

Microclimatology GEOG 4104A [0.5 credit]

Winter 2022

Seminar: 80 min twice per week

Instructor: Elyn Humphreys, B359 Loeb, elyn.humphreys@carleton.ca

Office hours: I keep an open-door policy but please also feel free to email me to make an appointment.

1. Course description:

Most organisms, including us, live within microclimates. Microclimatology describes the physical environment (light, temperature, humidity, wind speed) formed within a shallow layer near the Earth's surface at a range of scales. Unique microclimates can form within a few millimetres of a leaf surface and can occur within extensive surfaces such as forests. Microclimates can change dramatically from one surface to the next and from one moment to the next as a result of the exchange of energy, water, momentum, and other constituents between the surface and the atmosphere. The interaction between surface physical properties and atmospheric processes is key to successfully understanding ecosystem function at both local and global scales. These principles can be directly applied to a variety of practical applications and topics such as agriculture, forestry, urban planning, and global climate change.

2. Prerequisites: GEOG2013 or permission of the Department; **Preclusions:** none

3. Texts & lecture notes:

1) Required text: Oke, T.R. 1987. *Boundary Layer Climates*, 2nd Edition. Methuen, London, 435 pp. Available for free online through the Carleton University library.

2) Lecture slides and supplemental readings will be made available through Brightspace*

*Student or professor materials created for this course (including presentations and posted notes, labs, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

4. Course Calendar:

Lectures may be accompanied by a demonstration or activity, which may be outside. The following schedule may be subject to change.

- Unit 1 *Light and leaves* (Jan 10, 12, 17)
Readings: pg 3-17, 117-118, 130-134, 366-374, 399, 20-23, 84-87, 143-148
- Unit 2 *Hot Soils* (Jan 19, 24, 26, 31)
Readings: pg 33-37, 42-48, 232-236
- Unit 3 *Microclimates of tiny things* (Feb 2, 7, 9)
Readings: pg 6-8, 37-39, 51-54, 120-124, 236-240
- *Prep for test (Feb 14), in-class test #1 (Feb 16)*
- No classes during Reading Break (Feb 21 - 25)

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- Unit 4 *Wind & eddies* (Feb 28, Mar 2, Mar 7)
Readings: pg 54-59, 138-139, 167-170, 242-245
- Unit 5 *Evaporation* (Mar 9, 14, 16)
Readings: pg 63-71, 120-127, 158-167, 375-391
- Unit 6 *How do you feel?* (Mar 21, 23)
Readings: pg 190-197, 206-226
- Unit 7 *City Heat* (Mar 28, April 4; no lecture Mar 30)
Readings: pg 272-303
- *Prep day (April 6)/ In-class test #2 (April 11)*

Assignment due dates: #1 – Jan 24; #2 – Feb 7; #3 – Mar 14; #4 – April 6

4. Evaluation:

- 40% Take-home assignments (4)
- 10% Quizzes on readings
- 25% In-class test #1 (February 16)
- 25% In-class test #2 (April 6)

Assignments will be based on the lecture material, activities, and demonstrations in class. Collaboration is encouraged while working through the assignments, but each student must hand in their own individually prepared assignment. See statement on plagiarism below. All assignments are due at the beginning of class on the date specified. Late assignments will be deducted 10% if submitted after class but still on the due date or within the next day. Each additional day will be deducted 10% per day including weekends. No assignments will be accepted for grading once graded assignments have been returned. If you are having difficulty meeting the deadlines, speak to the course instructor **in advance** of the due date.

At least 6 short quizzes on readings, each worth 2%, will be given throughout the term. The final quiz mark will be calculated using the top 5 quiz results.

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

5. COVID-19

All members of the Carleton community are required to follow COVID-19 prevention measures and all mandatory public health requirements (e.g. wearing a mask, physical distancing, hand hygiene, respiratory and cough etiquette) and [mandatory self-screening](#) prior to coming to campus daily.

If you feel ill or exhibit COVID-19 symptoms while on campus or in class, please leave campus immediately, self-isolate, and complete the mandatory [symptom reporting tool](#). For purposes of contact tracing, attendance will be taken in all classes and labs. Participants can check in

using posted QR codes through the cuScreen platform where provided. Students who do not have a smartphone will be required to complete a paper process as indicated on the [COVID-19 website](#).

All members of the Carleton community are required to follow guidelines regarding safe movement and seating on campus (e.g. directional arrows, designated entrances and exits, designated seats that maintain physical distancing). In order to avoid congestion, allow all previous occupants to fully vacate a classroom before entering. No food or drinks are permitted in any classrooms or labs.

For the most recent information about Carleton's COVID-19 response and required measures, please see the [University's COVID-19 webpage](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca

Please note that failure to comply with University policies and mandatory public health requirements, and endangering the safety of others are considered misconduct under the [Student Rights and Responsibilities Policy](#). Failure to comply with Carleton's COVID-19 procedures may lead to supplementary action involving Campus Safety and/or Student Affairs.

6. Statement on Plagiarism:

Plagiarism will not be tolerated. Students should consult the [Academic Integrity Policy](#).

The University Academic Integrity Policy defines plagiarism as "*presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one's own.*" This includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, art works, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another's data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one's own; and

- failing to acknowledge sources through the use of proper citations when using another's work and/or failing to use quotations marks.

Plagiarism is a serious offence that cannot be resolved directly by the course's instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course or even suspension or expulsion from the University.

7. Academic Accommodations:

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For accommodation regarding a formally-scheduled final exam, you must complete the [Pregnancy Accommodation Form](#).

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details [click here](#).

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/equity/sexual-assault-support-services>

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation will be provided to students who compete or perform at the national or international level. Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>