



ENVS341

Advanced Environmental Earth Science

S3 Fieldwork 2019

Dept of Environmental Sciences

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General Information

Unit convenor and teaching staff

Paul Hesse

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Lecturer

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Contact via 0439700474

12WW Level 4

Credit points

3

Prerequisites

(39cp at 100 level or above) and permission by special approval

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 and through geomorphic mapping in GIS
 3. Analyse numerical data using statistical tools
 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	Hurdle	Due
<u>pre-field A4 handout</u>	10%	No	4/12/19
<u>Five minute oral presentation</u>	10%	No	by 8/12/19
<u>Field Report</u>	50%	No	13/12/19
<u>Field notebook</u>	30%	No	13/12/19

pre-field A4 handout

Due: **4/12/19**

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 20 copies of your assignment (please double side).**

The assignment must be ready to be submitted directly to Paul Hesse in New Zealand on 4th 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: **by 8/12/19**

Weighting: **10%**

Each student will also give a 5 minute oral presentation on their topic, in the field and using only their 1 sheet (single or double-sided) 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). Your grade will be adjusted according to how many peer marks you return (i.e. full marks if you mark all your peers; half marks if you mark only 50% of your peers).

On successful completion you will be able to:

- 2. Demonstrate your ability to 'Read the landscape' through morphodynamic description and analyses and through geomorphic mapping in GIS
- 6. Communicate scientific information and concepts through oral, visual and written formats

Field Report

Due: **13/12/19**

Weighting: **50%**

Using the data collected during your ENV5341 NZ 2019 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 PowerPoint presentation (max 15 slides), or a traditional scientific report (max 2000 words). **This is an individual report.** This assignment is due by 9 am 13th 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:

- 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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Field notebook

Due: **13/12/19**

Weighting: **30%**

You must submit your field notebook for assessment before the end of the fieldtrip on 13th 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 of data but it is your responsibility to update your own book with your strategy, plans, hypotheses, locations, activities, type of data collected and where recorded, and interpretations. 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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Delivery and Resources

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.

What is required to complete this unit satisfactorily?

Attendance: (fairly obvious) you have to turn up to complete the unit

Assignments: you must hand in/complete ALL the assessment tasks to complete the unit

Attitude: look, read, ask, discuss, debate, enjoy (it's an amazing landscape to be in)

Quality: your assessment items will be graded according to your achievement of the learning outcomes. We are looking for deep understanding as well as competence in particular skills of data collection, analysis, interpretation and presentation.

Honesty and sharing: you will often work in groups but all the assessment tasks are individual. Group data must be shared freely but presentation, writing up and interpretation are to be the efforts of each individual. Macquarie's procedures relating to **academic honesty and plagiarism** can be found at http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

Workload for this unit

3 cp x 3hrs/wk/cp x 15 wks = 135 hrs to be devoted to this unit according to University guidelines.

Pre-fieldtrip research and preparation of A4 handout = 25 hrs

Fieldwork (excluding air travel time) 11 days x 10 hrs/day = 110 hrs

Each day will be different but you should be prepared to start work at 8 am most days and work in the evenings on some days.

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. Some are available for loan from Department of Earth and Environmental Sciences. If you need to borrow one of these laptops, please contact Paul and arrange for pickup before the field trip. Remember that ArcGIS only runs on Windows. If you have a Mac you can (potentially) partition your hard drive and install windows (at cost) on one side (using bootcamp to switch between operating systems), enabling you to install ArcGIS.

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
- an extra pair of shoes for getting wet in rivers
- 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
- your lunch, drinks & snacks for the day - we do not stop at shops!!!
- a back pack to store it all in
- any medications you may need. We cannot provide you ANY medications (even paracetamol).

Other personal items

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

towel/toiletries – bring these.

Penalty for Late Submission

There is no room for lateness! However, if you should hand in some component late you will be penalised 20% each day.

Extensions and Special Consideration

There is no room for extensions either. However, if something comes up you must discuss an extension with a staff member BEFORE the deadline.

The only exception to not submitting an assessment item at the designated time is because of documented illness or unavoidable disruption. In these circumstances you should advise the unit convenor as soon as possible and you may wish to consider applying for Special Consideration. Information about unavoidable disruption and the special consideration process is available at http://mq.edu.au/policy/docs/special_consideration/policy.html

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Unit Schedule

Timetable and Itinerary

Date	from	Do	to
25 November?	At Macquarie University	Orientation and GIS skills	
4 December Wednesday	Sydney (QF121 or similar time)	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)
5 Thursday	Wanaka	Drive to Mt Cook; student talks along way; Clay Cliffs/Ostler Fault	High Country Lodge, Twizel
6 Friday	Twizel	Walk to Hooker/Mueller glaciers; student presentations; Tasman glacier and river	High Country Lodge, Twizel
7 Saturday	Twizel	AM- Black Birch stream fan; Birch Hill moraine. PM drive to Ohau/Hopkins valley; Guided activity. Night seminars on group project design.	High Country Lodge, Twizel
8 Sunday	Twizel	Statistics and Data analysis workshop (half day); Group projects in field (PM)	High Country Lodge, Twizel
9 Monday	Twizel	Group projects all day in the field. Night data entry; short presentation on project question/hypotheses and design	High Country Lodge, Twizel
10 Tuesday	Twizel	Group projects in the field all day. Night data entry and analysis.	High Country Lodge, Twizel
11 Wednesday	Twizel	Group projects in the field all day. Night data entry and analysis	High Country Lodge, Twizel
12 Thursday	Twizel	Project report writing; submit by 9am Tuesday	High Country Lodge, Twizel
13 Friday	Twizel	Return to Queenstown (AM). Adventure activity: Whitewater rafting (PM).	Queenstown Lakeview Holiday Park
14 Saturday	Queenstown	Recovery, shopping, ??? Transfer to airport.	Qtn QF122 15.25; arr Syd 16.45

(note students may travel on alternative flights but must arrive before 2.30 pm on Dec 4th)

From Wanaka to Queenstown Airport (via Cromwell) – 107 km, 1 hr 26 min

From Wanaka to Mt Cook – 209 km, 1 hr 53 min

Notes:

In 2019 we will hold a field safety induction session before the fieldtrip. We have also continued to work on improving GIS skills. This includes a day of safety induction, orientation and mapping on campus before the fieldtrip and a separate software installation clinic for those who need it. The map data will help orient you to the field area and the GIS skills will be useful to you when you are doing your research project and report in the field.

Day 1 (4thDec): Meet at Queenstown airport 2.30pm (On arrival of the direct Qantas flight from Sydney. Alternatively, you can fly beforehand but meet this flight in Queenstown). You must advise us of your plans and meet us at Queenstown airport on the arrival of the flight from Sydney. We will be working on this afternoon (oral presentations; note-taking) so you must be prepared for these activities.

Day 11 (14thDec): We will deliver you to Queenstown by lunchtime on the last day. You may prefer to stay on afterwards or return independently. You must advise us of your plans.

While the dates and places of accommodation are fixed, the days on which specific activities will take place may change without notice. We will examine geomorphic features and sediments opportunistically while in transit to the fieldwork areas.

We will have kitchen facilities at all our accommodation and there are good supermarkets in Wanaka and Twizel. You may either cook for yourself or eat out but be aware that there are limited eating options at Mt Cook. There are good laundry facilities in our accommodation at Twizel so pack just enough clothes to get you through those first few days.

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>). 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>).

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

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

- 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 clinometer), 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 and through geomorphic mapping in GIS
- 3. Analyse numerical data using statistical tools
- 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
- Field notebook

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

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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

- 3. Analyse numerical data using statistical tools
- 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
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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

- 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

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Assessment tasks

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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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- 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

- 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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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.

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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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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

- 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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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

- 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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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 on the last day.

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.

Accommodation: Field accommodation is in cabins ('lodges') and backpacker style dormitories with communal kitchens, dining, bathroom/toilet and work areas. You should bring a towel. No need to bring a sleeping bag.

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. You must accept the fieldtrip invitation in Field Friendly before the fieldtrip and complete your contact and personal details there.

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 (basic kits will be provided to each group) and any medications you require.
- 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.