS)</p> <p>Massey University: Centre for Mobile Computing Centre for Parallel Computing Centre for Research in Analogue and VLSI Microsystem Design</p> <p>University of Auckland: Centre for Digital Enterprise Centre for e-Research</p> <p>University of Canterbury: Human Interface Technology Lab NZ</p> <p>University of Waikato: Centre for Open Software Innovation WAND Network Research Group</p>
<p>Medical and Health Science</p>		<p>AUT: Health and Rehabilitation Research Institute (HRRRI) Institute of Biomedical Technologies (IBTec) National Institute for Public Health and Mental Health Research (NIPMHHR) National Institute for Stroke and Applied Neurosciences (NISAN) Sport Performance Research Institute New Zealand (SPRINZ)</p> <p>Massey University: Centre for Ergonomics, Occupational Safety and Health Centre for Public Health Research Centre for Social and Health Outcomes Research and Evaluation EpiCentre Sleep Wake Research Centre</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
		<p>University of Auckland: Auckland Cancer Society Research Centre Biomedical Imaging Research Unit Centre for Advanced Magnetic Resonance Imaging Centre for Asian Health Research and Evaluation Centre for Brain Research Centre for Child and Family Research Centre for Gambling Studies Centre for Health Services Research and Policy Centre for Longitudinal Research – He Ara ki Mua Centre for Medical and Health Sciences Education Centre for Mental Health Research Policy and Service Development Clinical Trials Research Unit Dan Walls Centre for Pure and Applied Optics Goodfellow Unit New Zealand National Eye Centre Research Centre for Cognitive Neuroscience Research Centre for Reproductive Medicine Werry Centre for Child and Adolescent Mental Health</p> <p>University of Canterbury: Health Sciences Centre</p> <p>University of Otago: AIDS Epidemiology Group Bioethics Centre Brain Health and Repair Research Centre Cancer Genetics Laboratory Cancer Society Social & Behavioural Research Unit Cardioendocrine Research Centre Centre for International Health Centre for Nutrition, Activity and Health Centre for Neuroendocrinology Centre for Reproduction and Genomics (CRG) Centre for Research on Children and Families Centre for Translational Cancer Research Centre for Translational Research in Chronic Diseases Christchurch Health and Development Study Chromosome Structural and Development Group Disease Research Laboratory Dunedin Multidisciplinary Health and Development Research Unit Ecology and Health Research Centre, Wellington School of Medicine Edgar National Centre for Diabetes Research Housing and Health Research Programme Hugh Adam Cancer Epidemiology Unit Injury Prevention Research Unit (IPRU) Institute for Oral Health Mental Health and Addiction Research Centre National Poisons Centre New Zealand Child and Youth Epidemiology Service</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
		<p>New Zealand Paediatric Surveillance Unit New Zealand Pharmacovigilance Centre Ngai Tahu Māori Health Research Unit Royal New Zealand College of General Practitioners Research Unit Sir John Walsh Wellington Asthma Research Group (WARG) Women's Health Research Centre (WHRC)</p> <p>Victoria University of Wellington: Health Services Research Centre Institute for Early Childhood Studies Malaghan Institute of Medical Research New Zealand Institute for Research on Ageing</p>
Humanities and Social Sciences		<p>AUT: Institute of Culture, Discourse and Communication (ICDC)</p> <p>Lincoln University: Lincoln University Centre for International Development (LUCID)</p> <p>Massey University: Centre for Guitar Studies Joint Centre for Disaster Research New Zealand Centre for Women and Leadership</p> <p>University of Auckland: Centre for Archaeological Research Centre for New Zealand Art and Research Discovery Centre of Methods and Policy Application in the Social Sciences (COMPASS) The Europe Institute Experimental Analysis of Behaviour Research Unit Islamic Studies Research Unit James Henare Māori Research Centre Mira Szász Research Centre for Māori and Pacific Economic Development New Zealand Asia Institute New Zealand Centre for Latin American Studies New Zealand Governance Centre New Zealand Leadership Institute Pacific French Research Centre Regional Research Unit Research Centre for Germanic Connections with New Zealand and the Pacific Research Centre for Medieval and Early Modern European Studies Survey Research Institute</p> <p>University of Canterbury: Macmillan Brown Centre for Pacific Studies National Centre for Research on Europe New Zealand Institute of Language, Brain and Behaviour (NZILBB) NZ Australia Research Centre NZ South East Asia Centre Product Innovation Centre Te Awatea Violence Research Centre Te Puna Puoru National Centre for Research in Music Education and Sound Arts</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
		<p>University of Otago: Centre for Research on National Identity (CRNI) National Centre for Lifecourse Research National Centre for Peace and Conflict Studies New Zealand Census-Mortality Study (NZCMS) New Zealand Centre for Sustainable Cities</p> <p>University of Waikato: Centre for Māori and Pacific Development Research Māori and Psychology Research Unit Mediarena Centre for Research Population Studies Centre Public History Research Unit Text and Translation Research Unit Traffic and Road Safety Research Group</p> <p>Victoria University of Wellington: Asian Studies Institute Centre for Applied Cross-Cultural Research Centre for Logic, Language and Computation Centre for Strategic Studies: New Zealand Centre for the Study of Leadership English Language Institute He Parekerekere – Institute for Research and Development in Māori Education International Institute of Modern Letters Irish Scottish Studies Programme New Zealand Contemporary China Research Centre New Zealand Dictionary Centre New Zealand Electronic Text Centre Roy McKenzie Centre for the Study of Families Stout Research Centre Victoria Institute for Links with Latin America Wai-te-ata Press</p>
	<p><i>Humanities and social sciences research focused on Māori culture and populations</i></p>	<p>Massey University: Te Mata o Te Tau Te Ropu Whariki</p> <p>University of Waikato: Te Kotahi Research Institute for Innovation, Well-being and Inspiration (IWI)</p> <p>University of Auckland: Nga Pae o te Māramatanga (CoRE)</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
<p>Law and Public Policy</p>		<p>AUT: Institute of Public Policy (IPP)</p> <p>Massey University: Centre for Public Policy Evaluation</p> <p>University of Auckland: New Zealand Centre for Environmental Law Research Centre for Business Law</p> <p>Victoria University of Wellington: Crime and Justice Research Centre Institute of Policy Studies New Zealand Centre of International Economic Law New Zealand Centre for Public Law Treaty of Waitangi Research Unit</p>
<p>Science</p>	<p><i>Agriculture and Horticulture</i></p>	<p>Lincoln University: Centre for Soil and Environmental Research (CSER)</p> <p>Massey University: Fertilizer and Lime Research Centre New Zealand Centre for Precision Agriculture</p>
	<p><i>Animal and Wildlife Science</i></p>	<p>Massey University: Animal Welfare Science and Bioethics Centre Equine Parentage and Animal Genetics Services Centre, New Zealand Wildlife Health Centre New Zealand</p> <p>University of Auckland: South Pacific Centre for Marine Studies</p> <p>University of Canterbury: NZ Centre for Human-Animal Studies</p> <p>University of Waikato: Honey Research Unit</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
	<p><i>Biology and Biotechnology</i></p>	<p>AUT: Biotechnology Research Institute (KODE Biotech)</p> <p>Massey University: Centre for Structural Biology</p> <p>University of Auckland: Bioinformatics Institute Centre for Genomics and Proteomics Institute for Innovation in Biotechnology The Maurice Wilkins Centre for Molecular Bio-Discovery (CoRE) National Research Centre for Growth and Development (CoRE) University of Canterbury: Biomolecular Interaction Centre Centre for Bioengineering Centre for Integrated Research in Biosafety (INBI)</p> <p>University of Otago: Centre for Bioengineering and Nanomedicine Development Biology Laboratory Genetics Otago Otago Genomics Facility Virus Research Unit Webster Centre for Infectious Disease</p> <p>University of Waikato: Thermophile and Microbial Biochemistry and Biotechnology Unit Waikato DNA Sequencing Facility</p> <p>Victoria University of Wellington: Centre for Biodiscovery</p>
	<p><i>Chemistry</i></p>	<p>University of Otago: Campbell Microanalytic Laboratory</p> <p>University of Waikato: Waikato Centre for Advanced Materials</p> <p>Victoria University of Wellington: The MacDiarmid Institute for Advanced Materials and Nanotechnology (CoRE)</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
	<p><i>Earth Sciences</i></p>	<p>AUT: Earth and Oceanic Sciences Research Institute (EOS)</p> <p>Massey University: Centre for Energy Research</p> <p>University of Auckland: Energy and Fuels Research Unit Energy Centre Institute for Earth Science and Engineering</p> <p>University of Canterbury: Centre for Atmospheric Research (UCAR) Centre of Excellence in Aquaculture and Marine Ecology (CEAME) Natural Hazards Research Centre</p> <p>University of Otago: Otago Energy Research Centre</p> <p>University of Waikato: Coastal Marine Group Stable Isotope Research Facilities Waikato Radiocarbon Dating Laboratory</p>
	<p><i>Environmental Sciences</i></p>	<p>Lincoln University: Bio-Protection Research Centre (CoRE) Centre for Land, Environment and People (LEaP) Isaac Centre for Nature Conservation (ICNC)</p> <p>Massey University: Allan Wilson Centre for Molecular Ecology and Evolution (CoRE) Centre for Environmental Technology and Engineering New Zealand Biochar Research Centre New Zealand Lifestyle Management Centre Roof Water Research Centre</p> <p>University of Auckland: Centre for Biodiversity and Biosecurity</p> <p>University of Canterbury: Gateway Antarctica</p> <p>University of Otago: Oceans and Climate Change Research Centre O-Zone Research Group</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
		<p>University of Waikato: Centre for Biodiversity and Ecology Research Environmental Research Institute (ERI) International Centre for Terrestrial Antarctic Research International Global Change Centre</p> <p>Victoria University of Wellington: Antarctic Research Centre Centre for Biodiversity and Restoration Ecology Centre for Marine Environmental & Economic Research New Zealand Climate Change Research Institute Victoria University Coastal Ecology Lab</p>
	<i>Food and Wine Science</i>	<p>Lincoln University: Centre for Viticulture and Oenology (V&O)</p> <p>Massey University: Riddet Institute (CoRE)</p> <p>University of Auckland: Wine Industry Research Centre</p> <p>University of Otago: Centre for the Study of Agriculture, Food and the Environment (CSAFE) Product Development Research Centre Sensory Science Research Centre</p>
	<i>General</i>	<p>Massey University: Centre for Theoretical Chemistry and Physics Microscopy and Imaging Centre, Manawatu New Zealand Institute of Advanced Study</p> <p>University of Waikato: Electron Microscope Facility Mass Spectrometry Facility</p>
	<i>Geoinformatics</i>	<p>AUT: Geoinformatics Research Centre (GRC)</p> <p>University of Otago: Spatial Information Research Centre (SIRC)</p>

Area of research	Scope of research	Research centres conducting research in this area, by university
	<p><i>Mathematics and Physics</i></p>	<p>AUT: Institute for Radio Astronomy and Space Research (IRASR)</p> <p>Massey University: Centre for Mathematics in Industry</p> <p>University of Auckland: Centre for Mathematical Social Sciences Centre for Discrete Mathematics and Theoretical Computer Sciences New Zealand Institute of Mathematics and its Applications (NZIMA) (CoRE)</p> <p>University of Canterbury: Biomathematics Research Centre</p> <p>University of Otago: Centre for Applications of Statistics and Mathematics (CASM) Jack Dodd Centre for Quantum Technology</p> <p>University of Waikato: Waikato Applied Statistics Unit Waikato Centre for Applied Statistic</p> <p>Victoria University of Wellington: Institute of Geophysics Magnetic Resonance Materials Laboratory Radiation Imaging and Detection Group Raman Laboratory</p>

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