Coastliners

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Controversial River: The St. Lawrence

by Stephen D. Brown, Specialist, Potsdam

1979 is a critical year for the St. Lawrence River. Issues such as seaway transportation, power development, tourism, fish and wildlife conservation and the quality of life along the river are being decided in faraway places such as Albany, Washington, D.C., Toronto and Ottawa. The outcome of these decisions promises – perhaps – a new and different river from the past.

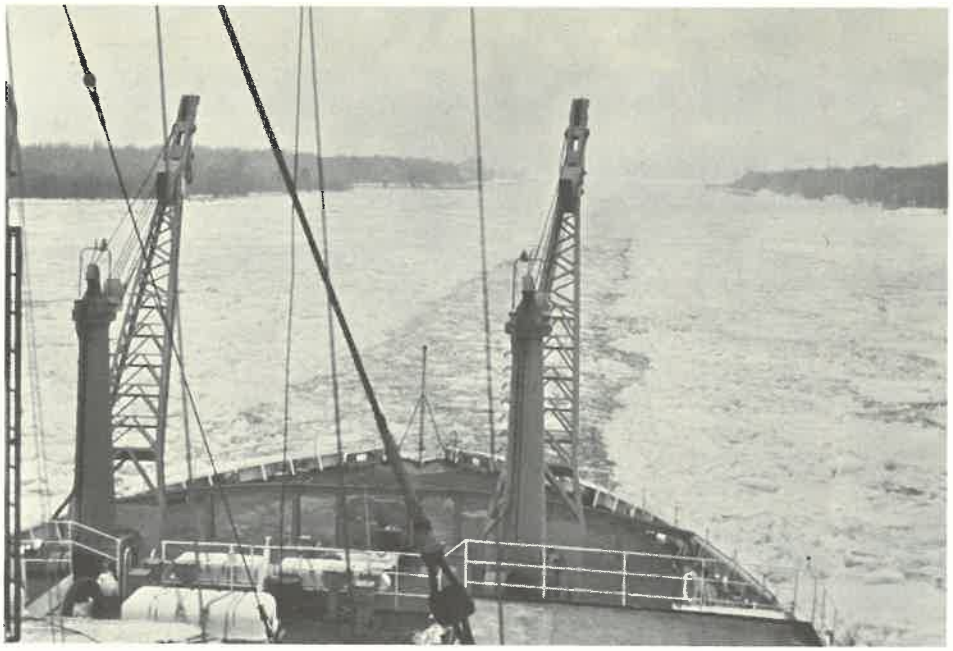
Today the St. Lawrence, the longest east-west river in North America, serves as a boundary between the U.S. and Canada, a corridor for ships between the continental bread basket and far-flung markets, a source of energy for hydroelectric power plants, a regulator of water levels, a source of water and receptacle for waste disposal for industry and local communities, and a gathering place for fish and wildlife, tourists and residents.

In 1979, a number of proposals regarding river use will be considered by government and interest groups. Typically, each proposal – extolling its own merits – gives little attention to other river users. The international character of the region also aggravates this situation, often preventing the valley from being treated as a geographical unit. The result of these myopic processes is intense competition for shore space and water usage.

The attempt to upgrade transportation on the St. Lawrence is an example of this dilemma. In 1977, the St. Lawrence Seaway – operating at near capacity – carried an all-time high of 63.3 million tons. Today, proposals to increase this capacity are being considered. They include: lengthening the navigation season beyond the usual April-to-December months by providing icebreaking, ice boom projects, dredging, shore protection, bubbler systems, and thermal additions; shortening travel time by twinning the locks; and accommodating bigger ships by enlarging the locks and connecting channels. These modifications, however, could generate such ecological and economic change that every river user – and even the way of life along the river – would be affected.

As in all controversies, there are many viewpoints. At a recent St. Lawrence Valley Conference Council meeting, for example, Robert Conners of the Power Authority of the State of New York (PASNY) suggested that ice jamming associated with winter navigation could create "adverse effects on upstream interests and power production." Conversely David Robb of the St. Lawrence Seaway Development Corporation expressed the belief that properly designed ice control methods could have a positive benefit on power generation. Meanwhile some river residents hold another viewpoint. At a public hearing attended by 400, Bea Schermerhorn, a marina owner and co-chairman of "Save the River" said: "This proposal of winter navigation emphasizes the fact that the river is being put on the sacrificial block..... There is also a conspicuous absence of 'North Country' people in the decision-making process."

As the various "camps" argue about the St. Lawrence "battleground," the total picture is often ignored. But river users should realize that if properly managed, the river can serve different purposes. If managed improperly, the river as it is known today may be destroyed. How the battles end will shape the St. Lawrence River of tomorrow.



A ship passes through a channel cleared by an icebreaker on the St. Mary's River between Lake Superior and Lake Huron. Ice breaking is just one of many proposals being considered to extend winter navigation on the St. Lawrence River. Photo courtesy of the U.S. Fish and Wildlife Service.

Troubled Waters: The New York Bight—Part II

by Donna Edgar, Specialist, Stony Brook

Editor's note: This article, the second in a series of three, focuses on the effect of pollution on the New York Bight. Part I dealt with sources, and Part III will discuss alternatives to pollution.

In 1675 Governor Edmund Andros, the second English governor of the colony of New York, forbade any person to "cast any dung, dirt, refuse of ye city or any-thing to fill up ye harbor under penalty of forty shillings."

Had Andros' promulgation been enforced over the centuries, marine life in the New York Bight — the 15,000 square miles of ocean water off New York and New Jersey might be less troubled today. Unfortunately, it has been only since the 1930s that dumping activities have been regulated. The prime offenders in the Bight today are toxic chemicals, microbial pollutants and nitrogen compounds which affect water quality, bottom sediments, marine and human life.

Due to their non-biodegradable nature, **toxic chemicals** such as oil and grease, heavy metals (eg. mercury, lead, and cadmium), pesticides and synthetic compounds (eg. DDT and PCB) become incorporated into bottom sediments, eventually accumulating in plants, fin and shellfish flesh to be passed on through the food chain to humans. A problem to public health, this accumulation also affects New York's valuable seafood industry.

In recent years representatives from the New York State Departments of Health and Environmental Conservation have suggested that people eating fish from the Hudson or Raritan Rivers limit their intake to once a week, and children under twelve, pregnant or nursing women eat none of these fish at all. Fish such as striped bass, eel, and bluefish which migrate from these rivers to saline water, and lobsters and crabs which come from the New York Bight may also contain toxic chemicals.

Microbial contaminants are the second offenders in the New York Bight. Necessitating the closing of many shellfish harvesting areas and swimming beaches, these microbes have been attributed to land runoff, treated and untreated sewage. By closing shellfish waters, the public is protected from diseases such as typhoid, hepatitis and cholera; while monitoring swimming beaches prevents gastrointestinal infections.

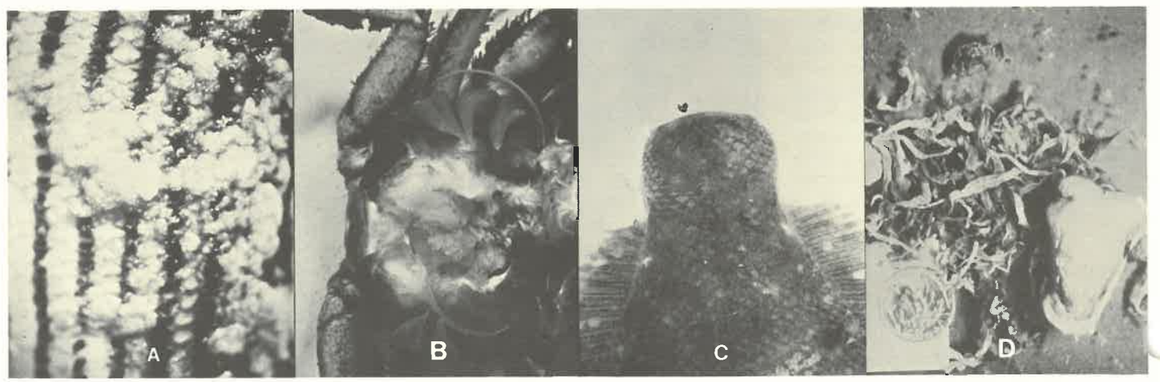
Both microbial and chemical contaminants can affect the egg and larvae stages of marine organisms, leading to an increase in abnormalities and a decrease in growth and production possibly affecting future populations. For fishermen in the Bight, it is not unusual to land fish with rotting fins or lobsters and crabs with eroded outer shells. Less common diseases are ulcers, tumors and deformed bodies.

Runoff and sewage provide the third pollutant, namely **nitrogen compounds.** These abundant nitrogen nutrients "fertilize" the water, causing the growth of **phytoplankton,** the tiny floating plants so essential in the food chain. However, when this fertilization is excessive, it speeds up the natural ageing of water, a process known as **eutrophication.** When the amounts of phytoplankton and floating wastes build up, sunlight is unable to filter through the water, causing the phytoplankton to die and decompose. The decomposition of phytoplankton and other organic materials causes the removal of oxygen from the water, a process called **biological oxygen demand** or BOD.

Although the depletion of oxygen or **anoxia** is a natural process especially in the summer, it also limits the amount of oxygen available to fish and plants in deep water. During the summer of 1976, for example, when oxygen levels over large areas of the Bight fell to zero milligrams per liter (levels below four milligrams are considered damaging to marine life), mass mortality of fin and shellfish occurred. The full environmental repercussions of the "fish kill of '76" may still be seen in years to come.

While each group of pollutants has its own sources and effects on the environment, each also poses unique problems for resource managers attempting to correct water degradation. The last article of this series will address management alternatives for the Bight.

For more information on the New York Bight, contact Donna Edgar at the Sea Grant office in Stony Brook. See also, **Water — Critical Choices** in UPDATE.



Examples of contaminated fin and shellfish from the Bight are (A) striped bass infected with viral "fish mange"; (B) crab suffering from exoskeletal shell disease associated with toxic chemicals from sewage and dredge materials; (C) fluke suffering from tail rot associated with contaminated sediments; and (D) the stomach contents of a ling cod taken from the Bight's sludge disposal area. Contents include cigarette filters, bandaids and worms. The quarter, not taken from the stomach, serves to indicate size.

Photographs are courtesy of the Marine Ecosystems Analysis Program.

Fishing along the Salmon River is seen at its peak in 1975 and during the ban of 1976. The big question after 1978 is: "Is there a future for salmon in the Salmon River?"

New York State Salmon Capital Revisited

by Robert B. Buerger, Specialist, Oswego

In the eastern Lake Ontario village of Pulaski, the first cool days of autumn mean one thing—salmon. But to Pulaski residents, salmon have been both friend and foe.

Since 1968 the Salmon River, which flows through Pulaski in the town of Richland in Oswego county, has been the center of the Lake Ontario salmonid stocking program. 1973–1975 were the good years when anglers flocked to Pulaski in pursuit of trophy coho and chinook salmon. 1976–1977 were the bad years when the State Departments of Health and Environmental Conservation (DEC) banned the consumption and possession of coho and chinook salmon. Now three years later, the ban has been lifted and Pulaski residents are hoping for a good 1978 fishing season. But what happens after 1978, nobody knows.

Effect On The Economy

In 1968 DEC began stocking Lake Ontario with salmon and trout in an effort to replace the depleted lake trout and Atlantic salmon fishery and to create a successful New York sports fishery similar to those in Michigan and other Great Lakes states. The Salmon River was selected, but initial efforts were hindered due to the sea lamprey, a fish parasite, in Lake Ontario. Through international cooperation with Canada, successful chemical treatment of lamprey spawning grounds was undertaken, making way for the first major salmon run up the river in 1973.

Within weeks, word of the run spread quickly, spurring over 5000 angler trips to the Salmon River-Pulaski area. But what anglers found when they reached Pulaski were inadequate boating facilities, fishing access, parking areas, lodging, and eating places. Through the efforts of local community groups with assistance from Sea Grant, Cooperative Extension, DEC, and other agencies many of these problems were solved by 1975.

Fishing impact continued to grow through 1975, bringing Pulaski the title "New York State Salmon Capital". Data for the period of 1973–1975 collected by Sea Grant researcher Tommy C. Brown from Cornell University document this increase in the number of angler trips made and the amount of money spent in the Salmon River area. To the Pulaski economy, salmon was gold.

DEC drastically cut back its salmon stocking except for a small monitoring program. Since most salmon return to streams to spawn after two or three years, this means the last major salmon run will be in 1978. Stocking of brown, lake and rainbow trout has continued, however.

The 1976 ban had an immediate devastating effect on the Pulaski local economy. Angler trips decreased by 70 percent. The loss in nonresident expenditures was about $300,000. In 1977, angler trips came to about 50 percent of the 1975 level. But the outlook for the local economy was still gloomy. The Pulaski Chamber of Commerce made plans to drop the "New York State Salmon Capital" slogan. Some Pulaski business owners said," . . . if they don't lift the ban, I'm out of business," and "We're going to try and stick it out until September, but we're seriously considering closing up now."

	1973	1974	1975
Total Angler Trips	5,665	16,428	22,637
Total Expenditures	$61,995	$182,708	$443,984

In 1976 anglers and Pulaski residents anticipated another big salmon run, but on September 14, the Commissioners of the State Departments of Health and Environmental Conservation issued a joint statement on Lake Ontario fish. Based on high levels of mirex and PCB found in Lake Ontario, the Commissioners banned the consumption and possession of certain lake fish including coho and chinook salmon. In addition,

On March 31, 1978 the ban was lifted. Anglers have caught the first 1978 salmon and with cooler weather coming, larger numbers of salmon and anglers cannot be far behind.

But this much is certain, 1978 will be Pulaski's last major salmon run until stocking is resumed. After that, nobody knows.

WINTER RECREATION

Lake Erie's Wintry Wonderland

by Jean L. Kinnear, Intern, Fredonia and Richard De Anglio, National Oceanographic Data Center

Editor's Note: The following article is excerpted from a brochure entitled "Lake Erie's Recreation Climate – Year Round". The brochure describes Lake Erie's climate and gives recreationists advice on how to respond to weather conditions as illustrated at the end of this selection. See I WANT MORE.

Scenes from "Lake Erie's Recreation Climate – Year Round," a brochure made possible by funding from the National Oceanic and Atmospheric Administration.

From bustling metropolitan Buffalo to the quiet, uncrowded grape farm country in the southwest, New York State's Lake Erie offers a year-round diversity in climate and things to do.

Ice skating is an early winter activity as ice begins to form in shallow waters during November. The lake itself does not usually begin to freeze until late January, with the Buffalo-Silver Creek area the first to freeze completely by early February. Two weeks later ice is everywhere.

Weather permitting, the lake hosts a variety of recreational activities. **Ice boating** takes advantage of the frequent seven to 16-knot winds that blow 75 percent of the time on February and March afternoons. Both the Buffalo Yacht Club and the Buffalo Canoe Club have cold water sailors in their ranks. Some hardy scuba divers go **ice diving.**

Ice fishing is also popular on the lake. Rainbow and brown trout, smelt, and perch have been taken through the ice at the Small Boat Basin in Buffalo. The lake also has **open water fishing** at Dunkirk Harbor where power plant effluent warms the water.

Snowshoeing, cross-country skiing, and **snowmobiling** are popular winter activities in the parks and on unplowed roads along the lake shore. Seasonal snowfall ranges from 45 inches at Dunkirk to 88 inches a few miles inland at Buffalo International Airport. About 25 miles farther inland, it increases to more than 100 inches. Good downhill skiing areas and winter recreation sites are located here. In December and January, an inch or more fresh snow is likely four to seven days a month on a base of six inches or more. Temperatures range from 15° to 32°F, and wind speeds average 10 knots or less. In Buffalo these conditions are present about 12 to 37 days a year, while some years, conditions are poor.

When everyone is tired of being indoors, the area erupts with **winter festivals** including ice skating, ski touring, snowmobiling, and even snowmobile jumping, snow sculpture, figure and dance skating competitions.

But there are also periods in the winter when heavy snow and strong winds curtail activities along the lake. At Buffalo, winds can reach 80 knots and more than 24 inches of snow can fall in a single 24-hour period. Blizzards are the most dramatic of all winter storms.

If you ever get trapped in a blizzard, avoid overexposure and exertion. Walking is dangerous because you can quickly become disoriented in blowing and drifting snow. If you are in a car, stay in the car. Keep fresh air available as blowing snow can seal the passenger compartment. Run the engine and heater sparingly – about five minutes per hour – with the downwind window open for ventilation. Exercise by clapping hands and moving arms and legs vigorously from time to time. Keep the dome light on at night so you can be spotted and be on the lookout for help.

The Five Who Came in From the Cold

by Leslie Ware, Intern, Fredonia

It was one of those displays of winter fury that Lake Erie likes to put on once a year. The temperature on that day last January dropped 28° in four hours, and a wind of 50 knots whipped the falling snow.

In the midst of the storm, a youth and four would-be rescuers were stranded off Dunkirk Harbor in boats locked into massive ice floes.

Imagine yourself among them. Would you have known how the cold might affect you and how to keep warm?

As it is, the thought of what happens to the human body — if **not** kept warm — is enough to keep even the most hardy soul in longjohns, layered clothing, down jacket and zipped-up foul weather gear.

Continued on next page

Cold Weather Dangers

Frostbite can occur when the skin temperature drops below 50°F. Should symptoms of frostbite such as white patches of skin appear, place the frostbitten area next to a warm part of your body, or dip it in water warmed to body temperature (90–100°F.). Exercise will help restore circulation, but be sure not to rub the affected part.

Snowblindness is caused by overexposure to bright and reflected light (ice boaters and anglers take note). The symptoms – a feeling of grit in the eyes, watering, redness and headaches – often don't appear until a while after exposure. They will usually disappear within a few days, but cold compresses and eye bandages may help. Again, don't rub.

When it comes to cold water, exposure is especially jarring.

Cold stress is the term used to describe the tensing of the body against cold water. The extremities become numb, and muscle strength decreases. Studies have shown that as little as one minute of exposure in 50° water leads to a 50 percent decrease in grip strength.

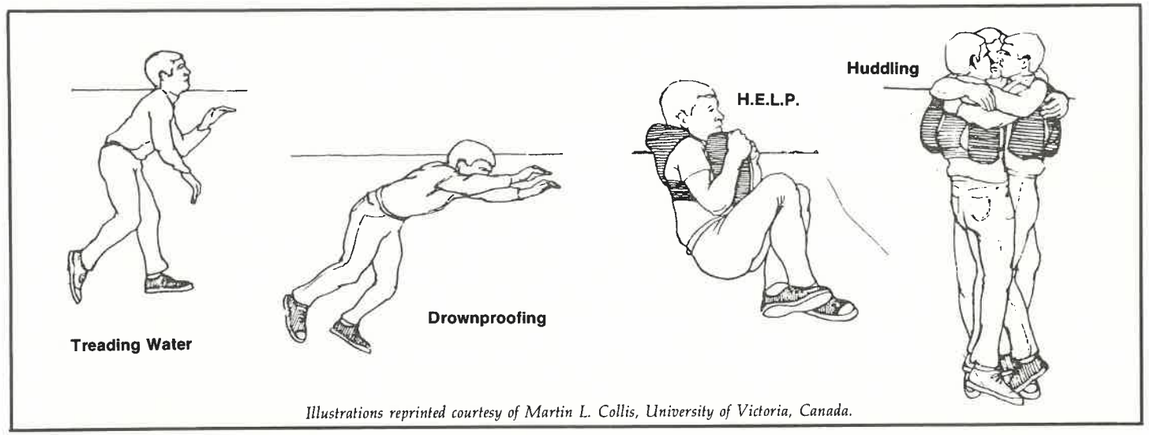
Cold water shock describes the immediate changes in body functions when someone is suddenly immersed in cold water. Occasionally, such immersion can lead to a heart attack because heart rate and blood pressure rise sharply. In any case, cold water shock involves immediate hyperventilation (breathing too fast), which can lead to inhalation of water.

Hypothermia occurs when the temperature of the body core is lowered by a dunking in cold water. The skin and nearby tissues cool very rapidly although it takes 10-15 minutes for the temperature of the heart and brain to decrease. Symptoms are fatigue, poor articulation, bluish skin and intense shivering. The latter occurs to counteract heat loss.

In a case of mild hypothermia, the victim may only need shelter and dry clothes. A hot, sugary drink may help but should only be given if the person can swallow without difficulty. **Don't** give the victim alcohol.

For more severe hypothermia, carry the victim to shelter and warmth. Gently remove all wet clothing and apply heat to the victim's trunk via a warm bath, shower, hot water bottles or heated blankets. Never put an unconscious victim in a bathtub, though.

If the victim seems to be dead, don't give up. Victims who have "drowned" in very cold water for much longer than the 7-minute limit — which is usually associated with brain death — have been revived through heart massage and mouth-to-mouth resuscitation.



Illustrations reprinted courtesy of Martin L. Collis, University of Victoria, Canada.

Keeping Out The Cold

So how can you keep your body from getting into such predicaments? If you're planning on being outside — but away from water, wear several layers of clothing, since warmth is usually proportionate to the number of layers. A down jacket, hat, gloves and long underwear or wool pants should be a part of the winter recreationist's wardrobe.

If you're iceboating or fishing, but may end up in the water by mistake, wearing a full foul weather suit (overalls and jacket) or wetsuit and a thermal life preserver is a good idea. If you opt for the wetsuit, wear pants over it so you can slide around.

Once in cold water, there are several methods for prolonging survival time — which is about 2½ – 3 hours in water of 50°F.

If you're near shore, you may want to swim, but don't chance it unless you're **certain** of reaching land. Some swimmers can go eight-tenths of a mile in 50° water; others can't swim 100 yards, and the average person swimming with a life jacket on cools 35 percent faster than when holding still.

If you don't have a life preserver, **treading water** (moving arms and legs continuously to keep the head out of the water) or **drownproofing** (floating face-down and raising the head to breathe every 10-15 seconds) may be used as anti-drowning techniques. Drownproofing is less effective than treading water, and both are less effective in cold water than almost anything you can do with a life jacket on, especially one with thermal protection.

With a life jacket, you can increase survival time approximately 50 percent by using the **H.E.L.P.** (Heat Escape Lessening Posture) or huddle techniques. H.E.L.P. involves holding bent arms tight at the sides of the chest — a major area for heat loss, bending the legs and raising thighs up in a fetal position. If you have companions in the water, **huddling** with them in a circle can maintain warmth. Each person should put his or her arms around the next two companions.

There's no sense in hibernating this winter, but it pays to know when to come in from the cold.

By the way, the ending to our stormy story was a happy one. One of the rescuers was up on winter survival, and despite an entire day and half the night out in the freezing weather, all those stranded were rescued alive. See I WANT MORE.

RESEARCH

Editor's Note: This issue of Coastlines introduces a new feature column entitled "Research" which explains results from work carried out by New York Sea Grant researchers. Previously not covered in Coastlines, articles on research of interest to Coastlines' readers will be published when available in popularized style. This issue features Sea Grant researcher Paul Man-Tong Yu from State University of New York at Buffalo.

Niagara River Ice Boom Causes Concern in State

by Nancy Arcarola and Shawn Pauly, Rensselaer Polytechnic Institute, Troy

A few years ago, the Power Authority of the State of New York (PASNY) and the Hydroelectric Power Commission of Ontario jointly installed an ice boom between Lake Erie and the Niagara River. The boom — a barrier designed to restrain ice in Lake Erie — restricts the flow of ice through the Niagara River to Lake Ontario. Each spring the boom is removed, thus allowing ice to flow down the Niagara River.

Since its initial use, the presence of the boom and its time of removal have been a source of controversy among a number of concerned groups.

Advocates

Many property owners along Lake Erie favor the ice boom because it keeps the ice in the Lake as long as possible, hopefully reducing shore erosion from wave action. The ice boom also helps coastal property owners by preventing massive ice jams along the Niagara River.

PASNY is another advocate of the boom since ice damages the water intake equipment for the generation of electric power on the Niagara River. The Power Authority is allowed to divert 50,000 more cubic feet of water from the Niagara during the winter months than during other seasons. According to PASNY, if it weren't for the boom, ice congestion would lower the water level, prevent sufficient water intake at the stations and cause power losses.

Opponents

Among those opposed to the ice boom are some farmers and fishermen. Farmers are particularly concerned with the time of the boom's removal. They fear that keeping the ice in Lake Erie prolongs the cold season, giving them less time to grow their crops and increasing the possibility of frost damage to buds.

Since installment of the boom on Lake Erie opposite Buffalo Harbor, the International Niagara Board of Control has been responsible for deciding when to put in and take out the boom. This Board gets its authority from the International Joint Commission composed of both American and Canadian officials. Photo is courtesy of the Power Authority of the State of New York.

Commercial fishermen don't want ice in the Lake during the winter because that's when they can fish closer to shore where catches are often better. They feel that the presence of a large ice mass, such as that caused by the boom, interferes with offshore fishing.

Effects of the Boom

PASNY has commissioned a number of studies to determine the actual effects of the ice boom. In addition, one Sea Grant study, conducted in 1977 by civil engineer Paul Man-Tong Yu, is of special interest to farmers and property owners along the Niagara River. This study determined that most of the ice melts in the Lake with or without the boom because there simply is too much ice to be transported out through the narrow river. Removing the ice boom — when the total ice area is greater than 116 square miles, as it often is — apparently does not prolong the cold season.

What implication does this research have for farmers, property owners and commercial fishermen? For farmers, it means that the growing season may not be affected as believed. For property owners, damage caused by ice runs is actually held to a minimum because the ice is kept out of the river until the end of the season and disposed of all at once. For commercial fishermen, the study shows that the ice boom should not increase the amount of ice in the Lake. That is, the removal of the ice boom would probably not allow fishermen to get any closer to shore.

In the final analysis, Man-Tong Yu's study supports the practice of removing the ice boom near the end of the ice season.

* * * *

Some farmers and local residents believe the boom has caused lower spring temperatures — which they feel increase fuel bills and delay planting time by about four days. A study by the Army Corps of Engineers provides some contrary evidence. Undertaken in 1977, this study compares springtime temperatures for Buffalo during the pre-boom and post-boom years with those of Rochester, Toledo and Cleveland which have no boom. According to the Corps' findings, temperatures for the post-boom years are colder for each of these cities — not just Buffalo.

UPDATE

For marine educators who want **MORE,** two films are available.

Based on the experience of Nassau and Suffolk counties, **Water - Critical Choices** explains how a Long Island community conducted a waste water management study. Nitrogen, coliform bacteria and micropollutants—the three major contaminants—are explained in terms of their source and impact on water quality. The film also examines the 1972 Water Pollution Control Act and the Act's "208" section on "Areawide Wastewater Management." Unique with this film are a leader's handbook of questions and answers, and a picture pamphlet highlighting topics in the film. The 16mm, 21-minute color film may be borrowed for $50.00 for the general public and $10.00 for Cooperative Extension from the Film Library, Judd Falls Road, Cornell University, Ithace, NY 14853. Specify first-and-second-choice viewing dates. The library will bill you after the film is returned.

Man in Cold Water, a 30-minute, 16mm color film describes the effects on humans of immersion in cold ocean water under conditions similar to those experienced following boating accidents. Based on research by scientists at the University of Victoria in Canada, this film can be rented or purchased from: Media and Technical Services, University of Victoria, Victoria, B.C., Canada.

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At last spring's Rochester - Lake Ontario Trout and Salmon Derby, anglers spent about $480,000 on bait, tackle and food in Monroe, Wayne and Orleans Counties. About $130,-000 of this money can be called "tourist dollars" - that is, money spent by people from outside the tri-county area.

These and other findings about the April 1978 derby are cited in the **1978 Rochester - Lake Ontario Trout and Salmon Derby Angler Survey.** The survey is available to Coastlines readers by writing to Mick Voiland at our Sea Grant Brockport office.

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A new **depository for New York Sea Grant publications** has been established. This collection of publications starting from January 1978 is intended for public use. Anyone wishing to borrow from the depository should write to: Sea Grant Depository, Documents Department, Penfield Library, SUNY/Oswego, Oswego, NY 13126; Attention: Blanche Judd.

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I WANT MORE

Additional information is available from New York Sea Grant. Please check the publications which interest you and send to your nearest Sea Grant Extension office.

Single copies of the following publications are free:

_____ **The Revitalization of Fulton Ferry: A Prototype for Waterfront Redevelopment in New York City,** New York Sea Grant Thesis Abstract, D. Hoffman, 1978, 1 p.

_____ **New Hope for Cold-Water Drowning Victims,** J. C. Elliott, 1978, 2 pp.

For the following publications, make checks payable to Cornell University:

_____ **Scuba Air Stations and Hyperbaric Chambers,** E. Matthews, 1978, 20 pp., 60 cents.

_____ **Lake Erie's Recreational Climate - Year Round,** Kinnear and DeAnglio, 1979, 75 cents. (This publication will be sent upon availability in spring 1979).

For the following publications, make checks payable to Research Foundation of SUNY:

_____ **Production of Edible Food from Surf Clam Wastes,** Zall and Cho, 1974, 4 pp., $1.00.

_____ **A Note on Learning-by-Doing and Willingness-to-Travel,** Munley and Smith, 1978, 10 pp., $1.00.

_____ **Sand and Gravel in the Greater New York Metropolitan Area: What Kind and How Much?** Carlisle and Wallace, 1978, 67 pp., $1.50.

_____ **Finite Element Modeling of Nearshore Currents,** L-F Liu and G. P. Lennon, 1978, 14 pp., $1.00.

_____ **A Coccidial Pathogen of Mariculture-Reared Green Sea Turtles,** Leibovitz, Rebell and Boucher, 1978, 7 pp., $1.00.

_____ **Bottom Frictional Stresses and Longshore Currents Due to Waves with Large Angles of Incidence,** L-F Liu and R. Dalrymple, 1978, 19 pp., $1.50.

Pregnant Scuba Divers May Endanger Unborn Children

Editor's Note: In July, the National Oceanic and Atmospheric Administration announced new research findings regarding possible danger to unborn children in pregnant scuba divers. Because of the increasing popularity of scuba diving as a year-round sport on the Great Lakes and marine coasts, Coastlines is featuring the original NOAA news release.

Pregnant women who scuba dive deeper than 60 feet may run a risk of harming their unborn children, perhaps fatally, research carried out under a National Oceanic and Atmospheric Administration (NOAA) Sea Grant at Texas A&M University reveals.

Tests on sheep in a pressure chamber indicated it probably is safe for pregnant women to make shallow dives, but researchers found that even a standard, no-decompression dive to 100 feet presents risks to the unborn infant.

Tests in the hyperbaric chamber equal to a dive of 100 feet for 25 minutes, which under U.S. Navy standards would not require recompression for a diver, caused serious, but treatable, illness to the sheep fetus.

The findings raise questions about scuba diving by women who may not know that they are pregnant, or by women who are pregnant but believe they are not advanced enough to curtail such activities, according to physiologist William Fife who supervised the project. Other researchers in the Commerce Department-sponsored project were graduate student Clifford Simmang and veterinary physiologist Jo Kitzman.

In the tests, devices were surgically implanted around umbilical arteries of pregnant sheep to let fetal blood flow be monitored for nitrogen bubbles. After the test dives, the animals were recompressed in the hyperbaric chamber and allowed a slower ascent, thus providing treatment for the decompression illness (bends) in the fetus.

The fetuses of the sheep showed a much higher susceptibility to decompression illness than did the mothers, the researchers said.

In tests equal to 100 feet for 25 minutes, they explained, bubbles in the fetal circulation were so massive that the fetuses probably would have died had they not been treated promptly.

Simmang said sheep and goats tend to be more resistant to bends than do humans.

From the observations, he explained, it is believed pregnant women may safely make shallow, short dives. However, he said, women should be cautious "because at some depth between 60 and 100 feet, a dive normally considered safe may be lethal to the fetus." See I WANT MORE.

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