Changes in global climate caused by human activities threaten the long-term viability of mankind on the planet. Although our understanding of how human activities affect the world environment is incomplete, it is believed that actions will need to be taken on a planetary scale before major irreversible impacts occur. Changes in human behavior of the magnitudes contemplated may not be achievable, but if they are, governmental institutions will necessarily play a central (though not exclusive) role. The capacity of governments to contribute to sustainable management of the global environment is likely to be limited, however.

This course explores some major questions presented by global climate change: What can governments do, given the scientific uncertainties that obscure the relationships among human activities and the world environment? What should governments attempt to do, given their mixed record of success in managing human affairs? What will governments do, given changes in climate that would affect demographic patterns and economics and political power for centuries?

Plan of the Course

Answers to these questions cannot all be found in libraries or laboratories. Sensible responses to the challenge of global change will of necessity combine the knowledge and judgment of persons from many disciplines and backgrounds. This course is intended for graduate and professional students interested in making global environmental change a significant part of their future work: the environmental sciences (e.g., geology) and their related disciplines (e.g., chemistry); the social sciences and related professional programs (marine studies, international studies, public affairs, law, public health, and business administration); and natural resource management (forest resources, fisheries, environmental engineering, urban planning, landscape architecture, and law).
The course is organized around five modes of exploration:

- Assessing the nature of global climate change as a policy problem both in its scientific aspects and from the perspective of the policy dynamics that drive the issue.
- Identifying the leading problems of governance posed by global climate change and assessing the alternative regime designs that might be pursued.
- Assessing problems of mitigation (i.e., controlling GHG emissions and carbon sequestration options).
- Assessing the impacts of climate change in hydrology/water resources and forests.
- Searching for ways to design responses, drawing upon the limited but useful understanding we have of how organizations learn.

The problem identification strand of the course depends largely on background readings and visiting lecturers from this campus and elsewhere. Visiting lecturers will be asked to focus on the questions of governance raised by the wide range of climate changes that may occur over the next century.

The ability of governments to respond to global change depends critically on their ability to learn: to recognize the impacts of climate change (in advance where feasible); to formulate technically sound responses within (and perhaps extending) the boundaries of practicality; and, not least, to adjust programs and resources in light of experience—a experience that is both social and biogeochemical, and that will emerge over a long time through the accumulation of impacts. Readings and the paper assignments are intended to link students' disciplinary and professional expertise to the policy questions raised by global change.

**Texts:** Texts for the course will be:


Some readings have been placed on reserve in the Fish/Ocean Library. These are all available via on-line reserve (OLR).
Expectations

Students enrolling in this course will be expected:

1. To prepare for each class by reading the materials assigned.
2. To attend all class sessions.
3. To outline the linkages they perceive, in a preliminary way, between the dynamics of organizational learning, global climate change as a policy problem in both its scientific and policy process dimensions, and the potential as well as probable governmental responses, given the constraints of long timescale problems. Once that analysis is concluded, design an alternative regime that you think has a better chance of controlling greenhouse gas emissions than the existing regime. Students may work as individuals or in teams. A (maximum) 10-page paper (double-spaced) per person is due on November 6, 2006. For teams of 3 or more the maximum limit is 30 pp.
4. To write a short policy analysis, describing an aspect of the global change issues that is: a) tractable for government (s) to deal with; b) salient to entities within government (s); and c) ripe for action within the next decade. The choices available should be described, their implications analyzed for both government (s) and the environment in which they act, and a recommended course articulated and defended. Limit your choice of themes to energy, water resources, or forests. A (maximum) 10-page (double-spaced) per person policy memorandum is due no later than 5:00 P.M. Monday, December 11. Again, students may work in teams or as individuals. No late papers will be accepted. Teams may choose to cover all three themes. For teams of 3 or more the maximum limit is again 30 pp.

Advice on the Policy Analytic Exercise

For first-year students who have not yet done a policy analysis exercise, the following format is offered as an example only.

First, please consider examples of governmental responses that you believe are conceivable over the next two decades; at this stage, considerations of feasibility and practicality may be premature (or not, as you may wish to argue). I have organized the course by identifying three principal modes of response: assessment, remedial action (mitigation), and adaptation. Please take these as a starting point — I should like you to consider each category, but not to limit your consideration to these types of response.

Second, please assess the responses, in light of the limited information available, along the following lines:

In theory:

Theoretical potential — how large an effect on global climate might there be from this response?
Synergistic/antagonistic interactions with other responses to global environmental change, or secular trends such as economic growth;

driving forces (population, economics, other) that affect the theoretical potential;

constraints on planning.

As costs increase:

What is the curve of marginal cost? If it is not known, can it be bounded?

How will non-market costs vary as the response is expanded?

Are there conceivable means to apportion costs (both economic and non-market) across national populations? In particular, is it conceivable that the non-market costs of adaptation (which appear to raise the most difficult questions of social justice) can be shared?

Scale:

What is the value of this response at less than global scale?

Is this response likely to be inhibited or adopted for reasons other than global climate change?

Achievable potential by 2025:

How much can be done in the next two decades?

Will market forces bring some or all of the potential forward? Are there other incentives available to facilitate international cooperation?

How much are governments at and below the national scale likely to do?

What international complications (or opportunities) stand in the way of national action? (When) is global action necessary?

In the longer-term:

Can you identify barriers to reaching the achievable and theoretical potentials?

How would one structure a plausible agenda for long-run attainment of the maximum potential?

How would you size up the possibilities for governments and other large institutions (e.g., international organizations, corporations, non-governmental organizations) to learn from the experience of responding to global anthropogenic change?
I am aware of the ambitious character of these questions, of course. Their purpose is not to induce futurist speculation, but rather to assist you (and us in the seminar) to improve our grip on the uncertainties that lie ahead.

**PART I: GLOBAL CLIMATE CHANGE AS A POLICY PROBLEM**

**WEEK I (OCT. 2): ON THE NATURE OF GLOBAL CLIMATE CHANGE AS A POLICY PROBLEM: SCIENTIFIC ASPECTS.**

**Required Reading**

For students with no prior scientific background:


For all students:


**Suggested Reading**


WEEK II (OCT. 9): ON THE NATURE OF GLOBAL CLIMATE CHANGE AS A POLICY PROBLEM: POLICY DYNAMICS.

Required Reading


Suggested Reading


WEEK III (OCT. 16): TOOLS: GLOBAL AND REGIONAL MODELS AND INTEGRATED ASSESSMENT

Required Reading


**Suggested Reading**


WEEK IV (OCT. 23): THE REGIME: THE GLOBAL CLIMATE CONVENTION

Required Reading

The United Nations Framework Convention on Climate Change, May 9, 1992. (OLR)


Suggested Reading


WEEK V (OCT. 30): ALTERNATIVE APPROACHES TO REGIME DESIGN AND MOVING BEYOND KYOTO

Required Reading


Suggested Reading


Ernst B. Haas. 1990. When Knowledge is Power.


WEEK VI (NOV. 6): MITIGATION: CONTROLLING GHG EMISSIONS (ENERGY SYSTEMS) [First Paper Due]

Required Reading


Suggested Reading


WEEK VII (NOV. 13): MITIGATION 2: ENERGY ECONOMICS

Required Reading


Suggested Reading

IPCC/WGIII. 1995. Climate Change 1995: Economic and Social Dimensions of Climate Change:


WEEK VIII (NOV. 20): MITIGATION 3: THE POTENTIAL OF CARBON SEQUESTRATION

Required Reading


Suggested Reading


WEEK IX (NOV. 27): IMPACTS AND ADAPTATION: HYDROLOGY AND WATER RESOURCES

Required Reading


Suggested Reading


W.J. McG. Tegart et al. 1990. Climate Change: The IPCC Impacts Assessment, Chapter 4, "Hydrology and Water Resources," pp. 4-1 to 4-42.


WEEK X (DEC. 4): IMPACTS AND ADAPTATION: FOREST RESOURCES

Required Reading


Suggested Reading


