3. FACULTY OF SCIENCE ORGANISATION

3.1 FACULTY STRUCTURE
3.2 FACULTY OFFICE ADMINISTRATIVE STAFF

The Faculty Office is situated in the Sciences Building, Building 41, and contains the Dean’s Office, the Associate Dean’s Office and the following Administrative Staff:

**Faculty Administrative Assistant/Dean’s Assistant:** Ms Christine Peacock

Room 41.258  Telephone: 4221 3530

The Faculty Administrative Assistant may be contacted for administrative information and appointments.

**Faculty Officer:** Ms Trina Reddall

Room: 41.258C  Telephone: 4221 3481

The Faculty Officer may be contacted by students for information on courses, regulations, administration and appointments.

**Student Equity and Diversity Liaison Officer:** Miss Erin Hiesley

Room: 41.152  Telephone: 4221 5332

The Student Equity and Diversity Liaison Officer (SEDLO) offers a support, referral, information and assistance service to students. She can assist students with a number of different issues; including general welfare and lifestyle issues, being a student at UOW and liaison between students and their faculties or different Student Services (disability service, counselling service, learning development etc). SEDLOs offer assistance to all UOW students but particularly students from equity groups, students with a disability and International students. The service is free and confidential.

**Faculty Finance Officer:** Ms Leanne Cambridge

Room: 41.260  Telephone: 4221 4855

**Faculty Education and Publicity Officer**

Room: 41.260A  Telephone: 4221 3512
3.3 ACADEMIC UNITS:

3.3.1 School of Biological Sciences
3.3.2 Department of Chemistry
3.3.3 School of Earth and Environmental Sciences

3.3.1 School of Biological Sciences

Academic Teaching Staff

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<tr>
<th>Head</th>
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<tr>
<td>Associate Professor B. Buttemer</td>
<td>35.G19C</td>
<td>4221 3013</td>
</tr>
<tr>
<td>email: <a href="mailto:buttemer@uow.edu.au">buttemer@uow.edu.au</a></td>
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Professors

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<tr>
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<tr>
<td>Professor D.J. Ayre</td>
<td>35.G03</td>
<td>4221 3440</td>
</tr>
<tr>
<td>Professor A. Hulbert</td>
<td>35.G10A</td>
<td>4221 3437</td>
</tr>
<tr>
<td>Professor M. Walker</td>
<td>35.104</td>
<td>4221 3439</td>
</tr>
<tr>
<td>Professor R.J. Whelan</td>
<td>41.258A</td>
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<tr>
<td>Professor M. Wilson</td>
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Associate Professors

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<tr>
<td>Associate Professor A.R. Davis</td>
<td>35.G01D</td>
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</tr>
<tr>
<td>Associate Professor K.O. French</td>
<td>35.G06A</td>
<td>4221 3655</td>
</tr>
<tr>
<td>Associate Professor M. Ranson</td>
<td>35.107</td>
<td>4221 3291</td>
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<tr>
<td>Associate Professor S. Robinson</td>
<td>42.G03</td>
<td>4221 5753</td>
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<tr>
<td>Associate. Professor R. West</td>
<td>35.G11</td>
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Senior Lecturers

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<tr>
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<tr>
<td>Dr. M. Dowton</td>
<td>35.108A</td>
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<tr>
<td>Dr. T. Minchinton</td>
<td>35.G09</td>
<td>4221 5188</td>
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<tr>
<td>Dr. J. Wallman</td>
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<td>4221 4911</td>
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<tr>
<td>Dr. W. Russell</td>
<td>41.177</td>
<td>4221 4916</td>
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<tr>
<td>Dr. R. Zhang</td>
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Senior Fellow

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<tr>
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<tr>
<td>Dr. A. Aquilina</td>
<td>35.122A</td>
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Lecturers

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<tr>
<td>Dr. T. Kuit</td>
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<td>4221 4602</td>
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<tr>
<td>Dr. J. McArthur</td>
<td>35.122B</td>
<td>4221 5650</td>
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<tr>
<td>Dr. T. Stutchbury</td>
<td>35.107A</td>
<td>4221 5506</td>
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Degree Courses

The School of Biological Sciences offers four degree courses:

(i) a three-year Bachelor of Science (BSc) with a major in Biological Sciences. This may be followed with a fourth Honours year - BSc (Hons) (see Sections 7.2 & 7.6).

(ii) a three-year Bachelor of Science with one of the following prescribed majors:
   - Biotechnology (jointly with the Department of Chemistry)
   - Ecology (jointly with other Science Units and Mathematics and Applied Statistics)
   - Environment (jointly with the other Science Units)

The details of these majors are given in Section 7.3.

(iii) BSc Advanced (Honours) Program (see Section 7.5)

(iv) a four-year Bachelor of Biotechnology (see Section 7.4) which is awarded either with or without Honours at the conclusion of the fourth year.

(v) a three-year Bachelor of Marine Science (see Section 7.4). This may be followed by a fourth Honours year.

The School of Biological Sciences also contributes to:

(vi) a four-year Bachelor of Environmental Science (see Section 7.4)

(vii) a four-year Bachelor of Medicinal Chemistry (see Section 7.4)

All degrees can be taken on a part-time basis, but students must be able to organise their time to meet the scheduled class times.

Current Research Interests of Staff

This is useful information for students wishing to identify staff expertise in particular academic areas.

Dr Andrew Aquilina

Protein structure and function relationships. Many changes occur in a protein's sequence after the translation of genetic information by the ribosome. Research is aimed at understanding the ways in which both naturally occurring and introduced sequence modifications alter the structure and function of large multisubunit proteins, in particular mammalian heat shock proteins.

Professor David Ayre


Associate Professor Bill Buttemer


Avian Field Endocrinology: Patterns of glucocorticoid and reproductive hormone release in free-living birds in relation to season, phylogeny, and habitat. Interaction between glucocorticoid secretion and reproductive behaviour in birds.

Associate Professor Andy Davis

Chemical Ecology: The relative importance of natural products as mediators of interactions between organisms, particularly compounds that play a role in preventing fouling of marine invertebrates.

Larval Ecology: Pelagic and Early benthic stages as determinants of subsequent patterns of invertebrate distribution and abundance.

Ecological impacts of introduced marine pests: specifically examining impacts on encrusting communities on rocky reefs.

Dr Mark Dowton

Molecular evolution, particularly of the mitochondrial genome. Research is aimed at understanding the ways in which DNA mutates and evolves, and the biological patterns that these mutations reveal. Molecular studies are focused on understanding how genes move in the mitochondrial genome, and why the rate of mutation has accelerated in certain animal groups.
Associate Professor Kristine French


Professor Tony Hulbert

Animal Physiology: Evolution of endothermy in vertebrates. Cellular basis of resting metabolism. Thermo-regulation and environmental physiology. Thyroid function and thyroid hormone action in vertebrates. Dietary fats and their effects on body function.

Dr Jason McArthur

Bacterial pathogenesis and disease: Current research is investigating the pathogenesis of post-infectious kidney disease. Studies are aimed at developing animal models for kidney disease, investigating bacterial protein interactions within kidney glomeruli and investigating immune cell recruitment and kidney inflammation during disease progression.

Dr Todd Minchinton

Population and community ecology of plants and animals living in coastal and estuarine habitats, including rocky reefs, mangrove forests, and salt marshes. Assessing the influence of humans on the structure, function, and biodiversity of natural ecosystems. Consequences of dispersal and recruitment to the structure of species assemblages.

Associate Professor Marie Ranson

Cellular and Molecular Biology: The role of cell-surface plasminogen activation in cancer metastasis. Links between tumour progression (aberrations in cell-cycle events and cell migration) and cell-surface plasminogen activation. Targeted alpha therapy using components of the plasminogen activation system for the control of micrometastatic cancer. Histopathology of cancer (breast and other cancers of epithelial origin). Structure-function analyses of the interaction between plasminogen and cell-surface receptors. Utilisation of the human plasminogen activation system by pathogenic micro-organisms: contribution to virulence and disease.

Associate Professor Sharon Robinson


Dr Wendy Russell


Investigation of the potential use of plants in extraction of toxic pollutants from soil and water (phytoremediation).

Dr Tamantha Stutchbury

The pre-clinical evaluation of potential cancer therapeutics and the role of the plasminogen activation system in cancer.

Professor Mark Walker

Genetics and Molecular Biology: Development ofacellular and live oral recombinant vaccines against the causative agent of rheumatic fever, Streptococcus pyogenes. Molecular and genetic analysis of human and veterinary pathogens. Development of recombinant oral and intranasal vaccine delivery systems for the stimulation of immunity against the veterinary pathogen Mycoplasma hyopneumoniae.

Dr James Wallman


**Associate Professor Ron West**

Coastal and estuarine ecology; biology of estuarine communities; environmental impacts in estuarine environments; fish biology; fisheries; fisheries policy; aquaculture; coastal zone management; and, integrated catchment studies.

**Professor Rob Whelan**


**Professor Mark Wilson**

Molecular Cell Biology: Discovering previously unknown mechanisms that operate in the human body to defend it against diseases and pathologies that arise from the inappropriate deposition of “damaged” (partly unfolded) proteins. The current focus is on how clusterin (and other recently identified novel extracellular chaperones) inhibits protein aggregation and targets them for disposal via receptor-mediated endocytosis and lysosomal degradation. Techniques commonly used in these studies include cell culture, confocal microscopy, flow cytometry, together with spectrophotometry and many other protein analytical methods. Planned future studies will make use of small animal models.

**Dr Ren Zhang**

Plant Molecular Biology: Regulation of plant development. Plant-microbe interactions. Genetic manipulation of plants and fungi for food and medicinal uses. Phytoremediation (use of plants for cleaning up the environment).
## 3.3.2 Department of Chemistry

### Academic Teaching staff

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Room</th>
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<tbody>
<tr>
<td><strong>Head</strong></td>
<td>Professor W.E. Price</td>
<td>18.102A</td>
<td>4221 3509</td>
</tr>
<tr>
<td></td>
<td>email: <a href="mailto:wprice@uow.edu.au">wprice@uow.edu.au</a></td>
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<tr>
<td><strong>Professors</strong></td>
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<tr>
<td></td>
<td>Professor J. Bremner</td>
<td>18.123</td>
<td>4221 4255</td>
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<td></td>
<td>Professor N. Dixon</td>
<td>18.G10</td>
<td>4221 4346</td>
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<td></td>
<td>Professor D. Griffith</td>
<td>18.217</td>
<td>4221 3515</td>
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<td></td>
<td>Professor L. Kane-Maguire</td>
<td>41A.272</td>
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<td>Professor S.G. Pyne</td>
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<tr>
<td><strong>Professorial Fellow</strong></td>
<td>Professor G.G. Wallace</td>
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<td>4221 3319</td>
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<td><strong>Associate Professors</strong></td>
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<td>Associate Professor P. Keller</td>
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<td>Associate Professor S. Ralph</td>
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<td>Associate Professor S. Wilson</td>
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<td><strong>Senior Lecturers</strong></td>
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<td></td>
<td>Dr J. Beck</td>
<td>18.104</td>
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<td>Dr S. Blanksby</td>
<td>18.223</td>
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<td>Dr D. Jolley</td>
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<td>Dr G.M. Mockler</td>
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<td></td>
<td>Dr M. Cameron</td>
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<td>Dr C. Dillon</td>
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<td>Dr M. in het Panhuis</td>
<td>18.130</td>
<td>4221 3155</td>
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<td>Dr G. O’Brien</td>
<td>18.112</td>
<td>4221 3072</td>
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<tr>
<td>(Director of First Year Studies)</td>
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<td></td>
<td>Dr D. Skropeta</td>
<td>18.127</td>
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Degree Courses

The Department offers Chemistry courses within the following degrees:

(i) three-year Bachelor of Science (BSc) with a major in Chemistry. This may be followed by a fourth Honours year – BSc (Hons) (see Section 7.2).

(ii) a three-year Bachelor of Science in one of the following prescribed majors:

- Biotechnology (jointly with the School of Biological Sciences)
- Medicinal Chemistry
- Environment (jointly with the other Science Units)
  (a) Chemistry strand
  (b) Physical Sciences strand, jointly with Engineering Physics

The details of these majors are given in Section 7.3.

(iii) BSc Advanced (Honours) Program (see Section 7.5)

(iv) a four-year Bachelor of Medicinal Chemistry (see Section 7.4)

(v) a four-year Bachelor of Nanotechnology (see Section 7.4)

The Department of Chemistry also contributes to:

(vi) a four year Bachelor of Environmental Science (see Section 7.4)

(vii) a four year Bachelor of Biotechnology (see Section 7.4)

Current Research Interests

This is useful information for students wishing to identify staff expertise in particular academic areas.

Dr Jenny Beck

Interactions between proteins, DNA and drugs. A variety of techniques, particularly mass spectrometry, are being used to investigate a range of biochemical interactions including, for example, between DNA and proteins involved in replication, in proteins involved in cellular differentiation, between ethanol and human proteins to study the effects of alcoholism, in anti-inflammatory drugs to probe the causes of side effects that occur with long-term treatment regimes.

Dr Stephen Blanksby

The reactions of ions and molecules are investigated in the gas phase using sophisticated mass spectrometric techniques and quantum chemical calculations carried out with the aid of supercomputers.

Professor John Bremner

Medicinal chemistry involving the design, synthesis and properties of new compounds with specific biological activity. Synthesis and properties of new heterocyclic molecules. Natural products and medicinal plants.

Dr Carolyn Dillon

Medicinal Inorganic Chemistry and Synchrotron Radiation Techniques: Investigations of the mechanisms of arsenic toxicity for the development of arsenic anti-cancer agents; for example, the potent anti-leukemia agent, arsenic trioxide. The biomolecular and intracellular reactions of arsenic compounds are being studied using conventional laboratory techniques including mass spectrometry through to synchrotron radiation methods such as arsenic mapping and X-ray absorption spectroscopy to determine the targets and chemical structures of arsenic in cells.

Professor Nicholas Dixon

Biological Chemistry, focussing on the relationship between protein structures and functions: interactions among the 30 proteins in the bacterial DNA replication machinery are studied as model systems to understand function of large dynamic macromolecular machines. Techniques include molecular genetics and protein chemistry. Functional studies using surface plasmon resonance biosensor technology and single-molecule methods are coupled with structural studies by NMR, X-ray crystallography and mass spectrometry in collaborating laboratories.

Professor David Griffith

Atmospheric trace gas analysis using Fourier transform infrared spectroscopy. Atmospheric reaction mechanisms, especially of gases involved in the Greenhouse Effect.
Dr Marc in het Panhuis
Materials Science: Assembly of polymers, surface active and carbon host materials into materials displaying multi-functional and intelligent properties. Continuous search for novel molecules or materials which when combined into a composite materials demonstrate enhancement in properties not possible for each constituent on its own. Spectroscopic, microscopic and electrical characterisation of materials. Biocompatible materials. Ink-jet deposition of materials.

Dr Dianne Jolley
Analytical method development, ecotoxicology, and water and sediment chemistry.

Professor Leon Kane-Maguire
Novel chiral conducting polymers and their use in electrochemical asymmetric synthesis of drugs and the separation of enantiomeric compounds. The use of organometallic complexes for the synthesis of radiopharmaceuticals.

Associate Professor Paul Keller

Dr Garry Mockler
Co-ordination chemistry. The study of the structures and properties of model compounds of copper proteins.

Dr Glennys O’Brien
Environmental chemistry - water and sediment chemistry; trace metals in sediments; and water and sediment quality.

Professor Will Price
Physical properties and structure of liquids and solutions, especially experimental transport and pVT studies. Separation systems based on conducting polymers. Aspects of food chemistry particularly related to extraction/processing.

Professor Stephen Pyne

Associate Professor Stephen Ralph

Dr Danielle Skropeta
Marine Natural Products Chemistry: The discovery and development of new classes of drugs from Australian marine fauna. This involves bioassay-guided fractionation of marine fauna extracts, purification using various chromatographic methods and structural identification of the bioactive agent using nuclear magnetic resonance spectroscopy and mass spectrometry. Our current targets are deep-sea marine fauna, marine carbohydrates and novel anticancer agents.

Professor Gordon Wallace
Intelligent polymer research. Synthesis and processing of Intelligent polymers and fabrication of devices containing them. The use of these materials and devices as chemical or bio sensors, membrane separation systems, artificial muscles and advanced coatings (corrosion protection, photovoltaics) is being pursued.

Associate Professor Stephen Wilson
Atmospheric chemistry. The measurement of UV-B irradiance, and the determination of photolytic production rates. Studies of the sources of man-made compounds in the atmosphere.
3.3.3 School of Earth and Environmental Sciences

**Academic Teaching Staff**

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<tr>
<th><strong>Head</strong></th>
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<tr>
<td>Professor L. Head</td>
<td>41.G14</td>
<td>4221 3721</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:lhead@uow.edu.au">lhead@uow.edu.au</a></td>
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**Professors**

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<td>Professor A.R. Chivas</td>
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<tr>
<td>Professor J. Morrison</td>
<td>19.G012</td>
<td>4221 4377</td>
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<tr>
<td>Professor C.V. Murray-Wallace</td>
<td>41.G31</td>
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<td>Professor G.C. Nanson</td>
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<tr>
<td>Professor C.D. Woodroffe</td>
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**Associate Professors**

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<tr>
<td>Assoc. Prof. T. Bryant</td>
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<td>4221 3172</td>
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<td>Assoc. Prof. P.F. Carr</td>
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<tr>
<td>Assoc. Prof. C.L. Fergusson</td>
<td>41.159</td>
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</tr>
<tr>
<td>Assoc. Prof. B.G. Jones</td>
<td>41.168</td>
<td>4221 3803</td>
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<tr>
<td>Assoc. Prof. G. Waitt</td>
<td>41.G29</td>
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**Senior Lecturers**

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<tr>
<td>N. Gill</td>
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<td>4221 4165</td>
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<tr>
<td>M. L. Puotinen</td>
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**Lecturers**

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<tr>
<td>C. Gibson</td>
<td>41.G08</td>
<td>4221 3448</td>
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</table>
The School of Earth and Environmental Sciences comprises the disciplines of Geography, Geology and Environmental Science. Major studies in Geography and Geology may be undertaken in the following degrees:

- **Bachelor of Science** (majors or prescribed interdisciplinary majors)
- **Bachelor of Arts** (a major must be taken jointly with an Arts major)
- **Bachelor of Environmental Science** (Earth Science and Land Resources strands)
- **Bachelor of Marine Science** (Marine Geoscience strand)
- **Bachelor of Computer Geoinformatics** (jointly offered with the Faculty of Informatics).

**Academic Advice**

Regular academic advice is provided to undergraduate students who have indicated that they wish to pursue Geography and/or Geology majors. Each student is assigned to a member of the academic staff who will act as an academic coordinator and mentor. Staff members and students should meet at least twice a year to discuss, in particular, progress and course details.

**Major Studies for the Bachelor of Science and Bachelor of Arts**

Students may elect to complete one of the following majors or combined majors. Full course outlines are provided in Section 7.2.

- **Physical Geography**
- **Human Geography**
- **Geology**
- **Geosciences**

**Bachelor of Science Prescribed Majors**

The following prescribed majors are available in the Earth and Environmental Sciences. Entry to one of these majors must be approved by the Dean or Associate Dean. The details of these majors are given in Section 7.3.

- **Land and Heritage Management**
- **Ecology** (jointly with the School of Biological Sciences)
- **Environment** (in conjunction with the other Science Units)
Current Research Interests

This is useful information for students wishing to identify staff expertise in particular academic areas.

**Associate Professor Ted Bryant**
Coastal evolution and the role of tsunami. Quaternary environmental change. Causes and nature of recent climate change.

**Associate Professor Paul Carr**
Igneous petrology, especially geochemistry of granites and related volcanic rocks; isotope geochemistry; volcanology; mineralogy.

**Dr Laurie Chisholm**
Application of remote sensing and GIS technologies to environmental management and resource assessment in general. Specific interests in hyperspectral remote sensing for discriminating vegetation stress, type and foliar biochemistry; sub-pixel analysis of hyperspectral imagery; integration of radar and optical data.

**Professor Allan Chivas**
Low-temperature geochemistry - Chemical, C-14, C1-36 and stable-isotope studies of the formation and evolution of modern and ancient lake basins, coral reefs, near-shore and deep-sea sediments, weathering profiles and laterites. Chemical hydrology, palaeoceanography and atmospheric chemistry. Chemical and isotopic studies of ore deposits.

**Associate Professor Christopher Fergusson**
Regional geology and tectonics of the Tasmanides of eastern Australia; tectonic studies in the Appalachians of western Newfoundland and the Zagros mountain belt of western Iran; sedimentology of deep-marine sediments.

**Dr Chris Gibson**
Impact of festivals; non-metropolitan futures; cultural research network; Asia-Pacific Cultural Economy.

**Dr Nicholas Gill**
Rural social and cultural change; cultural and historical aspects of arid zone pastoralism; Aboriginal land use; cultural geography and environment; environmental policy.

**Professor Lesley Head**
Australian prehistory and environmental change; cultural landscapes; past and present Aboriginal land use; pollen and charcoal analysis.

**Associate Professor Brian Jones**
Sedimentology of fluvial, fluvio-deltaic and volcanioclastic sequences; basin analysis; petrology of petroleum reservoir rocks; application of mathematical techniques to geological problems; coastal ecology.

**Professor John Morrison**
Estuarine science and management, especially nutrient budgeting; watershed management; soil genesis and management; pollution prevention and waste management; environmental chemistry, particularly in the area of coastal marine pollution; and Pacific small island environments.

**Professor Colin Murray-Wallace**
Quaternary studies and global environmental change; sedimentology and stratigraphy; amino acid racemisation, electron spin resonance and radiocarbon dating; coastal evolution and sea-level change; neotectonics.

**Professor Gerald Nanson**
River channel erosion. Floodplain formation of rivers of arid and tropical regions. Quaternary environmental change. Thermoluminescence dating.

**Dr Marjetta (Marji) Puotinen**
Geographical Information Systems; Coral Reef geomorphology; Hazard Analysis; Recent environmental change.

**Associate Professor Gordon Waitt**
Economic restructuring; international trade and tourism, marketing places.

**Professor Colin Woodroffe**