UNC Sea Grant

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COAST WATCH

Puerto Rican exchange takes teachers back to school

Photo by Sarah Friday

It didn't take much advertising for Lundie Spence, UNC Sea Grant's marine education specialist, to round up a group of qualified teachers for a special workshop in Puerto Rico July 14 to 22. Sixteen educators from North Carolina and Puerto Rico signed on the dotted line, paid their money and joined Spence and Juan Gonzalez, Puerto Rico Sea Grant's marine education specialist, for a unique cultural and scientific exchange program on the southwestern coast of the island. For the entire week, it was the teachers' turn to learn.

Wanted: Teachers with a sense of adventure and a desire to explore. Must be willing to travel. Full-time one week position available. Fringe benefits to last a lifetime.

"This was a pilot program to see if the two education systems could work bilingually and biculturally. And it did," says Spence. "It took some translators. But on the whole, because we were using hands-on activities, language and culture were not a barrier. There was a definite exchange and a comradery."

Eight teachers from North Carolina and eight from Puerto Rico crossed the language barrier and brought the classroom to life in the mountains, on the beaches and in the fields of Puerto Rico. The group spent part of the time in the class sharing curricula and studying the island's ecosystems, and the rest of the time probing those habitats.

For the teachers, this was a trip on the nature trail of their dreams. Coral reefs, mangrove swamps, tropical caves, experimental farms, rain forests and bioluminescent waters were located within two hours of their base in the village of Parguera.

"With a small amount of driving, these teachers were able to see a great diversity of habitats," says Spence. That's one reason she and Gonzalez chose

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Puerto Rico for the workshop.

Like Christopher Columbus and Richard Byrd, the teachers discovered new worlds they'd never seen before. All it took was a mask and a snorkel, a microscope, a pair of sneakers and an endless supply of curiosity.

Betty Dean of McLanesville made her greatest discovery out in the swampy waters of the mangroves. A paint box of vibrant colors swam right before her eyes as she hovered over the roots of the mangrove trees. Sea anemones, featherdusters, thin-shelled clams, algae and sponges created an underwater gallery of fine art. But "the neatest thing was the fish," she says. "When you first arrived, the fish would be scared away, but if you just hung there, they'd almost come up and kiss you."

The gallery extended to the coral reefs, too. Purple fan corals, yellow butterfish, orange brain corals, gold starfish and the clear, blue Caribbean water invited the educators to take the plunge and see the exhibits.

The best display came on a moonless night, in a warm Puerto Rican bay when millions of dinoflagellates danced in the water. When disturbed, these microscopic marine organisms set off a glowing sparkle. Swimming in the glittering light of Phosphorescent Bay was an experience many of the teachers will never forget.

"You could never, never have anybody explain to you what you're going to see," says Lucrecia Rousseaux of Charlotte. "There's such a big difference between seeing something in real life and looking at it in a book or at a movie. I know how enthused my kids are going to be when I tell them about it."

Photo by Sarah Friday

Puerto Rico's flowering hibiscus

Sharing experiences and sights not only enriched the cultural aspect of the exchange, but also gave the teachers something more than souvenirs to take back to school.

"We wanted the teachers to learn the details of one ecosystem and, hopefully, to see similarities in ecosystems close to home," says Spence. It didn't matter whether home was on the other side of the island or 1,500 miles north. "We were looking to focus on those points which make teachers of both regions work together." By exploring Puerto Rico's environment as a group, they found out how many of the ecosystems were alike. Puerto Rico's turtle grass beds resemble North Carolina's eel grass beds, for example. And the mangroves are similar to the state's salt marshes.

"We can take back what we've learned and compare the ecosystems," says Mary Kearns, a science consultant from Greensboro. "The things we did here were so varied. . . . If a teacher looks hard, she can find not an equivalent, but a substitute for the things we saw."

Dean didn't have to look very far to find something else the two groups had in common. "We worry about our salt marshes and the conservation of our coast. The Puerto Ricans have to worry about their coast, too," she says. "The bottom line is we're all one. We all have concerns. What one of us does affects others."

Take the rain forests, for example. They're disappearing quickly. North Carolina doesn't have rain forests, but teachers should tell their classes about them and their conservation, says Kearns. "The world's concerns are our concerns. It's alive for me."

"I look at my class, my biology class, now from a different point of view," says Maritza Febo of Rio Piedras, Puerto Rico. "Why forget the sea? It surrounds Puerto Rico and consititutes two-thirds of the surface of our planet Earth."

Febo and the other teachers are taking this new perspective to class this fall, along with materials, ideas and specimens they collected from the workshop. The return on their investment for the week's activities was even more than they imagined.

"I had good attitudes," Febo says, "but now they are more firm, more concrete—about teaching, moving my fellow teachers, moving my students in marine sciences. I'm bringing material—written material, visual material. I'm bringing collections—shells, a small algae collection and a small marine invertebrates selection."

The workshop helped Eva Corchado of Isabela, Puerto Rico, too. "My attitudes towards marine education have changed, therefore I will make sure that my students develop good attitudes, too. Among

others, I want them to respect, be interested and protect the environment, especially our marine ecosystems. I will introduce a chapter on mangroves, coral reefs, rain and dry forests when I teach my unit on environment and ecology. When I teach invertebrates, I will emphasize marine invertebrates."

"Almost everything we've done is applicable to modums in our classroom," says Frank Wheatley of Hampstead. This year, he plans to expand his biology and life science programs with information he gathered at the workshop.

Phares Sechler of China Grove also has some good ideas. She plans to transform her room into a ship or the ocean and integrate environments she saw in Puerto Rico into her chemistry, physics, earth and life science classes.

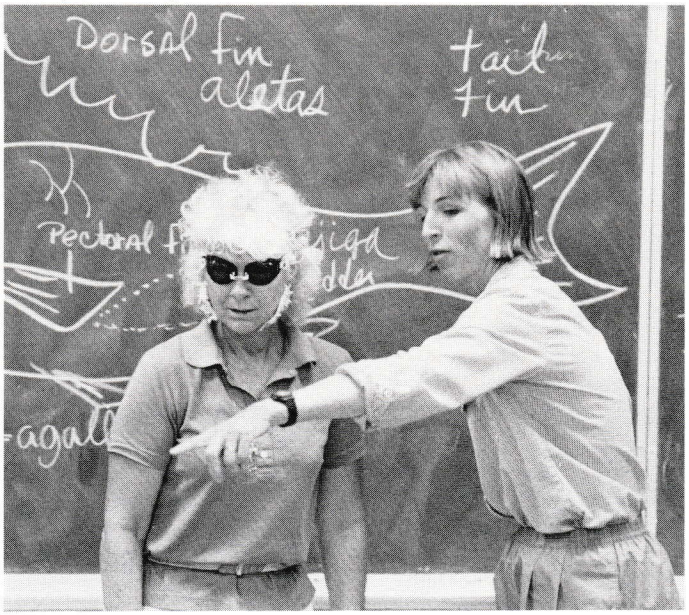
At a workshop like this one, Kearns adds, "the revitalization that the teachers experience is worth more than all the knowledge they gain, although that's important."

"This is the way you create interest," says Dean, "to get people to broaden their horizons. I think this is the kind of workshop that creates excitement."

During the week, excitement was one thing that never ran in short supply. Viewing the world's largest radar-radio telescope in Arecibo, discovering a mahogany tree, smelling fresh jasmine, seeing a barracuda eye-to-eye and meeting the people of a different culture were experiences each wanted to savor.

"We met these people on a one-to-one basis," says Spence. "Because of this, we were able to create friendships that are going to last. It's person-to-person contact that creates lasting effects. We will be sharing this for a long time."

Photo by Sarah Friday



Spence (right) and Dorothy Bjur of California explain the parts of a fish

And no doubt they will. Two North Carolina teachers started a newsletter to relay marine education ideas and news of the group. And next summer, the Puerto Rican teachers are planning to visit North Carolina.

"Because we had such a fine experience in Puerto Rico," says Spence, "we'd like to introduce the Puerto Rican teachers to a temperate environment and our educational system and involve the North Carolina teachers in looking more closely at their coastal habitats."

—Sarah Friday

Photo by Sarah Friday

Teachers explore coastal limestone formations that were once huge sand dunes

Teachers agree Spence in a class by herself

Photo by Allen Weiss

Lundie Spence

In class or out in the field, Lundie Spence plays the Pied Piper of marine science.

SARAH FRIDAY

Lundie Spence stood at the front of the classroom giving instructions for the day's activities. The students listened intently, writing down the important points. Somebody raised a hand and asked a question. It was like any other day at school. But it wasn't.

The students were teachers, half from Puerto Rico and half from North Carolina. And the class was on the Caribbean island, getting prepped on the various corals they'd see during the afternoon's snorkeling trip.

The beauty and variety of the tropical environments lured Lundie, Juan Gonzalez and the rest of the class to take the plunge and bring the classroom to life in Puerto Rico. For a week, the teachers watched the pictures in their science books back home come alive and added a few new pages of their own.

To Lundie, learning through involvement is the key to spurring educators' interest in marine science. She, Gonzalez and Manuel Hernandez, the Puerto Rico Sea Grant director, organized the Puerto Rico workshop with this in mind.

"I wanted to design a program in which teachers become immersed in the environment," says

Lundie. Showing them around won't do the job. They need to learn investigative techniques and how to apply a new awareness and understanding in the classroom.

Without a doubt, Lundie met her goals. A few hours a day, the group met in the classroom to discuss Puerto Rico's ecosystems and to trade resource materials. The remainder of the time they set out to smell, taste, feel, hear and see the island.

Out in the field, Lundie played a Pied Piper of sorts, leading the group through mucky swamps, knee-high grasses and tangled root systems looking for specimens. She was a whiz at naming almost any plant or slinky, slimy thing that crossed her path. Together with Gonzalez, a field guide and many of the Puerto Rican teachers, she pointed out and named most every crab, coral, grass, lizard, flower, fruit or tree along the way. If she couldn't answer a question herself, she quickly asked the closest authority.

"She's something special," says Lucrecia Rousseaux of Charlotte. "She's so patient and loving . . . so good about giving the information. She's so knowledgeable. It's an overwhelming experience. You never feel like she's being overbearing or this Spanish word "presumida"—presumptuous. She makes you feel good about what you're doing. The enthusiasm bubbles out of her."

If one of the teachers felt uncomfortable about her swimming or snorkeling skills, Lundie took her hand and guided her through the underwater world of boulder-sized corals and breath-taking beauty. When some of the class didn't understand a concept, she'd work through it with them until they did. And she was the first to make everyone feel at home, whether Puerto Rican or American.

"Lundie has a very organized sense of how to deal with people," says Phares Sechler of China Grove. "It keeps the workshop going and gets the job done.

"We could not get bored. There was more than enough for us to do. There was an allowance for us to be people, not just teachers. That's where a lot of the friendships were formed. When we shared curricula, everybody knew each other so well, it gave a beautiful depth to what people were sharing. We were able to appreciate where they were coming from."

Five days into the workshop, the group took an afternoon to go over resource materials Lundie and Gonzalez had gathered. The books and activities selected could be adapted to science classes at almost any grade level. When the materials were not directly applicable, the texts ignited new ideas for different projects.

The story doesn't stop with these teachers in that classroom. Many of them plan to use the information from the workshop to influence others in their school or area.

"I'm going to present a mini-Sea Grant, Puerto Rico workshop to my faculty," says Rousseaux. "I want to share it with my whole school. I'm going to take the materials I have to a central place where they can be used."

"In my school," says Maritza Febo of Rio Piedras, Puerto Rico, "I plan to get my fellow teachers moving." She wants to share her specimen collections and pictures from the workshop with them.

In addition, some of the Puerto Rican teachers are planning to meet with members of AMPEN, a marine and environmental education organization, to tell them about their experiences and share the materials. Through AMPEN, they'd like to develop a network of marine educators in Puerto Rico.

Lundie was the match that lit the blaze of enthusiasm in these teachers. In one week, her ideas, encouragement and confidence established new leaders in marine science education. From here, they'll take the flames and spread them to their students and other teachers. And so long as Lundie's around, there's little chance the fire will go out.

"I don't think that anybody could have put more into this workshop," says Kearns, "or that we could have gotten any more out of it."

Photo by Sarah Friday

For Lundie, teaching marine science comes naturally

Capturing the culture

Photo by Sarah Friday

The workshop mixed the cultures and curricula of the two countries

From the minute the plane touched down in San Juan, the North Carolina teachers felt welcome in Puerto Rico. Just as the wheels brushed the runway, about 300 passengers clapped fervently for the pilot.

It was a friendly and enthusiastic way to begin a week-long stay on an island posed between the Atlantic Ocean and the Caribbean Sea.

What was ahead for these teachers was a unique kind of summer school they would share with educators from a different culture. Class started when they landed, and didn't adjorn until they waved goodbye eight days later.

Immediate friendships were doubtful when the two groups first met on the back veranda of a small motel in Parguera. One group spoke mostly Spanish, and the other, mostly English. A few of the Puerto Ricans had been to America, but none of the North Carolinians had been to the island. It could have been a long week.

But a simple name game melted the ice. And soon, smiles, laughter, music, hand motions, drawings and a few translators dissolved the language barrier and helped create an atmosphere of sharing.

"I can't remember many times in my life when I have been in a place where almost every person near you was willing to give so much," said Maritza Febo. "Everywhere I looked, there was a group of English-speaking and Spanish-speaking persons struggling to communicate, to share knowledge, feelings, ideas. Language was no barrier."

"Living with the people, studying right along with them . . . that's what made this trip special," says Betty Dean. "I feel like I've been a Puerto Rican for a week."

To exchange ideas in the classroom, Spence, Gonzalez and the other speakers talked slowly and deliberately so everyone could understand. When information needed to be translated, one of four bilingual teachers would step in. However presented, the underlying message came through—that the teachers shared a common love of nature and of children.

"Their needs are the same. Their desires are the same," says Lucrecia Rousseaux. "They want the best for their children."

The North Carolina teachers found that their Puerto Rican counterparts want good school administrators, enthusiastic lectures, adequate texts and challenging curricula, too. But in Puerto Rico, they aren't always able to give their students what they'd like. Useful textbooks, for example, are rarely available. Latin American materials are not always suitable, they said, and those from the United States often need to be translated.

The workshop eased some of their frustrations. Spence doled out names and addresses of organizations that could provide assistance to Puerto Rican teachers. And Grace Lieberman, an education specialist with the World Wildlife Fund-U.S. in Washington, D.C., and Dorothy Bjur, a marine education consultant from Los Angeles, brought bilingual texts and activities.

Outside the classroom, the cultural exchange extended and intensified. "The Puerto Ricans are proud of their heritage and culture," says Mary Kearns, a science consultant from Greensboro. "They wanted us to see their festivals, to taste their foods, go inside their homes, meet their friends, hear their songs."

Experiences such as these gave the North Carolina teachers a better understanding of a different culture, one they could savor on their own or take back to school.

"Riding back on the boat from the mangroves, I decided I was going to teach my children Spanish this year," says Rousseaux, who teaches the fourth grade. "There's no reason why I can't teach them Spanish, the culture. It helps them understand the world is really a small place."

The students in Pam Milvaney's biology classes in Raleigh will get a taste of Puerto Rico this year, too. Milvaney brought back slides of the different ecosystems on the island, plant specimens and something else of value—the people. "I think anytime you go any place you bring back the people you met there," she says. "So when I show those slides, I'm sure I will incorporate the lifestyles of the people who live there along with the environments they live in."

"Being there" gave Mary Sue Lane of Apex new perspective, as well. "I've become much more aware of how others live," she says. "And as a teacher, this is important because I'm much more accepting of other people's opinions." This will make an impact on her teaching, she says, because she works in the only middle school in Wake County that has English as a second language. Before the trip, she always wanted to "Americanize" her foreign students. Now she realizes they have a separate culture that is important for them to retain.

—Sarah Friday

THE BACK PAGE

"The Back Page" is an update on Sea Grant activities — on research, marine education and advisory services. It's also a good place to find out about meetings, workshops and new publications. For more information on any of the projects described, contact the Sea Grant offices in Raleigh (919/737-2454). For copies of publications, write UNC Sea Grant, NCSU, Box 8605, Raleigh, N.C. 27695-8605.

Sea Grant has awarded mini-grant funds for an interdisciplinary study on marinas and their effect on coastal water quality. Participating in the project are John Fisher and Margery Overton, of the NCSU Department of Civil Engineering; Mark Sobsey, a UNC-Chapel Hill biologist; and Rick Perdue, of the NCSU Department of Recreation Resources Administration.

One of the problems associated with the increased number of marinas along the coast is the potential for degradation of water quality. The project, which includes funds from the N.C. Division of Coastal Management, will focus on several factors which may affect water quality: the number of boats, the type of marine sanitation device onboard, the frequency of boat use, the hydrographic patterns of the currents in the area, water temperature and salinity, and levels of coliform at the site.

Previously, it has been impossible to evaluate the complex issues related to marinas and their impact on coastal water quality, says Sea Grant Director B.J. Copeland. This study will provide researchers with some basic data.

Spencer Rogers, Sea Grant's coastal engineering specialist at Ft. Fisher, is looking for someone with property on an estuarine shoreline who can help him test a design for a small estuarine breakwater.

The property must be on southern estuaries in the state (the Neuse River and south). The area should have waves less than 3 feet and a flat offshore slope; the water depth should be 1 to 2 feet for the first 100 feet offshore.

Rogers will provide the design for the breakwater, and the homeowner must provide construction costs. He estimates the cost of the breakwater will be two-thirds to one-half that of a traditional bulkhead.

If you would like to talk with Rogers about the experiment, contact him at the Marine Resources Center at Ft. Fisher, P.O. Box 130, Kure Beach, N.C. 28449, or call 919/458-5780.

In 1984, prominent scientists from across the nation gathered in Raleigh to explore the future research needs of the nation's estuaries. This year, scientists will meet Nov. 12 to 13 in Baton Rouge, La., for the second in the series of symposia designed to examine relationships between scientific investigation and management of estuarine areas and resources.

UNC Sea Grant Director B.J. Copeland will serve as moderator for a session on mitigation measures. Joe Phillips, assistant director of the NCSU Agricultural Extension Service, will address the issue of citizen involvement.

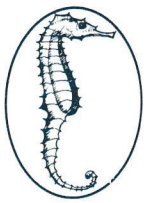
The symposium is sponsored by the National Sea Grant College Program and the National Marine Fisheries Service. For more information, contact Jo Paula Lantier at (504) 388-6445 or Donald Ekberg at (813) 893-3720.

Sea Grant Director B.J. Copeland will also serve as a panelist in a regional workshop on water quality and its relation to agriculture in the Southeast. The workshop will be held in Atlanta Nov. 7 to 8 and will draw together researchers, educators and participants from agricultural organizations and local, state and federal government.

For more information, contact the Southern Rural Development Center, Box 5406, Mississippi State, Miss. 39762, or call (601) 325-3207.

If your appetite for coastal information is just whetted by *Coastwatch*, then add another Sea Grant newsletter, *Coastal Heritage*, to your reading list. Published by the South Carolina Sea Grant Consortium, *Coastal Heritage* will feature program research, events, issues and activities. The newsletter will focus on such topics as aquaculture, advances in fisheries technology, resource management and erosion control.

For a free subscription to *Coastal Heritage*, write Communications, S.C. Sea Grant Consortium, 221 Fort Johnson Rd., Charleston, S.C. 29412-9110. To subscribe to *Coastwatch*, write Communications, UNC Sea Grant, Box 8605, NCSU, Raleigh, N.C. 27695-8605.



Lundie Spence, UNC Sea Grant's marine education specialist, recently received an Outstanding Extension Service award from N.C. State University in Raleigh. Of over 1,000 eligible candidates, Spence was one of eight selected for the honor.

Spence was recognized for her leadership in promoting marine education at the state and national levels. Since joining Sea Grant seven years ago, she has trained numerous North Carolina educators in marine science through workshops and resource publications. In 1979, she received the Governor's Award for Outdoor Educator of the Year. In addition, Spence served as president of the National Marine Education Association from 1983 to 1984, and as chair of the National Sea Grant marine educators in 1983. She was also in-

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strumental in initiating the national "World of Water"science fair competition and the National Youth Conference on Marine and Aquatic Science in 1984.

In a letter to Spence, NCSU Chancellor Bruce R. Poulton congratulated her by saying, "Your efforts and devotion to the application of knowledge for individual enrichment, community development and public service exemplify the spirit and mission of our Land-Grant University."

Chris Bender of Raleigh has a prize-winning style. He's one of 16 pre-college students recently named a winner in the second annual World of Water Competition. Sponsored by the National Marine Education Association, the competition recognizes students across the nation with exceptional marine science projects. Bender was selected for his project on the reaction of schooling fish to predators.

The winners and their sponsoring teachers will participate in the National Youth Conference Nov. 12 to 14 in San Diego, Calif.

In 1984, North Carolina ranked second among trout-producing states. Rainbow trout growers produced an estimated 3 to 5 million pounds of the fish. Because the fish achieve optimal growth in waters approximately 65 degrees Fahrenheit, year-round production in this state has been limited to the mountain region.

But in the warmer Piedmont and coastal regions, water temperatures are suitable for rainbow trout from approximately late October to early May. In the winters of 1982 and 1983, Sea Grant's Associate Director Ron Hodson and marine advisory agent Randy Rouse raised rainbow trout to a marketable size in the estuarine waters of South Creek, a tributary to the Pamlico River.

Now, they've detailed the results of their research in a *Blueprint*, "Raising Rainbows." The *Blueprint* also provides advice on setting up your own rainbow trout operation. For a copy of the free publication, write UNC Sea Grant. Ask for UNC-SG-BP-85-5.

If you're a coastal resident, you probably know what salt air can do to the metal on your car. But what about other important objects on and around your house—hurricane straps, air conditioning units and door frames? Spencer Rogers, UNC Sea Grant's coastal engineering specialist, has written a new *Blueprint*, "Corrosion in Salt Air," that details the rate of corrosion along the waterfront, its effects, and the methods and materials that can be used to slow its destruction.

For a free copy of "Corrosion in Salt Air," write UNC Sea Grant. Ask for UNC-SG-BP-85-3.

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