

EVE 552 Long Island Sound: Environmental Perspectives

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Spring Semester
Tuesday 5:00-7:30 pm
JE 335

Catalog Description: Examination of the environmental history and use of Long Island Sound with emphasis on natural habitats, economic uses and human impacts.

Rationale: The Environmental Education curriculum currently does not have specific courses addressing the coastal environments, particularly Long Island Sound. There is an obvious need for a course to address the historical and future use and resultant impacts to our coastal habitats and resources. SCSU is an appropriate venue given its location on the Connecticut shoreline. Teachers and environmental educators are frequently called upon to incorporate marine related issues into their educational programs. Long Island Sound has been designated as an estuary within the National Estuary Program, a program designed to protect nationally significant estuaries throughout the United States. The high population density surrounding Long Island Sound and the resultant competition for resources within the estuary present unique problems and opportunities for educators, scientists and program managers. This course will exploit these competing interests to allow students to examine the issues and possible management strategies to balance access to these coastal resources.

Course Objectives

Specific objectives of this course are to:

- 1) Promote an understanding of the historical development and use of coastal environments and linkages between the physical, ecological and social components of these environments.
- 2) Promote a historical overview of the impacts of human activities on coastal environments.
- 3) Develop an awareness of the multidisciplinary nature of the management of coastal environments.
- 4) Develop knowledge of the need and methods for achieving integrated management of coastal environments.

Learner Outcomes:

On completion of this course, students will be able to:

- 1) Describe the historical use of natural resources in Long Island Sound.
- 2) Identify important coastal processes and natural habitats.
- 3) Describe the environmental and economic importance of these habitats.
- 4) Identify principal local, state and national agencies charged with protecting and managing coastal resources.

- 5) Identify important contemporary problems (contaminants, eutrophication, economic development, etc.) associated with the deterioration of coastal resources.
- 6) Identify and describe the sources, transport and fate of contaminants entering coastal environments.
- 7) Perform field identification of principal flora and fauna in tidal salt marshes and rocky intertidal zones.
- 8) Identify strategies to address problems concerning coastal resource use.
- 9) Develop skills to communicate the objectives of management strategies to a broad range of stakeholders.

Course Outline

Week 1	The Coastal Environment: Coastal Zone, Issues, Management Concerns Readings: Klee, 1999 (Chapter 1) (6%)
Week 2	The Coastal Environment: Trophic Relationships and Habitats of Long Island Sound (Pelagic Communities) (7%) Readings: Klee, 1999 (Chapter 1)
Week 3	The Coastal Environment: Trophic Relationships and Habitats of Long Island Sound (Tidal Wetlands, Beaches, Rocky Intertidal Habitats) (7%) Readings: Wahle, 1991; Dryer and Niering, 1995
Week 4	Coastal Hazards: Shoreline Changes: Natural (erosion, sea level change) and Human Induced Change (dredging, coastal structures) (7%) Readings: Klee, 1999 (Chapter 4)
Week 5	Coastal Management: Players and Jurisdictions (6%) Readings: Anderson, 2002 (Chapters 1-3); Klee, 1999 (Chapter 2)
Week 6	Coastal Pollution: Contaminants (Ocean Dumping, Metals) (7%) Readings: Anderson, 2002 (Chapters 4-5); Klee, 1999 (Chapters 5-6)
Week 7	Coastal Pollution: Contaminants (Hydrocarbons, Marine Debris) (7%) Readings: Anderson, 2002 (Chapters 6-7)
Week 8	Coastal Pollution: Sewage, Nutrients, Eutrophication and Hypoxia (7%) Readings: Anderson, 2002 (Chapters 8-9)
Week 9	Habitat Loss and Destruction (Development Pressures) (6%) Readings: Anderson, 2002 (Chapters 10-11); Klee, 1999 (Chapters 4&8)
Week 10	Field Site (Saturday), The Maritime Aquarium at Norwalk (12-4 pm) (7%) Readings: Anderson, 2002 (Chapter 12)

- Week 11 Coastal Protected Areas (McKinney Wildlife Refuge) (6%)
Readings: Klee, 1999 (Chapter 3)
- Week 12 Integrated Approaches for Coastal Management (6%)
Readings: Klee, 1999 (Chapter 9)
- Week 13 Field Site Visit (Saturday), Outer Island Visit, Branford, CT (7%)
- Week 14 Long Island Sound Conservation and Management Plan (7%)
Readings: Klee, 1999 (Chapter 9)
- Weeks 15-16 Student Research Oral Presentations (7%)

Modes of Instruction:

Modes of instruction will include lectures, class discussions, individual student project oral presentations, videotapes and interactive CD-ROMs, and field trips to the Norwalk Maritime Center, Norwalk CT and conducting “hands on” field exercises at Outer Island, Branford, CT.

Evaluation

Each of the assignments described in this section are linked to specific learner outcomes identified in Section III. Learner Outcomes. Students will be assessed based on the following criteria and assignments:

— Students will be required to participate in class and small group discussions (20%). Students will be expected to complete the assigned weekly readings prior to class and be prepared to participate in class discussions. Student participation will be evaluated by the instructor based on the frequency and quality of contributions to class discussions. (Learner outcomes 2, 4, 5, 6, 7)

— A research paper will be assigned to allow students to more fully explore scientific and management options available to address environmental issues pertaining to a coastal zone management issue of specific interest. Each paper topic requires instructor approval. The paper will require each student to identify a pressing coastal issue and propose a management plan for addressing the problem (30%). (Learner outcomes 2, 3, 4, 5, 6, 7)

— Each student will prepare and deliver a 15-20 minute oral presentation identifying the issue(s) examined and the management options selected to address in the research paper and (20%). (Learner outcomes 4, 6, 7)

_ Students will work in small groups (2-4) and be required to perform a series of field measurements and observations during the class visit to Outer Island (Branford, CT). The field observations will include, but will not be limited to, identification of dominant flora and fauna, hydrographic measurements (salinity, temperature, dissolved oxygen) and tidal range observations (15%). (Learner outcomes 1, 2, 3, 4)

_ Students (individually) will be required to prepare a written field report using the data collected during the field investigations to identify aspects unique (biological, geological and chemical) to these coastal environments and discuss threats to the long-term stability and ecological health of these environments (15%). (Learner outcomes 1, 4, 5, 6, 7)

Required Text(s):

The Coastal Environment: Toward Integrated Coastal and Marine Sanctuary Management, Gary A. Klee. Prentice-Hall, Inc., Upper Saddle River, NJ. 1999. 281 pp. ISBN 0-13-08034-1.

This Fine Piece of Water: An Environmental History of Long Island Sound. Thomas Anderson. Yale University Press, New Haven, CT. 2002. 256 pp. ISBN 0-300-08250-9.

Selected Bibliography

*Anderson, T. 2002. This Fine Piece of Water: An Environmental History of Long Island Sound. Yale University Press, New Haven, CT. 256 pp.

*Botsford, L.W., Castilla, J.C. and Peterson, C.H. 1997. The management of fisheries and marine ecosystems. *Science*, 277: 509-514.

Carusone, C.R. 1993. Environmental Monitoring of Long Island Sound – Program Inventory. Long Island Sound Study Comprehensive Conservation and Management Plan Supporting Document, January, 1993. 57 pp.

*Dryer, G. and B. Niering. 1995. Tidal Marshes of Long Island Sound. Bulletin 34, Connecticut College Arboretum, New London, CT.

Executive Summary. 1993. Toxic Substance Contamination – Assessment of Conditions and Management. Recommendations. Long Island Sound Study Comprehensive Conservation and Management Plan Supporting Document, January, 1993. 68 pp.

*Garrison, T. 2001. Essentials of Oceanography. Second Edition. Brooks/Cole, Pacific Grove, CA. 361 pp.

*Klee, G.A. 1999. The Coastal Environment: Toward Integrated Coastal and Marine Sanctuary Management,. Prentice-Hall, Inc., Upper Saddle River, NJ. 281 pp.

*Laws, E.A. 2000. Aquatic Pollution: An Introductory Text. Third Edition. John Wiley and Sons, Inc. NY. 639 pp.

*Malakof, D. 1997. Extinction on the High Seas. *Science*, 277: 486-488.

*Schmidt, K. 1997. No Take Zone Sparks Spark Fisheries Debate. *Science*, 277: 489-491.

*Strieb, M. 1993. Assessment of Living Marine Resources. Long Island Sound Study Comprehensive Conservation and Management Plan Supporting Document,. January, 1993. 137 pp.

Weiss, H.M. 1995. Marine Animals of Southern New England and New York: Identification keys to common nearshore and shallow water macrofauna. State Geological and Natural History Survey of Connecticut. Department of Environmental Protection. Bulletin 115. DEP Maps and Publications Office, 79 Elm St., Hartford, CT.

Whale, L. 2002. Living Treasures; The Plants and Animals of Long Island Sound. Third Edition. Connecticut Sea Grant College Program, University of Connecticut, Groton, CT. 48 pp.

Whitlach, R.B. and Wood-Martin, J.R. 1998. Proceedings of the Fourth Biennial Long Island Sound Research Conference, November 13-14, 1998. State University of New York, Purchase. 170 pp. ISBN 1-878301-05-5.

Interactive CD-ROMs and Video Tapes

Our Crowded Shores, Balancing Growth and Resource Protection. 1998. National Oceanic and Atmospheric Administration, www.state-of-coast.noaa.gov. (CD-ROM)

Turning the Tide, America's Coasts at a Crossroads. 1997. Special Edition for NOAA's State of the Coast Project. National Oceanic and Atmospheric Administration, www.state-of-coast.noaa.gov. (CD-ROM)

The Science of Long Island Sound: Geological Oceanography. Program 1. Marine Sciences Research Center, SUNY at Stony Brook, NY. (25 minute videocassette)

The Science of Long Island Sound: Biological Oceanography. Program 3. Marine Sciences Research Center, SUNY at Stony Brook, NY. (25 minute videocassette)

*Outer Island Coastal Habitats, Department of Science Education and Environmental Studies, SCSU, New Haven, CT. (13 minute videocassette)

* Denotes source available at the SCSU Buley Library.