



# BSERVATIONS

A Newsletter of the Georgia Science Teachers Association

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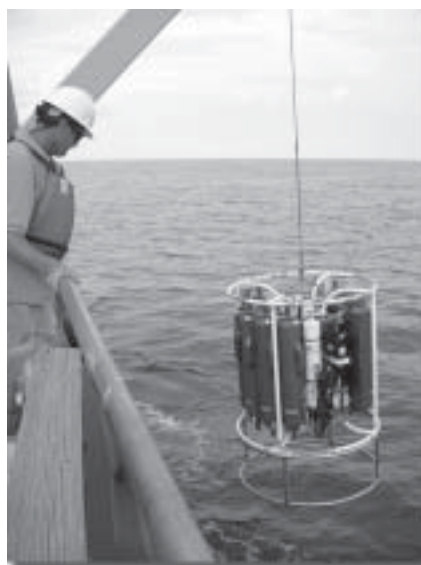
## and now... "Live" From Gray's Reef National Marine Sanctuary (really!) by Bob Williams

This summer 14 in-service and pre-service teachers participated in **COASTLINES 2003: No Wetlands = No Seafood**, an intensive 2-week workshop developed by the University of Georgia's Marine Education Center and Aquarium (MECA) and College of Education. This was one of the several worthwhile professional development programs funded by the Eisenhower Higher Education Program for 2003, and was a collaborative effort between MECA, the Shellfish Research Lab, the Marine Advisory Service, the Skidaway Institute of Oceanography, NOAA's Gray's Reef Marine Sanctuary office, and the UGA Marine Institute on Sapelo Island.

During the workshop the participants collected plankton and other invertebrates for study from the Skidaway River, made crab traps and fished with them, collected water samples for chemical analysis, identified specimens from several trawls aboard the R/V Sea Dawg, and were certified as "Adopt-A-Wetland" and "Project Wet" instructors. They also had an opportunity to interact with research faculty from the Skidaway Institute of Oceanography, doing coliform assessments in Dr. Marc Frischer's microbiology lab, and touring Dr. Dick Lee's bioremediation project.

For many participants the highlight of the workshop was a full day spent aboard the Institute's Research Vessel Savannah, a 92' National Science Foundation certified research ship. Joining the participants, instructors, and ship's crew were staff from the NOAA Gray's Reef National Marine Sanctuary office and a TV crew from the Savannah NBC affiliate, WSAV TV. The focus of the trip was to collect and analyze water column

*(continued on page 8)*



The Research Vessel Savannah

Ship's engineer Raymond Thomas oversees deployment of the CTD to collect water column samples at Gray's Reef. The CTD measures conductivity, temperature, and depth. This device contains a temperature and conductivity sensor, and is capable of obtaining real-time data. The CTD is connected to an onboard computer and can process data into graphical displays. Additional parameters can be obtained from CTD data including salinity, density, and sound velocity.

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- Another Inspired "Teacher At Sea"

*Summer time, and the livin' is breezy! Perhaps its the fact that the past 2 conferences have been at Jekyll Island, but this issue seems a little saltier than usual, what with all the marine related contributions. Thanks to the teachers who took the time over the summer to send in articles!*

BW

Visit our new website at [www.georgiascienceteacher.org](http://www.georgiascienceteacher.org)

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Teresa\_A\_Massey@fc.dekalb.k12.ga.us**The President's Column****Summer Time = Teacher Time**

Yikes! Me? President of GSTA? I'm finding it very hard to believe that I have that title. What's more, I'm having trouble realizing that I have to write a President's Column. Can the responsibility of leading this awesome organization truly be mine? No, I just hold the title of President. It's actually the capable and talented group of teacher leaders that make up the Board of Directors who will do the leading. I'm really looking forward to working with them and all of you to meet the challenges that will be presented throughout this year of change and development.

Those were some of the thoughts that passed through my head as I found a few moments here and there to do a little reflecting. After all, it is summertime. Isn't that when teachers are supposed to get a break? One thing is for sure ... there are so many options for teachers in the summer that no one could possibly take advantage of all that is available. I just spent a few days on Sapelo Island with an incredible group of teachers who are participating in the Long Term Ecological Research (LTER) Schoolyard Program. This is a team of formal and informal educators who are learning about Georgia-based science and mathematics by actually *DOING* scientific research. These educators are working in the field with the scientists. This seems to be a growing trend and is turning out to be a great win – win situation.

While on Sapelo, we ran into a group of teachers taking advantage of another program offered through The UGA Marine Education Center & Aquarium (MECA) in Savannah. There are also education opportunities for teachers to take their own groups to Ossabaw Island. Other teachers are taking advantage of NOAA's "Teacher at Sea" programs.

Moving away from our coast, Little River Canyon Field School presented "From Mountains to the Sea" for teachers from Alabama, Georgia, and Tennessee. Holbrook Travel Company took teachers even farther away – even as far as New Zealand. The National Geographic Society offered the Geography Action 2003 Institute and NASA provided learning experiences by revisiting the Lewis and Clark expedition. Chemistry, geology, zoology, technology, research, fun . . . you name it. There is something for everyone. I want to do it all!! What I have mentioned just scratches the surface of possibilities. One thing is for sure . . . resting during the summer is a myth. Good teachers just keep right on going and what an advantage it is for the students whose learning they are facilitating. I look forward to reading the articles that I know are going to be written by these teachers to share their experiences.

Don't forget to apply for awards, grants, and scholarships through GSTA to help fund your way for next year's opportunities. Application packets are due by October 25th.

GSTA will continue to keep you informed of the variety of opportunities available. Just keep reading and contributing to OBSERVATIONS and THE GEORGIA SCIENCE TEACHER, and checking in on the web site at [www.georgiascienceteacher.org](http://www.georgiascienceteacher.org).

This is going to be a great year!!!

*Venetia Butler*  
GSTA President

**NASA and GSTA's Observations**

Beginning with this issue of Observations, the NASA Space Place Program will be providing GSTA members with articles in each upcoming issue of our newsletter. They have a number of resources available, particularly for earth and space science teachers. For additional information, visit their websites listed below.

<http://spaceplace.jpl.nasa.gov>  
<http://scijinks.jpl.nasa.gov>

# Musical Satellites

By Tony Phillips



*"If light were sound, then chemicals would play chords."*

Water: C major. Cyanide: A minor. Chlorophyll: G diminished 7th. (Please note that the choice of chords here is only for the sake of illustration, and not meant to reflect the actual spectra of these chemicals.)

It's a loose metaphor, but an apt one. Musical chords are combinations of frequencies of sound (notes), while chemicals leave unique combinations of dips in the frequency spectrum of reflected light, like keys pressed on a piano. Spectrographs, machines that recognize chemicals from their "chords of light," are among the most powerful tools of modern chemistry.

Most earth-watching satellites, like the highly successful Landsat series, carry spectrographs onboard. These sensors measure the spectra of light reflected from forests, crops, cities, and lakes, yielding valuable information about our natural environment. Current satellites do this in a fairly limited way; their sensors can "hear" only a few meager notes amid the symphony of information emanating from the planet below.

EO-1 could change that. Short for "Earth Observing 1," EO-1 is an experimental NASA satellite in orbit since 2000. It's testing out a more advanced "spectrometer in the sky"-the Hyperion hyperspectral imager. How good is it? If Landsat were "chopsticks," EO-1 would be Gershwin's "Rhapsody in Blue."

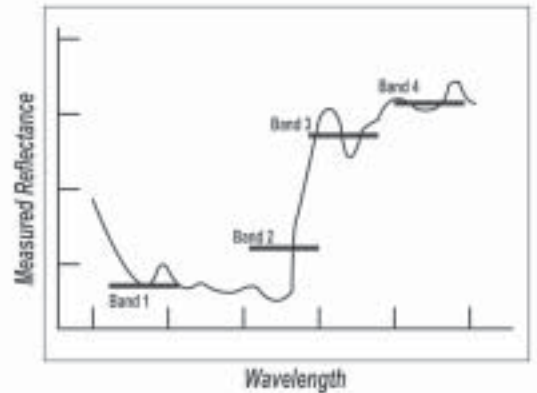
The Hyperion sensor looks at 220 frequencies in the spectrum of visible and infrared light (0.4 to 2.5 microns) reflecting off Earth's surface. Landsat, in contrast, measures only 10. Bryant Cramer, who manages the EO-1 project at the Goddard Space Flight Center, puts these numbers in perspective. "If we flew Landsat over the northeastern United States, it could readily identify a hardwood forest. But using hyperspectral techniques, you probably can . . . tell the oak trees from the maple trees."

Future earth-watching satellites may use Hyperion-like instruments to vastly improve the environmental data they provide. EO-1 is paving the way for these future missions by taking on the risk of flight-testing the sensor for the first time.

For farmers, foresters, and many others, this new remote sensing technology will surely be music to the ears.

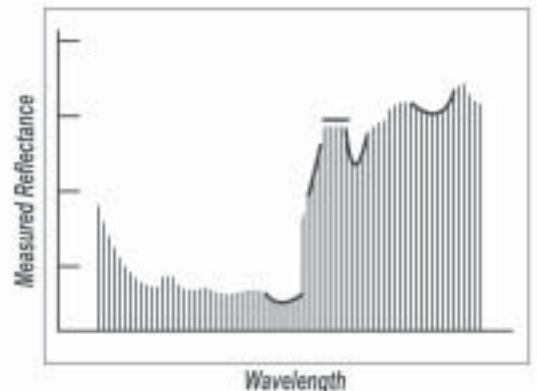
Read about EO1 at <http://eo1.gsfc.nasa.gov> . Budding young astronomers can learn more at [http://spaceplace.nasa.gov/eo1\\_1.htm](http://spaceplace.nasa.gov/eo1_1.htm) .....

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



**Multispectral Imaging (few bands)**

Hyperion instrument distinguishes hundreds of wavelength bands, while current Landsat instrument images only a few.



**Hyperspectral Imaging (hundreds of bands)**

## Counties in GSTA Districts

- District I** Dade, Catoosa, Walker, Whitfield, Murray, Gordon, Chattooga, Floyd, Bartow, Polk, Paulding, Harralson
- District II** Cherokee, Forsyth, Hall, Banks, Franklin, Hart, Stephens, Habersham, White, Lumpkin, Dawson, Pickens, Gilmer, Fannin, Union, Towns, Rabun
- District III** Cobb, Douglas, Fulton, Clayton
- District IV** Jackson, Madison, Elbert, Barrow, Jasper, Oconee, Clarke, Oglethorpe, Wilkes, Lincoln, Taliaferro, Greene, Putnum, Morgan, Walton
- District V** Carroll, Heard, Coweta, Fayette, Henry, Spalding, Butts, Lamar, Pike, Meriwether, Troup, Upson
- District VI** Harris, Talbot, Taylor, Macon, Muscogee, Chattahoochee, Marion, Schley, Sumter, Webster, Stewart, Randolph, Clay, Quitman
- District VII** Monroe, Jones, Baldwin, Wilkinson, Twiggs, Bibb, Crawford, Peach, Houston, Bleckley, Laurens, Treutlen, Montgomery, Wheeler, Dodge, Pulaski, Dooly, Wilcox, Telfair
- District VIII** Jeff Davis, Appling, Wayne, McIntosh, Long, Liberty, Bryan, Chatham, Effingham, Bulloch, Chandler, Evans, Tattnell, Toombs
- District IX** Hancock, Warren, McDuffie, Columbia, Richmond, Burke, Jefferson, Washington, Johnson, Emanuel, Jenkins, Screven, Glascock
- District X** Clinch, Ware, Charlton, Camden, Glynn, Brantley, Pierce, Bacon, Coffee, Atkinson
- District XI** Terrell, Lee, Crisp, Turner, Ben Hill, Irwin, Tift, Worth, Dougherty, Calhoun, Early, Baker, Mitchell, Colquitt, Cook, Berrien, Lanier, Echols, Lowndes, Brooks, Thomas, Grady, Decatur, Seminole, and Miller
- District XII** DeKalb, Gwinnett, Newton, Rockdale

# Toyota TAPESTRY Grants for Teachers

## WHAT IT IS:

Up to \$500,000 (50 grants of up to \$10,000 each) is available to teachers who propose innovative one-year projects that will enhance science education in their schools and a minimum of 20 "mini-grants" of \$2,500 each are available in 2004. Toyota will award a total of \$550,000 in grants under the TAPESTRY program in 2004.

## WHO IS ELIGIBLE:

Open to K-12 science teachers. Middle and high school classroom science teachers who spend at least 50% of their classroom time teaching science and teach a minimum of two science classes are eligible. Elementary teachers who teach some science in a self-contained classroom setting or as teaching specialists are eligible. Applicants must have at least three years science teaching experience prior to the present year. These guidelines apply to the project director only. Project staff may be teachers from any discipline or may be non-educators.

## HOW TO APPLY:

1. Obtain the Toyota TAPESTRY Proposal Cover Form and program rules by calling 1-800-807-9852 or visiting our website at [www.nsta.org/programs/tapestry](http://www.nsta.org/programs/tapestry) and downloading an application.
2. Design and plan a one-year long project that centers on environmental science, physical science applications (applied physics, chemistry, and technology) or literacy and science.
3. Projects should demonstrate creativity, involve risk-taking, possess a visionary quality, and model a novel way of presenting science.
4. Projects should involve hands-on activities, have an interdisciplinary approach and relate science to students' lives.
5. Write a proposal according to the TAPESTRY rules. Required proposal components include a signed and completed Cover Sheet, Summary, Description, Rationale, Potential Impact, Evaluation Plan, Project Calendar, Budget (up to \$10,000), Project Staff Vitae, and letters of support. For the mini-grants, you need to submit a Cover Sheet, Summary, Description, Budget and one letter of support.
6. Mail completed Toyota TAPESTRY Proposal Cover Form, and typed proposal to:

Toyota TAPESTRY Grants c/o NSTA 1840 Wilson Blvd. Arlington, VA 22201-3000
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APPLICATION DEADLINE: Received at NSTA by January 16, 2004

## AWARDS GIVEN:

- Grants:* Up to 50 grants of up to \$10,000 each will be awarded this year. In addition, a minimum of 20 "mini-grants" of \$2,500 each will be awarded.
- Trips:* The 50 project directors of the larger grants will be flown to Atlanta for the Awards Banquet held during the NSTA National Convention, April 1-4, 2004.

SPONSORED BY: Toyota Motor Sales U.S.A., Inc. (administered by the National Science Teachers Association)

Note: Now open to the 50 U.S. states and all territories and possessions of the U.S.  
For links to winning TAPESTRY projects and more information on how to apply, visit our website at <http://www.nsta.org/programs/tapestry>

# SouthEast Center for Ocean Sciences Education Excellence Ocean Sciences Education Leadership Institute

*By Margaret Olsen, SECOSEE Education Specialist*

The first-ever *SECOSEE Ocean Sciences Education Leadership Institute* took place from July 22- July 27 in Wilmington, NC. Twenty-nine participants from throughout NC, SC and GA participated in the inaugural *Leadership Institute*. Participants included 10 teachers from NC, 9 teachers from SC and 10 teachers from GA. There were 12 middle grade teachers, 13 high school science teachers and 4 media coordinators. The teachers from Georgia included Mikie Emerson, Donald Glenn, Priscilla George, Sharon Jaspán, Brenda Lewis, Katrinka Major, Rob Prestley, Jerri Reining, and Leigh Scott.

The *Institute* was held on the campus of the University of North Carolina-Wilmington at the Center for Marine Sciences (CMS) and Dobo Hall. Two sessions were held in the learning classroom at the NC Aquarium at Fort Fisher.

The major focus for this *Institute* was undersea research and exploration. Paula Keener-Chavis, NOAA/Ocean Explorations, presented curriculum lessons and experience with the resources on the NOAA/OE web site. Andy Shepard of the NOAA National Undersea Research Center provided two half-day experiences on the *R/V Cape Fear* where the participants tested the *ROV Phantom* and ocean chemistry instruments with Rachel McEvers and Dewey Golub from Project Oceanica. Martin Posey, marine benthic biologist with UNC-W, shared his research on hard bottoms and adjacent sandy habitats. Colleen Karl from NCSU's The Science House introduced the NESDIS ocean remote sensing lessons on the web, and Dr. Carrie Thomas from NC State presented an overview of remote sensing. Susan Lovelace from North Carolina Estuarine Research Reserve Education Program organized a canoe day on the estuary at Zeke's Island and invited Dan Rittschof from Duke Marine Laboratory to introduce his research on blue crabs. Peggy Sloan from the North Carolina Aquarium at Fort Fisher hosted dinner and provided a tour of the aquarium.

The follow-up activities from the June Institute provide for outreach and implementation of concepts from the presentations and experiences. Twelve clusters of teachers will partner with a nonformal education site to develop and implement a one-day inservice workshop. These are called "SE PORT" days (South East Portal for Ocean Research and Teaching). SECOSEE's objective is for these SE PORTs to be sites for ocean science and ocean education distribution. The following institutions have agreed to partner with SECOSEE as SE PORT sites: SC State Museum; SC Aquarium; Discovery Place in Charlotte; Fernbank Science Center in Atlanta, MECA in Savannah; Georgia Aviation Museum; West Georgia University; NC Museum of Life Sciences; NC State Museum of Natural History; NC Aquarium at Fort Fisher; NC Math and Science Education Center at ECU in Greenville and the ACE Basin NEER in Colleton County, SC. If you would like more information about a SE PORT Day near you, please contact Jennifer Jolly Clair at jollyclairj@cofc.edu.

The second *Ocean Sciences Education Leadership Institute* will be hosted by the University of Georgia Marine Education Center and Aquarium and Skidaway Institute of Oceanography from June 24-July 1, 2004. The major partners for this *Institute* will include Georgia Sea Grant, Georgia Marine Extension Program, NOAA/Office of Ocean Exploration, Grays Reef National Marine Sanctuary, and Sapelo Island Estuarine Research Reserve. The third *Institute* rotates to South Carolina in 2005. Details are now being developed.

If you would like more information on becoming involved with SouthEast COSEE, please contact Margaret Olsen, Education Specialist, at [olsen@uga.edu](mailto:olsen@uga.edu), or Dr. Lundie Spence, Director, at [lundie.spence@scseagrant.org](mailto:lundie.spence@scseagrant.org).

## GSTA Membership Application

Send applications (with check) to: GSTA • P.O. Box 2668 • Stockbridge, Georgia 30281

Please check one:  new member or  Renewal

Name: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_-\_\_\_\_ (h) / (\_\_\_\_) \_\_\_\_-\_\_\_\_ (w)

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

e-mail address: \_\_\_\_\_ GSTA District: \_\_\_\_\_

Employer: \_\_\_\_\_ School & System: \_\_\_\_\_

Level (check one):  Elementary  Middle  High  University  Other

Subject Area (check most appropriate):  Life Science  Earth Science  Physical Science

Dues: Regular \$30.00 / year • \$50.00 / 2 years • \$75.00 / 3 years (fiscal year is July 1 through June 30)

Student \$10.00 (Must be a full time undergraduate or graduate student, confirmed by major professor's signature)

Please check here if you are willing to contribute \$5.00 of your dues to support scholarships and awards through the GSTA Foundation. Additional amount: \$ \_\_\_\_\_

New member sponsor: \_\_\_\_\_ (not required for membership)

# Georgia Science Olympiad

Science Olympiad is a national k-12 program whose goals are to increase interest in and knowledge of science. Science Olympiad covers earth, life and physical science as well as some engineering and communication skills. The program utilizes the athletic model of preparation, teamwork and recognition and supports state and national science standards.

The grades K-3 program is an in-class (non-competitive) activity. The grades 3-6 program is a school system program that is somewhat competitive.

At the middle school (B division) and high school (C division) levels, teams of up to 15 students compete at regional tournaments. In each of the 23 events, two or more students work collaboratively. Approximately the top 20% of the teams from each regional then

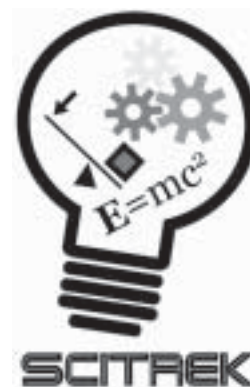
compete at the state tournament. The top two middle school and high school teams then compete at the national tournament.

Georgia middle and high school tournaments are held at a college or university campus with faculty running most of the events. Georgia's Science Olympiad program is currently about the sixth largest in the nation and Georgia Middle Schooler's have been the national champions since 1996. About 30% of Georgia's middle and high school students participate in the Science Olympiad.

The registration form can be found on the adjacent page (7). For additional information you can visit [www.gsu.edu/gso](http://www.gsu.edu/gso) or contact Milton Stombler at [mstombler@gsu.edu](mailto:mstombler@gsu.edu).



## SDU Classes at SciTrek!



Teachers, are you looking for a fun, hands-on, exciting way to renew your Georgia teaching certification? Join SciTrek Science Museum for one credit SDU science classes for first through eighth grade teachers beginning in September of 2003.

Each course will use grade level QCC objectives as a springboard into hands-on, minds-on science instruction for students. Teachers will have fun delving into curriculum-aligned activities designed to bring experiential learning to life in the classroom. Teachers will also take home a notebook filled with QCC-aligned, hands-on science lessons designed to raise student achievement.

How much does it cost? That's the best part . . .

**It's free!** Courses will be held on select Tuesday evenings throughout the school year from 4:00pm-7:30pm at SciTrek, conveniently located at 395 Piedmont Avenue in downtown Atlanta. SciTrek will provide all necessary materials as well as refreshments. (See schedule of classes below.)

SciTrek's website will have more complete course descriptions posted this summer, and the online registration process will be available beginning in late July. Please visit [www.scitrek.org](http://www.scitrek.org) for more detailed information. (Click on the teacher resources button under the education tab.) Also, feel free to direct questions to Kathleen Boyle at [education@scitrek.org](mailto:education@scitrek.org) or 404-522-5500 x245.

We look forward to working with you this fall!

	<b>1<sup>st</sup> Session*</b>	<b>2<sup>nd</sup> Session*</b>	<b>3<sup>rd</sup> Session*</b>
<b>1<sup>st</sup> Grade Teachers</b>	September 9, 2003	September 16, 2003	September 23, 2003
<b>2<sup>nd</sup> Grade Teachers</b>	September 9, 2003	September 16, 2003	September 23, 2003
<b>3<sup>rd</sup> Grade Teachers</b>	November 4, 2003	November 11, 2003	November 18, 2003
<b>4<sup>th</sup> Grade Teachers</b>	November 4, 2003	November 11, 2003	November 18, 2003
<b>5<sup>th</sup> Grade Teachers</b>	January 13, 2004	January 20, 2004	January 27, 2004
<b>6<sup>th</sup> Grade Teachers</b>	January 13, 2004	January 20, 2004	January 27, 2004
<b>7<sup>th</sup> Grade Teachers</b>	March 2, 2004	March 9, 2004	March 16, 2004
<b>8<sup>th</sup> Grade Teachers</b>	March 2, 2004	March 9, 2004	March 16, 2004

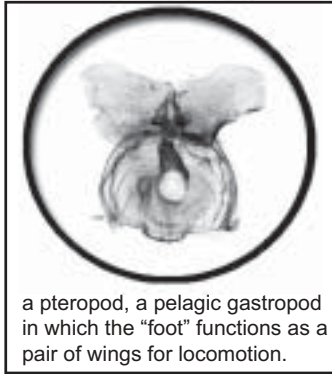
\* Note: Teachers must attend all three sessions of a course from 4:00pm-7:30pm in order to earn an SDU credit.



"Live" From The Reef, continued from page 1...

samples from Wassaw Sound out to the reef, 17.5 miles offshore of Sapelo Island, and then to survey the site using an ROV (Remotely Operated Vehicle) with the help of the NOAA staff.

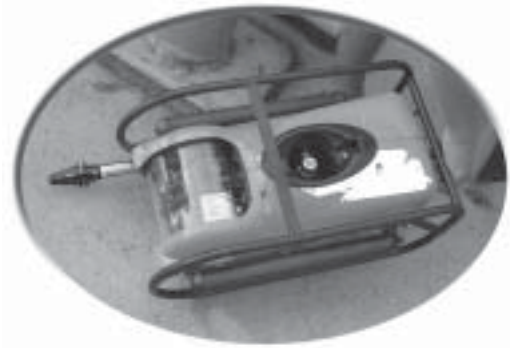
Beginning in Wassaw Sound, the teachers collected samples at 4 stations on the way to the reef. The crew would deploy the "CTD" (see illustration on page 1) for measuring a variety of chemical and physical parameters. The teachers would also collect plankton samples, finding many crab zoea (larvae) close to shore and pelagic organisms such as chaetognaths and pteropods further offshore. All of the information and data was logged into journals and entered into an GIS dataset while enroute.



a pteropod, a pelagic gastropod in which the "foot" functions as a pair of wings for locomotion.

At Gray's Reef the ship was met by a NOAA dive boat, and the divers helped secure the Savannah to the mooring. The ROV was launched and the teachers got to observe the rocky ledges of the reef with its resident sponges, fish, and invertebrates on the monitor by maneuvering the ROV from topside (see illustrations at right).

As all of this was taking place the WSAV TV crew was making preparations for its "Live From The Reef" broadcast slated for the 6 PM newscast. Using the ROV video feed, auge dive masks (so the divers could talk with us at the surface), and the same satellite video-telephone equipment used to broadcast live from Iraq, the news team delivered about 3 minutes of "live" news from the ship 17 miles offshore and from sixty feet down on the ocean floor. To our knowledge, this is the first time something like this had been done on "live" TV.



above: the NOAA ROV deployed during COASTLINES2003  
below: the view from the ROV



Plans are already underway for a repeat of the 2002 course "Rivers to Reefs" which also involves a day spent aboard the Research Vessel Savannah and a visit to Gray's Reef. Visit the UGA Marine Education Center & Aquarium's website at [www.uga.edu/aquarium](http://www.uga.edu/aquarium) to learn more about upcoming teacher workshop opportunities (3 planned for the summer of 2004).

## Unique Science Program for GSTA Classrooms

Steve Creech, Wyland Foundation

In fall 2003, the Scripps Institution of Oceanography (<http://sio.ucsd.edu/>) of the University of California San Diego, the Birch Aquarium at Scripps (<http://aquarium.ucsd.edu/>) and the Wyland Foundation (<http://www.wyland.com>) will introduce the Wyland Ocean Challenge, "Clean Water for the 21st Century," a new marine life art and science educational curriculum available free to every classroom, K-6, in the United States. The program meets all national standards for science and art, and is filled with art activities, case studies, and science experiments to teach students about the wonder of water on our planet. The program is explained in more detail at <http://www.wylandoceanchallenge.org>

This program was designed by teachers, working hand in hand with scientists, and conservationists such as Wyland to encourage creative exploration of our planet's water systems. It is completely non-profit, and as such we are dependent upon associations such as yours to let teachers know about our web site where they can get free downloadable activities and classroom materials. Our past programs have been supported by such people as United Nations Secretary General Kofi Aanan, vice president Al Gore, and scientists such as National Geographic's Dr. Sylvia Earle and Robert Ballard.

The program uses the Landmark Understanding by Design\* methodology of integrated curriculum (Grant Wiggins and Jay McTighe, Association for Supervision and Curriculum Development, Alexandria, VA, 1998.) by identifying and creating units to support enduring knowledge. Each activity has been designed to support the National Science Education Standards and National Visual Arts Standards, and is presented in a way that is both meaningful and captivating. Through scientific inquiry, creativity, service learning, and cooperative study methods, the activities give students the confidence to learn more fully, express themselves more creatively, and to become stewards in the preservation of the water systems of our planet.

Northeast GYSTC presents their Winter Professional Development Series

## Wings of Wonder Mexico

Mexico is a land of beautiful extremes. Pine-clad mountains, tiny indigenous villages, humid forests, ancient ruins, bustling metropolitan centers, arid deserts, and beautiful beaches all exist within its 756,000 square miles. Your journey will take you to the heart of the Mexican highlands to witness one of North America's most amazing migrations – the migration of the beautiful Monarch butterfly. The location of the Monarchs' winter sanctuary was known only to local villagers until 1975 when the scientific community finally uncovered the sites high in the Transvolcanic Mountain Range of Michoacán, Mexico. As participants in the Wildlife Habitat Council's Wings of Wonder program, Team Monarch educators will have the opportunity to "migrate" with the monarchs to Mexico - establishing relationships with partner educators in Mexico, visiting the Monarch sanctuaries of el Rosario and Chivati-Huacal, and exploring the cultural and natural history of authentic Mexico!

### Program Highlights

- Explore the world famous Monarch butterfly sanctuaries of el Rosario and Chivati-Huacal
- Exchange ideas with Mexican educators to forge new conservation and education partnerships
- Discover the cultural and natural history of authentic Central Mexico
- Search for bat colonies in the caves near Chivati-Huacal
- Visit the colonial cities of Morelia and Zitacuaro
- Hone your birding skills as you explore the wintering sites of neotropical migratory birds.
- Discover the beauty of the Sun and Moon Lagoons in the volcanic crater of Nevado de Toluca

#### Logistical Overview:

- Length = 8 Days
- Best time of year to go is November to February
- Dates of Travel: December 27, 2003 - January 3rd, 2004

#### Primary Emphasis:

- Monarch Butterflies & their Migration
- Natural History
- Ecosystem Ecology
- Biodiversity
- Cultural Awareness & History
- Conservation in Action
- Education in Mexico

**Northeast GYSTC “Wings of Wonder” Itinerary (continued) ...**

December 27th            Mexico City

Upon arrival at the Benito Juarez International Airport and after clearing immigrations and customs, our local representative will meet you and transfer you to the Hotel Majestic. Located in the Zocalo, Mexico City’s main square, the Hotel Majestic is within walking distance of National Palace, the Metropolitan Cathedral and the City Hall Buildings and just two blocks away from the Aztec Grand Temple Ruins & Museum. Enjoy a program orientation with your guide before dinner. Overnight at the Hotel Majestic. (D)

December 28th            San Juan del Río

Arise early this morning and depart for the village of San Juan del Río, in the Mexican state of Querétaro. Located north of Mexico City, the village is a popular weekend outing from the capital and is well known for its thermal springs, wonderful climate, and local artisans that specialize in wicker furniture, jewelry and woolen goods. Upon arrival enjoy lunch in the historic district followed by an exploration of the city’s historical sites – including the Bridge of History, the Colonial-Style Church of Santo Domingo, the Museum of the Santa Veracruz, where priceless jewels, paintings and archaeological pieces of this region are exhibited, and the Hacienda de la Llave, situated in the outskirts of the town. Arrangements to meet the principal of the Beni to Juarez elementary school have been made. Overnight at the Mision la Mansión. (BLD)

December 29th            Morelia

This morning you will begin your journey to the highlands in search of the Monarch Butterfly! The central volcanic highlands of Mexico are home to the Oyamel fir forest ecosystem favored by the Monarchs. This unique ecosystem provides specific microclimatic conditions necessary for the Monarchs’ long stay in Mexico. In 1986, a total of 16,110 hectares of this habitat was formally protected by federal law and the Reserva de la Biosfera Mariposa Monarca was created. The reserve protects 5 of the 13 known overwintering areas. Logging occurs in and around these sanctuaries — on a legal and illegal basis — posing a serious threat to the monarch’s winter habitat. Each sanctuary consists of a nuclear zone where logging is strictly prohibited, and a buffer zone in which limited cutting is allowed. Following breakfast at the hotel, you will depart for the Chivati-Huacal Butterfly Sanctuary. This sanctuary is located between the mountainous peaks of Chivati and Huacal and is home to some of the best-preserved forests in the area. In addition to witnessing the awesome spectacle of an entire forest awash in the brilliant orange and yellow wings of millions of Monarchs, you will also enjoy spectacular birding in the Chivati-Huacal Reserve. Your guide will assist you in identifying various tropical and neotropical bird species, including the migratory hummingbirds that populate the Michoacán area. Following your visit to the sanctuary you will explore the caves located east of the Huacal peak in search of bat colonies. Return to the beautiful city of Morelia and enjoy its wide boulevards, shady parks, and colonial architecture. Overnight at the Hotel de Catedral Morelia. (BLD)

December 30th            Morelia

Enjoy breakfast at the hotel and then depart for Lake Pátzcuaro, set in the coolness of the Michoacan hills at an elevation of 2,200 meters above sea level. Surrounding the lake are a number of villages, each producing one or several arts and crafts specialties. En route to Lake Pátzcuaro, you will visit the village of Tzintzuntán (place of the hummingbirds). Once the capital of a Tarascan Empire, the restored ruins (yacatas) of which are visible as you enter the village, Tzintzuntán is known for its basketry and straw crafts, rustic, carved wooden furniture, green glazed pottery and woven goods. Following lunch you will navigate the waters of Lake Pátzcuaro to enjoy excellent birding and stunning scenery. Approximately 15 miles long, Lake Pátzcuaro is nestled amid volcanic peaks and is famous for its “pescado blanco” (white fish) which are still caught in traditional butterfly nets cast from colorful canoes. Overnight at the Hotel de Catedral Morelia. (BLD)

December 31st-Jan 1st    Angangueo

The quaint town of Angangueo (mouth of the cave) is located at an altitude of 8,000 feet and is nestled in a canyon carved by the Rio Puerco. Spend the next two days exploring this mountainous area made famous by the “discovery” of the Monarch wintering sites nestled in its hillsides. The el Rosario Monarch Butterfly Sanctuary lies just 6 kilometers from the town of Angangueo and you will have ample time to enjoy the spectacular congregation of Monarchs found in the reserve. It is estimated that every winter over 100 million monarch butterflies migrate from Canada and the U.S. to spend the winter secluded in the pine and fir forests of the area. Overnights at Albergue Don Bruno.(BLD)

(continued on page 11)

Northeast GYSTC “Wings of Wonder” Itinerary (continued)

January 2nd Mexico City

Following breakfast you will depart for Mexico City with time to visit several interesting sites along the way. Your first stop will be Laguna de Avandaro (dream place in the Tarascan Indian language) in the village of la Cueva de Leon where you will board a boat and spend the morning exploring the lake in search of birds and other wildlife. Following lunch continue on to the National Park of Nevado de Toluca and the eroded strato volcano of the same name. The scenery is beautiful and as you make the ascent the vegetation changes dramatically. The crater of the volcano has two beautiful lakes (El Sol and La Luna), stunning views and even some archeological remains. Later in the afternoon continue on to your overnight accommodations in Mexico City for your farewell dinner. Overnight at the Hotel Majestic. (BLD)

January 3rd Farewell

Today you will be transferred to the Benito Juarez International Airport for your departure flight home. Holbrook was founded on the principle that travel fosters a greater understanding of our world’s cultural and natural treasures and that these experiences allow individuals to become agents for global change. We hope that your experiences in Mexico and your encounters with the Monarchs of Michoacán will remain with you forever and will challenge you to make a difference in the world we share!




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## What Does GSTA Do For Science Teachers?

- GSTA provides an organized voice for our profession in communicating and networking with businesses, scientists, government, and other local, state and national organizations.
- Science teachers are kept informed of current practices in science teaching and important events in Georgia and the nation through GSTA’s journal, **The Georgia Science Teacher**, and the newsletter, **Observations**.
- GSTA employs a political advocate to keep the organization informed of upcoming legislation and to pave the way for organization officials to meet with government representatives to express the position of GSTA to those who make legislation.
- GSTA provides well deserved recognition for science teachers through several awards:
  - \*Science Teacher of the Year (at district and state levels)
  - \*Teachers of Promise ( elementary, secondary and college)
  - \*Lifetime memberships (awarded to retired members)
  - \*The Dallas Stewart Award (for providing leadership to GSTA)
- Science teachers are given opportunities for professional growth and renewal through Mini Grants, Universal Staff Development Day and the Annual Science Teacher’s Conference.

Being a part of GSTA provides opportunities to connect with your peers to exchange ideas, compare teaching techniques, and discuss experiences in and out of the classroom. It provides access to current information in science education through the District Directors. Additionally, membership provides an avenue for communicating your concerns and ideas to the State Department of Education and the Georgia Legislature. You can take an active role in determining the future of science education in Georgia by your participation.

*This year*, because GSTA will be the host state for the National Science Teachers Association national convention in April, you can choose a **joint membership** in GSTA/NSTA. Both organizations have reduced the membership fee to offer a joint membership. The benefits include all of the above plus your choice of one NSTA professional publication: **Science and Children** (K-6), **Science Scope** (6-9), **The Science Teacher** (9-12), or **The Journal of College Science Teaching**. NSTA members receive a 10% member discount on all NSTA Book Store publications; reduced registration fees at NSTA conferences; the newsletter, **NSTA Reports**; and, timely legislative updates via e-mail.

## GSTA Conference Inspires Another “Teacher At Sea”

When I received the last issue of Observations I was thrilled to see Mildred Chamblee’s experience with NOAA’s Teacher at Sea Program because I had just received an email that I was accepted to be a teacher at sea on the Oregon II in the Gulf of Mexico. Rear Admiral Evelyn Fields, Director of NOAA, left a lasting impression when she spoke at the GSTA conference in February. When I returned home I pulled up the website she spoke about and began to read. I downloaded the application and decided I would apply. It was a good time for me to reflect on my teaching career and how I could take an experience such as this and bring it to life in my classroom.

As the months went by after I submitted my application I began to wonder if I would hear anything with summer soon approaching. Then one evening I was checking my email and had a message from Janice Svien the Teacher At Sea coordinator, stating that the Oregon II had a space for me in June if I were available. I was like a kid at Christmas thinking —“Wow, I get to go!”

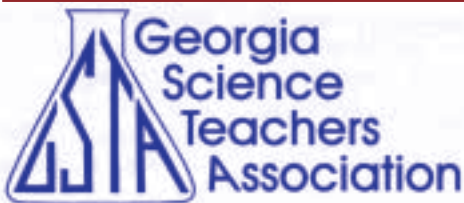


The Oregon II voyage would be a SEMAP (Southeast Area Monitoring and Assessment Program) cruise which involves federal, state, and university cooperation to collect, manage and distribute fishery independent data. The ship left Pascagoula, Mississippi on June 10<sup>th</sup> and was scheduled to return June 13<sup>th</sup>. I say scheduled because due to mechanical and technical difficulties the captain made the decision to head back to port the following day (11<sup>th</sup>).

My whirlwind experience consisted of data collection of ichthyoplankton samples to map distribution of fish eggs and larvae with bongo tows and neuston tows. We also collected environmental data with a CTD which stands for Conductivity (salinity), Temperature, and Depth. During my time on board we did one bottom trawl which involves the deployment of a 40-foot shrimp net over a specified depth stratum. The catch was brought aboard, and then we sorted, identified, and measured. We did it all basically by hand since most of the usual equipment was not working properly. This was a first hand experience and one that I would recommend to anyone who is interested in learning more about fish and how data is collected from our oceans. Learn more about the Mississippi laboratories and the Teacher At Sea program visit: <http://www.mslabs.noaa.gov/index.html> and <http://www.tas.noaa.gov>

Tammy Shiflett is a Venture K-5 teacher at C. A. Roberts Elementary school.

Left: Tammy Shiflett investigating an angel shark (sand devil) *Squatina dumeril*.



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### OBSERVATIONS

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