

OUR COAST

NCCOAST.ORG | 2016 EDITION



FULL MOON FEVER

TAKE A WALK ON
THE WILD SIDE
Must See Natural Inlets

WHAT'S GOING ON?
COASTAL EVENTS CALENDAR

+ Kid's Pages - Estuaries, a Happening Habitat



CELEBRATING THE COAST AND THE PEOPLE WHO DEPEND ON IT

The past couple of months have given us plenty to celebrate at the Coastal Federation. Two major issues we work hard to oppose were defeated. The Obama administration removed the Atlantic waters from the federal government's offshore oil and gas drilling plan and Titan America withdrew its plans to build a potentially environmentally-damaging cement plant in New Hanover County. Thanks to members, partners and supporters, we can all celebrate the positive decisions that will help to preserve and protect the N.C. coast.

While these issues have been resolved, there remains much work to be done to advocate, restore and protect our coastal resources. Threats remain that without action will compromise the quality of life and character of our coastal communities. From reviving our native oyster population to promoting environmentally compatible industry along the coast to preserving our few remaining natural inlets, the Coastal Federation meets the challenges facing

the coast and its people everyday.

In this edition of *Our Coast* we examine a few of these issues, as well as explore the unique culture, curious creatures and fascinating people that make up our coast. Discover why the N.C. coast is such an exciting place to observe and visit, and gain a better appreciation for the natural processes of the land and waters.

As we move toward our milestone 35th year of restoring and protecting the N.C. coast, we are grateful for the support of the people who live, work and visit here. We invite you to join us in our work by going to www.nccoast.org for volunteer and membership opportunities, or to learn more about the issues that are impacting the coast.

Together, we can continue to celebrate the N.C. coast remaining healthy, productive and accessible to all, now and in the future.

— Todd Miller, Executive Director



**North Carolina
Coastal Federation**
Working Together for a Healthy Coast

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COVER PHOTO
By Sam Bland | Summer Moon, Bogue Banks



© Kathleen Callahan

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We explore this issue and present ways that you can make a difference.

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While not the most cuddly or attractive animals you may stumble upon at the coast, the mysterious sea hare is one of the most fascinating animals swimming in our waters.

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North Carolina native and avid fisherman, Joey Hester answers our questions and tells us why he believes N.C. is a true gem!

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Summer Programs and Events

Check out our listing of Coastal Federation summer events and happenings!



FULL MOONS OF SUMMER

Full moon over Bogue Pier

Story and Photos by Sam Bland

An orange arc lit by the still setting sun slowly creeps above the ocean horizon, shimmering in the distance across the placid waters. Once above the horizon, the color of the full moon begins to fade to a lemon yellow and then, once well into the sky, becomes a brilliant silvery beacon. Evening beach strollers and fishermen pause under the spell of its light, gazing at the moon in reverence. The sight of the full moon can be intoxicating, provocative, overwhelming and spine-tingling. Comedian George Carlin once said: "There are nights when the wolves are silent and only the moon howls."

The full moon and the moon in general are rooted in legends, mythology, spirituality and literature. Werewolves, ghosts, insanity and biting dogs have long been associated with a full moon, but we know, this is not so. In the epic Henry Wadsworth Longfellow poem, *The Song of Hiawatha*, beautiful Nokomis, grandmother of Hiawatha, fell from the full moon to earth as a shooting star.

Each year, I eagerly anticipate the arrival of the summer full moons and the embrace of warm ocean breezes. I don't know what it is, but mysterious urgings cause me to wander outside and make my way to the beach to patiently wait for the radiant orb to silently glide into the night sky making its grand entrance. Viewing the full moon from the beach, as it casts a soft light reflected from the sun onto the spilling waves, has an effect on just about everybody. Just as a full moon pulls on the ocean waters it also influences humans and wildlife in unexplained ways.

Shorebirds, such as the red knot, synchronize their spring migration to coincide with the full and new moons during May and June. It is during this time that thousands of horseshoe crabs, ancient relic arthropods, crawl out of the coastal waters to spawn, laying millions of tiny plump energy packed green eggs. By fattening up on these eggs, the red knot can complete its migration to the Arctic nesting grounds strong and healthy enough to reproduce. Simply stated, without the horseshoe crab eggs, the red knot cannot survive. The full moon's reputation as a symbol of fertility is also demonstrated by some species of ocean corals that rely on the full moon to trigger their reproductive activities.

The full moon, as well as the entire lunar cycle, is essential for many animals, insects and plants that have biological functions and behaviors that are triggered by the full moon. Animals, including humans, are thought to instinctually respond to a circalunar clock based on the lunar cycle. Out in the ocean, the amount of moonlight that penetrates the water causes some marine



Bogue Sound Sunset, Salter Path, N.C.

© Jeanne M. Julian

species to move within the water column seeking consistent levels of light. In the estuaries, some fishermen look for the first blue crab peeler (soft shell) runs to occur during the spring full moons. Studies reveal that humans take longer to fall asleep, sleep lighter and don't sleep as long during the full moon. This ancient safety feature was passed on from our primal ancestors that were more likely to be preyed upon under the spot light of a full moon. Predator animals are more active on a bright night while prey animals prefer to hide and lay low. The full moon could just as easily be a spotlight alerting a great horned owl to the presence of a marsh rabbit. Some species of reef fish will stay out of sight

during the brightest period of the full moon to hide from predators. Out in the open dune valley, antlion sand traps are noticeably bigger than usual to snare insects that are more active during a full moon.

The moon and the sun are the main players that conspire to create the ocean tides through their gravitational attraction. These astronomical events affect the tides globally. Meteorological events such as the speed, duration and direction of the wind will, along with the earth's geographical features, add localized influences. As the moon orbits the earth, gravity pulls the ocean waters toward the moon creating the tides.



Horseshoe crab on Bear Island

and fall seasons. Like land animals, night feeding fish can see better and are thus, more active during a full moon. Stronger currents and larger tidal ranges also occur at a full moon allowing fish to move where they normally might not. As the powerful tide is ebbing or flowing through an inlet, the bottom is being agitated, kicking up small organisms that set off a food chain reaction to catch fish.

Each month when the earth, sun and moon are in alignment during the full or new moon, the gravitational pull is greater, resulting in tides higher and lower than usual. This is referred to as spring tides, not because of the season, but because the water seems to be springing out resulting in 20 percent higher tides. Then when you add in the times of the year when the moon is closest to the earth, called perigee, the tidal range is even more exaggerated. These events, also called King Tides, are fortunetellers foreshadowing tidal water levels that will be the norm in the future. Our largest King Tides occur twice a year when both the moon and the

Since it takes the moon 24 hours and 50 minutes to orbit the earth, each high tide is 12 hours and 25 minutes apart, thus from high to low tide is six hours and 12 minutes.

Fishermen have always had an opinion on the success of fishing in relation to the full moon.

During my fishing days, I remember following charts that predicted fishing success based on the lunar cycle. A number of fishermen agree that fishing activity increases during the full and new moon as well as the time of day when the moon rises and sets, especially during the spring



2016 FULL MOONS OF SPRING AND SUMMER

Along the East Coast, Algonquin Native American tribes referred to the monthly full moons with characteristic names that reflected nature.

Flower Moon - May 21

May brings forth an abundance of flowering plants.

Strawberry Moon - June 20

In recognition of the strawberry harvest season

Buck Moon or Thunder Moon- July 19

Male deer are starting to grow their velvety antlers. This moon is also known as the Thunder moon due to the frequency of intense summer thunderstorms.

Sturgeon Moon or Red Moon - August 18

The haze and humidity from the summer heat will tinge the rising moon a red color.

Harvest Moon - September 16

September is the time to harvest many crops. Harvest moon can be in either September or October whichever full moon is closest to the autumnal equinox.

sun are closest to the earth during a full or new moon. They are a wake-up call to the impacts of sea level rise in low lying coastal areas and the development and infrastructure that will be at risk to flooding on a regular basis. King tides are now flooding into yards, roads and forests that usually only occurs during serious weather events such as hurricanes and nor'easters. These super tides provide us a glimpse into the future and provide us the opportunity to now begin planning accordingly.

With the brilliant shine of a full moon glowing in the heavens, it seems possible that its gravitational pull is pulsing through our watery bodies. Research, however, shows that we are too small for the moon to affect our bodies. For me, it does, however, affect my emotions and spirit, bringing me delight, solace and wonder. Black Elk of the Oglala Sioux indigenous tribe stated: "The growing and dying of the moon reminds us of our ignorance which comes and goes- but when the moon is full, it is as if the Great Spirit were upon the whole world." □



SHOREBIRDS, SUCH AS THE **RED KNOT**, SYNCHRONIZE THEIR SPRING MIGRATION TO COINCIDE WITH THE FULL AND NEW MOONS DURING MAY AND JUNE.

ONCE IN A BLUE MOON

"Once in a Blue Moon" is an old saying that refers to something that doesn't happen very often. The original use of the phrase is based on the number of full moons that occurs during the astronomical seasons based on the equinox and solstice. Each season normally has three full moons, however about every two and a half to three years and extra full moon slips in, resulting in four full moons in a season. The extra moon is the result of the lunar year being eleven days shorter than the solar year. The third of the four full moons is called the Blue Moon.

Today, once in a blue moon is also widely accepted to refer to the second occurrence of a full moon in a calendar month.

The next astronomical blue moon is **May 21, 2016** and the next calendar blue moon is **January 31, 2019**.





EYES IN THE SKY

DRONES AID IN MONITORING COASTAL CONSERVATION LAND

By **BRAD RICH**

Back in the not-so-long-ago days of the early 21st century, it would have been easy to envision folks on horses riding across thousands of acres, inspecting crops at North River Farms in Down East Carteret County. Yeah, it was the 2000s, and it was trucks, not horses that ferried foremen around the croplands, but horses wouldn't have seemed out of place.

Fast forward a few years, though, and everything has changed. Instead of crops, wetland vegetation – marsh grass and trees that like their roots wet – is flourishing in the ground of the 6,000-acre former farm, and come this summer, fall at the latest, cameras and video equipment mounted on drones will be keeping tabs on the progress.

It's part of a rapidly growing marriage of conservation science and modern technology, brought to life by the nearby Duke University Marine Lab (DUML) in Beaufort and the North Carolina Coastal Federation. The Coastal Federation purchased the farm and is converting it to its original function as a natural sponge that soaks up stormwater and helps protect the water quality of the rivers, sounds and creeks of the watery wonderland that is Down East Carteret.

Dr. David Johnston, a Duke professor and marine researcher, might be called the commander of the nine- or 10-drone DUML "air force," and can't wait to get started this summer, in a program that will involve a number of his graduate students.

"It's exciting," he said of the collaboration. Drones (also known as unmanned aerial vehicles, or UAVs) are filling a gap between folks walking around on the ground, looking for, say, invasive species – an incredibly time-consuming process – and paying for manned aircraft to fly over and take photos from much higher altitudes.



The drones can give real-time data about tides, enabling Coastal Federation managers of North River Farms to see how low the tides go and how high they get, crucial factors in a wetlands ecosystem.

"Now, thanks to rapid increases in technology and declining costs, we're able, at to use these unmanned aircraft to get very high resolution photos and video from very close to the ground.

"We can go wherever we like and fly them almost whenever we like. They can operate safely in anything under about 25-knot winds, and in anything but really heavy rain, and still get very good data."

For example, Johnston said, the drones can give

real-time data about tides, enabling Coastal Federation managers of the former farm to see how low the tides go and how high they get, crucial factors in a wetlands ecosystem. They can monitor the health of the plants with thermal and near-infrared imagery, allowing the managers to react more quickly to problems.

"We'll also be able to monitor changes in the topography out there," Johnston said. "First we'll get baseline measurements, then, with subsequent images, we'll be able to see the changes."

Johnston, an assistant professor of marine conservation and ecology at the Duke lab, generally engages in research that focuses on the ecology and habitat needs of marine vertebrates in relation to pressing conservation issues such as climate change, habitat loss, ocean noise, incidental mortality and overharvests.

He and others at the lab got the drone ball rolling last year when they opened the Marine Conservation Ecology Unmanned Systems Facility after about a year of researching the possibilities.

After the U.S. Federal Aviation Administration late last year adopted rules for use of drones, Duke sought an FAA exemption and found that the process wasn't as difficult as some expected. Duke's now cleared for takeoff, and flights of up to 200 feet high. There have already been demonstrations at North River Farms, including one when a group of Russian conservationists visited the Coastal Federation and toured projects.

"There's a lot we can already do, but I'm sure there are many things we haven't even thought of yet," Johnston said. "It's going to be a very rapidly



Duke Marine Lab personnel monitor a drone flight at North River Farms

developing new field.”

Students, he said, will prepare a report for the Coastal Federation, and will even look at whether the organization might benefit by obtaining and operating its own drones.

Johnston can already see potential benefits.

“The Coastal Federation owns a lot of land and has a lot of conservation easements in the coastal region,” he said. “Some of them are pretty remote and the terrain in some cases is difficult. This would make it much easier to keep up with what’s happening in some of those areas: illegal dumping, for example.”

Dr. Lexia Weaver, a coastal scientist for the Federation, is the project manager at North River Farms, which is one of the largest wetlands restoration projects in the country. It began in 1999; farm drainage ditches, which once carried pesticides, fertilizers and other pollutants to the fragile shellfishing waters nearby, have been plugged.

Forests have been planted with thousands of trees, tidal marshes recreated, natural streams restored, all with the goal of mimicking the hydrology that existed before the land was converted to agricultural use. Funds for the multimillion-dollar effort have come from a variety of federal, state and private sources, and the long-term goal is to get at least some polluted shellfish waters reopened for harvest in streams like Ward Creek and North River.

Weaver, like Johnston, is excited about the North River drone project, and about the potential for the use of drones elsewhere.

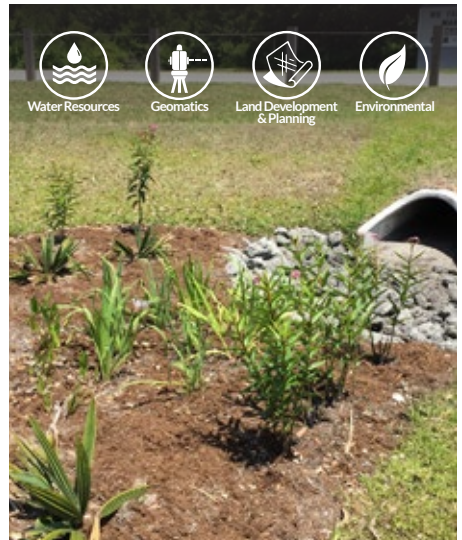
It’s a vast improvement over other methods of looking at property – such as use of Google Earth – she said, and is far more efficient than walking or driving and less costly than using manned flights.

“We think it has tremendous potential, especially for a piece of property this large,” she said. “The images are very good, and you’re able to see much more than you can with other methods. You can get a very good idea of how vegetation is growing and spreading.”

In addition to the advantages in monitoring plant growth and tidal flows, drones can also allow land managers to spot illegal hunting and other improper uses of land, a potential problem when conservation is the primary goal, Weaver said. Like Johnston, she noted that many pieces of property obtained to preserve and enhance water quality are in relatively remote areas and can be difficult to traverse, either on foot or in vehicles.

Others, she and Johnston noted, are already using drones to monitor and do population estimates on marine life, including sea turtles, and even to examine nesting sites for birds, without disrupting them. Seagrass beds can be monitored, and others, including some local governments, are eyeing the use of drones to monitor beach erosion.

In short, Johnston said, the use of UAVs is opening a new front for marine and conservation science. One might say that even the sky is no longer the limit. □



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WHAT'S IN A NAME?

There many noteworthy towns along with North Carolina coast, many with interesting stories behind their names. Some of these stories have a number of versions and it is often difficult to separate fact from fiction. Here are a few of our favorites, you be the judge as to whether the origin of the name is believable.

Southern Coast

Baldhead Island: Named after a tall sand dune barren of vegetation, a “baldhead” used by early sailors as a navigation landmark along the mouth of the Cape Fear River. The white sand of the dune stood out against the surrounding vegetation and guided ships entering the river.



Cape Fear: In 1585, sailing north to Roanoke Island, explorer Sir Richard Grenville and his crew sailed their ship behind a sandy spit of land at the mouth of a river. Fearful that they would wreck on this headland cape, they called this feature Cape Fear. The name eventually also referred to the river as well.



Frying Pan Shoals: This narrow, hazardous prolonged sand bar reaches almost 30 miles out to sea from Cape Fear, much like the long handle of a frying pan. Like a spider’s web, this sand bar has been snaring vessels since the early days of sailing.

Central Coast

Bear Island: Part of Hammocks Beach State Park, Bear Island is assumed to be named after the large furry mammal. Early maps, however, identify the island as Bare Banks due to the lack of vegetation on the island. It is theorized that a map maker made a spelling error and listed the island as Bear Island.

Pamlico Sound: This large lagoon was named by early explorers after the Pamouik, a Native American tribe that lived throughout the shores. The term “sound” refers to a saltwater lagoon.

Oriental: Originally known as Smith’s Creek, Oriental, was named after a Union steam ship that ran aground near Bodie Island in 1862 during the Civil War. When a post office was established in 1886, the postmaster’s wife felt that a new name was in order. Out beachcombing along the Outer Banks, she found the nameplate from the wrecked ship and thought it would make a great name for the town.



Northern Coast

Corolla: In 1889, when the U.S. Postal Service established a post office in the village of Jones’s Hill they solicited the help of the community to officially name the town. Jones Hill and Currituck Beach were submitted along with the name Corolla, a reference to the flower petals of the local wild violets. This unusual suggestion was selected as the new town name.

Kill Devil Hills: Rum plays a prominent roll into the theories of how Kill Devil Hills received its name. One story is that a band of pirates climbed to the top of a high dune and indulged in rum so powerful that it could kill the devil. Another is that bottles of the rum brand “Kill Devil” washed ashore after a shipwreck and littered the area beaches with an alcoholic windfall.

Ocracoke Island: One colorful story on how this isolated island earned its name involves Blackbeard the pirate. Blackbeard and his crew were anchored near the island and on the run from the British Navy. Resigned that a battle was imminent, Blackbeard called for the day to begin, pleading “O Crow Cock, O Crow Cock.”



ESTUARY ESCAPADES

What is an estuary?

An estuary is coastal habitat where fresh water meets the salty ocean water. It attracts many small and young aquatic animals, migrating birds and coastal shore animals because it provides food and shelter away from larger fish and predators.

Fish Friendly

The estuary is home to fish, shrimp, crabs, clams and oysters that are able to adapt to the mix of fresh and salt water, or brackish water.

Brackish water is water that is saltier than fresh water, but not as salty as ocean water.

Estuaries come in different shapes and sizes, and different types of estuaries are found all over the world. In North Carolina, there are 2.2 million acres of estuarine habitat.

Why estuaries are important.

Estuaries not only provide habitat for animals, but also contain a variety of plants that help keep our planet healthy. The plants in the estuary can trap and filter pollutants from rainwater runoff. This helps keep the water clean for you and the animals to swim in!

PLUS, plants help the estuaries act like huge sponges and soak up extra water from boat waves, wind and storms. They also protect the shore from wearing away or eroding due to these activities.

Estuaries are always changing due to the seasons, winds, tides, inlets, currents and more. Go explore one today, you might discover something new!



DO THIS!

Take a look at a map, and find a river or stream that is closest to where you live. Trace it with your finger and find where it goes! Does it connect with any areas you'll be visiting or live near on the North Carolina coast?

FUN FACT

12 North Carolina Rivers flow into the Atlantic Ocean, **7** of these empty into estuaries along the coast.

Did you know?

Along the coast of North Carolina is the Pamlico Sound that is the second largest system of estuaries in the United States, with a surface water area of about 3,000 square miles.

Who Lives in the Estuary?

Meet the Team! Here are few animals that call the estuary home.

Eastern Oyster

Can you do two things at once? Oysters can! They are filter feeders and can clean the water while eating their lunch! Oysters also provide food and habitat for other animals.



Great Egret

These graceful birds have long legs and large feet they use to walk around the estuary. They can often be seen in shallow water searching for fish, crabs or shrimp to eat.



Blue Crab

Can you walk sideways like a crab? Try it! Blue crabs have 10 legs. 2 of their back legs are similar to paddles and allow them to be great swimmers. These crabs will eat fish, shrimp, snails, and even other crabs.



FUN FACT

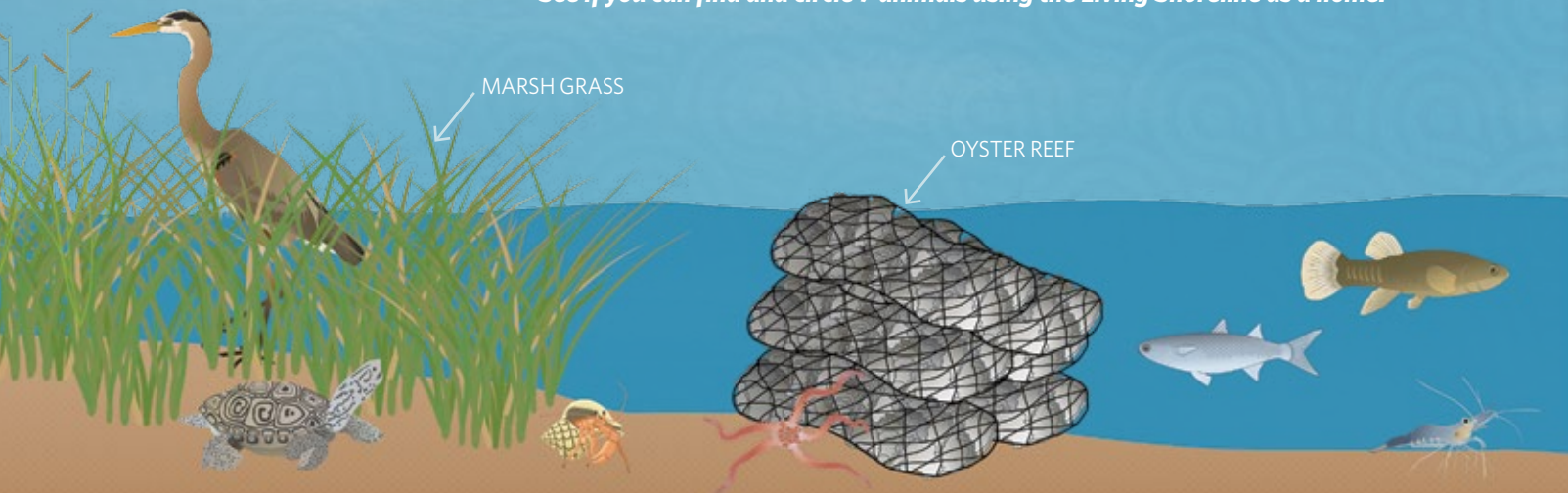
An adult oyster can filter up to **50 gallons** of water a day!

MARSH MADNESS

One habitat on the edge of the estuary is a salt marsh. Plants in the marsh provide food for many animals. Smaller creatures also hide in their leaves to escape from larger predators. One neat thing these plants do is hold sand and mud in place so that less erosion happens.

A Living Shoreline is one way people can protect estuarine beaches from erosion. Living shorelines use things from nature to keep soil in place when waves come. Planting marsh grasses or building oyster reefs with recycled oyster shells are some examples of Living Shorelines. We call them "living" shorelines since they also create habitat for other plants and animals!

See if you can find and circle 7 animals using the Living Shoreline as a home.





NATURE'S NURSERY

Many baby sea animals grow up in the estuary. They provide a safe place for these species to hatch and grow. See if you can match these baby animals with their adult parents.

Draw a line to connect the baby with its parent below.



Baby oysters, called **spat**, like to grow on top of hard surfaces. Their favorite place to grow is on the back of their family members—other oyster shells! Placing recycled oyster shells back in the estuary gives the spat more places to call home.

In the U.S., estuaries are nurseries to over **75% of all fish and shellfish** harvested. Much of the seafood we eat relies on having clean and healthy estuaries. **What's your favorite kind of seafood?**



Diamondback Terrapins are the only turtles that live their whole lives in the estuary!

Be a friend to the estuary

When you visit the beach, would you rather find seashells—or trash?

Litter can be tossed along the road, blown out of a truck, discarded at the beach, or lost from a boat. Although litter initially may be released far from the coast, it can travel downstream and enter the estuary or ocean, where it becomes marine debris.

Human activities can be harmful to animals and their habitats by damaging water quality, polluting the land and animals may mistake trash for food.

We are all responsible for protecting and maintaining the health of these special places. No matter where you live, you can do your part to keep waterways free of debris.



LEND A HELPING HAND.

Everyone can contribute to the solution of a healthy planet. Give it a try!

Drink from a reusable water bottle.

Always recycle the aluminum cans and plastic bottles and containers you pack in your cooler for the beach.

Reduce your trash by using reusable containers to store the things you pack for your lunch.

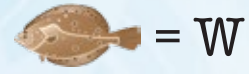
Litter cleanups can be found in many communities, and make the environment a cleaner, safer place for people and animals. Look for a cleanup in your area!

And remember it's windy at the beach, so don't let your picnic blow away and become trash!

SOLVE THIS!

Most of the seafood we eat spends some part of its life in an estuary. We want to protect our wetlands by keeping them clean and safe for the animals that live there and for the people for visit.

Use the pictures to unlock the code and reveal the message below!



Answer key: Nature's Nursery: 1C; 2D; 3B; 4A
Seafood code: No Wetlands, No Seafood



North Carolina Coastal Federation
Working Together for a Healthy Coast

Locations in Ocean, Wrightsville Beach and Wanchese, North Carolina.
For more information call: 252.393.8185 or visit: www.nccoast.org.



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Complete the short survey online at: nccoast.org/survey

We'd love to hear what you think of *Our Coast* magazine. Please take a moment to share your thoughts and be entered to win!

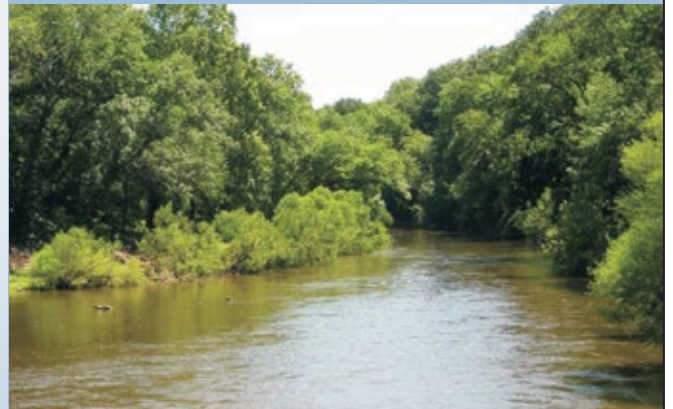


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Before Dam Removal



After Dam Removal and River Restoration



OUR INLETS

A UNIQUE NATURAL RESOURCE

By Mike Giles

Twenty inlets bisect our coastline in North Carolina. The majority of these inlets are shallow narrow ribbons of water. For centuries these inlets have been used as a way to navigate between the ocean and the coastal sounds, rivers and marshes behind our barrier islands. Inlets are the most interesting and wild places along our coast, and each are woven into the fabric of North Carolina's history. The intersection with the sea, wind, waves and tides offer a spectacular chance to view the power and fury of nature. Many thousands of residents and visitors repeatedly come to see how these special places that are ever changing throughout the seasons.

Rich Inlet © Kathleen Callahan

What is most apparent when you walk along the shores of one of our inlets is that change is constant. Inlets are always in motion. Every time you visit an inlet brings a new experience as the tides change and shoals and channel shift around. As you walk along an inlet shore you may find treasured shells and other artifacts from the sea. In the fall, you'll hear the "thunder clap" made when millions of schooling jumping mullets hit the water in harmony. For those with keen eyes, you'll see baby birds that blend into the bare, unvegetated sand where they nest.

Due to the dynamic nature of our coast and its many inlets navigation can be treacherous. History has shown these narrow and shallow passages to sheltered waters proved dangerous which contributed to the many wrecks, some of which are yet to be discovered. In the middle of Rich Inlet that separates Figure Eight and Lea Hutaff Islands remains of the Civil War blockade-runner Wild Dayrell. It is still visible and designated as a state historic site. Many wrecks lie covered in the sands beneath our inlets and with the right storm and tides, these relics of our past are uncovered.

The sand flats, shoals and myriad small islands in our inlet systems provide an abundance of marine organisms and small worms - irresistible tasty morsels for the thousands of birds that stop over at our inlets each year. Endangered and threatened species like the piping plover, black skimmer, American oystercatcher, least tern and the Wilson's plover nest and raise their young on the sand flats and beaches of our inlets and need protection from human interference. Walker Golder, deputy director and director of coasts and marshes for Audubon N.C. put it this way: "Our inlets provide the only place some of these birds have left to rest on long migrations, breed and raise their young on what is left of our natural coastline. Some of these fragile creatures travel from pole to pole and our inlets are critical for their very survival."

Visit an inlet between April and November to really appreciate how important these inlets are to our coastal tourism. Witness the transformation of these quiet and deserted areas to favorite social gatherings, fishing hotspots, family outings and just a plain get-away-from-it-



Oystercatcher on Rich Inlet



Scotch bonnet, state shell

all experience. Inlets are havens for vacationers and coastal residents alike, and in the offseason haunts of fisherman and those folks who just want to get away from it all during the cool and spectacular fall and winter months.

So if you are looking for that special place go to an inlet on a full moon in October. You'll see a "mullet blow" as massive schools of mullet migrate through inlets. Inlets welcome new friends and memories. So grab your beach chair, a good book or favorite fishing pole and a camera; the bounty of our coast awaits you. We'll see you there. ☐

Join the Coastal Federation guided boat trip to Rich Inlet and Bogue Inlets. Check our calendar of events at nccoast.org/events

IN 2011 THE STATE LIFTED ITS 20-YEAR-OLD BAN ON HARDENED STRUCTURES ALONG THE N.C. COAST.

It now allows for permits to be sought for terminal groins made of rock and metal that would wall off six inlets and destroy their natural productivity and beauty at six inlets.

Learn more about what the Coastal Federation is doing to prevent these hardened structures and the adverse effects they will have on wildlife, public boater access and public use of our recreational beaches at:

nccoast.org/inlets-beaches

BEACH BUMMER

STORMWATER'S EFFECT ON COASTAL WATER QUALITY



© Sam Bland

by *Kristen Daly*

Your favorite coastal vacation destination awaits — you pack up the car and answer the call of the coast. Let the good times roll, right? Well, not if you come face to face with a sign informing you that swimming at your favorite beach may be hazardous to your health.

Or you head out to dinner craving fresh local seafood just to find out that your favorite go-to eatery only has imported shellfish due to polluted water closing local harvest areas.

Restricted swimming or limited access to local shellfish can put a damper on anyone's coastal fun, so what causes these situations and what can we do to reduce them? We have the answers and some ways you can be part of the solution.

What's in the Water?

The primary source of pollution in N.C. coastal



waters is stormwater runoff. It is carried into waterways by rainfall and accounts for the majority of swimming advisories and shellfish bed closures each year. If as nature intended, the rainwater was able to soak into the ground, most of these pollutants would simply stay on the landscape. Stormwater runoff is rainwater that has been cut off from these natural pathways. In many areas rainwater now flows over buildings, asphalt and well-maintained yards picking up bacteria, viruses, pesticides, fertilizers, oil and grease to be deposited directly into coastal waters.

Kids, elderly and those with weakened immune systems are most likely to be affected by exposure to polluted coastal water resulting in symptoms ranging from ear and eye infections to skin rashes and even respiratory diseases.

So, what's being done about it?

Protecting the water-loving population from bacteria and other pollutants found in coastal waters is part of the Coastal Federation's major initiative to protect and restore water quality along with N.C. coast. Working with individuals and communities to advocate for better stormwater policies, install low impact development techniques and restore wetland habitat are just some of the ways we work to

reduce and naturally treat stormwater runoff to improve the quality of our coastal water.

What you can do.

Small changes and individual actions can go a long way in reducing runoff.

Increase in the use of native vegetation in your yard can help slow and absorb stormwater. Directing stormwater to an area planted with native trees and plants, such as a rain garden or backyard wetland greatly reduces the amount of runoff generated by your land.

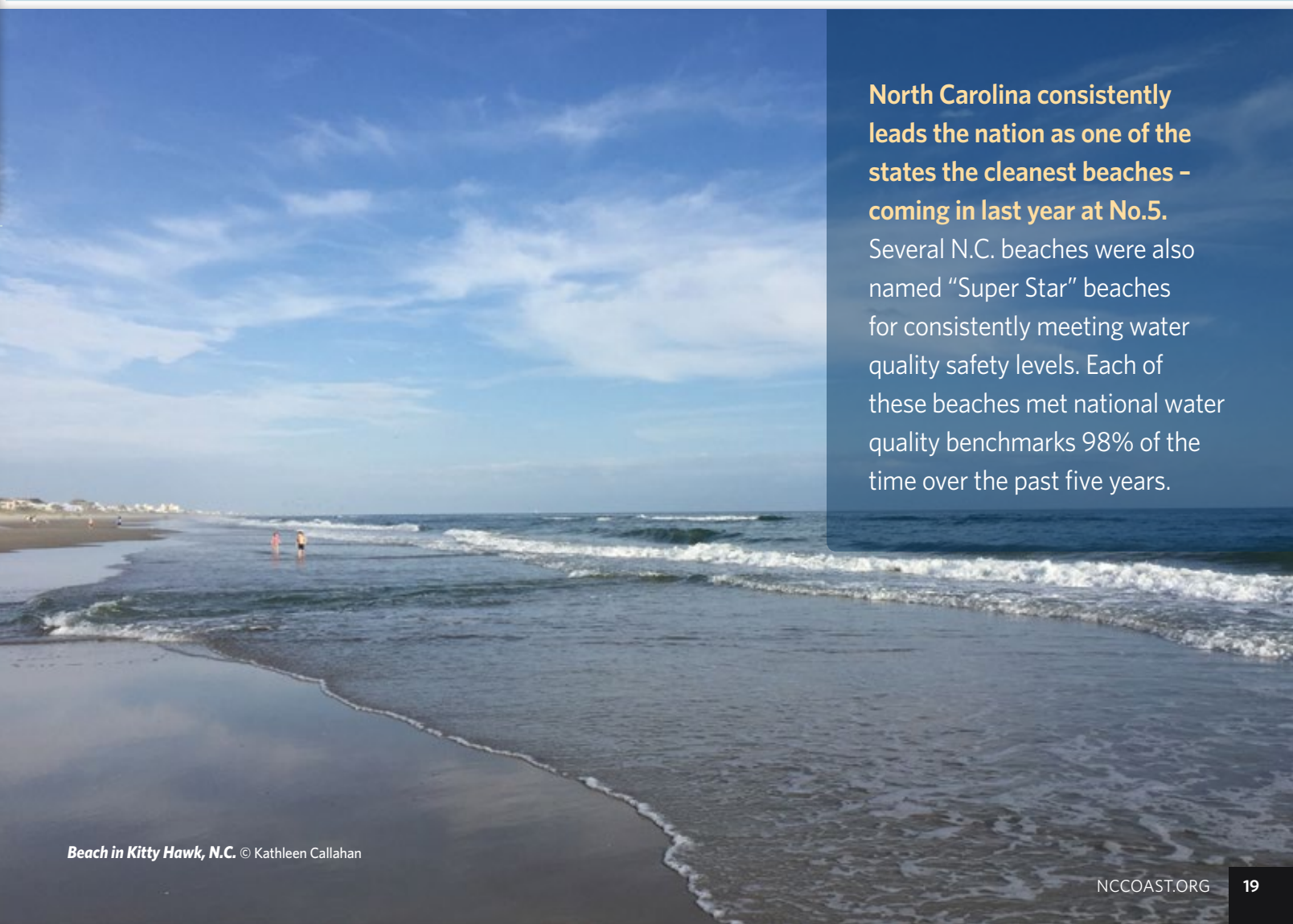
Use alternatives to traditional paving. Permeable pavers or porous concrete allow water to soak into the ground. Use of these alternative pavement techniques provide the look and convenience of paved walkways, driveways and parking lots without placing undue stress on the surrounding environment.

The Coastal Federation offers a variety of



volunteer opportunities for residents and visitors to take an active role in protecting and enhancing the health of our coastal waters. You can help build an oyster reef or plant marsh grasses to restore valuable wetland areas. □

Find volunteer opportunities or become a member at nccoast.org



North Carolina consistently leads the nation as one of the states the cleanest beaches - coming in last year at No.5.

Several N.C. beaches were also named "Super Star" beaches for consistently meeting water quality safety levels. Each of these beaches met national water quality benchmarks 98% of the time over the past five years.



A HARE RAISING CREATURE

Sea Hare in the surf on Bear Island

Story and photos by Sam Bland

Sea hares are without a doubt one of the most intriguing animals you will ever encounter. Anyone that has spent time wading the shallow inlet waters has most likely come across what appears to be a lively blob of spotted brown flesh slowly and steadily swimming by. Most people view sea hares with caution, concern and sometimes disgust and give them a wide berth. This could be from the misconception that has its roots in ancient Greece that a person would die if they touched a sea hare. When in fact, they are harmless.

Young kids however, are fascinated and drawn to the sea hare like a magnet. I once observed a young boy in the marsh waters behind Bear Island meandering along staring intently into the water. To no one in particular he loudly exclaimed, "I love these things." I instinctively knew what produced this proclamation of joy. The boy then reached down and gently stroked the sea hare as it moved along.

Sea hares are marine gastropod mollusks that do not have an external shell and resemble a big 8- to 10-inch garden slug. They do have a soft thin calcified shell that protects their heart and gill. It is embedded into the mantle and can partially be seen on their dorsal side.

The philosopher Aristotle has been credited with naming the sea hare due to a pair of body parts that, with an active imagination, resembles the

long ears of a hare. These are actually head tentacles called rhinophores, which are sensory organs that can detect dissolved chemicals in the water. This gives the sea hare an excellent

sense of smell that is essential in locating algae and eel grass. Due to their diet, these herbivore grazers have been referred to as "rabbits of the sea." The flesh color of the sea hare is the same color of the food that it eats. This provides great camouflage to avoid detection from predators and could easily be mistaken as a dirty sponge by humans. However, any predators brave enough to nibble on a sea hare will soon regret that decision as their tissue contains a toxin that makes them unpalatable.

Since the sea hare cannot retreat into a shell for protection like other gastropods, it does possess another form of defense. When disturbed, the sea hare will eject a cloud of ink similar to an octopus or squid. One would assume that this is a smoke screen to provide cover for a quick escape. Yet remember, this animal is like a slug and not adapted for a fast get away. The ink is thought to contain chemicals that confuses and interferes with the senses of a potential predator. As a chemical engineer, the sea hare is able to convert harmless algae pigment into this potent ink concoction. The sea hare can then move away from the disoriented predator using one of two methods. It can use the large foot at the base of its soft body to crawl away or it can undulate wing-like flaps of flesh called parapoda and swim away.

Native Americans would actually use the ink as dye for clothing. Today, some species of sea hares are used in neurobiology research due to a bundle of nerves that makes up their brain. They have the largest neurons of all animals, allowing particular actions to be traced to a single cell. But the most enjoyable use of this creature is to ponder its mystery as it cruises about in our diverse estuaries. □

Dr. Eric Kandel's use of sea hares in understanding how neurons develop memories won him the Noble Prize in physiology in 2000.



One-on-One with Member **JOEY HESTER**

In this issue, we chat with Coastal Federation member, Joey Hester, a former intern in our central office and current non-point source planning coordinator for the N.C. Division of Soil and Water Conservation.

Tell us a bit about yourself.

I'm from Rocky Mount and spent most of my childhood hunting and fishing, so the North Carolina countryside is like my giant back yard. I studied environmental science at the University of North Carolina at Chapel Hill, as well as ecologically sustainable development at Murdoch University in Australia. I currently live in Raleigh with my wife Kennan.

What is your favorite memory of the coast?

I remember climbing the Hatteras lighthouse with my sister when we were little (back before they moved it), annual family trips to Nags Head, and fishing in Masonboro Inlet with a childhood friend. I've had so many great experiences at the coast, it's hard to pick just one.

Do you have a favorite place to visit at the coast?

Portsmouth Island is a clear favorite- there's nothing there, it's absolutely undeveloped, so it's a good place to see what the coast looked like 200 years ago. I've been surf fishing there with my dad since I was little and we'll be back out there again in October. It's a good way to get away from the rest of the world. We mainly stay in the cabins at the south end. Even with the horse-sized mosquitos, I prefer that spot

over pretty much anywhere I've ever been. I tell people all the time that you don't find places like coastal North Carolina anywhere in the world.

When did you first become aware of the Coastal Federation?

I first learned about the Coastal Federation when I was looking for an internship for the summer of 2006, before my senior year at UNC. I worked with the habitat restoration team in the main office in Newport and learned everything I ever needed to know about oysters. It was an amazing summer, and I ended up staying on through the fall semester,

What coastal concern matters most to you & what would you like to see done about it?

Climate change and rising sea level. Now that we've armored our coast all the way to the

shoreline there's nowhere for the wetlands to go to migrate inland. I work with farmers who they say that they don't know about what's being said on the news, but they see water levels in their canals that weren't there 20 years ago and won't drop. These farmers have to deal with the salt water encroachment today, not in 20 years.

Any final thoughts.

North Carolina truly is a gem. There are few places like our coast in the whole country, and there are zero places like the Hatteras National Seashore in the whole world. This place is our home, it is special, and it deserves our utmost respect and adoration. There aren't many people left who dedicate their entire lives to protecting this priceless coastline, and so we need to make sure those rare few are supported every step of the way. □

We agree with Joey Hester- our North Carolina coast is truly a gem. Join the Coastal Federation, and become part of the effort to keep the coast a special place to live, work, and play.

YOUR SUPPORT HELPS TO:

Ensure clean, safe, accessible coastal waters for boating, swimming and fishing

Revitalize the native oyster population along with N.C. coast

Protect and restore coastal water quality for future generations

Reduce coastal marine debris that harms wildlife, human health and the economy

Join at nccoast.org/give

Remember, your membership is active for 12 months.

Questions?

Call or email us:
252.393.8185 or kellyb@nccoast.org

OUR COAST

Calendar of Events

For more information or to register for any of these programs or events, visit nccoast.org or call **252-393-8185**



Northeast

Service in Science Camp

June 20-24 | Nags Head

We're teaming up with Jennette's Pier to take campers out into a variety of habitats and restoration projects in the Outer Banks for a few days of hands on adventure.

Day at the Docks

Sept. 17 | Hatteras

This fun-filled community celebration the "Spirit of Hatteras" is packed with recreational and education events for the whole family.

5th Annual Fish Fry, Shrimp Boil

Sept. 30 | Wanchese

This annual event celebrates local catch and the people that love it. Fresh-cooked seafood, family-friendly activities and fishing stories are all included in our community celebration of water quality and coastal stewardship.



All Regions

Volunteer Opportunities

Oyster bagging, oyster reef construction, shoreline and marine debris cleanups occur at all of our offices along the coast.

Learn more at: nccoast.org/volunteer



Central

Birding Cruise

**May 22, June 5
Hammocks Beach State Park**

Go in search of resident and migratory birds on a slow cruise on a covered ferryboat through the estuaries in and around the White Oak River and Bogue Sound.

Coastal Cruise

June 22; July 6, 27; Aug. 10
Hammocks Beach State Park

The coastal waters and marshes of central North Carolina are magical places. Come get a closer look and learn about these magnificent places and why they are so special.

Coastal Discovery Summer Camp

July 11 - 13 | Hammocks Beach State Park

Children entering 3rd, 4th, or 5th grade will unlock their imaginations and explore the habitats and wildlife of the N.C. coast. Day-campers will participate in hands-on activities and interact with local professionals while building both social and academic skills.

Pelican Awards & Low Country Boil

Aug. 6 | Boathouse at Front Street Village in Beaufort

Annual awards celebrating those who make extraordinary contributions to the coast. This year's evening event will feature a low country boil along the scenic Beaufort waterfront.

Cycling for the Coast

Sept. 24 | Atlantic Beach

The 6th annual Cycling for the Coast scenic bike ride along beautiful Bogue Banks has distance options of 20k, 40k, and 80k, to accommodate all biking levels. Novices to biking enthusiasts can enjoy this fun ride - with a great after-party.



Southeast

Southeast events take place at: Fred and Alice Stanback Coastal Education Center, 309 W. Salisbury Street, Wrightsville Beach, NC 28480
Call for more information: 910-509-2838

Touch Tank Tuesday

June 7, 14, 21, 28; July 5, 12, 19, 26
Aug. 2, 9, 16, 23, 30

From slimy kelps to cute, shy hermit crabs to friendly whelks our weekly touch tanks will introduce you to some of the most interesting creatures that roam the N.C. coast.

Coastal Adventures

June 2, 8; July 7

Join us in the field as we explore our coastal treasures: Walk the Loop for Clean Water, boat to Rich Inlet, or tour a salt marsh and learn about living shorelines.

Coastal Speaker Series

June 8; July 14

Lectures, films and issues affecting the coast are presented and discussed with experts from around the state. Every third Wednesday from January - November



Surf to Sound Oyster Roast/ Shrimp Boil

Oct. 5

This new event centered around the popular Surf to Sound stand-up paddle board race at the Blockade Runner invites visitors and locals to join us for an evening of seafood and celebration.

A large advertisement for Emerald Isle Realty. The background is a scenic view of a beach and ocean from a balcony with white Adirondack chairs. The text "Emerald Isle Realty" is written in a large, elegant, teal script font. To the right of the text is a stylized yellow graphic of a fern frond. At the bottom, a dark green banner contains the text: "A Tradition on the North Carolina Coast Since 1962! • 855.609.8069 • www.EmeraldIsleRealty.com".

Emerald Isle Realty

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North Carolina
Coastal Federation

Working Together for a Healthy Coast

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