Delaware Recommended Curriculum

This unit has been created as an exemplary model for teachers in (re)design of course curricula. An exemplary model unit has undergone a rigorous peer review and jurying process to ensure alignment to selected Delaware Content Standards.

Unit Title: **Ecosystems**

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Content Area: **Social Studies**
Grade Level: **5**

Summary of Unit

"The relationship between human needs and the natural environment is fundamental to life. Humans modify the environment in culturally distinctive ways as they respond to the resource opportunities and risks present in the physical world. To understand this relationship, students must know of the major processes which shape the world into distinctive physical environments, and gain awareness of the opportunities and limitations to human action presented by those environments."

-- Understanding the Geography Standards; Peter W. Rees

This unit is intended to develop geographic perspectives of ecosystems and will be most effective if taught concurrently with the DRC Science unit, *Ecosystems*. Students will apply environmental relationships they have been learning about in the science program as they observe and analyze examples of ecosystems in landscapes found locally, regionally, and in other parts of the United States. Activities and materials in this unit will also extend and reinforce knowledge of the basic geography of Delaware and the United States. The interdependence of living things and the effects of human activities on ecosystems are the primary emphasis.

This unit assumes a basic knowledge of types of landforms and climate and the basic forces that cause these characteristics of the physical environment.

This instructional unit is supported through by a grant from the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce.

Stage 1 – Desired Results

What students will know, do, and understand

Delaware Social Studies Standards

- **Geography Standard Two 4-5a:** Students will apply a knowledge of topography, climate, soils, and vegetation of Delaware and the United States to understand how human society alters, and is affected by, the physical environment.

By the end of this unit, students will be able to…

KNOW:	UNDERSTAND:	DO:
Unique characteristics of the topography, climate, soil, and vegetation of Delaware. Characteristics and location of typical ecosystems found in Delaware. Characteristics and location of the Chesapeake Watershed and other key watersheds in the U.S. Similarities of Delaware, Chesapeake Watershed, other U.S. watersheds. Differences of Delaware, Chesapeake Watershed, other U.S. watersheds. Human society adapts to and alters the environment locally, regionally, and nationally.	Physical environments found in different parts of Delaware and the United States support a variety of ecosystems. The physical environment affects human activities. Human activity alters or impacts the physical environment.	Gather information from maps, photos and text to build a knowledge of ecosystems of Delaware. Gather information from maps, photos and text to build knowledge of the environment and problems facing the Chesapeake Bay & other key watersheds found in the U.S. Use deductive reasoning to determine how humans are affecting the environment. Observe, record, and analyze data in order to draw conclusions.

Stage 2 – Assessment Evidence

Evidence that will be collected to determine whether or not Desired Results are achieved

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This summative assessment is a performance task that requires students to use knowledge and understandings to perform a task in a new setting and context.

The assessment and scoring guide should be reviewed with students prior to any instruction. Students should do the assessment after the lessons conclude.

Essential Question Measured by the Performance Task

- How does human society alter and affect the physical environment?

Click here for the Performance Task.

Stage Three: Instructional Plan

Lesson 1: Locating Ecosystems

Essential Questions

- How might differences in physical environments result in diverse ecosystems in Delaware and the United States?
- How might mapped patterns in physical environments predict patterns in ecosystems?

Materials Needed

Copies of outline maps of the Delmarva and Chesapeake Bay Watershed, highlighters in four colors, copies of student readings

Click here for a printable Student Workbook.

Instructional Strategies

Strategy 1: Gathering Information
Mapped Patterns

This activity will introduce the idea that physical conditions determine what plants and animals can thrive and interact in an area to form an ecosystem. Students will compare public use areas along the shoreline of the region to see that slight differences in topography, salinity, wave and water action, and soils contribute to quite different landscapes and support different ecosystems.

To recall earlier learning and provide orientation, have students locate the Delmarva Peninsula on a satellite view of the United States and identify the approximate area of the state of Delaware. (This can be accomplished electronically or with paper maps.) Point out the locations of the Appalachian Mountains and Rocky Mountains, the Mississippi River and the Great Lakes. Remind the students that Delaware and the Delmarva Peninsula are on the Atlantic Coastal Plain.[1]

Have the students label an outline map of the Delmarva Peninsula and Chesapeake Watershed (use handout 1a and/or 1b) with names of bodies of water (Atlantic Ocean, Delaware Bay, Chesapeake Bay, Inland bays, Rivers) and names of states in the region (Delaware Maryland, Virginia, Pennsylvania, New York, and West Virginia, and the District of Columbia).

Explain that students will be relating what they learn about ecosystems to a variety of places in our state and in the Chesapeake Bay Watershed region. Tell the students that

[1] These locations and others are expected from students in the 4th grade DRC unit, Developing Mental Maps.

what they learn about local ecosystems can be applied to other areas of the United States and even the world.

Strategy 2: Extending and Refining
Mapped Patterns and Graphic Organizer

Have students return to the map they labeled (Delmarva Peninsula and Chesapeake Bay Watershed.)
Distribute highlighters in four colors. Have the students use a different color to highlight four coastal areas: the Atlantic Coast of the Delmarva Peninsula, the Delaware Bay coastline, the eastern shore of the Chesapeake Bay, and the western shoreline of the Chesapeake. Distribute Shorelines of the Chesapeake Bay and Delmarva.[2]

Have students read the articles about the parks and public areas. As they read, they should complete the graphic organizer, Thinking Like a Geographer. Next, have the students look at the map of the Delmarva and Chesapeake Bay Shorelines. Questions are included to help guide their thinking.

Check for Understanding

Hurricanes are large coastal storms that bring high winds, large waves and a storm surge (unusual rise in sea level) that can cause widespread flooding near coastlines. Select one of the shoreline parks and use its description to answer the following question.

- How might the ecosystems there be affected by a hurricane? Explain your answer with examples from the text.

Rubric

3 – This response uses relevant and sufficient text support to explain how a hurricane could affect the chosen ecosystem.

2 – This response makes limited use of the available descriptions and inconsistently uses relevant and sufficient text support to explain how a hurricane could affect the chosen ecosystem.

1 – This response makes inadequate use of the available descriptions and fails to use relevant and sufficient text to explain how a hurricane could affect the chosen ecosystem.

Strategy 3: Application
Comparing Ecosystems

[2] The lexile score for this reading is 1040, appropriate for the upper level of the Common Core State Standards 4-5 grade cluster.

Shoreline ecosystems are varied, but they have many similar characteristics. Delaware is a small state, yet it includes at least six main types of ecosystems, each with its own set of physical conditions and living organisms.

Each ecosystem produces a recognizable landscape. Distribute Six Ecosystems You Should Know. Review with students the types of ecosystems, including the living elements and the thumbnail photos that illustrate the landscape.

Have the students answer the questions related to Delaware ecosystems and label the Delaware map with likely locations for each ecosystem type.

Click here for the Check for Understanding.

Lesson Two

Essential Question

- How have people adapted to or altered ecosystems?

Instructional Strategies

Strategy 1: Gathering Information
Think/Pair/Square[3]

Have students work in pairs to respond to this question:

- When people move from one place to another, what are some things they might have to adapt to?
- Sample responses: climate differences, availability of stores and services, language, local laws and regulations, etc.

Give each individual student about one minute to think about an answer or solution on their own. The student then pairs up with another student to compare answers, then join another pair to compare answers.

Ask the group of four students to share their findings. Tell the students that this lesson will be about ways people have adapted to and, most importantly, altered the natural environment. Because people are part of ecosystems, the changes people make to the environment impact other parts of the ecosystem.

Strategy 2: Extending and Refining
Timed Pair Paraphrase[4]

This strategy has students paired to read and complete a graphic organizer for the purpose of answering a question. Have students read People and Ecosystems[5] and use the graphic organizer to assist in comprehension.

Select one student to go first. Tell that student "explain how people have adapted to or altered ecosystems. You have two minutes. If you stop sharing, your partner should ask questions."

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[3] This activity is built on the foundation of Think-Pair-Share without the class reporting. After Think-Pair-Share takes place, partners team up with another set of partners, creating groups of four students. Each group compares the two sets of answers or solutions. From the two the group decides on a compromise. The whole class reports out on their decisions. http://www.wcer.wisc.edu/archive/cl1/CL/doingcl/thinksq.htm

[4] This strategy requires all students to participate in the discussion.
Source: Betty Hollas. *Differentiated Instruction in a Whole-Group Setting.*c.2005. Crystal Springs Books, pg. 10

[5] This reading has a lexile measure of 990, appropriate for the Common Core State Standards 4-5 grade cluster.

After a few minutes, have each student tell what the other just said. "The paraphrase might start, 'I heard you say…'"

Ask students to share with the whole class what their partners said.
Reverse the process.

Strategy 3: Application
Trap Pond Case Study

Have students read the informational text and complete the graphic organizer at the end of the Humans Impact Ecosystems at Trap Pond State Park Case Study.[6]

Have students create a cause and effect timeline[7] as follows that explains how humans impacted ecosystems over time at Trap Pond State Park.

What happened?
_____I_____I_____I_____I_____
Why?

Complete the timeline, making sure to provide evidence supporting the explanation of why the event occurred.

Check for Understanding

- Based on what you have read, how have people adapted to or altered ecosystems? Explain your answer with details from the articles.

Rubric

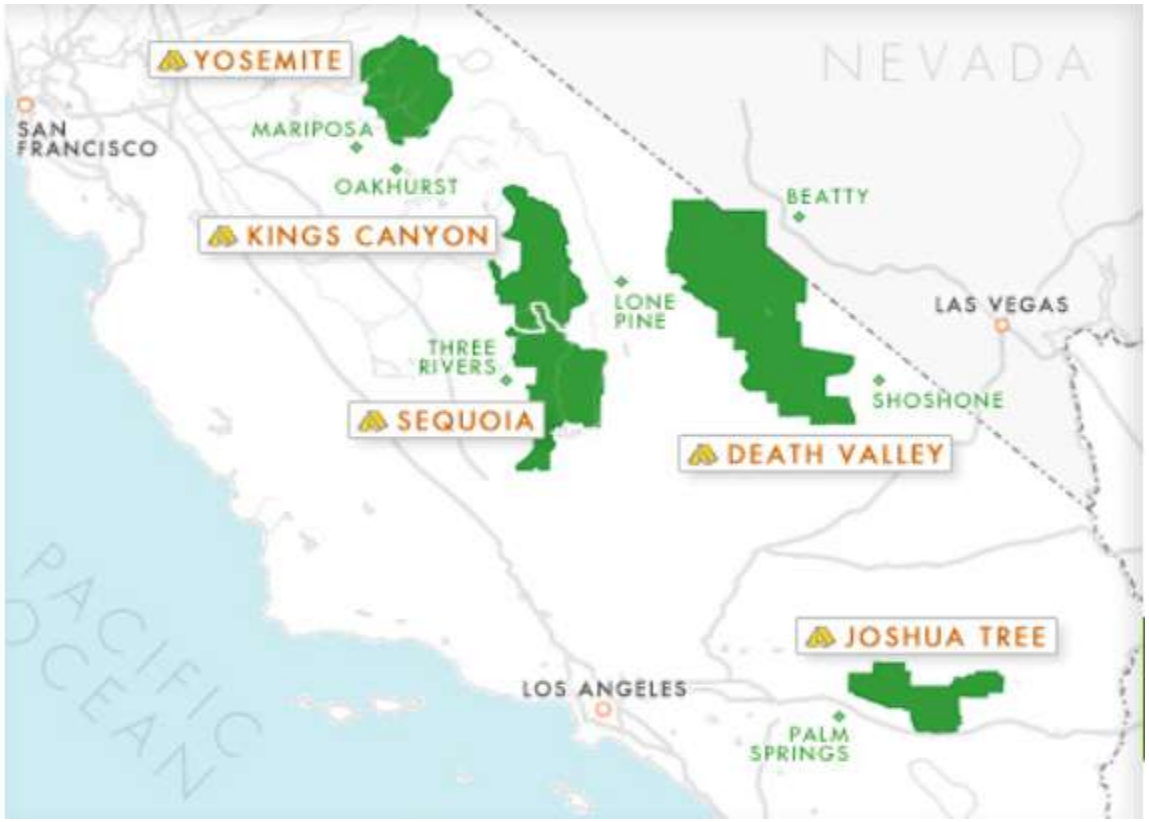
2 – This response gives a valid explanation with an accurate and relevant example.

1 – This response gives a valid explanation with an inaccurate, irrelevant, or no example.

[6] This reading has a lexile measure of 970, appropriate for the Common Core State Standards 4-5 grade cluster.

[7] Zwiers, Jeff. *Building Reading Comprehension Habits in Grades 6-12.* International Reading Association. c 2004.

California is a large state with 25 National Parks. Each has different ecosystems. This map below shows the location of several national parks. Focus on Yosemite and Death Valley.



Use the data below to compare these two national parks.

- How are the ecosystems at Death Valley National Park in the desert of southeastern California different from the ecosystems of Yosemite National Park in the mountains of northeastern California?
- Give two reasons why the ecosystems in these parks might be different.

LOCATION and DATA	Possible Ecosystem Differences	Reasons for Differences
Climate Data for Death Valley / **Yearly Amount** Record High Temperature F° — 134 Average High Temperature F° — 91.4 Average Low Temperature F° — 62.9 Record Low Temperature F° — 15 Precipitation (inches) — 2.36		
Climate Data for Yosemite / **Yearly Amount** Average High Temperature F° — 67.3 Average Low Temperature F° — 40.9 Precipitation (inches) — 36.07 Snowfall (inches) — 42.7		

Map created from national Geographic Society program Chesapeake Fieldscope M. Legates 2012

Assateague Island National Seashore Park

National Seashore parks have two important missions:

- to preserve the natural environment and the living things in the local ecosystem
- to provide recreation and educational programs for citizens.

Assateague Island, Virginia, is a narrow barrier island. It is located along the Atlantic coast of the Delmarva Peninsula. On the eastern side of the island, beach erosion is a constant problem. Coastal storms can sometimes cause major damage. The shape of the island's shoreline can quickly change due to strong winds and rough waves.

The park is famous for its Wild Chincoteague ponies. At time the ponies join sunbathers and fishermen on the beach and in parking lots. They can cause traffic jams and distract drivers. But most often they prefer to wander the island's wetland areas, forests, and meadows. They enjoy eating the marsh grasses that some island animals rely on for food and shelter. Sometimes they can cause harm to the island's soils and dune formation.

Approximately 3.2 million people visit the national seashore each year. They enjoy many activities like boating, fishing/crabbing, hunting, camping, or watching the horses. Some visitors ride over-sand vehicles which can disturb beach habitats for island wildlife.

Cape Henlopen State Park

This state park near Lewes, DE, features ocean beaches that see thousands of visitors every summer. Two swimming beaches provide lifeguard patrols between Memorial Day weekend and Labor Day. There is a bath house with showers, changing rooms, and a food concession. This swimming area also allows individuals in wheelchairs and power chairs to reach the beach from the boardwalk. The Cape Henlopen shoreline provides habitats for shorebirds, horseshoe crabs, fish and shellfish. Sand dunes grow along the shoreline. They are a natural way to protect inland areas from flooding and the effects of strong wind and waves.

Blackwater National Wildlife Refuge

Blackwater National Wildlife Refuge is located on Maryland's Eastern Shore. It opened in 1933 as a refuge for migratory birds. It is one of the chief wintering areas for Canadian Geese. The Atlantic Flyway is an important bird migration "highway" along the East Coast of the United States. From October through November, as many as 50,000 geese, ducks, and tundra swans take a rest stop at Blackwater Refuge. To feed them, staff plant grain fields and flood some lands (called impoundments) for waterfowl use. Up to 20 species of ducks and 250 species of other birds may also be seen here. The refuge has several hundred species of plants, 35 species of reptiles and amphibians, and numerous mammals. Among the mammals are two species that are hunted at certain times of the year: the white-tailed deer and the sika deer (an Asian species). Hunting at the Refuge is a means of recreation, as well as wildlife population control.

The water levels and salinity levels (salt level in the water) in the rich tidal marsh at Blackwater change often. Tidal marshes are useful for healthy coastlines and communities. Tidal marshes provide important food and shelter for more than 75% of water species. They shield shorelines from erosion and flooding by soaking up rainwater. They protect water quality by naturally filtering runoff and making use of excess nutrients left behind.

In addition to tidal marshes, the refuge includes freshwater ponds, mixed evergreen and deciduous forests, and small amounts of cropland. Each physical habitat supports different birds and animal life.

Blackwater Refuge is a shelter to three recovering species: the endangered Delmarva fox squirrel, the migrant peregrine falcon, and the American bald eagle. They are protected from hunting and trapping.

Calvert Cliffs State Park

Calvert Cliffs State Park is located on the western shore of the Chesapeake Bay. The shoreline in the park rises sharply from the bay. The cliffs were formed 10 to 20 million years ago when all of Southern Maryland was covered by a shallow sea. When the sea receded, the cliffs were exposed and began eroding. Scientists study the rock layers to learn about the natural history of the area.

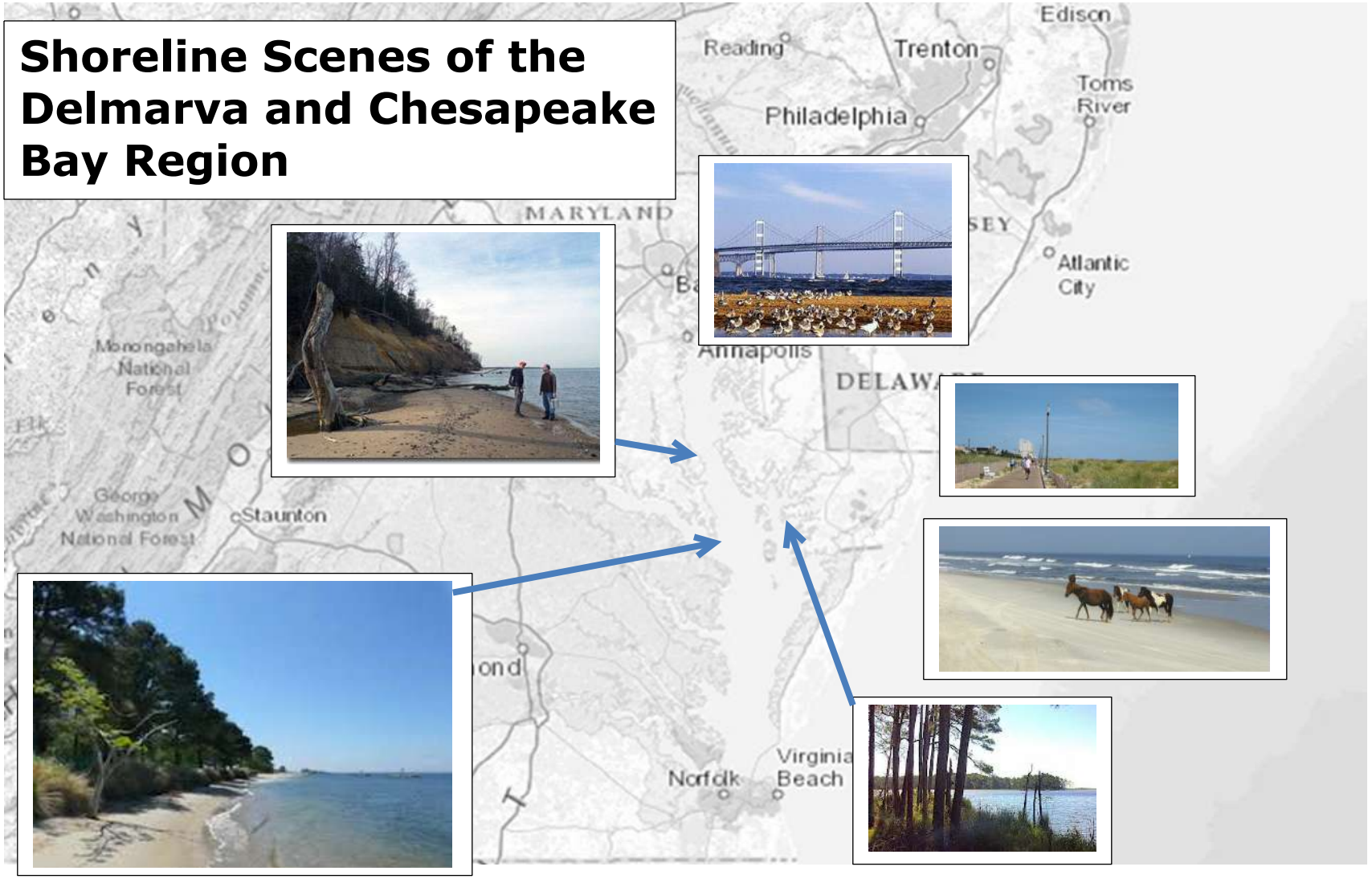
Fossils found in the cliffs are evidence of natural change. Tides bring high water levels twice each day. Winds and the movement of water cause erosion of the cliffs. Roots of trees and other vegetation are helpful to slow the rate of erosion.

Today, visitors to the cliffs enjoy many activities such as fishing, hunting, hiking, picnicing, and swimming. Fossil-hunting is a favorite hobby that many enjoy in the park. However, because of the danger of landslides caused by cliff erosion, climbing upon and walking beneath the cliffs is not allowed.

Delaware Seashore State Park

This narrow strip of sand is six miles long. It is surrounded on the east by the Atlantic Ocean and on the west by Rehoboth Bay and Indian River Bay. The main attractions are swimming, sunbathing, fishing and boating along the park's beaches. A special access pier at the Indian River Inlet allows the elderly and people with disabilities to get close to the fishing action. A nature trail on Burton's Island provides views of the salt marshes and bay islands. Birds like gulls and terns gather in summer nesting colonies. Thompson Island Preserve is a good example of the productive salt marsh habitat once common around the inland bays.

Shoreline Scenes of the Delmarva and Chesapeake Bay Region



Left to right: 1) Trees grow close to the edge of the Chesapeake Bay at Pt. Lookout, MD; 2) Erosion exposes fossils and undermines the forest at Calvert's Cliffs on the western shore of the Chesapeake; 3) The Chesapeake Bay Bridge spans the narrowest point of the Bay from Kent Island to Sandy Point, MD; 4) On Delaware's Atlantic Coast, the boardwalk at Rehoboth Beach, DE is protected by barrier dunes; 5) Wild ponies walk the beach at Assateague Island, Virginia on the Atlantic coast; 6) Salt marsh and quiet inlets meet the eastern shore of Chesapeake Bay at Blackwater Wildlife Refuge near Easton, MD.

Thinking Like a Geographer

Use the photos and information in *Shoreline Scenes of the Delmarva Peninsula and Chesapeake Bay Region* to answer these questions:

1. Why does the shoreline of the Atlantic Ocean look very different from the shoreline of the Chesapeake Bay? According to the text, how might differences in the movement of water and air affect the ecosystems that live in or near the ocean water or the bay?

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_____

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_____

2. Use a map or atlas to help you find the names of at least five rivers that drain into the Chesapeake Bay. Label them on the map below.

3. The water of the northern Chesapeake Bay has less salt, or lower salinity, than water in the southern Bay. Using your maps to help you, explain why you think this is true. How might differences in the salts and minerals dissolved in water affect the ecosystems that live in or near the water? Use information from the text to explain your answer.

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4. What are some changes to shorelines that result from **natural forces**? What information from the text helped you identify these changes?

_____

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_____

5. Choose two shorelines of the Chesapeake Bay. Compare and contrast the ways that **human activities** may affect the living organisms that are there in the water, air, and on land.

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Six Delaware Ecosystems You Should Know

Ecosystem	Physical features	Organisms	Examples and locations
City lot A piece of land forming part of a human settlement where organisms live.	Flat topography, finely graded soil, very small stones. May have streams or ponds.	Birds, ants, wasps, mosquitoes, flies, butterflies, weeds and grasses, rats, mice, pigeons, feral cats and dogs, flowers, squirrels, raccoons	Rodney Square, Wilmington 
Forest or Woodland An area covered by trees growing closely together and forming a canopy. In Delaware, a wide variety of deciduous and evergreen trees exist together. An understory of smaller plants and shrubs covers the forest floor.	Rocky, moist or sandy soils, fresh or brackish water in streams or ponds; may be flat or hilly	Birds, deer, squirrels, rabbits, beaver, foxes, skunks, grubs, reptiles, insects, deciduous trees, evergreens, vines, shrubs, fungi, lichens	Woodlands are found in all three Delaware counties. 

Tidal marsh/wetland An area where grasses and other plants and animals are adapted to continual periods of flooding from the tides and to high salt levels in the water.	Salt water, mucky soil, scattered hummocks, drainage ditches, shallow tidal streams	Muskrats, rodents, fish, waterfowl, reeds and tall grasses, cedar trees	Delaware River and Bay coastline, bordering inland bays 
Meadowland or Farmland An area used by people for agriculture. Natural vegetation has been cleared away and replanted with food plants. Plants and animals from local ecosystems must coexist with crops and livestock.	Loose soil, ridged surface from plowing, fertilizers and chemicals in soils, hedgerows and fences, may be flat or hilly	Foxes, snakes, birds, insects, groundhogs, rabbits, butterflies, moths, horses, cattle, hogs, crops, weeds and briars, small bushes, berries, trees in yards and hedgerows	Meadowland or farmland is found in all three counties of Delaware 

Cypress Swamp Under the swamp, a layer of clay prevents water from draining away. Pools of standing water are the perfect habitat for cypress trees, amphibians and snakes. Cypress swamps are common in the southeastern United States.	Clay and sandy soils, standing water, flat topography	Cypress trees, evergreen trees, fish, amphibians, water snakes, fungi, insects, Waterfowl, egrets	Great Cypress Swamp, Sussex County 
Shoreline A narrow strip of land on the ocean shore where organisms are adapted to the wave action of salt water, tidal changes in water level, and wind action.	Sand beaches, dunes, shells, clay, moving salt water, erosion from wind, wave and tidal action	Horseshoe crabs, hermit crabs, shellfish, fish, dolphins, shorebirds, foxes, cedar and pine trees, low shrubs, grasses	Cape Henlopen, Lewes, DE 

Thinking Like a Geographer

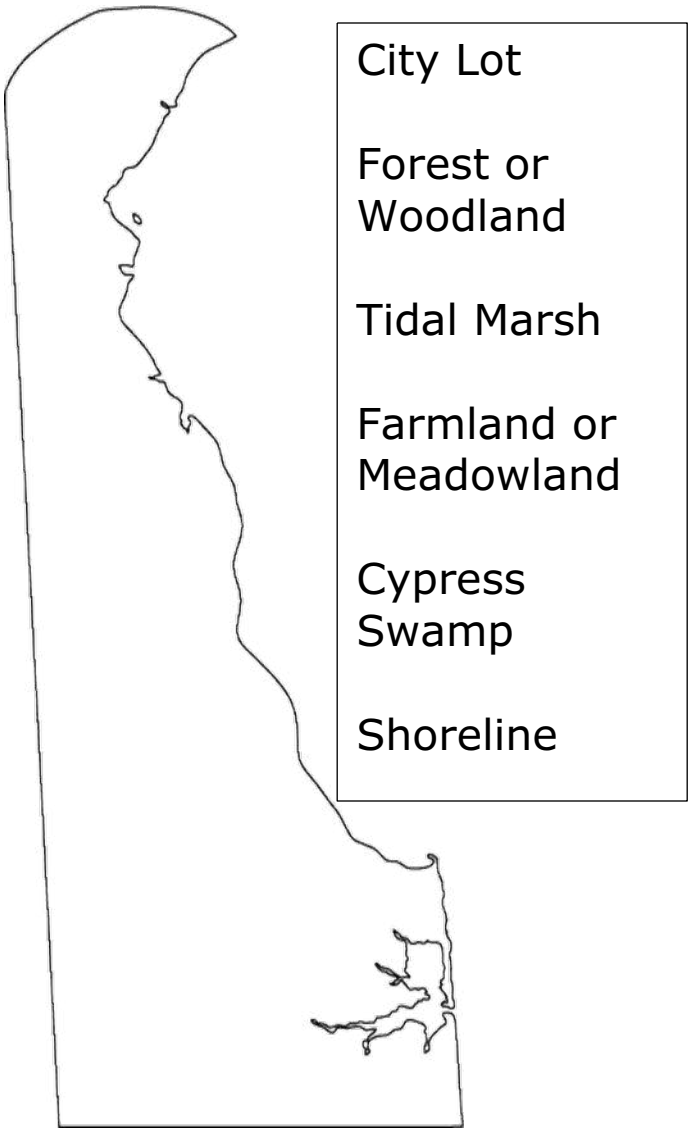
Use the information from 6 Delaware Ecosystems You Should Know to answer the following questions.

1. Which Delaware ecosystems include sandy soil? Which ecosystems include salt water? How does the type of soil or salt content effect which organisms live in that environment?

2. Using what you know about birds, explain why they can be found in all 6 Delaware ecosystems.

3. What details did the table provide to illustrate the differences between a tidal marsh and a swamp? How might these differences affect the organisms living there? Would an organism from the swamp be able to survive in the marsh? Explain your answer.

4. Use the outline map and information from the table to label areas of Delaware where each ecosystem is likely to be found.



People and Ecosystems

Whether they realize it or not, people are part of the ecosystems where they live. As people go about daily life, they adapt to the local environment and sometimes alter it. The activities of people affect the living and the non-living things in ecosystems around them.

People remove resources from local environments

Like all living creatures, people use living and non-living resources they find around them to satisfy their wants.

Early people satisfied their desire for food by hunting, fishing and gathering plants. The diet of early people depended on what plants and animals were available at the time. On Delmarva, native people moved from place to place to find food. They spent summers along the coastline, fishing and gathering crabs, oysters and clams. During the winter, they camped in the woodlands and hunted deer and other game. The shelters of native people were constructed with saplings, grasses and vines found in the local environment. They were temporary dwellings, occupied for only part of the year. Clothing and household tools were made from animal hides, shells, stones and bones.

Beginning in the early 1600s, European settlers arrived. They began to remove resources from the local landscape on a much larger scale. New technology included iron tools, plows, carts pulled by oxen, and saw mills. These settlers began to cut down large numbers of trees to build wooden ships, buildings and wagons. Logging increased as technology improved and transportation became easier. Farm fields replaced forests, and crops like wheat, corn, vegetables, and potatoes supplied food to families. Livestock were raised to supply meat. Many acres were needed for these cows and pigs to graze. More woodland was cleared, and even swamps and marshy land was drained to allow for more fields.

On the waters bordering Delmarva, commercial fishing became more efficient. Oysters, crabs, and clams were harvested and sold. Large fish like sturgeon and shad were caught and sold in city markets. Muskrat and beaver were trapped and sold for their fur. Waterfowl hunters took aim at geese. Horseshoe crabs were gathered in large numbers to be sold to fertilizer manufacturers.

- When large numbers of animals are removed from an ecosystem, what is the likely impact?

People introduce new species of plants and animals

The European settlers brought with them the seeds they needed to grow familiar grains and other crops. They brought farm animals - pigs, sheep, goats, cows and horses, chickens and ducks - that were new to local ecosystems. They even brought trees and shrubs they liked, planting them for fruit, nuts or medicine. Some plants and animals were unknowingly brought to America on board the settlers' ships. Some of them became part of local forests and meadows and caused little harm. But sometimes plants and animals from other ecosystems grow too fast and throw the local ecosystem out of balance. When this happens, they are called **invasive species**.

Left: The nutria is a rodent that destroys stream banks

Right: The zebra mussel competes with oysters in the Chesapeake Bay.

People change topography

In the early days on Delmarva, people often traveled by boat. Most Europeans settled near the coast or on the banks of streams. As people moved inland they needed roads. The rivers became barriers, and bridges were built to cross them. Ditches were built to drain swampy areas. Streams were sometimes dammed up to form millponds, and the power of the water turned grist mills or saw mills. These activities changed the look

of the landscape and impacted ecosystems. Habitats were destroyed and organisms were displaced.

People generate waste

Like all plants and animals, humans generate waste. Large amounts of human waste can affect the quality of groundwater, but human waste is only part of the story. Human activities usually generate some leftover materials or trash. Trash takes up space and can pollute the environment. Fires and engines give off fumes and smoke that can pollute the air. Materials added to the soil can leach out into groundwater or run off to pollute streams.

Thinking Like a Geographer

1. Given information in this text as well as in Shorelines of the Chesapeake Bay and Delmarva, compare and contrast the different ways that people use the land around them. Be sure to include examples from *each* text in your response.
2. How does the author support the idea that introducing non-native species is harmful to the environment? What examples from the article support your answer?
3. Which reasons and/or evidence provided in the article do a good job of supporting the author's idea that people alter their environment as they go about their daily lives? Why?
4. Settlements of Native people were usually small – less than 300 people. Use details from the article to explain how larger settlements would have had a greater impact on the environment.

Humans Impact Ecosystems at Trap Pond State Park

Visitors to Trap Pond State Park often mention its natural beauty. Most of the time, the pond seems peaceful and undisturbed. The bald cypress trees and pines whisper in the wind, swans and geese wheel overhead or glide along reflected in the tea-colored water. But this pond is not "natural." It is the result of human activities that changed the flow of water in this landscape. For hundreds of years humans and their activities have impacted the ecosystems in this place.

Four hundred years ago, this land was part of a cypress swamp. When rains were frequent, standing water could be seen between the trees. In drier seasons, the moisture retreated and the spongy surface between supported small plants and mammals. Native people visited occasionally to hunt, especially in the winter season. They gathered forest products for use in building shelters and simple tools.

Early European settlers valued the cypress trees because the lumber resisted rot. It made strong, durable houses, and could be cut into long, thin shingles for roofing and siding. But working in the swampy woods was hard for men and oxen. Another problem was the lack of power for machinery to saw logs into boards. To solve both problems at once, settlers built a dam

across the main stream of water in the area. A pond formed behind the dam, and the water in the pond provided power for the millwheel connected to the saw blade. Ditches were dug to drain water from the woods to the pond. As the wooded areas dried out, it was easier to cut down the trees and drag them to the pond. Then they could be floated toward the saw mill. Gradually the area around Trap Pond dried out and fields were cleared for crops and pasture. When all the trees were cut down, there was no more need for the old sawmill, and it fell into disuse.

In the 1800s, most people in the area around Trap Pond worked hard to make their living as farmers. They joined their neighbors for church services and social events. There were a few general stores, but most people traveled by horse and wagon to Laurel for shopping or to Georgetown for legal business. During this time, someone noticed that some cypress trees were buried in the silt at the bottom of the pond. For a brief time the men of the area made some money by pulling the logs out of the muck. Because the cypress wood resists rot, they were still solid and could be cleaned up and sold as lumber. But the supply of trees lasted only a short while and the boom was soon over.
During the 1930s, hard times came to America. The government started a program to give work to young men who had no jobs. Young men who worked for the Civilian Conservation Corps (CCC) were sent to Trap Pond. Their job was to build a new dam and construct a park facility. Besides the new dam, they built a sturdy picnic pavilion out of cypress logs and a log cabin home for the park caretaker. In 1951, Trap Pond became the first Delaware State Park. Over the years it has added facilities for people who want to have fun and learn about nature. The new Bald Cypress Nature Center has exhibits that tell the story of Trap Pond and its ecosystems.

Surrounded by woodland and protected from the dumping of trash, plants and animals at Trap Pond seemed secure. Yet there were signs of trouble. At times large numbers of fish died in a "fish kill." Naturalists checking the water of the pond found fewer aquatic organisms. What was causing this change? Water quality testing showed that pollution was entering the pond. But where was it coming from?

Investigation led scientists to farms in the area that were near streams. The farms raised livestock, and run-off from these farms carried polluted water into the streams and then into Trap Pond. The scientists worked with farmers to keep polluted run-off from entering the streams. Better management of waste from the farms led to a big improvement in the water quality at Trap Pond. When water quality improved, ecosystems at Trap Pond became healthy again.

Ways People Impact Ecosystems	Examples From the text
Remove Resources (plants, animals or non-living material)	
Introduce New Plants, Animals Or Microorganisms	
Alter Topography, change the flow of water	
Produce Waste and/or Pollution	
Conserve or manage resources	

Now that you have read about Trap Pond, use the article and the graphic organizer to help you answer the following questions.

1. How is the information in this text similar or different than other articles you have read about this topic?

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2. Based on the information in this selection, what actions would the author most want readers to take?

_____

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