GSE 808

Management of Degraded Environments

S2 Evening 2015

Dept of Environmental Sciences

Contents

General Information

Unit convenor and teaching staff
Lecturer
Dr Kerrie Tomkins
kerrie.tomkins@mq.edu.au

Credit points
4

Prerequisites
GSE803

Corequisites

Co-badged status

Unit description
This interdisciplinary unit aims to develop understanding of some aspects of the impact of human activities on the environment and remedial actions which can be taken. Topics may include one or more of: urban and industrial environmental remediation; rural landscape degradation processes and pathways; remediation techniques in rural landscapes; river rehabilitation; environmental flows; catchment management strategies; and mine site rehabilitation. This unit is a combination of evening classes, weekend field days, and web, library and field-based individual research. Note: permission to complete the unit without completion of GSE803 as a prerequisite will only be granted if the student has completed a science-based degree.

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:

Describe the fundamental issues and processes involved in the degradation of urban, rural and mining environments.

Outline the current approaches to managing degraded urban, rural and mining environments.

By individual research and field observations, identify the processes involved in the degradation of sites, evaluate their management, and offer solutions for remediation and

future management.

Demonstrate an effective grasp of the international literature on managing degraded environments and an understanding of the issues and approaches in Australia compared to the rest of world.

Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan, preparing a new environmental management plan for a degraded site, presenting the results of research, and succinct report writing.

General Assessment Information

Assessment criteria

The criteria that will be used in marking all assessments in GSE808 include the following, where the level of achievement is expected to be at the standard of a post-graduate student. GradeMark Rubrics will be used to mark and grade all Assessments. Further details on the assessment marking will be provided at the start of semester.

General Assessment Criteria	Expectation of achievement at the post-graduate level
• Addressing the task that is specified (or answering the question that is asked) for each assessment, including staying within the word limit unless otherwise specified.	• Students are able to complete the assessments as instructed.
• Demonstration of knowledge and research skills through written material and verbal presentations.	• Students have engaged in the subject matter and task. • Students can show understanding of the topic through an analysis and a well-developed discussion of the topic.
• Demonstration of independent thinking through written material and verbal presentations.	• Students are able to demonstrate in-depth thinking through discussion that places the topic in the broader context. • Students are able to demonstrate initiative and independent contributions through new ideas.
• Appropriate use and citation of a wide range of relevant literature, including scientific research papers and reports. Citation of references within the text and reference list is correct and consistent, with no abbreviations.	• Students will undertake thorough literature searches and demonstrate appropriate selection of relevant articles in support of their arguments.

• Demonstration of good planning with a clear structure, headings, and a logical argument based firmly on the literature cited.	• Students are able to structure written (and verbal) work to convey ideas clearly and logically.
• Presentation of legible work with: correct grammar and spelling, correct use of professional terminology as appropriate, and correct use of SI units, abbreviations and acronyms.	• Students will submit work that is presented in a professional manner.
• Figures, tables and other supporting information are legible and necessary, with reference to these in the text. Full and appropriate captions are included on each as well as the source where relevant.	• Students are able demonstrate appropriate selection and use of figures, tables and other supporting information.
• Effective communication of research outcomes.	• Students are able to get their message across clearly and concisely.

Evaluation of assessments will be based on the Macquarie University scale: High Distinction (HD), Distinction (D), Credit (Cr), Pass (P) and Fail (Fail). Grades may be further refined by use of a "+" or "-" to indicate work towards the top or the bottom of each grade's band of marks. Feedback will also come in the form of written comments, as well as general commentaries directed to the class after all marked assessments have been returned.

If you experience difficulty in learning or in achieving a good standard in your written expression, please let the convenor know ASAP. The University offers a variety of remedial writing courses and sources of advice that may help you. See: http://www.students.mq.edu.au/support/learning_skills/ for further details. We emphasise the necessity for clear communication and its importance in your performance assessment.

Penalties for late assessments and extension requests

All assessments must be completed and submitted, on time and in full, in order to receive a minimum pass grade. Penalties for late assessments will be a minimum of 10% per day (including weekend days) or part thereof. These deadlines and penalties ***will*** be imposed. Allowing some students to hand assessments in late is unfair to those who meet the deadlines.

The due dates for assessments are not negotiable except in the circumstances outlined below. Please take note of the date on which work is due and let the convenor know of problems in advance or as soon as possible, not after the event: they are likely to be much more sympathetic and flexible if you follow this advice.

The University has a Disruption to Studies Policy, which can be accessed here: http://mq.edu.au/policy/docs/disruption_studies/policy.html

In accordance with the Policy, students that experience a disruption to studies which is serious, unavoidable and greater than 3 days as per the Policy guidelines, ***and*** wish to request an

assessment extension on these grounds, must submit a formal application for special consideration to the Science Faculty. http://science.mq.edu.au/current-students/postgraduate-students/

If a student experiences a disruption to studies that is unavoidable, but not serious and is of 3 days or less in duration, they can apply for special consideration to the convenor under the following conditions:

- Personal illness or illness of a child – If an assessment is submitted after the due date, a medical certificate or a letter with appropriate supporting documents outlining the extenuating circumstances must be provided that covers the day that the assessment was due, and/or the days preceding.
- Work commitments - Work commitments will not be viewed as grounds for an extension unless your work commitment requires you to be away from home for at least 1 overnight or requires you to be at work for longer than 12 hours per day, e.g. field work or inter-state meetings.
- Other family commitments or emergencies - If you have other commitments that take you away from study you should plan for these in advance as part of an effective individual study plan. Extensions will only be considered if your ability to submit an assessment on time was caused by an unexpected event where you can demonstrate: that the event was not foreseeable or predictable ***and*** that the event substantially impacted upon your ability to complete the Assessment Task ***and*** that there was alternative option available.

The number of days of disruption and the timing of disruption will be taken into considered in determining whether special consideration should be granted or not. The ultimate grounds for the decision will be whether the disruption was unavoidable and fairness with respect to other students.

Academic Honesty

In completing and submitting each Assessment, students must be aware of, and adhere to, the University policy on Academic Honesty, which can be accessed here: http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

The University implements the Academic Honesty Policy for ***all*** pieces of academic work by using a number of systems and checks, including:

- Copy detection software such as Turnitin
- Random sampling of assessment items to check for similarities
- Comparing student performance across a number of tasks
- Requiring students to defend submitted work e.g. oral exams or presentations

The penalties, where a person has been proven to have breached the policy (or any of its related

procedures), are outlined here: http://www.mq.edu.au/policy/docs/academic_honesty/schedule_penalties.html

Each student is responsible for their own work and for reporting suspected breaches to the convenor or Head of Department together with all relevant materials or evidence of the basis of the allegation.

Assessment submission and return of grades

All written Assessments should be submitted through Turnitin (See iLearn for the relevant Assessment link). There is no requirement to submit a hard copy as well. Further details on how to use Turnitin will be provided at the start of semester.

The Assessments will be marked via GradeMark, an online marking system within Turnitin. All attempts will be made to mark and return Assessments within two teaching weeks of the submission. However, please keep in mind that with large pieces of written work it can take a significant time to complete this. The Assessments will be returned with digital feedback and your score will be posted in GradeBook.

Assessment Tasks

Name	Weighting	Due
Assessment 1	25%	26 August 2015
Assessment 2	50%	7 October 2015
Assessment 3	25%	4 November 2015

Assessment 1

Due: **26 August 2015**
Weighting: **25%**

The aim of this Assessment is to introduce students to the types of statutory requirements and regulations that govern environmental management and rehabilitation of degraded sites. The example used is the Cadia gold and copper mine near Orange, NSW. The Assessment will be started in the prac in Week 3 and should be completed in the students own time for submission in Week 5. Further information on the Assessment will be provided at the start of semester.

On successful completion you will be able to:

- Describe the fundamental issues and processes involved in the degradation of urban, rural and mining environments.
- Outline the current approaches to managing degraded urban, rural and mining environments.

- Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan, preparing a new environmental management plan for a degraded site, presenting the results of research, and succinct report writing.

Assessment 2

Due: **7 October 2015**
Weighting: **50%**

This Assessment aims to give students some practical experience in developing an environmental management plan. In this instance, the plan is a rehabilitation plan for the Fish River, near Bathurst NSW, following years of sand and gravel extraction from the river. The Assessment is largely group-work, but includes individual assessment. Students will be assigned to small groups of ~ 4 students in Week 5. A break-down of the Assessment is as follows:

1. Report: Each group will develop a rehabilitation plan that will be presented, along with supporting information, as a comprehensive report which is due in Week 9. The report will be assessed and the same marks will be awarded to each student in the group (worth 20 % of the total 50 %).
2. Participation: The contribution of each student to the group report will be assessed by peer review. Each member of the group will complete a self-evaluation and peer evaluation, providing a mark out of 20 for each group member with a written justification. The final mark will be the average of the individual marks (worth 20 % of the total 50 %).
3. Presentation: Each group will give a presentation of their rehabilitation plan to the class. The time allocated with be 5 mins per group member, plus 10 mins question and answer time per group. The presentation will be assessed individually based on the communication style and effectiveness (worth 10 % of the total 50 %).

Further information on the Assessment will be provided at the start of semester.

On successful completion you will be able to:

- Describe the fundamental issues and processes involved in the degradation of urban, rural and mining environments.
- Outline the current approaches to managing degraded urban, rural and mining environments.
- By individual research and field observations, identify the processes involved in the degradation of sites, evaluate their management, and offer solutions for remediation and future management.
- Develop skills and experience in analysing environmental data, critiquing an existing

environmental management plan, preparing a new environmental management plan for a degraded site, presenting the results of research, and succinct report writing.

Assessment 3

Due: **4 November 2015**
Weighting: **25%**

This Assessment aims to give students a greater awareness of the global issues of environmental degradation, as well as some perspectives on how Australia compares in its efforts to manage and remediate degraded environments. Students can choose their own topic to investigate, including one of those already covered in the course. The Assessment will also include some class discussion in Week 12 where it is expected that students will be well prepared to contribute based on their readings. The Assessment will be submitted in Week 13. Further information will be provided at the start of semester.

On successful completion you will be able to:

- Describe the fundamental issues and processes involved in the degradation of urban, rural and mining environments.
- Outline the current approaches to managing degraded urban, rural and mining environments.
- Demonstrate an effective grasp of the international literature on managing degraded environments and an understanding of the issues and approaches in Australia compared to the rest of world.

Delivery and Resources

Unit iLearn Page

This unit has a home page that can be accessed through the Macquarie University online facility (ilearn.mq.edu.au). It contains the usual discussion page, mail page and lecture notes page. As the semester progresses, it will be used to circulate data and other materials related to the course, field trips and assessments.

Evening classes

The weekly program consists of 3-hour classes on Wednesday nights from 6:30-9:30 pm in EMC-G230 (Science Faculty Tutorial Room). The classes include a combination of lectures, practicals, class discussion and student presentations as outlined in the unit schedule and text below. A short break during the 3-hours will be allowed where possible.

Note: Please bring writing materials and laptop computers to each class as these will be used regularly.

- **Lectures**: Most weeks will include background presentations that are essential to convey the course content and prepare for the field trips and assessments. Attendance is compulsory.
- **Practicals:** Week 3 is a practical exercise on Cadia Mine in preparation for Assessment 1. Attendance is compulsory.
- **Student presentations:** These will be held in Week 9 as part of Assessment 2. Each student is expected to present, as well as participate in the question-answer sessions following each group presentation. Attendance is compulsory.
- **Class discussion:** Week 12 includes a 1 hour discussion on how Australia compares to the rest of the globe in its management of degraded environments. Each student is expected to contribute to the discussion based on their research findings. Attendance is compulsory.

Note: There are no classes in Weeks 7, 8 and 11. However, it is expected that students will use the time to work on the unit Assessments. Class materials will be available in the Library Reserve. In these weeks, students are also welcome to discuss their progress with the convenor by prior arrangement.

Field Trips

Mining and Rural Field Trip: 10-13 September 2015

There will a four-day field trip to the Orange-Bathurst area in the central-west of NSW, commencing on Thursday 10 September. During the field trip, students will visit:

- The former Browns Creek Mine site to view environmental management and rehabilitation aspects of the old mine, driving back via Cadia Mine.
- Gumble dryland salinity site to view land degradation issues, soil conservation and catchment management practices.
- Fish River sand and gravel extraction site to view river degradation issues and collect field data for Assessment 2.

We will stay in stay in Orange and Bathurst. Accommodation will be organised by the convenor. Transport is to be organised by each student, with car-pooling recommended. See below for further details on costs. Details on logistics will be provided at the start of semester and in the weeks prior to the trip. Attendance is compulsory.

Urban Field Trip: 17 October 2014

There will be an additional ~half-day field trip in the Sydney area on Saturday 17 October. The field trip will visit previous contamination and remediation sites on the Rhodes Peninsula.

Students will need to organise transport to the sites. Further details will be provided at the start of semester and in the week prior to the trip. Attendance is compulsory.

Field trip essentials on what to bring

Each student will need to ensure that they are equipped with the following essentials during each field trip:

- Adequate food for each day (i.e. packed lunch)
- Adequate water for each day (minimum 1 ltr)
- Rain jacket
- Clothing appropriate for the weather and season (e.g. warm jumper, long-sleeved shirt for sun protection)
- Hat and sunscreen
- Closed shoes, preferably boots
- Field book, writing materials and camera

Field trip costs

The cost of the field trips are not included in the course fees, however all attempts will be made to keep these to a minimum. Additional costs that will need to be paid by each student for the Mining and Rural Field Trip include overnight accommodation (3 nights), meals and transport. Additional costs that will need to be paid for the Urban field trip include transport.

Indicative costs for accommodation in Orange and Bathurst are $50 - $150 p.p.n. depending on the style of accommodation. Options range from pub-style with shared bathrooms, to motel-style with private facilities. While it is anticipated that most will stay with the group, students are welcome to organise their own accommodation if they prefer.

Requirements to pass this unit

Attendance and assessment submission

You are required to attend all lectures, practicals, student presentations, class discussions and field trips, and submit all pieces of assessment to receive a Passing grade for this unit. Non-attendance may attract a penalty of up to 10 % of the final grade per day unless a valid reason with supporting documentation is provided.

.

Workload requirements

The workload for units at Macquarie University is based on a minimum of 3 hours per credit point per week to receive a Pass grade (including 13 x weeks of semester and 2 x weeks of mid-

semester break). For GSE808 this means that you are expected to spend at least 12 hours per week, or a total of around 150 hours on course learning activities to receive a Pass grade. Obviously this is dependent on the speed at which you learn, your ability to study effectively and how far in advance you commence the assessments. Ideally, the workload should be spread over the semester.

A guide of the hours required to receive a Passing grade is outlined below. However, keep in mind that grades are awarded based on a demonstration of understanding and ability, not on effort! Approximately 20 % of the course is class-room based, 20 % is field-based and the remaining 60 % is allocated for individual study, primarily to complete assessments and undertake further reading related to the course.

Activity	Hours per semester	Percentage allocation
CLASS-ROOM BASED ALLOCATION:		
Lectures	19.5	13 %
Assessment 1	3	7 %
Assessment 2	6.5	
Assessment 3	1	
FIELD TRIP ALLOCATIONS:		
Mining and Rural Field Trip	28	21 %
Urban Field Trip	4	
INDIVIDUAL STUDY ALLOCATION		
Completion of assessments and additional reading	88	59 %
TOTAL	**150**	**100 %**

Unit Rubric

In GSE808, it is expected that your assessments will be very high quality and demonstrate comprehension of course content including knowledge, skills and abilities which are at the standard of a postgraduate level. Grades for the unit as a whole will be awarded according to the following rubric.

	Developing	Functional	Proficient	Advanced
General description of the level of attainment	Has not yet reached the desired standard. Limited understanding of required concepts and knowledge. A **fail** grade (or under some circumstances, a conceded pass) would be given.	Has reached basic academic standards. Work has limited translation of concepts and procedures to new contexts unless aided. A **pass** grade would be awarded.	Has completely reached the standards expected. Can work independently in new contexts, adapting procedures to meet the context. Demonstrates awareness of own limitations. A **credit** grade would be awarded.	Has gone beyond the expected standards. Exhibits high levels of independence and can use concepts to generate new ways of completing procedures. Can engage in productive critical reflection. A grade of **distinction** or **high distinction** would be awarded.

.

Unit Schedule

Week	Location / time	Component	Assessments	Hours
1	Wed 29 July 6.30 – 9.30 pm	***Introduction*** • Course overview: organisation, readings and research, field trips and assessments. • Introduction to environmental degradation		3
2	Wed 5 Aug 6.30 – 9.30 pm	***Mining*** • Degradation of mining environments • Overview of Browns Creek mine		3
3	Wed 12 Aug 6.30 – 9.30 pm	***Mining cont.*** • Practical exercise on Cadia Mine in preparation for Assessment 1		3
4	Wed 19 Aug 6:30 – 9: 30 pm	***Rural*** • Degradation of rural environments • Overview of the Gumble salinity field site		3
5	Wed 26 Aug 6.30 – 9.30 pm	***Rural cont.*** • Overview of the Fish River sand and gravel extraction site • Group allocation for Assessment 2	Assessment 1 due (25 %)	3

6	Wed 2 Sept 6.30 – 9.30 pm	***Rural cont.*** • Field trip logistics • Preparation for Assessment 2 (no formal class)		3
7	Wed 9 Sept	**No Class**		-
Mid-semester break	Thurs 10 – Sun 13 Sept	***Mining and Rural field trip*** • Day 1: Browns Creek and Cadia mines • Day 2: Gumble field site • Day 3 and 4: Fish River		28
8	Wed 30 Sept	**No Class**		-
9	Wed 7 Oct 6:30 – 9:30 pm	**Student presentations of Assessment 2**	Assessment 2 due (50 %)	3
10	Wed 14 Oct 6:30 – 9:30 pm	***Urban*** • Degradation of urban environments • Overview of the Rhodes Peninsula remediation		3
Weekend	Sat 17 Oct	***Urban field trip*** • Visit to the Rhodes Peninsula area		4
11	Wed 21 Oct	**No Class**		-
12	Wed 28 Oct 6.30 - 9.30 pm	***International perspectives*** • International issues • How does Australia compare to the rest of the world		3
13	Wed 4 Nov 6.30 – 9.30 pm	***Course conclusion and feedback***	Assessment 3 due (25 %)	3

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/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://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

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcome

- By individual research and field observations, identify the processes involved in the degradation of sites, evaluate their management, and offer solutions for remediation and future management.

Assessment task

- Assessment 2

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Describe the fundamental issues and processes involved in the degradation of urban, rural and mining environments.
- Outline the current approaches to managing degraded urban, rural and mining environments.
- Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan, preparing a new environmental management plan for a degraded site, presenting the results of research, and succinct report writing.

Assessment tasks

- Assessment 1
- Assessment 2
- Assessment 3

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience,

of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- By individual research and field observations, identify the processes involved in the degradation of sites, evaluate their management, and offer solutions for remediation and future management.
- Demonstrate an effective grasp of the international literature on managing degraded environments and an understanding of the issues and approaches in Australia compared to the rest of world.
- Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan, preparing a new environmental management plan for a degraded site, presenting the results of research, and succinct report writing.

Assessment tasks

- Assessment 1
- Assessment 2
- Assessment 3

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcome

- By individual research and field observations, identify the processes involved in the degradation of sites, evaluate their management, and offer solutions for remediation and future management.

Assessment task

- Assessment 2

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically

supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcome

- Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan, preparing a new environmental management plan for a degraded site, presenting the results of research, and succinct report writing.

Assessment tasks

- Assessment 1
- Assessment 2

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcome

- Demonstrate an effective grasp of the international literature on managing degraded environments and an understanding of the issues and approaches in Australia compared to the rest of world.

Assessment task

- Assessment 3

Field trip Work, Health and Safety

The safety of you and those around you is our highest priority. Consequently, ALL participants in fieldwork activities are obliged to work and behave appropriately in the field, and to take care to protect their own health, safety and welfare and that of fellow fieldwork participants. You are required to follow instructions from the Fieldwork Leader at all times.

Prior to the fieldwork, you must let the Fieldwork Leader know of any allergies, special dietary requirements or medical considerations that may affect your ability to participate in fieldwork. You will need to complete a declaration of a known medical condition form, outlining a treatment plan for your condition. Details of your responsible next of kin must also be provided incase of emergencies.

You are required to wear and carry clothing and footwear as appropriate to the fieldwork situation. Your Fieldwork Leader will advise you as to what these are prior to the fieldtrip. Irrespective of the activity, footwear must be worn. For terrestrial fieldwork, ankle to knee protection must be worn either in the form of either long trousers or gaiters. For marine fieldwork, appropriate clothing to protect against sunburn and exposure should be worn. For all fieldwork activities, a hat, sunscreen, insect repellent and items to protect against unexpected weather changes, such as rain & cold, are strongly recommended. The Fieldwork Leader reserves the right to exclude anyone that is ill-equipped from the activity.

If you are taking any medication, please ensure that you take sufficient supplies with you on the field trip. The University's staff are unable, by law, to provide this to you. This includes pain relief, such as panadol or nurofen, cold and flu medication and anti-histamines for allergies.

If you need to leave the field location for any reason prior to completion of the scheduled activities, you must first inform the Fieldwork Leader. In the event of illness or injury, please let the Fieldwork Leader know immediately. All injury's or incidents must be reported via the on-line reporting system: http://www.ohs.mq.edu.au/form5a.php

Alcohol is a significant contributing factor in many incidents and acts of prejudicial conduct. Alcohol must not be consumed when undertaking fieldwork activities or when using a motor vehicle/machinery. After-hours consumption of alcohol is at the discretion of the Fieldwork Leader. Anyone acting irresponsibly or in any way deemed to be a danger to themselves or others by the Fieldwork Leader will be required to leave the field trip, return to Sydney at their own expense and report to the Head of Department. The consequences of this may include exclusion from the Unit of study or your Degree program.

For more information, contact:

Russell Field

Fieldwork Manager (Environment & Geography)

Macquarie University NSW 2109.

(W) 98508341

Recommended readings

The following textbooks and material related to the field trips are recommended for background reading. Note: it is essential that each student does their own literature searches and finds materials, particularly scientific papers that are relevant to the unit. This requirement is to: aid learning and understanding of the subject matter, develop good research skills, and successfully

complete the unit assessments. The library has a number of search engines that will enable you to directly access publications using ArticleLinker e.g. Web of Knowledge. Google Scholar can also be useful to find reports and other grey literature.

Environmental Management Standards

- AS/NZS ISO 14001:2004 Australian/New Zealand Standard Environment management systems – Requirements with guidance for use. Standards Australia. (**available online using the library licence**)

Mining environments

- Mulligan D.R. (ed) (1996) *Environmental Management in the Australian Minerals and Energy Industries*. UNSW Press. 793 pp. (**library**)
- Lottermoser B.G. (2010) *Mine Wastes: characterisation, treatment and environmental impacts.* 3rd edition. Springer-Verlag Berlin. 400 pp. (**available online**).

Former Browns Creek Mine

- Corkery R.W. & Co (1988) *Mining, rehabilitation and environmental management plan for the Browns Creek Mine: annual report no. 144/2.* (**library**)
- Corkery R.W. & Co (2002) *Browns Creek Horticultural Products Production Facility: Environmental impact statement* (3 vols), prepared by R.W. Corkery & Co. Pty Limited on behalf of Australian Native Landscapes Pty Ltd. R.W. Corkey, Orange NSW. (**library**)

Cadia Mine

- Bewert K.E., McQueen K.G. and McPhail D.C. (2003) Regolith-landform mapping and soil survey for mining rehabilitation and environmental management in the Cadia Valley, central NSW. In: Roach I.C. (ed) *Advances in Regolith.* CRC LEME. Pp 19-23. (**available online**)
- King N., Beard J. and Gibbs A. (2003) Contamination of an upland stream by heavy metals from an old mine site. *Australasian Journal of Ecotoxicology*. 9:61-68. (**available online**).
- Rohde T.K. and Williams D.J. (2008) Early hydrological monitoring of Cadia's Instrumented Trial Waste Rock Dump. Presented at Securing the Future and the 8th ICARD, June 23-25, 2009, Skelleftea, Sweden. (**available online**)

Rural environments

- Brierley G.J. and Fryirs K.A. (2005) *Geomorphology and river management: applications of the River Styles framework*. Blackwell Publishers, Oxford, UK. 398 pp. (**library**)
- Charman P.E.V. and Murphy B.W. (2007) *Soils: their properties and management*. 3rd

ed. Oxford University Press, UK. 461 pp. (**library**)

- Conacher A.J. and Conacher J. (1995) *Rural land degradation in Australia*. Oxford University Press, UK. 170 pp. (**library**)
- Downs P.W. and Gregory K.J. (2004) *River channel management: towards sustainable catchment hydrosytems.* Hodder Arnold, London, UK. 395 pp. (Republished 2014 by Routledge). (**library**)
- Stocking M. and Murnaghan M. (2001) *Handbook for the field assessment of land degradation*. Earthscan Publications Ltd, London, UK. 169 pp. (**library**)
- McTainsh G.H. and Boughton W.C. (1993). *Land Degradation Processes in Australia*. Longman Cheshire, Melbourne. 389 pp. (**library**)

Gumble field site

- Crosbie R.S., Wilson B., Hughes J.D., McCulloch C. and King W. (2008) A comparison of the water use of tree belts and pasture in recharge and discharge zones in a saline catchment in the Central West of NSW, Australia. *Agricultural Water Management*. 95:211-223. (**available online**)
- Ellis M.D. (1992) Factors affecting dryland salinity in Gumble Creek catchment. Honours thesis, Macquarie University. (**library**)
- King W. (2006) Sustainable grazing on saline lands: Water, soil and salt movement from sustainable salt-tolerant pastures in NSW. Land & Water Australia Project, Reference No. UWA32. NSW Department of Primary Industries. 87 pp. (**available online**)
- Mitchell D. (2007) Land use recommendations from integrated hydrology research in the Lachlan Catchment – the Bray's Flat Catchment Research Site. NSW Department of Primary Industries. 21 pp. (**available online**)

Fish River

- Richardson K. and Associates (1996-1997) Fish River Project: proposed extractive industry. Environmental Impact Statement. For Balmana Earthmoving and Transport Pty Ltd. 3 volumes. (**library**)

Urban environments

- Genske D.D. (2003) *Urban land: degradation, investigation, remediation*. Springer Berlin New York. 331 pp. (**library**)
- Meuser H. (2010) *Contaminated Urban Soils*. Springer ebook. 318 pp. (**available online**)
- Meuser H. (2013) *Soil Remediation and Rehabilitation: Treatment of Contaminated and Disturbed Land*. Springer ebook. 406 pp. (**available online**)

Rhodes Peninsula

- Final report on the redevelopment and remediation of the Rhodes Peninsula (2002) (**available online**)

International issues

- Barrow C.J. (2005) *Environmental Management and Development*. Volume 5 Routledge perspectives on development. Routledge, London. 286 pp. (**library**)