



GEOS206

Marine Sediments: Records of Past Earth

S1 Day 2019

Dept of Earth and Environmental Sciences

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General Information

Unit convenor and teaching staff

Lecturer, Convenor

April Abbott

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12 Wally's Walk, Level 3

11-12 Wednesday and by appointment

Simon George

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12 Wally's Walk, Level 3

Stefan Loehr

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Credit points

3

Prerequisites

GEOS125 or GEOS126 or GEOS112

Corequisites

Co-badged status

Unit description

This unit builds the skills necessary to understand geological processes in modern and ancient marine environments. With a focus on marine sedimentology, we will examine the formation, accumulation, alteration, and preservation of sediments in the geological record. We will cover the basics of fluid flow and sediment transport, sedimentary textures and structures, and illustrate the connections between modern landforms and ancient rocks/depositional environments. This unit will focus on the reconstruction and interpretation of ancient paleo- environments based on the analysis of sedimentary structures, stratigraphy, and fossils. The unit will include a practical component as well as a five day field trip to the New South Wales South Coast.

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:

Identify basic marine sediments, sedimentary structures, and stratigraphic features

Understand interactions between climate, circulation, tectonics, weathering, and sedimentary environments

Demonstrate ability to observe and record information in the field

Interpret the depositional history of a stratigraphic sequence

Evaluate scientific evidence to formulate and justify an internally consistent hypothesis

Effectively and accurately communicate scientific information

Acquire the ability to a) use GeoMapApp to answer basic oceanographic questions, b)

use a microscope to aid in the description and classification of minerals within

sedimentary rocks, c) apply basic mathematical skills to answer scientific questions, d)

work effectively in a small team

General Assessment Information

Late Submissions

Any work received after the deadline will be marked down 10%, with an additional 5% each day (24 hrs) past the deadline. Extensions are only possible with instructor permission and requests must be made by email to the unit convenor before the assessment deadline.

Final Exam

If you apply for Disruption to Study for your final examination, you must make yourself available during the supplemental exam period. If you are not available at that time, there is no guarantee an additional examination time will be offered. Specific examination dates and times will be determined at a later date.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Weekly Quizzes</u>	20%	No	one per week
<u>Petrography Assignment</u>	15%	No	Week 6
<u>Field Trip Report</u>	15%	No	Week 8
<u>Research Project Poster</u>	20%	No	Week 13
<u>Final Exam</u>	30%	No	Finals Week

Weekly Quizzes

Due: **one per week**

Weighting: **20%**

Weekly quizzes are to be completed between 5 pm Wednesday and 8 am Tuesday. No quizzes received after 8 am will be marked. The lowest two quiz grades will be dropped at the end of the unit.

On successful completion you will be able to:

- Identify basic marine sediments, sedimentary structures, and stratigraphic features
- Understand interactions between climate, circulation, tectonics, weathering, and sedimentary environments

Petrography Assignment

Due: **Week 6**

Weighting: **15%**

This assignment will ask you to demonstrate the skills you have acquired in practicals. Full assignment description and marking rubric will be provided on iLearn.

On successful completion you will be able to:

- Identify basic marine sediments, sedimentary structures, and stratigraphic features
- Evaluate scientific evidence to formulate and justify an internally consistent hypothesis
- Effectively and accurately communicate scientific information
- Acquire the ability to a) use GeoMapApp to answer basic oceanographic questions, b) use a microscope to aid in the description and classification of minerals within sedimentary rocks, c) apply basic mathematical skills to answer scientific questions, d) work effectively in a small team

Field Trip Report

Due: **Week 8**

Weighting: **15%**

This report is to demonstrate your learning from the field trip and synthesise your field experience with your in class learning. Report requirements and marking scheme will be provided prior to departure on the field trip.

On successful completion you will be able to:

- Understand interactions between climate, circulation, tectonics, weathering, and sedimentary environments

- Demonstrate ability to observe and record information in the field
- Interpret the depositional history of a stratigraphic sequence
- Effectively and accurately communicate scientific information

Research Project Poster

Due: **Week 13**

Weighting: **20%**

Research project assignments will be handed out during week 8. All posters will need to be landscape size A0 and handed in (hard copy) by the beginning of the first lecture during Week 13. Details on the research question, required content for the poster, and marking scheme will be included in the week 8 handout.

On successful completion you will be able to:

- Understand interactions between climate, circulation, tectonics, weathering, and sedimentary environments
- Interpret the depositional history of a stratigraphic sequence
- Evaluate scientific evidence to formulate and justify an internally consistent hypothesis
- Effectively and accurately communicate scientific information
- Acquire the ability to a) use GeoMapApp to answer basic oceanographic questions, b) use a microscope to aid in the description and classification of minerals within sedimentary rocks, c) apply basic mathematical skills to answer scientific questions, d) work effectively in a small team

Final Exam

Due: **Finals Week**

Weighting: **30%**

Cumulative examination of material covered in field work, readings, lectures, and practicals throughout the term.

On successful completion you will be able to:

- Identify basic marine sediments, sedimentary structures, and stratigraphic features
- Understand interactions between climate, circulation, tectonics, weathering, and sedimentary environments
- Interpret the depositional history of a stratigraphic sequence

Delivery and Resources

Lectures

Lecture slides will be available on the iLearn page but lecture recordings will not be provided for this unit. However, if you face special circumstances that prevent you from attending a lecture you may request access to a recording. Such circumstances may include a timetable clash, sickness, etc. If you have any concerns or under these circumstances, please contact the unit convenor (April Abbott, april.abbott@mq.edu.au) to discuss your situation.

Practicals

Practicals are an important opportunity to explore the applications of lecture and reading material. Students are expected to satisfactorily participate in a minimum of 10 (ten) of the 12 (twelve) weekly practicals and practicals will be collected and reviewed each week. Due to space and supplies limitations, you must participate in the practical session you are enrolled in. Permission to attend a different practical may be possible and will be evaluated on a case by case basis, but this permission must be approved by the unit convenor in advance. Laptop computers will be provided if required for the practical. Food and drink are not allowed in the practical room for safety reasons.

Field work

During this unit we will have a field trip to the NSW South Coast from April 14th through April 19th to study both modern and ancient marine depositional environments. As a vital part of the unit, participation in the field trip is *compulsory*. There is a fee associated with this field trip and the costs will be discussed during the first few weeks of the unit. Students will need to provide their own appropriate personal field gear (sturdy footwear, rain jacket, field notebook) and purchase food in addition to the field trip fee. Please contact one of your instructors immediately with any concerns.

Quizzes

A quiz will be posted on iLearn weekly (except in week 13) to be completed between 5 pm Wednesday and 8 am the following Tuesday. No quizzes completed after the 8 am deadline will be marked. Quizzes will cover material from lecture, readings, and practicals. Your two lowest marks will be dropped, each of the remaining 10 quizzes will count for 2% of your final mark.

Unit Schedule

The material for this unit will be grouped into 3 sections:

Week 1-4: Getting to the Ocean

In order to have deposition in marine environments, we need a supply of sediments. During this section we will cover the rock cycling, weathering, basic sedimentology, boundary environments, and basic fluid dynamics. Readings will provide background and depth for the material covered in lectures and practicals.

Week 5-10: Sedimentation in the Ocean

During this section we focus our attention to marine environments including what controls them, how we define them, and what we may expect to find at each. Readings will provide background and depth for the material covered in lectures and practicals.

Week 11-13: Interpreting the Rock Record

To end the unit, we will combine what we've learned so far (mainly from modern systems) and apply it so we can learn about systems long ago or far away. Readings will provide background and depth for the material covered in lectures and practicals.

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.*)

Undergraduate 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 improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

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.

Graduate Capabilities

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Identify basic marine sediments, sedimentary structures, and stratigraphic features
- Demonstrate ability to observe and record information in the field
- Interpret the depositional history of a stratigraphic sequence
- Acquire the ability to a) use GeoMapApp to answer basic oceanographic questions, b)

use a microscope to aid in the description and classification of minerals within sedimentary rocks, c) apply basic mathematical skills to answer scientific questions, d) work effectively in a small team

Assessment tasks

- Weekly Quizzes
- Petrography Assignment
- Field Trip Report
- Research Project Poster
- Final Exam

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Understand interactions between climate, circulation, tectonics, weathering, and sedimentary environments
- Interpret the depositional history of a stratigraphic sequence
- Evaluate scientific evidence to formulate and justify an internally consistent hypothesis
- Acquire the ability to a) use GeoMapApp to answer basic oceanographic questions, b) use a microscope to aid in the description and classification of minerals within sedimentary rocks, c) apply basic mathematical skills to answer scientific questions, d) work effectively in a small team

Assessment tasks

- Weekly Quizzes
- Petrography Assignment
- Field Trip Report
- Research Project Poster
- Final Exam

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and

they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Understand interactions between climate, circulation, tectonics, weathering, and sedimentary environments
- Demonstrate ability to observe and record information in the field
- Interpret the depositional history of a stratigraphic sequence
- Evaluate scientific evidence to formulate and justify an internally consistent hypothesis
- Acquire the ability to a) use GeoMapApp to answer basic oceanographic questions, b) use a microscope to aid in the description and classification of minerals within sedimentary rocks, c) apply basic mathematical skills to answer scientific questions, d) work effectively in a small team

Assessment tasks

- Petrography Assignment
- Field Trip Report
- Research Project Poster

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcome

- Effectively and accurately communicate scientific information

Assessment tasks

- Petrography Assignment
- Field Trip Report
- Research Project Poster