BIOL877
Topics in Australian Marine Science
S1 Day 2017
Dept of Biological Sciences

Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>2</td>
</tr>
<tr>
<td>Learning Outcomes</td>
<td>2</td>
</tr>
<tr>
<td>Assessment Tasks</td>
<td>3</td>
</tr>
<tr>
<td>Delivery and Resources</td>
<td>6</td>
</tr>
<tr>
<td>Unit Schedule</td>
<td>7</td>
</tr>
<tr>
<td>Learning and Teaching Activities</td>
<td>8</td>
</tr>
<tr>
<td>Policies and Procedures</td>
<td>9</td>
</tr>
<tr>
<td>Graduate Capabilities</td>
<td>10</td>
</tr>
</tbody>
</table>

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
SIMS unit corordinator
Dr Jessica Boomer
jessica.boomer@sims.org.au
Contact via +61 2 9385 2073

Caitlin Kordis
caitlin.kordis@mq.edu.au

Credit points
4

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

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 are taught by leading marine science researchers. Topics cover physical and biological oceanography, climate change, molecular ecology, aquaculture, marine biology and marine geosciences. In practical classes, students analyse and interpret remote-sensing data from the Integrated Marine Observing System, which provides comprehensive information on the biological and physical processes of Australia's coastal and oceanic waters.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

Learning Outcomes

1. After completion of this unit, you should be able to adopt a critical thinking, evidence-based approach to key research questions in marine science and management. The acquired knowledge and skills will be directly transferable to the workplace and professional practice. The case-based problems developed for this unit focus on the following learning outcomes.
2. Understanding of the diversity of IMOS data and instrumentation for data collection:
The Australian Integrated Marine Observing System (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 (remote sensing equipment, acoustic arrays,
autonomous underwater vehicles, ocean gliders) that is used to measure marine
systems.

3. 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.

4. 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.

5. 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 unit.

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

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DRAFT ONLY Practical exercises</strong></td>
<td>60%</td>
<td>No</td>
<td>as per SIMS schedule</td>
</tr>
<tr>
<td><strong>DRAFT ONLY Writing assignment</strong></td>
<td>10%</td>
<td>No</td>
<td>11 May 2017</td>
</tr>
<tr>
<td><strong>DRAFT ONLY Examination</strong></td>
<td>30%</td>
<td>No</td>
<td>8 June 2017</td>
</tr>
</tbody>
</table>

**DRAFT ONLY Practical exercises**

Due: as per SIMS schedule
Weighting: 60%

**Practical Exercises** - you will be required to hand in the results of your practical class exercises
at the beginning of the practical class the week following the module's completion. Each module
is worth 5%, but some may be assessed over two weeks (and so will be worth 10%).
This Assessment Task relates to the following Learning Outcomes:

- After completion of this unit, you should be able to adopt a critical thinking, evidence-based approach to key research questions in marine science and management. The acquired knowledge and skills will be directly transferable to the workplace and professional practice. The case-based problems developed for this unit focus on the following learning outcomes.

1. Understanding of the diversity of IMOS data and instrumentation for data collection: The Australian Integrated Marine Observing System (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 (remote sensing equipment, acoustic arrays, autonomous underwater vehicles, ocean gliders) that is used to measure marine systems.

2. 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.

3. 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.

4. 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 unit.

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

DRAFT ONLY Writing assignment

Due: 11 May 2017
Weighting: 10%

Writing assignment - You will be provided with the outline of the writing assignment in week 3. See the SIMS unit guide for TAMS for full instructions.
This Assessment Task relates to the following Learning Outcomes:

• After completion of this unit, you should be able to adopt a critical thinking, evidence-based approach to key research questions in marine science and management. The acquired knowledge and skills will be directly transferable to the workplace and professional practice. The case-based problems developed for this unit focus on the following learning outcomes.

• 1. Understanding of the diversity of IMOS data and instrumentation for data collection: The Australian Integrated Marine Observing System (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 (remote sensing equipment, acoustic arrays, autonomous underwater vehicles, ocean gliders) that is used to measure marine systems.

• 2. 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.

• 3. 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.

• 4. 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 unit.

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

DRAFT ONLY Examination
Due: 8 June 2017
Weighting: 30%

Examination - see the SIMS printed unit guide for TAMS for instructions (note the duration of the final examination has not been finalised).
This Assessment Task relates to the following Learning Outcomes:

• After completion of this unit, you should be able to adopt a critical thinking, evidence-based approach to key research questions in marine science and management. The acquired knowledge and skills will be directly transferable to the workplace and professional practice. The case-based problems developed for this unit focus on the following learning outcomes.

• 1. Understanding of the diversity of IMOS data and instrumentation for data collection: The Australian Integrated Marine Observing System (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 (remote sensing equipment, acoustic arrays, autonomous underwater vehicles, ocean gliders) that is used to measure marine systems.

• 2. 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.

• 4. 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 unit.

Delivery and Resources

Study commitment

All classes in BIOL877 are held on Thursdays at the Sydney Institute of Marine Science.

Practical classes

The practical classes will introduce you to IMOS – Australia’s Integrated Marine Observing System, 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 the coastal and marine environment.

During most weeks of the semester there is a weekly one-hour tutorial followed by a two-hour practical class. Attendance to the tutorials and practical classes is compulsory.

Students absent from more than one practical class without approval will be penalized 5% from
their final semester mark for every class missed.

Please inquire with your university about special consideration for longer absences.

Seminars/lectures

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

Seminars take place weekly.

**Unit Schedule**

**THIS IS A DRAFT TIMETABLE ONLY AND WILL BE UPDATED AT THE FIRST CLASS ON 2 MARCH 2017.**

2017 Topics in Australian Marine Science (TAMS) Unit Schedule:

TAMS will be following the Universities Australia Academic dates. As such the first day of classes will be **Thursday 2nd March**. There will be **no classes on Thursday 20th April** (mid-semester break) and we will finish on 8th June with the exam and a BBQ.

Classes start 9:30AM in the SIMS admin building (Building 19, Chowder Bay Road, Mosman) and finish 2:15.

---

<table>
<thead>
<tr>
<th>2017 Topics in Australian Marine Science (TAMS) Course Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tutorials/Practical (9:30am – 12:30pm)</strong></td>
</tr>
<tr>
<td><strong>Week 1 (2 Mar)</strong></td>
</tr>
<tr>
<td><strong>Week 2 (9 Mar)</strong></td>
</tr>
<tr>
<td><strong>Week 3 (16 Mar)</strong></td>
</tr>
<tr>
<td><strong>Week 4 (23 Mar)</strong></td>
</tr>
<tr>
<td><strong>Week 5 (30 Mar)</strong></td>
</tr>
</tbody>
</table>

https://unitguides.mq.edu.au/unit_offerings/78183/unit_guide/print
### Learning and Teaching Activities

#### Practical Classes

Practical classes will start at 9.30 am in the Seminar Room of the main administration building (Building 19) at the Sydney Institute of Marine Science (SIMS). The practical will run for 3 hours (9.30-12.30) followed by a seminar from 1.15 pm-2.15 pm.

<table>
<thead>
<tr>
<th>Week 6 (6 Apr)</th>
<th>PRAC 8: Physical Oceanography - Moorings (Matt Archer)</th>
<th>DPI Age and Growth</th>
<th>Fisheries Research and Management (John Stewart and Doug Ferrell)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 7 (13 April)</td>
<td>PRAC 7: Physical Oceanography - Radar (Matt Archer)</td>
<td></td>
<td>Biological Oceanography (Iain Suthers)</td>
</tr>
<tr>
<td><strong>Mid-semester break : 25 Mar - 3 Apr</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 8 (27 Apr)</td>
<td>PRAC 8: Zooplankton Ecology (Anthony Richardson, Jason Everett &amp; Iain Suthers)</td>
<td>Zooplankton Ecology (Anthony Richardson)</td>
<td></td>
</tr>
<tr>
<td>Week 9 (4 May)</td>
<td>PRAC 9: Zooplankton Ecology (Iain Suthers and Jason Everett)</td>
<td>SIMS Visitors Centre</td>
<td>Animal Tracking (Kate Lee)</td>
</tr>
<tr>
<td>Week 10 (11 May)</td>
<td>PRAC 10: Animal Tracking (Kate Lee)</td>
<td>Antarctic Marine Research (Graeme Clark)</td>
<td></td>
</tr>
<tr>
<td>Week 11 (18 May)</td>
<td>PRAC 11: Animal Tracking (Kate Lee)</td>
<td>Benthic Ecology (Ziggy Marzinelli)</td>
<td></td>
</tr>
<tr>
<td>Week 12 (25 May)</td>
<td>PRAC 12: Autonomous Underwater Vehicles (Ziggy Marzinelli)</td>
<td>Large Scale Restoration of Tidal Ecosystems (Will Glamore)</td>
<td></td>
</tr>
<tr>
<td>Week 13 (1 Jun)</td>
<td>PRAC 13: Autonomous Underwater Vehicles (Ziggy Marzinelli)</td>
<td>Geosciences (Eleanor Bruce)</td>
<td></td>
</tr>
<tr>
<td>Week 14 (8 Jun)</td>
<td>EXAM (Jessica Boomer)</td>
<td>Final BBQ</td>
<td>BBQ</td>
</tr>
</tbody>
</table>

This year it looks like Macquarie also has mid-semester breaks in week 8 of the TAMS program. Students will be expected to attend class in week 8 unless they have a university field trip.

---

**Unit guide** BIOL877 Topics in Australian Marine Science

https://unitguides.mq.edu.au/unit_offerings/78183/unit_guide/print
Seminars/lectures

Lectures and tutorials will be taught by leading marine science researchers. Topics will cover physical and biological oceanography, climate change, molecular ecology, aquaculture, marine biology and marine geosciences.

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:


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/](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](http://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/](http://students.mq.edu.au/support/)

Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
Graduate Capabilities

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

- After completion of this unit, you should be able to adopt a critical thinking, evidence-based approach to key research questions in marine science and management. The acquired knowledge and skills will be directly transferable to the workplace and professional practice. The case-based problems developed for this unit focus on the following learning outcomes.
- 2. 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.
- 3. 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.

- 4. 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 unit.

Assessment tasks

- DRAFT ONLY Practical exercises
- DRAFT ONLY Writing assignment
- DRAFT ONLY Examination

Learning and teaching activities

- practical classes will start at 9.30 am in the Seminar Room of the main administration building (Building 19) at the Sydney Institute of Marine Science (SIMS). The practical will run for 3 hours (9.30-12.30) followed by a seminar from 1.15 pm-2.15 pm.
- Lectures and tutorials will be taught by leading marine science researchers. Topics will cover physical and biological oceanography, climate change, molecular ecology, aquaculture, marine biology and marine geosciences.

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

- 1. Understanding of the diversity of IMOS data and instrumentation for data collection: The Australian Integrated Marine Observing System (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 (remote sensing equipment, acoustic arrays, autonomous underwater vehicles, ocean gliders) that is used to measure marine systems.
- 5. Presenting and visualising data You will learn how to effectively communicate your results through writing a scientific report on your findings.
Assessment tasks

• DRAFT ONLY Practical exercises
• DRAFT ONLY Writing assignment
• DRAFT ONLY Examination

Learning and teaching activities

• practical classes will start at 9.30 am in the Seminar Room of the main administration building (Building 19) at the Sydney Institute of Marine Science (SIMS). The practical will run for 3 hours (9.30-12.30) followed by a seminar from 1.15 pm-2.15 pm.

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

• After completion of this unit, you should be able to adopt a critical thinking, evidence-based approach to key research questions in marine science and management. The acquired knowledge and skills will be directly transferable to the workplace and professional practice. The case-based problems developed for this unit focus on the following learning outcomes.
  • 3. 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.
  • 4. 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 unit.

Assessment tasks

• DRAFT ONLY Practical exercises
• DRAFT ONLY Writing assignment
• DRAFT ONLY Examination

Learning and teaching activities

• Lectures and tutorials will be taught by leading marine science researchers. Topics will cover physical and biological oceanography, climate change, molecular ecology,
aquaculture, marine biology and marine geosciences.

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

- After completion of this unit, you should be able to adopt a critical thinking, evidence-based approach to key research questions in marine science and management. The acquired knowledge and skills will be directly transferable to the workplace and professional practice. The case-based problems developed for this unit focus on the following learning outcomes.

  1. Understanding of the diversity of IMOS data and instrumentation for data collection: The Australian Integrated Marine Observing System (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 (remote sensing equipment, acoustic arrays, autonomous underwater vehicles, ocean gliders) that is used to measure marine systems.

  2. 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.

  3. 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.

  4. 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 unit.

Assessment tasks

- DRAFT ONLY Practical exercises

https://unitguides.mq.edu.au/unit_offerings/78183/unit_guide/print
Learning and teaching activities

- practical classes will start at 9.30 am in the Seminar Room of the main administration building (Building 19) at the Sydney Institute of Marine Science (SIMS). The practical will run for 3 hours (9.30-12.30) followed by a seminar from 1.15 pm-2.15 pm.

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

- 1. Understanding of the diversity of IMOS data and instrumentation for data collection: The Australian Integrated Marine Observing System (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 (remote sensing equipment, acoustic arrays, autonomous underwater vehicles, ocean gliders) that is used to measure marine systems.
- 5. Presenting and visualising data You will learn how to effectively communicate your results through writing a scientific report on your findings.

Assessment tasks

- DRAFT ONLY Practical exercises
- DRAFT ONLY Writing assignment

Learning and teaching activities

- Lectures and tutorials will be taught by leading marine science researchers. Topics will cover physical and biological oceanography, climate change, molecular ecology, aquaculture, marine biology and marine geosciences.

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**

- 1. Understanding of the diversity of IMOS data and instrumentation for data collection: The Australian Integrated Marine Observing System (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 (remote sensing equipment, acoustic arrays, autonomous underwater vehicles, ocean gliders) that is used to measure marine systems.

- 2. 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.

- 3. 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.

- 4. 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 unit.

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

**Assessment tasks**

- DRAFT ONLY Practical exercises
- DRAFT ONLY Writing assignment

**Learning and teaching activities**

- practical classes will start at 9.30 am in the Seminar Room of the main administration building (Building 19) at the Sydney Institute of Marine Science (SIMS). The practical will run for 3 hours (9.30-12.30) followed by a seminar from 1.15 pm-2.15 pm.
- Lectures and tutorials will be taught by leading marine science researchers. Topics will cover physical and biological oceanography, climate change, molecular ecology, aquaculture, marine biology and marine geosciences.