UNC Sea Grant

August, 1985

COASTWATCH

Photo by Mark Hooper

DIVING THE DEEP

Photo by J. Foster Scott

TAKING THE PLUNGE

Amberjack, barracuda, spottail and cod are a few of the warm- and cold-water species of fish found around the reefs and wrecks off the Tar Heel coast.

For those who scuba dive, there's nothing like it. The weightless feeling. The beauty of the unfamiliar. The sense of adventure. It's all there for those who sink into this final frontier.

Bob Eastep, a dive instructor and dive boat captain with EJW Sport Shop in Morehead City, says diving is on the increase in North Carolina. "It used to be that I had the only charter boat in this area that strictly took out divers," Eastep says. "Now there are 10 dive charters in the Beaufort-Morehead City area."

It's not just North Carolina divers who are flocking to our coast. Eastep says divers from Virginia, New York, Florida, Maine, Alaska and even Germany have chartered his boat.

What attracts these undersea enthusiasts? For the most part, it's the hundreds of wrecks that litter the state's continental shelf. They range from Civil War blockade runners to German U-boats (see story, page 5).

But the wrecks provide more than a history lesson or the lure of artifacts. They're a study in underwater biology. The wrecks become encrusted with barnacles and corals that attract baitfish, which in turn attract larger fish. The diver might see amberjacks, barracudas, triggerfish, groupers, filefish or spottails, says Jim Murray, president of the N.C. Wreck Divers Association and the director of Sea Grant's Marine Advisory Service.

North Carolina's offshore waters house species of a warm and cold nature. The cold-water Labrador currents and the warm-water Gulf Stream meet along the coast, attracting species from opposite climates.

Eastep, who has been diving since 1957, says most divers see a wreck once or twice and don't want to go back again. "I've been on some wrecks 70 or 80 times," he says. "And I always see something different.

"I've seen a cobia following closely behind a ray, picking up the crabs the ray stirs up as it flaps its wings," he says. "Near the Gulf Stream, I saw a couple of whales. And a shark is a majestic thing to see underwater." Eastep enjoys watching the interactions between fish, examining the colorful corals and collecting shells.

For a more natural setting, divers can locate one of the state's natural reefs. "I'm trying to convince more divers to try the natural reefs," Eastep says. "They're not overpopulated with divers like many of the wrecks."

Murray agrees that the natural reefs are a favorable alternative to wreck diving. "You get the feeling that you are the first one to dive there," he says. In addi-

tion to a variety of fish, Murray says the reefs offer interesting flora.

But whether it's reef or wreck, John G. Stewart, an assistant professor of physical education and a diving instructor at N. C. State University, cautions that diving offshore can be rough. Typically seas off the North Carolina coast run one to three feet. Anything rougher can cause problems for the diver — reduced visibility underwater, stronger near-surface currents, greater likelihood of seasickness, difficulty in boarding a bobbing boat. Stewart and Eastep say that only experienced ocean divers should dive in rough seas.

Although some hazards do threaten the safety of scuba divers, others have been overdramatized. Movies such as "Jaws" and "The Deep" play up the ferocity of underwater creatures such as sharks, barracudas and eels. But Eastep and Stewart say these movies exaggerate the danger from such creatures. The rule of thumb: You leave the creatures alone, and they'll leave you alone.

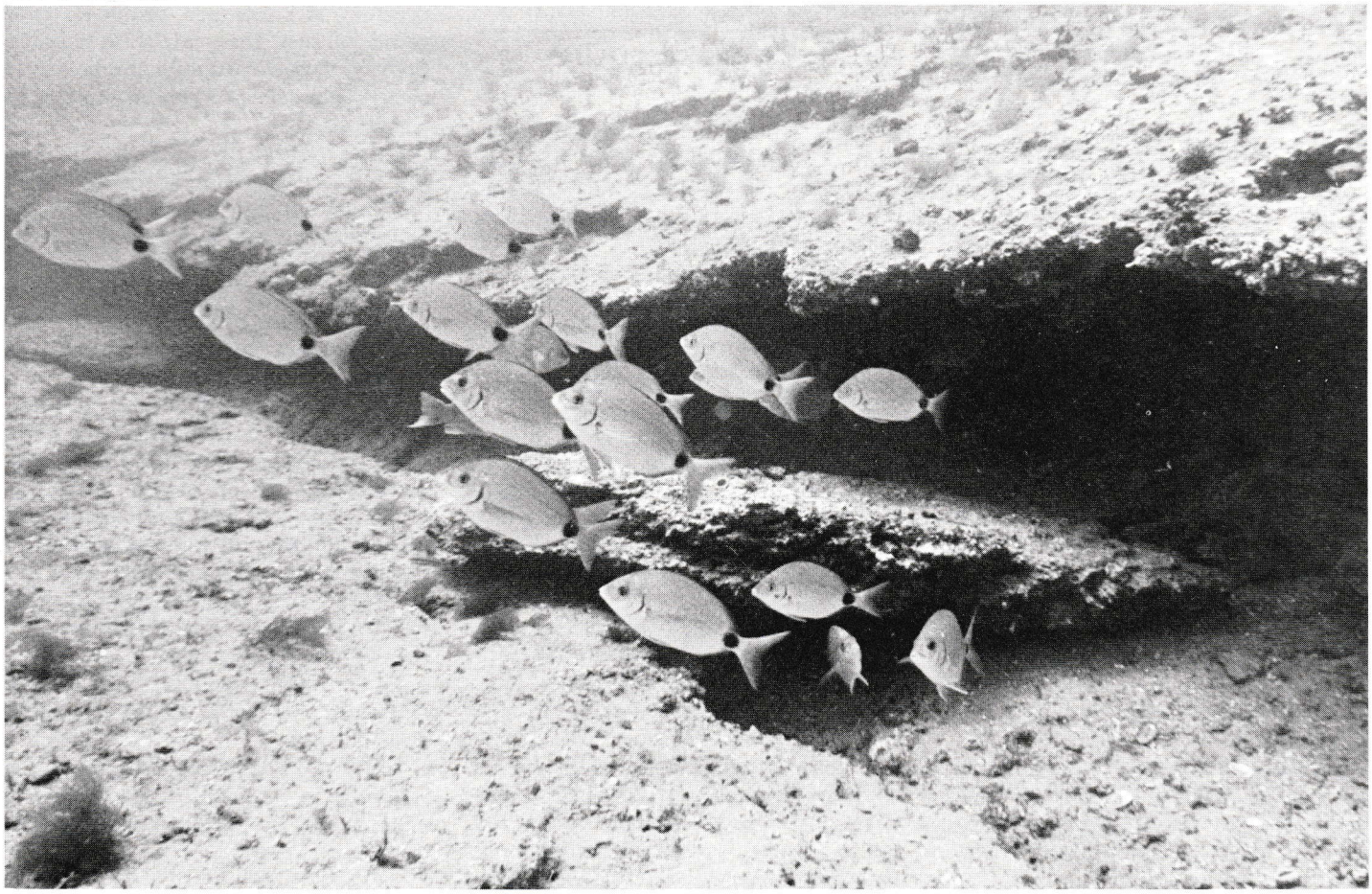
Although diving seems to be an enticing sport, many people abandon its ranks after their instruction or after only a few dives. Of the 250,000 people certified for scuba diving nationwide each year, Stewart says only 10 percent continue to dive regularly. As reasons for the high dropout rate, he cites the cost of equipment (from $700 to $1,500), the lack of good diving sites, an unfavorable initial open-water experience and the lack of diving companions.

In a 1984 survey of subscribers, *Skin Diver* magazine found that divers are most often male (86.9 percent), between the ages of 25 and 39 (60.8 percent), have an average household income of $43,000, and attended or are attending college (80.8 percent).

The average *Skin Diver* subscriber has been interested in diving more than 10 years and has been diving for six and a half years. Almost one-fifth of the respondents are members of organized dive clubs. And most divers have auxiliary interests or hobbies such as wreck diving, cave diving, underwater photography, shell collecting and spearfishing.

— Kathy Hart

Photo by Mark Hooper



A school of spottail pinfish swim near a natural underwater reef

DIVING SAFETY

An ounce of precaution

Once you slip beneath the waves you're out of your element. Instead of being surrounded by oceans of air, you're immersed in a sea of water. Your lifeline of air is pumped from a tank strapped to your back. Your life depends on you.

John G. Stewart says scuba diving is as safe as any other sport if you receive the proper training, observe the correct safety procedures and know your physical limitations.

Before giving the sport a plunge, enroll in a good certification program, Stewart says. The National Association of Underwater Instructors (NAUI), The Professional Association of Diving Instructors (PADI), the YMCA, the National Association of Skin Diving Schools (NASDA), and others offer instructional certification programs.

Check with your local dive shop, YMCA or college or university to see which certification programs are offered in your area. The various programs require students to meet virtually the same certification standards.

Stewart says students entering his course should be good swimmers. In addition to having completed a skin diving course (which is different from scuba diving because it requires only a mask, snorkel and fins), students must be able to swim 400 yards, swim underwater 20 yards, tow a passive victim 50 yards, tread water 15 minutes and retrieve an object from the bottom of the pool, he says.

Courses require classroom teaching and pool and open-water experience. Upon completion, students receive a certification card that will allow them to purchase air, rent equipment and charter dive boats. Although no state or federal law requires certification, dive shop owners and boat captains regulate the sport themselves to ensure safety and negate their liability in case of an accident.

Stewart advises beginning scuba enthusiasts to limit their initial dives to 60 feet or less. At deeper depths, divers must contend with the possibility of nitrogen narcosis (the narcotic effect that overcomes divers at deep depths, impairing their judgment) and decompression sickness. Commonly called "the bends," decompression sickness occurs when a diver surfaces too quickly from a long or deep dive, not allowing enough time to adequately release nitrogen through normal respiration. Bubbles of gas are released in the tissue and bloodstream, causing pain. The cure? Recompression at a hyperbaric chamber.

"Besides, I tell them at shallower depths, you have more light penetration and better colors," he says. "You can make longer dives, and you don't have to worry about nitrogen narcosis or decompression sickness."

Bob Eastep says the charter dive boats in Carteret County will refuse to take divers to wrecks or reefs over 80 feet deep until they have made five shallow-water dives. "We had people making their first dives on the U-352 (the wreck of a German submarine that sits about 120 feet below the ocean surface)," he says. "That wreck is entirely too deep for a beginning diver."

Stewart says diving accidents are caused when divers don't realize their limitations. "Drowning is the leading cause of death in diving," he says. "And most drowning accidents occur because people overestimate their capabilities. Of the diver, the equipment and the environment, the diver himself is the most hazardous."

Panic can be a diver's number one enemy underwater, Stewart warns. It can cause problems such as air embolism. Air embolism occurs when a diver holds his breath on ascent and doesn't exhale the gases that expand as the pressure on the body decreases. Unreleased gases can rupture the lungs, sending bubbles into the bloodstream. Since the bubbles tend to travel upward, they become lodged in the brain, cutting off circulation. Brain damage or death can occur in minutes.

Although air embolism and decompression sickness are problems that could happen, they rarely do happen, Stewart says. A properly trained diver should know how to handle emergency situations.

Other diving precautions that can prevent accidents include:

* Raise the divers' flag. It will warn other boaters that divers are in the surrounding waters.

* Never dive alone. Dive with someone whose capabilities you know and trust, and always stay within sight of your companion underwater.

* Use the U.S. Navy dive tables conservatively when planning your dives. Long or deep dives usually require decompression stops before surfacing.

* Use the U.S. Navy repetitive dive tables for any dive made within 10 minutes to 12 hours of a previous dive.

* Never dive after drinking or taking drugs. They can impair your judgment underwater.

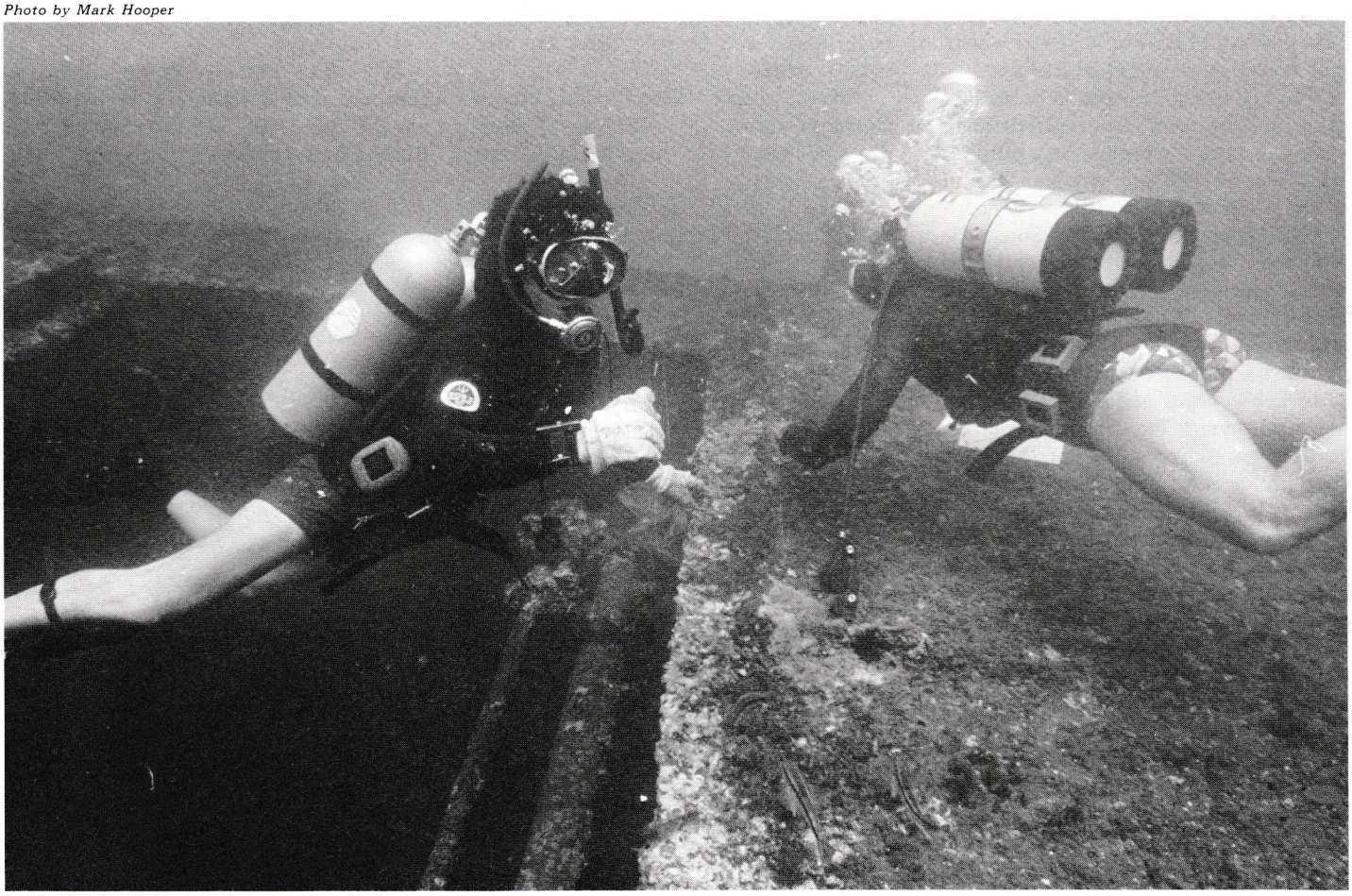
* Don't dive if you have a cold. You can rupture your eardrums or injure your sinuses.

* If you haven't been diving in the last four to six months, go through a conditioning program before donning a mask and fins.

— Kathy Hart

WRECK DIVING IN NORTH CAROLINA

Photo by Mark Hooper



From blockade runners to schooners to submarines, the ocean off the North Carolina coast is strewn with the remains of thousands of wrecks.

BY SARAH FRIDAY

Just a few miles off North Carolina's coast lies an underwater museum filled with history, mystery and enchantment. The sunken ships of the Graveyard of the Atlantic comprise a collection that's intriguing to a different kind of tourist. Fish and fishermen flock to these artificial reefs in search of meals. For a closer look, it's scuba divers who have the advantage.

Thousands of old crafts rest between Currituck and Calabash, making North Carolina a wreck diver's paradise. Only a few hundred ships have actually been located, however. Of these, about 100 are at divable depths, says Rod Farb, diver and author of *Shipwrecks: Diving the Graveyard of the Atlantic*. The wrecks lie from near shore to 60 miles offshore in water 30 to 160 feet deep.

The number and variety of wrecks in North Carolina lure novice and expert divers from around the world. Along the ocean floor are submarines, schooners, steamers, gunboats, blockade runners, barges, tugs, freighters and other boats up to four centuries old. Most of them sank when snagged on a series of shoals jutting from the capes and inlets of the Outer Banks. Others went down when they met another ship, dangerous currents, bad storms or hurricanes.

To no surprise, these vessels are in all states of disarray, says Farb. The *John D. Gill*, a World War II tanker off Wrightsville Beach, sits straight up. Other wrecks are upside down or on their sides. And most have disintegrated in the middle with the bow and stern left intact.

With such a unique collection of exhibits, the Graveyard of the Atlantic offers something for every kind of diver.

History buffs can explore Civil War blockade runners or a submarine like

Continued on next page

the *U-352*, the first German U-boat sunk by the Coast Guard during World War II. Farb says the sub off Morehead City is probably the wreck dived most in North Carolina because of its past and because it lies in warm, clear water near the Gulf Stream.

Divers looking to spot a school of amberjack or to photograph delicate corals can take the plunge on a number of inshore or offshore wrecks. One of the most colorful is the 528-foot *John D. Gill*, says Jim Murray. Since the *Gill* sank in 1942, it has collected corals, sponges, sea fans and other oceanic plants. Angelfish, barracudas, eels and a host of different marine species are prevalent, too.

For those who want a souvenir from their underwater trip, most wrecks offer a treasure chest of goods. "There's always a chance you'll find something," says Murray. "When you get to the more intact ones, you can poke around inside and see what's in there."

Portholes, artillery, coins, tableware and stained glass windows are popular takes. But brass is the number one find, says Linda Purifoy of Olympus Dive Charter in Morehead City. Her husband, George, brought home an 800-pound solid brass table from one of his dives. And he's collected other brass artifacts such as fittings, kitchen utensils and a large clock from the *USS Schurtz*, an oceanliner that sank in 1918.

Not everything is for the taking, however. Salvaging is prohibited on wrecks that lie within three miles of the coast unless a permit is obtained from the Underwater Archaeology Branch of the N.C. Department of Cultural Resources. Any historic artifacts found must be returned to the state.

Beyond the state's jurisdiction, diving and salvaging is permitted on all wrecks except those designated as National Marine Sanctuaries. The *USS Monitor* off Cape Hatteras falls under this category. The *Monitor* sank offshore during a storm, only months after battling the *Merrimack* in the world's first clash of ironclad ships during the Civil War.

Another ship, the *USS Peterhoff*, comes under federal jurisdiction and is listed in the National Register of Historic Places. Divers must obtain a permit from the U.S. Navy to remove artifacts from it.

Most wreck diving takes place off the southern coast around Morehead City and Wrightsville Beach, says Ron Thrower, owner of Reef and Ridge Sport Shop in Cary. But areas around Nags Head and Oregon Inlet are also very popular.

"Most people believe that North Carolina dives are cold, dark, deep dives," says Farb, "but many of the dives are like the Caribbean." The water temperature ranges from 65 to 80 F during the diving season, which usually runs from April to November.

Photo by Steve Murray

Divers leave surf after visiting a nearshore wreck

During the season, a number of charter services run to wrecks off North Carolina's coast. At the Olympus Dive Charter, for example, a group of 10 can reserve a boat for $500 a day. For 25 people, it's $900.

Offshore trips start early. The boat usually leaves the dock around 6 a.m., and depending on the site of the wreck, the ride can be long. Captains locate wrecks by using Loran-C or coordinates from a chart or manual such as UNC Sea Grant's book, *Hangs and Obstructions to Trawl Fishing: Atlantic Coast of the United States*.

It's best to dive a wreck with a trained dive master or leader, says Farb. Diving with groups such as the Wreck Divers Association or a scuba club is also a good idea. In addition, wreck divers need to take special safety precautions. Before the trip they must be in good physical condition, have experience and maintain their equipment. At the dive site, Farb recommends basic scuba safety such as having a buddy and keeping the dive flag displayed.

It's also necessary to carry a compass and a signaling device since wrecks tend to be disorienting. If divers plan to enter a wreck they should use a lifeline to prevent getting lost. And because wrecks are often in deep water, additional tanks of oxygen are a good first aid measure.

For inshore dives, less travel time and expense are involved, says Murray. There is also a better chance of good weather. Because the water is shallow, divers can stay below longer.

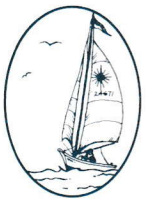
The same is true for beach diving. Often, divers can swim to the site, eliminating the need for a boat. Diving during slack tide is best, says Farb, because currents and surges are less turbulent and visibility on the wreck may be better.

To Farb, diving wrecks anywhere in North Carolina is like running upon an underwater oasis. Miles of the ocean floor look like the desert, but here and there is a vessel that's definitely no mirage.

(The hang log book is available by writing UNC Sea Grant, Box 8605, N.C. State University, Raleigh, N.C. 27695-8605. Ask for publication number UNC-SG-83-01. The cost is $2.)

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.



During hurricane season, boaters need to be on their own kind of coast guard. From June until November, hurricanes can occur any time, tossing boats around marinas or out to sea. But boat damage can be minimal if operators take some precautionary measures before the skies blacken and the wind whips through the sails.

First, prepare a checklist of equipment needed to secure your boat. Assemble it and keep it together. Also, check your homeowner's insurance policy to see if it adequately covers storm damage to your boat and protects you if the boat gets loose and causes damage elsewhere.

On board, have enough line (about 200 feet) to tie your boat securely. Nylon line or spring lines are recommended. Use chafing gear on all lines to protect them from wear. Make sure the fenders are well secured to your boat to protect it from other boats, sea walls and other obstructions during a storm. Keep bilge pumps in top working order. Have radio equipment available for receiving weather information and for communications. Keep batteries fully charged; a spare battery on deck is a good idea. If possible, fuel tanks should be kept full during hurricane season.

The National Weather Service issues a warning 12 to 24 hours before a hurricane. Boat owners should act immediately upon a warning.

If conditions are safe, transport your boat to a dry shelter. If you can't get to a shelter, pull your boat ashore and tie it to a large, strong tree with a good root system. When tying it, remember that the tide rises 10 to 20 feet above normal and wind directions change during a hurricane. Secure the boat for all directions.

If the boat must stay in the water, take all movable equipment off such as sails, radios and cushions. Latch down all you cannot move. And seal all openings to make it as watertight as possible.

If you are on the water when a warning is issued, immediately head for safe harbor. Don't stay with your boat; seek shelter on land.

The National Oceanic and Atmospheric Administration is taking applications for fisheries observers for the Foreign Fishing Vessel Observer Program. Fifteen to 25 positions are available each month for two- and three-month tours at sea. Observers live aboard foreign fishing vessels operating within the U.S. 200-mile fisheries conservation zone in North Pacific waters. Duties include collection and recording of biological and catch volume data.

Preference will be given to candidates with training in marine biology, fisheries biology, fisheries or related fields. For an application packet, write Robin Hill, Frank Orth and Associates Inc., Suite 517, 110 110th Avenue, N.E., Bellevue, Wash. 98004. Or, call 206/455-3507.

UNC Sea Grant will cosponsor an artificial reef conference Sept. 30 at the University of North Carolina at Wilmington. The conference will bring together university researchers, fisheries managers, public officials and fishermen to discuss the status of artificial reef development in the southeast. The conference is free and open to the public. Other sponsors include the UNC-W Department of Biological Sciences, the National Oceanic and Atmospheric Administration's National Undersea Research Program—Southeast Region, and the Wrightsville Beach King Mackerel Tournament Committee. For more information, call Sea Grant Marine Advisory Service Director Jim Murray at 919/737-2454 or UNC-W marine biologist Dave Lindquist at 919/394-3474.

North Carolina fishermen who plan to harvest seafood other than oysters from the tidal waters of Virginia must apply for a license. If you plan to fish in Virginia waters during the 1986 calendar year, you must apply for a nonresident harvester's license and any other required licenses prior to Sept. 30, 1985.

For more information, contact the Virginia Marine Resources Commission, P.O. Box 756, 2401 West Avenue, Newport News, Va. 23601. Or call 804/247-2238.

Boating is big business in North Carolina. That's why Sea Grant and the N.C. Saltwater Fishing Federation are sponsoring a study to examine the economics of the state's recreational boating industry.

Using mini-grant funds, Sea Grant researcher Jeff Johnson, an anthropologist at East Carolina University, will compile information on the number of boating manufacturers, the people they employ, and the money the industry generates. His findings, along with data from an earlier Sea Grant study of North Carolina's recreational sound fishery, will provide a better picture of the overall impact of the sportfishing industry.

Bob Stryker, former president of the federation, says this study will provide information that sport fishermen can present to the legislature and to the fisheries commission to support the idea that the industry is large. In addi-

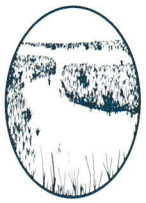
Continued on next page

tion, it may help support the contention that more funding is needed for recreational fisheries development and management.

Larry Cahoon, a biologist at the University of North Carolina at Wilmington, has been awarded a mini-grant to study the distribution of benthic microalgae on the outer continental shelf. Cahoon believes the algae may be important in the overall productivity of the continental shelf since it may provide an important food source for a variety of organisms.

Previously, scientists believed the waters of the continental shelf were too deep to allow penetration of enough light for algae to grow. But in preliminary work completed under another mini-grant, Cahoon found large populations of the microalgae.

Sea Grant researcher Hans Paerl will travel to Nairobi, Kenya, Sept. 30 to participate in a United Nations Educational, Scientific and Cultural Organization symposium on the comparative ecology of aquatic environments. Paerl will join scientists from other nations to discuss the characteristics and functioning of freshwater and coastal marine ecosystems.



The N.C. Department of Natural Resources and Community Development's Division of Environmental Management is holding a technical session and public hearing on special water quality criteria for primary nursery areas. The technical session is 10 a.m. to noon and 1 p.m. to 5 p.m. Sept. 16 at Carteret Technical College in Morehead City. A public hearing will follow at 7 p.m.

In the technical session, UNC Sea Grant Director B. J. Copeland and researchers Hans Paerl, Don Stanley, Wayne Skaggs, Wendell Gilliam, Len Pietrafesa and John Miller will present technical information they've obtained through their Sea Grant projects.

Public hearings will also be held in Wilmington on Sept. 17 at 7 p.m. at Cape Fear Technical Institute and in Washington, N.C., on Sept. 23 at 7 p.m. in the Beaufort County courthouse.

A summary of the proposed water quality criteria can be obtained by contacting the Division of Environmental Management at 919/733-5083.

The UNC Sea Grant Program will be reviewed for recertification October 8-11 at the Carolina Inn in Chapel Hill. A team of scientists and administrators will review the program's progress, direction and impact on coastal North Carolina since its original certification as a college program in 1976.

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