EES C21 Urban environmental issues of the Greater Toronto Area

Day: Thursdays **Room: BV: 363** **Time: 10-12** **Fall 2010**

Purpose

The world is increasingly urban and urban development is proceeding at an astonishing pace. By 2050 it is estimated that 5 billion people will live in a city; 80% of Canadians already do. The effects are far reaching; environmental impacts arise from the need to import energy and other resources and as waste materials are exported to surrounding areas. The risk from natural hazards increases as urban areas grow; the regional climate is also altered and there are massive impacts on watersheds, the hydrological cycle and groundwaters. Most cities face the challenge of 'historic wastes' disposed of in the past under lax environmental regulation while grappling with modern wastes.

This course is designed to provide you with an overview of the impact of urban development on watersheds and waterfronts principally across the Greater Toronto Area but we will also touch on global issues. It will interest students from a broad range of disciplines from specialist environment scientists to those interested in urban planning and design, or urban ecology. What you learn in this course can be applied to any urban area. At the conclusion of the course we will attempt to answer the simple question; are urban areas environmentally sustainable? Can they be made to be sustainable?

Course content and major themes

Lectures (and an all day field trip during week 5 at a time convenient for all) will familiarize you with the broad, wide-ranging impacts of urban development on ecosystems across the GTA. We will compare these impacts with those being felt in other world-wide cities of different economic setting, climate and geology. For international students this provides an opportunity to learn about their own cities.

After a brief overview (Week 1), the course starts (weeks 2, 3, 4) with a review of the GTA's geologic setting (both rock and glacial sediments on top) and its implications for earthquake risk and waste management.

There is NO class in week 5, but an all day field trip (details will be provided later).

Waste disposal is a major issue both in regard to municipal waste (i.e., garbage) and radioactive wastes; large areas are underlain by what is called 'historic wastes' (what is called the 'built landscape') disposed of in the past and commonly used to infill ravines and valleys (week 6).

The complex issue of radioactive waste disposal in the Port Hope area will be addressed by Kathy Wallace (Ph.D student Env Sci UTSC, who formerly worked for Terraprobe, a major environmental consulting company based in Brampton).

The far reaching issue of urban impacts on surface waters and groundwaters will be addressed in week 8 by Dr. Mandy Meriano (Ph.D. UTSC, 2007, formerly of the National Water Research Institute in Christchurch, New Zealand, and now Lecturer in Env Sci at UTSC).

Environmental assessment and remediation techniques are varied and dependent on the precise nature of the wastes and the site geology. This is the topic of an invited lecture week 9 by Sean Salvatori (UTSC Env Sci '91) who works for M.M. Dillon another large consulting company based in Toronto.

Invited speakers give you a valuable opportunity to find out what it is like working for a consulting company or in a government laboratory and how you need to prepare.

Assessment

Six weekly quizzes (20 questions requiring short definitions or answers) are worth 30% of the final course mark. They take about 15 minutes to complete and will be held at the beginning of class and will be based on the previous week's lecture material. They will be marked immediately to give you an idea of how well you are doing on an ongoing basis.

A group written project (2 students max) is due at the *beginning of class* week 6 (October 21st) on the topic of the environmental issues facing other North American cities in areas of different climate and geology (25% of final course mark).
Each group will also report their findings as a short (20 minute) seminar during weeks 10 and 11 (15% of final course mark). The final exam is worth 30%.

Lecture topics

Week 1: (16th September) Course introduction, scope and grading
Week 2: (23rd September) Bedrock geology of the GTA ('basement')
Week 3: (30th September) Glacial geology of the GTA and the geology of the 'built landscape' (*Quiz 1*)
Week 4: (7th October) Earthquake risk assessment in Ontario and eastern Canada (*Quiz 2*)
Week 5: *All day field Trip*: Impacts of urbanization on watersheds and waterfronts; the Port Industrial District and Frenchman's Bay. *Note: No class*
Week 6: (21st October) Municipal waste management and landfilling practice (*Group mid-term report due*)
Week 7: (28th October) Radioactive waste management (Kathy Wallace: Ph.D candidate UTSC)(*Quiz 3*)
Week 8: (4th November) Urban groundwaters (Dr. Mandy Meriano: Lecturer UTSC)(Quiz 4)
Week 9: (11th November) Environmental assessment techniques and remediation of contaminated urban sites (Sean Salvatori; M.M. Dillon) (*Quiz 5*).
Week 10: (18th November) Group seminars I; urban issues in other North American and world cities. (*Quiz 6*) Are urban areas environmentally sustainable? If not, what do we need to do?
Week 11: (25th November) Group seminars II; urban issues in other cities (*con't*) and *course revision session for final exam*.

Grading:

6 weekly quizzes: 30% (5 marks each)
Group mid-term report: 25%
Group seminar on mid-term topic: 15%
Final Exam: 30%

Note: The usual caveats about plagiarism apply to this course; plagiarized work will be given a grade of zero and you will be reported to the Dean. Late work will be docked 10% of the mark per day. Missed test or lab exercise and late hand-ins will only be excused for cases in which the absence was entirely beyond your control (e.g., medical reasons), and only if the proper U of T support documentation is completed and submitted. Without this we are under no obligation to accept late work

Course material:

Eyles, N. 1997: (Editor) *Environmental Geology of Urban Areas*, Geological Association of Canada (especially Chapter 2: Environmental geology of the Greater Toronto Area) Geotext No. 3. This book is available on short-term loan from UTSC library. I will provide chapter 2 (Environmental geology of the GTA).

Eyles, N. 2002: *Ontario Rocks*. Fitzhenry and Whiteside, Markham.

I will also assign readings from week to week.

Contact information:

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