Course: NRE 677 Climate Adaptation Seminar
1.5 credits, Fall 2014 (DRAFT - readings still being updated)

Professor: Rosina Bierbaum (rbierbau@umich.edu)
Classroom: Dana 1040
Course Schedule: Wednesday 4-6 PM; October 29-December 17, 2014
Office Hours: TBD

Course Overview: This 7-week seminar will delve into the specifics of climate change adaptation activities taking place internationally and domestically in different sectors and regions. Particular emphasis will be placed on understanding the different components of climate change adaptation and resilience and how stakeholders at the international, national, state, local, private, and nongovernmental sector scale are taking action to address existing and projected climate impacts. The course will expose students to the conceptual and practical aspects of adaptation to climate change, allowing students to obtain greater understanding of adaptation activities, barriers, needs, and opportunities.

Course Format: This two-hour course will be taught on Wednesdays for 7 weeks, starting on October 29th and running until December 17th. The course format will be a mixture of presentations from the Professor and outside experts as well as in-class discussions based on readings. Students are expected to read all materials and be active participants in weekly discussions. Each student will be required to submit a brief response to the weekly readings in the form of discussion questions and/or bulleted thoughts (a minimum of 3 per week) to the professor at least 24 hours in advance of each class. Students will also deliver in-class presentations at regular intervals. The final deliverable for the class will be a policy paper written for key domestic or international decision makers, using some of the tools learned in class. This assignment will be due Wednesday, December 17th.

Grading and Evaluation: Students will be graded based on three main deliverables:
- 40% Class participation (including discussions and submissions of pre-class questions)
- 35% In class presentations
- 25% End of term project/paper (due 12/17/14)

Class Materials: There is no formal text for this class. Instead, weekly readings are assigned based on the discussion topic. Students are expected to come to class having reviewed all of the weeks’ pertinent materials and prepared to discuss their reactions.

Course Schedule: Week 1: An Introduction to Climate Adaptation (Bierbaum)
During this session, students will discuss the basic tenets of climate adaptation, including the core components of sensitivity, adaptive capacity, exposure, vulnerability, and risk. An introductory overview of adaptation across sectors and scales will be presented to lay the foundation for future courses.

At the close of this session, students will select a country included in one of the three regions covered by the World Bank’s “Turn Down the Heat2” report (or Turn Down the Heat 3” if it is out. Students will be asked to study that country’s adaptation activities and compose a 1 page summary describing what climate impacts are likely to be most problematic, and what information or tools they would like to have to evaluate adaptation options. The summary is due in Week 3, but students should come to class in Week 2 having started this assignment.

Required Reading (~100 pgs)
- Intergovernmental Panel on Climate Change Climate Change 2014: Impacts, Adaptation and Vulnerability, Working Group II Contribution to the Intergovernmental Panel on Climate Change Fifth Assessment Report, Summary for
Policymakers.


Week 2: Climate Adaptation – Tools to Help with Analysis and Decision Making (Bierbaum; Richie Ahuja, EDF; Elizabeth Gibbons, The Graham Institute)

This session will focus on climate adaptation decision making and analysis tools, and local climate adaptation efforts. Our guest speakers will address climate adaptation challenges and opportunities in rural India and the Great Lakes Region in the US.

In addition to having completed the reading for this week, students should come to class with ideas and thoughts about what sorts of information and/or tools would be useful to evaluate adaptation options for the country they are focusing on. (See previous session for country-level climate adaptation assignment.)

Required Reading (~100)

- “In India, Farmers Adapt to Climate Change.” Environmental Defense Fund. (~1 page) http://www.edf.org/blog/2013/03/14/india-farmers-adapt-climate-change
- Please familiarize yourself with the GLAA-C Decision Support Tool (http://graham.umich.edu/glaac/great-lakes-atlas) and the Tools section of the Carpe Diem West Academy website (http://carpediemwestacademy.org/tools)


• Note: one or two additional readings may be assigned for this week to complement presentations by guest speakers.

Week 3: International Adaptation (Bierbaum; Alan Miller, GEF and IFC)
This session will focus on the status of international climate change adaptation looking at both activities happening at the global level as well as activities taking place outside of the United States. The session will look at international efforts such as the UNFCCC and the IPCC process and country-specific adaptation activity. During class, students will also be asked to share the findings of their country adaptation analysis and thinking about tools that might help identify appropriate adaptation options (see previous session).

At the close of this session, in preparation for Week 4, students will be asked to select a U.S. Federal Agency to analyze the climate adaptation activities of and come to the next class with a one-page (single-sided) fact sheet that describes the results; these fact sheets will inform a class discussion in Week 4.

Required Reading (~90 pages)


Week 4: Climate Adaptation at the U.S. Federal Level (Bierbaum; Jacobson, CEQ and SNRE)
This session will focus on climate adaptation activity at the U.S. Federal level including analysis of internal activities as well as Federal activities that enable and/or constrain other stakeholder climate adaptation activities. As part of this lesson, the President’s Climate Action Plan will be discussed and other actions under Executive Order 13514, and the Global Change
Research Act. Additionally, students will be asked to profile climate adaptation activities underway in a Federal agency of their choosing.

At the close of this session, students will be asked to form groups of 2-3 and select a U.S. State and analyze the State’s climate adaptation activities for the next session. Student groups should prepare a 5-minute presentation on their results and be prepared to deliver this presentation in the next session.

**Required Reading (~100 pages)**

- America’s Climate Choices: Adapting to the Impacts of Climate Change (pages 51-74) (23 pages)
- A Review of Adaptation in the US: more than before, but less than needed. *Mitigation and Adaptation Strategies for Global Change*. October 2012. (37 pages)
- “President’s Climate Action Plan.” Executive Office of the President. June 2013. (p 4-5, p 12-16). (7 pages)
- Students should review specific climate adaptation plans for the Agency they were assigned in the previous session.

**Week 5: State-Level Climate Adaptation** (Bierbaum; C2ES)

This session will focus on climate adaptation efforts unfolding at the state level. Students will look at how some states are undertaking formal climate adaptation planning processes, while others are integrating climate considerations into existing processes and plans. This session will be interactive, with student teams presenting on the findings from their State research.

At the close of this session, in preparation for Week 6, students will be assigned a local or regional government and asked to analyze climate adaptation activities underway in this location. Students should come to the next session prepared to discuss the results of their analysis.

**Required Reading (~80 pages)**

- Cruce, T. 2009. Adaptation Planning – What States and Localities are Doing. Pew Center on Global Climate Change. (25 pages)
• Case Study: Western Adaptation Alliance. (2 pages) http://sustainablecommunitiesleadershipacademy.org/resource_files/documents/Building-a-Partnership.pdf
• Students should review specific climate adaptation plans for the State they were assigned in the previous session: Georgetown Climate Center database on adaptation (http://www.georgetownclimate.org/adaptation) and the Center for Climate and Energy Solutions’ database of state and local climate adaptation may be useful resources (http://www.c2es.org/us-states-regions/policy-maps/adaptation).

Week 6:  Climate Adaptation at the Local and Multi-Municipal Level (Stults, ICLEI; Lee/Cooper, NYC)
This session will look at local government adaptation efforts happening at both the individual and at the multi-municipal level. As this scale has been particularly active, students will have the opportunity to evaluate different adaptation approaches at the local level and hear from a local stakeholder about how adaptation is unfolding in their community. Group discussion and lecture will look at how municipalities across the U.S. are approaching climate adaptation from planning to implementation. Students will also have a chance to share the results of their municipal analysis.

Required Reading (~128 pages)
• Leichenko, R. (2011). Climate change and urban resilience. Current Opinion in Environmental Sustainability, 3(3), 164–168. (5 pages)
• Students should review specific climate adaptation plans for the municipality they were assigned in the previous session.

Week 7:  Climate Adaptation in the Private and Nongovernmental Sectors (Nordgren, Kresge; Seabright, Coca Cola)
This session will look at climate adaptation activities and motivators for the private and nongovernmental sectors. Guest presenters will discuss adaptation activities underway in their
organization, any activities underway to enable other sectors to adapt, and how/why these strategies were selected. [Reminder: Final papers are due next week.]

Required Reading (~94 pages)

- Carbon Disclosure Project. Insights into Climate Change Adaptation by UK Companies. March 2012. (50 pages)
- Climate Adaptation Services at ICLEI – Local Governments for Sustainability (5 pages) http://www.icleiusa.org/climate_and_energy/Climate_Adaptation_Guidance/
- Climate Adaptation Services at The National Conservancy (5 pages) http://www.nature.org/ourinitiatives/urgentissues/global-warming-climate-change/how-we-work/supporting-strong-adaptation-strategies.xml

Additional Resources

The following may be useful in staying up-to-date on climate mitigation and adaptation policy, practice, and research:

Periodicals
Science
Nature

News Outlets
Climate Nexus - http://climatenexus.org
E&E News – ClimateWire, EnergyWire, GreenWire – http://www.eenews.net (UMich faculty, staff, and students have free access)

Websites & Blogs
Climate Central - http://www.climatecentral.org
Skeptical Science - http://www.skepticalscience.com
http://Climatechange.net
Georgetown Climate Center - http://www.georgetownclimate.org/adaptation
GreenBiz.com