Course Syllabus
School of Public Policy
University of Maryland

PUAF 741
Global Environmental Problems
Prof. Nathan E. Hultman
Fall 2013

Course meetings
Tue 4:15 – 6:45 pm lecture
1107 VMH

Course description
About a generation ago, many environmental problems came to be seen not only as issues for a local region or even a country, but rather as pervasive problems affecting the entire planet. Persistent pollutants, air and water pollution, habitat loss, and species extinction were in the vanguard of this evolution in perspective, followed by truly global scope problems such as ozone depletion and climate change. Undergirding the increasing focus on global problems were persistent questions about resource scarcity, population, and what came to be known as sustainable development. This course investigates our understanding of such Global Environmental Problems, first by examining and assessing the science behind several such issues, and then by situating each in its historical and policy context. In doing so, we establish both a facility with the basic elements of each issue as well as a critical perspective on how that issue overlaps with questions about development, security, equity, and environmental protection.

Contact Information
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Office hours: Wed 1:30-2:30 or appt

Syllabus Version: 2.0
Readings

Required Books


Other readings. Other required readings will be available online via direct links in the syllabus, or on electronic course reserves. You will notice I provide links in the syllabus to many online resources. Some of these are subscription only, but if you log in on campus, or via campus servers, you should have access to all of them.

Assignments and Exams

• Two 1-page reading critiques
• Four problem sets
• An op-ed to be submitted to a media outlet
• One mid-term quiz
• A final exam

You may turn in assignments after their due date, but you must pay a penalty. If the paper is late by a day or less, you can get up to half credit. Between 1 and 3 days late, you can get up to 25%.

Your participation grade includes attendance and discussion in class.

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<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Op-Ed</td>
<td>10%</td>
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<tr>
<td>Problem sets (4)</td>
<td>20%</td>
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<tr>
<td>Quiz</td>
<td>15%</td>
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<td>Final Exam</td>
<td>30%</td>
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<tr>
<td>Reading critiques (2)</td>
<td>20%</td>
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<td>Participation</td>
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Schedule of Lectures and Readings

Note: Readings are to be completed before the lecture on the day that they are listed

Sep 03
Week 1. Introduction and Quantitative tools I

In class:

- Introductions
- Course overview
- Scientific Notation and Orders of Magnitude
- Scientific Units and Unit Analysis
- Estimation and the Back-of-the-Envelope Calculation

September 10
Week 2. Science, environment, and development: A case

In class:

- Guest Lecture by Prof. Stephanie Lansing from the UMD Dept. of Environmental Science & Technology
- Examples of application of science and technology for reducing environmental pollution and providing improved health and access to energy
- Prof Hultman in India
- There will be a question on the quiz or final exam drawn from Prof Lansing’s lecture, so attendance and engagement are required!


Chasek, Downie, and Brown (CDB). Chapter 1. “The Emergence of Global Environmental Politics”.


September 17
Week 3. Quantitative Tools II

In class:

- Basic physics and chemistry
- Stock-flow / Box models
- Residence times
- Feedbacks
- Hand out PS1

Harte 1–15
Harte 16–28, 36–44
September 24
Week 4. Quantitative Tools III

- Non-steady state systems and growth
- Population dynamics and Demographic projections

Harte 50–54, 111–116, 216–223
Pielke, Ch. 4 “Values”+ Ch 5, “Uncertainty”

October 01
Week 5. Scientific expertise in environmental policy

In class:
- Decision tools and policy analysis
- Risk assessment and risk analysis
- Precautionary principle and applications
- Uncertainty and values
- Scientists’ contribution to debates
- Hand out PS2
- Due: PS1

Pielke, Chs. 6, 8, & 9. “How science policy shapes science in policy and politics”; “When scientists politicize science”; “Making sense of science in policy and politics.”

October 08

Week 6. Population; Resource Scarcity; Limits to Growth?; Planetary Boundaries

In class:
- Population debates
- The IPAT discussion
- Resource scarcity and Limits to growth debate
- **Due: Reading Critique 1. Pielke’s book**

http://129.237.201.53/books/malthus/population/malthus.pdf

http://www.sciencemag.org/content/162/3859/1243.full


http://www.clubofrome.org/docs/limits.rtf

http://www.ecologyandsociety.org/vol14/iss2/art32/

October 15

Week 7. Earth systems, Persistent Chemicals & Nutrient cycles

In class:
- Biogeochemical cycles
- Regulation of chemicals
- Agricultural sustainability
- **Due: PS2**

Carson, Rachel (1962), *Silent Spring*. Chs. 1-3 (ELMS) 
CDB Ch 3, pp. 121-151

http://www.nature.com/nature/journal/v486/n7401/full/nature11018.html

http://www.nature.com/nature/journal/v478/n7369/full/nature10452.html

Harte 95–99
October 22

Week 8. Air Pollution

In class:

- Air pollution: Acid rain, Smog, Indoor air pollution
- Human health impacts
- Air-shed management & governance
- Energy, development, and climate nexus
- Hand out PS3

Harte 104–110, 120–123; 124–127


BBC, St Paul's Cathedral pollution damage 'lowest ever' 10 Oct 2012. [http://www.bbc.co.uk/news/uk-england-london-19896401](http://www.bbc.co.uk/news/uk-england-london-19896401)

Oct 29

Week 9. Ozone: A model for science in policy?

In class:

- Ozone chemistry and recent developments
- Evolution of international ozone politics
- Due: PS3

CDB Ch. 3, pp. 101-120


November 05
Week 10. Climate Change

In class:
• Basic climate change science
• Impacts & Adaptation
• Policy regime – National and international
• A deeper discussion of this topic is provided in PUAF 698K: Climate Science & Policy
• Due: Reading Critique 2. Hartwell paper

CDB Ch 3, pp. 151-173
Climate Change Policy Ch 1: Mastrandrea & Schneider “Climate change science overview”
Hartwell Paper http://www.lse.ac.uk/collections/mackinderProgramme/theHartwellPaper/
http://www.nature.com/nclimate/journal/v3/n1/full/nclimate1783.html
http://www.brookings.edu/research/opinions/2011/12/12-durban-platform-hultman


November 12
Week 11. Nuclear Power

In class:
• Radiation units, doses, and risk
• Nuclear power fuel cycle
• Nuclear waste / Spent fuel storage
• Hand out PS4
• Nuclear expansion after Fukushima


Optional

November 19
Week 12. Quiz, and video

In class:
• Quiz
• Due: PS4
• Video: American Experience, “Rachel Carson’s Silent Spring”
• Hand out Op-Ed guidelines & Discuss

Catch up on readings thus far.

November 26

Week 13. Natural Resources, Species, and Habitats

In class:
• Biodiversity, deforestation, desertification, fisheries
• Ocean acidification, wetland loss,
• REDD+

CDB Ch 4 “Natural Resources, Species, and Habitats”
Chapin, Consequences of changing biodiversity, Science, 2000. (ELMS)

Dec 03


In class:
• States and nonstate actors in environmental politics
• The genesis and legacy of Rio; Rio+20
• Due: Op-Ed

CDB Ch 5: “Effective environmental regimes: Obstacles and Opportunities”
CDB Ch 6: “Environmental Politics and Sustainable Development”

Dec 10
Week 15. Recasting “Sustainable Development” for the 21st Century

In class:
• Elements of sustainability, development, innovation, entrepreneurship
• The new MDG process and inclusion of sustainable development goals
• The Green Growth agenda
• Integrative exercise

CDB Ch 7, “The future of global environmental politics”

Week 16. Final Exam

Time TBD
(SPP has to schedule this for us and it is not usually done until early October)
Details on the final exam:
• Coverage will be comprehensive -- all material/topics in the course are fair game.
• I am looking to see what you know, not trying to trip you up on what you don’t
• I am looking to see that you understand
  o the major scientific drivers of global environmental problems
  o the ways that environmental science and scientists interact with the policymaking process
  o diverse perspectives on the drivers of environmental change and human security
  o The historical changes in approaches to governing environmental problems
• Format will be short answer (paragraph) and longer (1-2 page) essays
• Closed book – though you can bring in one standard sized (8.5 x 11) “crib sheet” of paper with notes that you will then hand in
• The test will be designed to be completed in 3 hours or less.
• No laptops or internet use.
• We provide bluebooks