

• **Mark your calendars...**

- Nov 7, 10 am-3:30 pm—Free invasive plants workshop at Gamble Rogers State Park. Contact Terri Newmans at 386-517-2086 to register
- Nov 14, 9 am-3 pm—Go Native! Program at Flagler County Extension Office. \$15 pre-registration required by Nov 9. Contact Ruth at 386-437-7464.
- Nov 14, 9am-4pm—Marshfest (Dutton Island Preserve, Atlantic Beach). Call 904-247-5828 for information.
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2009 is winding down...

It's that time of year again—pumpkins abound, Christmas decorations have been in the stores for weeks, annual reports are due, and I'm wondering where the past 10 months have gone! There are still many wonderful events coming up in the last two months of 2009, including the inaugural Right Whale Festival, to be held Dec 5th in Jacksonville Beach (see back page for more info.) Volunteers are needed for this event—if you are interested in helping out, please contact Cheryl Bonnes at Cheryl.bonnes@noaa.gov and let her know how and when you would like to volunteer. Options are: T-shirt sales, passport program, site upkeep throughout the day, wear costumes, silent auction booth, and clean up at the end of the day. There will be three shifts: 7:30 - 11 am; 11 - 2:30; and 2:30 - 6:30 pm. Volunteer judges are also needed for upcoming regional and state science fairs (see back page for info.)

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Don't collect coquina rock at the beach!

Marineland Beach and Washington Oaks Gardens State Park are two locations with fairly unique coastal features—they have rocky intertidal areas made up of deposits of coquina rock. Coquina rock has been used for building many structures in St Augustine since the late 1600's, including the Castillo de San Marcos and many buildings that are now part of Flagler College. When coquina rock is quarried, it is quite soft and easily cut, however when exposed to air, the rock hardens. This allowed the Castillo to be able to withstand direct hits from cannonballs. Today, coquina rock is sometimes quarried for use in landscaping. However, it is illegal to remove pieces of coquina rock from beaches or other public lands. If you see people damaging or removing coquina rock, you are asked not to confront them, but to contact the Florida Fish and Wildlife Conservation Commission at 888-404-3922.



Living Shorelines

On a recent boat trip in the intracoastal waterway from Palm Coast to Fort Matanzas, it was very interesting to notice the variety of shorelines present in the region. They ranged from fully-vegetated salt marsh to eroding banks to various styles of seawalls. In looking at a series of aerial maps of the region, we can see that the width of the intracoastal waterway in northern Flagler County doubled from 1942 to 2008. This increase in width is probably mostly due to erosion caused by boat wakes. It is not surprising, therefore, that property owners have installed vertical concrete, wooden or other structures to prevent their property from eroding further. However, while these “hardscapes” can serve to protect one piece of property, they can result in increased erosion on adjacent or opposite properties, because wave energy becomes reflected off the hard walls. Seawalls also can become undermined from below or behind, causing them to fail and collapse.

An alternate strategy for preventing coastal erosion is being promoted in Florida by the US Fish and Wildlife Service, and many local governments and state agencies are supporting that effort. “Living Shorelines” have proved very effective in many locations, including the Chesapeake Bay and the Indian River Lagoon. Living Shorelines use natural shoreline ecosystems to absorb wave energy without causing erosion. Living Shorelines extend from the upper bank of the property to below the water level. They typically include a variety of plants, including salt marsh grasses and/or mangroves as well as structural elements such as oyster shell, or even riprap. The overall concept of Living Shorelines is to provide habitat which will grow and change as water levels change (unlike seawalls which are a fixed height). Having structural elements in the shallow water, and plants which are rooted below water level but grow above the water helps absorb wave energy.



Eroded shoreline in Palm Coast

Invasive plants such as Brazilian pepper (*Schinus terebinthifolius*) have proved to be poor stabilizers of shorelines, as seen in the Indian River Lagoon during the 2004 hurricane season. Native marsh grasses, on the other hand, are very effective at resisting erosion and dissipating wave energy—especially when planted on shallow slopes. In these cases, they can reduce wave energy by 50% in the first 8 feet of vegetation, and by 100% over a distance of 100 feet. Other native coastal plants such as sea oxeye daisy, saw palmetto and cabbage palms are fairly resistant to shoreline erosion. Sea grapes tend not to hold up to erosion very well. Mangroves can also provide a good buffer to wave energy—the wider the mangrove fringe, the better the buffering effect.

You can learn more about Living Shorelines from presentations at <http://www.fws.gov/northflorida/> .

In many locations, property owners do not own enough land to create the desired shallow slope for a living shoreline. In these cases, riprap structures made from large coquina rock or limestone rock can be used. Larger diameter rocks (3-6') are less likely to be shifted by wave action than smaller rocks. Coquina and limestone rocks will settle and will also erode, however they are also likely to become vegetated, which will increase their aesthetic appeal and may help stabilize the shoreline further. If the rocks that are used are too small, they will tend to shift at the toe of the slope, causing the entire rock wall to collapse. Seawalls and articulated block structures tend to be vertical (or steeply sloped) and are prone to scouring. Waves can cause erosion of soil from behind articulated blocks, and from behind seawalls, causing the collapse of these structures.

A traditional seawall in Palm Coast. Rocks have been used to reduce the impact of waves breaking on the concrete.

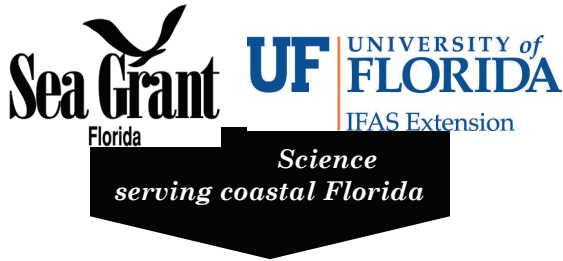


Living Shorelines help to preserve the natural, historic and aesthetic values of coastal properties. From an engineering standpoint, they provide acceptable to very good performance in hurricanes (based on the Indian River Lagoon sites during the 2004 hurricane season, when category two and category three hurricanes passed directly over the region.) They are typically less expensive to install than rock shorelines or seawalls, however they may be more cumbersome to get permitted as they require approval/permits from a variety of agencies.

Many successful Living Shoreline projects have been completed in Florida. In the Pelican Island National Wildlife Refuge, oyster shell was used to create a submerged breakwater, allowing areas to be filled and planted with marsh and mangrove vegetation. These planted areas then naturally expanded, restoring 0.84 acres which had previously eroded from the island in the Indian River Lagoon. At the Cargill Fertilizer plant in Tampa, an eroding shoreline was re-sloped and planted with marsh grasses in 1990; by 2003 it had become a healthy mangrove/salt marsh ecosystem. At John Lloyd Park, across from Port Everglades in South Florida, limestone boulders were used to create a protected area which naturally vegetated with mangroves over a 20-year period. This mangrove habitat is directly across from the shipping docks. The St Johns River Water Management District is currently conducting salt marsh restoration projects within Gamble Rogers and North Peninsula State Parks.



A naturally-vegetated shoreline along the Intracoastal Waterway



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More “Mark your calendars”

- Dec 5, 10 am—4 pm: Right Whale Festival at Sea Walk Pavilion, Jacksonville Beach. Beach cleanup, music, beach run and more! See www.rightwhalefestival.org for details.
- Dec 9th & 10th—Flagler County Science Fair Judging—JUDGES NEEDED! Please contact Tennille Wallace at wallacet@flaglerschools.com or 386-437-7526
- Jan 10-17, 2010: National Invasive Species Awareness Week. Check local media to find out about air potato roundups and more!
- Feb 3: River Region East Science Fair Judging (FCTC, St Augustine)—JUDGES NEEDED. Please contact Mark Lewis at lewism@stjohns.k12.fl.us or 904-819-7529.
- Jan 15– Feb 19: Upland Master Naturalist Class (Volusia Co.) See www.masternaturalist.org for more information and to register.
- Feb 1-24: Coastal Master Naturalist Class (Clay Co.) See www.masternaturalist.org for more information and to register.
- Feb 6, 10 am—4 pm: Water Education Festival at MOSH (Jacksonville)—Free!
- Feb 22: NE Florida Regional Science Fair Judging (Jacksonville). JUDGES NEEDED. Register at www.nefrsef.org.
- April 8, 8:30 am—5 pm—State Science Fair (Orlando)—JUDGES NEEDED. Please register at www.floridassef.net (follow Judging link)
- April 9-May 14: Coastal Master Naturalist Class (Volusia Co.) See www.masternaturalist.org for more information and to register.



Please check the calendar at <http://calendar.ifas.ufl.edu> for other environmental education programs around the state.

Aqua Notes is provided as one of the many services relating to educational programs offered by the University of Florida/IFAS cooperative extension service. This publication is available on the Web at <http://stjohns.ifas.ufl.edu> or in an alternate format on special request. In compliance with ADA requirements, participants with special needs will be reasonably accommodated with 5 days advance notice by contacting the Flagler County Extension Service at 386-437-7464. Those needing telecommunications assistance, please call the Florida Relay Service (TDD) at 1-800-955-8771. The use of websites or product names in this publication is not a guarantee, warranty or endorsement of the sites/products named and does not signify that they are approved to the exclusion of others. For more information about this document, contact Maia McGuire at the Flagler County Extension Service at 386-437-7464.