ENR 7380: Climate and Society
Autumn 2019
3 Credits

Dr. Eric Toman
School of Environment and Natural Resources
The Ohio State University
Kh 316c
614.292.7313
toman.10@osu.edu

Office hours by appointment

Class sessions
Wednesday: 2:15-4:55
Kottman Hall 333c

Prerequisites: Graduate standing or permission of instructor (upper division undergraduate students interested in this course are encouraged to contact the instructor)

Course description
This course examines the links between climatic changes and human societies and examines social influences on our current state of knowledge, impacts, and potential responses.

Considerable research indicates the climate system is changing with ongoing and projected future impacts on water and food availability, timing of life cycle events (e.g., flowering and migration), weather patterns and extreme events, among others. While responses to any environmental problem must be based on our best scientific understanding of the natural world, solving large and complex problems also requires attention to their human dimensions. In a review of the U.S. investment in global change research, the National Academies of Science stated that while there had been substantial advances in our basic understanding of climate science, there was limited progress applying this knowledge to address resulting impacts (NRC 2007). The committee concludes this lack of progress is due to limited support for social science research, insufficient interdisciplinary research, and a lack of established networks between scientists and decision makers (NRC 2009).

In this course, we will draw upon a broad range of existing research to consider human contributions to climate change, impacts of climate change on human societies, and the factors that contribute/inhibit human responses to climate change. We begin by developing a foundation in the physical science describing climate change (what/how/why) and then consider ongoing and projected future impacts. The remainder of our class sessions will examine the social construction of climate change as a complex (wicked) problem and consider the range of influences that encourage/inhibit development of responses. We will apply class concepts to ongoing policy discussions at the domestic level within the U.S. as well as the international negotiation process.

Learning outcomes
After completing this course, participants will be able to:

• Describe the role of the natural and social sciences in developing an understanding of global climate change and potential responses.

• Describe interactions between the practice and communication of science (social and natural) and the development of policy/management responses including how social and political factors can influence how science is conducted, interpreted, and communicated.

• Apply critical thinking skills to examine the current state of knowledge, identify research gaps, and discuss potential approaches to mitigate and adapt to the changing climate.
Course format and expectations

This course will primarily consist of small and large group discussions of readings, supplemented with participatory lectures (including guest presentations), videos, and in-class activities. Because of the interactive nature of this course, students are expected to attend class sessions prepared (defined as having read and reflected upon readings and course content) and actively participate in class discussions. Participation will be observed throughout the term and counted towards the course grade (see below). For those classes that include participation from guest speakers, it is particularly important that you come to class prepared to actively engage in class discussion during these sessions.

While our discussions will involve an active and vigorous exchange of ideas, participants are expected to demonstrate respect for one another at all times. This does not mean we cannot disagree. Differences in beliefs and understandings are welcome and are expected to be communicated with respect for others’ beliefs.

Readings

Required readings for this course will be posted to the course Carmen website. The schedule below is considered an initial reading list and some changes throughout the semester are likely (changes will always be posted to Carmen a minimum of one week before their associated class session). Readings are to be completed prior to the class period for which they are assigned.

Grading

A total of 300 points are possible for this course. The table below demonstrates the minimum percentages required for each grade level.

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Assessment tasks

Grades will be based on performance on the following activities. Late assignments will be docked one letter grade for each day past due.

- **Class participation (40 pts possible):** Your active engagement is required for the success of this class. Regular attendance is necessary, but not sufficient on its own. Students are expected to be active participants in discussions, activities, and interactions with guest speakers. Students must also adequately prepare for and participate in the negotiation activity in week 12.

- **Reflections on readings/course concepts (8 X 5 = 40 pts):** On designated weeks (noted on course schedule) you will develop a brief (300 words or less) reflection on course material. Reflections are due, in hard copy, at the beginning of class on the assigned day (late submissions will be docked one letter grade) and should further explore concepts raised in class readings and
discussions, integrate concepts across readings and class sessions, and demonstrate application of course concepts. Some designated reflections (noted in schedule) of these will have assigned topics while others will be “open” for you to select the topic of your choice. In each case, I will expect your reflection to present your original, critical analysis, and not merely describe a point of view - yours or someone else's. I expect your writing to be clear, succinct, logically organized, and free of grammatical or spelling errors. We will discuss reflections at the beginning of class (this will often involve sharing your reflection with another student for feedback and discussion).

• **Briefing memos (2 X 10 = 20 pts):** Briefing memos are used to summarize scientific findings and provide a recommendation for policy or management action. This is often a challenging task for scientists given the limitations posed by the short length and the intended audience (e.g., decision/policy-makers, likely non experts in topic area). You will develop two briefing memos (submitted in weeks 2 and 12). Guidelines and an example memo are available on Carmen. **Note:** memos should not exceed 1 page in length. Bring one copy to class to submit for grade.

• **Climate impacts summary and presentation (40 pts):** In week 4, students will work in teams to provide a summary of the current state of knowledge in a particular topic area (selected from a list of potential topic areas). Everyone is expected to contribute equally to this assignment and students will assess the contributions of teammates. Guidelines and a template for the Summary will be available on Carmen. Summaries should be submitted to Carmen under the appropriate “Discussion” section by 12:00 PM on the day they are due to allow other students to access them prior to class. **Bring one hard copy per team to class to submit for grade.**

• **Discussion Leader (40 pts):** During specified weeks, students will work in teams to lead the discussion of selected readings. Students will select the week they choose to serve as a Discussion Leader. Working together, students will be responsible to facilitate class instruction regarding the material presented in the assigned papers. Everyone is expected to contribute equally and students will assess the contributions of teammates. Students should plan on developing enough material for approximately 60 minutes and include a brief summary of the assigned readings (assume others have read the articles), statement of the main ideas raised by the author(s), potential applications to course topics, and, where applicable, limitations of the work. These discussions should not solely consist of a one-way delivery of material but include an interactive component. Dr. Toman will provide additional information about content and suggested activities to discussion leaders as the time approaches. **Students should sign up to lead the discussion for one of the selected days prior to the second class session through the appropriate “Discussion” on Carmen. Dr. Toman may make adjustments if needed to ensure adequate student participation in all weeks.**

• **Climate literacy tool (40 pts):** In week 10, students will submit an original project designed to build the climate literacy of policy-makers, decision-makers, or the lay public. Draft ideas for these tools will be discussed in week 7; students should be far enough along that students can provide discuss their ideas and planned approach with class members. Examples will be available on Carmen. **Final literacy tools are due in week 10 and can be submitted electronically through Carmen or in class as needed for your specific tool.**

• **Final project (80 pts):** For the final project, students may complete either of the options below. The first of these, the **Integrated proposal**, will be completed in teams with other students in class. The second option, the **Synthesis paper**, will be completed by students individually. We
will discuss these options further in class and students will need to decide on which option they will pursue by class in Week 5.

- **Integrated proposal:** Working in teams of 3 – 4, students will identify an area of interest with relevance to class topics and develop a brief project proposal that illustrates how the project will be carried out. Specifically, the proposal should include:
  - Develop a central research question related to this issue; this question should be integrated and require engagement of multiple scientific disciplines.
  - After agreeing on the central research question, teams will develop specific research objectives and hypotheses. These objectives need to make clear contributions to the central research question and the hypotheses need to be testable through one or multiple disciplines.
  - Contributors to each objective will articulate the expected outcomes (specific data, models, etc.) and impact of the proposed work.
  - Students will reflect on their central research question and whether the research expertise represented among team members is sufficient to address the full scope of the central research question and, if necessary, identify other research disciplines they currently lack and may need to invite to join the team.

- **Synthesis paper:** You will develop a paper that illustrates application of course concepts and their extension beyond the material covered in class. This paper will involve gathering additional information on a question of interest to provide a more in-depth examination of the issue and related psychological, social, and/or institutional influences and recommendations. The paper is expected to be 4,000 – 5,000 words in length (not including bibliography or tables/figures and include an appropriate number of citations (minimum of 15 expected). Citations may be included in the acceptable format for your specific field. We will have a roundtable discussion of ongoing student projects during our final session; each student will be expected to discuss their project topic and initial findings. Students must submit their proposed topic area to the instructor by week 9.

**Absences**
As this course is primarily discussion based and only meets once a week, your attendance at each class session is critical. All absences must be approved by contacting the instructor prior to the class session you plan to miss. Unexcused absences will result in reduced participation points.

**Academic misconduct**
Academic dishonesty will not be tolerated. Students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:
- **cheating**: use or attempted use of unauthorized materials, information, or study aids;
- **fabrication**: falsification or invention of any information;
- **tampering**: altering or interfering with evaluation instruments and documents; or
- **plagiarism**: representing the words or ideas of another person as one’s own.

You must write in your own words. Cutting and pasting blocks of text from sources is plagiarism. You may quote from source material, but the quote must be brief and cited according to recognized citation guidelines. Ask in advance if you are uncertain regarding the appropriate use of material
from other sources. **Penalty for academic dishonesty may result in failing the course and additional University disciplinary action.**

**Disability services**
Any student who feels they may need an accommodation based on the impact of a disability (including mental health, chronic or temporary medical conditions) will need to register with the Office of Disability Services (ODS). I encourage you to contact me immediately so that we may discuss specific needs and potential accommodations. Students are responsible for proactive communication regarding these accommodations and retroactive accommodations may not be possible. ODS is located in Baker East and can be contacted at (614) 292-3307 (voice), (614) 292-0900 (TDD) and online at [www.osu.edu/units/ods](http://www.osu.edu/units/ods).

**Counseling services**
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student’s ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of these conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life’s Counseling and Consultation Service (CCS) by visiting [ccs.osu.edu](http://ccs.osu.edu) or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. When CCS is closed, you can reach an on call counselor at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org).

**Course schedule**
See below for the preliminary schedule of course topics, readings, and assignments. Guest presenters may join us in person or via video/teleconference for some classes (specific sessions noted below). The schedule and assigned readings may be adapted based on availability of speakers and class needs and interests. Readings are to be completed prior to the class session for which they are assigned and are available on the course Carmen website.

**Week 1: Introduction**
Discuss course: 1) outcomes/expectations, 2) background/goals of participants, 3) assignments, and 4) schedule.
- What is climate change and why is action to address climate change required?
- How have we organized ourselves to better understand climate change and potential responses (big picture—illustrating history and current organization-science, domestic policy, and international negotiations)? Interested parties and scales of responses. What can be done about it (mitigation and adaptation)?

**Assignments**
- Following our first class, students will sign up through the appropriate Carmen Discussion for their topic of interest for the impacts summaries/presentations for week 4 (projected impacts in Ohio/Midwest U.S.; list of resources to use as starting point posted on Carmen). Sign up on Carmen (Impacts Summary page...link available through home page).
Week 2: State of science…known knowns, known unknowns, unknown unknowns

- The state of climate change science
- Alternative hypotheses and conclusions
- Remaining gaps and uncertainties

Readings
IPCC, 2013: Climate Change 2013: The Physical Science Basis. Working Group 1 Contribution to the Fifth Assessment Report of the IPCC. Geneva, Switzerland. (Read Summary for Policy Makers and scan the Introduction (pay attention to how key terms are defined and how treat uncertainty.)


Assignments
- Briefing memo: Summarize state of science for policy makers. Describe state of knowledge, level of certainty, and conclude whether this current state of knowledge warrants action.

Week 3: Philosophy of Science; Science – Policy Interface
Introduction to philosophies of science, coupled human and natural systems, and wicked problems.

Readings


Assignments
Open reflection on class concepts, readings, and/or discussions to date
**Week 4: Regional / Sectoral impacts**

State of science regarding regional and sectoral impacts from climate change. Student presentations on select topic areas.

National to Regional climate projections—*Student presentations on following topics (one team per topic)*

1. Water Resources: Describe projected impacts on water quantity and quality in the U.S., the Midwest, and Ohio (SAP 4.3, ch. 4; Pryor et al. 2014 – Key messages 5 and 6; Georgakakos et al. 2014)
2. Agriculture: Describe the projected effects on agricultural and forest productivity in the U.S., the Midwest, and Ohio (SAP 4.3, ch. 2; Pryor et al. 2014 – Key messages 1 and 2; Hatfield et al. 2014)
3. Ecosystems: Describe projected expected effects on ecosystems in the U.S., the Midwest, and Ohio (SAP 4.3, ch. 5; Groffman et al. 2014)
4. Public health: Describe projected public health challenges in the U.S., the Midwest, and Ohio (SAP 4.6, ch. 2; Pryor et al. 2014 – Key message 3; Luber et al. 2014)
5. Energy use/production: Describe projected impacts of climate change on energy use and production (SAP 4.5, ch.’s 2 and 3; Pryor et al. 2014 – Key message 4; Dell et al. 2014)

*Use the above as a starting point, but feel free to identify and use other resources as well, use the above as a starting point for your review. See the National Climate Assessment Website for additional information.*

**Readings**

Everyone read:

**Assignments**

- Student presentations: Follow guidelines on Carmen for in-class presentations.
- Summary of topic area: Following guidelines provided on Carmen, each team will develop a summary of on your selected topic area. One summary will be submitted per team. *Summaries should be posted to the appropriate Carmen “Discussion” by 12PM the day of class.*

**Week 5: Contributions from the social sciences (Groups)**

Introduce social science disciplines; discuss contributions of sociological research to understanding climate change and potential responses.

**Readings**


Science and Technology. Cambridge: Cambridge University Press. (Discussion led by assigned Discussion Leaders)


Assignments
Open reflection on class concepts, readings, and/or discussions to date
Assigned Discussion Leaders – lead discussion of 1) Wynne and 2) Kollock.

Week 6: Contributions from the social sciences continued (Individuals)
Discuss contributions of psychological research to understanding climate change and potential responses.

Readings


Assignments
Open reflection on class concepts, readings, and/or discussions to date
Assigned Discussion Leaders – lead discussion of 1) Pearson et al. and 2) Gifford

Week 7: Where are we now?-Public awareness, attitudes, and influencing factors
Discuss current attitudes, levels of support for action in U.S.

Readings


**Assignments**

- Prior to class, use the questions posted on Carmen to interview 3 non-classmates regarding their beliefs about climate change.
- Complete reflection on your interviews.
- Draft of climate literacy tool to discuss with classmates.

**Week 8: Communicating climate change; Media effects – Agenda setting and Balance**

Communication across boundaries and the role of the media in reporting climate change information


**Assignments**

Open reflection on class concepts, readings, and/or discussions to date

**Week 9: Domestic Policy – Mitigation**

Discuss current state of climate policy in the U.S. with an emphasis on mitigation.


Assignments
Open reflection on class concepts, readings, and/or discussions to date
Submit draft paper topic
Assigned Discussion Leaders – lead discussion of 1) Wynne and 2) Kollock.

Week 10: Adaptation in the U.S.-Science and Policies
Invited guest speaker-Laura Petes (National Oceanic and Atmospheric Administration)
Discuss ongoing efforts to support climate adaptation.

Readings


Assignments
Submit final Climate Literacy Tool.

Week 11: International negotiations
Discuss history and current status of the UN Framework Convention on Climate Change negotiating process.

Readings


Read news summaries of recent Conference of the Parties (COP) meetings posted on Carmen.

**Assignments**
Open reflection on class concepts, readings, and/or discussions to date.

**Week 12: Model UNFCCC negotiation activity**
Complete in-class negotiation activity following guidelines posted on Carmen.

**Readings**
Complete readings specific to assigned role prior to class.

**Assignments**
Prepare for in-class negotiation activity including completing readings, identifying negotiating positions, and developing alliances as appropriate.
Briefing memo: use to summarize your negotiating position and supporting evidence (follow format provided on Carmen)

**Week 13: Incorporating climate change in planning and decision-making**

**Readings**


**Assignments**
Complete reflection on challenges and opportunities to integrate climate change in planning and management activities

**Week 14: Organizations, Markets, and Climate Justice**

**Readings**


**Assignments**
Open reflection on class concepts, readings, and/or discussions to date

**Week 15: Where do we go from here?**
Review and summarize concepts, discuss implications
Roundtable discussions of student projects

**Readings**

**Assignments**
Complete course evaluation form on Carmen to evaluate course; submit hard copy to remain anonymous.

Final projects due by 5:00 PM on Monday 12/9/19