



# BIOL3440

## Aquatic Ecosystems

Session 1, In person-scheduled-infrequent, North Ryde 2023

*School of Natural Sciences*

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#### Disclaimer

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## General Information

Unit convenor and teaching staff

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Tarun Rajan

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Credit points

10

Prerequisites

130cp at 1000 level or above including (BIOL2410 or BIOL227) or (BIOL2310 or BIOL228) or (ENVS3239 or ENVS339)

Corequisites

Co-badged status

Unit description

This unit introduces the diverse nature of aquatic ecosystems, from catchment to coast, their biota, and the physical and chemical factors that have shaped their structure and function.

The unit provides a holistic catchment perspective, covering lakes, rivers and estuaries communities, fish, invertebrates and ecosystem processes, with a focus on Australian systems. Students will come to understand the key ecological components and processes in aquatic systems, and how ecological knowledge can be applied to management issues. The unit will provide students with experience in environmental monitoring and manipulative experiments, including formulating hypotheses, designing experiments, data collection, analyses, and communication of results. Students will also gain fundamental field-based skills which underpin the monitoring and assessment of aquatic systems. A basic knowledge of statistics is assumed. This unit has a strong emphasis on fieldwork, with essential supporting and contextual knowledge provided by laboratory classes and lectures. This unit helps prepare individuals for employment in aquatic sciences and is beneficial for those continuing to postgraduate studies in aquatic ecology and management.

This unit also requires ALL students to attend a multi-day fieldtrip in the greater Sydney area.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

**ULO1:** Describe the characteristics and ecological roles of the major biotic groups in aquatic ecosystems. This includes the identification of invertebrates commonly used for monitoring aquatic systems.

**ULO2:** Comprehensively understand the physical, chemical, and biotic factors in oceans, estuaries, rivers, streams, lakes, and aquifers that influence biota, and ecosystem functions and services.

**ULO3:** Apply various field and experimental methods for sampling aquatic ecosystems. This includes familiarization with the collection of data and the health and safety requirements associated with both lab and field work.

**ULO4:** Prepare, edit and analyse scientific data and reports to a professional standard. This includes developing aims and hypotheses, the statistical analysis and presentation of data.

## General Assessment Information

### Requirements to Pass this Unit

To pass this unit you must:

- Attempt all assessments, and
- Achieve a total mark equal to or greater than 50%, and
- Attend and participate in the hurdle activities (2 day field trip; and a 1 day field class)

Hurdle assessment: Development of knowledge, skills and experience sampling in aquatic systems. This will be obtained through a two day field trip (off campus and requires an overnight stay) and a one-day field class on campus. Attendance and participation at both the field trip and one day field class is compulsory. You must be able to demonstrate basic proficiencies in the field, the capacity to collect and process data and a strong understanding of the occupational, health and safety associated with field work. Two field trips will be run back to back (you only attend one) and two field days will run - again you only need to attend one. Given that these are organised events there is no possibility to rerun them.

Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration. For externals, an alternate time for the quiz (a single one hour block) can be assigned to the student, however, this must be within 72 hours after the official time for the quiz. Please contact Anthony Chariton directly by email to arrange a time.

## Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7<sup>th</sup> day (including weekends). After the 7<sup>th</sup> day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for [Special Consideration](#).

## Assessments where Late Submissions will be accepted

Late submissions with the previously stated penalties all apply to all submissions.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Class quiz</a>	20%	No	5/5/23
<a href="#">Field work attendance and participation</a>	0%	Yes	Week 6
<a href="#">Freshwater mesocosm experiment</a>	35%	No	10/3/, 7/4/ and 19/5
<a href="#">Aquatic Environmental Assessment Report</a>	45%	No	9/6/23

### Class quiz

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **5/5/23**

Weighting: **20%**

The quiz will cover all unit material, including additional reading material prior to the quiz date.

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- Comprehensively understand the physical, chemical, and biotic factors in oceans, estuaries, rivers, streams, lakes, and aquifers that influence biota, and ecosystem functions and services.
- Apply various field and experimental methods for sampling aquatic ecosystems. This includes familiarization with the collection of data and the health and safety requirements associated with both lab and field work.

## Field work attendance and participation

Assessment Type <sup>1</sup>: Field work task

Indicative Time on Task <sup>2</sup>: 0 hours

Due: **Week 6**

Weighting: **0%**

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

All students must attend and participate in a field trip to Kangaroo Valley. Students will be required to arrange their own travel arrangements. Attendance and participation is compulsory for both internal and external students.

On successful completion you will be able to:

- Describe the characteristics and ecological roles of the major biotic groups in aquatic ecosystems. This includes the identification of invertebrates commonly used for monitoring aquatic systems.
- Comprehensively understand the physical, chemical, and biotic factors in oceans, estuaries, rivers, streams, lakes, and aquifers that influence biota, and ecosystem functions and services.
- Apply various field and experimental methods for sampling aquatic ecosystems. This includes familiarization with the collection of data and the health and safety requirements associated with both lab and field work.

## Freshwater mesocosm experiment

Assessment Type <sup>1</sup>: Practice-based task

Indicative Time on Task <sup>2</sup>: 25 hours

Due: **10/3/, 7/4/ and 19/5**

Weighting: **35%**

The experiment will be run virtually. Three assessment tasks will be based on this semester long project.

On successful completion you will be able to:

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- Comprehensively understand the physical, chemical, and biotic factors in oceans, estuaries, rivers, streams, lakes, and aquifers that influence biota, and ecosystem functions and services.
- Apply various field and experimental methods for sampling aquatic ecosystems. This includes familiarization with the collection of data and the health and safety requirements associated with both lab and field work.
- Prepare, edit and analyse scientific data and reports to a professional standard. This includes developing aims and hypotheses, the statistical analysis and presentation of data.

## Aquatic Environmental Assessment Report

Assessment Type <sup>1</sup>: Report

Indicative Time on Task <sup>2</sup>: 33 hours

Due: **9/6/23**

Weighting: **45%**

As a practicing ecologist or environmental manager, you will be expected to prepare or review documents that describe or predict the likely effects of developments on aquatic ecosystems. The objectives of this assessment task is for you to develop skills in preparing such a report.

Students will complete an environmental assessment report based on a provided scenario. . The report will follow the standard format for a professional scientific report, i.e., it will have an abstract/summary, introduction, materials and methods, results and discussion sections and appendices. It will be appropriately referenced. Further details of the assignment requirements will be provided during the semester.

On successful completion you will be able to:

- Describe the characteristics and ecological roles of the major biotic groups in aquatic ecosystems. This includes the identification of invertebrates commonly used for monitoring aquatic systems.
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- Apply various field and experimental methods for sampling aquatic ecosystems. This includes familiarization with the collection of data and the health and safety requirements associated with both lab and field work.
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<sup>1</sup> If you need help with your assignment, please contact:

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

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

## Delivery and Resources

Delivery and Resources

### Lectures

All lectures will be held via zoom.

### FIELD TRIP, FIELD CLASS and PRACTICALS

#### FIELD TRIP-Kangaroo Valley

**All students (internal and externals) must attend a field trip to Kangaroo Valley. It is a requirement of the unit. YOU MUST ATTEND A FIELD TRIP!**

Two field trips will be arranged as a means limiting the number of students per trip. **You only attend one of the field trips.** Students must make their own way to Kangaroo Valley (approximately 2.5 hrs south of Sydney). You will need to arrange your accommodation,

however, we will provide suitable options in Lecture 1. All details will be discussed in Lecture 1.

### **Kangaroo Valley Field Trip 1:**

Sun 10th (10:30 am) April to approximately 3 pm Mon 11th April

### **Kangaroo Valley Field Trip 2:**

Tues 12th April (10:30 am) to approximately 3 pm Wed 13th April

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### **One day field class- Chowder Bay**

A half day field class will be run on **Monday 9th May**.

The class will be run in two groups 9am -12pm and 1pm-4pm, you only attend one. It will be at Chowder Bay in Sydney (near Mosman). You will get experience in sediment sampling and fish netting in estuarine systems. You will need make your own way there, details will be provided during the semester.

YOU WILL GET WET AND BE IN THE WATER SO PLEASE DRESS FOR THE OCCASSION.

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### **Practicals**

You only attend one of the practicals, one is for externals the other internals. These are the only pracs for the unit. **You must attend one of the practicals after you field class. This is essential and compulsory.**

**Externals: (day after Field Trip 2): Thur 14th April**

**Internals: (after mid-semester break): Monday 2nd of May**

### **Off-shore students**

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

## **Policies and Procedures**

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)



- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

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

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

## Student Code of Conduct

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

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Academic Integrity

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

## Student Support

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

## The Writing Centre

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

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

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

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

## Student Enquiries

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

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Changes from Previous Offering

The field trip is no longer at Kangaroo Valley it is now at Lake Macquarie.