

CORNELL UNIVERSITY
Fall 2008
City and Regional Planning

CRP 354/554: Introduction to Environmental Planning

Location: Sibley 211 (and computer lab on specified days)
Day/time: Tuesdays, Thursdays, 11:40 – 12:55
Instructor: Stephan Schmidt
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Teaching Assistant: Emily Hamilton, erh58@cornell.edu
Credit: 3 hours
Office Hours: Mondays and Wednesdays; 10-12 and by appointment

Course Description

There is no one course (or even set of courses) a student can take to become an environmental planner: someone interested in waste water management will take different courses than someone interested in wilderness preservation. Due to the broad and varied terrain of the material, this course will engage the students in both the substance and the process of environmental planning through a number of highly participatory activities.

First, students will engage in a series of presentation-style debates addressing the major philosophical underpinnings of environmental planning and policy. Issues to be debated include growth vs. scarcity, regulatory vs. free market responses to environmental challenges, and administrative/expert knowledge vs. Indigenous/local knowledge in addressing environmental problems. The purpose of this section is for the students to development a broad philosophical approach toward environmental planning issues.

Environmental conflicts often arise over value differences between multiple stakeholders all of whom have a vested interest. The second part of the course will involve a series of role-playing situations in which students will engage in mock simulations using negotiation and collaborative techniques to address an environmental planning dilemma. Examples include; siting an incinerator in a low-income neighborhood, siting an off shore wind farm, and managing growth and preserving open space in a fast growing community. The purpose of this section is primarily to engage students in procedural considerations of planning with a particular focus on consensus building, negotiation, and addressing value differences. However, in addition, students will also become familiar with the substantive issues involved in these scenarios.

The third part of the course will involve students in the process of environmental plan making through a local issue (the Marcellus shale drilling). Students will collect, process, and analyze relevant data (using spatial (GIS), socio-economic (census), existing comp plans, and interviews), explore federal, state, and local regulatory environment, and offer suggestions concerning appropriate local government responses to natural gas drilling New York's southern tier. The purpose of the final memo will be to

link current or existing conditions with possible threats and/or opportunities posed by natural gas drilling with potential planning interventions at the local level, all within the state and federal regulatory environment.

Grading:

Major Environmental Planning Debates: 25%.

This section of the course is intended to challenge students to identify and understand their own beliefs and convictions as part of broader debates within the field of environmental planning. Everyone will be asked to choose one debate in which to participate. Each debate team is free to define the ethical or philosophical issue as they see fit. Each "side" will have 20 minutes to make its presentation and 10 minutes to comment on the other side's presentation. Each team is expected to provide a handout or outline of their argument for everyone in the class. You might want to think about taking a "side" that is contrary to your usual view in order to stretch your thinking. Your grade will be solely a function of how well you prepared and presented your ideas, not on the viewpoint you adopted. The debates will be graded as a group project, and will consist of a composite grade of the instructor, the TA, as well as an average class peer review grade (to be completed and handed in by the end of the debate). The debates will be based on both style and substance. See sample debate grading rubric (located in the Course Information folder on Blackboard). In addition to the readings for each debate category, the following books (which will be placed on reserve at the Fine Arts library) also set out the major philosophical debates facing environmental planners:

Environmental Ethics: What Really Matters, What Really Works. Edited by David Schmidtz and Elizabeth Willott. New York, NY: Oxford University Press, 2002. ISBN: 0195139097.

Dryzek, J. (2005) *The Politics of the Earth: Environmental Discourses*

Economics of the Environment: Selected Readings. Edited by Robert N. Stavins. 4th ed. New York, NY: W.W. Norton & Company, 2000.

Environmental Planning Role playing simulations: 25%

Using environmental role-playing simulations from Harvard Law School's Program on Negotiation Clearinghouse, students will participate in a series of situations in which you will have an opportunity to apply the ideas and techniques discussed in class in the face of numerous institutional obstacles. The role-playing simulations will be graded as follows: 50% of grade will be based on participation, 50% will be based on a composite grade of instructor, TA, and other participants. The peer review component of the grade will be based on a scale from 1 (lowest) to 10 (highest) based on the following rubrics:

- 1) *Preparation:* Did the student come prepared to discuss the material?
- 2) *Comprehension:* Did the student understand the material?
- 3) *Engagement:* Was the student involved and engaged in group participation?
- 4) *Creativity:* Did the student offer creative and insightful input?
- 5) *Collaboration:* Was the student will to listen, negotiate, and compromise?

The TA will email each team a peer review form (an excel sheet) and these will be filled out and turned in via the Assignments link on Blackboard.

Assignments: 10%

Students must submit a (1 - 2 page) response piece to their debate (due September 17), the role playing simulations (October 15), and the readings on environmental plan making (October 20). Generally, these assignments will include an additional response component for graduate students. Please submit the assignments via the 'Assignments' link in Blackboard. Do NOT email the assignments as an attachment to either myself or the TAs, nor should you place the assignments in the 'Drop box' on Blackboard. These will not be graded and you will receive no credit for them.

Environmental Plan making: 30%.

This portion of the course will serve as an introduction to the plan making process, and focus specifically on collecting and analyzing data concerning the Marcellus Shale drilling issue which has recently emerged as an important environmental issue in the southern tier of New York State. The purpose of the project is to examine how gas drilling will affect local governments and how they can best prepare for future gas drilling. Students will familiarize themselves with the regulatory environment for local environmental planning (both Federal and state), collect area specific environmental data, examine specific environmental impacts of and issues associated with drilling, and review, analyze, and interpret best management practices in order to put together a brief memo outlining local government responses to shale drilling. By examining a locally relevant issue, we will touch upon many aspects of the environmental planning process. This section will consist of three collaborative group efforts to collect and present relevant information (each will last about a week). Each group will get a group grade (TA and instructor) for their efforts as well as a peer review grade. In addition to the more specific readings listed and posted in the course folder, the following books are also useful for both the substance and process of environmental plan making (these will be places on reserve at the Fine Arts library):

Daniels, T. and Daniels, K. 2003. *The Environmental Planning Handbook*, Planner's Press, Chicago: APA

Randolph, John. (2004) *Environmental Land Use Planning and Management*. Washington, DC: Island Press

Berke, P. et al. 2006 *Urban Land Use Planning*, 5th ed. University of Illinois Press, Urbana and Chicago

Marsh, W. 2005 *Landscape Planning: Environmental Applications*, 4th ed. John Wiley

Final Memo 10%:

Each student will be responsible for compiling a memo based on the group research outlining and prioritizing areas which the county should focus on addressing. The purpose here is to link the existing conditions with the potential impacts of gas drilling with proposed actions. This is *not* meant to be a full summary of all the information collected; 5 to 10 pages are sufficient.

Academic Integrity:

Each student in this course is expected to abide by the Cornell University Code of Academic Integrity (<http://cuinfo.cornell.edu/Academic/AIC.html>). Any work submitted by a student in this course for academic credit will be the student's own work; team assignments will be considered group work. Please cite all work that you rely on in your own written work; direct quotations of other work should be enclosed with quotation marks, with a citation afterward that contains the page number of the work where available. When you rely substantially on another person's work without quoting from it directly, please use in-text citations at the end of an appropriate section. Failure to provide complete and proper citations may constitute plagiarism, which violates the Cornell Code of Academic Integrity. If detected, plagiarism may result in a failing grade for the course. In compliance with the Cornell University policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so arrangements can be made.

Required Text

Dryzek, J. and Schlossberg D. (eds) 2005, *Debating the Earth: The Environmental Politics Reader*, 2nd edition, Oxford University Press

Optional: Daniels, T. and Daniels, K. 2003. *The Environmental Planning Handbook*, Planner's Press, Chicago: APA

In addition, other readings will be made available through either Blackboard, online, or at the Fine Arts Library.

August 27: Introduction to course

ENVIRONMENTALISM IN PERSPECTIVE

September 1:

Blackboard/Online: William Cronon, (1996) "The Trouble with Wilderness; or, Getting Back to the Wrong Nature," *Environmental History*, (1:1) pp. 7-28. also available at: http://www.guernicamag.com/features/41/the_trouble_with_wilderness_or/

Responses, *Environmental History*, (1:1) pp. 29-55 (Blackboard):

Samuel P. Hays, (1996) "Comment: The Trouble with Bill Cronon's Wilderness"

Michael P. Cohen, (1996) "Comment: Resistance to Wilderness"

Thomas R. Dunlap, (1996) "Comment: But What Did You Go Out into the Wilderness to See?"

William Cronon, (1996) "The Trouble with Wilderness: A Response,"

Schmidt, S. (2008) "The evolving relationship between open space preservation and local planning practice" *Journal of Planning History*, vol. 7(2)

September 3:

Blackboard/Online: Shellenberger, M. and Nordhaus, T. 2004. *The Death of Environmentalism: Global warming politics in a post-environmental world*
http://www.thebreakthrough.org/images/Death_of_Environmentalism.pdf

Online: Pope, Carl, An in-depth response to "The Death of Environmentalism"
<http://www.grist.org/article/pope-reprint/>

THE DEBATES

September 8: Growth vs. Scarcity

Readings:

Dryzek, J. and Schlossberg D. (eds) 2005, *Debating the Earth: The Environmental Politics Reader*, 2nd edition, Oxford University Press

Section One: Limits and Survivalism

The Limits to Growth, *Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, and William H. Behrens III*
The Tragedy of the Commons, *Garrett Hardin*
A Planet Under Stress, *Lester Brown*

Section Two: The Promethean Response

Introduction to the Resourceful Earth, *Julian L. Simon and Herman Kahn*
The Truth about the Environment, *Bjorn Lomborg*
Ten Pinches of Salt: A reply to Bjorn Lomborg, *Tom Burke*

Blackboard: Abernethy, Virginia Deane. "Carrying capacity: the tradition and policy implications of limits." *Ethics in Science and Environmental Policy* (January 2001): 9-18.

Blackboard/Online: Bailey, Ronald. "Post-Scarcity Prophet: Economist Paul Romer on growth, technological change, and an unlimited human future." *Reason* (December 2001).

<http://www.reason.com/news/show/28243.html>

Blackboard/Online: WorldBank. "From The Economist-CON and PRO: Quantity and Quality Why Quality Matters." *Development Outreach* (Winter 2001).
<http://www1.worldbank.org/devoutreach/winter01/article.asp?id=94>

On reserve: Dryzek, John (2005) "The Politics of the Earth: Environmental Discourses"
Chapter 2: Looming Tragedy: Survivalism
Chapter 3: Growth Forever: The Promethean Response

DesJardins, J. *Environmental Ethics: An introduction to Environmental Philosophy*, 4th ed. Thomson
Ch. 4: Responsibilities to future generations: Sustainable development

Beckerman, W. *Through green-colored glasses: Environmentalism reconsidered*, CATO Institute, Washington DC
Ch 8: Growth and welfare: Must they conflict?

September 10: Environmental regulation vs. Free Market environmentalism

Dryzek, J. and Schlossberg D.
Section Five: Market Liberalism
Rethinking the Way We Think, *Terry L. Anderson and Donald T. Leal*
Market-Based Environmental Policies, *Robert Stavins and Bradley Whitehead*
Selling Environmental Indulgences, *Robert E. Goodin*

Online: Giuliano, Genevieve, and Martin Wachs. "Managing Transportation Demand: Markets Versus Mandates." *Reason Foundation Policy Study*.
<http://www.reason.org/ps148.html>

Blackboard: Pearce, David. "An Intellectual History of Environmental Economics." *Annual Review of Energy and the Environment*: 72-75.

Blackboard: Portney, Paul R. "Market-Based Approaches to Environmental Policy." *Resources* (Summer 2003): 15-18.

Blackboard: Harrington, Winston, and Richard D. Morgenstern. "Economic Incentives Versus Command and Control: What's Best for Solving Environmental Problems?" *Resources* (Fall/Winter 2004): 13-17.

Blackboard: Fullerton, Don, and Robert Stavins. "How Economists See the Environment." *Nature* 395 (October 1998): 433-434.

Blackboard: Ackerman, Frank, and Kevin Gallagher. "Getting the Prices Wrong: The Limits of Market-based Environmental Policy." *Global Development and Environment Institute Working Paper 00-05*. Medford, MA: Tufts University Global Development and

Environment Institute, 2000.

Blackboard: David R. Karp, and Clark L. Gauling. "Motivational Underpinnings of Command-and-Control, Market-Based, and Voluntarist Environmental Politics." *Human relations* 48, no. 5 (1995): 439-465.

On Reserve: Tietenberg, Tom H. "Economic Instruments for Environmental Regulation." In *Economics of the Environment: Selected Readings*. Edited by Robert N. Stavins. 4th ed. New York, NY: W.W. Norton & Company, 2000.

On reserve/Blackboard: Dryzek, J. "The Politics of the Earth: Environmental Discourses"
Chapter 6: Leave it to the markets: Economic Rationalism

September 15: Administrative/Expert knowledge vs. Local/Indigenous Knowledge

Dryzek, J. and Schlossberg D.

Section Three: Administrative Rationalism

Rationality and the Logic of the National Environmental Policy Act, *Robert V. Bartlett*

Appraising Adaptive Management, *Kai Lee*

Beyond Backyard Environmentalism, *Charles Sabel, Archon Fung, and Bradley Karkkainen*

Goal: Replace Risk Assessment with Alternatives Assessment, *Mary O'Brien*

Section Eleven: Southern and Indigenous Perspectives

Environmentalism of the Poor, *Ramachandra Guha and Juan M. Alier*

On Poverty and Globalization, *Vandana Shiva*

Overturing the Doctrine: Indigenous People and Wilderness - Being Aboriginal in the Environmental Movement, *Fabienne Bayet*

Blackboard: Briggs, John. "The Use of Indigenous Knowledge in Development: Problems and Challenges." *Progress in Development Studies* 5, no. 2 (2005): 99-114.

Blackboard: Landry, Marc, et al. *Civic Environmentalism in Action*. Washington, DC: Progressive Policy Institute, Center for Innovation and the Environment, 1999.

Blackboard/On line: McClosky, Michael. (1999) "Local Communities and the management of public forests." *Ecology Law Quarterly* 25: p.624
<http://www.heinonline.org/HOL/Page?collection=journals&handle=hein.journals/eclawq25&id=636>

Blackboard: Agrawal, A "Indigenous and scientific knowledge: Some critical comments"

Blackboard: Singleton, Sarah. "Collaborative Environmental Planning in the American West: The Good, the Bad, and the Ugly." *Environmental Politics* (2002).

On reserve/Blackboard: Dryzek, J. "The Politics of the Earth: Environmental Discourses"

Chapter 4: Leave it to the Experts: Administrative Rationalism

Blackboard: Eden, S. (1996) Public participation in environmental policy: considering scientific, counter-scientific and non-scientific contributions

September 17: Debate post-mortem, Introduction to game simulation (note: time and student numbers permitting, we may include a 4th debate)

Reading:

Blackboard: Susskind, L. (1999) Introduction from “Negotiating Environmental Agreements: How to Avoid Escalating Confrontation, Needless Costs, and Unnecessary Litigation”

Assignment #1 Due: 1-2 page reflection piece on the debates. How was your thinking on any of these issues challenged (or not)?

In class: assign role for role playing scenario #1

THE ROLE PLAYING SIMULATIONS

September 22, 24: Land use and sprawl: *Managing growth in Rockville*

Online: Downs, A. “What does smart growth really mean?” (2001)

http://www.kltprc.net/foresight/Chpt_48.htm

Blackboard: Randolph, John. (2004) *Environmental Land Use Planning and Management*. Washington, DC: Island Press, Chapter 7: Local Government and Smart Growth Management

Over the past few years, the City of Rockville has undergone a period of significant growth, resulting in steadily decreasing unemployment and a high rate of immigration from other areas. Even greater levels of immigration are predicted over the next two to three years. Consequently, housing demand now surpasses supply and developers have begun purchasing large tracts of agricultural and forest land at the urban fringe in order to convert them for residential purposes. Already, a number of scattered residential developments have appeared. In addition, a representative of a regional “Superstore” has recently made inquiries about purchasing several tracts of property just outside of Rockville. It is predicted that a large scale commercial enterprise will soon be opening in the vicinity.

After extensive community-wide debate, the current Mayor of Rockville (Mayor Gale) has concluded that Rockville is in urgent need of a ‘master plan’ to guide sustainable growth. A number of groups have come forward to present their ideas on how (if at all) future growth should be managed. Unfortunately, no real progress has been made. As a result, Mayor Gale has retained the services of the nearby university’s dispute resolution center for the purpose of helping the community come to some consensus. Invited stakeholder representatives include an environmental lobby group, the alliance of local

home builders, a small business association, the farming community, a town planner and a representative of the incoming 'superstore'.

September 29, October 1: Energy: *Off Shore wind farm negotiation*

Note: I will be away on October 1 for the ACSP conference

Shellfish Wind Associates has submitted a proposal to develop offshore wind farms in Dakota Shoal, and the Federal Permitting Agency (FPA) is reviewing the controversial proposal. A group of relevant stakeholders has been meeting to discuss the recently submitted draft Environmental Impact Statement (EIS), and this is the third meeting convened by the FPA. Stakeholders are seeking consensus regarding the following issues:

How much agreement is there around the developer's EIS?

What additional environmental, economic, and/or aesthetic considerations should be addressed in the permitting decision?

What is preventing stakeholders from reaching agreement?

Readings:

Blackboard: Kempton et al (2005) The offshore wind power debate: Views from Cape Cod

October 6, 8: Environmental Justice: *Siting an Asphalt Plant in the City of Madrona*

Blackboard: Bullard, R. (1994) Overcoming Racism in Environmental Decision-making, *Environment*, vol.36(4), pp.10-20, 39-44 and commentary in response to Bullard's article: *Environment* (1994) vol.36(8), pp2-4

Blackboard: Bullard, R. and Johnson, G. (2000) Environmental Justice: Grassroots Activism and its impact on public policy decision making, *Journal of Social Issues*, vol 56(3): 555-578

The City of Madrona's zoning board has approved construction of an asphalt plant in the largely minority-populated neighborhood of Pina. The plant will supply the asphalt necessary for major projects which are vital to stimulating Madrona's stagnant economy. Opponents of the plant, mainly environmental groups, churches, and neighborhood organizations, believe the zoning process was unfair, particularly in light of the cumulative health risks that will fall primarily on the 'minority community'. One long-time Pina resident and physician has suggested that there is a correlation between the high rates of lung and respiratory cancer evident in Pina residents and the already high level of air pollution in the neighborhood. Proponents of plant construction claim that all legal requirements regarding the siting and environmental impact assessment have been met. Six key stakeholders must meet to consider how to address this matter in a fair way and also how to deal with claims of racism in environmental decision making.

October 13: No class Fall break

October 15: Game simulation wrap up, Introduction to Part 3

Readings:

Blackboard: Schively, C (2007) Understanding the NIMBY and LULU Phenomena: Reassessing our knowledge base and informing future research, *Journal of Planning Literature*, 21: 255

Assignment # 2 Due:

For Undergraduates:

Please write a reflection piece on the three role playing simulations. Some possible ways to organize your thoughts: How did the three simulations compare? What were some of the lessons learned (ie what works, what doesn't)? How did your interpretation of your role and involvement in the simulation change/evolve?

For graduates:

Please respond to the above. In addition, include a separate response concerning (more broadly) the role of value conflict over NIMBYs and LULUs in Environmental planning, and how any or all of these role playing simulations informed your discussion. For some background on NIMBY and LULU, you can refer to the Schively article.

ENVIRONMENTAL PLAN MAKING

October 20: Introduction to Environmental Plan making

Readings

Randolph: Chap 2: Environmental Planning

Daniels and Daniels: Chapter 1: Taking Stock of the local Environment and creating an environmental action plan

Berke et al. Chapter 9: State of Community Report, Chapter 10: The Plan-making process

Assignment Due: Based on the assigned readings, prepare 1-2 page write up on what constitutes a “good” planning process; what elements an environmental plan should include. *Grad students:* In addition to the above: What is the optimal relationship between technical or scientific knowledge and community participation? Is the appropriate role for an environmental planner to be an advocate, mediator, or consensus builder? Be prepared to discuss in class.

October 22: Overview of Marcellus shale: scientific context as well as specific environmental issues, etc.

Blackboard: Soeder, D. and Kappel, W. *Water Resources and natural gas production from the Marcellus Shale*, USGS

Sumi, L. Shale Gas: Focus on the Marcellus Shale

Arthur, J.D et al Hydraulic Fracturing Considerations for Natural Gas wells of the Marcellus shale (background on drilling process)

New York's natural gas and oil resources endowment, NYSERDA (historical overview from a pro-drilling perspective)

In class: Guest lecture by Bill Kappel, USGS

Organize into separate teams for both data collection and issues

October 27: Relevant State and Federal Regulation

Blackboard: Ortolano, L. 1997. *Environmental Regulation and Impact Assessment*, John Wiley and Sons, Chapter 15: Environmental Impact Statements and Government Decision Making

EIS Primer, A Guide for reviewing Environmental Impact Statements, Westchester County (overview of the EIS process in New York state)

Skim:

Dept of Environmental Conservation website, Environmental Impact Assessment in New York State <http://www.dec.ny.gov/permits/357.html>

Dept of Environmental Conservation website, *Final scope for the Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining: Regulatory Program* <http://www.dec.ny.gov/energy/47554.html>

In class: Guest lecture by Rachel Treichler, Sierra Club

October 29, Nov. 3, 5: Cooperative data collection: Current conditions and existing trends

For this section, the class will be divided into several teams. Each team will be assigned key areas to both collect and present data to the class. These data collection exercises are integral to the plan making exercise. Students will compile a packet of relevant data and information in PDF format (for blackboard), including data sources and citations and present this to the class. Please submit the final documents to the TA for posting on Blackboard.

1. **Natural resource and existing infrastructure inventory:** Collect information on both the natural features and existing infrastructure of the area. Data to be

collected can include soils, topography, hydrology, habitat, land cover, existing protected areas, or other environmentally sensitive areas. Possible infrastructure to be inventoried include roads, drilling sites. Data sources include the DEP site, CUGIR, Google maps. Knowledge of GIS is useful! See Berke et al, Chap 6: Environmental Systems (on Blackboard) for good background discussion as well as an idea of what information should be included.

2. **Social/demographic data:** Provide an overview of relevant demographic, social, and economic trends and characteristics of the study area. This can include aggregate numbers and trends as well as census data at the block, block group and tract level. Data can include information pertaining to population, housing, ethnicity, income, local economy.. Knowledge of Census website is useful (see Blackboard for an introduction to the US Census) See Berke et al, Chap 5: Population and Economy (on Blackboard) for good background discussion as well as an idea of what information should be included.
3. **Existing planning environment:** Provide an overview of existing planning documents and relevant ordinance, regulations, etc if such in fact exist. These can include comprehensive plans, zoning plans, subdivision and land development regulations and ordinances, capital improvements plans. How is gas drilling regulated, if at all? While some documentation exists (see course folder), this may involve contacting local officials as well.
4. **Relevant political information:** Based on newspaper archives, local media and websites, as well as human contacts provide a relevant, timely and topical narrative of the drilling issue within the study area. Areas to explore include who the relevant actors are (drilling companies, advocacy groups, political figures) and a rough time line of events. This will help in providing important contextual material. Potential sources include Google, LexisNexis, as well as personal contacts, for example, the Tioga Investigates Natural Gas (TING) Steering Committee

Guest speakers: Andy Fagan (Tioga County CCE Director)

Relevant documents on course folder (note: for the rest of the class, relevant documents will all be posted on the course folder, not on Blackboard! These documents are not meant to be final, but rather to assist students in organizing their research)

November 5: Group presentation

November 10, 12, 17 Cooperative data collection: Threats, opportunities, Issues

For this section, the class will again be divided into several teams. The purpose is to create an “inventory” of the issues, possible threats and opportunities which natural gas drilling presents. Each team will be assigned key areas to research and present to the class. The research will be based on existing studies and research undertaken both in New York

State as well as elsewhere. If there are conflicting studies, please incorporate into your narrative. Students will compile a packet of relevant information in PDF format (for blackboard), including data sources and citations and present this to the class. Please submit the final documents to the TA for posting on Blackboard.

1. **Environmental:** what are the potential environmental impacts (particularly water quantity and water quality, but also other environmentally sensitive areas) of natural gas drilling and hydro-fracking?
2. **Public services and Quality of life:** what are the potential impacts of natural gas drilling and hydro-fracking on public services and quality of life? Factors to be examined may include schools, roads, housing as well as longer terms social impacts
3. **Public health:** what are the potential impacts of natural gas drilling and hydro-fracking on public health issues?
4. **Economic impact** what are the potential impacts of natural gas drilling and hydro-fracking on the existing economy in terms of job creation and local tax revenue? What are some local economic development possibilities? What are some possible longer-term impacts on the regional economy?

Guest Speaker: Jeffrey Jacquet, Cornell Cooperative Extension

Relevant documents on course folder

November 17: Group presentation

November 19, 24: Cooperative data collection Local Government toolbox

For this section, the teams will research and collect information on best management practices, case studies, model plans and ordinances to create possible local government toolbox to deal with some of above issues. The research will be based on existing ordinances, regulations, reports, plans (particularly of places which have already had to deal with natural gas drilling in New York State as well as elsewhere). Included in this analysis are suggestions for state enabling legislation as well. Students will compile a packet of relevant information PDF format (for blackboard), including data sources and citations and present this to the class. Both Penn State and Cornell Cooperative extension are an excellent source of information. Please submit the final documents to the TA for posting on Blackboard.

November 26: Thanksgiving Break

December 1: Brief group presentations

December 3: *Individual* final memo due! Create a summary linking existing conditions, potential threats and/or opportunities with possible local government responses. Prioritize and make suggestions. Make the information easily accessible (For example, you may chose to include flow charts or impact matrices – see Ortolano, chap 16 or Berke, chap 6). This is not intended to be a synopsis of all material collected and synthesized up until now! 5 – 10 pages is sufficient.