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IFAS EXTENSION

aqua-notes

Sea Grant Florida

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Volume 4, Issue 4

November, 2004

Mark your calendars...

- November 3-14: Greater Jacksonville Agricultural Fair (www.jacksonvillefair.com)
- November 16-21: St. Johns County Fair (www.stjohnsfair.com)
- December 4, 10 am—noon: FWCC/FMSEA Educator Collecting Permit workshop at St. Johns County Ag Center (3125 Ag Center Drive, St. Augustine). Contact Maia at 904-824-4564 for details.
- December 16, 3 pm—Duval Environmental Educators' Network meeting at Jacksonville Zoo Education Building.
- More on back page!

Hurricanes, hurricanes, go away...

Fortunately, hurricanes Charley, Frances, Ivan and Jeanne caused only inconveniences for me and the rest of the St. Johns County Extension staff—we were all extremely lucky. We were unable to get into our offices for a total of about 7 work days, as the building was used as a special needs shelter for two of the hurricanes. The September "Exploring our Environment" class has had to be postponed until April, to the disappointment of both the participants and the instructors! The spring and summer of 2005 are shaping up to be very busy, as you will see by glancing at the calendar on the back page. Between Coastal Master Naturalist classes, two EoE programs, the First Coast Birding and Nature Festival, and a COSEE workshop, I'm going to have my hands full!

M·P·McGuire

Maia McGuire, PhD
Marine Extension Agent

Many of the remaining pine trees behind the St. Johns County Agricultural Center are growing at quite an angle following the 2004 hurricane season

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Updated website

If you haven't visited the NE Florida Sea Grant Extension website recently, you're in for a surprise! Please visit http://stjohns.ifas.ufl.edu/sea/seagrant.htm and let me know what you think. If you are an educator, follow the education link and you'll find several powerpoint presentations and activities ready for viewing and/or download (note that some of these files are large...). Information about the adult environmental day camp program, "Exploring our Environment" is also accessible from the education page. If there are topics or resources that you would like to see added to the website, use the feedback box, or call or e-mail Maia directly (904-824-4564 or mpmcguire@ifas.ufl.edu).

Florida Association of Science Teachers

I attended the annual conference of the Florida Association of Science Teachers in October, and would like to share some of the information that I learned there. I was fortunate to meet Steve Alten, author of seven books, including "Meg" and "Domain." "Meg" is a fiction novel about the megalodon shark, ancestor of the great white shark. The book has been selected by English and science teachers around the country for students in the 6th grade and higher, and it was rated the #1 book for reluctant readers by the Young Adult Library Services Association. Steve's books contain a great deal of science blended into the stories. He has started a program called "adopt-an-author," (www.adoptanauthor.com) where teachers can access downloadable curriculum materials based on his (and others') books. This is a free resource. Steve is also willing to make conference calls to classes, and may be willing to travel and visit individual schools.

Linda Oravetz, state science FCAT coordinator, gave a presentation on changes that are taking place in the Science FCAT. One major change is that in March 2005, 10th grade students will NOT be tested in science—11th grade students will be tested instead. This change allows students to have one more year of science before taking the FCAT, which should allow students to be better prepared for the test. Science FCAT is not currently a graduation requirement, although that is one of the "incentives" that is being discussed to try and encourage students to perform well on the test. Another possible incentive would be to use science FCAT scores as one of the criteria used in awarding Bright Futures scholarships. FCAT scores (by subject, grade level and school) are posted at www.fldoe.org.

Several presenters stressed the importance of introducing children to science at an early age—preferably in kindergarten and elementary school. One presenter cited a study that found that girls decide by the age of seven whether or not science is something that interests them. It is increasingly difficult for teachers to teach science because of demands imposed by the "No Child Left Behind" Act and the FCAT school grading system. However, it is important to realize that science can be used to address math and English requirements, and can be made fun and interesting for students by incorporating hands-on activities into the curriculum. Teachers wishing to find activities to supplement their lesson plans can contact Maia by e-mail (mpmcguire@ifas.ufl.edu) or phone (904-824-4564) and I'll do my best to help you out. The Pelotes Island Nature Preserve has FCAT-based reading, writing and math activities addressing a number of topics and all grade ranges at http://pelotes.jea.com.

For more information about the Florida Association of Science Teachers, visit http://www.fastscience.org

Cuban treefrogs—invasive species

The largest treefrog in North America is the Cuban treefrog (1.5 to 5 inches in body length), however it is not native to North America. This species was introduced to southern Florida from the Caribbean and has continued to spread in Florida. You may have read recently that a Cuban treefrog was found in Savannah, Georgia.Cuban treefrogs are voracious eaters -- and unfortunately they eat Florida's native frogs, toads, and lizards, in addition to insects and spiders. In fact, Cuban treefrogs are SO successful at taking over habitat and eating Florida's native species that they are considered an invasive exotic (non-native) species -- they are a threat to the biodiversity of Florida's native ecosystems and wildlife.

The distinguishing characteristics of the Cuban treefrog are:

- Size of the adults (up to 5 inches in body length, much larger than native Florida treefrogs);
- Enormous toe pads (larger than toepads of native treefrogs in Florida);
- Bumpy skin on the back, like skin of a toad; and
- Skin on top of head is fused to skull.

Cuban treefrogs can be highly variable in color -- from pale tan/pale green without any markings to dark green or brown with an even darker color pattern on the back and legs. Sometimes they almost look white when they are inactive or cold.

Information on Cuban treefrogs was obtained from http://www.wec.ufl.edu/extension/frogs/. Visit this site for more information, including instructions on a humane way to euthanize these animals.

"Cool" Creatures—Cephalopods

You may be wondering how something belonging to a group of organisms that translates as "head foot" could possibly be interesting. Here are a few characteristics: Cephalopods have three hearts which pump blue blood; they can change color almost instantly; they can learn through trial and error, yet they are closely related to slugs. What are these amazing animals? Octopuses, squid, cuttlefish and the chambered nautilus all belong to the class Cephalopoda, within the Phylum Mollusca (which also includes slugs, snails and clams).

Octopuses have always fascinated me. I remember taking a tour of the Bermuda Biological Station for Research and learning that the tank containing the octopus had to have a large brick placed on top of the screen covering in order to prevent the octopus from crawling out of the tank and wandering down the hallway into the scientists labs. As a teenager, I once found a baby octopus small enough to sit on the tip of my pinky finger. When I heard that an octopus could learn to open a jar in order to get at food inside the jar, I knew that these were truly amazing creatures!

Octopuses (or octopi) have highly complex eyes, with a visual keenness similar to that of humans. They have a very acute sense of touch, especially around the rims of the suction cups which line each of the eight arms. (For the perfectionists out there, these cups are technically referred to as acetabula, or "cup-shaped cavity.") Like other cephalopods, octopuses have a pair of powerful beak-like jaws which are used to bite and tear off food. The radula (essentially a tongue covered with tiny teeth) is used to pull food into the mouth. Squid and cuttlefish also have eight arms, but in addition have two tentacles which are longer than the arms. The tentacles are used for catching prey. The suction cups of squid arms (and the tips of the tentacles) can be lined with numerous small hooks. The chambered nautilus has 38 tentacles, with no suction cups.

Cephalopods can have an external shell (chambered nautilus), internal "shell" (cuttlefish, squid) or no shell at all (octopus). One deep-water cuttlefish, called "Spirula," has a coiled, internal shell which is filled with gas and is used for buoyancy. When these cuttlefish die, the shell is often washed ashore and is commonly called a ram's horn shell. The shell ("bone") of the European cuttlefish is commonly sold in pet stores as a mineral supplement for birds.

Spirula shell

Cephalopods are carnivores. Squid and cuttlefish use their tentacles to catch fish, crustaceans (like crabs and shrimp) and even other squid. Octopuses can inject poison and enzymes into their prey (usually snails, clams and crustaceans). Nautilus seek out crustaceans that are crawling along the bottom.

Octopus, squid and cuttlefish can change color because they contain pigment cells called chromatophores. These pigment cells can be yellow, orange, red, blue or black and the intensity of the color can be varied by stretching out or relaxing the cell. Reflector cells below the chromatophores add to the intensity of the colors. One octopus, the mimic octopus, changes both color and body shape to imitate other species, such as sea snakes, flatfish and even jellyfish. Squid and octopuses will change color when startled, often becoming dark. Probably the most famous defensive mechanism of cephalopods (except cuttlefish) is the ability to squirt ink. Some deep water squid and octopuses are bioluminescent (can produce glowing pigments.)

Cephalopods are either male or female. Males perform color changes and behavioral displays to attract a female. Egg clusters are often attached to a hard surface, although some deep water species have floating eggs. Adult squid usually die after spawning; female octopuses guard their eggs until they hatch, then the female dies. Squid live 1-3 years, common octopuses live about 2 years but the chambered nautilus can live to be 20 years old.

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Science serving coastal Florida

More "Mark your calendars"

- February 12, 2005—Water Education Festival at Museum of Science and History (Jacksonville)
- February 12—SEAS workshop at Florida Museum of Natural History. For information, contact Heather Lane at 813 949-9096 or hlane@flaquarium.org.
- March 17-April 21—Florida Master Naturalist Program (Coastal Module)—Volusia County. See www.masternaturalist.ifas.ufl.edu for details and to register.
- April 2—SEAS workshop at GTM Reserve (NE Florida). For information, contact Heather Lane at 813 949-9096 or hlane@flaquarium.org.
- April 15-17—Florida Marine Science Educators Association annual conference, St. Augustine. See www.fmsea.org for details.
- April 23-24—Washington Oaks Gardens State Park Earth Day (Flagler Co.)
- April 25-29—Exploring our Environment—from the river to the ocean (class is full).
- May 12-15—First Coast Birding and Nature Festival, St. Augustine.
- June 13-19—Exploring our Environment—from the river to the ocean. Marineland. Follow Education link at http://stjohns.ifas.ufl.edu/sea/seagrant.htm or call Maia at 904-824-4564.
- June 19-24—COSEE teacher workshop at Cedar Key. Contact Karen Blyler at 352-846-0996 ext 246.