

# STRATEGIC PLAN 2015-2019

## EXECUTIVE SUMMARY

School of Biological, Earth and Environmental Sciences

Never Stand Still

Faculty of Science

Biological, Earth and Environmental Sciences

## 1 VISION

*The School of Biological, Earth and Environmental Sciences will, through its individual staff and associated research centres and groups, conduct internationally-recognised research and high quality teaching, generate and attract research leaders and innovators, and deliver advances in a diversity of pure and applied fields within the biological, earth and environmental sciences.*

## 2 THE SCHOOL IDENTITY

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Since its formation in 2001, BEES has continued to evolve as a school whose research and teaching deliberately spans the biological sciences, the geosciences and related cross-disciplinary areas. BEES is one of the largest schools at UNSW and a unique grouping of disciplines within Australian universities.

Research is the core activity of the School, the principal consideration in the appointment of staff and allocation of resources, and the platform for the teaching program. Projects and themes range across the pure to applied research spectrum, covering aspects of the origin, behaviour and future of the natural world, and human interactions with that world. Research focus areas are supported through a number of research centres and groups within the School (which effectively act as departments and as the research homes for staff and research students) as well as links with other organisations.

The growing status of the School is derived from the international reputation of its staff, the quality and quantity of its research, the calibre of its graduates, its increasing capacity to attract research funds from diverse sources, the extensive collaborations with various external organisations, and its research culture.

Properly resourced, high quality and engaging teaching is also crucial to the School. Teaching provides the means of transferring knowledge derived from our research and scholarship to the next generation of scientists, assists in the recruitment of future research students and generates the main source of operating funds. The emphasis of our teaching, especially at upper levels, is derived from the School's areas of research focus.

Other important activities of the School are service to the University and professions, and interaction with the community – locally, nationally and internationally.

## 3 RESEARCH and CENTRES

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BEES is a research-intensive School, dedicated to pure and applied research spanning the biological sciences to the geosciences, and the nexus between science and policy. Research is the core activity of academic staff and the main driver for School planning. The School seeks to conduct research that has impact at national and international levels, progressing or changing the direction of research in key fields, and making a significant contribution to the community. Delivery of a high quality teaching program to prepare graduates for professional practice or further research training is also key to the School's success.

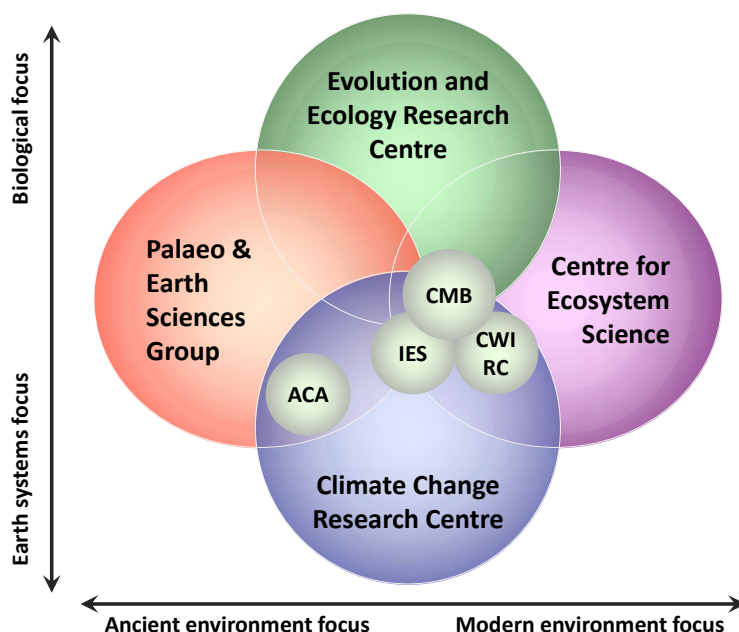
As individuals and as a group we will:

- i. pursue means of strategically and effectively supporting our research, though capture of major grants and research consultancy funds, development of facilities, attraction of high calibre research students and development of links with other researchers and organisations;
- ii. publish and promote our research in high quality journals, major scientific meetings and other media outlets, in the expectation of advancing science, helping society develop, gaining peer recognition through citations and awards, impacting government policy and management, and receiving invitations to lecture, collaborate and contribute our expertise to key advisory roles within industry and government;
- iii. further develop the research culture that continues to underpin improvements to our research performance, allowing us to attract and retain high calibre staff and students, and generally enhances the reputation of the School, the Faculty of Science and UNSW; and
- iv. provide high quality and engaging teaching.

BEES is unique amongst Schools at UNSW in being entirely constructed around research centres. The School hosts or is a partner in the following centres or research groups:

- ACA Australian Centre for Astrobiology
- CCRC Climate Change Research Centre (and lead for the ARC Centre for Excellence in Climate Systems Science)
- CES Centre for Ecosystem Science
- CMB Centre for Marine Bioinnovation (with School of Biotechnology & Biomolecular Sci)
- CWIRC Connected Waters Initiative Research Centre (with Faculty of Engineering)
- EERC Evolution and Ecology Research Centre (teaching and research)
- IES Institute of Environmental Studies
- (tbd) Palaeo- and Earth Science Group (provisional title is CRADLE)

These centres encapsulate and enhance outside recognition of our research strengths, attract and provide the research or intellectual focus for staff and HDR students and effectively act as the School's academic departments. The research strengths of the School are contained within four overlapping orbits:



The larger centres are, or should be, positioning themselves as research leaders at national or international levels. This leadership should be translated into participation in major research funding schemes or large projects capable of delivering both substantial research funding and support for both centre operations and new initiatives. Such external funding, coupled with support from UNSW-derived strategic funds, should be used to attract and retain high performing researchers from other universities or institutions.

Category 1 funding (especially ARC) attracts both kudos and block grants to UNSW. It is important for the School to secure major funding from this source, in addition to funds obtained directly from government or industry.

HDRs are a key driver of the School's research performance and funding, and provide significant teaching support. BEES has one of the largest HDR cohorts at UNSW. With existing staffing levels in the School and its centres, a cohort of at least 175 HDRs is supportable. Additional scholarship funding outside the APA system is required, given the large number of high calibre international HDR students that approach the school or are identified by BEES staff annually. In line with UNSW developments, the School will continue to develop the PhD program to enhance the technical and professional skills of the students.

**Actions:**

- *The School will continue to support the development of its centres and ensure consistency between the strategic plans of the centres and the School*
- *All staff should be associated with at least one research centre and all Level C–E staff should hold a leadership position within a centre, the School or the University.*
- *Allocation of space and location of facilities in the new Biological and Earth Sciences buildings must provide spatial coherence of the centres - their staff and research students.*
- *Where significant disciplinary overlap exists, centre mergers should be considered where this will improve the efficiency of centre administrative support and capacity of the centres to contribute to the operation and management of the School.*
- *Staff will seek to maximise research funding from all available sources with a balance between funding categories being maintained in the School.*
- *Staff at levels B to E will generate sufficient external funds from all sources to support their research and HDRs, and be a chief investigator on at least one major funding application or existing grant per year, preferably including a Cat 1 grant application.*
- *Staff will increase strategic collaborations with external organisations.*
- *Staff will participate in formal mentoring of research strategies including review of grant applications, supervision of HDRs and development of newly-appointed staff.*
- *The School will provide a pool of funds for HDR students to apply for small grants or to cover the central levies on non-NCGRS listed granting bodies.*
- *Staff and students will adhere to the UNSW Research Code of Conduct.*
- *The School will work with GRS to develop strategies to attract and support overseas HDR students, especially the provision of more IPRS scholarships and sources of stipends for tuition waivers, and the ability to write tuition fee waiver provisions into grant applications.*
- *The School will work with its centres and Faculty to develop PhD programs designed to enhance the research experience and capabilities of its graduates, as well as further develop the School's research culture. This will include workshops for specific skills transfers, and regular centre or School postgraduate research forums and reviews.*
- *The School will establish the position of Director of Graduate Studies and continue to develop its HDR management procedures to ensure adequate supervision and resourcing of students and their rapid progression to completion*
- *The School will provide base-funding for HDRs as well as some research support where other grant funding is not available.*

**3.1 RESEARCH AND CENTRES OUTCOMES**

- i. The research reputation and influence of the School, its centres and our individual staff continues to rise, especially in the areas of defined strength.
- ii. While maintaining disciplinary strengths, interdisciplinary research that integrates the biological and earth sciences increases.
- iii. Research funding from all sources, especially national competitive grants schemes, and infrastructure support is sufficient to maintain growth in research outputs.
- iv. The centres continue to build as effective support structures for researchers and research students and assist in focusing and underpinning the research directions of the School.

## 4 TEACHING

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Teaching is a critically important activity of the School, in fulfilling the traditional role of universities in transferring knowledge and skills to the next generation, in generating future research students and in the provision of the vast majority of the School's operating funds.

The syllabus for levels I and II is designed to produce graduates with sufficient breadth and depth of knowledge required to undertake upper level courses, to commence postgraduate studies or for professional practice. The School will differentiate itself from competitors through the emphasis and time allocated to field-based courses and other practical exercises, possibly at the expense of the time allocated to formal lectures.

In response to rising entry requirements for flagship programs such as Advanced Science, opportunities (or even obligation) for students to extend their quantitative numerical and experimental skills must be provided (or enforced through core requirements of such programs). This will improve the overall quality and capability of such students entering into our Honours and HDR programs, and make them the preferred candidates in the eyes of potential employers.

To ensure staff have sufficient time to devote to research and HDR supervision, and equity with other Schools in Science, teaching loads will be capped at 1.75 courses per FTE staff member. All research fellows at Level B or above must undertake some undergraduate teaching to ensure students are exposed to the research side of the School and as part of their contribution to the collegial culture of the School.

Recruitment into, and support of, the Schools Honours cohort is important to both teaching and research. Honours students provide some contribution to the research output of the School and are the main field of recruitment into the HDR program. The structure of the Honours year has been revised to give greater focus on training the students as researchers and developing professional skills, in preparation for either ongoing research degrees or entry to the workforce.

### **Actions:**

- *Courses must obtain an overall CATEI rating  $\geq 5.0 / 6.0$ .*
- *All new staff up to Level C must complete FULT and staff will be encouraged to complete the certificate in higher education.*
- *All courses to have a senior demonstrator and adequate teaching assistance to reduce course administrative load on staff (within budgetary constraints)*
- *The majors supported and course offerings in the School will be reviewed to provide better alignment with the staff profile and the areas of research focus, and ensure a high quality teaching program for students.*
- *Teaching loads for normal R&T staff will range from 100–140 face-to-face hours per year, with adjustments for research, supervisory and major administrative loads, and include coordination of one course.*
- *Fellowship-funded staff at level B and above will contribute 30 hours of face-to-face teaching per year and Level A staff will be encouraged to undertake some teaching.*
- *Course offerings will be reduced to 70 per year (assuming maintenance of current staffing levels).*
- *The number of level II courses with <40 students and level III with <30 students will be minimised (including parallel-taught courses).*

- *Experimental laboratory and field-based teaching will be expanded at the expense of formal lecturing, as a key characteristic of the teaching of biological and earth sciences in the School.*
- *Staff will be encouraged to seek financial support for teaching innovations, and recognition for teaching achievements through internal grants (e.g., Learning and Teaching grants and awards) and external grant sources.*
- *The School will continue to develop its Honours programs, with a focus on preparing students for subsequent HDR study or high-level graduate entry into the workforce.*
- *The knowledge and skills developed in level III courses will contribute to preparation for the Honours Program.*
- *The School will participate in Faculty based schemes and contribute funds to vacation scholarships for undergraduate students with interests in undertaking further research and encourage transfers of suitable candidates from other universities.*

#### 4.1 TEACHING OUTCOMES

- i. Provision of high quality and highly rated courses, designed to prepare students for professional practice or entry to research programs, in the various majors and programs for which the School has responsibilities
- ii. Efficient delivery of the teaching program that maximises course enrolments and provides sufficient general operating funds for the School.
- iii. Development of new teaching strategies and methods to attract a larger proportion of Science undergraduates to the School and generate a high retention rate from first year to upper years and Honours.
- iv. Development of a wider range of field-based course offerings.
- v. Development in students the key generic attributes required for professional practice, including writing, data handling, field and laboratory skills, in addition to disciplinary-specific knowledge and capabilities.

## 5 STAFF

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The strength of any school is largely dependent on the quality and quantity of staff, both academic and general. The calibre of the staff is a function of robust appointment processes, effective career development and performance review systems, the provision of adequate rewards and recognition of good performance and means for rectifying poor performance. There will be a balance between normal research and teaching and fellowship-funded academic positions. There is no intention to grow by further acquisition of other groups within the University, but there is opportunity for some growth through strategic partnerships and development of some joint appointments.

Although there have been improvements in the last few years, it is recognized that there is a lack of diversity in the staffing profile in the School with a profile that does not reflect the diversity within our student cohort or the University as a whole. This must be addressed through new appointments.

Workloads calculations will be extended from a focus on direct teaching, course development and supervision hours, to take into account the time devoted to research (work on projects, grant applications and publication), the organisation and management of courses, and tangible service to the University and profession. Academic staff will need to undertake activities that generate

sufficient funds to support (i) academic and general staff salaries plus on-costs; and (ii) a significant proportion of School and centre general operating costs and strategic funds.

Ongoing professional development and mentoring schemes spanning research and teaching, with the setting of personal performance targets and annual performance reviews are important. In consultation with the HOS and centre directors, both academic and P&T staff must set clear goals to be achieved over various time-spans, the criteria for measuring success, and balance their individual goals with the needs and vision of the School.

**Actions:**

- *The School will develop a new 5-year plan for academic appointments, consistent with this strategic plan, and continue to develop its system of appointments, performance management, and develop better means for linking performance targets to career options and rewards.*
- *The School will maintain the proportion of fellowship-funded staff at >50% and staff above Level B at >30% of total academic staff.*
- *The School will maintain a rigorous and equitable appointments process, with all non-targetted appointments advertised internationally and preferably at level B or C.*
- *Systematic searches will be conducted for potential applicants from under-represented areas and they will be directly encouraged to apply. Selection panels must be trained in proper procedures (including identification of conscious and unconscious bias)*
- *The four mechanisms for new appointments that will be pursued are (i) the direct appointment of normal research and teaching academics following a rigorous selection process, (ii) self-funded research fellows, (iii) targetted appointments and (iv) joint appointments of staff with key external organisations.*
- *Senior technical staff will be progressively allocated to research centres and groups to provide general technical support and maintenance of research facilities, and the areas of teaching that spring from staffing in those centres and groups.*
- *Administrative staffing structures will be reviewed to ensure such structures meet the needs of the School and the centres and generally conform with UNSW models.*
- *Professional and technical staff will be encouraged to undertake professional development and/or further academic study as part of their career development.*
- *The School will continue to develop specific criteria to assess the various grades of performance and the annual reviews, of both academic and general staff, will include consideration of how to achieve such criteria.*

## **5.1 STAFF OUTCOMES**

- i. The School and the centres continue to build an environment and culture that encourages staff to excel in research, teaching and service.
- ii. High calibre academic, administrative and technical staff are appointed, and supported through on-going professional mentoring, review and development.
- iii. The School maintains a high proportion of staff in research-only (i.e. fellowship) positions.
- iv. The staffing profile of the School reflects the profile of the student body and university as a whole, with proportion of female staff significantly increased.
- v. Effective implementation of EEO principles and the UNSW Code of Conduct (staff and students).

## 6 ADMINISTRATION, FINANCE and FACILITIES

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The research and teaching performance of the School and its centres is underpinned by the administrative processes and general support provided by the P&T staff. Many of the processes and functions are defined at University or Faculty level and others are specific to the School.

Implementation of this strategic plan and success in research and teaching requires the School to be economically viable. The budget must be sufficiently robust to withstand fluctuations in enrolment numbers and changes to University or government funding models.

In 2015 the School must generate ~\$12M in operating funds (nearly all from teaching and HDR supervision). Whereas the School had a relatively balanced portfolio of income in 2014, with 67% from coursework teaching, 26% from HDR supervision and 7% from other sources, the proportion of operating funds spent on salaries needs to be reduced to free funds for other strategic purposes.

The major infrastructure issues for the School are being addressed by the University, with planning under way for both a new building and refurbishment of the existing building that will permit co-location of all campus-based components of the School. The field component of research and teaching is crucial to the School and existing research stations and infrastructure at the Sydney Institute for Marine Sciences, Fowlers Gap, and Smiths Lakes must be maintained.

BEES staff have an impressive recent track record of high level exposure in most forms of media and this will be encouraged – print, radio, current affairs programs and specialist television programs. Whilst a large amount of the content of the electronic media will be populated by individual staff, it is important that key sites such as the School and the centres web sites have ongoing development and proper curation.

There is a legislative and moral obligation of the University, School, supervisors and managers to maintain a safe working environment and the School must continue to improve H&S performance.

### **Actions:**

- *The School will maintain a balanced OP001 budget, and progressively reduce total salary costs to <85% of the budget, and continue to advocate for an increase in the financial benefits derived from research performance in the School.*
- *The School will continue to develop its media outreach platforms and opportunities.*
- *The School will continue to develop its H&S systems, ensure staff are properly trained in H&S implementation, and that processes and facilities within the School are in place to ensure compliance with H&S Legislation and UNSW policies and that a culture of proactive H&S activities is embedded in all aspects of the School's operations.*

### **6.1 ADMINISTRATION, FINANCE AND FACILITIES OUTCOMES**

- i. The School maintains a balanced budget with sufficient funds to support new initiatives and general operational needs.
- ii. The structure and staffing of the administrative and technical areas of the School efficiently support operations.
- iii. Resources are used efficiently.
- iv. Staff and students operate in an environment that is safe and supportive.