

RIVER BASINS, ESTUARIES AND ECOSYSTEMS OF NORTH CAROLINA PROJECT

You will be working independently to complete a folder detailing river basins, estuaries, and ecosystems of North Carolina. The folder's activities will count as a test grade. In other words, you will determine the next test grade you earn by completing the number of activities that equates to the grade you want to receive, so work efficiently, thoroughly and to the best of your ability.

Each activity needs to be on a separate sheet. Be sure to **LABEL** each assignment with the **NUMBER** in the **RIGHT HAND CORNER**. **BE SURE YOUR NAME IS ON EVERY SHEET BY THE NUMBER!!!** You will need supplies such as paper, glue, colored pencils/crayons etc. **You are responsible for keeping all work in your folder in numerical order! You may leave your folder in the appropriate box at the front of the room.**

Objectives

- *To explain the structure of the hydrosphere including: Local river basins and local water availability.
- *To evaluate the estuaries and river basins of North Carolina as they exemplify the fact that they are reservoirs of nutrients, minerals, and life forms.
- *To evaluate the value and sustainability of North Carolina's wetland ecosystems.
- *To illustrate how terrestrial and aquatic food webs are interconnected.
- *To describe how humans are affecting water quality.

Activities

1. Create your folder. Use a piece of construction paper folded in half or two sheets stapled/glued together. Design the cover of your folder with the following information:
 - a. Title: **RIVER BASINS, ESTUARIES AND ECOSYSTEMS OF NORTH CAROLINA**
 - b. Your Name
 - c. Class
 - d. You may decorate your cover as you so choose.
 - e. The **Project Contract** must be glued to the inside cover of your folder.

Use the *Discover North Carolina's River Basins* Booklet to complete the following activities:

2. **Vocabulary:** Define all of the key words in the booklet. *(They are in little green boxes as you read.)*
3. **Environmental Education** (Choose one)
 - a. Discuss in writing four reasons environmental education is important.
 - b. Create a cartoon that illustrates the reasons environmental education is important. Color the cartoon.
4. **Reading Analysis Questions:** Complete the worksheet as you read the booklet.
5. **Flip Chart:** Use a sheet of paper to create a flip chart in which you define fully and illustrate the following terms: river basin, estuary, watersheds, groundwater, and ecosystem.
6. **Water Cycle:** Draw, color, and label the water cycle.
7. **Rivers:** Create a flash card that illustrates what a river is and why rivers are important.
8. **Water Quality:** Make a concept web or tree map that illustrates the following:
 - a. *What things positively affect the health and water quality of a river? How do they do this? What are the effects of this?
 - b. *What things negatively affect the health and quality of a river? How do they do this? What are the effects of this?

9. **Government Intervention:** Decline in water quality led to government involvement. Discuss some of the outcomes of this. What did North Carolina do in response to this? Paragraph form.
10. **Buffers:** Draw a vegetative/riparian buffer and a river with no vegetative buffer. Below each picture, explain how it affects the river and the plants and animals living in the river.
11. **Pollution:** Identify non-point source and point source (define, tree map to classify the two types of pollution).
12. **Pamphlet:** What can you do to protect your water basins? Create a pamphlet that you could pass out that would encourage others to help protect these valuable areas.
13. **NC River Basins:** North Carolina has 17 river basins. Draw North Carolina and color each of its river basins a different color. Locate your river basin and use a Sharpie to outline it in black.
14. Create at least 10 questions and interview an adult (Parent, grandparents, neighbor, etc..)

Use the "Wetlands: Their Functions and Values in Coastal North Carolina" to do the following:

15. **Functions of Wetlands:** Read the article and use a tree map to classify the functions of wetlands in North Carolina.
16. Complete the "Word Find"

THESE ACTIVITIES MUST BE COMPLETED INDIVIDUALLY. IF YOU ARE EXPERIENCING PROBLEMS, COME AND ASK ME TO GIVE YOU CLARITY ON WHATEVER ISSUES ARE TROUBLING YOU.

Contract and Grading Rubric

I, _____, wish to earn a(n) _____ on this project in Science. I understand that I **MUST** work on this project in class; although I can do some work at home. I also understand that **I AM RESPONSIBLE** for keeping **ALL** my work in my **FOLDER**. I also understand that I am expected to do my **OWN** work. ***It is understood that I will only get full credit for each assignment that is completed accurately, thoroughly, and neatly.***

Student Signature _____

Date _____

Last day to turn in activities: _____ (letter grade reduction if late)

Grading Scale: (Each activity is worth 5 points).

A+ (100) = 16 activities	A (95) = 15 activities	A- (90) = 14 activities
B (85) = 13 activities	B- (80) = 12 activities	C (75) = 11 activities
10 or less (each activity is worth 5 points)		

Units completed and turned in:

#1	#2	#3	#4
#5	#6	#7	#8
#9	#10	#11	#12
#13	#14	#15	#16
My project			

****ANYONE NOT WORKING ON THE ASSIGNMENT QUIETLY AND CONSISTENTLY EACH DAY IN CLASS WILL GET 5 POINTS DEDUCTED FROM HIS/HER FINAL GRADE FOR EACH DAY S/HE DOES NOT PARTICIPATE APPROPRIATELY. NO EXCEPTIONS!**

***Discover North Carolina's River Basins
Reading Analysis Questions***

1. What two issues brought the value of rivers to the public's view?

2. What is a river basin?
3. What determines the health of the aquatic ecosystem?
4. How many river basins are there in N.C.?
5. What river basin do you live in?
6. How big is our river basin?
7. What are the nine components of your ecological address?
8. How is pollution classified?
9. What is a vegetative buffer?
10. What can you do to help maintain healthy water?
11. What is carried in water?
12. What is the difference between wetland and groundwater?
13. How can streams be physically manipulated?
14. What led to the government getting involved in the treatment of water?
15. Using the scale map on page 12 estimate the length of N.C. at its longest point.

Wetlands :: Their Functions and Values in Coastal North Carolina

What are wetlands?

Wetlands are lands that are wet at least part of the year because their soils are either saturated with water or have a shallow layer of water. Wetlands include a variety of natural systems, such as marshes, swamps, bays, hardwoods, pocosins and wet flats. While each wetland type looks and functions differently, all wetlands share certain properties, including characteristic wetland vegetation, hydric soils and hydrologic features.



Wetlands usually are covered by plants, ranging from marsh grasses to trees. All wetland plants must tolerate living in saturated soil without oxygen during parts of the growing season. Many wetland plants are called "hydrophytes," because they can live with their roots in water.

Soils that have developed in wetlands are known as hydric soils, because they have formed under water-logged conditions. They have distinctive color, texture and, sometimes, odor. The presence of hydric soil means an area was once a wetland; however, it does not by itself mean that the area functions as a wetland today.

The most obvious wetlands, such as cypress swamps, have standing water in them nearly all the time. Some wetlands, like tidal saltmarshes, develop along the fringes of open water where they are flooded daily. Others, such as bottomland hardwoods along streams, develop in response to seasonal flooding.

Some wetlands occur far from open water -- in depressions where rainwater collects or in areas where the groundwater is frequently at or near the soil surface. Some of these wetlands are noticeably wet most of the time, but others may appear to be dry forests at certain times of the year. Although such areas may not be easily identified as wetlands by an untrained observer, many of them still perform important wetland functions.

Wetlands are worth protecting

Different types of wetlands perform various natural functions, many of which are important to coastal North Carolina. The role of wetlands as wildlife habitat has long been recognized. More recently their critical roles in protecting water quality, preventing floods and erosion, and maintaining fish populations have become evident.

Water-quality protection

During rainstorms, runoff from farm land, highways and urban areas washes into rivers and sounds. This runoff may contain toxins, bacteria, sediment or nutrients that can harm aquatic life and contaminate drinking water. Stormwater runoff is a major contributor to water-quality problems in coastal North Carolina.

Wetlands are natural buffers between uplands and waterways. By trapping sediment, removing nutrients and detoxifying chemicals, wetlands act as efficient and cost-effective filtration systems. When runoff enters a wetland, many of the harmful components are removed before the water enters a stream.

Wooded wetland corridors along headwater creeks are the most important filters of agricultural runoff in the coastal area. Bottomland hardwoods and swamp forests along rivers remove sediments, nutrients and toxic chemicals from the river when floodwaters run through them. Wetlands are vital for protecting the quality of coastal sounds because they remove upstream pollutants from the water.

Flood protection

Wetlands minimize the danger of damaging floods by storing and preventing rapid runoff of water. Large pocosin wetlands can store enormous amounts of water and slow runoff of freshwater into brackish estuaries. Bottomland wetlands along streams provide holding basins for floodwaters and slow the water to reduce flood damage.

Wetlands store water after rains and release it gradually into groundwater or through surface outflow. This function of wetlands helps maintain more constant water levels in streams.

Shoreline-erosion protection

Wetland vegetation is often very dense, both above and below ground. This plant cover can absorb energy from floods and wave action. By dissipating energy, binding soil and encouraging sediment deposition, wetlands stabilize shorelines along coastal streams, lakes and sounds.

Fish and wildlife habitat



Wetlands provide essential habitat for many diverse species -- fish, wildlife and plants. In North Carolina, more than 70 percent of the species listed as endangered, threatened or of special concern depend on wetlands for survival. Many common species of waterfowl, fish, birds, mammals and amphibians live in wetlands during crucial stages of their lives.

Coastal marshes provide nursery areas for finfish and shellfish. These marshes are among the most productive natural systems in the world, and this productivity makes the adjoining sounds some of America's richest fisheries.

Bottomland hardwood wetlands provide abundant food, nesting sites, resting areas and escape cover for many wildlife species. Many fish species use spring-flooded bottomlands as spawning and feeding locations.

Large pocosins are a refuge for wilderness animals, such as black bear and bobcat. Carolina bays are critical habitat for many uncommon amphibians and reptiles. Pine savannas are host to numerous rare plants, such as insectivorous species, and to the endangered red-cockaded woodpecker.

Without its wetlands, coastal North Carolina would have much less biological diversity and would be a far less interesting place to live or visit.

Economic importance of wetlands

Numerous economically important products and activities depend on wetlands. Fish, shellfish, blue crabs and shrimp -- vital to our commercial and sports fisheries -- use coastal saltmarshes for habitat and food. Inland freshwater wetlands also affect estuarine water quality and productivity; thus they too influence fisheries.

An important use of freshwater wetlands in coastal North Carolina is timber production. Many wetland areas, if managed properly, can produce forest products without substantially detracting from their other wetland functions.

Other traditional wetland uses of economic importance include hunting, fishing and trapping. The water-filtration and flood-protection roles of wetlands are also of economic value, since they save money that would otherwise be spent on runoff control, water treatment and property preservation.

In addition to hunting and fishing, many wetlands offer opportunities for birdwatching, canoeing and photography. Almost all of the public recreation areas in the coastal area include significant wetlands. Visits to wetland wildlife refuges are an important part of the tourist economy in some coastal counties.

Development in wetlands

Development in wetlands in North Carolina requires a permit from either the U.S. Army Corps of Engineers or the N.C. Division of Coastal Management. Wetland permits are meant to protect the valuable wetland functions described in this brochure. Before disturbing wetlands, consult with one of these agencies.

http://www.ee.enr.state.nc.us/images/River%20Basin%20Images/final_web_neuse.pdf