

DIVISION OF ENVIRONMENTAL AND LIFE SCIENCES

STRATEGIC PLAN

2001 - 2006

Vision and Mission of the Division

To provide a community of learning and knowledge in the Environmental and Life Sciences, with an international, national and regional reputation for quality and commitment.

Vision and Mission Statements for the three key performance areas in the Division:

TEACHING AND LEARNING

Vision

To develop and disseminate knowledge through an exceptional commitment to scholarly teaching and learning

Mission

To be an exemplary provider of modern education, based on research and innovative teaching, and designed for graduates of the 21st Century

RESEARCH

Vision

To be a leading Australian University in Research in Environmental and Life Sciences

Mission

To develop and enhance a high performance research culture that permeates the Division, fosters vibrant academic staff and postgraduate student research, complements research-based scholarly teaching, and contributes to research outputs for the Australian community in interactions with a range of community and government partners.

COMMUNITY OUTREACH

Vision

To engage with the community at large and to promote open access to high-quality scholarship and services

Mission

To provide and sustain a reciprocal relationship with the wider community particularly in the areas of Environmental and Life Sciences

2 THE PLANNING CONTEXT

2.1 Present Position

The Division of Environmental and Life Sciences encompasses seven discrete departments of Biological Sciences, Chemistry, Health and Chiropractic, Earth & Planetary Sciences, Graduate School of the Environment, Human Geography and Physical Geography. It is responsible for the delivery of a number of undergraduate programs in these discipline domains and contributes some units to other patterns of study across the institution.

Postgraduate coursework programs are limited, primarily to those in environment and resource management. Workplace-directed programs are virtually non-existent. On the whole undergraduate programs have the flexibility for students to access different discipline areas within and without the Division. Within the institution the funding model is weighted to support resource-intensive science subjects. Whilst such a model is considered by some to be imperative for effective delivery, such a funding model does not encourage incorporation of science weighted components into other degree programs.

The Division supports a significant level of research. It is home to two Key Centres and a CRC as well as an Industry-funded Research/Consultancy Centre. Research performance as measured by publications, grants and post-graduate completions puts this Division at the forefront within the University.

The Division has patchy connectivity with Industry. Whilst it houses some DISR & SPIRT funded grants with industry partners, it has not as yet reached its full potential. Connectivity with industry through student and staff projects needs to be supported.

The infrastructure of the Division is adequate for current needs. Successful ARC and Systemic Infrastructure applications has ensured the purchase of large and expensive items of research equipment and such strategies are and will need to be consistently pursued.

One of the greatest assets of the Division is its staff. Talent and commitment are present at all levels and ensure the smooth operation of all teaching and research programs. The Division needs to ensure that such contributions are consistently recognized and rewarded.

In all the Division has a solid teaching and research base. All departments are located in close proximity on one campus site. It's student catchment areas have traditional high engagement in University education and the disposable income for up-skilling or interest-based courses. The intercept of the Hills Motorway and the Parramatta rail link will make Science at Macquarie a more realistic option for students in the population growth areas of western and north western Sydney.

Finally, Macquarie is positioned within the 'Technology Triangle' of North Ryde. Although IT and business management are a significant focus of these corporations – the opportunity exists to make contact with decision makers and build not only research connection but also the interface between science and management.

2.2 The External Operating Environment – Drivers for Change

What we have identified as our strengths are also our greatest potential weaknesses. Science teaching and research is expensive and the financial support from government has been falling, or at least static, in the face of rising costs. This is co-incidentally matched by flagging student interest, particularly amongst potential research students.

Science itself suffers from an image problem. Controversy continues over such issues as genetically modified organisms, cloning and perceived environmental rape and pillage. This, coupled to poor industry investment in science and, hence, perceived poor job prospects for science graduates, means fewer students, arguably of declining calibre, are embarking on scientific careers.

Academic salaries and conditions are perceived to be lagging, paralleled by those of secondary teachers. In all, fewer students study science at school, reducing potential flow on the Universities. Moreover the system does little to facilitate, encourage and fund ongoing education for secondary science teachers. This ultimately affects the currency and capacity of the secondary science system.

On the research side, the funding model which rewarded highly competitive, peer reviewed, National Competitive Index listed grants has been replaced by one which equally recognizes the industry \$. This will result in an estimated drop in productivity based reward funding into the Division. However, this drop may be compensated for, although not balanced by, the funding model that rewards postgraduate load and minimal completion times for research higher degrees. In all, the Division needs to foster industry funding and optimise the completion rates of its research students.

Finally, government based funding has introduced into universities increasing elements of user pays and client accountability. This latter issue is manifest in disseminating course experience reports and the introduction of graduate profiles. The user pays paradigm has seen the rise of numbers of graduate fee-paying programs, particularly in business. However, science is doubling hamstring, with perceived limited marketability and limited capacity to pay.

It is clearly up to us to create our own opportunities. We have the strengths in teaching and research; we have a good position, good infrastructure and staff. We have the capacity to build on strengths arising from cross-departmental collaboration, facilitated by the Divisional Structure.

3 CORE VALUES

The Division is committed to playing a key role in expanding the knowledge base of its disciplines and to disseminating such knowledge. Research scholarship and the creation of a fruitful learning environment are at the heart of Division activities. The Division is committed to open and consistent communication as a crucial feature of the work environment. It values the contribution of all staff and actively seeks input and feedback from all stakeholders. Moreover, the Division seeks to develop a cohesive teamwork approach to its endeavours in all areas. The

Division recognises the need to reconcile what are often seen as the competing priorities of teaching, research and administration and strives to continuously improve performance in all areas.

Pursuing the highest possible quality in teaching, research and administrative service delivery by:

- providing an environment that fosters creativity, initiative and acceptance of mistakes;
- promoting professional excellence in all staff; and
- adopting best practice as the norm.

Supporting and recognising individual and team contributions by:

- providing clear lines of communication to all staff and students in terms of expectations of performance, feedback and rights to express ideas and concerns;
- working together in shaping and achieving goals and effective work practices, sharing concerns and responsibilities and building on the expertise of individuals to provide best solutions;
- ensuring fairness and equity in providing opportunities for all staff to learn, grow and advance – diversity in background, experience and ideas are valued by the Division;
- recognising and rewarding individual and team contributions to Division success whether it be in a supporting role or academic role, and
- promoting a team spirit with mutual respect among various sections of the Division based on commitment to the shared mission and vision.

Responding to the needs of community, industry and government by:

- striving to understand and respond to the diverse needs of our stakeholders, including students and the community at large, serving them with integrity and efficiency, and
- providing the best possible service through establishing agreed standards of quality and delivery, and
- making community interest and need a prime consideration in decision making.

4 PLANNING IMPERATIVES

To become a successful, stakeholder-focussed entity the Division needs to develop a comprehensive understanding of its dynamic operating environment. Strategic scanning and analysis needs to focus on the various stakeholders, their operating environment and their needs.

These stakeholders and associated imperatives are:

Students

- Students' needs are becoming increasingly diverse. The Division will need to develop an understanding of these needs, and respond to them through product and service differentiation, in order to retain and increase market share. Existing services will need to be provided in a cost effective manner and the range of products provided will need to be modified to meet these needs.
- Students will place increasing value on:
 - approachability and accountability
 - efficiency and convenience, flexibility of access
 - being informed
 - employment prospects related to course offerings

Students will become increasingly aware of competing options from other institutions here and overseas and place pressure on the School to improve its performance.

Staff

- Globalisation of the higher education industry will require significant changes in School and institutional culture and paradigms
- The nature and rate of change (technological change, changing organisational structures and changing work relationships) will become an increasingly important issue, requiring workforce planning and flexibility
- The workforce will become increasingly decentralised
- The activities of the Division will be regarded in the global context. This will require the Division to take into consideration the entire workforce (both internal and external) which contribute to the business
- The demographic, social and technological trends evident in the community will generally be reflected in the workforce.
- Competition will mean we need to test many of our activities in the market and to manage change internally, which will require high standards of teamwork and communication as we face uncertainty.

Competitors

- Changes in policies for the government funded research base will increase the necessity for collaborative and industry funded and focussed research.
- The higher education industry in Australia and overseas is becoming increasingly open to competition. Major national and international players have adopted aggressive marketing strategies to establish their long term position in the market.
- The Division will need to maintain and increase some of its existing market share over the next few years.
- In addition to direct competition from within the higher education industry, advances in telecommunications and the introduction of competition legislation will enable other non-traditional private institutions to compete in providing educational services.

Government

- Reduced government funding will put pressure on the Division to appraise educational offerings. This will result in either a reduction in diversity, development of niche marketing and/or development of collaborative industry programs and joint degrees.
- Increases in HECS costs of science-based programs have reduced demand for student places in the sciences and a comparative decline in UAI cutoffs. This allied to reduced employment opportunities for some science graduates may result in reduced activity in some discipline areas.
- Comparative effective decline in university salaries may result in decreased availability of staff in some areas although this may be counter balanced by reduced opportunities for employment in the higher education sector.
- The introduction of competency-based training and the associated entry of non-university sector providers into higher education will impact on student numbers. In an environment with an increased focus on employability of graduates the Division faces the challenge to persuade students that a university education offers more than a basic set of employable competencies.
- Funding based on research performance outcomes, specifically postgraduate completions, research grants awarded and publications and interaction with industry, requires the Division to develop strategies to maintain its research productivity in the face of shrinking resources.

The Research Community

- As a matter of principle the Division needs to support the intellectual pursuits of research and scholarship.

- The Division has an obligation to contribute to the knowledge base of its discipline areas. This is of value not only to researchers but in its flow-on to students and the wider community.
- The Division needs to generate and maintain research outcomes in order to attract research grants, researchers and postgraduate students.
- Attendance at conferences and publication in refereed journals are vital to raising the profile of the institution. The Division will need to generate strategies to facilitate the research effort.

5 The Divisional Goals

The goals, objectives and strategies articulated in this section will be overseen and co-ordinated by the relevant Divisional Committee which is concerned with leading discussion on strategic directions in the Division and working with the Head of Division and the Heads of Departments to achieve these goals. Individual ownership and commitment by all staff is essential for their success. The following section summarises the outcomes of planning meetings held by each of the core Divisional Committees.

Key Performance Area: Teaching and Learning

GOAL 1 – The Students

To produce graduates who are recognised as having received the highest quality education and training at undergraduate, honours and postgraduate levels.

Objectives:

- 1.1 The attraction and retention of a larger proportion of students admitted to the University including those with higher UAI entry levels;
- 1.2 The development of generic skills, professional competencies, and all-round ability to be lifelong learners;
- 1.3 The recognition of and attention to student diversity through programming of learning activities and assessment tasks;
- 1.4 The equitable and effective treatment and education of “at risk” students;
- 1.5 Putting in place a scheme to provide on-going academic advice and mentoring of students in the Division;
- 1.6 Application of access and equity issues to all students.

Strategies

- 1.1 Include specific training in generic skills for all students, as well as specific skills training relevant to their particular subject areas;

- 1.2 Institute a system of regular quality reviews of all teaching programs to ensure that program contents, structures and assessment are of the highest standard consistent with the production of competent graduates;
- 1.3 Maintain a system for the constant review of units offered with regard to relevance, viability and duplication;
- 1.4 Conduct graduate destination and program satisfaction surveys;
- 1.5 Where applicable, canvass survey employers' attitudes to unit objectives, content and structure, as well as program outcomes;
- 1.6 Develop innovative approaches to teaching and learning and support these through funding opportunities arising from internal and any possible external teaching development funds
- 1.7 Undertake regular student evaluations of unit design and teaching performance.

Performance Indicators

- 1.1 Generic skills identified in teaching and learning objectives and assessment details of each unit offered by the Division
- 1.2 TEDS evaluation of all units at least every 3 years
- 1.3 Every unit evaluated at Teaching and Learning Committee annually
- 1.4 Course Advisory Committees established for named degrees
- 1.5 At least two applications per annum for Teaching Development and Flagship grants to support innovative teaching

<h3>GOAL 2 – The Teaching Staff</h3>

<p>To cultivate an academic environment in which teaching is valued as a scholarly endeavour that is encouraged, supported and rewarded.</p>
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Objectives

- 2.1 Attract develop and retain high quality staff;
- 2.2 Recognise and reward innovative teaching, particularly through recommendation for Teaching Awards;

- 2.3 Develop and reward the embedding a reflective practice approach to teaching through the use of academic portfolios as a positive tool in documenting progress and quality in their teaching;
- 2.4 Development of mechanism for recognising and fostering the nexus between good teaching and good research;
- 2.5 Foster a culture of teaching skills development;
- 2.6 Reward the scholarly approach to teaching and learning.
- 2.7 Encourage staff to attend staff development courses provided by CPD;
- 2.8 Institute staff "teaching and learning" seminars;
- 2.9 Maintain a teaching mentoring system for new staff taking up their first teaching appointment;

Performance Indicators

- 2.1 Successful promotion of high quality teachers
- 2.2 Innovative and quality teaching recognised in Workload and performance management of academic staff
- 2.3 At least on Division-wide seminar per annum on teaching
- 2.4 Database of mentors

<h3>GOAL 3 – Course and Degrees</h3>

To implement a Division-wide system for improving course and subject quality.

Objectives

- 3.1 Develop an open environment which encourages and analyses the effectiveness of innovation in teaching;
- 3.2 Establish support for of teaching development activities
- 3.3 Utilise flexible delivery of units to sustain maximum opportunities for all students.

Strategies

- 3.1 Emphasise teaching performance criteria in staff appointments and promotions;
- 3.2 Provide funds to support teaching support facilities including in computing library serial and other facilities;
- 3.3 Provide resources and staff to facilitate flexible delivery through attention to alternative modes and forms of delivery through web-based and other forms of electronic teaching along with external student orientated forms of teaching.
- 3.4 Use continuous course improvements processes by:
 - supporting incremental changes to courses and units;
 - implementing regular cycles of in-depth reviews of curricula and unit contents;
 - monitoring and reviewing the quality of courses and units against courses and units offered nationally and internationally in each subject area, including feedback from professional bodies, public and private sector employers and graduates
- 3.5 For each curriculum area, identify and map those segments of courses and units which develop capacities for desired graduate attributes.

Performance Indicators

- 3.1 Teaching criteria included in all academic position criteria in the Division
- 3.2 At least two applications per annum for Teaching Development grants supported by the Division
- 3.3 Allocation of library and computing funds to support multi-modal access to teaching support materials

GOAL 4 – Transition Phases

To provide for, prepare and support students at all transition phases in their entry to university, change in levels of learning, and the undergraduate-honours-postgraduate transitions.

Objectives

- 4.1 Develop for first-year students, confidence in their ability to handle the transition from the secondary school teacher-student relationship to the greater independence and self-help tertiary environment;
- 4.2 Facilitate students' skills in independent critical learning;
- 4.3 Develop an interactive relationship with the academic staff teaching – student learning process;
- 4.4 Develop skills in appropriate use of information and information technology.

Strategies

- 4.1 Initiate, continue to provide and evaluate appropriate induction activities including high quality advice on course/unit and subject selection and activities which would facilitate social interaction as part of the learning process;
- 4.2 Provide opportunities to facilitate students' skills in independent critical learning;
- 4.3 Prepare students for relevant and appropriate use of information and information technology through all units;
- 4.4 Initiate, listen and respond to feedback from undergraduate and postgraduate students in terms of their experiences during transition phases.

Performance Indicators

- 4.1 Induction program and handbook produced and reviewed annually for new students
- 4.2 Introduction of information literacy component into key year one units offered by the Division
- 4.3 Produce and conduct annual survey of graduands from the Divisions programs

Research Goals

Goal 1: To maintain national and international leadership in specific research areas within the Division
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Objective 1:

To provide an optimal mix of time and resources to achieve research creativity and output.

Strategies

- 1.1 Ensure that the workload model recognizes explicitly the research contribution of individuals, balancing workloads to ensure that research activity accounts for at least one third of academic workload commitments (as per formalized agreements/stipulations).
- 1.2 Reward research excellence through the workload model (e.g. teaching loads, return of research quantum \$, and other forms of support).
- 1.3 Recognize and promote novel research initiatives through seed funding.

Performance Indicators

- 1.1 Workload model includes overt recognition of research and research supervision
- 1.2 Research quantum distribution provides support to research active staff

Objective 2:

To encourage the development of high-level research skills by staff, especially new researchers.

Strategies

- 2.1 Promote and support participation in professional development programs, including Higher Education degrees whenever pertinent.
- 2.2 Broaden research skills bases through cross-disciplinary research, focussing on new researchers and postgraduate students.

Performance Indicators

- 2.1 Every member of staff to attend at least on staff development activity per annum
- 2.2 Finance provided to interdisciplinary projects

Objective 3:

To sustain productive areas of research.

Strategies

- 3.1 Ensure that undue emphasis should not be placed on sources of support for innovation and seed money sources (venture capital) *at the expense of* critical support for those areas that have served us well in the past, and are 'responding' to new initiatives in a strategic manner.
- 3.2 Provide supplementary funding support for active areas of research that are going through a transitional (developmental) phase.
- 3.3 Provide the impetus and information to ensure that individual staff and research centres should break the mould of dependence on single source funding (e.g. through ARC).

Performance Indicators

- 3.1 Continued high level of application to NCGI funding
- 3.2 At least two applications per department per annum for non-NCGI funding
- 3.3 Research quantum distribution to provide “fertilisation” funds for promising areas of research

Goal 2: To be involved in creative and innovative research partnerships and nurture research leadership in other areas of the division

Objective 4:

To establish links and collaborative programs for research with private and public sector organizations, through development of Research Centres of Excellence wherever *appropriate*.

Strategies

Work with the Divisional Outreach Committee and the Industry Liaison Officer to enhance University-industry-community liaison, fostering consultancies where appropriate, through industry fairs, open days, etc.

- 4.1 Promote cross-disciplinary research through workshops, seminars, links to the teaching program developing an appropriate intellectual environment.
- 4.2 Maximise potential opportunities generated by the Divisional Industry Liaison Officer.

Performance Indicators

- 4.1 At least one “industry meets the Division” day per annum
- 4.2 Industry Liaison Officer promotes research and students expertise through ELS newsletter; Research Bulletin; one-on one meetings; semina

Objective 5:

To increase income from research activities.

Strategies

- 5.1 Broaden the funding base for research, generating more support for personnel, equipment, infrastructure and other research costs.
- 5.2 Ensure close liaison between the Divisional Industry Liaison Officer, the Research Committee, and all departments in the Division.
- 5.3 Maximise research output in international peer-reviewed journals, increasing research exposure and maximising research quantum.
- 5.4 Facilitate the smooth development of Patents, trademarks and other forms of Intellectual Property through collaboration with the University Research office, Macquarie Research Limited, and the new Divisional industry linkage person.

Performance Indicators

5.1.1 Establish monthly Research Bulletin

5.1.2 Industry Liaison Officer becomes member of Research and Outreach Committees and attends Department meeting

Goal 3: To be nationally and internationally recognised as providing sound and innovative graduate training in research.

Objective 6:

To attract high quality Australian and international research students.

Strategies

6.1 Increase postgraduate research enrolments through further international linkages/collaboration.

6.2 Promote our research findings through publication and conference presentations.

6.3 Ensure that a professional research outlook is maintained at our interface to the outside world - through the www sites of all academic staff.

Performance Indicators

6.1 At least two successful APAI Linkage grants per annum

6.2 All Academic staff to publish according to their discipline profile

6.3 New web site developed and reviewed annually

Objective 7:

To expedite the timely completion of high quality postgraduate degrees.

Strategies

5.2 Ensure that adequate resources are available for postgraduates, including scholarships and top-ups.

5.3 Ensure that all postgraduate students are processed through appropriate quality mechanisms, including monitoring of performance through annual review.

Performance Indicators

- 5.1 All Departments to introduce funding allocation to support their postgraduate research students
- 5.2 All postgraduate students in the Division apply for central funding during their candidature
- 5.3 Division-wide best practice for supervision and monitoring be addressed and Research Committee and introduced across the Division

Objective 8:

To communicate the findings of research enthusiastically and widely

Strategies

- 5.1 Promote alternative (innovative) forms of research outcome
- 5.2 Establish more effective media linkages.
- 5.3 Promote staff development through conference attendance.

Performance Indicators

- 5.1 Applications for non-NCGI funding to increase
- 5.2 All staff to be included on PR database of academic expertise
- 5.3 Funds be allocated at the Departmental level to support at least one attendance at a conference per annum

Community Outreach

Goal 1: To provide opportunities for high quality education for life-long learning
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Objective 1:

To promote the Division as a destination of choice for undergraduate/postgraduate and continuing education

Strategies

- 1.1 Undertake face-to-face contact including on-campus visits and involvement in the range of activities that currently promote the Division's undergraduate programs, including:
 - Open Days
 - Advising Days
 - Careers Markets
 - School visits
 - University Experience Program
 - Cyber Challenges
 - Siemens Science Experience
 - Clean N Green competition
 - Museum program
 - HSC Enrichment Program
 - Attendance at High School prize nights
 - Work experience
 - Science and Fiction Movies at Macquarie.
- 1.2 Develop tools to promote the Division's 'specialised' degree programs
- 1.3 Participate in the School Partners Program
- 1.4 Contribute to in the range of publications that currently promote the Division's undergraduate programs, including:
 - Relevant undergraduate program booklets
 - Keeping in Touch
 - The Lighthouse
 - Macquarie Your University
- 1.5 Maintain and improve the quality of the Divisions web presence
- 1.6 Promote and establish further undergraduate prizes and scholarships.
- 1.7 Maintain contact with previous High School visitors to the campus through development of a database and mailouts/phone contacts regarding activities of relevance.
- 1.8 Develop information distribution path of potential industry/business collaborative grants, scholarships
- 1.9 Engage in guest lectures and conference presentation and use public relations opportunities such as Macquarie News and Media releases.
- 1.10 Develop and maintain and up-to-date and accurate database of the Division's alumni.

Performance Outcomes

- 1.1 Increase in UAI for Science programs offered by the Division
- 1.2 Increase in Higher degree by research students in the Division
- 1.3 Increase in International students in the Divisions undergraduate and postgraduate programs

Goal 2: To make available and promote our professional expertise to the community

Objective:

Provision of up-to date and relevant information to external stakeholders

Strategies

- 2.1 Produce documentation for distribution to potential industry/business collaborators
- 2.2 Maintain Divisional PR activities for industry target groups such as the Research Expo and Meeting@Macquarie.
- 2.3 Ensure the Division's 'experts' are properly represented in Xpertnet., including ensuring staff details are updated.
- 2.4 Employ a Divisional Industry Liaison Officer.
- 2.3 Use ELS Newsletter as an effective and regular means of communication with industry and business.
- 2.4 Invite industry/business representatives of relevance to the Division to Departmental seminars

Performance Indicators

- 2.1 Increase in industry interactions with the Division by at least a factor of two annually
- 2.2 Appoint Division Liaison Officer
- 2.3 Produce appropriate PR brochures and review annually

Goal 3: To promote community access to the Division's facilities including museums, equipment and Health Services

Strategies

- 3.1. Encourage development and community use of a University arboretum.
- 3.2. Encourage development and community use of the Division's Museums and collections, particularly through school and community visits.
- 3.3. Maintain involvement in the range of activities that currently facilitate community service and interaction. These include:
 - Open Days (particularly activities and public lectures)
 - Movies at Macquarie
 - National Science week lectures.
- 3.4. Maintain close relations with the University Public Relations Unit through better liaison with the University's media officer.. In particular, facilitate articles on the Division in Macquarie News and in the wider media (e.g. ABC-TV, 2SER, etc.).
- 3.5. Establish better interaction with environmental and community groups through individual connections and invitations to relevant Divisional events

Performance Indicators

- 3.1. Visits by schools to increase by a factor of two per annum
- 3.2. Professional development program for Science Teachers to be introduced and reviewed annually
- 3.3. Increase in positive reports by ELS staff in media

