



# Turtle Talk

Sea Turtle Preservation Society

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Mission: Helping Sea Turtles Survive



## Education- Barbara Stewart

by Jill A. Lankford

A key component of STPS's mission is to educate on the importance of our local sea turtles. While all of our volunteers are responsible for this guidance, only a handful actually perform the education portion. Barbara Stewart is one of STPS's finest educators and skilled child whisperers. She was a teacher for over 20 years before retiring and then did substitute teaching for several more years after that. Barbara, or Barb as she calls herself, moved from Massachusetts to Brevard County in 2012. She was involved in girl scouting, volunteering at the senior center, and was on her towns Conservation Committee. Barb says she has "always been interested in conservation and animal welfare." She

heard about the Sea Turtle Preservation Society from her sister. Since she "loves sea turtles and wanted to help" she volunteered to do



educational presentations, library displays, working at booths, and helping out with the Turtle Krawl events. Barb was doing a presentation to a group of young children at the Melbourne Westside Library

this July when the STPS newsletter staff popped in on one of her demonstrations. Her ability to relate to young children and develop future advocates was an enlightening experience to witness. While every educator has their own methodology or technique, hers is uniquely entertaining. We all had our favorite teacher when we were growing up. That one educator that we talk about for the rest of our lives. This is her. The one person who is making that lasting

impression. She is able to put her students in their own imaginary world of being a turtle. She had her students questioning whether they were a land turtle or a sea turtle. The real kicker of this observation is that the children were inadvertently creating the ability to place themselves in something or someone else's shoes. They were unwittingly learning how to be empathetic.

With a room full of children, the atmosphere is full of energy. However, it did not take long for Barb to get everyone interested. She knows exactly what to do and holds their attention skillfully. Before we get into that, let us first thank The Melbourne Westside Library for allowing us to host these vital awareness programs.



The theme was to discuss the difference between a land turtle and a sea turtle. There was a line drawn on the floor with tape. "Keep behind the line as this separates the land from the sea," says Barb. Genius idea on her part, may we add. We can now begin learning the difference between a land turtle, or tortoise and a marine turtle or sea turtle. "If you were a land turtle, what would make you different from a sea turtle?" "That is correct...your shell or carapace." "What makes your shells different?" "One of us can go into our shell and the other cannot. One of us has legs to walk and the other has flippers. One of us eats different foods than the other." "Now everyone stand." "If I am a sea turtle, I swim like this...If I am a new hatchling coming out of my shell, so I squish down into your eggs...hatch, climb, climb, climb...quickly, quickly, to the ocean... Oh no, an obstacle. run, run, run...watch out for the crabs and seagulls... follow the moon; shoot for the stars...swim, swim, swim. Deep breathe...we need air to go under...quickly, a bird, dive back down...swim, swim, swim...so tired and hungry...get to the seaweed....We made it...finally, we can eat and rest...HOORAY!! The

room filled with excitement when we discovered that most of us made it.

“Okay, everyone...when you get home tonight, be a land and sea turtle, so you can tell the difference. Barb skillfully referenced the movie, “Finding Nemo”. Does anyone remember the name of the two sea turtles that were in the movie? There were two. One is named Crush...can anyone guess why he is named Crush? Remember what the sea turtle ate?” “He was LOGGERBACK!” one child responded with laughter. His attempt to crossbreed turtles was genius. A loggerhead and a leatherback. So very close. This kid is onto something here and may be a little ahead of his time, but not out of the realm of possibility. These rare hybrid sea turtles are actually turning up on Florida’s coastline now.

Barb goes on to explain how sea turtle and land turtles mouths and skulls are different and has the real turtle skulls to prove it. She points out that greens have serrated edges on their jaws and therefore eat seaweed and plants. Loggerheads have a strong jaw and eat clams. A leatherback can get up to six feet tall and dive way deep down to eat giant jellyfish. During the presentation, the library skillfully presented books about sea turtles and land turtles, so that each one of Barb’s little turtles could check one out. Additionally, Barb brought a bag of

goodies and games for everyone to enjoy and continue referring and learning when they get home.

The presentation was a huge success on so many levels. Barb did not forget the truly important messages for our local beach dwellers, which was that when they are playing on the beach, they fill in any holes; flatten those sand castles; look back for anything left, and pick up any trash discarded after their fun and exciting day at the ocean. You may see one of these human sea turtles practicing their hatch and dash, so do not get in their way.

If you had not noticed yet, what Barb does is a priceless eco-tool for our planet. The ripple effect of her efforts are invaluable. So, thank you Barb for everything that you do for STPS and the sea turtles and land turtles. If anyone else wants to step into a role of this nature, be sure to go to our website at <http://www.seaturtlespacecoast.org/>

Sea Turtle Preservation Society is a nonprofit and run by volunteers. Your donations fund our conservation and education efforts.

[If you'd like to donate or adopt a sea turtle, click here.](#)

Recurring events:

**Monthly Membership**- 1<sup>st</sup> Thursday of every month

Guest Speakers:

Feb - Lisa Good from Blue Life (Brevard Zoo)

Mar - Wanda Scanes, Recycling Coordinator from Waste Management

**Beach Cleanup**- The 1<sup>st</sup> Saturday following the monthly meeting

## Where are we?

You're always welcome to drop into our store and education center, but we also visit lots of events, organizations and schools to share information. We'd love to 'talk turtle' with you at our booth during the following events:

**Pelican Island Wildlife Festival**  
**March 3, 2018**  
**10:00 AM - 4:00 PM**

Please also check for updates on our online calendar:  
<http://www.seaturtlespacecoast.org/calendar.html>

# Hot Chicks, Cool Dudes and a Rising Sea: How Climate Change Impacts Sea Turtles

by Kimberly White

Climate change- we hear about, read about, but what does it have to do with sea turtles? Often when we think about the environmental impacts of climate change, the image that pops into our minds is that of the polar bear or melting glaciers. However, it isn't just our arctic friends who face the affects of climate change. All species of sea turtles are facing the current and potential impacts climate change can have. In fact, according to See Turtles, climate change is predicted to cause



the extinction of many species in the years to come.

At the current rate the

temperature is warming, it exceeds wildlife's natural abilities to adapt to dramatic environmental changes. This poses a larger threat to animals with a longer life span. Michael Jensen, marine biologist and research fellow with NOAA, states "...temperatures are changing incredibly fast. Evolution requires many generations for animals to adapt...these are animals that live for 50 years or more, and things are changing dramatically just in their lifetimes." [1].

## Hot Chicks and Cool Dudes

Like many reptiles, a sea turtle's sex is dependent on the environmental temperature during embryonic development. Dr. Jeanette Wyneken, a professor at Florida Atlantic University, says her class uses a simple guideline: hot chicks and cool dudes. Cooler nests will produce more males whereas warmer nests will produce more females.

As temperatures rise, scientists are seeing drastic changes in sea turtle sex ratios. A new study looking at Pacific green sea turtles along the coast of northern Australia, one of the largest and most important green sea turtle nesting grounds, concluded with shocking results. Females outnumbered males 116 to 1.

The ratios will become more imbalanced if temperatures continue to rise. More nesting grounds will be producing primarily females, possibly all females. That's only if the eggs hatch. If the nests get too hot, the eggs will begin to cook.

Jeanette Wyneken states, "We're seeing more dead eggs. And when we go get turtles hatching, they're often heat-stressed: They may hatch and crawl to the water, but then die." [2].

A 2012 study in Nature Climate Change predicts that leatherback populations will see a 7% decline each decade and 75% of the nesting population will be gone by 2100.

## Sea level rise

Nesting temperatures aren't the only impact of climate change that sea turtles are facing. Another major issue is the rising sea level.

Over the next 80 years, seas are expected to rise by 3ft worldwide with an extra 15 inches for the U.S. east coast. This means that beach habitats will be the first to take the hit. Nesting sites will be inundated, causing the eggs to drown. Beach erosion is causing cliffs that sea turtles can fall from or not maneuver around, leading to death. According to PBS NewsHour, Archie Carr National Wildlife Refuge and other vital nesting sites are in

peril, "Rising sea levels, which lead to bigger tides and storm surges, are eroding

beaches and washing out more and more sea turtle nests before eggs hatch." [3]. PBS NewsHour reported that 45% of nests were lost in 2011 due to storm surges.



While these potential impacts may be devastating, this does not mean we should lose hope. It just means that we need to work towards climate change solutions together, for people and sea turtles alike.

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# Volunteer Spotlight: Roger Pszonowsky

by Lisa Haynes-Henry

"I guess I should write a book."

When an interview begins like that you know that you're in for a good time.

Roger Pszonowsky remembers when he fell hard for marine turtles. "I think it was the summer of 2002, when a family vacation at Oak Island, NC exposed me to sea turtles. I had learned the year before that turtles nested on the beach, but that year I met two volunteers on the beach that were 'nest parents' because of the light problems on the beachfront. They told me how the hatchlings went to the brightest lights, and then my family and I experienced hatchlings rushing to the ocean, fantastic." Oak Island, which includes Caswell and Yaupon Beaches, and the state of North Carolina, are involved with their nesting sites in different ways than Sea Turtle Preservation Society is able to be. The [Caswell Beach Turtle Watch](#) volunteers developed a way to put a cage-like structure over each nest when it's laid. As the nest nears the end of its incubation period teams of volunteers sit at the nest awaiting the moment when the hatchlings 'boil' or exit the nest. The volunteers welcome vacationers to sit next to a 'turtle track' created by garden edging that helps to guide the turtles to the ocean. While waiting for the boil, volunteers spend the evening educating vacationers on marine turtles and threats to their survival. The reason they can do this is that they only have 58 nests this year and North Carolina laws are different. Pszonowsky acknowledges that STPS isn't able to sit at each nest waiting as many as five nights for a boil because we have as many as 25,000 nests in our region.

Pszonowsky and his wife Rhonda moved from Ohio to the Space Coast in 2004. Sounding like a man on a mission, they attended a meeting and asked, or in his words pestered members, "When do we get started, what's next, what do I need to know, when are you going to call me." He took his introduction class with Dave Hochberg and continued to push to become more involved. Hochberg eventually told him if he wanted to learn more to, "get some books," which became the basis for his personal sea turtle library.

As Pszonowsky spent more time at STPS, Hochberg asked him to assist with hatchlings, post-hatchlings, and strandings, turtles who have ended up on shore or in the Indian River Lagoon injured, sick, or affected by a cold stun. As he became more involved, the permit holder at the time decided it was time to include Pszonowsky on the permit. He eventually took over the Marine Turtle Permit #169, which he holds today. By holding the permit, Pszonowsky is the contact person for the Florida Fish and Wildlife Conservation Commission.

After gaining more experience with assisting the sick, injured or hatchling/post-hatchling turtles, Pszonowsky decided to expand the stranding team program. With the help of STPS member and friend Ann Zscheile, who researched other programs, the Sea Turtle Emergency Rescue Program (STERP) was born. With being the primary permit holder within STPS, Pszonowsky and coordinator Dave Cheney are the people in charge of the education and oversight of the volunteers who transport turtles to our partner rehabilitation facilities, as well as those who walk the beach after natural disasters to locate

turtles on the beaches. See the call out box for more information on becoming a STERP member.

Since 2004, Pszonowsky has served in many other roles in STPS. While he admits he's helped with most of the programs that keep the organization running, he does have a few that are most memorable.

He is a proponent of education. STPS was started to change the lighting problems on the beach and take the scientific message to the community by educating both local residents and vacationers about turtles. And sharing his knowledge with anyone interested is still a priority of his. He recalled that his very first education class was at a truant student class in Cocoa. "I did not know it until I arrived," he said. It went well and after that, he started educating people of all ages on marine turtles and how we can affect their survival. He enjoys attending the night walks and meeting people from all over the world and seeing the excitement through their eyes.

Self admittedly, when he came to STPS he didn't know much about turtles. As part of his role in STPS Pszonowsky spends time educating himself as well. There are Marine Turtle Permit holder meetings that provide scientific information about turtles and what can be done to provide greater protections. He takes every opportunity possible to work with scientists in the field such as University of Central Florida's Professor Emeritus Dr. Llewellyn Ehrhart, of the Marine Turtle Research Group with whom he's had the pleasure of going out on boats to watch research being conducted. Any book about marine turtles, any person with more knowledge than him, or anyone with an interest in turtles are all potential resources for educational materials for people interested in STPS.

Another role he held in the organization led to one of his proudest achievements. Pszonowsky and other volunteers provided the leadership to partner with the Brevard Zoo and create the Sea Turtle Healing Center. There was a need to have a local hospital/rehabilitation center where STPS could take sick or injured turtles to, as the other facilities were a great distance away, and the travel could stress the turtles more. The dream became a reality in April 2014. The Sea Turtle Healing Center has multiple tanks and medical and volunteer personal available to help injured or sick turtles. This facility is one of only a few that can house turtles that have fibropapilloma virus, a contagious disease that causes tumors to grow both inside and outside the turtle's body. Through the foresight of Pszonowsky, Cheney and others, STPS provides annual financial support to the healing center to offset the costs of caring for the turtles.

Pszonowsky says is that being involved with STPS, "has been lots of fun." The opportunities he has been offered or created with the organization to learn and share his knowledge about turtles is impressive. He is a proponent of pinpointing opportunities for advocacy and working to get people to embrace those messages. "Repeating our (advocacy) message is important every day. Advocacy is keeping pressure on ourselves as humans to do the right thing for those we share the environment with. Carrying signs, marches...well maybe sometimes it would work, but education is a slow and continuous process." He added, "I have met so many turtle persons that shared their passion by passing it on."

## Sources:

1. Email to Roger, September 30, 2017
2. Response from Roger in writing, October 1, 2017
3. Phone Interview, October 2, 2017
4. Email follow up questions, October 5, 2017
5. Email request to change verbiage from Roger, February 12, 2018

# Delving into the World of the Adult Male Green Sea Turtle: Dean Bagley's Exciting Research Continues

by Autumn J. Faulkner

Mosquitos thrummed through the cloying air of early dawn. A mosaic-faced, chelonian form edged across the mirrored sands. Hidden in the track carved by the reptile's long, prominent tail, a furtive ghost crab skittered behind. The docile, late spring waters of South Brevard's Archie Carr National Wildlife Refuge (ACNWR) lapped around the margins of the turtle's vaulting, deep-olive-colored carapace.

For the next few months, a small, blue-painted piece of cargo, carefully epoxied to the now swiftly-moving creature's glinting shell, would accompany the turtle on his navigation through the marine world beyond. The satellite-tracking device's little antenna slanted skyward as the turtle quickly slipped from view beneath the chuckling, rose-tipped waves.

It was late May in 2017, the beginning of green turtle (*Chelonia mydas*) mating season. In the glittering waters just off Archie Carr National Wildlife Refuge's 20.5 km stretch of serene, uncommercialized beach, mating pairs were already being spotted surfacing to breathe.

The Archie Carr refuge provides abundant nesting habitat for three species of sea turtle and receives 15,000 to 30,000 nests annually, accounting for around 32% of Florida's green turtle nests per year. Over time, green turtle nest numbers have been rising exponentially, with a marked increase in recent years. Numbers essentially doubled from 2011 to 2013, followed by record years in 2015 and 2017. The influx of females coming to nest on Brevard's night-inked beaches has also attracted more males.

Very little is known about the male counterpart to Florida's green turtle population. Females, which trundle ashore to nest, are much more accessible than the males, who do not come ashore, are fast and adroit swimmers and surface only for a second or two, making them difficult to spot, let alone access for measurements and tracking attachments.

Fortuitously, as the numbers of mating pairs increased in Brevard's nearshore waters, some male green turtles were discovered in the shallow, gurgling swash waters, often as part of a mating pair. Suddenly, these large and elusive turtles had become easily accessible to researchers.

After years of planning, in 2013, Dean Bagley, a Research Associate with the UCF Marine Turtle Research Group (MTRG), outfitted two of the beached mating pairs with satellite transmitters. This was the first time males had been encountered and tracked at a U.S. nesting beach, launching a new, pioneering study into their breeding behavior, migration patterns and home foraging grounds.

Though expensive, the small transmitters Bagley uses reveal a host of important and astounding in-water information about these male turtles. Satellite telemetry uses orbiting polar satellites to determine

where a surfacing, transmitting animal is located when the satellite passes overhead. Researchers can then plot the data received to determine: location, routes traveled, swim speed and water temperature. By plotting the turtle's movements, patterns and trends emerge, providing insights into where the turtles are breeding, what routes they are taking, where they stop along those routes and where the primary, post-breeding foraging grounds are located.

Since the early 2000s, Bagley has been satellite-tracking adult and sub-adult green turtles with UCF. Between 2001 and 2008, she tracked 29 large immature greens. Not every turtle exceeding 70 cm (2.3 ft) scl (straight carapace length) migrated, but the many turtles that did migrate, swam to adult foraging locations in the Florida Keys, Bahamas, Cuba and Puerto Rico.

Bagley also works with the Inwater Research Group (IRG), a Florida nonprofit. In 2004, with IRG, she went to investigate an area that some of the tracked turtles were targeting in the Florida Keys. The vibrant habitat was in a region west of the Marquesas Keys and hosted lush, underwater meadows of verdant seagrass. The team spotted many large adult green turtles as they broke the warm, glazed surface of the placid waters to breathe. Bagley tracked six of these sub-adult and adult green turtles to confirm that they were resident in this area.

According to a study IRG published with contributing researchers in 2010 (Bresette et al., 2010) adult green turtles west of the Marquesas Keys, in a region known as the eastern Quicksands, were observed clustering in "herds" over seagrass pastures found in deeper (3 to 5 m) coastal waters. Juveniles did not mix with the adults and congregated in the shallow waters of nearby Mooney Harbor.

This region west of the Marquesas Keys is considered the only known adult green turtle foraging ground in the mainland United States. The lively habitat is not only important to Florida-nesting green turtles, but IRG has found it to be a critical foraging area for green turtles from Mexico and Costa Rica, as well.

Since 2013, Bagley has satellite-tracked twelve more males, including five in 2017, from Archie Carr National Wildlife Refuge. Many of these males have also returned to the region west of the Marquesas, but not all. This year, one male returned to an area just north of Big Pine Key in the Florida Keys. Two adult green females Bagley tracked in 2014 also settled in this region.

Suspecting this area may prove to be another "hot spot" for adult foraging greens, Bagley recently worked with Kelly Sloan (Sanibel-Captiva Conservation Foundation) and Dave Addison (Conservancy of Southwest Florida) to submit a grant proposal to the Sea Turtle Grants Program to conduct some initial transects to look for turtles. If the grant is awarded, IRG will investigate the Big Pine Key area with these researchers next winter.

Bagley believes there may be more prime adult green turtle foraging areas in the Florida Keys. With IRG, she has begun a grant-funded Keys Megatranssect, spanning around 265 km (165 mi) along the Hawk Channel, from Biscayne Bay all the way down to Rebecca Shoal. This transect will comprise a series of visual surveys, scanning the waters for foraging adults in an effort to uncover new hot spots where the turtles may be clustered. The team used satellite data to plot the course and the researchers will be stopping at known foraging spots along the way, collecting seagrass samples to use as a baseline for isotope analysis. They will also document and assess the habitat to try

and determine what it is about a habitat that greens prefer over others.

Cumulative research has lead Bagley to these vital waters in the Keys, providing insight into where sea turtles go when they vanish from shore. There may be more vital foraging grounds valuable to the growing numbers of adult green turtles that need protection.

Along with this data, Bagley is learning much more intimately about how adult male greens behave during the breeding season, where they go when they venture from the Archie Carr refuge waters and the scope of their breeding ranges. Some of the tracked males did not make the refuge waters their primary mating grounds and several took various trips away from their primary breeding sites. One male even ventured into the Gulf Stream for a 4-day-ride. On their migration routes back to their respective foraging grounds, alone, all of the males tracked in 2017 traveled over 500 km (310 mi).

These phenomenal animals are absolutely staggering and the information gathered, from the samples taken on the beach for genetic and stable isotope analysis, to the measurements taken of the long tails of the males and the lengths of their carapaces, to the scope of their breeding and migration ranges, is enhancing our understanding of these remarkable and surprising animals.

"Every bit of this research adds another piece of the puzzle in better understanding this understudied segment of the species, which can contribute to their conservation," Bagley says, reflecting on this continuing research.

Funding for Dean Bagley's UCF MTRG satellite-tracking study of the adult male greens of Archie Carr National Wildlife Refuge in previous years was provided by: Sea Turtle Grants Program (with proceeds from the Florida Sea Turtle License Plate), SeaWorld & Busch Gardens Conservation Fund, Telonics, Inc., Wildlife Computers and the Sea Turtle Preservation Society. Funding for 2017 was provided by: National Save the Sea Turtle Foundation, SeaWorld & Busch Gardens Conservation Fund, Wildlife Computers and Sea Turtle Preservation Society.

The funding STPS received for one of the transmitters was provided by an avid young student named Spencer Moberg. The student from Deerfield Middle School in Deerfield Beach, FL, created a project called "Passion Project 8<sup>th</sup> Grade" in 2016. He raised \$3,000 for STPS, who in turn, immediately decided that Spencer's donation should be used to contribute to this exciting new research on adult male green turtles.

There is so much more to learn.

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Fast forward 50 to 100 years. Now imagine a day when non-

## Spotlight: Natalie Kendall

by Jill A. Lankford

biodegradable plastics can only be seen in an art museum. Technically, they will have to end up somewhere if they are indestructible, right? How about in the form of awareness art pieces that provide society with alternative use ideas? Young Natalie Kendall, grandniece of STPS Member and Volunteer, Debra McPherson, has created an amazing collage made from items found on our local beaches. By embedding discarded pieces of trash into her piece she is able to bring an awareness about pollution and how it impacts our eco-system. What began a Central Middle School project for community service, ends up a national and possible international awareness piece. Come to the STPS Sea Turtle House and see Natalie's vibrant artwork displayed in our education center. Do I hear the calling for a Plastics Artwork challenge?



# Lawrence Wood, PhD- Hawksbills in the Reef

by Jill A. Lankford

If you happened to miss our monthly meeting when Lawrence Wood, PhD, graciously lectured us about the "Jewels of the Reef: The Secret Lives of Hawksbills," you are in luck. We can get you all caught up on why these strong-billed reef eaters are one of the more threatened sea turtle species. Interestingly, there are only a few species of vertebrates that eat sponges, so his visit was particularly informative and featured these sea turtles and their reliance on our changing reefs.

Dr. Wood lives in Jupiter, Florida, where he is closer to his work. He is currently heading up the "Hawksbill Project," sponsored by the "National Save the Sea Turtle Foundation." Dr. Wood additionally writes publications in the Foundation's "Florida Environmental Outreach Magazine" and helps with scholarships by reviewing proposals and gift programs. There are about six projects and publications he has written on hawksbills alone. An interesting and exciting part of his work is the field data he acquires. Along with a team of divers, Dr. Wood travels to nearby reefs and shipwrecks to swim down and collect these beautiful sea turtles. He is very familiar with their habitation and knows exactly where to find them from his years of research and earlier data collections.

This collection of information is an important role in documenting changes to their eco-system and more specifically the daily habits of these hawksbills. Many things can impact change in the ocean floor and the system of underwater reefs from which they feed. Fisheries that still use trolling methods are impacting reef structures. Dr. Wood agrees that if there was one environmental impact to the hawksbills it would be from the "effects of carbon dioxide in the air causing a change in the pH of the ocean, which disrupts the ability of many organisms in the ocean to build strong shells (calcium carbonate shells, including corals). Scientists are still studying and will continue to study their environment and changes within so that we may continue making positive changes in our lifestyles to aid in their survival. One other immediate change is alleviating trade. Dr. Wood advised that the "...trade in valuable products of these sea turtles is reducing, but is still in existence." The shell itself is essentially turned into whatever trinket. For example, there are still souvenir shops in Indonesia that sell stuffed sea turtles and sell them to the public."

When Dr. Wood collects his data, he and his team dive anywhere from 80 to 100 feet down to bring the sea turtle back to the surface. The team takes measurements and tags are injected in the form of microchips similar to those given to our domestic house pets. These chips offer a "secondary way of identifying the animal." Only a few sea turtles become fitted with transmitters, which can stay on up to a year or so. This amount of time provides researchers with enough information to form a pattern of data. Samples are also collected in the form of blood work. The blood determines gender and within this sample, also "determines sex ratios in the aggregation being studied." For instance, the ratio of male to female sea turtles is identified. The data will enable researchers to look at the level of testosterone in their blood. Current data show that there is a "female bias of about two and a half females per male." Sometimes they can collect tissue biopsies for genetic fingerprinting. This determines where the turtle was originally hatched. This genetic testing assigns populations to regions. Dr. Wood is working on new projects that involve "stable isotopes. He explains that "...elements such as carbon and nitrogen, come in

different forms. By identifying which forms have been stored in the tissues of the turtles, we can identify what, besides seagrass, for example, the sea turtle has been eating like algae or invertebrates; or perhaps what kind of habitat it has been living in, such as open ocean or lagoon."

Dr. Wood did touch briefly on the natural crossbreeding of the sea turtles and how blood samples can help discover more about their genetic makeup. Hawksbills have been known to breed with loggerheads and greens. "If it looks like a sea turtle, it must be a sea turtle," says Dr. Wood of the mindset of a hawksbill. It takes 25 years to get to the reproduction stage and these hawksbills need a safe place to grow up to survive until this time. They pay close attention to their availability to food, shelter, and air. All need to be within close proximity of one another. They need homes and have a "shipwreck roosting behavior," which means that they like being surrounded by a structure, which may also include rocks, reefs and caves. They will return to the same spot every night as it is easier to find again. They additionally need to resurface anywhere from fifteen minutes to an hour for air. At night while resting they may stay down a little over an hour. These roosting behaviors are all determined by these priceless tracking devices.

Hawksbills, like other sea turtles are important to our ecosystem. The reefs take on many phases of growth and substance and are food and shelter for many ocean dwellers. The Hawksbill being one, is "very picky about which sponges they would rather eat," says Dr. Wood. There is no question that his research is imperative to the survival of this species.



Therefore, ongoing research and data collection will help us all better understand how we can make changes as needed.

We are certain Dr. Wood will be back to discuss any new discoveries he makes along the way. His presentations are priceless. In the meantime, if you want to know more about Dr. Wood you can visit the website for National Save the Sea Turtle Foundation at <http://www.savetheseaturtle.org/>. You can also read his many interesting publications such as Foraging Behavior of Wild Hawksbill Turtles (*Eretmochelys imbricata*) in Palm Beach County, Florida, USA, accessible at <http://www.bioone.org/doi/abs/10.2744/CCB-1242.1>.

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A warm, evening sea breeze slinks through long, souging tufts of beach panicum grass. Folded, wing-like leaves flutter along the sprawling tracks of railroad vines, flowers tightly closed like purplish fists. A rare, pale-faced beach mouse flurries about one of his numerous

# Battling Beach Erosion and Light Pollution: Keeping Brevard's Beaches Safe and Beautiful for Sea Turtles and Humans

by Autumn J. Faulkner

burrows, arranging a fresh store of golden sea oat spikelets. Aged twilight sinks across this wilderness of shaggy vegetation as Jupiter shines over the glinting, back-dune sea grapes, the western sky still rusty with sunset. Night takes hold. A velvet darkness enshrouds the humming beach. The Milky Way, a sight unknown to over one-third of humanity because of city light pollution, glows like a sapphire cloud over the sea. The dark figure of a loggerhead turtle trundles through the murmuring swash, tiny dinoflagellates sparking electric blue where the great, marine reptile disturbs the wet sand.

Brevard's beaches are paradise, as equally alluring in the celestial night as they are bathed in radiant sunshine. These beaches also provide important nesting habitat for loggerhead, green and less-often, leatherback sea turtles. Paula Berntson, of Brevard County's Natural Resource Management Department, works diligently to preserve this nesting paradise.

On May 04, 2017, at the beginning of sea turtle nesting season and the May 01 to October 31 beach lighting ordinance, Paula delivered a stirring presentation at the STPS member meeting at Pelican Beach Park.

"We work hard to try and make everyone as happy as possible; the people and the wildlife," she said, reflecting on her work to reduce artificial light pollution and restore the dune ecosystems of Brevard's eroded beaches.

In 1995, the lush, gently-sloping, sandy beaches of Brevard looked starkly different. Heavily eroded, previously-constructed seawalls and rock revetments in Cape Canaveral, Cocoa Beach, Indialantic and Melbourne Beach were exposed like broken teeth, regularly lashed by high tides. Water rushed the whole length of the Cocoa Beach Pier, erasing the beach. Melbourne Beach was also gnawed by Hurricane Erin that year and several properties, including the Breakers Condominium, were in danger of being undermined. Brevard's sandy beaches recede and accrete (build up with sand) through natural cycles as the beaches build in summer and recede in winter. Undeveloped beaches recover over time after massive amounts of sand are displaced by intense storms. Developed beaches, however, can become severely eroded and cause considerable damage to near-shore structures. In 1999, the arrival of Hurricanes Floyd and Irene only worsened Brevard's dramatic beach erosion. Beachside residents were concerned about the fate of their properties and many wanted to build seawalls and similar beach-armoring structures for protection from the encroaching ocean. Seawalls are a hazard to sea turtles and degrade their nesting habitat.

Though the sea turtle nesting density in Brevard is highest in the southern, federally-owned Archie Carr National Wildlife Refuge (ACNWR), nesting along Brevard's more commercially-developed beaches, from Cape Canaveral to northern Melbourne Beach, is still significant. Every successful nest helps ensure the future of the three

threatened and endangered sea turtle species that come to these beaches every summer.

As a solution to the plight of beachside residents and sea turtles, the County partnered with the U.S. Army Corps of Engineers (Corps) as the local sponsor of the federal Brevard County Shore Protection Project (BCSPP). The Corps awarded the contract to Great Lakes Dredge & Dock and on November 13, 2000, sand began pumping onto the shoreline of the North Reach, which includes 9.4 miles of beach, from Jetty Park in Cape Canaveral to the northern boundary of Patrick Air Force Base (PAFB).

The stunning results from the first North Reach project, where 2.8 million cubic yards of sand were distributed, are still enjoyed today. Majestic vegetation flowers over lumbering dunes, facing a wide expanse of soft, sandy beach, drawing visitors from all over the world in increasing numbers, along with increasing numbers of summertime sea turtles.

The Protection Project, along with the North Reach, includes three more regions along Brevard's 72-mile-long coast. The Mid Reach spans 7.6 miles immediately south of the PAFB and extends to Flug Avenue in Indialantic. From Flug Avenue, the South Reach stretches 3.8 miles to Spessard Holland Park in Melbourne Beach. Here, the South Beaches run 14.5 miles to Sebastian Inlet State Park, in southern Melbourne Beach.

"For our projects south of Patrick Air Force Base, we have always worked very closely with biologists and students from the University of Florida's (UCF) Marine Turtle Research Group (MTRG) to make sure our projects are as sea-turtle-friendly as possible," Paula explains.

Following UCF MTRG's suggestions over time, the dune slope of the Mid Reach, South Reach and South Beaches was adjusted to accommodate nesting turtles. Construction in these areas did not take place during nesting season.

In the North and South Reaches of the federal Shore Protection Project, sand was pumped in from two near-shore borrow sources, the Canaveral Shoals and the Space Coast Shoals. This beach-quality sand was deposited and shaped into a gently-slanted, wide beach. After the initial nourishment of these Reaches, sea oats were planted at all the street ends and public parks.

More than a million dune plants, such as sea oats, have been planted following sand placement projects in the Mid Reach and South Beaches. The plants stabilize the dune, provide protection from future storms, allow more sand to naturally accrete over time and develop into a healthy, well-vegetated ecosystem for wildlife and beachgoers to enjoy. Well-developed, vegetated dunes also help shield the beach from the intrusion of artificial lighting.

Artificial light, emitted by human development, has been notorious for confusing and disorienting sea turtle hatchlings. Following the 2004 hurricanes, the County received grant funding from the National Fish & Wildlife Foundation (NFWF) to implement several projects to mitigate upland lighting and make Brevard's beaches more sea turtle friendly. As grant manager, Paula has retrofitted many oceanfront buildings with low, shielded fixtures containing longer-wavelength amber bulbs.

She also works to educate beachside residents about keeping their lights low and shielded, while offering sea-turtle-friendly fixtures and bulbs to property owners willing to install them.

Using grant funds, Paula worked to reduce the intrusive effects of street lighting, as well, by retrofitting over 500 streetlights with cutoff fixtures and shields and hired a contractor to plant sabal palms and richly-leafed sea grapes at public street ends to shade the invading light that can sometimes infiltrate the beach from over three blocks away. The grant funding also allowed Paula to conduct a beachside property owner plant give-away of sea grapes, native inkberry, beach elder and silver saw palmetto. These light-shielding, dune-enriching plants were given to the property owner without charge, provided that the recipient planted these native species on the east side of their property.

Every year, Paula partners with Keep Brevard Beautiful to hold a Sea Oats Sale, accepting pre-orders for trays of young, lissome sea oat plugs between late November and early February.

Education is at the heart of Paula's work. She talks with people every day and, when invited, gives ebullient presentations like the one she presented to STPS this past spring.

The NFWF grant funds allowed Paula to buy a massive inventory of sea-turtle-friendly bulbs and fixtures, which she still distributes regularly. It also enabled her to print a large number of educational cards about sea turtle nesting season and hazards to the species that people can easily prevent. The cards were printed for distribution to hotels and motels to place in rooms to educate visitors on how to keep the beach safe for sea turtles.

Visitors come to Brevard to rove the sands, admiring animals like the little, pink-eared marsh rabbit peeping out from behind the pastel-yellow flowers of the high-dune prickly-pear. They come to watch small pods of dolphins surging through the waves, foraging for fish huddled amongst near-shore coquina rocks. Sea turtles are perhaps one of the greatest tourist draws. People from all over the world come to watch these beautiful creatures return to the sea after successful rehabilitation, and trundle ashore to nest in the ink of night. By reducing the glare of urban lighting, marvels of the star-scape above glitter over a nesting female as guides explain how she carves a nest chamber with her powerful hind-limbs. A meteor can be seen arcing across the summer constellations as the female finishes disguising her newly-laid nest and shuffles back to the silver flash of inviting waves.

Paula strives to create a balance between people and turtles, allowing both to coexist in harmony on Brevard's scenic shores. The sea turtles that migrate to Brevard's coastal waters to reproduce have benefitted from conservation efforts, but their future is still threatened. Each hatchling that emerges and makes a successful dash to lapping waves beyond makes a difference.

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## Step Aside Please - Sea Turtle Rescue Coming Through

by Jill A. Lankford

The Sea Turtle Emergency Response Program (STERP) is designed to "decrease the loss of post-hatchling sea turtles that wash ashore in Central Brevard County." (Cheney, D., 2017) STERP leaders offer a training program, which equips volunteers with the necessary awareness tools to search for and rescue post-hatchling sea turtles. Given that our area is subject to hurricanes and tropical storms, we need as many hands on deck as we can get out there to gather these poor, tired little guys and gals and get them to a safe place to rest. As we have all seen lately, there has been a bit of seaweed on our beaches since the last storm. This very same seaweed once housed our immature sea turtles at sea until they mature and swim away on their own. STERP Volunteers are trained on how to identify these small sea turtles in this washed up seaweed. "Loggerheads can change the color of their shell, so they are more difficult to spot in the seaweed," says Dave Cheney, STERPS's Coordinator. The seaweed will not wash in every time, so their cover may be blown and they may become exposed to the elements (birds, raccoons, crabs and ants). Sure, this is part of the circle of life and everything must feed, but part of our human nature is to protect those things that cannot protect themselves. This is where STERP comes in and the many volunteers that have signed up for this huge responsibility. Discovery is not the only duty of a STERP volunteer. Some of our rescued sea turtles may need a lift to SeaWorld, the Brevard Zoo, Ponce Inlet or another designated post to get the help they need once they wash ashore. Volunteers would also be an ambassador for these little soldiers by spreading the word about how we can all help and educate one another. This word may get others inspired to get involved and the more informed people we know, the less uninformed people we will have in our Brevard County area. Not only are our volunteers making a huge difference in the community, they are building valuable qualities within themselves and creating trusting, lasting relationships within the community. In October 2016, over 2,000 volunteers helped save post-hatchlings after hurricanes Matthew and Nicole.

Since there are specific guidelines when getting involved in sea turtle rescues, you will not want to miss coming to one of these informative classes. There are specific guidelines and designations for the STERP volunteer to guide them on how to hold, handle and transfer them to a nearby designated post. So, it is extremely important that we are educated. After it is all said and done and your first rescue takes place, the feeling of knowing that you played an imperative role in saving just one sea turtle, and how you were able to increase their rate of survival is priceless. You can look out at the ocean now with a special meaning and connection. Come get involved...check out this website <http://www.seaturtlespacecoast.org/>