WaterDrops

Estuaries

Southwest Florida Water Management District Water Resources Newsletter for Grades 3–5

Hello Readers!

This issue of ***WaterDrops*** is about estuaries. Try to imagine you are looking down from an airplane and see rivers and streams as they flow to the sea. At the point where a river opens up into the salty waters of a bay, an estuary is formed. An estuary is a body of water partly surrounded by land where fresh water from rivers and streams runs into and mixes with salt water from the gulf. Estuaries protect water quality by filtering out dirt and pollution. Because an estuary is part fresh and part salty, the sheltered waters of an estuary are home to a variety of plants, trees, birds, fish, mammals and other wildlife.

To help you learn more about estuaries, we have included a feature story, articles, activities and games. When you finish this issue, we hope you will understand the importance of estuaries and their need for protection. In other issues of ***WaterDrops***, you can learn more about how important water is to us. Don't forget to send in the activity on the back page for a prize.

Happy Splashing!

Water Drips & Drops

Did you know that an estuary contains brackish water? Fresh water flows toward the gulf. Fresh water from rivers and salty gulf water mix in estuaries, creating brackish water.

Southwest Florida Water Management District
WATERMATTERS.ORG · 1-800-423-1476

Feature Story

A PADDLING ADVENTURE

On the first ring of the alarm, Kelly jumped out of bed. I don't think I've ever been up this early, she thought to herself as she hurried to get ready for the big day. Kelly's older brother, Raymond, who works at a nature center on the seacoast, promised to take her on a paddling trip if she got a good report card. To his surprise, she received all As and Bs! Kelly's reward was to spend the day canoeing with him through the estuary at the nature center.

In less than an hour, Raymond and Kelly arrived at the nature center and collected their gear. Then they walked down the winding path, which was still covered with early morning dew.

"I hope you remembered to bring your camera, Kelly," said Raymond. "There will be a lot of sights you won't want to forget."

"I sure did," said Kelly. "I want to make an album and take it to school."

Soon they arrived at the beautiful estuary where fresh water from the land met and mixed with salty water from the sea. Raymond helped Kelly into the canoe and gave her one of the paddles. The sun glistened on the water as they gently paddled through the black needlerush and cord grass of the saltwater marsh. "These grasses help keep the soil anchored when the tides move in and out," said Raymond.

"Oh, look over there," added Raymond as he pointed at a brown pelican and a roseate spoonbill. "They're nesting among those red mangroves."

Kelly aimed her camera, took a picture and then asked, "What are red mangroves?"

"They are very unusual trees that grow well in salty water," said Raymond. "They can actually separate and take in fresh water from the salt water. It's pretty cool!" Then he added, "People call them walking trees because the roots sticking out above the surface of the water make them look like they are standing or walking." Another "click" sound could be heard from Kelly's camera.

"There's a salt marsh snake on that branch," said Raymond as they drifted toward the bank. Raymond explained to Kelly that Florida has more species of snakes than any other state, but that only one species can survive well in salty water. It is the salt marsh snake. The camera made another "click."

"What else lives in an estuary?" asked Kelly.

"Oh, there are all kinds of things beneath the surface," responded Raymond. "Estuaries are important nursery areas for a variety of fish, shrimp, crabs and shellfish, which provide food for bigger fish and animals."

Kelly and Raymond observed several herons, egrets and other wading birds as they paddled and "clicked" their way along the coast.

"What's that big shadow floating near the surface?" asked Kelly.

"It could be a Florida manatee," said Raymond. Within a few moments, the manatee approached them. "There are only around 3,000 of these gentle marine mammals left in Florida," said Raymond. "They are often called sea cows because they eat grasses and other plants in the brackish, shallow waters."

"What is brackish water?" asked Kelly as she took another picture.

"It's water that is a mixture of fresh water and salty water, like the water in an estuary. Everything that lives here must be able to survive in this kind of environment."

Just then Raymond looked at his watch. "We better head back to the nature center now. We can have our picnic lunch there."

"Okay, Raymond," said Kelly. "Thanks for the trip. Maybe we can do this again sometime?"

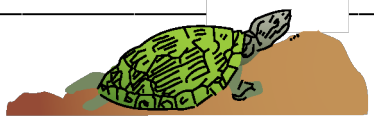
"If you can keep your grades up, I will bring you back here at the end of next semester," said Raymond.

"That's a deal," said Kelly. "I plan to study extra hard!"

Kelly took several pictures on her canoeing adventure. Describe two of them. Be sure to give each picture a title.

Picture 1

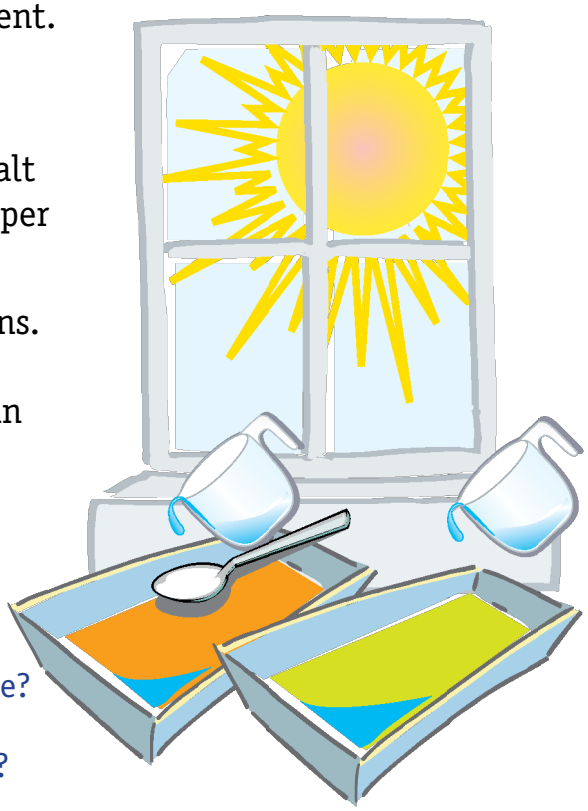
Picture 2



Take It Home

MAKING WATER EVAPORATE

Evaporation happens when water turns into vapor in the air. In an estuary, water evaporates into the air and moves through a cycle that finally returns in the form of moisture from the clouds. During this process, what do you think happens to the salt that is in the salty water? To find out, try this easy experiment.



Materials:

- 2 cake pans
- 1 cup water
- pencil
- labels
- 1 cup water with 1 tablespoon salt
- 2 sheets colored construction paper
- scissors

Directions:

1. Cut the pieces of construction paper to fit in the pans.
2. Lay one piece of construction paper in each pan.
3. Pour 1 cup of water in the first pan and label the pan "plain water."
4. Pour 1 cup of the salty water in the second pan and label the pan "salty water."
5. Place both pans near a sunny window.
6. Answer the questions below.

a. How many days did it take for the water to evaporate?
b. Where did the water go?
c. What was left in the pan that contained plain water?
d. What was left in the pan that contained salt water?
e. Does salt evaporate? Why or why not?
f. Did the fresh water and salt water evaporate at the same rate?

Ask Water Cycle Wanda

Carlos asks: I know there are a lot of estuaries in Florida. Which one is the largest?

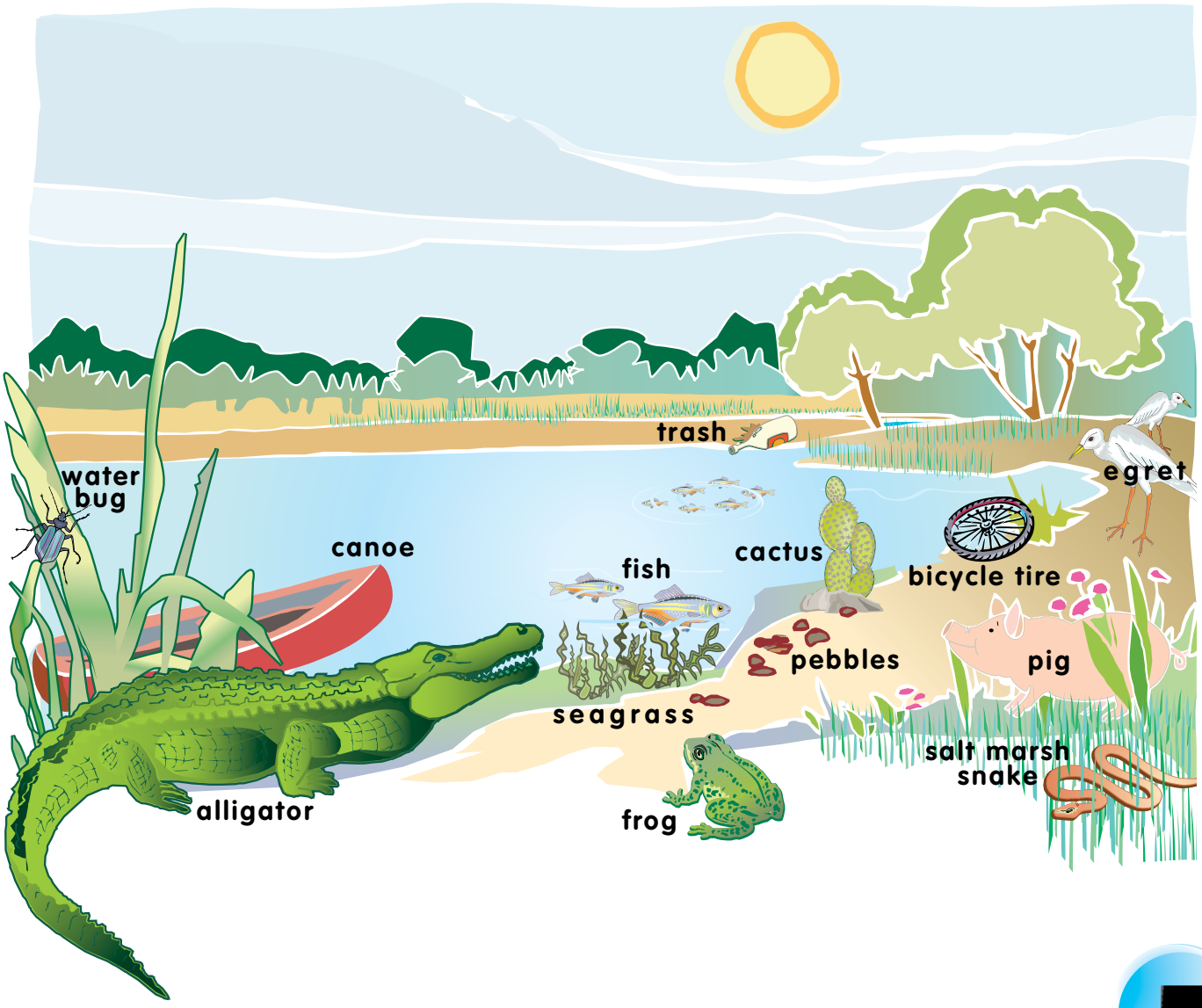
Water Cycle Wanda: Tampa Bay is the largest open-water estuary in the state. The estuary covers almost 400 square miles. The depth of the water within the estuary is approximately 12 feet. The major rivers that empty into the estuary are the Alafia, Hillsborough, Manatee and Little Manatee.

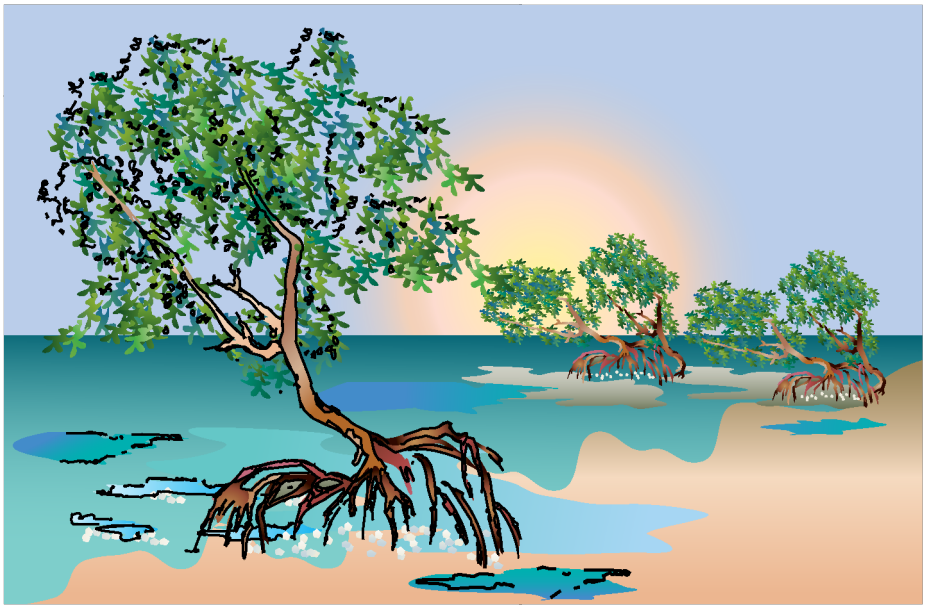
ESTUARY ENVIRONMENT

What Doesn't Belong Here?

Florida estuaries provide homes for a variety of living and nonliving things. The mixture of salty water and fresh water create a special environment for everything that belongs here.

Let's see if you can decide which things do NOT belong in an estuary. Study the pictures below and draw an X over each thing that should not be in an estuary. When you finish, the unmarked pictures will show the things that do belong in this special ecosystem.





TROPICAL WALKING TREES

If you have visited Florida's central and southern coastal banks, then you may have been lucky enough to see a mangrove swamp. Mangroves are very unusual trees, and some of them even have tangles of roots appearing above the surface of the water. This type of mangrove, known as the red mangrove, often looks like it's "walking" on the water, which is why they have the nickname "walking trees." Mangroves trap materials brought in by the tides and help prevent coastal erosion. Mangroves can survive in their salty water environment because they are able to screen out the salt as they breathe in oxygen from the water. Mangrove trees need warm weather and warm water to stay healthy. In addition to the red mangrove, Florida is also home to two other species of mangroves: white and black. There are many types of fish living in mangrove estuaries during some stage of their lives. A variety of birds use the mangroves for roosting and nesting. Many other forms of wildlife may also be found near mangroves, including raccoons, wild pigs, rodents, deer and bats.

Fill in the blank

Complete each sentence by writing the correct word.

A popular name for the red mangrove tree is a _____.

The red, white and black mangrove trees are the three _____ of mangroves that exist in our state.

Mangrove trees are able to remove the _____ as they breathe in oxygen from the water.

WORD SEARCH

Can you find these words?

Word Bank

ESTUARY
POLLUTANT
MANATEE
MANGROVE
BRACKISH
SPECIES
NURSERY
WILDLIFE
SALTY
FRESH

A	L	E	Y	R	E	S	R	U	N	S
S	P	B	R	A	C	K	I	S	H	P
E	O	S	E	Y	P	O	L	H	A	E
F	L	T	E	C	K	N	S	R	V	C
I	L	U	T	I	A	E	B	O	E	I
L	U	A	A	M	R	S	R	I	F	E
D	T	T	N	F	S	G	A	D	L	S
L	A	Y	A	H	N	I	L	L	G	P
I	N	B	M	A	W	S	A	N	T	E
W	T	A	M	E	S	T	U	A	R	Y

WATER WORDS

Unscramble the following groups of letters to form words related to water. Then make up a water sentence using some of the words.

ishbcrak _____

lasty _____

syeaurt _____

sherf _____

osioner _____

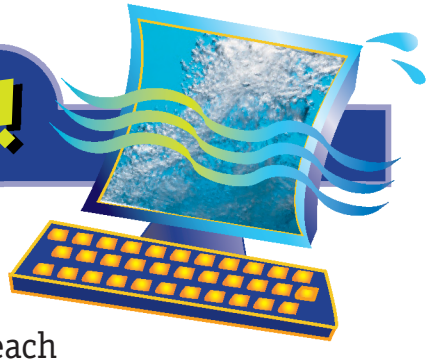
evgroman _____

_____

_____

Answers to ***WaterDrops*** activities are printed in the Teacher's Guide. View or order free copies of the Teacher's Guide and other ***WaterDrops*** issues online at *WaterMatters.org/publications/*.

What's Wet on the Web!



Are you ready to learn more about estuaries and our environment? Take one of the virtual tours that are presented on the web at *WaterMatters.org/watersheds/*. After you complete each tour, list several facts you learned about estuaries.

ESTUARY PLEDGE

I promise to do my best to help keep southwest Florida's estuaries clean and healthy. I will tell others how important estuaries are to our natural environment. I will do my best to be an environmental citizen.

Signed _____

Mail a copy of your pledge to us and we will send you a prize!

Name _____

Address _____

City _____ State _____ ZIP_____

County _____ School _____

Teacher _____ Grade _____

Send to: **Youth Education**
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Southwest Florida Water Management District
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Brooksville, FL 34604-6899

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