

Geo 470 / Geo 570 (Fall 2019):
Integrated Environmental Management
Class Project Focus: Cattaraugus Creek Watershed Strategy &
Erie County Climate Vulnerability Study

"Water management is multidimensional. It embraces planning, design, construction, operation, and maintenance. Its ingredients include technological capability, social attitudes, economic realities, political viewpoints, and environmental goals." - W. Viessman Jr., in *Water management: challenge and opportunity, Journal of Water Resources Planning and Management* 116 (1990) (2), pp. 155-169.

Instructor: Chris S. Renschler (rensch@buffalo.edu)

Class Time: Tuesdays and Thursdays 9:30 am - 10:50 am (145H Wilkeson)

Office Hours: Tuesdays 11:00 am - Noon and Thursdays 1:00-2:00 pm (116 Wilkeson)

Audience: Graduate and Undergraduate Students in Geography, Geology, Civil & Environmental Engineering, Law, Planning, Environmental Studies, Business Administration and Management Science, or permission by instructor. According to the New York State Education Department, this course can count towards **continuing education requirements to maintain your professional engineering license** (please contact the instructor for more details).

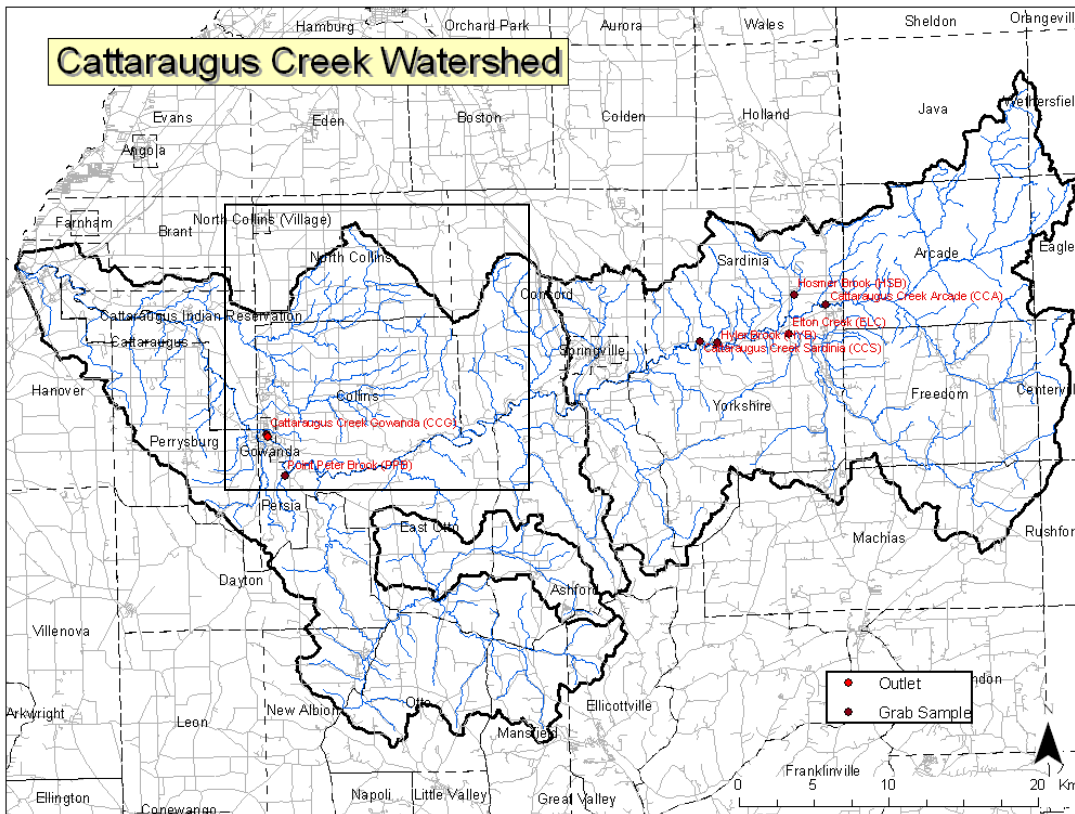
Goals & Objectives: This interdisciplinary course introduces an integrated framework for environmental management that addresses biophysical, social, and economic issues affecting natural resources such as water, soil, air, plant and animal communities and their use through agriculture, forestry, fishery, mining, human settlements and industry. The multidisciplinary approach equips the participants with the necessary approaches and techniques to communicate effectively and develop sound management policy and practice in the context of the watershed scale ranging from small watersheds to large basins. The course presents detailed case studies and outlines methods for problem definition and goal setting to elect management strategies and procedures for monitoring and implementation.

The course includes the following topics:

- Environmental properties and processes/watershed components and processes
- Establishing management plan parameters and objectives
- Stakeholder identification and consultation
- Development of practical management options
- Methods and modeling tools for the assessment of management alternatives
- Techniques for determining the legal implications
- Environmental, economic, and social impact assessment, and
- Choosing the best plan and implementing it.

Recommended Textbook: Heathcote, Isobel W. 2008. *Integrated Watershed Management: Principles and Practice*. 2nd edition. Wiley. 453 p. ISBN: 978-0-470-37625-6 (the 1998 version or 1st edition of this book is also acceptable).

Class Project: This year all students will focus in their individual projects within groups of topic areas of the Cattaraugus Creek Watershed Strategy. Students will represent the positions of a group of project partners or stakeholders within a particular focus topic to investigate their specific interest and specific plans in managing water quantity and quality in the smaller Clear Creek (inserted box), the larger Cattaraugus Creek and neighboring watersheds (see map below).



Throughout the course students will get to know through discussions and presentations the details about various stakeholders' interests and plans from project partners involved in the project. As a consequence of that interaction, the students will outline in their individual report **Part A)** the position of their individually assigned/chosen project stakeholder/partner on the particular topic areas and **Part B)** propose possible solutions on how that position fits into an integrated watershed management plan that fits all other potentially participating stakeholders and problem areas. The recommendations of this coordinated group project will not only offer a real contribution of all students as collaborating consultants in outlining and designing an integrated watershed management plan (that could be potentially implemented sometime in the future), but also the experience and contacts that will help students to potentially land internships or other future career opportunities in integrated environmental management.

Schedule: The official course webpage is only accessible through Ublearns - enrolled students must check on Ublearns for the latest updates in schedule and syllabus. Please note that this schedule for the fall 2019 will most likely change!!!

| Week | Dates | Tuesday (usually lecture) | Thursday (lecture and group work) |
|------|--------------|---|---|
| | | Textbook Chapter (Ch.) + <i>Invited Speaker or Case Study (CS.)</i> | |
| 1 | Aug 27/29 | Presentation of Syllabus and Schedule + Introductory Lecture (Ch.1) | |
| 2 | Sep 3/5 | Environmental Inventory (Ch. 2) + <i>Introduction of Cattaraugus Creek Projects (CS. 1)</i> | |
| 3 | Sep 10/12 | Definition & Scoping (Ch. 3) Thursday: Josh Wilson, Erie County - Environment & Planning | |
| 4 | Sep 17/19 | Consultation (Ch. 4) + Best Management Practices (Ch. 5) + Simple & Detailed Assessment Methods (Ch. 6+7) | |
| 5 | Sep 24/26 | Tuesday: Kristin Szczepaniec, Partnership for the Public Good + Thursday: Shannon Dougherty, NY DEC | |
| 6 | Oct 1/3 | Environmental & Social Impacts (Ch. 10) + <i>PEOPLES Resilience (CS.4)</i> + Choosing the Best Plan and Implementing It (Ch. 11+12) | |
| 7 | Oct 8/10 | Tuesday: Judith Levan, NWS+ Environmental Models (CS.2) Thursday: Michael Shelly, UB RENEW Institute + Costing and Funding (Ch. 8) | |
| 8 | Oct 15/17 | Tuesday: Lauren Schifferle, US ACoE + Student Project Signup Thursday: Margaux Valenti, Buffalo Niagara Waterkeeper + Legal Concerns (Ch. 9) | |
| 9 | Oct 22/24 | <i>Student Project Introductory Seminars (Part A)*</i> | <i>Student Project Introductory Seminars (Part A)*</i> |
| 10 | Oct 29/31 | <i>Student Project Introductory Seminars (Part A)*</i> | <i>Student Project Introductory Seminars (Part A)*</i> |
| 11 | Nov 5/7 | <i>Student Project Q&A</i> | <i>Student Project Q&A</i> |
| 12 | Nov 12/14 | <i>Student Project Presentations (Part B)** during Tuesday in the GAW (Geography Awareness Week) in O'Brian Hall Letro Courtroom (first floor) 8:30 am-Noon - All project partners/stakeholders are invited</i> | <i>Student Project Q&A on Individual Project Reports</i> |
| 13 | Nov 19/21 | No class - Q & A on Individual Project Report (Instructor is available in the office) | No class - Q & A on Individual Project Report (Instructor is available in the office) |
| 14 | Nov 26/28 | No class - Project Report due Nov 28 Noon*** (Instructor is available in the office) | No class- Thanksgiving/Fall Recess Project Report Review: Distribution of Assignments |
| 15 | Dec 3/5 | No class - Q & A on Revision of Final Student (Instructor is available in the office) | Evaluation Report from Reviewers 8:15-10:50 am (smaller groups will be scheduled throughout the morning) Revised reports are due latest by Dec 12! |

Required Activities: Students are evaluated [% of total grade] based on their performance in

- [10%] a 200-word abstract + a list of references (due 5 pm Oct 10),
- [20%] *a student introduction seminar about stakeholder and your idea (**this represents Part A of your final report**; 1 1/2 min presentation + 1/2 min discussion; **use template on UBLearns for your presentation**; due latest by 5 pm previous day),
- [20%] **a final project presentation (**this represents Part A and Part B of your report**; **use template on UBLearns for your presentation**; 1 minutes presentation (Part A) + 1 minute presentation (Part B); due 5 pm previous day),
- [30%] ***a final project report (Part A and B; **use template on UBLearns for your presentation (10 required pages for undergraduates; 12 required pages for graduates)**; due by Nov 23 at 9 am as hard copy (Wilkeson 105) and MS Word file through UBLearns assignments),
- [10%] project review comments (pickup for review packages in class Nov 29 or in the Geography main office (Wilkeson 105) thereafter; filled out review sheets and marked up reports are due in class Dec 6),
- [5%] attendance (missing without excuse will reduce the 5% by 1% per missed class),
- [5%] participation in class including discussions **and online activity in the UBLearns IEM Library (enroll and share your materials, presentations and reports!)**.

The final letter grades are A (90-100%), A- (85-89%), B+ (80-84%), B (75-79 %), B- (70-74%), C+ (65-69%), C (60-64%), C- (56.6-60%), D+ (53.3-56.6%), D (50-53.3%), and F (0-50%). PowerPoint presentations for seminar, project presentations and Final Report need to be submitted **TWICE** through UBLearns Course Assignments and UBLearns IEM Library Course. Send an email notice to instructor before 5pm the day prior to the scheduled presentation that you submitted your presentation to **BOTH** course webpages (one is your submission and the other one is to share with your group members). Failure to submit assignments in time will result in a point reduction (10% after 5 pm; 25% if provided in class). Make-up presentations have to be presented in the following class. Late submission of abstract, project report, and review comments will result in a point reduction of 25% per day.

Each seminar presentation, abstract, project presentation, and final project report are evaluated based on the following key (you have to address all five aspects):

1. Introduction/Problem Definition (20%),
2. Approach/Methods (20%) (*Represents Project Partner/Stakeholder Position*),
3. (Expected/proposed/achieved) Results/Discussion (20%),
4. (Expected/proposed/achieved) Conclusions/Recommendations (20%), and
5. Graphic Support/Tables/References (Format for Citations) (20%).

Students registered at the undergraduate level (Geo 470) will not be evaluated as the advanced graduate level (Geo570). As a consequence graduate students are required to an additional 30% of words in their final project report and are expected to cover additional reading material in their list of references and for their review sessions. For incomplete work, academic integrity, and disability services refer to the University undergraduate

Incomplete Policy, Integrity Policy, and the University's Disability Service Office (you must register with the office to receive accommodation for physical and learning disabilities), respectively.

Student Learning Outcomes for Geo 470 Integrated Environmental Management

Instructor: Chris S. Renschler

| Student Learning Outcome | Program Outcomes /Competencies | Instructional Method | Assessment Method |
|---|---|---|--|
| Knowledge | Student demonstrates a mastery of principles in integrated environmental management; makes a compelling analysis/ argument for needs and solutions | Lecture, Case Studies, Class Discussions, Student Project | Project Idea Presentation, Project Design Report and Presentation, Project Report and Presentation, Participation |
| Thinking | Student recognizes relevant spatial/temporal processes; assesses problems and patterns with sophistication | Lectures, Case Studies, Class Discussions, Student Project | Project Idea Presentation, Project Design Report and Presentation, Project Report and Presentation, Participation |
| Skills | Student fully understands and correctly uses valid/appropriate method and demonstrates techniques in theory and/or in practice independently | Class Discussions, Student Project | Project Idea Presentation, Project Design Report and Presentation, Project Report and Presentation, Participation |
| Critical reading | Student reads sources critically, fleshing out the arguments, perspectives, and contexts in them | Supplemental Material to Lecture for Reading, Review of Project Report and presentations of Peers | Participation, Review Process (oral and written) |
| Academic written voice in project report | Student writes course project report clearly and forcefully and has an argument/hypothesis that is well-founded and persuasively made | Student Project Design and Project Report, Review Comments | Project Design Report, Project Report, Participation, Review Assessment |
| Oral presentation and discussion of course project | Student presents course project logically and creatively; engages in question and answer; contributes to class discussion by formulating thorough answers and questions and engaging with teams and/or classmates | Student Project | Project Idea Presentation, Project Design Presentation, Project Report Presentation, Oral Review Comments, Participation |