



ENVS2266

Earth Surface Processes

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Natural Sciences

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General Information

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Credit points

10

Prerequisites

ENVE117 or ENV5117 or ENV51017 or GEOS117 or GEOS112 or GEOS1110 or EESC1150

Corequisites

Co-badged status

Unit description

Understanding how and why the Earth's surface looks and changes in the way it does is fundamental to effective environmental management. This unit examines earth surface processes from a catchment perspective: hill slopes and soils; rivers and floodplains; and the materials, including contaminants, that comprise them. We draw on Australian and overseas examples from diverse environments to demonstrate how biophysical processes shape our landscape. Students gain practical, laboratory and field-based skills that help them interpret the landscape. These are taught in both on-campus sessions and weekend field trips. This unit builds on themes introduced in ENV51017 and GEOS1110, and provides a sound conceptual background for students continuing in environmental sciences, environmental management and courses in ecology, biology, geology and archaeology.

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: Apply knowledge and understanding of important concepts in geomorphology

ULO2: Interpret geomorphic processes from landforms and materials in a wide range of environments

ULO3: Demonstrate geomorphological and sedimentological skills in data collection and analysis in laboratory and field settings

ULO4: Critically evaluate and analyse scientific literature, including the interpretation of data.

ULO5: Complete a field research project including data gathering and interpretation

ULO6: Communicate scientific information and concepts through oral, visual and written formats, including scientific reports

General Assessment Information

All assessments must be submitted by 5:00 pm on their due date. Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

A 12-hour grace period will be given after which the following deductions will be applied to the awarded assessment mark: 12 to 24 hours late = 10% deduction; for each day thereafter, an additional 10% per day or part thereof will be applied until five days beyond the due date. After this time, a mark of zero (0) will be given. For example, an assessment worth 20% is due 5 pm on 1 January. Student A submits the assessment at 1 pm, 3 January. The assessment received a mark of 15/20. A 20% deduction is then applied to the mark of 15, resulting in the loss of three (3) marks. Student A is then awarded a final mark of 12/20.

PRACTICALS (10%, four practicals must be submitted from which two will be chosen randomly to mark)

These should be clearly presented (as opposed to beautiful) but short and not over-produced. The main objective is to see that you have understood the content of each practical and are competent in the required skills so that we can monitor your progress. The remaining pre and post fieldwork practicals will be used for preparation of maps or data analysis which will be used in the fieldwork reports.

<i>Developing</i>	<i>Functional</i>	<i>Proficient</i>	<i>Advanced</i>
an incomplete or unreadable record of observations; many inaccuracies, gaps, few or inaccurate interpretations	record accurately and clearly details of location, observations, data, interpretations using diagrams, tables, maps, graphs and text. Give clear, complete answers to questions	complete, accurate and clear record (as for Functional) with clear interpretations, considered answers, additional schematic diagrams	as for proficient but with original attempts at synthesis and exploration of hypotheses.

WEEKLY CONTENT QUIZZES (5%)

Each week a short quiz (iLearn) will be test your knowledge and understanding of each week’s lecture content.

<i>Developing</i>	<i>Functional</i>	<i>Proficient</i>	<i>Advanced</i>
Unable to define or apply many terms or concepts taught in lectures.	Able to define terms introduced in lectures and apply concepts to examples.	Able to define terms consistently and apply concepts to examples with confidence and accuracy.	As for proficient, with ability to extrapolate to new examples and situation.

FIELD REPORT 1 (20%)

This report is based on the first fieldtrip, the preparatory practical sessions, post-fieldwork data analysis and your own reading and research on the topic. You will be given a question which you must address in your report. The research and thought which go into each report are an important part of your learning in this unit. We expect that you will deepen your understanding of the topic and your field experience by discovering the links between your observations and previous published research in the scientific literature. The report should be presented with a high standard of presentation (clarity and accuracy, not necessarily ‘pretty’), with diagrams, maps, graphs and tables (as appropriate) and standard scientific citation and referencing. You will be provided with some essential and useful readings for these reports but you should also undertake your own research of the primary scientific literature.

<i>Developing</i>	<i>Functional</i>	<i>Proficient</i>	<i>Advanced</i>
Lacks a clear explanation of research question, hypothesis or research strategy. Results may not be presented completely or accurately and may not support interpretations. May lack support from suitable literature.	able to explain the research question clearly; explain the hypothesis and show a clear and suitable research strategy; show appropriate results clearly and with accuracy; draw main conclusions from data and outstanding limitations. Supported by reference to appropriate literature.	as for functional level but with greater insight into question, results and interpretations. Includes acknowledgement and/or discussion of limitations of data/interpretations.	as for proficient but with originality in approach and/or interpretation of results.

FIELD REPORT 2 (30%)

This report is based on the second fieldtrip, the preparatory practical sessions, post-fieldwork data analysis and your own reading and research on the topic. You will develop your own question which you must address in your report, tailoring the presentation and discussion of your results to answer the question and placing them within a context revealed by your readings. The report should be presented in the format of scientific report, with a high standard of presentation (clarity and accuracy, not necessarily ‘pretty’), with diagrams, maps, graphs and tables (as appropriate) and standard scientific citation and referencing. You will be provided with some essential and useful readings for these reports but you should also undertake your own research of the primary scientific literature. See guidelines (below) for report writing style.

<i>Developing</i>	<i>Functional</i>	<i>Proficient</i>	<i>Advanced</i>
Lacks a clear explanation of research question, hypothesis or research strategy. Results may not be presented completely or accurately and may not support interpretations. May lack support from suitable literature.	able to explain the research question clearly; explain the hypothesis and show a clear and suitable research strategy; show appropriate results clearly and with accuracy; draw main conclusions from data and outstanding limitations. Supported by reference to appropriate literature.	as for Functional level but with greater insight into question, results and interpretations. Includes acknowledgement and/or discussion of limitations of data/interpretations.	as for Proficient but with originality in approach and/or interpretation of results.

EXAMINATION (35%)

The exam will be scheduled in the regular University examination period. The exam is 2 hours in length and will cover all subjects covered in the lectures, practicals and fieldtrips. There is a combination of short answer and longer (short essay) style questions. Past exam papers can be found on the library web site.

<i>Developing</i>	<i>Functional</i>	<i>Proficient</i>	<i>Advanced</i>
Unable to explain basic terms and concepts clearly or accurately. Unable to illustrate terms and concepts with specific examples or conceptual diagrams. Unable to extrapolate concepts to new situations.	able to explain terms and concepts clearly and accurately; can illustrate terms and concepts with specific examples and conceptual diagrams. Can apply knowledge to new situations with some competence.	as for Functional level but with greater critical insight. Includes acknowledgement and/or discussion of limitations or drawbacks of own knowledge.	as for Proficient but with originality in approach and/or interpretation.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Practical classes</u>	10%	No	Monday 5pm, week following practical class.
<u>Weekly content quizzes</u>	5%	Yes	Friday 5 pm following weekly lectures.
<u>Field Report 1</u>	20%	No	Monday 25/4/22 5pm
<u>Field Report 2</u>	30%	No	Monday 30/5/22 5 pm
<u>Final Exam</u>	35%	No	Mid-year exam period.

Practical classes

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 10 hours

Due: **Monday 5pm, week following practical class.**

Weighting: **10%**

Completed practicals to be submitted, including presentation of data, diagrams, graphs or short answers relating to the practical classes

On successful completion you will be able to:

- Interpret geomorphic processes from landforms and materials in a wide range of environments
- Demonstrate geomorphological and sedimentological skills in data collection and analysis in laboratory and field settings
- Critically evaluate and analyse scientific literature, including the interpretation of data.
- Communicate scientific information and concepts through oral, visual and written formats, including scientific reports

Weekly content quizzes

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 2 hours

Due: **Friday 5 pm following weekly lectures.**

Weighting: **5%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

A short quiz testing knowledge and understanding of each week's workshop content

On successful completion you will be able to:

- Apply knowledge and understanding of important concepts in geomorphology

Field Report 1

Assessment Type ¹: Report

Indicative Time on Task ²: 15 hours

Due: **Monday 25/4/22 5pm**

Weighting: **20%**

Written report including maps, graphs and tabled data based on the findings from a fieldtrip to a coastal location

On successful completion you will be able to:

- Apply knowledge and understanding of important concepts in geomorphology
- Interpret geomorphic processes from landforms and materials in a wide range of environments
- Demonstrate geomorphological and sedimentological skills in data collection and analysis in laboratory and field settings
- Critically evaluate and analyse scientific literature, including the interpretation of data.
- Complete a field research project including data gathering and interpretation
- Communicate scientific information and concepts through oral, visual and written formats, including scientific reports

Field Report 2

Assessment Type ¹: Report

Indicative Time on Task ²: 20 hours

Due: **Monday 30/5/22 5 pm**

Weighting: **30%**

Written report including maps, graphs and tabled data based on the findings from a fieldtrip to a river

On successful completion you will be able to:

- Apply knowledge and understanding of important concepts in geomorphology
- Interpret geomorphic processes from landforms and materials in a wide range of environments
- Demonstrate geomorphological and sedimentological skills in data collection and analysis in laboratory and field settings
- Critically evaluate and analyse scientific literature, including the interpretation of data.
- Complete a field research project including data gathering and interpretation
- Communicate scientific information and concepts through oral, visual and written formats, including scientific reports

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 25 hours

Due: **Mid-year exam period.**

Weighting: **35%**

Covers all material in the lectures and practical classes

On successful completion you will be able to:

- Apply knowledge and understanding of important concepts in geomorphology
- Interpret geomorphic processes from landforms and materials in a wide range of environments
- Critically evaluate and analyse scientific literature, including the interpretation of data.
- Communicate scientific information and concepts through oral, visual and written formats, including scientific reports

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

- You must attend one of five weekly, 3 hour **practical** sessions, usually held in 11WW 220
- **Lectures** will be on zoom (Monday) unless pre-recorded (to be advised)
- There are two compulsory **fieldtrips** for all students: 1-2 or 2-3 April (1.5 days, overnight), and 6, 7 or 8 May (1 day)

Off-shore students

Off-shore students **must** email the convenor as soon as possible to discuss study options.

COVID Information and on-campus classes

On-campus teaching continues to be scheduled for Session 1, 2022. Masks are compulsory for all classes in indoor spaces and social distancing will be implemented wherever possible. Students will also be required to sanitise surfaces before and after use.

Students are requested to minimise the risk of spreading COVID to themselves and others in accordance with the university and NSW Health guidelines: <https://www.mq.edu.au/about/corona-virus-faqs> and <https://www.nsw.gov.au/covid-19/stay-safe>.

Any further requirements or changes to units in relation to COVID will be communicated to students via iLearn.

PRACTICAL CLASSES comprise a practical exercise, including map and air photo interpretation, numerical analysis, examination of rocks and sediments or local fieldwork. Practicals provide hands-on experience of the topics in each module and are designed to assist learning by encouraging your active participation. The week 1 practical is held in 11WW 240 and some other practicals will be held in the field within a short distance from the university. **Each student must bring the appropriate equipment to the practical session and pre-read the practical description. Equipment may include; pencils, ruler, calculator, field note book. You should also wear appropriate clothes for the laboratory (week 1) and field: closed shoes, sun protection etc.**

WORKSHOPS/LECTURES are designed to give depth and background to the practical learning. They provide you with a framework with which to focus your study of the subject and are an essential and important component of the course. They are by no means exhaustive on each and every topic, and you are expected to supplement them by reading especially from the textbook but also from the current journals, where the most up-to-date information can be found. There is a reading list for you to use as a starting point later in this document, and additional material will be referred to during the workshop/lecture program. Slides will be available on-line through <https://ilearn.mq.edu.au/> for viewing and/or printing but they are not a replacement for attending classes.

FIELD WORK There are two **compulsory** weekend fieldtrips in this unit during which a range of natural and human-modified landscape features are examined. Each of these fieldtrips reinforces and extends the content of the Soils and Coasts modules (first fieldtrip) or Catchment and Fluvial Processes module (second fieldtrip). The major assignments are based on these field trips. In addition, three of the weekly practicals (Pracs 2, 3 and 7) will be conducted in the field within the normal practical class times. Equipment and safety issues for field work are described below.

Scaffolding of workshops, practicals, fieldwork and assessment

All modules will 'lead' with practical experiences and will be followed by large group teaching (workshops with lectures or zoom meetings) to back up and provide depth to the practical experience.

The fieldtrips build on knowledge, concepts and skills developed in the workshops/lectures and practicals. You should prepare for each fieldtrip by reading the recommended papers, attending the workshops/lectures and practicals.

Four **practicals** (two out of four submissions will be marked) and the **fieldtrips** (field reports) are directly **assessable**. Knowledge and understanding of **workshop/lecture content** is assessed in the mid-year **examination**.

TEXTBOOKS and ESSENTIAL READINGS

The following texts are suggested as being valuable reading. You are not required to purchase them, but may find them useful. There are some copies in the library.

- Paton TR, Humphreys GS and Mitchell PB, 1995. *Soils: A New Global View*. UCL Press.
 - National Committee on Soil and Terrain, 2009. Australian Soil and Land Survey Handbook, 3rd edition. CSIRO Publishing, Melbourne.
- Fryirs, K.A. and Brierley, G.J., 2013. [Geomorphic Analysis of River Systems: An Approach to Reading the Landscape](#). Wiley-Blackwell. ISBN 978-1-4051-9274-3.

For a full list of suggested readings see the Leganto block on the iLearn page (right hand side), as well as the PDF version in the unit information folder.

TECHNOLOGY USED AND REQUIRED

You will require access to a computer for parts of this unit. You can gain access to powerpoint slides used for each lecture by visiting the iLearn page for ENV52266 (<https://ilearn.mq.edu.au/>). iLearn may be used by staff to send reminders and notices concerning fieldtrips, practical classes and lectures. You should check the site regularly, especially the day before lectures/pracs. There is also the space for a bulletin board discussion between students; please feel free to use this to discuss issues relating to any aspect of the unit and geomorphology in general. For specific questions of the lecturers, email them directly (see front cover). For practical 4 you should use ArcMap GIS software. You will be able to access this on University laptops in the pracs, in the 11WW computer labs after hours. You may also be able to install a copy on your own computer (not on Macs), requiring a licence code issued by the University.

The major assignments must also be submitted electronically through Turnitin, via the iLearn page for this unit. This software provides a means of gauging the timing of submission, an originality checker to test for potential plagiarism and a paperless grading system, more information on this program can be found at (<http://turnitin.com/>) and (http://mq.edu.au/iLearn/student_info/assignments.htm) and a 'quick guide' in ilearn next to the Turnitin link. Many of the readings (scientific papers) are available on-line from the library.

Unit Schedule

See iLearn page and laboratory manual (to be issued in week 1)

There are lectures and a practical in week 1 (see the iLearn page for details)

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>). 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](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

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

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/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

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

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

The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)

- [Upload an assignment to Studiosity](#)
- [Complete the 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

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

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.

Changes from Previous Offering

We always tinker a little to try and make things better. In 2022 we are working within the University's precautions around the coronavirus. Lecture timeslots will be for either recorded lectures or live zoom meetings. We have special permission for face-to-face practical classes and fieldwork but under certain restrictions (to be advised).

Fieldwork

FIELDWORK

Weather: We never cancel fieldtrips for bad weather! You must be prepared to work in the rain with the appropriate clothing. Likewise you should always protect yourself from the sun and dehydration.

Transport: You will need to arrange your own transport for these fieldtrips. Ideally you should arrange to drive to each site with several other students from your practical class. There are

usually a limited number of spaces available in staff vehicles.

Arrival: See the prac book for the arrival time for your fieldtrip. For Seal Rocks there are two options (1) 8 am Friday morning, (2) midday Saturday. For Macdonald River we (currently) plan for the same timetable.

Cost: You must cover your own food and transport costs and pay for accommodation. We book accommodation on behalf of the group and you must pay your money using the form to be provided on the iLearn page BEFORE THE TRIP.

Food: We will advise you of plans depending on which fieldtrip option you choose. You will need lunches to eat in the field and to provide your own breakfast. Depending on which fieldtrip option you choose you may need to bring one dinner. There are no shops nearby. We will provide a BBQ dinner on one night of each fieldtrip.

Accommodation: Field accommodation is in bunk rooms with communal kitchens, dining, bathroom/toilet and work areas. You should bring (apart from the gear listed below) a sleeping bag, pillow and towel.

Departure: We aim to leave the field by midday Saturday (first option) or 5pm on the Sunday afternoon (second option), after all field equipment is returned and the accommodation cleaned. You must sign off before returning home.

Personal Field Equipment: Each student should bring the following aids/comforts on each field trip:

- sturdy shoes - no sandals, thongs, or high heels! (no visible skin below the ankles)
- water bottle (at least 1 litre)
- wet weather gear - we go whatever the weather!!! Cheap plastic ponchos will not survive walking through scrub.
- hat (with a wide brim, front and back), insect repellent and sunscreen
- field note book and pencils (see note below)
- calculator, hand lens, small pocket knife
- camera
- your lunch, drinks & snacks for the day - we do not stop at shops!!!
- a back pack to store it all in

FIELD EQUIPMENT YOU SHOULD PURCHASE

- Field notebook
- Hand lens

Each student MUST purchase a small hardcover notebook for use in the field. It should be bound down the spine on the left side, or across the top (but NOT spiral bound). The notebook

does not necessarily have to be used only for this unit (you may have used it on previous trips) but it should be good quality and able to withstand a week in the field – in what may be wet conditions. The best, and most expensive, option is a waterproof Rite-in-the-Rain, Markrite or Chartwell notebook. There are several versions but the best options are 1. Geological (Rite in the Rain 540F), with columns, lines and grids (good for sketching and data), included classifications; 2. Small Rite in the Rain notebook (200T) which can be inserted in a hard cover (200C). The first will last you several fieldtrips (and units), the second will probably last you this Unit.

These items can be bought online, for example, Prospectors Supplies. They can be used in many ENV5, BIOL and EESC units.

SAFETY IN THE FIELD AND LABORATORY

Any student who has a disability that may limit their participation in field work or that could result in a medical emergency in the field should notify the unit convenor immediately. As a general guide to the level of physical fitness required, you should be able to walk 10 km over open undulating terrain in 3 hours.

Each student must ensure his/her own safety at all times during field excursions.

- Do not undertake fieldwork alone. You must work with at least one other person.
- You must be adequately equipped to undertake fieldwork, including wet weather clothing, warm clothing, hat and sun protection, protective footwear (closed toe boots or shoes).
- You should bring a first aid kit if you have one (they will be provided to each group but do not include any drugs/creams etc).
- Do not undertake any activity you feel to be unsafe. Discuss with the fieldtrip leader any concerns you have about particular tasks.
- Be watchful of the safety of your fellow students, if they become separated from the group or are at some other risk. Tell the fieldtrip leader as soon as you notice a potentially dangerous situation.
- If you have any medical condition (including allergies) that require medication then you should bring medication with you. We do not have and cannot provide any medication (including non-prescription).

Laboratory work in this unit does not involve hazardous chemicals. Nevertheless, in the laboratory you must wear safe (closed) footwear and generally follow safe practice. Where items of equipment are to be used, do not use them until you have received adequate training.