



BIOL3440

Aquatic Ecosystems

Session 1, In person-scheduled-infrequent, North Ryde 2025

School of Natural Sciences

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General Information

Unit convenor and teaching staff

Anthony Chariton

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Credit points

10

Prerequisites

130cp at 1000 level or above including BIOL2410 or BIOL2610

Corequisites

Co-badged status

Unit description

This unit explores aquatic ecosystems, from catchment to coast, focusing on their biota and the physical and chemical factors shaping their structure and function. It takes a holistic catchment approach, covering lakes, rivers, and estuaries, as well as fish, invertebrates, and ecosystem processes, with an emphasis on Australian systems. Students will learn about key ecological components and processes in aquatic environments and how this knowledge can be applied to management issues. The unit includes practical experience in environmental monitoring and experiments, including hypothesis formulation, experiment design, data collection, analysis, and communication of results. Students will also develop field-based skills essential for assessing aquatic systems. A basic knowledge of statistics is assumed. Fieldwork is a key component, supported by laboratory classes and lectures, providing foundational knowledge for careers in aquatic sciences and postgraduate studies in aquatic ecology and management.

ALL students are required to attend a multi-day fieldtrip in the greater Sydney area, costing approximately \$120.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Clean Water and Sanitation; Life Below Water

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.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Class quiz</u>	20%	No	30th April
<u>Freshwater mesocosm experiment</u>	35%	No	7/3/25; 11/5/25; 16/5/25
<u>Aquatic Environmental Assessment Report</u>	45%	No	13/06/25
<u>Field work attendance and participation</u>	0%	Yes	Week 4

Class quiz

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 10 hours

Due: **30th April**

Weighting: **20%**

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

On successful completion you will be able to:

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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 **1**: Practice-based task

Indicative Time on Task **2**: 25 hours

Due: **7/3/25; 11/5/25; 16/5/25**

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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- 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 **1**: Report

Indicative Time on Task **2**: 33 hours

Due: **13/06/25**

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:

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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.
- 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.

Field work attendance and participation

Assessment Type ¹: Field work task

Indicative Time on Task ²: 0 hours

Due: **Week 4**

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. 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.

¹ 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.

² 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

Lectures will be live on zoom: Tuesday (11-12) and Wednesday (1-2)

No book text is required but some recommendations will be available in iLearn.

FIELD TRIP

The field trip will be to Lake Macquarie. There will be two back to back field trips due to numbers, BUT YOU ONLY ATTEND ONE!

You either attend:

Lake Macquarie Field Trip 1: Mon (17th) and Tues (18th) March **OR**

Lake Macquarie Field Trip 2: Wed (19th) and Thurs (20th) March

Details and registrations for the field trip will be provided in iLearn and discussed in the first lecture. This includes the costs for accommodation and transport (for those requiring it).

PRACITCALs

There are four x 3 hr practicals to attend, these are held on Fridays. Details are provided on iLearn and discussed in the lecture.

Mid-semester Quiz

This will be held online during the lecture on the 30th April.

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 connect.mq.edu.au or if you are a Global MBA student contact 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 the [Service Connect Portal](#), 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/.

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.

Unit information based on version 2025.04 of the [Handbook](#)