

LSU Coastal Roots™ Program

Compendium of Coastal, Wetland, and Restoration Information for Louisiana Educators



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Purpose of this Compendium

Preservation and restoration of Louisiana's coastal habitats and land are two of the most pressing issues facing our state. Educators have a vital role in bringing to the awareness of young people the urgency of caring for their natural surroundings. By teaching our students using activities that build knowledge and encourage action, educators will increase the environmental literacy of our young citizens and inspire them to become active stewards of our coastal habitats. I am committed to supporting educators interested in teaching about Louisiana's coastal issues by providing them as many high-quality resources as possible. This compendium is an initial effort to offer educators a guide to the best available resources to enhance and support their educational activities.

While I started compiling these materials years ago, many people have had a hand in identifying and annotating the resources in this compendium:

- Janina Fuller, graduate student, LSU School of Human Resource Education and Workforce Development
- Cally Chauvin, middle school teacher
- Justin Bruno, graduate student, LSU Educational Theory, Policy and Practice
- Ashley Castello, LSU graduate student, LSU Educational Theory, Policy and Practice
- Dr. Margaret-Mary Sulentic-Dowell's EDCI 3200 students, who provided the initial list of children's books as part of a service-learning project for their course

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I intend to periodically update and expand this compendium. I welcome educators to send me information and/or links to resources that should be included in future editions.

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Louisiana GLEs for Coastal and Wetland Education

The following Grade Level Expectations (2003) have been selected for their relevance to teaching coastal and wetland related concepts in grades PreK – 12. Other GLEs not listed may also be appropriate, but the GLEs listed below reflect those most closely related to coastal and wetland education topics. Notations in parenthesis refer to the LA Benchmarks for Science (1997).

PreK

Physical Science Properties of Matter

9. Sort objects using one characteristic (PK-CS-P2; PS-E-A1)

Life Science - Characteristics of Organisms

20. Give examples of different kinds of plants and different kinds of animals (PK-CS-L1)

Life Science - Life Cycles of Organisms-

22. Learn about animals and plants through nonfiction literature (PK-CS-L1; LS-E-B1)

Life Science - Organisms and Their Environments-

24. Describe plants and animals in the schoolyard or home environments (PK-CS-L1; LS-E-C1)

Life Science - Characteristics of Organisms

25. Identify easily observable variations within types of plants and animals (e.g. features of classmates, varieties of trees, breeds of dogs) (LS-E-A4)

Life Science - Life Cycles of Organisms -

28. Observe life cycles and describe changes (e.g. humans, dogs, insects) (LS-E-B1)

Earth and Space Science

30. Distinguish between areas of Earth covered by land and water (ESS-E-A2)

Grade 1

Science as Inquiry – Understanding Scientific Inquiry

12. Explain and give examples of how scientific discoveries have affected society (SI-E-B6)

Life Science - Characteristics of Organisms-

26. Describe the differences between plants & animals (LS-E-A1)

27. Identify what animals and plants need to grow and develop (LS-E-A1)

28. Describe the characteristics of living (biotic) and nonliving (abiotic) things (LS-E-A2)

Life Science - Life Cycles of Organisms-

30. Record and share observations of changes in developing plants (LS-E-B1)

31. Describe how animals and their offspring are similar and how they are different (LS-E-B3)

Life Science - Organisms and Their Environments-

32. Describe features of some animals that benefit them in their environments (LS-E-C1)

34. Record evidence of plants and animals in the schoolyard or other environments (LS-E-C2)

Earth and Space Science - Properties of Earth Material

35. Examine soils to determine that they are often found in layers (ESS-E-A1)

37. Illustrate how water changes from one form to another (e.g. freezing, melting, evaporating) (ESS-E-A-3)

Grade 2

Science as Inquiry – Understanding Scientific Inquiry

13. Explain and give examples of how scientific discoveries have affected society (SI-E-B6)

Life Science – Characteristics of Organisms

27. Match the appropriate food source & habitat for a variety of animals (e.g., cows/grass/field, fish/tadpoles/water) (LS-E-A1)

28. Describe structures of plants (e.g. roots, leaves, stems, flowers, seeds) (LS-E-A3)

29. Compare differences and similarities among a variety of seed plants (LS-E-A3)

30. Identify physical characteristics of organisms (e.g. worms, amphibians, plants) (LS-E-A4)

31. Identify and discuss the arrangement of the food pyramid (LS-E-A6)

Life Science - Life Cycles of Organisms

33. Compare the life cycles of selected organisms (e.g. mealworm, caterpillar, tadpole) (LS-E-C1)

Life Science – Organisms and Their Environments

35. Identify the components of a variety of habitats and describe how organisms in those habitats depend on each other (LS-E-C1)

36. Observe and record the properties of rocks, minerals, and soils gathered from their surroundings (e.g. color, texture, odor) (ESS-E-A1)

Earth and Space Science – Properties of Earth Material

37. Compare bodies of water found on Earth (e.g. oceans, seas, lakes, rivers, glaciers) (ES-E-A2)

Science and the Environment

45. Locate and identify plants and animals within an ecosystem (SE-E-A2)

46. Illustrate and describe a simple food chain located within an ecosystem (SE-E-A2)

47. Identify the sun as the primary energy source in a food chain (SE-E-A2)

48. Describe a variety of activities related to preserving the environment (SE-E-A3)

50. Describe ways in which habitat loss or change can occur as a result of natural events or human impact (SE-E-A5)

51. Describe and give examples of threatened or endangered species (SE-E-A5)

Grade 3

Science as Inquiry – Understanding Scientific Inquiry

17. Explain and give examples of how scientific discoveries have affected society (SI-E-B6)

Life Science – Characteristics of Organisms

35. Compare structures (parts of the body) in a variety of animals (e.g. fish, mammals, reptiles, amphibians, birds, and insects) (LS-E-A3)

36. Compare structures (e.g. roots, leaves, stems, flowers, seeds) and their functions in a variety of plants (LS-E-A3)

37. Describe how plant structures enable the plant to meet basic needs (LS-E-A4)

38. Classify groups of organisms based on common characteristics (LS-E-A4)

39. Compare organisms from different groups (e.g. birds with mammals, terrestrial plants with aquatic plants) (LS-E-A4)

Earth and Space Science – Properties of Earth Materials

46. Describe earth processes that affected selected features in students' neighborhoods (e.g. rusting, weathering, erosion) (ESS-E-A1)

48. Identify examples of the processes of a water cycle (e.g. evaporation, condensation, precipitation, collection of runoff) (ESS-E-A3)

Science and the Environment

57. Describe the interrelationships of living (biotic) and nonliving (abiotic) components within various ecosystems (e.g. terrarium, swamp, back yard) (SE- E-A1)

58. Describe how humans have had negative and positive effects on organisms and their environments (SE-E-A3) (SE-E-A5)

61. Explain how selected animals once classified as endangered have recovered (SE-E-A5)

62. Identify animals in Louisiana that have recovered and that are no longer considered endangered (SE-E-A5)

Grade 4

Science as Inquiry – Understanding Scientific Inquiry

21. Use evidence from previous investigations to ask additional questions and to initiate further explorations (SI-E-B6)
22. Explain and give examples of how scientific discoveries have affected society (SI-E-B6)

Life Science -Characteristics of Organisms

40. Explain the functions of plant structures (e.g. roots, leaves, stems, flowers, seeds) in relation to their ability to make food through photosynthesis (LS-E-A3)
41. Describe how parts of animals' bodies are related to their functions and survival (e.g. wings/flying, webbed feet/swimming) (LS-E-A3)

Life Science – Life Cycles of Organisms

45. Identify reproductive structures in plants and describe the functions of each (LS-E-B1)
46. Describe how some plants can be grown from a plant part instead of a seed (LS-E-B1)
47. Sequence stages of life cycles of various organisms, including seed plants (LS-E-B1)
48. Classify examples of plants and animals based on a variety of criteria (LS-E-B2)
49. Compare similarities of plants and animals based on a variety of criteria (LS-E-B2)

Life Science - Organisms and Their Environments

50. Explain how some organisms in a given habitat compete for the same resources (LS-E-C1)
51. Describe how organisms can modify their environments to meet their needs (e.g. beavers making dams) (LS-E-C1)
52. Describe how some plants and animals have adapted to their habitats (LS-E-C2)
53. Identify the habitat in which selected organisms would most likely live and explain how specific structures help organisms to survive (LS-E-C2)
54. Describe the effect of sudden increases or decreases of one group of organisms upon other organisms in the environment (LS-E-C3)

Earth and Space Science – Properties of Earth Materials

56. Investigate the properties of soil (e.g. color, texture, capacity to retain water, ability to support plant growth) (ESS-E-A1)
58. Draw, label, and explain the components of the water cycle (ESS-E-A3)
63. Demonstrate and explain how Earth's surface is changed as a result of slow and rapid processes (e.g. sand dunes, canyons, volcanoes, earthquakes) (ESS-E-A5; ESS-E-A1)

Science and the Environment

70. Design an ecosystem that includes living (biotic) and nonliving (abiotic) components and illustrate interdependence (SE-E-A1)
71. Describe and explain food chains/webs and the directional flow of energy in various ecosystems (e.g. construct a model, drawing, diagram, graphic organizer) (SE-E-A2)
72. Predict and describe consequences of the removal of one component in a balanced ecosystem (e.g. consumer, herbivores, nonliving component) (SE-E-A2)

Grade 5

Science as Inquiry – Understanding Scientific Inquiry

38. Explain that, through the use of scientific processes and knowledge, people can solve problems, make decisions, and form new ideas (SI-M-B6)
39. Identify areas in which technology has changed human lives (e.g. transportation, communication, geographic information systems, DNA fingerprinting) (SI-M-B7)
40. Evaluate the impact of research on scientific thought, society, and the environment (SI-M-B7)

Physical Science – Transformations of Energy

12. Identify the sun as Earth's primary energy source and give examples (e.g. photosynthesis, water cycle) to support that conclusion (PS-M-C3)

Life Science – Structure and Function of Living Systems

18. Describe metamorphosis of an amphibian (LS-M-A3)
19. Describe the processes of photosynthesis and respiration in green plants (LS-M-A4)

Life Science – Population and Ecosystems

22. Develop and use a simple dichotomous key to classify common plants and animals (LS-M-C1)
23. Construct food chains that could be found in ponds, marshes, oceans, forests, or meadows (LS-M-C2)
24. Describe the roles of producers, consumers, and decomposers in a food chain (LS-M-C2)
25. Compare food chains and food webs (LSM-C2)
26. Identify & describe ecosystems of local importance (LS-M-C3)
27. Compare common traits of organisms within major ecosystems (LS-M-C3)
28. Explain and give examples of predator/prey relationships (LS-M-C4)

Life Science – Adaptations of Organisms

29. Describe adaptations of plants and animals that enable them to thrive in local and other natural environments (LS-M-D1)

Earth and Space Science – Structure of the Earth

30. Identify organic and inorganic matter in soil samples with the aid of a hand lens or microscope (ESS-M-A4)
32. Demonstrate the results of constructive and destructive forces using models or illustrations (ESS-M-A7)
33. Identify processes that prevent or cause erosion (ESS-M-A7)
34. Identify the components of the hydrosphere (ESS-M-A11)

Science and the Environment

48. Determine the ability of an ecosystem to support a population (carrying capacity) by identifying the resources needed by that population (SE-M-A2)
50. Describe the consequences of several types of human activities (e.g. polluting streams, regulating hunting, introducing nonnative species) on local ecosystems (SE-M-A4)
51. Describe naturally occurring cycles and identify where they are found (e.g. carbon, nitrogen, water, oxygen) (SE-M-A7)

Grade 6

Science as Inquiry – Understanding Scientific Inquiry

38. Explain that, through the use of scientific processes and knowledge, people can solve problems, make decisions, and form new ideas (SI-M-B6)
39. Identify areas in which technology has changed human lives (e.g. transportation, communication, geographic information systems, DNA fingerprinting) (SI-M-B7)
40. Evaluate the impact of research on scientific thought, society, and the environment (SI-M-B7)

Science and the Environment

42. Identify energy types from their source to their use and determine if the energy types are renewable, nonrenewable, or inexhaustible (SE-M-A6)
43. Explain how the use of different energy resources affects the environment and the economy (SE-M-A6)
44. Explain how an inexhaustible resource can be harnessed for energy production (SE-M-A6)
45. Describe methods for sustaining renewable resources (SE-M-A6)
46. Identify ways people can reuse, recycle and reduce the use of resources to improve and protect the quality of human life (SE-M-A6)
47. Illustrate how various technologies influence resource use in an ecosystem (e.g. forestry management, soil conservation, fishery improvement) (SE-M-A8)

Grade 7 (Life Science)

Structure and Function in Living Systems

6. Compare the life cycles of a variety of organisms, including non-flowering and flowering plants, reptiles, birds, amphibians, and mammals (LS-M-A3)

Reproduction and Heredity

22. Give examples of the importance of selective breeding (e.g., domestic animals, livestock, horticulture) (LS-M-B3)

Populations and Ecosystems

23. Classify organisms based on structural characteristics, using a dichotomous key (LS-M-C1)
24. Analyze food webs to determine energy transfer among organisms (LS-M-C2)
26. Describe and compare the levels of organization of living things within an ecosystem (LS-M-C3)
27. Identify the various relationships among plants and animals (e.g., mutualistic, parasitic, producer/consumer) (LS-M-C4)
28. Differentiate between ecosystem components of habitat and niche (LS-M-C4)
29. Predict the impact that changes in a species' population have on an ecosystem (LS-M-C4)

Adaptations of Organisms

30. Differentiate between structural and behavioral adaptations in a variety of organisms (LS-M-D1)
31. Describe and evaluate the impact of introducing nonnative species into an ecosystem (LS-M-D1)
32. Describe changes that can occur in various ecosystems and relate the changes to the ability of an organism to survive (LS-M-D2)
33. Illustrate how variations in individual organisms within a population determine the success of the population (LS-M-D2)
34. Explain how environmental factors impact survival of a population (LS-M-D2)

Science and the Environment

35. Identify resources humans derive from ecosystems (SE-M-A1)
36. Distinguish the essential roles played by biotic and abiotic components in various ecosystems (SE-M-A1)
37. Identify and describe the effects of limiting factors on a given population (SE-M-A2)
38. Evaluate the carrying capacity of an ecosystem (SE-M-A2)
39. Analyze the consequences of human activities on ecosystems (SE-M-A4)
40. Construct/draw food webs for various ecosystems (SE-M-A5)
43. Identify and analyze the environmental impact of humans' use of technology (e.g., energy production, agriculture, transportation, human habitation) (SE-M-A8)

Grade 8 (Earth and Space Science)

Structure of Earth

15. Illustrate the role of organic processes in soil formation (ESS-M-A4)
19. Determine the results of constructive and destructive forces upon landform development with the aid of geologic maps of Louisiana (ESS-M-A7)
20. Describe how humans' actions and natural processes have modified coastal regions in Louisiana and other locations (ESS-M-A8)
21. Read and interpret topographic maps (ESS-M-A9)
22. Compare ocean floor topography to continental topography by using topographic maps (ESS-M-A9)
23. Explain the processes of evaporation, condensation, precipitation, infiltration, transpiration, and sublimation as they relate to the water cycle (ESS-M-A10)
24. Investigate and explain how given factors (e.g., climate, type of rock, ground cover) affect the rate of water movement in the water cycle (ESS-M-A10)

28. Use historical data to plot the movement of hurricanes and explain events or conditions that affected their paths (ESS-M-A12)

Earth in the Solar System

48. Communicate ways that information from space exploration and technological research have advanced understanding about Earth, the solar system, and the universe (ESS-M-C8)
49. Identify practical applications of technological advances resulting from space exploration and scientific and technological research (ESS-M-C8)

Science and the Environment

50. Illustrate possible point and non-point source contributions to pollution and natural or human-induced pathways of a pollutant in an ecosystem (SE-M-A3)
51. Analyze the consequences of human activities on global Earth systems (SE-M-A4)
52. Describe the relationship between plant type and soil compatibility (SE-M-A9)
53. Distinguish among several examples of erosion (e.g., stream bank, topsoil, coastal) and describe common preventive measures (SE-M-A10)

Grade 10 (Biology)

Biological Evolution

18. Classify organisms from different kingdoms at several taxonomic levels, using a dichotomous key (LS-H-C4)
20. Analyze differences in life cycles of selected organisms in each of the kingdoms (LS-H-C6)

Interdependence of Organisms

24. Analyze food webs by predicting the impact of the loss or gain of an organism (LS-H-D2)
26. Analyze the dynamics of a population with and without limiting factors (LS-H-D3)
27. Analyze positive and negative effects of human actions on ecosystems (LS-H-D4) (SE-H-A7)

Environmental Science (USUALLY AN ELECTIVE)

Ecological Systems and Interactions

1. Describe the abiotic and biotic factors that distinguish Earth's major ecological systems (SE-H-A1)
4. Determine the effects of limiting factors on a population and describe the concept of carrying capacity (SE-H-A3)
5. Examine and discuss the major stages of succession, describing the generalized sequential order of the types of plant species (SE-H-A4)
8. Explain how species in an ecosystem interact and link in a complex web (SE-H-A7; SE-H-A10)
10. Analyze the effect of an invasive species on the biodiversity within ecosystems (SE-H-A9)
12. Give examples and describe the effect of pollutants on selected populations (SE-H-A11)

Resources and Resource Management

18. Identify the factors that affect sustainable development (SE-H-B6)

Personal Choices and Responsible Actions

21. Analyze the effect of common social, economic, technological, and political considerations on environmental policy (SE-H-C3)
22. Analyze the risk-benefit ratio for selected environmental situations (SE-H-C4)
23. Describe the relationship between public support and the enforcement of environmental policies (SE-H-C5)

Environmental Awareness and Protection

27. Describe how accountability toward the environment affects sustainability (SE-H-D5)

For the complete **LA GLE** listing and the **2008 LA Comprehensive Curriculum**, visit <http://www.doe.state.la.us/ldc/saa/2257.html>

General Resources about the Louisiana Coast, Wetlands, and Restoration Efforts

Louisiana Wetlands: Functions and Values – CD-ROM (CWPPRA/USGS)

Presentations on wetlands functions and values, coastal wetlands land loss and restoration, the Wetlands Reserve Program (WRP) and wetlands conservation opportunities statewide. Contact: DNR, 800-267-4019 or click on “Email LaCoast” on <http://www.lacoast.gov>. Grades 6-12.

Louisiana Coastal Facts (DNR)

<http://dnr.louisiana.gov/crm/webfactsheet--2008-02-06.pdf>

Summary of important facts about population, marsh acreage, commerce, fishing, eco-tourism and other pertinent topics.

Restoration Program Background (DNR)

<http://dnr.louisiana.gov/crm/background/>

Introduces major causes of wetland loss, valuable resources provided by the wetlands, current coastal restoration programs, coastal restoration project implementation, and project types.

Coastal Louisiana – Coloring Book (CWPPRA/USGS)

<http://lacoast.gov/education/kids/coloringbooks/coastal/index.htm>

Four pictures of coastal Louisiana that can be printed out to color or colored online (requires Flash).

Louisiana Wetlands: An American Resource – Activities (CWPPRA/USGS)

<http://lacoast.gov/education/classroom/webquest.htm>

Uses the WaterMarks publication as a source for WebQuest questions.

Teacher Workshop Presentation on the LA Coast (CWPPRA/USGS)

<http://lacoast.gov/education/classroom/webquest.htm>

PowerPoint presentation with notes, put together by staff from the Coastal Wetlands Planning, Protection and Restoration Act. Slightly out-dated (pre-Katrina). Good graphics and explanations.

NOTE: The two contact people noted at the end of the presentation no longer work for CWPPRA.

Salt Marsh Habitat of the Barataria-Terrebonne Estuary – Activity Book (BTNEP)

<http://educators.btnep.org/Resources/resource.asp?id=66>

Written from Clawdette the Crab's perspective. Follow Clawdette through the estuary. To obtain a copy call 800-259-0869. Grades 1-4. **Free upon request.**

Caring for Coastal Wetlands (CWPPRA/USGS)

<http://lacoast.gov/reports/program/CaringBrochure/index.htm>

Brochure on the Coastal Wetlands Planning, Protection, and Restoration Act.

EstuaryLive! – Activities (BTNEP)

<http://estuarylive.btnep.org/default.asp?id=26>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary's importance to the nation.

- **The Watersheds of the National Estuary Program** - Map depicts watersheds of the continental U.S. and their respective estuaries. Grades 3-12.
- **The BTNEP Location Map for EstuaryLive!** - Map of the Barataria-Terrebonne Estuary System.
- **Travels of Jean Lafitte** - World map showing all the locations visited by Jean Lafitte. Grades 6-12.
- **Salt Marsh Activity Book: Where is the BTNEP Estuary?** - A map students can color-by-number showing where the Barataria-Terrebonne Estuary is relative to the state of Louisiana.
- **Salt Marsh Activity Book: What is an Estuary?** - Color-by-number map shows different types of water found in an estuary.
- **Salt Marsh Activity Book: The Spongy Marsh** - Line drawings with measurements help students imagine the impact of a storm surge with / without wetland protection.



EstuaryLive! – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=69>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary's importance to the nation.

- **Elmer's Island and Community Involvement** (Clip 9) - Shows students participating in the Coastal Roots Program. David Bourgeois demonstrates how students grow seeds and then plant what they grow.
- **Jean Lafitte** (Clip 10) - Kerry St. Pé explains how valuable the coastal areas were to Jean Lafitte. "Wetlands are the treasures," says St. Pé.

Haunted Waters – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=61>

An award winning documentary on the cultural, geologic, and environmental history of the Barataria-Terrebonne National Estuary System.

- **People and the Environment** (Clip 2) - Introduces the estuary, the environment of the Mississippi Delta and the people who live there.
- **Growing Economy** (Clip 5) - Depicts the planting, harvesting and processing of sugar cane in the early days of the local economy.
- **Ethnic Influences** (Clip 16) - Shows aspects of life on Grand Isle in the late 1800's and some of the cultural influences from around the world.

Bayou Lafourche: The Longest Street in the World – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=48>

This documentary captures the history, culture, lifestyle, environmental troubles and emerging ecological solutions of the 100-mile ribbon of bayou that weaves through the Barataria-Terrebonne Estuary.

- **Bayou History-Head of the Bayou** (Clip 2) - Describes the early days of steamboat traffic connecting Bayou Lafourche to the rest of the world.

Vanishing Wetlands, Vanishing Future – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=62>

This video on BTNEP's seven priority problems is in the style of Bill Nye the Science Guy and is best suited for middle school, though the vocabulary is applicable to high school topics.

- **Mississippi Delta** (Clip 2) - Explains the formation of the Mississippi Delta and the principles of hydrologic modification.
- **Government Involvement** (Clip 9) - Outlines some of the political considerations of water management in south Louisiana. NOTE: Some of the material in this clip has changed, and new technology has been developed since this film was made. Mike Robichaux is no longer our State Senator.
- **Student's Views on Wetlands** (Clip 10) - Students express their feelings about losing our wetlands. The teacher explains her use of three processes to teach her Wetlands Unit: hands-on inquiry based lessons, technology, and culminating activities in visual and performing arts.

The JASON Project: Disappearing Wetlands – Curriculum

http://www.jason.org/uploads/PublicUploads/CuteSoft/Store/DW_order_form.pdf

Explains what wetlands are, why they are disappearing, and how best to manage these ecosystems in your neighborhood, in Louisiana, and around the world. **Cost and ordering information are provided.** Grades 4-8.

Wetlands Education – Activities (EPA)

<http://www.epa.gov/owow/wetlands/education/>

A wide variety of resources for wetlands education. Grades K-12.



Spirit of the Estuary: Using Art to Understand Ecology – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=76>

A multi-disciplinary curriculum that addresses wetland environmental issues through the integration of fine art, language art, science, and social studies. Grades 6-12.

- **I Am an Estuarian** (Activity 1-1) - Poetry is used to describe the biotic factors and organisms of the Barataria-Terrebonne Estuary, as well as its people and culture.
- **Rhythm of the Tides** (Activity 1-5) - Basic music rhythms help illustrate the concepts of tidal movement and how the tides are related to movements of the earth, moon and sun.
- **The Landscape of the Estuary** (Activity 1-6) - Focus is on the natural and human-made landscape features of the estuary, particularly the ridges, bayous and associated settlements. Students explore their own built environment through field trips and art, creating maps and artwork to compile tourism brochures that highlight natural and human-made features of interest.
- **Jambalaya, Crawfish Pie, File' Gumbo** (Activity 1-12) - Students create an authentic Southern Louisiana-style cookbook, with recipes, cultural stories and illustrations, and identify the impact the estuary has on local culture and cooking.
- **The World's Greatest Sculptor** (Activity 2-7) - Sculpture enables students to design a river system, learning in the process about riparian life, erosion and its effects on the landscape.
- **Doin' What Comes Naturally: Naturalist? Artist? Or Both?** (Activity 2-8) - In observing, drawing and journaling about nature, students learn a variety of drawing and sketching techniques and discuss the importance of careful, accurate drawings of the natural world. Works of naturalists are studied and students use journal entries to reflect on field experiences.
- **Nature's Art** (Activity 2-9) - Students discern how art materials are derived from natural sources and how feelings can be communicated through artwork. Artwork is analyzed and the impact artwork has on people's perception of the estuary is discussed.
- **Mamas, Your Babies Grow Up to Be ___** (Activity 2-10) - Cultural heritage is examined through art and history. Students design a class mural depicting scenes from estuary life and ask viewers how they are affected by the mural.
- **Cajun Music: Traduire** ("to translate") (Activity 2-11) - Cajun French words are translated into English. Students describe how Cajun musicians relate with the wetland environment and interpret Cajun lyrics into their own words.
- **Bals De Maison** ("house dances") (Activity 2-12) - Students observe Cajun dance styles and learn how Cajuns have used dance and music as sources of entertainment and socializing, even as the wetlands isolated Cajun culture.
- **From the Cane Field to the Easel: The Mystery of the Blue Dog** (Activity 2-14) - Using the work of Cajun artist George Rodrigue as inspiration, students study works by Pollock, Warhol and Munch. They create their own pop art image to include elements of the estuarine environment.
- **Music Makers** (Activity 3-1) - Students research Cajun and Zydeco music, and interview local musicians to get their perspectives on Louisiana's wetlands.
- **Commercials for the Coast** (Activity 3-2) - Wetlands vocabulary is used to write a "jingle" that teaches about wetlands.
- **Who Knows? The Shadow Puppets Do!** (Activity 3-3) - Priority problems in the Barataria-Terrebonne Estuary System are identified and students research them in depth. Focus questions are brought to life using puppetry, including all aspects of staging.
- **Honk If You Love the Wetlands** (Activity 3-4) - Functions and values of wetlands are outlined, and students design and share a communication strategy to make others aware of the importance of wetlands.
- **Pass the Word - Creating an Environmental Action Brochure** (Activity 3-5) - Computer technology is employed to produce an action brochure informing citizens of the seven priority wetland issues and encouraging them to take action.
- **Estuary Extra! Your Own Environmental Newspaper** (Activity 3-6) - Students brainstorm ideas for newspaper topics, select departments of the newspaper in which to work, and plan, design, edit and publish a student newspaper.
- **Musical Meaning** (Activity 3-7) - Students research songs about the wetlands and interpret lyrics.
- **And Then a Hero Comes Along** (Activity 3-8) - Students identify and research people recognized for contributions to preservation of the environment, specifically of the estuary.



Wetland Issues – CDs (BTNEP)

<http://educators.btnep.org/default.asp?id=49>

- **Exploring Coastal Louisiana with Boudreaux and Marie**
Interactive CD-ROM addressing coastal wetland issues in Louisiana. A component of the CD-ROM focuses on Barataria-Terrebonne and showcases its ecological, economic, and cultural importance. Bird and animal identification and wetland quizzes promote interaction and learning. Boudreaux's camp has a map room, a kids' room, and many other surprises. Developed jointly by BTNEP, CWPPRA, and the USGS National Wetlands Research Center. Lesson plans available on the root directory of the CD. To request your CD, contact <sandra@btnep.org>.
- **Thibodeaux's Treasure**
Interactive CD invites elementary school children to learn about our wetlands as they join Jeanne Thibodeaux and Tee Boudreaux on a treasure hunt journey. This CD will teach basic skills and inspire coastal stewardship through a cartoon learning environment. To request your CD, contact <sandra@btnep.org>. Grades K-4.

Educator's Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator's Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **Habitat Lap Sit** (Activity 1-3) - Highlights the importance of a habitat. This lesson requires cooperation from all class members. Grade 4.
- **Wetlands in a Pan** (Activity 1-4) - Demonstrates the functions of a wetland. Students create models, test them, and evaluate their effectiveness. Grades 3-4.
- **We are Losing Our Wetlands** (Activity 1-5) - Students visualize how much of our wetlands are being lost. The use of measurement and calculations are incorporated in this lesson. Grades 3-4.
- **Wetland Metaphors** (Activity 1-6) - Uses metaphors to simulate the functions of the wetlands. Common household objects are used to create wetland metaphors. Grade 7.
- **Estuary Ecosystems** (Activity 1-7) - Comparison activity where students research other estuaries and compare them to BTNE. Informational research skills are incorporated in this activity. Grades 7-8.
- **Wetland Eco-Bingo** (Activity 1-8) - Game that covers all areas of the BTNE habitat and ecosystem, this is a great review activity. Grade 5.
- **A Bayou Journey in 1880** (Activity 1-16) - Guided imagery helps students relax and listen as the teacher reads the story, "A Bayou Journey to Last Island in 1880." Grade 5.
- **The Great Marsh Dilemma** (Activity 1-17) - Helps students understand the many aspects of the problems of wetland loss in Louisiana. Students role-play members of the community. Grades 7, HS Biol, HS Env Sci.
- **Where is the Barataria-Terrebonne Estuary?** (Activity 1-2) - Students identify major waterway areas in the BTNEP area using a beach ball and a large table cloth to create a map of the region. Grades K-2.
- **Ask an Expert** (Activity 4-2) - Incorporates oral history to show changes that have occurred to our coastal areas. Students conduct oral history interviews about how the Louisiana coast has changed during their lifetimes. Grades 4, 5, 7, 8, HS Biol.
- **Weaving Our Wetland Economic Web** (Activity 5-1) - Focuses on our coastal economy, both renewable and nonrenewable. Students list local economic activities, conduct a survey, and develop a concept map. Grades 5 & 7.

Lessons on the Lake – Curriculum (LPBF/SLU/NOAA)

<http://www3.selu.edu/turtlecove/lessonsonthelake>

Interactive tool to learn more about watersheds, in particular the Lake Pontchartrain Basin. The Lake Pontchartrain Basin, in Louisiana, is part of the much larger Mississippi River watershed which covers more than half of the United States. Grades 5-12.



360 Degree Views of Bayou Sauvage Project Sites (CWPPRA/USGS)

<http://lacoast.gov/media/QTVR/index.htm>

Two views of Bayou Sauvage project sites. You can see in 360 degrees by moving the mouse.

Lafourche Parish: From the Beginning – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=66>

A comprehensive guide to Lafourche Parish, its history, culture, and resources. Activities will help students better understand this important Louisiana parish. All files are in Adobe format and completely downloadable from this site. Grades 6-12.

- [What is Happening to Our Coast](#) - Describes the coastal environment and how it changes under natural and human influences.
- [Creating a Wetscape Activity](#) - Students make their own watershed to see how their water systems can be affected by what others do. Grades 5-8.
- [Coastal Morphology](#) - Describes distinct habitats within the coastal ecosystem.
- [History of the Mississippi River](#) - Presents deltaic processes and their consequences.
- [Healthy Estuary](#) - Ten focus questions and 34 indicators are used to present an overview of the environmental health of the Barataria-Terrebonne Estuary System. Grades 7-8.
- [Healthy Estuary Activity](#) - Students use an estuary guide booklet to answer a series of questions on estuary health.
- [Louisiana Seafood](#) - History of and distinctions among fishing practices, harvesting methods, catch types and production values.
- [Shrimp and Shellfish](#) - Worksheet on commercial fishing practices.
- [Function of the Wetlands](#) - Flow chart graphically depicts aspects of wetland function.
- [When You Were My Age](#) - Oral history reflects the true experience of a people and affords an opportunity for students to communicate with those who have witnessed the current history of an area.
- [A Bit of History](#) - History of the Cut Off Canal and its importance to Bayou Lafourche.

Freshwater Ecoregions of the World (WWF/TNC)

<http://www.feow.org/index.php>

Covering virtually all freshwater habitats on Earth, this first-ever ecoregion map, together with associated species data, is a useful tool. It can be used to build a foundation for global and regional conservation planning efforts, to identify outstanding and imperiled freshwater systems, to create a logical framework for large-scale conservation strategies, and to provide a global-scale knowledge base for increasing freshwater biogeographic literacy.

Coastal Louisiana – Activities (NOAA)

<http://www.coastalscience.noaa.gov/education/labook.pdf>

Information on coastal Louisiana provides the opportunity to color, connect the dots, solve mazes, try word searches and more. Grades K-4.

Estuary Characteristics (USN)

<http://www.onr.navy.mil/focus/ocean/habitats/estuaries1.htm>

Illustrated diagrams of estuaries and descriptions of their characteristics.

Exploring Estuaries (EPA)

<http://www.epa.gov/owow/estuaries/kids/>

An interactive website where students can learn factual information about estuaries, take a virtual tour of an estuary, and solve an estuary mystery.

NowCOAST (NOAA)

<http://nowcoast.noaa.gov>

Web mapping portal provides access to real-time meteorological, oceanographic, and river observations from a variety of federal, state, and university observing networks. Users may access immediate information to complement lessons on a specific estuary or coastal region, or to support general lessons on weather forecasting, watersheds, water quality, and physical oceanography.



Estuaries: Where Rivers Meet the Sea – Activities (NOAA)

<http://www.estuaries.gov>

This site has two purposes: 1) Provide information on National Estuaries Day activities, such as EstuaryLive! and local National Estuarine Research Reserve and National Estuary Program events; 2) Serve as a long-term resource on the importance of estuaries and the need to protect them.

Estuaries – Tutorial (NOAA)

<http://oceanservice.noaa.gov/education/kits/estuaries>

An overview of estuarine habitats, the threats facing them, and efforts to monitor and protect estuaries nationwide.

Seagrass Scientists (NOAA)

<http://nerrs.noaa.gov/Education/pdf/5thGradeSeagrassScientists.pdf>

Learn about the jobs that estuarine scientists and wildlife biologists perform by simulating a sampling method that measures the health of a seagrass community over time.

What is a Watershed? – Videos

http://www.conservationinformation.com/?action=learningcenter_kyw_whatisawatershed

Three educational videos about watersheds: “*What is a Watershed?*”, “*Everyone Impacts a Watershed*”, and “*Potential Sources of Pollution*”.

Locate Your Watershed (EPA)

<http://cfpub.epa.gov/surf/locate/index.cfm>

Locate your watershed by entering your ZIP code or the name of a stream, city, tribe, lake, school, or airport. Find out what citizen groups are actively trying to protect your watershed, what role your watershed plays in the national watershed network, current water use data, and more.

Wetlands Reading List (EPA)

<http://www.epa.gov/owow/wetlands/science/readlist.html>

Annotated list of reading materials for grades PreK-12.

Tides Tutorial (NOAA)

<http://oceanservice.noaa.gov/education/kits/tides>

Overview of the complex systems that govern the movement of tides and water levels. The Roadmap to Resources complements the information in the tutorial by directing you to additional information and data from NOAA and other reliable sources.

Wetlands Affect You and Me – Activities (EPA)

<http://epa.gov/gmpo/education/pdfs/WetlandsAffect.pdf>

<http://epa.gov/gmpo/education/pdfs/WetlandsAffectTeachers.pdf>

Extensive curriculum guide includes information addressing the designing of a wetland, generation of organic matter, observation and inventory of wetland soils and organisms, the construction of an aquarium, the process of wetland destruction, and the preparation and consumption of a cattail. Grades 4-6.

The Young Scientist’s Introduction to the Wetlands (EPA)

<http://epa.gov/gmpo/education/pdfs/YoungScientistsIntro.pdf>

General information, illustration, and diagrams on the wetland ecosystem, including different terms for different wetland habitats, the array of plant and animal life found in wetland habitats, and the range of professions involved in wetlands work and research. Grades 4-6.

Estuary Activity Kit (EPA)

<http://epa.gov/gmpo/education/pdfs/EstuaryActivityKit.pdf>

Information on common toxic chemicals found in households, the problem of hypoxia, research on average water use, the process of erosion and sedimentation, and the importance of wetland wildlife, such as waterfowl. Many activities include the construction of models of certain structures, such as estuaries and wetland habitats. Grades 5-7.



Wetlands: Nature's Water Wonders – Curriculum (EPA)

<http://epa.gov/gmpo/education/pdfs/WetlandsNatureWaterWonders.pdf>

Comprehensive information on wetland habitats. These materials stress the importance of human interaction with wetlands, illustrate the web of living and nonliving inhabitants of wetlands through role-play, and offer various forms of assessment for wetland activities. Grades 5-7.

Let the Cattail out of the Bag – Activity (EPA)

<http://epa.gov/gmpo/education/pdfs/Activity-Cattail.pdf>

Students encounter a “touchy-feely” bag full of wetland objects while blindfolded, in order to gain a better understanding of the sensory experiences associated with wetland habitats. Students must then hypothesize on what they felt and smelled. Grades K-6.

Wetland in a Pan – Activity (EPA)

<http://epa.gov/gmpo/education/pdfs/Activity-WetlandPan.pdf>

Using clay, carpet scraps, soil, and muddy water, students make a model wetland that demonstrates the flood-buffering and filtering effects which take place in wetland areas. Grades 3-12.

Wetland Metaphors – Activity (EPA)

<http://epa.gov/gmpo/education/pdfs/Activity-WetlandMetaphors.pdf>

In identifying the ecological functions of wetlands, students use common household items, such as sponges, antacid tablets, soap, small pillows, etc. to represent objects in the wetlands and their functions. Grades K-12.

Coastal Louisiana – Activity Book (NOAA)

<http://coastalscience.noaa.gov/education/labook.pdf>

Provides information on Coastal Louisiana and the opportunity to color, connect the dots, solve mazes, try word searches and more. Grades K-4.

Catch A Wave – Activity

<http://k12science.org/curriculum/tideproj/teacherlessons.shtml>

Students use online real-time data to guide their discovery of the causes and effects of ocean waves and tides. Grades 6-12.

More Than Just A Swamp – Puzzle (EPA)

<http://www.epa.gov/owow/wetlands/education/puzzle.html>

Wetland terminology is provided with an interactive crossword puzzle.

Wetlands Transects (SEA)

<http://www.sea.edu/academics/k12.asp?plan=wetlandstransects>

Students place transect lines beside a local stream or river, then record species of plants and insects living around the waterway. Students learn transect techniques and other sampling methods, and compare species diversity and density among transects.

Currents Tutorial (NOAA)

<http://oceanservice.noaa.gov/education/kits/currents>

Overview of the types of ocean currents, what causes them, how they are measured, and how they affect our lives, including animations.

Functions and Values of Wetlands in Louisiana – Bulletin (LSUAC)

<http://www.lsuagcenter.com/en/communications/publications/Publications+Catalog/Environment/Wetlands/Functions+and+Values+of+Wetlands+in+Louisiana.htm>

Overview of wetlands in Louisiana.

Portrait of an Estuary – Bulletin (LSUAC)

<http://www.lsuagcenter.com/en/communications/publications/Publications+Catalog/Environment/Wetlands/Portrait+of+an+Estuary.htm>

Description of Louisiana estuaries.

Eco Pros Wetlands – Activities

<http://www.eco-pros.com/wetlands.htm>

Interactive website provides basic information about wetlands along with lesson plans and activities.



Ready, Set, Get Wet – Activities (EPA)

<http://epa.gov/gmpo/education/pdfs/ReadySetGetWet.pdf>

Various activities include a picture search, preparation tips for visiting a wetland area, experiments involving growing wetland algae and designing wetland models, and constructing a food web. Grades 3-5.

Web Quest (CWPPRA/USGS)

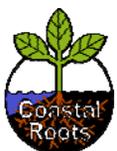
<http://www.lacoast.gov/education/classroom/webquest.htm>

Secondary-level WebQuest teaches more about Louisiana wetlands.

America's Wetland Education Page (AWF)

<http://www.americaswetland.com/custompage.cfm?pageid=28>

Student-friendly website includes teacher resources.



Coastal Erosion

Educator's Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btneep.org/default.asp?id=64>

The BTNEP Educator's Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **We are Losing Our Wetlands** (Activity 1-5) - Students visualize how much of our wetlands is being lost with the aid of measurement and calculations. Grades 3-4.
- **Coastal Erosion: Making Sense of it All** (Activity 1-10) - Students create concept maps explaining the effects of coastal erosion on Louisiana. Students research information and orally present their findings. Grades 3-5, 8.
- **Demonstration Destruction** (Activity 1-11) - Students create a model of a coastal area and demonstrate a negative effect on the environment. The students are divided into groups, each group taking a factor that causes coastal erosion. Grades 3-5, 8.
- **Investigating Habitat Change** (Activity 1-12) - Mapping skills are developed as students collect data and determine the percentage of land loss over several periods of time. Grades 5 & 8.

Claude & Clawdette's Estuary Adventure – Activities (BTNEP)

http://educators.btneep.org/client_files/editor_files/CCEA-Cartoon%2010.pdf

Students finish a story about boats and coastal erosion using this activity page.

Haunted Waters – Video Clips (BTNEP)

<http://educators.btneep.org/default.asp?id=61>

An award winning documentary on the cultural, geologic, and environmental history of the Barataria-Terrebonne National Estuary System.

- **Settling of the Land** (Clip 4) - Describes the building of Indian mounds in the time of Jean Lafitte, the presence of native wildlife, and the settling of German immigrants and West African slaves with help of the Native Americans.
- **Levees** (Clip 7) - Explains why levees were built and how they prevented further flooding like the Flood of 1927. Wendell Curole, Dr. Davis, and Mark Schexnayder show physical evidence of what levees did for the sugar cane farmers in lower Louisiana.
- **Flooding and Sugarcane** (Clip 8) - Clip 8 begins where Clip 7 ended, adding information about the hydrologic system of lower Louisiana and the problems of living in low lying areas. Students are encouraged to think critically about how levees changed the landscape and how fertilizer affects our waterways.
- **Oil Business** (Clip 13) - Details the detrimental impacts of oil industry activities on the health of coastal wetlands.
- **Death by Sea** (Clip 17) - Examples of the effects hurricanes can have on the Barataria-Terrebonne ecosystem.
- **Erosion Rates** (Clip 18) - Describes what is happening to our Barrier Islands and shows how quickly the land forms that protect us from hurricanes are disappearing. A map is shown of how Louisiana will look in the year 2040.

EstuaryLive! – Video Clips (BTNEP)

<http://educators.btneep.org/default.asp?id=69>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary's importance to the nation.

- **Levees** (Clip 11) - Mr. Wendell Curole explains the importance of the levees and why they were built.
- **Oil** (Clip 12) - Kerry St. Pé briefly introduces the importance of the local offshore oil industry.
- **Salt Water Intrusion** (Clip 15) – Why are stable salinity levels important in different parts of the estuary?



Rescuing the Treasure – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=63>

A sequel to “*Haunted Waters, Fragile Lands*,” this video describes the importance of estuaries and restoration techniques.

- **Land Loss - 2040 Map** (Clip 2) - Explains the wetlands as our living resource, what an estuary is and what BTNEP is. Also shows a map of Louisiana’s land loss from 1950 until 2040.

EstuaryLive! – Activities (BTNEP)

<http://estuarylive.btnep.org/default.asp?id=26>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary’s importance to the nation.

- **Louisiana's Coastal Plain: A Look at Land Loss** - PowerPoint slides show progressive land loss from 1839-2020. Grades 4-12.
- **BTNEP: Changes Over Time** - Students answer questions about changes in the Golden Meadow wetlands based on their analyses of comparative land use maps. Grades 6-12.
- **Salt Marsh Activity Book: Why Are We Losing Salt Marsh?** - Color the picture and answer questions about progressive land loss. Grades 2-6.
- **BTNEP Coastal Land Loss** - Colored map printout shows land loss from 1839-2020. Grades 4-12.

Washing Away – DVD (LPB/PBS)

<http://www.lpb.org/programs/washingaway/>

A documentary about the loss of Louisiana's coastal wetlands produced in August of 2007.

“*Washing Away*” tells the stories of six Louisianans and how the storms affected the coastline, their land and their livelihoods. These people share their stories and their knowledge of the larger impacts of coastal land loss on the environment, wildlife, the economy, industry, culture and communities. Lesson plans supplement the documentary. For a copy of this program visit us at the above URL, send email to orders@lpb.org, or call the LPB at 800-973-7246. **Cost is \$25.**

MarshMission – CD

Two narrated PowerPoint presentations and a Flash movie about Louisiana’s vanishing wetlands. To request your copy of the CD, send an email to <jsche15@lsu.edu>.

- **Vanishing Wetlands** by C.C. Lockwood (approx. 27 min.)
- **Changing Landscape** by Rhea Gary (approx. 27 min.)
- **The Rise and Disappearance of Southeast Louisiana** by Dan Swenson (7 min.)

Bayou Lafourche: The Longest Street in the World – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=48>

This documentary captures the history, culture, lifestyle, environmental troubles and emerging ecological solutions of the 100-mile bayou that weaves through the Barataria-Terrebonne Estuary.

- **Saltwater Intrusion on the Bayou** (Clip 3) - Effects of intrusion on freshwater supplies.
- **Losing the Wetlands** (Clip 1) - How changes in coastal wetlands directly affect the lives and livelihood of the people who live there.

Spirit of the Estuary: Using Art to Understand Ecology – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=76>

A multi-disciplinary curriculum that addresses wetland environmental issues through the integration of fine art, language art, science, and social studies. Grades 6-12.

- **Dialogue: Disappearing Wetlands** (Activity 2-13) - Students analyze David Bates’ painting, *Grassy Lake*, generating and interpreting a list of what they observe in the painting; improvise a dialogue between two people in a canoe in a swamp; write a dialogue about the disappearing wetlands in Louisiana; research the wetlands of the BTNEP for the purpose of creating a script that will be shared with an audience; critique, edit and revise each others’ work; learn techniques needed to create a tape of their dialogues; use the Internet to find an appropriate audience with whom to share their taped dialogues; make a fact page or brochure to provide additional wetlands information to their audience; and record daily reflections about the process in their journals.



Lafourche Parish: From the Beginning – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=66>

A comprehensive guide to Lafourche Parish, its history, culture, and resources. Activities will help students better understand this important Louisiana parish. All files are in Adobe format and are downloadable from this site. Grades 6-12.

- **What is Happening to Our Coast** - Describes the coastal environment and how it changes under natural and human influences.
- **Components of Coastal Land Loss** - States broad environmental and economic consequences when land turns to water or land is covered with water due to subsidence, sea level rise, flood control structures, canals and navigation channels, storms and wave action, herbivory, and development.
- **Oh Where Have All the Animals Gone?** - Students choose a wetland animal about which to create an information brochure.
- **Restoration History** - History is outlined in order to understand how Bayou Lafourche received funds for restoration projects.
- **A Quote From Mark Twain** - A gem of wisdom from the great author.
- **Interpreting Twain's Quote Activity** - Students express their responses to what is happening today in south Louisiana.

Wetlands & Wonder: Reconnecting Children with Nearby Nature – Video (EPA)

<http://www.epa.gov/owow/wetlands/education/wetlandsvideo/>

This 14-minute video from the U.S. Environmental Protection Agency discusses loss of wetlands and its effect on our connection to the natural world. The video includes streaming text for the hearing impaired.

The Dead Zone – Lesson Plan (EPA)

http://oceanservice.noaa.gov/education/classroom/lessons/13_ecoforecasting_deadzone.pdf

An inquiry-based lesson on what causes hypoxic conditions that produce the “Dead Zone” in the Gulf of Mexico. The maps from this pdf are an excellent resource for studying the watershed issues. Grades 9-12 but may be adapted for a younger audience.



Subsidence

Subsidence and Sea Level Rise in Louisiana: A Study in Disappearing Land (NOAA)

<http://www.magazine.noaa.gov/stories/mag101.htm>

An article showing examples of subsidence. The photography gives a true picture of what is happening to Louisiana's coastal areas.

Subsidence and Sea-Level Rise in Southeastern Louisiana: Implications for Coastal Management and Restoration (USGS)

<http://coastal.er.usgs.gov/LA-subsidence/>

Data on subsidence in southeastern Louisiana. A colored map accompanies the text.

Louisiana's Wetlands Are Sinking Under Pressure (CWPPRA/USGS)

<http://www.lacoast.gov/watermarks/2000b-06/4sinking/>

Causes and effects of subsidence in south Louisiana.

Loss of Wetlands: Subsidence – Activities (CWPPRA/USGS)

<http://www.lacoast.gov/education/FragileFringe/subsiden.htm>

Activity-based lesson on defining and demonstrating the results of subsidence.

Vanishing Wetlands, Vanishing Future – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=62>

This video on BTNEP's seven priority problems is in the style of Bill Nye the Science Guy and is best suited for middle school, though the vocabulary is applicable to high school topics.

- **Subsidence** (Clip 4) - Describes the mechanisms and effects of salt water intrusion due to subsidence. Habitat loss is shown in several ways: canals, sediment loss, salt water intrusion. It also simply states how each effects our wetland areas.

Rescuing the Treasure – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=63>

A sequel to "Haunted Waters, Fragile Lands," this video describes the importance of estuaries and restoration techniques.

- **Subsidence** (Clip 6) - Describes the effects of subsidence on local habitat and culture.

Lafourche Parish: From the Beginning – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=66>

A comprehensive guide to Lafourche Parish, its history, culture, and resources. Activities will help students better understand this important Louisiana parish. All files are in Adobe format and are downloadable from this site. Grades 6-12.

- **Subsidence-An Important Factor** - Definitions and descriptions of tectonic and compaction subsidence.
- **Subsidence Made Simple Activity** - Concepts of subsidence are demonstrated using a jigsaw puzzle.

Louisiana Wetlands Disappearing (AAPG)

http://www.aapg.org/explorer/2007/01jan/subsidence_map.cfm

Map showing subsidence in different areas of Louisiana at an inch/year ratio (Visual Simulation).

Subsidence – Activities

http://www.mysciencebox.org/files/3katrina_case.doc

Case study lesson on Katrina includes activities dealing with subsidence.

Probable Production-Induced Subsidence, Fault Reactivation, and Wetland Loss in the Gulf Coast Region – Slide Show (USGS)

<http://coastal.er.usgs.gov/gc-subsidence/slide-show/>

Secondary-level or teacher resource slide show about subsidence and how it ties to wetland loss.



Barrier Islands

Educator's Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator's Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **Barrier Islands** (Activity 1-01) - Shows how barrier islands protect coastal Louisiana from the winds and waves of storms. Students construct models and simulate the wave movements of a storm.
- **The Tragedy of Isles Dernieres** (Activity 1-15) - Investigates history and science while unraveling the tragic story of the Isles Dernieres, and offers an excellent opportunity to use modern technology. Grades 8 & HS Env Sci.

Barrier Islands as Part of and Protection for the Wetlands (CWPPRA/USGS)

<http://www.lacoast.gov/education/FragileFringe/barriers.htm>

Identifies the value of the barrier islands to the wetlands.

Barrier Island Fact Sheets (USGS)

<http://marine.usgs.gov/fact-sheets/Barrier/barrier.html>

Data and GIF images support the need to save our eroding barrier islands.

Barrier Islands: Last Island and Trinity Island

<http://www.cclockwood.com/stockimages/barrierislandslastisland.htm>

Awesome photography by C.C. Lockwood of the barrier islands of Louisiana. (Photos may not be used without express written permission.)

Northern Gulf of Mexico Ecosystem Change and Hazard Susceptibility Project (USGS)

<http://ngom.usgs.gov/index.html>

Explores the Louisiana wetland and estuary system. Good resource for sharing an active science investigation with secondary students. Grades 8-12.

Coastal Barriers

http://www.eoearth.org/article/Coastal_barriers_in_the_United_States

Information about coastal barriers and islands.

Barrier Islands: To Build or Not to Build?

<http://www.glencoe.com/sec/science/webquest/content/barrierisland.shtml>

Various uses of barrier islands result in disagreements about how they are to be managed. Should barrier islands be protected and left undeveloped? Should people be allowed to build homes and hotels on barrier islands?

Haunted Waters – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=61>

An award winning documentary on the cultural, geologic, and environmental history of the Barataria-Terrebonne National Estuary System.

- **History of Barrier Islands** (Clip 3) - Cajuns, Creoles and others of many nationalities settled in the barrier islands long ago.



Soil

The Great Plant Escape: Case 2 “Soiled Again” – Activity

<http://www.urbanext.uiuc.edu/gpe/case2/index.html>

Detective Le Plant needs you to get your hands dirty by helping him dig for clues in the soil. To solve this case, you must find out what soil is, why it is important, and in what kinds of soil plants grow. Grades 4-5.

BrainPop: The pH of Soils – Video

<http://www.brainpop.com/science/seeall/>

Short video takes the students through the pH scale and why it is so important to the soil. Look under “Science” and click on “pH scale” and soil clips. **Requires subscription.**

GLOBE Project: Soil Chapter – Activity

<http://archive.globe.gov/tctg/tgchapter.jsp?sectionId=86>

PDF chapter on soil includes protocols, field guides, learning activities, appendix and data sheets.

CyberBee: Probing Questions – Activities

<http://www.infotoday.com/MMSCHOOLS/mar02/cybe0302.htm>

Which type of soil supports more plant life? Why do you think the habitats have different pH levels in the soil? Includes sample worksheet, lesson plans, where to buy science probes for testing and links to related sites.

pH Agriculture – Lesson Plan

http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/13/3f/ad.pdf

Includes information on major components of soils, factors affecting soil pH, effect of pH on plant growth, the relationship between soil pH and nutrient availability, and more.

The Biotic and Abiotic Factors: The Relationship Between pH and the Sprouting of Corn Seeds – Lesson Plan

<http://www.rci.rutgers.edu/~dougproj/programs/outreach/Life/AbioticpH.pdf>

Enables students to identify solutions of varying pH, observe the relationship between biotic and abiotic factors affecting pH levels, and to determine optimal pH for seed growth. Grades 7 and above.

Salt Marshes – Video (NOAA)

http://oceanservice.noaa.gov/education/kits/estuaries/media/supp_estuar06a_saltmarsh.html

Shows how plants and the soil are tolerant to high and low tides; defines what a levee is and lists plants that are compatible in the salt water marshes of our coastal areas.

Soil Analysis – Activity

<http://www.mysciencebox.org/soilanalysis>

Soil analysis activity with links to specific grade levels, scientific concepts, lesson types and related topics.

Soil Net – Activities

<http://www.soil-net.com>

Ample soil information and activities for Grades 1-4.

Soil Soakers – Activities (EPA)

http://www.epa.gov/oerrpage/superfund/students/clas_act/fall/soakers.htm

Students learn to test soils’ ability to absorb and retain water and how these qualities pertain to wetlands. Grades 2-6.

Buried Treasure – Activities (EPA)

http://www.epa.gov/oerrpage/superfund/students/clas_act/fall/buried.htm

Teaches students about soil decomposition and how this process relates to wetlands. Grades 3-6.



Underground Adventure – Activities

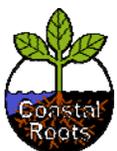
<http://www.fieldmuseum.org/undergroundadventure/>

Students decide on a research question, propose a hypothesis, establish a study site at their school, conduct field research, take notes on their findings in a scientific journal, and modify their hypothesis based on what they find. Grades 3-8.

Delineating a Wetland Using Soils – Lesson Plan

<http://www.classroomearth.org/node/183>

Students identify wetlands using soil samples in this AP Environmental Science Class lab.



Water Quality

Educator's Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator's Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **What is Freshwater and What is Saltwater?** (Activity 3-1) - Students locate Louisiana waterways and compare the Gulf of Mexico (salt water) to the Barataria Bay (freshwater).
- **The Ideal Filter** (Activity 3-2) - Focuses on the wetlands filtering system. Students design an ideal filter to simulate the job done by a wetland in purifying dirty water.
- **The Hurricane's Coming!** (Activity 3-3) - Stresses the importance of wetlands being nature's best filters and protectors. Students build models that show the function and value of wetlands as storm protectors.
- **Keep It Above Board** (Activity 3-4) - Focuses on trash decomposition in the environment. Students compare the decomposition rates of several items and create a collage.
- **Exploring the Barataria-Terrebonne Watershed** (Activity 3-5) - Contrasts the relatively flat landscape of coastal Louisiana with hillier terrain in the Tunica Hills region. Students discuss how water moves through watersheds.
- **Watershed Drainage and Sources of Pollution?** (Activity 3-6) - Involves the importance of keeping our watershed healthy. Students make a model watershed and investigate runoff, point source and non-point source pollution.
- **Understanding Nutrients: Nitrogen Cycle** (Activity 3-7) - Emphasizes the roles of phosphorus and nitrogen in aquatic plant growth. Students participate in a skit to understand the Nitrogen cycle.
- **Understanding Nutrients: Phosphorus Cycle** (Activity 3-8) - Emphasizes the role of phosphorus in aquatic plant growth on our ecosystems. Students participate in a game.
- **The Effect of NO₃ on Plant Growth** (Activity 3-9) - Investigates the effects of various concentrations of fertilizer on plant growth. Students design an experiment on fertilizer, record results after one week and draw conclusions from their data.
- **Measuring the Bayou's Vital Signs** (Activity 3-10) - Investigates the water quality of Bayou Lafourche. Students test Bayou Lafourche water for effects of various concentrations of fertilizer on plant growth and other water quality issues.

Healthy Water, Healthy People – Activities

<http://www.projectwet.org>

Innovative water quality education program sponsored by [Project WET](#) and the Hach Scientific Foundation, offering hands-on activity guides, testing kits, training, and more. This unit is for anyone interested in learning and teaching about contemporary water quality education topics.

- **Mapping It Out** (Pp. 6-8) - Uses two excellent teaching techniques: the KWL process and Concept Mapping. Students express prior knowledge of water quality.
- **From H to OH!** (Pp. 15-20) - Allows students to simulate the creation of acids and bases.
- **Grab a Gram** (Pp. 29-34) - Introduces basic water quality measurements like parts per million (ppm) and milligrams per liter (mg/L).
- **Multiple Perspectives** (Pp. 55-59) - Entails completing a set of activities showing different points of view about water quality.

Monitoring Estuarine Water Quality – Activities (NOAA)

<http://apps.datainthe classroom.org/water-quality/>

Features five activities at different levels to teach about monitoring water quality using real data. Grades 6-8.



Vanishing Wetlands, Vanishing Future – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=62>

This video on BTNEP's seven priority problems is in the style of Bill Nye the Science Guy and is best suited for middle school, though the vocabulary is applicable to high school topics.

- **Fish Kills** (Clip 5) - Measurements can detect minerals and chemicals that can be harmful to fish. Crop fertilization is performed in ways that cause minimal damage to wetlands.
- **Pathogen Contamination** (Clip 6) - Proper detection and sewage treatment procedures keep pathogens from reaching open wetlands.
- **Oyster Industry** (Clip 7) - Discusses commercial impact of oyster industry on Barataria-Terrebone area.
- **Toxic Substances** (Clip 8) - Presents sources of toxins in the wetlands and describes how toxins can harm the environment.

Give Water a Hand – Action Guide (EPA)

<http://epa.gov/gmpo/education/pdfs/GiveWaterHand.pdf>

<http://epa.gov/gmpo/education/pdfs/GiveWaterHand-Leader.pdf>

An extensive program on the importance of the protection of water, including activities and research projects on how to ensure the water quality of a certain area. Grades 4-8.

Can Sea Water Freeze? – Activity (NASA)

http://aquarius.nasa.gov/pdfs/sea_water_freeze.pdf

Freeze liquids of varying salinity; learn how salinity relates to the buoyancy of sea ice and icebergs.

Properties of Fresh & Sea Water – Activity (NASA)

http://aquarius.nasa.gov/prop_fresh_sea.php

Conduct experiments on the boiling point, freezing point, and heat capacity of fresh water and sea water.

Stacking Water – Lesson Plan (SEA)

<http://www.sea.edu/academics/k12.asp?plan=stackingwater>

Students use clear straws to stack colored water of different salinities. Grades 6-12.

Tides Tutorial – Activities (NOAA)

<http://oceanservice.noaa.gov/education/kits/tides>

Overview of the complex systems that govern the movement of tides and water levels. The Roadmap to Resources complements the information in the tutorial with additional information and data from NOAA and other reliable resources.

Waters of the Earth – Lesson Plan (SEA)

<http://www.sea.edu/academics/k12.asp?plan=watersoftheearth>

Students create a visual display showing the distribution of water on earth. Grades K-10.

Evaporation Investigation – Activity (NASA)

http://aquarius.nasa.gov/evap_invest.php

Observe and understand the process of evaporation. Grades 1-6.

Magnificent Ground Water Connection – Activities (EPA)

<http://www.epa.gov/region01/students/teacher/groundw.html>

Printable lessons and worksheets on ground water, the water cycle, water conservation, water contamination, and water protection. Grades K-12.

Morphie's Great Water Ride Adventure – Activities

<http://www.on.ec.gc.ca/greatlakeskids/morphie-home-e.html>

Learn about the water cycle by riding through it with Morphie Raindrop. Grade 2.

Thirstin's Water Cycle (EPA)

http://www.epa.gov/safewater/kids/flash/flash_watercycle.html

Students control the water cycle as they learn in this interactive, animated activity. Grades 1-5.



Water Cycle: Now You See It, Now You Don't – Activities (NASA)

http://aquarius.nasa.gov/water_cycle.php

Learn about the relationship between temperature and condensation. Grades 2-5.

Water Cycle Game – Activity (NOAA)

<http://response.restoration.noaa.gov/watercyclegame>

Explains the complexity of the water cycle through role-playing as a molecule of water.

Fragile Fringe – Activities (USGS)

http://www.nwrc.usgs.gov/fringe/ff_index.html

Guide for teaching about coastal wetlands.

What is a Watershed? – Videos

http://www.conservationinformation.com/?action=learningcenter_kyw_whatisawatershed

Three educational videos about watersheds: “*What is a Watershed*,” “*Everyone Impacts a Watershed*,” and “*Potential Sources of Pollution*.”

Water Sourcebooks (EPA)

<http://www.epa.gov/safewater/kids/wsb/>

Environmental education program explains the water management cycle, showing how it affects all aspects of the environment. All 324 activities include hands-on investigations, fact sheets, reference materials, and a glossary of terms. Grades K-12.

Density: Sea Water Mixing & Sinking – Activity (NASA)

http://aquarius.nasa.gov/seawater_mix_sink.php

Uses temperature-salinity (T-S) diagrams to understand seawater density. Grades 6-12.

Dive In! – Lesson Plan (NOAA)

<http://www.uncw.edu/aquarius/education/lessons/Aq%20Dive%20In.pdf>

How do buoyancy, pressure, and light affect the work of underwater scientists? Archimedes' Principle and how light is affected as it passes through water are investigated; students compare and contrast atmospheric and underwater pressure. Grades 9-12.

Electrolysis of Salt Water – Activities (NASA)

<http://aquarius.nasa.gov/electrolysis.php>

Conduct an experiment to see that water can be split into its constituent ions through the process of electrolysis. Grades 9-12.

Liquid Rainbow – Activities (NASA)

http://aquarius.nasa.gov/liquid_rainbow.php

Use analytical thinking by devising schemes to stack solutions of different densities. Grades 1-5.

Potato Float – Activities (NASA)

http://aquarius.nasa.gov/potato_float.php

Understand how the same object can both sink and float, depending on its density relative to a fluid. Grades 4-8.

Locate Your Watershed (EPA)

<http://cfpub.epa.gov/surf/locate/index.cfm>

Locate your watershed by entering your ZIP code or the name of a stream, city, tribe, lake, school, or airport. Find out what citizen groups are actively trying to protect your watershed, what role your watershed plays in the national watershed network, current water use data, and more.

Off Base – Lesson Plan (NOAA)

<http://oceanexplorer.noaa.gov/explorations/08lophelia/background/edu/media/offbase.pdf>

Students learn to: define pH and buffer; explain in general terms the carbonate buffer system of seawater; explain Le Chatelier's Principle; predict how the carbonate buffer system of seawater will respond to a change in concentration of hydrogen ions; identify how an increase in atmospheric carbon dioxide might affect the pH of the ocean; and discuss how this alteration in pH might affect biological organisms. Grades 9-12.



Water Analysis Lesson – Activity

<http://www.mysciencebox.org/wateranalysis>

Basic water analysis lesson.

Lessons on the Lake: Rollin' Down the River: Riverine Systems – Activities (USGS)

<http://pubs.usgs.gov/of/1998/of98-805/lessons/chpt4/index.htm>

Teaches about river systems and watersheds.

The Global Water Sampling Project – Activities

<http://www.k12science.org/curriculum/waterproj/environmentalscienceactivities.shtml>

International cooperative project includes resources and lessons about water quality.

Louisiana 2006 Water Quality Assessment Report (EPA)

http://iaspub.epa.gov/waters10/attains_index.control?p_area=LA

Report on water quality levels for Louisiana.

Mississippi River Water Quality: Implications for Coastal Restoration (CWPPRA/USGS)

<http://www.lacoast.gov/reports/its/MRWQ.pdf>

Secondary-level or teacher resource bulletin tying water quality to coastal restoration efforts.

Louisiana Hydrowatch (USGS)

<http://la.water.usgs.gov/default.html>

Hydrologic data for Louisiana, including data collection sites and maps, best for secondary classrooms.



Point and Non-Point Source Pollution

Educator's Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

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- **Swamp Sweep** (Activity 3-11) - Students conduct a scientific investigation to determine amounts, types, and sources of debris found along a selected waterway within their community. Results are used to make a positive change towards the problem. Grade 7.

Project WET – Activities

- **Just Passing Through** (pp. 166-170) - Learn how vegetation affects the movement of water over land surfaces and helps prevent erosion.
- **A-maze-ing Water** (pp. 219-222) - Learn how runoff water can pick up pollutants and carry them through storm water systems.
- **Sum of the Parts** (pp. 267-270) - Distinguish between point and non-point sources of pollution, and understand how everyone contributes to water pollution in a river system.

Healthy Water, Healthy People – Activity

- **Footprints On The Sand** (pp. 90-97) - Students simulate development of a beachfront community to explore the possible effects of development on water quality.

Non-point Source Kids Page – Activities (EPA)

<http://www.epa.gov/owow/nps/kids/>

Topics dealing with non-point source pollution at different levels, with activity sheets and articles. Grades 2-6.

Splash

<http://www.conservationinformation.org/index.asp?site=1&action=products&deptID=9&dept=CDs>

A sailboat tours different areas selected by students and helps students find sources of non-point and point pollution. This interactive game is **available on CD for a minimal fee (around \$9.00)**.

Ohio State University Extension Fact Sheet

<http://ohioline.osu.edu/aex-fact/0465.html>

Extensive chart listing non-point source pollutants and their sources. It also shows graphics of point source pollution examples and summarizes the Clean Water Act of 1972.

What's the Point? Point vs. Non-point – Lesson Plan

http://www.saws.org/education/H2o_university/Elementary/ClassModules/docs/What's_the_Point.pdf

Activity-based lesson with graphic organizer that can be used as a Pre- and Post-test.

Rainwater Blues DVD (DNR)

Today non-point source (NPS) pollution remains the nation's largest source of water quality problems. It is the reason that approximately 40% of our rivers, lakes and estuaries are not clean enough to meet basic uses such as fishing or swimming. To order a free "Rainwater Blues" educational video contact Linda Pace, Louisiana Department of Natural Resources, Coastal Resources Scientist Supervisor, (800) 267-4019, <linda.pace@la.gov>. Please indicate whether you would like the 15- or 30-minute version. **Free upon request.**

Pollution – Tutorial (NOAA)

<http://oceanservice.noaa.gov/education/kits/pollution>

Presents the history and types of non-point source pollution, methods used to detect pollutants, and assess and reduce their damaging effects on the environment. The Roadmap to Resources complements the information in the tutorial by directing you to additional information and data resources from NOAA and other reliable sources.



Vanishing Wetlands, Vanishing Future – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=62>

This video on BTNEP's seven priority problems is in the style of Bill Nye the Science Guy and is best suited for middle school, though the vocabulary is applicable to high school topics.

- **Fish Kills** (Clip 5) - Measurements can detect minerals and chemicals that can be harmful to fish. Crop fertilization is performed in ways that cause minimal damage to wetlands.
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- **Toxic Substances** (Clip 8) - Presents sources of toxins in the wetlands and describes how toxins can harm the environment.

Marine Debris – Coloring Book (NOAA)

<http://www.education.noaa.gov/books/debris/debris1.htm>

Helps kids understand how to recognize the hazards of throwing junk into the ocean and overboard from boats.

It All Runs Down Hill – Activity (NOAA)

http://oceanservice.noaa.gov/education/for_fun/ItAllRunsDownhill.pdf

Simple student activity in which a model of a watershed is created to show how rainfall carries pollution into the ocean and other bodies of water.

Turning the Tide on Trash: Marine Debris – Curriculum (EPA)

<http://www.epa.gov/owow/OCPD/Marine/contents.html>

An extensive learning guide on how water pollution threatens the vitality of the world's ocean systems. Activities include ways to see how marine debris, such as human trash, can cause discomfort and harm to marine wildlife.

Mercury is Rising – Activity

http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive1203.html

Calculate the amount of fish a person can eat per month in order to stay within acceptable limits of the EPA's mercury guidelines.

You Can Protect Our Waters – Bulletin (LSUAC)

http://www.lsuagcenter.com/en/communications/publications/Publications+Catalog/Environment/Water+Quality/You+Can+Protect+Our+Waters_seriespage-2.htm

Basic bulletin from LSU Ag Center introducing water pollution.

Watersheds and Wetlands – Activity

<http://www.mysciencebox.org/wetlands>

Basic lesson series teaching about watershed pollution and how it ties to the wetlands.

Lessons on the Lake: Pontchartrain Basin: A Watershed – Lesson Plan (USGS)

<http://pubs.usgs.gov/of/1998/of98-805/lessons/chpt1/index.htm>

Created by the Lake Pontchartrain Basin foundation. Teaches about watersheds and wetland pollution.

Lessons on the Lake: Liquid Assets: Our Water Resources – Lesson Plan (USGS)

<http://pubs.usgs.gov/of/1998/of98-805/lessons/chpt5/index.htm>

Created by the Lake Pontchartrain Basin foundation. Teaches about protecting our water resources.



Hurricanes

Educator's Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator's Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **The Hurricane's Coming!** (Activity 3-3) - Stresses the importance of wetlands being nature's best filters and protectors. Students build models that show the function and value of wetlands as storm protectors.

Preparing Your House for a Hurricane (CWPPRA/USGS)

http://lacoast.gov/education/kids/hurricane/hurricane_house.htm

Basic information about hurricanes, including definitions of watch and warning. The last slide has the viewer pick up outdoor items and store them in the proper location, as well as boarding up windows and shutting doors.

Getting Hurricane Supplies (CWPPRA/USGS)

http://lacoast.gov/education/kids/hurricane/hurricane_supplies.htm

Basic information about hurricanes, including definitions of eye and cloud wall. Viewer clicks on portions of the slide to answer questions. The last slide has viewer placing the most important items needed for hurricane preparedness into a supply box.

Willful Winds: Hurricane Andrew and Louisiana's Coast – Booklet (CWPPRA/USGS)

<http://lacoast.gov/education/willfulwinds/index.htm>

Details the impact of Hurricane Andrew on Louisiana's coast.

EstuaryLive! – Activities (BTNEP)

<http://estuarylive.btnep.org/default.asp?id=26>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary's importance to the nation.

- **Packing it on! The Width of Levees** - Students respond to questions about the Golden Meadow Hurricane Protection Levee.
- **Keeping up with the Surge!** - Students analyze effects produced by the Golden Meadow pump station under various conditions.
- **Standing Up to the Surge!** - Students perform calculations and volumetric measurements pertinent to design and building of the Golden Meadow Hurricane Protection Levee.
- **Hurricanes Isidore and Lili: A View from Space** - Satellite images are analyzed to answer questions about the forms of hurricanes.
- **Hurricanes Isidore and Lili: Another Look** - Students analyze storm track diagrams.
- **Hurricanes Isidore and Lili: East Timbalier Island** - Students analyze storm effects on East Timbalier Island.
- **Hurricanes Isidore and Lili: Trinity Island** - Students compare photos to look for differences in land area and other qualities after hurricanes.

Weather Information – Booklet (NOAA)

<http://www.oar.noaa.gov/k12/html/teacherinfo.html>

Provides research and investigation experiences using online resources on El Niño, hurricanes, and weather.

Forces of Nature

<http://environment.nationalgeographic.com/environment/natural-disasters/forces-of-nature.html>

Created to accompany a National Geographic film, this site offers explorations of the biggest forces our earth can bring us: tornadoes, earthquakes, volcanoes and hurricanes. Virtual labs let you design your own disaster, and National Geo-quality photos fill in the gaps of your visual imagination.



Hurricane Basics (NOAA)

http://www.climate.noaa.gov/education/hurricanes/hurricane_basics.pdf

Offers resources and information about hurricanes, including how they form and grow. It also includes the cycle of Atlantic storm names for the years 2005 through 2010 and a tracking chart for the Atlantic/Caribbean Sea site.

Hurricane Names (NOAA)

<http://www.nhc.noaa.gov/aboutnames.shtml>

Hurricanes have names that are taken from a central list. Is your name there? Take a look at the names for the Worldwide Tropical Cyclone Names that are to be used for storms in the Atlantic and the Pacific as well as the waters around Australia, the Fiji Islands and India.

Hurricane Education Materials – Activities (NOAA)

<http://www.climate.noaa.gov/index.jsp?pg=education/hurricanes/materials.jsp>

Hurricane related activities, including a storm surge lesson, a family disaster plan, hurricane awareness, basics, and a fact sheet, posters, booklets and links to further activities. Grades 9-12.

Hurricanes (NOAA)

<http://www.oar.noaa.gov/k12/html/hurricanes2.html>

Basic hurricane information and a web-based activity on graphing hurricane related data.

Hurricane Tracking Chart (NOAA)

http://www.nhc.noaa.gov/gifs/track_chart.gif

Track Atlantic hurricanes using this gif image of the Atlantic Ocean from Nova Scotia to northern South America and the Gulf of Mexico.

National Hurricane Center Home Page (NOAA)

<http://www.nhc.noaa.gov/>

Learn about the history of noteworthy storms, hurricane direct hits on the mainland U.S. coastline and for individual states from 1900-1996.

Saffir-Simpson Hurricane Scale (NOAA)

<http://www.nhc.noaa.gov/aboutsshs.shtml>

A 1-5 rating based on the hurricane's intensity, this scale is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall. Wind speed is the determining factor in the scale, as storm surge values are highly dependent on the slope of the continental shelf in the landfall region.

Sea State – Activities

http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive0906.html

Being able to accurately forecast the conditions at sea has been the goal of explorers, sailors, and fishermen for thousands of years. Now, through the use of ocean observing systems, we can not only predict, but pinpoint, exactly what the sea will be like before leaving the dock.

Masters of Disaster – Curriculum

<http://www.redcross.org/disaster/masters>

Helps teachers integrate disaster safety concepts into lesson plans.

National Severe Storm Laboratory's Weather Room – Activities (NOAA)

<http://www.nssl.noaa.gov/edu/>

General information about tornadoes, hurricanes, lightning and thunderstorms. Includes weather lessons, a basic introduction to map analysis and interpretation, and information about weather careers. Elementary school coloring books are available for printing and use for weather education.

NCDC S.C.H.O.L.A.R.S. – Activities (NOAA)

<http://www.ncdc.noaa.gov/oa/edu.html#scholars>

Provides a wide range of printable materials for use in teaching about climate changes and various weather phenomena, such as hurricanes and tornadoes.



Forecast Watch – Activities (NOAA)

<http://www.noaawatch.gov/>

A roundup of NOAA weather Web sites, including links to the latest weather forecasts around the USA and around the world. Track storms through NOAA weather satellites, get the latest weather maps and learn how to protect yourself and your community from severe weather.

Past Weather – Activities (NOAA)

<http://www.ncdc.noaa.gov/oa/ncdc.html>

A roundup of NOAA Web sites that contain archived weather information. Official weather records date back to 1895. Obtain certified weather information for a court case, building project or other purpose.

Play Time for Kids – Activities (NOAA)

<http://www.nws.noaa.gov/om/reachout/kidspage.shtml>

Designed to help kids learn about hurricanes, winter storms, thunderstorms, and other hazardous weather.

NOVA ScienceNOW: Hurricanes – Lesson Plan (PBS)

http://www.pbs.org/wgbh/nova/teachers/activities/3204_02_nsn.html

Models how wetlands reduce the intensity of a hurricane.

Kid's Hazards Quiz – Activities (NOAA)

<http://www.ngdc.noaa.gov/hazard/kgStart.shtml>

Natural hazards such as earthquakes, tsunamis, and volcanoes affect both coastal and inland areas. Select your quiz subject from thunderstorms, tornadoes, hurricanes, floods, winter storms, tsunamis, volcanoes, landslides, and wildfires. You can also set up a family disaster plan from this web site.

Hurricane on the Bayou – Video

<http://www.hurricaneonthebayou.com>

Dynamic IMAX movie created during Hurricane Katrina teaching about the impact of hurricanes on the Louisiana coast. Includes resources for teaching lessons about the movie. **Movie can be ordered via a link on the site.**

Hurricane Force: A Coastal Perspective – Videos

http://www.open-video.org/featured_video.php?type=Related&videoid=4560&PHPSESSID=5cb816611751559645c8026db3c85bcd

Series of video clips describing the impact of hurricanes on the Gulf Coast.



Human Impacts

Project WILD – Lessons

Only available to teachers by attending a workshop. For information on **how to sign up for a workshop** email <info@projectwild.org>.

- **Ethi-Thinking** (Pp. 303-304) – Students list activities that might be harmful to wild plants and animals.
- **Changing the Land** (Pp. 345-352) – Humans affect biological communities in many ways. (This activity can also be used with the BTNEP Map.)

Educator’s Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator’s Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **Coastal Wetlands Needs You!** (Activity 1-14) - Encourages the students to brainstorm ways they can contribute to solving and abating the problems associated with coastal land loss and habitat destruction. Students create a Citizen Action Brochure. Grades 2, 3, 5, 7, HS Biol.
- **Issue Analysis and Decision Making** (Activity 1-13) - Students conduct research on potential restoration options, then discuss risks and benefits of a freshwater diversion project. Grades 7, 8, HS Env Sci.
- **Swamp Sweep** Activity (3-11) - Focuses on debris found along a selected waterway within their community. Students conduct a scientific investigation and use the results to make a positive change toward solving the problem. Grade 7.

Spirit of the Estuary: Using Art to Understand Ecology – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=76>

A multi-disciplinary curriculum that addresses wetland environmental issues through the integration of fine art, language art, science, and social studies. Grades 6-12.

- **The Material of Culture** (Activity 1-2) - Students research cultural artifacts; study the process of creating material culture; create an exhibit of Native American, African, and/or Cajun/Creole cultural artifacts.
- **To Build or Not to Build** (Activity 1-3) - Students learn that Louisiana’s coast is disappearing at a catastrophic rate; compare and evaluate a variety of actual coastal restoration techniques; use accurate scientific terminology to discuss basic facts of coastal zone management; describe examples of current problems associated with land loss; develop a PSA to create an awareness of coastal land loss issues; analyze restoration projects that identify and remediate coastal and loss problems; prepare an evaluative presentation that critiques current practices.
- **Where Has All the Green Space Gone** (Activity 1-4) - Students identify greenspace, natural areas and/or other important sites in the BTNE; research history of development in the BTNE; reflect on the ecological impact of urbanization; construct a green map; and communicate student findings to the community.
- **Architecture of the B-T Basin** (Activity 1-7) - Students gather information on the characteristic features of the traditional architectural styles found in the Barataria-Terrebonne Estuary; organize the features in a graphic organizer; visit at least one historic building in their community; choose and draw a building that displays features of one of the traditional styles; contrast the traditional styles with modern architectural styles and discuss the importance of preserving historic buildings.
- **Form & Function of Boat Designs** (Activity 1-8) - Students study, compare and contrast the design features of four boat types described in the handout *The Form and Function of Louisiana Fishing Boats* and on the Louisiana Folklife website; create a Venn diagram to highlight the similarities and differences between two fishing boat designs; draw their favorite fishing boat designs either from life (preferred if possible) or from a photograph; describe and explain in both oral and written form the design features they consider most important to the specific job their chosen boat does and how form follows function.



Wetland Loss: Digging of Canals – Activities (CWPPRA/USGS)

<http://www.lacoast.gov/education/FragileFringe/canals.htm>

Illustrates the destruction of wetlands that resulted from the digging of canals for oil and gas exploration in the coastal wetlands and cypress logging in the swamps. Grades 4-8.

Salt Marsh Habitat of the Barataria-Terrebonne Estuary – Activity Book (BTNEP)

BTNEP Activity Book. To obtain a copy call 800-259-0869. *Free upon request.*

- **From Marsh to Marina** (Pp. 21-23) - Shows the changes that can occur in a marsh and how humans have impacted the area to meet their needs.
- **Why Are We Losing Salt Marsh?** (Pg. 24) - Shows how land loss occurs through natural causes and man's activities.

Rescuing the Treasure – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=63>

A sequel to “*Haunted Waters, Fragile Lands*,” this video describes the importance of estuaries and restoration techniques.

- **Tourism** (Clip 4) - Presents aspects of the ecosystem that attract visitors who can't see these attractions anywhere else in the world.
- **Problems of the Future** (Clip 7) - Shows consequences of wetland loss. Students are asked to think about what they can do to help with this situation.
- **Solutions and the Future** (Clip 8) - Gives possible future solutions to help prevent the loss of our wetlands. BTNEP brings citizens, public officials and scientists together to come up with solutions. Citizen involvement is one of the most effective ways to save our wetlands.
- **This is Our Future** (Clip 9) - Shows how Louisiana's wetlands help the whole United States, not just Louisiana (seafood industry, oil and gas industry, recreational activities, wildlife, etc.).

EstuaryLive! – Activities (BTNEP)

<http://estuarylive.btnep.org/default.asp?id=26>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary's importance to the nation.

- **Hypoxia: Root of the Dead Zone** - A bar graph helps students understand effects of hypoxia on the wetlands.

Lafourche Parish: From the Beginning – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=66>

A comprehensive guide to Lafourche Parish, its history, culture, and resources. Activities will help students better understand this important Louisiana parish. All files are in Adobe format and are downloadable from this site. Grades 6-12.

- **A Quote From Mark Twain** - A gem of wisdom from the great author.
- **Interpreting Twain's Quote Activity** - Students express their responses to what is happening today in south Louisiana.
- **Early Man in Louisiana** - Information and maps describing prehistoric settlers of the bayou.
- **Bayou Indians Activity** - Students research crafts, lifestyles, and customs of the bayou's original inhabitants, and create an object that reflects a part of their heritage.
- **Researching the Bayou Indians** - Students select a tribe to research and answer questions about tribal relationships with the Federal Government.
- **European Man in Louisiana** - History of the settling of Louisiana by explorers and people of various nationalities.
- **Investigating European Man in Louisiana Activity** - A worksheet helps students recall key events and people in local history.
- **Sugar Time Activity** - Students create a timeline of the growth and development of the sugar industry.
- **Louisiana Oil Industry** - Describes both the importance of the local oil industry and how it threatens the ecosystem.



Empty Oceans – Lesson Plan (NOAA)

http://www.sanctuaries.noaa.gov/education/teachers/pdfs/sustain_seafood_lesson2.pdf

How does the human population affect the population of marine species? What can citizens do to sustain seafood populations? Grades 6-8.

National Marine Sanctuaries – Activities (NOAA)

<http://www.sanctuaries.noaa.gov/education/teachers/features/lpexplore.html>

Explore our national marine sanctuaries and learn about habitats and human impacts.

Oceans Connecting a Nation – Activities

http://k12science.org/curriculum/oceansproj_new/index.html

Urges students to consider the impact humans are having on the oceans. Grades 8-12.

Blue Frontier Oceans for Life – Lesson Plans

<http://www.nationalgeographic.com/seas/>

Multimedia approach promotes ocean exploration and conservation. Underwater expeditions to National Marine Sanctuaries provide case studies and data for lesson plans. Topics include: biological oceanography; ocean regions and habitats; physical ocean process; human links to and impacts on the ocean; applications of oceanography. Virtual expeditions link the classroom experience with the individual National Marine Sanctuaries, research methods and technology, and researchers' experiences. **Free, on-line teacher workshops** feature top ocean researchers and policy makers.

Keep Away – Lesson Plan (NOAA)

<http://oceanexplorer.noaa.gov/explorations/06mexico/background/edu/GOM%2006%20KeepAway.pdf>

Students discuss the meaning of biological diversity and compare and contrast the concepts of variety and relative abundance as they relate to biological diversity. Given information on the number of individuals, number of species, and biological diversity at a series of sites, students make inferences about the possible effects of oil drilling operations on benthic communities.

The Dead Zone – Lesson Plan (NOAA)

http://oceanservice.noaa.gov/education/classroom/lessons/13_ecoforecasting_deadzone.pdf

Inquiry-based lesson on what causes hypoxic conditions that produce the “dead zone” in the Gulf of Mexico. The maps from this pdf are an excellent resource for studying watershed issues. Grades 9-12 but may be adapted for a younger audience.

Human Disturbances of the Estuaries (NOAA)

http://oceanservice.noaa.gov/education/kits/estuaries/media/supp_estuar09a_toxic.html

Data on fertilizers and toxic substances that damage coastal areas.

Waterlife: Where Rivers Meet the Sea – Activities (NOAA)

<http://oceanservice.noaa.gov/education/waterlife/welcome.html#top>

Interactive story based on estuarine environment introduces the estuary, its diverse ecosystems, tidal influences, restoration efforts, and marine debris. Emphasizes personal responsibility and care for environment. (NOTE: This product is still in the development stages, keep visiting the website for more details.)

Who Moved the Beach? – Lesson Plan (NOAA)

http://oceanservice.noaa.gov/education/classroom/lessons/09_coastmanag_erosion.pdf

Identify the primary causes and impacts of coastal erosion, and how human communities should respond to this process. For advanced 8th (Honors), and 9-12th graders.



Animals of the Coastal Zone

Educator's Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator's Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **A Song on the Bayou** (Activity 4-1) - Focuses on a song about *Cocodrie* (alligators), by a Cajun music artist, Papillon. Students compare a nutria to an alligator and discuss how these animals function and survive in their habitat. Grades 3-4.
- **The Story of a Blue Crab** (Activity 2-1) - Focuses on the life cycle of the blue crab. Students discuss each stage of the life cycle and how the habitat plays a role in this process. Grade 2.
- **Understanding Animal Adaptations** (Activity 2-2) - Emphasizes the ways in which humans and beavers have developed body structures that adapt to their habitats. Students dress up a volunteer using props. Grade 1.
- **Louisiana Meal** (Activity 2-3) - Focuses on common foods in Louisiana. Students choose a native animal or plant and create a meal using the USDA Food Pyramid as a guide.
- **Wetlands Loss = Fisheries Loss** (Activity 2-6) - Explores the land-water interface relationship. Students simulate the marsh breakup and create their own productivity curve. Grades 5-8.

Education on the Halfshell: Oysters and Biology – Activities (LASGCP)

<http://lamer.lsu.edu/classroom/halfshell/index.htm>

- **Understanding a Dichotomous Key** - Students learn to use a dichotomous key by identifying various sea shells.
- **Creating a Dichotomous Key** - Students explore the benefits of creating dichotomous keys as a means of identifying an organism or object.
- **Writing a Descriptive Essay** - Students learn how to write a descriptive essay as a means of identifying an organism or object.
- **Oyster Culture Cycle** - Students understand the fragile balance of providing food for our growing population and learn how the oyster hatchery can help with this balance.

SeaScope (Scope-On-A-Rope) – Activities (LASGCP)

<http://lamer.lsu.edu/classroom/seascope/>

SeaScope activity folios are written by teachers for teachers. They use the video microscope nicknamed "Scope-On-A-Rope" (SOAR) in science lessons on aquatic organisms.

- **Looking for Ol' Crusty** - Students create a slide show using technology, gather data, write stories and poems, and choreograph an original dance to depict the crawfish.
- **Trailing the Snail Addendum: When Ordering Snails for the Classroom** - Snail behavior and characteristics are observed.
- **Secrets of Sand** - Students are introduced to the physical properties of sand.
- **Mosquitoes: Their Place on the Planet** - Stages of mosquito metamorphosis are observed and recorded.
- **Squidology** - Students learn how squid have evolved for survival in the sea by observing, measuring, making hypotheses, and recording data.

"Scope-On-A-Rope" (SOAR) units can be borrowed at no cost to Louisiana teachers. Visit the SOAR website, <http://www.scopeonarope.lsu.edu> for details.

Plants and Animals of the Louisiana Wetlands

<http://www.wild-lab.com/courses/wetlands/research/animals.htm>

This site offers several links that provide lists, location, habitats, size, life span, pictures, etc. of a multitude of wetland plant and animal species. Links include information on:

- | | | |
|-----------------------------|-----------------------------|------------------|
| • Food Chains / Webs | • Amphibians | • Lizards |
| • Hydrophytic Plants | • Turtles | • Mammals |
| • Habitats and Diets | • Snakes | • Birds |
| • Insects | • American Alligator | • Fish |



Wetlands Animals – Quiz (CWPPRA/USGS)

<http://lacoast.gov/education/kids/AnimalQuiz/>

Clues are given about an animal that can be found in the wetland area.

Louisiana State Plants – Lists (DOT)

<http://www.fhwa.dot.gov/environment/rdsduse/la.htm>

A comprehensive list of all the plants found in Louisiana with their scientific names.

Bird Identification – Quiz (CWPPRA/USGS)

<http://lacoast.gov/education/kids/birdquiz/index.htm>

Identify common birds of Louisiana. A multiple choice format using pictures.

Wings over the Wetlands – Video (BTNEP)

Examines the importance of South Louisiana's wetland habitats to the many birds that either call this region home or who depend on it as they pass through during migration. Runtime: 27 minutes.

Worksheet online. Order from BTNEP: <http://btnep.org>. Grades 5-12. **Free upon request.**

EstuaryLive! – Activities (BTNEP)

<http://estuarylive.btnep.org/default.asp?id=26>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary's importance to the nation.

- **Consider the Crab** – A graph is analyzed to discover important facts about the blue crab industry.
- **Birds: Beautiful Migrants** – Maps and text explain the importance of the estuary to seasonal migrants.
- **Coast Birds PowerPoint Presentation** – Images of estuary migrant birds.
- **Brown Pelican – A Recovery Success Story** – A graph and thought questions about Louisiana's state bird.
- **Fiddler Crabs of the Joyner Nature Preserve at Pelotes Island** – Describes the life habits of the Fiddler crab and shows a video of how the animal moves.

Haunted Waters – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=61>

An award winning documentary on the cultural, geologic, and environmental history of the Barataria-Terrebonne National Estuary System. These clips describe the history of hunting in the bayou and the importance of careful management of these natural resources.

- **Hunting** (Clip 10)
- **Harvesting Alligators** (Clip 14)
- **Muskrats** (Clip 11)
- **Life from the Water** (Clip 15)

Vanishing Wetlands, Vanishing Future – Video Clip (BTNEP)

<http://educators.btnep.org/default.asp?id=62>

This video on BTNEP's seven priority problems is in the style of Bill Nye the Science Guy and is best suited for middle school, though the vocabulary is applicable to high school topics.

- **Oyster Industry** (Clip 7) - Discusses commercial impact of oyster industry to the Barataria-Terrebonne region.

Rescuing the Treasure – Video Clip (BTNEP)

<http://educators.btnep.org/default.asp?id=63>

A sequel to "Haunted Waters, Fragile Lands," this video describes the importance of estuaries and restoration techniques.

- **Wildlife** (Clip 3) – The lives of the estuary residents are intimately tied to the creatures that live there.

Counting FishStix – Lesson Plan (NOAA)

<http://www.uncw.edu/aquarius/education/lessons/Aq%20FishStix.pdf>

Students learn how scientists estimate the population size of different fish groups by collecting and analyzing data from surveys they conduct in the classroom.



Spirit of the Estuary: Using Art to Understand Ecology – Curriculum (BTNEP)

<http://educators.btnep.org/default.asp?id=76>

Addresses wetland environmental issues through the integration of fine art, language art, science, and social studies. Grades 6-12.

- **Be Instrumental** (Activity 1-9) - Students learn about the natural products of wetlands that humans used to create instruments; create their own instruments from the wetlands; create their own chant to tell the story and importance of wetlands.
- **Birds of Paradise: Protect My Home** (Activity 1-10) - Students list threatened/ endangered birds; examine and describe the role of humans in threatening, endangering and protecting the birds; and create a postcard urging people to protect the birds of the Barataria-Terrebonne estuary.
- **A Handful of Estuary Critters** (Activity 2-1) - Students list a minimum of 10 critters of the Barataria-Terrebonne Estuary; select one critter and research, observe and describe it; paint as realistically as possible one critter on their partners' hand using craft paint or tempera paint; and photograph and display their work.
- **Natural Notes** (Activity 2-2) - Students understand the importance of sound in the natural world and wetlands in particular; mimic the sound made by their chosen animal; and understand its habitat
- **This is Driving Me Buggy ... So Let's Wrap it Up!** (Activity 2-3) - Students research common insects of the BTNE; sketch outlines of insects or find patterns of insect shapes; make potato prints or Styrofoam stamps; and design and print wrapping paper with an insect pattern.

ACES – Curriculum (NOAA)

<http://www.signalsofspring.net/aces/about.cfm>

An expansion of "Signals of Spring," an award-winning, classroom-based curriculum program in its 10th year, where in addition to learning formal science concepts, students use Earth imagery to explain the movement of animals that are tracked by satellites. The ACES curriculum also introduces environmental issues the animals face, and the environments of the NOAA National Marine Sanctuaries. Students learn science within the context of the ocean, with high-quality curriculum-based activities, as they use NOAA remote sensing data to develop authentic inquiry skills. **Must register for full access.**

How to Hide in the Ocean – Lesson Plan (SEA)

<http://www.sea.edu/academics/k12.asp?plan=hideinocean>

Observe and discuss the advantages of camouflage, then try designing a well-camouflaged fish. Grades K-8.

Sinking Races – Lesson Plan (SEA)

<http://www.sea.edu/academics/k12.asp?plan=sinkingraces>

Build plankton models and compete to see which sinks most slowly. Grades 2-8.

Wetland Inhabitant Word Search – Activity (EPA)

<http://www.epa.gov/owow/wetlands/pdf/wrdsrch.pdf>

Search for the types of animals found in wetlands.

Fisheries – Activities (NOAA)

<http://www.oar.noaa.gov/k12/html/fisheries2.html>

Explains what fisheries management is, why fisheries management is important, and how fish populations are managed.

Fisheries Learning on the Web – Activities (NOAA)

<http://www.miseagrant.umich.edu/flow/index.html>

Comprehensive curriculum about the Great Lakes ecosystem. Each lesson is aligned with national and state curriculum standards for science and social studies and features a hands-on classroom activity. FLOW was selected "Teachers' Top Web Picks" (BRIDGE Web site) for Sea Grant Ocean Science Center Education. Grades 4-8.



Weather Information – Booklet (NOAA)

<http://www.oar.noaa.gov/k12/html/teacherinfo.html>

Provides students research and investigation experiences using on-line resources on El Niño, hurricanes, and weather.

Turtle Trouble – Lesson Plan (NOAA)

<http://nerrs.noaa.gov/Education/pdf/6thGradeTurtleTrouble.pdf>

Understand the job of aquatic scientists and the roles they play in influencing public policy. Participation in a mock community environmental forum teaches the importance of community involvement and working within the law to have a positive impact for the community and for wildlife. Grade 6.

Marine Activities, Resources & Education – Activity

<http://www.lawrencehallofscience.org/mare/oiresources/curriculum/wetlands/Wetlands%20Illustration.pdf>

Drawing of several coastal plants and wetlands provides examples of coexistence between plants and animals of the wetlands.

Climate Change, Wildlife and Wetlands – Activity (EPA)

http://www.epa.gov/climatechange/wycd/downloads/trail_cards.pdf

Printable cards of plants, animals, and ecosystems that may be affected by climate change.

Fisheries at the Galveston Laboratory – Activities (NOAA)

<http://galveston.ssp.nmfs.gov/kidstuff/index.html>

View, copy, or download 3 different educational activity books developed by the lab's education staff. How do biologists research and keep track of sea turtle populations in order to save them? Learn about wildlife and why caring for their wetland habitat is not just about them. Think like a shrimp fisherman in the Gulf of Mexico.

Local Fisheries Knowledge Project – Activities (NOAA)

<http://www.st.nmfs.gov/lfkproject>

Through interviews with local fishermen, and others in fishing-related industries, explore the connection between fisheries, their communities, and our lives. Students document and preserve the rich knowledge and experiences of these individuals for future generations. Grades 9-12.

Louisiana Animals – Activities

<http://www.vickiblackwell.com/laanimals.html>

Web resources on animals of Louisiana. Grades 1-5.



Plants of the Coastal Zone

Making Tracks – Videos

Introduce science concepts found in the outdoors. Worksheets included. Length: 3-4 minutes each.

- **History of Forest Succession** (Quick Time video)
http://www.makingtrackschallenge.com/movie_detail.php?reference=64
- **Fall Colors - How the Forest Makes Energy** (northern deciduous forests; Quick Time video)
http://www.makingtrackschallenge.com/movie_detail.php?reference=36
- **The Rotten Truth About Forest Decomposition** (Quick Time video)
http://www.makingtrackschallenge.com/movie_detail.php?reference=61

EstuaryLive! – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=69>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary's importance to the nation.

- **Black mangrove** (Clip 5) - The roots of the black mangrove nourish the tree, help prevent erosion of wetland soils, and provide cover for small animals.

EstuaryLive! – Activities (BTNEP)

<http://estuarylive.btnep.org/default.asp?id=26>

Investigates the rich bounty of organisms in the Barataria-Terrebonne ecosystem, the delicate balance between the natural environment and human impacts, and the estuary's importance to the nation.

- **Where Do Black Mangroves Grow Best?** - Students use their knowledge of ecology to propose the best sites to plant black mangrove trees.

Haunted Waters – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=61>

An award winning documentary on the cultural, geologic, and environmental history of the Barataria-Terrebonne National Estuary System.

- **Cypress Boom** (Clip 6) - Explains how the bayou culture was shaped by the cypress industry.
- **Trembling Prairies** (Clip 9) - Shows the production techniques for harvesting and the uses of Spanish moss.

Spirit of the Estuary: Using Art to Understand Ecology – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=76>

A multi-disciplinary curriculum that addresses wetland environmental issues through the integration of fine art, language art, science, and social studies. Grades 6-12.

- **Painting in Style: Flowers of the Estuary** (Activity 2-4) - Students describe the following styles of art: Egyptian Hieroglyphics, Classical Realism, Impressionism and Pointillism, Surrealism, and Abstract and Cubism; identify paintings from each of the above styles; identify the following flowers of the estuary: Water Hyacinth, Louisiana Iris, Cardinal Flower, White Water Lily, and the Spider Lily; research and identify at least ten flowers of the estuary and their habitats; create artwork using one of the above styles; identify and discuss the elements and principles of design in their paintings.
- **We Walk in Beauty** (Activity 2-5) - Students identify a minimum of fifteen plants that live in the Barataria-Terrebonne Estuary; research the life cycle and the special characteristics of a plant from the estuary; describe the skills necessary to keep a field journal; use observation, reflection, drawing, and writing during a field trip to; create a field journal.
- **Cherokee Leaf Painting** (Activity 2-6) - Students describe how plants can be used as dyes; transfer a leaf's natural dye to a piece of fabric; practice the craft of leaf painting.

Bridge Ocean Education: Spartina Salt Marshes

<http://life.bio.sunysb.edu/marinebio/spartina.html>

Excellent images that can be placed on PowerPoint slides.



Wild Plants of Our Wetlands – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=78>

Introduction to wetland environment with pre-visit, on-site, post-visit and assessment activities that can be coordinated with field trips to the Jean Lafitte National Park Historical Park and Preserve (<http://www.nps.gov/jela/>). Grades 6-12.

Trees Make a Difference – Activities (BTNEP)

http://educators.btnep.org/client_files/editor_files/Trees%20Make%20a%20Difference%20Final%20Copy.pdf

Planting native trees in Terrebonne Parish is a great idea! This guide explains the How? Where? What? and Why? of planting native Louisiana trees. Grades K-4.

N. Carolina Estuary Reserve Foundation: The Salt Marsh Players – Lesson Plan

<http://67.199.66.38/uploads/File/education/curriculum/Salt%20Marsh%20Players.pdf>

Students are assigned roles in a skit designed to illustrate how a salt marsh works and how the organisms in it interact with each other. Grades 1-8.

Seagrass Scientists – Lesson Plan (NOAA)

<http://nerrs.noaa.gov/Education/pdf/5thGradeSeagrassScientists.pdf>

Learn about the jobs that estuarine scientists and wildlife biologists perform by simulating a sampling method that measures the health of a seagrass community over time. Grade 5.

International Paper: Life of the Forest – Booklet

<http://internationalpaper.com/Our%20Company/Learning%20Center/Life%20Of%20The%20Forest/index.html>

Timber company booklet introducing forest life cycles and common trees.

The Brown Marsh Project Responds to Louisiana's Smooth Cordgrass Dieback (CWPPRA/USGS)

<http://www.lacoast.gov/articles/bms/index.htm>

Describes a time span during which native plants were observed to be dying in massive numbers and the response to help the habitat recover.

Gulf Coast Prairies and Marshes – Activities

<http://www.nature.org/wherewework/northamerica/states/louisiana/preserves/art6866.html>

Information about plants in the Gulf Coast prairies and marshes, including notes regarding conservation efforts and impacts on wildlife and links to activities and further participation.

Project Learning Tree – Curriculum

<http://www.plt.org>

Curriculum resources focusing on forestry, tree life, and forest wildlife. Includes teacher workshop details and comprehensive lesson and activity book correlated by subject, standard, grades, and activity. **Teachers must participate in daylong workshop to receive materials**, but the website includes some lessons and activities.



Threatened and Endangered Species

Endangered Species – Coloring Book (CWPPRA/USGS)

<http://lacoast.gov/education/kids/coloringbooks/endangered/index.htm>

Interesting facts are presented along with drawings to be colored of each organism in its native habitat: [Bald Eagle](#), [Black Bear](#), [Butterfly](#), [Longhorn Beetle](#), [Woodpecker](#), [Crayfish](#), [Gecko](#), [Pitcher Plant](#), [Crane](#), [Prairie Chicken](#), [Sturgeon](#), and [Mussel](#).

Endangered Species – Activity (FWS)

<http://www.fws.gov/endangered/kids/pdf/presentation.pdf>

PowerPoint by the U.S. Fish & Wildlife Service defines the term “endangered species” and gives picture examples. A quiz accompanies the PowerPoint.

Kids Corner – Activities (FWS)

<http://www.fws.gov/endangered/kids/index.html>

Activities and information on endangered species and conservation.

Manual of Rare Plants, Animals, and Natural Communities of LA's Coast Zone – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=84>

Fact sheets on rare animal and plant species and natural communities of special concern for all of the river basins contained within Louisiana's coastal zone. The fact sheets in the book will provide specific information about each species of community found within the coastal zone, including descriptions, distribution map, conservation status, and photos or illustrations as available. Created by the Louisiana Department of Wildlife & Fisheries Natural Heritage Program with funding from the *BTNEP 2007 Mini-Grants Program*.

Spirit of the Estuary: Using Art to Understand Ecology – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=76>

A multi-disciplinary curriculum that addresses wetland environmental issues through the integration of fine art, language art, science, and social studies. Grades 6-12.

- "A Time to Be Born; A Time to Die" (Activity 1-11) - Students identify threatened/endangered species of the Barataria-Terrebonne Estuary; identify comeback species of the BTNE; understand the causes of the threatened or endangered status of those animals or plants.

Manatee – Activities (LASGCP)

<http://lamer.lsu.edu/classroom/manatee/>

Did you know that manatees have been spotted in Louisiana? The following activities provide an understanding of manatee habits and a deeper appreciation for this unique animal.

Manatee Activities for your classroom:

- [How to Make a Manatee Model](#) (216KB PDF)
- [Louisiana Manatee Sightings List from 1929 through 2001](#) (65KB PDF)
- [Worksheet for LA Manatee Sightings](#) (808 KB PDF)
- [Answers Worksheet for LA Manatee Sightings](#) (823 KB PDF)
- [Manatees in Louisiana](#) (7.93MB PDF), a *Louisiana Conservationist* magazine article by Jill Wilson from the July/August 2003 issue
- [Manatee & Marine Mammal Web Resources](#) a list of manatee information websites
- [Manatee Fact Sheet](#) (252KB PDF)

National Marine Fisheries Service – Lesson Plans (NOAA)

<http://www.nmfs.noaa.gov/pr/education/lessons.htm>

Explains how the NMFS office protects endangered species, helps conserve marine mammals and works with the Marine Mammal Stranding Network.

Countering Contamination: Data and DDE – Lesson Plans (USGS)

<http://www.pwrc.usgs.gov/contaminants-online/pages/ToolsTeachers/TTintro.htm>

Series of lessons focusing on ecotoxicology, DDE and bioaccumulation in bald eagles. Grades 8-12.



Lessons on the Lake: Ecosystems in Delicate Balance: Threatened, Endangered, and Introduced Species of the Lake Pontchartrain Basin – Lesson Plan (USGS)

<http://pubs.usgs.gov/of/1998/of98-805/lessons/chpt7/index.htm>

Discusses endangered species in the basin area.

Brown Pelicans Return to Louisiana Coast (CWPPRA/USGS)

<http://lacoast.gov/articles/bps/index.htm>

Describes loss and return of the Brown Pelican to the Louisiana coast.

US Fish and Wildlife Southeast Louisiana National Wildlife Refuges Endangered Species (FWS)

<http://www.fws.gov/southeastlouisiana/species.html>

Describes some endangered species in Louisiana and programs enacted to protect them.

Endangered Species of Louisiana

<http://www.endangeredspecies.com/states/la.htm>

Concise list of plant and animal endangered species in Louisiana including scientific names.

Recapture Lab – Activity

<http://www.accessexcellence.org/AE/ATG/data/released/0524-GLyon/index.php>

Math lesson describing how wildlife biologists typically estimate the number of animals in a given area. Uses students' proportion skills.



Identification and Classification of Plants and Animals

Wildlife Index

http://www.exploringnature.org/database/wildlife_index.php

A wildlife index that provides information on range, habitat, physical traits, diet, habits, predators, reproductive traits, lifespan, illustrations and physical diagrams. Animals are classified by classification system, habitat, specific traits and locations.

uBio

<http://www.ubio.org/>

The Universal Biological Indexer and Organizer (uBio) is a comprehensive database of known scientific and common names of living (and once-living) organisms. The Taxonomic Name Server catalogs names and classifications to enable tools that can help users find information on living things using any of the names that may be related to an organism.

Leaf Key to Common Trees in Louisiana – Bulletin (LSUAC)

<http://www.lsuagcenter.com/en/communications/publications/Publications+Catalog/Environment/Forestry/Leaf+Key+to+Common+Trees+in+Louisiana.htm>

How to identify common trees and plants in Louisiana.

Native Tree Growing Guide for Louisiana – Bulletin (LSUAC)

<http://www.lsuagcenter.com/en/communications/publications/Publications+Catalog/Environment/Forestry/Native+Tree+Growing+Guide+for+Louisiana.htm>

Description of native trees in Louisiana.

Changing Attitudes about Nature Through Bird Identification – Activity

http://www.accessexcellence.org/AE/AEC/AEF/1996/dawson_bird.php

Lesson series on bird identification appropriate for a variety of grade levels.

Louisiana State Arthropod Museum (LSUAC)

<http://www2.lsuagcenter.com/Inst/Research/Departments/arthropodmuseum/index.htm>

Includes a photo index of insects. Information about free insect identification or having a researcher come visit your class is also available.

Herbarium Collection – Activity

http://www.accessexcellence.org/AE/AEC/AEF/1996/paye_plants.php

Details a secondary level project to create a field guide of local plants.

Pond Life Identification

http://www.microscopy-uk.org.uk/pond/x_index.html

UK site including pictures for identifying common microscopic pond life.

Dress Up a Twig – Lesson Plan (EPA)

http://www.epa.gov/oerrpage/superfund/students/class_act/winter/dressup.htm

Introduces how to identify a tree by its twigs rather than its leaves. Grades 3-6.

Twig Match Lesson – Lesson Plan (EPA)

http://www.epa.gov/oerrpage/superfund/students/class_act/winter/twigmtch.htm

Lesson expanding how to identify trees by twigs rather than leaves.

Random Sampling – Activity

<http://www.biologycorner.com/worksheets/randomsampling.htm>

Lesson on random sampling tied to estimating the number of a given plant species.



Food Chains and Webs

Educator's Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator's Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **Wetland Webs** (Activity 2-4) - Introduces the concept of food webs. Students form a huge food web of producers, herbivores, omnivores, carnivores, detritivores and scavengers. Grades 2, 4, 5.
- **Marsh Food Web Rummy Card Game** (Activity 2-5) - Reinforces the theme of wetland food webs. Students are divided into small groups to play a rummy card game. Grades 2, 4, 5.
- **Trading Spaces** (Activity 2-8) - Uses of research skills to identify invasive species, both plant and animal, found in the BTNE area. Students create posters to make a collective mural to place for display. Grades 5, 7, HS Env Sci.

Lafourche Parish: From the Beginning – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=66>

A comprehensive guide to Lafourche Parish, its history, culture, and resources. Activities will help students better understand this important Louisiana parish. All files are in Adobe format and completely downloadable from this site. Grades 6-12.

- **Biology** - Flow charts, text, tables and vocabulary lists expand the students' understanding of wetland biology.
- **Soft Drink Energy Pyramid** - Students identify producers, consumers and decomposers and discuss the energy pyramid.
- **Identifying the Food Chains** - A questionnaire is used to help analyze the illustrated food web.
- **Food Pyramid of the Salt Marsh** - This graphic depicts familiar wetland organisms in a food pyramid.

Parenting the Next Generation Website – Activities

- **Food Chains and Webs** - A simple description of food chains and webs with graphics.
<http://www.vtaide.com/png/foodchains.htm>
- **Food Chains MCQ** - A quick pre- or post-test that can be used to see understanding of chains.
<http://www.vtaide.com/png/foodchains.htm>

Brain POP

<http://magma.nationalgeographic.com/ngexplorer/0309/quickflicks/index.html>

Food Chain Movie - A short clip showing the food chain process with a video quiz.

EcoKids Website

http://www.ecokidsonline.com/pub/eco_info/topics/frogs/chain_reaction/index.cfm

Chain Reaction - An interactive game about creating a food web.

Ready, Set, Get Wet – Activities (EPA)

<http://epa.gov/gmpo/education/pdfs/ReadySetGetWet.pdf>

Wetlands inquiry includes picture search, preparation tips for visiting a wetland area, experiments involving growing wetland algae and designing wetland models, and constructing a food web. Grades 3-5.

The Marine Food Chain

<http://drake.marin.k12.ca.us/stuwork/rockwater/PLANKTON/Food%20Chain.htm>

A chart depicting a marine food chain with key definitions and factual information.

Gone Fishing – Lesson Plans

[http://www.coolclassroom.org/teachers_guide/teachersguide.html#\(printable teacher's guide\)](http://www.coolclassroom.org/teachers_guide/teachersguide.html#(printable%20teacher's%20guide))

[http://www.coolclassroom.org/cool_projects/lessons/biology/biology.html\(link to student activity\)](http://www.coolclassroom.org/cool_projects/lessons/biology/biology.html(link%20to%20student%20activity))

Students explore the role of phytoplankton in a marine food web and how physical factors in the environment affect living communities (Approximately (4) 45-50 minute classroom periods).



Marine Activities, Resources & Education – Wetland Illustration

<http://www.lawrencehallofscience.org/mare/oiresources/curriculum/wetlands/Wetlands%20Illustration.pdf>

This ready-made drawing of several coastal plants and wetlands provides an illustration on which students can easily place arrows to show a food chain / food web.

Countering Contamination: Data and Dichlorodiphenyldichloroethylene (DDE) – Lesson Plans (USGS)

<http://www.pwrc.usgs.gov/contaminants-online/pages/ToolsTeachers/TTintro.htm>

Series of lessons focusing on ecotoxicology, DDE and bioaccumulation in bald eagles. Grades 8-12.

A Wetlands Food Web Story – Activities

<http://www.natureillinois.org/natwrks.htm>

Food web story centering on wetlands wildlife. Grades 1-5.



Non-indigenous (Invasive) Species

Oh No! Hannah's Swamp is Changing – Activities (LASGCP)

<http://lamer.lsu.edu/classroom/nis/>

An illustrated children's book about basic concepts of exotic species impacts. Concepts include what nonindigenous species are, the effects that they have on our environment, and what can be done to stem the tide. The book contains a poster and several activities. Grades K-4. **Order form provided; cost is \$10.**

Project TELLUS: Exotic Species – Video and Activities (LASGCP)

<http://lamer.lsu.edu/classroom/nis/pdfs/ExoticSpecies.pdf>

Two activities and an evaluation designed to accompany the *Project TELLUS* Video on Exotic Species. For a copy of the video, contact the LA Sea Grant College Program at www.laseagrant.org.

NAB the Aquatic Invader – Activities (LASGCP)

<http://www.sgnis.org/kids/>

Students become private investigators on an aquatic invader case and help other detectives “book the bad guys.” They start by Meeting the Suspects and then read their profile sheets. Students uncover more clues by solving the case files on each Detective Page and collecting evidence and background information to help catch each suspect. When enough evidence has been gathered to “book a bad guy”, students click on the “Book'em” file and answer the questions. Current invasive species are from the Great Lakes area. The Gulf of Mexico region will be adding invasive species to the website in the near future. Grades 4-10.

Exotic Aquatics (LASGCP)

http://lamer.lsu.edu/exotics/exotics_list.htm

Information and links about four invasive species that cause big problems for Louisiana ecosystems: [Nutria](#), [Zebra Mussel](#), [Water Hyacinth](#), and [Hydrilla](#).

Clawdette’s Estuary Adventure – Activities (BTNEP)

http://educators.btnep.org/client_files/editor_files/CCEA-Invasives%2013-A.pdf

Discusses exotic and invasive species and offers activities.

Educator’s Guide to the Barataria-Terrebonne National Estuary – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator’s Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

- **Nutria: Nutrition and Nuisance** (Activity 2-7) - Introduces an invasive species called a nutria. Students develop a persuasive argument for eating nutria. Grades 4-5.
- **Trading Spaces: Invasive Species** (Activity 2-8) - Uses research skills to identify invasive species, both plant and animal found in the BNES area. Students create posters to make a collective mural to place for display. Grades 5, 7, HS Env Sci.

Haunted Waters – Video Clips (BTNEP)

<http://educators.btnep.org/default.asp?id=61>

An award winning documentary on the cultural, geologic, and environmental history of the Barataria-Terrebonne National Estuary System.

- Nutria and Marshes (Clip 12) - Describes how the nutria interact with the native ecosystem.

Estuary Survival – Activity

<http://omp.gso.uri.edu/ompweb/doee/teacher/pdf/act33.pdf>

Investigate what invasive species are feeding on and how this may harm the native species.

About Nutria (CWPPRA/USGS)

<http://www.lacoast.gov/search/start.pl?Terms=nutria&submit=Submit>

Articles that can be downloaded and copied to distribute to students about Nutria. Nutria are responsible for major destruction of our wetlands.



Lafourche Parish: From the Beginning – Activities (BTNEP)

<http://educators.btnep.org/default.asp?id=66>

A comprehensive guide to Lafourche Parish, its history, culture, and resources. Activities will help students better understand this important Louisiana parish. All files are in Adobe format and are downloadable from this site. Grades 6-12.

- **Louisiana Crops and Fur Resources** - Traces growth and production in the wax and fur industries.
- **And Then Came the Nutria-Part One** - Myths and facts of the nutria's introduction in Louisiana.
- **Extra Extra Read All About It!** - Students create a newspaper page on Louisiana's fur, crop or nutria industry.
- **And Then Came the Nutria-Part Two** - Management of nutria and how pelt values have changed over the years.

Seeing Purple: A Population Explosion – Activity

<http://www.iisgcp.org/edk-12/gogl/SeeingPurple.pdf>

Through a simulation, sampling, and estimation activity, students learn about the impact of purple loosestrife on a wetland due to its exponential growth. Learn about purple loosestrife's life cycle and appreciate how scientists determine population size in an ecosystem.

Invasive Species (NOAA)

http://oceanservice.noaa.gov/education/kits/estuaries/media/supp_estuar09d_invasives.html

Introduces invasive species and non-native species.

Habitat Survey – Activity

<http://www.mysciencebox.org/survey>

Students identify invasive plants growing in a specified area.

Nutria Fact Sheet (USGS)

<http://www.nwrc.usgs.gov/factshts/020-00.pdf>

Fact sheet on the nutria and detailing the impact that this non-indigenous animal has on Louisiana coastal native species.

Assessing an Ecosystem's Plant Biodiversity – Activities

<http://www.classroomearth.org/node/177>

Students explore an ecosystem's plant diversity, mathematically determine the dominant vegetation, and estimate the relative presence of the invasive species in the study area.

Gypsy Moths

<http://www.fs.fed.us/ne/morgantown/4557/gmoth/>

Resource on gypsy moths and their spread and destruction in North America.



Curriculum Resources

Barataria-Terrebonne National Estuary Program Website for Educators (BTNEP)

<http://educators.btnep.org/>

Main website for educators (**All products are FREE to the public**). Offers a host of comprehensive information and activities for educators. Videos, DVDs, Field Trip guide, Workbooks, Educational Resource Guides, Maps, Workshops, etc. To obtain materials, call 800-259-0869. Grades K-12. **Free upon request.**

Educator's Guide to the Barataria-Terrebonne National Estuary (BTNEP)

<http://educators.btnep.org/default.asp?id=64>

The BTNEP Educator's Guide to the Barataria-Terrebonne National Estuary is a comprehensive, downloadable source of information and activities for formal and nonformal educators. Grades K-12.

Lafourche Parish: From the Beginning (BTNEP)

<http://educators.btnep.org/default.asp?id=66>

A comprehensive guide to Lafourche Parish, its history, culture, and resources. Activities will help students better understand this important Louisiana parish. All files are in Adobe format and are downloadable from this site. Grades 6-12.

Spirit of the Estuary: Using Art to Understand Ecology (BTNEP)

<http://educators.btnep.org/default.asp?id=76>

A multi-disciplinary curriculum that addresses wetland environmental issues through the integration of fine art, language art, science, and social studies.

Project WET

<http://www.projectwet.org/>

The Project WET Curriculum and Activity Guide is a collection of over 90 science-based, interdisciplinary activities and lesson plans. In the United States *The Project WET Curriculum and Activity Guide* is **only available through workshops**. Grades K-12.

Project WILD

<http://www.projectwild.org/>

Only available to teachers by attending a workshop. To sign up for a workshop send an email to info@projectwild.org.

Aquatic Project WILD

<http://www.projectwild.org/>

Activity Guides and workshops emphasize aquatic wildlife and aquatic ecosystems. Activity guides are **free of charge to teachers who participate in three to six hour workshop**. To sign up for a workshop contact Cheryl Fischer (<cfischer@wlf.louisiana.gov>, 985/ 882-9601).

Flying WILD

<http://flyingwild.org>

You can receive a copy of *Flying WILD: An Educator's Guide to Celebrating Birds* by **attending and successfully completing a Flying WILD Educator Training**. For workshop information contact Ed McCrea, Flying WILD Outreach (<emccrea@eecg.org>, 814/ 260-9138).

WOW! The Wonders of Wetlands

<https://sslserver.com/wetland.org/shop/mainpub.shtml?id=pub1>

More than 50 fun and effective learning-activities for both indoor and outdoor use. These activities focus on the three definitive wetland parameters: water, soil, and plants; and there are animal-oriented exercises as well.

Healthy Water Healthy People: Water Quality Educators Guide

<http://www.projectwet.org/>

Available through the Project WET website. You can order the book without having to take a class. **Cost is \$24.95.**



POW! The Planning of Wetlands, An Educator's Guide

http://www.wetland.org/publications_home.htm

Based on over thirty years' experience in wetlands construction, horticulture and education, "POW!: The Planning of Wetlands" is a curriculum and two-day workshop that guides educators through the creation, restoration and/or enhancement of a wetland on school grounds or within the community. Unlike other schoolyard habitat programs where the design is manufactured by experts and the students are brought in solely for labor, POW!'s 25 hands-on activities are designed to engage the class in all project phases. The class will survey their school grounds, calculate drainage area, create a water budget, design the wetland based on desired functions, choose appropriate native wetland vegetation, construct and plant the wetland, and monitor biological and chemical parameters of the finished habitat. The 300+ page guide also contains a wealth of wetlands information as well as a native wetland vegetation guide. Activities are correlated to National Science Standards and are presented in an educator friendly lesson plan format with Student Activity Pages ready for copying. **You must take the course to get a copy of this resource.**

Write On! Wetlands Challenge Books

http://www.wetland.org/education_writeon_challenge.htm

Build your wetland library and the next generation of wetland stewards at the same time. To celebrate American Wetlands Month each year in May, Environmental Concern sponsors the national Write On! Wetlands Challenge, a literary and arts competition that challenges youth to write and illustrate a children's book about wetlands. The competition begins in February with a Call for Authors, followed by a Call for Artists in May. The winning words and art combine to create a book whose quality, emotion and enthusiasm is truly inspiring. So far three books have been published: *Sammy's Wetland Adventure*, *Wetlands Make Sense*, and *Wetlands A to Z*. Each sells for **\$7 plus shipping and handling**.

Wetlands 101

http://www.wetland.org/education_wetland101.htm

Designed to give a basic understanding of wetland ecology, types, functions and management, this is the perfect first step for anybody interested in learning more about wetlands. The course is divided into wetland characteristics, wetland functions, and wetland management. A quiz for the general public is **free upon request** at <http://www.wetland.org/quiz/>. The quiz covers material appropriate for advanced middle school and high school students.

National Marine Sanctuaries Education (NOAA)

<http://sanctuaries.noaa.gov/education/teachers/>

Standards-based lesson plans, professional development opportunities, field studies, multicultural programs, online resources and more. The National Marine Sanctuary Program provides teachers with resources and training to support ocean literacy.

Resource Guide for Teachers of Marine Science (NOAA)

<http://swfsc.noaa.gov/>

This resource guide was prepared by staff of the National Marine Fisheries Service to provide information on Coastal Awareness in Science for elementary, junior high and high school science teachers. Its purpose is to promote the exploration of ecology and coastal awareness. The guide is divided into a reference to books at the elementary, middle, and high school levels; as well as a section on teacher resources with curriculum guides, lesson plans, bibliographic collections, etc. and audiovisual materials for all age levels, includes CD-ROM, Film and Video.

COAST Resource Guide

<http://www.coast-nopp.org/toc.html>

This guide is divided into elementary/middle school and high school activities. Lessons fall within the following topic areas: physical parameters, plate tectonics, marine and aquatic habitats, marine and aquatic pollution, marine and aquatic resources, and deep sea technology.



Lake Pontchartrain Basin's Lessons on the Lake (LPBF/SLU/NOAA)

<http://www3.selu.edu/turtlecove/lessonsonthelake>

Activities that teach about watersheds, in particular the Lake Pontchartrain Basin, which is part of the much larger Mississippi River watershed that covers more than half of the United States.

Coastal Louisiana Activity Book (NOAA)

<http://www.coastalscience.noaa.gov/education/labook.pdf>

Provides information on Coastal Louisiana and gives young children the opportunity to color, connect the dots, solve mazes, try word searches and more.

A Beautiful World Starts With You

http://www.energystar.gov/ia/business/k12_schools/KidsBrochure.pdf

Five pages of coloring and energy conservation activities from Energy Star.

Case of the Broken Loop (EPA)

<http://www.epa.gov/epawaste/education/pdfs/4-6.pdf>

Follow the detective through each of these activities to learn more about reducing waste and conserving resources.

Earth Day Activity Book (EPA)

<http://www.epa.gov/region5/publications/happy/happy.pdf>

An 11-page coloring book full of tips for making the Earth a better place.

Follow That Trail! (EPA)

<http://www.epa.gov/epawaste/education/pdfs/k-3.pdf>

Students look for clues to solve puzzles related to pollution and conserving resources.

Keep Away (NOAA)

<http://oceanexplorer.noaa.gov/explorations/06mexico/background/edu/GOM%2006%20KeepAway.pdf>

Students discuss the meaning of biological diversity and compare and contrast the concepts of variety and relative abundance as they relate to biological diversity. Given information on the number of individuals, number of species, and biological diversity at a series of sites, students make inferences about the possible effects of oil drilling operations on benthic communities.

Marine Debris Coloring Book (NOAA)

<http://www.education.noaa.gov/books/debris/debris1.htm>

This coloring book helps kids understand how to recognize the hazards of throwing junk into the ocean and overboard from boats.

Ocean Pollution

<http://cosee-central-gom.org/ovweb/ocean%20pollution/prologue1.html>

This unit includes 15 lessons with hands-on activities to educate students about ocean pollution. Grades 5-6.

Emergency Response and Restoration (NOAA)

<http://response.restoration.noaa.gov/kids/kids.html>

Shows how NOAA and other agencies respond to oil spills and hazardous chemical accidents. It also contains some experiments to try.

EARTH Lesson Plans

http://www.mbari.org/earth/lesson_grid.htm

Lesson plans from the Monterey Bay Aquarium Research Institute on ocean observations, ocean animals and predators, marine animal classification, and coastal processes.

Pollution (NOAA)

<http://oceanservice.noaa.gov/education/kits/pollution>

Teaches about non-point source pollution, the history and types of non-point source pollution, methods used to detect pollutants, and assess and reduce their damaging effects on the environment. The Roadmap to Resources complements the information in the tutorial by directing you to additional information and data resources from NOAA and other reliable sources.



Teens for Planet Earth

<http://teens4planetearth.com/teenshome>

Surf these pages for incredible facts about the natural world, for the latest conservation news, and to discover how teens can – and do – make a difference by carrying out environmental service-learning projects in their communities.

Sammy Soil Coloring Book (EPA)

<http://www.epa.gov/gmpo/edresources/ssoil.html>

The Sammy Soil Online Coloring Book was developed by the Mississippi Soil and Water Conservation Commission by means of a grant from the Gulf of Mexico Program to help children understand the importance of conserving natural resources -- our soil and water.

ACES Curriculum (NOAA)

<http://www.signalsofpring.net/aces/about.cfm>

An expansion of “Signals of Spring,” an award-winning, classroom-based curriculum-program in its 10th year, where in addition to learning formal science concepts, students use Earth imagery to explain the movement of animals that are tracked by satellites. The ACES curriculum also introduces the environmental issues the animals face, and the environments of the NOAA National Marine Sanctuaries. Students learn science within the context of the ocean, with high-quality curriculum-based activities, as they use NOAA remote sensing data to develop authentic inquiry skills. **Must register for full access.**

COAST Resource Guide

http://www.coast-nopp.org/resource_guide/index.html

This guide, intended to be used by teachers to structure classroom activities, is divided into two sections to reflect the different emphases and requirements of elementary/middle school programs and high school programs. Click on either “elementary and middle school activities” or “high school activities” to access lesson plans on ocean related topics.

Cold One Day, Warm Another?

http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive1105.html

Learn how upwelling influences beach water temperatures in this Data Tip, a collaboration with the U.S. Army Corps of Engineers Field Research Facility.

Lesson Plan Library (NOAA)

<http://oceanservice.noaa.gov/education/classroom>

Collection of 50 guided inquiry based activities based on the research, technology, and activities conducted by NOAA's Ocean Service in the areas of oceans, coasts, and charting and navigation. All of the lessons emphasize hands-on activities using on-line data resources, and are correlated to National Science Education Standards. Each lesson includes: Focus Questions, Learning Objectives, Teaching Times, Background Information, Learning Procedures, a “Me” Connection, Evaluations, Extensions, as well as Resources and Student Handouts. The lessons in the Discovery Classroom have been developed for students at the high school level, but are easily adapted for students at the middle school or undergraduate level.

Making Waves

<http://waves.marine.usf.edu/mwhome.htm>

University of South Florida scientists have teamed with teachers to design lesson plans based on current ocean research. Topics include: coral reefs, sea level rise and shoreline erosion, harmful algal blooms, El Niño , natural disasters, using real-time data to study ocean conditions, and studying the ocean from space. Each unit contains a student-friendly background article, one or more classroom activities, satellite images, web links, recommendations for grade level application and evaluation.

Project Learning Tree

<http://www.plt.org>

Curriculum resources focusing on forestry, tree life, and forest wildlife. Includes teacher workshop details and comprehensive lesson and activity book correlated by subject, standard, grades, and activity. Teachers must participate in daylong workshop to receive materials, but website includes some lessons and activities.



Climate and Marine Fisheries (NOAA)

<http://www.pfel.noaa.gov/research/climatemarine>

Examines how changes in the earth's climate affect marine ecosystems and fisheries. Includes summary information on climate as it relates to fisheries and provides examples of the impact on fisheries from short-term changes (El Niño scale), from intermediate to decadal scale changes, and from long-term climate variability. It also provides examples of the potential impact of global change on marine fisheries, links to research on climate and fisheries, and data sources for analysis.

Properties of the Ocean

http://oceanworld.tamu.edu/educators/props_of_ocean/activities/index.html

Five ocean related activities on SONAR, waves, salinity, water density, and underwater topography.

Wyland Clean Water Challenge

<http://www.wylandoceanchallenge.org/index.cfm?mid=2&sid=6>

Teaches about the waters of the world and the life within them. Students create a representation of their newfound knowledge through the arts.

Louisiana Project Learning Tree

<http://www.laplt.org/>

Louisiana branch of Project Learning Tree including details on upcoming workshops.

Project Webfoot

<http://www.ducks.org/projectwebfoot/>

Curriculum resources focusing on marine and freshwater wildlife. Includes lessons and activities.

Audubon Nature Institute Education Outreach Program

http://www.auduboninstitute.org/education_outreach.html

Describes Audubon's mobile education program, camps for Pre-K through 7th-graders, teacher workshops and outreach programs.

South Louisiana Wetlands Discovery Center

<http://www.slwdc.org/>

The South Louisiana Wetlands Discovery Center offers educational opportunities about this region's very fragile unique wetland environment and offers ways locals and tourists can help to conserve and preserve the wetlands. The educational opportunities materialize in the unique pairing of two [educational models](#), an interpretive program component for grades K-12 and a science-focused educational component or "research laboratory" for grades 4-16, each focusing on the South Louisiana coastal environment while serving different audiences.



Maps

LA Coast Maps (CWPPRA/USGS)

<http://www.lacoast.gov/maps/>

Maps of coastal Louisiana restoration projects, pre- and post- hurricane, land loss, aerial photographs and teaching aids.

Habitat Changes in the Lower Barataria-Terrebonne Estuarine Basins 1956-2000 (BTNEP)

<http://www.btnep.org>

A series of four maps in one poster depicting the loss of wetlands in an area mapped during the following years: 1956, 1978, 1988, & 2000. Obtain from BTNEP, call 800-259-0869.

2003 Land Loss Maps of Coastal Louisiana: 1994 Land Loss Maps (CWPPRA/USGS)

<http://www.lacoast.gov/maps/2003landloss/index.htm>

100+ years of land change for coastal Louisiana and Southeast Coastal Louisiana.

Land Loss Animations of Coastal Louisiana (CWPPRA/USGS)

<http://www.lacoast.gov/maps/animations/index.htm>

Louisiana's CWPPRA Basins, click on parish map.

Louisiana Wetlands Disappearing (AAPG)

http://www.aapg.org/explorer/2007/01jan/subsidence_map.cfm

Map showing subsidence in different areas of Louisiana at an inch/year ratio (Visual Simulation).

Satellite Imagery of Louisiana (CWPPRA/USGS)

<http://www.lacoast.gov/maps/lastate.htm>

Satellite imagery showing Louisiana.

WETMAAP

<http://www.wetmaap.org/>

Wetland Education Through Maps and Ariel Photography. Seven areas: Avery Island, Cocodrie, False River, Golden Meadow, Martello Castle, North Shore (Lake Pontchartrain) & the Red River have been completed and are ready for teacher use in the Louisiana area. An activity set has also been done for Mobile Bay, AL.

National Estuary Program Map (BTNEP)

http://www.ccs host.com/btnep_educators/client_files/editor_files/The%20BTNE%20Watershed.pdf

Shows the watersheds of the National Estuaries including Barataria-Terrebonne Estuary.

Southeastern Louisiana: Lake Pontchartrain and Manchac area

http://www.selu.edu/acad_research/programs/turtle_cove/maps_data/index.html

- Black and white image of the western 1/2 of Lake Pontchartrain, including portions of Lake Maurepas, the cities of Mandeville, Ponchatoula, and the lakeshores of Metairie and Kenner. [27 mb tiff file](#) (may require Quicktime plug-in). The same image in jpeg format [2.7 mb .jpg file](#)
- Colorized thematic mapper image of the Manchac WMA [25 mb tiff file](#) (requires Quicktime plug-in). The same image in jpeg format [1.4 mb .jpg file](#)

Land Changes (USGS)

<http://www.nwrc.usgs.gov/special/landloss.htm>

Land changes for coastal Louisiana and Pre-2005 Data, NWRC Wetland maps, info, animations of wetland loss projections, more

Louisiana Land Loss Facts

<http://www.slld.net/csimage.html>

Four maps on the same page that depict the land loss in Louisiana (1839, 1870, 1993, 2020).



Sea Floor Mapping (NOAA)

http://oceanservice.noaa.gov/education_new/seafloor-mapping

Join Cobalt, the Sea Floor Detective, and Saftey Seagull as they explain how scientists map the ocean floor, what nautical charts are and how their used, and why this information is so important. Contains animations, movies, fun facts, and much, more. Grades 3-5.

Biodiversity 911

<http://www.biodiversity911.org/>

Why do we really need all those plant and animal species? Does it really make a difference if another is lost to extinction? Learn of the many factors that affect habitat and how individuals can make a positive impact. Games, activities and tips.

Freshwater Ecoregions of the World (WWF/TNC)

<http://www.feow.org/index.php>

Covering virtually all freshwater habitats on Earth, this first-ever ecoregion map, together with associated species data, is a useful tool for underpinning global and regional conservation planning efforts, particularly to identify outstanding and imperiled freshwater systems; for serving as a logical framework for large-scale conservation strategies; and for providing a global-scale knowledge base for increasing freshwater biogeographic literacy.

Map Puzzles (SEA)

<http://www.sea.edu/academics/k12.asp?plan=mappuzzles>

Students make puzzles from world maps, dramatizing how much of the globe is covered by ocean.

Lessons on the Lake Maps (USGS)

<http://pubs.usgs.gov/of/1998/of98-805/lessons/appendix/index.htm>

Compilation of maps by Lake Pontchartrain Basin foundation for use with their lessons or independently.

Gulf of Mexico Shoreline Change Map (USGS)

http://coastalmap.marine.usgs.gov/ArcIMS/Website/usa/GoMex/shoreline_change/viewer.htm

USGS Gulf of Mexico detailing the changes of the Louisiana and surrounding coastlines.

Subsidence and Sea-Level Rise in Southeastern Louisiana: Implications for Coastal Management and Restoration (USGS)

<http://coastal.er.usgs.gov/LA-subsidence/>

Data on subsidence in southeastern Louisiana. A colored map accompanies the text.



Video Resources

American Wetland Videos

<http://www.americaswetland.com/custompage.cfm?pageid=2&cid=13>

Public Service Announcements (free downloads)

- [America's Energy Coast](#)
- [Don't Be A Big Loser Campaign](#)
- [Losing America's Coast](#)
- [American Wetlands](#) (Famous Louisianans)

BTNEP Videos

<http://educators.btnep.org/default.asp?id=48>

To obtain these videos on DVD, contact BTNEP at 800-259-0869. **Free upon request.**

- [Haunted Waters, Fragile Land](#) (Video Clips Available online)
An award winning documentary on the cultural, geologic, and environmental history of the Barataria-Terrebonne National Estuary System.
- [Vanishing Wetlands, Vanishing Future](#) (Video Clips Available online)
This video on BTNEP's seven priority problems is in the style of Bill Nye the Science Guy and is best suited for middle school, though the vocabulary is applicable to high school topics.
- [Rescuing the Treasure](#) (Video Clips Available online)
A sequel to *Haunted Waters, Fragile Lands*, describing the importance of estuaries and restoration techniques. Activity sheet available. Grades 5-12.
- [EstuaryLive! Video Clips](#) (BTNEP) (Video Clips Available online)
- [Wings Over Wetlands](#) Video - Examines the importance of South Louisiana's wetland habitats to the many birds that either call this region home or who depend on it as they pass through during migration. Activity sheet available. Grades 5-12.
- [Bayou Lafourche: The Longest Street in the World](#) - A documentary that captures the history, culture, lifestyle, environmental troubles and emerging ecological solutions of the 100-mile ribbon of bayou that weaves through the Barataria-Terrebonne Estuary. Through the lens of a camera and the voices of many stakeholders, videographer Jim Fields examines the bayou, its historical significance, the culture, and the problems that have been created since this once mighty waterway has been altered and controlled by humans. Grades 6-12.

LA Coast Videos and Public Service Announcements (CWPPRA/USGS)

<http://lacoast.gov/media/videos/>

These graphic presentations are available to be downloaded for free and shown as PSA's or included in educational presentations.

- [Delta Wide Crevasses](#) (RealMedia 3.96 MB)
- [Hopendale Hydrologic Restoration](#) (RealMedia 6.02 MB)
- [Mississippi Delta Land Loss 1932-2050](#) (RealMedia 2.44 MB)
- [Land Loss Update: Louisiana Coastal Land Loss Computer Simulation 1932 through 2050](#)
- [Land Loss Update Video](#) (RealMedia file 10.7 MB 2003-06-16)
- [Land Loss Update Video](#) (AVI file 53.2 MB 2003-06-16)
- [Lower Bayou Lafourche / Port Fourchon, Southeastern, Southwestern Louisiana](#)
- [Brown Marsh Overflight](#) (176x120 Resolution)
- "Save Louisiana Wetlands" Campaign - Public Service Announcements
 - [Harry Connick, Jr. Video](#)
 - [Aaron Neville Video](#)
 - [Chef Paul Prudhomme Video](#)
 - [Kermit the Frog Video](#)

Project TELLUS Exotic Species Video and Activities (LASGCP)

<http://lamer.lsu.edu/classroom/nis/pdfs/ExoticSpecies.pdf>

Two activities and an evaluation designed to accompany the Project TELLUS Video on Exotic Species. For a copy of the video, contact the LA Sea Grant College Program at www.laseagrant.org.



Rainwater Blues (DNR, Coastal Management Division)

<http://dnr.louisiana.gov/crm/coastmgt/interagencyaff/non-point/rainwaterblues.asp>

Non-point source pollution, unlike pollution from industry, comes from everyone and everywhere. Rainfall picks up and carries natural and man-made pollutants and deposits them into our lakes, rivers, bayous, wetlands, estuaries and even our drinking water supplies. This DVD contains both a 15 and a 30 minute version of the video. To order this DVD, contact Linda Pace at (800) 267.4019, Voice 225.342.7936, <linda.pace@la.gov>. **Free upon request.**

MarshMission CD-ROM

Two narrated PowerPoint presentations and a Flash movie about Louisiana's vanishing wetlands. To request your copy of the CD, send an email to <jsche15@lsu.edu>.

- **Vanishing Wetlands** by C.C. Lockwood (approx. 27 min.)
- **Changing Landscape** by Rhea Gary (approx. 27 min.)
- **The Rise and Disappearance of Southeast Louisiana** by Dan Swenson (7 min.)

Black Bears and Songbirds of the Lower MS River Valley CD-ROM (CWPPRA/USGS)

<http://lacoast.gov/FreeStuff/CD-ROMs/blackbears.htm>

Inform students of the importance of forested wetlands and the animals that depend on them. This highly interactive CD-ROM features audio and video clips of wildlife and research biologists. Developed by the USGS and The US Fish and Wildlife Service. Request a copy through the LaCOAST webpage at <http://lacoast.gov/freestuff/CD-ROMs/>.

The Water Sourcebook Series CD-ROM

http://www.legacyenvd.org/resource/resource_teacher.htm

The Water Sourcebook Series consists of a set of 4 volumes appropriate for Grades K-2, Grades 3-5, Grades 6-8, & Grades 9-12. Each volume is a flexible comprehensive environmental education program on water issues. The Water Sourcebook Series explains the water management cycle using a balanced approach and how it affects every aspect of the environment. The curriculum provides strong science and math content, but also links these subject areas to social studies and language arts. Each Water Sourcebook contains hands-on activities and investigations, fact sheets, reference materials, and a glossary of terms. There are 5 chapters contained in each book, Introduction to Water, Drinking Water and Wastewater Treatment, Surface Water Resources: Ground Water Resources, and Wetland and Coastal Waters. The Water Sourcebook helps kids learn about water, "use what you need and don't pollute" is the message sent to children through the Water Sourcebook Series. **Cost for the CD-ROM is \$10. Order form is online (see the website).**

Mercury Awareness: Prevention and Protection Video and DVD (DEQ)

<http://www.deq.louisiana.gov/portal/tabid/2792/Default.aspx>

This nine-minute video has been developed to inform people mercury pollution, exposure and fish advisories in Louisiana's bodies of water. Available in CD, VHS and **on the website**.

Runoff Non-point Source Pollution Video (NOAA)

http://oceanservice.noaa.gov/education/kits/pollution/media/supp_pol01a.html

Very short "Quicktime" video on different runoff scenarios, this can be used as an attention getter or discussion point.

Hurricane on the Bayou Video

<http://www.hurricaneonthebayou.com>

Dynamic IMAX movie created during Hurricane Katrina teaching about the impact of hurricanes on the Louisiana coast. Includes resources for teaching lessons about the movie. **Movie can be ordered via links on the site.**

Hurricane Force: A Coastal Perspective Videos

http://www.open-video.org/featured_video.php?type=Related&videoid=4560&PHPSESSID=5cb816611751559645c8026db3c85bcd

Series of online videos describing the impact of hurricanes on the Gulf Coast.



LSU Coastal Roots Resources

LSU Coastal Roots Program Information

<http://coastalroots.lsu.edu>

The Coastal Roots Program began in 2000 as an education outreach project for the Louisiana Sea Grant College Program. In 2006, the Coastal Roots Program was transitioned into the LSU Department of Educational Theory, Policy, & Practice and the LSU Center for Plant, Environmental, and Soil Sciences.

- [Coastal Roots Summary](#) (PDF file; 104 K)

Putting Down Roots (2002) by E. Coleman & E. Bush

<http://nsgl.gso.uri.edu/lsu/lsuh02002.pdf>

An overview of how to establish a native plant nursery at a school.

Nursery instructions

<http://coastalroots.lsu.edu/toc-nursery.htm>

- [Stratification Instructions](#) (cypress) (203KB, PDF)
- [Reading a Salinity Refractometer](#) (580KB, PDF)
- [Planting Your Seeds](#) (162KB, PDF)
- [Nursery Production Checklist](#) (124KB, PDF)
- [Bumping Up Your Seedlings](#) to Larger Pots (153KB, PDF)
- [Division of Grasses](#) (1124KB, PDF)

Coastal Roots Plants

<http://coastalroots.lsu.edu/toc-nursery.htm>

- [Southern Baldcypress](#) (191K, PDF)
- [Bitter Panicum](#) (354K, PDF)
- [Black Mangrove](#) (338K, PDF)
- [Hackberry](#) (222K, PDF) [Live Oak](#) (208K, PDF)
- Longleaf Pine (*coming soon!*)
- [Louisiana Iris](#) (193K, PDF)
- Loblolly Pine (*coming soon!*)
- Nuttall Oak (*coming soon!*)
- [Red Mulberry](#) (331K, PDF)
- Swamp Red Maple (*coming soon!*)
- [Wax Myrtle](#) (216K, PDF)

Can Yard and Cold Frame Information

<http://coastalroots.lsu.edu/toc-nursery.htm>

- [Putting Down Roots](#) (Coleman and Bush, 2002) (3025KB, PDF)
- [Building a Cold Frame - Plans](#) (213KB, PDF)
- [Preparing to Construct Your CR Can Yard](#) (162 K, PDF)
- [Constructing Can Yards and Irrigation Systems](#) (972KB, PDF)
 - [Making a Can Yard](#) (slideshow by Cody from Pierre Part Elementary, 900KB)
- **Automatic Irrigation Timers**
 - **Pre-2006 timers:** [instructions for the "old" timers](#) (203KB, PDF)
[troubleshooting your "old" irrigation timer](#) (592KB, PDF)
 - **Post-2006 timers:** [instructions for the "new" timers](#) (197KB, PDF)

Coastal Roots in the Classroom

<http://coastalroots.lsu.edu/toc-teacherinfo.htm>

- **Coastal Roots Lessons** - Visit the [LA Sea Grant Education website](#) to check out five lessons you might want to incorporate in your classes centered on your CR school nursery. There is also an information sheet about preparing for your restoration fieldtrip. Click on Coastal Roots!

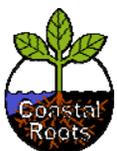


- **Bloggin' about Coastal Roots** - St. Martin Episcopal students are blogging about their experiences working on Coastal Roots. Teachers Kate Marchal and Warren Lind have set up a [St. Martin's Coastal Roots Blog](#) to help their students write about and reflect on what they are learning in the CR Program. They are posting pictures as well as comments about their school plant nursery. Contact [Dr. Pam Blanchard](#), pamb@lsu.edu, if you would like to know more about this technology-rich classroom activity.
- **Coastal Roots Social Network on NING** - Visit the Coastal Roots Social Network on NING to communicate with others about what is happening in Coastal Roots schools. Go to <http://lsucoastalroots.ning.com> to learn more! Need help? Contact [Dr. Pam Blanchard](#), pamb@lsu.edu, or Craig Howat (Luling Elementary). Thank you to Craig Howat for his initiative to get this working for our program!

Teacher Learning Opportunities

<http://coastalroots.lsu.edu/toc-teacherinfo.htm>

- **Louisiana Wetland Education Coalition (LaWEC)** - a group of educators interested in teaching about Louisiana wetland and coastal issues. Newsletters are sent out every three to four weeks informing listserv members of upcoming workshops and educational opportunities. **Free upon request.** Contact Dr. Pam Blanchard (<pamb@lsu.edu>), if you would like to join.



Grant Resources

ING Unsung Heroes Awards

<http://www.ing-usa.com/us/aboutING/CorporateCitizenship/Education/INGUnsungHeroes/index.htm>

The ING Unsung Heroes program helps K-12 educators and their schools fund innovative classroom projects. At least one award will be granted in each of the fifty states, provided one or more qualified applications are received from each state. The deadline for applications is in late April.

Write On! Wetlands Challenge

<http://www.qscb.org/forum/index.php?PHPSESSID=0cncm2rtduu7flgrc4sgch71m4&topic=150.msg152#msg152>

This competition, celebrating American Wetlands Month in May, challenges students to create a book written and illustrated by kids for kids. Hosted by Environmental Concern Inc, the contest asks students in grades 6-8 to write a children's book with a wetland theme. The winning entry will be illustrated by students in grades k-5 and published by Environmental Concern Inc. The theme in 2009 is The Case of the Wetland Mysteries! All entries must be in the form of a mystery story. The deadline for entry is in early March.

Earth Partnership for Schools

<http://uwarboretum.org/eps/>

The Earth Partnership Program, from the University of Wisconsin-Madison Arboretum, focuses on ecological restoration as a way of establishing a positive relationship between people and the land. The program assists teachers in establishing restoration projects on school sites and providing the tools for building a curriculum that incorporates restoration into almost any subject area. The program includes a two-week institute in the summer and ongoing support from UW-Madison Arboretum staff to help schools with restoration planning and curriculum development. Check out the resources under *Tools for Teachers*.

International Paper Foundation

http://www.internationalpaper.com/Our%20Company/IP%20Giving/A_IP%20Foundation/Application_Guidelines.html

The Foundation primarily supports environmental education, literacy and critical community needs. Most environmental education funds are offered to programs that address air and water quality, involve outdoor activities and forestry education, and are focused on young children.

Environmental Protection Agency

<http://www.epa.gov/enviroed/grants.html>

The EPA's Environmental Education Division, Office of Children's Health Protection and Environmental Education, offers funds to projects that build public awareness and the ability to make informed decisions affecting environmental quality. Applications are due in mid-December.

National Environmental Education Foundation

<http://www.classroomearth.org/grants>

The Student Conservation Association awards financial prizes to high schools where students have designed service projects that improve, restore, beautify or conserve their high school environment. The application deadline is in early October.



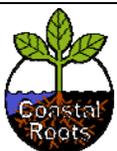
Books about Wetlands and Coastal Resources

This is an annotated list of books about the coast and wetlands habitats. It is organized into general categories (animals, coastal erosion, trees and plants, weather, and wetlands/swamps). It contains mostly children's trade books, but there are several books for adults scattered through the listing. Age levels and annotation sources are noted where appropriate. If you know of a good book that should be included in this listing, please send the author and title to Pam Blanchard.

Animals	
Andreae, G. & Wojtowycz, D. (1998). <i>Commotion in the ocean</i> . New York, NY: Scholastic.	A collection of silly verses about various creatures that live in the ocean, including crabs, swordfish, whales, and polar bears. Ages 4-8. 32 pp. bn.com ISBN-13: 9780439082145
Appelt, K. (2002). <i>Where, where is swamp bear?</i> New York, NY: HarperCollins Publishers.	While fishing with his grandfather in the swamp, a young boy asks all kinds of questions about a very special bear. Ages 5-7. 32 pp. bn.com ISBN-13: 9780688171028
Bernhard, A. (1994). <i>Wetlands plants and animals coloring book</i> . Mineola, NY: Dover Publications.	Illustrations depict salt-marsh environments of northeast U.S. and Canada. Ages 6-9. 48 pp. bn.com ISBN-13: 9780486277496
Carle, E. (1987). <i>A house for hermit crab</i> . New York, NY: Scholastic, Inc.	A hermit crab who has outgrown his old shell moves into a new one, which he decorates and enhances with the various sea creatures he meets in his travels. Ages 4-8. 32 pp. bn.com ISBN-13: 9780590425676
Clements, A. (2002). <i>Big Al</i> . New York, NY: Simon & Schuster Children's Publishing.	A big, ugly fish has trouble making the friends he longs for because of his appearance--until the day his scary appearance saves them all from a fisherman's net. Ages 4-8. 32 pp. bn.com ISBN-13: 9780689842473
Crocker, C. (2003). <i>The tale of the swamp rat</i> . New York, NY: Philomel Books.	Guided by an ancient alligator, a silent young rat learns to find his own way in the drought-stricken swamp. Ages 12+. 240 pp. bn.com ISBN-13: 9780399239642
Cushman, D. (1990). <i>Possum stew</i> . New York, NY: Dutton Juvenile.	Possum tricks Gator and Bear, but they get back at him when they tell him they are going to make possum stew. Ages 5-6. bn.com ISBN-13: 9780525445661
Cussen, S. (2005). <i>Those peculiar pelicans</i> . Sarasota, FL: Pineapple Press, Inc.	This book answers 20 questions so you will understand why pelicans are so peculiar. Ages 8-12. 55 pp. bn.com ISBN-13: 9781561643408
Fleming, C. (2004). <i>Gator gumbo: A spicy-hot tale</i> . NY, NY: Farrar, Straus & Giroux.	A hungry alligator, slow with age, hopes to catch some good meat to add to his spicy gumbo. Ages: 5-8. 32 pp. bn.com ISBN-13: 9780374380503
Galko, F. (2002). <i>Wetland animals</i> . Chicago, IL: Heinemann.	Describes wetlands, the different kinds of animals that can be found in them, and their ecological importance. Ages 5-7. 32 pp. bn.com ISBN-13: 9781403404435
Grace, T. (1992). <i>Picture book of swamp and marsh animals</i> . Mahwah, N.J: Troll Associates.	Spotlights more than a dozen creatures found in swamps and marshes including the box turtle, manatee, pelican, and alligator. Ages 6-9. 24 pp. bn.com ISBN-13: 9780816724350
Hall, M. (2006). <i>Muskrats</i> . Mankato, MN: Capstone Press.	Photographs and simple text introduce the characteristics and behavior of muskrats. Ages 5-6. 24 pp. bn.com ISBN-13: 9780736820663
Itoh, S. (1988). <i>White egret</i> . San Francisco, CA: Chronicle Books.	Ten years of field research have resulted in this revealing portrait of egrets. Lovely and technically fine color photos capture their rituals from early spring through winter migration. 168 pp. bn.com ISBN-13: 9780877015239
Kalman, B. & Bishop, A. (2002). <i>What are wetlands?</i> New York, NY: Crabtree Publ.	Investigates types of wetlands and the animals and plants that live there. 32 pp. bn.com ISBN-13: 9780865059705
Lockwood, C. C. (2002). <i>The alligator book</i> . Louisiana State University Press.	Renowned wildlife photographer and naturalist C. C. Lockwood devotes himself to uncovering the latest facts about this ancient, dragon-like species. 152 pp. bn.com ISBN-13: 9780807128287
Mallory, K. (1999). <i>Home by the sea: Protecting coastal wildlife</i> . New York, NY: Harcourt Children's Books.	Describes programs being carried out in New Zealand to protect coastal animals such as dolphins and penguins which are being threatened by development. Young Adult. 64 pp. bn.com ISBN-13: 9780152018023.
Mayer, M. (1987). <i>There's an alligator under my bed</i> . New York, NY: Dial Books for Young Readers.	The alligator under his bed makes a boy's bedtime a hazardous operation, until he lures it out of the house and into the garage. Ages 4-7. 32 pp. bn.com ISBN-13: 9780803703740
Morcos, A. C. (2002). <i>Tale of nada nutria</i> . Bloomington, IN: AuthorHouse.	A community of nutria gets separated when a hurricane destroys their home. Morcos expresses themes of friendship, family and courage with nutria as her main characters. 112 pp. beta.authorviews.com ISBN-13: 9780759693456
Pfister, M. (2005). <i>Rainbow fish colors</i> . New York, NY: North-South Books.	With holographic foil stamping throughout, these mini board books make a perfect way to teach colors and counting concepts to very young children. Infants-PreK. 24 pp. bn.com ISBN-13: 9781558580091
Pratt-Serafini, K. J. (2001). <i>Salamander rain: A lake and pond journal</i> . Nevada City, CA: Dawn Publications.	This colorful book is an invitation to kids to learn and care more about ponds, lakes and other wetlands that are found closer to home than we think. Ages 9-12. 32 pp. bn.com ISBN 1584690178
Richardson, A. (2005). <i>Alligators</i> . Mankato, MN: Coughlan Publishing.	Provides an introduction to alligators, discussing their characteristics, habitat, food, offspring, and dangers. Includes a range map, a life cycle diagram, and more facts. Ages 4-8. 24 pp. amazon.com ISBN-13: 9780736843264



Schmitz, S. (1986). <i>Fish calendar</i> . Englewood Cliffs, N.J: Silver Burdett Press.	Describes the general characteristics of fish, what they eat, how they breed, their natural environment, their habits, what plants and other animals they associate with, and the differences between salt and freshwater fish. Ages 8-10. 37 pp. bn.com ISBN-13: 9780382092404
Sendack, M. (1991). <i>Alligators all around: An alphabet</i> . New York, NY: Harper Collins Publishers.	With its toothy alligators that burst balloons, imitate Indians, and even ride reindeer--here's the book that has children chanting their alphabet in no time at all. Ages 5-8. 32 pp. bn.com ISBN-13: 9780060255307
Somervill, B. A. (2004). <i>Animal survivors of the wetlands</i> . New York, NY: Scholastic Library Publishing.	Explores how certain wetlands animals, such as the whooping crane and the brown pelican, have recovered after being threatened with extinction. Ages 10-12. 63 pp. bn.com ISBN-13: 9780531165911
Sovak, J. (2003). <i>Learning about swamp animals</i> . Mineola, NY: Dover Publications	Fact-filled pages and 12 realistic sticker illustrations describe the tree frog, American alligator, great blue heron, white-tailed deer, cottonmouth snake, and 7 other creatures. Ages 8-10. 16 pp. bn.com ISBN-13: 9780486430256
Tate, S. (2005). <i>Izzie Lizzie alligator: A tale of a big lizard</i> . Manteo, NC: Nags Head Art.	Learn about the American alligator's family behavior and how pollution affects this species. Facts about alligators are presented while encouraging readers to visit a National Wildlife Refuge and to become Helpful Humans. Ages 4-9. 32 pp. christianbook.com ISBN-13: 981878405233
Taylor, J. D. (1991). <i>Endangered wetland animals</i> . New York, NY: Crabtree Publishing Company.	Ten endangered animals are highlighted with clear, simple text matched by stunning, full-color photographs by renowned wildlife photographer and author Dave Taylor. Ages 7-8. 32 pp. bn.com ISBN-13: 9780865055300
Wallace, M. D. (2004). <i>America's wetlands: Guide to plants and animals</i> . Golden, CO: Fulcrum Publishing.	With maps, a list of common and scientific names, and additional resources, America's Wetlands is a complete guide to North America's most exciting ecosystem. 48 pp. bn.com ISBN-13: 9781555914844
Ward, J., & Marsh, T.J. (2000). <i>Somewhere in the ocean</i> . New York, NY: Scholastic.	A counting book in rhyme presents various marine animals and their children, from a mother manatee and her little calf one to a mother octopus and her little babies ten. Numerals are hidden in each illustration. 32 pp. bn.com ISBN-13: 9780873587488
Westcott, N. B. (1990). <i>Lady with the alligator purse</i> . New York, NY: Little, Brown, Young Readers.	The old jump rope/nonsense rhyme features an ailing young Tiny Tim. Infants-Pre-K. 24 pp. bn.com ISBN-13: 9780316930741
Coastal Erosion	
Baines, J. (2001). <i>Coasts</i> . London, United Kingdom: Hodder Wayland.	Describes different types of coasts, the animals and plants they support, the resources they provide for humans, how they are endangered, and how they can be protected. Includes case studies and activities. Ages 8-12. 32pp. bn.com ISBN-13: 9780817253707
Blaustein, D. (2000). <i>The Everglades and the Gulf Coast</i> . Salt Lake City, UT: Benchmark Books.	Presents an overview of wetland ecology as seen in Florida's Everglades, the largest freshwater wetlands ecosystem in the continental United States. Young Adult. 64 pp. bn.com ISBN-13: 9780761408963
College of William and Mary. (2007). <i>Where's the beach? Examining coastal erosion</i> . Dubuque, IA: Kendall Hunt Publishing Company.	Plans for building a children's camp at the beach are on hold due to beach erosion. The camp received a donation to develop nature-themed experiences and protect the environment, and the camp manager must begin construction quickly to be ready for the summer season. As members of the town council, students develop scientifically-based regulations that will satisfy both the long-term needs of the town and plans for the new camp. Ages 6-12. 196 pp. kendallhunt.com ISBN-13: 9780757523885
Colten, C. (2001). <i>Transforming New Orleans and its environs: Centuries of change</i> . Pittsburgh, PA: University of Pittsburg Press.	From prehistoric midden building to late-twentieth century industrial pollution, this book traces through history the impact of human activity upon the environment of the Lower Mississippi River Valley. Adult. 288 pp. bn.com ISBN-13: 9780822957409
Committee on the Restoration and Protection of Coastal Louisiana, National Research Council. (2006). <i>Drawing Louisiana's map: Addressing land loss in coastal Louisiana</i> . Washington, DC: National Academies Press.	Evaluates the near-term plan for the restoration of coastal Louisiana. Originally released by the U.S. Army Corps of Engineers as the "Louisiana Coastal Area [LCA], — Ecosystem Restoration Study" in November 2004, this report draws broad conclusions about how restoration efforts proposed in the LCA Study should evolve in concert with response, reconstruction, and restoration activities in light of hurricanes Katrina and Rita. Adult. 204 pp. nationalacademies.org ISBN-13: 9780309100540
Cumming, D. (1997). <i>Coasts</i> . Chicago, IL: Raintree Publishers.	Describes coastal erosion, deposition, wildlife, and pollution. Ages 9-12. 48 pp. bn.com ISBN-13: 9780817245207
Dunne, M. (2005). <i>America's Wetland: Louisiana's Vanishing Coast</i> . Baton Rouge, LA: Louisiana State University Press.	Award-winning photographer Bevil Knapp and veteran reporter Mike Dunne sound the clarion call of the catastrophic effects of Louisiana's vanishing coastline - not just for Louisiana but for the nation and the world. Adult. 144 pp. bn.com. ISBN-13: 9780807131152
Ganeri, A. (2006). <i>Cracking coasts</i> . New York, NY: Scholastic Hippo.	Geography with the gritty bits left in! Wave goodbye to boring geography lessons as you clamber up some Cracking Coasts. Marvel at the ginormous Giant's Causeway. Scream as you surf an awesome reef breaker. Shiver with fear as you take a trip to the spooky Skeleton Coast. Visit an eerie lighthouse and go sailing with a snail. Geography has never been so horrible! 126 pp. amazon.com ISBN-13: 9780439963978



Hallowell, C. (2005). <i>Holding back the sea: The struggle on the Gulf Coast to save America</i> . New York, NY: Collins Publ.	Addresses the consequences of ignoring the warning signs that nature provides and the struggle to convince the rest of the country that South Louisiana lay in the path of destruction. Adult. 265 pp. bn.com ISBN-13: 9780061124242
Hecht, J. (1990). <i>Shifting shores, rising seas, retreating coastlines</i> . New York, NY: Simon and Schuster Children's Pub.	Describes the various factors that change the shape of coastlines including storms, natural erosion, and rising sea levels. Young Adult. 160 pp. bn.com ISBN-13: 9780684190877
Heitzmann, C., & Koch, J. (2007). <i>Gulf Coast memory scrapbook: A pictorial journey of hope and healing</i> . Greensburg, IN: Winters Publishing.	Although many of these celebrated artists lost their homes, jobs, music, artwork and supplies in Hurricane Katrina, they did not lose their need to create. The memories depicted here represent just a few of the people, places, and things that make the Mississippi Gulf Coast special to those lucky enough to call it home. 32 pp. amazon.com ISBN-13: 9781883651305
Hirschi, R. (1993). <i>Save our oceans and coasts</i> . New York, NY: Delacorte Books for Young Readers.	Discusses the characteristics, animal life, and importance of oceans and coastal areas and ways to protect these habitats. Ages 9-12. 72 pp. amazon.com ISBN-13: 9780385310772
Lockwood, C.C., & Gary, R. (2005). <i>Marsh mission: Capturing the vanishing wetlands</i> . Baton Rouge, LA: Louisiana State University Press.	Louisiana is in a desperate battle to save its coastal wetlands, which are disappearing at the rate of a football field-sized area every 38 minutes. Lockwood immersed himself in the wetlands for an entire year, living on a houseboat with his wife, a schoolteacher, who created an interactive classroom from the boat via the Internet. 106 pp. bn.com ISBN-13: 9780807130964
MCCormick, A. L. (1995). <i>Vanishing wetlands</i> . Farmington Hills, MI: Gale Group.	This book explains that if wetlands are not overburdened with effluence they can act as pollution filter systems for groundwater. Young Adult. 112 pp. amnh.org ISBN-13: 9781560061625
Mirocha, P. (2006). <i>The Gulf Coast: A literacy field guide</i> . Minneapolis, MN: Milkweed Editions.	This collection explores what makes the Gulf Coast region culturally and environmentally distinct. Stories, poems, essays and journal entries provide information on the area's natural features and reveal the region's remarkable richness. Age 9. 252 pp. bn.com ISBN-13: 9781571316653
Streever, B. (2001). <i>Saving Louisiana? The battle for coastal wetlands</i> . Jackson, MS: University Press of Mississippi.	An objective look at an ecological uproar pitting scientists, oil companies, and citizens in coastal conflict. 200 pp. bn.com ISBN-13: 9781578063482
Wells, K. (2007). <i>Crawfish mountain</i> . New York, NY: Random House Publishing Group.	The fight over one man's tract of sacred marsh fronts a deeper story of our place in the environment and our obligations to it. 384 pp. bn.com ISBN-13: 9780375508769
Trees and Plants	
Sievert, T. (2005). <i>Wetland Plants</i> . Mankato, MN: Coughlan Publishing.	This book offers a description of wetlands and a brief survey of plants in freshwater and saltwater marshes. 24 pp. bn.com ISBN-13: 9780736843256
Weather	
Bennett, P. (1999). <i>Flood</i> . Mankato, MN: Black Rabbit Books.	Examines the nature and causes of floods, their impact on society, and ways of defending against them. Ages 7-10. 32 pp. bn.com ISBN-13: 9781887068895
Berger, M., & Berger, G. (2004). <i>Hurricanes have eyes but can't see and other amazing facts about the weather</i> . New York, NY: Scholastic, Inc.	A photographic exploration into the world of weather. Topics include hurricanes, tornadoes, blizzards, and dust storms. Ages 7-8. 48 pp. bn.com ISBN-13: 9780439625340
Cole, J. (2006). <i>The magic school bus inside a hurricane</i> . NY, NY: Scholastic.	When Ms. Frizzle's class takes a field trip to the local weather station, they end up in a hurricane. Ages 4-8. 48 pp. bn.com ISBN-13: 9780590446877
Dudley, W. (2006). <i>Hurricane Katrina</i> . Farmington Hills, MI: Gale Group.	A book of brief articles that present contrasting views. Ages 12+. 80 pp. bn.com ISBN-13: 9780737735529
Gibson, K. B. (2005). <i>The fury of Hurricane Andrew, 1992</i> . Hockessin, DE: Mitchell Lane Publishers, Inc.	Describes what a hurricane is, using the damage caused by Hurricane Andrew when it hit Florida in 1992 as an example. 32 pp. hungrybookworm.com ISBN-13: 9781584154167
Hood, S. (1998). <i>Hurricanes!</i> New York, NY: Simon Spotlight.	Provides information and safety tips relating to hurricanes and discusses notable examples from the past. Ages 7-10. 62 pp. bn.com ISBN-13 : 9780689820175
Kent, D. (2006). <i>The great Mississippi flood of 1927</i> . New York, NY: Scholastic Library Publishing.	Examines important events as defining moments in U.S. history. Each incident includes vital details without overwhelming younger readers. The aftermath is discussed last, telling how the event defined or changed history. Ages 12+. 48 pp. shop.scholastic.com ISBN-13: 9780516236285
Lindop, L. (2003). <i>Chasing tornadoes</i> . Minneapolis, MN: Lerner Publishing Group.	Includes a great deal of scientific information, beginning with a basic explanation of the subject and what scientists are trying to discover, as well as information on educational backgrounds necessary to pursue these careers. Ages 12-15. 80 pp. bn.com ISBN-13: 9780761327035
London, J. (1998). <i>Hurricane!</i> New York, NY: Harper Collins Publishing.	A young boy describes the experiences of his family when a hurricane hits their home on the island of Puerto Rico. Ages 8-10. 32 pp. bn.com ISBN-13: 9780688129773
Mercier, D. M. (2006). <i>Yesterday we had a hurricane</i> . Chesapeake, VA: Bumble Bee Publishing.	The experience of a hurricane as seen through the eyes of a child. Young readers will learn about big storms that come from the ocean, the effects of wind and rain, and some of the more lighthearted and practical alternatives to doing without electricity. Ages 5-8. 40 pp. bn.com ISBN-13: 9780975434253



Norcross, B. (2007). <i>Hurricane almanac: The essential guide to storms past, present, and future.</i> New York, NY: St. Martin's Griffin.	The first half of this book gives hurricane science, history, and perspectives on how we deal with hurricanes. The second half is a personal guide to "Living Successfully in the Hurricane Zone." 352 pp. bn.com ISBN-13 : 9780312371524
Rabe, Tish (2004). <i>Oh say, can you say, what's the weather today? All about the weather.</i> New York, NY: Random House Books for Young Readers.	In rhyming text, the Cat in the Hat teaches Sally and Dick about different weather conditions and how we learn about them. Ages 5-8. 45 pp. bn.com ISBN-13: 9780375822766
Schadler, C. D. (2000). <i>When the rain came down in bayou town.</i> Gretna, LA: Pelican Publishing Company.	The people of Bayou Town are in a race against the rain as they try to repair the hole in the Boudreaux family's roof. Alfons even swims into action to save a family of beavers. 32 pp. bn.com ISBN-13: 97815655468
Simon, S. (2007). <i>Hurricanes.</i> New York, NY: Harper Collins.	Discusses where and how hurricanes are formed, the destruction caused by legendary storms, and the precautions to take when a hurricane strikes. Ages 5-9. 32 pp. bn.com ISBN-13: 9780061170713
Sipiera, P. P. (1999). <i>Floods.</i> New York, NY: Scholastic Library Publishing.	Explains the importance of water to life on Earth, how flooding occurs, and some of its most devastating consequences. 48 pp. bn.com ISBN-13: 9780516264349
Smith, D. W. (1999). <i>Hattie Marshall and the Hurricane.</i> Gretna, LA: Pelican Publishing Company, Inc.	As a hurricane destroys the coast of South Louisiana in October 1893, Hattie and Eric learn that family and friendship are far more important than gold. Ages 9-12. 144 pp. bn.com ISBN-13: 9781565546752
St. Romain, R. A. (2003). <i>Moon's cloud blanket.</i> Gretna, LA: Pelican Publishing Company.	In this retelling of a Native American tale, the Moon weaves a blanket of clouds around a mother and her children who are freezing atop a cypress tree, having sought shelter from a flood. Ages 5-8. 32 pp. bn.com ISBN-13: 9781565549227
Visser, R. (2006). <i>Story of a storm: A book about Hurricane Katrina.</i> Brandon, MS: Quail Ridge Press.	Through collage art, a story is told that expresses profound emotions and describes the devastating effects of Hurricane Katrina. The story begins with preparation and evacuation, moves through the stresses of being displaced and not knowing the whereabouts of loved ones, and ends with a message of the persistence of hope. Ages 4-8. 32 pp. storyofastorm.com ISBN-13: 9781893062863
Wiesner, D. (1992). <i>Hurricane.</i> Boston, MA: Houghton Mifflin Company.	The morning after a hurricane, two brothers find an uprooted tree which becomes a magical place, transporting them on adventures limited only by their imaginations. Ages 5-8. 32 pp. bn.com ISBN-13: 9780395629741
Wetlands/Swamp	
Ableman, B. E. (1998). <i>Swampland.</i> Danbury, CT: Children's Press.	Describes the characteristics of the Okefenokee Swamp and the animals and plants that live there. Ages 4-8. 32 pp. bn.com ISBN-13: 97805162037448
Aloian, M., & Kalman, B. (2006). <i>A wetland habitat.</i> New York, NY: Crabtree Publishing Company.	Stunning, colorful photographs and clear, concise language help teach children about A Wetland Habitat. Ages 4-8. 32 pp. crabtree.com ISBN-13: 9780778729556
Anderson, M. (1998). <i>Leapfrogging through wetlands.</i> Indianapolis, IN: Dog-Eared Publications.	Written by scientists, science educators and writers, these action-packed books discuss the work of scientists and their research, and deal with environmental problems and some of their solutions. Ages 9-11. 40 pp. booksamillion.com ISBN-13: 9780941042185
Arnosky, J. (2000). <i>Wild and swampy.</i> New York, NY: Harper Collins Children's Books.	Describes and portrays the birds, snakes, and other animals that can be seen in a swamp. Ages 6-10. 32 pp. bn.com ISBN-13: 9780688171193
Arnosky, J. (2007). <i>Babies in the bayou.</i> New York, NY: Penguin Young Readers Group.	Children will fall under the bayou's spell as they learn about a new world in this lyrically charming book by one of our most respected naturalists. Ages 3-8. 32 pp. bn.com ISBN-13: 9780399226533
Bateman, D. M., & Lies, B. (2007). <i>Deep in the swamp.</i> Watertown, MA: Charlesbridge Publishing, Inc.	Describes the plants and animals of Florida's Okefenokee Swamp. Ages 3-8. 32 pp. bn.com ISBN-13: 9781570915970
Braus, J. (1999). <i>Wading into wetlands.</i> New York, NY: Chelsea House Publishers.	Kids and teachers wade into bogs, swamps, and marshes to show firsthand why wetlands are so important to wildlife and people. Ages 6-12. 87 pp. bn.com ISBN-13: 9780791048375
Brewer, D. (2003). <i>Wetlands.</i> Mankato, MN: Black Rabbit Books.	This book explores wetland ecosystems, and the impact human activities have had on them. Ages 6-9. 57 pp. bn.com ISBN-13: 9781593907268
Brown, M. (2005). <i>Postcards from Buster: Buster and the great swamp.</i> Boston MA: Little Brown Children's Books.	When his father takes him to visit the Louisiana bayou, Buster sends postcards to his friends back home telling them about the Cajun language, learning to catch crabs, and keeping watch for a swamp monster. Ages 6-9. 32 pp. bn.com ISBN-13: 9780316159128
Carroll, D. M. (2001). <i>A swampwalker's journal: A wetland's year.</i> Boston, MA: Houghton Mifflin Company.	Carroll takes us on a lively, unforgettable yearlong journey through the wetlands, illustrated with his own elegant drawings, and reveals why wetlands are so important to all life on Earth. Adult. 304 pp. bn.com ISBN-13: 9780618127375
Duey, K. (1999). <i>Swamp: Bayou Teche, Louisiana, 1851.</i> New York, NY: Aladdin Paperbacks.	In 1851 in Louisiana, Paul is abandoned in the bayous by his older brothers and it is up to his lame Cajun friend Lily to find him. Ages 9-12. 160 pp. bn.com ISBN-13: 9780689829291
Duffy, T. (1994). <i>Vanishing wetlands.</i> New York, NY: Scholastic Library Publishing.	Learn about types of wetlands and the importance of preserving them. Young Adult. 112 pp. bn.com ISBN-13: 9780531130346



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Dunphy, M. (2007). <i>Here is the wetland</i> . Berkeley, CA: Web of Life Children's Books.	Uses a cumulative approach to describe the wetland ecology of a freshwater marsh, the most common type of wetland in North America. Ages 5-8. 32 pp. bn.com ISBN-13: 9780977379583
Fowler, A. (1999). <i>Life in a wetland</i> . New York, NY: Scholastic Library Publishing.	A simple description of what a wetland is and what kinds of life can be found in it. Young Adult. 32 pp. bn.com ISBN-13: 9780516264172
Garrett, A., & Chandler, K. (1999). <i>Keeper of the swamp</i> . New York, NY: Turtle Books.	A boy's heritage from his dying grandfather, who protects the alligators of their Louisiana swamp from poachers, is the knowledge of the ways of the swamp and how it should be preserved. Includes informational pages on alligators and swamps. Ages 4-8. 40 pp. bn.com ISBN-13: 9781890515126
Geraghty, P. (1995). <i>Over the steamy swamp</i> . London, United Kingdom: Voyager Books.	A hungry mosquito starts a food chain in a steamy swamp as each hungry animal both preys and is preyed upon. Ages 4-6. 32 pp. bn.com ISBN-13: 9780152005610
Gibbons, G. (1999). <i>Marshes and swamps</i> . London, United Kingdom: Holiday House, Inc.	Defines marshes and swamps, discusses how conditions in them may change, and examines the life found in and around them. Ages 5-8. 32 pp. bn.com ISBN-13: 9780823415151
Greenaway, T. (2000). <i>Swamp life</i> . New York, NY: DK Children.	Discusses the plants and animals that live in swamps. Includes caiman, snapping turtles, and water lettuce. Ages 6-9. 32 pp. bn.com ISBN-13: 9780789460714
Guiberson, B Z., & Lloyd, M. (1994). <i>Spoonbill swamp</i> . New York, NY: Henry Holt & Co., Inc.	Depicts a swamp and the creatures that inhabit it, focusing on the day-to-day activities of spoonbills and alligators. Ages 4-8. 32 pp. bn.com ISBN-13: 9780805033854
Hirshberg, J. S. (2000). <i>Nicky the swamp dog: A true story</i> . Lafayette, LA: Acadian House Publishing.	True story of a small dog who finds a home with a swamp tour guide in the Atchafalaya River Basin in southern Louisiana. Ages 8-10. 39 pp. bn.com ISBN-13: 9780925417367
Isaacs, A. (2000). <i>Swamp angel</i> . New York, NY: Puffin.	Along with other amazing feats, Angelica Longrider, also known as Swamp Angel, wrestles a huge bear, known as Thundering Tarnation, to save the winter supplies of the settlers in Tennessee. Ages 4-8. 48 pp. bn.com ISBN-13: 9780140559088
Johnson, R. (2004). <i>Journey into a wetland</i> . Minneapolis, MN: Lerner Publishing Group.	Takes readers on a walk in a swamp, showing examples of how the animals and plants of wetlands are connected and dependent on each other and the wetland's watery environment. 48 pp. bn.com ISBN-13: 9781575055930
Kalman, B. & Burns, K. (2006). <i>Wetland food chains</i> . New York, NY: Crabtree Publishing Company.	A wide variety of plants and animals live, visit, and feed in wetlands, but wetlands are fast disappearing. This book explains which plants and animals live in this habitat and how they interact with one another in the marsh. 32 pp. amazon.com ISBN-13: 9780778719991
Ladoux, R. (2001). <i>Louisiana. (Hello USA)</i> . Minneapolis, MN: Lerner Publishing Group.	Introduces the geography, history, people, industries, and other highlights of Louisiana. Ages 8-11. 84 pp. bn.com ISBN-13: 9780822540656
Lawlor, E. (2000). <i>Discover nature in water and wetlands: Things to know and things to do</i> . Mechanicsburg, PA: Stackpole Bks.	Introduces the reader to some common plants and animals that can be found in various water environments and provides various related "hands-on" activities. 240 pp. bn.com ISBN-13: 9780811727310
Lindeen, C. (2003). <i>Life in a wetland</i> . Mankato, MN: Coughlan Publishing.	Simple text and photographs introduce the wetland biome, including the environment, animals, and plants. Ages 4-8. 24 pp. bn.com ISBN-13: 9780736821049
Liptak, K. (1991). <i>Saving our wetlands and their wildlife</i> . New York, NY: Scholastic Library Publishing.	Describes different types of wetlands and their wildlife, including endangered plants and animals, explaining the environmental threats to the wetlands themselves. Ages 12+. 64 pp. bn.com ISBN-13: 9780531200926
Loughran, D. (2003). <i>Living near the wetland</i> . Danbury, CT: Children's Press.	Introduces the wetland environment and some of the people and animals that dwell in wetlands. Ages 6-7. 31 pp. bn.com ISBN-13: 97805162274412
Luenn, N. (1994). <i>Squish! A wetland walk</i> . New York, NY: Atheneum.	In simple poetic language Nancy Luenn describes what a wetland is, indicates the animals that call a wetland home, and tells why the wetlands are important to us. Ages 5-8. 32 pp. bn.com ISBN-13: 9780689318429
Mayer, M. (1997). <i>Liza Lou and yeller belly swamp</i> . New York, NY: Aladdin.	With her quick thinking Liza Lou manages to outwit all the haunts, gobbygooks, and witches in the Yeller Belly Swamp. Ages 3-7. 48 pp. bn.com ISBN-13: 9780689815058
Mudd-Ruth, M. (2000). <i>The Mississippi River</i> . Oregon City, OR: Marshall Cavendish Inc.	The complex elements of the multiple ecosystems making up the Mississippi River Way are presented in this science text in an understandable and comprehensive manner. Age 11. 64 pp. bn.com ISBN-13: 9780761409342
National Wildlife Federation. (1997). <i>Wading into wetlands</i> . Columbus, OH: McGraw-Hill.	Learn about the characteristics of fresh and saltwater wetlands and how to protect them while joining in 20 thrilling indoor activities that reveal such wonders as gator holes, meat-eating plants, and quakin' and shakin' bogs. Ages 6-12. 87 pp. bn.com ISBN-13: 9780070465077
Nichols, C. (2002). <i>Wetlands</i> . Oregon City OR: Marshall Cavendish.	Presents the different kinds of wetlands, such as swamps, marshes, and bogs, and introduces some of the animals that live there. 32 pp. bn.com ISBN-13: 9780761414346
Paul, T. (1997). <i>By lakes and rivers</i> . New York, NY: Crabtree Publishing Company.	Illustrates and describes the tracks of beavers, herons, frogs, and other wetland creatures, with information on the sounds they make, their pawprints, and their dwellings. Ages 7-8. 32 pp. bn.com ISBN-13: 9780865055865
Pitre, V. (1991). <i>Grandma was a sailmaker: Tales of the Cajun wetlands</i> . Accord, NY: Blue Heron Press.	The author recounts his part-Acadian material grandmother's unusual occupation making boat sails, tents, and tarpaulins for small ships. Other stories reflect his experiences from the 1920s through the 1940s in Lafourche Parish, South Louisiana. Ages 4-8. 160 pp. booksxyz.com ISBN-13: 9780962172458



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Rivera, S. (2005). <i>Wetland</i> . Minneapolis, MN: Lerner Publishing Group.	Introduce beginning readers to habitats with this colorful look at some of the plants and animals that live in a wetland. Ages 8-12. 23 pp. bn.com ISBN-13: 9780822525981
Salas, L. P. (2007). <i>Wetlands: Soggy habitat</i> . Mankato, MN: Coughlan Publishing.	This introduction to wetlands would work well as part of a nature walk to a wetland. Includes a glossary, an index, and suggestions for further reading. From the "Amazing Science Ecosystems" series. Ages 5-9. 24 pp. bn.com ISBN-13: 9781404831001
Schade, S., & Buller, J. (2003). <i>Back to the Bayou</i> . New York, NY: Scholastic, Inc.	Danger Joe Denim and his family are on an outing to the heart of Louisiana swampland, where they will film a Danger Joe episode starring the world's largest American Alligator. Ages 7-9. 112 pp. bn.com ISBN-13: 9780439409780
Sill, C., & Sill, J. (2008). <i>About habitats: Wetlands</i> . Atlanta, GA: Peachtree Publishers.	This guide teaches children what wetlands are, what kinds of animals and plants live there, and how wetlands help maintain the delicate balance among Earth's environments. Ages 8-12. 240 pp. bn.com ISBN-13: 9781561454327
St. Antoine, S. (2002). <i>Stories from where we live: The Gulf Coast</i> . Milkweed Editions.	With stops in such uniquely southern locales as Texas's Neches River Bottom, Mississippi's Pascagoula, and Louisiana's Bayou Dorcheat, this book introduces past and present inhabitants of the area, including Choctaw Indians, fur traders, cotton farmers, and city kids. Ages 12+. 252 pp. bn.com ISBN-13: 9781571316363
Stewart, M. (2003). <i>Life in a wetland</i> . Minneapolis, MN: Lerner Publications.	Simple text and photographs introduce the wetland biome, including the environment, animals, and plants. 24 pp. bn.com ISBN-13: 9780822546870
Stille, D. R. (1999). <i>Wetlands</i> . New York, NY: Scholastic Library Publishing.	Examines the different types of wetlands and the plant and animal life they support. 48 pp. bn.com ISBN-13: 9780516215129
Stone, L. M. (2004). <i>Wetlands</i> . Vero Beach, FL: Rourke Publishing.	Explores the wetlands of North America, animals that dwell in them, and how wetlands are changing. Ages 12+. 48 pp. bn.com ISBN-13: 9781589526884
Vogel, C. (2003). <i>Shifting Shores</i> . London, United Kingdom: Franklin Watts.	Looks beneath the ocean's surface at the shifting of tectonic plates, the relationship between ocean and climate, and the complex paths of currents that thread the seas. Ages 12+. 80 pp. bn.com ISBN-13: 9780531123225
Warner, G. C. (2002). <i>Mystery of the Alligator Swamp</i> . Morton Grove, IL: Albert Whitman and Company.	Benny sees something in the swamp that no one can explain. Could it be the ghost of Gator Ann-a long dead alligator-come back to haunt the swamp and its inhabitants? 144 pp. bn.com ISBN-13: 9780807555170
Wilhelm, H. (1995). <i>Tyrone and the swamp gang</i> . New York, NY: Scholastic, Inc.	The dinosaur star of Tyrone, the Double Dirty Rotten Cheater and Tyrone the Horrible is back! Tyrone, the world's first bully, stirs up trouble at school when he talks everyone into joining his new gang, the Swampies. Ages 6-8. 30 pp. bn.com ISBN-13: 9789590254748

This listing of coastal and wetland-related books was initially compiled by Dr. Margaret-Mary Sulentic-Dowell's EDCI 3200 (Reading, Writing, and Oral Communication in the Elementary School) during the spring of 2008. These LSU preservice students compiled the list as a service-learning project for the course. The contributed list was subsequently annotated and expanded by Coastal Roots staff. We are grateful to these future teachers for their assistance.



Guide to Abbreviations

AAPG	American Association of Petroleum Geologists
AWF	America's Wetland Foundation
BTNEP	Barataria-Terrebonne National Estuary Program
CWPPRA	Coastal Wetlands Planning, Protection and Restoration Act
DEQ	Department of Environmental Quality
DNR	Department of Natural Resources
DOT	Department of Transportation
EPA	Environmental Protection Agency
FWS	U. S. Fish & Wildlife Service
LASGCP	Louisiana Sea Grant College Program
LPB	Louisiana Public Broadcasting
LPBF	Lake Pontchartrain Basin Foundation
LSUAC	Louisiana State University Agriculture Center
NASA	National Aeronautic and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PBS	Public Broadcasting System
SEA	Sea Education Association
SLU	Southeastern Louisiana University
TNC	The Nature Conservancy
USGS	United States Geological Survey
USN	United States Navy
WWF	World Wildlife Fund

