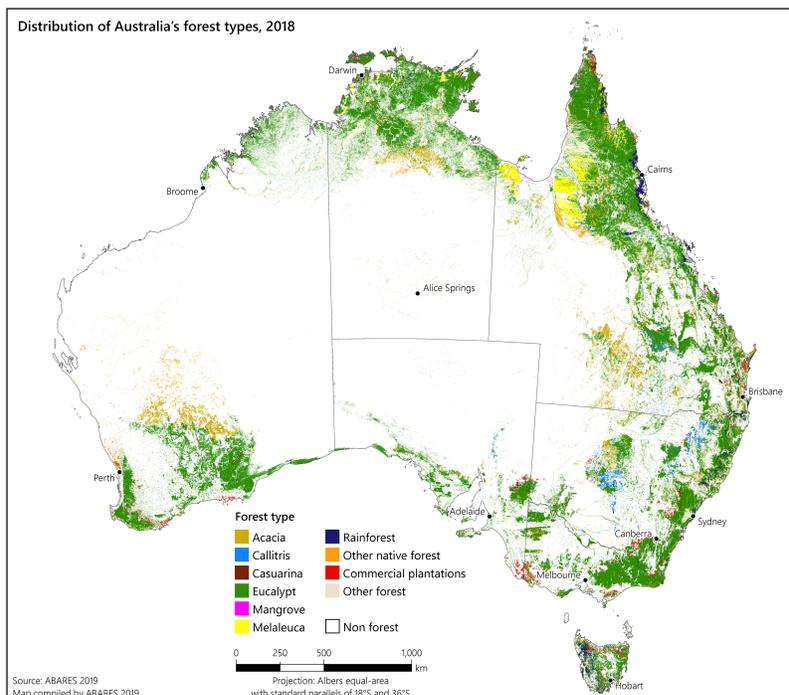
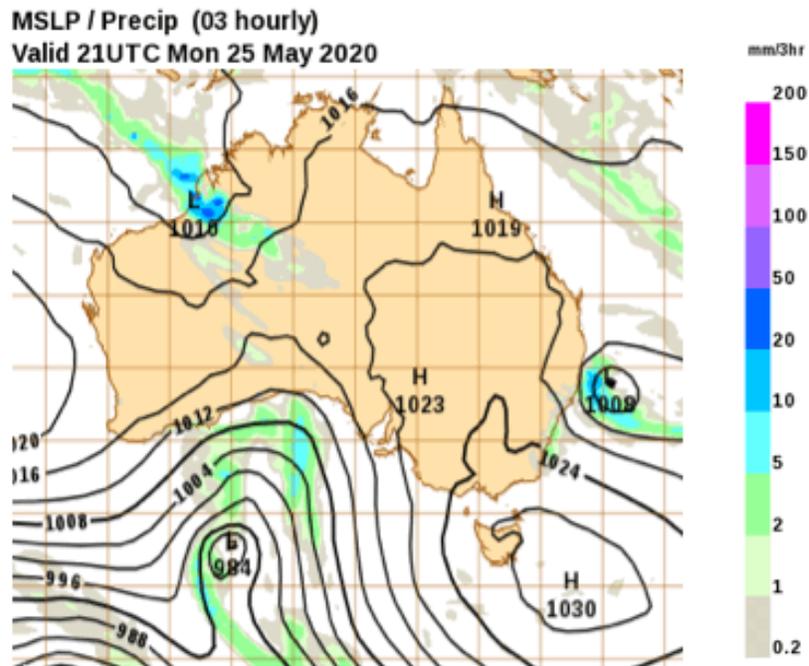


Term 2, 2020

GEOS2711  
AUSTRALIAN CLIMATE  
AND VEGETATION

School of Biological, Earth and  
Environmental Sciences,  
Faculty of Science



top: image from <http://www.bom.gov.au/australia/charts/viewer/index.shtml> accessed 26 May 2020.

bottom: image from <https://www.agriculture.gov.au/abares/forestsaustralia/profiles/australias-forests-2019> accessed 26 May 2020.

## GEOS2711 in a COVID19 environment

First and foremost, thanks for choosing GEOS2711 this term.

As you have probably seen from UNSW-wide announcements, all T2 teaching will be fully online due to the COVID19 situation. This will be the first time GEOS2711 will run online so for me it will be a steep learning curve. I am sure it will work out but I am happy to maintain some flexibility, given the circumstances, and so if something isn't working please let me know.

While the online delivery will involve significant changes to how the course is run, all of us involved in teaching GEOS2711 are committed to providing you with a high-quality course and learning environment, and to address all of the course learning outcomes. I suspect this is the start of some very big changes in higher education: as an example, I can't ever see face-to-face lectures returning (and they are a terrible way to learn anyway). I am hoping that the changes we make will result in an even better course: again, as an example, we are including very specific guidance as to what you should learn in each section.

The online environment presents some challenges. We will be dealing with these primarily via Moodle (and Blackboard Collaborate): this means you really need to pay attention to announcements, as activities (including workshops, labs and class discussion) will happen during set times (but they will be recorded for review). The lectures will be available online as recorded sessions. Your participation in workshops and labs is not only necessary but a requirement of successfully completing many tasks (and hence the course). Please familiarize yourself with the structure of the GEOS2711 Moodle Page asap and the information on how to use Blackboard Collaborate prior to the first workshop (Thursday 1pm, Week 1).

One challenge remains: how to do fieldwork in a COVID19 environment! (This is something that our entire School is dealing with: field work is an integral part of our research, and how we teach, and how you learn.) We have carefully designed an alternative to the usual fieldwork-based assignment used in GEOS2711, and while this hits all of the important learning outcomes the actual experience is difficult to replicate. The other major challenge is the final exam (which will be a timed, online exam): but I will discuss that in more detail at a later date.

Thanks again for enrolling in GEOS2711. I can always be contacted via email ([s.mooney@unsw.edu.au](mailto:s.mooney@unsw.edu.au)) or via Moodle if you would like to raise issues with me.

Best wishes

*Scott*

GEOS2711 Course Convener

## Information about GEOS2711

A/Prof Scott Mooney is the Course Convener in GEOS2711 and should be the first point of contact for any problems. You can check out what A/Prof Mooney does at <http://www.bees.unsw.edu.au/scott-mooney>: in GEOS2711 he will convene the course, present lectures and oversee the workshops and laboratory classes. Please use email [s.mooney@unsw.edu.au](mailto:s.mooney@unsw.edu.au) (or Moodle) to raise issues.

Professor Jason Evans belongs to the UNSW Climate Change Research Centre <http://www.crc.unsw.edu.au> and is a Chief Investigator at the ARC Centre of Excellence for Climate Extremes. You can check out what he does at <http://www.bees.unsw.edu.au/jason-evans>. Prof Evans will present the climate lectures in GEOS2711 and run a couple of the workshops and labs, focusing on climate variability.

Professor David Keith works on vegetation dynamics, fire and population and ecosystem modeling. You can check out what Prof Keith works on here: <http://www.ecosystem.unsw.edu.au/people/david-keith>. In GEOS2711 he will present lectures and run a couple of the workshops and labs, focusing on areas within his broad expertise.

Dr Suzanne (Sue) Schibeci is a lecturer in the Faculty of Science Learning and Teaching Unit. Dr Schibeci has a background in the evolution of elements of the distinctive Australian flora, and will help throughout the course, primarily through Moodle.

## Course Information

### Lectures

The course was originally timetabled as Monday 11-noon; Tuesday 2-3pm; Thursday 5-6pm, all in Pioneer Theatre but all lectures will be online. There are 24 lectures in total: in most week there are three, but there are none in week 6 (the UNSW Study Break) and in weeks 2, 9 and 10 there are only 2.

Our plan is to pre-record lectures for each week and have the recordings available online before Monday at 11 am. In some cases, these lectures will be in 3 x 15-20-minute blocks (that is, in 3 parts). This is based on research, student feedback and our experience which suggests listening to small segments is more effective than one continuous long recording.

### Workshops and Labs

There is a workshop every week (except for the UNSW Study Break in week 6). Workshops (called lab1 on the UNSW timetable) run Thursday 1 – 3 pm. The workshops will be run using Blackboard Collaborate: you will get instructions for every lab (as some require you do some work before you join the discussion.)

There are seven labs in GEOS2711 this term. They run on Fridays from 12 – 2 pm in weeks 2, 3, 4, 5, 7, 8 and 9 (but not in weeks 1, 6 and 10). The labs will also be run using Blackboard Collaborate: you will get instructions for every lab (as some require you do some work before you join the discussion.)

Attendance/participation in workshops and labs is compulsory in GEOS2711 (see the note under Assessment): you will need to complete pre- or post-class activities to demonstrate your attendance.

## Course Description

<b>Course Description</b>	<p>GEOS2711 Australian Climate and Vegetation is a 6 unit of credit course.</p> <p><i>Contemporary climatic patterns and controls in Australia. Development of the Australian vegetation. Elements of the Australian vegetation and their distribution. Climate change with particular emphasis on the Quaternary. ENSO phenomena and climatic variability in Australia. Fire and vegetation interactions. The impact of European occupation in Australia.</i></p>
<b>Course Aims</b>	<p>The objective of <i>Australian Climate and Vegetation</i> is for students to reach an understanding of the topics summarised in the UNSW Handbook description. The course will present material relevant to the Australian climatic environment and vegetation of the continent. It covers introductory material associated with the academic disciplines of climatology, botany, biogeography and some elements of ecology and environmental science.</p>
<b>Student Learning Outcomes</b>	<p>By the end of this course, you will have an appreciation of the controls that shape the Australian climatic environment. These generic controls are also applicable to other locations on the Earth. Information regarding the nature of the Australian vegetation will lead to an understanding of the factors associated with the distribution of various communities, with a special emphasis on the vegetation of the Sydney Basin. The laboratory program is designed to consolidate many of these skills. The workshops in GEOS2711 are problem- and discussion-based and will consider conceptually difficult issues or reinforce aspect of the course content.</p>

## Relationship to Other Courses/Programs

Australian Climate and Vegetation is distinct from, but complementary to the Stage 2 course *Australian Surface Environments and Landforms* (GEOS2721). Together with GEOS2821 *Introduction to GIS and Remote Sensing*, these courses make up Stage 2 of Physical Geography at UNSW and provide the background for more advanced Physical Geography courses. GEOS2711 is also a core course in the Ecology Major (in Life Science, Environmental Management, Science and Advanced Science). The course has synergies with other geoscience and environmental science courses at UNSW and thereby provides an important element of geo- and environmental science programs. The course also has synergies with the 2<sup>nd</sup> year Biology course BIOS2051 *Flowering Plants*, which introduces the discipline of botany at UNSW.

<b>Graduate Attributes Developed in this Course</b>		
<b>Science Graduate Attributes</b>	<i>0 = NO FOCUS</i> <i>1 = MINIMAL</i> <i>2 = MINOR</i> <i>3 = MAJOR</i>	<b>Activities/Assessment</b>
1. <b>Research, inquiry and analytical thinking abilities</b>	<b>3</b>	Lectures                      final exam, assignments Workshops                    final exam, major assignment report Laboratory Exercises        assessed lab exercises
2. <b>Capability and motivation for intellectual development</b>	<b>2</b>	The lectures in this course are introductory thereby motivating students towards further enquiry. The course is designed to provide relevant knowledge for various environmental science disciplines.
3. <b>Ethical, social and professional understanding</b>	<b>2</b>	Professional understanding developed through all components of the course. No focus on ethical or social issues beyond those relating to human impacts, vegetation and climate.
4. <b>Communication</b>	<b>3</b>	Skills in scientific communication developed through lab and written assignments reports.
5. <b>Teamwork, collaborative and management skills</b>	<b>2-3</b>	Teamwork and collaboration are emphasized in the workshop activities. The various assessment tasks provide time management skills.
6. <b>Information literacy</b>	<b>2</b>	The course is designed to provide skills in information retrieval, with an emphasis on scientific enquiry.

## **Rationale and Strategies Underpinning the Course**

The learning and teaching rationale underpinning the course draws on of the following concepts:

- Learning is best achieved where students undertake a variety of tasks (reading, writing, discussing) and particularly those that stimulate higher-order thinking such as analysis, synthesis and evaluation. This is achieved through interactive lectures and discussion classes (workshops), where questions and critical thinking are encouraged and via lab exercises;
- The learning experience is also enhanced through the use of activities that are interesting and challenging. Students are more engaged in the learning process when the relevance of the material to professional, disciplinary and/or personal contexts is obvious. A variety of teaching methods and modes of instruction are employed in GEOS2711;
- In GEOS2711 dialogue is encouraged between the students and teachers and among students, through the use of the online learning space Moodle and via discussion. The course aims for an inclusive learning and teaching experience, creating a community of learners.

## Recommended Text and Reading

Students should note that this course covers a wide range of material: you will be expected to read key references for each topic and to read around some of the topics. Some general references are listed below, and key references will be provided at the end of each lecture/section and generally available in Moodle. As a guide, the UNSW Academic Board suggests that a normal workload for a 6 UOC course is 9.4 hours per week (including class contact hours, time spent on assessable tasks and preparation/reading).

There is no compulsory text set for this course however it is highly recommended that students have access to a general text. Bridgman *et al.* (2008 *The Australian Physical Environment*, OUP) is extremely useful as an overview of climate and biogeography in Australia. In addition, some older texts are still relevant and cover the climate of Australia well (e.g. Sturman & Tapper 1996 *The Weather & Climate of Australia and New Zealand*, OUP). For vegetation it is hard to go past *Australian Vegetation* (2017 edited by David Keith, Cambridge University Press) or *Ocean Shores to Desert Dunes* (2004 also by David Keith).

## Other Resources and Support for Students

Students should note that dedicated pages for GEOS2711 exist on Moodle and all course hand-outs, lectures, labs and announcements will be managed using this resource. Additional electronic resources will also be provided via Moodle. This means that you should check these pages regularly.

## WHS in GEOS2711

There are relatively few WHS issues associated with this course. Nonetheless, students should be aware that the BEES WHS site (<http://www.bees.unsw.edu.au/health-and-safety>) contains important information relating to workplace safety. This information complements that which can be obtained from the UNSW Health & Safety website (<http://www.safety.unsw.edu.au>)

## Lecture Outline

Lecture no.	Timetable...	Lecture title	Lecturer
1	Monday week 1	Introduction to the course	A/Prof Scott Mooney (SM)
2	Tuesday week 1	General features of Australia	SM
3	Thursday week 1	Contemporary climatic patterns in Australia I	Prof Jason Evans (JE)
Monday week 2 (June 8 <sup>th</sup> ) is Public Holiday			
4	Tuesday week 2	Contemporary climatic patterns in Australia II	JE
5	Thursday week 2	The Australian vegetation: continental patterns	Prof David Keith (DK)
6	Monday week 3	The Australian vegetation: drivers of assembly	DK
7	Tuesday week 3	The vegetation of the Sydney Basin	DK
8	Thursday week 3	Concepts and methods for classification and mapping of native vegetation	DK
9	Monday week 4	Biogeography of Australian vegetation: historical roots	DK
10	Tuesday week 4	Biogeography of Australian vegetation: recent advances	DK
11	Thursday week 4	Fire and pyrogeography in Australia	DK
12	Monday week 5	Fire ecology in Australia	DK
13	Tuesday week 5	Synoptic processes and rainfall in Australia I	JE
14	Thursday week 5	Synoptic processes and rainfall in Australia II	JE
Week 6 is the 'study week'... no classes			

Lecture no.	when	Lecture title	Lecturer
15	Monday week 7	Southern conifers in Australia: past and contemporary distributions	SM
16	Tuesday week 7	Quaternary environmental and vegetation change in Australia I	SM
17	Thursday week 7	Quaternary environmental and vegetation change in Australia II	SM
18	Monday week 8	Alpine ecology: climate and vegetation	DK
19	Tuesday week 8	Twentieth Century climatic variability in Australia I	JE
20	Thursday week 8	Twentieth Century climatic variability in Australia II	JE
21	Monday week 9	Extreme climatic events in Australia I	JE
22	Tuesday week 9	Extreme climatic events in Australia II	JE
23	Monday week 10	Recent vegetation change in Australia	Dr Sue Schibeci
24	Tuesday week 10	Summary and Review	SM

## Workshop and Lab Outline

In the following Table the lecturer in charge of the class is indicated in brackets.

week	Workshop (Thursday 1 – 3pm)	Lab (Friday 12 – 2 pm)
1	Assumed knowledge. Aims and learning outcomes (SM)	No lab
2	Controls of the Australian climate (Climate dogs) (JE)	Atmospheric circulation and synoptic patterns in the Australasian region (JE)
3	Introduction to field methods: describing vegetation (DK)	Online investigation of a field site: Dalrymple Hay NR (SM)
4	Potential field sites in the Sydney Basin. Other resources (SM)	Climatic variability across Sydney (JE)
5	How to analyse vegetation data (DK)	Vegetation mapping (DK)
7	Long term climate change in Australia: drivers of long-term trends in vegetation (SM)	The distribution of 'southern conifers' and <i>Nothofagus</i> (SM)
8	Scenarios for predicting climate change (JE)	The distribution of Australia's alpine flora under climate change scenarios (DK)
9	Recent vegetation change in Australia (SS)	Analysing climate data: identifying variability and extremes (JE)
10	Revision and course review (SM)	No lab

## Course Assessment

	%	Due date
1. Climatic variability across Sydney	15	end of week 4 (Friday 26 <sup>th</sup> June)
2. Written assignment	15	start of week 7 (Monday 13 <sup>th</sup> July)
3. Major Report	20	end of week 8 (Friday 24 <sup>th</sup> July)
4. Final Examination	50	normal exam period
Total:	100%	

## Important Notes about Assessment

- In this course all written assignments must be submitted electronically via Moodle. Instructions will be provided in the workshop classes.
- The assessment criteria for each of the assignments will be discussed in the workshops preceding that task. Each assignment will be assessed and returned within two weeks of submission with written feedback. Students should be aware that the amount of feedback is normally positively correlated with their own efforts!
- Assignments submitted after the due date will be penalised at the rate of 10% per day unless you have been granted Special Consideration (which usually requires a Medical Certificate). All outstanding assignments must be handed in by the end of Week 10. Work will only be accepted after this date if Special Consideration is granted.
- Attendance will be monitored regularly, and students are expected to conform to University regulations which state that final assessment may be refused if you attend less than 80% of classes. This particularly applies to the workshops and labs: there are pre-class or post-class documents you need to complete to demonstrate your attendance/participation.
- References in assessed material must use the 'in-text' or Harvard system (see <https://student.unsw.edu.au/referencing> for information).
- Academic misconduct will not be tolerated in any form in this course and particular attention is drawn to the information about plagiarism included over.

## Course Evaluation and Development

Student feedback is gathered regularly in GEOS2711 by various means, including "Course and Teaching Evaluation and Improvement (CATEI)", MyExperience, through discussion on Moodle (previously WebCT, Blackboard) and in classes via occasional end of session surveys. Such feedback is carefully considered with a view to acting on it constructively wherever possible. This feedback has helped to shape and develop this course resulting in continuous modifications to the lecture, lab and field content. Considerable 'tweaking' of the assessment schedule has occurred to better reflect the time that students have devoted to various tasks. In past evaluation students were concerned about plant identification during the fieldwork: this has been addressed with a lab devoted to field preparation and a focus on vegetation structure and dominant species only in the field. Since 2015 we have significantly enhanced the climate section of the course, with the addition of a specialist climatologist. It should be emphasized that in previous surveys a very high proportion of students described the course as "challenging and interesting". If you have any constructive criticism with a view to making this an even better course, please contact the course convener.

## What is Plagiarism?

Plagiarism is the presentation of the thoughts or work of another as one's own. Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via <https://student.unsw.edu.au/plagiarism>.

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre at <https://student.unsw.edu.au/individual-consultations-academic-support>.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

\* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.

## Equity and Diversity

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener or with UNSW Disability Support Services <https://student.unsw.edu.au/disability>. Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

## Grievance Policy

In all cases you should first try to resolve any issues with the course convener (SM). If this is unsatisfactory, you should contact the Director of Teaching in BEES (A/Prof Stephen Bonser [s.bonser@unsw.edu.au](mailto:s.bonser@unsw.edu.au)) or the Head of School, School of BEES (A/Prof Alistair Poore, [a.poore@unsw.edu.au](mailto:a.poore@unsw.edu.au)). UNSW has formal policies about the resolution of grievances that can be reviewed in MyUNSW A to Z Guide (see <https://student.unsw.edu.au/complaints>).

## Summary timetable for GEOS2711 Term 2, 2020

Week	Lecture 1 Monday 2pm Pre-recorded, available on Moodle	Lecture 2 Tuesday 10am Pre-recorded, available on Moodle	Lecture 3 Thursday 11am Pre-recorded, available on Moodle	Workshop Thursday 1pm Online Blackboard collaborate	Lab Friday noon Online Blackboard collaborate	Assignments
1	Introduction to the course	General features of Australia	Contemporary climatic patterns in Australia I	Assumed knowledge Aims and learning outcomes	No lab	
2	Queen's birthday long weekend	Contemporary climatic patterns in Australia II	The Australian vegetation: continental patterns	Controls on Australian climate (Climate Dogs)	Atmospheric circulation and synoptic patterns	
3	The Australian vegetation: drivers of assembly	The vegetation of the Sydney Basin	Concepts and methods for classification and mapping of native vegetation	Intro to field methods: Describing vegetation	Climatic variability across Sydney	
4	Biogeography of Australian vegetation I: historical roots	Biogeog of Australian vegetation II: recent advances	Fire regimes and pyrogeography in Australia	Potential field sites in the Sydney Basin	Online investigation of a field site: Dalrymple Hay Nature Reserve	Climatic variability across Sydney Assignment due before COB Friday 26 <sup>th</sup> June
5	Fire ecology in Australia	Synoptic processes and rainfall in Australia I	Synoptic processes and rainfall in Australia II	How to analyse vegetation data	Vegetation mapping	
6	no classes: UNSW Study Break					
7	Southern conifers in Australia: past and contemporary distributions	Quaternary vegetation in Australia I	Quaternary vegetation in Australia II	Long term climate change in Australia: drivers of long-term trends in vegetation	The distribution of 'southern conifers' and <i>Nothofagus</i>	Written assignment due before COB Monday 13 <sup>th</sup> July
8	Alpine ecology: climate and vegetation	Twentieth Century climatic variability in Australia I	Twentieth Century climatic variability in Australia II	Scenarios for predicting climate change	Distribution of alpine flora under climate change scenarios	Major Report due before COB Friday 24 <sup>th</sup> July
9	Extreme climatic events in Australia I	Extreme climatic events in Australia II	No lecture	Recent vegetation change in Australia	Analysing climate data: identifying variability and extremes	
10	Recent vegetation change in Australia	Course summary	No lecture	Revision and review	No lab	