

**DEPARTMENT OF CITY AND REGIONAL PLANNING**

University of North Carolina at Chapel Hill

**Seminar on Building Disaster Resilient Communities**

**PLAN 110 (40), Fall 2003  
Tuesday/Thursday  
3:30pm-4:45pm  
New East 301**

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New East 319  
Office hours: Tuesday/Thursday  
11am-noon or by appointment**

**Course Objectives**

This is a course in tools and processes for building sustainable, disaster-resilient communities. By the end of the course, you will be able to articulate what constitutes a disaster-resilient community, know how to assess vulnerability to a variety of hazards, and be able to specify tools and programs for creating resilience in the public and private sectors. You also will be able to tailor tools and programs to address a variety of specific types of hazards and the needs of a variety of population groups. In this regard, you will have developed a dependable sense of judgment for assessing the validity, effectiveness, feasibility, strengths and weaknesses of various strategies and methods.

**Format**

This is a seminar course. By reading material describing methods for building hazard resilient communities, we will assess the strengths and weaknesses of planning and hazard mitigation methods and share our conclusions with other members of the seminar. Each of us will be responsible for a series of class Power Point presentations describing and evaluating specific methods, using materials provided by the instructor and materials in the planning library and identified in a comprehensive bibliography provided by the instructor. As part of their presentations, students will provide seminar participants with a short (2-5 pages) summary of the material covered, including for hazard mitigation measures key features, strengths, weaknesses, and applications.

In addition to two-three seminar presentations, each student will conduct a semester-long course project: in which you prepare a policy issue paper on a problem of your choosing related to hazards resilience in a locality, region, or state. Interim papers with class presentations are due at two points during the semester, with a final presentation at the end of the semester as if to a town council, regional council, or state legislative committee. Specific instructions for the issue paper are provided at the end of this syllabus.

In every class session, every member of the seminar is responsible for conscientiously preparing for class by reading the assigned material and actively participating in seminar discussions.

## **Requirements**

There are three requirements: (1) seminar presentations and papers describing and evaluating various hazards analysis and mitigation measures and methods (40% of course grade); (2) preparation of an individual issue paper (40% of course grade); and (3) general semester-long participation in seminar discussions (20% of course grade).

Letter grades assigned for this work have the following numeric equivalents: A+/H+ - 100; A/H - 96; A-/H- - 92; B+/P+ - 88; B/P - 84; B-/P- - 80; C+/L+ - 76; C/L - 72; C-/L- - 68; D+ - 64; D- - 60; F/F - less than 60.

Grades for late assignments will be reduced 5 points for each day the assignment is past due. Grades of incomplete may be given in the event of a medical or other emergency. An application for an incomplete on any assignment, including the term project, must state the reasons for the request and propose a new deadline.

The University's Honor Code is in effect. Please consult with the instructor if you are uncertain about your responsibilities under that code with respect to this course. It will apply particularly for written work.

### ***Seminar presentations (40% of course grade):***

You will be responsible during the semester for making regular presentations to the seminar and moderating discussion. The presenter has three responsibilities. (1) You develop an understanding of the issue, method, or hazard mitigation measure assigned (involves careful reading of the required readings that everyone does and reference to additional material to the extent possible) and taking the lead in explaining the material and answering questions about it. (2) You prepare a short 2-5 page handout that summarizes your presentation. (3) You lead a critical discussion by posing questions, setting up hypothetical scenarios, or in other ways promoting and guiding participation. Presenters are encouraged to read beyond the required readings indicated in the syllabus. Readings may be selected from the bibliography, "*Creating Hazard Resilient Communities*," which will be provided by the instructor. You might also consult the list of web sites available from the Hazards Research and Applications Information Center at the University of Colorado: [www.colorado.edu/hazards](http://www.colorado.edu/hazards). Presenters may suggest additional readings or alternatives to the required readings in the syllabus and place those on reserve in the Planning Library. The instructor also has an extensive library and files of miscellaneous materials on some topics; presenters should ask about this material. The presenters have the responsibility to search for additional good examples and new references for us, particularly those published within the past year and those available on web sites. The instructor will be looking for those recommendations from presenters.

The instructor will cut off overly long presentations and discussions, correct errors, ask questions not being addressed by presenters or in discussions, require everyone to contribute to the discussion, and discourage individuals from inadvertently dominating the discussion. You should use Power Point for your presentations and are encouraged to use games, role-playing and other presentation techniques. **Do not read from a written presentation.**

***Term project (40% of course grade):***

The preparation of an issue paper is essentially a formalized approach to problem definition. It attempts to identify what the problems at issue really are, to isolate the fundamental objectives involved, to suggest policy and program alternatives, and to identify the potential impacts and implications of choices among them. It also summarizes existing laws, policies, and government programs that bear on the problem (either as part of the problem or as possible solutions), and other resources that could be brought to bear on it.

The issue paper will be prepared in four steps, as described below:

1. Problem Definition (three to five pages due September 30 with short class presentation). Assume that you are a planner with a local or regional planning agency or a policy analyst with a state legislature or administrative agency and identify a problem with resilience to natural hazards that you consider important. The problem definition portion of the issue paper defines concisely what the problem is; why it is important; its present and potential future magnitude (and basis for your estimate); who is affected by it; and its possible causes.
2. Existing Policies (three to five pages with short class presentation due October 28). Summarize existing government laws, policies, regulations, and programs that bear on the problem and briefly assess why these policies are not solving it.
3. Objectives and Alternatives (three to five pages due November 25). Identify the main objective(s) or criteria you believe any solution to the problem should meet if it is to count as a solution, and then describe briefly what alternative actions might prove to be effective solutions.
4. Recommendations (three to five pages due with whole report and class presentation on December 2/4). Given your assessments in the previous three parts, (1) state what specific course of action you would recommend to your organization if you had to make a recommendation without any additional time or information (this can be either one of the alternatives above, or some mixed solution, or no action), and your reasoning for that recommendation; and (2) identify as specifically as possible what additional analyses would contribute the most to improving the quality of the decision if you had additional time and resources to spend on studying it.

Additional information on the preparation of an issue paper is provided in Appendix A.

***General participation in and contribution to class discussions. (20% of course grade)***

You are expected to attend every session, to be prepared by having studied the required readings, and to participate in seminar discussions and exercises actively, knowledgeably, thoughtfully, and creatively. You should listen, read and think, but you must also participate.

**Course Readings**

Burby, Raymond J. ed. *Cooperating with Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities*. Washington, DC: Joseph Henry/National Academy Press, 1998.

Schwab, Jim with Kenneth C. Topping, Charles C. Eadie, Robert E. Dyle and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 483/484, Chicago, IL: American Planning Association,

Raymond J. Burby et al. "Selected References on Creating Hazard Resilient Communities" Chapel Hill: Department of City and Regional Planning, University of North Carolina at Chapel Hill, August 2003.

There is considerable required reading from *Cooperating with Nature* and *Planning for Post-Disaster Recovery and Reconstruction*, and you should purchase copies for your private use. In addition, there are additional readings from a number of sources for many course sessions. These are available for you to copy in the Planning Library.

**Summary Course Outline**

The course is divided into four modules. Within each module, sessions build a cumulative base of knowledge that can be drawn upon in building hazard resilient communities.

- I. The legacy of vulnerability and vision of resilience
  1. Overview of course and introduction to hazard mitigation (August 26)
  2. Hydrologic hazards – Assignment of Class Presentations (August 28)
  3. Geologic hazards (September 2)
  4. Atmospheric hazards (September 4)
  5. Wildfire and other natural hazards (September 9)
  6. Technological hazards (including terrorism) (September 11)
  7. Urban development processes and a vision of resilience (September 16)

8. Resilience through federal and state programs (September 18)
  9. Resilience through local hazard mitigation planning (September 23)
  10. Resilience through partnerships with the third sector (September 25)
  11. Presentation of Part 1 of term project (September 30)
- II. Managing change to build hazard resilient communities
12. Creating an information base (October 2)
  13. Collaborative and participatory processes (October 7)
  14. Communicating with the public (October 9)
  15. Emergency management and post-disaster recovery plans (October 14)
  16. Hazard mitigation plans and plan elements (October 16)
  17. Presentation of Part 2 of term project (October 28)
- III. Resilience-Building Tools and Procedures
18. Managing land use to build resilience (October 30)
  19. Incorporating resilience in zoning, subdivision and other regulations (November 4)
  20. Creating resilience among vulnerable and special populations (November 6)
  21. Acquiring and relocating high-hazard property (November 11)
  22. Retrofitting high hazard property (November 13)
  23. Financing resilience (November 18)
  24. Implementing programs/enforcing regulations to build resilience (November 20)
- IV. Putting It All Together
25. Case studies in Creating Resilience (November 25)
  - 26-27: Presentation of term projects (December 2/December 4)

## **Schedule of Classes and Required Reading**

### **Part 1: The Legacy of Vulnerability and Visions of Resilience**

#### August 26: Introduction and overview of course

Burby, Raymond J. 1998. "Natural Hazards and Land Use: An Introduction," In Raymond J. Burby, Ed. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*. Washington, DC: Joseph Henry/National Academy Press, Chapter 1.

Godschalk, David R. 2003. "Urban Hazard Mitigation: Creating Resilient Cities," *Natural Hazards Review*, 4, 3 (August): 136-143.

#### August 28: Hydrologic hazards

Schwab, Jim with Kenneth C. Topping, Charles C. Eadie, Robert E. Dyle and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 483/484, Chicago, IL: American Planning Association, pp. 206-212, 217-228.

Skim: Whitton, John. 1979. "Chapter 8. Floods" In *Disasters: The Anatomy of Environmental Hazards*. Athens: The University of Georgia Press, pp. 248-279.

#### September 2: Geologic hazards

Schwab, Jim with Kenneth C. Topping, Charles C. Eadie, Robert E. Dyle and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 483/484, Chicago, IL: American Planning Association, pp. 184-189, 194-195, 281-310.

Skim Whitton, John. 1979. "Chapter 2. Earthquakes" and "Chapter 5. Landslides," In *Disasters: The Anatomy of Environmental Hazards*. Athens: The University of Georgia Press, pp. 31-73 and pp. 137-177.

#### September 4: Atmospheric hazards

Schwab, Jim with Kenneth C. Topping, Charles C. Eadie, Robert E. Dyle and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 483/484, Chicago, IL: American Planning Association, pp. 195-206, 235-259.

Skim Whitton, John. 1979. "Chapter 7. "High Winds," In *Disasters: The Anatomy of Environmental Hazards*. Athens: The University of Georgia Press, pp. 211-247.

#### September 9: Wildfire and other natural hazards

Schwab, Jim with Kenneth C. Topping, Charles C. Eadie, Robert E. Dyle and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 483/484, Chicago, IL: American Planning Association, pp. 192-193; 213-216; 261-280.

Skim Whitton, John. 1979. "Chapter 4. Sinking Coastlines" and "Chapter 6. Ground Surface Collapse" In *Disasters: The Anatomy of Environmental Hazards*. Athens: The University of Georgia Press, pp. 105-136 and pp. 178-210.

#### September 11: Technological hazards (including terrorism)

Federal Emergency Management Agency. 1997. *Multihazard Identification and Risk Assessment*. Washington, DC: FEMA, pp. 274-290.

#### September 16: Urbanization processes and their contribution to vulnerability

Platt, Rutherford. 1998. "Planning and Land Use Adjustments in Historical Perspective". In Raymond J. Burby, Ed. *Cooperating With Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*. Washington, DC: Joseph Henry/National Academy Press, Chapter 2.

U.S. Conference of Mayors, et al. 1979. *The Private Development Process: A Guidebook for Local Governments*, Washington, DC: U.S. Department of Housing and Urban Development, pp. 1-34.

September 18: Resilience through federal and state programs

May, Peter J. and Robert E. Deyle. 1998. "Governing Land Use in Hazardous Areas with a Patchwork System." In Raymond J. Burby, Ed. *Cooperating with Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities*. Washington, DC: Joseph Henry Press, Chapter 3.

September 23 Resilience through local hazard mitigation planning

Beatley, Timothy. 1998. "The Vision of Sustainable Communities." In Raymond J. Burby, Ed. *Cooperating With Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities*. Washington, DC: Joseph Henry/National Academy Press, Chapter 8.

Godschalk, David, Edward Kaiser, and Phillip Berke. 1998. "Integrating Hazard Mitigation and Local Land Use Planning" in Raymond J. Burby, Ed., *Cooperating With Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities*, Washington, DC: Joseph Henry/National Academy Press, Chapter 4.

September 25 Resilience through Partnerships with the Third Sector

Paterson, Robert. 1998. "The Third Sector: Evolving Partnerships in Hazard Mitigation," in Raymond J. Burby, Ed. *Cooperating With Nature: Confronting Natural Hazards With Land-Use Planning For Sustainable Communities*. Washington DC: Joseph Henry/National Academy Press, Chapter 7.

September 30: Presentation of Part 1 of term project

**Part 2: Managing Change to Build Hazard Resilient Communities**

October 2: Creating an information base

Deyle, Robert E., Steven P. French, Robert Olshansky and Robert G. Patterson. 1998. "Hazard Assessment: The Factual Basis for Planning and Mitigation" in Raymond J. Burby, Ed. *Cooperating with Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities*. Washington, D.C.: Joseph Henry/National Academy Press, Chapter 5.

Federal Emergency Management Agency. 2001. *Understanding Your Risks: Identifying Hazards and Estimating Losses*. FEMA 386-2. Washington, DC: FEMA, August, review entire document.

October 7: Collaborative and participatory processes

Godschalk, David R., et al. 1994. *Pulling Together: A Planning and Development Consensus-Building Manual*. Washington, DC: Urban Land Institute. Chapters Two - Five, pp. 5-60.

Burby, Raymond J. 2001. "Making Plans that Matter: Citizen Involvement and Government Action." *Journal of the American Planning Association*, 46, 1 (Winter 2003): 33-49.

#### October 9: Communicating with the public

Wheeler, Kenneth. 1994. "Effective Management Means Effective Communication. In *Effective Communication: a Local Government Guide*. Washington, DC: International City Management Association, Chapter 1.

Scanlon, Joseph. 1988. "Chapter Four. Reaching Out: Getting the Community Involved in Preparedness" in Thomas E. Drabek and Gerald J. Hoetmer, Eds. *Emergency Management: Principles and Practice for Local Government*. Washington, DC: International City Management Association.

#### October 14: Emergency management and post-disaster recovery plans

Drabek, Thomas E. 1988. "Chapter One. The Evolution of Emergency Management," In T.E. Drabek and G.J. Hoetmer, Eds., *Emergency Management: Principles and Practice for Local Government*. Washington, D.C.: International City Management Association, pp. 1-25.

Schwab, Jim with Kenneth C. Topping, Charles C. Eadie, Robert E. Dyle and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 483/484, Chicago, IL: American Planning Association, pp. 43-111.

#### October 16 Hazard mitigation plans and plan elements

Skim selected hazard mitigation plans on reserve in the planning library.

#### October 28: Presentation of Part 2 of term project

### **Part 3. Resilience-Building Tools and Procedures**

#### October 30: Managing land use to build resilience

Olshansky, Robert B. and Jack D. Kartez. 1998. "Managing Land Use to Build Resilience." In Burby, Raymond J. (ed.). *Cooperating With Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*. Washington, DC: Joseph Henry Press, Chapter 6.

### *In Coastal Areas*

Godschalk, David R., et al. 1999. "Chapter Three. Florida After Hurricane Andrew," In *Natural Hazard Mitigation: Recasting Disaster Policy and Planning*. Washington, DC: Island Press, pp. 103-159.

Godschalk, David R., David Brower, and Timothy Beatley. 1989. "Chapter Two. Alternative Approaches to Mitigation," In *Catastrophic Coastal Storms*. Durham, NC: Duke University Press, pp. 23-48.

### *In Floodplains:*

Faber, Scott. 1996. *On Borrowed Land: Public Policies for Floodplains*. Cambridge, MA: Lincoln Institute of Land Policy, pp. 1-32.

### *In Landslide Areas*

Erley, Duncan, and William Kockelman. 1981. *Reducing Landslide Hazards: A Guide for Planners*. Planning Advisory Service Report No. 359, Chicago: American Planning Association.

Olshansky, Robert B. 1996. *Planning for Hillside Development*. Planning Advisory Service Report No. 466. Chicago: American Planning Association.

### *In Seismic Hazard Areas*

California Seismic Safety Commission. 1995. "Achieving Seismic Safety Through Land Use Planning," In *Turning Loss to Gain*. Report to the Governor, Seismic Safety Commission Report No. 95-01, Sacramento: California Seismic Safety Commission, pp. 107-122.

### November 4: Incorporating resilience in zoning, subdivision, and other regulations

Schwab, Jim with Kenneth C. Topping, Charles C. Eadie, Robert E. Dyle and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 483/484, Chicago, IL: American Planning Association, pp. 113-137.

Morris, Marya. 1997. *Subdivision Design in Flood Hazard Areas*. Planning Advisory Service Report No. 473, Chicago: American Planning Association, pp. 62.

Platt, Rutherford H. and Alexandra D. Dawson. 1999. "The Takings Issue and the Regulation of Hazardous Areas." In Platt, Rutherford H. *Disasters and Democracy*. Washington, DC: Island Press, pp. 131-164.

City, Christopher. June 2000. "Duty and Disaster: Holding Local Governments Liable for Permitting Uses in High-Hazard Areas." *North Carolina Law Review*, Vol. 78, No. 5.

November 6: Creating resilience among vulnerable and special populations

Mileti, Dennis S. 1999. *Disasters by Design*. Washington, DC: Joseph Henry/National Academy Press, pp. 119-128.

November 11: Acquiring and relocating high-hazard property

Platt, Rutherford. 1999. Chapter Seven. "St. Charles County, Missouri: Federal Dollars and the 1993 Midwest Flood," In *Disasters and Democracy: The Politics of Extreme Natural Events*. Washington, DC: Island Press. pp. 215-239.

November 13: Retrofitting high hazard property

Alesch, Daniel J. and William J. Petak. 1986. *The Politics and Economics of Earthquake Hazard Mitigation*. Boulder: Institute of Behavioral Science, University of Colorado, pp. 15-38; 179-234.

Laska, Shirley Bradway. 1991. *Floodproof Retrofitting: Homeowner Self-Protective Behavior*. Boulder, CO: Institute of Behavioral Science, University of Colorado, pp. 1-17.

November 18: Financing resilience

Burby, Raymond J. et al. 1991. "Chapter Four. Financial Planning Strategies," In *Sharing Environmental Risks: How to Control Government's Losses in Natural Disasters*. Boulder, CO: Westview. pp. 66-68.

Deyle, Robert E. and Richard A. Smith. 2000. "Risk-Based Taxation of Hazardous Land Development." *Journal of the American Planning Association* 66(4): 421-434.

Olshansky, Robert B. 1996. "Financing Landslide Hazard Mitigation in the United States," *Journal of Environmental Planning and Management* 39, 3:371-385.

Schwab, Jim with Kenneth C. Topping, Charles C. Eadie, Robert E. Dyle and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 483/484, Chicago, IL: American Planning Association, pp. 179-182.

November 20: Implementing programs/enforcing regulations to build resilience

May, Peter J. and Patricia A. Bolton. 1986. "Reassessing Earthquake Hazard Reduction Measures," *Journal of the American Planning Association* 52, 4: 443-451.

Burby, Raymond J., Peter J. May, and Robert B. Paterson. 1998.

“Improving Compliance with Regulations: Choices and Outcomes for Local Government,” *Journal of the American Planning Association* 64, 3: 324-334.

Burby, Raymond J. and Peter J. May. 1999. “Making Building Codes an Effective Tool for Earthquake Hazard Mitigation,” *Environmental Hazards* 1, 1: 27-37.

#### **Part 4. Creating Resilience**

November 25: Case Studies in Creating Resilience

Readings to be assigned

December 3/5: Presentation of term projects

#### **Appendix A: Issue Paper Instructions**

The preparation of an issue paper is essentially a formalized approach to problem definition. It attempts to identify what the problems at issue really are, to isolate the fundamental objectives involved, to suggest public policy alternatives for solving the problem, and to identify the potential impacts and implications of choices among them. It also summarizes existing laws, policies, and government programs that bear on the problem (either as part of the problem or as possible solutions), and other resources that could be brought to bear on it.

An issue paper is supposed to be as complete an assessment of all that is currently known about the problem or issue, as the readily available data and literature will allow. The idea of an issue paper is to explore the problem at a depth sufficient to give the reader a good idea of its dimensions and the possible scope of the solution. Based on this it might be possible for the decision maker to conclude either to do nothing further or to commission a definitive study looking toward some sort of action recommendation. The issue paper stops short, however, of either original data collection or a detailed investigation and comparison of the impacts of policy alternatives, for otherwise it would be the analysis itself.

The issue paper should have four parts, as described below. Each part counts for 10% of the course grade.

1. Problem Definition (three to five pages due September 30). Assume that you are a staff member with a planning agency and identify an issue related to natural hazards that has a land use/urban development dimension that you consider an important threat to the sustainability of the community, region, or state. The problem definition portion of the issue paper defines concisely what the problem is; why it is important; its present and potential future magnitude (and basis for your estimate); who is affected by it; and its possible causes. Be sure to cover both physical causes of the problem and underlying human sources or activity patterns that

influence physical causes; be as specific as possible. Be sure also to be candid about uncertain or disputed issues, such as conflicting estimates of the magnitude or causes of the problem; to use data if readily available; and to cite their sources.

2. Existing Policies (three to five pages due October 28). Summarize existing government laws, policies, regulations, and programs that bear on the problem and consider why these policies are not solving it. Are they ineffective? Effective but inadequately funded or implemented? Why? Are some of them in fact causes of the problem themselves, enacted perhaps for different purposes?

3. Objectives and Alternatives (three to five pages due November 25). Identify the main objective(s) or criteria you believe any solution to the problem should meet if it is to count as a solution, and then describe briefly what alternative actions might prove to be effective solutions. Be creative here. Be sure to consider proposals already under consideration by others, but don't be limited to them—use your own ideas about actions by government and others that might be effective, as long as you can think of some good reasons for them. Also try to take a more unconstrained look at possibilities that may have been overlooked or too quickly dismissed by others as not feasible. For each alternative, describe briefly what it involves, who would have to act on it, how and why you would expect it to be effective, and its primary pros and cons (in terms of your objectives and criteria, its costs, positive and negative side effects, and uncertainties).

4. Recommendations (three to five pages due with whole paper on December 2/4). Given your assessments in the previous three parts, state what specific course of action you would recommend to deal with the problem as if you had to make a recommendation without any additional time or information (this can be either one of the alternatives above, or some mixed solution, or no action), and your reasoning for that recommendation.

Each part of the issue paper will be given an advisory grade. You may accept this grade and do no more work on that part of the paper, or you may revise the paper in hopes of obtaining a better grade. If you choose to revise the paper, your revisions must be returned when you submit the next part of the issue paper. Sections of the paper may be revised only once for an improved grade. The final grade for the issue paper will be the average of the grades assigned to each part.