UNC Sea Grant

April, 1984

COASTWATCH

Photo by Mark Hooper

A fisherman may work alone on the water, but back on the docks he's willing to share his ideas

Fishermen talking.

Over the VHF radio, on the telephone or down on the docks, they're exchanging information and sharing ideas with friends. They don't hesitate to tell a fishing friend about a new piece of gear that will catch him more fish. And before long, news of that new equipment has passed from fisherman to fisherman. Everybody knows.

A Sea Grant researcher has studied how fishermen exchange information. This month, *Coastwatch* takes a look at the study, how its results will help Sea Grant's Marine Advisory Service and what some North Carolina fishermen are saying about how they exchange information.

Who's a leader among fishermen?

In New England, they're called "highliners." Here, they're known as "smart" or as "experimenters."

They're the fishermen who are respected. The ones whose names always come up in conversations about commercial fishing. The ones who are first to try something new. They are the leaders.

Sea Grant researcher Jeff Johnson, an anthropologist at East Carolina University, recently completed a study of social networks, information flow and the adoption of technology among North Carolina commercial fishermen. He found that the relationships in a fishing community have a strong influence on the way fishermen do things.

If you ask North Carolina fishermen who their best friends are, they'll say they are friends with everybody in town, says Johnson. But, ask them whom they respect, to whom they talk and to whom they look for advice. Chances are, the names of a few fishermen will be repeated. Johnson says those fishermen are the leaders in the community. And, they hold the key to getting information circulated through the community.

Johnson's study is the first of its kind to concentrate on fishermen. Previously, studies focused on farmers. Those studies pointed to people who had higher incomes, had more education, and who read a lot as the leaders in the community. "But, fishermen are different from farmers," says Johnson. "Farmers may not see their neighbors for weeks. But fishermen pull into the same harbor every day. We need to know how information gets passed among those fishermen."

Johnson hypothesized that people do things because they talk to others and observe others. To test that hypothesis, he took his study to Crabtown, North Carolina. He won't divulge the real name of the town he studied, but he does provide a few clues. Crabtown is a rural village along the central North Carolina coast. For the past two centuries, Crabtown's existence has depended on commercial fishing. Johnson says fishing is more than an occupation for the approximately 500 Crabtown residents; it's a lifestyle.

Johnson spent a summer with the fishermen of Crabtown. He talked with them, fished with them, and interviewed them. (Marcus Hepburn, another Sea Grant researcher, helped Johnson collect the data.) And, he found that the Crabtown fishermen were cliquish. By questioning the fishermen about their associations with other fishermen, Johnson was able to construct a model of social networks in the fishing village consisting of four cliques. "Once we know the structural relations in the community, we know how to get information out," says Johnson.

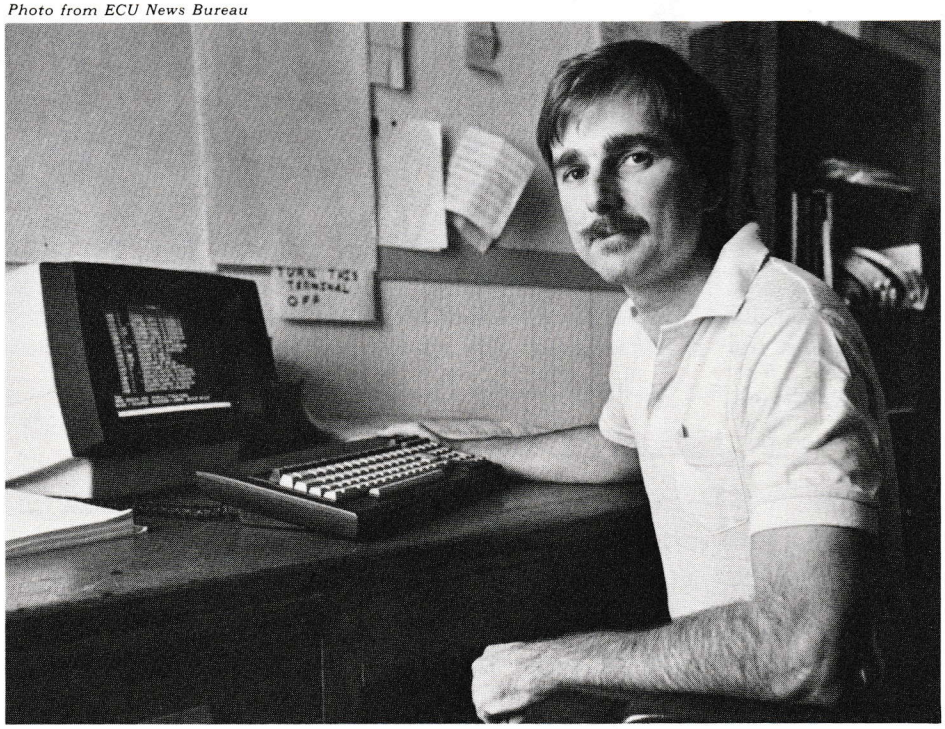
Crabtown fishermen consistently referred to two main cliques—the Big Fleet and the Little Fleet. The cliques are based on the age and fishing style of its members and where they dock their boats. The Big Fleet is composed of fishermen in their late 30s. The Little Fleet is made up of fishermen in their late teens or early 20s.

Out of the four basic cliques, at least two fishermen emerged as "opinion leaders," says Johnson. One of those fishermen was referred to most often by other fishermen as someone they talked to frequently. The other leader is part of the Big Fleet, but he has connections with the younger group as well. These "cross-clique ties" allow him to serve as a liaison between the two groups, says Johnson.

"If I want to get information to the fishermen, I'd first want to know who are the opinion leaders," says Johnson. "Then I'd look for someone with cross-clique ties to maximize the possibility of getting the information to the fishermen."

For example, Johnson knew that he

Photo from ECU News Bureau



Jeff Johnson works out network models on his computer

"If I want to get information to the fishermen, I'd first want to know who are the opinion leaders."—Jeff Johnson

could expect a fisherman to follow the example set by his clique. If the leader of one clique adopted an innovation, the others would follow.

To test that theory, Johnson examined the adoption of two innovations: a sled for shrimp trawling (see page 5) and a kicker plate for clam kicking. The sled replaced the heavy wooden doors on the inside wings of a shrimp net. The kicker plate directs the prop wash from the boat down at the sediments, loosening clams and making them easier to net. The kicker plate has increased the efficiency of mechanized clamming and has allowed fishermen to exploit clam beds in areas not accessible with the use of traditional techniques.

Johnson found different results for each innovation. Most of the fishermen adopted the sled in the first two shrimping seasons. But, the kicker plate showed a longer period of adoption.

Opinion leaders aren't the only influencing factors in the adoption of an innovation, explains Johnson. For example, a fisherman is more likely to adopt an innovation if he can see it in operation. One fishermen told Johnson, "You see somebody do something and you'll try it."

The sled is plainly visible to other fishermen, particularly when the boat is in the harbor. Johnson says it "would have most knowledgeable fishermen questioning its advantage and use."

On the other hand, the kicker plate is found on the rudder below the waterline. The only time a fisherman would see the plate is when the boat is in dry dock. Johnson says the kicker plate's low visibility contributed to its long adoption period.

Fishermen can also find out about innovations by listening to their VHF or CB radios. The first fisherman to experiment with the sled in eastern North Carolina heard the captain of a large shrimp boat say that it was the greatest rig he had ever used. Johnson says that captain played an important role in the adoption of the sled in the area.

The radio is so effective in spreading information that some fishermen either keep it turned off or talk in elaborate codes that only members of their clique can decipher.

The opinion leaders have other ways of learning about innovations. "People who read commercial fishing periodicals tend to be more experimental," says Johnson.

But, he adds that education is not necessarily a determinant of an opinion leader. "For the older fishermen, a seventh-grade education in their day was pretty good. It's as good as a high school education is today," says Johnson. "But once a fishermen knows how to read and write, that's all that matters out on the water."

Johnson says his study has just begun to explain the flow of information through a fishing community. His next step would be to follow these fishermen for three or four years, monitoring the cliques for change and observing the adoption of other innovations.

He adds that it's time to know as much about fishermen and their social network as we know about farmers.

—Nancy Davis

Photo by Steve Murray

At harbors such as this in Oriental, fishermen often share information with fishermen docked nearby

From a fisherman's view

Coastwatch went straight to the source—the fishermen—to find out how they exchanged information, to learn how they heard about new innovations, and to discover who were leaders and innovators in the fishing community.

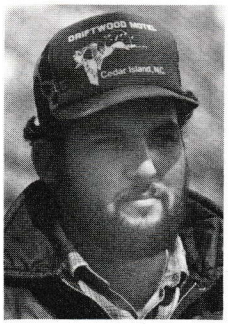
For Clinton Willis, a Marshallberg fisherman, seeing is believing. And believing means trying it for yourself. Willis says once a fisherman sees a new piece of gear and hears that it works, then he's usually willing to try that piece of equipment for himself.

Willis says that sometimes other fishermen share their innovations and sometimes they won't. "I asked a fishermen about a boat he had rigged with a four-barrel trawl," Willis says. "He told me he had worked out the problems himself and I would have to do the same. I did work it out myself."

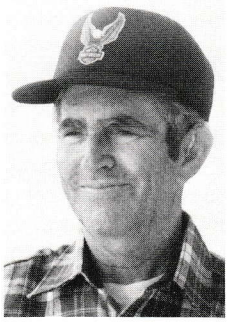
Benjamin Brooks, a Harkers Island fisherman, sees himself as an experimenter. "A lot of ideas I come up with are my own," Brooks says. "I work them out and try them myself. Right now, I am experimenting with a deep-water clamming boat."

Brooks says some people in the community think he experiments too much. "But I'm not satisfied with things that always stay the same," he says. "I get bored. I like to try something different. I like to see improvements. I don't think I would make much of an assembly-line worker." But Brooks says he doesn't mind sharing his new ideas.

Paul Nelson, a Williston fisherman, says he occasionally gets ideas about new gear and fishing techniques from commercial fishing publications such as *National Fisherman* and *The Small Boat Journal*. But more often than not, it's from friends and family that he learns about new innovations. "Most fishermen are outgoing with their new ideas," Nelson says. "I have a lot of respect for the older, 40- to 50-year-old fishermen, who have a lot of experience behind them, but are also still willing to experiment. The most successful fishermen are those that have knowledge and who are willing to work hard. What you get from the water you have to work for."



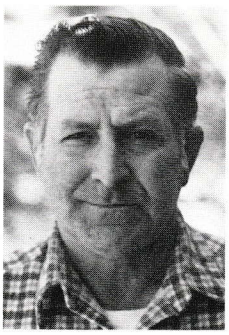
Earl Chadwick, a Marshallberg fisherman, has been plying the waters of Core and Back Sounds for 37 years. He was the first fisherman in Carteret County to try the four-net/sled configuration on his 26-foot trawler. "I heard about it (the four barrel) from some of my relatives who were fishing down south," he says. "I tried it. I made the doors and nets myself." Despite the fact that the twin nets did not work out on Chadwick's small boat, he is proud of being the first to experiment with the twin nets.



Chadwick says most fishermen learn about new gear from other fishermen. "Fishermen are like a bunch of ducks," he says. "One of them does something and all the others follow." Chadwick says that the younger fishermen in the area tend to look to the older, more experienced fishermen for help and advice.

Mark Hooper, a Smyrna fisherman, says most Carteret County fishermen are willing to share their new ideas and information about new gear with the fishermen they know. "Word usually spreads pretty fast, especially around bigger fish houses where a lot of fishermen dock," Hooper says. "If a fisherman finds a piece of gear or equipment that works a little better, he's usually willing to share it with those he works around. Fishermen get together and talk. They talk on the radio (VHF) or at the fish house. It amazes me how fast word can spread."

James Styron, a 53-year-old Davis fisherman, says there are no secrets in small fishing communities anymore. "In small areas like this, everybody knows about a new piece of gear in two days' time," Styron says. "Whether they find out over the radio (VHF) or through direct communication, everybody knows."



Styron says one innovation has swept through Carteret County this year. It's the steel cage. Fishermen have replaced the "bags" they pull behind their boats with steel cages. "They're more efficient," he says. "They last longer and the upkeep is less. And they catch less sand and seaweed." Styron estimates after only one (clam kicking) season, 70 to 80 percent of the fishermen in his area are using the steel cage.

(Photos by Mark Hooper and Irv Hooper)

An innovation tailored To Carolina waters

One hundred years ago fishermen used row boats, sail boats and seines to net shrimp. Today, it's motorized, mechanized trawlers hauling large "two-barrel" or "four-barrel" nets.

Between the seine net and the double trawl are a lot of innovations. Some of those innovations, such as the double rig, were developed outside of the state. But other innovations have been tailored just for the bent of the North Carolina coast.

Take the sled for instance. It was developed in Georgia during the 1970s as part of the four barrel or twin trawl, a net configuration that allows a fisherman to pull a set of two nets from the port and starboard outriggers. The sled is an "L"-shaped piece of metal placed in the middle of each set of nets. It attaches at the top and bottom line of the wings of each net and helps to keep the nets open vertically.

News of the twin trawls reached Carteret County by the mid-1970s, and the larger boats that fished offshore began to make the changeover. Some of the small trawls (less than 40 feet) that shrimped "inside" or sound waters also experimented with the four barrel.

"I tried the four nets with the sled," says Earl Chadwick, a Marshallberg fisherman. "But I didn't have room on my 26-foot boat for all those nets, and my boat didn't have enough power to pull all that weight."

Other fishermen experienced similar problems, so the small-boat fishermen abandoned the idea of shrimping with the twin trawl. But the experimentation did introduce the idea of substituting the sled for one or more of the doors.

The doors are flat wooden structures that traditionally had been attached to the wings of the net to spread it horizontally. But shrimping with the four-door, double trawl meant steering problems for fishermen plying the shallow waters of Core and Back Sounds.

In shallow water, the prop wash did not pass over the top of the two inside doors as it did in deep water. Instead, the prop wash was deflected straight back from the boat between the two inside doors. This presented no problem as long as the boat moved in a straight line. But in rough weather, the prop wash often began striking first one inside door and then the other, causing the trawlers to see-saw.

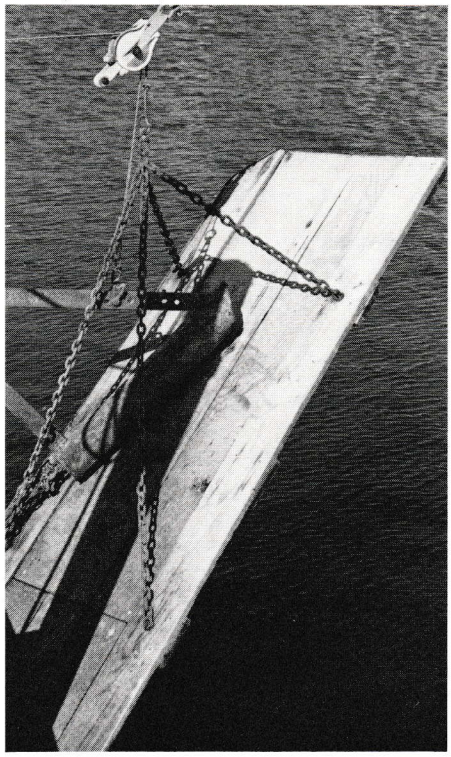
And even on calm days, shrimpers had problems steering their vessels during turns. The prop wash would strike the inside door on the opposite side from the turn, causing a great pull on the boat.

And while fishermen understood the cause of their problem, there seemed to be no solution in sight. No solution, that is, until they saw the sleds used on the twin trawls. Almost immediately, Carteret County fishermen began experimenting with the sled on their double-barrel trawls, says Jeff Johnson.

First the fishermen tried a pipe, filled in the bottom with lead, Johnson says. The pipe acted as a weighted staff that fishermen hoped would hold the nets open vertically. But the pipe did not prove successful.

In 1978, several "downeast" fishermen began experimenting with the "L"-shaped sled, Johnson says. But instead of using only one sled between two nets as was done in the twin trawl configuration, Carteret County fishermen used two sleds between two nets. They ran a line, known as a crossover line, between each sled. Using this configuration, the outside doors opened the nets horizontally and the sled opened them vertically, Johnson says.

Photo by Mark Hooper



Metal sleds replaced inside wooden doors on shrimp trawlers

The sleds created little or no resistance to the prop wash and boat maneuverability was increased dramatically. "It gets the nets and the doors away from the wheel wake," says Paul Nelson, a Williston shrimper. "You can pull the nets a lot easier. It's easier to turn around and the boat is more steady while you're towing."

But the real test for the sled came when fishermen pulled in the nets. "I think the nets with the sleds produce as much shrimp as the nets with the doors, maybe a little better," says Nelson. Johnson says the two-door/two-sled configuration allowed the fisherman to fish a wider range of environments without steering problems.

Most of Carteret County's inside shrimpers began using the sled. "Several fishermen told me the sled saved the small boat," Johnson says. "The feeling was that the smaller class of shrimp boat (under forty feet) became much more competitive to the larger class of inside boat since the smaller boats could concentrate more on shallow-water trawling and had more efficient gear."

—Kathy Hart

The science of providing advice

Sea Grant's marine advisory agents know that research is no good if it stays in the laboratory. So, they peddle information and innovations out on the docks, in seafood houses and on the beach.

The agents spend some time behind their desks, answering questions and offering advice. But, part of the time, they're out trying to spread the word about new ways to catch fish, to shed crabs, to fiberglass a boat. And, they've learned the value of knowing just who to turn to in a community where they're trying to get the word out. They've also learned that it's sometimes hard to find the leaders in a fishing community.

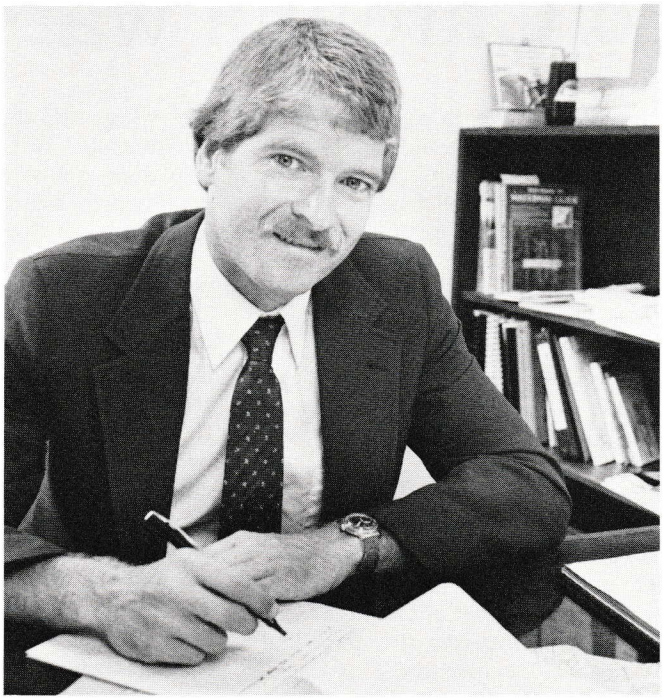
Jim Murray, Sea Grant's Marine Advisory Service director, says Jeff Johnson's study of social networks, information flow and the adoption of technology among North Carolina commercial fishermen, will help his team improve the way they do business.

"Johnson approached his study in a very scientific way," says Murray. "But our agents can use the study to pinpoint the leaders for themselves. They can make themselves available, ask questions, and find out who the highliner is in a community. With a little digging, they can find him."

Murray says the best way to find an opinion leader is by asking around. "You say, 'I've got this idea. Who is the best person to talk to about it.' And, pretty soon, you start hearing one name repeated by most of the fishermen.

"Once you find him, you start dealing with him on a personal basis. You cultivate that relationship," says Murray.

Photo by Steve Wilson



Jim Murray

Johnson's study is more than an assessment of the social networks in Crabtown, North Carolina, says Murray. There are approximately 400 Sea Grant marine advisory agents nationwide. With the help of this study, they'll all be able to do their jobs better, says Murray.

Coastwatch is a free newsletter. If you'd like to be added to the mailing list, fill out this form and send it to Sea Grant, NCSU, Box 8605, Raleigh, N.C. 27695-8605.

Name _____

Address _____

City•State•Zip Code _____

Coastal property owner __yes __no Boat owner __yes __no

I am in the following line of work:

__Boatbuilding/Repair
__City/County government
__Commercial fishing
__Educator
__Farming
__Homemaker
__Lawyer
__Marina operator
__Marine recreation
__Mass media
__Seafood processing/marketing
__State government
__University professor/researcher
__Other _____

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.

If you'd like to learn how to raise striped bass fingerlings, UNC Sea Grant has a workshop for you. Sea Grant and the N.C. Cooperative Fishery Research Unit are sponsoring a three-day workshop, May 7-9, at the Aquaculture Research and Demonstration Center in Aurora.

Randy Rouse, UNC Sea Grant's aquaculture agent, says the workshop will be a "hands on" opportunity for participants to learn how to spawn striped bass females and fertilize the eggs with white bass or white perch sperm. The workshop will also cover the techniques used to raise the hybrids from the egg to the fingerling size.

Howard Kerby, a Sea Grant researcher who has worked extensively with striped bass hybrids, will provide most of the workshop instruction. But members of the N.C. Division of Marine Fisheries and the N.C. Wildlife Resources Commission will be on hand to explain the laws that pertain to obtaining the stocks.

The cost of the workshop will be $40 if participants choose to stay in a dorm or trailer at the Aquaculture Research and Demonstration Center (bring your own sleeping bag). The cost is $30 if participants choose to find their own accommodations. The registration fee includes a striped bass culture book and four meals (two breakfasts, two lunches).

The workshop is limited to 20 participants, who will be chosen on a first-come, first-serve basis. To register, send the registration fee to Ron Hodson, UNC Sea Grant, NCSU, Box 8605, Raleigh, N.C. 27695-8605. For more information, call Hodson at 919/737-2454, or Rouse at 919/322-4054.

Year of the Ocean. It's a celebration King Neptune would smile on. From March 10, 1984, until March 10, 1985, events are planned that will educate the public about the ocean's heritage, its resources and its future. In North Carolina, October 6-14, has been designated as Week of the Ocean. Museums and schools are planning special "ocean" events.

Doug Young at the Office of Marine Affairs in Raleigh is keeping a calendar of events for this year-long celebration. If you'd like to find out what's on the schedule or would like to place an event on the calendar, contact Young at the N.C. Office of Marine Affairs, 116 W. Jones St., Raleigh, N.C. 27611. Or call 919/733-2290.

Fish may be flocking to piers if an artificial reef proves successful. Jim Murray, director of Sea Grant's Marine Advisory Service, and David Lindquist, associate professor of biology at the University of North Carolina at Wilmington, are testing fish aggregating devices, or floating reefs, in the waters off of piers at Wrightsville Beach.

Murray says the devices will be placed alternately off two piers, with one pier serving as a control. They'll move the devices back and forth between the piers to avoid having people fishing off just one pier.

The aggregating devices, which will be placed about 250 yards from the end of the piers, are made of fiberglass rods with netting which hangs in the water. The devices are secured 10 to 12 feet off the ocean floor by vertical float lines.

Last fall, the researchers gathered catch per unit of effort data for each pier. Once they install the devices, Murray and Linquist hope to be able to tell if the fish populations increase at the pier with the devices and if the devices actually improve fishing at the pier.

We'll let you know the results of their study.

Kudos to *Coastwatch*. For the third consecutive year, *Coastwatch* has won an international award from the Society for Technical Communication (STC). After the judging was over, *Coastwatch* garnered an Award of Achievement at the 1983-1984 International Technical Publication Competition. *Coastwatch* was edited by Neil Caudle; Kathy Hart and Nancy Davis were staff writers.

Two other UNC Sea Grant publications—*Sea Grant in North Carolina, 1981-82* and *About Hurricanes*—earned Awards of Merit at the regional competition sponsored by the Carolina Chapter of the STC. *Sea Grant in North Carolina, 1981-1982* was written by Neil Caudle, Kathy Hart and Nancy Davis. *About Hurricanes* was a publication produced by UNC Sea Grant, the N.C. Office of Coastal Management and N.C. Division of Emergency Management.

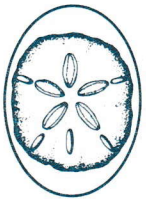
Kathy Hart is Sea Grant's new Director of Communications. Hart, a graduate of the UNC School of Journalism, has been with Sea Grant for five years. As Director of Communications, she will also serve as editor of *Coastwatch*.

Continued on next page

Get out your camera. It's time to start shooting for the Bogue Banks Photography Competition. North Carolina photographers can enter their best color and black-and-white prints depicting the beauty of the North Carolina coast—including plants, animals and natural scenes. In a new category, photos may depict any aspect of life in coastal North Carolina.

The competition is sponsored by the Marine Resources Center at Bogue Banks, the Carteret County Arts Council, Branch Banking and Trust Company, and the N.C. Marine Education and Resources Foundation.

Entries will be accepted June 1-3 at the Marine Resources Center at Bogue Banks. Complete rules are available by writing Marine Resources Center/Bogue Banks, Atlantic Beach, N.C. 28512, or by calling 919/247-4004.



They've been popular in Europe for years. Now, they're catching on in America. What is this European invasion? It's the bed and breakfast home. More Americans are making a profit on unused rooms by turning their homes into bed and breakfast lodging. But, Rich Novak, Sea Grant's recreation specialist in Manteo, says there are some things to consider before opening your home to strangers. That's why he has written a booklet, *Opening a Bed and Breakfast*.

The booklet describes the investments, regulations, reservation and scheduling system, and rate structure a prospective bed and breakfast owner should consider before making his or her home a bed and breakfast business. For a copy of *Opening a Bed and Breakfast*, write UNC Sea Grant. Ask for UNC-SG-84-03. The cost is $1.

Leon Abbas, UNC Sea Grant's coastal recreational specialist and marine economist, has resigned. Abbas, who has been with the program since August 1977, is leaving to enter private business. His resignation is effective June 30.

The North Carolina coast offers some of the best saltwater fishing between Maine and Florida. The nearby Gulf Stream attracts a wide variety of fish to challenge the angler. Many people who don't own seaworthy vessels participate in offshore fishing by taking a day trip on a charter boat or headboat. A charter boat is a vessel that is rented by groups of up to six people. Headboats, which are larger vessels, can often accommodate up to 125 people. Generally, reservations are required for charter boats and may also be necessary for headboats.

To help anglers locate a charter boat or headboat for their fishing expeditions, UNC Sea Grant, the National Marine Fisheries Service and the N.C. Division of Travel and Tourism have put together a list of most of the charter boats and headboats operating along the North Carolina coast. The listing provides the name of the boat, the captain, the docking location and a telephone number for making reservations.

For a copy of this free brochure, write UNC Sea Grant. Ask for "A Listing of Charter Boats and Headboats in North Carolina."

If you're a property owner along a North Carolina river or sound, you may have some rights you didn't know about. They're called riparian rights. Walter Clark, Sea Grant's coastal law specialist, says that one of the most recognized riparian rights is the right of access to deep water. Clark has written a blueprint, *Riparian Rights: What Are They? What Are Their Limits?* If you'd like a free copy of the publication, write UNC Sea Grant. Ask for UNC-SG-BP-84-1.

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