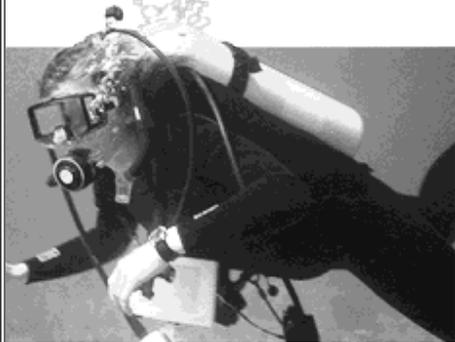


Oceans Live

The Center for Marine Resource Studies, South Caicos Island, Caribbean



Why is the Ocean Salty?



If you have ever jumped into the ocean and accidentally taken in a mouthful of water, you know how salty seawater tastes. This is because oceanic salinity, the amount of salt dissolved in ocean water, is much higher than the salinity of fresh water.

One reason for the high salinity in oceans is that they act as a great collecting basin for all the water that falls on land. When rain falls from the sky, it carries few salts, but as it moves through rivers and lakes towards the ocean, the water picks up salts from

the Earth's surface. When it finally reaches the ocean, the water is quite salty.

Another process that makes seawater salty is underwater volcanic activity. In 1962, scientists discovered an underwater mountain range which runs longitudinally around the Earth, bisecting both the Atlantic and Pacific Oceans. This underwater rift is actually an area where matter from inside the Earth, known as basalt, bubbles up and forms a new sea floor. Basalt is rich in chloride and potassium, elements which are integral in forming the salts which make sea water salty.

The Turks and Caicos Islands lie within one of the saltiest areas of ocean on Earth. Because the climate is both hot and dry, water evaporates quickly, leaving fewer water molecules to every salt molecule.

Essay written by Alice Kidder and Lauren Purcell. Alice Kidder is an SFS student from Brown University. Lauren Purcell is an SFS student from Grinnell College.

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Q: Have you seen any wildlife on South Caicos yet?
Alix, Pennsylvania, USA

A: When we flew into South Caicos three days ago, I was immediately struck by the number of wild animals wandering around. On the drive to the school, we were greeted by horses, donkeys, cows, dogs, cats, and hogs! Then, on our first snorkel, my kitchen crew and I swam around the west dock and saw some sting rays and an octopus hiding under a rock, waiting to grab an innocent crab for lunch! During site clean-up this morning, Win and I were really lucky. After cleaning off the bottom of the burpee (a kind of boat), Mark took us on a boat ride to shark alley. Alas, no sharks were to be seen. We did, however, see a large sea turtle that we almost ran over. I can't wait to go on my first scuba dive here and see all the creatures that I have been hearing about and looking at in books!

Answered by Jennie Mandeville, an SFS student from Middlebury College.



Sept. 11 Students had their first camp clean-up today. They

saw a cow on the side of the road on the way to the dump!

Sept. 9 Reef shark sighted on faculty dive. Students began rescue skill training.

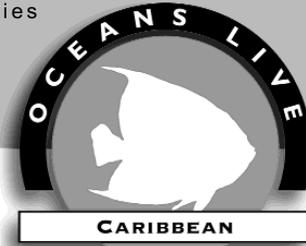
Sept. 8 First day! As soon as the students got here, they took their swim tests and got their first feel of our beautiful ocean here.



Look for articles in today's paper about the ocean or about a body of water in your community. Make a list of people's attitudes and relationships to these bodies of water. Does your behavior affect the world's oceans?

Oceans Live

The Center for Marine Resource Studies, South Caicos Island, Caribbean



Ocean Zones



Beyond the tidal zone is the pelagic realm, which includes the entire area of open ocean. The top, sunny layer of this zone is home to such familiar creatures as whales, sharks, and corals. The deeper layers extend down 4,000 meters and do not receive sunlight.

The final main region of the ocean is the abyssal zone, which extends down almost to the sea floor. Due to extreme pressure and no sunlight, the organisms in this zone have highly specialized adaptations to help them survive.

When we conduct underwater research in the waters around South Caicos, we generally snorkel and scuba dive in the intertidal and subtidal zones, where there is enough light to do our work.

David Koeker is an SFS student from Colorado College.

Because the ocean is so vast, it is divided into several regions.

The tidal zone exists where the ocean meets the land. This zone includes three subzones. The splash zone is located above the typical waterline, where waves wash up onto the beach. The intertidal zone exists between the high and low tide lines. There is a large food supply in this zone (mostly worms), so many bird species can be found feeding here. Finally, the subtidal zone combines a constant water supply with lots of sunlight near the sea floor, making it a rich environment for sea life.

**EXTRA!
EXTRA!**

Sept. 13 We all got very wet during the storm, but managed to keep everything together. We all enjoyed the rain, and were happy to have the fresh water!

Sept. 15 Students relaxed on Long Beach today and played football with a coconut.

Sept. 16 Lectures start on a regular basis now that weather outlook is good.

**KIDS
NEWS
EXPLORER**

Animal Ads

Search today's newspaper for ads that portray animals. What can you tell about people's relationships to animals from these ads? Choose one animal, research it, and present an oral report to the class about its natural history. Include whether it is an endangered species or not. Why was the animal used in the ad?



Q: What kinds of animals live on South Caicos?

A: There are quite a variety of animals on South Caicos. I really didn't know what to expect and have been quite surprised. The most abundant animals I have seen so far are the lizards. They scurry around the trees outside the Center and try to keep away from Claus, the resident cat. There are also wild ponies milling around to the east of the Center near our volleyball courts. Although they are wild, they let us pet them. It is really quite amazing. We have not been in the water too much yet, but I have already seen two stingrays and yesterday I even saw a barracuda. They are beautiful animals, but it will take a little while to get used to swimming with them! Probably the funniest animal I have seen so far is an enormous pig. He was just walking down the street looking for food, making lots of snorting sounds. He had the whole group laughing. I look forward to seeing all the animals here, especially the pink flamingos!

Answered by Hilary Harp, an SFS student from Franklin and Marshall College.

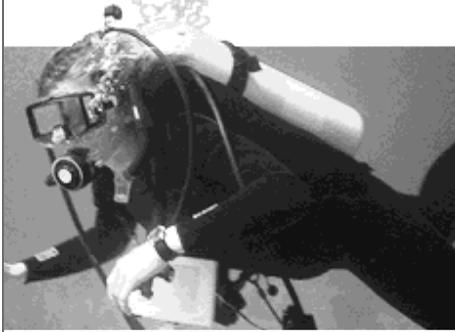
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Coral Reefs



Coral reefs are made up of colonies of tiny animals, called polyps, living inside calcium carbonate skeletons. They survive by using tentacles to sting prey for food. Algae living in the coral tissue also provide nutrients and are responsible for the corals' many different colors.

Corals are mainly found in warm and sunny tropical waters. A coral reef begins with a single coral taking hold on a solid substrate. The coral reproduces, eventually forming the large colonies that make up coral reefs. As

corals die, their skeletons are left behind to serve as a foundation for new colonies. This process builds the reef at a rate of 2–4 cm in height per year. Australia's Great Barrier Reef took approximately 9,000 years to form.

Many fish, invertebrates, and algae live within the reef environment and are dependent on the corals for protection. Without the benefits corals provide, the reef ecosystem would cease to exist. Unfortunately, though, coral reefs are presently being threatened by many different things. Natural predators, such as the parrot fish and seastar, feed on polyps, weakening and sometimes killing colonies. The damage done by divers touching corals, boat anchors dropping onto reefs, and the construction of shipping ports also endangers the reef ecosystem. The dumping of toxic chemicals into the ocean and the freshwater runoff of oil and heavy metals are further threats.

Essay by Jamie Haines, an SFS student from Connecticut College, and Peter Dixon, an SFS student from Colorado College.

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Q: What kinds of animals live on the reefs near South Caicos?

A: The reefs around South Caicos are beautiful. The brightly colored coral ranges from brilliant purple to deep orange. Many animals live in and around the reefs, including bright, rainbow-colored parrot fish; giant silver barracudas that even swim with authority; and small white jawfish that hide in holes in the sand when they are scared. If you are lucky, you might see a stingray, nurse shark, lemon shark, or reef shark. Although these animals have a dangerous reputation, they are quite docile when not threatened. I think that the most amazing animal that can be found in these reefs is the giant spotted eagle ray. It is usually about 3–6 feet wide and 5–10 feet long, and is one of the most graceful and beautiful animals of the sea.

Answered by Jennifer Bassett, an SFS student from the University of Southern California.



Sept. 18 We went to the beach today for rest and relaxation. The sun was brighter than we thought, so a few of us are sporting sun-burned noses this evening.

Sept. 20 Students went on a bird walk today.

Sept. 23 Some students went diving this afternoon and saw a giant spotted eagle ray skimming along the ocean floor.



Environmental Reporting

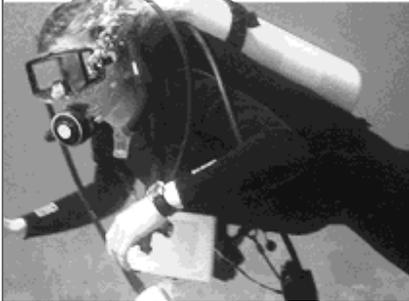
Find articles in the paper that address environmental problems. Write a one-page article of your own summarizing these problems and posing possible solutions.

Oceans Live

The Center for Marine Resource Studies, South Caicos Island, Caribbean



Mapping the Underwater World



A few times a week, my Directed Research group heads out to sea. We measure and document the population and habitat of conch, a huge mollusk which is harvested by the fishermen of South Caicos. At the dive site, each person in the group has a job which is vital to the research; teamwork makes it happen. On the ocean floor, one person lays out a 60-meter tape measure that has weights at both ends. This is called a transect. Next, two divers swim along the transect,

count the number of conch shells they see at six meter intervals, and record these numbers on special underwater slates. Two people swim behind the conch counters and collect the live conch in a mesh bag. These are brought back to the boat to be measured and weighed using calipers and scales. While some students are measuring and releasing the conch, one diver uses a one-meter-by-one-meter grid, called a quadrat, to determine the ocean bottom composition in the habitat of the conch. They place the grid along the transect every ten meters and write down on their slates all of the algae and grasses they observe within the grid. Underwater research is challenging and fun. Eventually, our conch data may help us protect this important fishery.

Sept. 24 After classes were done today, students participated in Youth Day, an annual Turks and Caicos Islands holiday.

Sept. 28 While snorkeling in Shark's Alley today, students spotted a lemon shark, reef shark and sea turtle, all over five feet long!

Oct. 1 Students took their three-hour midterm exam this morning, after preparing for it for two days.

EXTRA!
EXTRA!

Tools of the Trade

Review several newspaper articles in the business section that report on different professions. Make a list of any tools mentioned in the articles that are used by these people. Do you use any of the tools on the list? What kinds of tools do you use at school, around the house, in sports, etc.?

KIDS
NEWS
EXPLORER

Q. What is a barometer's role in predicting the weather?

A. Webster's Unabridged Dictionary defines a barometer as "an instrument for measuring atmospheric pressure and thus for forecasting the weather." Atmospheric pressure is a measure of how much force gas particles in the atmosphere are exerting on each other. The gas particles tend to increase the pressure when they are heated and decrease the pressure when they are cooled or if there is water vapor in the air. From this information, we can use a barometer to tell what the weather will be. If the barometer indicates high pressure, it is likely to be sunny and clear. If the barometer shows a decrease in pressure, expect rain or stormy conditions. For example, during Hurricane Floyd down here on South Caicos, the pressure fell dramatically.

Answered by Nick Pioppi,
an SFS student from the
University of New Hampshire.

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The Classification of Organisms



There is incredible diversity among the earth's organisms. Since scientists need to communicate with each other about these organisms, it is necessary to have a universal means of identification. Therefore, according to their particular characteristics, all animals are classified within a hierarchy of seven groupings: kingdom, phylum, class, order, family, genus, and species. However, referring to an organism by seven different names can be confusing. In order to simplify terminology, scientists usually use only two of the grouping names: genus and

species. This classification method is called binomial nomenclature. For example, the queen conch is classified as: Kingdom Animalia, Phylum Molluska, Class Gastropoda, Order Mesogastropoda, Family Strombidae, Genus *Strombus*, and Species *gigas*. Among scientists, though, this animal is known simply as *Strombus gigas*.

Animal classification comes in handy here on South Caicos when we go diving and have to identify marine organisms on the reef. In order to identify an organism, we look for characteristics that it has in common with other organisms in a particular grouping. For example, we look at an organism's size, shape, color and habitat. If a fish is three feet long, is silvery and has sharp teeth, we know that it is probably a type of barracuda. After practicing organism identification for a few weeks, we have learned to recognize organisms very quickly.

Essay by Jennie Mandeville, an SFS student from Middlebury College, and Nicki Fraioli, an SFS student from the University of San Diego.

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Q. What is the most colorful fish you have seen so far?

A. There are many colorful fish that live in the reefs, but the most colorful one I have seen so far is the stoplight parrotfish. Parrotfish are so named because of their very bright colors. As juveniles, stoplight parrotfish really don't look like anything special—they are usually a reddish brown color with a few white markings. By the time they reach their terminal phase, though, stoplight parrotfish are bright emerald green with red bellies and accents of yellow, purple, blue and salmon on their fins and gills. Their scales are quite large and distinct, making them look a little like legless lizards. They are quite unafraid of divers and can often be spotted munching away on a coral head.

Answered by Alice Kidder, an SFS student from Brown University.



Newspaper Classification

How is today's newspaper organized? What are the different parts of the newspaper? Are there different types of articles? Are there different types of ads? Make a list of the different sections in the paper and then assemble a scrapbook that shows the different types of articles, ads, etc.

Oct. 6 Students went on an early morning dive at the Arch, just off the East Bay reef.

Oct. 8 Governor John Kelly came today to give a lecture about the history of the Turks and Caicos Islands.

Oct. 11 Today was sunny and beautiful. Students went on a marine fish identification exercise this morning.

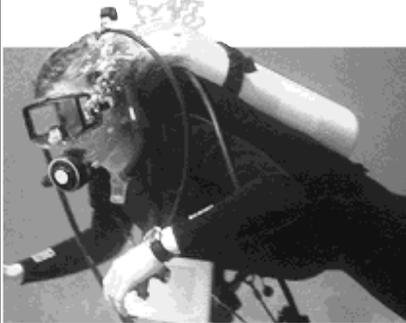
**EXTRA!
EXTRA!**

Oceans Live

The Center for Marine Resource Studies, South Caicos Island, Caribbean



Survival of the Fittest



An adaptation is any change in a plant or animal species that occurs over a period of time due to changes in the organism's habitat. Adaptations help organisms to better survive in their immediate environment. Changes in color, shape, behavior and organ function can all aid animals in avoiding predators and living longer in their particular environment.

Examples of interesting animal adaptations abound in the waters around South

Oct. 13

Students went on an early morning dive this morning.

The dive was cut short by an ornery barracuda, who followed the students back to the boat.

Oct. 17 Many students spent their day off today at Ambergris Cay, relaxing on the beach.

Oct. 19 Sunny as usual today, but all is quiet at the Center. Students are studying hard for their midterm exams.

EXTRA!
EXTRA!

Caicos. The flounder, for example, is a small fish that hides from predators by lying on the ocean floor and having skin and scales that look exactly like the sandy bottom. The Caribbean spiny lobster, in turn, has adapted to its environment through behavior. Spiny lobsters are a favorite food of many predators in the ocean, including spotted eagle rays, groupers, and nurse sharks. By eating and migrating at night, lobsters are able to avoid some of their predators, who eat primarily during the day.

Plants adapt to their environment, too. For example, mangroves are a family of amazing coastal plants that can live in salt water. Some mangroves use exclusion to keep salt out. This means that cells in the tips of their roots take in only fresh water, leaving the salt in the sea. Other mangroves take in salt water, but excrete the salt through pores on their leaves and stems.

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Q. How do you catch a spiny lobster?

A. The South Caicos fishermen catch lobster in many different ways. Most fishermen free dive for spiny lobsters. They go down an average depth of 75 feet per dive with only snorkel equipment—they hold their breath the whole time! This is a physically rigorous way of life.

Another common way to catch lobster is to put bleach or detergent in the lobster dens to force the creatures out of their habitats. This is the easiest catching method, yet by far the most harmful to the environment.

"Tossing," the oldest method of catching lobsters, involves using a pole with a wire loop on the end to snare the lobster. This procedure takes a lot of skill and practice, yet it is the least detrimental to the ecosystem.

Answered by Karoun Charkoudian,
an SFS student from
Johns Hopkins University.

Q&A

Current Event Adaptation

Animals in the wild are not the only things that are adapted to their environment. In today's paper find out how people adapt to different environmental and political conditions.

KIDS
NEWS
EXPLORER

Oceans Live

The Center for Marine Resource Studies, South Caicos Island, Caribbean



Fishing for Fun



When I have a couple of hours to myself, one of my favorite things to do here in South Caicos is to go fishing. It's different from any other fishing I've ever done. Instead of using a fishing pole, I have a large plastic reel wrapped with fishing line. A small weight is tied to the end of the line to help with casting and also allow the bait to sink to the bottom. Two hooks are tied above the weight and fitted with some type of bait, then

cast as far as possible into the water. I've found the best bait to use is queen conch and other small reef fish, such as young schoolmasters and wrasses.

So far, I've caught such things as grey snappers, adult schoolmasters, yellowtail snappers, a spotted moray eel, and even an octopus (which spit out the bait as soon as I pulled him out of the water!). When I catch something, I almost always let it go, or let some of the locals use it for bait to catch sharks. A couple of times, my line has snapped because either a really big fish or a shark took the bait. It's probably a good thing the line broke, since I have no idea how I would pull a fish that size out of the water and onto the dock. Even when I don't catch anything, fishing is a good way to relax under the stars and hang out with my friends.

*Essay by Peter Dixon,
an SFS student
from Colorado College.*

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Q. How does a fish identification exam work?

A. We recently took a fish exam in which we had to identify many different types of reef fish. To prepare for our test, we watched a slide show about the different fish types and studied the fish names and characteristics. Then, on Thursday, we went out to a nearby snorkel site. After getting our gear together and pairing up with our buddies, we began snorkeling around the reef. When our leader found a fish we had to know, she pointed to it. We then wrote down the fish name on our underwater slates. We went through twenty different fish, and were able to identify most of them! During our exam, we also saw spotted eagle rays several times. Each one came within six feet of our group!

*Answered by Erin Davies,
an SFS student from
Ohio Wesleyan University.*



Oct. 22 A group of students went on a night snorkel this evening and saw a porcupine fish and an octopus.

Oct. 25 Students are on their mid-term break. Most students are traveling in the Dominican Republic.

Weather Patterns

In today's paper, look in the weather section and see how your local weather (temperature, precipitation, etc.) compares to the weather on South Caicos Island. Compare the local weather to other locations around the world. Do you notice any patterns regarding where you find warmer and cooler temperatures? Write the temperatures on a map to find out!

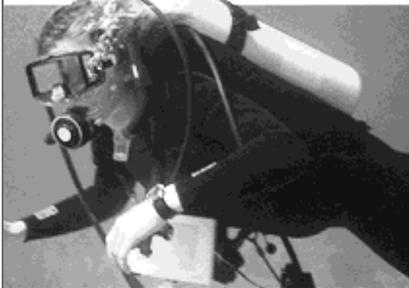


Oceans Live



The Center for Marine Resource Studies, South Caicos Island, Caribbean

Food Webs: The Cycle of Life



A food chain is a representation of the feeding relationships within an ecosystem. Each position along this chain is called a "trophic level." The first trophic level consists of primary **producers**, including most plants and algae, which absorb sunlight and convert it into food via a process called photosynthesis.

The remaining trophic levels consist of a variety of **consumers**. Consumers must feed upon other organisms because they cannot produce their own food from sunlight. The primary consumers, located on the

second trophic level, eat only plants and are thus called *herbivores*. The third trophic level consists of secondary consumers, called *carnivores* because they eat herbivores. Food chains can have as many as two more trophic levels, consisting of carnivores and/or *omnivores*, which eat both herbivores and carnivores.

Once an organism dies, it is broken down by **decomposers**, found on all trophic levels. The broken down particles are then recycled to become food for the producers again, thus completing the cycle of life.

In reality, the feeding relationships between organisms are rarely as linear or as simple as a food chain implies. A food web is a much more accurate description of the feeding relationships between organisms, as it represents a larger, more complex network of many interconnected food chains.

Oct. 28
Students returned from semester break this evening.

Oct. 29 Today was Family Day. Erin's Dad and sister, Bernadette's Mom, and Jennie M.'s Mom all visited for last evening and today.

Oct. 30 Site cleanup today. The Finfish Directed Research group saw a turtle and a spotted moray eel. Pretty exciting!

EXTRA!
EXTRA!

Food Web Ads

Find three ads about food in today's newspaper. Where did the food come from (e.g., a hamburger comes from a cow)? In what part of the food web does this food belong? Is it a producer, an herbivore or a carnivore?

KIDS' NEWS EXPLORER

Q. What is the biggest marine animal found in South Caicos waters?

A. The largest marine animal that one is likely to see around South Caicos is the humpback whale. Humpback whales, like all whales, are mammals. They are warm-blooded, breathe air, and give birth to live young. Humpback whales divide their time between feeding and breeding areas, which can be thousands of kilometers apart. Feeding areas tend to be closer to the North and South Poles, where whales can devour huge schools of small fish and krill (tiny shrimp-like organisms) in the cold, nutrient-rich waters. As the winter months come along, humpbacks migrate towards their breeding grounds. The South Caicos Banks are situated near a common migratory region for these whales. It is not uncommon to see the distinctive black and white marked flukes of a humpback whale during December, January and February.

Answered by Mark Capone,
an SFS student
from Vassar College.

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Underwater Nature Trails



Underwater nature trails are a relatively new concept, stemming from a growing need to protect the world's coral reefs. Unfortunately, as snorkeling and diving have become more popular, the health of coral reefs has suffered. Novice divers and snorkelers often do not realize that coral reefs are very delicate structures; touching or standing on coral can kill it.

The idea behind underwater nature trails is to control reef damage while teaching swimmers about both the underwater world and the

conservation measures needed to preserve it. The trails consist of permanent informational markers on the reef which lead swimmers through the reef environment, pointing out the most interesting sights and related conservation issues along the way. The educational benefits of such trails are high. Also, if swimmers stay on the paths, any damage done to the reef is confined to a small area.

Underwater nature trails do have some downsides. Some argue that the trails' manmade markers destroy the reef's natural beauty. The trails are also very expensive to construct, and their existence is no guarantee that swimmers will not wander off into other reef areas.

In the end, underwater nature trails are not a perfect solution. However, they do slow reef destruction and increase conservation awareness. Perhaps, in conjunction with other reef education programs, they will help us to successfully maintain the reefs for future generations.

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Teamwork

The SFS students need to cooperate and work in teams on their directed research projects. Find an article that shows people working together for a common goal. Why do people work together? What are the benefits of cooperation?



Q: How deep do you dive near South Caicos?



A: When we go scuba diving in South Caicos, we only go to a maximum depth of 60 feet. The ocean environment changes as you go deeper and the fish often get much bigger. We often see turtles and sharks. The visibility usually decreases as you go deeper, but here in South Caicos the visibility is really good. You can often see the bottom in 70 feet of water from the boat. The pressure levels increase as you get deeper and the temperature level usually decreases, but here the temperature difference between the surface water and the bottom usually is not that much. The ocean environment at 60 feet is really amazing!

Jamie Haines is an SFS student from Connecticut College.

Nov. 3 Night snorkel tonight!

Nov. 4 The Finfish Directed Research group saw a 5-6 foot barracuda and Erin saw a shark fin.

Nov. 9 We had lots of dramatic rain showers and wind as we went about classes and directed research today.



Oceans Live

The Center for Marine Resource Studies, South Caicos Island, Caribbean



Reef Pollution



Coral reefs are very fragile ecosystems. Any small disturbance can have a long-lasting and significant impact. Unfortunately, in recent years, most if not all of these disturbances have been caused by humans.

The most common manmade pollutants of coral reefs are sewage, fertilizers, soaps, detergents, and insecticides. These pollutants reach the reefs via water that runs off land and into the ocean. Improperly treated industrial wastes are also an increasingly serious

problem in coastal waters. Because the reefs depend on a stable salinity, even an influx of clean fresh water can damage reefs.

The most visible reef pollution can be seen from a boat or on a snorkel. Plastic containers, bags, soda cans, and wrappers are all harmful ocean pollutants. However, humans can have an even more direct negative impact. Coral is made up of a community of delicate organisms, called polyps, which are protected by a thin mucous membrane layer. Just by touching a coral head, a diver destroys the membrane, thus weakening or even killing the coral. In addition, when a diver or snorkeler kicks up sand, it settles on the coral. The coral must then expend a lot of energy cleaning itself, leaving less energy for feeding.

Despite these present problems, researchers and scientists are optimistic that through education and awareness reef pollution can be minimized.

*Essay by Jessica Aronowitz,
an SFS student
from Wellesley College.*

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Q. What is SCUBA?

A. SCUBA is an acronym for Self Contained Underwater Breathing Apparatus. Scuba diving is a way of staying underneath the water for an extended period of time by breathing air equal to the surrounding pressure.

Scuba diving equipment includes basic snorkeling gear (mask, fins, snorkel), a cylinder to hold pressurized air, and various pieces of safety equipment to regulate airflow, air pressure, depth, buoyancy and air levels. Divers must also wear a weight belt, because people are naturally buoyant in water and even more buoyant in salt water; in order to stay on the ocean floor, they need extra weight to hold them down.

Scuba diving is a great way to explore the ocean. If done properly and safely, it can be very rewarding and enjoyable.

*Answered by Jessica Aronowitz,
an SFS student
from Wellesley College.*



Rain Survey

Look in the weather section of today's newspaper and make a list of towns and cities where it is raining. Into what major rivers and oceans might this rainwater eventually be deposited?



Nov. 9 A very dark day here on South Caicos, with lots of rain showers and wind.

Nov. 11 Director Murray Rudd married Donna Curtis (Center librarian and our very own sitesALIVE intern) this morning. Congratulations to them both!

Nov. 15 Students are studying for exams. The weather is quite sunny after a rainy weekend. Hurricane Lenny does not look like it is headed our way, but we are keeping a steady watch.

Oceans Live

The Center for Marine Resource Studies, South Caicos Island, Caribbean



Renewable Versus Non-Renewable Resources



Resources are classified as perpetual, renewable, or non-renewable.

Perpetual resources are those that are likely to remain inexhaustible on any human time scale. More important to us as humans are the renewable and non-renewable resources.

Renewable resources are those that are replaced through natural processes, like the trees in a forest. These types of resources can still be polluted or used too rapidly, but are sustainable if managed properly. Non-renewable resources are those that exist in a fixed amount on earth, like oil and aluminum.



Nov. 16 The first half of our final exams are complete!

Nov. 17 We visited an iguana tagging project today.

Nov. 18 We started working steady on our Directed Research today, and also did a field exercise.

Nov. 19 More Directed Research today, along with some field exercise follow-up work. Students also had two more assignments to hand in. The final crunch is on!

The problem of if and how to conserve these resources is presently a major debate. Obviously, non-renewable resources will not last forever. Even renewable resources may become non-renewable or extinct if not managed properly. For example, deforestation currently occurs at alarming rates worldwide. By removing large areas of trees, a renewable resource, and failing to sufficiently replace them, humans are causing an overall decrease in timber growth. If not properly addressed, this environmental degradation will only worsen over time.

However, there are many things we can do on a small scale to help the overall problem of resource depletion. The recycling of a soda can provides the resources to create another useable soda can or other aluminum product. It may not seem like much, but if everyone makes an effort, the problem of managing our resources will become significantly easier to solve.

Essay by Nick Pioppi, an SFS student from University of New Hampshire.

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Q: Are there different kinds of reefs?

A: There are three different kinds of reefs around South Caicos: patch reefs, fringing reefs, and barrier reefs. Patch reefs consist of scattered reef heads on the sandy sea bottom. When you look at them from above, patch reefs are fairly spaced out, like little patches sewn on the sea floor. Built on rock and dead coral, fringing reefs lie right next to the shoreline and are usually more compact than patch reefs. In comparison, barrier reefs are separated from the shoreline by lagoons, or shallow waters.

Although these reefs are different in their placement and structure, they are very similar in the kinds of corals found in them and the creatures that live in and around the corals. They are also similar in their great beauty and complexity.

Answered by Georgia Williamson, an SFS student from Millsaps College.



Resource Conservation

Find and read an article in today's paper about a natural resource (fish, oil, water, trees, etc.). Is the resource in danger of being overused? Should it be conserved? Explain.

Oceans Live



The Center for Marine Resource Studies, South Caicos Island, Caribbean

Protecting the Marine Environment



In the past, humans have neglected to protect and conserve the marine environment for several reasons. First, the oceans, seas, and coastal waters are so large that we thought they could easily absorb and recover from pollution. It is also difficult to understand human impacts on the ocean if we cannot readily see them.

Nevertheless, humans do have a great impact on the marine environment. Humans have caused the

most marine damage in areas where large populations live, especially where multiple communities live within 50 miles of the coast. Areas where human activities are the most intense are also the most damaged areas, but there is no place in the ocean that has been unaffected by human activities such as overfishing, intensive diving, and pollution-generating transport.

In order to protect the marine environment from human activities, we must develop greater numbers of Marine Protected Areas (MPAs). In tropical areas like South Caicos, these regulated MPAs can be used to protect coral reefs, mangroves, and seagrass beds from further degradation. Banning or restricting commercial fishing within MPAs can enable fish stocks to develop, grow and even replenish stocks outside the park. Ideally, MPAs should be able to control human activity for recreational purposes while conserving and maintaining biodiversity.

*Essay by Patricia Betts,
a member of the SFS resident
faculty on South Caicos.*

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Q. Are there any animals native only to the TCI?

A. The rock iguana is a species of lizard found only in the Turks and Caicos Islands. Rock iguanas are large, herbivorous, terrestrial animals that feed mainly on berries, leaves, and fruit.

Many human-inhabited islands of the TCI have lost their iguana populations because of predation by cats and dogs that accompany people. However, iguanas still remain on many of the uninhabited islands of the TCI chain.

Recently, the SFS students had the opportunity to observe and assist in the measuring and tagging of rock iguanas. These iguanas are being transferred from Ambergis Cay, where a development is in the process of destroying three-fourths of their habitat, to Long Cay (just off of South Caicos). People hope that the rock iguana population will be saved by moving it to Long Cay.

*Answered by Mark Capone,
an SFS student from Vassar College.*



Nov. 20 Tonight the students are having a fish fry with local fishers.

Nov. 21 Today was a relaxing day—lots of homework but also lots of volleyball.

Nov. 24 The cooking and baking has begun for tomorrow's dinner. Also, two Directed Research groups spent the day in Providenciales, collecting information for their research projects.

Nov. 25 We had a very nice American Thanksgiving this evening, complete with lots of food, decorations and calls home.



Resource Conservation

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Oceans Live

The Center for Marine Resource Studies, South Caicos Island, Caribbean



Economic Development: A Blessing or a Curse?



At present, the South Caicos economy is based primarily on fishing. However, as the creatures of the sea are a limited population, endangered further by pollution and overfishing, fishing is becoming a more difficult means of earning a living. Tourism, in turn, offers South Caicos a new means of income. If more people come to enjoy the scenic beaches of the island, the demand for lodging, restaurants, and other amenities will increase, creating jobs and benefiting the local economy.

Unfortunately, if not properly managed, tourism has some potentially major downsides. For one, if South

Caicos becomes a popular tourist destination, it risks losing its quiet and peaceful way of life. Tourists would also create a strain on the island's natural resources. South Caicos has a severely limited water supply, primarily consisting of collected rainwater; more crowds means greater water consumption. An even greater problem is the increased production of wastes. Resort developments and other tourist attractions lead to greater runoff from sewage and pools. This runoff could pollute the very attractions that the tourists come to see—the island's near-pristine beaches and reefs.

In the end, the local government needs to strike a balance between improving their economy and protecting their natural resources for future generations. The students here at SFS are working with the government on research that will hopefully lead to the creation of a long-term business plan which is both economically viable and environmentally friendly.

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Dec. 2 We celebrated Mark Capone's birthday today.

Dec. 6 Students presented their Directed Research projects today for the Center's students and staff. Tonight, students will be going on another night dive!

EXTRA!
EXTRA!

Q. What has been your favorite part about being on South Caicos?

A. South Caicos is a really great place. It's beautiful. It's also really small, so you know all the locals. There's always fun things going on.

However, I've got to say that the ocean is the best part—it's gorgeous. After being so close to the ocean these past months, I'm really going to miss it when I go home. While here, I've dived almost every day and seen all kinds of turtles and sharks. A few days ago, I saw a spotted eagle ray—that was the most exciting animal that I've seen here. It swam up close to us and then circled around. It was really awesome. Last night, we went fishing, and although we didn't catch anything, even just sitting on the dock in the ocean breeze was a thrill.

*Answered by by Jennifer Bassett,
an SFS student from the
University of Southern California.*

Industrial Impacts

Look in the business section of today's paper. How are companies affecting the communities, cities and countries in which they are located? Make a list of these effects. Are these effects good or bad?

KIDS' NEWS EXPLORER