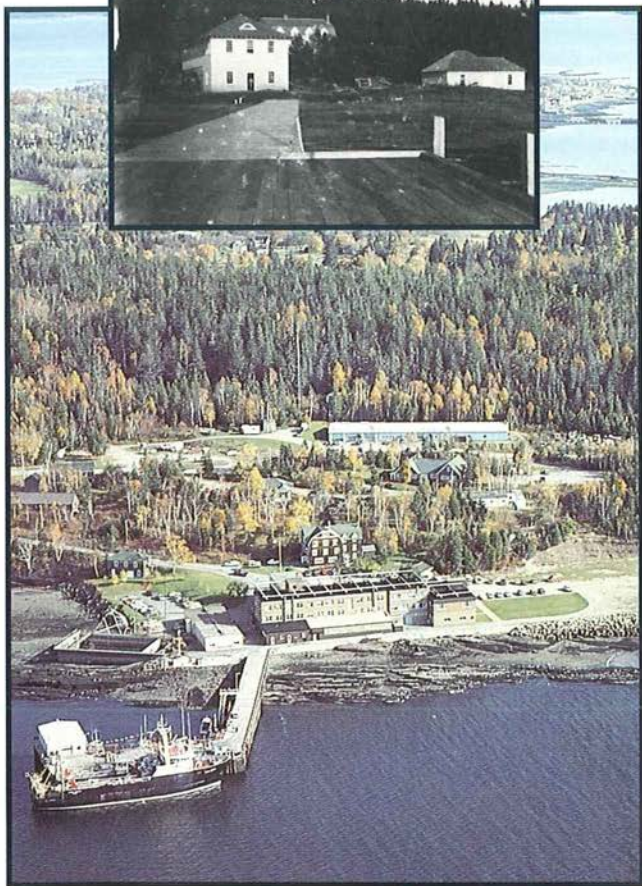




# ST. ANDREWS BIOLOGICAL STATION



Fisheries  
and Oceans

Pêches  
et Océans

Canada

**I**n 1898 Canada's first fisheries research laboratory was set up in Passamaquoddy Bay—on a floating scow that resembled a pullman car! Since that simple beginning, the St. Andrews Biological Station has researched the rich waters of the Maritimes with increasing sophistication. But more than that, it has become a leading centre for research on: aquaculture; marine fish and invertebrate assessments and biology; and marine pollution.

A permanent land base was established in 1908, in the resort town of St. Andrews, New Brunswick, where the scenic landscape slopes to the sea at Brandy Cove near the mouth of the St. Croix River. Some of the original buildings are still in use on the hillside of the 23-acre site, but now they face out towards a sprawling facility equipped with laboratories, solar panels on the roof, and a jetty for research vessels.

Marine scientists at St. Andrews have established a national and international scientific reputation for the Biological Station, one of a network of 12 major research facilities in Canada operated by the Department of Fisheries and Oceans (DFO). The St. Andrews Biological Station, along with the Bedford Institute of Oceanography, the Halifax Fisheries Research Laboratory and several Fish Culture Stations, are components of the science sector in the DFO Scotia-Fundy Region. The St. Andrews scientists study the fisheries resources in support of the Department's national goals of fish conservation, protection and management. They also study fish under experimental conditions to obtain long-term knowledge of the biology of different commercial species. In support of aquaculture, scientists conduct research on how fish can be



domesticated and assist farmers in coping with practical problems, especially on how to improve the culture of fish. They also study and identify marine phytotoxins and environmental hazards that might affect fish, and develop solutions to these problems.

Annual survey cruises on DFO research ships are made from St. Andrews to the Scotian Shelf, Georges Bank and the Bay of Fundy to sample fish stocks. The scientific information is used to develop fishing quotas referred to as the total allowable catch or TAC of the various commercial fish stocks. The assessment of marine fish stocks in the Bay of Fundy and Gulf of Maine area is carried out by scientists at the Biological Station in conjunction with DFO scientists at the Bedford Institute of Oceanography in Dartmouth, Nova Scotia.

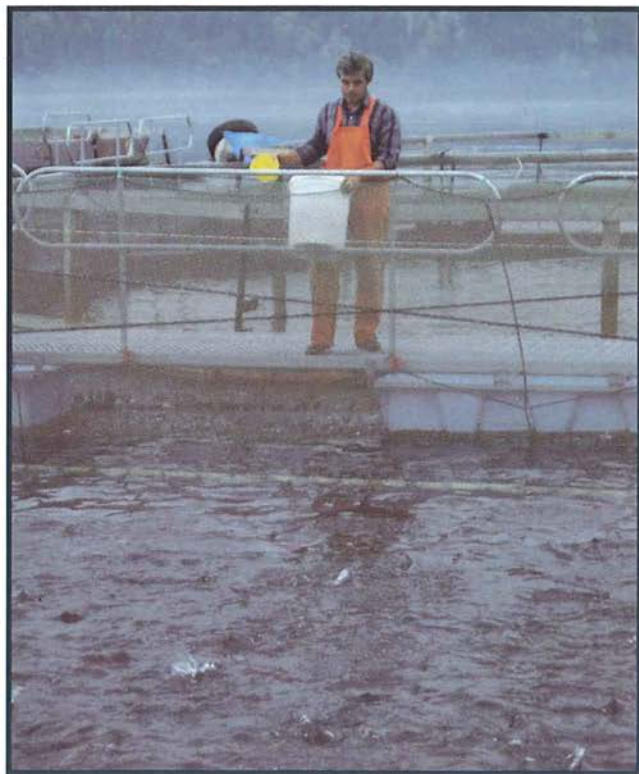
Regular and special cruises bring in biological, ecological, physiological and oceanographic information to establish the numbers of fish and the age composition of the stocks, their general health, the availability of





food, fish distribution and migration habits and other data useful for fish management. A major task is to develop improved techniques to assess the effects of environment on the stocks. For example, scientists want to know how water temperature and salinity affect fish migration habits and to determine the relationship between certain water conditions and where fish congregate.

The abundance of fish larvae is an indicator of the future state of certain stocks. Scientists are trying to determine the relationship between early life stages of marine fish and commercial fish abundance. There are also studies to see if the same species of fish vary from place to place (for example, haddock are larger on Georges than on Browns Bank) and whether the reasons are genetic or environmental; also to find out to what degree marine fish from widely separate stocks intermingle, if at all. One of the main species of fish in the Bay of Fundy is herring and special methods are used to track their migration, for example, acoustic devices are used to detect and estimate the size of schools.



Scientists who specialize in invertebrate fisheries conduct biological, culture and assessment studies on commercially important Bay of Fundy invertebrates such as lobster, scallop and soft shell clam. Some effort is devoted to studying underutilized commercial species such as sea urchins, crabs and periwinkle, which are objects of small but growing fisheries. They investigate the development of rearing systems as well as conducting field and laboratory studies on the growth, reproduction, general biology, distribution and ecology of the various commercial species. Much of the invertebrate research conducted at St. Andrews can be utilized in the management of commercial fisheries as well as in the development of an aquaculture industry.

Station scientists played an important role in establishing the salmonid aquaculture industry in the southern Bay of Fundy, and their research programs have continued to evolve in response to problems identified by those who are producing salmon and trout commercially in the Bay of Fundy. Research on salmon



biology is conducted at the Biological Station while salmon broodstock development and genetic studies are done through the Salmon Genetics Research Program, a joint research effort sponsored by the Biological Station and the Atlantic Salmon Federation, a private conservation and research group, at their research facilities near St. Andrews.

The Biological Station also established the Salmonid Demonstration Development Farm some 40 kilometres away at Lime Kiln Bay. By running full scale commercial trials, this experimental farm has been successful in developing, demonstrating and transferring scientific knowledge — especially about the growth, survival, nutrition, husbandry and broodstock development of salmon grown in the sea cages — to salmon farmers.

The rapid expansion of salmon farming has caused some concern about the impact of aquaculture on the environment and on existing traditional fishing activity. A research program at the Biological Station is devoted to identifying potential environmental problems related to salmon aquaculture in the marine environment and developing ways to deal with them.

In addition to research on salmon culture, scientific programs are underway at the Biological Station to develop aquaculture methods especially for the culture of marine finfish species such as halibut, striped bass and other species that may, in the future, contribute to a broad-based Atlantic aquaculture industry.

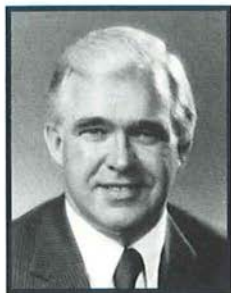
Marine chemists and biologists at St. Andrews identify hazards and estimate risks of organic chemicals, both for the short and long-term health of fish. These scientists measure pesticides and other toxic substances including natural toxins in fish and shellfish, sediment, and industrial effluents, and any other sources that might adversely affect fish. The group is also developing biochemical tests to determine how toxic chemicals affect fish health and to serve as an early warning of impending environmental contaminant problems. A current area of focus is on the assessment of chemicals used in the aquaculture industry.

Ecologists from St. Andrews have carried out a comprehensive research program since 1981 to determine the damage done to lakes and rivers of the Maritimes by acid rain. They have determined some of the biological effects of acidification on various fish species, especially salmon, which have steadily declined from some western Nova Scotia river systems. Studies continue on how acid rain affects the aquatic ecology of salmon streams, what effect acidity has at different stages of the fish's growth, and other aspects in order to evaluate the extent of the problem. The feasibility of liming water to neutralize the acid and create spawning beds is also being investigated.



The research findings of Station scientists, which are published in various scientific journals and reports, also support the needs of such national and international groups as the Canada Atlantic Fisheries Scientific Advisory Committee (CAFSAC), the Atlantic Herring Management Committee, the Northwest Atlantic Fisheries Organization (NAFO) and the International Commission for the Conservation of Atlantic Tunas (ICCAT). Scientific staff also provide advice on fisheries, aquaculture and the marine environment to the International Council for the Exploration of the Sea (ICES). In addition, Station scientists are directly involved in the World Aquaculture Society and the Canadian Aquaculture Association.

The Station functions in close collaboration with provincial governments, universities, and the private sector. It is a founding member of the Huntsman Marine Science Centre (HMSC) located adjacent to the Biological Station. The HMSC is a non-profit, multi-university education and research centre for marine science and accommodates increasing numbers of visiting students and professors. The St. Andrews Aquarium Museum is a cooperative project of the HMSC and the Biological Station and is open to the public during the summer.



A handwritten signature in black ink that reads "Tom Siddon". The signature is fluid and cursive, with the first name being particularly prominent.

**Tom Siddon**  
**Minister**  
**Fisheries and Oceans**

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