

# COAST WATCH

Photo by J. Foster Scott



*A pinpoint landing makes two laughing gulls on a piling*

## The birds

Plume hunters plundered their colonies during the late 1800s. Then people began crowding them out of their natural nesting habitats—the swamps and beaches. A few years ago, the pesticide, DDT, took its toll on some species.

But so far, they've survived. Generally, they're referred to as colonial waterbirds. But specifically, they're egrets, ibises, herons, gulls, skimmers, terns and pelicans. They nest in colonies—hence the name colonial—along North Carolina beaches and estuarine islands during spring and summer.

Colonial waterbirds have been subdivided into colonial seabirds (pelicans, gulls, terns and skimmers) and colonial wading birds (herons, egrets and ibises). The seabirds that nest in North Carolina are migratory and for the most part, lay their eggs in simple nests on the ground. Wading birds tend to nest in dense thickets of shrubs and low trees. Some wading birds overwinter in the state.

For over a decade, North Carolina's colonial waterbirds have been under the scrutiny of James Parnell, an ornithologist at the University of North Carolina at Wilmington and a UNC Sea Grant researcher. Parnell has examined the birds' nesting habits and habitats, and counted their populations.

Ask Parnell why colonial waterbirds need to be studied and protected, and he will gruffly answer, "On good days, I tell people that colonial waterbirds

*Continued on next page*



are at the top of the food chain. They're important environmental barometers which indicate the health of the ecosystem. They're also an important part of the ecosystem and we don't know what would happen if they weren't there. For all we know, they could be important links in the transfer of energy from the ocean to the estuary.

"On bad days, I tell people that the birds have as much right to be there as any other bird, animal or human. They're pretty, and people want to see them and enjoy them."

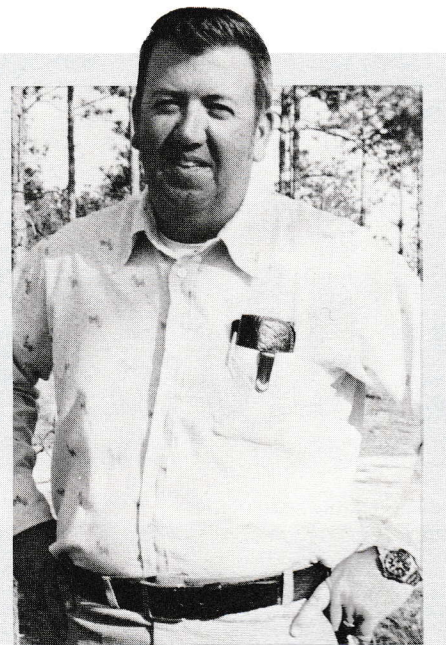
For years the government and private organizations have worked to manage the populations and habitats of game birds such as ducks, geese and doves. But until recently, the idea of managing non-game birds usually meant only protecting them, says Parnell.

**U**nder the Migratory Bird Treaties, it is illegal to kill waterbirds. The National Audubon Society, which was conceived in part to stop the carnage of waterbirds to feather women's hats, has worked since 1904 to protect nesting areas through its sanctuary program (see story, page 4). And all colonial-waterbird nesting sites on wildlife refuges or at national parks are protected.

Since the 1920s and 1930s, the U.S. Army Corps of Engineers has managed colonial-waterbird habitats incidentally to its management of the Intracoastal Waterway and other

"I tell people that colonial waterbirds are at the top of the food chain. They're important environmental barometers which indicate the health of the ecosystem."

—James Parnell



navigational channels. The sand, silt and shell dug from these channels resulted in the creation of over 400 man-made islands in the state's estuaries.

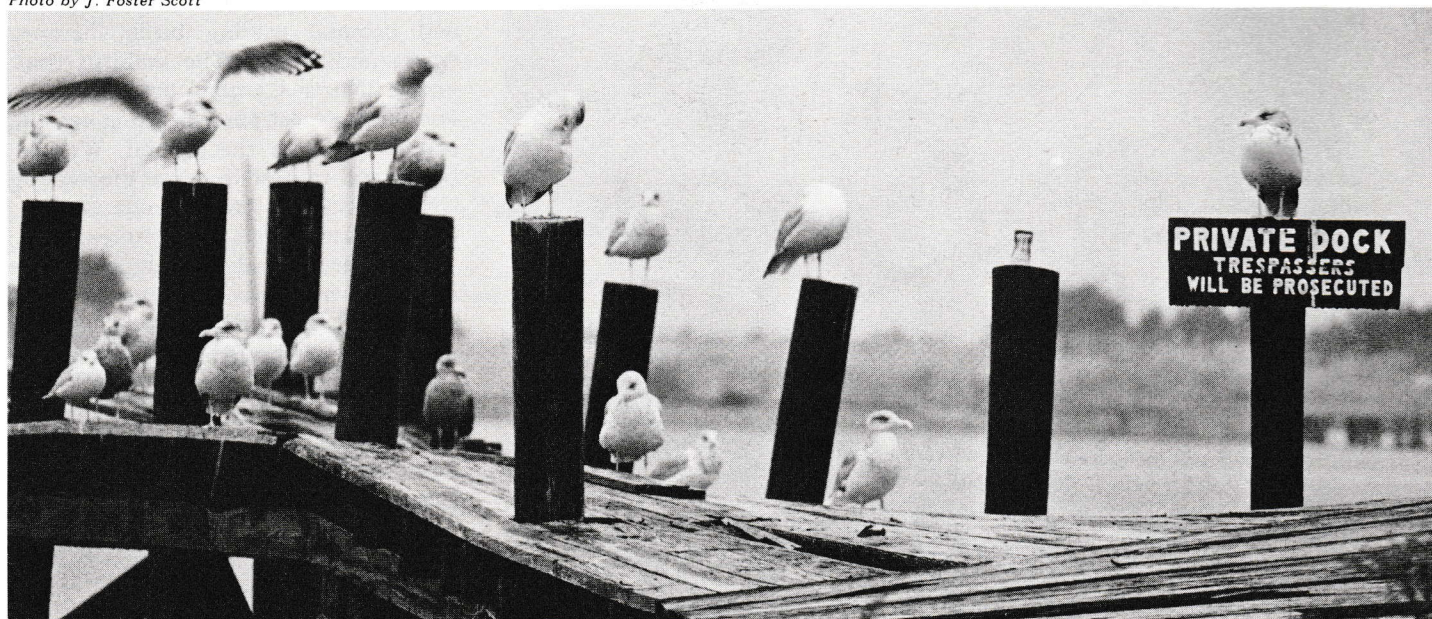
The dredge-spoil islands were ideal nesting areas for colonial waterbirds. And they were built at a time when the birds were beginning to come up short on natural nesting habitats because of increased beach utilization and development of the barrier islands.

The continued maintenance of the waterway and channels through dredging has also meant continued upkeep of waterbird nesting habitats. The corps occasionally deposits a new

covering of dredge material on some of its man-made islands, leaving behind a bare site. Such sites will revegetate, passing through a series of predictable stages of succession, each of which may provide nesting habitats for different species of colonial waterbirds.

**B**ut modern environmental protection laws now require the corps to dike any upland deposition of dredge material. Parnell says diked islands tend to sag, forming hollows for the collection of fresh water, which speeds the growth of vegetation on the island. And for those species of waterbirds, such as terns and skimmers, which

Photo by J. Foster Scott



*Heedless to the warnings of man, these gulls make themselves at home on a private dock*





*Sandwich terns are distinguishable by their bicolored bills*

prefer sandy nesting habitats, the islands quickly become useless.

Parnell says there could be problems in the future for the sandy nesters if too many diked, dredged islands became heavily vegetated or if the corps continues to deposit more and more of its dredge material on beachfront or mainland areas. A 1983 census of all nesting colonial waterbirds in North Carolina, conducted by Parnell, showed a decline in the populations of least terns, common terns, gull-billed terns and black skimmers—all bare-sand nesters.

Parnell points out that new deposits of dredge material or other manage-

ment tools such as tilling, applying plant retardants or burning could be used to keep vegetation at a minimum. Scientists are just beginning to study methods of altering or creating nesting habitats for colonial waterbirds.

**I**n the 1983 census, sponsored by UNC Sea Grant and U.S. Army Corps of Engineers, Parnell found that four percent of the colonial-waterbird nests occurred on barrier-island sites; 18 percent on natural estuarine islands; 27 percent on diked, dredge-material islands; and 51 percent on undiked, dredge-material islands. He also learned that populations of brown

pelicans, white ibises, laughing gulls and royal terns had increased since his 1977 census.

After comparing the 1977 and 1983 censuses, Parnell found that the waterbirds were nesting at fewer sites, but that the sites in use were supporting larger colonies. This trend has Parnell worried because dense aggregations of birds at relatively few breeding sites might mean a single catastrophic event, such as an epidemic, could spell disaster for a large percentage of birds.

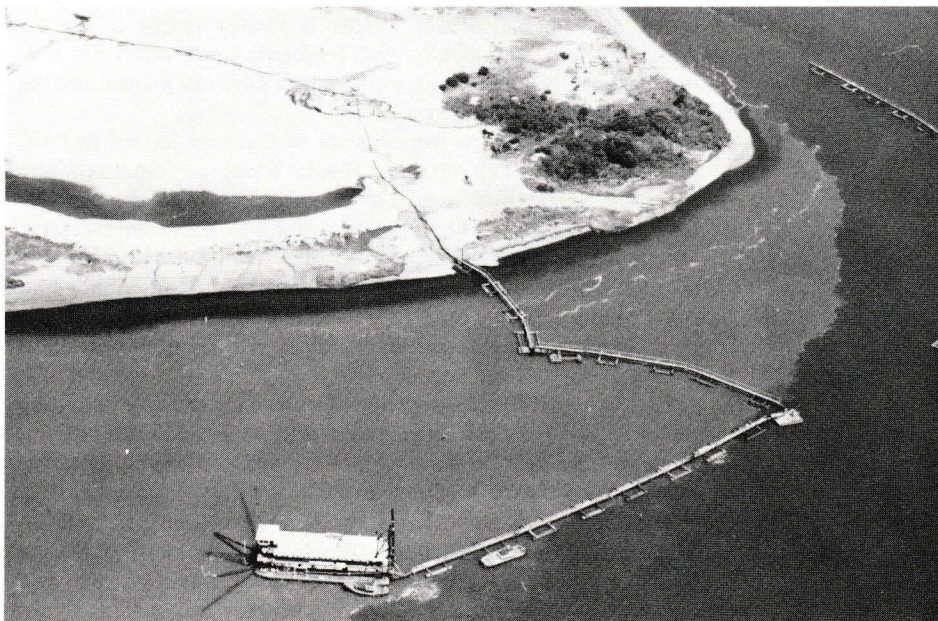
**B**ut it's not only habitat degradation that has ornithologists worried about the waterbirds' future. Scientists are also concerned about the encroachment of man.

"There's a recognition on the part of Audubon that the human population in this country is shifting to the southeast," says Donald McCrimmon, a research biologist with the National Audubon Society. "That's potentially a problem for colonially nesting waterbirds."

"In North Carolina, the greatest threat is from recreational interests that are only going to increase with more and more people using the waterways. More birds are going to be subject to impact. We need to learn more about the resource requirements of birds to permit them to coexist with the surge of populations."

Parnell says human disturbance of colonies during nesting may leave the eggs or newly born chicks vulnerable to weather conditions or predation from other birds and animals. During spring and early summer, he warns people to avoid the islands where the birds are nesting and to leave the nests and young chicks of beach nesters alone.

—Kathy Hart



*Fresh dredge material being deposited on an island*



*Baby common tern and egg*



# Battery Island

## A home for all birds

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**E**ach year, beginning in April, about 10,000 feathery travelers arrive at Battery Island—a chunk of marsh rising out of the Cape Fear River, just across from Southport in Brunswick County. The birds build simple stick platform nests in a dense thicket of red cedar, yaupon, wax myrtle and live oak. Throughout the summer they nest and raise their young. When autumn arrives, most of the birds fly away to parts unknown.

Battery Island is a popular summer home for birds. Its population includes representatives of almost all the heron, egret and ibis species found in North Carolina, and the island is home to the state's largest population of white ibises. So far, the birds have been returning each year in equal or greater numbers than the year before.

In 1982 the state and the National Audubon Society agreed to a partnership. The state would lease Battery Island to Audubon as a sanctuary which would be managed through the University of North Carolina at Wilmington



*Tricolored heron perches in a thicket*

(UNC-W). James Parnell and his graduate students would oversee the project. (The state originally acquired Battery Island in 1978 as part of a greater tract of land donated by the N.C. Nature Conservancy.)

State officials say it's a novel approach to maintaining a site just for birds. "It's the first time that the state of North Carolina has entered into an agreement like this," says Tom Wells, a consultant and management planner for the state's Division of Parks and Recreation. "It's a joint venture management plan, primarily for the benefit of the birds."

Parnell and Audubon officials are quick to point out that Battery Island is more than the usual bird sanctuary, where protection is the primary goal. "Audubon wants to do that here. But in addition, this sanctuary is the site for some management research as well as a place to protect the birds," says Parnell.

The Audubon Society wants to learn how to manage wading bird colonies, says Donald McCrimmon, a research biologist with the National Audubon Society. Not an easy task with herons, egrets and ibises, he adds.

Parnell explains: "The birds, in the process of nesting and raising their young, actually damage their own habitat. They produce so much excrement that they overfertilize the vegetation."

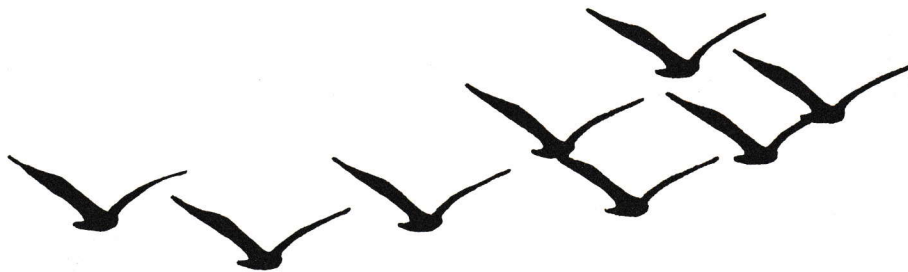
**T**he result is a die-back of the vegetation in which the birds nest. (While seabirds nest on the ground, wading birds prefer thickets of bushes and trees.) Consequently, the island is no longer as desirable a nesting ground, says Parnell. "As long as there are plenty of places to nest, they just move on," says Parnell. "But, if you're going to try to manage them, you don't want the birds to leave. We're trying to learn how to make a place like Battery Island usable for a long period of time."

Parnell learned the importance of Battery Island in 1976 and 1977 in a Sea Grant project when he censused the colonial waterbird nesting populations of the North Carolina estuaries. Then, he found 1,831 nests on Battery. (Parnell says one nest translates into two adults and at least one young bird.) In his report, Parnell said the colony had been stable for the past four years, the thickets where the nesting took place appeared healthy, and there appeared to be room for colony expansion.

But since then, the populations have grown to over 5,000 nests. While bird lovers rejoice the expansion in the colony, Parnell and the Audubon Society want to make sure the island can remain a viable nesting ground.

Parnell says the work on Battery Island will be a long-term project. He and his students will be looking at the birds' reproductive biology, nest-site characteristics and population dynamics. They'll be planting vegetation to see what can best withstand the heavy doses of nitrogen in the





birds' excrement. They'll be tilling small plots of vegetation to see the effects. And, they may even attempt to create "artificial" bushes for the birds to use while destroyed vegetation grows back.

The biologists will be manipulating the habitat in the hope of producing a more stable, long-term environment for the birds, says McCrimmon.

The management possibilities include maintaining the habitat for herons and egrets as well as developing a habitat for ground-nesting birds such as least terns, brown pelicans and laughing gulls, says McCrimmon. That may mean planting hardier vegetation for the herons and egrets, or changing the substrate in a way that will attract the ground nesters.

"We'd like to make Battery a place where a variety of birds could find a safe place to nest for a long period of time," says McCrimmon. "There's a tendency for colonies like this to come and go. The real challenge is to make the colony suitable for 25 years or more."

For example, terns and gulls may nest for only two to five years on an island before its vegetation changes and they move on to another island. But some wading birds will use the same island for as long as 25 years.

Not all the birds on Battery live in harmony and McCrimmon says they may eventually choose to exclude some species from nesting. For example, fish crows nest among the herons and eat about half of the eggs which the white ibises lay. Mark Shields, one of Parnell's graduate students and the Audubon warden on Battery Island, found that fish crows are able to get the ibis eggs, regardless of the density of the vegetation where the birds nest.

The crows are greedy; they take many more eggs than they can eat, says Shields.

Parnell says the fish crows are one pressure on the birds they may decide to eliminate. For example, they might try to manipulate the vegetation in such a way as to reduce the crow population by making the site less desirable to that species.

If fish crows don't get the eggs, the birds face possible predation from the black-crowned night heron. Those birds go after the young of the other species and feed the baby birds to their own.

Such predators get help from cattle egrets which arrive at Battery Island later in the season, when the other species have already begun to nest. They disrupt the nesting birds, leaving the young vulnerable to predation.

About two weeks after the young birds hatch from the egg, they venture from the nest. This is when they are most vulnerable to people. As a sanctuary, Battery Island is off-limits to visitors and, as warden, Shields has the authority

to enforce that rule. It is particularly crucial to avoid human intrusion during the nesting weeks, says Parnell.

The birds may also find themselves at the mercy of the weather, says Parnell. "Timing is critical. A storm can be very damaging to young birds. All the nests may be destroyed or the birds may be beat to death by hail."

McCrimmon points out that, to some extent, the hazards which face the birds—predation from other species, over-fertilization of the vegetation, and exposure to bad weather—are all part of a natural system of checks and balances in the population. But the Audubon Society hopes to help the birds maintain a balance on Battery Island. If they succeed, the birds will return. If nature takes her course, the birds may destroy their own home and go in search of another.

—Nancy Davis



*White ibis hatchling peers from its nest*



*Adult white ibis, a wading bird*



# Brown pelican colonies flourish

There's something about a pelican that draws attention in North Carolina. Maybe it's their comical appearance—that curved neck, bald head, long beak and drooping pouch. Or maybe it's because we're not accustomed to seeing the birds, whose populations have never been strong in this state. Well, until now that is.

In the early 1970s, birdwatchers, ornithologists and federal officials were worried that our feathered friend might not survive the perils of modern society. The pesticide DDT caused pelicans to lay eggs with thin shells that frequently resulted in the death of its contents. In response to its problems and dwindling populations, the eastern brown pelican was placed on the U.S. Fish and Wildlife Service's Endangered Species list in 1973.

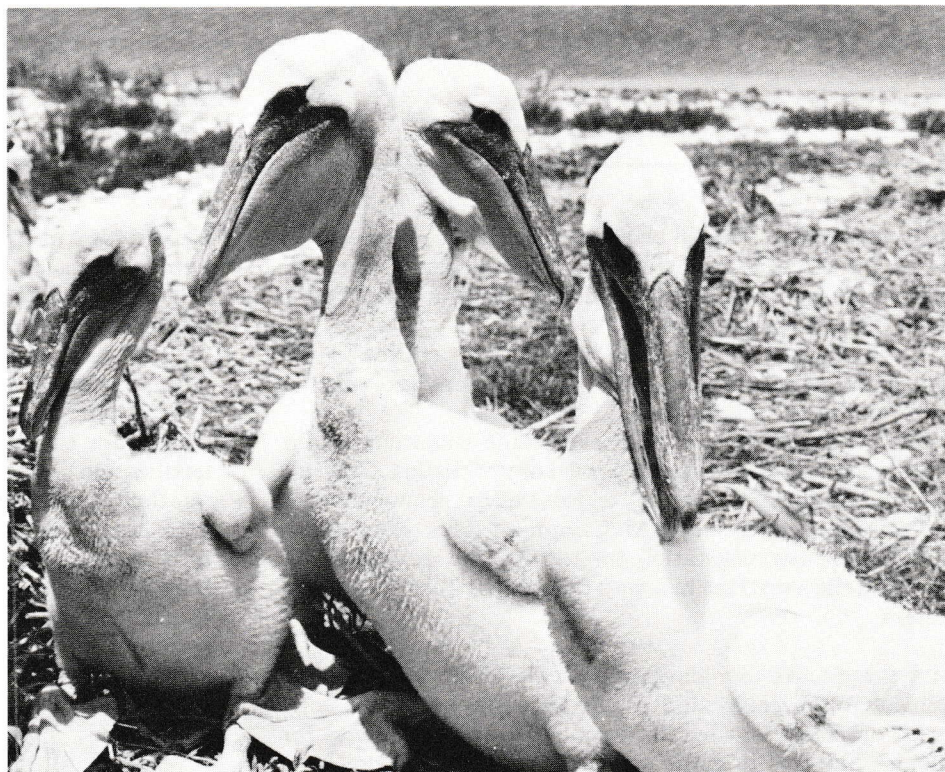
The pelican's nesting sites were protected from North Carolina to Florida. And to help matters, DDT was banned in 1972. The pelicans began to slowly recover.

In his 1977 survey of nesting colonial waterbirds, James Parnell found 100 pairs of nesting brown pelicans in North Carolina's estuaries. In his 1983 survey, approximately 1,300 pairs were located. "We don't claim all these are new birds," Parnell says. "Some may have relocated from a South Carolina site that washed away."

In his book, *Atlas of Colonial Waterbirds of North Carolina Estuaries*, (available for \$7 from UNC Sea Grant), Parnell says that brown pelicans have been nesting in North Carolina since 1929. For over 25 years, the only known colony of pelicans nested on small islands near Ocracoke.

But in 1978, a new colony was established on two neighboring dredge-spoil islands, Old Royal Tern Island and Ferry Slip Island, in the Cape Fear River. Along with the terns, laughing gulls, oyster catchers and black skimmers, the pelicans nested on the islands in the spring and summer. In just a few years, the Cape Fear site became the largest nesting colony of pelicans in the state.

But in 1982, erosion threatened the pelican's Cape Fear nesting haven. Parnell and others were worried that the nests would wash away during



*Fluffy, young brown pelicans*

spring and summer storms. And to make matters worse, there were no other islands in the area suitable for the pelicans to move to.

The U.S. Army Corps of Engineers recognized the need to save the pelicans' nesting site. They appealed to the N.C. Office of Coastal Management to bend their water quality standards so that the island could be rebuilt. The state agreed that the pelicans were a case worthy of a little rule-bending.

Early last year the corps dumped 30,000 cubic yards of dredge material on Old Royal Tern Island, enlarging it from 1.5 acres to 4 acres and raising its elevation from 1 foot above average high tide to 6 feet. The corps will take similar action with Ferry Slip Island in a few years.

While federal and state agencies worked to save the Cape Fear pelican colony, the birds were busy establishing another colony on an island near Atlantic. And last summer, a few nests were found on an island near Oregon Inlet.

All of this surge in population has led the U.S. Fish and Wildlife Service to propose removing the brown pelican

from its endangered list along the East Coast. "We have very good information that the populations of pelicans never really declined in Florida," says Judy Jacobs, a Fish and Wildlife endangered-species biologist. "The populations in South Carolina that were affected by DDT are back up to historical levels. And in North Carolina, populations are higher than ever before."

But Parnell is concerned about the possibility of removing the pelicans from the endangered list. "We know the birds are doing well now," Parnell says, "But we don't know why. I'd like to know why the birds are doing so well before we remove them from the endangered list because when that happens they lose a lot of support in the law."

The Fish and Wildlife Service will issue a final report on the status of the brown pelican this November. If the pelican is removed from the endangered list, it will become a "species of management concern," Jacobs says. This designation means the Fish and Wildlife Service will continue to allot funds and time to their management.

—Kathy Hart



# 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, Box 8605, NCSU, Raleigh, N.C. 27695-8605.*



Five students from Elizabeth City State University have been awarded National Marine Fisheries Service summer stipends for study in the marine sciences. The students will spend eight weeks in Beaufort and Morehead City, with their time divided between the National Marine Fisheries Service Laboratory and the UNC Institute of Marine Science in Morehead City. They'll be attending classes as well as assisting scientists with their fisheries and estuarine research. Sea Grant Director B.J. Copeland says the program is part of an effort to increase the marine and coastal curriculum at Elizabeth City State University.

The five students are: Pretlo Knight, Tyrone Speight, Anna Joyce Digiovanni, Timothy McLendon and Gregory Robertson.

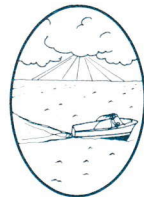
The summer stipends are just one way that Elizabeth City State University hopes to increase its marine science program. In February and March, the university presented a Marine Seminar Series for faculty, students and local school teachers. Dirk Frankenberg, Director of Marine Sciences at the University of North Carolina at Chapel Hill, provided an introduction to marine science. William Cleary, a professor at the University of North Carolina at Wilmington, presented a seminar on

coastal geology. Sea Grant Director B.J. Copeland gave an overview of marine environmental problems in North Carolina and Sea Grant researchers Stan Riggs, Hans Paerl and Charles Peterson summarized some of their research. Lundie Spence, Sea Grant's education specialist, gave a workshop on marine-science teaching resources.

UNC Sea Grant Director B.J. Copeland is chairman of an N.C. Marine Science Council committee on marine biotechnology. The committee will address the ways that North Carolina might become involved in marine biotechnology. "Marine biotechnology is near the verge of a major breakthrough and North Carolina is uniquely situated to be a leader in this future," says Copeland. Genetic engineering of fish and shellfish and the production of marine pharmaceuticals are just two of the many possibilities for marine biotechnology, he says.

Other members of the committee are: Bill Queen, Director of the Institute for Coastal and Marine Resources at East Carolina University; Ted Rice, Director of the National Marine Fisheries Service - Beaufort Laboratory; and, John Bone, executive vice president of the Outer Banks Chamber of Commerce.

The committee will report to the council at its meeting in Manteo, May 24 and 25.



More and more folks are choosing to live on the water. And with the growing number of floating homes or house boats, local governments have become concerned about the environmental, safety and health risks that may be associated with floating-home development.

Walter Clark, Sea Grant's coastal law specialist, says the 1983 session of

the N.C. General Assembly amended one of its statutes to give counties more control over development in state-owned waters within the counties' jurisdiction.

New Hanover County recently adopted an ordinance which places some regulations on floating homes in that county. Clark says court decisions in other states have generally upheld local ordinances which regulate floating homes so long as the ordinance is meant to protect the public's health, safety and general welfare.

If you'd like more information about the requirements for house boats, contact Clark at the Sea Grant office in Raleigh.



It's been 30 years since Hurricane Hazel thrashed the coast of North Carolina. Could this be the year when another major hurricane strikes? The state's Division of Emergency Management wants to make sure you're prepared. Hurricane Awareness Week will be held June 3-9. And, it will be a time for you to learn about hurricanes, what they can do and how you can be prepared.

Al Hinn, meteorologist-in-charge at the National Weather Service in Wilmington, says the next hurricane which strikes the coast has the potential to cause even more damage than Hurricane Hazel. "In the years since the 50s, we've seen a lot of development and growth take place on the barrier islands, and the day of reckoning will come. I think we'll pay a much dearer price when that time comes because we have much, much more to lose now than we did back then."

Hinn says that from a statistical point of view, North Carolina is hurricane-prone. "Hurricanes have not gone out of style," he adds. We've just been lucky lately.

For more information on hurricanes,

*Continued on next page*



write Sea Grant for the free publication, *Storms, People and Property*. Ask for UNC-SG-78-15. For tips on how to prepare for a hurricane, Sea Grant has a free blueprint, *Hurricane Safety Checklist*. Ask for UNC-SG-BP-82-3.

Frank Thomas, Director of Sea Grant's Seafood Lab in Morehead City, and Joyce Taylor, Sea Grant's marine advisory agent at the lab, have revised and updated *An Annotated Bibliography on Mechanically Separated Finfish and Crustacea Meats*. The new version contains more than five times the number of entries as the original publication. The revision, sponsored by Sea Grant, the Alaska Fisheries Foundation and the N.C. Agricultural Extension Service, provides an up-to-date listing of the literature available on mechanically deboned finfish and crustacea meats, as well as surimi. For a copy of the book, write Sea Grant and ask for UNC-SG-84-02. The cost is \$4.

Jim Easley, UNC Sea Grant's marine economics specialist, and Sea Grant advisory economists from other states have formed a committee on financial management for commercial fishermen. The economists will be assembling a resource manual describing various financial programs which commercial fishermen can use in their decision-making.



UNC Sea Grant has been providing its technical expertise at a series of public meetings on water quality. In March, the commissioners of Dare, Tyrrell, Hyde, Washington, Beaufort, Pamlico and Carteret counties held a workshop on water quality issues of the Pamlico peninsula. Sea Grant and the N.C. Agricultural Extension Service provided the technical assistance for the workshop. Sea Grant researcher Wayne Skaggs presented some facts on land drainage and Director B.J. Copeland responded with some answers from Sea Grant research. Wayne Wescott, Sea Grant's marine advisory agent in Manteo, presented the concerns of the fishermen.

In April, Sea Grant researchers participated in a seminar on coastal water management issues sponsored by the N.C. Department of Natural Resources and Community Development. Copeland gave an overview of estuaries and some of the complex problems facing the state's coastal water systems. And several Sea Grant researchers provided an update of university research.

Wayne Wescott, Sea Grant's marine advisory agent in Manteo, will present a series of workshops in June and July on recreational shrimping. The sessions will cover all the basics of what it takes to catch your own meal

of shrimp. For a schedule of the workshops, call Wescott at 919/473-3937.

Wescott also has written a blueprint, *Recreational Shrimping: Nets, Doors and Power*, which provides some tips for rigging a boat for shrimping. For a free copy, write Sea Grant. Ask for UNC-SG-83-2.

Joyce Taylor, Sea Grant's marine advisory agent at the NCSU Seafood Laboratory in Morehead City, has prepared a colorful 17-by-22-inch poster depicting the seasonal availability of North Carolina seafoods. The chart is based on North Carolina commercial landing statistics from recent years and is intended as a guide for buying fresh fish and shellfish. For a single free copy of the poster, write UNC Sea Grant. Ask for UNC-SG-84-04.

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