Course Syllabus

EAS 501.046 - Science and Management of the Great Lakes

Winter 2019 -- 3 credits

Times/Place: Tuesday & Thursday 8:30-10 am, Mason Hall 1427

Instructors

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Course Description

This course reviews the broad sciences required for appreciation and understanding of the Great Lakes Ecosystem, and simultaneously explores the challenges inherent in sustainable management of both the Lakes themselves and the societal benefits they support. A rich collection of online lectures by regional experts will provide background scientific understanding of the Great Lakes as a vast, complex and invaluable ecosystem. Class activities will include weekly case studies that illustrate the complexities of current management and policy initiatives aimed at sustaining ecosystem health and services; each case study exercise will be resourced by an experienced guest manager from the Great Lakes community. Students will also lead a series of literature discussions that examine aspects of research, policy, planning and governance. A series of synthesis assignments build from developing individual policy briefs to essays to group presentations on insights gained over the semester.

Learning objectives - to be revisited through the semester

1) Appreciate challenges of and need for managing large regional ecosystems
2) Examine aquatic ecosystem properties, functions and stressors
3) Identify the range of disciplines pertinent to management
4) Analyze the role of science in management and policy
5) Consider a range of scales in decision making
6) Consider how local or case examples may be transferable
7) Inspect the complexity of socio-environmental systems
8) Value multiple perspectives
9) Appreciate how history sets the stage for future trajectories
10) Consider challenges and opportunities of multi-scale ecosystem governance

Skills to be developed

1) Distilling complex concepts into a policy brief
2) Facilitating inclusive discussions
3) Communicating effectively for a range of audiences in oral presentations and writing
4) Synthetic thinking individually and as a group

Course Structure

This course is "flipped". Online lectures will provide students with first exposure and background material. These will support engaged learning in the classroom in the form of case studies with practitioner participation and student-led discussions of literature. The course is developed around five themes: Water Quality, Fisheries Management, Water Quantity, Coastal Communities and Envisioning the Future. Each theme also has at least one synthesis activity and associated assignment.

Online lectures

We have developed a series of video lectures which function like an online text book on the Science and Management of the Great Lakes. Experts from across the Great Lakes region have recorded topical lectures (usually ~12 minutes each). Video lectures include narrated slide presentations, TED-style talks and interviews. Links to the lectures for each week are posted in Canvas, along with a series of accountability questions related to lecture material. It is the student's responsibility to **watch these lectures before class on Tuesday each week.**

Case studies

We have developed a series of 13 case studies (1 per week) in the Michigan Sustainability Cases Gala platform. Students should **register in this platform www.learngala.com using their umich.edu google account. Students should read the case and familiarize themselves with associated materials before each class period**. During class, we will be joined by a practitioner who has experience for each case study.

Discussions

We will begin the semester with a workshop on facilitating discussions. The semester will then include 6 student-led discussions of topical literature. Readings will be posted on Canvas. During class periods, 1-hour will be devoted to student-led discussions. Following this we will spend the remaining 20 minutes of class discussing the broad context of what we have learned synthesizing lessons for management and understanding.

Students will be assigned in groups to discussion topics. Each topic is associated with 1-3 pieces of topical literature and three learning goals for the discussion. Students are expected to meet with their discussion groups and develop a 1-page plan outlining how they will facilitate an inclusive discussion that accomplishes their learning goals. The plan should be shared with all three instructors as a Google Doc. This **plan is due one-week before the discussion by the start of class.**

Synthesis Assignments

Synthesis assignments include a policy brief, blog post, group project on adaptive management, an integrative exam, and essay and group presentation on lessons from practitioners. Assignment requirements will be posted on Canvas. Generally, assignments will be due one week after the related in-class synthesis activity. **All assignments are due by the beginning of the class period on their due date.**

Late Assignments will be penalized 10% per day.

Regrades: a request for regrading an assignment should be submitted in writing including a clear justification.

Grading

Attendance	5%	
Participation in Case Studies and Discussions	5%	
Accountability for Online Lectures	5%	
Discussion Plan and Facilitation	10%	Assigned by topic- DUE class before discussion
Policy Brief on Lake Levels or Future of Shipping and Ports	10%	DUE Feb 5 or April 11
Maple River Dam Blog Post	10%	DUE Feb 21
Group Project on Adaptive Management	10%	IN CLASS March 14

Integrative Exam	15%	IN CLASS March 28
Lessons from Practitioners Essay	15%	DUE April 16
Lessons from Practitioners Presentation	15%	IN CLASS April 23

Course Schedule

Theme	**Week**	Date	**Format**	**Topic**
Intro	1	Thurs Jan 10	----	Course Overview and Introduction to the Physical System
Water Quantity	2	Tues Jan 15	Case Study 1	Lake Level Controls
		Thurs Jan 17	Discussion 1	Workshop on Facilitating Discussions
	3	Tues Jan 22	Discussion 2	Events leading up to Great Lakes Compact
		Thurs Jan 24	Case Study 2	Great Lakes Compact- Basin wide
	4	Tues Jan 29	Case Study 3	Implementation of Great Lakes Compact in Michigan
		Thurs Jan 31	Synthesis 1	Policy Brief
Fisheries Management	5	Tues Feb 5	Discussion 3	Food Web Collapse
		Thurs Feb 7	Case Study 4	Tribal Fishing **ASSIGNMENT DUE: Policy Brief**
	6	Tues Feb 12	Case Study 5	Sea Lamprey Control
		Thurs Feb 14	Synthesis 2	Maple River Dam Case Synthesis

Water Quality	7	Tues Feb 19	Discussion 4	Great Lakes Water Quality Agreements
		Thurs Feb 21	Case Study 6	Role of adaptive management in implementing the Great Lakes Water Quality agreement **ASSIGNMENT DUE: Case Synthesis**
	8	Tues Feb 26	Discussion 5	Multi Model P Management
		Thurs Feb 28	Case Study 7	Agricultural Watershed Nutrient Management
Break	9	NO CLASS		
Water Quality	10	Tues Mar 12	Case Study 8	Maintaining and Monitoring Beaches
		Thurs Mar 14	Synthesis 3	Group Project on Adaptive Management for Beaches **GROUP PRESENTATION: in class**
Coastal Communities	11	Tues Mar 19	Discussion 6	Integrated Coastal Zone Management
		Thurs Mar 21	Case Study 9	CZM: Planning for Resilience
	12	Tues Mar 26	Case Study 10	Areas of Concern Program
		Thurs Mar 28	Synthesis 4	**INTEGRATIVE EXAM**
Envisioning the future	13	Tues Apr 2	Case Study 11	Blue Accounting

		Thurs Apr 4	Synthesis 5	Panel: Future of shipping and ports
	14	Tues Apr 9	Discussion 7	Michigan as a climate refuge state: Value of water security and storage
		Thurs Apr 11	Case Study 12	Turning the economic corner; blue, sustainable, and productive **ASSIGNMENT DUE: Panel synthesis essay**
	15	Tues Apr 16	Synthesis 6	Group Work Session- Principles and lessons gleaned from practitioners **ASSIGNMENT DUE: Lessons from practitioners essay**
		Thurs Apr 18	Case Study 13	Growing, vibrant, sustainable coastal communities
Wrap Up	16	Tues Apr 23	Synthesis 7	**GROUP PRESENTATION: in class**