Chesapeake Bay Seagrass Problems, Solutions Eyed

Two Virginia Institute of Marine Science (VIMS) scientists, studying why eelgrass beds in lower Chesapeake Bay have drastically diminished during the past decade, are also developing ways to transplant the important seagrass and hasten its recovery, the Institute reports. Robert Orth and Polly Penhale of the Institute are also combining their talents to learn the importance of eelgrass to the production of marine animals in Chesapeake Bay, and the effects of environmental factors (light and temperature) on its growth.

Their work, sponsored by the Chesapeake Bay Program of the Environmental Protection Agency, was reported at the 13th International Botanical Congress in Sydney, Australia. Orth related his theory involving the impacts of grazing snails on eelgrass. "Small marine snails feed on the bacteria, diatoms and algae that grow on eelgrass. This grazing keeps the grass fronds clean, allowing the necessary light penetration to support photosynthesis," he said.

A serious loss of eelgrass in Chesapeake Bay occurred after Tropical Storm Agnes in 1972, when huge quantities of rain drastically lowered salinities in the bay. Fresh water killed the snails, and the eelgrass subsequently became fouled and died without their cleansing action, according to Orth.

"While we have not proved this conclusively, evidence suggests we are on the right track," he said.

Penhale reported to the Botanical Congress the results of a 3-year study of the contributions of seagrasses and associated plants to the overall productivity of a marine ecosystem. Her paper was coauthored by Kenneth Webb and Richard Wetzel of VIMS. A marine plant physiologist, her work also involves studies of the impact of light on seagrass growth, and the community structure of seagrass beds in lower Chesapeake Bay.

Fish-Holding Experiments for Scup Are Reported

Tests of fish-holding systems for whole scup, *Stenotomus chrysops*, aboard the MV *Suzanne Beth* have been reported by the University of Rhode Island (URI) Food Science Department and the URI Marine Advisory Service.

The holding systems were: 1) Boxed in normal vessel ice; 2) boxed in experimental enzymatic ice; 3) chilled seawater using normal ice in a 3:1:0.5 fish, ice, seawater ratio by weight; and 4) chilled seawater using experimental enzymatic ice in the 3:1:0.5 fish, ice, seawater ratio. The control sample was the vessel's normal stowed-in-ice fish.

All tests were carried out over an 18-day period. Quality assessment on all the samples was made with the following methods: 1) Torrymeter, 2) xanthine oxidase enzyme test sticks, 3) ammonia analysis, and 4) organoleptic evaluation. All samples were treated from day 1 of the voyage and all figures refer to holding times post mortem.

Basically, the chilled seawater (CSW) systems using normal and enzymatic ice, showed a higher quality product for a longer period of time than either of the boxed-in-ice systems or the control sample. Sample shelf life was as follows:

1) Scup boxed with normal ice was acceptable at 10 days.

2) Scup boxed with enzymatic ice was acceptable at 13 days.

3) Scup held in CSW using normal ice was still acceptable at 18 days.

4) Scup held in CSW using enzymatic ice was acceptable at 18 days.

The control sample taken from the fish hold was acceptable at 9 days, mainly because of the use of adequate horizontal pound boards keeping the compression loads on the fish to a minimum. Drip loss was checked and found to be negligible, but a softer species, such as whiting, if subjected to high compression loads, will suffer weight loss.

This was the second such experiment in the URI series. The first involved holding butterfish boxed in ice, CSW, and frozen in domestic food freezers on board the vessel, with the control being iced, bulk-held butterfish in the hold. Here, the boxed-in-ice butterfish generally proved to be better over a 10-day period, post mortem.

NY Dedicates Great Lakes Salmonid Hatchery

A new $10 million Salmon River Fish Hatchery at Altmar, N.Y., has been dedicated by the Department of Environmental Conservation. The hatchery, 10 years in planning and construction, will produce 4.5 million trout and salmon, weighing 250,000 pounds, annually for the State's Great Lakes waters.

"These prized salmonids are the foundation of a growing sports fishery," explained Commissioner of Environmental Conservation Robert F. Flacke. "That fishery, in addition to providing top-notch angling for fishermen from across the Northeast, will bring at least $100 million a year into New York's economy and jobs to its citizens.

"Eggs will be taken here, hatched, and fish reared to release size. Those stockings will be of chinook and coho salmon, brown trout, rainbow trout, and steelhead. These fish will grow to huge size on the rich forage fish that exist in Lakes Erie and Ontario . . .

Chinooks will be taken between 25 and 45 pounds. New York's current Lake

Ontario record is 47 pounds. Cohos will range from 8 to 15 pounds, reaching toward our current 21-pound 9 ounce record. Browns will go to 17 and more pounds and steelhead up to 21-plus pounds."

Harvest Practices May Hurt Hawaiian Seaweed

Government controls may be needed to preserve Hawaii's limu (seaweed) industry, according to Jerry Kaluhiwa, director for the Limu Restoration Project near Heeia State Park in Windward Oahu. Limu, especially ogo and manauea (species of *Gracilaria*), is becoming scarce and more expensive, Kaluhiwa said. Limu's scarceness, he contends, partly results from harmful practices of commercial harvestors and from short-sighted marketing.

Kaluhiwa believes governmental action may be needed to save existing limu beds and to protect new ones. Access to limu beds, he said, should be limited to prevent the beds from being destroyed by indiscriminate overharvesting. He cited the problems the restoration project has had with pickers gathering limu from its sites in Kaneohe Bay that it uses to grow seedlings.

"Anybody can come in and pick the limu," Kaluhiwa said. "We can't stop them. All we can do is ask them to pick the limu in the right way so it can grow back." Kaluhiwa also believes that commercial harvesters should be required to go through a licensing process in which they demonstrate the ability to properly harvest limu.

The methods for picking limu so that it may grow out again are simple:

1) Pinch or snip the limu 1½ inches or more above the holdfast, or the base of the stalk. Pinching or snipping the limu any closer to the holdfast may kill the plant;

2) Reset the rock or object to which the limu is attached back into the water's bottom. If the rock is thrown back into the water, the limu may end up face down and die. Also, even if the limu ends right side up, wave action may flip it over; and

Proper limu harvest method.

3) Pick underused species of limu. Many are edible and tasty, and harvesting may help to prevent them from overcrowding the more popular species.

Kaluhiwa suggested that local markets could help ease the pressure on popular limu like ogo and manauea by looking at the retail possibilities for underused species. (Source: *Makai.*)

Seaweed Farm Prospects Noted in Washington Area

According to Tom Mumford, a seaweed expert with the Washington Department of Natural Resources, seaweed is rich in Vitamins B and C and important trace minerals, and it contains between 36,000 and 50,000 units of Vitamin A, which is far more than either chicken eggs or cow's liver.

"Oriental cultures," says Mumford, "have eaten seaweeds for centuries and still consider them as staples in their diet." "Nori" is the Japanese name for a edible seaweed of the genus *Porphyra*, and it is the most widely consumed and most commercially profitable of all edible seaweeds, which, says Mumford, should more properly be called sea vegetables. "In Japan," Mumford points out, "nori culture has become the largest single marine fishery, annually constituting a billion-dollar industry."

In the United States, nori is an imported product, and as might be expected, the main consumers in this country have been among the Oriental communities. Mumford says, however, that imports have recently risen by 40 percent, reflecting a growing interest on the part of other Americans in the benefits of sea vegetables.

At a workshop sponsored by the Department of Natural Resources and the Washington Sea Grant Program last year, the possibilities of developing a nori culture industry in Washington waters were discussed. Out of some 80 species of nori that exist worldwide, Puget Sound contains 16, several of which would be appropriate for culturing.

For the past several months, Mumford and John Merrill of the University of Washington Department of Botany have been conducting research to determine the ideal oceanographic conditions for culturing nori in Puget Sound. According to Mumford, the Department of Natural Resources is setting up a nori demonstration farm, with assistance from Japanese nori farmers. They have been looking at a site in southern Puget Sound near Hartstene Island or McNeil Island. Mumford has also been involved in a Sea Grant-sponsored project aimed at developing net structures for growing seaweed that are able to withstand adverse weather conditions and also determining the tastiest *Porphyra* species found on Washington seashores.

"A commercial nori industry in Puget Sound is still sometime off," says Mumford, "but there is considerable interest in the idea. Oyster farmers, for example, could combine seaweed culture with oyster farming in some areas."

Fishing Under Sail: Learning From the Past

Fishermen and boatbuilders can learn a lot about wind-powered workboats right in their own backyards, according to Mike Alford, of the Hampton Mariners Museum in Beaufort, N.C. Hundreds of fine old sailing workboats have been discarded and are moldering in creeks, sheds, and yards.

Alford has begun a study of the North Carolina's historic boats for the Museum. When he finds a boat with historic importance, he measures it, photographs it, and transforms the lines and contours into detailed blueprints, hoping to eventually compile a reference book for boatbuilders and historians alike.

Alford believes that without the introduction of cheap gasoline in this century, the old classics of the State's fleet would have continued to evolve.

"I believe that what we've seen is a sudden interruption in the natural development of the boat," he says. "We almost, but not quite, lost the art of fishing under sail. We need to go back to the extremely efficient boats of a couple of generations ago, and pick up where we left off."

Alford points to three mainstays in the old North Carolina sailing fleet of workboats:

1) The sharpie, used mainly for oyster fishing along the shallows of the central coast, beginning in the late 1800's;

2) The spritsail skiff, a late-19th century craft used up and down the coast; and

3) The Albemarle shad boat, which may have been indigenous to North Carolina.

Each of the types evolved to suit the locations, fisheries and economic conditions of the times, Alford adds.

Erratum

In the article "Possible temperature effects on charter boat catches of king mackerel and other coastal pelagic species in northwest Florida," 43(8):21-26, the order of authorship was transposed. The correct order is: William A. Fable, Jr., Joe Finnegan, Jr., Harold A. Brusher, and Lee Trent.

Publications

New NMFS Scientific Reports Published

The publications listed below may be obtained from either the Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402, or from D822, User Services Branch, Environmental Science Information Center, NOAA, Rockville, MD 20852. Writing to the agency prior to ordering is advisable to determine availability and price, where appropriate (prices may change and prepayment is required).

NOAA Technical Report NMFS SSRF-750. Schwartz, Frank J. **"World literature to fish hybrids with an analysis by family, species, and hybrid: Supplement 1."** November 1981. 507 p.

ABSTRACT

Supplement 1 comprises 1,814 citations published between 1971 and October 1980 which deal with fish hybrids of the world. Continuing the format of the original compilation, each reference has been read, analyzed, and referenced by author, family, species, and hybrid cross.

NOAA Technical Report NMFS SSRF-751. Griswold, Carolyn A. (editor). **"The barge *Ocean 250* gasoline spill."** November 1981. 30 p.

ABSTRACT

On 16 March 1978, the barge *Ocean 250* grounded on Watch Hill Reef 1,006 m off Watch Hill, Rhode Island. An estimated 2.6 million liters of gasoline was spilled into Block Island Sound.

Results of cytogenetic analyses indicated maximum damage occurred in fish eggs collected in plankton and neuston samples in the spill area. Membrane or embryo damage occurred in up to 100 percent of the fourbeard rockling, *Enchelyopus cimbrius*, and yellowtail flounder, *Limanda ferruginea*, eggs collected over a 4 day period following the spill. Low levels (<12 ppb) of hydrocarbons analyzed in the gasoline range were found in the water column at stations in the spill area 36-40 hours after the spill first began. Zooplankton samples collected from the same area showed traces of hydrocarbons from the gasoline range as did two species of benthic invertebrates, the sea scallop, *Placopecten magellanicus*, and the hardshell clam, *Mercenaria mercenaria*. Twenty-three fish samples representing 10 species were analyzed. Five showed levels twice that of the control sample taken from Fox Island, Narragansett Bay. There was no apparent damage to benthic communities, and analyses of zooplankton communities at the time of the spill and 3 weeks later showed normal patterns of species composition and abundance.

With the exception of localized damage to fish eggs, there was no apparent discernible damage to fish or invertebrate populations in the area immediately following the spill, and although there were measurable amounts of gasoline hydrocarbon components in a small number of water, fish, and invertebrate samples, there is no evidence that this would cause long-term damage to the populations. Shore surveys did not indicate damage to intertidal flora and fauna along Fishers Island, New York, or along the southern Rhode Island coastline.