

Princeton University  
Woodrow Wilson School of Public and International Affairs  
Graduate Program

**WWS 591a: Policy Workshop: Climate Change, State Initiatives, and Coastal Hazards:  
Mitigation and Adaptation Strategies for New Jersey**

Fall Term - 2006

Thursdays, 1–4:00 pm, 020 Robertson Hall

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INTRODUCTION, CLIENT, AND ASSIGNMENT

Scientific evidence has become compelling that climate change will cause substantial changes to our planet. Reductions in the emissions of greenhouse gases are needed to slow the expected rate of global warming. Reductions in the emissions of carbon dioxide, a key greenhouse gas, require changes in both the energy system and in how we use land. Threats to coastal regions from climate change are particularly acute and predictable, including flooding and erosion damages resulting from increased incidence of severe storms and accelerated sea level rise. Climate change has profound land use implications. Climate change also has serious economic ramifications, including substantial risks for insurers and re-insurers, and affects the affordability and availability of property and catastrophic insurance. In the absence of federal leadership within the United States, states, regions, and local governments are beginning to develop policies to reduce emissions of greenhouse gases and to adapt to expected impacts of climate change.

The workshop's task is to develop creative yet realistic, well-reasoned and supported policy recommendations for the New Jersey Department of Environmental Protection (NJDEP) on mitigation and adaptation strategies for the State of New Jersey, to address climate change and in particular coastal hazards.

In the context of climate change policy, mitigation means interventions to reduce sources or enhance sinks of greenhouse gases, particularly CO<sub>2</sub>. Adaptation means adjustments to actual or expected climatic change and its effects, which moderates harm or exploits beneficial opportunities. The workshop will examine and recommend mitigation options with statewide applicability, but focus adaptation options on New Jersey's coastal regions.

While NJDEP is the client, the workshop's analyses will necessarily involve other State agencies, including the Board of Public Utilities, State Planning Commission, Department of

Community Affairs, Department of Banking and Insurance, and the Department of Transportation.

As the workshop fulfills the planning workshop requirement for the MPA-URP degree, attention will be paid to the urban and regional planning implications of climate change in New Jersey. In addition, depending on a student's paper topic, the workshop may also satisfy one of the course requirements for a certificate in Science, Technology and Environmental Policy (STEP).

While NJDEP is the client, the instructors will provide guidance to workshop members throughout the semester from their various perspectives. Mauzerall is an atmospheric scientist and former US EPA-Global Change Division program manager who has taught several courses at Princeton University on energy, climate change and sustainable development. Kinsey is a practicing urban and regional planner and former Director, Division of Coastal Resources in NJDEP who has taught graduate courses at Princeton University on land use policy, affordable housing, and environmental justice, and urban planning workshops.

## BACKGROUND

The State of New Jersey is taking steps to address climate change. Important State initiatives are underway, including:

1. NJDEP prepared and began implementing a GHG (Greenhouse Gas) Reduction Action Plan in 1999, with a goal of reducing GHG emissions to 3.5% below 1990 levels by 2005, pursuing several "no regrets" strategies, including energy conservation, innovative technologies, pollution prevention, waste management, and natural resources-open space; <http://www.state.nj.us/dep/dsr/gcc/ghg-whatism.htm>
2. NJDEP developed a detailed GHG emission inventory and signed voluntary GHG reduction agreements with major New Jersey businesses, industrial companies, energy utilities, all 56 colleges and universities, K-12 public schools, religious organizations, and some municipalities.
3. New Jersey deregulated its electric energy market in 1999 and offers green power options; <http://www.bpu.state.nj.us/cleanEnergy/GreenPowerChoice.shtml>
4. The Governor's Blue Ribbon Panel on Development of Wind Turbine Facilities in Coastal Waters examined the potential of wind power along the coast in 2005; <http://www.njwindpanel.org/>, while the Atlantic County Utilities Authority opened a wind farm in Atlantic City in 2005: [http://www.acua.com/alternative/a\\_projects\\_dsply.cfm?id=275](http://www.acua.com/alternative/a_projects_dsply.cfm?id=275)
5. NJDEP's Environmental Trends Monitoring project tracks important and alarming trends; <http://www.nj.gov/dep/dsr/trends2005/>; see in particular Greenhouse Gas Emissions <http://www.nj.gov/dep/dsr/trends2005/pdfs/ghg.pdf>; Climate Change in New Jersey <http://www.nj.gov/dep/dsr/trends2005/pdfs/climate-change.pdf> and Energy Use and Renewable Energy Sources <http://www.nj.gov/dep/dsr/trends2005/pdfs/energy.pdf>
6. New Jersey Board of Public Utilities ("BPU") promotes more energy-efficient and renewable energy technologies through its Clean New Jersey Program; <http://www.njcleanenergy.com/> and <http://www.bpu.state.nj.us/cleanEnergy/cleanEnergyProg.shtml>

7. Governor Corzine's Executive Order No. 11 (2006) established the position of Director of Energy Savings in the State Department of Treasury to increase energy efficiency, reduce energy usage and harness the State's purchasing power to decrease GHG emissions; <http://www.state.nj.us/governor/news/news/approved/20060422.html>
8. NJDEP's Bureau of Sustainable Communities and Innovative Technologies assists municipalities in becoming sustainable communities; <http://www.state.nj.us/dep/dsr/bscit.htm>
9. New Jersey's Second *State Development and Redevelopment Plan*, adopted in 2001 and currently being revised by the State Planning Commission and Office of Smart Growth, advances climate issues by promoting compact, mixed-use, and transit-oriented development and addressing energy resources issues; <http://www.nj.gov/dca/osg/plan/index.shtml>
10. New Jersey joined in 2005 with five other Northeast and Mid-Atlantic states in a cooperative effort to reduce CO<sub>2</sub> emissions from electric power generators by implementing a multi-state cap-and-trade program with a market-based emissions trading system, the Regional Greenhouse Gas Initiative; the cooperating states released a model rule to implement this initiative in August 2006; <http://www.rggi.org/>
11. The New Jersey Flood Mitigation Task Force, established by Governor Codey in 2005 in response to two successive Delaware River floods in 2004 and 2005 that caused widespread damage from Montague to Trenton, issued its final report in August 2006, recommending numerous statewide flood hazard mitigation strategies; <http://www.nj.gov/dep/njflood/>
12. The New Jersey Meadowlands Commission, a State agency exercising direct land use authority, committed in 2006 to meet the Kyoto Protocol goals and will reduce GHG emissions within the 30 square mile Meadowlands District in North Jersey to 7% below 1990 levels by 2012, through measures such as its pending Green Building initiative to create voluntary incentives for LEED compliance for development in the Meadowlands District; [http://www.hmdc.state.nj.us/press\\_advisories/July\\_2006/Kyoto.cfm/kyoto\\_release\\_CL.pdf?&CFID=448838&CFTOKEN=91568834&jsessionid=723092940a20\\$EAx7\\$29](http://www.hmdc.state.nj.us/press_advisories/July_2006/Kyoto.cfm/kyoto_release_CL.pdf?&CFID=448838&CFTOKEN=91568834&jsessionid=723092940a20$EAx7$29) and

In addition, at least 20 New Jersey municipalities have signed the U.S. Mayors Climate Protection Agreement. <http://www.ci.seattle.wa.us/mayor/climate/> and [http://www.coolcities.us/taxonomy\\_menu/2/46?from=10](http://www.coolcities.us/taxonomy_menu/2/46?from=10)

Against this background of initiatives underway, the workshop will examine climate change mitigation strategies and coastal hazard issues in an increasingly visible and public policy arena. The workshop will focus on timely initiatives and complement the work already underway in State government.

Specifically, the New Jersey Public Interest Research Group released in May 2006 its list of New Jersey's "coastal treasures" at risk from global warming and related sea level rise - Meadowlands, Atlantic City, Cape May, Long Beach Island and the Delaware Bay Shore - and called on Governor Corzine to commit to reduce New Jersey's GHG emissions by 20% below current levels by 2020 and 70% by 2050 by adopting six "global warming solutions": more energy efficiency in buildings, more energy efficiency in appliances, fewer long commutes, more

motor vehicle fuel efficiency, no further expansion of fossil fuel infrastructure, and make energy generators pay for CO<sub>2</sub> emissions in the RGGI system.

Governor Corzine is convening a Summit on Confronting Climate Change in New Jersey in September 2006, bringing together senior State government officials, financial services and insurance industry leaders, and scientific and industry experts to focus on climate change impacts on flooding and storms.

NJDEP is proposing significant amendments to its Flood Hazard Area Control rules in the fall of 2006, in the wake of serious Delaware River flooding in 2005 and 2006.

[http://www.nj.gov/dep/niflood/docs/web\\_rule\\_8\\_31\\_06.pdf](http://www.nj.gov/dep/niflood/docs/web_rule_8_31_06.pdf)

In the post-Katrina era, New Jersey is increasingly vulnerable to potentially catastrophic loss of life and property, and displacement of residents and visitors, from hurricanes and coastal storms.

### COURSE REQUIREMENTS AND PROCESS

The workshop will prepare a coherent, integrated, collective final report, with a one-page summary, findings, recommendations, and supporting rigorous analyses, emphasizing policy implementation (15-20 double-spaced pages, plus exhibits and supporting individually- or collectively-written appendices). In addition, a concise PowerPoint presentation for briefing the client and perhaps other relevant audiences will also be prepared.

Initial background readings, lectures, discussions, an introductory meeting with the NJDEP client in Trenton, and informal briefings by pertinent governmental, scientific, and NGO experts will take place during Weeks 1-6. Additional day trips for meetings with key experts may also be arranged.

Each workshop member will research and write a 10-15 page (double-spaced), well-referenced background paper on one of the key aspects of the workshop's assignment during Weeks 1-7. The written paper will be submitted to the workshop. The key findings and recommendations from the papers will be presented orally by each workshop member to the entire group in Week 7, assisted by a concise PowerPoint presentation. Possible background paper topics include, but are not limited to:

1. Current best practices in state mitigation strategies
2. Current best practices in domestic local government mitigation strategies
3. Examination of off-shore wind power as a mitigation option for NJ
4. Examination of opportunities for improvements in public transportation in NJ at the local and state level (e.g., enhancements in commuter trains to NYC, regional bus systems, etc.) as method to reduce GHG emissions
5. Examination of options for decreasing or reversing the increase of VMT (vehicle miles traveled)
6. Examination of energy efficiency in buildings and opportunities for improvement (note S2152 pending in the Legislature authorizes the Commissioner of Community Affairs to promulgate a green building sub code as part of the State Uniform Construction Code)
7. Promise and pitfalls of coastal flooding adaptation strategies
8. European coastal hazards adaptation strategies
9. State hazard mitigation planning: the state of the states

10. Land use solutions to coastal hazards adaptation
11. Uses of markets in mitigation and coastal hazards adaptation in New Jersey
12. Potential roles for the insurance industry in mitigation and adaptation
13. Adaptation lessons for coastal New Jersey from Small Island States
14. Nuclear power for New Jersey: Should the five existing plants be expanded or their operating lives extended?
15. Potential of biofuels (especially biodiesel from agricultural crops and waste grease)?
16. Potential of taxes (on fuel or carbon) as a greenhouse gas mitigation option
17. Cumulative adverse impacts of climate change, development pressures, and patterns of land use change on coastal New Jersey
18. etc.

Workshop members should select, define, and refine the individual paper topic in consultation with workshop members and the instructors.

The workshop's final collective report will not simply be a compendium of the individual background papers, although some background papers, with rewriting, may be included as appendices in the workshop's final report.

During the fall recess (October 28 - November 5, 2006), small groups of students may travel to various domestic and foreign destinations, e.g., California, Pacific Northwest, Germany, United Kingdom, Netherlands, New Zealand, etc., to conduct interviews and gather information relevant and helpful for the workshop's assignment.

Weeks 7-12 will be devoted to the workshop's collective effort to develop a coherent final report and PowerPoint presentation. An interim workshop report with an initial outline and preliminary analysis is due in Week 7, before the fall recess, and will be discussed with NJDEP. Additional speakers and field trips may be arranged as needed during Weeks 7-12

Throughout the semester, workshop members are expected to communicate with each other via Blackboard as well as e-mail and memos, on research leads, findings, etc. that will contribute to the group's deliberations and collective final report.

The workshop's final report is likely to be due Wednesday January 10, 2007, and in any case will be due prior to the presentation to NJDEP. The presentation to NJDEP and a panel of experts will take place during Reading Period, January 8-16, 2007.

## EVALUATION

The final course grade and written evaluation of a student's performance in the workshop will be based upon:

Workshop participation	25%
Student presentations	25%
Individual paper	25%
Final report	25%

## WORKSHOP MEMBERS

Jessica Colon	<a href="mailto:colonj@princeton.edu">colonj@princeton.edu</a>
Patty Fong	<a href="mailto:pfong@princeton.edu">pfong@princeton.edu</a>
Suzanne Gelderman	<a href="mailto:sgelderm@princeton.edu">sgelderm@princeton.edu</a>
Stephanie Greenwood	<a href="mailto:sgreenwo@princeton.edu">sgreenwo@princeton.edu</a>
Avinash Kishore	<a href="mailto:akishore@princeton.edu">akishore@princeton.edu</a>
Elizabeth Lindsey	<a href="mailto:elindsey@princeton.edu">elindsey@princeton.edu</a>
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Marcos Marrero Rivera	<a href="mailto:mmr@princeton.edu">mmr@princeton.edu</a>
Perris Straughter	<a href="mailto:pstraugh@princeton.edu">pstraugh@princeton.edu</a>
John Virgoe	<a href="mailto:jvirgoe@princeton.edu">jvirgoe@princeton.edu</a>

## READINGS

Books listed in this syllabus are on reserve in the Stokes Library. Articles and chapters of some books are on e-reserves, at: <http://infoshare1.princeton.edu/reserves/elecres.html>. Click on Login Directly to your Course Reading Page and enter the user ID and password available from the instructors. Non-electronic readings can be located through the University Library Main Catalogue, at: <http://catalog.princeton.edu/cgi-bin/Pwebrecon.cgi?DB=local&PAGE=First>. Click on Course Reserve, then enter the instructor's name and department (Woodrow Wilson School) and scroll to highlight the course number, then click Search. Other readings are accessible on the Web through links in this syllabus. Three books are available for purchase at Micawber Books, 114 Nassau Street (921-8454). Multiple copies of these books are also on reserve in Stokes Library:

Flannery, Tim. *The Weather Makers: How Man Is Changing the Climate and What It Means for Life on Earth*. New York: Atlantic Monthly Press, 2006. ISBN 10: 0-87113-935-9, or

Gore, Al. *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*. Emmaus, PA: Rodale, 2006. ISBN 13:978-1-59486-567-1

Psuty, Norbert P. and Douglas D. Ofiara. *Coastal Hazard Management: Lessons and Future Directions from New Jersey*. New Brunswick, NJ, Rutgers University Press, 2002.

Readings are listed below in descending order of importance for the week's discussions in class. Skimming is an important skill to learn.

Workshop members are urged to do as much reading as possible in advance, and recognize that the readings listed by week are also a resource for use throughout the semester. In addition to readings listed by week, this syllabus closes with lists of additional resources on reserve in Stokes Library and helpful web sites.

WEEKLY SCHEDULE (Readings, Assignments, and Guest Speakers)

**Week 1 September 14 Introduction**

Introduction to workshop assignment. Basic background information. Discussion of workshop process. Fall recess travel. Organizational matters and logistics for the semester. Selection of student liaison with Graduate Program Office. Introduction to current state of understanding of climate change science, as well as climate change policy, planning, and coastal zone management in New Jersey. Introduction to the challenges and realities of developing and implementing policies.

Readings:

Hansen, Jim. "The Threat to the Planet." *New York Review of Books*. Vol. 53, No. 12, July 13, 2006, pp. 12-16.

<http://www.nybooks.com/articles/19131> (see e-reserves for version with important graphics)

Rosen, Richard A. Ruth f. Weiner, and reply by Jim Hansen. "The Threat to the Planet: An Exchange." *New York Review of Books*. Vol. 53, No. 14, September 21, 2006, p. 98.

<http://www.nybooks.com/articles/19304>

Intergovernmental Panel on Climate Change. *Climate Change 2001: Synthesis Report, Summary for Policymakers*, September 2001. <http://www.ipcc.ch/pub/un/syrenq/spm.pdf>

Cooper, Matthew J.P., Michael D. Beevers, and Michael Oppenheimer. "Future Sea Level Rise and the New Jersey Coast: Assessing Potential Impacts and Opportunities." Princeton University, Woodrow Wilson School of Public and International Affairs, Science, Technology and Environmental Policy Program. November 2005.

[http://region.princeton.edu/pub\\_detail\\_23.html](http://region.princeton.edu/pub_detail_23.html)

NJPIRG. "NJPIRG Releases NJ's Coastal Treasures at Risk from Global Warming; Calls on Governor Corzine to Take Action." May 25, 2006.

<http://njpirg.org/NJ.asp?id2=24429&id3=NJ&> and

<http://njpirg.org/NJ.asp?id2=15441&id3=NJ&>

Flannery, Tim. *The Weather Makers: How Man Is Changing the Climate and What It Means for Life on Earth*. New York: Atlantic Monthly Press, 2006. ISBN 10: 0-87113-935-9, or

Gore, Al. *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*. Emmaus, PA: Rodale, 2006. ISBN 13:978-1-59486-567-1

*An Inconvenient Truth*. Movie in theatres. <http://www.climatecrisis.net/>

Gilbert, Daniel. "If only gay sex caused global warming." *Los Angeles Times*. July 2, 2006.

Steinhauer, Jennifer. "Clinton Foundation to Work to Reduce Greenhouse Gases." *The New York Times*. August 2, 2006.

**Week 2    September 21    Meeting with Client, New Jersey Department of Environmental Protection, in Trenton, New Jersey**

Host and Guest Speaker: Jeanne Herb, Director, Policy, Planning, and Science, NJDEP, and NJDEP colleagues

Readings:

Pew Center on Global Climate Change. "Learning from State Action on Climate Change, February 2006 Update."

<http://www.pewclimate.org/docUploads/PewStatesBriefFeb2006%2Epdf>

Fox, Jeanne and Bradley Campbell. "N.J. part of initiative to address global warming." *Asbury Park Press*, December 23, 2005.

["http://www.app.com/apps/pbcs.dll/article?Date=20051223&Category=OPINION&ArtNo=512230352&SectionCat=POLITICS&Template=printart](http://www.app.com/apps/pbcs.dll/article?Date=20051223&Category=OPINION&ArtNo=512230352&SectionCat=POLITICS&Template=printart)

New Jersey Department of Environmental Protection web site: <http://www.state.nj.us/dep/>

New Jersey Department of Environmental Protection Organization Chart, June 2006.

<http://www.nj.gov/dep/commissioner/orgchart.pdf>

Kammen, Daniel M. Global Climate Change in California and Beyond – Is There a Way Out? Feasible and Affordable Solutions. Testimony during informational hearings, Sonoma and Marin Counties, March 10, 2006.

NJDEP. New Jersey Greenhouse Gas Action Plan, 1999 with amendments and 12 fact sheets;

<http://www.state.nj.us/dep/dsr/gcc/ghg-whatism.htm>

Kammen, Daniel M. The Climate Change Crisis: Can California Create a Way Out? Testimony before the California Select Committee on Air and Water Quality Hearing, Santa Monica City Hall, August 11, 2005.

2005 Northeast Regional Greenhouse Initiative. <http://www.rggi.org/>

New Jersey Blue Ribbon Panel on Development of Wind Turbine Facilities in Coastal Waters. *Final Report to Govern Jon S. Corzine.* April 2006.

<http://www.njwindpanel.org/docs/finalwindpanelreport.pdf>

California Energy Commission, Climate Advisory Committee. *Climate Change in California: Choosing Our Future.* Presentation by Dr. Michael Hanemann, University of California, Berkeley, October 2004.

[http://www.energy.ca.gov/global\\_climate\\_change/04-CCAC-1\\_advisory\\_committee/documents/2004-10-07\\_meeting/2004-10-07\\_OUR\\_FUTURE.PDF](http://www.energy.ca.gov/global_climate_change/04-CCAC-1_advisory_committee/documents/2004-10-07_meeting/2004-10-07_OUR_FUTURE.PDF)

California. Office of the Governor. Press Release: "Gov. Schwarzenegger , British Prime Minister Tony Blair Sign Historic Agreement to Collaborate on Climate Change, Clean Energy." July 31, 2006. <http://gov.ca.gov/index.php/press-release/2770/> and UK-CA Agreement, <http://gov.ca.gov/index.php/fact-sheet/united-kingdom-and-california-announcement-on-climate-change-clean-energy-c/>

Governor's Steering Committee. *Leading by Example: Connecticut Collaborates to Reduce Greenhouse Gas Emissions*. New York: Rockefeller Brothers Fund, 2003.  
<http://www.rbf.org/pdf/leading%20by%20example.pdf>

Kammen, Daniel M., Nemet G., and Baka, J. Economic and Environmental Analysis of California's Clean Alternative Energy Act. A Report of the Energy and Resources Group & Goldman School of Public Policy, University of California, Berkeley, April 17, 2006.

California AB32 – State level controls on GHG emissions. San Francisco Chronicle, April 2006.  
<http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2006/04/11/EDGNSGUB5E1.DTL>

California AB 1493. Reducing climate change emissions from motor vehicles. California Air Resources Board. <http://www.arb.ca.gov/cc/cc.htm>

Connecticut Climate Change web site: <http://www.ctclimatechange.com/>

Connecticut Global Climate Change Summit: Business Risks and Opportunities for Connecticut's Insurance Industry, October 27, 2005.  
<http://www.ctclimatechange.com/Insurance.html>

### **Week 3 September 28 Planning, Climate Change, and Smart Growth**

Guest Speaker: Eileen Swan, Executive Director, New Jersey Office of Smart Growth (former Mayor, Lebanon Township, Hunterdon County, NJ, former member of the New Jersey Highlands Council, and consultant on greenways to the New Jersey Conservation Foundation)

*Assignments: Workshop budget due at Graduate Program Office by October 2. Proposal for fall recess international travel research due at Graduate Program Office by October 2. Discussion of individual paper topics.*

#### Readings:

Speth, James Gustav. "Climate Change in America: What We Can Do In America, A Ten-Point Plan," December 2004, Afterward for paperback edition of *Red Sky at Morning: America and the Crisis of the Global Environment*. New Haven: Yale University Press, 2005.  
[http://www.redskyatmorning.com/downloads/afterword\\_paperback\\_010505.pdf](http://www.redskyatmorning.com/downloads/afterword_paperback_010505.pdf)

Friedman, "Energy and Smart Growth: It's about How and Where We Build." Translation Paper No. 15. Washington, D.C.: Funders' Network for Smart Growth and Livable Communities, 2004.  
[http://www.fundersnetwork.org/usr\\_doc/Energy\\_and\\_Smart\\_Growth.pdf](http://www.fundersnetwork.org/usr_doc/Energy_and_Smart_Growth.pdf)

Kay, Jane Holtz. "What Can Planners Do?" *Planning Magazine*. Vol. 71, Issue 8, Aug/Sept, p. 10.

Luberoff, David. "State Planning in New Jersey." *Public Works Management & Policy*. July 1999, Vol. 4, No. 1, pp. 10-30.

New Jersey Office of Smart Growth web site: <http://www.nj.gov/dca/osg/>

New Jersey State Planning Commission. *Second New Jersey State Development and Redevelopment Plan*, 2001. <http://www.nj.gov/dca/osg/plan/index.shtml> (skim)

DeGrove, John. *Planning, Policy, and Politics: Smart Growth and the States*. Cambridge, MA: Lincoln Institute of Land Policy, 2005, Chapter 4, "New Jersey," pp. 93-130.

Stanley R. Euston. "Rebooting State Planning: Climate Change and the Energy Challenge: A proposal to reinvigorate state planning to address climate change issues." *Planning & Environmental Law*. Vol. 57, No. 11 [November 2005]. p. 3.

Kalnay, Eugenia and Ming Cal. "Impact of urbanization and land-use change on climate." *Nature*. Vol. 423, 29 May 2003, pp. 528-531.

Womersley, Mick. "Smart Growth, Sprawl and Climate Change Mitigation in the United States." In Matthias Ruth, ed. *Smart Growth and Climate Change: Regional Development, Infrastructure and Adaptation*. Cheltenham, UK: Edgar Elgar, 2006, pp. 62-81.

#### **Week 4    October 5    Mitigation Options**

Guest Speakers: Stephen W. Pacala, Professor of Ecology and Evolutionary Biology, Co-Director, Carbon Mitigation Initiative, and Director, Princeton Environmental Institute, Princeton University

Richard S. Dovey, President, Atlantic County Utilities Authority, developer of New Jersey's first wind farm in Atlantic City

#### Readings:

Pacala, S. and Robert Socolow. "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies." *Science*. Vol. 305, Issue 5686, August 13, 2004, pp. 968-972.

Jochem, Eberhard K. "An Efficient Solution." *Scientific American*, September 2006, Vol. 295 Issue 3, pp. 64-68.

Kammen, Daniel M. "The Rise of Renewable Energy." *Scientific American*, September 2006, Vol. 295, Issue 3, pp. 85-93.

Heywood, John B. "Fueling Our Transportation Future." *Scientific American*, September 2006, Vol. 295, Issue 3, pp. 60-64.

Ogden, Joan. "High Hopes for Hydrogen." *Scientific American*, September 2006, Vol. 295 Issue 3, pp. 94-102.

Martinot, Eric, Renewable Energy Gains Momentum: Global Markets and Policies in the spotlight, *Environment*, 48:26, July/August 2006.

Kammen, Daniel M. "Eight Ways to Beat the Heat." *Los Angeles Times*, June 11 2006.

Martinot, Eric. *Renewables 2005 Global Status Report*. Prepared for REN21 Network by The Worldwatch Institute. pp. 1-35.

Is It Time to Shoot for the Sun? *Science*. Vol. 309 July 2005. pp. 548-551.

Jacobson, Mark and Gilbert Masters, Exploiting Wind Versus Coal. *Science*. Vol. 293 August 2001.

Ram, B., W. Musial and S. Butterfield. "Energy from Offshore Wind." National Renewable Energy Laboratory. Feb. 2006. Houston, TX.

"The Renewable Portfolio Standard: How It Works and Why It's Needed." American Wind Energy Association. Oct. 1997. <http://www.awea.org/policy/rpsbrief.html>

"Wind Power Today: Federal Wind Program Highlights." U.S. Department of Energy. Apr. 2005. <http://www.nrel.gov/wind/pdfs/37147.pdf>

Tester, Jefferson W., Elisabeth M. Drake, Michael J. Driscoll, Michael W. Golay, and William A. Peters. *Sustainable Energy: Choosing Among Options*. MIT Press, 2005. Just out last year, this tome is a comprehensive quantitative introduction to energy technologies, with extensive discussion of non-technical issues.

US Department of Energy. "A Consumer's Guide to Energy Efficiency and Renewable Energy." 2005. [www.eere.energy.gov](http://www.eere.energy.gov)

US Department of Energy. "Building Technologies Program." 2006. [www.eere.energy.gov/buildings](http://www.eere.energy.gov/buildings)

US Green Building Council. 2005. [www.usgbc.org](http://www.usgbc.org).

Carbon Mitigation Initiative, Princeton Environmental Institute, Princeton University. <http://www.princeton.edu/%7Ecmi/>

## **Week 5    October 12    Adaptation Options for Coastal Hazards**

Guest Speaker: Norbert P. Psuty, Professor of Geology Emeritus, and Director, Sandy Hook Cooperative Research Programs, Institute of Marine and Coastal Sciences, Rutgers University

### Readings:

Psuty, Norbert P. and Douglas D. Ofiara. *Coastal Hazard Management: Lessons and Future Directions from New Jersey*. New Brunswick, NJ, Rutgers University Press, 2002. ISBN 0-

8135-3150-0 Chapters 1, Dynamic Coastal Systems; 5, Sea-Level Rise: Its Dimensions and Implications; 9, Hazard Management as a Component of Coastal Management; 11, Coastal and Hazard Management: Trends, Options, and Future Directions; pp. 1-8, 133-156, 280-323, and 354-388. Skim other chapters as necessary for a fuller understanding of New Jersey coastal hazards issues.

Klein, Richard J.T., et al. "Coastal Adaptation to Climate Change: Can the IPCC Technical Guidelines Be Applied?" *Mitigation and Adaptation Strategies for Global Change*. Vol. 4, 1999, pp. 239-252.

Najjar Raymond G. et al. (including Norbert Psuty) "The potential impacts of climate change on the mid-Atlantic coastal region." *Climate Research*. Vol. 14:219-266, 2000.

Revkin, Andrew C. "Climate Experts Warn of More Coastal Building." *The New York Times*. July 25, 2006, Section F, page 2.

Marine Law Institute University of Maine Law School, et al. *Anticipatory Planning for Sea-Level Rise Along the Coast of Maine*. Washington, D.C.: U.S. Environmental Protection Agency, September 1995.  
[http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BUS6Q/\\$File/main\\_e\\_0.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BUS6Q/$File/main_e_0.pdf)

U.S. Environmental Protection Agency. "Saving New Jersey's Vanishing Shores." Brochure. July 1999, two pages.  
[http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BVPRQ/\\$File/save\\_njshores.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BVPRQ/$File/save_njshores.pdf)

Kinsey, David N.. "Lessons from the New Jersey Coastal Management Program." *Journal of the American Planning Association*. Vol. 51, No. 3, Summer 1985, pp. 330-336.

Heinz Center, Coastal Initiative Program.  
[http://heinzctr.org/Programs/SOCW/coastal\\_vision/index.shtml](http://heinzctr.org/Programs/SOCW/coastal_vision/index.shtml)

Heinz Center. *Human Links to Coastal Disasters*. 2002.  
[http://heinzctr.org/NEW\\_WEB/PDF/Full\\_report\\_human\\_links.pdf](http://heinzctr.org/NEW_WEB/PDF/Full_report_human_links.pdf)

Heinz Center. *Evaluation of Erosion Hazards*. 2000.  
[http://heinzctr.org/NEW\\_WEB/PDF/erosnsum.pdf#zoom=100](http://heinzctr.org/NEW_WEB/PDF/erosnsum.pdf#zoom=100) and  
[http://heinzctr.org/NEW\\_WEB/PDF/erosnrpt.pdf#pagemode=bookmarks&view=Fit](http://heinzctr.org/NEW_WEB/PDF/erosnrpt.pdf#pagemode=bookmarks&view=Fit)

Griggs, Gary, Kiki Patsch, and Lauret Savoy; with contributions by Reinhard Flick. *Living with the Changing California Coast*. Berkeley, CA: University of California Press, 2005. "Weather, climate change, sea level and the coastline ; Understanding the shoreline; The erosion of the coastline; Responding to coastal hazards California's coastal hazards: theory and practice." TC224.C2 G75 2005.

Wu, Shuang-Ye, Brent Yarnal, and Ann Fisher. "Vulnerability of Coastal Communities to Sea-Level Rise: A Case Study of Cape May County, New Jersey, USA.." *Climate Research*, Vol. 22:255-270, November 2002. (<http://www.int-res.com/articles/cr2002/22/c022p255.pdf>).

Edgerton, Lynne T. *The Rising Tide: Global Warming and World Sea Levels*. Washington, D.C.: Island Press, 1991, at least Chapters 3, 5, and 7, pp. 24-39, 49-69, and 77-87. QC981.8.G56E34 1991

## **Week 6    October 19    NGO Perspective**

### Guest Speakers:

Tim Dillingham, Executive Director, American Littoral Society, Sandy Hook, N.J., member of the New Jersey Highlands Council, and former director New Jersey Chapter Sierra Club

Dery Bennett, Director of Special Projects and former Executive Director (1968-2003), American Littoral Society, Sandy Hook, N.J.

Michael Oppenheimer, Professor of Geosciences and International Affairs; Director, Program in Science, Technology and Environmental Policy, Princeton University, and Science Advisor to Environmental Defense

### Readings:

*Minority Report* of Tim Dillingham, American Littoral Society, in New Jersey Blue Ribbon Panel on Development of Wind Turbine Facilities in Coastal Waters. *Final Report to Govern Jon S. Corzine*. April 2006, pp. 19-24.

<http://www.njwindpanel.org/docs/finalwindpanelreport.pdf>

Sierra Club. Cool Cities, Solving Global Warming One City at a Time. <http://www.coolcities.us/>

Sierra Club. Cool Cities, "Solving Global Warming One City at a Time, Sierra Club's Guide to Local Warming Solutions." March 2006, 16 pages.

<http://www.coolcities.us/files/coolcitiesguide.pdf>

NJPIRG. Global Warming Solutions web site. <http://njpirg.org/NJ.asp?id2=15441&id3=NJ&>

American Littoral Society web site: <http://www.littoralsociety.org/Default.aspx>

## **Week 7    October 26    Presentations and Discussions**

### Readings:

Tufte, Edward R. *The Cognitive Style of PowerPoint: Pitching Out Corrupts Within*. 2<sup>nd</sup> ed. Cheshire, CT: Graphics Press, LLC, 2006.

*Assignments: First papers due. Five minute maximum oral presentations of individual first paper findings and recommendations. Workshop interim report with initial outline of final report due for discussion, revision as necessary, and submission to client. Discussion of proposed field research during recess.*

***Fall Recess, October 28 - November 5: Comparative Field Research***

**Week 8 November 9 Discussions**

Discussion of findings from field research during fall recess. Finalizing of workshop final report organization and workshop member responsibilities. Feedback from client on initial outline of final report.

**Week 9 November 16 Discussions**

Discussions and decisions on joint recommendations. Planning the workshop's final report. Assignments of remaining work.

**Week 10 November 30 Discussions**

Discussions and decisions on joint recommendations. Planning the workshop's final report. Assignments of remaining work.

**Week 11 December 7 Draft Report**

Draft final report completed, circulated within the workshop for comment, and discussed. Preparation of PowerPoint presentation.

**Week 12 December 14 Draft Report and Presentation**

Revisions to draft final report. Preparation of final report. Rehearsal of PowerPoint presentation to client and panel of experts.

**Assignment: Final Report due before the presentation to NJDEP (and in any case by the end of Reading Period, i.e., by January 17, 2007)**

**Presentation(s) to NJDEP and Panel of Experts of Workshop Findings and Recommendations:**

**To be scheduled, to be held during Reading Period (January 8-16, 2007)**

**Some Web Sites on Climate Change, State Initiatives, and Coastal Hazards:**

Intergovernmental Panel on Climate Change. includes the *IPCC Third Assessment Report—Climate Change 2001: The Scientific Basis; Impacts, Adaptation and Vulnerability; and Mitigation*. In addition, special reports entitled Carbon Dioxide Capture and Storage,

Emission Scenarios, and Safeguarding the Ozone Layer and the Global Climate System.  
<http://www.ipcc.ch/index.html>

These reports come from the flagship international assessment effort of climate change.

Tyndall Center for Climate Change Research. <http://www.tyndall.ac.uk/index.shtml>

International Energy Agency. Dealing with Climate Change, Policies and Measures (searchable data base). <http://www.iea.org/textbase/envissu/pamsdb/index.html>

U.S. Environmental Protection Agency, Global Warming.  
<http://yosemite.epa.gov/oar/globalwarming.nsf/content/index.html>

U.S. Department of Energy, Energy Information Administration, 2004. *International Energy Annual 2003*. <http://www.eia.doe.gov/emeu/iea/contents.html>

European Union. Collection of energy research documents and reports from the European Union on a variety of topics ranging from zero emission coal power plants to various renewable energy technologies.  
[http://europa.eu.int/comm/research/energy/index\\_en.htm](http://europa.eu.int/comm/research/energy/index_en.htm)

BP. *Statistical Review of World Energy 2006*.  
<http://www.bp.com/subsection.do?categoryId=95&contentId=2006480>

U.S. Department of Energy, Energy Information Agency. . *International Energy Outlook, 2003*. Report # DOE/EIA-0484, 2004.. <http://www.eia.doe.gov/oiaf/ieo/index.html>.

International Energy Agency, 2002. *World Energy Outlook 2002*. Paris, France: OECD/IEA.  
[http://library.iea.org/dbtw-wpd/Textbase/nppdf/stud/02/weo2002\\_1.pdf](http://library.iea.org/dbtw-wpd/Textbase/nppdf/stud/02/weo2002_1.pdf).

International Energy Agency, 2003. *Key World Energy Statistics. 2003*.  
<http://www.iea.org/dbtw-wpd/bookshop/add.aspx?id=144>

IPCC. *Seventh International Conference on Greenhouse Gas Control Technologies*, Vancouver, Canada (papers presented), 2004. <http://www.ghgt7.ca>

Gale, J. and Y. Kaya, eds., 2003. *Proceedings of the 6<sup>th</sup> International Conference on Greenhouse Gas Control Technologies, 1-4 October, 2002, Kyoto, Japan*. Two volumes. Amsterdam: Pergamon. <http://www.ieagreen.org.uk/ghgt6.htm>

National Research Council, 2004. *The Hydrogen Economy: Opportunities, Costs, Barriers, and R&D Needs*. Washington, D.C., National Academy Press.  
<http://www.nap.edu/books/0309091632/html/>

Tompkins, Emma L., et al. *Surviving Climate Change in Small Islands - A guidebook*. Norwich, UK: Tyndall Center for Climate Change Research, October 2005.  
<http://www.tyndall.ac.uk/publications/surviving.pdf>

Union of Concerned Scientists. [http://www.ucsusa.org/global\\_warming/](http://www.ucsusa.org/global_warming/)

Climate Change Futures: *Health, Ecological and Economic Dimensions*.  
<http://www.climatechange-futures.org/>

OECD. Adaption to Climate Change: Key Terms, May 2006.  
<http://www.oecd.org/dataoecd/36/53/36736773.pdf>

NJDEP, Coastal Management Program. <http://www.nj.gov/dep/cmp/>

*An Inconvenient Truth* movie web site. <http://www.climatecrisis.net/>

Climate Solutions (oriented to Pacific Northwest and British Columbia).  
<http://www.climatesolutions.org/>

U.S. Mayors Climate Protection Agreement. <http://www.ci.seattle.wa.us/mayor/climate/>

The Energy Foundation. <http://www.ef.org/programs.cfm?program=climate>

Pew Center for Global Change. <http://www.pewclimate.org/>

Protecting New Jersey (advocacy group for New Jersey Catastrophe [insurance] Fund  
<http://www.protectingnewjersey.org/>

Protecting America (advocacy group for a national catastrophic insurance fund)  
<http://www.protectingamerica.org/Index.asp?SecID=63>

CERES, Investors and Environmentalists for Sustainable Prosperity (coalition of investors, environmental and public interest organizations addressing climate change).  
<http://www.ceres.org/>

Environmental Defense. Global Warming Undo It campaign. <http://www.undoit.org/home.cfm>  
and Fliht Global Warming campaign. <http://fightglobalwarming.com/>

Natural Resources Defense Council. Solving Global Warming.  
<http://www.nrdc.org/globalwarming/solutions/now.asp>

Climate Compass. European-based local climate protection initiatives. <http://www.climate-compass.net/>

Real Climate web site (real science from climate scientists). <http://www.realclimate.org/>

IEA Greenhouse Gas R&D Programme. <http://www.ieagreen.org.uk/publications.html>

New Jersey Department of Environmental Protection. <http://www.state.nj.us/dep/>

New Jersey Board of Public Utilities. <http://www.bpu.state.nj.us/home/home.shtml>

New Jersey Office of Smart Growth. <http://www.nj.gov/dca/osg/>

Metropolitan East Coast Assessment: [http://metroeast\\_climate.ciesin.columbia.edu/coastal.html](http://metroeast_climate.ciesin.columbia.edu/coastal.html)

Federal Emergency Management Agency. <http://www.fema.gov/>

National Oceanic & Atmospheric Administration. <http://www.noaa.gov/>

NOAA. Coastal Hazards Planning. <http://www.csc.noaa.gov/id/hazards.html>

Investor Network on Climate Risk. <http://www.incr.com/>

CERES, Investors and Environmentalists for Sustainable Prosperity. <http://www.ceres.org/>

Climate Institute. [http://www.climate.org/climate\\_main.shtml](http://www.climate.org/climate_main.shtml)

Clinton Global Initiative.

[http://www.clintonglobalinitiative.org/home.nsf/pt\\_cmt\\_topic?open&cat=climate](http://www.clintonglobalinitiative.org/home.nsf/pt_cmt_topic?open&cat=climate)

Apollo Alliance. <http://www.apolloalliance.org/>

Apollo Alliance. New Energy for States, Energy-Saving Policies for Governors and Legislators.

[http://www.apolloalliance.org/state\\_and\\_local/statepolicy\\_report.cfm](http://www.apolloalliance.org/state_and_local/statepolicy_report.cfm)

Apollo Alliance. *Report: New Jersey Energy Policy Provides Model for the President*, February 20, 2006. [http://cdncon.vo.llnwd.net/o2/fotf/apollo\\_nefs\\_PR/nefs\\_pr\\_NJ.pdf](http://cdncon.vo.llnwd.net/o2/fotf/apollo_nefs_PR/nefs_pr_NJ.pdf)

Tides Center. <http://www.stopglobalwarming.org/default.asp>

Heinz Center for Science, Economics and the Environment. <http://heinzctr.org/index.shtml>

Subscribe to CLIMATE-L list serve (moderated, world-wide submissions on climate change issues, about 2-3 per day on average): <http://www.iisd.ca/email/subscribe.htm>

Another useful list serve to consider is Climate Change Information Service, for various daily news clippings. Register at: <http://www.climatewire.org/login.cfm>

Subscribe to Garden State Environews, a daily e-mail of New Jersey-oriented environmental, energy, and land use news clippings, subscribe at: <http://www.qsenet.org/>.

To follow New Jersey news, the best daily source on the web is the Newark *Star-Ledger*; consult both the "New Jersey News" and "Statehouse" sections, available at:

<http://www.nj.com/news/ledger/jersey/> and <http://www.nj.com/statehouse/ledger/>

### **Additional Material on Reserve in Stokes Library:**

Smil, Vaclav, *Energy at the Crossroads: Global Perspectives and Uncertainties*. Cambridge, MA: MIT Press, 2003. Smil's book is an excellent overview of "energy."

Tester, Jefferson W., Elisabeth M. Drake, Michael J. Driscoll, Michael W. Golay, and William A. Peters. *Sustainable Energy: Choosing Among Options*. MIT Press. 2005. Just out last year,

this tome is a comprehensive quantitative introduction to energy technologies, with extensive discussion of non-technical issues

International Energy Agency, *World Energy Outlook 2004*. Paris, France: OECD/IEA. The projections for the world energy system, typically twenty five years into the future, published by the International Energy Agency in its biannual World Energy Outlook, are cited by the energy industries and frame their worldview.

Deutch, John and Richard K. Lester, *Making Technology Work: Applications in Energy and the Environment*. Cambridge: Cambridge University Press, 2004. Deutch and Lester have written a set of case studies dealing with energy and environmental topics. The emphasis is on teaching the techniques of the policy analyst to the undergraduate engineer.

Speth, James Gustav. *Red Sky at Morning: America and the Crisis of the Global Environment*. New Haven: Yale University Press, 2002.

Ruth, Mathias, ed. *Smart Growth and Climate Change: Regional Development, Infrastructure and Adaptation*. Cheltenham, UK: Edgar Elgar, 2006. HC79.E5 S525 2006

Mills, Evan. "Insurance in a Climate of Change." *Science*. Vol. 309. 12 August 2005, pp. 1040-1044.

Beatley, Timothy, David J. Brower, and Anna K. Schwab. *An Introduction to Coastal Zone Management*. 2<sup>nd</sup> ed. Washington, D.C.: Island Press, 2002. HT392 .B43 2002

### **Some Resources for Comparative and Field Research:**

France. Mission Interministérielle de l'Effet de Serre.  
<http://www.effet-de-serre.gouv.fr/fr/actions/nordsud.htm>

German Advisory Council on Climate Change. [http://www.wbgu.de/wbgu\\_auftrag\\_en.html](http://www.wbgu.de/wbgu_auftrag_en.html)

Netherlands, Ministry of VROM (Housing, Spatial Policy, and the Environment). "Climate Policy Evaluation Memorandum 2005, On the way to Kyoto: An evaluation of Dutch climate policy aimed at meeting the Kyoto Protocol commitments." October 31, 2005.  
<http://www.sharedspaces.nl/docs/internationaal/On%20the%20way%20to%20Kyoto.pdf>

New Zealand, Minister Responsible for Climate Change Issues. "Cabinet Paper: Climate Change Policy: The Way Ahead." July 4, 2006.  
<http://www.climatechange.govt.nz/resources/cabinet/cab-06-188.html>

New Zealand Climate Change web site. <http://www.climatechange.govt.nz/>

New Zealand Climate Change. *Coastal Hazards and Climate Change: A Manual for Local Government in New Zealand*, 2004.  
<http://www.climatechange.govt.nz/resources/local-govt/coastal-hazards-may04/html/index.html>

Québec, Canada, Ministère des Affaires Municipales et Régionales. *Reduction of Greenhouse Gas Emissions and Land Use Planning– Best Practices Guide*, 2005, 77 pages. For online reading: [Reduction of Greenhouse Gas Emissions and Land Use Planning – Best Practices Guide](#) ; For printing or downloading: [Reduction of Greenhouse Gas Emissions and Land Use Planning – Best Practices Guide](#)

United Kingdom. Office of the Deputy Prime Minister. *The Planning Response to Climate Change: Advice on Better Practice*. Prepared by CAG Consultants and Oxford Brookes University. London: Office of the Deputy Prime Minister, September 2004. 107 pages.  
[http://odpm.gov.uk/pub/498/ThePlanningResponsetoClimateChangeAdviceonBetterPracticePDF1234Kb\\_id1144498.pdf](http://odpm.gov.uk/pub/498/ThePlanningResponsetoClimateChangeAdviceonBetterPracticePDF1234Kb_id1144498.pdf)