

External Review of Research at UWS



The UWS Research Landscape

**Vice-Chancellor's Institutional
Review Committee Report**
March 2002



University of Western Sydney

Preface

Universities have a major contribution to make to the national agenda both in the area of applying knowledge-based solutions to social and community issues and in the transformation of our economy to one based on knowledge and services. This contribution comes particularly through university research.

UWS aspires both to recognition as a contemporary place of learning and inquiry and to be a university that contributes to the national social and economic good. It is in this spirit that we set out to conduct a comprehensive University-wide review of research, research training and research management. Such a review is a major exercise and requires hard work, goodwill, a critical approach and an open-minded attitude to change and reform. Not surprisingly such a comprehensive exercise is rare in Australian higher education.

Last year 12 interim Key Research Centres were designated at UWS, each of which received, at least, \$200K for 2001, with COREs (Centres of Research Excellence) receiving \$75K each. These allocations were made with a commitment to review the centres in the latter part of 2001.

In its planning this review became a more comprehensive process of assessment of the 12 centres and 6 new applicants, as well as of the 14 remaining CORE centres applicants (i.e. those that were not otherwise captured in the process) and ultimately a critical assessment of the most promising directions in research for UWS and the ways in which



the institution might most profitably develop its research strengths and culture.

This has been in many ways an exceptional process. It is very unusual to review almost the entire corpus of research and research training of a university at one point in time. Most institutions have rolling evaluation programs, but as the framework for our review took shape it became clear that here was an opportunity to take stock in the first year of the new unified UWS that would not come again in the foreseeable future.

Six external panels of distinguished researchers in the fields of:

- Science and Industry,
- Engineering,
- Psychology and Humanities,
- Human and Community Futures, and
- Social Sciences and Industry

met for two days each to consider submissions, interview staff and students, and prepare their recommendations. These reports in turn were provided to the Vice-Chancellor's peak review panel whose brief was to assess the research and research training capacity and performance of UWS and to help us frame our strategy and priorities for at least the next five years. Our goal was to chart a path that will take us into the future as a comprehensive University with widely acknowledged research strengths and a highly developed honours and postgraduate training program. External reviewers, Professors Mary O'Kane, Peter Sheehan and Chris

Fell, have been pre-eminent scholars and leaders in research assessment and strategy in Australia over the last decade or more. The Chancellor was also a member of the panel, bringing a lifetime of expertise at the interface between business and higher education.

I also wish to thank all who took part in this Review: members of the staff and student bodies of UWS who prepared submissions for the Review, our Office of Research Services, and our Committee and Panel members who gave generously of their time, expertise and insights. And in this context I especially acknowledge the intensive and dedicated work of Jeff Bailey, Gar Jones and Jane Hobson, and the directors and deans who worked so hard to develop data and submissions, to organise the program and to prepare the reports.

It is significant and pleasing that both our Institutional Review Committee and all our External Review Panels commented on the dynamism and intellectual energy of the UWS researchers and research students that they met during the review process. We are clearly well equipped to face a challenging future.

Through this exercise, we have gained valuable insights into our achievements and a blueprint for a research future for the University which will see UWS flourish with its own distinctive, high-impact research and research training profile. Our research activities will be closely integrated with our other

core activities of education and community service. Greater Western Sydney will be the focus and beneficiary of our enhanced research activities.

The Review findings emphasise the core concepts of selectivity and concentration in order that that we maximise the use of our expertise and resources in tackling research problems of regional and national significance. UWS has already made significant moves in this regard and thus has an excellent base for fast future growth.

I believe this report and the submissions and panel assessments which underpin it will become the touchstone for the funding, management and development of research at UWS into the foreseeable future. There is no doubt that the University has the capacity and opportunities to build a respected research profile and to win recognition as an institution known for the relevance, excellence and distinctiveness of its research and scholarship.



Professor Janice Reid
Vice-Chancellor

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Recommendations

Selectivity and concentration

Recommendation 1: That the University continue to pursue a research management strategy based on selectivity and concentration, concentrating resources in a limited selection of research areas where the University has expertise and can build critical mass and high research impact.

Recommendation 2: That, at the highest level, research concentration be expressed as a small number of major, multidisciplinary and interdisciplinary, research themes that support the University Mission and have national and local relevance. These themes might be very broad in scope (e.g. food) or more focused (e.g. environmental management in urban areas).

Recommendation 3: That, at the next level, the University designate a small number of University Research Centres (URC) and Research Centres (RC), reserving the name 'Centre' for such designated entities. These centres would each be expected to submit a research report, a research plan and a business plan for annual approval. Continued existence of a centre would be subject to these all being satisfactory. Furthermore, centres would be reviewed by an external panel every three years. Centres would receive from the University a significant share of the Government grants such as the IGS that can be attributed to their performance. Ideally, centres would be relevant to one or more research themes.

Recommendation 4: That the University develop a range of well-publicised mechanisms to encourage concentration and collaboration within the University. Also it is recommended that there be well-publicised mechanisms to encourage and reward strong partnerships between areas of University research concentration and international, national and regional partners. The University should aim to be a national exemplar for developing cross-disciplinary, large-scale collaborative programs.

Recommendation 5: That the University align research training where possible with areas of research concentration as expressed through themes and centres.

Recommendation 6: That the University complement its emphasis on research concentration by providing research development support and setting aside funds to support small research groups and individuals carrying out research programs. This is important as it is from small groups that new research centres can be built up.

Recommendation 7: That the University target *one* area for development each triennium which currently has a low or moderate profile but has:

- contemporary importance
- regional spin-offs
- future value

Integration of research with other UWS activities

Recommendation 8: That the University ensure its research activities are integrated with its other core activities with particular attention being given to integration of research activities with strategic planning, branding and profile, budgeting, risk management, human resource activities, the education program and University organisational structure.

Recommendation 9: That the University leverage reputation built up in areas of research themes to attract top students to courses in allied areas and to attract fee-paying students in postgraduate courses directly related to themes.

Recommendation 10: That the University ensure human resources policy including policies on recruitment, staff development, promotion, succession planning, visitors and affiliates, and study leave support its research strategy. Consideration should be given to creating/attracting a small number of professors of international eminence in the University's research theme areas who are specially designated and paid (cf. UNSW Scientia professors or Melbourne University's Laureate professors).

Recommendation 11: That the University research structures be well integrated with the academic organisation of the University and the critical role in research management of the Deans be recognised in human resource management, reporting and resource allocation.

Increasing institutional research performance, quality and profile

Recommendation 12: That the University ensure that research carried out is of the highest quality possible, with work resulting in high impact, both in terms of use and citation, being especially recognised and rewarded.

Recommendation 13: That the University aim to double its number of research publication units over the next five years.

Recommendation 14: That the University aim to win (and be the headquarters for) at least two Commonwealth-funded centres (Special Research Centre, CRC etc..) over the next three years.

Recommendation 15: That the University actively work to ensure that members of the University are nominated for research and related prizes whenever feasible.

Recommendation 16: That the University build up a program of inviting international visitors in areas relevant to research themes who will inspire the University community and will lift the University's profile and standing with external stakeholders.

Institutional research funding – increasing external funding and allocating internal funds

Recommendation 17: That the University aim to double its external research funding over the next five years.

Recommendation 18: That each University Research Centre and Research Centre develop a plan to attract a portfolio of funding over several years. A portfolio approach mitigates the risk of sudden funding reductions if only one external funding source is targeted.

Recommendation 19: That the University develop a research consultancy and commercialisation strategic plan which emphasises ways to increase funding from these sources.

Recommendation 20: That the University consider how to use its land-rich status and its strong

community support to develop technology parks and incubators which support SMEs and start-up companies in Greater Western Sydney and which offer opportunities for co-location of University research groups and companies operating in related fields.

Recommendation 21: That the University actively work with partners (and leverage partner contribution) to fund major research infrastructure through applications to research infrastructure funds such as LIEF (Linkage Infrastructure Equipment & Facilities).

Recommendation 22: Research resource allocation across UWS should be on the basis of the following broad principles:

- Differential resource allocation based on excellence, strategic direction and promise. Some centres have reached their full levels of potential strength and impact and required minimal support; some have further development needs including space allocation, personnel and equipment. Any investment would be expected to produce significant expansion of their work and achievement
- Preferential access to UWS Research Scholarships for meritorious students in accordance with the standard of all other UWS scholarship holders.
- That resource allocation to University Research Centres and Research Centres be on the general principle of returning up to 100 per cent of the Institutional Grants Scheme (IGS). This maintains the 'no tax' policy on external income earned to provide a strong platform for centres to move toward being 100 per cent self funding or to require only minimal support, thus demonstrating return on investment.
- Access to RTS funds should take account of load, completions and integration with an area of research concentration.
- Development needs such as space, equipment and personnel to be supported, enabling strong growth and consolidation of achievement.
- Recognition of quality and promise: while Schools are the central incubators of future UWS research strengths, College resources should be strategically deployed to develop future generations of researchers in emerging research

concentrations, particularly on a collaborative funding basis with matching central and college funding.

- Prominence should be given to the impact on the relationship between UWS and Greater Western Sydney. All Centres should actively pursue mutually beneficial relationships of enquiry, application, understanding, and strategic promulgation of research in GWS.
- Promotion of the relationship to thematic research (e.g. through strategic funds for the development of CRC bids).
- Active promotion of (a) connectivity between like areas and (b) interdisciplinary problem solving research.
- The direction of internal resources as leverage towards external funding and strategically planned growth.
- Identification and development of commercialisation opportunities. Major University Research Centres to be supported by a commercialisation manager.
- Processes of mutual accountability and transparency (triennial resource allocation, management systems in place, business planning, budgetary review, annual internal review via annual report and external benchmarking against like entities and triennial external review process on status of designation). Forward commitments will provide the only basis for carry forward funds.
- Allocation of space to bring together several centres of like-interest that can foster genuine research synergies.
- Utilisation of funding to encourage integration of research entities with significant overlap.
- Utilisation of discretionary funds to attract highly focused senior researchers and research leaders and outstanding postdoctoral appointments.

Research training

Recommendation 23: That the University seek to increase the number of research postgraduates from overseas and through fee-paying offerings which are relevant to employers who might be willing to pay fees for their employees.

Recommendation 24: That the University consider increasing its range of professional doctorates, particularly in fields related to research themes that are particularly relevant to Greater Western Sydney.

Recommendation 25: That the University consider offering joint PhD and other degrees with high-profile international partner universities in areas of research concentration and excellence.

Recommendation 26: That there be a strong emphasis on giving undergraduate students a sense of what high-quality research and knowledge creation involves.

Recommendation 27: That PhD students and postdoctoral staff be given formal training (maybe leading to a qualification such as a graduate certificate) in university teaching to increase their employability.

Recommendation 28: That research training for academic staff be offered in the areas of research management, research funding strategies, research commercialisation, preparation of publications, and new research methods. Such training might, in some cases, lead to a formal qualification.

Intellectual property

Recommendation 29: That the University's policy on intellectual property be revised to address issues of electronic and web publication and issues related to evaluation of ideas mooted for patent and other intellectual property protection such as plant breeding rights.

1. Introduction

The Research Landscape 2002-2004 is the summary report of a comprehensive review process undertaken during August-October 2001 of UWS research concentrations, culminating in the observations and recommendations of the Vice Chancellor's Institutional Review Committee (IRC). The global review was announced in late 2000 as part of the UWS unification process and an ongoing commitment to quality assurance. It sought to respond both to Commonwealth Government's Research White Paper, *Knowledge and Innovation: A policy statement on research and research training*,¹ and to the historical profile of research at UWS, which was dispersed across its three previous network Members. In late 2000, the 'new UWS' designated as its initial research concentrations 12 Interim Key Research Centres and 8 CORE Centres (Centres of Research Excellence), on the basis that they and other applicants for central university designation and funding support would undergo a rigorous external review in 2001.

This Institutional Research Review has been in many ways an exceptional process. It is very unusual (indeed probably the only similar exercise in Australian higher education was the joint ARC/ANU review² of the ANU Institute of Advanced Studies in the mid 1990s) to review almost the entire corpus of research and research training of a university at one point in time.

The review evaluated research effort at UWS, as expressed through current research concentrations, and put forward a set of recommendations that endorsed the core notion of research concentration and selectivity. The recommendations are aimed at ensuring that UWS will flourish and develop a distinctive, high-impact research and research training culture in a fluid policy and funding environment, which may continue to be challenging to young universities.

2. The Terms of Reference

To provide advice to UWS on:

1. The model and parameters for research development and management for the next 5 years which will position it strongly for international recognition for research in selected fields.
2. The appropriateness and implementation of the recommendations of the review panels.
3. Directions for productively linking or merging UWS research groups to improve scale, breadth and productivity.
4. Strategies for fostering or introducing new and emerging areas of research focus.
5. Optimal mechanisms and principles for resourcing research and research training.
6. Strategies for integration with industry, the professions and the Greater Western Sydney area.
7. A framework for successful identification assessment and management of intellectual property and commercialisation opportunities.
8. Principles and strategies for the mutual enrichment of research, research training and undergraduate education, and to
9. Review the final report to the Vice-Chancellor and Board of Trustees and the funding allocation decisions and associated institutional reporting and accountability framework and timeframe.

3. The Review Process

Phase 1

The review process incorporated the work of six External Review Panels (ERP) (see Appendix 2 for summary of the panels' key findings). Eminent scholars and industry leaders made up the review panels (see Appendix 1). These undertook the evaluation of:

- 12 Interim Key Research Centres and 6 new proposals for Key Research Centres (5 Panels)
- 8 Interim Centres of Research Excellence (CORE), and 6 new proposals for CORE status (1 panel) (see Appendix 2 for listing of all proposals.)

This process was facilitated through the Office of Research Services under the leadership of the Pro Vice Chancellor, Research. Each review was conducted across 2 days.

UWS is committed to peer review of its research and teaching activities and keen to ensure that its research concentrations maximise their impact and substantially add value to their disciplines and fields.

Phase 2

The Institutional Review Committee considered the reports and recommendations from the External Review Panels prior to making its overarching recommendation for the preferred research management model at UWS.

The Institutional Review Committee also considered:

- The UWS Research and Research Training Report submitted to DEST as part of the 2001 profile visit.
- Objective global data on UWS research performance, including information for the period 1997-1999 on (a) the fraction of academic staff who are currently considered to be research active by disciplinary grouping or by School covering performance relating to external income, publications and Higher Degree Research (HDR) completions and (b) overall level of research activity by academic ranking for the same performances measures.

4. Institutional Review Committee

The Committee comprised the Chancellor and Vice-Chancellor together with three eminent and experienced current or former senior university administrators:

- Professor Janice Reid, Vice Chancellor, UWS (Chair)
- Mr M. John Phillips, Chancellor, UWS
- Emeritus Professor Chris Fell, previously Deputy Vice-Chancellor (Research and International), University of New South Wales
- Professor Mary O'Kane, previously Vice Chancellor, University of Adelaide
- Professor Peter Sheehan, Vice Chancellor, Australian Catholic University

Also in attendance were:

- Professor Jeff Bailey, Acting PVC (R) and Dean of Research Studies, UWS
- Mr Gar Jones, Director, Research Services, UWS
- Ms Jane Hobson, Project Officer, Research Services, UWS.

5. Organisation of this report

The Committee made 29 major Recommendations regarding the future of research and research training at UWS. These recommendations are presented *in toto* for ease of reference at the front of this report. The recommendations fall into the following general categories which have been used as the organisational structure of this report:

- Selectivity and concentration
- Integration of research with other UWS activities
- Increasing institutional research performance, quality and profile
- Institutional research funding – increasing external funding and allocating internal funds
- Research training
- Intellectual property

6. Selectivity and concentration

The Committee considered the position of UWS in the Australian higher education sector, including the UWS commitment to be a university that undertakes nationally and internationally competitive research in well defined areas, as well as showing its overarching commitment to its region. Discussion focused particularly on the aspirations and positioning of UWS in the next 5 to 10 years in terms of the quality and excellence of research performance.

At present, UWS is in the lower third on most research indicators for Australian universities. At a time when universities are competing fiercely in research, UWS needs to take advantage of its relative newness to build a distinctive research and research training culture that is congruent with its Mission. It probably should emphasise research that is aimed at tackling problems of modern urban communities with research tools that are multidisciplinary and interdisciplinary rather than copying the old universities of Australia where most of the research is primarily discipline driven.

It was agreed that UWS as a research university will be shaped, in part, by the research problems that UWS sets itself to solve, the external research funding and policy environment, the research environment UWS provides to its competitive researchers, together with the capacity of UWS to sustain and develop research in a policy environment, strategic resource allocation, and effective risk management.

Although it needs to be constantly monitoring the research environment inside and outside the University, UWS should chart its own distinctive research course, concentrating its resources in selected areas that are congruent with its Mission and goals and in which it has significant expertise and in which it can make a vital knowledge contribution to the communities it serves.

Recommendation 1: *That the University continue to pursue a research management strategy based on selectivity and concentration, concentrating resources in a limited selection of research areas where the University has expertise and can build critical mass and high research impact.*

6.1. Developing a distinctive research culture with research themes

The Committee was strongly of the view that the research profile of UWS into the future should be thematic and interdisciplinary rather than focused on specific traditional disciplines or scattered across a large number of loosely related (or unrelated) topics. Broad themes can be an effective grouping device that gives coherence and focus to University activities and which is easy to explain to internal and external stakeholders.

Grouping major research (and related) activities into a small number of themes would enable the University to focus resources on building internationally recognised research expertise and reputation in key areas, recruiting strategically around these, having highly supportive and stimulating research training environments, ensuring continuity of programs, even if key staff move and having the critical mass necessary to contribute not only to research but to expert consultancies, contract research and undergraduate education.

More than simply conferring the advantages of scale, selectivity and concentration, themes would help to define the profile and purposes of the University in stakeholders' minds, enable research groups to attract international visitors and national collaborations, and perhaps, most importantly, align the research profile of UWS with major regional concerns and issues, which in themselves are key priorities for regional governments and populations nationally and internationally. The Committee's shared view was that the distinctive location (geographic and socioeconomic) of UWS is one of its greatest assets and holds great potential for its development along all dimensions of the University's Strategic Plan. The Committee reaffirmed the Board of Trustees' commitment to UWS' research being strongly located in, and focused on, Greater Western Sydney.

The Committee believed that a sensible and feasible approach to the definition of key themes for concentration would be to consider the balance of current and proven expertise within UWS and the priorities for the Region. This would also allow the limited identification of realistic opportunities that are as yet not represented in the University's research efforts.

The University's Office of Regional Development and Office of Research Services would have a contribution to make in this process and the Colleges, as the sites of research, should provide a major input into the

decision making process. UWS has an advantage in this process in already having the analyses of public agencies and representative groups in Greater Western Sydney to draw upon. For instance the Teamwest consultations delineated as priorities for its work program: economic development; transport; human services, integrated environmental management; information resources; and arts and cultural development.³ The recent study *Who Cares About Western Sydney*⁴ has shown that for community respondents the key priorities are: traffic problems and poor public transport; crime, vandalism and safety; unemployment; drugs and alcohol abuse; and pollution.⁵ The State Government's key priorities for the 2001-2002 year reflect broadly the main concerns of agencies and residents: i.e. securing jobs and investment; supporting families and communities; protecting the environment; and providing better government services. These themes are overlapping and consistent across different agencies. They are representative and provide a map of felt needs in the Region, providing UWS valuable signposts for its research development.

Another part of UWS that could help with this process is the newly-established Whitlam Institute of UWS, which while itself not a research centre, has a facilitative role in fostering and supporting major research projects of relevance to the development of urban regions and the social welfare, health and education services so vital to Greater Western Sydney. In promoting public understanding and debate about the issues that are outlined in its charter and in providing funds and sponsorship for research relevant to its mission the Institute has the potential to enhance research within the University's research centres and Colleges that is relevant to key urban and social welfare issues.

The Committee recommended a process of consultative seminars with external stakeholders and academic staff around potential themes, so as to elucidate and highlight current capacity, potential research directions, potential areas of development, funding opportunities, multidisciplinary contributions, regional salience, current expertise and opportunities for partnerships in Australia and overseas. Members did not wish to pre-empt this debate and settle too firmly on what the small number of themes might be, but it did consider possible areas for exploration:

- Water
- Urban and Community Development

- Culture and Communities
- Public Health
- Environmental Sustainability
- Food
- Schools and Education

In the Committee's judgement, the above list of themes appears to represent significant areas for UWS. They are not, however, exclusive of other research topics. All should provide easily understood, definable areas of excellence and investment.

Recommendation 2: *That, at the highest level, research concentration be expressed as a small number of major, multidisciplinary and interdisciplinary, research themes that support the University Mission and have national and local relevance. These themes might be very broad in scope (e.g. food) or more focused (e.g. environmental management in urban areas).*

6.2 Research Centres

For UWS, the establishment, support and growth of research centres is an important strategy for reaching UWS' goals, as stated in the Research and Research Training Report submitted to DEST. Colleges and Schools are the critical linkage in the relationship between research and teaching, as well as providing the basis for effective research mentoring and development of staff and research students.

6.3 Centre Overlap and Nomenclature

The Committee noted the considerable degree of overlap of interest and expertise in several of the University's existing centres and urged the University to enter into discussions to better integrate its current research centres.

The Committee drew attention to the confusing nomenclature used presently to classify the different kinds of research clusters (e.g. Centre of Research Excellence), the variable levels of performance within these and the borrowing of terms that have meaning in other contexts (e.g. Key Research Centre as used by the Australian Research Council). It was strongly in favour of using terminology that has current acceptance and is well understood across the higher education sector ('units', and 'group'), of retaining certain terms (Centre) for formally recognised

institutional groups and using terms such as 'group' to denote incorporation within Schools and Colleges.

Of concern also was the variety of acronyms for the various research centres, a practice that can be confusing to the external community and works to the disadvantage of the University. Centre and group names should have meaning for 'outsiders' and stakeholders of various kinds and would need to be chosen more meaningfully in the future.

A seemingly straightforward title 'The Centre for Advanced Food Research' can be ambiguous, in failing to indicate what 'advanced' means or refers to. SELF, LEAP and SAGE are creative names but they have no explanatory value in and of themselves and their longer forms are hard to explain. As an example of the need for integration and clarification of names, CLEM (Centre for Landscape and Ecosystem Management) and SEET (Centre for Sustainability in Ecological Engineering and Technology) have quite distinctive titles, yet both are, at least partly, engaged in water research. The activities of both might be subsumed under a University wide 'water research program'. Titles for the landscape of research concentration from 2002 would need to change.

6.4 Major aspects of the research management model

The discussion can be distilled into a set of principles for guiding research management. The principles, endorsed by the Committee are as follows:

1. Research 'themes' should be supported by the University. Such themes or programs would normally be expected to require the collaborative efforts of more than one research centre or group.⁶
2. There would be a very small number of outstanding research centres that would represent the major research concentrations of UWS (to be called 'University Research Centres').
3. There would be another larger collection of promising, productive centres of research (to be called 'Research Centres').
4. Both of these research concentration areas (1 & 2) would receive central funding. Funding would be based on need and performance with funding and capital support negotiated for each of the research concentration areas.

5. Other research entities would be managed and/or funded by Schools and Colleges and would be called Research Groups.

6.5. Expected characteristics of UWS research centres

The Committee articulated a set of baseline descriptors to be applied to University Research Centres.

- Demonstrate intellectual cohesion around well articulated research problems and research programs addressing those problems.
- Have a critical mass of researchers including: a leading, visionary and productive research leader, a small (e.g. 4-6) group of strongly performing researchers, including postdoctoral fellows, research students and a medium (e.g. 8-12) group of developing researchers.
- Articulate 'succession plans', demonstrating the development of future generations of researchers via support of postdoctoral fellows and research student training.
- Have a substantial and clearly articulated relationship to the University's academic programs, including undergraduate, honours, postgraduate course work and research degrees; they would not, however, take up roles more appropriate to a School.
- Demonstrate organisational cohesion and leadership.
- Demonstrate collaborative research partnerships both within the Centre, within the University and with community or industry players.
- Demonstrate that its program has impact, as measured by its influence on other research and teaching programs.
- Demonstrate a 'return on investment', i.e. external income generation, benchmarked by discipline as articulated within External Panel Reviews. Such external income should have an upward trajectory and should exceed any internal funding by a very significant factor.
- Demonstrate quality in research publications, including but not limited to citation quantity.

- Have broad types of dissemination of results, appropriate to its community, industry and scholarly linkages.

6.6. External Review Panel recommendations on future Centres

The Committee considered the work carried out by the six External Review Panels, praising highly the rigour and comprehensive nature of the process used for the reviews. It discussed the reports of the External Review Panels and endorsed in general terms the recommendations of these Panels.

A recurring theme in the External Review Panel Reports is the missed opportunities for collaboration between researchers within UWS (see Appendix 4 for the interim research landscape in 2000). The panels recommended several collaborations and research programs for further investigation. The Committee strongly recommends that the University facilitate mechanisms for exploring and developing such collaborative activity. The overall research performance of UWS is still at a fledgling stage within the national system, so there is a strong imperative for the University to assist its researchers to find ways to overcome disciplinary and methodological differences in order to achieve the impact and status of a major interdisciplinary program. Achieving effective collaboration of this type is a major challenge to the researchers involved and to their University. It is not something Australian universities and other research institutions generally do well. If UWS can develop effective mechanisms to bring groups of researchers from different backgrounds together into large but focused research programs, it will become a beacon to the rest of the research system in Australia. Its relative newness as an institution is a considerable advantage in this and should be exploited.

The aggregated Review Panel and Review Committee recommendations on major university research concentrations is summarised in Appendix 3.

Recommendation 3: *That, at the next level, the University designate a small number of University Research Centres (URC) and Research Centres (RC), reserving the name 'Centre' for such designated entities. These centres would each be expected to submit a research report, a research plan and a business plan for annual approval. Continued existence of a centre would be subject to these all being satisfactory. Furthermore, centres would be*

reviewed by an external panel every three years. Centres would receive from the University a significant share of the Government grants such as the IGS in line with their research impact and external funding. Ideally, centres would be relevant to one or more research themes.

Recommendation 4: *That the University develop a range of well-publicised mechanisms to encourage concentration and collaboration within the University. Also it is recommended that there be well-publicised mechanisms to encourage and reward strong partnerships between areas of University research concentration and international, national and regional partners. The University should aim to be a national exemplar for developing cross-disciplinary, large-scale collaborative programs.*

6.7 Research centres & research training

The Committee noted the strong imbalance between current research strengths and areas of demand for research training. It also expressed the view that a major research concentration had to undertake substantial research training, contributing to the development of the next generation of researchers. In doing so, it was expected that research centres would develop strong and supportive research cultures and strong management structures to underpin effective research training.

Recommendation 5: *That the University align research training where possible with areas of research concentration as expressed through themes and centres.*

6.8 Strategies for fostering new research areas

UWS must be able to respond to opportunities and recognise potential as well as supporting demonstrable excellence. Demonstrated excellence will be nationally and internationally competitive. Some of the University's emerging strengths are in new fields, but if strategically managed will be expected to become competitive in the national and international arena.

UWS also needs to examine the development of areas that its regional communities regard as pressing and of high priority – for example, a research program focusing on transport as it affects urban regions.

UWS could respond to these priority needs by recruiting high-level research teams to establish such areas. Equally, UWS may wish to build on niche programs where it currently has an emerging reputation but not necessarily a research intensive program supporting this niche. Research teams could be recruited to support such areas adding research depth to programs that have significant community impact and outreach.

Colleges and Schools should use the significant research resources allocated to them through the Institutional Grant Scheme (IGS replaces research quantum) and Research Training Scheme (RTS must be specifically reported on to the Department of Education, Science and Training) to ensure development of competitive research groups and programs, particularly those focused on problem solving collaborative research with regional partners. The Office of Research Services is working with the Colleges to foster the investment of research related resources into research scholarships and postdoctoral fellowships to build the research profiles of the Colleges and to attract and keep high achieving students.

Recommendation 6: *That the University complement its emphasis on research concentration by implementing mechanisms and setting aside some funds to support small research groups and individuals carrying out research programs. This is important as it is from small groups that new research centres can be built up.*

Recommendation 7: *That the University target one area for development each triennium which currently has a low profile but has:*

- contemporary importance,
- regional spin-offs,
- future value.

7. Integration of research with other UWS activities

A fundamental characteristic of a contemporary university is a flourishing research culture which is deeply integrated into the broader activities of the university. Research is not an add-on activity. If the University is to make a name for itself in research, it must ensure that all its policies reflect its major research aspirations.

Recommendation 8: *That the University ensure its research activities are integrated with its other core activities with particular attention being given to integration of research activities with strategic planning, branding and profile, budgeting, risk management, human resource activities, the education program and University organisational structure.*

Recommendation 9: *That the University leverage reputation built up in areas of research themes to attract top students to courses in allied areas and to attract fee-paying students in postgraduate courses directly related to themes.*

Recommendation 10: *That the University ensure human resources policy, including policies on recruitment, staff development, promotion, succession planning, visitors and affiliates, and study leave support its research strategy. Consideration should be given to creating/attracting a small number of professors of international eminence in the University's research theme areas who are specially designated and paid (cf. UNSW Scientia professors or Melbourne University's Laureate professors).*

Recommendation 11: *That the University research structures be well integrated with the academic organisation of the University and the critical role in research management of the Deans be recognised.*

8. Increasing institutional research performance, quality and profile

There are four key groupings influencing UWS' research performance and development profile:

- research centres
- Colleges/Schools
- the professoriate
- individual researchers including research students

The Committee considered the role of the professoriate in UWS' research performance to be critical and needing further development.⁷ The Committee suggested the professoriate be challenged to respond to government policy direction in research and, in particular, it should provide leadership in achieving a rapid increase in research outputs

(quality publications, patents, etc.) and in securing one or more Commonwealth-funded centres.

It is also important that UWS staff be recognised for their research achievements and impacts. A good way of doing this is nominating them for major research prizes and for bodies such as the Learned Academies.

Eminent visitors can be a useful in raising the profile of an institution. The Committee strongly recommended that a formal visitor program be instituted.

Recommendation 12: *That the University ensure that research carried out is of the highest quality possible, with work resulting in high impact, both in terms of use and citation, being especially recognised and rewarded.*

Recommendation 13: *That the University aim to double its number of research publication units over the next five years.*

Recommendation 14: *That the University aim to win (and be the headquarters for) at least two Commonwealth-funded centres (Special Research Centre, CRC, etc.) over the next three years.*

Recommendation 15: *That the University ensure that members of the University are nominated for research and related prizes whenever feasible.*

Recommendation 16: *That the University build up a program of inviting international visitors in areas relevant to research themes who will inspire the University community and will lift the University's profile and standing with external stakeholders.*

9. Institutional research funding – increasing external funding and allocating internal funds

A substantial fraction of government funds going to universities is in the form of research funds awarded on a competitive basis. In times when university funding is very tight securing these competitive research funds can be an important part of overall university funding strategy.

A range of strategies can be adopted to facilitate increasing external research funds. In the Committee's view, researchers should increase the

number of competitive grant applications submitted by UWS, so that grant successes increase proportionally. All Research Centres should develop a multi-year funding portfolio strategy with the aim of both increasing funds and of mitigating risk of sudden decreases in funds from one particular source.

There is currently a strong Commonwealth government policy thrust for universities to earn more on commercial activities. Universities need to consider any advantages they might have in this respect, such as, in the case of UWS, land and strong community support. These advantages open up possibilities connected with technology parks.

A major research cost is research infrastructure. UWS could encourage its researchers to work with partners to apply for government research infrastructure funds for major pieces of research equipment.

To earn external research funds, the University typically needs to invest substantially in its research concentrations and its areas of research promise. Equally, internal funding allocation policies can have a major bearing on the incentive structure for researchers to apply for external funds.

The Committee agreed that UWS' commitment to research was substantial, although it suggested that a significant increase in funding be considered. UWS should consider developing a funding model for research concentrations that involves matched funding initiatives with and between Centres, Colleges and central funding mechanisms. Equally, UWS should ensure that its investment in University research centres allows it leverage access to the substantial funding available for national infrastructure initiatives and CRC developments. It was also noted that the University's research development strategy (including research training) had to form an essential component of the overall budget strategy for the University, particularly ensuring that research performance was rewarded, thus driving further achievement. The allocation of Research Training Scheme funding to student project support and academic units (including research centres) would also provide important performance incentives to both supervisors and students.

The External Review Panels and Committee regarded the block funding model as inappropriate, in the longer term, for the different levels of development and resource needs of the Centres. Panel views relating to the disposition of scholarships, postdoctoral fellowships, capital refurbishment funding, centre management support, communication support, equipment, and visiting

professorial fellowships are contained in their reports.

It is recommended that resource allocation to University Research Centres and Research Centres take into consideration the general principle of returning up to 100 per cent of the Institutional Grants Scheme (IGS). Long-term, all research centres should be largely self-supporting, apart from the IGS funding, although during the transitional period various special funding pools and support mechanisms will be established to support centres. In particular, support will include, among other possibilities, IGS funding, the provision of space, centre managers and administrators, facilities, post-doctoral fellows and research student scholarships. A commercialisation manager will support the four University Research Centres, as the External Review Panel identified a need for all URCs to build commercialisation opportunities.

Over and above this support, the Committee proposed a scheme of appointing eminent professors in certain areas to add the critical mass and to progress some centres to international significance. The Vice Chancellor's Initiatives Fund will also support postdoctoral appointments over 2002 and 2004. Special enabling funding will be provided through the Vice-Chancellor's Initiative Fund that will encourage inter-Centre collaboration, support the consultation on major research themes together with the building up over time of UWS-wide interdisciplinary programs of national and international significance.

Recommendation 17: *That the University aim to double its external research funding over the next five years.*

Recommendation 18: *That each University Research Centre and Research Centre develop a plan to attract a portfolio of funding over several years. A portfolio approach mitigates the risk of sudden funding reductions if only one external funding source is targeted.*

Recommendation 19: *That the University develop a research consultancy and commercialisation strategic plan which emphasises mechanisms to increase funding from these sources.*

Recommendation 20: *That the University consider how to use its land-rich status and its strong community support to develop technology parks and incubators which support SMEs and start-up companies in Greater Western Sydney and which offer opportunities for co-location of University research groups*

and companies operating in related fields.

Recommendation 21: *That the University actively work with partners (and leverage partner contribution) to fund major research infrastructure through applications to research infrastructure funds such as LIEF.*

Recommendation 22: *Research resource allocation across UWS should be on the basis of the following broad principles:*

- Differential resource allocation based on excellence, strategic direction and promise. Some centres have reached their full levels of potential strength and impact and required minimal support; some have further development needs including space allocation, personnel and equipment. Any investment would be expected to produce significant expansion of their work and achievement.
- Preferential access to UWS Research Scholarships for meritorious students in accordance with the standard of all other UWS scholarship holders.
- Return of IGS earned at an increased level, up to 100 per cent, maintaining the 'no tax' policy on external income earned to provide a strong platform for centres to move toward being 100 per cent self funding or to require only minimal support, thus demonstrating return on investment. Access to RTS funds should take account of load, completions and integration with an area of research concentration.
- Development needs such as space, equipment and personnel to be supported, enabling strong growth and consolidation of achievement.
- Recognition of quality and promise: while Schools are the central incubators of future UWS research strengths, College resources should be strategically deployed to develop future generations of researchers in emerging research concentrations, particularly on a collaborative funding basis with matching central and college funding.
- Prominence should be given to the impact on the relationship between UWS and Greater Western Sydney (GWS). All Centres should actively pursue mutually beneficial relationships of enquiry, application, understanding, and strategic promulgation of research in GWS.

- Promotion of the relationship to thematic research (e.g. through strategic funds for the development of CRC bids).
- Active promotion of (a) connectivity between like areas and (b) interdisciplinary problem solving research.
- The direction of internal resources as leverage towards external funding and strategically planned growth.
- Identification and development of commercialisation opportunities. Major University Research Centres to be supported by a commercialisation manager.
- Processes of mutual accountability and transparency (triennial resource allocation, management systems in place, business planning, budgetary review, annual internal review via annual report and triennial external review process on status of designation). Forward commitments will provide the only basis for carry forward funds.
- Allocation of space to bring together several centres of like-interest which can foster genuine research synergies.
- Utilisation of funding to encourage integration of research entities with significant overlap.
- Utilisation of discretionary funds to attract highly focused senior researchers and research leaders and outstanding postdoctoral appointments.

10. Research Training

The University lost government-funded research training places as a result of the implementation of the White Paper on Research and Research Training. The Committee recommends the University look to other sources such as full-fee paying overseas students to increase its research training numbers and that these increases should be in areas of research concentration. Some of these students might be jointly supervised by UWS and partner universities. UWS might well complement the PhD with an increased range of professional doctorates, offered in fields of major UWS concentrations.

As Australia moves increasingly towards a knowledge-based economy, it is important that all university graduates have some sense of knowledge creation and research. The Committee

recommended that areas of research strength should be able to contribute in a targeted way to coursework postgraduate and undergraduate programs within UWS.

With the large increase in the number of Australians studying for a PhD in recent years, UWS can give its research degree graduates (and its postdoctoral fellows) an edge in the employment market by offering them formal training in university teaching and where possible offering them teaching experience through part-time academic employment.

Training in research is not only a matter for students but can be an important part of staff development. Training for staff might be in the areas research management, research funding strategies, research commercialisation, preparation of publications, and new research methods. Such training might, in some cases, lead to a formal qualification.

Recommendation 23: *That the University seek to increase the number of research postgraduates from overseas and through fee-paying offerings which are relevant to employers who might be willing to pay fees for their employees.*

Recommendation 24: *That the University consider increasing its range of professional doctorates, particularly in fields related to research themes that are particularly relevant to Greater Western Sydney.*

Recommendation 25: *That the University consider offering joint PhD and other degrees with high-profile international partner universities in areas of research concentration and excellence.*

Recommendation 26: *That there be a strong emphasis on giving undergraduate students a sense of what high-quality research and knowledge creation involves.*

Recommendation 27: *That PhD students and postdoctoral staff be given formal training (perhaps leading to a qualification such as a graduate certificate) in university teaching to increase their employability.*

Recommendation 28: *That research training for academic staff be offered in the areas of research management, research funding strategies, research commercialisation, preparation of publications, and new research methods. Such training might, in some cases, lead to a formal qualification.*

11. Commercialisation and Intellectual Property

Proper attention to issues of intellectual property is a necessary feature of research commercialisation. The University's intellectual property policy needs to be revised to take account of electronic publishing issues.

Recommendation 29: *That the University's policy on intellectual property be revised to address issues of electronic and web publication and issues related to evaluation of ideas mooted for patent and other intellectual property protection such as plant breeding rights.*

Conclusion

This Committee commends the University for undertaking a comprehensive and rigorous review of its existing research and research management. A set of recommendations and observations is provided which should provide the guidance for UWS to build on a good base to achieve a distinctive and successful research profile over the next five to ten years.

Appendix 1

Panel & Committee Members

External Review Panel Members

- Professor Terry Boyd, Queensland University of Technology
- Professor Ben Bradley, Charles Sturt University
- Adjunct Professor David Collins, Macquarie University
- Mr Graham Darley, Chairman, Airspan Networks Pty Ltd
- Emeritus Professor Ross Day, La Trobe University
- Professor Mark Diesendorf, Director, Sustainability Centre Pty Ltd
- Emeritus Professor Sol Encel, UNSW
- Emeritus Professor Paul Grundy, Monash University
- Emeritus Professor Judy Lumby, Director, NSW College of Nursing
- Professor Stirk Kyle, Professor of Food Technology, Victoria University
- Associate Professor Elspeth Probyn, University of Sydney
- Professor Peter Rogers, Department of Biotechnology, University of New South Wales
- Dr Helen Scott-Orr, Executive Director, Research, Advisory and Education, NSW, Department of Agriculture
- Professor Peter Waterman, Director, Centre for Phytochemistry, Southern Cross University
- Mr Jeff Wright, Sydney Catchment Authority

Institutional Review Committee

Mr M. John Phillips, AM, Chancellor of UWS.

Professor Janice Reid, AM, Vice Chancellor and President of UWS.

Professor Chris Fell, B.Sc PhD (Camb) FTSE. Hon FIE.Aust FICHEM. Past Deputy Vice-Chancellor of University of New South Wales. During that time Prof. Fell was responsible for the research, international and information technology activities of UNSW. Professor Fell was elected President of the Federation of Australian Scientific and Technological Societies (FASTS) Australia's peak council for scientists and technologists in November 2001. Trained as a chemical engineer, he worked in industry before joining UNSW. Research in his group led to the establishment of the high technology company Memtech Limited. Professor Fell played a pivotal role in the birth of the CRC for Waste Management and Pollution Control.

Professor Mary O'Kane, B.Sc (Qld), Ph.D. (A.N.U.), Hon D.Univ. (CQU). Vice-Chancellor of Adelaide University 1996-2001. Fellow, Australian Academy of Technological Sciences and Engineering, Fellow, The Institution of Engineers, Australia. Professor O'Kane is a member of the Board of CSIRO and was formerly a Director of FH Faulding Ltd and Chair of the Research Grants Committee of the Australian Research Council. She was also a member of the CRC Committee. Her main research interest is artificial intelligence - spoken language understanding/automatic speech recognition. Professor O'Kane has won many grants and awards and has undertaken a variety of consultancies.

Professor Peter W. Sheehan AO, BA PhD (Syd) FAPS FAPSA FASSA Since 1998, Prof. Sheehan has been Vice Chancellor Australian Catholic University. Previously, he was Deputy Vice-Chancellor (Research and Postgraduate Studies) at University of Queensland. Professor Sheehan is past Chair of the Australian Research Grants Committee and the Research Committee of the Australian Research Council. He is also past President of the Academy of the Social Sciences in Australia.

Appendix 2

External Review Panels

Summary of Key Issues / Findings

1. Overview

Six external review panels have examined proposals from across UWS for designation as UWS research concentrations – either Key Research Centres (KRC), or Centres of Research Excellence (CORE). Five disciplines panels examined 18 Key Research Centre proposals – 12 from existing Interim KRC and 6 from new centres. A sixth panel examined proposals for CORE centre status – reviewing 14 proposals. All the reviews were undertaken by eminent scholars, researchers and industry representatives external to UWS – 15 reviewers in total. Two of these expert members operated across two of the five KRC panels and three were members of the CORE review team, providing some continuity across processes and recommendations.

Proposals Reviewed

Key Research Centres

1. *Australian Expert Group in Industry Studies* (AEGIS), Professor Jane Marceau, College of Law and Business [Status at time of review: Interim KRC]
2. *Australian Institute for Gambling Research* (AIGR), Professor Jan McMillen, College of Arts, Education and Social Sciences [Status at time of review: Interim KRC]
3. *Centre for Regional Research and Innovation* (CRR), Professor Trevor Cairney, College of Arts, Education and Social Sciences [Status at time of review: Interim CORE]
4. *Urban Frontiers Program* (UFP), Professor Bill Randolph, College of Arts, Education and Social Sciences [Status at time of review: Interim KRC]
5. *Critical Psychology* (CP), Professor Valerie Walkerdine, College of Arts, Education and Social Sciences [Status at time of review: Interim CORE]
6. *Institute for Cultural Research* (ICR), Professor Ien Ang, College of Arts, Education and Social Sciences [Status at time of review: Interim KRC]
7. *Macarthur Auditory Research Centre, Sydney* (MARCS), Professor Denis Burnham, College of Arts, Education and Social Sciences [Status at time of review: Interim KRC]
8. *Self-Concept Enhancement and Learning Facilitation* (SELF), Professor Herb Marsh, College of Arts, Education and Social Sciences [Status at time of review: Interim KRC]
9. *Centre for Horticulture and Plant Sciences* (CHAPS), A/Professor Robert Spooner-Hart & A/Professor Jann Conroy, College of Science, Technology and Environment. [Status at time of review: Interim KRC]
10. *Centre for Advanced Food Research* (CAFR), Professor David Laing & A/Professor Jim Hourigan, College of Science, Technology and Environment [Status at time of review: Interim KRC]
11. *Landscape and Ecosystems Management* (LEM), Professor Peter Cornish, College of Science, Technology and Environment [Status at time of review: Interim KRC]
12. *Centre for Biostructural and Biomolecular Research* (CBBR), Professor Barry Richardson, College of Science, Technology and Environment [Status at time of review: Interim KRC]
13. *Centre for Property, Construction & Knowledge Management Research*, (CPCK) Professor Alan Jeary, College of Law and Business [Status at time of review: Interim CORE/College Research Grouping]
14. *Research Centre for Sustainability in Ecological Engineering & Technology*, (SEET) A/Professor Steven Riley, College of Science, Technology and Environment [Status at time of review: Interim KRC]

15. *Centre for Construction Technology and Research (CCTR)*, Professor Russell Bridge and Dr Mark Patrick, College of Science, Technology and Environment [Status at time of review: Interim KRC]
16. *Centre of Nursing Research & excellence in Western Sydney (CnREWS)*, Professor Lesley Wilkes, College of Social and Health Sciences [Status at time of review: College Research Grouping]
17. *The Sydney Active Ageing Gerontology Centre (SAGE)*, Professor John McCallum, College of Social and Health Sciences [Status at time of review: College Research Grouping]
18. *The Hawkesbury Centre*, Dr Robert Woog, College of Arts, Education and Social Sciences [Status at time of review: Interim CORE]

Centres of Research Excellence

1. *Skin Technologies Research*, Professor Philip Moore, College of Science, Technology and Environment [Status at time of review: Interim CORE]
2. *Complementary Medicine*, Dr Alan Bensoussan, College of Social and Health Sciences [Status at time of review: College Research Grouping]
3. *Lower Extremity and Podiatry (LEAP)*, Mr Tony Redmond, College of Social and Health Sciences [Status at time of review: College Research Grouping]
4. *Reframing Education policy, Practice and Theory*, A/Professor Steve Dinham, College of Arts Education & Social Sciences [Status at time of review: College Research Grouping]
5. *Social Justice and Social Change*, Professor Jan Mason, College of Social and Health Sciences [Status at time of review: College Research Grouping]
6. *Social Justice Research*, Dr Moira Carmody, College of Social and Health Sciences [Status at time of review: College Research Grouping]
7. *Regional Integrated Monitoring Centre (RIMC)*, Mr Peter Stephenson, College of Science, Technology and Environment [Status at time of review: College Research Grouping]
8. *Financial Services and Accountability*, A/Professor Don Ross, College of Law and Business, [Status at time of review: College Research Grouping]

9. *Comparative Media*, Dr Anthony Uhlmann, College of Arts, Education and Social Sciences [Status at time of review: College Research Grouping]
10. *Precision Robotics*, Dr John Gal, College of Science, Technology and Environment [Status at time of review: College Research Grouping]
11. *Intelligent Engineering Systems*, A/Professor Mahmood Nagrial, College of Science Technology and Environment [Status at time of review: College Research Grouping]
12. *Centre for Advanced Systems Engineering (CASE)*, Mr George Bryan, College of Science Technology and Environment [Status at time of review: Interim CORE]
13. *Innovation and Continuous Improvement Technologies (INCITE)*, A/Professor Ross Chapman, College of Law and Business [Status at time of review: Interim CORE]
14. *Intelligent Information Computing Laboratory*, Dr Yan Zhang, College of Science Technology and Environment [Status at time of review: College Research Grouping]

2. Excellence and Standing

The panels have concluded that UWS has several areas of emerging research concentration, some that have begun to register performance in the national arena, some with an established niche. Several of the programs engendered great excitement and were viewed as offering tremendous potential. Several programs were considered either (a) premature, (b) under performing and (c) at the possible peak of their growth/success.

International profiles varied. Overall UWS research has a muted impact internationally; international profile tends to settle more on individuals (e.g. Critical Psychology, Australian Expert Group in Industry Studies) than on a specific research program, although certain areas had the potential to develop their profiles.

Panels were also impressed by several Centre Directors, their passion and commitment to their research programs and training of the next generation of researchers.

Overall, even the strongest programs had need for both greater focus and integration of aims and programs, as well as stronger management

structures. The weakest had padded their proposals with non-productive staff. The issue of critical or optimal mass of active researchers was a pressing problem for several centres. Some centres had begun to address this issue, although areas of obvious excellence (i.e. Australian Expert Group in Industry Studies, Australian Institute for Gambling Research) were still hamstrung by the lack of a solid core of active researchers committed to their programs. In the case of one of the strongest centres, Centre for Horticulture and Plant Sciences, it was recommended that the University/College give serious consideration to the recruitment of a senior research professor, possibly an expatriate Australian, who could assist the excellent research team and leadership to move on to the next phase of their development, particularly relating to commercialisation and internationalisation of their research activity.

3. Intersection/Collaboration

The panels were struck by the obvious intersection between various separate UWS research groupings and the lack of collaboration between these groups. This was an across the board phenomenon. The desire for structural autonomy and separate funding seemed to have outweighed the essential collaborative possibilities inherent in related research work being undertaken by currently separate groups.

A particular example was the work being undertaken by the Institute for Cultural Research and Critical Psychology. Both centres have grown from a broad stream of cultural studies, share the same physical space, both seemingly unable to collaborate with each other. The theory and application of these two centres' work coalesced around a broader set of intersections that two panels saw linking to a University program or institute focusing on *Community and Cultural Studies* – an intellectual site that could provide thematic integration across several UWS centres, including Institute for Cultural Research, Critical Psychology, Australian Institute for Gambling Research and Urban Frontiers Program. Likewise, with the water research and technology areas being undertaken by Landscape and Ecosystems Management and Research Centre for Sustainability in Ecological Engineering & Technology, panels saw no reason for the levels of demarcation that they witnessed. UWS has so few active researchers, and so few areas of current and potential national strength, that it needs to consolidate such strengths and provide a structure that does not create rigid hierarchies. This would

leave UWS with a sensible number of major research concentrations, and a substantial internal investment to ensure that these areas can become flagships for the University. Centre configuration should not focus on individual self-interest and friendship networks.

During the review process, several Directors spoke at length about their desire to control yet more internal funding, to be given further staffing, space and authority, more so than about the intellectual excitement of their research program and the contribution it would make to UWS and its external communities. The culture of creating Key Centres and providing regimented funding to those who achieved the status of KRC may have contributed to this state of affairs. What was required was a more organic landscape that allowed areas of excellence to receive targeted support. When the panels encountered vision, energy and strategic intent, they were engaged and supportive of the centres/groupings. The panels urged UWS to avoid the creation of 'silos', where building the infrastructure and importance of a small group within the silo became more important than the strategic needs of the whole University community. The campus specific nature of the centres was sometimes a necessary outcome of the establishment of facilities and infrastructure, yet the panels felt that many of the proposals still seemed to focus on former network member alliances, often to the detriment of a 'critical mass' of active researchers. Thus the panel recommendation regarding the development of a major research program focused on *Community and Cultural Studies* would allow for these structural inheritances to be removed, combining research groups that emerged from the former UWS Macarthur and UWS Nepean.

The culture of competition among Key Research Centres and between Key Research Centres and Schools for research students and resources did not always provide healthy outcomes and should be monitored. In a sense, UWS needed to embed more fully a corporate culture relating to research, mindful that research was very often founded on the excellence and exuberance of individuals. Managing and harnessing this energy for the whole University should be the aim.

4. Differential Funding/ Differential Needs

The panel recommendations regarding funding were strongly focused on the notion of funding for need and strategic direction. The panels saw no sense in

providing exactly the same amount of funding to each designated research concentration – needs and impact differed. Some centres had reached their levels of potential strength and impact and required targeted support to maintain a solid achievement (e.g. Self-Concept Enhancement and Learning Facilitation). Some areas needed both space allocation and equipment, an investment that would allow for significant expansion of their work and achievement. Panels recommended a greater focus and coordination on commercialisation issues – in particular, Advanced Food Research, Centre for Horticulture and Plant Sciences, and Centre for Construction Technology and Research. With the first two of these, a great need was seen for providing a ‘support box’ around to guide their commercialisation potential – in this case sharing a professional officer position. Substantial central funding from the University should be, in all instances, linked to the submission of business plans by all major UWS research concentrations.

5. Management

The Panels saw a need for centres to invest in developing strong management structures/systems. This structural imperative was separate from the need for the strong research leadership that Directors should provide. Several Directors were seen to be dissipating their energies and research skills on too much day to day management. Panels made recommendations related to the employment of project managers, officers who could bring a level of professional management to research programs, particularly regarding the development of collaborative research with industry/sector partners and increasing the centres’ level of project/financial management expertise.

On another level, panels were concerned that several Directors of current interim KRC were committed to teaching methodologies and workloads at the undergraduate level that were fundamentally detrimental to research productivity. In particular, the Advanced Food Research program needed to restructure itself to reflect the management of a research program, rather than an academic teaching program and its overriding staffing/infrastructure needs. In many instances, the management of research training was also ad hoc. An excellent example of good practice in this area, however, was the proposed ‘Hawkesbury Centre’. While it is not a major research concentration, this group had developed a strong, responsive program and structure to support a large number of research

students and should receive some central support for these activities, possibly funded as a Research Training Concentration (RTC). Though even with this program, the lack of a publication culture among students was evident.

6. Research Training

The panels were very supportive of the research students they encountered throughout the review process, particularly their quality and the enthusiasm for their engagement in research work. The panels were surprised, however, to find that several interim Key Research Centres had limited or non-existent research training programs. In some cases, this seemed to be by ‘strategic neglect’, particularly in the some of the social science groupings – Australian Expert Group in Industry Studies, Urban Frontiers Program and Australian Institute for Gambling Research. The panels reiterated that a major research concentration had to undertake substantial research training, contributing to the development of the next generation of researchers. Equally, some panels also saw opportunities for certain areas to contribute in a targeted way to other postgraduate and undergraduate programs within UWS, particularly Australian Expert Group in Industry Studies, Critical Psychology, and Australian Institute for Gambling Research. Given the major funding that will flow from research completions through the Research Training Scheme (RTS), the lack of a healthy cohort of research students in some areas that were achieving excellent research income (e.g. Australian Expert Group in Industry Studies) was considered an imbalance that must be corrected. UWS research concentrations must develop strong and supportive research cultures and strong management structures to support effective research training.

7. Postdoctoral Fellows

The panels were impressed with the quality of the Postdoctoral Research Fellows they encountered during the review process and urged UWS to provide a substantial contribution to the funding of such fellows. Again, certain centres (Self-Concept Enhancement and Learning Facilitation, Australian Institute for Gambling Research, Australian Expert Group in Industry Studies) had not demonstrated any historical commitment to funding and supporting postdoctoral fellows, even when they had the funding to do so. On the other hand, one of the strengths of the Institute for Cultural Research

was its postdoctoral program, incorporating within the centre 5 postdoctoral fellows – two funded by the ARC and with a new one in the latest ARC grant round. Likewise, Macarthur Auditory Research Centre, Sydney, Centre for Horticulture and Plant Sciences, Advanced Food Research and Centre for Construction Technology and Research demonstrated a strong commitment to this advanced form of research training, seeking to build the next generation of intellectual capital and leadership.

Developing career paths for such research staff was essential to the intellectual well being of the UWS research effort. Panels were equally adamant that such appointments should be academic appointments, not general staff positions as was the historical practice at the former UWS Hawkesbury.

8. Income Generation

The panels believed that definite income targets should be set for all major UWS research concentrations. In essence, science and technology areas should aim for annual income of \$2 million, while social sciences should aim for \$1 million per annum, and humanities groups between \$500K and \$1 million. These were viewed as medium term objectives: within 3 to 5 years. None of the reviewed centres were currently at these levels of achievement. It was noted that the Institutional Grants Scheme (IGS) will provide UWS with approximately a 20 per cent return on its external income generation. Thus a centre generating one million dollars external research income would return, in due course, approximately \$200K to UWS through the IGS alone – not to mention the related return through RIBG and RTS, much of which will internally returned to the centre as performance reward. Panels were strongly supportive of a 'Return on Investment' (ROI) framework that set the ground rules for all major research concentrations. Continued UWS investment in its major concentrations was dependent upon, at the minimum, an equal return on investment. Thus a centre that was provided with \$200K per annum would be expected to return approximately \$1 million in external income per annum. Some centres had received significant internal investment but the return on investment had not been monitored or pursued, setting in train a particular set of expectations regarding core funding from the university that was not considered sustainable.

9. Research Publications

Some of the centres reviewed were achieving excellent publications output (Self-Concept Enhancement and Learning Facilitation, Centre for Construction Technology and Research, Centre of Nursing Research & Excellence in Western Sydney, and Institute for Cultural Research), but the majority of the proposals for Key Centre status –13 – were achieving publications output below the sector wide average of 0.91. Seven were below the UWS average output of 0.46. This was a significant concern, and was often reflected in the lack of a publication culture among the research students of certain groupings. The UWS definition for Research Active Staff was considered a baseline measure, one that should be significantly exceeded by active researchers working in major UWS research concentrations.

10. Location and Space

The issue of dedicated space for research concentrations was an issue raised by proposers, particularly those centres that were undergoing expansion, although such needs should be carefully tested. The issue of dedicated space for research students was also paramount. Many of the centres reviewed had invested in major research facilities and laboratory space – it made great sense to consolidate research activity around these – Advanced Food Research and Centre for Horticulture and Plant Sciences (Hawkesbury), Macarthur Auditory Research Centre, Sydney (Bankstown), and Centre for Construction Technology and Research (Penrith), the latter with a new building under construction. Equally, great opportunities existed, through the provision of designated research space, to bring together several related research groupings, possibly at Parramatta (either on campus or within the Parramatta CBD as a transition step until building development could accommodate such centres on campus) to develop a major program/institute focused around *Community and Cultural Studies*. This could be supported by the provision of shared space, facilities and administrative staffing.

Appendix 3

UWS Research Concentration from 2002

Recommended research concentrations from 2002 are built from four University Research Centres and nine Research Centres drawn from across the Colleges.

Research Groups will continue to be College based and supported. <http://www.uws.edu.au/uws/uwsn/admin/research/ROhome/>

Recommended University Research Centres

- *Centre for Advanced Food Research (CAFR)*, Prof. David Laing & A/Prof. Jim Hourigan, College of Science, Technology and Environment http://www.uws.edu.au/uws/uwsh/admin/research/cent_grp/cafr.shtm
- *Centre for Construction Technology and Research (CCTR)*, Prof. Mark Patrick & Prof. Russell Bridge, College of Science, Technology and Environment⁸ <http://ctr.uws.edu.au/>
- *Centre for Horticulture and Plant Sciences (CHAPS)*, Prof. Jann Conroy & A/Prof. Robert Spooner-Hart, College of Science, Technology and Environment <http://www.uws.edu.au/chaps/>
- *Macarthur Auditory Research Centre, Sydney (MARCS)*, Prof. Denis Burnham, College of Arts, Education and Social Sciences <http://www.uws.edu.au/marcs/>

Recommended Research Centres

- *Australian Expert Group in Industry Studies (AEGIS)*, Prof. Jane Marceau, College of Law and Business⁹ <http://www.aegis.uws.edu.au/>
- *Australian Institute for Gambling Research (AIGR)*, Prof. Jan McMillen, College of Arts, Education and Social Sciences¹⁰ <http://www.aigr.uws.edu.au/>
- *Centre for Advanced Systems Engineering (CASE)*, Mr George Bryan, College of Science Technology and Environment <http://www.uws.edu.au/obd/case/index.html>
- *Centre for Property Research*, Prof. Graeme Newell, College of Law and Business <http://www.uws.edu.au/prc/>

- *Complementary Medicine*, A/Prof. Alan Bensoussan, College of Social and Health Sciences
- *Institute for Cultural Research (ICR)*, Prof. Ien Ang, College of Arts, Education and Social Sciences.¹¹ <http://icr.uws.edu.au/>
- *Self-Concept Enhancement and Learning Facilitation (SELF)*, Prof. Herb Marsh, College of Arts, Education and Social Sciences <http://edweb.uws.edu.au/self/>
- *Skin Technologies Research*, Prof. Philip Moore, College of Science, Technology and Environment <http://www.uws.edu.au/sfh/skintech/>
- *Social Justice and Social Change*, Prof. Jan Mason, College of Social and Health Sciences

College or School Groups

Proposals reviewed that were not recommended as University research centres were in various stages of development. The research activity in those groupings will continue within their respective Schools and Colleges, which will determine levels of support and designation, although that will not include 'centre', which is reserved for University research centres.

College of Arts, Education and Social Sciences

- *Centre for Regional Research and Innovation*, Prof. Trevor Cairney
- *Comparative Media*, Dr Anthony Uhlmann
- *Critical Psychology*, Prof. Valerie Walkerdine
- *Reframing Education policy, Practice and Theory*, A/Prof. Steve Dinham
- *The Hawkesbury Centre*, Dr Robert Woog
- *Urban Frontiers Program*, Prof. Bill Randolph



College of Science, Technology and Environment

- *Centre for Biostructural and Biomolecular Research*, Prof. Barry Richardson
- *Intelligent Engineering Systems*, A/Prof Mahmood Nagrial
- *Intelligent Information Computing Laboratory*, Dr Yan Zhang
- *Landscape and Ecosystems Management*, Prof. Peter Cornish
- *Precision Robotics*, Dr John Gal
- *Regional Integrated Monitoring Centre*, Mr Peter Stephenson
- *Sustainability in Ecological Engineering & Technology*, Prof. Steven Riley

College of Social and Health Sciences

- *Centre of Nursing Research & Excellence in Western Sydney*, Prof. Lesley Wilkes
- *Lower Extremity and Podiatry*, Mr Tony Redmond
- *Social Justice Research*, Dr Moira Carmody
- *The Sydney Active Ageing Gerontology Centre*, Prof. John McCallum

College of Law and Business

- *Financial Services and Accountability*, A/Prof Don Ross
- *Innovation and Continuous Improvement Technologies*, A/Prof Ross Chapman¹²
- *Property, Construction & Knowledge Management Research*, Prof. Alan Jeary.

Appendix 4

UWS Interim Research Concentration 2000

Key Research Centres

1. Australian Expert Group in Industry Studies
2. Australian Institute for Gambling Research
3. Centre for Advanced Food Research
4. Centre for Biostructural and Biomolecular Research
5. Centre for Construction Technology and Research
6. Centre for Horticulture and Plant Sciences
7. Institute for Cultural Research
8. Landscape and Ecosystems Management
9. Macarthur Auditory Research Centre, Sydney
10. Self-Concept Enhancement and Learning Facilitation
11. Sustainability in Ecological Engineering & Water Technology
12. Urban Frontiers Program

Centres of Research Excellence (CORE)

1. Centre for Advanced Systems Engineering
2. Critical Psychology
3. Innovation & Continuous Improvement Technologies
4. Property Research
5. Regional Research and Innovation
6. Skin Technologies
7. Social Ecology
8. Systemic Development

Research Groups

1. Academy of Timorese Studies
2. Affect and Communication
3. Astronomy
4. Australian Centre for Security Research
5. Built Environment
6. Centre West
7. Childhood and Youth Policy Research Unit
8. Clinical Development
9. Creative New Media
10. Critical Social Sciences
11. Early Childhood Education
12. Education Support Centre for Learning and Teaching Enhancement
13. Education Transitions
14. Elder Law
15. Electrochemical Research and Analytical Technology
16. Financial Services Research Group
17. Health at Home
18. Health Outcomes & Innovations
19. Health Services Research
20. Information Systems-Knowledge Management in Organisations
21. Integrated Catchment Management
22. Intercultural Studies in Education
23. Interpreting and Translation Research Group
24. (IS-KOMO) Research Group
25. Koala Watch
26. Language Acquisition
27. Latin American Centre
28. Learning and Social Transformation

29. Marketing Management and Hospitality
30. Marsupial Immunology & Disease
31. Men's Health Information and Resource Centre
32. Microbiology and Molecular Biology in Medical and Veterinary Science
33. Modelling and Simulation Research Group
34. Molecular Design and Synthesis
35. Mycorrhiza
36. Oncology and Palliative Care
37. Paediatric and Child Health Nursing
38. Pedagogy in Practice
39. Plasma Sciences and Technology
40. Power Conversion and Intelligent Motion Control
41. Professional Communication
42. Regional Integrated Monitoring Centre (RIMC)
43. Research in Healthy Futures
44. Search for Extraterrestrial Intelligence
45. Spatial Culture
46. Sport, Physical Activity and Well Being
47. Sustainable Aquaculture
48. Water and Environmental Technology
49. Workplace Learning and Organisational Development

¹ Hon. David Kemp, Minister Employment, Education, Training and Youth Affairs, *Knowledge and Innovation: A policy statement on research and research training* DETYA, Canberra, 21 December 1999.

² National Board of Employment, Education and Training, *The Australian Research Council Review of the Institute of Advanced Studies*, AGPS, Canberra, May 1996.

³ Teamwest Regional Priorities Group *Greater Western Sydney 1999 Regional Agenda* WSROC, February 1999.

⁴ Urban Frontiers Program, University of Western Sydney and Planning Research Centre, University of Sydney *Who Cares About Western Sydney*, WSROC October 2001.

⁵ NSW Treasury Budget 2001 – 2002: Western Sydney Budget Statement, NSW State Government, Sydney 2001.

⁶ The Committee endorsed thematic programs as flexible and responsive to contemporary regional and national issues. For example, a 'water research program' will involve participants from centres and groups, as well as individuals across the University who have expertise and interests in the program.

⁷ On 1997-1999 data, Professors outperformed Senior Lecturers and Associate Professors on income and publications, although not on research completions.

⁸ The External Review Panel suggested CCTR explore linkages with construction stream of CPOK.

⁹ The External Review Panel recommended synergies between AEGIS and INCITE be explored.

¹⁰ External Review Panels recommended that the University consider the development of a program of research around Cultural and Community Studies. AIGR, ICR and the College groupings identified by the ERP should explore this possible program in 2002.

¹¹ The Committee recommended that the term Institute be reserved for the time being. Both AIGR and ICR will need to be retitled.

¹² The Committee recommended this grouping explore relations with AEGIS.