



TAKE CARE OF TEXAS: EDUCATOR MATERIALS

## VIRTUAL FIELD TRIP HANDOUT

# Estuary Systems of Texas

This handout references the video “Estuary Systems of Texas” that can be found at [YouTube.com/TakeCareOfTexas](https://www.youtube.com/TakeCareOfTexas). While watching the video, complete the Fill-in-the-Blank section of the handout. Once the video is finished, work in groups of 2-3 to complete the Discussion section.

Name: \_\_\_\_\_

## Fill in the blank

### Interdependence of the Ocean’s Living Systems and the Environment

You may not realize it, but the ocean is essential for all Texans, not just residents living on the coast. Oceans are the largest \_\_\_\_\_ in the world, which means that they store many of the emissions that humans produce each year. The ocean also provides a home for many of the unique plants and animals that live in and around our state.

Humans are an important part of ocean \_\_\_\_\_ as well, by fishing in the waters, boating, and visiting the many beaches along the Gulf of Mexico.

### Intro to Estuaries

The State of Texas has thousands of rivers and streams that crisscross the state, entering the Gulf of Mexico in \_\_\_\_\_ major areas, which we call \_\_\_\_\_. Estuaries are unique areas of marine habitat where freshwater enters a body of salt water and the two \_\_\_\_\_ together. They are home to many unique plants and animals that thrive in the shallow, salty waters of these estuaries.

### Short- and Long-Term Environmental Changes and their Impacts on Estuaries

The estuaries of Texas are impacted by short-term and long-term environmental changes. These can be naturally occurring or can be created by humans.

Some short-term impacts that are significant along the Texas coasts are hurricanes and \_\_\_\_\_ spills. Hurricanes can cause flooding, soil erosion, and massive fish kills due to changes in salinity and dissolved oxygen.



VFT-1a (Updated 5/24)

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A long-term impact on estuary environments is that plants which used to be limited to the extreme \_\_\_\_\_ tip of Texas, like mangroves, are beginning to creep into more northerly Texas habitats. These mangroves may \_\_\_\_\_ with marsh grasses for resources, which is why mangrove expansion is associated with loss of marsh grass cover. They can also alter the morphology of barrier \_\_\_\_\_, which permanently impacts the environment and the plants and animals that live there.

### How TCEQ Monitors the Health of Estuary Systems

In order to monitor the natural and human impacts on our estuaries, TCEQ monitors various \_\_\_\_\_ that show how the environments are changing over time.

One of the ways TCEQ monitors estuary health is through seagrass monitoring. Seagrass \_\_\_\_\_ are essential for the health of the coastal regions of Texas. They serve as nurseries for larval fish and other animals, as well as trapping \_\_\_\_\_ in their root systems, preventing erosion and improving water clarity.

TCEQ scientists on the SWQM teamwork with other organizations to survey the seagrass beds and assess the amount of seagrass, what different types are present, and how \_\_\_\_\_ the root systems are, then compare that data to past years to see if there were any \_\_\_\_\_ or losses.

These data can tell us what next steps need to be taken to make sure the estuary is healthy and doing its job in the overall marine ecosystem of Texas.

### Conclusion

While you may live far away from the coast, you're never too far away to make an impact. Some ways you can ensure that ocean systems are healthy for generations to come are:

1. Keeping \_\_\_\_\_ from entering our waterways by disposing of your waste (especially pet waste!) properly and picking up trash outside—especially near rivers and streams.
2. Use less toxic \_\_\_\_\_ products.
3. Teach your family and friends about why it is important to care for our \_\_\_\_\_!

## Discussion Questions

A **watershed** is an area of land from which water drains into a body of water. Scientists examine watersheds to help determine possible sources of pollution. The map below shows an example of a topographic map of a surveyed watershed for a river in Texas. There are several buildings and facilities both inside and outside the river's watershed.

1. Explain "interdependence" as it relates to environmental systems.
2. Give 3-5 examples of how humans and the ocean are dependent on each other.
3. Give some examples of short-term environmental changes that might affect estuary habitats. How can humans help conserve estuaries during these short-term periods of change?
4. Give some examples of long-term environmental changes that might affect estuary habitats. How can humans help conserve estuaries during these long-term periods of change?



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## Answer Key

### Fill in the blank

#### Interdependence of the Ocean's Living Systems and the Environment

You may not realize it, but the ocean is essential for all Texans, not just residents living on the coast. Oceans are the largest **carbon sinks** in the world, which means that they store many of the emissions that humans produce each year. The ocean also provides a home for many of the unique plants and animals that live in and around our state.

Humans are an important part of ocean **systems** as well, by fishing in the waters, boating, and visiting the many beaches along the Gulf of Mexico.

#### Intro to Estuaries

The State of Texas has thousands of rivers and streams that crisscross the state, entering the Gulf of Mexico in **seven** major areas, which we call **estuaries**. Estuaries are unique areas of marine habitat where freshwater enters a body of salt water and the two **mix** together. They are home to many unique plants and animals that thrive in the shallow, salty waters of these estuaries.

#### Short- and Long-Term Environmental Changes and their Impacts on Estuaries

The estuaries of Texas are impacted by short-term and long-term environmental changes. These can be naturally occurring or can be created by humans.

Some short-term impacts that are significant along the Texas coasts are hurricanes and **chemical** spills. Hurricanes can cause flooding, soil erosion, and massive fish kills due to changes in salinity and dissolved oxygen

A long-term impact on estuary environments is that plants which used to be limited to the extreme **southern** tip of Texas, like mangroves, are beginning to creep into more northerly Texas habitats. These mangroves may **compete** with marsh grasses for resources, which is why mangrove expansion is associated with loss of marsh grass cover. They can also alter the morphology of barrier **islands**, which permanently impacts the environment and the plants and animals that live there.

#### How TCEQ Monitors the Health of Estuary Systems

In order to monitor the natural and human impacts on our estuaries, TCEQ monitors various **environmental factors** that show how the environments are changing over time. One of the ways TCEQ monitors estuary health is through seagrass monitoring. Seagrass **beds** are essential for the health of the coastal regions of Texas. They serve as nurseries for larval fish and other animals, as well as trapping **sediment** in their root systems, preventing erosion and improving water clarity.

TCEQ scientists on the SWQM teamwork with other organizations to survey the seagrass beds and assess the amount of seagrass, what different types are present, and how **healthy** the root systems are, then compare that data to past years to see if there were any **gains** or losses.

These data can tell us what next steps need to be taken to make sure the estuary is healthy and doing its job in the overall marine ecosystem of Texas.

#### Conclusion

While you may live far away from the coast, you're never too far away to make an impact. Some ways you can ensure that ocean systems are healthy for generations to come are:

1. Keeping **litter** from entering our waterways by disposing of your waste (especially pet waste!) properly and picking up trash outside—especially near rivers and streams.
2. Use less toxic **cleaning** products.
3. Teach your family and friends about why it is important to care for our **environment!**



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