ENVE341

Advanced Environmental Earth Science

FY1 Day 2014

Dept of Environment & Geography

Contents

General Information

Unit convenor and teaching staff
Unit Convenor
Paul Hesse
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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:

Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret

stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) identify hazards associated with mountain landscapes
Demonstrate critical thinking in your reading of the literature and interpretation of your own data
Demonstrate your ability to 'Read the landscape' through morphodynamic description and analyses
Analyse numerical data using statistical tools to determine significance of trends
Design a field research project including data gathering and interpret your own data
Communicate scientific information and concepts through oral, visual and written formats

Assessment Tasks

Name	Weighting	Due
pre-field A4 handout	10%	7/12/14
5 minute oral presentation	10%	day 1-4
field report	50%	16/12/14
field notebook	30%	16/12/14

pre-field A4 handout

Due: **7/12/14**
Weighting: **10%**

design an A4 handout for all gorup members to be used in the field while you give your oral presentation

On successful completion you will be able to:

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

5 minute oral presentation

Due: **day 1-4**
Weighting: **10%**

talk about your chosen topic to the group. Peer assessment.

On successful completion you will be able to:

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

field report

Due: **16/12/14**
Weighting: **50%**

an individual report based on your small group field research project. To be presented either as a Powerpoint presentation, written report or poster in the manner of a standard scientific report

On successful completion you will be able to:

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) identify hazards associated with mountain landscapes
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field notebook

Due: **16/12/14**
Weighting: **30%**

your notebook will be kept by you and used to describe sites you visit, your observations and information concerning your field research project

On successful completion you will be able to:

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c)

survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) identify hazards associated with mountain landscapes

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Delivery and Resources

This unit is taught entirely in the field. You must complete assessment item 1 before the trip, but all other components are completed in New Zealand.

Following enrolment, the main means of communication is by email. Copies of documents will be made available on the iLearn page.

Required and recommended readings

There are no set texts or readings. You must research the topic of your A4 handout and oral presentations using peer-reviewed scientific literature. On-line materials should also be peer-reviewed and fully references wherever possible.

You are asked to write your final report in the field. Bring the papers that you have found so we can pool them to create a mobile working library.

There are many useful resources at the GNS (Geological and Nuclear Sciences) and NIWA (National Institute for Air and Water) websites. GNS has glacial/geomorphological maps (http://maps.gns.cri.nz/website/csigg/) and an earthquake and fault database.

Technology used and required

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 Kirstie 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 was available at the accommodation at Wanaka (where we will be on the night prior to 'report' submission) during 2010, at a cost of ~$5 per hour.

However, we strongly recommend that you research and read the relevant literature prior to the field trip.

Changes to this unit in 2014

This unit will operate in essentially the same way as in 2013.

We always 'tinker' with units to try and make them better so we may find our tinkering needs more tinkering and we welcome your feedback before, during and after the trip.

Unit Schedule

Please note: this information is for December 2014 (ignore the funny dates above - this is the only way I can get information out for 2014)

Timetable and Itinerary (variations likely)

Day 1 (Sun 7th Dec): Sydney to Queenstown (you can fly independently but meet this flight in Queenstown). Drive to Wanaka (~2 hours). Stay at Wanaka.

Day 2-4: Drive to Mt Cook Village via Lindis Pass (~6 hours). Short student presentations along the way. Stay at Mt Cook chalet. On day 4 visit Tasman Glacier and Tasman River outwash plain and then return to Twizel.

Day 5: Research projects in the Hopkins valley and vicinity of Twizel.

Day 6: Class on data analysis

Day 7-9: Continue work on field projects in Twizel area.

Day 10: Travel to Queenstown via Shotover River: white-water rafting (?). Stay in Queenstown.

Day 11: Free morning; 2pm flight to Sydney.

(note: you may extend your stay in New Zealand by arranging earlier or later flights but you must meet the fieldtrip on Dec 7 in Queenstown and you will be dropped off in Queenstown on Dec 17. In a similar way you may find cheaper airfares to and from Christchurch but you must still make these dates).

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

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/p

olicy.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/

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://informatics.mq.edu.au/help/.

When using the University's IT, you must adhere to the Acceptable Use Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

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

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) 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

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret

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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

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) identify hazards associated with mountain landscapes
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Assessment tasks

- pre-field A4 handout
- 5 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

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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

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) identify hazards associated with mountain landscapes
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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

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) identify hazards associated with mountain landscapes
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Assessment tasks

- pre-field A4 handout
- 5 minute oral presentation
- field report

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

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret

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Assessment tasks

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- 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

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) identify hazards associated with mountain landscapes
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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

- Demonstrate field skills, including a) make clear, accurate field descriptions of geomorphology, soil profiles, sediment sections b) interpret landforms and make a geomorphic map from your interpretation of air photographs, maps or other sources c) survey topography (tape and clino), compute and plot data d) describe and sketch soil and sediment sections in the field using standard methods e) draw and interpret stratigraphic sections, correlate profiles and interpret temporal and process relationships f) analyse hydrology using river styles and river planform description/classification, flood return period and stream power g) identify hazards associated with mountain landscapes
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About fieldwork

Fieldwork fundamentals

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: We will organise mini-bus transport from Queenstown airport, returning there on the last day. It is your responsibility to organise your arrival at Queenstown airport at the designated time and your departure AFTER (not before) the designated time on the last time.

Cost: You must cover your own food costs and pay for your transport to and from Queenstown. Prior to the fieldtrip you will be advised of the estimated cost for local (bus) transport and accommodation. You must pay this amount before leaving on the fieldtrip. Because some of the costs (e.g. fuel) are only estimates and the costs are subject to currency fluctuations the advised cost may vary. Excess money will be returned after the trip; shortfalls must be met by additional payments and will be advised after conclusion of the trip.

Accommodation: Field accommodation is in cabins ('chalets') and backpacker style dormitories with communal kitchens, dining, bathroom/toilet and work areas. You should bring a towel.

Safety in the field

Any student who has a disability or health condition 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 2 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).

•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.

About this unit

Please note that this information is for December 2014. Ignore the funny dates in red.

This fieldtrip runs every year in December.

In 2014 the dates are 7 - 17 December.

(see unit schedule for more information)

Costs and Scholarships

Cost: You must cover your own food costs and pay for your transport to and from Queenstown. Prior to the fieldtrip you will be advised of the estimated cost for local (bus) transport and accommodation. You must pay this amount before leaving on the fieldtrip. Because some of the costs (e.g. fuel) are only estimates and the costs are subject to currency fluctuations the advised cost may vary. Excess money will be returned after the trip; shortfalls must be met by additional payments and will be advised after conclusion of the trip.

This is a crude estimate of costs. The amount may vary according to time of booking (airfares etc) and number of students (hire vehicle, accommodation).

Airfare (Syd-Queenstown rtn; incl taxes; red-e-deal)AUD$650

Accommodation and on-ground transportAUD$650

Food (11 days x NZ$20)NZ$220

Total (NZ$1 = AUD$0.9)AUD$1500

(you may well find cheaper airfares if you shop around or fly to Christchurch and then catch a bus to Queenstown)

Travel Grants

Macquarie University students may be eligible for 'Mobility Scholarships' from Macquarie International. If awarded, these may be for amounts of AUD$500 or commonly higher.