Department of Landscape Architecture &
Urban Planning

Texas A&M University

LDEV-671: SUSTAINABLE PLANNING & DEVELOPMENT

Spring, 2011
Prerequisites: Graduate standing
Mon./Weds. 4:10 p.m.- 5:25 p.m.
Wisenbaker (WERC) 049/OCSB

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Course Description

This course will cover a broad range of topics related to resiliency and sustainability in coastal areas. Readings and classroom discussions will examine a range of issues associated with understanding resiliency/sustainability from ecological, social, economic, organizational, planning, and built-environment perspectives. Specific topics will include: ecological disturbance, adaptive learning, sustainable enterprise, social vulnerability, natural hazards, climate change, development management, and ecological footprint analysis. The approach of the course will be problem-based, where students will have the opportunity to apply the principles of sustainability and resiliency to realistic problems, settings, and solutions. The content of the course will prepare students to address the interdisciplinary, complex problems associated with coastal sustainability and resiliency in their work and everyday lives.

Course Objectives

- To understand the principles of resiliency and sustainable development in coastal areas at and between a variety of scales and settings;
- To critically examine the challenges and opportunities to build, plan for, and direct sustainable/resilient communities;
- To apply the principles of resiliency and sustainable development to real-world problem domains;
- To develop individual student expertise on a topic related to sustainability/resiliency that will in turn enhance professional development and increase effectiveness in the workplace after graduation.

Course Requirements

The format for the course will be reading intensive and discussion based. Students will be expected to apply their own knowledge and specializations to solving specific sustainable planning and development problems from a variety of perspectives. Several problem papers will be assigned that ask students to apply the concepts presented throughout the course to actual planning and development situations. A final project will require students to identify, write about, and present to the class a sustainability/resiliency problem of their choice.

Specific course requirements are as follows:

1. Class participation: students will be expected to attend class regularly and contribute to class discussions that critically evaluate readings and case studies. Students will be expected to bring to discussions knowledge and expertise gained throughout their graduate program or work experience. **Grading 20%.**
2. Problem papers: two take-home problem papers will be assigned which require students to critically evaluate and solve problems associated with sustainable planning and development. **Grading 40%.**
3. Final project: students will be required to select a resiliency/sustainability problem within their area of interest and draft a final paper/plan/site plan/architectural design based on specific parameters. The project will be presented in class as well as submitted as a written document or drawing. Students may work individually or in groups. **Grading 40%.**

**Late papers will be downgraded 10% for each day they are turned in past due.
Papers turned in after the assignment has been graded and returned to students will not receive credit.

Readings

Required Texts

Walker, B. and Salt, D. 2006. Resilience *Thinking: Sustaining ecosystems and people in a changing world*. Washington, D.C.: Island Press.

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Washington, D.C.: Island Press.

Recommended Texts

Porter, Douglas. 2000. *The Practice of Sustainable Development*. Washington, D.C.: Urban Land Institute.

Gunderson and Holling, eds. 2002. *Panarchy: Understanding transformations in human and natural systems*. Washington, D.C.: Island Press.

Additional Resources

Paton and Johnston, eds. 2006. *Disaster Resilience: An Integrated Approach*. Springfield, IL: Charles C. Thomas.

Berkes, Colding, and Folke, eds. 2003. *Navigating Social Ecological Systems: Building resilience for complexity and change*. Cambridge: Cambridge University Press.

McFadden, Nicholls, and Penning-Rowsell. 2007. *Managing Coastal Vulnerability*. Oxford: Elsevier. Good source for case studies.

http://www.resalliance.org/1.php

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*Readings not contained in required texts will be available online at epsru.tamu.edu – courses – LDEV671 – Syllabus. You can access the readings as a pdf within the course syllabus document.

INTRODUCTION AND OVERVIEW OF SUSTAINABILITY AND RESILIENCY

January 19

Introduction to course

January 24 – Definitions

Walker, B. and Salt, D. 2006. Resilience *Thinking: Sustaining ecosystems and people in a changing world*. Chapter 1, pgs. 1-14.

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Chapters 1 & 2, pgs 1-26.

Porter, D., 2000. *The Practice of Sustainable Development*. Ch. 1, pgs. 1-23.

January 26 – Sustainability and Resiliency Linkages

Berkes, Colding, and Folke, eds. 2003. *Navigating Social Ecological Systems: Building resilience for complexity and change*. Cambridge: Cambridge University Press. Forward, pgs. Xv-xxi; and Chapter 1, pgs 1-25.

Walker, B. and Salt, D. 2006. Resilience *Thinking: Sustaining ecosystems and people in a changing world*. Chapter 2, pgs. 28-38.

Paton and Johnston, eds. 2006. *Disaster Resilience: An Integrated Approach*. Springfield, IL: Charles C. Thomas. Chapter 5, pgs. 79-83, Principles and Techniques of Sustainable Hazard Mitigation.

CASE STUDY – THE EVERGLADES ECOSYSTEM, FLORIDA

January 31

Walker, B. and Salt, D. 2006. Resilience *Thinking: Sustaining ecosystems and people in a changing world*. Pgs 15-27.

Gunderson and Holling, eds. 2002. *Panarchy: Understanding transformations in human and natural systems*. Chapter 12, Surprises and Sustainability: Cycles of renewal in the Everglades, pgs. 315-332.

Gunderson and Light. 2006. Adaptive Management and Adaptive Governance in the Everglades Ecosystem. *Policy Sciences* 39 (4):323–334.

ECOLOGICAL RESILIENCE

February 2

Holling, C. S. Resilience and Stability of Ecological Systems, article 1, pgs. 19-47. In Lance Gunderson, Craig Allen, C. Holling, eds. *Foundations of Ecological Resilience*, 2010, Island Press.

Holling, C.S. The Resilience of Terrestrial Ecosystems, article 3, pgs. 67-109. In Lance Gunderson, Craig Allen, C. Holling, eds. *Foundations of Ecological Resilience*, 2010, Island Press.

Recommended

Woodroffe, C.D. Natural Resilience of Coastal Systems: Primary Concepts. 2007. Pgs. 1-16.

February 7 – Panarchy

Walker, B. and Salt, D. 2006. Resilience *Thinking: Sustaining ecosystems and people in a changing world*. Chapters 3 & 4, Pgs. 53-63; 74-95.

Gunderson and Holling, eds. 2002. *Panarchy: Understanding transformations in human and natural systems*. Chapter 2, pgs. 25-62.

***Guest Speaker: Bob Harris, Houston Advanced Research Center**

February 9 – Panarchy (Cont.)

Gunderson and Holling, eds. 2002. *Panarchy: Understanding transformations in human and natural systems*. Chapter 3, pgs. 62-103.

Recommended

Gunderson and Pritchard, eds. 2002. *Resilience and the Behavior of Large-Scale Systems***.** Chapter 1, pgs. 3-18.

CASE STUDY – CORAL REEFS

February 14

Walker, B. and Salt, D. 2006. Resilience *Thinking: Sustaining ecosystems and people in a changing world*. Case 3, pgs. 64-73.

Hughes, T. Catastrophes, Phase Shifts, and Large-Scale Degradation of a Caribbean Coral Reef Article 7, pgs. 205-216. In Lance Gunderson, Craig Allen, C. Holling, eds. *Foundations of Ecological Resilience*, 2010, Island Press.

Recommended

Gunderson and Pritchard, eds. 2002. *Resilience and the Behavior of Large-Scale Systems***.** Chapter 5, pgs. 111-150.

February 16 – Human Systems

Walker, B. and Salt, D. 2006. Resilience *Thinking: Sustaining ecosystems and people in a changing world*. Chapter 5, pgs. 111-124.

ORGANIZATIONS AND ADAPTIVE CAPACITY

February 21- Adaptive Management

Carl Folke, Thomas Hahn, Per Olsson, and Jon Norberg. 2005. ADAPTIVE GOVERNANCE OF SOCIAL-ECOLOGICAL SYSTEMS. *Annu. Rev. Environ. Resour*. 2005. 30:441–73. doi: 10.1146/annurev.energy.30.050504.144511.

Lebel, L., J. M. Anderies, B. Campbell, C. Folke, S. Hatfield-Dodds, T. P. Hughes. and J. Wilson. 2006. Governance and the capacity to manage resilience in regional social-ecological systems. *Ecology and Society* **11**(1): 19, pgs 1-15. URL:http://www.ecologyandsociety.org/vol11/iss1/art19/ .

February 23

Janssen, M. A., Ö. Bodin, J. M. Anderies, T. Elmqvist, H. Ernstson, R. R. J. McAllister, P. Olsson, and P. Ryan. 2006. A network perspective on the resilience of social-ecological systems. *Ecology and Society* **11**(1): 15. URL:http://www.ecologyandsociety.org/vol11/iss1/art15/.

Olsson, P., L. H. Gunderson, S. R. Carpenter, P. Ryan, L. Lebel, C. Folke, and C. S. Holling. 2006. Shooting the rapids: navigating transitions to adaptive governance of social-ecological systems. *Ecology and Society* **11**(1): 18. URL:http://www.ecologyandsociety.org/vol11/iss1/art18/.

February 28– Sustainable Enterprise

Hoffman, A. 2000. *Competitive Environmental Strategy: A Guide to the Changing Business Landscape*. Washington, D.C.: Island Press. Ch. 9, pgs.183-197.

Hawken, P. 1993. *The Ecology of Commerce*. Ch1, pgs. 1-17; Ch. 4, pgs. 57-73.

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Chapter 10, Palm Beach County, pgs. 123-127.

March 2 – Sustainable Enterprise (Cont.)

Hoffman, A. 2000. *Competitive Environmental Strategy: A Guide to the Changing Business Landscape*. Washington, D.C.: Island Press. Ch.11, pgs. 228-242.

Worthington et al. 2009. Beyond risk mitigation: Enhancing corporate innovation with scenario planning. *Business Horizons* 52, 441—450.

Paton and Johnston, eds. 2006. *Disaster Resilience: An Integrated Approach*. Springfield, IL: Charles C. Thomas. Chapter 15, pgs. 249-264.

SOCIAL DIMENSIONS OF RESILIENCY

March 7 - Social Vulnerability

Cutter, Susan et al. 2003. Social Vulnerability to Environmental Hazards. *SOCIAL SCIENCE QUARTERLY*, Volume 84(2): 244-258.

Zahran, S., Brody, S.D., Peacock, W.G., and Vedlitz, A., Grover, H. (2008). Social Vulnerability and The Natural and Built Environment: A Model of Flood Casualties in Texas, 1997-2001. *Disasters* 32(4), doi:10.1111/j.0361-3666.2008.01054.x.

Recommended

Paton and Johnston, eds. 2006. *Disaster Resilience: An Integrated Approach*. Springfield, IL: Charles C. Thomas. Assessing Social Resilience. Chapter 6, pgs. 88-103.

***Guest Speaker: Walter Peacock, Director of the Hazard Reduction and Recovery Center**

March 9 – Social Capital and Improving Equity

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. pgs 33-38.

Adger,W. Neil. 2003. Social Capital, Collective Action, and Adaptation to Climate Change *Economic Geography* 79(4): 387-404.

Porter, D., 2000. *The Practice of Sustainable Development*. Ch. 5, pgs. 67-73.

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Chapter 12, Resilience after Katrina, pgs. 135-142.

March 14 and 16 – Spring Break

March 21 – Measuring Resiliency and Sustainability

Texas Sustainable Indicators Project, 2006, **Skim.**

Emmer et al. 2008. Coastal Resiliency Index: A Community Self-Assessment

A Guide to Examining How Prepared Your Community Is for a Disaster. Pgs. 1-10: http://www.seagrant.noaa.gov/focus/documents/HRCC/resiliency_index_7-15-08.pdf .

NOAA CSC project Report (to be distributed)

NATURAL HAZARDS AND RESILIENCY

March 23 – Natural Hazards Introduction

Adger et al. 2005. Social-Ecological Resilience to Coastal Disasters. *Science* 309: 1036-1039.

Tobin, G. 1999. Sustainability and Community Resilience: the holy grail of hazards planning? *Environmental Hazards* 1:13-25.

Paton and Johnston, eds. 2006. *Disaster Resilience: An Integrated Approach*. Springfield, IL: Charles C. Thomas. Introduction, pgs. 3-9.

Recommended

Richard J.T. Klein, et al. 2003. Resilience to natural hazards: How useful is this concept? Environmental Hazards 5: 35–45.

Berkes, F. 2007. Understanding uncertainty and reducing vulnerability: lesson from resilience thinking. *Natural Hazards* 41: 283-295.

March 28 – Acute Hazards

Thomas J Campanella. 2006. Urban Resilience and the Recovery of New Orleans. *Journal of the American Planning Association* 72(2):141-145.

FEMA. 2009. Hurricane Ike in Texas and Louisiana: Mitigation Assessment Team Report, Building Performance Observations, Recommendations, and Technical Guidance. Read Executive Summary; Chapter 1, pgs. 1- 30.

City of Galveston Long Term Recovery Plan. 2009. Pgs. 1-13; skim rest as interested. http://recoverygalveston.org/documents/Galveston_Long-Term_Community_Plan.pdf

***Guest speaker: Lori Swartz, Galveston Planning Dept.**

March 30- Chronic Hazards

Brody, S.D., Kang, Jung Eun, Zahran, S., Bernhardt, S.P. (2009). Evaluating Local Flood Mitigation Strategies in Texas and Florida. *Built Environment* 35(4): 492-515.

Brody, S.D., Kang, Jung Eun, Bernhardt, S.P. (2010). Identifying Factors Influencing Flood Mitigation at the Local Level in Texas and Florida: the Role of Organizational Capacity. *Natural Hazards* 52:167–184, DOI 10.1007/s11069-009-9364-5.

Recommended

See also: Brody, S.D., and Highfield, W.E. (Forthcoming). *Rising Waters: Evidence for Reducing Floods in the 21st Century*. Cambridge, UK: Cambridge University Press. Draft Chapters 7 & 9.

April 4- Chronic Hazards II- Climate Change

Brody, S. D., S. Zahran, et al. (2008). "A spatial analysis of local climate change policy in the United States: Risk, stress, and opportunity." Landscape and Urban Planning **87**(1): 33-41.

Hamin, E. and N. Gurran (2009). "Urban form and climate change: Balancing adaptation and mitigation in the US and Australia." Habitat International **33**(3): 238-245.

Recommended

Zahran, S., Brody, S. D., Vedlitz, A., Grover, H, and Miller, C. (2008). Explaining Local Commitment to Climate Change Policy in the United States. *Environment and Planning C* 26(3): 544-562.

COMMUNITY PLANNING AND DEVELOPMENT

April 6 – Planning for the worst

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Chapters 3 & 4, pgs. 29-54; Chapter 6, pgs. 59-71.

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Chapter 8, Worchester County, MD, pgs. 99-110.

City of Galveston Draft Hazard Mitigation Plan: http://www.cityofgalveston.org/administration/emergency/hazard_mitigation.cfm .

April 11 – Planning Tools and Techniques

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Chapter 7, pgs. 59-71.

Godschalk, D. 2003. Urban Hazard Mitigation: creating resilient cities. *Natural Hazards Review* 4(3):136-142.

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Chapter 11, Charleston County, SC, pgs. 129-134.

Galveston County, Office of Emergency Management. 2009. *Bolivar Blue Print*. Pgs. 1-24, http://www.co.galveston.tx.us/bolivar/documents/Bolivar%20Blueprint%20Electronic.pdf

April 13- Urban Form

Wheeler, 2004. *Planning for Sustainability*, Chapter11, pgs. 161-165; Chapter 12, pgs. 186-208.

Beatley and Manning, 1997. *The Ecology of Place*. Ch. 3, pgs. 40-85.

Burby et al. 2001. Urban Containment Policy and Exposure to Natural Hazards: Is There a Connection? *Journal of Environmental Planning and Management*, 44(4), 475–490, 2001.

BUILDING, CONSTRUCTION, & GREEN ARCHITECTURE

April 18 – Site Analysis

LEED Report, 2002. "Site Selection." Pgs. 1-15.

FEMA. 2009. Hurricane Ike in Texas and Louisiana: Mitigation Assessment Team Report, Building Performance Observations, Recommendations, and Technical Guidance. Read Executive Summary; Chapter 3, pgs. 3. 40-3.41.

Bijan Khazai, Jane C. Ingram, David S. Saah. 2007. The Protective Role of Natural and Engineered Defence Systems in Coastal Hazards. Pgs. 3-5; 7-8; skim rest as interested.

Porter, D., 2000. *The Practice of Sustainable Development*. Ch. 6, pgs. 75-114.

***Guest speaker: Bill Merrell, TAMU-Galveston**

April 20 – Buildings and Architecture

Wheeler, 2004. *Planning for Sustainability*, Chapter 13, pgs. 224-234.

FEMA. 2009. Hurricane Ike in Texas and Louisiana: Mitigation Assessment Team Report, Building Performance Observations, Recommendations, and Technical Guidance. Read Executive Summary; Chapter 7, pgs. 7.1-7.1717.

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times*. Chapter 9, Oregon Coast, pgs. 111-122.

Recommended

FEMA. 2009. Hurricane Ike in Texas and Louisiana: Mitigation Assessment Team Report, Building Performance Observations, Recommendations, and Technical Guidance. Read Executive Summary; Chapter 3, pgs. 1-90, [focus on roof systems].

LEED Report, 2002, pgs. 34-46.

Hargroves and Smith. 2005. *The Natural Advantage of Nations*. Chapter 18, Greening the Built Environment, pgs. 346-370.

HOUSEHOLD/INDIVIDUAL PREPAREDNESS

April 25

- Calculate footprint on: www.myfootprint.org

Paton and Johnston, eds. 2006. *Disaster Resilience: An Integrated Approach*. Springfield, IL: Charles C. Thomas. The Role of Individual and Household Preparedness. Chapter 7, pgs. 105-124.

HCFCD Family Flood Plan.
http://www.hcfcd.org/tropicalweather/downloads/FamlyFloodPreparePlan2007.pdf.

Gunderson and Holling, eds. 2002. *Panarchy: Understanding transformations in human and natural systems*. Chapter 13, The Devil in the Dynamics, pgs. 333-359.

Recommended

Paton, D. 2003. Disaster Preparedness: a social-cognitive perspective. *Disaster Prevention and Management* 12: 210-216.

April 27

Flood Disaster Development Game: http://www.stopdisastersgame.org/en/home.html .

COURSE SUMMARY/CONCLUSION

May 2

Walker, B. and Salt, D. 2006. Resilience *Thinking: Sustaining ecosystems and people in a changing world*. Washington, D.C.: Island Press. Chapter 6, pgs. 139-154.

Gunderson and Holling, eds. 2002. *Panarchy: Understanding transformations in human and natural systems*. Washington, D.C.: Island Press. Chapter 15, pgs. 395-417.

*****Final Paper Due: On day of scheduled final exam.***

"The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accomodation of their disabilities. If you believe you have a disability requiring an

accomodation, please contact the Department of Student Life, Services for Students with Disabilities in Room 126 of the Koldus Building, or call 845-1637."

In all aspects of this course, please adhere to the University Honor Code: "An Aggie does not lie, cheat, or steal or tolerate those who do."