

Hi, friends, my name is Wayne - Wayne Drop.

No, not Rain Drop, Wayne Drop. I know, I know! My friends always

Wayne?

As in Rain

Drop?

tease me about my name, too. I want to talk to you about how I became more confident about taking the FSPLAT. What is the FSPLAT, you ask? It's only the most important test a water drop can take in elementary school!

About a month before the test, I was sitting in class and squirming in my seat. My teacher, Ms. Dew Right, noticed I seemed nervous and irritable. "Wayne, is something wrong?" she asked. "I'm sorry Ms. Dew Right," I answered, "I guess I'm just worried about taking the FSPLAT."

"You know, Wayne, I think I have just the thing to help you." Ms. Dew Right took a study guide from her file cabinet and gave it to me. "If you'll review this guide about the Everglades, I know you'll have the information you need to do well on the FSPLAT," Ms. Dew Right told me.

As I read over the study guide, I became more and more excited. "Ms. Dew Right! I can't believe how much I already know about the Everglades!"





"Wow! That's great, Wayne! How do you know so much about the *Everglades?* Did you see a special about it on TV?"

"No, Ms. Dew Right. I've traveled through part of the Everglades, twice! I've seen many of these things with my own eyes!" I was so thrilled I could hardly contain myself.

"Wow, Wayne, that's really exciting! Why don't you tell the class about your trips through the Everglades?"

Feeling like my old self again, I eagerly ran to the front of the room and began telling my classmates about my first visit to the Everglades.

One hot afternoon last summer, my friends and I were surfing over central Florida in fluffy, slow-moving cumulus clouds. The wind picked up suddenly and we rode wild air currents to the top of tall, dark cumulonimbus thunderstorm clouds. The higher we went, the cooler we got, until we condensed from water vapor into tiny liquid **droplets.** Like a thrilling "Drop of Fear" ride, **gravity** pulled us down through the clouds toward the ground, and lightning flashed around us. As we were falling, I couldn't help but notice the patches of lakes that seemed to stretch for miles. My friends and I were heading toward what is called the Kissimmee region — the northernmost reaches of the Everglades **watershed**. We dove straight down into *Turkey Lake*, just west of the huge theme parks in central Florida.



Even though there are different types of clouds, all clouds are made of water. Sometimes they are made of tiny drops, far apart, and held up by the wind. At other times, they are big drops, close together, held up by very strong upward and downward winds blowing inside the cloud. When the air temperature within the cloud becomes very cold, the drops become too heavy to stay up, so they fall to Earth as rain. If it's cold enough, they fall to Earth as snow.

2 Vocabulary word: Gravity is the natural force that causes objects to move toward the center of the earth.

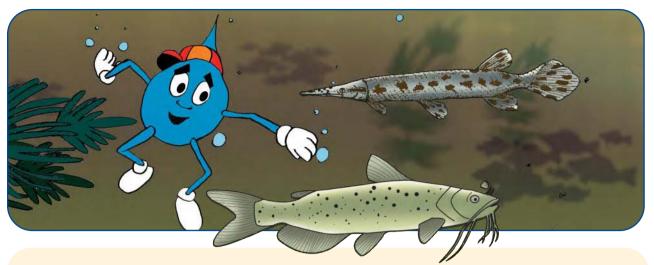






A watershed is an area of land from which water collects, flows and drains into a river, estuary, lake, bay or ocean. Florida has five major watersheds. We will learn about the southernmost watershed, which extends from Orlando to the Florida Kevs and from the Atlantic coast to the Gulf of Mexico. This watershed is divided into three regions: the Kissimmee, the Okeechobee and the Everglades. Did you know that this watershed is sometimes called the KOE Watershed, covers 16 counties and is home to more than 5.5 million people?





It was awesome! There were hundreds of fish of different sizes, shapes, and colors. They

swam all around us, darting in and out of vegetation and bumping and poking us. We just decided to cling together and enjoy the journey. We traveled through an intricate pattern of lakes called the "Kissimmee Chain of Lakes," and before long, we were swept south into the Kissimmee River.

This beautiful river used to twist and turn slowly for 100 miles. It had a 1-to 2mile-wide floodplain. These wetlands were naturally flooded on a regular basis. In 1954, the citizens of Florida asked the government of the United States to design a plan to prevent flooding in their communities. The U.S. Army Corps of Engineers changed the shape of the river, digging a straight canal, 300-feet-wide and 30-feet-deep. The straight canal was very effective in preventing flooding, and the wetlands that were next to the canal were drained and turned into pasture. Years later, residents discovered that changing the natural flow of water damaged the ecosystem. The Army Corps of Engineers is now working with other agencies to restore the portions of the Kissimmee River and its adjacent wetlands. Native wetland plants and wading birds have already returned to the restored areas.

Ground Water

As I was enjoying my peaceful, relaxing ride down the Precipitation Kissimmee River, I felt a sudden jerk. Then things got so rough it felt as if I was being batted about like a ping-pong ball. I soon realized I was riding on the tail of a large mouth bass that had been hooked and was being pulled from the water. Boy, was it angry! It was fighting so hard as it was pulled ashore that I was flung onto the sunny bank. Luckily, a swamp lily leaf cushioned my fall, but I almost immediately evaporated back into the atmosphere. As a result, I didn't get to finish my trip down the Kissimmee River.

The U.S. Army Corps of Engineers

4 In the early 1900's, many changes were made to the environment to make land available for homes



US Army Corps of Engineers

and farms. The things Florida's new residents had not considered were the hurricanes, droughts and natural seasonal flooding of the rivers. When

hurricane of 1928 hit south Florida, many people were killed.

Atlantic

Ocean



After more devastating flooding in 1947, residents asked Congress to provide them with flood protection. The U.S. Army Corps of Engineers was sent to build 1,400 miles of canals, earthen levees, and water control structures to control the flow of water. Little did anyone know that creating these canals and levees would harm the natural environment that is dependent upon a certain amount of water each season. In 1992, work was started to correct the mistakes that were made in the past. The Comprehensive Everglades Restoration Plan (CERP) was designed and

approved by Congress. This plan is so complex that it will take over 30 years Evaporation to complete and adjustments will have to be made throughout the process.

5 The Water Cycle:

- Evaporation and **Transpiration**
- Condensation
- Precipitation





"Wayne, that was cool!" Alonzo exclaimed. "Tell us about your second trip to the Everglades."

My second trip was last spring, when my family and I flowed down the Kissimmee River to the middle region of the Everglades watershed to attend a family reunion. This middle region is known as Lake Okeechobee. The **Seminole** and **Miccosukee Indians** call it "Big

Water" because it stretches for 730 square miles- almost as big as 800,000 football fields.

As morning dawned on the third day of my family reunion, some of us were gently filtering our way through plants that were hidden under water, floating on top of the water or emerging out of the water. Before I knew what was happening, my family was scooped up in a clear tube. As we were lifted higher, we came face to face with a smiling scientist from the **South Florida Water Management District.** She was conducting a field study by taking water samples to test for **pH** and chemicals such as phosphorus and nitrogen. She was testing to see whether the delicate balance of the Everglades was disturbed by runoff from agricultural and other developed lands. After recording the results of her field study, she carefully cleaned the test tubes and delivered us back to the lake.

6 The Miccosukee and Seminole Indians called all of south Florida their home. Their traditional means of travel was by dugout canoe. Trips were made from their



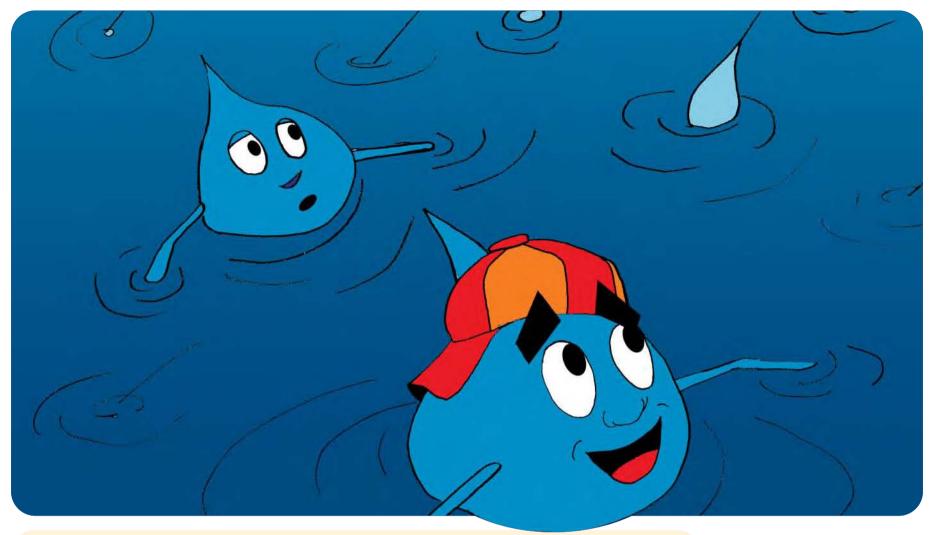
hammock villages to farm islands and hunting grounds. They made occasional visits to the urbanized coast to do trading with other Florida settlers. By the 1960's, the change in the amount, timing and distribution of water affected the Native American way of life. Canoes could no longer be used for everyday travel.

THE MANAGERS

The South Florida Water Management District, (SFWMD) is a partner with the federal government in the effort to restore the Everglades. This agency has the local responsibility to provide flood protection and water supply, and to manage the water that nourishes the natural ecosystem. Other partners in restoration include the Florida Departments of Environmental Protection and Agriculture, the Seminole and Miccosukee Indian Tribes, and other local agencies.

The South Florida Water Management District was created just over 50 years ago, to serve as a partner to the federal government and manage the flood control project throughout south Florida. Canals, earthen levees and pump stations route fresh water around the region as needed. This system keeps homes and farms dry during heavy rains, and provides water for people and farms. One of the agency's most important responsibilities is to provide a safe, dependable supply of fresh water for people, farms and the natural environment, now and in the future.

The agency is one of five water management districts in the state of Florida. It is the oldest and largest of the five. Its area includes the greater Everglades ecosystem, stretching from its headwaters near Orlando to the coastal estuaries and Florida Keys. The agency has many offices, with its main headquarters in West Palm Beach, FL.

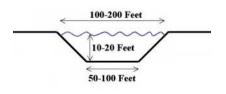


A few hours later, it got a little cool and the wind started to blow. Out of the sky, millions of drops fell, joining the reunion. Floating together, we all seemed to make the lake swell so much that I thought we might get to the top of the 34-foot high limestone dike surrounding Lake Okeechobee. Suddenly, some drops started streaming left and some to the right. We weren't sure which direction we were going next. When *Lake Okeechobee* receives a lot of water, humans release some of it through the *St. Lucie River*, on the east side of the lake, or through the *Caloosahatchee River* on the west side. We could see why the humans needed to protect their surrounding towns from flooding during big storms and hurricanes! The Kissimmee watershed sends a lot of water to Lake Okeechobee.

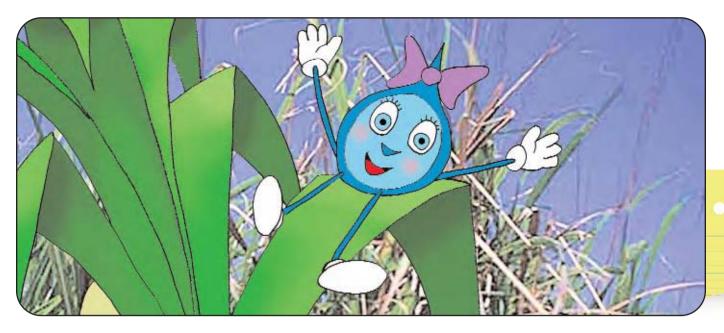
Our visit with family was interrupted as the *South Florida Water Management District* opened the canal⁸ gates to the Caloosahatchee River and we streamed west out to the *Gulf of Mexico*. Once again, I was unable to complete the entire journey through the Everglades watershed.



8 Canals move water. Water flows through canals with the help of pump stations, (as in the photo above) or simply by gravity. The ability to move water where it is needed provides important flexibility for effective water management.









9 Vocabulary Word: Irrigation = A method in which a supply of water is brought to a dry place to help grow crops, or water yards or recreational areas.

As I finished my second story, I noticed Tanesha waving her hand. "Do you have a question for Wayne, Tanesha?", asked Ms. Dew Right.

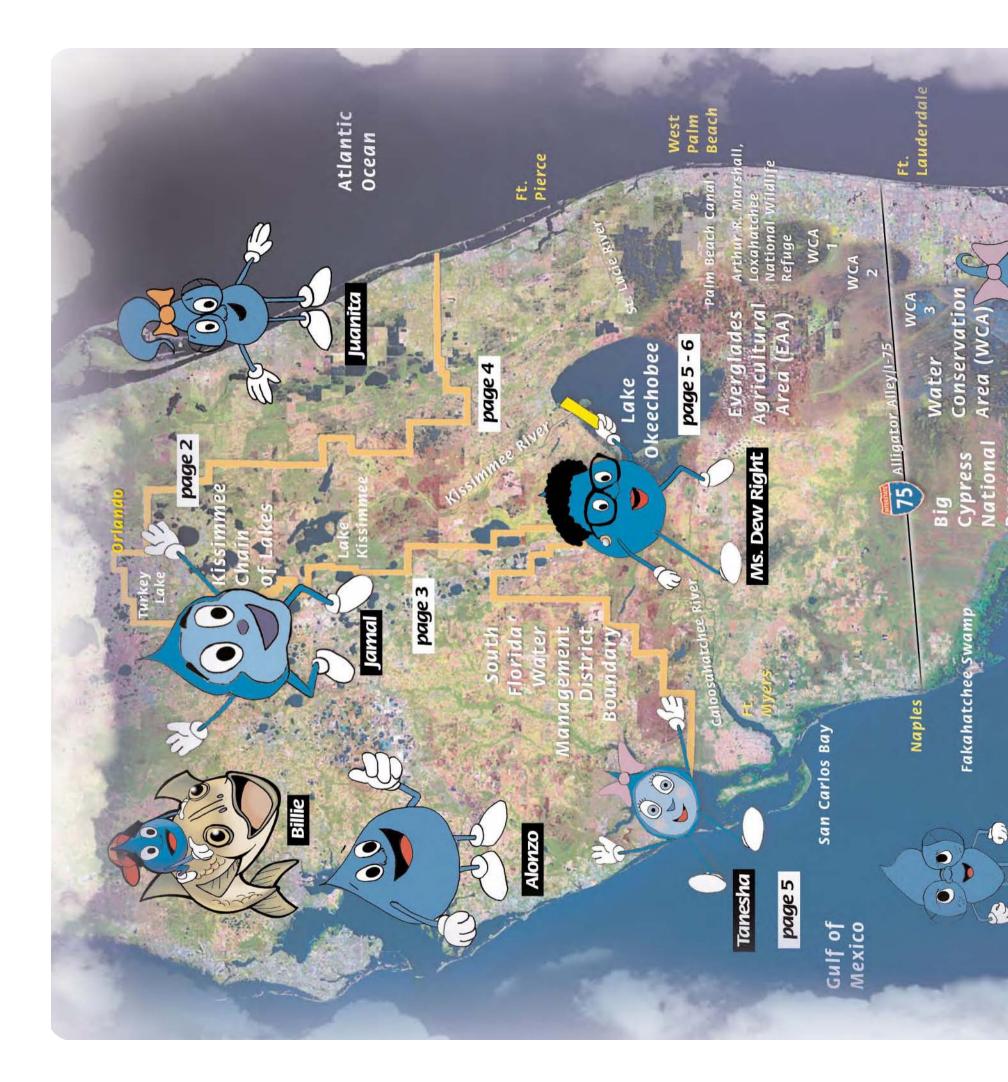
"No, but Wayne's story reminded me of a short trip I took to the Everglades Agricultural Area."

"Tell us about it!" yelled the other classmates.

Tanesha told a story about how humans grow their food. "I was hanging out in Lake Okeechobee, and decided to squeeze through one of the water control structures in the dike that surrounds the lake. I flowed south into a big canal, and then a smaller one, until I was sucked into a pipe. Woo hoo! I splash-landed in a field ditch, surrounded by acres of green, leafy sugarcane plants. SWEET! I seeped down into rich, dark soil until I was absorbed into a root. Next, I was pulled upward through tubes in the stem and out into the veins of the flat leaves. My trip ended with *transpiration*, when I changed to water vapor and was released into the air through a small pore on the bottom of the leaf. Of course, I ended up with my head in the clouds again!" Tanesha told us that if the plants don't get enough water they can die, so farmers use **irrigation**9 systems to make sure plants will get all of the water they need to stay healthy and grow. Some manmade, landscaped areas such as golf courses also need nutrients such as nitrogen and phosphorus. They can be irrigated with treated wastewater instead of fresh water. This recycled water is perfect because it has the built-in fertilizers the grass needs, and conserves fresh water for other uses such as drinking and taking showers.

"You know what, Ms. Dew Right, maybe if I finish my journey through the Everglades, I'll know all the answers to the FSPLAT."

"I have an idea. Since you ALL must pass the FSPLAT, let's ALL take a trip tomorrow to the *Everglades*," said Ms. Dew Right. "Yeah!" the class shouted in harmony together. "That will be fun!"





The Florida Keys

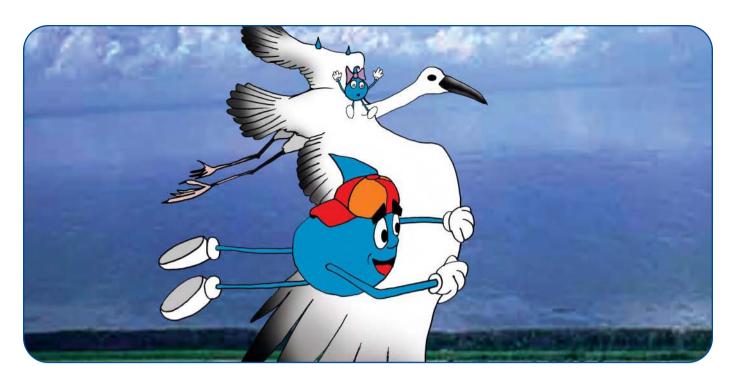
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Hawk Channel
Hawk Keys National
Florida Keys Sanctuary
Marine Sanctuary

Christopher

Dry Tortugas National Park

Key West



We had a restless night, since we were too excited about our field trip to sleep. The next morning, we looked forward to the arrival of our fine - feathered friend, the endangered wood stork, who comes by every morning looking for food. He would transport us to the southern part of the watershed- the Everglades region.

The flight was smooth when we were gliding, but very bumpy when he flapped his wings, which spanned more than 5 feet wide. I had a wild ride on one of his black tail feathers and didn't think that I would survive the flight. My classmate, Misty, distracted me when she pointed out a prowling endangered **Florida panther** directly below us. "What a rare sight," she whispered.

We traveled further south, passing a few *South Florida Water Management District* pump stations and teardrop-shaped tree islands rising above the rest of the landscape. Unexpectedly, our feathered friend started to descend, performing amazing dives, rolls and turns, and finally splash-landing in a shallow pool of water. Ms. Dew Right calmed down the group after its wild ride and announced that this was our last stop. We thanked our endangered friend for the ride and rolled off his black wing tips into the Shark River Slough of Everglades National Park. As we looked back at the wood stork, he waded around on his long, skinny black legs. He was pretty fussy - he didn't like to fish in water that was too deep or in water that was too shallow. He scratched around with his big pink feet, trying to stir up something to eat. He stuck his open beak into the water and groped around. When his beak made contact with a small fish, "SNAP!" He slammed it shut in a lightning-fast reflex.

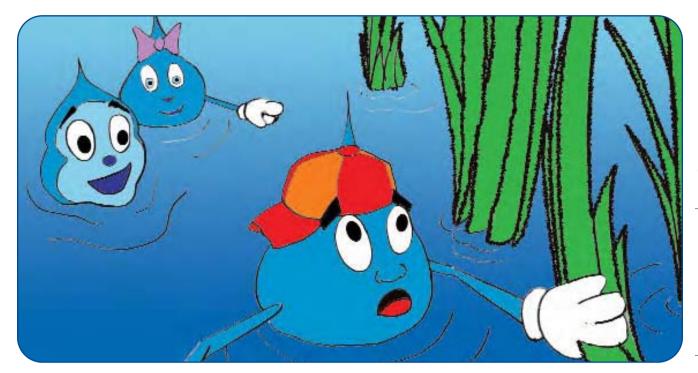


10 Adaptations are special characteristics that make animals and plants better suited to their environment. Wood storks are wading birds that have special adaptations that allow them to survive in the Everglades. The wood stork's main source of food is fish. It feeds by "tactolocation." The open bill is moved from side to side underwater until it makes contact with a fish and snaps shut. The snap of a wood stork's beak happens faster than you can blink your eyes. The wood stork, like other wading birds, also has long legs that help it walk through shallow water. The water level in the wetland has to be just right for the wood stork to feed and nest, so the species is considered an excellent indicator of the health of the Everglades.



An endangered species is a plant or animal that is in danger of dying out. The Florida panther, wood stork and manatee are some of the best known endangered species. Did you know there are approximately 15 endangered species that depend on the Everglades for survival?





As we drifted through the open-water slough, we bumped into some tall, **sharp-edged**sedges¹² emerging from the water. My classmates began to

snicker because they could tell I was nervous being in this new environment. Ms. Dew Right explained that this habitat was called a "sawgrass marsh."¹³ The water here was not very deep and animals seemed to be everywhere. Some were swimming through the water and some were walking. We rested for a while on light brown floating mats of periphyton,¹⁴ which our teacher told us was a very important algae complex that cleans and filters phosphorus out of the water.

After our break, we cautiously pushed on, banging and scraping our way through the edge of the sawgrass ridge until we caught up with a park ranger who was explaining to visitors why the area we were in was called "Shark River Slough." "Did he say sharks?!" one of my classmates asked Ms. Dew Right as he huddled near her in fear. Just then we heard the ranger say, "There really aren't any sharks in the slough; it's just called that because the fresh water from the Everglades runs to *Shark River*. *Shark River* meets up with the salt water in *Florida Bay* and makes brackish water, creating the perfect nursery for real live sharks to give birth to their young."



The natural cleansing ability of **periphyton** is being used to clean up water in man-made stormwater treatment areas as part of Everglades restoration. Not all algae are "good". A "bad" exotic algae, native to the Pacific Ocean, is growing over and suffocating sea grass and coral reef areas on the coast of Florida. Excess nutrients contribute to harmful algal growth, including toxin-producing red tides.



What's a sedge you ask? It is a type of plant that is commonly mistaken for tall grass. However,

sedges have triangular stems and grasses have round stems. The two flat sides of a sedge leaf meet to form a "V" shape.

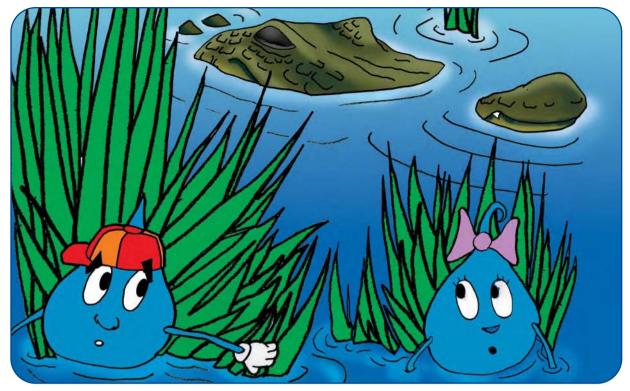
Sawgrass is a sedge and is the dominant vegetation in the Everglades. It gets its name from the very sharp, saw-like teeth on the edges and mid-rib of its leaves.

THE PROTECTORS

South Florida has four national parks in its backyard: Everglades
National Park, Biscayne National Park,
Dry Tortugas National Park and Big
Cypress National Preserve.
Everglades National Park
covers 1.5 million acres
and was established in
1947. The park includes
sawgrass marshes, pine rock land,
subtropical hardwood hammocks,
marl prairies, tree islands, and
mangrove estuaries.

Biscayne National Park, designated in 1980, is a place where mainland, mangrove, Biscayne Bay, and coral reef come together.

Dry Tortugas National Park is a cluster of seven islands made of coral reefs and sand. This area is known for its bird and marine life and pirate legends. It was first discovered by Ponce de Leon in 1513 and designated a national park in 1992. Big Cypress National Preserve was established in 1974 and is a wetland that drains first into mangrove estuaries and then into the 10,000 Islands. It is known for its large expanse of cypress trees with their big "buttressed" trunks and "knees."



Just a little relieved, we all looked over and saw a mellow red-bellied turtle sunning on a log, when all of a sudden, "SNAP!" Ms. Dew Right

almost evaporated from shock, and we all laughed again. A giant reptile had come out of nowhere and caught the turtle in its powerful jaws! "The mighty alligator," said Misty, "is the landlord of the *Everglades*." I sure wouldn't want to mess with something that had 80 big teeth and such powerful jaws! As we floated along, I saw a few other alligators basking and warming themselves in the sun along the banks.

"Wanna get a little gross?" Misty asked.

"Ummm..." I hesitated. "What do you have in mind?"

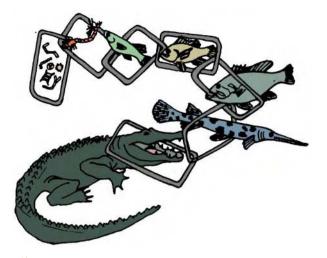
"Let's go see where scat comes from," said Misty.

"What?!"

"You know, if it's from sea birds or bats, it's called 'guano!' Oh come on, Wayne Drop. I'm talking about droppings!"

"Did you know that some scientists actually study animal droppings?" asked Juanita. "That's correct," added Jose. "For example, they dissect owl pellets to look for skulls and other bones so they can tell what kind of animals the owl had been eating."

"Did you know that a single dairy cow produces more than 120 pounds of manure a day?" added Jamal. "Ugh! I think that's more than I wanted to know..." Christopher moaned.



****THE GATOR HOLE**

There was once a gator in the slough. Who just didn't know what to do. As the winter months had gone by, His home had become dry. So he pouted and cried out "Boo hoo!"

But the gator started to think.
"I need water to live and to drink."
So he started to dig
A gator hole really big
It looked like a huge giant sink.

To the gator hole came so many fish.

To the birds it looked like a big serving dish.

The gator didn't grow any thinner

Because he had plenty for dinner.

The birds and the fish were delish.

Since the only water around was in his pool,

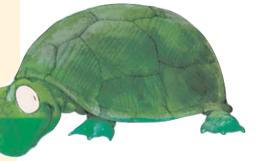
The gator decided not to be so cruel.

He didn't eat all of his guests

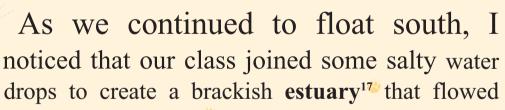
He allowed some of them to rest

But his hole he always did rule.

* Carlos Mancebo, 4th Grade Teacher, Dante B. Fascell Elementary School







through the tangled roots of coastal mangroves. These trees had long prop roots and looked like they were walking on stilts out toward the ocean.

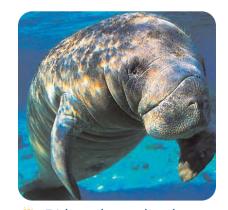
As we made our way through the mangrove roots, a kayak paddle swooshed us up onto the hull and we hitched a ride into Florida Bay. As the kayak slowed, we could see a shadow heading toward us. When large nostrils arose from the water with a snort, followed by a rough whiskered muzzle, we knew it was our gentle friend, the manatee.¹⁹ As the slow moving herbivore came closer, we slipped off the kayak onto the manatee's back and headed toward one of the last stops of this miraculous journey through the Everglades. We were heading directly toward the Florida Keys, which were once secret hideouts for pirates and their stolen treasure



17 The estuary is where the fresh water from the Everglades meets up with the salt water of the coast. The estuary is also where a change in vegetation occurs. The change is quite amazing. Certain flora (plants) and fauna (animals) like to live in fresh water, and others like to live in saltwater. Some things can live in both types of habitats, but most prefer to live in and are especially adapted to either one or the other.



48 Along Florida's coast you will find the largest stand of mangrove forests in the United States.



19 Did you know that the closest relative to the manatee is the elephant? The manatee is only one of more than 15 endangered species found in the south Florida national parks.



We flowed under one of the bridges along U.S. Highway 1, and I saw the beautiful coral along the ocean floor.²⁰ The class discussed how tiny animals create coral reefs and how their complex patterns of nooks and crannies provide homes for many other marine animals. A barracuda flashed a sinister grin at us while brightly colored saltwater fish guarded their territories. We floated past green sea turtles, munching on meadows of seagrass. I spotted a group of large creatures whose fins broke the surface of the water in graceful arcs before they dove back down. Ms. Dew Right explained that these animals, known as bottlenose dolphins, were mammals, not fish, that live in the water. "What do you mean?" I asked. She

> explained that dolphins breathe air through a blowhole on top of their head and have lungs just like humans do. Ms. Dew Right

decided we should take a ride on these playful mammals. We had so much fun

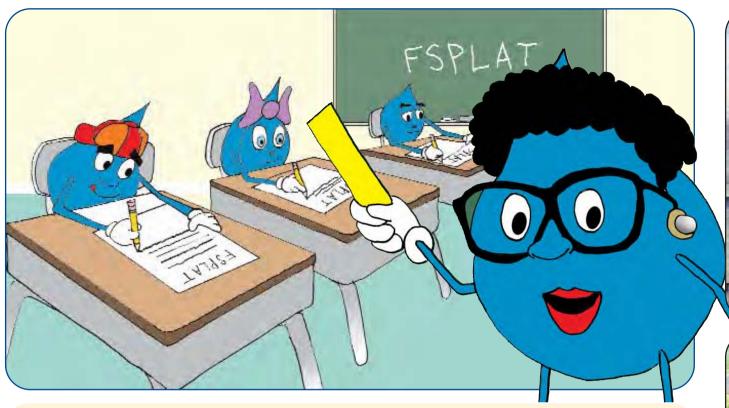
After a while, all of the excitement began to catch up with us. Ms. Dew Right decided that the class would take a little siesta. We didn't realize that the temperature was rising, and that we were being drawn up as water vapor into the large storm clouds that were filling the sky. We awoke to find ourselves floating high above the ground in dark, angry clouds. Our clouds marched across the sky to the north, passing the large cities where humans lived. When the clouds floated into the right position, Ms. Dew Right gave the signal, and we all fell as rain to our earthly homes.

as the dolphins leaped and dove in and out of the turquoise waves!



20 Just off the Florida Keys is North America's only living coral barrier reef and one of the longest barrier reefs in the world. Coral reefs contain more varieties of life than any other marine environment. They are part of a fragile ecosystem that includes mangroves and sea grasses, which grow on both the ocean side and the bay side of the Florida Keys. In recognition of this important environment, the Florida Keys National Marine Sanctuary was created in 1990.





The following day, Ms. Dew Right reminded the class of the many things we learned on our journey. We talked about the scientific field study, our encounters with many creatures, and our amazing journeys through the *Kissimmee-Okeechobee-Everglades* watershed. We laughed as we remembered the tales we had heard from each other. "It feels good to be important," Misty said seriously. The class nodded in agreement. We knew that water drops like us are critically important to the plants, animals, humans and environment of south Florida. We all realized that the resources of the *Kissimmee River, Lake Okeechobee, the Everglades, Florida Bay* and the *Florida Keys* of today are different from what they were in the past and even different from what they will be in the future, and that everyone needs to help keep them healthy.

...How the story ends is up to you

As we ended our discussion, Ms. Dew Right told us how proud she was of us and reminded us that we were more than ready to take the FSPLAT the next day.

How well do you think Wayne and his classmates did on the FSPLAT?

Ms. Dew Right's class would like you to share a story. Describe your outdoor experience in the *Everglades*, a neighborhood park, or even in your own backyard.







issimmee - Okeechobee - Everglades Game Safe Move ahead Move back 6 spaces 1 space - You You threw plants kept a respectful Space and fish from your Move ahead 2 distance from aquarium into spaces - You turned alligators, a canal the water off while space - You read When crocodiles

Safe Space

and snakes.

Move back 8 spaces - You fed an alligator.

Move back

spaces - You cut

down mangroves ecause they were blocking your

you brushed your teeth.

Safe

Space

Everglades.

a book about the

Wayne wins, we

Move ahead 3 spaces - You observed but didn't disturb wildlife.

> Skip your next turn - You had sprinklers on when it was raining.

> > Move

ahead 1

space - You

reduced the peed of your

motorboat in a manatee area

Safe

Space

Move back 1

Move ahead 5 spaces - You visited **Everglades** National Park.

Materials: Gameboard, gamepiece of your choice (use a small object you like or use your imagination—for example, draw a small picture of an alligator or make a small sculpture out of clay), dice

How to play: Each player rolls one of the dice. The person with the highest number goes first. Roll one of the dice and move your gamepiece. When you land on a space, follow the directions. Take turns rolling the dice and making a move.

Move ahead 6 spaces - You told your friends it's important

to save

Space

water.

Become a

Move back 1 space - You disturbed nesting birds. space - You left the faucet on after washing your hands.

KOE Kid!

Safe Space

Move back 3 spaces - Your boat propeller tore up seagrass in a shallow area.

Go back to START - You touched a coral reef while snorkeling.

Move ahead 7 spaces ou carried out and threw away all trash when visiting a natural area.

Move back 2 spaces - Your pet python got too big so you released it in the park.

Move back spaces - You picked wildflowers for your ational Park



www.evergladesplan.org

The Journey to Restore America's Everglades

A partnership of the U.S. Army Corps of Engineers, South Florida Water Management District, Everglades National Park and many other federal, state, local, and tribal partners.





