



ENVS8353

Environmental Applications of GIS and Remote Sensing

Session 2, In person-scheduled-weekday, North Ryde 2026

School of Natural Sciences

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General Information

Unit convenor and teaching staff

Convenor / Lecturer

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by appointment

Lecturer

Maina Mbui

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by appointment

Credit points

10

Prerequisites

ENV58308 or NSCI7364 or ENV56364

Corequisites

Co-badged status

Unit description

This unit builds on the spatial information science skills acquired in the introductory unit and covers advanced GIS concepts and principles of remote sensing. Topics include: analysis of landscape and environmental variables, GIS modelling, geostatistics, remote sensing systems and a range of case studies. Practical sessions include techniques for spatial data collection, data management, modelling, , and image processing. This unit is designed to prepare students with skills that enhance their educational experience and work-readiness in the field of spatial information science. The GIS software used is ArcGIS. Students enrolling in this unit must have access to a computer with the Windows operating system. Mac or Linux system will not be supported.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Sustainable Cities and Communities; Climate Action; Life on Land.

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: Apply appropriate spatial analyses to derive useful information for making informed decisions

ULO2: Design and implement suitable methodologies for environmental applications using remotely sensed data

ULO3: Demonstrate an understanding of the advantages and limitations of spatial analyses and remote sensing systems

ULO4: Communicate geographic information effectively using maps, reports and presentations

General Assessment Information

Requirements to Pass this Unit

To pass this unit you must achieve a total mark equal to or greater than 50%.

This unit does not have a Hurdle Requirement.

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 7th day (including weekends). After the 7th 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 technical concerns. 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](#). For example, if the assignment is worth 8 marks (of the entire unit) and your submission is late by 19 hours (or 23 hours 59 minutes 59 seconds), 0.4 marks (5% of 8 marks) will be deducted. If your submission is late by 24 hours (or 47 hours 59 minutes 59 seconds), 0.8 marks (10% of 8 marks) will be deducted, and so on.

Assessments where Late Submissions will be accepted

Assessments 1 & 2 - YES, Standard Late Penalty applies.

Assessment 3 (Final Exam) - NO, unless Special Consideration is granted.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Spatial Data Processing and Visualisation	20%	No	13/09/2026	Individual	Yes	Open

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Applied Geospatial Analysis: Solving Environmental Challenges through Integrated GIS & Remote Sensing	50%	No	01/11/2026	Individual and Group	No	Open
Final Exam	30%	No	Exam Period	Individual	No	Observed

Spatial Data Processing and Visualisation

Assessment Type ¹: Portfolio

Indicative Time on Task ²: 15 hours

Due: **13/09/2026**

Weighting: **20%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

Spatial analysis and visualisation are fundamental to professional geospatial practice. You will apply GIS and remote sensing methods to analyse spatial data and communicate insights through clear interpretation and visualisation. This task develops your technical geospatial processing skills and your ability to translate complex spatial data into meaningful outputs.

On successful completion you will be able to:

- Apply appropriate spatial analyses to derive useful information for making informed decisions
- Demonstrate an understanding of the advantages and limitations of spatial analyses and remote sensing systems

Applied Geospatial Analysis: Solving Environmental Challenges through Integrated GIS & Remote Sensing

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 45 hours

Due: **01/11/2026**

Weighting: **50%**

Groupwork/Individual: Individual and Group

Short extension ³: No

AI Approach: Open

This project requires you to integrate knowledge and skills developed in lectures and practicals and to conduct remote sensing analysis. You will present your findings as an oral presentation together with a report.

On successful completion you will be able to:

- Design and implement suitable methodologies for environmental applications using remotely sensed data
- Demonstrate an understanding of the advantages and limitations of spatial analyses and remote sensing systems
- Communicate geographic information effectively using maps, reports and presentations

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 21 hours

Due: **Exam Period**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will undertake a final examination during the formal examination period.

On successful completion you will be able to:

- Apply appropriate spatial analyses to derive useful information for making informed decisions
- Design and implement suitable methodologies for environmental applications using remotely sensed data
- Communicate geographic information effectively using maps, reports and presentations

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
- [Academic Success](#) 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.

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

Week 1 Classes

Both lecture and practical classes commence in week 1.

Lecture program

There is one one-hour lecture per week from **weeks 1 to 13**. Please check lecture timetable and room location before semester starts. The recordings of lectures will be made available via Echo360 after each class.

Practical program

There is one three-hour practical class from **weeks 1 to 12** for ALL students. Please check prac timetable and location (including online session); Zoom links will be provided to the students enrolled in online classes. **ESRI ArcGIS Pro** software is used in this unit and **it only supports Windows systems**. ArcGIS Pro software is available via AppStream at <https://mq.okta.com/>. There is NO on-campus session.

Method of communication

We will communicate with you via your university email and through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.s.mq.edu.au) (<https://policies.s.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/>

Academic Success

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

- [Ask a Study Coach](#)
- [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 <https://students.mq.edu.au/support/technology/service-desk>.

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 learning materials and unit content have been reviewed and updated for the 2026 offering to better support students from a diverse range of academic and professional backgrounds, while strengthening the development of discipline knowledge and practical skills.

The assessments and their weightings have also been revised to better align with the unit learning outcomes and enhance the overall learning experience. These changes have been informed by student feedback and the course's continuous improvement process.

Unit information based on version 2026.03 of the [Handbook](#)