

COASTWATCH

Photo by Steven Wilson

Here comes coal

It all began when the Arab oil producers doubled their prices in 1979. Suddenly Europe wanted to burn coal in its power plants. The demand for American coal grew huge, and coal ships waited months in line off Newport News and Hampton Roads, the big coal-handling centers of the East.

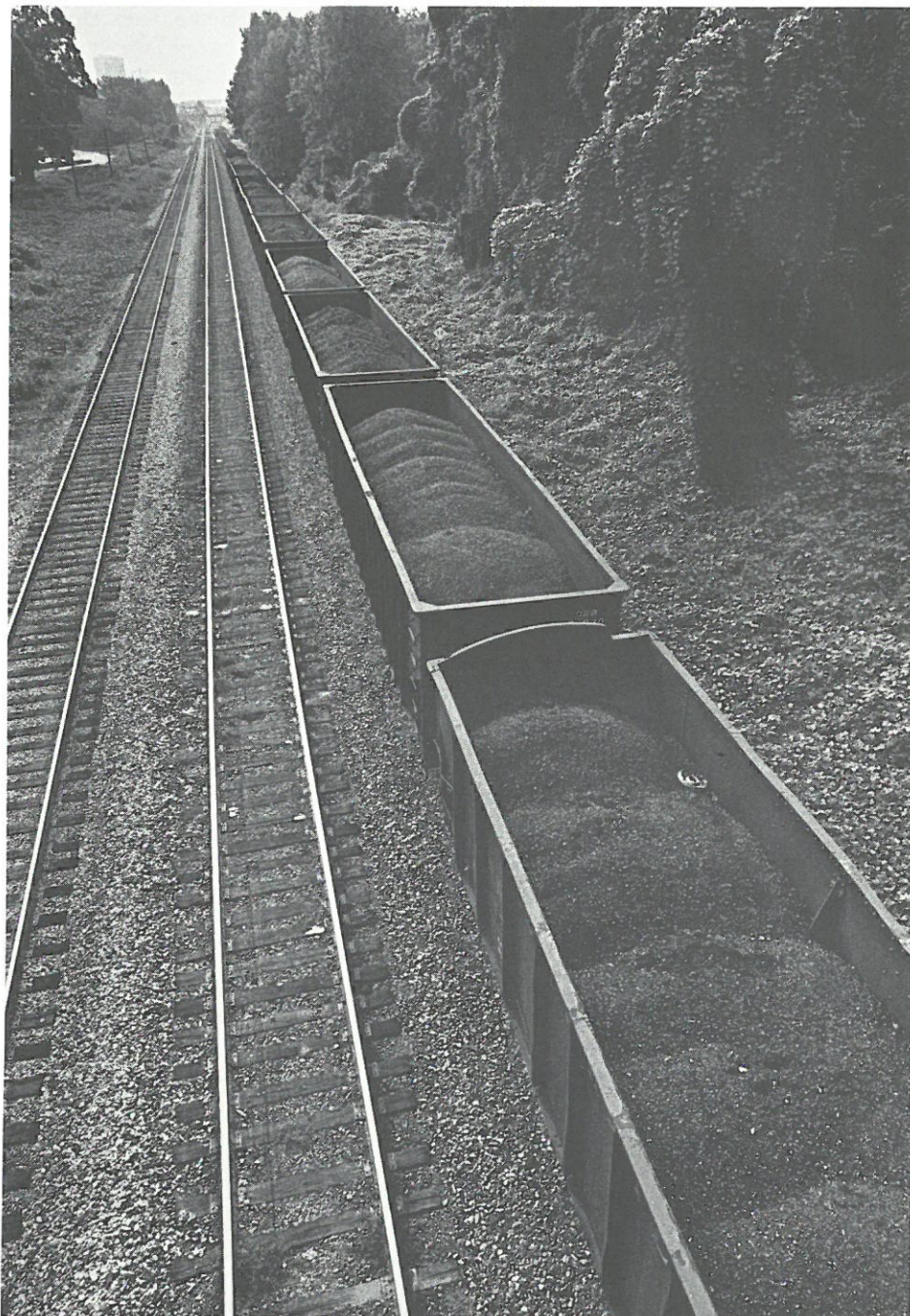
Almost overnight, coal companies began rushing to stake claims on new coal-terminal sites.

North Carolina was among the first places they looked. The state was near enough to the coal fields of Appalachia. There was already one deep-water port. The climate was mild, so coal wouldn't freeze on the docks during winter. By May, 1981, one company was ready to ship coal from Morehead city. Others were standing in line to buy land and file permits.

State officials called coal the "salvation" of the Morehead City port, which operated in the black for the first time since 1967. Federal officials lauded the industry for its role in helping with the balance of trade.

But while some sang coal's praises, others sang the blues. Citizens groups began to protest the prospects of coal trains and coal dust in their towns. Then, late in 1981, the European coal market weakened and coal's bright picture clouded. Would the whole coal boom vanish in a cloud of dust?

This month, Coastwatch examines the coal export industry in North Carolina, and its effect on the coast.



A coal train rumbles across the Piedmont on its way to the coast

Three towns, two ways of looking at a coal pile

Some say the face of Carteret County is black with coal dust. Others see no coal dust there at all.

By a similar quirk of optics, the mound of coal rising at the State Port coal terminal shows two different shapes to people watching it from windows in Beaufort, Morehead City and Atlantic Beach: Some see a mountain of prosperity; others, a heap of bad news.

"I can see that coal pile from my house, and that's not the view I came here for," says George Hammond, an Atlantic Beach resident. "I don't like the noise, the harassment of the trains, and the dust in the air. And, I don't like knowing that I might need to get to a hospital some day when a coal train is blocking all the crossings."

Hammond is a retired engineer who spends much of his time these days working with Carteret County Crossroads, a group campaigning against the development of coal terminals in the county. Hammond says the group's 300 members plan to press the state to prepare thorough environmental impact statements, not only for terminals proposed for Radio Island, near Beaufort, but also for the operation already under way at the State Port in Morehead City.

Hammond says that his group is angry because coal came rolling into the community over their objections and without, he says, enough study beforehand. The group cites a

previously untested law, section 143B-437 of the state's General Statutes, which states that "the Department of Commerce shall conduct an evaluation, in conjunction with the Department of Natural Resources and Community Development, of the effects on the state's natural and economic environment of any new or expanding industry or manufacturing plant locating in North Carolina."

But Clint Abernathy, assistant secretary of Commerce, says that the law was satisfied when the coal terminal, built by Alla-Ohio Valley Coals,

But coal company spokesmen say the coal, its dust and runoff are being contained on the site. They suggest that coal might be taking the rap for other sources of air pollution.

And Don McMahan, superintendent of bulk handling at the port, says that coal is a safe commodity for the port to handle.

"When they first told me we'd be handling coal, I didn't know what the dust problems might be," McMahan says. "But I've found coal to be wonderful to work with. It's easy on the men, it's heavy enough to handle well,

"When they first told me we'd be handling coal, I didn't know what the dust problems might be"—Don McMahan

received its permits from other agencies.

"The facility at Morehead had to get both an air quality and water quality permit," he says.

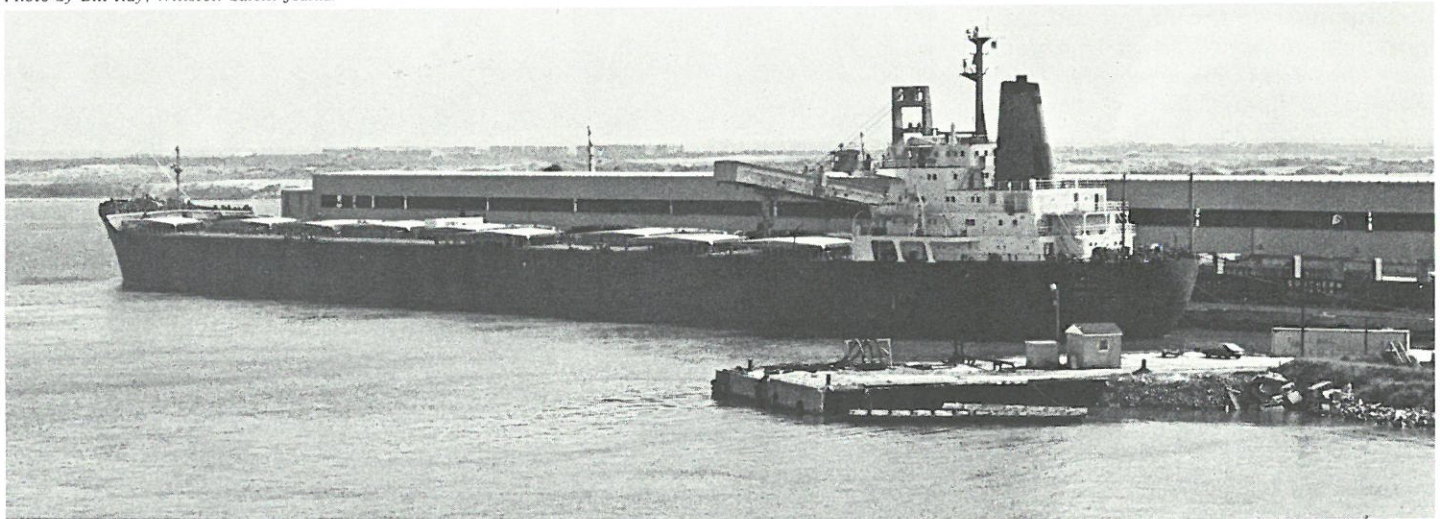
Opponents of the facility argue that its effects reach far beyond concerns over air and water quality, and Hammond says he believes the facility has not taken adequate measures to protect the environment.

"People are complaining about the dust, and if you can see the dust in the air, then you know some of it must be getting into the water," Hammond says. "And nobody knows yet what that might be doing to fishing around here."

and it's comparatively clean. If we didn't keep it wet, the dust would blow, but we use firefighting equipment to keep the piles hosed down. My office is fifty feet from the coal pile, and I don't have that much problem with dust."

McMahan says water from the piles seeps into two settling ponds where coal particles settle to the bottom. The water is then recycled through the pumper onto the piles, so that there is no discharge. When sludge in the ponds builds up, it is mixed with coal shipments and loaded on outbound ships. A dike-like embankment around the site prevents runoff from contaminating the waters of the Newport

Photo by Bill Ray, Winston-Salem Journal



The state's first load of export coal went out on the Chihaya in May, 1981

estuary, McMahan says.

"It's helped the port," McMahan says of the coal. "We were set up here to handle phosphate, but the phosphate shipments never have come up to the levels we expected, so we have the capacity to carry coal. It's meant about forty-five new jobs and sixteen others part-time."

During 1981, the State Port at Morehead City showed a profit for the first time since 1967. Coal exports get the credit.

All of the coal shipped out so far has belonged to Alla-Ohio, which leases the site of the new terminal from the state. The coal is mined mostly in West Virginia and Kentucky and travels by rail to the terminal, where it is loaded on ships bound for Europe. The product is called steam coal, because it is used to fire steam-generating power plants. Steam coal is less dense and somewhat less hazardous than metallurgical coal, which is mixed to order on the docks. The Newport News and Hampton Roads area of Virginia handles most of the country's exports of metallurgical coal.

The first coal ship from North Carolina loaded 62,635 short tons on May 8, 1981. McMahan says that the port shipped coal at a rate amounting to 2 million tons per year until financial troubles forced Alla-Ohio to suspend shipments in November, 1981.

But between the coal fields of Appalachia and the covered conveyor that feeds the big ships, coal is raising a ruckus along the rail line. In New Bern, townspeople are worrying about 75-car coal trains rattling their historic district, which the railroad bisects. And in Morehead City, where trains and traffic share Arendell Street, the town's main avenue, trains turn and unload at the State Port nearby, sometimes tying up as many as nine city blocks for 20 for 30 minutes. There are 36 grade crossings on Arendell Street alone.

But the coal terminal's defenders say there will be ways to unsnarl both the traffic and the critics.

"We'll get accustomed to coal," says Roy Stevens, director of the Carteret County Economic Development Council. "I can think of things I'd rather have here than a coal terminal. But right now, that is who is interested."

—Neil Caudle

Photo by Ron Chapple



Workmen use water hoses to control dust at the terminal

Trains and trouble at mayor's door

From the mayor's office in Morehead City, Bud Dixon can rock back in his chair and watch the coal trains rumbling down Arendell Street. Dixon lives and works on that street, within rattling range of the coal cars coming in and out of the State Port nearby.

Lately, Dixon has been feeling the weight of those cars in more ways than one. He is the mayor, but he is also the president, by appointment, of the Atlantic and North Carolina Railway between Goldsboro and Morehead City. He presides over the State of North Carolina's controlling share of the railroad, which is leased to Southern Railway. So state officials' enthusiasm for a new coal industry has not been lost on Bud Dixon. But neither has his own town's dread of coal. And he has doubts about how the costs and benefits of exporting coal will balance out in his community.

"We know that Morehead City cannot take any more transportation problems than it already has," Dixon says. "And the majority of our people here are against coal coming in. They associate it with what they've seen up at Newport News. They just know that coal is a dirty commodity, and they don't want it, period."

"We're not really in a good location for industries like this to come in and develop," he adds. "We have always relied on tourism and commercial fishing for much of our economic growth, and those industries just can't stand too much industrial development around them."

But while strong voices sound off on both sides of the issue, Dixon says there's not much he can do right now but wait. He waits for the results of a study, conducted with a \$30,000 grant from the state, of how the trains will affect the town's underground utilities, tourist trade, emergency services and property values. He waits for the N. C. Department of Transportation to finish its study of rail traffic problems in the New Bern-to-Morehead City corridor, a study on which the development of Radio Island as a port is waiting. And, he waits for Southern Railway, the state and the coal companies to agree on just who should foot the bill for solving the transportation bottlenecks.

Meanwhile, he goes to meetings where officials and coal company representatives assure him that nobody wants to see six heavy coal

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Coal pile rising near the railway



Mayor Bud Dixon of Morehead City

trains a day descending on downtown Morehead City. But despite their assurances, Dixon says he doesn't know what recourse his community might have if the trains come rolling in on their way to a new terminal on Radio Island.

"I don't think it's going to happen," Dixon says, "but I don't know yet what we could do to stop them if it did."

The Coastal Resources Commission has made the development of coal terminals on the island dependent on state-approved port and transportation plans that would prescribe ways of untangling the traffic and environmental problems, both on the rails and around the harbor. And, Coastal Management officials say they believe any development would have to be consistent with those plans, or the development could not be approved.

Right now, that message seems to imply that coal headed for Radio Island would have to bypass

Morehead City's business district, either by a new railway or by some alternative means, such as slurry pipelines or barges.

But the question remains: Who'll pay for such improvements? Marvin Wilson, Southern Railway's chief engineer in the company's Atlanta, Georgia office, says he doubts his company will sink millions into a new railroad route without some assurance that the coal industry's boom doesn't turn to bust.

"We've already laid some new welded rail between New Bern and Morehead," Wilson says, "and if you're talking about just getting the track we've got now ready for more traffic, we could do that fast—this year. But if you're talking about bypasses around New Bern or Morehead, that's something else."

Wilson says estimates of \$50 million to \$100 million for a rail bypass around either city are "on the low side."

"It's going to be hard to get around

Morehead City," he explains. "To the north, there's some valuable residential area. To the south, there's water. It would take three to five years to buy up the right-of-ways and build."

(Gulf-Interstate, the company planning a large coal terminal on Radio Island, hopes to be in business by 1984 with an initial capacity of about five million tons a year.)

While Southern is unlikely to sink millions into bypasses unless it knows coal shipments will pay off, the coal companies are unlikely to make guarantees until they know they can get their coal to sea. And, state officials are reluctant to approve plans for new terminals until some headway is made on the transportation problems.

"They're just going to have to get together and work something out," Dixon says. "They've all got something to gain from it."

—Neil Caudle

Coal pays, but the costs are hard to figure

So far, the coal shipped through North Carolina has generated about as much reaction in coastal communities as it has electricity in Europe. But between the cheers and jeers, the question most often asked is: Will handling coal cost us more than it is worth?

The answer is unclear. But even so, assistant secretary Clint Abernathy says the State Department of Commerce is aggressively seeking the coal export industry.

"We go after any commodity that can be moved through the ports," he says. "The tonnage over the docks helps local economies and brings revenue to the port. In the case of Morehead City, about ten million dollars will go into the local economy this year (1982) because of jobs associated with handling coal."

But Morehead City mayor Bud Dixon is skeptical. "I can't see how sixty jobs will mean ten million dollars," he says. "There's no question it will help some, but some of the benefits may be offset by decreasing property values and tourist trade."

Abernathy dismisses the view that increases in coal shipments will spell declines in tourism and fisheries. "We have not been able to identify any real costs," he says. But he adds that the department has not conducted a cost-benefit analysis to determine specifically what the economic trade-offs might be.

Most of the information available on the costs and benefits of the coal export industry has been compiled during two studies. One of them, conducted by the state's Department of Natural Resources and Community Development (NRCD), produced a report last October called "Coal Export in North Carolina: A Review of the Issues." The other study is being conducted by the UNC Institute for Transportation Research and Education, which has prepared a series of comprehensive reports on energy transportation in the coastal area. Together, the reports offer state officials a primer in the brand-new business of coal exports and the problems it poses for North Carolina.

The reports do list a range of economic benefits the coal industry promises: jobs, new businesses serving

the export trade, capital investments, and revenue for the ports. But the reports also detail an array of problems, costs and risks.

As the coal industry develops in North Carolina, the state will be grappling with several key issues. Here are some of them, in brief:

Rail Transportation

If the coal industry's estimates prove accurate, 50 million tons of coal a year will cross North Carolina by 1985. It would take about 35 trips a day, using coal trains 75 cars long, to get the job done. About a dozen of those trips—six in, six out—would pass through Morehead City. And, unless some kind of bypass is built, the trains would tie up traffic at each grade crossing for a total of about an hour and a half each day. The remaining trains would travel to Wilmington—about 18 trips a day—and a proposed slurry pipeline site at a yet-undecided location.

For now, the only way to move coal across the state in quantity is by rail. Can the state's rail system stand up to the test of 50 million tons of coal a year? Here are the weak links:

—In Morehead City, the state will probably recommend some sort of bypass around the town. But for now, rail planners won't say where a bypass might be constructed. Any such line would almost certainly intersect key

fishing grounds or nursery areas. "The cost of getting over wetlands is extremely high," says Mark Boggs, a planner who is helping conduct the state's study of coal transportation in the area. "Right now, we don't have any route in mind."

—In New Bern, gateway to the Morehead City corridor, the single railroad splits Hancock Street and train traffic may endanger some of the town's historic structures. A study funded by the state's Office of Coastal Management is investigating the possible effects of vibration and noise on the historic district, and the results are due this spring. Rail planners point out that a bypass might be possible, though very expensive, around New Bern.

—Two Southern Railway routes between Raleigh and New Bern both have problems. One passing through Chocowinity serves the Texas Gulf complex at Aurora and regularly handles hazardous chemicals. Trains on the line must use a two-mile wooden trestle to cross the Neuse River into New Bern, and neither the track nor the trestle is designed for heavy trains. The alternative route, through Goldsboro, will require rebuilding to accommodate heavy coal-train traffic.

—Trains headed for the proposed Williams Terminals site would share

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Photo courtesy of ITR



Arendell Street, Morehead City

U. S. Army-operated track with trains carrying ammunition and chemicals through the town of Boiling Springs, where residents and army engineers have reported sinkholes forming under the railroad and trestle. Traffic moves there at 5 mph.

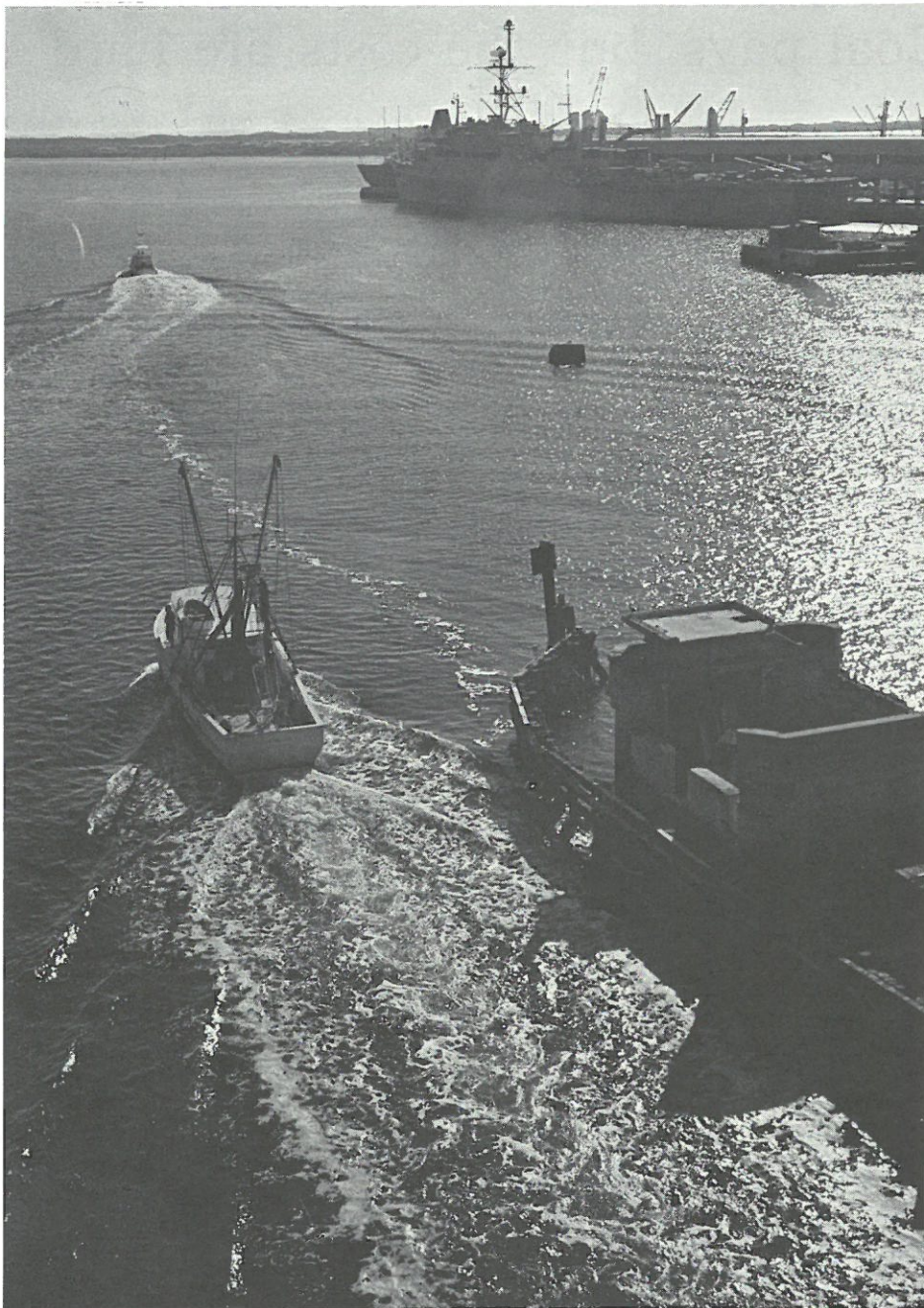
There are other such problems with the coastal region's rail corridors—some already being remedied. According to the studies, most of the track in the area would have to be improved in order to meet traffic projected for 1985.

Navigation

Overhauling the railroads won't solve all the transportation problems facing the coal export industry in North Carolina. At the ports and terminals, the question is how to float big shipments in relatively shallow waters. The tendency among coal transporters is toward bigger ships and shipments, which produce higher profits. At Morehead City, one of the few "deep-water ports" in the East, the channel and turning basin are dredged to only about 42 feet in depth. Gulf-Interstate, the Texas company that wants to develop a large terminal on Radio Island and share the channel with the port, has already announced that it wants to dredge the channel to 55 feet, initially, so that it can handle ships of a moderate weight-class. The company has said it hopes the channel could eventually be dredged to 65 feet or more, to accommodate even bigger ships. The bottom of the channel is sandy and easily dredged, but achieving a depth of 55 feet would necessitate doubling, at least, the length of the channel, to over seven miles. Jetties are proposed to protect the channel. Sites for depositing the dredge spoil are reaching capacity, and, the costs of such operations are very high.

Terminals around Wilmington would have another obstacle. The Cape Fear River can not be dredged much deeper than its present 38 feet without striking limestone formations and rock outcroppings. Says Paul Cribbens, a North Carolina State University engineer who has been studying the problem as part of the Transportation Institute's study: "It looks like we'll have to consider the possibility of shallow-draft boats rather than dredging in the Wilmington area."

Photo by Clay Nolen



Fishing boats share channel with ships at State Port

Cribbens has studied alternatives to the rail-to-port transportation scheme and offers three "scenarios" that he says deserve further investigation:

—In either the Neuse or Pamlico river, cranes could load coal from rail cars onto barges, which could in turn make their way to port, or rendezvous with coal ships at sea. This plan would help avoid the New Bern-to-Morehead rail corridor.

—In Wilmington, where waterways are less crowded, wider, shallow-draft ships could be used, sparing the need for deeper dredging.

—Coal stockpiled at a convenient location could be moved in underwater pipelines to ships waiting in an offshore terminal, well clear of congested coastal areas.

But as Cribbens and others point out, all of these plans have costs and risks. Barges loaded with coal could clot waterways and create traffic conflicts. Spills and accidents could have grave consequences for aquatic life in the rivers. Projections for a slurry pipeline proposed by Whelebrater-Frye indicate the pipeline would pump several million gallons of water out of

the ground each day, possibly affecting local water quality and supplies.

Environmental Risks

Coal transport is so new to North Carolina that nobody knows exactly what the environmental impacts might be. But the biggest concern is over so-called heavy metals, elements found in coal and its dust that can be toxic if they are sufficiently concentrated.

"There are thirty heavy metals in coal runoff," says Susan Schmidt, a researcher who has studied the hazards of coal for the Office of Coastal Management. "Maybe twelve of those can accumulate in fish and in the food chain."

Coal contains such elements as aluminum, arsenic, cadmium, chromium, copper, mercury, nickel, lead, selenium, sulfate, iron, and manganese.

"Aquatic species can magnify metals," Schmidt says. "The best example is oysters, since they magnify metals in the water column by something like four thousand times."

Schmidt says there's no reason to believe that the metals from coal pose an immediate threat to fisheries in the

Neuse and Pamlico estuaries, even though heavy metals have been blamed for cancer and gene abnormalities in humans.

"Right now, the waters are relatively pristine," Schmidt says. "It's just going to take careful monitoring to keep them that way."

Patrick Whaley, a scientist at the Duke University Marine Laboratory in Beaufort, has analyzed coal samples from piles at the State Port terminal and says that, while there are heavy metals present in the samples, they are not present in great concentrations. "The levels are not high enough to be alarming," Whaley says. The coal samples were sub-bituminous, a type of coal less dense than the harder metallurgical coals.

But Whaley adds that even though the amounts of heavy metals seem low, there is still good reason to be cautious with coal, its dust and runoff.

Managing coal-pile runoff and dust from the Morehead City and Radio Island sites is especially crucial, since tides flush adjacent waters into the Newport River estuary, one of the most productive in the state.

But the NRCDC report indicates that

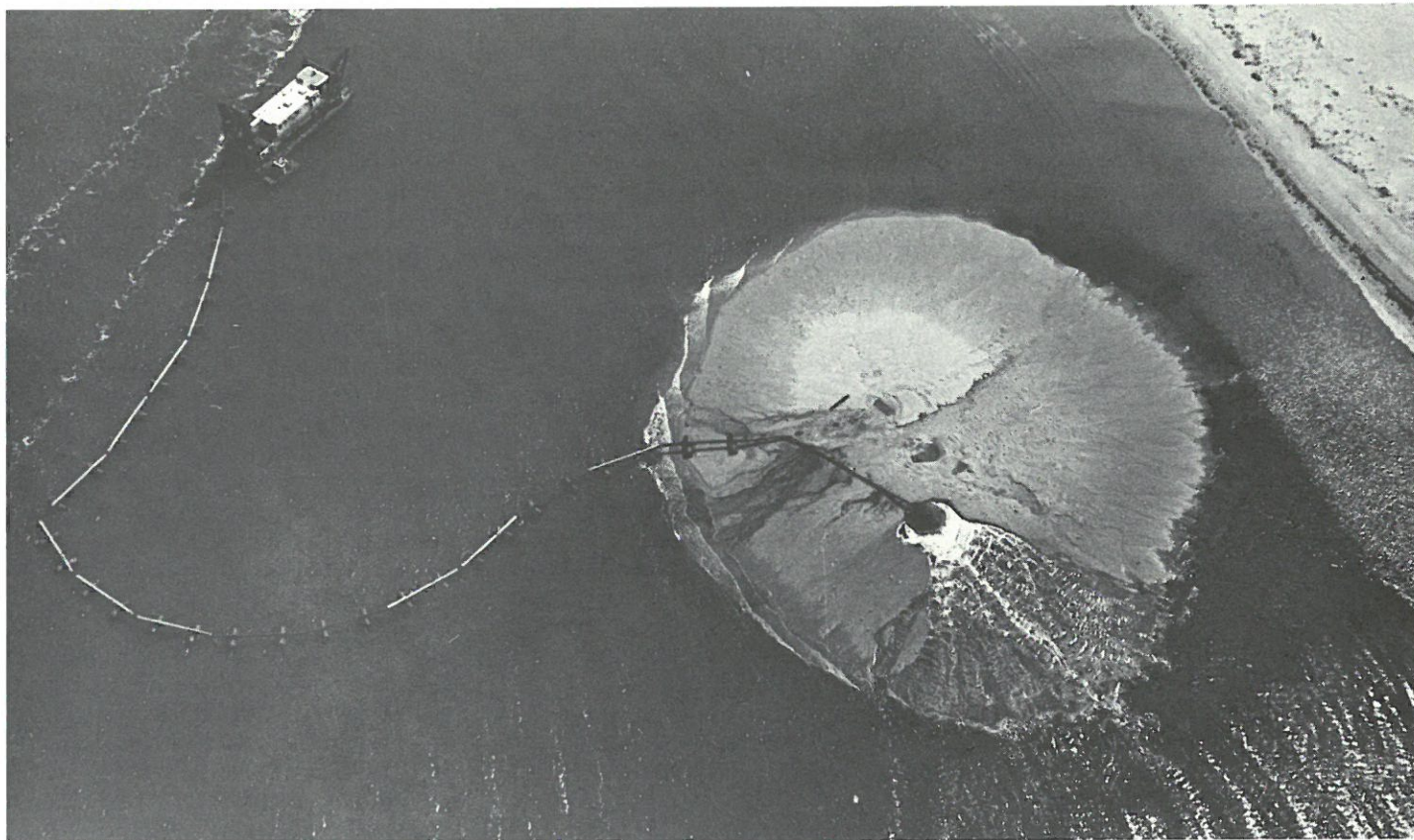
there is perhaps more risk to the state's fisheries from ship and barge traffic and dredging operations than from the coal itself—problems that would likely accompany the development of any export trade.

The report concludes that "the most important unresolved problem may be the cumulative effects of dredging new channels and deepening existing ones. . ."

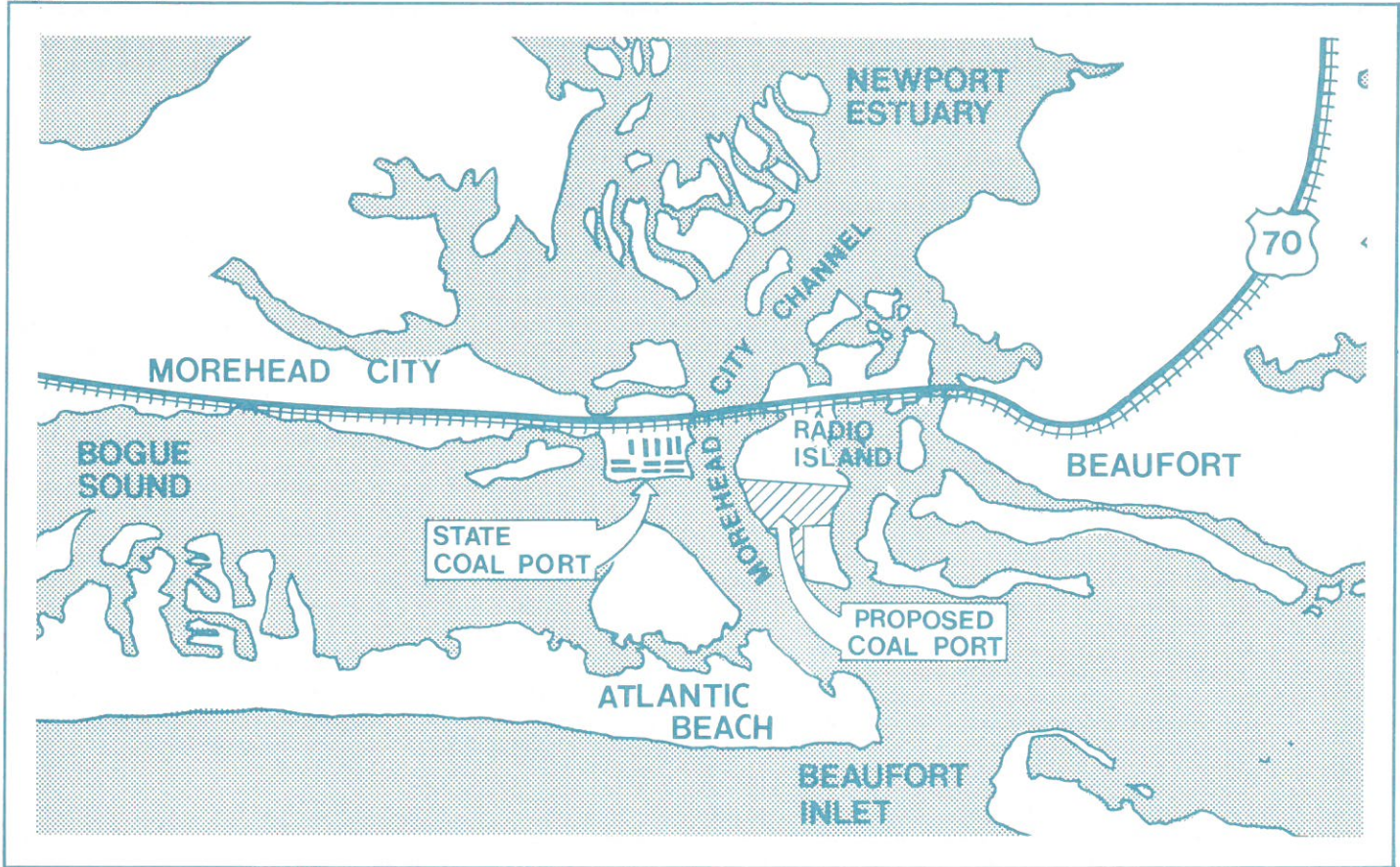
What is the price tag for resolving such issues? The answer is elusive, but experts agree that the problems will require more research, careful monitoring and thorough planning. And those efforts have costs.

Roger Schecter, of the state's Office of Regulatory Regulations, helped prepare the NRCDC report, and he has reached at least one conclusion about the state's role:

"Most of the environmental issues could be addressed through regulatory coverage," Schecter says. "But one of the things that concerns us is that the state doesn't have a great deal of experience with this kind of industry. We're going to have to start using our authority, and be tougher in our enforcement."



A channel dredge builds a new dredge-spoil island in a North Carolina inlet



Map shows coal trains' route through Morehead to terminal sites

Here's the lineup: one on base, seven on deck

At least eight companies want to build coal export terminals in North Carolina. One of them, Alla-Ohio Valley Coals, has already set up shop. The others have either sought permits or are preparing to do so. Here is the list:

- The American Coal Export Company has secured all the necessary permits to build a terminal on an 80-acre site along the west bank of the Cape Fear River just north of Wilmington. The company plans a terminal with a capacity of three to seven million tons a year. Coal trains would reach the site by the Seaboard Coastline. American Coal plans to dredge the river channel from the US 117 bridge to the site. The company plans to finish its construction in October.

- Cleancoal Terminals, Inc. has permits in process for developing a three-million-ton-per-year terminal on a 20-acre tract owned by Seaboard Coastline in the northern downtown

area of Wilmington. Coal trains would reach the site through northeastern Wilmington and, because the tract is small, would have to uncouple and recouple off the site. A city report on the proposed terminal found that it posed a noise problem not covered by state regulations, but went on to recommend that the city not delay the project. The company plans to have the facility operating in September.

- The Williams Terminals Company is proposing to build a coal export facility south of Wilmington on the Cape Fear River in Brunswick County. The company plans to open the terminal at about half its projected 20 million-ton capacity on a 400-acre tract just north of Southport. Coal trains would reach the site by the Seaboard Coastline track and the U. S. government rail to the Sunny Point Military Ocean Terminal. The company plans to be operating at the site in 1984.

- Whelebrater-Frye, Inc. has

proposed a slurry pipeline for either of two sites, one in Carteret County, another near Scotts Hill in Pender County. The company plans an initial capacity of 12 to 14 million tons per year. At the site, coal would be mixed with water and then piped under water to a loading buoy about 10 miles offshore. Permits have not been filed, but the company plans to be operating in North Carolina in 1985.

- Utah International, Inc. has proposed a terminal to export coal from a site on the Brunswick County side of the Cape Fear River, about 10 miles south of Wilmington. The facility would open with a capacity of five to seven million tons a year, with plans for expanding to 15 to 20 million tons. No completion date has been set.

- Carolina Coal Company has proposed using the State Port Terminal in Wilmington to export four to nine million tons of coal a year. Plans for this terminal have not been set.

- Gulf-Interstate has proposed a

coal terminal for Radio Island, near the State Port in Morehead City. The capacity of the 77-acre site would be five million tons per year initially, 20 million tons projected. The company plans a completion date of 1984, and is expected to file in February for permits to build its \$60 million facility. Permits could be approved as early as July, but are contingent upon the state's approval of both a port development plan and a study by the Department of Transportation. The

Coastal Resources Commission, which last year reclassified Radio Island as a "rural port", did so on the condition that the plan and the study first resolve land-use and transportation problems associated with developing the site for handling bulk products.

• Alla-Ohio Valley Coals, Inc. has developed a \$4.5 million dollar terminal on a site it leases at the State Port in Morehead City. The company began operating at the site in April, 1981, and handled about one million

tons before shipments were suspended in November, 1981, when the company filed under Chapter 11 of the bankruptcy law. The terminal has a capacity of about three million tons a year. The company says that it intends to resume shipments and honor its lease with the state, which expires in 1984. The company, which now owns the only coal export facility in the state, has also proposed developing a 10-to-15-million-ton facility on Radio Island.

For now, more fizzle than steam in coal market

Sam Holcomb is on the spot. Last year, his company's new coal terminal opened to mixed reviews in Carteret County. Then, in November, the operation shut down to reorganize under Chapter 11 of the bankruptcy laws. Now, the company's future is in the hands of its creditors and referees, and the coal waits in piles while recession and a weak European market dim last year's euphoria over coal.

Holcomb is the regional manager for Alla-Ohio Valley Coals, a parent company of 28 coal firms. Eight of those firms have filed to reorganize, and one of them is the Morehead City Coal Terminal.

"We're optimistic that the Morehead City facility will pull through in good shape," Holcomb says. "That terminal is the flagship of our company, because it is the only export terminal we own. It is critical in the company's planning."

But Alla-Ohio's troubles were only the first in a series of sour notes sounded this winter about the prospects for a booming coal industry in North Carolina. An oil glut slowed European power plants' conversion from oil to coal. Recession wiped out the spot market for coal. Polish coal mines reopened after being shut down much of last year.

And, there were signs the nation was overdeveloping its export terminals. *Fortune* magazine reported in December that "if all the proposed coal terminals are built, the U. S. will have coal-loading capacity of 628.5 million tons per year—vastly in excess of what is needed." The magazine's report didn't take into account the seven or more terminals proposed for North Carolina. But it did predict that many of the proposed projects around the country will never be built.

Because of these reports, some state officials are wondering aloud if the alarm over a coal boom hasn't been premature. Others argue that planning now will help head off other growing pains in the state's future development.

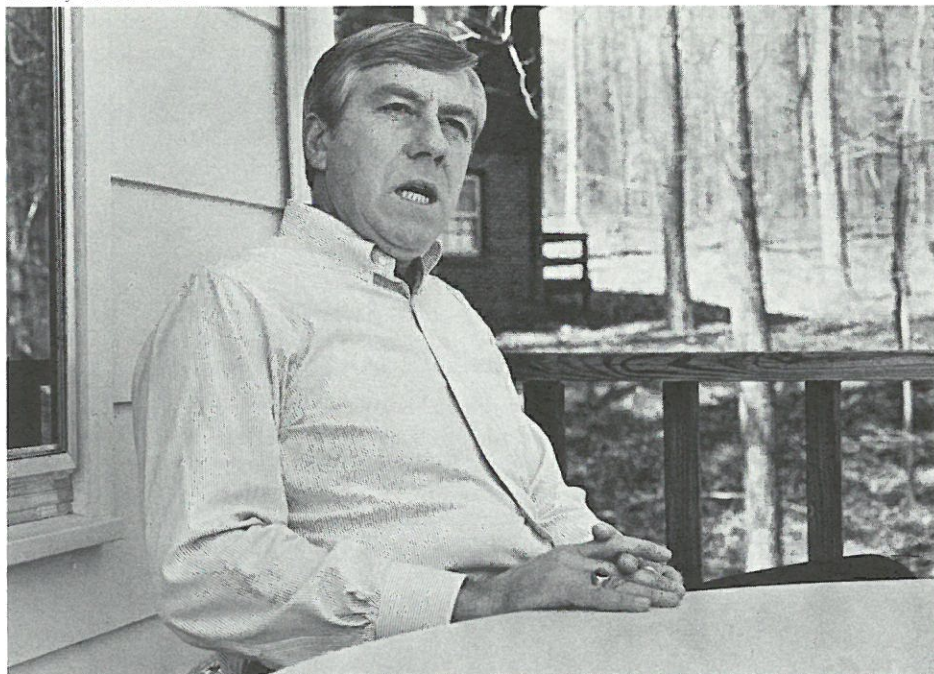
Will there be enough coal business to go around?

"The world coal market is cyclical," Holcomb says. "It has peaks and valleys. It will be the companies who can get long-term contracts that will survive. There will be some casualties, but nobody feels that the market is not going to come up."

Despite his company's financial woes, Holcomb says Alla-Ohio's early start has given it several options and a jump on the competition.

"We still have a prime interest in developing a bigger terminal on Radio Island," he says. "But if that doesn't come to pass, because of transportation problems or some other reason, we could still be very profitable where we are. We could bring in one unit train plus a few other cars a day, just as we've been doing, ship two million tons a year, and make a profit."

Photo by Steven Wilson



Alla-Ohio's Sam Holcomb at home in Cary, N.C.

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).

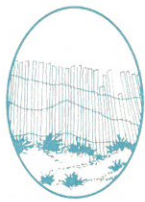


Again this year, UNC Sea Grant will award graduate fellowships for students studying in marine science fields. Each fellowship includes an annual stipend of \$7,000 for doctoral students and \$6,000 for masters students. Tuition and fees are paid and an additional \$1,000 is provided for supplies and incidentals. Two fellowships are available for 1982. Applications must be received no later than April 1.

Prospective doctoral and masters students from any recognized public or private institution are eligible. Recipients must be planning to attend the University of North Carolina at Chapel Hill (UNC-CH), North Carolina State University (NCSU) in Raleigh or East Carolina University (ECU) in Greenville.

Applicants must be registered, full-time students, may not hold other graduate assistantships, must remain in good standing with their institutions and must make satisfactory progress toward receiving their degree. Applicants must also submit written proposals outlining their proposed plans for research and study.

For more information and applications, contact the Department of Marine, Earth and Atmospheric Sciences at NCSU, the Curriculum in Marine Science at UNC-CH or the Institute of Coastal and Marine Resources at ECU. Information is also available from the graduate schools of the participating universities and from UNC Sea Grant, 105 1911 Building, NCSU, Raleigh, N.C. 27650.



The minimum setbacks for coastal construction are the subject of another Sea Grant mini-grant. The researchers are Alan Stutts and Chrystos Siderlis from North Carolina State University's Department of Recreation and Resources Administration.

Enforced since 1979, the minimum construction setback requirement is calculated on a 30-year erosion rate which results in a setback as short as 60 feet or as long as 400 feet. (The average annual erosion rate is two feet.) As a general rule, the further a structure is set back from the ocean, the greater its resistance to hurricanes and erosion. However, many builders and property owners are using the minimum standard as a maximum, building right at the line.

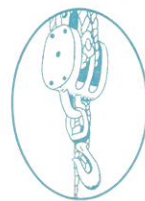
Working with Spencer Rogers, Sea Grant's coastal engineer, Stutts and Siderlis will be studying a sample area of the coast, measuring setbacks. This data will be combined with interviews with property owners and state and local officials. Their objective is to determine if the setback requirements have adverse effects, encouraging development further seaward and increasing the potential for loss of property.



Several Sea Grant people attended conferences in February to present their work. Ron Hodson, Sea Grant's associate director and project director of the NCSU Aquaculture Demonstration Project, and Randy Rouse, a technician at the project, traveled to the World Mariculture Society's meeting in Charleston, South Carolina. Technical sessions at the international meeting covered new developments in the culture of fish, shrimp, lobsters, crawfish and molluscs. John Foster, also of the Aquaculture Demonstration Project and Bill Rickards, direc-

tor of Virginia Sea Grant, also presented a paper and poster on teaching eels to eat pelleted feeds. (Rickards was UNC Sea Grant's associate director before he moved to Virginia last spring.)

John Sanders, Sea Grant's coastal weather awareness specialist, was also in Charleston for the Mid-South Atlantic Coastal Hazards Conference. Sponsored by the National Oceanic and Atmospheric Administration, the U.S. Geological Survey and the Federal Emergency Management Agency, the two-day conference presented information and programs on agencies and businesses that deal with hurricanes, floods, erosion, oil spills, pollution and other coastal hazards. Sanders also participated in the poster session.



Fuel costs have pinched harder and harder at fishermen's pocket-books in recent years. As an answer to the problem, fishermen and others are considering sail power as an alternative or supplemental means of powering their vessels.

To learn more about sail power, the Virginia Sea Grant Marine Advisory Service is cosponsoring a workshop May 19-21 in Norfolk, Virginia on "Applications of Sail-Assisted Power Technology." The University of South Florida College of Engineering and Sail Assist International Liaison Associates, Inc. are also sponsoring the workshop.

Conference participants will discuss and evaluate realistic applications of sail-assisted power on fishing, research, towing and cargo-carrying vessels. Also during the conference, participants will examine the practical issues associated with constructing, retrofitting and working sail-assisted vessels; the economics of sail-assisted vessels; Coast Guard certification; insurance pros and cons; financing, and realistic uses of sail-assisted power on

fishing and oceanographic vessels. In addition, data on fuel savings will be presented and evaluated.

At least two working sail-assisted vessels will be at docksides for the conference, including the *Norfolk Rebel*, featured in the February 1981 *Coastwatch*.

Conference registration is \$60 and includes two lunches plus conference materials. Lodging arrangements should be made directly with the Omni International Hotel, 777 Waterfront Drive, Norfolk, Va. 23501.

For more information contact, Jon Lucy, Sea Grant Marine Advisory Service, Virginia Institute for Marine Sciences, Gloucester Point, Va. 23062 or call (804) 642-6131.

In a second year of budget cuts, President Ronald Reagan has again proposed reducing the federal Sea Grant program budget to phase-out levels. The proposed budget submitted to Congress allows only \$1.7 million for Sea Grant in 1983, to be used to shut down the program.

Efforts are being made to try to restore the Sea Grant budget to operational levels.



James D. Murray joined UNC Sea Grant March 5 as the new director of marine advisory services. Murray comes to North Carolina from New Jersey,

where he served as director of the New Jersey Sea Grant Marine Advisory Services. He has also worked in the Minnesota and New York Sea Grant Programs.

Murray received his undergraduate degree in economics from Syracuse University and his master's degree in resource management from the State University of New York at Syracuse.

Murray replaces J.C. Jones, who retired as director of the marine advisory services during 1981.

UNC Sea Grant Director B.J. Copeland will chair a committee set up by the Council of Sea Grant Directors to establish national priorities for estuarine research during the next five to 10 years. Copeland says the committee will work closely with the Office of Sea

Grant in Washington, D.C., to determine which estuarine projects should receive federal funding from Sea Grant.

One top concern the committee will examine, Copeland says, is the relationship between management of freshwater intrusion and estuarine production, a major problem facing many coastal states including North Carolina.

Spencer Rogers, UNC Sea Grant's coastal engineering specialist at the N.C. Marine Resources Center at Ft. Fisher, has received an academic appointment as senior engineering extension specialist with the North Carolina State University Department of Civil Engineering. Rogers now has joint appointment in Sea Grant and the civil engineering department.

North Carolina's Atlantic graveyard has claimed more than its fair share of wrecks, but none more famous than the Civil War ironclad U.S.S. Monitor. Beginning April 23, the N. C. Marine Resources Centers at Fort Fisher, Bogue Banks and Roanoke Island will feature a display of the Monitor, which sank off the Outer

Banks in 1862. Artifacts and photos tell the history of the Monitor and the dives which brought up pieces of the ship and its contents. Parts of the exhibit are on loan from the National Oceanic and Atmospheric Administration, the U.S. Navy and the Division of Archives and History. For more information about the exhibits, contact the Office of Marine Affairs at 733-2290.



Project CAPE (Coastal Awareness in Public Education), a project by the Dare County Schools, has four marine education units available for educators to

purchase. For eighth-grade study, Project CAPE offers *Field Studies for the Coastal Environment*; for fifth and sixth graders, *Coastal Livelihoods and Crafts*; for third and fourth graders, *Cape Hatteras Lighthouse*; and for kindergarten through second graders, *Coastal Ecosystems*. The lighthouse unit also includes a color filmstrip.

Several of these units were written by East Carolina University graduate

Continued on next page

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, Box 5001, Raleigh, N.C. 27650.

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To help us specialize our services, please answer these questions.

I am in the following line of work:

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| <input type="checkbox"/> Farming | <input type="checkbox"/> State government |
| <input type="checkbox"/> Homemaker | <input type="checkbox"/> University professor/researcher |
| <input type="checkbox"/> Lawyer | <input type="checkbox"/> Other _____ |

Coastal property owner yes no Boat owner yes no

students on UNC Sea Grant scholarships. For more information about the units, write Project CAPE, Dare County School Board, P. O. Box 640, Manteo, N.C. 27954.

When the Girl Scouts of America decided to choose water as their 1982 theme, Sea Grant was a natural place to come for information. Raleigh area girl scouts held their girl scout expos March 6 in local malls, providing demonstrations on water conservation and use. UNC Sea Grant Director B. J. Copeland acted as adviser to one girl scout troop and Sea Grant materials were provided to others.



Implications of Proposed Management Measures for the North Carolina Sea Scallop Industry, by John R. Maiolo of East Carolina University,

describes the impact of a management measure proposed by the New

England Fishery Council on North Carolina scallop fishermen and seafood dealers. In August 1980, the New England Council proposed that only scallops that meet a 30-count standard (30 meats per pound) could be harvested from New England waters. North Carolina fishermen and shuckers argued such a ruling would put them out of business. Maiolo explores the socio-economic impacts of these proposed changes in his paper.

For a copy of the paper, write UNC Sea Grant, P. O. Box 5001, Raleigh, N.C. 27650-5001. Ask for publication number UNC-SG-WP-81-7. The cost is \$1.

Developing a Growth Management System for Rural Coastal Communities, by David Brower, Candace Carraway and Thomas Pollard of the Center for Urban and Regional Studies at UNC-Chapel Hill, describes the methods rural coastal communities can use to influence the characteristics of growth and achieve community land-use goals and policies.

For a copy of this publication, write

UNC Sea Grant. Ask for publication number, UNC-SG-WP-81-9. The cost is \$3.50.

Wind-Wave Climatology and Wind Tides for Fort Raleigh Wave-Gauge Site, 1979, by C. Ernest Knowles of the NCSU Department of Marine, Earth and Atmospheric Sciences, is the latest in a series of Sea Grant working papers.

To receive a copy of this working paper, send \$1.75 to UNC Sea Grant. Ask for publication number UNC-SG-WP-81-8.

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