



Washing Away

LOSING LOUISIANA



WE CAN STILL TURN THE TIDE

ACTIVITIES FOR MIDDLE AND HIGH SCHOOL STUDENTS
DEVELOPED BY CLAUDIA FOWLER

OVERVIEW:

Louisiana's wetlands are disappearing at an alarming rate and the effects of Hurricanes Katrina and Rita have exacerbated this loss. There are efforts underway to turn the tide.

GRADE LEVEL EXPECTATIONS:

Louisiana Grade Level Expectations (Science)

Grade 5

- SI-M-A1 GLE2 Use a variety of sources to answer questions (SI-M-A1)
 SI-M-A4 GLE 11 Construct, use and interpret appropriate graphical representations to collect, record, and report data (E.g., tables, charts, circle graphs, bar and line graphs, diagrams, scatter plots, symbols) (SI-M-A4)
 SI-M-A7 GLE 19 Communicate ideas in a variety of ways (e.g., symbols, illustrations, graphs, charts, spreadsheets, concept maps, oral and written reports, equations) (SI-M-A7)

Grade 7

- LS-M-D2 GLE 32 Describe changes that can occur in various ecosystems and relate the changes to the ability of an organism to survive (LS-M-D2)
 SE-M-A1 GLE 35 Identify resources humans derive from ecosystems (SE-M-A1)
 SE-M-A4 GLE 39 Analyze the consequences of human activities on ecosystems (SE-M-A4)
 SE-M-A8 GLE 43 Identify and analyze the environmental impact of human's use of technology (e.g., energy production, agriculture, transportation, human habitation) (SE-M-A8)

Grade 8

- ESS-M-A8 GLE 20 Describe how humans' actions and natural processes have modified coastal regions in Louisiana and other locations (ESS-M-A8)
 ESS-M-A9 GLE 21 Read and interpret topographic maps (ESS-M-A9)

High School

- LS-H-D4 GLE 27 Analyze positive and negative effects of human actions on ecosystems (LS-H-D4)
 SE-H-A2 GLE 4 Determine the effects of limiting factors on a population and describe the concept of carrying capacity (SE-H-A2)
 SE-H-A7 GLE 8 Explain how species in an ecosystem interact and link in a complex web (SE-H-A7)
 SE-H-C3 GLE 21 Analyze the effect of common social, economic, technological and political considerations on environmental policy (SE-H-C3)



www.lpb.org/washingaway



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Louisiana Grade Level Expectations (Social Studies)

Grade 8

- G-1A-M2 GLE 2 Locate major landforms and geographic features, places and bodies of water/ waterways on a map of Louisiana (G-1A-M2)
- G-1B-M3 GLE 7 Explain how or why specific regions are changing as a result of physical phenomena (e.g., changes in the coastal wetlands) (G-1B-M3)
- G-1B-M3 GLE 8 Identify and describe factors that cause a Louisiana region to change (e.g., natural occurrences, disasters, migration) (G-1B-M3)
- H-1D-M4 GLE 78 Describe and analyze the impact of Louisiana's geographic features on historic events, settlement patterns, economic development, etc (H-1D-M4)
- H-1D-M4 GLE 79 Explain how Louisiana's natural resources have shaped its history (e.g., petroleum) (H-1D-M4)

High School

- G-1A-H1 GLE 3 Analyze or interpret a map to locate geographic information, using a variety of map elements (e.g., compass rose, symbols, distance scales, time zones, latitude, longitude) (G-1A-H1)
- G-1C-H6 GLE 37 Analyze regional issues and alliances in terms of common interests related to territory and resources (e.g., oil, water, boundaries) (G-1C-H6)
- E-1B-H6 GLE 46 Evaluate the role and importance of Louisiana ports and products in the national and international economy (E-1B-H6)

SUGGESTED STRATEGIES:

This is a project-based resource of activities that examines the status of wetland issues in coastal Louisiana with an emphasis on the impact of Hurricanes Katrina and Rita.

It is suggested that students work in small groups to research their assigned topics and make a final presentation to the entire class. Presentations should utilize technology, when possible, including online topographic maps, graphic displays and videos. Students should use resources that provide current and accurate scientific data.

This activity offers an opportunity for students to practice their map reading skills and to see the relevance of this tool. If possible, student groups should have access to topographic maps of coastal Louisiana. Many of the state agencies and advocacy groups provide access to maps at their websites and often time teachers receive sets of maps through various professional development opportunities such as WETMAPP. As a minimum, a state road map will suffice.

Time should be allowed for students and teacher to develop the components of a scoring rubric to assess the projects *before* students begin work on their assignments. This will ensure that students are aware of the teacher's expectations.

The following list of topics should be assigned to student groups and can be adjusted to accommodate class size, demographics and background knowledge of the students. For example, Topic 1 could be broken down into individual functions and or values and Topic 3 can be subdivided into individual causes, as well. Note that the protection of New Orleans is being offered as a separate category due to its unique status; the value of the oil and gas industry is also a separate category. A few websites are listed under each topic description to serve as a starting point for students but they are expected to find additional resources for their presentation.

1. Review the definition of “wetlands” with students and query them to determine their prior knowledge of the status of the coastal wetlands in Louisiana.
2. Inform students the fact that in 8 hours, Hurricane Katrina destroyed 80 square miles of vegetative marsh in Upper Breton Sound. Scientists had predicted, prior to Katrina, that by 2050 there would be approximately 60 square miles lost in this area. Aerial photos of this loss and others can be found at the America’s WETLAND site.
http://www.americaswetlandresources.com/background_facts/basicfacts/hurricane.html.
3.
 - a. Show students a model that is exactly one square yard.
(*a piece of plywood, poster paper, etc.*)
 - b. Ask students to calculate the number of square yards in one mile.
($1760\text{ yds}^2 = 3,097,600\text{ square yards}$)
 - c. Log onto the home page of America’s WETLAND (<http://www.americaswetland.com/>) and identify the counter that displays “square yards of land lost since January, 2006.”
 - d. A student should record the changing number, each school day, from the website and display it in a prominent place as a reference throughout the school year.
4. Prior to the assignment of topics, share the following three video clips with students taken from the **Washing Away** documentary: Ted Falgout (14:13-17:33), Ted Falgout (31:51-35:05) and Kerry St. Pé (38:02-40:36). Instruct students to be listening for specific functions and values of the coastal wetlands offered by these long time residents of coastal Louisiana.
5. Following the viewing, elicit from students any of their thoughts and/or experiences in the coastal marshes.
6. Assign the topics listed below to student groups. (Details follow.)
Topic 1 *Functions and Values of the Wetlands*
Topic 2 *Oil and Gas as a Wetlands Value*
Topic 3 *Causes of Wetlands Loss*
Topic 4 *Major Legislation to Address Wetland Loss*
Topic 5 *Major Types of Restoration Projects*
Topic 6 *Current Recommendations to Protect New Orleans*

Topic 1

Functions and Values of the Wetlands

This group should develop their presentation around the major functions and values of wetlands. Students can find these from one of the sites listed below. Each value and each function should be discussed, in some detail, including the economic value pre-post hurricane impact, the short and long term projections for recovery of each value and other relevant information. Students should note how these resources have helped to shape the history of Louisiana. When possible, students should include how the carrying capacity for specific species in an ecosystem is impacted.

Note: *The “value” of offshore oil and gas resources will be addressed as an individual topic.*

America’s WETLAND

http://www.americaswetlandresources.com/background_facts/whytheconcern.html

America’s WETLAND Values of Wetlands

<http://www.americaswetland.com/custompage.cfm?pageid=4&cid=8>

American Association of Petroleum Geologists

<http://www.aapg.org/explorer/2003/09sep/fourchon.cfm>

LaCoast

<http://www.lacoast.gov/reports/rtc/1997/4.htm>

USDA-Natural Resources Conservation Service

<http://www.nrcs.usda.gov/programs/farmland/1996/FuncFact.html>

WETMAPP

http://www.wetmapp.org/Functions_and_Values/index.html

Topic 2

Oil and Gas as a Wetlands Value

The Louisiana Offshore Oil Port (LOOP), located approximately 20 miles off Louisiana's Gulf Coast, is the largest U.S. oil import terminal and handles about one million (1,000,000) barrels of crude oil a day. The value of the oil and gas industry, not only to Louisiana but to the world should be included and how this industry has helped to shape Louisiana's history. Students should also include the role that Port Fourchon plays in the wetlands story and the effects that wetland loss is having on the Port and ultimately the oil and gas industry. The importance of the offshore boundaries and the issues that arise is an important point to include. The effects of Hurricanes Katrina and Rita on this value should be discussed.

American Association of Petroleum Geologists

<http://www.aapg.org/explorer/2003/09sep/fourchon.cfm>

Louisiana Department of Natural Resources Interactive Map Site

<http://sonris-www.dnr.state.la.us/>

LA 1 Coalition

<http://www.la1coalition.org/facts.html>

US Department of Energy

http://tonto.eia.doe.gov/oog/special/eia1_katrina.html

Wikipedia

http://en.wikipedia.org/wiki/Louisiana_Offshore_Oil_Port

Topic 3

Causes of Wetlands Loss

The causes of wetland loss are related to both natural and human actions (*WETMAAP slides 16 and 17 in Functions and Values* http://www.wetmapp.org/Functions_and_Values/index.html). This presentation should explore each type and discuss what affects Hurricanes Katrina and Rita had on these causes. Give examples of how man's use of new technologies has helped/hindered wetland loss. Students should use models/demonstrations, when feasible.

Note: *This is a topic that can be subdivided, if needed.*

America's WETLAND Aerial Photos of Wetland loss

http://www.americaswetlandresources.com/background_facts/basicfacts/hurricane.html

Environmental Literacy Council: Article by Dr. Shea Penland UNO

<http://www.enviroliteracy.org/article.php/1129.html>

LaCoast

<http://www.lacoast.gov/education/causes.htm>

Louisiana Department of Natural Resources

<http://www.dnr.Louisiana.gov/crm/background>

WETMAPP

http://www.wetmapp.org/Functions_and_Values/index.html

Topic 4

Major Legislation to Address Wetland Loss

Funding is critical to address wetland loss. Millions of state and federal dollars have already gone into planning and research but so much more money is needed. Not surprising, this is a very political issue. This report should provide a brief overview of early efforts toward legislation, the current plans that have emerged from that legislation, the special interest groups/organizations that assist in the coastal restoration efforts and the current status of efforts to secure this funding. Include an analysis of how social, economic, technological and political considerations effect these policies.

Breaux Act

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

Coastal Impact Assistance Program

<http://dnr.louisiana.gov/crm/ciap/ciap.asp>

Coast 2050 Plan

<http://www.coast2050.gov/>

Louisiana Coastal Area Ecosystem Restoration Plan

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

Louisiana Department of Natural Resources-Coastal Restoration

<http://dnr.louisiana.gov/crm/coastres/coastres.asp>

Louisiana Governor's Office of Coastal Activities

<http://www.goca.state.la.us/>

Topic 5

Major Types of Restoration Projects

There are several restoration projects currently in place in the wetlands of Louisiana. Students should report on the types of projects, where they are located (using maps and other graphics to illustrate these sites) and what they are designed to do. Scientists and concerned citizens have debated the location of these projects and the effectiveness of each of them but all agree that something must be done. The report should include the effectiveness of each type.

Breaux Act

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

Louisiana Department of Natural Resources-Restoration Program Background

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

Louisiana Coastal Area Ecosystem Restoration Project

<http://www.mvn.usace.army.mil/prj/lca/factsheet.asp>

Topic 6

Current Recommendations to Protect New Orleans

Flooding has been an issue for the city of New Orleans since it was established in 1718 and residents have been talking about the “big one” for decades. The levee system that was built to protect the city failed during Hurricane Katrina. This project should present some of the current recommendations to protect New Orleans from flooding and provide some historical background on the current levee and floodwall systems. Students should report on any efforts to address building construction to avoid general street flooding from seasonal storms.

Army Corps of Engineers: Lake Pontchartrain and Vicinity Hurricane Protection Project Report
<http://www.gao.gov/new.items/d051050t.pdf>

Congressional Research Service of the Library of Congress : Protecting New Orleans: From Hurricane Barriers to Floodwalls
<http://fpc.state.gov/documents/organization/58444.pdf>

Floodwalls in New Orleans
<http://www.newscientist.com/article.ns?id=dn8038>

Scientific American link that describes some of the proposed ideas to help protect New Orleans..
<http://www.scientificamerican.com/article.cfm?chanID=sa006&articleID=0004B83F-4437-13CD-843783414B7F0101&pageNumber=5&catID=2>

Louisiana Sea Grant - specific maps and information relative to Rita and Katrina
<http://www.laseagrant.org/hurricane/archive/maps.htm>

FINAL ACTIVITY:

After all student projects have been presented, consider a student-led “mock” public forum such as a town meeting, a public hearing or legislative hearing in order for students to put into practice what they have learned from this activity. Some suggested topics are: the feasibility of wetland restoration, the passage of legislation that student’s draft, how realistic is the notion that New Orleans could be protected from a Category 5 storm?

NOTE: A trip to a region of the **Barataria-Terrebonne Estuary** or to any wetland area would be beneficial to students. There are many agencies and groups that could potentially assist you in providing this opportunity for your students.

The **Barataria-Terrebonne National Estuary Program** <http://www.btnep.org/>,
the **Louisiana Universities Marine Consortium (LUMCON)** <http://www.lumcon.edu/>,
the **Lake Pontchartrain Basin Foundation** <http://www.saveourlake.org/>
and the **LA Wetland Education Coalition** <http://www.lacoast.gov/education/lawec/>
are just a few of the many agencies that provide programs for youth (and teachers) which focus on learning more about the wetlands.

ADDITIONAL RESOURCES:

Teachers Guides That Focus on Wetlands

Educators Guide to the Barataria-Terrebonne Estuary
<http://educators.btnep.org/default.asp?id=64>

Fragile Fringe
<http://www.lacoast.gov/education/FragileFringe/>

Lafourche Parish from the Beginning
<http://educators.btnep.org/default.asp?id=66>

Lessons on the Lake: An Educator’s Guide to the Lake Pontchartrain Basin 2nd Edition
<http://pubs.usgs.gov/of/1998/of98-805/lessons/index.htm>

Wonders of the Wetlands!
<http://www.wetland.org/wowteacher.html>

EVALUATION:

It is suggested that students and teacher design a rubric for assessing the project-based presentations. Teachers can find assistance in creating such rubrics at various sites on the web such as Rubistar.
<http://rubistar.4teachers.org/index.php>