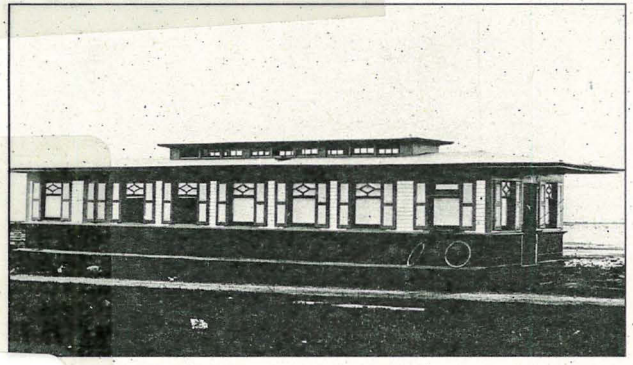
100 Years of Marine Research in St. Andrews



1899

1999

Canada

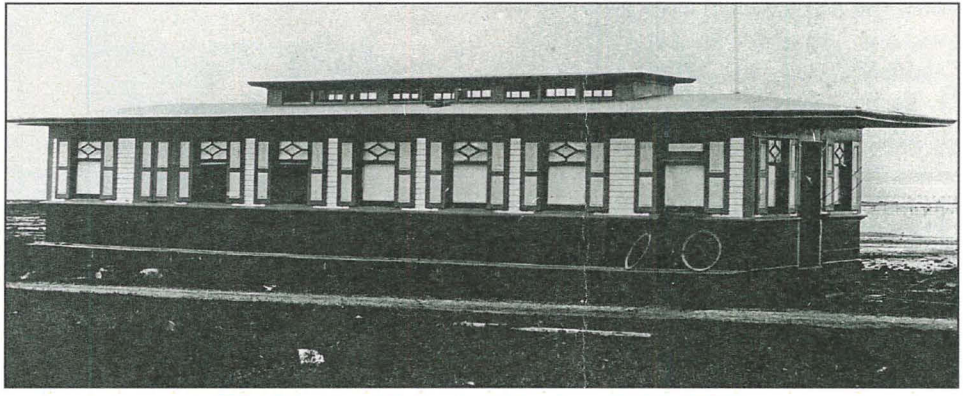
Canada's First Marine Biological Station, 1899-1907

The 19th century was an age of discovery and adventure for those with a passion for the sea. It was also the century when the world's first marine biological stations were established. Canada, although a fledgling nation, was a maritime country with a vast coastline and abundant fisheries to promote and protect. Early researchers were hampered by the lack of a laboratory located on the coast.

Canada's first marine biological station began operations in 1899, largely as a result of the efforts of E.E. Prince, the Commissioner of Fisheries for Canada, along with valuable support from the Royal Society of Canada and the British Association for the Advancement of Science.

Prince described the Marine Biological Station as:

"... a neat one-story structure of wood, well lighted from the roof and sides, and somewhat resembling a Pullman car... Its total length is 50 feet, the principal room, or main laboratory, occupying the central part of the structure..."



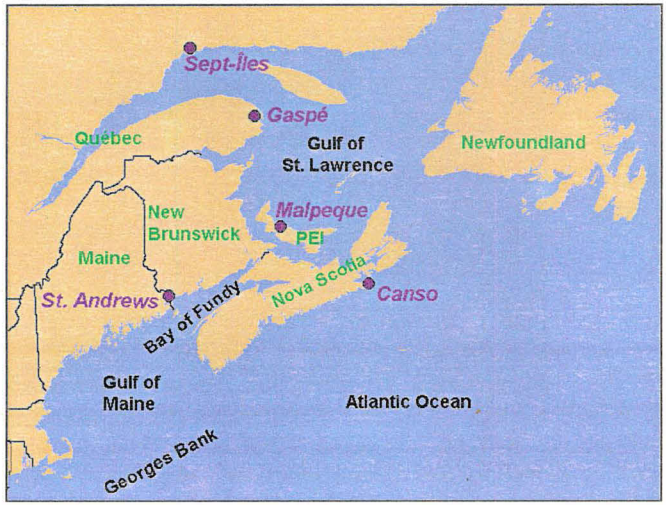
The Marine Biological Station (1899-1907)

The station was designed to be portable. It operated at St. Andrews, New Brunswick during the summers of 1899 and 1900. In 1901 it was placed on a scow and moved to Canso, Nova Scotia, where it operated for the next two years. It was subsequently moved to Malpeque, Prince Edward Island for 1903-1904 and Gaspé, Québec for 1905-1906. The laboratory was damaged while being towed to Sept-Îles in 1907 and abandoned. A scientific program was operated from temporary facilities in Sept-Îles during 1907.

The Marine Biological Station was a government owned and operated facility, but was primarily for the use of university researchers.

The "Board of Management of the Marine Biological Station" which was established to oversee the operations of the station, included some of Canada's most distinguished scientists of the time:

- E.E. Prince, Director (Canadian Department of Marine and Fisheries)
- D.P. Penhallow, secretary-treasurer (McGill University)
- R. R. Wright (University of Toronto)
- L.W. Bailey (University of New Brunswick)
- A.P. Knight (Queen's University)
- A.B. Macallum (University of Toronto)
- V.-A. Huard (Université Laval)



- A.H. MacKay (Dalhousie University)
- E.W. MacBride (McGill University)

The research done at the portable station included:

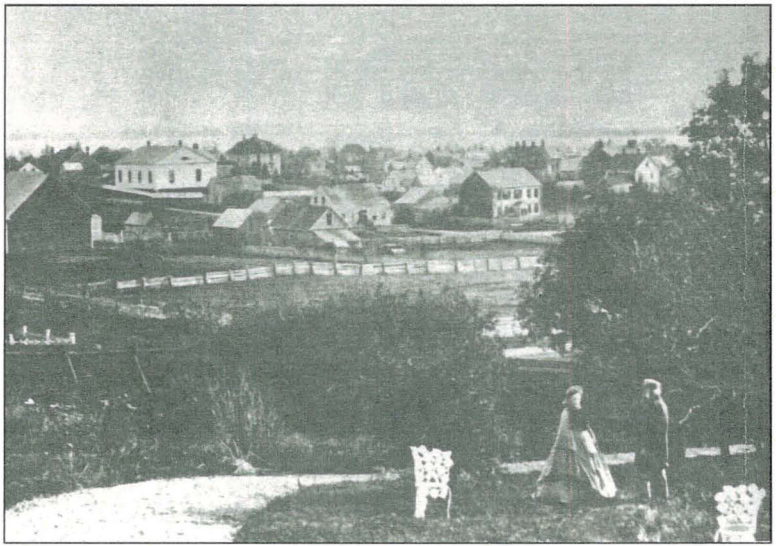
- surveys of local marine fishes, invertebrates, and plants;
- the food of commercial fishes;
- the fisheries and life histories of herring, lobsters, oysters, and clams;
- the physiology of marine animals;
- the effects of polluted waters on fish;
- the chemistry of animals and seawater.

To publish the research findings, Prince initiated a scientific journal *Contributions to Canadian Biology*. This series developed into one of the most respected journals for fisheries and aquatic sciences in the world. It has evolved through several name changes, including the *Journal of the Biological Board of Canada*, the *Journal of the Fisheries Research Board of Canada*, and, since 1980, the *Canadian Journal of Fisheries and Aquatic Sciences*.

A Permanent Atlantic Biological Station: *Why St. Andrews?*

The excellent results obtained by researchers working at the portable station demonstrated the need for a permanent marine laboratory. The Board of Management of the Marine Biological Station examined a number of locations in the Maritimes, finally choosing St. Andrews. D.P. Penhallow, the permanent station's first Director, noted that St. Andrews:

"... is convenient of access to Montreal, St. John, and other centres whence supplies could be drawn without reasonable delay, and in itself it possesses sufficient resources to meet all ordinary demands. Moreover, it is one of the real fishing centres of eastern Canada. The large number of clams, herring and other fish annually taken in Passamaquoddy Bay and adjacent regions make it the immediate centre of a large live fish industry as important as that of any other town on the coast. The great expanse of sheltered waters embraced in Passamaquoddy Bay and the St. Croix river; the great variety of depths to be met with there; the presence of large numbers of fish weirs from which material may be readily obtained, and the exceptionally rich feeding grounds about Grand Manan and Campobello, combine to make it an ideal place for the establishment of a station engaged in solving problems associated with the fishing industry..."



St. Andrews, circa 1900

At the time, there was a direct railway line between Montreal and St. Andrews. Another factor was that 1.4 hectares (3.5 acres) of land at the Brandy Cove site were made available by the Canadian Pacific Railway at a cost of only $250.

The St. Andrews Biological Station, 1908 to 1999

The St. Andrews Biological Station (originally called the Atlantic Biological Station) opened in the spring of 1908. Penhallow described the facilities in his annual report for 1908:

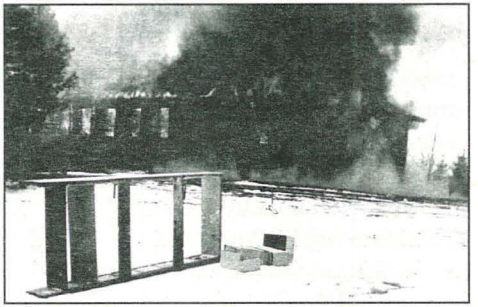
"... a laboratory building 79 x 31 feet; capable of accommodating nine junior and three senior investigators, together with necessary store rooms; a dwelling house ... ; and an aquarium in which should be kept for scientific and other purposes, such forms of marine life as would be brought back from the various expeditions in which the staff would engage."

The Biological Station in 1909

There was also a wharf and two small boats.

In the early years, the station was only used during the summer field season, generally from May to September. It was not until 1928 that year-round scientific research was conducted at the station.

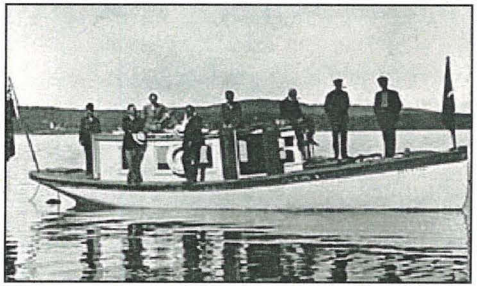
In 1932, a fire destroyed the Biological Station's main laboratory building, including the library. Because funding to reconstruct the laboratory would have been almost impossible to obtain during the Depression, the Director, A.G. Huntsman, obtained funds for reconstruction by redirecting funds normally used for research and reducing the salaries of the staff, and a new laboratory was in operation the following year.



The fire of 1932

In 1959, a major expansion more than doubled the size of the main laboratory building. Since then, various additions and renovations have been carried out to the main building. Some aquatic laboratory buildings have been added, primarily to help in the growing aquaculture research sector. The campus now covers 9.3 hectares. One of the original buildings remains from 1908, the former Residence Building, although it is now used for offices.

Science at the St. Andrews Biological Station



The Sea Gull (1908-1915)

From the beginning, emphasis has been on the conduct of applied research for the benefit of Canadian fisheries. While based in St. Andrews, Biological Station scientists have conducted research throughout Atlantic Canada and beyond, concentrating on the area from Georges Bank to the Gulf of St. Lawrence.

A major early effort was the Canadian Fisheries Expedition of 1914-1915, under the leadership of the Norwegian scientist J. Hjort, which mapped herring stocks, made oceanographic observations, and collected plankton from the Gulf of St. Lawrence and the outer coast of Nova Scotia.

Initially, the researchers at the station were professors and students from eastern Canadian universities. A.G. Huntsman, of the University of Toronto, became the Biological Station's first scientific staff member in 1916. By 1934, university volunteers were phased out, resulting in a large reduction (but not elimination) of the number of university scientists conducting research at the Biological Station. Since then, scientists employed by the federal government have been responsible for conducting research at the Biological Station.

Many years later, the Biological Station - in particular its Director, J.M. Anderson - together with a consortium of eastern Canadian universities, was instrumental in the formation of the Huntsman Marine Science Centre, named in honor of the Station's former Director, A.G. Huntsman. The centre was opened in 1970 at a site adjacent to the Biological Station. It was formed primarily to provide access to a marine environment for university scientists and students, and to encourage cooperation between government and university researchers.

A Biological Station laboratory, 1927

Fisheries Research

Research in support of the commercial fisheries has been the main emphasis over the years. This includes research on the life history of commercial species, their food, population biology, ecology, and fisheries management. Over the years, Biological Station scientists have worked on groundfish (especially cod and haddock), herring, tuna, swordfish, salmon, lobsters, crabs, oysters, scallops, clams, sea urchins, and several other commercial species. Harvest fisheries research typically focusses on stocks in the Gulf of Maine and Bay of Fundy area. Thus, several important transboundary stocks are part of the Biological Station's mandate. This has led to long-standing collaborations with USA counterparts in state and federal agencies.

Fishing a herring weir

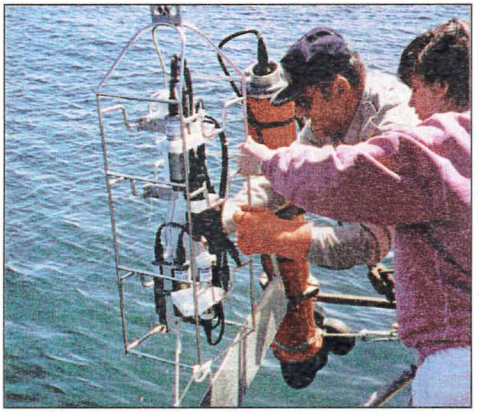
Chemical analyses

Environmental Research

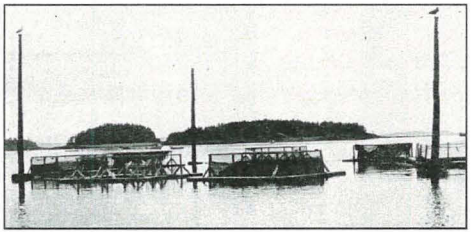
Environmental research began at the portable laboratory, when studies were conducted on the effects of sawdust, pulp-mill wastewater, and other effluents on fishes. Since then, research has been conducted on Atlantic Canadian problems such as oil pollution, dredge spoil disposal, tidal barrages, pesticides, acid rain, and the interactions between aquaculture and the environment. Research on toxic phytoplankton has been conducted since the 1940s when Biological Station scientists identified the phytoplankton which causes paralytic shellfish poisoning in clams and mussels in the Bay of Fundy.

Oceanographic Research

Oceanographic research has been conducted since the early years of the Biological Station. The previously mentioned Canadian Fisheries Expedition of 1914-15 laid the basis for oceanographic research in Atlantic Canada. Regular hydrographic measurements have been taken in the Bay of Fundy since about 1916 and St. Andrews was the centre of the Atlantic coast oceanography program until the 1960s. Biological Station oceanographers continue the hydrographic monitoring, and their research focuses on coastal oceanography and how oceanographic conditions affect fisheries and aquaculture.



Hydrographic measurements



Atlantic Canada's first salmon farm (circa 1978)

Aquaculture Research

Aquaculture research began at the portable laboratory. At that time, oysters were the main species studied, especially on Prince Edward Island. In 1930, an experimental hatchery and ponds for trout culture were constructed at the Biological Station. Research on lobster and salmon culture began in the 1970s. The salmon research was instrumental in the development of the salmon aquaculture industry in the Maritimes. In recent years, researchers have studied new species, to promote diversification of the aquaculture industry. These species include haddock, halibut, striped bass, sea urchins, scallops, and clams.

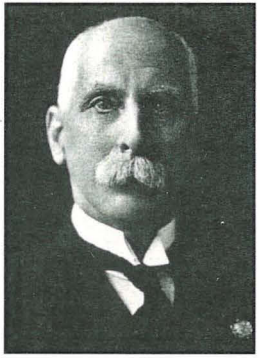
Biological Station Directors

Marine Biological Station of Canada Scientists-in-charge 1899-1907

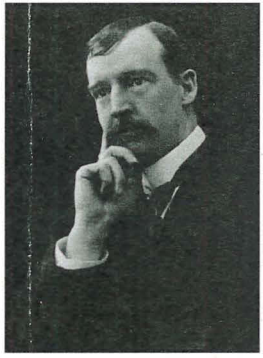
1899-1900	E.E. Prince (St. Andrews)
1901-1904	R.R. Wright (Canso, Malpeque)
1905-1907	J. Stafford (Gaspé, Sept-Îles)

St. Andrews Biological Station Directors since 1908

1908-1909	D.P. Penhallow (Resident Director)
1910-1911	L.W. Bailey, A.B. Macallum, R.R. Wright (Directors-in-charge)
1910-1920	A.G. Huntsman (Curator-in-charge), except J.W. Mavor in 1914
1921-1934	A.G. Huntsman
1934-1940	A.H. Leim
1941-1954	A.W.H. Needler
1954-1967	J.L. Hart
1967-1972	J.M. Anderson
1972-1975	R.O. Brinkhurst
1975-1976	D.J. Scarratt E.J. Sandeman P.J.G. Carrothers (Acting Directors)
1977-1992	R.H. Cook
1992-1997	W.M. Watson-Wright
1997-	T.W. Sephton



E.E. Prince



D.P. Penhallow

A.G. Huntsman

This report was prepared by B.D. Chang. M. Rudi assisted with historical research. B. Best and M. Ringuette assisted with graphics. Photograph of D.P. Penhallow: McGill University Archives (PL 007477).

Produced by the Biological Station, St. Andrews, NB
Published by Communications Branch, Fisheries and Oceans Canada, Maritimes Region, Halifax, NS

Cat. No. Fs 23-369/1999 ISBN 0-662-64288-0