UNIVERSITY OF NORTH CAROLINA

# SEA GRANT COLLEGE NEWSLETTER

August, 1976

*1235 Burlington Laboratories*
*NCSU, Raleigh, N.C. 27607 Tel: (919) 737-2454*

## Trading oysters for beans?
## . . . the question of fresh water . . . .

In the old West, the issue was fences. On the North Carolina coast, it's ditches and "fresh water intrusion."

Fresh water intrusion is the runoff of fresh water into normally brackish or salty water. The definition is simple but the implications are complex. Many of the brackish, estuary waters that receive fresh water such as rain are also the nursery grounds for shrimp, oysters, flounder, trout and other commercially important marine life. These creatures can adapt to a wide range of salinities and temperatures, but they all have limits to the amount of fresh water they can stand. And they may be hurt by rapid fluctuations in water's salt content.

Other factors are involved, but according to a study on brown shrimp done by the North Carolina Division of Marine Fisheries, salinity is a major ingredient for survival in the estuaries.

Runoff has always occurred along the coast. When it rained, the fresh rainwater eventually found its way to the shore. But in recent years, as corporations have cleared vast acreages for "superfarms" and developers have made room for homes, the face of the coastal area has changed. Mazes of drainage ditches now make more avenues for fresh water to rush to the brackish coastal areas. And fewer swamp forests are present to trap the water and slowly filter it to the shore.

*(See "The Problem," page two)*

## The problem: changing land use

*(Continued from page one)*

Now when it rains, rainwater can run in wide channels to the brackish nursery areas, opening the possibility for changing salinity rapidly and altering the directions of water flow. The effect could be destruction of the nursery grounds.

The problem, according to the state report, is particularly prevalent in tributaries of the northern Pamlico Sound, such as Long Shoal River, Swanquarter Bay and Rose Bay. And fishermen in those areas are getting worried, and upset.

Opposition has focused on one drainage operation in Hyde County which would drain 1,200 acres into Rose Bay. A law suit was filed and is now in limbo, according to Swanquarter attorney John S. Fletcher. He calls the suit a "warning to the landowner that people felt he was doing something he shouldn't and that if anything went wrong they'd look to him for recompense" and a "notice to the government to do something."

The fishermen brought their worries to the state more directly in June:

**Rose Bay oyster houses stand empty.**

"We, the undersigned, being commercial and sport fishermen who use the creeks, rivers and bays adjacent to Pamlico Sound and the waters of Pamlico Sound, petition the Marine Fisheries Commission and state officials as follows:

"—to investigate the invasion of traditionally salt or brackish waters by fresh water.

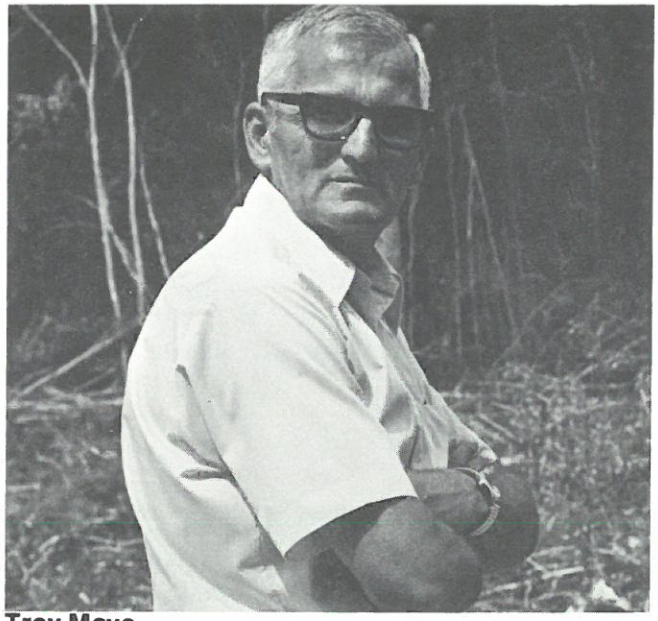
"—to investigate the effect of changing salinity in said waters upon the production of oysters, shrimp and other salt water species.

"—to initiate programs to preserve the traditional salt waters of the aforesaid waters.

"—to investigate the effect of decreased salinity in said waters upon the economy of the Pamlico drainage area, and to initiate proper controls to insure the continued health of commercial and sport fishing in this area.

"—to investigate the feasibility of dredging Ocracoke Inlet or a new inlet near the Ocracoke area.

"This petition is prompted by the belief that during the past decade the fresh water has been encroaching upon salt water areas in a gradual, but persistent manner."



**Troy Mayo**

The petition was signed with about 3,000 names and carried to Raleigh by fisherman Harold Harris and his neighbor Troy Mayo. Harris has fished Rose Bay and the sound for 10 years and Mayo is a native of Swanquarter who fished a quarter of a century ago and now works an oyster bed in the middle of Pamlico Sound. Harris and Mayo agree Rose Bay production is down and they point to fresh water intrusion as the main culprit.

"The bureaucrats and educated fools can't see what's going on without a study. But you can ask the stupidest person in Hyde County and he'll tell you," Mayo declared. "The damage has been done in the past 10 years by the big corporate farms. We've got sense enough to know that farming has to continue but if we don't stop these big corporate farms or get some new laws, all these sounds and bays and tributaries will be gone.

"Twenty-five years ago, I owned a 26-foot shad boat. We used to go out in Rose Bay, two people, for five or six hours and we'd catch 35 to 40 tubs of oysters—that was two men pulling by hand," Mayo continued. "Today you go out in this same area with a power winder and all modern equipment and I'd be surprised if you catch 10 tubs of oysters. Up until about five years ago we had 10 to 15 people that made their living just in Rose Bay. Today you haven't got a one—it's just that simple."

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## More than one culprit—a many-faceted situation

The problem is a little more complicated, according to Fentress ("Red") Munden of the Oyster Rehabilitation Section of the Division of Marine Fisheries. He agrees that state oyster production has dropped considerably in the past 25 years, although the drop has leveled off in the last five years. But fresh water intrusion is only part of the cause.

Extreme overharvesting at the turn of the century is still hurting today's oyster production, Munden said. And passage of minimum wage laws helped close the oyster shucking houses that had produced a major source of cultch—the broken shells scattered on the water's bottom to catch oyster spat, or seed. With less readily available cultch, there was less shell material going back into the water to develop oyster beds, Munden explained. Harvesting pressures, particularly in Rose Bay which has an exceptionally fine oyster, also took their toll, he said. Recently low prices due to low oyster demand have encouraged fishermen to

**A dredging operation in the Rose Bay area. The water will eventually wind its way to Rose Bay itself.**

diversify and depend more on crabs and shrimp, he added.

"Fresh water definitely plays a part, but oyster production is very complex. You can't put your finger on one thing and say 'Aha, this is it,' " Munden said. "I can't deny, though, that I feel very strongly that fresh water intrusion is a problem. But we'd do better to approach it not from oyster production, but from shrimp—they're more susceptible to water changes."

A study of juvenile shrimp in Rose Bay showed that fresh water intrusion definitely disrupted the salinity of small creeks in the area. The result was a smaller shrimp harvest by fishermen, particularly if salinity dipped and fluctuated during the critical early spring months.

The study is not conclusive, though, according to its author, Preston Pate, of the Division of Marine Fisheries. The state really does not know the extent of the fresh water intrusion problem, Pate said.

To find the "truth," the Environmental Management Commission has authorized another study, based on the demands in the Rose Bay petition. This study is expected to take three years and will look at the problem, its solutions and their costs and benefits as well as possible legislation.

### Wrinkles in the law

Right now most fresh water intrusion is not under any government jurisdiction. State dredge and fill laws apply only to marsh areas and estuarine water. And, according to Pate and permit coordinator John Parker, much of the draining is done where there is either no marsh, not enough to justify refusal of a permit or in areas that do not drain directly into the estuaries.

The Army Corps of Engineers was scheduled to gain regulatory control this summer over activity in wetlands adjacent to tributaries of navigable waters. President Ford issued a moratorium on the law, however, and the wording would exclude much of the land now being drained and all ditches now in operation, according to Corps spokesman Wayne Wright.

Sedimentation control laws apply to the silt flowing in the water, but not the freshwater itself. And agricultural and forestry lands are exempt, according to Taylor Currin, Chief Engineer in the Department of Natural and Economic Resources (DNER) Land Quality Section.

The Coastal Area Management Act, with its provisions for designating special areas of environmental concern, also excludes farming and logging operations. Attempts to change the law so it would apply to farming or logging would be "practically impossible politically," according to one DNER official.

*(See "Plodding," page four)*

## Plodding along; so far, so good?

*(Continued from page three)*

"At present time, no one has regulatory authority over fresh water going into salt water," concluded Robert A. Carter, head of the Water Quality Operations Branch of the Division of Environmental Management. "It's a pollutant to salt water organisms, but it's not defined as such."

UNC Sea Grant Director B. J. Copeland says there is a possibility that his program may become involved in the state study on Rose Bay. Sea Grant researchers have already been studying runoff effects of the Open Grounds superfarm and a Water Resources Research Institute study of First Colony Farms has just begun.

If fresh water runoff is identified as a pollution problem, several controls have already been suggested. One idea is to leave a buffer zone between drainage projects and the shorelines to retard fresh water intrusion. Diverting drainage ditches into deeper areas of the sounds or into less productive nursery areas where excess fresh water would have less impact is another idea. Or the draining water could be maneuvered to a large holding area where it would be released more slowly.

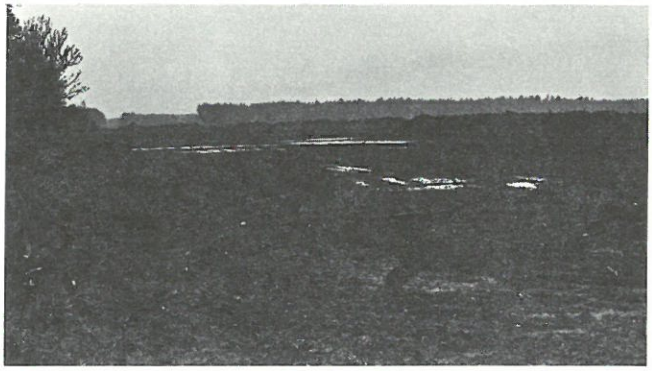
Any state action will take time, Pate said, but any action must be backed with hard data.

"The problem is not so severe that there's any potential for complete destruction of, say, the shrimp industry. But we feel if the trend continues in converting these highly valuable nursery areas into fresh water habitat, the effects will certainly be detrimental to the seafood industry. We want to attack the problem as rapidly as we logistically can. We recognize that just because the drainage ways are there, the potential is there for some drastic effects—even if it doesn't occur 100 times out of 100."

"We love beans and beef and we have a serious need to extend agricultural operations," Jim Brown, also of the Division of Marine Fisheries, added. "At the same time we dearly love shrimp and oysters. There exists a very serious need for imposing compatability between the two. Can it be done? That's the question. Can it be done under existing authorities or does it mean we'll have to pass new laws and add more control to the existing maze we have now. Or do we just keep plodding along with our fingers crossed?

"The problem has been developing probably since the very first drainage projects," Brown continued. "We've been aware of it as a potential problem for 10 to 12 years but only recently have we come up with any data that pinpoints it as a serious problem. The initial effect is reducing the effectiveness of some of our more productive nursery areas. The subsequent effect that bothers us is the type of pollution that may result from the land use at the other end—the possibilities of accidents with pesticides and runoff of fertilizer.

"The whole thing sometimes reminds me of the fellow who jumped off the Empire State Building. When he passed the 13th floor he saw there was a party going on. He waved and said 'So far, so good.' "



**Drained and logged land, an increasingly common coastal sight.**

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