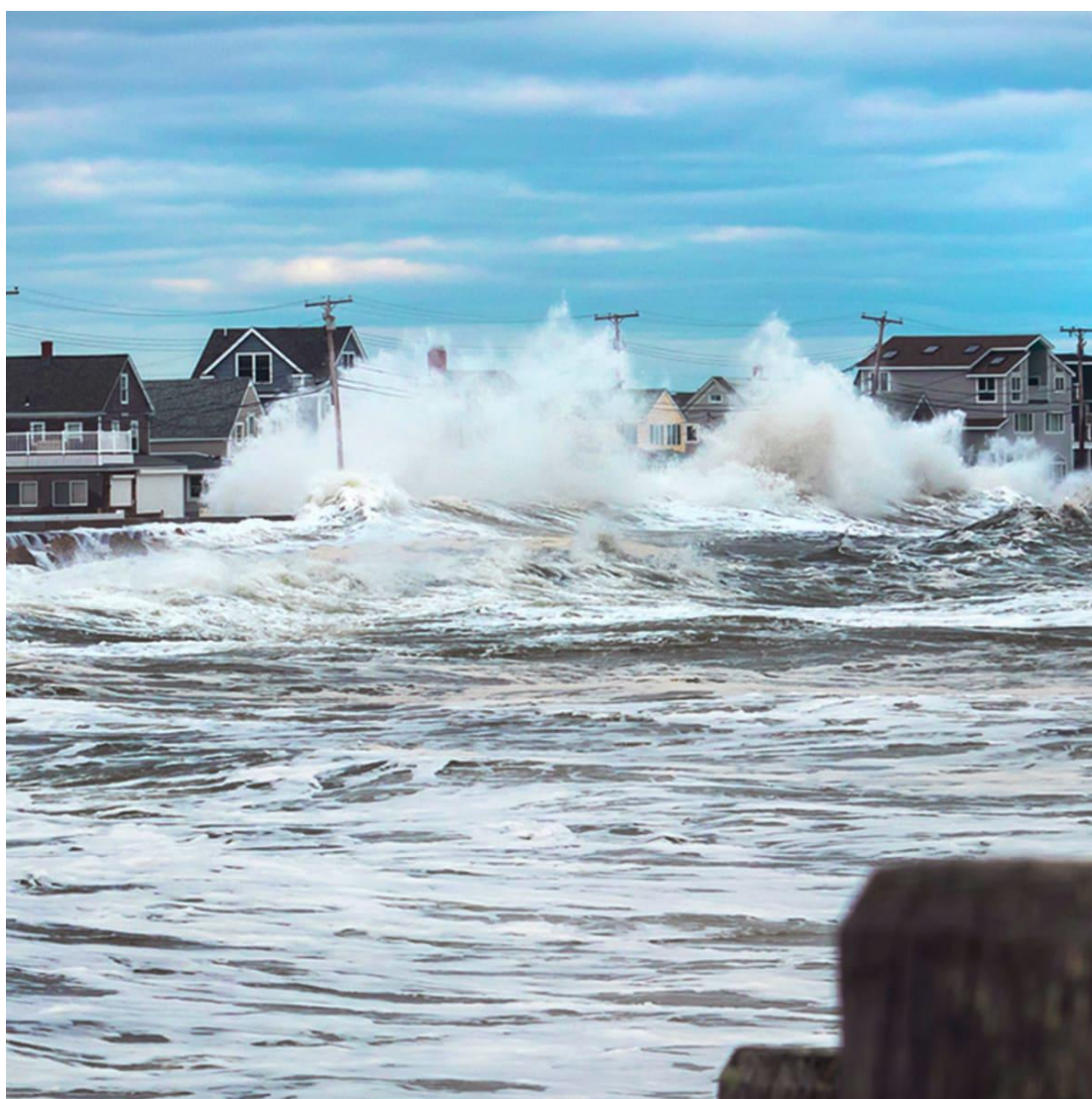


**GEOG514: Climate Change Vulnerability and Adaptation  
Fall 2022**

11:35 AM - 2:25 PM Thursdays  
From September 1st - December 1, 2022

Burnside Hall Room 308  
Instructor: Assistant Professor Mette Bendixen  
Mail: [mette.bendixen@mcgill.ca](mailto:mette.bendixen@mcgill.ca)\*

Office hours: Wednesdays 1:00PM-2:00PM starting September 7, 2022  
Professor Bendixen's office: Burnside 420 (4th floor)  
*(If needed, online office hours available upon request during same time slot)*



*In extraordinary circumstances beyond the University's control (or the Profs'!), the content and/or evaluation scheme in this course is subject to change.*

*\* I do not respond to emails in the evenings or during weekends.*

Welcome everyone to GEOG514 - I am excited to have you in the course!

Enrolling in this course is a serious commitment on your part to actively learn about the topics covered during the seminars. I strive to create a collegial seminar series with a class dynamic built on trust and curiosity, where students can build on their existing skill sets. The course is structured in a way that gives you ownership, flexibility and numerous ways to earn your overall course grade. Thereby, you will have a range of opportunities to practise and demonstrate what you are learning throughout the course.

The course will focus on climate change vulnerability and adaptation research with a specific focus on coastal zones throughout the world.

## INTRODUCTION

This course introduces you to climate change vulnerability and adaptation research with a specific focus on the coastal zone. We will cover examples from multiple regions to highlight key approaches and developments.

This course is organised around three themes to showcase the high global variance in vulnerability and adaptation in a variety of coasts.

Theme 1: *'Arctic coastal changes in a warming climate'* sets the stage with a brief overview of climate change in the Arctic, and the associated implications and opportunities. It then introduces us to the conceptual ideas of 'adaptation'.

Theme 2: *'The world's coastal areas under growing pressure'* turns to analyse a variety of vulnerable coastal areas throughout the world outside the Arctic. This part of the course will take an interdisciplinary approach to discuss consequences of sea level rise from both an economic and political setting while including what it means for local inhabitants and livelihoods.

Theme 3: *'Adapting to a new normal'* concludes by introducing in-depth examples of adaptive measures to allow for more detailed debates and analyses.

### As GEOG514 student, you will:

- Read 3-5 scientific articles each week and formulate and submit individual questions to all readings prior to coming to class
- In teams of two, identify one scientific article to present the key findings of and lead the following discussion (40 mins)
- Act as 'discussant' leading discussions of other team's presentations
- Write and present an individual term paper proposal
- Write and present an individual term paper
- Give and receive peer-feedback on term paper proposal

## COURSE OBJECTIVES

The objectives of this course are:

- 1) To introduce current research on vulnerability, variability and changes in a variety of coasts around the world
- 2) To critically examine the major socio-economic and environmental processes affecting vulnerable global coastal areas and the variability in adaptation to changes
- 3) To develop the critical writing and analytical skills through a individual research paper, peer feedback and class discussions

## COURSE STRUCTURE

This course is a seminar-based course, meaning we will read 3-5 scientific articles for each seminar. The course is intended for graduate students and upper level undergraduate students interested in the socio-ecological dimensions of climate

change variability. Students should have taken relevant undergraduate environmental change course(s) and are expected to have a general understanding of the science of climate change.

Group and team activities, guest lectures (in-person or online), class discussions and student team presentations as well as readings and associated reading questions constitute the foundation of the course. You are expected to attend each 3 hour session in class and participate actively in all of them. You also need to prepare yourself prior to the seminars by reading the material and complete the reading questions.

### **COURSE ASSESSMENT**

In the class, you as students have responsibilities and freedoms different from a typical undergraduate class. My intention is to give you numerous ways to earn your overall course grade and actively participate in this seminar by: reading, writing, reflecting, presenting, participating actively, giving peer-feedback and demonstrating your abilities to make use of the knowledge you gain in class. Furthermore, the course is designed to include a number of low-risk assignments to allow for flexibility (40% of the grade is achieved through four tasks, counting 10% each) and give you the opportunity to showcase your learning in a number of ways. Roughly half of the grade is focused in various ways on your individual term paper.

I want to remind students to be helpful, open-minded and welcoming in their interactions with others - peers as well as professors and guest speakers.

Assessment item	Grade	Due date	Submission
Student-led presentations in teams of two	10%	Seminar #4, #5, #6 and #9  <i>Sign up sheet is found on myCourses</i>	Submit two potential articles to Prof. Bendixen one week prior to presentation date (only one will be presented though).
Individual term paper proposal and presentation:	10%	<u>Proposal acceptance</u> from prof. Bendixen: October 5, 2022 no later than 11:30 AM.  <u>1-2 page proposal draft:</u> October 12, 2022 no later than 11:30 AM.  <u>Proposal presentation:</u> Seminar #7 + #8  <i>Sign up sheet is found on myCourses</i>	Complete on myCourses  Complete on myCourses  Present in class
Student-to-student peer feedback on term paper proposal	10%	Feedback: October 19 at 11.30 AM.	Complete on myCourses
Final individual term paper and presentation	35%	Monday December 5, 2022 9:00AM (EST)  <u>Final presentation:</u> Seminar #11 + #12* *If you're presenting in #7, you also present in #11, and if you present in #8, you present in #12  <i>Sign up sheet is found on myCourses</i>	Complete on myCourses
Reading questions*** *** This will be conducted as self-grading, see below for instructions and expectations	10%	Before each class on Wednesday at 8:00PM for Seminar #2, #3, #4, #5, #6, #9, #10	Complete on myCourses
Student participation (quality and contributions to the in-class discussion)	25%	Ongoing in class	Active participation in class

## Readings

The course is not based on a single text, but rather covers a wide breadth of material through the scientific literature. The readings are available on MyCourses - see more details in the Reading List below. You should and you are expected to complete the obligatory readings before class, as they will provide the information for the discussions taking place in the seminars. As part of the learning experience, you must formulate Reading Questions for each read text (only the text indicated with numbers for each seminar). I will also refer to 'Proposed extra reading' - these are not mandatory readings, but shared with you in case you want to read more, or you may find them useful when proposing your article for your team-led presentation. 'Background readings' can be newspaper articles, report highlights, tweets etc. which you can read to gain more perspective and ideas for the course.

## Reading questions

The reading questions account for 10% of the total grade and will be conducted as self-grading, meaning students will assess their own preparation (how thoroughly did you read the material) and the Reading Questions asked. This approach gives you the opportunity for self-reflection and self-assessment on the course content. You will be grading your own performance for seminar #2, #3, #4, #5, #6, #9, #10.. When grading your own reading questions, consider which of the three categories you feel your performance lies within:

1: Poor, 2: Average, 3: Above average.

The Reading Questions are incentives for you to do thorough readings and to reflect on the literature we are covering in class. They also offer you an opportunity to demonstrate your understanding and critically assess and reflect on the readings undertaken in class. You are expected to write one question to each paper, e.g. in Seminar # 4 we will read 2 articles chosen by Prof. Bendixen and additionally 2 articles chosen by the two presenting student teams = you must submit 4 questions in total.

Reading questions are submitted on myCourses before each class on Wednesday at 8PM for Seminar #2, #3, #4, #5, #6, #9, #10. You are expected to write Reading Questions to 5 of the seminars mentioned above, but are encouraged to write questions to them all (7 in total). Should you write questions to 6 or 7 seminars, I will calculate your grade based on the 5 top grades. When submitting your Reading Questions on myCourses, please also clearly indicate your self-graded performance for that specific week.

Reading	Self-grade	1: Poor	2: Average	3: Above average
Seminar #2				
Seminar #3				
Seminar #4				
Seminar #5				
Seminar #6				
Seminar #9				
Seminar #10				

You can earn max 15 marks = 10 % of total grade.

Example: If you earn 12 marks of the max 15, you will have earned 8 marks towards your total grade of 100.  $12/15 \times 10 = 8$  marks

### Student-led presentations in teams of two

Your student-led presentation accounts for 10% of the total grade. By requiring you, the students, to identify a paper of relevance to the course topic I invite you to add your own interest and perspective to the course. This way, you are taking active parts in shaping the course content.

In week 4, 5, 6 and 9, students will be responsible for leading and critically summarising and presenting one scientific article per team. Additionally, they will be responsible for leading the discussion (by being discussants) on an article chosen by another team in a different week from when they are presenting. This way students will obtain a chance to present while also experiencing how to direct and lead a discussion. Team presentations will constitute the class discussion where everyone is expected to participate actively, discuss and ask questions.

The size of the teams will be confirmed after the add/drop deadline on September 13, 2022, but we will aim for teams to consist of 2 people. Both team members should present. Students will have a 40 minute slot, in which they are expected to give a presentation (20 min) on the article and the discussants will lead the following discussion (20 min).

#### *Tips for finding relevant scientific articles:*

- Look through journals such as Nature, Science, Nature Sustainability, Nature Climate Change, Global Environmental Change, Science of the Total Environment
- Go over the reference list of the articles planned for that specific week you are presenting, and identify potential relevant journals to look closer into

*Tips for presenting relevant scientific articles:*

- Make sure you focus on understanding the main points, positive aspects of the paper, future directions it could lead to, and critique aspects that are genuinely constructive.
- Define the key takeaway(s) from the article - Identify the questions asked in the article?
- Break down main points - present the figures in detail. What do you like - what do you dislike? What was hard to understand? "this bit didn't make sense" and "I liked this figure for [reason]". It is okay to not understand everything!
- Describe the format of the text - different formats have different strengths.
- Explain why you chose this paper exactly? You saw it and found it and was curious to learn more? You agree/disagree with the key points/approaches? Etc.

Each team must send two suggestions for articles to read to Prof. Bendixen one week prior to their presentation for approval. A pdf or a link to the article will then be uploaded to the Readings found on myCourses for all to read for the following seminar..

### **Individual term paper proposal and presentation**

A proposal title and 5-10 lines on the term paper proposal idea must be submitted to Prof. Bendixen on October 5, 2022 at 11:30 AM, on myCourses. More guidelines about the format and content will be communicated in class.

A 1-2 page term paper proposal draft is due on October 12 at 11:30 AM, 2022 on myCourses.

The term paper proposal is presented by the individual student during Seminar #7 and #8. Each student gets a slot of 12 mins and should present their proposal idea (aim for 7 minutes) and will receive feedback from peers for the remaining time.

### **Student-to-student peer feedback on term paper proposal**

Student-to-student peer feedback accounts for 10% of the total grade. Each student will give written anonymous feedback to one peer. The students will receive on October 12, one term paper proposal to review. The feedback must be submitted on myCourses and is due on Oct. 19 at 11.30 AM.

### **Final individual term paper**

The individual term paper and presentation of the paper accounts for 35% of the total grade. Each student will prepare a term paper on a topic related to their research interests. The aim is for the student to produce a publishable quality paper of 5000-6000 words. The term paper can be on any topic as long as it engages with the themes of the course. You may wish to conduct a critical literature review that either expands on one of the themes we have examined in class, related to your thesis, or a complementary theme of your choosing. Alternatively, you could explore a relevant case study related to a current event, a



specific geographic site etc. Throughout the course, we will be sharing ideas and discussing potential topics for term papers (ideas will be shared by peers on myCourses and on MURAL for each seminar). More guidelines about the format and content of the final paper will be communicated in class.

Deadline: Final individual term paper is due Monday, Dec 5, 2022, 9:00AM (EST).

Submit in word, pdf, or latex format on myCourses.

In Seminar #11 and #12, students will present their final research paper. Students presenting in Seminar #7, also present in #11, and those presenting in Seminar #8, present in #12.

Students will prepare a short powerpoint presentation of their final term paper, including a summary of the background, objectives, methodology, key findings, and implications of their work. Students will present their final term paper during the last weeks of the course,

### **Student participation**

Student participation accounts for 25% of the total grade. It is essential you come to the seminars well prepared - I expect you to do the relevant readings and submit your Reading Questions before we meet each week to make sure you can actively participate in the discussions. Your reading questions (for at least 5 of the total 7 seminars) are due on myCourses before each class for Seminar #2, #3, #4, #5, #6, #9, and #10 on Wednesday at 8:00 PM.

## COURSE SCHEDULE – SEMINAR 1-12 – READING LIST AND CLASS OVERVIEW

*NB: All readings indicated with a number are obligatory readings. Reading questions must be submitted through myCourses for all readings that week indicated with a number on the Wednesday before our seminar, no later than 8:00PM.*

### Seminar #1:

Intro, welcome, get to know each other and practical information

**Background reading:** [‘10 New Insights in Climate Science 2021’](#). Future Earth. *Get up to speed with the most recent advances in climate change research.*

### Seminar #2 THEME 1:

1. ‘Delta progradation in Greenland driven by increasing glacial mass loss’ Bendixen et al. 2017
2. ‘Promises and perils of sand exploitation in Greenland’ Bendixen et al. 2019
3. ‘Increase in Arctic coastal erosion and its sensitivity to warming in the twenty-first century’ Nielsen et al. 2022
4. ‘Collapsing Arctic coastlines’ Fritz, Vonk & Lantuit 2017
5. ‘Population living on permafrost in the Arctic’ Ramage et al. 2021

**Background reading:** [Tweet by freelance climate reporter Ajit Niranjana](#) with an overview of the main results from the most recent IPCC report.

### Seminar #3 THEME 1:

1. ‘Opportunistic climate adaptation and public support for sand extraction in Greenland’ Bendixen et al. 2022
2. ‘Equity and justice in climate change adaptation amongst natural-resource-dependent societies’ Thomas & Twyman 2005
3. ‘The Adaptation Challenge in the Arctic’ Ford, McDowell & Pearce 2015

**Proposed extra reading:** ‘Thawing Permafrost in Arctic Coastal Communities: A Framework for Studying Risks from Climate Change’ Nymand Larsen 2021

**Background reading:** [‘Turning Greenland’s sand into gold’](#). Nature Sustainability. 2022. Jungsberg.

### Seminar #4 THEME 1:

1. ‘Progress in climate change adaptation in the Arctic’ Canosa et al. 2020
2. ‘Adaptation actions for a changing arctic’ AMAP 2018 (page 307-328)
3. Student group #1 paper:
4. Student group #2 paper:

**Instructions** for term paper proposal

**Proposed extra reading:** ‘The Arctic has warmed nearly four times faster than the globe since 1979’ Rantanen et al. 2022

### Seminar #5 THEME 2:

1. 'Sea level rise risks and societal adaptation benefits in low-lying coastal areas' Magnan et al. 2022
2. 'Environmental impacts of climate change adaptation' Enriquez-de-Salamanca et al. 2017
3. Student group #3 paper:
4. Student group #4 paper:

**Proposed extra reading:** 'The ability of societies to adapt to twenty-first century sea-level rise' Hinkel et al. 2018.

**Background reading:** ['Worlds apart. A story of three possible warmer worlds'](#). IPCC. *Get an insight into three different scenarios of how a warming world will look like.*

**Background reading:** ['Tweet by Dr. Jeremy Bassis](#) on sub stories on 2022 sea level rise report'

### Seminar #6 THEME 2:

1. 'Beach nourishment has complex implications for the future of sandy shores' de Schipper et al. 2020
2. Student group #5 paper:
3. Student group #6 paper:

**Instructions** for term paper proposal presentation in Seminar #7 and #8

**Proposed extra reading:** 'Protection and restoration of coastal habitats yield multiple benefits for urban residents as sea levels rise' Guerry et al. 2022.

**Background reading:** ['Coastal sea levels in the US to rise a foot by 2050, study confirms'](#). NY Times, Henry Fountain, Feb 2022.

**Background reading:** ['Cities need to be redesigned for the climate crisis. Can they make us happy to?'](#) The Guardian, Julia Louise Pereira, March 2022

**No seminar in Week 4!** Office hours on Oct. 12 between 12:00-2:00PM upon request.

### Seminar #7:

No readings - Group A paper proposal presentations

### Seminar #8:

No readings - Group B paper proposal presentations

**Instructions** for term paper

### Seminar #9 THEME 3:

1. Student group #7 paper:
2. Student group #8 paper:  
**Watch** EuroCoast Zoominar with Dr. Eugene Farrell

**Proposed extra reading:** 'A systematic global stocktake of evidence on human adaptation to climate change' Berrang-Ford et al. 2021

**Background reading:** '[Peace-building and conflict management](#)' NGO PACT, short article on environmental realities as drivers of conflicts and opportunities - Who are we adapting for?

### Seminar #10 THEME 3:

1. 'Understanding the values and limits of nature-based solutions to climate change and other global challenges' Seddon et al. 2019.
2. 'Equity in human adaptation-related responses: A systematic global review' Araos et al. 2021 with guest lecture!

**Instructions** for term paper presentation in Seminar #11 and #12

**Proposed extra reading:** 'Core principles for successfully implementing and upscaling Nature-based Solutions' Cohen-Shacham 2019.

**Background reading:** '[Nature-based solutions is the latest green jargon that means more than you might think](#)' Editorial piece from Nature, Jan 2017. Introduction to the term NbS.

### Seminar #11:

No readings - Group A Final paper presentations

### Seminar #12:

No readings - Group B Final paper presentations

**Round up** on the GEOG514 course

## IMPORTANT INFORMATION

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### **Late policy**

Illness and family misfortune can happen to us all and are legitimate reasons for extensions on assignments or postponement of exams. If there are reasons you cannot meet a deadline be sure to discuss with Professor Bendixen well in advance if possible.

All submitted material will be considered late after the due time and date. Late assignments will have 25% deducted for the first 24 hours they are late and 10% for each additional day thereafter.

**NOTE:** There will be no supplemental examination and no additional work will be accepted to upgrade marks of D, F, or J.

### **Language of Submission**

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives. (Approved by Senate on 21 January 2009 - see also the section in this document on Assignments and Evaluation.)

Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue)

### **Student assessment Policy**

The University's Student Assessment Policy exists to ensure fair and equitable academic assessment for all students and to protect students from excessive workloads. All students and instructors are encouraged to review this Policy, which addresses multiple aspects and methods of student assessment, e.g. the timing of evaluation due dates and weighting of final 7 examinations.

The Student Assessment Policy can be consulted here:  
[https://mcgill.ca/secretariat/files/secretariat/2016-04\\_student\\_assessment\\_policy.pdf](https://mcgill.ca/secretariat/files/secretariat/2016-04_student_assessment_policy.pdf).

As per article 3.2.3. in the Student Assessment Policy, "In the event of extraordinary circumstances beyond the University's control, the evaluation scheme in a course is subject to change, provided that there be timely communications to the students regarding the change."

## Academic integrity

Academic integrity is important. Anything that undermines the evaluation process at McGill undermines the value of our degrees. McGill's Code of Student Conduct and Disciplinary Procedures appears in the Handbook on Student Rights and Responsibilities Article 15(a) of the Code, which is devoted to plagiarism, reads as follows:

*No student shall, with intent to deceive, represent the work of another person as his or her own in any academic writing, essay, thesis, research report, project or assignment submitted in a course or program of study or represent as his or her own an entire essay or work of another, whether the material so represented constitutes a part or the entirety of the work submitted.*

J. Raymond Hendrickson, in his book *The Research Paper* (Henry Holt and Company, New York, 1957), suggests the following guidelines for avoiding plagiarism:

- When writing a paper try to use your own words the majority of the time.
- When you do use another person's words, use quotation marks and give credit to the source, either within the text or in a footnote.
- Don't make slight variations in the language and then fail to give credit to the source. If the expression is essentially the same, the author still deserves credit.
- Even if you aren't directly quoting the material, you should still document information and ideas that you use in your paper whenever they are new to you (i.e., something that you discovered in your research).
- If you're unsure, add the footnote or citation. It is better to be extra cautious than not give credit when you should.

These rules concern information obtained from any source (e.g., books, journal articles, the Internet, other students) and apply to any written submission (term papers, essays, assignments, take-home exams and lab reports). Remember that, according to McGill's Code of Student Conduct and Disciplinary Procedures, plagiarism is an academic offence. Students who are found violating the Code will be reported to the Associate Dean, and appropriate action will be taken.

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures; for more information, see [www.mcgill.ca/students/srr/honest/](http://www.mcgill.ca/students/srr/honest/).

L'Université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences

que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site [www.mcgill.ca/students/srr/honest/](http://www.mcgill.ca/students/srr/honest/))

### **Course Communications**

In GEOG514, Professor Bendixen uses the McGill University *myCourses* system. You will find the course outline, readings and all relevant material here. Announcements will regularly be posted so it is important that you regularly check myCourses.

### **Course Evaluations**

Course evaluations at McGill University are now done on-line through the Mercury system. Completing the evaluation is voluntary but the results of the evaluation are extremely useful to Professor Bendixen and can provide guidance for students who may wish to take this course in the future. Professor Bendixen strongly encourages you to participate in the evaluation of this course as it will help to improve the course for my future teaching. Professor Bendixen will notify you when the evaluation period opens and will remind you periodically during the evaluation period of the value of completing the evaluations. Thank you for this!

### **Copyright**

Instructor-generated course materials (e.g., recordings of lectures, handouts, notes, summaries, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.

I want to remind everyone of their responsibility in ensuring that material produced for GEOG514 is not reproduced or placed in the public domain. This means that each of you can use it for your educational (and research) purposes, but you cannot allow others to use it, by putting it up on the Internet or by giving it or selling it to others who may also copy it and make it available.

Please refer to McGill's Guidelines for Instructors and Students on Remote Teaching and Learning

(<http://www.mcgill.ca/tls/instructors/classdisruption/strategies/guidelines-remote>) for further information. Thank you very much for your help with this.

### **Learning environment**

As the instructors of this course, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Students with Disabilities, 514-398-6009.

Additional policies governing academic issues which affect students can be found in the McGill Charter of Students' Rights" (The Handbook on Student Rights and Responsibilities is available at <https://www.mcgill.ca/deanofstudents/rights>)

McGill University is on land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. We acknowledge and thank the diverse Indigenous people whose footsteps have marked this territory on which peoples of the world now gather.

L'Université McGill est sur un emplacement qui a longtemps servi de lieu de rencontre et d'échange entre les peuples autochtones, y compris les nations Haudenosaunee et Anishinabeg. Nous reconnaissons et remercions les divers peuples autochtones dont les pas ont marqué ce territoire sur lequel les peuples du monde entier se réunissent maintenant.