Coastlines

NEW YORK STATE SEA GRANT INSTITUTE
STATE UNIVERSITY OF NEW YORK and CORNELL UNIVERSITY

Vol. 15 No. 1 Winter 1984

Promising Material for Marine Structures

by Bruce DeYoung, Riverhead

Periods of economic stress can stimulate constructive innovation as organizations seek to do more with less. This is the case in New York State, where public and private groups are collaborating with Sea Grant on an applied research project to benefit the marine trades.

The impetus for this research is the skyrocketing cost of purchasing and maintaining moorings utilizing galvanized chain. With ½" chain typically costing over $2/foot (U.S. $ 1983). many are frustrated by corrosion limiting its life span to three years or less. "The financial loss from corrosion of mooring chain hurts" says Don Fiore, an entrepreneur who sets and rents small boat moorings in Port Jefferson Harbor on Long Island. "Any improvement in the lifespan of moorings means money in my pocket."

An alternate material, conveyor belting, holds promise for ameliorating this dilemma. Strips of conveyor belting are being successfully used in the construction of floating tire breakwaters. Often 75% cheaper than chain, this material does not corrode and can exceed strength characteristics of the chain.

This research project involves laboratory investigations and field testing the feasibility of using rubber belting as a substitute for chain in small moorings. The project's objectives include: identifying appropriate belting materials for use in the marine environment; developing and testing the strength of alternate fastening methods; and, determining the acceptability of its use by industry and government agencies.

To conduct this research, material science researchers at State University of New York at Farmingdale are testing the strength of belting materials and alternate fastening methods using recognized laboratory procedures. In several cases it was found that both the belting and a method of fastening it using industrial glue exceeded 5,000 pounds before failing. This value compares favorably with the conventional material, steel chain, now used in moorings. Professor Anthony Franco of the State University at Farmingdale is the principal investigator for this research project. A mechanical engineer, Profesor Franco is accustomed to testing new inventions and helping to get them into use. "I'm convinced that there are many ways for marine industry to use belting materials successfully," says Franco, "especially in small moorings."

In conjunction with laboratory investigations Sea Grant Extension staff are working with industry and government representatives to field test the use of belting materials in mooring systems. "Our experience with rubber belting has been postive," says Frank Keane of the New York State Office of Parks and Recreation. To date, over 300 navigational aid moorings have been converted to belting by this agency.

Implications of this research for marine applications are numerous. Preliminary evidence indicates that rubber belting materials may reduce the cost of building, mooring and maintaining artificial reefs and floating structures. Beyond economics, this material may allow moorings and small navigational aids to be located in areas not conducive to the use of line in the mooring system. Lastly, this material's relatively low value may ease vandalism and reduce pilferage of structures moored in urban areas.

Moorings in Setauket Harbor

"Further research and field experience is needed to confirm the benefits of using this material" says Bruce DeYoung, Sea Grant Program Coordinator. Further information on this innovation is available from Bruce at the Riverhead office.

Coastal Living

Teens Tour L.I.

This past summer 80 teens and their leaders from 25 counties, New York City and New Jersey gained first-hand knowledge about Long Island resources and the problems associated with them. Under the watchful eye of a team of county agents and Sea Grant and college specialists, the kids heard from a shark fisherman, visited a working commercial fish net and had the opportunity to go out on a party boat fluke fishing.

The team, headed by Dr. Ronald A. Howard, Jr. of the Department of Natural Resources, also supervised the group as they prepared fish for dinner, learned about coastal erosion and marine birds, and visited such unique Long Island sites as a horse breeding farm and the Pine Barrens.

Dr. Howard explained, "This tour is an annual event to give New York 4-H'ers a better sense of the wealth of natural resources the state has to offer. Although we will again visit Long Island next summer, future plans call for a tour of our North Country followed by one on the Great Lakes. It is our hope that the teens will not only see the differences in the state's resources, but will put together similarities in problems and management techniques."

—Contact D. Green, E. Aurora

Moves

The Brockport and Oswego Sea Grant Extension offices and the New York Sea Grant Institute office in Albany all have completed local moves. See HOME PORTS on page six for details.

4-H'ers learn how the Bluepoints Company grows clams.

4-H Clam Clubs

In a different twist to the traditional 4-H pheasant raising program, 4-H teenagers in Suffolk County participated in a hard clam mariculture project. With guidance from Robert Kent, 4-H Agent of Suffolk County and Sea Grant Researchers, Robert Malouf and Charles deQuillfelt of the Marine Science Research Center at Stony Brook, the teenagers grew young hard clams in underwater trays.

"After a slow start due to an unusually cool spring," says Kent, "the project really took hold. I think we will be able to expand the effort next year as many people have become interested."

The 4-H'ers constructed four wooden racks designed by the Stony Brook scientists. On August 31, approximately 8,250 clams were placed in the trays and located at the Flax Pond Facility of SUNY Stony Brook. The clams were released at the end of October after achieving sufficient growth.

This project got teens directly involved with one of the biggest industries on Long Island. Such familiarity with hard clam mariculture could lead to informed decisions in the future.

—Contact D. Green, E. Aurora

4-H Agent Bob Kent looks on as clam club members construct growing racks.

COASTLINES is published quarterly by the New York Sea Grant Extension Program. This program is funded by the National Oceanic and Atmospheric Administration, the State of New York, and the New York Sea Grant Institute. Subscriptions to Coastlines are free for New York residents. Two-year out-of-state subscriptions are $4. Request Coastlines from Sea Grant Extension Program, Fernow Hall, Cornell University, Ithaca, N.Y. 14853.

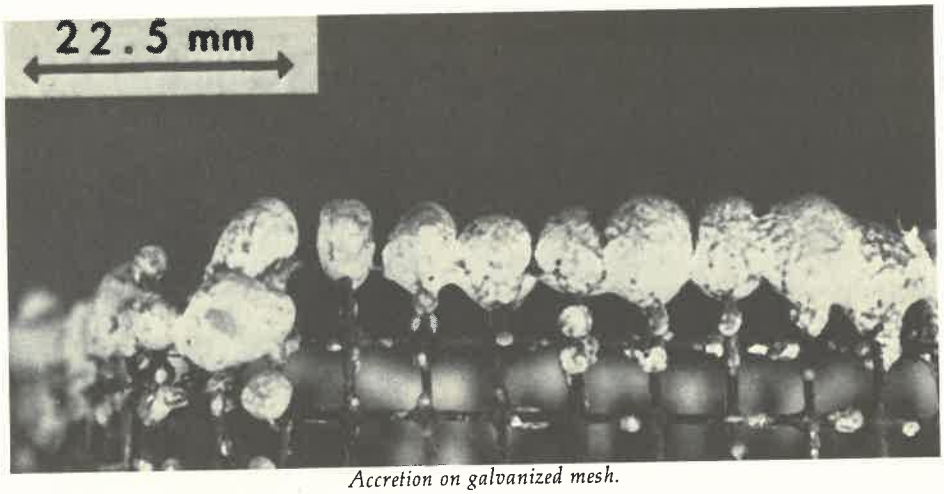
Research in Short

Coastal Construction Through Mineral Deposition

by William Wise, Albany

The marine environment is a difficult environment in which to build and maintain structures. Concrete, steel, and wood components of seawater structures are subject to fracture, corrosion, and decay through a variety of physical, chemical, biological processes. Replacement costs frequently are high.

With support from the New York Sea Grant Institute, investigators at SUNY/Stony Brook's Department of Materials Science have been developing a reliable technology for the construction and repair of seawater structures. This new technology is based on a process called cathodic electrodeposition, in which inorganic minerals are deposited out of seawater onto a wire mesh through which flows an electric current. After a long period of trial and error to determine the many complex parameters affecting the quality and rate of accumulation of the deposit, a reliable, reproducible process is nearing development.



Accretion on galvanized mesh.

The use of cathodic electrodeposition the construction of structures in seawater was first studied in the early 1970's at the University of Texas at Austin. Intitial work indicated that, given proper conditions, material with a compressive strength at least equal to that of Portland cement could be deposited within a reasonable period of time. Speculation arose that here was a process for creating very large, complex underwater structures in the sea itself, at a fraction of the cost of land-based construction. The only limits, it then appeared, were the amount of wire mesh one had and the size of one's battery.

Shortly thereafter the researchers pursuing this exciting new technology left the university to attempt to commercially develop the process, having never fully described the precise electrochemical and materials science parameters necessary for maximum accretion.

Extensive adoption of mineral accretion technology in marine construction would require this information to be well and widely known. In 1981 the New York Sea Grant Institute provided research support to Dr. Herb Herman to develop and fully document a mineral accretion system based on cathodic electrodeposition.

As a result of the work of Herman and colleagues, we now understand the processes involved in mineral accretion by electrocathodic deposition and the engineering and environmental parameters influencing these processes. With help from the Sea Grant Institute, Herman is trying to find support to evaluate specific applications of this technology in the marine environment.

One of the more interesting potential applications is the disposal of radioactive wastes in the deep ocean. It is thought that the radioactivity emanating from disposal cannisters could create an electrical current in an enveloping wire mesh and also provide sufficient heat to fire the mineral accretion process, providing a self-sealing disposal system. More mundane uses include the construction and repair of pilings and other traditional seawater structures. Successful demonstration of mineral accretion technology in a "concrete" application could open the door to a new approach in marine construciton.

I Want More!

Please check the publications which interest you and send to your nearest Sea Grant Extension office. Make checks payable to Cornell University.

_____ **Guidelines for Effective Use of Floating Tire Breakwaters.** 1983. Craig T. Bishop, Bruce R. DeYoung, Volker W. Harms and Neil W. Ross. Cornell Cooperative Extension Information Bulletin 197. 19 pp. $3.50.

_____ **Courtesy is Contagious: 4-H Hospitality Training Program.** 1983. Linda Parks. 41 pp. $4.00.

_____ **Minimizing Gull Damage to Coastal Agricultural Crops.** 1983. Charles R. O'Neill, Jr. Fact Sheet. 11 pp. $0.50.

_____ **Educational Vessell Ontario Project: 1983 Annual Report.** 1983. Michael P. Voiland. 11 pp. Free.

Access Progress

As fuller development of Lake Ontario's salmonid sportfishery has progressed in the last three years, the need for boat launching access to lake water has become critical. While most sportfishing interests cite the need for a faster pace of access development, municipal, county and state governments have made good progress toward the ultimate goal of providing safe, convenient and inexpensive boating access to Lake Ontario.

Since the last *Coastlines* update on lake access (September-October 1980), the City of Oswego has completed its Wright's Landing launching complex and the site has become a center for fishing boat access. The County of Monroe opened its new Rochester Harbor launch facility, once the county and the City of Rochester resolved a dispute with lease-holders at the site. Also, at the municipal level, the Town of Lewiston put the finishing touches on its new Niagara River launching facility, improving boating and fishing access to the lower river's recreational amenities.

On the State's part, channel navigation and wave protection has been improved at the Mexico Point launch. Needed alterations have been made to existing facilities at Fort Niagara and Golden Hills State Parks, and monies were allocated in 1983 for improvement work at facilities in Fair Haven, Stony Creek, Port Ontario, Oak Orchard and Westcott Beach State Parks.

But, perhaps the most significant effort by the State has been the development of a strategic, long-range plan for Great Lakes access. Prepared and issued by two state agencies — the Department of Environmental Conservation (DEC) and the Office of Parks, Recreation and Historic Preservation (OPRHP) — the plan calls for maximizing the economic benefits that improved boating and fishing access can bring to the state by undertaking a $32 million facility construction program on lakes Erie and Ontario through 1990. Agency officials believe the return-on-investment could approach $50 for every dollar spent.

Implementation of the joint agency plan does not call for the creation of a new funding mechanism or grant program. Rather, both agencies are counting on tapping existing capital construction programs, bond monies and the state's general fund on a planned, annual appropriation basis. According to state officials, budget requests to get the program off the ground in its first full year (1984-85) have been submitted to the governor's office, and, of course would also have to clear the legislature's appropriation process. Keeping the 8-year plan of development on schedule will require annual approval of budget requests.

For further information on the state's plan, contact DEC or OPR regional or Albany offices. Additional information might be obtained from elected state officials from the lakeshore region.

— Contact M. Voiland, Brockport

Lake Ontario's sportfishery creates much demand for boating access.

Ice Fishing

Like most other pursuits, ice fishing requires safety precautions on the part of participants. One of the first areas of concern is with the thickness and quality of the ice.

Prolonged periods of freezing weather will produce good, hard ice. A river or lake may not have a uniform ice layer, however. Warm springs (even 40°F water can be warm in winter) or currents may produce areas of thin, unsafe ice. Areas that seem dark or show evidence of crumbly or honeycombed ice should be avoided. So called "rotten" ice also should be avoided when winter yields to spring. Weak spots may appear unpredictably as ice breaks down.

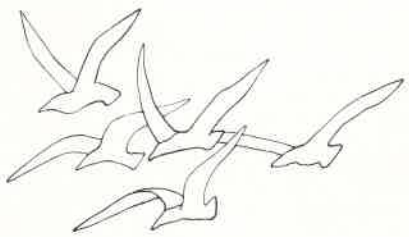
Under sub-freezing conditions 5-7 cm (2 to 3 inches) of ice is minimal for widely spaced anglers. Solid ice 7-11 cm (3 to 4 inches) thick is adequate to support small groups of people. At least 13-15 cm (5 or 6 inches) of good, solid ice should be present before operating snowmobiles and similar equipment on it. These standards should be considered minimal.

In some situations no amount of ice is really safe. When fishing shoreline ice or frozen bays on larger bodies of water, anglers must be acutely aware of winds. Wind and wave action can break up good ice even 46-60 cm (18 to 24 inches) thick with alarming speed. Many unwary ice fishermen have been chased ashore with open water lapping at their heels, plucked from drifting floes by the Coast Guard, or lost when they failed to respect the power of wind and waves on the ice they had trusted.

If you should break through the ice, a step backward on the secure foot might limit the accident to your errant foot. If you do go through, heavy, relatively airtight clothing will provide some flotation until it soaks through. Working quickly, but without panic, grasp the edge of the ice. If the ice breaks away, repeat the process until solid ice is located. Kick you feet for thrust and attempt to get your torso onto the ice surface. Once you have cleared the edge, roll toward the safe ice you crossed previously.

Once you are safely on good ice, you must give immediate attention to getting warm and dry. Do not hesitate. A heated shanty, a warm car is needed immediately to prevent loss of body heat.

—Contact D. Greene, E. Aurora



Minimizing Coastal Gull Damage

Gulls can be real nuisances along the coasts. They leave evidence of their visits on boats in marinas, on jetties, piers, and docks, and flocks of gulls come inland to feed. This coming inland poses a hazard to aircraft at coastal airports and there is now evidence that gulls may be damaging coastal fruit and vegetable crops, such as cherries, blueberries, cabbage, and corn, as well.

Herring gulls (along the state's marine coast) and the ring-billed gull (along the Great Lakes) are the primary nuisance gulls in inhabited coastal areas. In the 1970s, chemicals such as DDT were blamed for decreases in gull populations. Improved environmental quality and increases in food supplies appear to be responsible for moderate increases in herring gull and dramatic increases in ring-billed gull populations over the past decade.

Gulls prefer to eat fish, insects, earthworms, and refuse, with fish the preferred food. However, they are very opportunistic and will go after almost anything edible, including garbage, fish being boated by anglers or by commercial fishing boats, and certain farm crops.

Gulls are protected by the terms of the Migratory Bird Treaty Act between the United States and Canada. Controlling the birds by killing or otherwise hurting them is illegal.

Gulls are very difficult to frighten. In fact, they can be seen along runways while jets are taking off and landing. They are also quite adaptable to actions taken to scare them away, making for an on-going battle when trying to rid an area of their visits.

Some success has been achieved by mounting stuffed gulls in strange positions and placing them in fields. This only works in the daytime and decreases in effectiveness as the stuffed birds deteriorate. Also, gulls get used to the stuffed birds and ignore them.

Bright strobe lights, flashed at irregular intervals, have been tried at airports, but have been found to be only temporarily effective. This method could be quite expensive on a large farm or orchard, but could be practical around fruit of vegetable processing plants or commercial fishing docks with gull problems.

Loud noises, such as horns and sirens, at random intervals, have a temporary effect. Gas cannons and firecrackers don't work as well since gulls are not hunted and therefore don't regard explosions as threatening sounds. Playing amplified recordings of the distress and alarm calls of gulls over loudspeaker systems has shown some success around airports but is expensive. Colored signal flares which give off a flash and an explosion seem to work well, combining both sound and sight. As with other controls, effectiveness decreases as the birds become used to the activity.

An invisible ceiling is another alternative. This is produced by stringing wires or monofilament line overhead at a spacing in which gulls will get tangled or confused when they attempt to fly through. The birds become scared of that airspace and will avoid the area. However, this is only practical for small or intensively used areas due to the physical limitations of stringing the wires.

And finally, removing food sources is important. Since garbage and wastes attract gulls, eliminating these before gulls tell their friends about the free handouts is one way of nipping the problem in the bud.

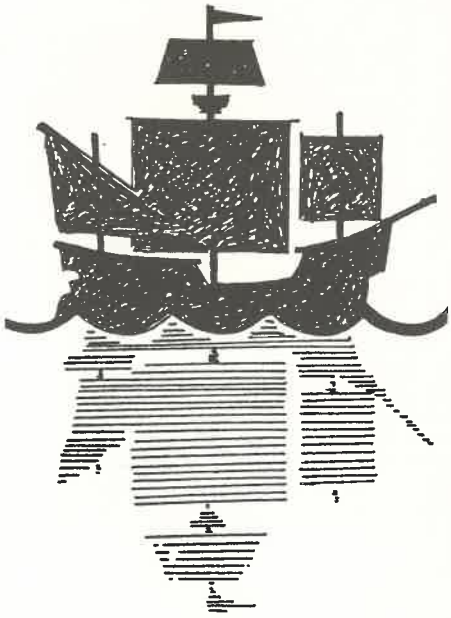
See I WANT MORE to order a fact sheet on controlling gulls in coastal areas.

—Contact C. O'Neill, Brockport

EVO Report

The 1983 annual report of the education vessel "EV-Ontario", which plied Lake Ontario's waters this past summer, now is available. More than 200 private groups, manufacturers, businesses and individuals helped sponsor this educational effort. Projects included angler education, 4-H youth cruises, coastal resource tours, equipment demonstration, and much media coverage of Lake resources. See I WANT MORE for ordering information.

—Contact M. Voiland, Brockport



Launching a New Trade Association

In October 1982, about 3 dozen marina owners in the Hudson Valley were sent a questionnaire to determine if there was interest in forming a local trade association. Six months and five meetings later, the Hudson Valley Marine Trades Association came into being with elected officers and association by-laws in place.

The by-laws identify the specific purposes of the organization as: to raise the standards of service within the boating industry; to create an interested and informed public; to provide safety, cooperative advertising, and product buying, a voice in legislation; and, to present annually one or more shows featuring the products and services to its members.

Target membership for the first year is to have 25 members, this representing the "critical mass" felt by the group to be necessary to stage a successful trade show.

The Sea Grant Extension program facilitated the formation of the group through acting as the catalyst for group action. Formation of a local trade association was actually one of several options presented to this previously ununified business group. Other options included the no action alternative, a choice of several national associations, and a choice of local associations in neighboring areas. The decision to have a local association hinged on the desire to have a formal vehicle to address local concerns.

—Contact S. Lopez, New City

Courtesy is Contagious

To increase awareness of the importance of hospitality and to help community leaders, educators, and retail businesses upgrade their community hospitality skills, a training packet entitled "Courtesy Is Contagious" now is available.

The hospitality package includes educational materials used by a trainer to conduct a pilot hospitality training program for 4-H'ers and their leaders in St. Lawrence County.

The package includes a 41-page "Courtesy Is Contagious" Teaching Guide which was designed to help trainers conduct small workshop or group learning experiences in tourism and hospitality skills.

Appendices to help the trainer with training events includes activities, sample exercises, skits and visual aids. See I WANT MORE to order.

—Contact L. Parks, Potsdam

New FTB Guide

A new publication entitled "Guidelines for the Effective Use of Floating Tire Breakwaters (FTBs)" now is available. Its intent is to illustrate appropriate uses of FTBs and to identify key design considerations in FTB construction.

Developed by an international team of Sea Grant researchers and advisory personnel, it includes coverage of how FTBs work, advantages and disadvantages of their use, legal considerations, specific design considerations, selecting construction materials, construction techniques and maintenance. See I WANT MORE for ordering information.

—Contact B. DeYoung, Riverhead

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