

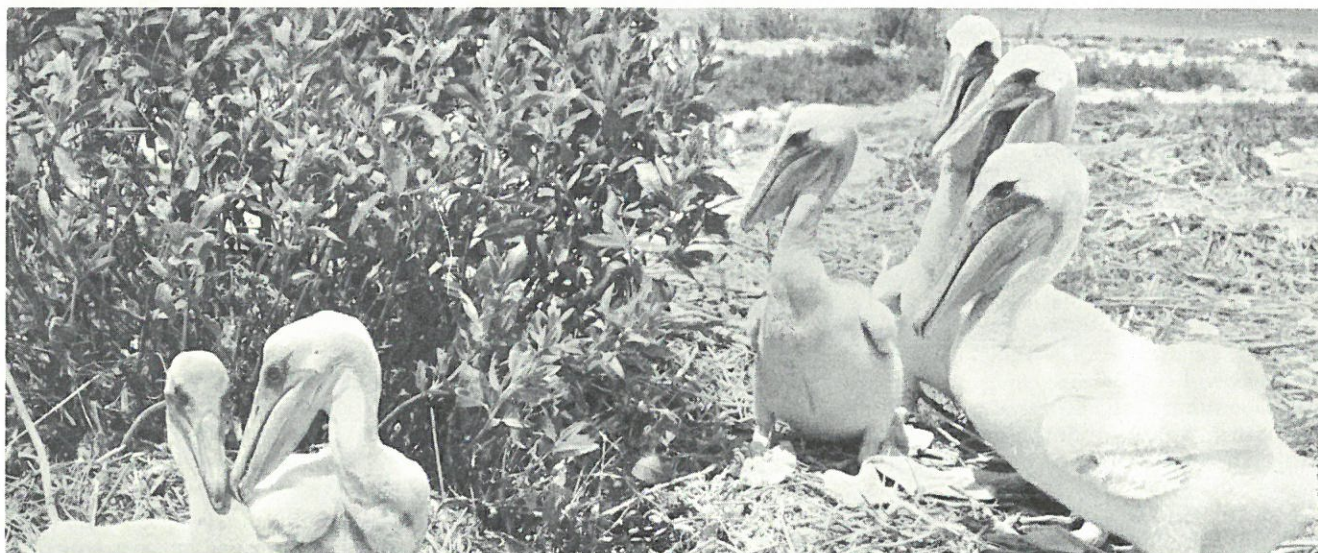


University of North Carolina Sea Grant Program

NEWSLETTER

JUNE, 1974

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



Young brown pelicans find life free from predators on North Carolina's dredge spoil islands.

Designing a home for waterbirds

Jutting skyward from North Carolina's vast system of sounds and estuaries are hundreds of islands—some large, some small, some dotted with tall pines, others like small deserts.

The man-made islands, built over the years with sand and mud dredged from the state's 1,500 miles of channels, are, for most of the year, deserted.

But one day in May, the silence that blankets the islands is broken, first by a single squawk, then by the deafening screech of hundreds of waterbirds.

A few weeks later, the dredge islands are teeming with life. Terns, gulls, willets and hordes of other waterbirds nest and raise their young there, safe from predators and rude intrusions.

Not much was known about the waterbirds and their nesting patterns until Dr. James Parnell, biologist at UNC-Wilmington, and Robert Soots of Campbell College began going to the dredge islands to study plant succession three springs ago. Now the birds receive the focus of their Sea Grant-supported research.

Important to the birds, the researchers found, is the level of vegetation covering the dredge spoil. Royal terns, for instance, nest on almost bare sand. Common terns prefer sparse grass, gulls nest in thick grass, and herons and egrets raise their young in shrubs and woody thickets.

According to Parnell, the past pattern of depositing spoil on the islands has been fortunate. Spoil is dumped periodically on some islands, returning vegetation levels to year one, he said. After drying, freshly dumped spoil becomes a perfect nesting site for royal terns.

But some environmentalists are calling for changes in the costly dredging operation, changes that could transfer much of the dumping to the mainland. Such changes, if begun, could threaten one of the very few remaining nesting sites for waterbirds requiring almost no vegetation.

Once the islands are covered with grasses, and later shrubs, thickets and trees, some of the water-

(See "Homes," page 5)

seascope

DR. THOMAS L. LINTON

Dr. Linton is director of the N.C. Office of Marine Affairs. Prior to assuming that position last fall, he served as Commissioner of the N.C. Division of Commercial and Sports Fisheries. Linton was on the University of Georgia faculty before coming to North Carolina in 1968.



Using our coastal resources wisely

North Carolina's coast is filled with a wealth of natural resources. As the beaches with their unique natural features become increasingly popular as vacation and living areas, it becomes a must that the state take action to insure that our limited coastal resources are conserved.

North Carolina is fortunate to have in operation mechanisms capable of guiding the wise use of our coastal resources.

State agencies, such as the N.C. Office of Marine Affairs, are charged with the responsibility of designing and putting into effect organized, long-range plans for managing the use of coastal lands and resources.

But before state administrators can design wise resource conservation plans, they must have a thorough understanding of the forces acting on the coastal areas—and the impact of these forces on natural resources.

For this information, they turn to the University, the institution with research capabilities to get at answers to coastal questions. University scientists, such as those supported by the UNC Sea Grant Program, are conducting research to learn exactly what resources we have, how they are affected by increased development, and what we can expect to happen to them in the future. They are also studying ways to develop coastal resources in a wise manner. Working closely with state agencies, University scientists help answer questions and solve problems brought to them from various agencies and the public.

Playing a central role in developing plans for coastal resource use is the N.C. Marine Science Council, a part of the Office of Marine Affairs. The Council has the responsibility of contributing direction, unity and continuity to the formulation and achievement of the state's goals and objectives relating to coastal resources.

The Marine Resources Center, with facilities under construction in Dare, Carteret and New Hanover Counties, will provide an arena for carrying out coastal resource management plans developed by the Marine Affairs office. A coastal planning section, now being established, will seek to achieve land and water resource management programs that integrate local, state and federal interests.

With the recent enactment of the Coastal Area Management Act, state agencies, the University and the public have been brought closer together in achieving wise land and resource use in coastal Carolina.

The University of North Carolina Sea Grant Program Newsletter is published monthly by the University of North Carolina Sea Grant Program, 1235 Burlington Laboratories, Yarborough Drive, North Carolina State University, Raleigh, N. C. 27607. Vol. 1, No. 2, June, 1974. Dr. B. J. Copeland, Director. Dixie Berg, Editor. Second-class postage paid at Raleigh, N. C. 27611.

Pest control course held

A two-day training course on mosquito and biting fly control in the coastal area May 8-9 attracted some 50 participants, representing all coastal counties.

Sponsored by the UNC Sea Grant Program and held at the Division of Commercial and Sports Fisheries in Morehead City, the course covered techniques for surveying and controlling mosquitoes, greenheads, yellow flies and sand flies. It was conducted by North Carolina State University entomologists, led by Dr. R. C. Axtell, and by the N.C. Department of Human Resources, Solid Waste and Vector Control Branch.

Participants reviewed state policies for insect control and pesticide safety. They were shown methods of sampling and monitoring to determine when and where insect populations are at their peak. In the area of specific controls, participants examined ULV, or ultra low volume, and discussed methods of ditching and impoundment.

Information covered at the course is available in the Sea Grant publication, "Training Manual for Mosquito and Biting Fly Control in Coastal Areas."

The manual, of potential interest to workers engaged in pest control, extension agents and fisheries and wildlife biologists, is available at the Program office.

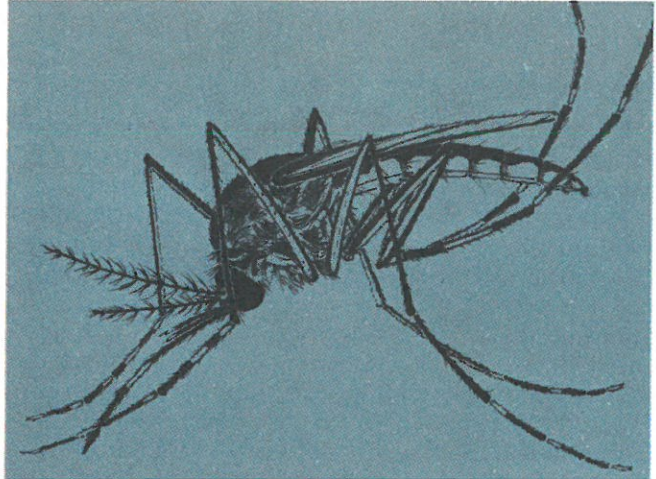
Dolphin raised from egg

Attempts to raise the delicate dolphin fish from egg to juvenile have succeeded in research supported by UNC Sea Grant.

Research assistants, Bob Rainville and Harry Liner, working with Dr. Charles Mayo at the National Marine Fisheries Service laboratory in Miami, succeeded in rearing dolphin through the extremely vulnerable larval period lasting approximately 13 days. This is believed to be the first time juvenile dolphin have been raised from an egg in the laboratory.

The research, one aspect of Dr. W. W. Hassler's Sea Grant project to raise dolphin for food, sought to determine the conditions best suited for rearing dolphin. Efforts to improve rearing techniques are continuing.

A familiar insect in coastal Carolina, the Aedes mosquito.



Seeking wiser ways to control biting bugs

Most sun worshippers and sports fishermen are willing to put up with an overdose of sunshine.

But just let a few mosquitoes buzz into the campsite. In a flash, that haven "away from it all" can become a small torture chamber.

Although they're not making wild promises to forever rid coastal areas of mosquitoes and all those other biting insects that can make beach vacations miserable, Sea Grant scientists are looking for better ways to at least lower their numbers.

North Carolina State University entomologists, Drs. Richard C. Axtell and K. L. Knight, are studying coastal insect control with the aim of better advising local governments and citizens on more effective and environmentally sound ways to manage mosquitoes and biting flies. Fewer pesky insects could mean more tourists and more dollars for coastal businesses, they believe.

The scientists began their search for better insect control by asking coastal residents how bothered they are by the biting varmints and what they'd like done about the problem.

To gauge the problem, they surveyed residents of Pamlico, Pender and Carteret Counties. The survey showed that a large majority of those responding are bothered often by biting insects. Eighty percent wanted more community effort devoted to insect control and most of those said they would be willing to pay for it.

The scientists paralleled the human survey with surveys of the pests to determine when and where they strike in greatest numbers. To learn more about the insects, Axtell and Knight have studied their life cycles, breeding sites and the conditions that lead to large populations.

Monitoring, the entomologists say, is central to the success of any pest management program. With precise information on the times and places pests are most severe, controls can be wisely applied. With data on peak population periods, it may be

possible to predict and prevent large numbers of the biting insects.

Pest management programs, combining a variety of control methods and using them as pest populations reach peak periods, can save time and money, according to Axtell. Instead of applying control measures on a regular calendar basis, they are used as the problem worsens.

Management schemes may combine cultural practices, biological controls and chemicals. An effective technique introduced to many local governments by Sea Grant researchers is ULV, or ultra-low-volume. Instead of "fogging", ULV sprays an almost invisible mist of selected insecticide. Monitoring and well-trained operators can be the key to ULV's success, researchers believe.

Homes for waterbirds

(Continued from page 1)

birds have no other place to nest, Parnell points out.

Facing prospects that dumping on dredge islands may undergo some changes, the scientists are turning their attention to "managing" the islands for continued use by terns and gulls.

Parnell and Soots believe it is possible to design islands suitable for several species of waterbirds by maintaining some bare areas, some grassy and some thicketed. The researchers lean toward selected herbicides for the best control of vegetation. With the U.S. Army Corps of Engineers, they are working on an island near Drum Inlet to test island management.

The scientists aren't really sure where the waterbirds nested before dredge islands were built, nor are they certain of the birds' importance in the ecosystem. But they believe that many of the species are in danger of becoming "endangered" if care is not taken to preserve their nesting sites.

Changing dredge spoil to valuable marshland

To a lot of folks, the swampy marsh that separates hard, dry land from the Atlantic looks pretty worthless.

But scientists know that marsh offers more than meets the eye. The grasses that grow there and the tidal waters that flood the marshes offer nursery and nutrients for young, growing shrimp and fish.

Marsh, vital to the growth of many fish and shellfish, has shrunk alarmingly in recent decades, the victim of man's hunger for land.

Meanwhile, not far from the marsh, in the shallow sounds and estuaries between North Carolina's mainland and its Outer Banks, machines with long arm-like claws suck sand and mud from the bottom of channels and pump it onto beaches or into open waters. Dredging channels, keeping them deep enough for boats, is a never-ending chore. All too quickly, dredge spoil, having no grass or vegetation to hold it, makes its way back into the channel.

Years of costly dredging with its wear and tear on the environment, coupled with a mounting concern over the loss of marsh, has prompted a stern look at both problems. And for once, scientists figure they can "kill two birds with one stone."

The answer, they believe, is to turn dredge spoil into marsh by covering it with grasses that grow in the natural marsh, the most dominant of which is smooth cordgrass.

Supported by the UNC Sea Grant Program, the Center for Marine and Coastal Studies and the U.S. Army Corps of Engineers, Dr. W. W. Woodhouse, North Carolina State University soil scientist, began testing smooth cordgrass on dredge spoil in late 1971. Dr. E. D. Seneca, NCSU botanist, and S. W. Broome, research associate, have assisted in learning how smooth cordgrass (*Spartina alterniflora*) is established, grown and reproduced on spoil.

In the short time they have worked with the grass, the scientists have shown it can be a successful stabilizer.

According to the scientists, complete cover can be achieved with smooth cordgrass in two growing seasons. Seeding or transplanting can be used to establish a cover, and both have advantages. Seeding is fast and cheap, but transplanting is adaptable to a wider variety of conditions, the researchers say.

Woodhouse, who for more than a dozen years has worked to stabilize N. C.'s sand dunes with beachgrasses and sea oats, has also turned his attention to halting eroding shorelines with marsh grasses. His work, aimed at building new marsh while stabilizing shorelines, holds promise for property owners whose beach-front lots are being gobbled up by winds and tides.



Smooth cordgrass is a successful stabilizer of dredge spoil and eroding shorelines.

Fighting marsh insects

Dunes, shorelines and spoil have enemies that are more secretive—and less direct—in their attack than winds and tides. Those enemies are the insects feeding on grasses that hold coastal lands in place.

Hoping to slow the guerilla-style warfare waged by certain insects, Dr. William V. Campbell, North Carolina State University entomologist and Sea Grant researcher, is studying their strategies.

His research focuses on a new species of scale insect (*Eriococcus carolinae*) found devastating American beachgrass south of North Carolina's Oregon Inlet.

Recently, Campbell has broadened his study to beetles that feed on smooth cordgrass, the dominant marsh grass in North Carolina, which is now being used to stabilize eroding shorelines and spoil. Early stages of this research are aimed at learning what effects, if any, the beetles have on marsh grass.

In his study of the scale insect, Campbell has found that in its larval, or immature, stage, the scale sucks the sap of beachgrass plants. Eventually the plants die, leaving the sand unprotected from winds.

Luckily, beachgrass is not alone in its battle against the scale's attack. Just one pound of active ingredient of the chemical dimethoate applied per acre wipes out the scale infestation, says Campbell. Once the pest is eradicated from an area, its return is slow since the female scale does not fly.

Campbell is also testing other control methods, including mixed plantings of a variety of grasses, controlled burning and application of a high grade oil.

Unearthing the secrets of N. C.'s geologic past

Over the years, North Carolinians who spent most of their days living next door to the Atlantic learned to respect their neighbor. Those that got to know her built their homes and shops in places protected from her gusting winds and tides.

But those who spent only a few weeks of each year in her company often put cottages right on her doorstep. The Atlantic didn't seem to care whose property she blew and washed away in her daily cleaning. In many cases, it didn't take her long to over run her neighbors' lands.

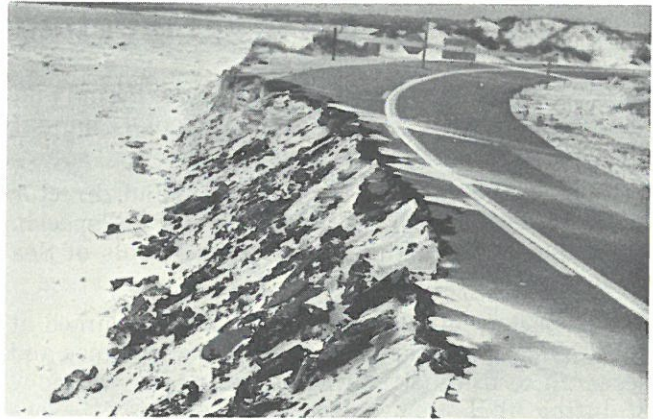
Many newcomers and summer people didn't understand their great neighbor. No one explained to them that shorelines are retreating about five to 10 feet per year, while sea level continues to rise.

Nobody told them because nobody really knew the changes time had witnessed in the state's shorelines. Even today, a picture of the geologic forces that shaped—and are still shaping—North Carolina's beaches is not complete. But a study in the Roanoke Island area by East Carolina University geologists, Drs. S. R. Riggs, and M. P. O'Connor, should add key pieces to the geologic puzzle of coastal North Carolina. Their study is supported by UNC Sea Grant.

The research aims at learning what minerals and soils make up coastal lands both above and below the water's surface, where they are located and in what amounts.

Tied closely to their study of soils is research to unravel the geologic processes that chiseled North Carolina's present coastline.

Relying on old maps of the area as well as sophisticated tests and analyses of the soils and fossils found at various levels beneath the soil sur-



(Photo by Jerry Machemehl)

Studies of geologic forces acting on the state's coast can help pinpoint areas where development might be unwise.

face, Riggs and O'Connor have traced many of the changes shaping the state's coast for the past 40,000 years. Such forces as a rising sea level, constant shifting of the barrier islands and the periodic opening and closing of inlets and channels shaped today's shoreline, the researchers say.

From their evidence of the past, the geologists hope to better predict shoreline changes.

Riggs and O'Connor believe their findings will provide sound bases for decisions on how coastal lands should be used in the future. They will make their findings available in a geologic atlas to be published later this year.

Wise coastal land-management hinges on an understanding of the processes that have and will continue to act on coastal lands, Riggs and O'Connor contend. Their atlas will be aimed at informing land-policy decision-makers of these processes and at providing guidelines for wise coastal development.

You can help us get Sea Grant news to you. Please indicate the needed changes in our mailing and return to the Program Office.

Name _____

Address _____

Street or Box Number

City

State

Zip Code

I have changed my name or address.

I wish to be added to your mailing list.

I no longer wish to receive the UNC Sea Grant Newsletter.

I received more than one copy of the Newsletter.

Fishermen hold annual meeting

More than 125 members attended the Sound and Sea Fisherman's Association's second annual meeting April 20 in Nags Head.

Keynote speaker was Dr. B. J. Copeland, director of the UNC Sea Grant Program. In his speech, Copeland outlined the activities and goals of Sea Grant in North Carolina.

He pointed out that Sea Grant studies aimed at stabilizing dredge spoil and eroding shorelines and research to find better ways to reduce populations of biting flies and mosquitoes in coastal areas should benefit fishermen.

Sea Grant also supports research to find better harvesting and handling methods, new ways to use seafoods, and improved processing techniques and markets, he told the group.

But Sea Grant's goals aren't met until research results are in the hands of those who need and can use them, the director said. A program of advisory services aims at relaying information from the lab to the coastal community and at taking questions back to the lab for research, he said.

Copeland urged fishermen to contact Sea Grant advisory personnel with problems and questions.

The Sound and Sea Fisherman's Association is a co-operative of some 250 small, independent fishermen in the Albemarle and Outer Banks regions. Organized two years ago with assistance from Sea Grant's continuing education program, the Association has made visible gains in reaching its goal of increased freezer and storage space. A 10,000 cubic foot freezer has been built in Wanchese, Association headquarters. Steps have been taken to acquire additional facilities for fish handling from Ocracoke to the Virginia border.

UNC SEA GRANT PUBLICATIONS

The following are publications produced by UNC Sea Grant dealing with research discussed in this newsletter. They are available upon request from the Program Office.

Marsh building with Dredge Spoil in North Carolina. W. W. Woodhouse, E. D. Seneca and S. W. Broome UNC-SG-72-10.

Public Rights and Coastal Zone Management. T. J. Schoenbaum. UNC-SG-72-13.

Public Opinion on Insect Pest Management in Coastal North Carolina. R. R. Gerhard, J. C. Dukes, J. M. Falter and R. C. Axtell. UNC-SG-73-03.

Seacoast Plants of the Carolinas for Conservation and Beautification. K. Graetz. UNC-SG-73-06.

The Continental Shelf Lands of the United States: Mineral Resources and the Laws Affecting Their Development, Exploitation and Investment Potential. E. Dahle. UNC-SG-73-11.

Hydrographic Atlas of North Carolina Estuarine and Sound Waters, 1972. F. J. Schwartz and A. F. Chestnut. UNC-SG-73-12.

An Investigation of Propagation and the Mineral Nutrition of *Spartina Alterniflora*. S. W. Broome, W. W. Woodhouse and E. D. Seneca. UNC-SG-73-14.

Coastal Sediment Process Associated with a Major Transgressive System. S. R. Riggs and M. P. O'Connor. UNC-SG-74-04.

Training Manual for Mosquito and Biting Fly Control in Coastal Areas. R. C. Axtell. UNC-SG-74-08.

University of North Carolina
Sea Grant Program
1235 Burlington Laboratories
North Carolina State University
Raleigh, North Carolina 27607



Second-class postage paid at Raleigh,
N. C. 27611