

**University of Guelph  
Department of Geography**

GEOG 6610 – Global Hydrology  
Fall 2022  
Course Outline  
Monday 2:30-5:30

**Instructor:**

Dr. Aaron Berg

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Office Hours – By appointment.

**Overview:**

This course will offer an examination of global hydroclimatology including precipitation, evaporation, subsurface water and runoff. Physical processes, measurement, analytical techniques and modelling strategies will be considered in the context of global change. Particular emphasis will be placed on the current data sources, methods, and models for evaluating and understanding the global hydrological cycle.

Specific Topics to be addressed may include:

- Role of the hydrologic cycle in the Earth's climate system;
- Uncertainties and measurement of global stocks and fluxes of water;
- Advances in the study of climate system-hydrology teleconnections and interaction including: ocean-atmosphere, land-atmosphere, land-ocean interaction;
- Advances in remote-sensing and hydrology;
- Current state of numerical models for hydrologic simulation and prediction in GCMs;
- Potential impact of global land use change on the hydrological cycle (e.g. water impoundments, deforestation, irrigation.);
- Implications of global climate change on the global water cycle;

**Evaluation:**

Assignments (3x7%)

Literature presentation and participation (15% +5%) (participation includes preparing a minimum of 5 questions over the semester to ask during the literature presentations)

Research Proposal (15%) and peer evaluation (5%)

Final Research Project (35%)

Final Research Presentation (5%)

**Required Textbook and Reading:**

Readings will be selected from literature.

### Schedule of Dates

Date	Topic	Readings/Assignments
Sept. 12	Introduction	
Sept. 19	The Climate System: Water and Energy Budget	TBA/
Sept. 26	Hydrology and Climate: Teleconnections and land-atmosphere interactions	TBA/ Class Presentations / Assignment 1 due
Oct. 3	Present Understanding of the global water cycle: Precipitation	TBA/Research Proposal Due/Class presentations
Oct. 17	Research Proposal Discussion	Research Proposal Discussion and Reviews
Oct. 24	Present Understanding of the global water cycle: Evaporation/ Transpiration	TBA/Class Presentations Assignment 2 Due
Oct. 31	Present Understanding of the global water cycle: Runoff	TBA/ Class Presentations
Nov. 7	Present Understanding of the global water cycle: Snow, ice and soil moisture	TBA/ Class Presentations/ Assignment 3 Due
Nov. 14	Present Understanding of the global water cycle: Modeling Perspectives	TBA/ Class Presentations
Nov. 21	Long term hydrologic variability and climate change	TBA/
Nov. 28		Research Presentations
Dec. 2		Research Presentations

The final copy of your written research paper is due December 14th.

### Evaluation Discussion:

Assignments (3 assignments from the textbook will be assigned for grading) 7 % each.

Literature presentation and discussion (15%) + 5% for participation

Each student will be required to present a brief (15 minute) presentation of a selected topic and lead the discussion. This presentation should effectively summarize the selected topic and outline some current avenues of research towards this theme. As part of the preparation the student will select a paper appropriate for the topic as part of the required reading. Assessment of why this particular paper was provided will be discussed. Please be prepared with questions of the paper (expectation of a minimum of 5 questions asked through the semester)

Research Proposal (15%) and Proposal Review (5%)

Each student will submit a research proposal for the final project. The research proposal will be no more than two pages in length. The proposal will be organized to provide an introduction/background of the topic proposed, a clearly outlined hypothesis, methods to be employed, expected results, and the

significance of the research in the context of global hydrology. We will hold a panel review to discuss and defend the various research proposals.

**Final Research Project (35%) and Presentation (5%)**

Each student will be required to undertake a research project on some aspect of global hydrology. The project must be based on analysis and/or modelling using actual data, and can include GIS and remote sensing. The results should be presented in the format of Geophysical Research Letters a journal that specializes in concise research notes. The paper should include an introduction including the specific objectives of the study, a brief, pertinent literature review, methodology, presentation of results, discussion, and conclusion. All figures should be of high quality in keeping with a graduate level course. The paper should be no longer than 10 pages (1.5 spaced), 12 point font, plus no more than 4 figures and 2 tables (N.B. keep in mind this is a term paper not a thesis). You are also required to provide a 12-minute presentation on your project near the end of the semester. Please discuss your topic with me early in the semester (I have lots of ideas that can be attempted if you are stuck).

## **University of Guelph Policy Statements:**

### **E-mail Communication**

As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students. For emailing the TA or instructor please use GEOG 3610 in subject line.

### **When You Cannot Meet a Course Requirement**

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

### **Drop Date**

The last date to drop one-semester courses, without academic penalty, is posted in the Graduate Calendar. For regulations and procedures for Dropping Courses, see the Graduate Calendar.

### **Copies of out-of-class assignments**

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

### **Accessibility**

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email [csd@uoguelph.ca](mailto:csd@uoguelph.ca) or see the website: <http://www.uoguelph.ca/csd/>

### **Academic Misconduct**

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor. An example of academic misconduct that might occur in this course is to copy an answer, on an exam or lab exercise, from another student. Each student must create their own digital files for computer-based exercises.

### **Recording of Materials**

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

### **Resources**

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations that apply to undergraduate, graduate and diploma programs.

### **Disclaimer**

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website [[hyperlink to the website](#)] and circulated by email.

**Illness**

The University will not require verification of illness (doctor's notes) for the fall 2020 or winter 2021 semesters.