

NATURAL HAZARDS AND DISASTER PLANNING

GEOG 419/619

Spring 2012

3:00 to 4:30 PM
Tuesdays and Thursdays
Sage Hall, Room 3215

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Texts: Smith, Keith and David Petley, *Environmental Hazards: Assessing Risk and Reducing Disaster*. 2009 (5th edition). **[required]**
Schwab, James C. (ed.), *Hazard Mitigation: Integrating Best Practices into Planning*. 2010. *[recommended, copy on reserve in Polk Library]*
Outside Readings as listed on page 2.

COURSE OUTLINE AND READING SCHEDULE

Class Meeting	Lecture / Discussion Topic	Assignment
January 31- Feb.2	Introduction: Definition of Hazards.	Smith, Chapter 1 Burton (1-Chapter 2)
February 7-9	Vulnerability to Hazards	Smith, Chapters 2 and 3 Cross (4), Mitchell (10)
February 14-16	Perception of Hazards.	Smith, Chapter 4 Burton (1-Chapter 4) Slovic (13)
February 21-23	Hazard Adjustments: Loss Sharing	Smith, pages 72-84 Burton (1-Chapter 5) Ismail-Zadeh (8)
Feb. 28- March 6	Hazard Adjustments: Loss Reduction	Smith, pp. 84-101 Schwab, Chapters 1-5 Monmonier (11)
March 8-13	Flood Hazards.	Smith, Chapter 11 Freudenburg (7), Oshkosh (12)
March 15	Coastal Storm Hazards.	Smith, pp. 181-192, 197-206 Cross (2)
March 27	EXAM 1	
March 29-Apr. 5	Seismic Hazards.	Smith, Chapter 6 Curtis (6)
April 10-12	Volcanic Hazards	Smith, Chapter 7
April 17-19	Landslide and Avalanche Hazards.	Smith, Chapter 8
April 24-26	Windstorm, Frost, and Heat Hazards	Smith, pages 189-196, 207-221 Cross (3), Kocin (9)
May 1	UW Oshkosh Disaster Plan Reports	Schwab, Chapter 9
May 3	Drought Hazards.	Smith, pp. 221-231 & Chap. 12 Wilhite (15)
May 8	Hazards of Global Change & Technology	Smith, Chapters 13-15 van Aalst (14)
May 12	EXAM 2	

* Assignments should be read before each class. You are expected to contribute to class discussions about the readings. Topic schedules are approximate.

OUTSIDE READINGS

1. Burton, Ian, Robert W. Kates, and Gilbert F. White. 1993. *The Environment as Hazard*. New York: Oxford University Press. GB5014.B87
2. Cross, John A. 1992. "The Hurricane Hazard in the United States". Chapter 10 of *Natural and Technological Disasters: Causes, Effects and Preventative Measures* (Majumdar, S. K. et al.(eds.) Easton: Pennsylvania Academy of Science), pp. 125-137.
3. Cross, John A. 1994. "Agroclimatic Hazards and Dairy Farming in Wisconsin." *The Geographical Review*, 84 (3): 277-289.
4. Cross, John A. 2001. "Megacities and Small Towns: Different Perspectives on Hazard Vulnerability." *Environmental Hazards* 3 (2): 63-80.
5. Cross, John A. and Yasuyo Makido. 2004. "Natural Hazards and Disaster Information on the Internet." Chapter 26 of *International Perspectives on Natural Disasters: Occurrence, Mitigation, and Consequences* (Joseph P. Stoltman, John Lidstone, and Lisa M. DeChano (eds). Dordrecht: Kluwer Academic Publishers), pp. 445-456.
6. Curtis, George D., 1992. "Tsunamis-Seismic Sea Waves." Chapter 9 of *Natural and Technological Disasters: Causes Effects and Preventative Measures* (Majumdar, S. K. et al.(eds.) Easton: Pennsylvania Academy of Science), pp. 108-124.
7. Freudenburg, William R., Robert Gramling, Shirley Laska, and Kai T. Erikson. 2007. "Katrina: Unlearned Lessons." *WorldWatch* 20 (5): 14-19.
8. Ismail-Zadeh, Alik and Kuniyoshi Takeuchi. 2007. "Preventive Disaster Management of Extreme Natural Events." *Natural Hazards* 42 (3): 459-467.
9. Kocin, Paul J. 1992. "Snowstorms and Blizzards." Chapter 16 of *Natural and Technological Disasters: Causes, Effects and Preventative Measures* (Majumdar, S. K. et al.(eds.) Easton: Pennsylvania Academy of Science), pp. 208-222.
10. Mitchell, J. Kenneth. 1998. "Megacities and Natural Disasters: A Comparative Analysis." *GeoJournal* 49 (2): 137-142.
11. Monmonier, Mark and George A. Schnell. 1992. "Natural Hazard Mapping: Status and Review." Chapter 34 of *Natural and Technological Disasters: Causes, Effects and Preventative Measures* (Majumdar, S. K. et al.(eds.) Easton: Pennsylvania Academy of Science), pp. 440-454.
12. Oshkosh, City of. 2006. "Floodplain Zoning Ordinance for the City of Oshkosh, Wisconsin." (http://www.ci.oshkosh.wi.us/Municipal_Codes/Chapter_30-39-67.pdf)
13. Slovic, Paul. 1987. "Perception of Risk," *Science*, Volume 236 (4799): 280-285.
14. van Aalst, Maarten K. 2006. "The Impacts of Climate Change on the Risk of Natural Disasters." *Disasters*. 30 (1): 5-18.
15. Wilhite, Donald A. 2004. "Drought." Chapter 7 of *International Perspectives on Natural Disasters: Occurrence, Mitigation, and Consequences* (Joseph P. Stoltman, John Lidstone, and Lisa M. DeChano (eds). Dordrecht: Kluwer Academic Publishers), pp. 147-162.

COURSE OBJECTIVES

This senior-level course will utilize lectures, class discussions, demonstrations, and scenario modeling to accomplish the course objectives. These objectives are:

- 1) To review those atmospheric and geologic events that threaten human life and property, emphasizing the physical conditions which accentuate or ameliorate these threats and presenting scientific data concerning the spatial and temporal distribution of these events.
- 2) To demonstrate how human occupation and use of various lands creates hazards and that to understand and mitigate hazards both the physical environment and human behavior must be examined.
- 3) To provide the student with a broad base of planning tools that can be used to mitigate the hazards. These will include education of the public and enhancement of public awareness, land use planning within hazard zones, structural adjustments, and evacuation procedures.
- 4) To introduce the student to the wide array of published materials and maps that can be used in planning for hazard mitigation and disaster recovery.

This course also addresses a variety of specific assessment goals that were established for the Geography Major. In particular, this course provides the student with:

4. Knowledge and understanding of the links between natural conditions and human activities and of the different ways of creating environments according to different cultural values, ethnic heritage, religious beliefs, socio-economic standings, political systems, and technical development.
8. Skills in using verbal, quantitative and symbolic data in the form of maps, text, photographs, graphs, tables, and diagrams.
10. Skills in using a variety of intellectual skills to explore geographical topics at scales ranging from local to global.
11. Skills in approaching geographic inquiry from the scientific perspective by (1) identification of the research problem and relating it to current knowledge; (2) development of research hypotheses; (3) identification of strategies to collect and to analyze data; and (4) interpretation of the results of these analyses and syntheses, making judgments and developing generalizations.
14. Value of the potential for using geographic knowledge and skills in seeking solutions to local, regional, national, and global problems, and
15. Value the concern that our use of our globe will influence the quality of the environment and human habitat for future generations, noting that these concerns about Global Change should also be viewed from the perspective of non-Western and Third World populations.

COURSE REQUIREMENTS

Course grades for undergraduate credit will be based upon student achievement on two exams; the preparation of a research paper, two brief executive summaries, one action plan, and critical reviews of draft papers; and class participation. Although adjustments might be made in the final grading scale, students who obtain 94 percent or more of the total points possible will receive a course grade of "A", 90 % will receive an "A-", 86 % a "B+", 82 % a "B", 78 % a "B-", 74 % a "C+", 70 % a "C", 66 % a "C-", 62 % a "D+", and 58 % a "D". Below 58 % is an "F". Students should **NOT** assume that their grades will be rounded up to the next higher letter (e.g. a 93.9% is an "A-", not an "A"). Graduate students must fulfill all undergraduate requirements plus complete additional graduate assignments.

Exams: Two exams will be given, each counting 30 percent of the course grade. These exams will contain both objective and subjective questions, covering lectures, class discussions and the reading assignments.

Exam 1 covers all lectures, textbook and outside reading assignments and class discussions from February 1 through March 17.

Exam 2 covers all lectures, textbook and outside reading assignments and class discussions from March 31 through May 10.

Make-up Exams: It is expected that you will take exams at the assigned times. If illness should prevent you from taking an exam, you must notify your professor (phone 424-1018 or e-mail cross) no later than the next day to explain your absence and schedule a make-up exam. Failure to promptly and adequately explain your absence will result in your receiving a grade of “0” on a missed exam.

UW Oshkosh Hazard Planning and Disaster Management Project: The University of Wisconsin Oshkosh must regularly deal with the consequences of heavy rainfall and snowfall, high winds, plus a variety of additional threats that occur far less frequently. At times, the institution has suffered significant losses from natural disasters—such as when floodwaters completely inundated River Commons and flooded the basements of Swart Hall and Polk Library, along with additional buildings on campus several years ago.

Small groups of students (3 to 4 students) will jointly prepare a report entitled “Hazard Management and Disaster Plan for the University of Wisconsin Oshkosh.” In preparing your report you should focus upon two distinct, but related actions: (1) making long-term plans in the location and design of buildings to avoid experiencing adverse consequences from various natural hazards and (2) preparations to respond to emergencies that arise during natural disasters. Each student within the group should select a separate natural hazard (and one student per group can select an all encompassing “technological hazard” grouping) and should cover both long-term planning and emergency response actions regarding their selected hazard(s) in their chapter of the report. At a minimum, all groups must cover flood, snow, and windstorm hazards.

Each student’s contribution to the project must be distinctly identifiable and each student will be evaluated upon the quality of his/her contribution to the project. Free-riders should not be tolerated by any group, and these individuals need to be clearly identified. (Indeed, if a member of the group contributes nothing towards the preparation of a report, that student’s name should not be included among the authors of the project.) All members of the group should assist in the editing of the final draft of the group report and assuring that the various parts of the report are free of grammar and spelling errors and are consistently presented without contradictory sections.

Each group should present their project report in both a written form and an oral presentation. The presentation should take 20 minutes and will take place on May 1. May 1, which is also the date you must submit your written projects, providing a paper copy to your instructor which includes the text and all maps and other illustrations and submitting an electronic copy to the course’s D2L site.

Students within each group are strongly urged to assist each other in finding appropriate references for their report. Students are encouraged to obtain appropriate reference materials from both print

sources and the Internet (see below), however Internet materials should **not** account for more than one-half of the references or material discussed in your paper. (Publications such as government reports that are available in paper format, yet which have also been posted on the Internet, do not count as Internet materials.) You may find that several reports about hazards and disasters in Wisconsin provide useful background information for your project. Such background information can be found in the *Hazard Analysis for the State of Wisconsin* and the *State of Wisconsin Hazard Mitigation Plan* by the Wisconsin Department of Military Affairs, both of which have been uploaded onto the D2L site in the Wisconsin Hazards Research Project section.

Research groups should form by the end of the second week of the semester and should prepare an outline, an assignment of duties to each member, and a tentative bibliography of potential references, which should be submitted to your instructor no later than February 16. Groups should schedule a meeting with their instructor during the second or third week of the semester to review their progress, potential references, and allocation of topics among the group members.

Your project counts 40 percent of your course grade. Papers will be evaluated based upon how thoroughly you cover your topic, how well the paper is written, how well the information is presented, how well the paper is illustrated, and how well your paper is referenced. Furthermore, each student's contribution towards the preparation of the group report will be considered in the awarding of project grades. Remember that all quotes, statistics, and ideas which are not your own must be referenced. For references, you may wish to follow the style used for the Outside Readings on page 2 of this syllabus. Data from the World Wide Web must also be referenced by giving the name and complete URL address of the websites consulted. Such website references should mimic these examples:

Wisconsin Emergency Management. 2007. "Current Flood Recovery Information for the Public."
(<http://emergencymanagement.wi.gov/section.asp?linkid=1180&locid=18>), website last accessed on January 2, 2008.

Adger, W. Neil, Terry P. Hughes, Carl Folke, Stephen R. Carpenter, and Johan Rockström. 2005. "Social-Ecological Resilience to Coastal Disasters." *Science* 309 (5737): 1036-1039.
(<http://www.sciencemag.org/cgi/reprint/309/5737/1036.pdf>), website last accessed on January 4, 2010.

Class lecture notes are never considered appropriate references, however information provided in lecture may lead you to seek appropriate published materials. Students are reminded that plagiarism is considered an act of academic misconduct that is a violation of Chapter UWS 14 of the Wisconsin Administrative Code. It will result in your failure in this course. (The College has recently purchased a license to the Turn-It-In software, and papers will be checked. For this reason, all students must submit both a paper copy of their project and an electronic copy of the text via the course's D2L dropbox.)

Attendance: Students are expected to actively participate in class discussions. Because students cannot participate in discussions or learn from lecture if they are absent, **attendance is mandatory**. Students are reminded that the *UW Oshkosh Undergraduate Bulletin* states that "students are expected to be present for each scheduled class session." Attendance records will be kept and consulted in determining the final course grades for students in a borderline situation. In addition, Federal regulations require attendance records to be kept on students receiving financial aid to reduce fraudulent payments. Because I do not know which students receive such aid, all students will be asked to sign an attendance sheet daily to comply with

legally binding information requests that I might receive regarding your attendance.

Tape Recording: Students may make tape recordings of lectures only under the following conditions: (1) the recording will be used only by the student making the recording, another student within the class, or the student's tutor; (2) the recording will be erased within two weeks of the time the lecture was recorded; and (3) the recording is done in a manner which is not disruptive to the instructor or other students within the class. Any other use of the recordings is prohibited and will be considered a violation of university regulations.

Office Hours: Office hours are maintained during which you may seek assistance with the course material, ask questions about majoring in geography, and discuss careers in geography. All students are encouraged to discuss their research projects with their professor. These hours are from 8:00 until 11:30 AM on Monday and Wednesday mornings and Monday and Wednesday afternoons from 1:00 until 2:45 PM. I am also willing to talk with students in the classroom immediately following lecture. Additional times may be arranged by appointment. However, please do NOT try to see me during the half hour immediately before class. My e-mail address is: cross@uwosh.edu and my phone number is 424-1018.

ADDITIONAL REFERENCE BOOKS

Additional books have been placed on reserve in the Polk Resource Center. These include:

- Alexander, David E. 1993. *Natural Disasters*. New York: Chapman & Hall. GB5014 .A4513
- Alexander, David E. 2000. *Confronting catastrophe: new perspectives on natural disasters*. New York: Oxford University Press. GB5014 .A46
- Bryant, Edward A., 1991. *Natural Hazards*. New York: Cambridge University Press. GB5014 .B79
- Hays, Walter, W., 1981. *Facing Geologic and Hydrologic Hazards: Earth-Science Considerations*. (U.S. Geological Survey Professional Paper 1240-B). Washington: Government Printing Office. I 19.16:1240-B
- Hewitt, Kenneth and Ian Burton, 1971. *The Hazardousness of a Place: A Regional Ecology of Damaging Events*. Toronto: University of Toronto Press. GF85 .H4
- Majumdar, Shyamal K, Gregory S. Forbes, E. Willard Miller, and Robert F. Schmelz (editors), 1992. *Natural and Technological Disasters: Causes, Effects and Preventive Measures*. Easton: Pennsylvania Academy of Science. GB5005 .N37
- Mileti, Dennis S. 1999. *Disasters by design: a reassessment of natural hazards in the United States*. Washington: Joseph Henry Press HV551.3 .M55
- Monmonier, Mark. 1997. *Cartographies of Danger: Mapping Hazards in America*. Chicago: University of Chicago Press. GB5014 .M66
- Stoltman, Joseph P., John Lidstone, and Lisa M. DeChano (eds). 2004. *International Perspectives on Natural Disasters: Occurrence, Mitigation, and Consequences*. Dordrecht: Kluwer Academic Publishers.
- Tierney, Kathleen J., Michael K. Lindell, Ronald W. Perry (eds.). 2001. *Facing the unexpected: disaster preparedness and response in the United States*. Washington: Joseph Henry Press HV551.3 .T54
- Tobin, Graham A. and Burrell Montz. 1997. *Natural hazards: explanation and integration*. New York: Guilford Press. GB5014 .T63

White, Gilbert F. (editor), 1974. *Natural Hazards: Local, National, Global*. New York: Oxford University Press. GB70 .W45

SUGGESTED INTERNET WEBSITES

Numerous websites have been established which convey current hazard and disaster information. You may find the following sites of particular interest. Although the web addresses were correct when checked in January 2010, changes may occur.

Best Sites for All-Hazard Information

- University of Colorado Natural Hazards Center
<http://www.colorado.edu/hazards/>
- U.S. Geological Survey Hazards Website
<http://www.usgs.gov/themes/hazard.html>
- Federal Emergency Management Agency Homepage
<http://www.fema.gov/>
- Wisconsin Emergency Management (Department of Military Affairs)
<http://emergencymanagement.wi.gov/>

Numerous additional websites exist, and it is recommended that you refer to the article by Cross and Makido (2004), "Natural Hazards and Disaster Information on the Internet," that has been placed on reserve for information about and web addresses for some of the most useful sites that deal with specific hazards.