9
The New Millennium

In 1998, funding cuts led an effort to increase student loads. From 1995 to 1999, student load increased considerably, while at the same time full-time academic staff numbers were reduced from eight to six. As a result, student–staff ratios declined from 16:5 to 37:1. In addition, several administrative duties were downloaded from central to departmental levels.

From 2000 on, the department underwent many changes. It became part of a wider College of Science, changed its name to the Department of Earth and Marine Sciences (DEMS) in 2004, and then merged with RSES in late 2007. There were four heads of department over this time: Richard Arculus, David Ellis, Patrick De Deckker and Bear McPhail. In 2008, after the merger with RSES, Professor Brian Kennett, the Director of RSES, took over the whole school, and Professor Stephen Cox was appointed as Associate Director Education to supervise the undergraduate program. Another major development affecting the Faculty of Science was the establishment of the Fenner School of Environment and Society as a joint centre for research and environmental studies.

A prospectus for research and research training in Australian Earth Science, *Towards 2005*, was prepared in 1998 by a working party of the Australian Geoscience Council for the ARC. This report recommended, inter alia, an increase in practical training and an emphasis on environmental studies. The department responded by forging closer links with the Australasian Institute of Mining and Metallurgy (AusIMM) through the good offices of Peter Hancock (a Visiting Fellow). The department also reversed its previous stance and allowed AusIMM to accredit ANU courses. AusIMM urged the university to maintain the independence of the Geology Department, and, with the Minerals Council, has been steadfast in urging the government to increase its funding for minerals sector-related courses to the same per-student level as it provides for agricultural courses.

In 2000, Peter Hancock raised funds from South African and Australian companies to establish the AusIMM Australia–South Africa Minerals Scholarship for ANU students to visit South Africa to carry out honours projects, and to gain work experience in a developing country, to travel and meet with industry
professionals and academics to advance their own personal and professional development. The aims of this scholarship were to identify, encourage and nurture the attributes of professional geologists of the future who could rise to positions of leadership in the industry. In 2008, Dominique Tanner was the first ANU student to win the prestigious Sir Frank Espie AusIMM Scholarship—one of only three awarded nationally each year from hundreds across the fields of geoscience, engineering, mineral processing and environmental science.

The ANU students formed their own junior branch of the AusIMM, the ‘Brindabella Student Chapter’, in 2000, under student President Chris Gunton. AusIMM has also run regular careers nights and geo-trivia nights for the students and it supports economic geology field excursions and participation in the annual Central West Mining Forum in Orange. The students also initiated a ‘ready for work’ course in 2008 with intensive instruction in mining and exploration techniques. This was supported by several companies and AusIMM, and might be extended in future. AusIMM also ran a joint ANU–University of Wollongong mineral venture in which 35 highschool students were taken on a 10-day tour of mines and mineral sites around the Hunter region and western New South Wales in an endeavour to attract more students.

Course Structure

Staff from DEMS and RSES applied for and won a major innovations grant. They were later joined in this initiative by members of BOZO. This led to a change in emphasis, with the inclusion of marine science and a change in the department’s name to Earth and Marine Sciences to reflect the broader scope of the courses offered. A new degree—a Bachelor of Global and Ocean Sciences—was introduced with a high UAI-entry requirement (Plate 9.1).

The whole undergraduate curriculum in Earth and Marine Sciences was reviewed in 2006, and this was followed by extensive changes. The degree structure changed to an eight/eight/eight pattern, with four units each semester, instead of three, and the new units were reduced in size to accommodate three lectures and one three-hour practical session a week. Honours pathways involved additional and more advanced work. The department’s new curriculum (Table 9.1) begins with two first-year courses in collaboration with the Fenner School of Environment and Society (a combination of the School of Resources, Environment and Society and the Centre for Resource and Environmental Studies). There are six second-year geoscience-related courses, plus a second-year
course in environmental chemistry. At third-year level, there are eight semester courses, plus three field courses (field geology, coastal environmental earth sciences, and carbonate reefs). New courses include geophysics, groundwater, global cycles, marine bio-geochemistry, and ocean and atmosphere modelling. Students choose majors in Geology, Double Geology, Environmental Geoscience, Marine Geoscience, and Marine Palaeontology—the first three of which are accredited by the AusIMM. These involve lecturers from outside the Geology Department, especially from RSES and BOZO. The department also contributes to the Minerals Tertiary Education Council (MTEC) program for honours and masters students in participating universities. A specific field geology course (the old C01) has been dropped, but field mapping has been included in the first-year coastal field trip and Professor Steven Cox has been involved in teaching field geology with Brad Opdyke at second and third-year levels.

Plate 9.1 Bachelor of Global and Ocean Sciences
Table 9.1 Geology courses offered in 2006–07

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td>Geol 2012 Introduction to Structure and Field Geology (Cox and Opdyke)</td>
<td>Geol 1006 Blue Planet: Introduction to Earth System Sciences (Mackey and Opdyke)</td>
</tr>
<tr>
<td>Geol 2014 Surficial Processes, Source to Sink (Opdyke)</td>
<td>Geol 2015 Chemistry of Earth and Oceans (Arculus and Rubatto)</td>
</tr>
<tr>
<td>Geol 2017 Mineralogy (Ellis)</td>
<td>Geol 2019 Marine Palaeontology and Evolution of Life on Earth (De Deckker)</td>
</tr>
<tr>
<td>Geol 2018 Geophysics# (RSES staff)</td>
<td>Geol 2020 The Lithosphere (Arculus and Ellis)</td>
</tr>
<tr>
<td>Geol 3002 Structural Geology and Tectonics# (Cox)</td>
<td>Geol 3007 Economic Geology (Mavrogenes)</td>
</tr>
<tr>
<td>Geol 3019 Carbonate Reef Studies (De Deckker and Opdyke)</td>
<td>Geol 3025 Groundwater (McPhail)</td>
</tr>
<tr>
<td>Geol 3022 Planetary Geology (Arculus and Ireland)</td>
<td>Geol 3026 Environmental and Regolith Geoscience (De Deckker and Pillans)</td>
</tr>
<tr>
<td>Geol 3023 Marine Bio-Geochemistry (Eggins and Ellwood)</td>
<td>Geol 3027 Global Cycles and Palaeoecology (Opdyke)</td>
</tr>
<tr>
<td>Geol 3024 Magmatism and Metamorphism (Herman)</td>
<td>Geol 3028 Coastal Environmental Earth Science (Ellis and Beavis)</td>
</tr>
<tr>
<td>Geol 3030, 3031 and 3050 Advanced Seminar units</td>
<td>Geol 3030, 3031 and 3050 Advanced Seminar units</td>
</tr>
</tbody>
</table>

# offered in alternate years

The numbers of undergraduate students have declined to a worryingly low level over this period, although the number of students in honours classes has been high (16 in 2001; Plate 9.2), and the numbers of graduate students have increased. Overseas links have enabled some students to study in France, China and South Africa. Overall, the course offerings have been increased. A new course in planetary geology was given by Professor Arculus and Professor Taylor. A new field course has recently been offered at Broken Hill by Professor Gordon Lister from RSES.

Current Research

Current research directions are closely aligned to the ‘Australian Academy of Science National Strategic Plan for the Earth Sciences’ (2003). The department’s research effort increased and cross-cooperation with RSES—which had always been good—expanded markedly, especially as two staff (Cox and Mavrogenes) were joint appointments.
The CRC-LEME grew to be an important section of the department and its operation was extended for a further seven years, with a grant of six new PhD students. Dr Bear McPhail, who was appointed Group Leader after Professor Eggleton’s retirement, established a new regolith program involving low-temperature aqueous geochemistry, groundwater hydrology and geo-microbiology. Two new Research Fellows were also appointed: Dr Dirk Kirste, a hydrogeochemist, and Dr Sue Welch, a geo-microbiologist (see Chapter 6, CRC-LEME).

A new Department of Education, Training and Youth Affairs (DETYA) science lectureship, funded by the Minerals Tertiary Education Council, appointed Dr Ian Roach to teach regolith courses. Maree Coldrick (the DEMS Administrator) was seconded part-time as the Secretary of LEME in an attempt to reduce costs. In spite of its success over many years—and its importance to Australian science—it was terminated in 2008.

Success in obtaining research grants boomed, and marine research with international cruises increased with Professor De Deckker and Professor Arculus and Dr Opdyke taking part. The department was successful in its bid to host
the office succeeding the Australian Ocean Drilling Program for three years from 2004. These cruises produced newsworthy reports of new discoveries of undersea volcanoes (see Chapter 6).

Two large ARC Discovery Grants were awarded in 2002—one for Professor De Deckker (shared with Professor J. Dodson, University of Western Australia), and the other for Professor Arculus and Dr Mavrogenes (shared with RSES). Professor De Deckker is the leader of a group involving the ANU, several other universities and government departments in an ‘Ocean Discovery Network’. An ARC Discovery Grant to Professor Ellis and Research Fellows Dr Ulli Troitzsch and Dr Andrew Christy led to a patent for a new semiconductor (zirconium silicate). Dr Prame Chopra was awarded an ABC Science Media Fellowship and spent time in Sydney with the ABC.

Other research partnerships were established in the Cooperative Research Centre (CRC) for Antarctic Climate and Environment (ACE), the Centre of Excellence for Ore Deposits and Mineral Exploration in Tasmania (CODES), partnership in the Centre of Excellence for Coral Reef Research, strong linkages with GA involving advisory roles and shared facilities, cooperation with CSIRO Exploration and Mining for jointly funded positions in ore-genesis studies, and many successful joint bids with the Universities of Canberra, Wollongong, Curtin and Melbourne for major equipment. These research projects are outlined in more detail in the staff research reports (Chapter 5).

Building and Equipment Support

Some recent changes to the building have occurred. The seminar room named for the founding professor was converted to an honours office and the name transferred to the remodelled lecture theatre on the ground floor. In 2008, the New Geology Building housing the undergraduate teaching section of RSES was named the ‘David Brown Building’ (Plate 3.7). Upstairs, the Geology II and III laboratories were also refurbished. The office space in the Zoology Building housing our palaeontologists—and for a while the hot-rock project—was relinquished in 2008, and the Visiting Fellows relocated to the main building. Dr Wyborn and Dr Chopra resigned to direct the commercial operations in geothermal energy.

The geochemical laboratories on the ground floor were rearranged. The INNA instruments were sold and new spectrometers were housed in their place (ICPAES: inductively coupled plasma atomic-emission spectrometer, and
ICPMS: inductively coupled plasma mass spectrometer). These were set up with the help of two Research Fellows: Dr T. Eszat and Steve Eggins. A new thin-sectioning and rock-grinding machine was purchased, and the department was part of a consortium to gain a new electron microscope. The Anutech support staff were retrenched and the analytical facilities are now managed by Dr Andrew Christy and Linda McMorrow. Val Elder has continued her sterling voluntary efforts to sort out the museum holdings. Support staff were further reduced by allocating Sarah O’Callaghan part-time to the School of Resource and Environmental Management (SREM) (Fenner School), and then to a full-time position. Currently, the department has only nine technical support staff, compared with 15 in the early days!

**The Departmental Review of 2007**

A major review of the department chaired by Professor G. Govett of NSW University took place in May 2007. Important recommendations were that

1. the department be combined with RSES within the College of Science, but maintain its location and have a separate education budget and leader
2. the research program should incorporate the distinctive geological identity of current DEMS research
3. the postgraduate programs should be integrated with those of RSES
4. laboratory facilities and equipment should be integrated and rationalised to achieve efficiency
5. following the demise of LEME, the department should re-evaluate its future research directions.

The committee commended the staff of DEMS for the talent and commitment they bring to their teaching program and outstanding support for their students—‘a model for the faculty’. They expressed concern, however, about the number of courses offered and that the integration of geology and environmental geology at first-year level did not meet student approval. They were also critical of the lack of geophysics in the curriculum and the lack of prerequisites in maths and physics. There was also a concern that outreach to local schools and industry was inadequate and should be enhanced. Finally, the committee recommended that the department develop operations that increased funding and student enrolments, budgeted better for support services and considered staff rearrangements to effect savings.