

ENVR3140

Water is Life: Aquatic Ecosystem Services

Tentative Schedule and order of material to be covered

2023 Week starting	Topics	Due this week (Wednesdays)
September 6	Treaty 1; Introduction to Key Concepts in Ecosystem Services; Categorization Schemes; Limitations	
September 11	Cultural Services: Human well-being, Art, Story, Spirit, Education, and Fun	
September 18	Water is Life -- Pipelines, Water Advisories, and Indigenous Water Rights	Pages 1-6
September 25	Everything Flows: Science As Process, Storywork and Myth	Project Proposals (with instructor)
October 2	National Truth and Reconciliation Day – No class Monday, Activities on Campus	
October 3	Water is Alive -- Microbes as Ecosystem Service Providers: Diversity, Metabolism, and Evolution	Pages 7-12
October 9	Thanksgiving -- No Class Monday	
October 11	Provisioning Services: Commercial and Wild Foods from the Sea, Energy and Ecology, Genetic Resources	
October 16	Deep Sea Mining and Trawling	Pages 13-18
October 23	Regulating Services: Water Quality Maintenance, Bioremediation, and Climate Stabilization	Project Draft Deadline (written)
October 30	Oil Spill Bioremediation by Microbes + Experiment	Pages 19-24
November 6	Habitat Supporting Services: Primary Production, Nutrient Cycling	Project Updates (with instructor)
November 13	Fall Break -- No Classes all week	
November 20	The Future of Sea Ice and Arctic Marine Ecosystems	Pages 25-30
November 27	Disturbance and Redundancy; Tipping Points for Biodiversity; Policy & Implementation; Circular Economies; Blue Economies	
December 4	The Anthropocene: Future Directions for Planet Earth and Humanity	Pages 31-36
December 11	(Finals Week) Project Presentations	Project Presentations Pages 37-40

Faculty of Environment, Earth and Resources
Department of Environment and Geography
University of Manitoba

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Office Hours: by email or drop-in MWF 2:30-3:30

Course Times: MWF 1:30-2:20

Course Location: St. John's 202

Credit Hours: 3 + 0

Prerequisites: ((BIOL 1010 OR (BIOL 1020 AND BIOL 1030)) AND (CHEM 1300)) OR ENVR2000

Course Materials:

Required

None.

Recommended

Bouma, Jetske A., and Pieter JH van Beukering, eds. Ecosystem services: from concept to practice. Cambridge University Press, 2015.

Marine Ecosystems: Human Impacts on Biodiversity, Functioning and Services (2015) Crowe and Frid, Eds. ISBN 9781107675087

Nicholson, Daniel J., and John Dupré. Everything flows: Towards a processual philosophy of biology. Oxford University Press, 2018.

Other readings and notes will be distributed via UM Learn.

Outline:

This course introduces the field of Ecosystem Services, an analytical framework for evaluating the economic, cultural, and biogeochemical contributions that ecosystems make to human health and well-being. Examples will be drawn from aquatic ecosystems and cover topics such as pollution and contamination cleanup, commercial and subsistence food provisioning, climate regulation, and cultural uses in folklore, art, religion, science, and recreation. A special emphasis will be made on microbes as key biological drivers of aquatic ecosystems, including topics in microbial diversity, metabolism, and evolution. This course is graded on the letter grade system.

Objectives:

- Learn to think from a processual viewpoint
- Use mythical/storywork frameworks to understand self and other perspectives regarding aquatic ecosystems
- Increase mindfulness of water and aquatic ecosystems
- Advance personal development and well-being
- Understand the role of microbes in maintaining and providing aquatic ecosystem services
- Conduct service project to share knowledge and experience for the advancement and preservation of aquatic ecosystem services

Grading Scheme:

Attendance and Participation: 20%. Students are expected to attend class and participate in group discussions to the best of their ability.

Daily Pages: 40% (40 prompts worth 1% each). You will be provided writings prompts at intervals throughout the course. The responses are due in batches of 6 every 2 weeks on Wednesdays. To be acceptable, the responses should be related to the prompt and should be at least 500 words each on average for the 6 responses. The style (descriptive, expository, persuasive, narrative, technical, poetic) is up to you. The responses are graded complete/incomplete, but writing feedback will be provided. Files should be submitted to UMLearn in .doc, .docx, .odf, .txt, or .rtf formats so that I can use Track Changes (i.e. please no PDFs or Papers files).

Service Project: 40%. A service project is defined as any project that benefits other people or the environment (aka outside of the class) and is directly related to Aquatic Ecosystem Services. The form of each project will be negotiated with the instructor, but could include creative projects (art, music, sculpture, theater posted to TikTok or Youtube, etc.), be research-oriented (e.g. collecting data and writing a scientific manuscript), or direct action (public outreach, water quality monitoring, trash cleanup, activist efforts, etc.). The project must be developed specifically for this class and equate to approximately 20 hours of service (10% of final grade). A draft worth 10% of the final grade is due mid-term. The final project must be presented to the class (10 minutes each) during Finals Week (10% of final grade). Multiple students can work together on one project. Final project documentation must be submitted at the end of the term describing the purpose/motivation, the connection to ecosystem services, hours worked, methods/strategies/techniques, results/outcomes, and discussion/reflection (5 pages double spaced, 10% of final grade).

There is no final exam.

Total: 100%

Policy regarding late assignments: Writing assignments are due 1 hour following class on Wednesdays (see schedule). Each student will be provided one one-week extension for use during the semester with no penalty. No additional extensions will be provided without a formal excusal from the registrar.

Evaluative Feedback: Will be provided in the form of annotations and suggestions to daily pages.

Final Grade: A total mark of less than 50% in the course will result in a grade of **F**. Marks between 50% and 100% will be graded from **D** to **A+** according to the Department of Environment and Geography grading scheme below:

Letter Grade / Percentage

90-100 / A+

80-89 / A

75-79 / B+

70-74 / B

65-69 / C+

60-64 / C

50-59 / D

<49.9 / F

Academic Conduct: Students should acquaint themselves with the University's policy on plagiarism and cheating and examination impersonation (see University of Manitoba General Calendar). The copying of another student's assignment (or an instructor's answer sheet from a previous year) or the submission of the same material for two or more courses is plagiarism. Plagiarism and other forms of cheating are prohibited. The full definition of plagiarism and the possible penalties associated with it are outlined in the General Calendar. If your submitted assignment contains material you have copied from another source (e.g., from a textbook, web page, or from the published literature) you must give proper credit to that source.

Medical Circumstances:

Students who are unable to meet a course requirement due to medical circumstances are currently not required to submit medical notes. However, students are required to contact their instructor or academic advisor by email to inform of the missed work and to make arrangements for extensions, deferrals, or make-up assignments. Please follow these guidelines if you are unable to meet an academic requirement for your courses.

- Contact your instructor for term work such as a class, quiz, midterm/test, assignment, lab;
- Contact an advisor in your faculty/college/school of registration for a missed final exam (scheduled in the final examination period);

- Inform your instructor/advisor as soon as possible do not delay. Note for final exams, students must contact within 48 hours of the date of the final exam; and
- Email your instructor/advisor from a U of M email address, and include your full name, student number, course number, and academic work that was missed.

Sep. 19

Last date to drop Fall term and Fall/Winter term spanning courses with refunds

Nov. 21

Voluntary Withdrawal (VW) deadline Fall term classes