



BIOL877

Topics in Australian Marine Science

S1 Day 2019

Dept of Biological Sciences

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	3
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	5
<u>Delivery and Resources</u>	6
<u>Unit Schedule</u>	8
<u>Policies and Procedures</u>	9
<u>Graduate Capabilities</u>	11
<u>Changes from Previous Offering</u>	16

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Convenor

Jane Williamson

jane.williamson@mq.edu.au

Contact via 0298508167

W21B 103

Jessica Boomer

jessica.boomer@mq.edu.au

Kate Barry

kate.barry@mq.edu.au

Credit points

4

Prerequisites

Admission to MMarScMgt or MConsBiol or GradDipConsBiol or MPlan or MSc or MScInnovation

Corequisites

Co-badged status

Unit description

This unit introduces students to current research undertaken in various disciplines of marine science in Australia. It is a multi-institutional unit taught at the Sydney Institute of Marine Science (SIMS) with contributions from the four University partners of SIMS. Lectures and tutorials will be taught by leading researchers in marine science. Topics cover physical and biological oceanography, climate change, molecular ecology, aquaculture, marine biology and marine geosciences. In practical classes, students will analyse and interpret remote-sensing data from the Integrated Marine Observing System (IMOS), which provides comprehensive information on the biological and physical processes of Australia's coastal and oceanic waters. This gives students hands-on experience in working with and analysing big data sets. BIOL877 is a core unit in Macquarie University's Master of Marine Science and Management 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:

Understanding of the diversity of IMOS data and instrumentation for data collection. The IMOS national facility is collecting comprehensive biological data as well as complex physical and oceanographic data that give a real picture of the coast. By being exposed to the full range of IMOS data you will learn about the different instrumentation (ocean gliders, national mooring network, acoustic arrays, autonomous underwater vehicles) that is used to measure marine systems.

Formulating and testing hypotheses. IMOS data is being used by researchers to answer important questions such as ocean and climate change and variability, major boundary currents, continental shelf processes and biological responses. You will be able to formulate your own hypotheses associated with these topics and decide on how much data is 'needed' to test it.

Accessing and managing data. The internet has made it possible to access large amounts of data covering extensive spatial scales. New skills are needed to access and manage those large data sets. You will learn how to access and manage large datasets using online tools and other software.

Analysing large data sets. You will develop skills to analyse large data sets that are specific for the marine environment using a variety of software programs and tools specifically developed for the course.

Presenting and visualising data. You will learn how to effectively communicate your results through writing a scientific report on your findings.

General Assessment Information

ASSESSMENT DETAILS

Details of assessments will be provided in class, on iLearn (Macquarie University's online unit management system) and/or through the TAMS Moodle.

ASSESSMENT SUBMISSION

Digital copies of all assessments will be required. Assessments will be run through Turnitin. As assessments need to be written in the student's own words.

ACADEMIC HONESTY

Plagiarism is the presentation of thoughts and work of another as one's own.

Examples include:

- Copying thoughts or work of another without appropriate acknowledgement
- Paraphrasing another person's work with very minor changes
- Piecing together sections of the work of others into a new document.

All assessments need to be written in the student's own words. The penalties imposed by the University for plagiarism are serious and may include expulsion from the University. ANY evidence of plagiarism will be dealt with following University policy. Penalties for plagiarism will be imposed for each assessment and clearly defined in marking grades. Further penalties imposed by the Faculty disciplinary committee may range from a loss of all marks and the award of zero depending on the circumstances.

EXTENSIONS, PENALTIES AND DISRUPTION TO STUDIES

The deadlines for assignments are not negotiable. If an assignment is submitted late a penalty of -5% of the mark allocated for the assignment will be deducted per day (i.e. 6 days late = -30% of marks available). Submission must occur within one week (7 days) of the due date or the assignment will not be marked.

Students absent from more than one practical class without approval will be penalised 5% of their overall unit grade for every class missed.

If you experience a serious and unavoidable disruption to your studies and require an extension for an assessment please submit a Disruptions to Studies notification via ask.mq.edu.au with supporting documentation, and a Professional Authority Form completed by your health care professional. If you anticipate a potentially serious and unavoidable disruption (e.g., upcoming surgery) speak to the unit staff early and apply for an extension before the due date.

UNIT COMPLETION

To pass this unit you must achieve an overall minimum grade of 50%.

SUPPLEMENTARY EXAMS

If you receive special consideration for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. You can check the supplementary examination information page on FSE101 in iLearn (bit.ly/FSESupp) for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Written assignments on practic</u>	60%	No	TBA
<u>Exam</u>	40%	No	TBA

Written assignments on practic

Due: **TBA**

Weighting: **60%**

Due: The week following the module's conclusion or as directed by the lecturer.

You are required to hand in written assignments based on the results of exercises completed as part of the practical modules. These will be submitted as an electronic report before the beginning of the practical class the week following the module's conclusion, or as instructed by the lecturer. Reports will include graphs and figures as well as the interpretation of your results in the broader context of the topic. Each practical module is worth 10%. Note some of the modules may be assessed over multiple weeks and will be worth 20% (Physical Oceanography module), while others may involve submitting multiple smaller reports each worth 5% (R module). The results of the IMOS practical (Week 1) are not assessed.

On successful completion you will be able to:

- Understanding of the diversity of IMOS data and instrumentation for data collection. The IMOS national facility is collecting comprehensive biological data as well as complex physical and oceanographic data that give a real picture of the coast. By being exposed to the full range of IMOS data you will learn about the different instrumentation (ocean gliders, national mooring network, acoustic arrays, autonomous underwater vehicles) that is used to measure marine systems.
- Formulating and testing hypotheses. IMOS data is being used by researchers to answer important questions such as ocean and climate change and variability, major boundary currents, continental shelf processes and biological responses. You will be able to formulate your own hypotheses associated with these topics and decide on how much data is 'needed' to test it.
- Accessing and managing data. The internet has made it possible to access large amounts of data covering extensive spatial scales. New skills are needed to access and manage those large data sets. You will learn how to access and manage large datasets using online tools and other software.
- Analysing large data sets. You will develop skills to analyse large data sets that are

specific for the marine environment using a variety of software programs and tools specifically developed for the course.

- Presenting and visualising data. You will learn how to effectively communicate your results through writing a scientific report on your findings.

Exam

Due: **TBA**

Weighting: **40%**

You will sit an exam at the conclusion of the unit. The exam format will be 20 multiple choice questions based on the seminar series and five short answer questions addressing the practical modules you have worked on during the semester.

On successful completion you will be able to:

- Understanding of the diversity of IMOS data and instrumentation for data collection. The IMOS national facility is collecting comprehensive biological data as well as complex physical and oceanographic data that give a real picture of the coast. By being exposed to the full range of IMOS data you will learn about the different instrumentation (ocean gliders, national mooring network, acoustic arrays, autonomous underwater vehicles) that is used to measure marine systems.
- Formulating and testing hypotheses. IMOS data is being used by researchers to answer important questions such as ocean and climate change and variability, major boundary currents, continental shelf processes and biological responses. You will be able to formulate your own hypotheses associated with these topics and decide on how much data is 'needed' to test it.
- Accessing and managing data. The internet has made it possible to access large amounts of data covering extensive spatial scales. New skills are needed to access and manage those large data sets. You will learn how to access and manage large datasets using online tools and other software.
- Analysing large data sets. You will develop skills to analyse large data sets that are specific for the marine environment using a variety of software programs and tools specifically developed for the course.
- Presenting and visualising data. You will learn how to effectively communicate your results through writing a scientific report on your findings.

Delivery and Resources

STUDY COMMITMENT

All classes in BIOL877 are held on Thursdays at the Sydney Institute of Marine Science (SIMS)

SEMINARS

A seminar series is built around current research questions in Australian marine science. Scientists from a number of disciplines will showcase their research and the most important research questions in their field in a one-hour weekly seminar.

Seminars take place weekly from 1.15pm to 2.15pm at SIMS.

PRACTICAL CLASSES

The practicals will introduce you to Australia's Integrated Marine Observing System (IMOS), a national infrastructure facility that collects oceanographic data from Australia's coasts and oceans. These data are made publicly available and used by scientists to explore and monitor biological and oceanographic processes in coastal and offshore marine environments.

Practical classes usually consist of a one-hour tutorial followed by a two-hour hands-on practical. They run weekly from 9.30am to 12.30pm at SIMS.

UNIT WEBSITE

The unit web page can be accessed via the student portal (log in at <https://iLearn.mq.edu.au/login/MQ/>). There you will find unit information, resource material, announcements, forums and dialogue facilities. You are encouraged to use the discussion and email facilities for communication amongst your fellow MQ students and the MQ unit convenor. Please check the unit website regularly for any announcements and additional resource material.

BIOL877 is unusual in that delivery of the unit spans four Universities. Because of this, you will also receive information through the TAMS Moodle, which will be explained to you by the Unit staff on the first day.

Lectures and information in the Practical classes will be recorded, although it is expected that you attend in person unless a prior arrangement has been made.

TECHNOLOGY USED AND REQUIRED

Students are expected to access all unit material through the iLearn and Moodle websites. Basic multimedia software (e.g., Windows Media Player, Quicktime) will be needed to listen to recorded lectures. Students will be required to use internet resources for sourcing information and to use the appropriate software.

As we are working with large freely available datasets, the practicals will all be computer-based. You are encouraged to bring your own laptop if you have one as it will be easier to continue your work at home from where you left off in class. We will be providing you with some software for use in some classes but in others, the work will be web-based or via electronic spreadsheets.

Before coming to class please do the following:

- Ensure you are running up-to-date software with all security patches installed
- Have either Mozilla Firefox or Google Chrome installed, in addition to your default web browser. These browsers are more compatible with our software.
- Install Microsoft Excel and some form of a word processor (e.g., Microsoft Word). There are student versions of these available, and there are also some free alternatives.
- Have your computer language and keyboard set to English for any practicals conducted in R.

SOFTWARE INSTALLATION

Throughout this unit you will be required to install a variety of software. The software is provided for you but you will be required to install the software BEFORE the relevant class. Please try to install the software in the first week or two of classes so we can address any issues well in advance. The unit coordinator will be available to assist with software installation from 8.30am each Thursday morning at SIMS.

Further information about software installation will be provided in a separate handout.

ASSUMED KNOWLEDGE

This unit is data-intensive. You will be downloading, manipulating and analysing datasets with many thousands of observations. As a result, you need to be proficient in the use of Microsoft Excel and basic statistics. Please check the assumed knowledge section of the iLearn website prior to the practicals for online tutorials covering these topics.

WIRELESS ACCESS AT SIMS

A special wireless network has been set up for TAMS at the Sydney Institute of Marine Science.

SSID: TAMS

Password: tams2019

Unit Schedule

2019 Topics in Australian Marine Science (TAMS) Schedule				
Semester Week	Date	Tutorials/Practical (9:30am – 12:30pm)	Lunch	Seminars (1:15 – 2:15 pm)
1	28-Feb-19	1. Welcome; 2. Course Overview/Expectations/ Computing; 3. Introduction to the AODN Ocean Portal	Welcome Lunch	Marine Microbes around Australia

2	7-Mar-19	Introduction to R	SIMS Lab Tour	Whales
3	14-Mar-19	Animal Tracking		An overview of Research at SIMS
4	21-Mar-19	Animal Tracking		Climate Change
5	28-Mar-19	Physical Oceanography		Coastal Ocean Dynamics
6	4-Apr-19	Physical Oceanography		Restoration Ecology
7	11-Apr-19	Physical Oceanography		Marine Palaeontology
8	18-Apr-19	Statistics for Marine Science in R	SIMS Discovery Centre Tour	Reef Management
Mid-semester Break 19-28 th Apr				
9	2-May-19	Zooplankton		Ecology of Coastal Tropical Sharks
10	9-May-19	Zooplankton		Threatened Species Management
11	16-May-19	Autonomous Underwater Vehicles/Benthic Ecology		Geoscience
12	23-May-19	Exam	BBQ	

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) (<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](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://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

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 outcomes

- Understanding of the diversity of IMOS data and instrumentation for data collection. The IMOS national facility is collecting comprehensive biological data as well as complex physical and oceanographic data that give a real picture of the coast. By being exposed to the full range of IMOS data you will learn about the different instrumentation (ocean gliders, national mooring network, acoustic arrays, autonomous underwater vehicles) that is used to measure marine systems.
- Formulating and testing hypotheses. IMOS data is being used by researchers to answer important questions such as ocean and climate change and variability, major boundary currents, continental shelf processes and biological responses. You will be able to formulate your own hypotheses associated with these topics and decide on how much data is 'needed' to test it.
- Accessing and managing data. The internet has made it possible to access large amounts of data covering extensive spatial scales. New skills are needed to access and manage those large data sets. You will learn how to access and manage large datasets

using online tools and other software.

- Analysing large data sets. You will develop skills to analyse large data sets that are specific for the marine environment using a variety of software programs and tools specifically developed for the course.
- Presenting and visualising data. You will learn how to effectively communicate your results through writing a scientific report on your findings.

Assessment tasks

- Written assignments on practice
- Exam

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

- Understanding of the diversity of IMOS data and instrumentation for data collection. The IMOS national facility is collecting comprehensive biological data as well as complex physical and oceanographic data that give a real picture of the coast. By being exposed to the full range of IMOS data you will learn about the different instrumentation (ocean gliders, national mooring network, acoustic arrays, autonomous underwater vehicles) that is used to measure marine systems.
- Formulating and testing hypotheses. IMOS data is being used by researchers to answer important questions such as ocean and climate change and variability, major boundary currents, continental shelf processes and biological responses. You will be able to formulate your own hypotheses associated with these topics and decide on how much data is 'needed' to test it.
- Accessing and managing data. The internet has made it possible to access large amounts of data covering extensive spatial scales. New skills are needed to access and manage those large data sets. You will learn how to access and manage large datasets using online tools and other software.
- Analysing large data sets. You will develop skills to analyse large data sets that are specific for the marine environment using a variety of software programs and tools specifically developed for the course.
- Presenting and visualising data. You will learn how to effectively communicate your

results through writing a scientific report on your findings.

Assessment tasks

- Written assignments on practice
- Exam

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

- Understanding of the diversity of IMOS data and instrumentation for data collection. The IMOS national facility is collecting comprehensive biological data as well as complex physical and oceanographic data that give a real picture of the coast. By being exposed to the full range of IMOS data you will learn about the different instrumentation (ocean gliders, national mooring network, acoustic arrays, autonomous underwater vehicles) that is used to measure marine systems.
- Formulating and testing hypotheses. IMOS data is being used by researchers to answer important questions such as ocean and climate change and variability, major boundary currents, continental shelf processes and biological responses. You will be able to formulate your own hypotheses associated with these topics and decide on how much data is 'needed' to test it.
- Accessing and managing data. The internet has made it possible to access large amounts of data covering extensive spatial scales. New skills are needed to access and manage those large data sets. You will learn how to access and manage large datasets using online tools and other software.
- Analysing large data sets. You will develop skills to analyse large data sets that are specific for the marine environment using a variety of software programs and tools specifically developed for the course.
- Presenting and visualising data. You will learn how to effectively communicate your results through writing a scientific report on your findings.

Assessment tasks

- Written assignments on practice

- Exam

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 outcomes

- Understanding of the diversity of IMOS data and instrumentation for data collection. The IMOS national facility is collecting comprehensive biological data as well as complex physical and oceanographic data that give a real picture of the coast. By being exposed to the full range of IMOS data you will learn about the different instrumentation (ocean gliders, national mooring network, acoustic arrays, autonomous underwater vehicles) that is used to measure marine systems.
- Formulating and testing hypotheses. IMOS data is being used by researchers to answer important questions such as ocean and climate change and variability, major boundary currents, continental shelf processes and biological responses. You will be able to formulate your own hypotheses associated with these topics and decide on how much data is 'needed' to test it.
- Accessing and managing data. The internet has made it possible to access large amounts of data covering extensive spatial scales. New skills are needed to access and manage those large data sets. You will learn how to access and manage large datasets using online tools and other software.
- Analysing large data sets. You will develop skills to analyse large data sets that are specific for the marine environment using a variety of software programs and tools specifically developed for the course.
- Presenting and visualising data. You will learn how to effectively communicate your results through writing a scientific report on your findings.

Assessment tasks

- Written assignments on practice
- Exam

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 outcomes

- Accessing and managing data. The internet has made it possible to access large amounts of data covering extensive spatial scales. New skills are needed to access and manage those large data sets. You will learn how to access and manage large datasets using online tools and other software.
- Analysing large data sets. You will develop skills to analyse large data sets that are specific for the marine environment using a variety of software programs and tools specifically developed for the course.
- Presenting and visualising data. You will learn how to effectively communicate your results through writing a scientific report on your findings.

Assessment tasks

- Written assignments on practice
- Exam

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 outcomes

- Formulating and testing hypotheses. IMOS data is being used by researchers to answer important questions such as ocean and climate change and variability, major boundary currents, continental shelf processes and biological responses. You will be able to formulate your own hypotheses associated with these topics and decide on how much data is 'needed' to test it.
- Presenting and visualising data. You will learn how to effectively communicate your results through writing a scientific report on your findings.

Assessment tasks

- Written assignments on practice
- Exam

Changes from Previous Offering

The following changes from 2018 will occur for TAMS in 2019:

- The exam is now worth 40% instead of 50%
- The written assessment has been combined with the practical exercises to allow students to explore the practical topics in more depth. These written assignments, which follow the practical modules, will be worth 60% in total.