EPP
FALL 08

Environmental Policy and Planning is a group within the
Department of Urban Studies and Planning
School of Architecture and Planning
Massachusetts Institute of Technology

http://web.mit.edu/dusp/epp

Enabling Energy Efficiency

Despite the breadth of policy consensus on developing renewable energy sources, energy efficiency remains enigmatic as a true resource strategy – i.e. can we design policies to promote efficiency that will significantly displace the need for other resources? What can we achieve with technology, pricing, and behavioral strategies, and the potential for large-scale deployment created by utility funding models, carbon cap-and-trade, energy saving building codes, appliance standards, and green community practices? And, at a societal level, how does efficiency compare with supply options, as measured by the critical dimensions of quantity of energy delivered, cost, pollution created (esp. greenhouse gasses), timing, and safety?

To examine these questions, this fall DUSP and the MIT Energy Initiative jointly appointed Harvey Michaels (MIT, SB '74 Civil Engineering; SB '75 Urban Studies; MCP '75) as Research Scientist and Lecturer focusing on energy efficiency and integrated resource planning, with support from the MIT Class of 1960 fund for energy curriculum development. Michaels brings his experiences from a career in government and consulting focused on creating "efficiency resources", as well as entrepreneurship, developing a Web-software enterprise to help consumers and businesses reduce their energy costs.

Michaels seeks to help DUSP students acquire unique qualifications to participate in the growing opportunities for public action on efficiency and greenhouse gas mitigation, with a particular focus on how to leverage the benefits of community-based resources to meet large and aggressive state, national, and worldwide policy objectives.

This fall, Michaels taught a new subject entitled Enabling an Energy Efficient Society (11.194/11.953/ESD.931), to help students develop a framework (analytic methods and tools) for creating a successful efficiency

continued on page...2

News and Views

In January 2009, DUSP will welcome a new Department Head, Professor Amy Glasmeier. Amy will be the first Head in the 75 year history of the Department to be appointed from the outside. That means, she has an extraordinary opportunity to help us look at what we do through fresh eyes. I hope she will ask us to go back to first principles and consider what we teach, how we teach, what research we do, who we serve, how we relate to the rest of MIT and how we connect to the world-at-large.

I can imagine a process of reconsideration that would lead us in a very different direction. We are terribly over-invested in traditional lecture/seminar-style teaching which doesn't, in my view, fully exploit the faculty resources we have available. We have something close to 40 full time equivalent faculty. We could deploy a much greater portion of our faculty time in client-centered project work that students and faculty would pursue collaboratively. We could offer every MCP student and every PhD student an individual tutorial once a year. Currently, we offer over 150 classes a year with median class enrollments that are probably under 10. And still, most faculty don't even teach two courses every semester. Why

continued on page...4

Inside this Issue

Enabling Energy Efficiency *continued from page...1*

policy or business strategy. "Our particular focus is on discovery of realizable opportunities for efficiency that may reduce the energy use of homes, buildings, and communities by 50% or more over the next 20 years without sacrificing comfort or function", Michaels noted. "Students are developing bold but workable strategies to overcome barriers to achieving massive-scale, cost-effective efficiency."

The class has included frequent guest lectures from government policy leaders (US and MA), utility planners (MA and CA), and efficiency-focused companies, which were opened to the MIT community though the student-run Energy and Sustainability Clubs.

This fall as well, Michaels has been working with the MIT Energy Initiative on the design of an efficiency research agenda, with the objective of examining theoretical and practical issues that have held back efficiency from full consideration as a leading policy for meeting energy resource needs. Michaels continues to research an efficiency strategy referred to as "responsive energy"; approaches that help energy consumers modulate energy use in the homes and businesses in response to their time-specific needs for end uses such as comfort, light, and hot water. "Right now, we are short on electric generation at peak times despite a network running, on average, at only 50% utilization. Responsive Energy builds on initiatives for utility Smart Grid, home automation systems, pricing, and behavioral support systems to meet consumer needs at remarkably lower resource costs," Michaels noted, at a recent presentation to the DUSP Responsive Cities discussion group. Responsive Energy is particular cross-campus strength at MIT related to energy efficiency, with related research in several departments and labs.

In Spring 2009, Michaels anticipates teaching a Practicum course, to conduct planning in support of the July 2008 passage of the far-reaching Massachusetts Green Communities Act, which mandates that energy utilities plan efficiency programs that achieve "all cost-effective efficiency". Working with utility sponsors, the proposed Practicum will support the design and analysis of a utility/community partnership model program design to offer to cities and towns within its service area. The hypothesis to be examined is how utilities can work with (and fund) community coordinating resources, to catalyze deeper cost-effective efficiency than would occur through their own direct delivery. The practicum participants will examine various elements of resource planning, policy option design and assessment, barriers analysis, and experimental design/evaluation of strategies such as

-partnering to create community goals for consumer participation, and various forms of scorekeeping, catalyze more rapid adoption in homes of high efficiency equipment, such as CFLs and Energystar appliances?

-community focus to increase the percentage of participation, and depth of savings in businesses and public facilities (municipal, school, hospital, churches)?

-community-specific assessment of barriers and options to overcome resistance to building advanced efficiency buildings created by land use, code and utility approval connection processes
-engaging communities in helping discover specific groups that are likely to be underserved or under-participating in the new "all-cost effective efficiency" mandate, and whether community-supported interventions are likely to overcome these barriers.

Finally, Michaels hopes to help build connections between DUSP and the Energy Initiative, as well as various efficiency related education and research initiatives across campus. "To be an effective resource option, we need to assess institutional barriers to efficiency, and create policies that will ensure significant deployment; otherwise policymakers will have no choice but to go forward with more expensive, less clean, and less safe options for meeting our energy needs. I have found DUSP students to be uniquely capable and interested in addressing this challenge," Michaels noted.

Green Edge Speaker Series

The Fall EPP Speaker Series was launched in September under the banner theme - Green Edge – to bring unique presenters, who are doing cutting edge work on sustainability to talk with the EPP and broader MIT community about their perspectives on the subject. The series was organized by a team of students and staff – Alexis Schulman, Kathy Araujo, Isabelle Anguelovski, Tijs van Maasakkers, Todd Schenk, Anna Livia Brand and Nina Tamburello. Events have included speakers, drawn from across academia, government, non-governmental organizations and the private sector. Please watch for upcoming announcements on the Spring Speaker series.

September 23

Sarah Das, Woods Hole Oceanographic Institution

Run for the Hills? What We Are Learning About the Polar Ice Sheets

September 30

Arthur Petersen, Netherlands Environmental Assessment Agency

Exploring the Quality of Evidence for Complex and Contested Policy Decisions in the Netherlands

October 7

Olivier Barreteau, Cemagref UMR G-EAU, France

Companion Modeling: Getting People Involved in Modeling of Their Natural Resource Systems

October 21

Timmons Roberts, College of William and Mary

Climate Change and Patterns of Injustice

October 28

Josh Hassol, Cambridge Energy Alliance

Energy Initiative Update

November 4

Amy Smith, MIT D-Lab and the Mechanical Engineering Department

Innovation in the Developing World

November 18

Andrew Brown, New Amsterdam Project

New Approaches to Sustainable Cars

December 2

David Cash, Massachusetts State Government

Current Energy and Environmental Policies

Doctoral Tutorial: Green Technology Innovation

This fall, Professor Larry Susskind offered a unique doctoral tutorial for students from across the Institute to focus on environmental theory-building. In *Green Technology Innovation* (11.982), scholarly literature by authors, such as James Utterback, Eric Von Hippel, Everett Rogers and Amory Lovins, is examined to develop a series of propositions and theory about how green technology innovation at scale can be most effectively encouraged across public and private sectors. With an eye on the complexity and scope of contemporary sustainability challenges, the tutorial is designed to ask what it will take to spur contextually relevant and more sustainable solutions. As part of this intellectual inquiry, students and Professor Susskind are in the process of drafting an article for publication. The tutorial group meets every Friday.

Faculty Environmental Network

In September, more than 75 MIT faculty members who teach environmental courses at the Institute banded together to form the MIT Faculty Environmental Network (FEN). All five schools are represented, particularly the School of Architecture and Planning. The FEN has two goals: (1) to make it easier for students to avail themselves of the environmental and sustainability teaching resources at MIT, and (2) to help faculty members in the environmental field improve their teaching. As a first step toward meeting both these goals, the FEN has initiated the Environmental Literacy Project at MIT. Each month, three faculty members (from different departments) present one key idea or method that they think an environmentally literate graduate of MIT ought to know about. Attendance at these sessions has been surprising strong. We've already had presentations dealing with environmental justice, the modeling of global climate change, cost-benefit analysis and the precautionary principle, climate sensitivity, and the future of nuclear power. Each presenter is obliged to provide a one page summary of their 15 minute luncheon presentation. These are all being posted on a limited access wiki through which members of the FEN can offer comments and reactions. At the end of the academic year, after 25 or more ideas/methods have been presented, and the wiki has several layers of faculty commentary, we'll take it public.

In addition to the Environmental Literacy Project lunches, the FEN is organizing two faculty discussion groups. One deals with ways of making the teaching resources at the Institute more seamlessly available to students, regardless of their department or degree program. The other deals with strategies forbetter integrating research and teaching so that the material covered in classes reflects the most advanced faculty research. These groups will be gearing up in the spring.

The Coordinator of the FEN is Professor Larry Susskind.

continued from page...1

not reduce the number of classes dramatically and expect each faculty member to offer one or two tutorials every semester? Why not expect each faculty member to offer a research or field-based project every semester that puts them into a collaborative work mode with a small team of students?

We have a number of faculty leading field-based projects every semester, but we don't have a long-term commitment -- as a Department -- to produce possible solutions to long-standing urban and environmental problems that we have identified collectively and that we are prepared to work on as a group (over a number of years, if necessary). We have an incredible concentration of knowledge and skill -- probably more than any other academic planning department in the world. Perhaps we should select a small set of issues or problems, frame them together -- as a department -- and then dedicate a substantial portion of our collective time to producing the theoretical ideas, new techniques, and strategic interventions that will help cities, towns and regions throughout the world address these issues or problems more effectively Right now, we have no collective research or practice agenda. Decade after decade we let 1,000 flowers bloom. Maybe it's time to see what a collectively-focused effort could produce. We are spending an awful lot of money every year without a clear purpose.

Our approach to pedagogy -- the way we teach -- is stuck in the last century. There is very little systematic experimentation going on with how we teach. We don't really know whether any number of alternatives to faculty lectures (and Power Point presentations), assigned readings, traditional classroom discussion, short papers and exams will produce better results (i.e. better educated and professional-prepared students) or not. It's time, I think, to be much more explicit about how we measure the quality of teaching and learning in our department. If we could clarify goals and metrics, we could experiment in more useful ways with very different approaches to teaching and learning.

When I see how the other engineering, science, and social science departments on campus relate to the professions for which they are preparing students, I'm disappointed that we are not more involved as a department in pushing the field(s) of urban and regional planning, public policy, economic development, city design, urban sociology (and several others). We should be in a leadership role in various professions, and we're not. Very few of our students and faculty are actively involved in professional urban and regional planning circles.

The city of Cambridge and the city of Boston "plan" (or don't plan) year in and year out in ways that rarely reflect best practice. For decades, we have provided staff to local and metropolitan agencies, but it rare indeed for DUSP to be involved in helping to define, launch or evaluate major development, environmental protection, or social welfare initiatives in Cambridge or Boston. That's our fault.

MIT undergraduate education needs to provide a better balance between science, engineering, humanities and social science. Too many students burrow deeply into one field and don't ever discover what's going on in our department and our field. Students in other graduate programs, who ought to be learning about public policy-making, the dynamics of social change, the essentials of social entrepreneurship, sustainable development and the essentials of democratic decision-making, are not. We could be playing a much more central role in the education of the almost 10,000 students at MIT and not just the 250 students in DUSP.

So, I hope we are all prepared to pitch in if our new Department Head asks us to start with a clean sheet of paper and imagine a new DUSP.

Dong-Young Kim

(EPP, PhD, '06)

I am currently an Assistant Professor at the Korea Development Institute (KDI) School of Public Policy and Management (Seoul, Korea), became the Acting Director of the KDI School's Center for Conflict Resolution and Negotiation (CCRN) in October 2008, which was designated as the national research and training center in conflict management by the Presidential Decree on Conflict Prevention and Resolution for the Central Government in 2007.

The CCRN has been committed to training mainly Korean government officials with short-term executive programs in conflict management, consensus-building, and negotiation. Stemming from my training in the EPP group, especially with Professor Lawrence Susskind, I bring experience in designing education programs and various workshops at the CCRN. As an Acting Director, I plan to revamp current short-term training programs into long-term programs (one semester-length) and several specialized programs in order to train more effectively the core government officials who are mainly responsible for conflict management in each agency.

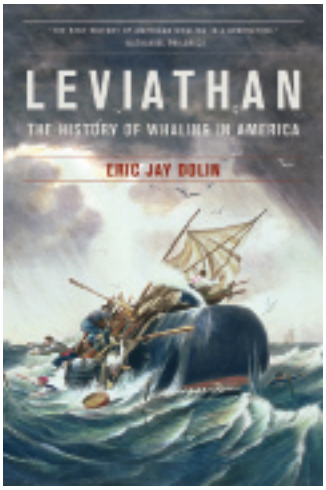
Along with a training component, I am now deeply involved in research projects with the newly established Deputy Minister for Management of Social Integration under the Prime Minister's Office in order to revise and improve the government strategies to facilitate the use of alternative dispute resolution practices across the government organizations. These projects include the evaluation of the current Presidential Decree for conflict prevention and management and upgrade the Presidential Decree into an Act and the application of the dispute system design (DSD) to some of major government entities. Finally, I initiated a project with Prime Minister's Office to conduct a social experiment with a thorough preparation in order to make a successful consensus building case in a siting controversy case.

I recently published the book "The Challenges of Consensus Building in a Consolidating Democracy: Diesel Vehicles and Urban Air Pollution in Korea" (VDM Verlag Dr. Müller, 2007) and I am translating Professor Susskind's book, "Breaking Robert's Rules: The New Way to Run Your Meeting, Build Consensus, and Get Results" into Korean.

Eric Dolin

(EPP, PhD, '95)

My latest book, Leviathan: The History of Whaling in America (W. W. Norton, 2007), traces the rise and fall of America's whaling industry over the course of more than 300 years, from Captain John Smith's botched whaling expedition to the New World in 1614, up until 1924 when the last of the Yankee wooden whaleships went to sea. Every writer hopes that his or her books are widely read and critically acclaimed, and I was lucky enough with Leviathan to achieve both goals. It found a good audience and received a number of honors, including being selected as one of the best nonfiction books of 2007 by The Los Angeles Times, The Boston Globe, and The Providence Journal, and as one of the top ten history books of the year by Amazon.com's editors. Leviathan was also named an Honors Book in nonfiction for the 8th annual Massachusetts Book Awards; it received a silver medal in history from the 2008 Independent Publisher Book Awards; and for writing it I was given the 23rd annual L. Byrne Waterman Award, by the New Bedford Whaling Museum, for "outstanding contributions to research and pedagogy in the Arts, Humanities, and Sciences." I live in Marblehead, Massachusetts, with my wife (who I met while I was at MIT) and two children, and am currently working on a book that will explore how the fur trade transformed America from the 1500s up through the late 1800s. For more information, please check out my website, www.ericjaydolin.com, and when you are there make sure you click on the "books" tab and take a look at The Ph.D. Survival Guide, a humorous book I wrote based on my doctoral experience at MIT.



Pia Kohler

(EPP, PhD, '06)

In January 2006 I completed my PhD at EPP; my dissertation focused on the institutions providing science advice to multilateral environmental agreements (MEAs), including those related to climate change, ozone depletion, biodiversity, wetlands protection, and chemicals management. After a semester teaching in the Political Science Department at Wellesley College, I accepted a tenure-track position in International Relations at the University of Alaska Fairbanks (UAF) in the fall of 2006.

UAF, "Alaska's Arctic University", is the state's only Ph.D. granting institution and, like MIT, is one of the country's few land, sea and space grant universities. As one of five faculty members in the Political Science Department at UAF, I have been teaching a wide variety of courses, from US Foreign Policy to International Law and the Environment, and from Government and Politics of Canada to Science, Technology and Politics. Our student population too is extremely varied, with many non-traditional students who contribute a wide-range of life experiences to the classroom!

The many opportunities for interdisciplinary activities were key in my deciding to take on the UAF post, and in particular I am enjoying taking part in several projects as part of the International Polar Year (from March 2007 to March 2009), during which I have been able to build on aspects of my doctoral work and focus on the interface between western science and indigenous knowledge. The University of Alaska system is also part of NSF-EPSCoR (Experimental Program to Stimulate Competitive Research) fostering interdisciplinary research on rapid change in Alaska.

Of course, Fairbanks, AK is quite a shift from Cambridge, MA – and not just because I routinely find moose in my yard and now consider 0ºF to be quite balmy! While I have been able to continue to follow science-relevant negotiations within MEAs, I have focused more specifically on the Stockholm Convention on Persistent Organic Pollutants (POPs), which is very relevant to the Alaskan context since Arctic indigenous communities are most vulnerable to POPs contamination. I have also been learning more about the local institutions that harness science and traditional knowledge for policymaking.

Nevertheless, some of the most rewarding opportunities as a junior faculty member have been those that have allowed me to interact with peers beyond Alaska. In the fall of 2007 I had the privilege to take part in the Dissertations Initiative for the Advancement of Climate Change Research (DISCCRS) a one-week NSF-funded workshop bringing together recent PhDs from the natural and social sciences during which I forged lasting connections with scholars from all over the world. In the summer of 2008, the Fulbright German Studies Seminar on Science and Society provided insight into Germany and the EU's understanding of science's impact on policymaking, and also on the other US-based participants' interpretation of the science/society interface. The International Canadian Studies Institute, a two-week seminar throughout Western Canada not only gave me an in-depth perspective of many aspects of Canadian policymaking but also allowed me to make lasting contacts with colleagues from universities throughout the Northwest of the US.

Finally, I have continued my involvement with the Earth Negotiation Bulletin (ENB) organization as a Team Leader, editor and reporter. My participation while at MIT in this non-governmental organization, which provides reporting services for MEAs, allowed for an insight into the MEA negotiations process, a valuable contribution to my PhD research. I encourage other students at EPP to look into the ENB process as a possible support framework for their PhD research.

Masa Matsuura

(EPP, PhD, '06)

In November 2008, I was appointed to Associate Professor of marine technology policy at the Graduate School of Public Policy, University of Tokyo. The University of Tokyo has recently organized an interdepartmental consortium called Ocean Alliance. As a part of this alliance, I will be investigating a variety of marine-related issues from the perspective of negotiation and consensus building, ranging from the security of ocean transportation networks in Asia to the sustainable management of small fishing communities in Japan.

Together with Professor Hideaki Shiroyama (University of Tokyo), I have translated Breaking Robert's Rules into Japanese. The Japanese version, titled "Consensus Building Nyu-mon," is published by Yu-hi-kaku in April 2008. Since its publication I have been busy with responding to inquiries by the readers who are actually being faced with different kinds of urban planning deadlocks in Tokyo.

Alumni Notes

continued from page...6

Adil Najam (EPP, PhD, '01)

I was appointed the new Director of the Frederick S. Pardee Center for the Study of the Longer-Range Future at Boston Univeristy, where I also hold the Frederick S. Pardee Chair in Global Public Policy, and I am a Professor of International Relations and also of Geography and Environment. I returned to BU from The Fletcher School of Law and Diplomacy, Tufts Univeristy, where I spent five years as an Associate Professor of Negotiation and Diplomacy. My PhD at EPP was on the role of developing countries in global environmental negotiations. I went on serve as a Lead Author of the Third and Fourth Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC), focusing on sustainable development and climate change. The IPCC shared the 2007 Nobel Peace Prize with former Vice President Al Gore.

In a recent profile that discussed his new appointment, The Boston Globe described me as a "global citizen" and as "The Moderator." Much of his scholarship and practice has focused on bringing together those with different views – whether they be developing and industrialized countries around the concept of sustainable development, or Pakistanis with very different political views through his blog Pakistaniat.com. These skills will come in handy at his new position leading the Pardee Center – a research institute, set up with a $10 endowment, whose mission is to foster interdisciplinary, policy-relevant, and future-oriented research that contributes to long-term improvements in the human condition.

MUSIC Update

Visit by USGS Leaders

The highlight of the fall was a visit by Ione Taylor, USGS Chief Scientist for Geography, Carl Shapiro, USGS Senior Advisor for Science, Decisions, and Policy, and Richard Calnan, USGS Senior Advisor for International Programs. These senior USGS leaders met with MUSIC co-directors, interns, researchers, and faculty for two full days on October 23 and 24. They were very impressed with the quality of the presentations, especially by the enthusiasm of the interns for MUSIC, and the extent of MUSIC activities. It is difficult to get fifteen minutes of time with Federal officials at this level. That they spent two full days at MIT to learn about MUSIC speaks highly of the significance of MUSIC to USGS. Herman Karl visited USGS headquarters in Reston, Virginia on November 7, where he met with the new Associate Director for Geography, the Financial Officer for the Geography Discipline, and Ione Taylor and Carl Shapiro to develop a strategic plan and budget for MUSIC's domestic and international activities as part of the new USGS Science, Decisions, and Policy program.

Personnel

MCP Interns and PhD Researchers

MUSIC welcomed four new interns this fall—Linda Cielsielski, Kim Foltz, Sarah Hammitt and Evan Paul. They join returning second year interns Anna Bromberg, Jenny Edwards, Allison Lassiter, and Nathan Lemphers. The MCP interns along with doctoral students, Beaudry Kock and Tijs van Maasakkers, are working on seven action-research projects.

The USGS Global Change Program continues to provide base funding for the internship program and research on adaptation to climate change. The Bureau of Reclamation is funding Beaudry Kock's doctoral research and the Dutch applied science organization, TNO, is contributing toward funding Tijs van Maasakkers doctoral research.

Scholars-in-Residence

Dr. Oliver Barreteau is a Senior Scientist at Cemagref, the French research institute on environmental and agricultural engineering. During his stay with MUSIC, he aims to compare approaches to collaborative decision making in the field of water management in France and North America. He is an active member of the Everglades and urban climate change projects.

continued from page...7

Dr. Neda Farahbakhshazad is a Research Scientist at the Swedish Royal Institute of Technology. Her interest is the role of science in policymaking. While at MIT she will devote most of her time to initiating multi-institutional research proposals and coordinating MUSIC's international activities.

Oliver and Neda plan to help build partnerships between MUSIC and Cemagref and the Royal Institute of Technology after returning to Europe. As MUSIC European Field Directors, they will help develop proposals to the EU and coordinate international partnerships and action research projects.

Dr. Marilyn ten Brink, Chief Water Analysis Branch, USEPA, completed one year as a Scholar-in-Residence. She is continuing her studies and research with MUSIC for another year as a Visiting Scholar.

MUSIC Assistant Director

After serving for two years as MUSIC Assistant Director, doctoral student Beaudry Kock has stepped down to focus on his research. He is now off-campus at the offices of the Bureau of Reclamation in Denver. Larry Susskind and Herman Karl thank Beaudry for his hard work in helping them manage MUSIC during the past two years.

Larry and Herman are delighted to announce that Dr. Juan Carlos Vargas-Moreno has accepted the position as MUSIC Assistant Director. Dr. Vargas-Moreno is a MIT Postdoctoral Fellow leading and managing research on MUSIC's Everglades Climate Change project. He is also a Lecturer at MIT's Department of Urban Studies and Planning. Juan Carlos holds a Dip. in Architecture from the University of Costa Rica and both Masters and Doctoral degrees from the Harvard Graduate School of Design where he studied Landscape Planning and Ecology under Prof. Carl Steinitz. He is also an alumnus of the Harvard Kennedy School of Government Doctoral Fellows Program in Sustainability Science where he conducted research for the Science Environmental Planning Group under the supervision of Prof. William Clark.

Action-Research Projects

We have seven projects underway for the coming academic year. Besides the research to accomplish the field assignment, each project asks one or more theory-building questions.

Everglades Restoration—Addressing the Challenge of Climate Change Through Strategic Habitat Conservation: A Stakeholder-based Approach

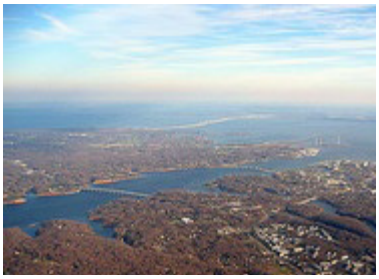
In order to help the responsible parties plan and manage the Greater Florida Everglades Ecosystem in the face of the uncertainties posed by changing climate; we propose to develop a stakeholder-based alternative futures process. As part of this research we will ask, "Is it possible to manage landscape-scale ecosystems if the effects of climate change require rapid intervention?" We will be developing new GIS-based scenario-casting tools that should facilitate broader-gauged stakeholder involvement in the review of adaptive management strategies. Our client is the U.S. Fish and Wildlife Service and the U.S. Geological Survey. Representative theory building question: How do the media shape stakeholder involvement and public-private dialogue? How do the media

Assessing Ecosystem Sustainability and Vulnerability to Climate Change in the Lower Mississippi Valley

MUSIC is conducting research to assess the potential impacts of changing climate on the trust resources and endangered species -- as well as the sustainability and vulnerability of the ecosystems that support them -- in the Lower Mississippi Valley (LMV). One question we address is, "When most of the land is privately owned, how can conservation practices at the landscape-scale be implemented?" This is a continuation of our on-going efforts to examine more effective ways of integrating federal and state resource planning efforts that begin with different, but overlapping, geographically defined boundaries. Our client is the U.S. Geological Survey. Representative theory building question: What are the appropriate standards to use in judging the quality of the policy-making process, the scientific process and the process through which these two are brought together?

continued from page...8

Chesapeake Bay—A Collaborative Simulation Process and Toolkit for Building "Coast-Smart" Communities in Maryland



We will be developing and testing (in a high profile public setting hosted by the governor) a multi-party negotiation game (simulation) and policy toolkit aimed at helping Maryland coastal communities understand the moves they can make (and their implied costs) in an effort to adapt to and blunt the adverse impacts of climate change. The goal is to publicize the toolkit so that all Maryland coastal communities can use it. Our client is the state Coastal Zone Commission that has the lead on climate change in Maryland. Their funding comes from NOAA. Representative theory building question: How should coastal communities manage the risks of climate change based upon the prevailing "theory" of climate change adaptation? How should the prevailing theory be changed to be more relevant and useful?

Guidance Tools for Planning and Management of Urban Drainage Systems under a Changing Climate

Present and future management of urban runoff is made more complicated by the potential long-term impacts of climate change. Our objective is to formulate new options that urban water managers can use to respond to the challenges of drainage management in the face of climate change. Funding comes from the National Oceanic and Atmospheric Administration. Our clients are the cities of Aurora, CO and Somerville, MA. Representative theory building question: Does a collaborative stakeholder process increase the odds of producing a management plan appropriate to range of potential scenarios?

Building Adaptive Capacity in Nearshore Ecosystems in Maine

We posit that the usefulness and value of science to resource managers and communities trying to address the potential impacts of climate change will be significantly increased if non-governmental stakeholders are involved in collaborative adaptive management efforts. We want to determine how best to ensure that both expert scientific advice as well as "indigenous knowledge" are incorporated into politically plausible management strategies. Our client is the Quebec-Labrador Foundation and the non-profit called Environmental Policy Design. Their funding comes from the Cox Family Trust and the U.S. Geological Survey. Representative theory building question: Once information has been collected, how should local knowledge be presented in a way that makes it most useful for scientists and policy-makers?

Offshore Wind Farms: Adaptive Strategies to Achieve Sustainable Energy in the Face of Changing Climate

For the United States to adapt to and prepare for the impacts of changing climate, we need to promote more sustainable energy production. We are working to document the new regulatory framework governing the siting of off-shore wind farms in the Eastern United States (as a result of the 2005 National Energy Policy Act). Our assumption is that state governments have a crucial role to play and that federal and state regulatory reviews will need to be coordinated, as will efforts to engage multiple stakeholders in implementing state-level sustainable energy policies. We hope to work with state officials in Rhode Island and Maine and to continue our work with officials in Massachusetts where there has been substantial opposition to the construction of off-shore wind farms. We have no specific agency client, but we do have industry support from a wind technology company. Representative theory building question: To what extent does the current permitting process create unnecessarily contentious interactions among stakeholders and inhibit learning about the potential of wind demonstration projects?

continued from page...9

ArkAgent: Arkansas Modeling Project

Achieving social, economic and environmental sustainability in a regional basin of the American West, under conditions of climatic, demographic and hydrologic change, is a tremendously challenging but necessary task. The problem this project explores is whether a complex simulation tool developed collaboratively can help communities better visualize a more sustainable water management future. We are also interested in insights the tool can shed on the dynamics of long-term sustainability in a regional basin of the American West. Our client is the Bureau of Can a collaboratively built agent-based simulation tool support analysis of complex sustainability choices?

Events

MUSIC Kick-Off Meeting September 10
MUSIC interns, researchers, faculty, staff and partners attended this all day event, which kicks-off the MUSIC year. An overview and history of MUSIC by Larry and Herman was followed by presentations of each of the action-research projects. The meeting ended with an open discussion and presentations of MUSIC international partnerships and plans for development of Collaborative Software that will lead scientists and managers through a stakeholder engagement process. MIT World videotaped the meeting, which is called "Coping with Climate Change in Coastal Communities."

MUSIC Advisory Board Meeting September 12
Board Chairman, Walter Sleeth, called the first meeting of the MUSIC Advisory Board to order. Larry and Herman reviewed MUSIC activities, including the curriculum for Science Impact Coordinators and action research projects. The Board discussed strategies for sustainable funding of MUSIC and how to coordinate with MIT Development Office to raise an eight million dollar endowment. Larry and Herman are developing a business plan to assist in the fund raising effort. The Board is enthused about MUSIC, seeing it as being on the forefront of theory building in the area of collaborative decision-making and adaptation to the potential risks of climate change, and board members agreed that the potential for raising the endowment is high.

G3C (Global Climate Change Collaborative) Meeting September 15
This was the second meeting of the G3C. Thirteen participants discussed two potential projects—a water management project in Israel and Palestine and an environmental project in the Sunderbans. A small subgroup was formed to develop a framework to evaluate collaborative governance that will be applied to G3C and MUSIC projects.

Proposals

MISTI-France
Olivier Barreteau and Herman Karl submitted a proposal, "Comparison of Consensus Building Approaches for Natural Resources Management," to MISTI-France for seed funds of $30,000 to develop a student exchange program. We propose a comparative analysis of the collaborative approaches taken by MUSIC and Cemagref through case studies in the US and France.

NATO
Clive Lipchin, Director of the Arava Institute, Israel, is leading a small team preparing a proposal to submit to NATO to convene a conference of the G3C and other invited participants.

Curriculum
MUSIC has developed a core curriculum to train Science Impact Coordinators. The curriculum consists of four required courses and two electives chosen from a list of recommended courses. The required courses are: Introduction to Environmental Policy and Regulation, Preparing for the Impacts of Climate Change—Synthesizing Science and Governance, Complexity, Ecology, and Policy Design, and Elements of Public Interest Leadership.

Scholar in Residence: Olivier Barreteau

Juan Carlos Vargas-Moreno
Assisting Director of MUSIC
Post-Doctoral Fellow and Visiting Lecturer

Participation is becoming the fashionable as well as mandatory way as far as natural resources management is concerned. This is true not only for policy-making but also increasingly for research itself as well. However, there is a general lack of specific training of participants to these "participatory approaches", methods to implement them and suitable frames to monitor and evaluate them.

At Cemagref, the French research institute on environmental and agricultural engineering, within joint research unit G-EAU in Montpellier, dedicated to water management and water uses, I have been fully involved in these issues: starting with the development of tools, agent-based modelling (ABM) and Role Playing Games (RPG) to understand and facilitate collaborative decision processes in the field of water management, expanding this to the elaboration with colleagues a specific research stance, Companion Modelling (http://www.commod.org), reaching questions of monitoring and evaluation of these collaborative decision processes we get embedded with when we start a facilitation work. I am still working at these three levels, with a specific interest on interactions induced by sharing of a water system at the interfaces of urban and rural areas.

My first main assumption is that ABM and RPG, as social simulation tools, provide the basis for virtual world as collective thought support tools to discuss the diversity of viewpoints on the system at stake, as well as to explore consequences of specific scenarios with them. My second main assumption is that these models can be co-designed and discussed with participants in a collaborative process, whatever their background knowledge and education is: these models are meant to evolve in these interactions. My third assumption is that participatory processes, whether they be used in research or in policy-making, can not be assessed in the same way as other decision support or research processes, because I assume that purposes might evolve across the process.

During my one year scholar-in-residence stay, I expect to go further on these points as well as to set up new collaborations between EPP/MUSIC and my team at Cemagref, in the frame of the starting worldwide network around MUSIC. I've found an interesting community of ideas andwork developed here. I am more specifically involved in two research projects here: adaptation to climate change of urban water management (with case studies in Somerville MA and Aurora CO) andadaptation to climate change of management of the Everglades. In the first one I will contribute to the development of a social simulation tool to be used in interactive sessions with stakeholders in order to simulate scenarios, designed by stakeholders. In the second one, I will participate in the design of the participatory process on the basis of identification of socio-technical networks to frame the initial scope of the participatory setting. Beside these two projects, I've also committed myself within the G3C group on a joint work, lead by Kirk Emerson from University of Arizona, to design an evaluation framework for Collaborative Governance to Climate Change Moderation. This participation in the G3C is also thought as a starting point for development of further collaborations, while back in France. I am also exploring other paths for further collaboration either bilaterally, through exchange of students (French speaking EPP interns are much welcome for that!) and comparison of case studies in France and the US, as well as at the EU level.

Finally, I am in office 9-314, and will be happy to discuss further with you if you come by!

Considering Climate Change in Strategic Habitat Conservation for Southern Florida.

Climate change is posing a major challenge to wildlife conservation, and in few places is this issue as pressing as in the Greater Everglades of Southern Florida. A globally significant ecological resource with no fewer than 68 endangered species, the Everglades is surrounded on three sides with expanding human populations, and on the forth with significant sea level rise. A multi-billion dollar restoration effort is underway, including some of the largest conservation land acquisitions and land swaps in recent U.S. history. But most of this work was planned well before the full extent of global warming was anticipated, and must now adjust significantly, both in substance and in terms of planning methods. New information emerges nearly daily, not only about global warming and its consequences on wildlife habitat relationships, but also on potential human adaptations.

I joined MIT this fall as the project manager of an ambitious, four-year research effort to adapt and develop methods capable of treating such complex planning issues. The project is funded by the U.S. Fish and Wildlife Service (FWS) and the U.S. Geological Survey. Principal Investigators are Prof. Michael Flaxman and MUSIC Co-Director Herman Karl. The project team includes visiting research scientist Olivier Barreteau, MCP students Linda Ciesielski and Alison Lassiter, and UROP interns Aaron Thom and Kelsey Baker.

Our action-research has two major objectives. The first is to develop a set of regional-scale "alternative futures" that spatially simulate likely climatic, hydrologic, and land use conditions in 2030 (based on IPCC scenarios). The second, is to examine the impacts of such changes on fish, wildlife, plants, and their habitats, such as National Wildlife Refuges in the Greater Everglades Ecosystem. The work will be conducted using a spatially enabled stakeholder process, designed to combine the best available scientific information with local knowledge, and to be flexible in incorporating new information as it becomes available. We believe that a key issue raised in this case is how to increase the speed and quality of public environmental decision-making.

The challenge of environmental management in circumstances such as the Everglades is that methods based on a single forecast are the simplest to construct, but almost always wrong. Scenario-based methods are more reliable and adaptable, but they generate significantly more information, which can become a data management and sharing challenge. Also, independently-generated scenarios can incorporate such widely ranging assumptions that they are impossible to compare, a situation which is occurring repeatedly in Southern Florida. Nonetheless, the consequences of global warming are so far reaching and the science so volatile that a scenario-based approach is almost mandatory. We must, therefore, develop planning methods and institutional arrangements which can effectively manage the generation of large numbers of comparable alternative scenarios, and their testing and evaluation according to a wide variety of biophysical and socioeconomic impact models. Global environmental and social conditions are not static; neither should the policies that manage regions in an era of climate change.

Another major challenge is that scenario casting should not be solely an "expert" exercise. In order for scenarios to be useful tools for understanding the future consequences of societal action today, they must be co-generated with stakeholders, considering their knowledge and assumptions as baseline for each scenario. Therefore, participatory planning methods are needed that can substantively engage local, regional, state and federal stakeholders in alternative futures scenarios generation. Some well developed techniques are available based on the simulation of future land use conditions in map-based form. This allows decision-makers to see geographically to both the impacts of climate change on the environment (for example habitat displacement), and the effect on the territory of human actions and policies (urbanization and environmental impacts).

Applying for the EPP Certificate

Since 2007, students in DUSP have been eligible to enroll in the Environmental Planning Certificate Program. Any student who can meet the requirements, regardless of their degree program or area of specialization, can receive the EP Certificate when he or she graduates. The requirements are completion of (1) 11.601 (the graduate Introduction to Environmental Policy and Planning; (2) an environmental management practicum such as 11.360 or 11.362; and (3) six subjects, at least one from each of five listed sub-areas: Science, Health and Political Decision-making; Land Use, Growth Management and Restoration; Ecology and Landscape; Facility Siting, Infrastructure and Sustainable Development; and Methods of Environmental Planning and Analysis. The goal is to give graduates of DUSP seeking jobs in the environmental planning field a competitive edge by acknowledging their specialized competence and skill sets.

The Certificate Program is administered by the EPP faculty. The list of subjects in each sub-area along with the overall Certificate requirements are subject to change. Students can sign up for the Certificate Program by contacting Ms. Nina Tamburello (EPP administrator) at **ninat@mit.edu**.

Here is the current list subjects currently included in each subfield:

Sub-field # 1: Science, Health and Political Decision-making (at least one is required)

11.630J Environmental Law, Policy and Economics
11.631J Regulating Chemicals, Radiation and Biotechnology
11.725J Chemicals in the Environment: Fate and Transport
11.373 Science, Politics, and Environmental Policy
11.375 Role of Science and Scientists in Collaborative Approaches to Environmental Policy-making
11.368 Environmental Justice
14.42 Environmental Policy and Economics

Sub-field # 2: Land Use, Growth Management and Environmental Restoration (at least one is required)

11.360 Community Growth and Land Use Planning
11.367 Law and Policy of Land Use
11.374 Politics of Ecosystem Management
11.953 Comparative Land Use and Transportation Planning
11.959 Advanced Seminar in Landscape and Urbanism
1.252J Urban Transportation Planning
11.543 Transportation Policy and Environmental Limits

Sub-field #3: Ecology and Landscape (at least one is required)

1.018J Ecology I: The Earth System
1.72 Groundwater Hydrology
1.731 Water Resource Systems
1.75 Limnology and Wetlands Ecology
1.814 Industrial Ecology
11.305 Landscape Ecology and Urban Development
11.952 Theories and Methods of Landscape Planning 11.955 Complexity, Ecology and Policy Design

Sub-field # 4: Facility Siting, Infrastructure and Sustainable Development(at least one is required)

11.366J Planning for Sustainable Development
11.304 Site and Urban Systems Planning
11.479J Water and Sanitation in Developing Countries
11.572J Transportation Systems
11.528J Urban Spatial Structure, Transportation and Technology
11.941 Developing Energy Policies for a Sustainable Future
11.946 Energy Efficiency
11.951 Urban Climate Vulnerability, Adaptation and Justice
4.401 Introduction to Building Technology

Sub-field # 5: Methods of Environmental Planning and Analysis (at least one is required)

11.255 Negotiation and Dispute Resolution in the Public Sector
11.362 Environmental Planning Methods
11.520 Workshop on Geographic Information Systems
11.521 Spatial Data Management and Advanced Geographic Information Systems
11.523 Fundamentals of Spatial Data Base Management

Substitutions

Substitions must be approved in advance by the EP Certificate Committee. Course descriptions will be needed for subjects offered at other universities along with proof of completion. Please list course number and title.

Do Urban Energy Initiatives Reduce Cities' Carbon Footprints?

In September 2008, the MIT Energy Initiative awarded Judy Layzer a $125,000 seed grant for research on urban sustainability. In particular, this project seeks to ascertain whether and how cities' energy-efficiency initiatives actually reduce their carbon footprints.

Planners have begun to focus on cities as critical battlegrounds in the fight to become more sustainable. For some, urban sustainability presents a daunting prospect: cities consume 75 percent of the world's resources and have dramatically altered the biogeochemical cycles of the regions where they are located. Yet despite the inherent challenges, hundreds of cities in the U.S. and around the world have embraced sustainability planning. Urban sustainability initiatives take a variety of forms, but most focus first and foremost on reducing the city's carbon footprint. For example, more than 825 U.S. mayors have signed the Mayors' Climate Agreement, which commits them to pursuing the Kyoto Protocol goal of reducing carbon dioxide (CO_2) emissions 7 percent below 1990 levels by 2012. To achieve this goal, cities have instituted a variety of policies and practices. Some cities, such as Boston and Los Angeles, require that every new building meet LEED certification. Others, such as New York City, have pledged to plant millions of new trees, noting that soil and vegetation not only mitigate the urban-heat-island effect but also absorb CO_2. Dozens of cities are retrofitting their municipal buildings to conserve energy, and converting their bus and truck fleets to low-carbon fuels.

Many observers believe that such efforts, although valuable symbolically and as a political stimulus to the federal government, are unlikely to succeed in actually reducing Americans' carbon footprint. They point out that cities have little wiggle room to pursue non-economic policies of any kind, since they compete in a global political economy in which both capital and labor are mobile. So, in theory at least, municipal officials will relentlessly pursue economic development in order to retain capital and high-value taxpayers, and their willingness to undertake sustainability initiatives that constrain economic growth will be severely limited. Skeptics also point out that cities do not control many of the most fundamental factors that affect people's energy consumption, such as the price of fossil fuels, federal highway funding mechanisms, subsidies for depleting natural capital, and the content of international trade policies.

Urban sustainability advocates respond, however, that most construction, land-use, and transportation decisions in the U.S. are made locally, and those decisions are central to reducing citizens' demand for energy. Ample research suggests that well-designed city—one that is dense and compact and has good transit options—is an extremely energy-efficient way to organize people. When people live in dense, mixed-use communities, they can use distributed power generation, which is more than twice as efficient as central power production. Compact cities also have fewer infrastructure requirements because electric, communication, water, and sewage lines are shorter and require less energy. (Sprawling development, by contrast, not only promotes fuel consumption in a variety of ways; it also destroys forest- and farmland, both of which absorb carbon.) Municipal governments are, themselves, large consumers of energy, so their purchasing and construction policies can have a substantial impact on an area's carbon footprint. Moreover, say urban sustainability advocates, if properly designed, energy-efficiency initiatives are economic development policies because they not only save money but have the potential to create jobs in retrofitting, technological innovation, and alternative energy installation.

In light of this ongoing debate, Layzer's research seeks to answer several questions: to what extent do urban energy-efficiency initiatives actually reduce residents' carbon footprints and the carbon emissions of cities overall? What factors impede cities' efforts to become more energy efficient and less dependent on carbon-based fuels? What additional measures—at the state and federal level—have been shown to enhance cities' attempts to reduce their carbon emissions? The aim of the project is to identify policies and practices that are most effective at reducing the carbon footprint of metropolitan areas, as well as to explain why and how those policies and practices work in different social and political contexts.

New Spring Courses

In the spring of 2009, Judy Layzer will be offering a new graduate seminar entitled Food Systems and the Environment. The semester will be divided into five sections, beginning with pre-industrial agriculture and moving through the development and spread of industrial agriculture to more recent developments, such as the introduction of genetically modified foodstuffs, the expanding market for organic crops, and the return to local and regional food systems. In each section we will look at methods of food production, from farm to plate, as well as the policies that have arisen to support (or impede) transitions from one system to the next. We will consider the science, economics, and politics behind those policies. We will also debate the environmental sustainability, as well as the health consequences, of different modes of food production and distribution. Finally, we will compare approaches and consider the welfare of both developing and developed countries. In the fall of 2009, Professor Layzer will again offer her seminar, Science, Politics, and Environmental Policy (11.373), a revised version of the course she has taught in previous years. In addition to updating the reading, she has incorporated much of the material from 11.374, the Politics of Ecosystem Management.

11.955 Complexity, Ecology and Policy Design

Thursdays, 4 p.m. - 7 p.m.
Professor Charles Curtin, Ph.D.

This course introduces a complex systems perspective for understanding environmental change. Key components are the role of scale and hierarchy, stability, resilience and the thermodynamic underpinnings of environmental systems. Although this perspective can be applied to engineered systems, social systems, or ecological systems, this course will focus on the interaction of human and natural systems with an emphasis on examples drawn from the discipline of landscape ecology. After developing a foundation in complexity theory, the course will examine key ecological principles with an emphasis on large-scale ecology. The next section will highlight cognition, the way people make decisions, and the implications of decision-making processes for governance and sustainability. The final phase of the course will integrate human and natural systems through a study of ecological policy design focusing on integrative approaches to science and natural resource management.

New IAP Course

11.956 Elements of Public Interest Leadership

Mon Jan 12 thru Fri Jan 16, 1:00 p.m. - 04:00p.m.
Pre-register on WebSIS and attend first class.
Listeners allowed, space permitting
Level: H 3 units
Graded P/D/F Can be repeated for credit

This seminar is designed to be an instructor-guided inquiry into elements of high-performance situated leadership in the public interest. Power-based or "positional" elements of leadership will be deemphasized. Perspectives will be both theoretical and applied, but with a focus on leadership that fosters human dignity outcomes in practical ways. Important skills include those of observation, critical thinking, management, and technical content. This seminar will cover key skill- and personality-related elements of leadership, grounded in case studies, biographies of important leaders, and student inquiries into current leadership training and perspectives. Contact: Herman Karl, 9-330, x4-0262, hkarl@mit.edu

EPP Spring Courses

11.255 Negotiation and Dispute Resolution in the Public Sector (4-0-8)
Joint Subject

Investigates social conflict and distributional disputes in the public sector. While theoretical aspects of conflict and consensus building are considered, focus is on the practice of negotiation and dispute resolution. Comparisons between unassisted and assisted negotiation are reviewed along with the techniques of facilitation and mediation.

Lawrence Susskind TR (3:30-5:30) 66-140

11.257 Addressing the Land Claims of Indigenous People (3-0-6)

This seminar will examine the unresolved land claims of indigenous people (otherwise known as First Nations or First People) around the world. We will look at indigenous cultures and their struggle for survival; human rights and the emergence of indigenous rights; indigenous societies and their relationships with government regulators; education and the assimilation of indigenous peoples; and government aspirations for indigenous peoples. Each member of the seminar will be asked to focus on one indigenous nation of their choice (anywhere in the world), focusing, in particular, on the rights that are or are not accorded to that group and the group's efforts to maintain their identity through the pursuit of land claims of various kinds. In preparation for the class, read Jeffrey Sissons, First Peoples: Indigenous Peoples and Their Futures, Reaktion Books, London (2005).

Lawrence Susskind M (5:30-7:30) 10-401

 continued from page...14

11.375 Preparing for the Impacts of Climate Change—Synthesizing Science and Governance (2-0-7)
This seminar is for students interested in exploring creative ways of responding to the risks associated with climate change. Introductory sessions will review the theory and practice of adaptive management. Student teams will work on *Everglades Restoration—Addressing the Challenge of Climate Change Through a Stakeholder-Oriented Process of Strategic Habitat Conservation*. Teams will address theory-building questions like "How is landscape representation used to translate scientific knowledge into policy?" " How does the use of 'boundary objects' link science and policy?" "Can technology facilitate the translation of emerging science into sustainable management strategies?" The seminar will test the premise that there needs to be a fundamental realignment in the way science is produced and used in public policy-making and governance. The seminar will try to determine whether this premise is true and, if so, what form should this realignment take.

Herman Karl W (11:00-2:00) 24-110 |

11.376 Sustainability in Action (3-0-12)
Project-based course that aims to devise a socially equitable approach to urban environmental sustainability for the city of Boston. Introduces concepts of environmental sustainability, social equity, systems dynamics, ecological footprints, and environmental indicators. Working in teams, students map Boston's environmental and demographic features; identify opportunities to make the city more sustainable; and make a persuasive case for adopting their ideas.

Judith Layzer M (2:00-5:00) 10-401

11.631 Regulation of Chemicals, Radiation, and Biotechnology (3-0-9)
Lectures, class discussion, two exams, short writing assignments(s). Focuses on policy design and evaluation in the reguation of hazardous substances and processes. Includes weekly classes on risk assessment, industrial chemicals, pesticides, food contaminants, pharmaceuticals, radiation and radioactive waste, product safety, workplace hazards, indoor air pollution, biotechnology, victims' compensation, and administrative law. Health and economic consequences of regulation, as well as its potential to spur technology changes, are discussed for each regulatory regime.

Nicholas Ashford W (7:00-10:00) E51-372 |

11.946 – Enabling Energy Efficiency through Community/Utility Partnerships (3-3-6)

We will conduct a planning process in support of the July 2008 passage of the far-reaching Massachusetts Green Communities Act, which mandates that energy utilities plan programs that achieve "all cost-effective efficiency" prior to approval to any new conventional energy resources. We anticipate working with NSTAR (the Boston area electric and gas utility) as a sponsor. Specifically, we will examine how utilities can partner with (and fund) community coordinating resources, to catalyze deeper cost-effective efficiency than would occur through their own direct delivery.

The specific focus will be to support the design and analysis of a partnership model program that utilities may choose to offer to cities and towns within their service area. In concept, the community-based model is based on financial and operational support from the utility to support a focused local effort to achieve benefits of greater local engagement, coordination, and quality control.

The process will include examination of experiences in prior community based efficiency activities in Cambridge, Marshfield, and elsewhere, as well as design and analysis of a more standardized approach to working with communities to support the utility-run efficiency mandate. Our development of a utility/community partnership model program design will apply methods of resource planning, policy option design and assessment, barriers analysis, and experimental design/evaluation of strategies such as Community energy challenge, Processes in support of advanced efficiency in construction, and customized offerings to address community barriers and equity.

Harvey Michaels F (2:00-4:00) 3-401

11.951 Urban Climate Vulnerability, Adaptation, and Justice (3-0-9)
This course examines the challenges that cities will face and strategies they can use to prepare for the impacts of climate change. Particular attention will be paid to the presence of global disparities, the needs of vulnerable populations and resource constrained locales, and the ways in which national, municipal, and community-based activities can achieve equitable levels of climate-readiness. The course will be anchored in one or more projects that support the adaptation efforts of urban government agencies and NGOs.

JoAnn Carmin M (10:30 – 1:30) 4-146

11.955 Complexity, Ecology, Policy Design (3-0-6)
This course introduces a complex systems perspective for understanding environmental change. Key components are the role of scale and hierarchy, stability, resilience and the thermodynamic underpinnings of environmental systems. Although this perspective can be applied to engineered systems, social systems, or ecological systems, this course will focus on the interaction of human and natural systems with an emphasis on examples drawn from the discipline of landscape ecology. After developing a foundation in complexity theory, the course will examine key ecological principles with an emphasis on large-scale ecology. The next section will highlight cognition, the way people make decisions, and the implications of decision-making processes for governance and sustainability. The final phase of the course will integrate human and natural systems through a study of ecological policy design focusing on integrative approaches to science and natural resource management.

Charles Curtin W (4:00-7:00) 10-401

11.970 Food Systems & the Environment (3-0-9)
This course investigates the evolution of food production, from farm to plate, in the U.S. and globally. We consider the science, economics, and politics behind the transition from a pre-industrial to an industrial food system. We also debate the costs and benefits of genetically modified food, organic agriculture, and local/regional food production. Our focus will be on the environmental sustainability and human health consequences of different approaches, for both the developed and the developing world.

Judith Layzer T (9:00-12:00) 5-232

1.369J Energy Policy for a Sustainable Future (3-0-9H)
Focuses on a wide range of current energy and energy-related environmental policies that foster the development and mass deployment of sustainable energy technologies, fuels, and practices. Primary focus is US-based policies at the state, regional and federal level that impact the electricity, transportation and buildings and facilities sectors. Detailed case studies, diverse readings, and guest lectures by prominent policy makers and practitioners.

Jonathan Raab MW (9:00-10:30) 4-153

Mike Hogan Featured in Tech Talk

This article orginally appeared in MIT Tech Talk on October 1, 2008.

David Chandler, MIT News Office

Well-intentioned rules passed by many states to combat climate change through the development of renewable energy technologies may not achieve the intended effects and may even be counterproductive, according to research by an MIT graduate student. But the problem is easy to fix: A modified set of regulations could be much more effective, the study found.

At least 25 states have enacted renewable portfolio standards (RPS), which require electric utilities to obtain a certain percentage of their power from renewable sources by a certain date (such as "20 percent from renewables by 2020"). But these standards will not achieve the desired effects and may actually end up delaying some of the most promising renewable-energy technologies, the study found.

Michael Hogan, the student who carried out the study as part of his master's thesis work in MIT's Environmental Technology and Public Policy Program, says that such standards push investments much too heavily toward technology that is already well proven and close to being economically competitive, especially land-based wind power. In the process, technologies that may have much more potential to replace coal plants in the longer term, such as solar thermal systems and offshore wind, get short shrift.

Current RPS programs, Hogan found, "are likely to play at best a very marginal role at an unnecessarily high cost in delivering the necessary reductions in greenhouse gases, with little in the way of long-term technological development benefits." But by introducing a few refinements to these programs, he says, it is possible to greatly improve the chances that they will achieve the desired results.

Hogan's professional background is tailor-made for this line of research: He spent 28 years in the energy business, including leading roles in starting and running a number of energy companies and organizations, before deciding to resume his education with the MIT Department of Urban Studies and Planning master's program. During his years in the energy business he was responsible for the development of more than $8 billion in energy-related assets in seven countries.

The central problem, Hogan says, is that 80 percent of U.S. carbon dioxide from electricity generation, and about a third of the nation's overall emissions, come from just 620 coal-burning power plants. Thus, any attempt to reduce greenhouse gas emissions must focus squarely on addressing these plants. "In a very real sense," he writes, "nothing else matters."

While RPS tends to foster investment in wind farms, these almost never displace baseload coal-fired plants, he says, which is the key objective. Among other changes, he proposes that the rules be modified to create "bands" of technologies, based on their degree of commercial readiness, and that the regulations should strongly favor promising but still early stage technologies. Encouraging investment in technology that won't produce results until later in the process could actually foster much more significant progress, he says. "We have to bet on all the horses," he says.

In addition, it is important to recognize that rules should be tailored to the conditions in particular parts of the country, he says. For example, while land-based wind dominates the upper Midwest, solar thermal systems should be favored in the Southwest, deep-offshore wind in the Northeast, and biomass in the Southeast.

Lawrence Susskind, Ford Foundation Professor of Urban and Environmental Planning and Hogan's thesis adviser, says his student has demonstrated that renewable portfolio standards "are not working as well as they should."

Susskind says that in carrying out this study, Hogan "builds on his long experience developing energy facilities in many parts of the world" and through his analysis "offers a detailed package of reforms that could make a difference."

Hogan said the research changed his own perspective. "I went in thinking I would reaffirm things I already believed," he says, but that turned out not to be the case. For example, he said, "I went in very negative about offshore wind in the near term," but the study "completely changed my mind."