



ENVE341

Advanced Environmental Earth Science

S3 Day 2016

Dept of Environmental Sciences

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General Information

Unit convenor and teaching staff

Convenor

Paul Hesse

paul.hesse@mq.edu.au

Contact via paul.hesse@mq.edu.au

E7A633

Credit points

3

Prerequisites

39cp and permission of Executive Dean of Faculty

Corequisites

Co-badged status

Unit description

This unit is offered as:

- A Session 1 or Session 2 unit involving small group tutorial teaching with academic staff on areas of relevance to recent research advances in the field. Assessment typically includes assignments, analysis of recent literature, and other major tasks determined in consultation with the unit convenor.
- As Session 3 unit that travels to the South Island of New Zealand. On an 11 day fieldtrip source-to-sink dynamics in a tectonically active, glaciated landscape are examined. The geomorphology and Quaternary evolution of the systems are contrasted with those of the Australian landmass examined in other units in the Environmental Earth Science major.

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:

1. Demonstrate field skills, including a) describe and sketch soil and sediment sections in the field using standard methods b) ability to take clear and comprehensive field notes using standard approaches c) survey topography (tape and clino), compute and plot data d) analyse hydrology using river styles and river planform description/classification,

measure and interpret dissolved, suspended and traction load of rivers. e) identify hazards associated with mountain landscapes

2. Demonstrate your ability to 'Read the landscape' through morphodynamic description and analyses
3. Analyse numerical data using statistical tools to determine significance of trends
4. Demonstrate critical thinking in your reading of the literature and interpretation of your own data
5. Design a field research project including data gathering and interpret your own data
6. Communicate scientific information and concepts through oral, visual and written formats

Assessment Tasks

Name	Weighting	Due
<u>pre-field A4 handout</u>	10%	10/12/16
<u>Five minute oral presentation</u>	10%	during fieldtrip
<u>Field Report</u>	50%	19/12/16
<u>Field Notebook</u>	30%	19/12/16

pre-field A4 handout

Due: **10/12/16**

Weighting: **10%**

The pre-field 1 page A4 sheet handout and within-trip oral presentation combined comprise 20% of the unit assessment, and the topics will be from the list below. For the handout, each student will explain and illustrate their topic using no more than one (1) A4 sheet of paper (using both sides, and listing any references you cite). You should have read and cited at least 3 primary, peer-reviewed sources. Assessment will be on the clarity and quality (accuracy, relevance, currency, organisation) of the 1-sheet handout (10%). **You must submit 25 copies of your assignment (please double side).**

The assignment must be ready to be submitted directly to Paul Hesse in New Zealand on 10th December.

On successful completion you will be able to:

- 4. Demonstrate critical thinking in your reading of the literature and interpretation of your own data
- 6. Communicate scientific information and concepts through oral, visual and written

formats

Five minute oral presentation

Due: **during fieldtrip**

Weighting: **10%**

Each student will also give a 5 minute oral presentation on their topic, in the field and using only their 1 sheet handout and the landscape as resources. This will occur at intervals throughout the first four days of the trip. Assessment will be on the clarity and quality (coherence, audibility, use of resources, ability to answer questions) of the oral presentation (10%). This will be **peer-assessed** (i.e. you will grade, and be graded by, your classmates).

On successful completion you will be able to:

- 2. Demonstrate your ability to 'Read the landscape' through morphodynamic description and analyses
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Field Report

Due: **19/12/16**

Weighting: **50%**

Using the data collected during your ENVS341 NZ 2016 fieldtrip, prepare an individual report, poster or presentation on your group project.

You must design a topic as a small group (3-4 people) and have it approved. These will be discussed and agreed on the first two evenings at Twizel. You can choose to write a traditional scientific report (max 2000 words), design a poster (A2 or A1) by hand or in PowerPoint, or a PowerPoint presentation (max 15 slides). **This is an individual report.** This assignment is due by 9 am 19th December.

You will use the group data collected in the field and made available freely in NZ. You should treat the numerical data in a statistical manner to see whether or not your interpretations of the data are justifiable. Note that you don't have to use all of the data, just that which is relevant. Processed data should be included in the report as tables or diagrams; raw data should be contained in Appendices. This assignment will incorporate relevant available literature with your field data to form a detailed understanding of that environment.

All group data must be shared freely between all group members. All analysis beyond the original data must be performed individually (that means summary tables, graphs, diagrams and maps). The writing up is also an individual, not group, responsibility and must reflect your own judgement, understanding and interpretation.

All 'reports' will be assessed on the evidence of accurate data gathering, accurate interpretation, critical analysis in relation to literature, clarity and suitability of the design of the project, insight of geomorphic interpretations of the data and clarity, structure and accuracy of the presentation.

On successful completion you will be able to:

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- 2. Demonstrate your ability to 'Read the landscape' through morphodynamic description and analyses
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Field Notebook

Due: **19/12/16**

Weighting: **30%**

You must submit your field notebook for assessment before the end of the fieldtrip on 19th December at Queenstown. This field book should contain all your observations made throughout the trip, including your group research project. You will be assessed according to (1) completeness, (2) accuracy, (3) clarity and (4) understanding of both notes and diagrams. For some tasks it will be necessary for only a single group member to take notes so it is your responsibility to update your own book during breaks or at night. For large datasets, do not copy from book to book but refer to the owner of the data and give a summary of the site's/day's activities in your own notebook with your own individual interpretations. The notebook does not necessarily have to be purpose-bought (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!

On successful completion you will be able to:

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- d) analyse hydrology using river styles and river planform description/classification, measure and interpret dissolved, suspended and traction load of rivers. e) identify hazards associated with mountain landscapes
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Delivery and Resources

We will be working in a remote environment – both remote from help and remote from Australia – and this imposes some limitations on the technology we can use (i.e. what we can carry).

We will use mostly very simple technology in the field. **What you should buy and bring:** hand lens; camera; notebook; calculator; USB memory stick **What we will provide that you must carry:** tape measures, GPS, geological hammer, grain size card, safety equipment.

If you have a **laptop computer** you will find it useful for producing your report. At least two are available for loan from Environmental Science, but competition for them might be high. If you need to borrow one of these laptops, please contact Paul or Tim and arrange for pickup before the field trip.

For your pre-field A4 report you are expected to undertake research using on-line research databases and electronic journals and other resources.

Wireless internet will be available at the accommodation at Twizel (where we will be on the night prior to 'report' submission), at a cost of ~\$X per hour. However, the connection can be slow and we strongly recommend that you research and read relevant literature prior to the field trip.

Personal field equipment required

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

- sturdy shoes ('no visible skin below the ankles')- sandals, thongs, or high heels are for après-field activities
- water bottle (full, of course!)
- wet weather gear – a waterproof jacket with a hood and waterproof pants
- hat (with a wide brim, front and back) and sunscreen
- field note book and pencils (see note below)
- calculator, hand lens
- camera; binoculars (if you have them)

- your lunch, drinks & snacks for the day - we do not stop at shops!!!
- a back pack to store it all in

Other personal items

cooking/eating – no utensils necessary; but we will have cooking facilities at each location.

towel/toiletries – bring these.

Unit Schedule

Date	from	Do	to
1 December Thursday	At Macquarie University	Orientation and GIS skills	
10 Saturday	Sydney QF121, 9.30; arr Qtn 14.30	Drive via Kawarau R to Wanaka. Field lecture: fieldtrip organisation, fieldbook notetaking, data recording and analyses. Student oral presentations along way.	Lakeview caravan park Wanaka (cabins)
11 Sunday	Wanaka	Drive to Mt Cook; student talks along way; Clay Cliffs/Ostler Fault	Hermitage (backpackers)
12 Monday	Hermitage	Walk to Hooker/Mueller glaciers; student presentations; Black Birch stream fan	Hermitage (backpackers)
13 Tuesday	Hermitage	AM- Tasman glacier and river; Birch Hill moraine. PM drive to Ohau/Hopkins valley; begin group projects? Guided activity? Night seminars on group project design.	High Country Lodge, Twizel
14 Wednesday	Twizel	Group projects all day in the field. Night data entry; short presentation on project question/hypotheses and design	High Country Lodge, Twizel
15 Thursday	Twizel	Data analysis (half day); GIS skills (half day)	High Country Lodge, Twizel
16 Friday	Twizel	Group projects in the field all day. Night data entry and analysis.	High Country Lodge, Twizel
17 Saturday	Twizel	Group projects in the field all day. Night data entry and analysis	High Country Lodge, Twizel
18 Sunday	Twizel	Project report writing; submit by 9am Tuesday	High Country Lodge, Twizel

19 Monday	Twizel	Adventure activity? Whitewater rafting? Return to Queenstown	Queenstown Lakeview Holiday Park
20 Tuesday	Queenstown	Recovery, shopping, ??? Transfer to airport.	Qtn QF122 15.25; arr Syd 16.45

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

New Assessment Policy in effect from Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy_2016.html. For more information visit http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student_conduct/

Results

Results shown in *iLearn*, 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.

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

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

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- 2. Demonstrate your ability to 'Read the landscape' through morphodynamic description and analyses
- 3. Analyse numerical data using statistical tools to determine significance of trends
- 4. Demonstrate critical thinking in your reading of the literature and interpretation of your own data
- 5. Design a field research project including data gathering and interpret your own data
- 6. Communicate scientific information and concepts through oral, visual and written formats

Assessment tasks

- pre-field A4 handout
- Five minute oral presentation
- Field Report

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- 1. Demonstrate field skills, including a) describe and sketch soil and sediment sections in the field using standard methods b) ability to take clear and comprehensive field notes using standard approaches c) survey topography (tape and clino), compute and plot data d) analyse hydrology using river styles and river planform description/classification, measure and interpret dissolved, suspended and traction load of rivers. e) identify hazards associated with mountain landscapes
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Assessment tasks

- Field Report
- Field Notebook

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally

and socially.

This graduate capability is supported by:

Learning outcomes

- 5. Design a field research project including data gathering and interpret your own data
- 6. Communicate scientific information and concepts through oral, visual and written formats

Assessment tasks

- Field Report
- Field Notebook

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

- 1. Demonstrate field skills, including a) describe and sketch soil and sediment sections in the field using standard methods b) ability to take clear and comprehensive field notes using standard approaches c) survey topography (tape and clino), compute and plot data d) analyse hydrology using river styles and river planform description/classification, measure and interpret dissolved, suspended and traction load of rivers. e) identify hazards associated with mountain landscapes
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- 5. Design a field research project including data gathering and interpret your own data
- 6. Communicate scientific information and concepts through oral, visual and written formats

Assessment tasks

- pre-field A4 handout
- Five minute oral presentation
- Field Report
- Field Notebook

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

- 1. Demonstrate field skills, including a) describe and sketch soil and sediment sections in the field using standard methods b) ability to take clear and comprehensive field notes using standard approaches c) survey topography (tape and clino), compute and plot data d) analyse hydrology using river styles and river planform description/classification, measure and interpret dissolved, suspended and traction load of rivers. e) identify hazards associated with mountain landscapes
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- 3. Analyse numerical data using statistical tools to determine significance of trends
- 4. Demonstrate critical thinking in your reading of the literature and interpretation of your own data
- 5. Design a field research project including data gathering and interpret your own data

Assessment tasks

- pre-field A4 handout
- Five minute oral presentation
- Field Report
- Field Notebook

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

- 2. Demonstrate your ability to 'Read the landscape' through morphodynamic description and analyses
- 3. Analyse numerical data using statistical tools to determine significance of trends
- 4. Demonstrate critical thinking in your reading of the literature and interpretation of your own data
- 5. Design a field research project including data gathering and interpret your own data

Assessment tasks

- pre-field A4 handout
- Five minute oral presentation
- Field Report
- Field Notebook

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 outcomes

- 1. Demonstrate field skills, including a) describe and sketch soil and sediment sections in the field using standard methods b) ability to take clear and comprehensive field notes using standard approaches c) survey topography (tape and clino), compute and plot data d) analyse hydrology using river styles and river planform description/classification, measure and interpret dissolved, suspended and traction load of rivers. e) identify hazards associated with mountain landscapes
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- 5. Design a field research project including data gathering and interpret your own data

- 6. Communicate scientific information and concepts through oral, visual and written formats

Assessment tasks

- pre-field A4 handout
- Five minute oral presentation
- Field Report
- Field Notebook

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- 5. Design a field research project including data gathering and interpret your own data
- 6. Communicate scientific information and concepts through oral, visual and written formats

Assessment task

- Field Report

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- 4. Demonstrate critical thinking in your reading of the literature and interpretation of your own data
- 5. Design a field research project including data gathering and interpret your own data
- 6. Communicate scientific information and concepts through oral, visual and written formats

Assessment tasks

- Field Report
- Field Notebook