



ENVS7104

Climate Change and Adaptation

Session 1, Weekday attendance, North Ryde 2020

Department of Earth and Environmental Sciences

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General Information

Unit convenor and teaching staff

Professor Neil Saintilan

neil.saintilan@mq.edu.au

Contact via 0409378863

Room 435, Level 4, 12 Wallys Walk

Tuesday 1-3pm

Credit points

10

Prerequisites

Admission to MRes

Corequisites

Co-badged status

ENV58104

Unit description

Global climate change is one of the important issues facing humanity in the 21st century; the ability to mitigate or adapt to projected climate changes depends on developing an integrated perspective on the physical, biological, biogeochemical, socio-economic and cultural factors that influence the climate system. This unit focuses on the scientific framework for understanding climate change, and covers (a) the multiple drivers of climate change, (b) the role of physical and biogeochemical feedbacks in the climate system, (c) climate change projections, (d) impacts from anthropogenic climate change including those from extreme events and (e) the principles of mitigation and adaptation of climate change and how they are performed under national and international context. It will provide students with the background to critically evaluate current understanding of the complex interactions that determine climate trajectories, the reliability of the tools used to make climate-impact projections and the effectiveness of various mitigation and adaptation strategies.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: analyse, question, and synthesise knowledge about climate change from a range

of sources

ULO2: research, interpret, and assess data on climate change and drawing connections across fields of knowledge

ULO3: demonstrate an understanding of and effectively manage uncertainty in scientific data and complexity with respect to current climate change

ULO4: identify the impacts from climate change on the environment, energy, economy and health

ULO5: confidently communicate and convey opinions on climate change mitigation and adaptation strategies in forms appropriate to different audiences

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult [iLearn](#) for revised unit information.

[Find out more about the Coronavirus \(COVID-19\) and potential impacts on staff and students](#)

General Assessment Information

Assessment Criteria

Assessment at Macquarie University is standards-based, as outlined in the [Assessment Policy](#). This means that your work will be assessed against clear criteria, and these criteria will be made available when the assessment tasks are released to you on iLearn.

Submission of Assessments

All assignments must be submitted online through [Turnitin](#) unless otherwise indicated. Links for the submission of each assignment will be available on [iLearn](#).

Marking of Assessments

Assignments will be marked through Turnitin with grades and feedback provided through GradeMark. Please do not submit your assignments via email or in hard copy.

We aim to return your assignments with feedback within two to three weeks of the date that you submit your assignment, and before your next assignment is due. We appreciate your patience and will advise you through iLearn when your marked assignments and feedback are available for viewing.

Penalties for Late Assessments

The penalty for late submission of assessments in this unit is **ten percent (10 %) of the assessment value per day**, calculated from the due time and date. This means that if the

assignment is worth a total of 30 marks (or 30 % of the unit) you will lose 3 marks for each day late. This is a hefty penalty designed to make you aware of the importance of organising yourself around assessment due dates. The penalty will be applied over weekdays and weekends unless you have been granted an extension prior to the due date.

Extensions for Assessments

To obtain an extension for an assessment task, you will need to follow the formal process as outlined in the [Special Consideration Policy](#), and you must provide appropriate supporting documentation (e.g. medical certificate - see advice for [Special Consideration](#) requests). The final decision regarding the granting of an extension and/or a late penalty lies with the unit convenor. Permission for extension must be sought **well before the due date** unless this is absolutely impossible. Let us know of problems in advance or as soon as possible, not after the event: we are likely to be much more sympathetic and flexible in our requirements if you follow this advice.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

The Unit consists of a **weekly lecture** (1pm-2pm Wednesdays, 9 Wallys Walk 131 Tutorial Room), and a 2-hour tutorial. The tutorial times are:

Wednesday 2pm-4pm: 3 Innovation Road Tutorial Room G220, **or**

Thursday 1pm-3pm: 3 Innovation Road Tutorial Room G210

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult [iLearn](#) for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

	LECTURE	TUTORIAL
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Week 1	<p>Atmospheric composition and climate</p> <p>Earliest papers on global warming. The link between greenhouse gasses and temperature. Global Climate Models. Observation vs prediction</p>	<p>Myth-busting 1: The Climate Hiatus</p> <p>Myth-busting2: Solar activity, Volcanoes and termites.</p>
Week 2	<p>Timescales of Climate Change and climate variability</p> <p>The Tertiary and the Quaternary, Glacial and Interglacial periods, Trends through the Holocene, Interdecadal and interannual climate trends in Australia (ENSO, the IPO and the SAM)</p>	<p>Working with BOM climate data</p>
Week 3	<p>Projections of Climate Change in the 21stCentury</p> <p>Climate modelling for the IPCC. The projections of the 5thAssessment Report.</p>	<p>NARCLIM climate change projections and report</p>
Week 4	<p>The Cryosphere, Ocean warming and Sea Level Rise</p> <p>Ice sheet collapse. Drivers of sea-level rise. Sea level rise observations and projections. Sea level rise impacts</p>	<p>Myth-busting 3: Climate Change is good for us</p> <p>Myth-busting 4: How can such a small concentration lead to such large effects?</p> <p>LAB REPORT DUE: 20 March</p>
Week 5	<p>Adaptation/mitigation case study: REDD+ and Blue Carbon</p> <p>Enhanced natural carbon sequestration. Blue Carbon theory and opportunities</p>	<p>Facilitated Discussion:</p> <p>Sea-level rise impacts on infrastructure and natural ecosystems</p>
Week 6	<p>Climate Change Vulnerability and Adaptation in Australia</p> <p>Bushfires, including the 2020 season. Drought and agriculture. Extreme Heatwaves, snow season, coral bleaching, sea level rise vulnerability</p>	<p>Facilitated discussion: Causes and consequences of the 2019-2020 Australian Bushfires</p>
Week 7	<p>Adaptation/mitigation case study: environmental water</p> <p>The challenge of climate change adaptation in the Murray Darling Basin. The water market as an adaptation mechanism</p>	<p>Facilitated Discussion: Is climate change killing the Murray Darling Basin?IMPACT REPORT DUE: 10 April</p>
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Week 8	<p>Climate Change winners and losers</p> <p>Opportunities and vulnerabilities at the global scale. CO₂, warming and agriculture, fisheries, inter-generational equity, poverty and exposure.</p>	<p>Facilitated discussion: Northern hemisphere warming-good thing or bad?</p>
Week 9	<p>Mitigation: the IPCC Framework</p> <p>Emissions and temperature outcomes. Contributions to global emissions. Trends in emissions by sector</p>	<p>Major Report Submission (No tutorial)</p>

Week 10	Student Presentations	ADAPTATION REPORT: 11 May Student Presentations
Week 11	Student Presentations	Student Presentations
Week 12	Opportunities for mitigation in Australia (Garnaut report) Market mechanisms, carbon pricing and emissions trading. History of Australian climate and energy policy. Opportunities for transition to low emissions technology. Natural carbon sequestration and storage	Myth Busting 5 Myth Busting 6
Week 13	Overview and Key Learnings	Report feedback

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note: The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.**)

Students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](#) or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](#)

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.