

SUSTAINABLE LANDUSE

In spite of the rising costs from floods caused by heavy rains, storm surges, or hurricanes, currently, except for Florida, no other state requires their local or regional governments to include flood mitigation into their comprehensive plans. Economic development usually takes precedence over all other concerns. Yet, there remains an acute need for appropriate planning and management of land use in the vast floodplains and coastal regions where the majority of the population concentrates in United States. Land use planning can be described as a systematic assessment of physical, social, and economic factors to inform and assist people on how they can utilize land in ways that are sustainable and at the same time meets human and community needs. Planners deploy tools such as zoning, sub-division regulations, planned development, land allocation systems, and comprehensive plans to meet their land use planning goals.

This course on *Sustainable Landuse* will explore critical challenges, conflicts, and issues due to development in floodplains and low-lying coastal zones. The objective of this course is to understand how applications of land use planning for flood mitigation can help communities achieve sustainability: economically – by reducing recurring property loss, damage, and lost revenues from multiple occurring hazards; and environmentally – by protecting fragile areas such as wetlands, coastal sand dunes, and floodplains. We will investigate and debates topics such as:

- Nature of floodplains, and how river and coastal floodplain systems work
- Impact of human use and urban development patterns on floodplains
- Land use planning tools for floodplains and flood hazard areas – local comprehensive plans, zoning and sub-division regulations, and floodplain management
- Case studies to showcase land use based growth management and risk reduction strategies
- Current approaches and public policy options on managing floods and floodplains – National Flood Insurance Program, No Adverse Impact, and National Mitigation System
- Mitigation techniques and land use measures to minimize flood damage and preserve floodplains

At the end of this course, students will be able to independently analyze, assess, and evaluate the dynamic processes that are associated with sustainable land use planning. The course will:

1. Expose you to a wide array of institutions and actors involved in land use policy, planning and management of river and coastal floodplains.
2. Examine land use policy and planning instruments for managing and protecting floodplains and low-lying coastal zones from increasing loss and damage from floods.
3. Through case studies, the course will give an overview of current land use mechanisms, planning strategies, and policy options for floodplain management.

COURSE FORMAT AND REQUIREMENTS

This class is schedule twice a week for three and half hours and is organized around readings, lectures, discussions, guest talks, teamwork, and video presentations. Course readings are based on journal articles, reports, and book chapters, and will be posted on Blackboard not more than two weeks prior to the class. Readings can be found under section titled 'Course Documents' on Blackboard, organized according to weekly themes.

Attendance, Preparation, and Class Participation Individually and in Team (20% of the Grade): Students are expected to attend classes regularly, read all assigned materials, and come prepared to participate in the discussion of readings. Additionally, students will be assigned to work in teams throughout this course. Teams will be expected to appoint a leader and a recorder. Each student is expected to take turn in assuming the lead in reporting and presenting team products to the entire class.

Mid-term Exam (30% of the Grade): A mid-term take home exam will evaluate individual understanding of the course materials. The exam will consist of two questions, based on the main themes and issues covered in class, and will require your detailed response. Each question will be worth 15 points. Your response should be no more than 3 double-spaced typed pages for each question.

Floodplain Management Plan (50% of the Grade): The class will be divided into teams of two-three students (as enrollment permits) to apply what is learned in the course to "real life" situations. Each team will develop, prepare and submit a comprehensive floodplain management plan for a local floodplain in a selected stream reach, a coastal area, or for an entire community. The plan should be designed to achieve the goals of flood loss reduction and maintenance of natural resources and functions. Each team will present their plans during the last course session, with invited community professional staff in attendance.

COURSE POLICIES

Grading: Your final grade will be based on a combination of activities and assignments mentioned above and the grade breakdown and structure is given below.

Grade Breakdown

Activities	Percentage
Attendance, Preparation, & Participation	20%
Mid-term Exam	30%
Floodplain Management Plan	50%

Grade Structure

Letter Grade	Point Range
A+	98 - 100
A	94 - 97
A-	90 - 93
B+	87 - 89
B	84 - 86

B-	80 - 83
C+	77 - 79
C	74 - 76
C-	70 - 73
D	≤69

Late Works and Missed Assignments: Late work in general will not be tolerated. If you plan to miss a class or deadline, please inform instructor at least 24 hours prior to make alternative arrangements. Students are expected to keep track of assignment deadlines and grades. If you did not receive your paper back or are missing a grade, please bring it to the attention of the instructor.

Plagiarism Statement: The copying of any work in whole or in part without citation is considered plagiarism and will not be tolerated. Students, whose work has been confirmed as plagiarized: a) will not receive any points for the plagiarized assignment, and/or b) in the case of more serious violation will receive a Fail (F) grade for the entire course.

Office Hours and Contact: Office hours will be held by appointment prior to class. Questions about course, readings, and assignments can be addressed through email as well. Please give 48 hours for a response.

COURSE THEMES AND READINGS

SESSION 1: INTRODUCTIONS / COURSE SYLLABUS / FLOODPLAIN TEAMS

Video: *Water's Edge* (2004), by Gregory Greene. Produced by: The Electric Wallpaper, 78 Minutes

SESSION 2: NATURE OF FLOODPLAINS

Marsh, William M. (2005) *Landscape planning: Environmental applications*. NJ: John Wiley & Sons, Inc.

Chapter 10: Streamflow, floodplains, flood hazard, and land use planning

Freitag, Bob. (2009) *Floodplain management: A new approach for a new era*. Washington, DC: Island Press

Chapter 3: Rivers and floodplains

Chapter 4: Natural processes must drive solutions

Marya Morris. (1997) *Subdivision Design in Flood Hazard Areas*. Planning Advisory Service Report Number 473. Chicago: American Planning Association

Chapter 2: Protecting the natural functions of the floodplain

SESSION 3: LANDUSE POLICIES IN FLOODPLAINS

Freitag, Bob. (2009) *Floodplain management: A new approach for a new era*. Washington, DC: Island Press

Chapter 1: Floods are not the problem

Marya Morris. (1997) *Subdivision Design in Flood Hazard Areas*. Planning Advisory Service Report Number 473. Chicago: American Planning Association

Chapter 1: Reducing Flood Losses and Protecting Floodplain Resources

Godschalk, David. R, et.al. (1999) *Natural Hazard Mitigation: Recasting disaster policy and planning*. Washington, DC: Island Press

Chapter 2: Evolving mitigation policy directions

Fowler, Dave & Monday, Jacquelyn. (2009) Natural and beneficial floodplain functions: Floodplain management – more than flood loss reduction, *National Wetlands Newsletter*, (31) 4, pp. 6- 9

SESSION 4: URBAN GROWTH AND DEVELOPMENT ON FLOODPLAINS

Freitag, Bob. (2009) *Floodplain management: A new approach for a new era*. Washington, DC: Island Press

Chapter 5: Our relationship to rivers

Hipple, James D., Drazkowski, Barry, & Thorsell, Patrick M. (2005) Development in the upper Mississippi basin: 10 years after the Great Flood of 1993, *Landscape and Urban Planning*, (72), pp. 313-323

Brody, Samuel D., et al. (2007) The rising costs of floods: Examining the impact of planning and development decisions on property damage in Florida”, *Journal of the American Planning Association*, 73 (3), pp. 330-345

Esnard, Ann-Margeret; Brower, D. & Bortz, B. (2001) Coastal hazards and the built environment on barrier islands: A retrospective view of Nags Head in the late 1990s, *Coastal Management*, 29 (1), pp. 53-72

SESSION 5: ASSESSING AND MANAGING RISK

Freitag, Bob. (2009) *Floodplain management: A new approach for a new era*. Washington, DC: Island Press

Chapter 2: A new vocabulary

Johnson, Laurie; Samant, Laura Dwelley & Frew, Suzanne. (2005) *Planning for the Unexpected: Land-Use Development and Risk*. Planning Advisory Service Report Number 531. Chicago: American Planning Association, pp. 1-55

Bollens, Scott A., Kaiser, Edward J., & Burby, Raymond J. (1988), Evaluating the effects of local floodplain management policies on property owner behavior, *Environment and Management*, (12) 3, pp. 311-325

SESSION 6: NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Federal Emergency Management Agency (FEMA). (2005) *National Flood Insurance Program (NFIP): Floodplain Management Requirements*, FEMA 480

Zahran, Sammy, et.al. (2009) Modeling national flood insurance policy holding at the county scale in Florida, 1999-2005, *Ecological Economics*, (68), pp. 2627-2636

SESSION 7: FLOODPLAIN MANAGEMENT APPROACHES

Hayes, B.D. (2004) Interdisciplinary planning of non-structural flood hazard mitigation, *Journal of Water Resources Planning and Management*, (130) 1, pp. 15-25

Freitag, Bob. (2009) *Floodplain management: A new approach for a new era*. Washington, DC: Island Press

Chapter 6: Approaches: Structural and nonstructural

Chapter 7: Capabilities and tools

Chapter 8: Strategies: Work with, Not against rivers

Chapter 9: Choosing the best strategy

Chapter 10: What next?

SESSION 8: LANDUSE PLANNING TOOLS

Video: Wisconsin Department of Natural Resources. (1997) *Darlington Story: Mitigation Revitalizes a Floodplain Community*, 26 minutes

Marya Morris. (1997) *Subdivision Design in Flood Hazard Areas*. Planning Advisory Service Report Number 473. Chicago: American Planning Association

Chapter 3: Planning tools for flood hazard areas

Chapter 4: Site-specific measures to minimize flood damage and preserve natural functions of floodplains

Holway, James M. & Burby, Raymond J. (1993) Reducing flood losses: Local planning and land use controls, *Journal of the American Planning Association*, (59) 2, pp. 205-216

SESSION 9: PROPERTY RIGHTS & NO ADVERSE IMPACT IN FLOODPLAINS

Guest Lecture by Edward A. Thomas Esq. (Floodplain Manager, Attorney, and Disaster Response and Recovery Specialist)

Thomas, Edward A. & Medlock, San Riley. (2008) Mitigating misery: Land use and protection of property rights before the next big flood, *Vermont Journal of Environmental Law*, (9) 2, pp. 155-188

Association of State Floodplain Managers (ASFPM). (2007) *Coastal No Adverse Impact Handbook*. Pp. 1-165 (Weblink:
<http://www.floods.org/index.asp?menuid=340&firstlevelmenuid=187&siteid=1>

SESSION 10: CASE STUDIES - I

Godschalk, David. R, et.al. (1999) *Natural Hazard Mitigation: Recasting disaster policy and planning*. Washington, DC: Island Press

Chapter 3: Florida after hurricane Andrew

Chapter 4: Missouri after the Midwest floods of 1993

SESSION 11: CASE STUDIES - II

Godschalk, David. R, et.al. (1999) *Natural Hazard Mitigation: Recasting disaster policy and planning*. Washington, DC: Island Press

Chapter 5: Iowa after the Midwest floods of 1993

Chapter 7: Massachusetts after hurricane Bob and other storms

Chapter 8: Tennessee after a series of floods and storms

SESSION 12: FLOODPLAIN MANAGEMENT PLAN PRESENTATIONS