Report of the Commemoration of the 100th anniversary of the St. Andrews Biological Station - 2008

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2008 marked the 100th anniversary of the establishment of the permanent Atlantic (now St. Andrews) Biological Station and the Pacific Biological Station. Both stations offer a 100-year case study in the development and delivery of public marine science in Canada, and a reflection of the evolution of marine science internationally. The anniversary presented the opportunity to reflect on the legacy of the Biological Stations, which include major contributions to study of the oceans, the development of marine activities in fishing and aquaculture, study of human impacts on the marine environment, the rapid development of fisheries and oceans management and the establishment of international committees and marine initiatives. A number of activities took place throughout the year, culminating in a workshop on the history of marine science and a public event held the 15, 16 and 17 of October, 2008. This report summarizes the commemoration activities of the St. Andrews Biological Station (SABS) and major conclusions from the events. Included in the appendices are several historical projects and materials related to the events.

RÉSUMÉ

Gavaris, E.D. and Stephenson, R.L. 2010. Report of the Commemoration of the 100th anniversary of the St. Andrews Biological Station – 2008. Can. Manuscr. Rep. Fish. Aquat. Sci. 2943: iv + 27 p.

En 2008, on a souligné le centenaire de la Station biologique de l'Atlantique (maintenant la Station biologique de St. Andrews) et de la Station biologique du Pacifique. Les deux stations constituent une étude de cas de 100 ans sur le développement des sciences de la mer dans le secteur public au Canada et elles offrent une réflexion sur l'évolution des sciences de la mer dans le monde entier. À l'occasion du centenaire de ces stations biologiques, on a constaté leurs réalisations, notamment leurs importantes contributions à l'étude des océans, au développement des activités dans les domaines de la pêche et de l'aquaculture, à l'étude de l'incidence des activités humaines sur le milieu marin, à l'évolution rapide de la gestion des pêches et des océans, ainsi qu'à l'évolution d'initiatives marines et de comités internationaux. Un certain nombre d'activités commémoratives ont eu lieu au cours de l'année, le summum étant un atelier sur l'histoire des sciences de la mer et une cérémonie de commémoration publique tenue les 15, 16 et 17 octobre 2008. Le présent rapport résume les activités commémoratives tenues à la Station biologique de St. Andrews (SBSA) et les principales conclusions tirées relativement aux activités. Dans les annexes, on inclut divers projets et documents historiques liés aux activités.

INTRODUCTION

The Atlantic (now St. Andrews) Biological Station is the oldest marine research facility on Canada's Atlantic coast. It opened in May of 1908 on the shores of Passamaquoddy Bay, in the town of St. Andrews, New Brunswick. The original facilities included a main laboratory for 12 investigators, a residence building, a wharf and two small boats. The Pacific Biological Station was established at the same time on the shores of Departure Bay, just outside Nanaimo, British Columbia. Both stations offer a 100-year case study in the development and delivery of public marine science in Canada and the evolution of marine science internationally. The history of the stations illustrates the development of our scientific capacity in terms of methods and approaches in several areas, including the development of fisheries research and science for fisheries management, lab-based experimentation, oceanography, aquaculture, observation and data on aquatic environments, environmental science, and the mentoring and development of students.

The 2008 centennial offered an opportunity to explore and to celebrate the legacy of the Atlantic and Pacific Biological Stations. This is a legacy of contribution of public science for the benefit of Canadians as well as strong contributions to the international scientific community. At both stations, efforts were made to uncover the compelling stories embedded in the 100 years of history. Products of these efforts include: A booklet on the history of the St. Andrews Biological Station (SABS); an interactive display of the history of SABS, including short videos and a slide show of historical and current photos; a photo archives project at the SABS library; a short video of the history of the Pacific Biological Station (PBS); and numerous presentations and posters at both PBS and SABS. Some of these are appended to this report (Appendix A) and most will be archived in the St. Andrews Biological Station Library Archive.

Finally, both stations held various events to celebrate their 100 year history. This report includes summaries of the diverse commemoration activities hosted by the St. Andrews Biological Station, beginning with the major events of the 15, 16 and 17 of October, 2008 which saw a number of SABS alumnae return to St. Andrews. The commemoration events provided the encouragement for historical research and the creation of many historical products, some of which are referenced here. They also allowed for the meeting of minds and experiences, leading to most valuable and unique discussions and conclusions revolving around the evolution and future direction of aquatic science in St. Andrews, Canada and the international community.

ACKNOWLEDGEMENTS

We would like to thank all of the following people: Trish Hopkins, Angela Vance, and Lara Cooper for their work in organizing the History Workshop; Charlotte McAdam, Joanne Cleghorn, Caleigh Dunfield and Grant Hurley for their work with the SABS digital photo archives and contributions to research for the historical projects; Suzanne Taylor for her contributions to event organization, communications, and history materials; Blythe Chang and Ed Trippel for their research on the history of SABS and compilation of essays and the history booklet; Grant Hurley and Jill Little for their work on the history posters; the Fairmont Algonquin hotel for hosting the history workshop; Trish Hopkins, Angela Vance, Lara Cooper and Carla Carney for their organization of the Commemoration Event; Jill Little for her design of posters and logos; Art McIntyre for his work on videos; Shawn Robinson and Steve Neil for their participation in event organization; Peter Lawton for his contributions to the organization and filming of events; Public works for their efforts in organizing the Commemoration Event; The Town of St. Andrews for hosting the "kitchen party"; John Castell and other SABS alumni for organizing activities; Giles Walker and John Anderson for active participation in the re-screening of "Down to the Sea", and the W.C. O'Neill Arena Complex for providing the venue; Shawn Robinson for his organization of the concert, and all the musicians for their performance; Lara and Andrew Cooper and Sunbury Shores for leading the CLASS project, and passing on the education of the history and current projects of SABS to local youth; Finally we would like to thank all staff, alumni, and friends of SABS for their enthusiastic participation in all events.

WORKSHOP

'The Evolution of Marine Science in Canada'

October 15/16 2008 – Algonquin Hotel.

A history workshop was held on Wednesday, October 15 and Thursday, October 16 of 2008 at the Algonquin Hotel. Invitations were mailed to alumni and associates. A list of the 92 workshop participants/attendees and the agenda for the workshop can be found in Appendix B. Over the two days, there were twenty presentations and a discussion panel of previous directors. This workshop explored the evolution of marine science in Canada. It considered the changing objectives of the station and how that related to the evolution of marine science in Canada and, more broadly, internationally. It considered whether the progression of priorities and projects at the St. Andrews Biological Station was a reflection of the national or international situations.

The workshop also looked forward to discuss what we might learn from history about the Biological Station and about the challenges facing Canadian science and technology generally.

The workshop included both scholarly and anecdotal presentations, ranging from accounts of particular programs to syntheses of general issues facing the Station. A video of the entire workshop will be deposited with the St. Andrews Biological Station Archives. Many photographs were taken at the event, which will be incorporated into the St. Andrews Biological Station Library's Photo Archives project. Abstracts of the presentations and a summary of the discussion from the Director's Panel follow. Several papers from the history workshop are being edited for publication.

ABSTRACTS OF PRESENTATIONS

Title: An Introduction to the Workshop and a History of SABS

Author: Rob Stephenson, Research Scientist, St. Andrews Biological Station

Abstract: The Atlantic (now St. Andrews) Biological Station, established in 1908, offers a 100-year case study in the development and delivery of marine and aquatic science in Canada and the rapid evolution of marine and aquatic science internationally. The St. Andrews Biological Station (SABS) evolved from an institute of academic investigation through a series of arrangements and federal department affiliations that included the internationally renowned Fisheries Research Board of Canada. The legacy of SABS includes major contributions to study of the oceans, to the development of marine activities of fishing and aquaculture, to the study of human impacts on the aquatic environment, to substantial change in the fisheries and oceans management paradigm, and to the evolution of international committees and marine initiatives. The history of the programs of the Station demonstrates a dual role that includes the generation of scientific information for both development of fisheries and aquaculture as well as for the restriction of fishing and other activities to achieve sustainability. Throughout its history SABS has faced changing trends in a number of key areas including the relative merits of fundamental vs. applied science, interaction of public science with university science, and the administration of public science. While the context and some of the driving forces have changed, there has been consistency in much of the underlying responsibility of 'public science' to undertake relevant research in support of legislation, to collect and maintain data, and to provide credible information and advice.

Title: Science in Canada: The context of the Biological Board of Canada and its St. Andrews Biological Station

Author: Eric L. Mills, Professor Emeritus, Dalhousie University

Abstract: Before the building of a floating biological station in 1899, a move that led to the foundation of permanent biological stations at St Andrews and Nanaimo in 1908, the marine sciences were studied piecemeal in Canada throughout the nineteenth and early twentieth centuries. Canada's preeminent scientific establishment then was the Geological Survey of Canada, founded in 1842 only two years after a magnetic observatory in Toronto. GSC personnel, notably J.F. Whiteaves, G.M. Dawson, and John Macoun, contributed to Canadian marine biology, but their studies were always secondary to other work. And for at least two decades after 1908, as a case study shows, lack of money, instruments, ships, and personnel prevented Canadian marine scientists from working at a world-class level, despite the efforts of the Board's rising star, A.G. Huntsman to bring their science up to European standards.

Title: Hjort, Huntsman and the Mystery of MSY: Its Origins and Implications for Fisheries Science

Author: Jennifer Hubbard, Associate Professor, Ryerson University

Abstract: In fisheries biology the management goal of MSY emerged after World War II, when population biology studies to develop fishing equations for predicting stock abundance became the mainstay of fisheries biology. Although in hindsight this appears to have been inevitable, there were several fisheries biologists, including A.G. Huntsman, who were opposed to this approach. The first iteration of the concept of MSY in fisheries came from none other than the pioneer of fisheries biology, the Norwegian

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scientist Johan Hjort, in a paper published in 1933, which introduced the theory of optimal yield, and, according to Tim Smith, reoriented the thinking of a generation of biologists. But the terms “optimal yield” and “sustained yield” are much older, found in American forestry and before this in German forestry. This paper will explore the implications of this older, 19th century tradition, especially in the transfer of the concept between disciplines during the Progressive Era, which was characterized by conservation of resources linked with the “rational use” of those resources. The development of fisheries biology as the Atlantic Biological Station was molded not only by larger disciplinary trends, but also by its origins within the British tradition of unpaid scientists professionally serving the nation in institutions free from government control. This tradition was originated by Joseph Banks, the 18th century natural historian and explorer, and the first scientist sent by Britain to survey the cod fisheries of Newfoundland. The ‘service ideal’ led to fisheries biology being oriented towards helping fishermen rather than conservation problems.

Title: SABS and the Canadian Fisheries Expedition

Author: Mike Sinclair, Regional Director, Science, Department of Fisheries and Oceans, Science, Maritimes

Abstract: The Canadian Fisheries Expedition of 1914 and 1915 under the leadership of Johann Hjort of Norway was a fortuitous opportunity for the planning of research at the St. Andrews Biological Station during the early years. The first year of the station coincided with the initiative of a programme by the International Council for the Exploration of the Seas (ICES) to track the size and age components of herring and groundfish in European fisheries. This activity was an extension of the work of Committee A of ICES, which had been addressing the societal issues of the causes of decadal scale fluctuations in the yields from the so-called “Great Fisheries” on herring and cod. The work led to a paradigm shift from “migration thinking” to “population thinking” (Hjort 1914). Hjort tested this hypotheses on the causes of fluctuations during the expedition in Atlantic Canada. This intellectual giant worked with scientists of the Biological Board of Canada, including Huntsman, during 1914 and 1915. As such the research managers at the Station were exposed to cutting edge ideas in fisheries oceanography and marine ecology. The development of the ideas associated with this paradigm shift are summarized, including the importance of the expedition. The preliminary report of 1915, as well as the full report of the expedition in 1919 could be considered tutorials on the state-of-the-art of marine science at that time.

Title: Technology in Marine Science at SABS 1908 -2008

Author: T. J. Foulkes, Former Staff, St. Andrews Biological Station

Abstract: Highlights of developments in technology over the century at SABS are presented from this technologist’s perspective. Significant focus is on the work of his Marine Technology section and underwater camera vehicles such as BRUTIV, and on the technology for and related to marine resource stock assessment as spin-offs from his work with the Fishing Gear Engineering Research program since 1964. Text, slides, and video clips from the Workshop PPT presentation are used, and references and appendixes are provided.

Title: Paralytic Shellfish Poisoning – 70 years in Retrospect

Author: Jennifer L. Martin, Research Scientist, St. Andrews Biological Station

Abstract: Paralytic Shellfish Poisoning (PSP) is a syndrome derived from eating shellfish containing toxins produced by a phytoplankton species that has been present in the Bay of Fundy for many years. Research on PSP at the St. Andrews Biological Station (formerly the Atlantic Biological Station) was

initiated in the late 1930s by Carl Medcof and he continued his research for 44 years. During that period, a volunteer researcher, Alfreda B. Needler, was able to establish the link between the organism *Gonyaulax tamarensis* (now called *Alexandrium fundyense*) with the production of toxins and their accumulation in shellfish. Following Needler's discovery, Charlotte Sullivan suggested that phytoplankton be used as an alternate to shellfish monitoring for toxins. Highlights of Medcof's career included: investigating cases of PSP in humans and animals; initiation of the present monitoring program for toxins in shellfish; suggesting a temporary closure of mussel fishery to determine uptake and depuration of toxins and the level of risk to the human consumer; implementing a survey of shellfish along the Atlantic coast to determine the extent of the problem; establishing shellfish zones for PSP toxicity; looking at toxin uptake / depuration / commercial processing; determining which shellfish accumulated toxins and investigation of the "human" bioassay with Bush Bond. Annand Prakash's research overlapped with Medcof's and he investigated annual cycles of toxicity, linking growth to salinity and isolating and culturing *Gonyaulax*. Although Medcof retired in 1975, he was honoured by the international community on harmful marine algae in 1985 for his contributions to related research.

Although toxins are accumulated in scallops, the meats (or muscles) continue to be free of toxins. Through the years, researchers including Neil Bourne, John Caddy, Glen Jamieson, Ross Chandler and more recently Shawn Robinson have studied toxicity in scallops and the biotransformation of toxins in tissues.

Alan White came to the Biological Station in 1972 and continues growth studies of *Gonyaulax*. Lucie Maranda worked with Alan briefly on toxicity, growth studies and food web. In 1976 and 1979, herring mortality occurred in weirs off the coast of Grand Manan and White linked the mortality to uptake of PSP toxins through the food web. Subsequent work showed that salmon, cod, pollock, and flounder could also potentially be affected. Other work included suggesting that PSP level in shellfish had a great degree of inter-annual variability with periods of highs and lows and that it might be linked to the lunar tidal cycle.

I came to work on PSP in 1977 and continue to work on harmful algal bloom research with Murielle LeGresley today. Work continues on remote sensing, prediction /hindcasting, modelling, linkages between phytoplankton/shellfish toxicity, toxin uptake/ depuration, spatial and temporal trends, *Alexandrium* in relation to total community, relationship between overwintering cysts and "vegetative" cells, determining sources of salmon mortality and domoic acid related studies.

Title: A Historical Review of the Standardized Survey Program

Author: Don Clark, Research Scientist, and T.D. MacDonald, Summer Student, St. Andrews Biological Station

Abstract: Research on groundfish distribution and biology has been a part of the Biological Station mandate since the early 1900's. Directed field research on groundfish expanded rapidly from the early 1950's, particularly as large Research Vessels became available. The work conducted was generally focused on specific issues, and developed into a standardized program by 1970 following recommendations from ICNAF. The summer bottom trawl series has provided annual monitoring of abundance and biological characteristics of groundfish on the Scotian Shelf and in the Bay of Fundy since 1970. This is one of the longest running survey series in the Atlantic. The geographic coverage of standardized surveys conducted by the Biological Station has varied over time, as have the exact biological sampling objectives. This presentation will highlight the development of the survey program over time.

Title: The Great Lobster Disappearance

Author: David Aiken and Susan Waddy, Research Scientists, St. Andrews Biological Station

Abstract: Lobster has been a focus of scientific research throughout the 100-year history of the St. Andrews Biological Station (SABS). In fact, lobster culture was one of the top 3 priorities listed by Penhallow for SABS in the 1908 Annual Report (along with oyster culture and fish migration). Few people realize that Professor Penhallow recommended that the original SABS facility — the floating barge — be converted into a lobster hatchery.

In 1899, E.E. Prince said, “In the Dominion of Canada there remains the last great lobster fishery of the world.” At that point, Canadian fishermen were landing 96 million pounds a year, representing roughly 10 lbs of lobster for every one landed in the United States. In the ensuing years SABS built the strongest lobster research capability in the world, and Dr. Dick Wilder (“Mr. Lobster,” he was called) and his predecessors held sway over all of the lobster fisheries in the Dominion.

In the history of SABS, lobster research has been focused under 4 broad themes: (a) Canning technology; (b) Storage and Shipment technology; (c) Fishery Biology; (d) Culture and Enhancement technology. Typically, economic imperatives and organizational restructuring determined which of these would be emphasized at any point in time, but it is fair to say that the thread of some themes (e.g., fishery biology) runs through all programs from 1908 to the present.

In spite of the early dominance of SABS lobster science on the world stage, the importance of lobster programs at SABS gradually waned as management changed and broader fisheries priorities emerged. Today the SABS mandate for the lobster fishery is but a tiny fraction of what it was during much of the 20th century, and lobster research was virtually ceased under a management philosophy that insists: “We know all that we need to know to manage the fishery effectively.”

Title: Physiological Studies at the St. Andrews Biological Station

Author: Tillmann J. Benfey, Professor, University of New Brunswick

Abstract: Fish physiology has played a prominent role in the research history of the St. Andrews Biological Station. Although initially largely focused on the natural life history of fishes, this grew to encompass significant advances in understanding anthropogenic effects on wild fish populations and in developing the local aquaculture industry. This presentation will elaborate on the lasting impacts of this research, both within and beyond the scientific community.

Title: Experimental Flow Studies at St. Andrews Biological Station

Authors: D.J.Wildish, Former Staff, and S.M.C. Robinson, Research Scientist, St. Andrews Biological Station

Abstract: The St. Andrews Biological Station (SABS) has been involved in experimental studies on the flow of seawater and river/stream water as it drives biological factors for well over half a century. The studies were initiated in response to important Maritime industries such as fishing/fish culture, bivalve culture and the environmental side-effects of industries such as forestry (e.g. aerial spraying of forests and streams with pesticides), mining and heavy metal pollution and tidal power developments to produce electricity. In this historical review of work at SABS we have included only those experimental studies where flow was integral to the hypothesis tested or was an important variable in the experiment. Flow is particularly important to those mobile organisms, such as fish, which swim in moving water and to sessile organisms, such as bivalves, which rely on flow to carry food particles (seston) to them. An historical account of the flow simulators used at SABS, beginning in the 1960’s is presented. Until the early 1990’s flow simulators were constructed at SABS, but after the loss of manned workshop facilities in 1993, flume

construction was undertaken at the Bedford Institute of Oceanography. Freshwater experimental physiological and behavioural research at SABS has mostly been with salmonid fishes. Bivalve studies included ecological, physiological and behavioural level studies of marine mussels, scallops and oysters, particularly in relation to feeding and growth. The legacy of the results from this research is to provide basic information on the biological responses of fish and bivalves that can lead to the construction of predictive models of value both in fish and bivalve culture, as well as in managing and protecting the marine environment.

Title: A Historical Review of Large Pelagics Research at SABS: From Storing the Catch to Satellite Tracking

Authors: John D. Neilson, Julie M. Porter, Research Scientists, and Leah McConkey, Summer Student, St. Andrews Biological Station

Abstract: The history of SABS-based research on large pelagics species (principally bluefin tuna and swordfish) began in the 1930s, and followed the development of commercial fisheries at the turn of the century. In common with much of fisheries research during that time, research in 1930s and 1940s was focused on questions of human utilization (appropriate preservation methods, extraction of vitamins) and enhancing the efficiency of the commercial fisheries. Questions of biology such as tuna migrations began to be addressed in 1960s, and led to the documentation of trans-Atlantic movement bluefin tuna, among other significant conclusions. The fact that bluefin tuna show such highly-migratory behaviour continues to resonate for the organization charged with the management of large pelagic species in the Atlantic (ICCAT, International Commission for the Conservation of Atlantic Tunas), as new information on movements and migrations are still being gathered with resulting profound impacts for their understanding of population dynamics. SABS-based researchers also had a history of contributing work on bluefin tuna age and growth that continues to the present day, and such work has been influential in describing this important component of the productive capacity of the resource.

Similarly, studies of swordfish biology came to the fore during the 1960s and subsequently, with Canada conducting surveys as far south as the Caribbean Sea. These surveys documented the occurrence of swordfish larvae in that region. Interestingly, very recent swordfish satellite tagging work has shown that the Caribbean Sea is the only spawning area used by swordfish marked off Georges Bank, yet several areas are described for the western Atlantic.

Both the fishery and large pelagics science program at SABS waxed and waned throughout the review period. In the recent period, however, Canada and SABS staff acted in leadership roles at ICCAT, a recognition of the scientific background and expertise that this program has provided over the years. As an example, SABS scientific staff have held the Rapporteur (chairperson) role for the Swordfish Species Working Group at ICCAT since 1994.

This history is reviewed in our presentation on a decadal scale, and is also augmented with a poster presentation outlining the main points.

Title: The Herring Program as an example of the Evolution of Finfish Fisheries Research

Author: Rob Stephenson, Research Scientist, St. Andrews Biological Station

Abstract: Herring, and herring fisheries, have been important to nations of the eastern Atlantic for centuries – and because of this importance herring has been at the forefront of scientific study and of a number of scientific advances. The St. Andrews Biological Station has had a herring program throughout the Station's history, and the development of the herring program (based on over 550 publications

associated with the Station) reflects the evolution of finfish research over the past century.

Title: Some Contributions of Women to the Early Study of Marine Biology of Canadian Waters

Author: Mary Arai, Former Staff, Pacific Biological Station

Abstract: During the nineteenth century the cultural role of women in North America and Europe expanded from strictly household to more broadly educated. At this time “Natural History” became a socially approved interest for both men and women. This has been better documented in the U. S. than in Canada. As education for women expanded into schools and then colleges, the opportunities for women to teach also grew. Although women were not involved in the field explorations of eastern Canadian waters, they were able to work in the museums on the resulting specimen collections. They attended classes and did research at marine stations such as the Marine Biological Laboratory at Woods Hole. As the education of male scientists became more professional a few pioneer women also obtained higher degrees and taught in universities, some in faculties primarily educating women such as Household Science but also some such as Carrie Derick of McGill in Biology Departments. 1901-1907 Josephine Tilden operated the Minnesota Seaside Station on southern Vancouver Island. In 1908 marine laboratories were built at St. Andrews, New Brunswick and Nanaimo, British Columbia. After the First World War, summer work at these laboratories, as well as opportunities in the US, allowed a number of women to carry out research and obtain graduate degrees. Unfortunately the depression and restrictions on hiring women for field work or following marriage led to difficulties in obtaining employment or even research facilities for most of these women. Opportunities again expanded after the second world war.

Title: A History of the Pacific Biological Station

Author: Ray Lauzier, Research Scientist, Pacific Biological Station

Abstract: The Pacific Biological Station was first established on the shores of Departure Bay in Nanaimo, British Colombia in 1908. The two visionary men primarily responsible were Rev. George William Taylor and E. E. Prince. Most of the science at the station was initially conducted by volunteers visiting from universities. The years following saw the facilities of the station expand, the areas of investigation broaden, and a full permanent staff hired. Expansion and renewal has continued in response to changing demands and conditions in government policy, technology and scientific interest. This paper provides an outline of these changes in facilities, staff and research vessels over the course of one hundred years and how it pertains to the research capabilities and major projects at the Pacific Biological Station.

Title: A Personal Perspective on the History of the Scallop Investigations at the SABS up until the 1970’s — with some ideas for future research

Author: John Caddy, Former Staff, St. Andrews Biological Station

Abstract: The paper reviews the research contribution of the St Andrews laboratory to an unbroken century of investigations on scallop biology and fisheries. After a brief summary of past studies on scallops and their ecosystem, the performance of shellfish dredges and their selectivity led to a pioneering study of the impacts of fishing on the grounds, which was supplemented in the 1960’s-70’s by underwater studies using scuba and submersibles. The influence of ICNAF in promoting assessment of shellfish resources, and introducing regulations on scallop mean landed sizes is recognized in what were then the international waters of Georges Bank. The extension of jurisdiction to 200 n. miles led to negotiation with the USA of the international boundary across Georges Bank, where scallops were the most valuable renewable resource. The publications of the scallop research programme of St Andrews

played a key role in these by demonstrating the duty of care for Georges resources exercised by the Canadian government. Following declaration of a Canadian EEZ, scallop research was coordinated by the CAFSAC committee, and with the scallop industry through government-industry meetings. The onset of regular surveys of scallop resources on offshore banks was accompanied by stock assessments which showed that the irregularity of recruitment was a major influence on exploitation strategy. Here, modelling exercises showed that the dynamic pool assumption for invertebrates is an invalid one for semi-sedentary shellfish populations, and demonstrated the importance of countering effort concentration onto patches of new recruits. Eventually an effective control of access was achieved by assigning enterprise allocations. This made possible an increase in the sizes harvested by reducing overall fishing effort.

It is speculated that the focus of future scallop investigations will be on enhancing stock productivity by stock enhancement and the application of spatial strategies such as rotating harvesting schemes, and by reducing recruitment irregularities by taking advantage of source/sink phenomena in sedentary populations to enhance spawning stock size.

Title: The St. Andrews Diaspora: SABS as an Incubator for World Aquatic Sciences

Author: Howard Powles, Former Summer Student, St. Andrews Biological Station

Abstract: Although the contributions of the scientific staff at SABS to marine science over the years are well known and will doubtless be well documented at the reunion, people *from* SABS (those who have spent time there and moved on) have also contributed substantially to aquatic sciences and other fields in Canada and internationally. Cohorts of scientists have moved through the Station over the years -- young British scientists (1960s), summer students in the Fisheries Research Board program (1960s and more), young francophone scientists (1970s) – and there has also been a continual recruitment and emigration of people working on staff, on thesis projects or on other temporary projects. People who have spent time at SABS have had a unique and memorable life experience combining scientific work, intersecting personal lives, and a beautiful natural environment, which influences their future lives and careers and doubtless contributes to their desire and capacity to contribute to the marine sciences and other fields.

This presentation will identify and describe some of the groups and individuals who have gone on from SABS to make contributions elsewhere in the world. Necessarily incomplete and episodic, it will draw on the experiences of the author as a summer student in 1966-67 and those of his friends and colleagues who have spent time at the Station over the years and moved on. In addition to the above, reference may be made to formative experiences from the 1960s, for example Mike Sinclair and John Caddy demonstrating scallop swimming after several Mooseheads, a surprisingly decorous toga party, evening drives through the St. Andrews cemetery, participation in the first love-in in the Maritimes, the Centennial Year July 1 parade, a walk in the snow by Trudeau's francophones.....

The Fisheries Research Board summer student program of the 1960's was a predictable, prestigious intake program many of whose graduates went on to make contributions in science and elsewhere. Reviving a stable intake program like this would help improve recruitment of aquatic scientists to government programs in Canada and would represent a nice memorial of 100 years of government aquatic science institutions in Canada.

Title: Contributions to Ecotoxicology at SABS

Author: Peter Wells, Adjunct Professor, Dalhousie University

Abstract: Environmental science has been conducted at the St. Andrews Biological Station (SABS) since the laboratory was established formally early in the 20th century. This paper briefly describes early work up to the 1950s, especially studies on DDT and Atlantic salmon, the extensive aquatic toxicology studies in

the program formally established between late 1950 and 1970, and the many contributions to environmental chemistry, aquatic toxicology and ecotoxicology since the 1970s in the Environmental Science Program. Scientists at SABS, and associated researchers, have contributed to marine environmental science and ecotoxicology in Canada for decades, gaining national and international recognition for their many studies on Maritime Canada's aquatic ecosystems.

Title: A history of oceanographic research at the St. Andrews Biological Station

Authors: Fred Page and Blythe Chang, Research Scientists, St. Andrews Biological Station

Abstract: Oceanographic research has been a major focus of work at the St. Andrews Biological Station throughout most of the Station's first 100 years. The Station's first year-round scientist was an oceanographer, H.B. Hachey, in 1928. The Atlantic Oceanographic Group (AOG), was founded in 1944 under the leadership of Hachey, and was initially located at SABS, where it continued until 1960, when it was transferred to Halifax. An oceanographic program continued at SABS, under L.M. Lauzier, until he was transferred to Ottawa in 1970. In the 1970s and early 1980s, there was no formal oceanographic program at SABS; some hydrographic monitoring continued, but oceanographic research needs for other SABS programs were conducted by scientists at the Bedford Institute of Oceanography. Oceanography returned to SABS in the mid-1980s with a fisheries oceanography research program led by R.I. Perry, and since 1991 by F.H. Page. Under Page this program evolved into a general coastal oceanography program that is now the largest oceanography program in the history of SABS.

The geographic focus of SABS oceanographers has been in the Bay of Fundy, but at times, has extended throughout eastern Canada, including Hudson Bay, Newfoundland, the Gulf of St. Lawrence, the Scotian Shelf and the Gulf of Maine. This was especially true in the early years, when St. Andrews was the headquarters for all oceanographic research in Atlantic Canada. In recent years the geographic focus has been the Quoddy Region of southwestern New Brunswick.

A major pillar of oceanographic science at SABS has been hydrographic sampling and monitoring. An early publication from 1916 noted that observations on hydrography (especially water temperature and salinity) and currents are important in themselves, but are also valuable to help explain the distribution and abundance of fish. Hence, oceanography in relation to fisheries has been studied throughout SABS' history, and hydrographic observations were a major part of the Canadian Fisheries Expedition of 1914-15, an investigation focused on fisheries, especially herring, in Atlantic Canada and the Gulf of St. Lawrence in particular. Regular hydrographic monitoring, particularly at the Prince 5 fixed station located near Campobello Island in the Bay of Fundy, began around 1916 and monthly sampling has been conducted at the station since 1924. Regular year round sampling of phytoplankton at several other stations has been conducted since 1989.

The focus of oceanographic research at SABS has varied over the decades but there has been a consistent interest in fisheries and aquaculture oceanography. Interest in the latter began in 1909 with a study that looked at the potential for oyster aquaculture in Passamaquoddy Bay. Research in relation to estimating the potential effects on fisheries of proposed tidal power dams was conducted in the 1930s and again in the 1950s. In recent years, the interactions between oceanography and aquaculture has become a focus, and interest in tidal power has resurfaced.

Early research was hampered by a lack of good equipment. A paper from 1916 noted that no current meters were available for measuring current speed and direction. So oceanographic research depended on water sampling to obtain hydrographic data. Starting in 1919 drifter bottle releases were conducted in the Bay of Fundy. In subsequent years, drifters have been released throughout Atlantic Canada. The data from early drifters was restricted to the time and place of release and the time and place of recovery. Now

drifters that record their time and geographic position throughout their trajectory are used. Current meter technology has also improved considerably, from propellor-type early models, to electomagnetic and acoustic models now used. Computational fluid dynamics modelling techniques, together with affordable computer power, is another recent development that helps generate understanding of oceanographic conditions and processes.

Title: A review of the historic role of the St. Andrews Biological Station in aquaculture research and development.

Author: Robert H. Cook, Former Director, St. Andrews Biological Station

Abstract: From the Biological Station's earliest years, its ready access to seawater and fresh water for the experimental holding of fish and shellfish provided the foundation for investigations on physiology, behaviour and culture. This capacity ultimately resulted in research providing the science required for the development of commercial aquaculture. A most notable success was its pivotal research on the biology and culture of Atlantic salmon and its leadership in technology transfer initiatives with the private sector. Several Station researchers and managers undertook leadership roles in National and International aquaculture societies and organizations resulting in the recognition of the Biological Station as a leader in aquaculture research and development. Close working relationships with the neighbouring Huntsman Marine Science Center and the Atlantic Salmon Federation, and the effective collaboration with other research centers, Universities, Funding Agencies, the Province of New Brunswick, and members of the private sector all contributed to this success. Research on the culture of marine invertebrates, such as the oyster, lobster and giant scallop and on the culture of several marine fish species has also been impressive. The future for aquaculture research at St. Andrews is bright as new research programs and partnerships continue to develop. One recent example is the designation of the Biological Station to head DFO's national Centre for Integrated Aquaculture Science. A table summary of aquaculture contributions and activities at Biological Station is presented and discussed. This overview is partially based on the reflections of a group of Biological Station aquaculture researchers, past and present, who were consulted in September 2008 to consider the history of aquaculture at the St. Andrews Biological Station.

Directors' Panel

Following the presentations, five former Directors of the St. Andrews Biological Station took part in a panel discussion moderated by the Director, Dr. Robert L. Stephenson. The panel participants, who spanned forty years of SABS' history, were Dr. John Anderson, Dr. Ralph Brinkhurst, Dr. Robert Cook, Dr. Wendy Watson-Wright and Dr. Thomas Sephton.

Several questions were posed to the panel, which they answered in order of their Directorship. The first question asked them to outline what major factors shaped their time as Director at SABS. Major themes that ran through all the responses included reorganization and fragmentation, as this period saw a shift of management structures from the advisory Fisheries Research Board to the inclusion of SABS within the Federal government department. Through these changes Cook noted "wasted energy being devoted logistically" and Brinkhurst added that there was "a lot of fragmentation". Watson-Wright commented that a lot of her efforts were devoted to trying to "bring everyone back together under one Director". Both Watson-Wright and Sephton mentioned extensive periods of "Program Review" and "Strategic Planning". When asked about what they thought their major achievements were, most cited "keeping the Station alive" amid many threats of closure during various periods of recession or reorganization. Anderson stated that the establishment of the Huntsman Marine Laboratory (now Huntsman Marine Science Centre) was a major accomplishment, while Brinkhurst and Cook both commented on new and renewed facilities. Sephton added, "the achievements in aquaculture research".

The discussion then turned to the final question: what is the way forward? Anderson began with the advice that the Station should be flexible enough to “be able to make things happen” and to “be opportunistic”. He also suggested a focus on collaboration with universities and other centres of research, as well as public outreach directed at young people. Cook commented that the rich history of SABS should be taken advantage of and that he would like “to see the Biological Station become an archive centre”. Wendy Watson-Wright, ADM of DFO Science, encouraged SABS to be attentive of the departmental mandates, but also suggested SABS should “be proud of the past here...but keep your eyes ahead...be proactive or... opportunistic... productive... creative... and collaborative”. Sephton added that “outreach is really where the department and our science programs have to go to be better understood by our political masters”. Brinkhurst supported this by stating that SABS should “advertise what we do when we get the chance”. Dr. Julie Porter, a section head at SABS and participant in the workshop, suggested that “investment in our summer students is a wonderful way to promote outreach”. All agreed that the recent decision to replace aging laboratory and office facilities was a very positive sign for the future of SABS.

The discussion continued to elaborate on ideas for moving the station forward, and turned to the role managers play in the field of science, and who best to be making these decisions: managers or scientists? Cook offered that too often “we were being led by economists with very little understanding of the department...making very long-standing commitments”. Watson-Wright countered that “there has to be leadership in management. We are very broad and we now have so many administrative requirements, and they just keep getting added and added and added”. Dr. Michael Sinclair, Regional Director of Science for the Maritimes region of DFO and workshop participant, offered the middle ground that ended the discussion: “the primary function of the Director of the Station, or branch manager or something, is to manage... The management team has to have enough expertise that knows how science works... there is a drive to have professional managers...if we fill up the whole slate with those, then you don't have the wisdom of how science functions... I think science requires some scientific expertise somewhere in that team”.

It was concluded that the workshop and the commemorative events in general had offered not only the opportunity for convivial reminiscences, but a critical examination of the historical role of SABS in public marine science and ideas for the future. Tim Smith offered a summary of the two day workshop and some closing remarks, reminding the participants that exploration into the history of science can help to “find your future using your past”.

Video and audio files of the workshop, as well as a transcript of the directors' panel discussion, will be kept in the SABS archives.

PUBLIC COMMEMORATION EVENT

for the 100th Anniversary of the St. Andrews Biological Station

Friday October 17th 2008.

Many staff, alumnae, and associates gathered for a short commemoration event the afternoon of Friday, October 17, 2008. Guests included a number of alumnae, family, town residents, local fisheries, aquaculture, environmental representatives and provincial and federal government officials. The commemoration was held in a large tent on the upper parking lot, due to the disruption in the lower campus from the construction of new facilities which began in 2008.

In his welcoming remarks, SABS Director Dr. Robert Stephenson gave a brief history of SABS and pointed out the importance of the support of the town and the region for the progress of growth in programs and facilities. The Honourable Greg Thompson (Minister of Veterans Affairs and MP Charlotte-Fundy Isles) elaborated by commenting on the benefits of having an academic institution of such high esteem in the area. St. Andrews Mayor John Craig also spoke, referring to the economic benefits SABS brings to the town and how proud town residents are of its long and prolific history. Other distinguished speakers included Ms. Faith Scattolon, Regional Director General for DFO Maritimes, Dr. Fred Whoriskey, chairman of the board of the Huntsman Marine Science Centre and Mr. Rick Doucet, New Brunswick Minister of Fisheries. After the speeches, the guests of honour participated in cutting the cake and unveiled a granite plaque with the SABS logo (image below) to be placed in front of the new building (under construction). After the ceremony, all guests were invited to mingle and view the various displays on the historical and current research activities of SABS. The agenda for the event is included in Appendix C.

The public commemoration was followed by a 'kitchen party' dinner at the W.C. O'Neill Arena Complex organized by the Town of St. Andrews. The following 'Alumnae weekend' included a free public concert at the W.C.O'Neill Arena Complex involving musicians with connection to SABS and a number of independent alumnae activities.

Fig. 1: the plaque unveiled at the commemoration event,
to be placed in front of the new building.

RE-SCREENING OF THE FILM 'DOWN TO THE SEA''

The National Film Board of Canada film ‘Down to the Sea’, is a documentary that records the underwater research of the Station in 1971. The film was the first film of Giles Walker, who was a summer student at SABS at the time. First screened in the St. Andrews arena theatre in 1971, the film was noted for its novel use of participant narrative rather than a single narrator. The film re-screening was well attended by members of the public as well as SABS staff, alumnae and associates. Dr. John Anderson, who was Director of SABS at the time of the film's creation, provided an introduction. Discussion with Director Giles Walker, Dr. John Anderson and audience members followed the film. Copies of the film can be found at the National Film Board of Canada, and in the SABS library.
The poster used for advertising the October 2008 screening can be found in Appendix C.

OTHER EVENTS

COMMEMORATION CONCERT

Saturday October 18th

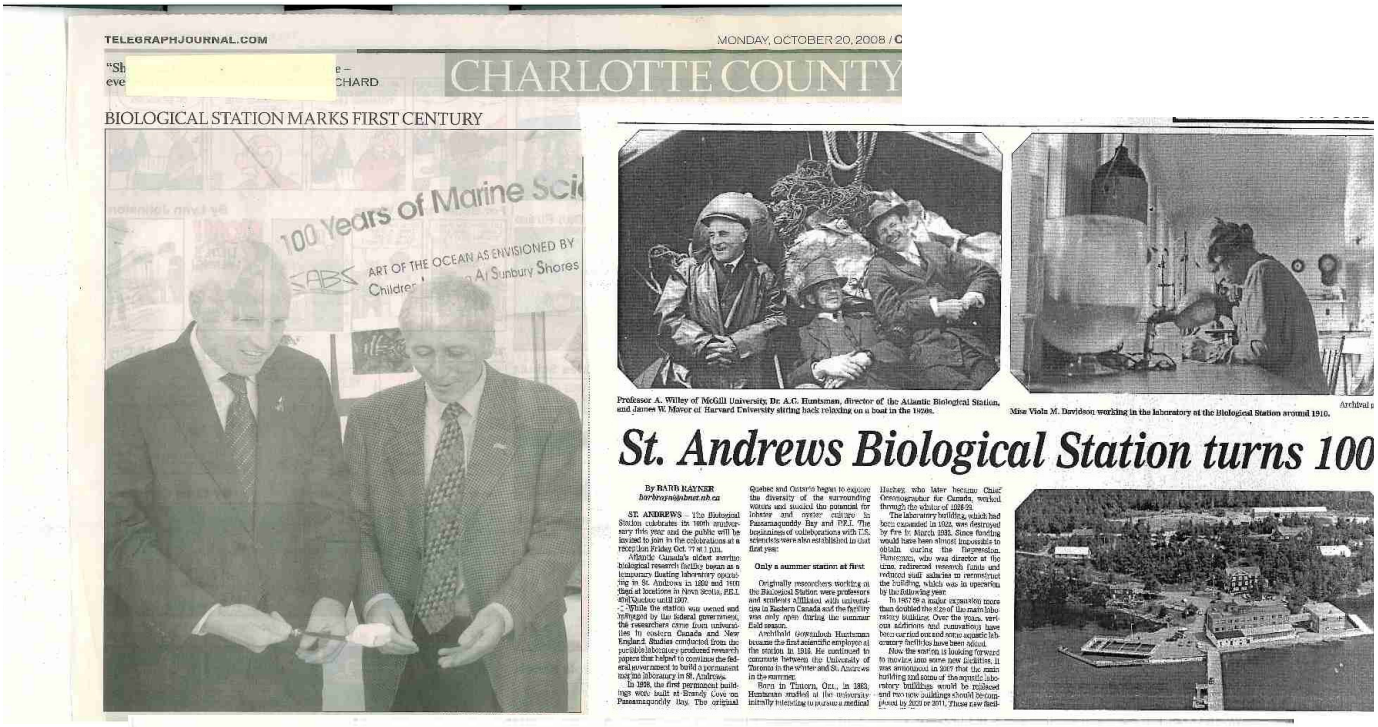
A free concert featuring folk and jazz bands with a connection to SABS was held the afternoon of Saturday, October 18, 2008. The concert was held in the W.C.O'Neill Arena Complex. The poster for the advertisement of the concert can be found in Appendix C.

SUNBURY SHORES ARTS AND NATURE CENTRE INC. – CLASS EVENT

Scientists from SABS, Andrew and Lara Cooper, collaborated with the Children Learning at Sunbury Shores (CLASS) program to educate local youth on the historical and current research activities of the Station. They provided scientific materials and information to over 300 students from the Charlotte County areas to inspire their art projects centred on the theme “100 years of marine science“. The art projects were shown in a public exhibit at Sunbury Shores Arts and Nature Centre Inc. As well, a few selected items were included at the public commemoration event held at SABS on Friday October 17, 2008.

NEWSPAPER REPORTS

Fig. 2-5: These images are some of the newspaper clippings from the local paper outlining the activities for SABS' centennial celebrations.



TELEGRAPHJOURNAL.COM MONDAY, OCTOBER 20, 2008 / C

CHARLOTTE COUNTY

BIOLOGICAL STATION MARKS FIRST CENTURY

Professor A. Willey of McGill University, Dr. A.G. Huntsman, director of the Atlantic Biological Station, and James W. Mavor of Harvard University sitting back relaxing on a boat in the 1920s.

Miss Viola M. Davidson working in the laboratory at the Biological Station around 1910.

Archival p

St. Andrews Biological Station turns 100

By BARB RAYNER
barbrayn@nbnet.nb.ca

ST. ANDREWS – The Biological Station celebrates its 100th anniversary this year and the public will be invited to join in the celebrations at a reception Friday Oct. 17 at 1 p.m.

Atlantic Canada's oldest marine biological research facility began as a temporary floating laboratory operating in St. Andrews in 1902 and 1903 then at locations in Nova Scotia, P.E.I. and Quebec until 1907.

While the station was owned and managed by the federal government, the researchers came from universities in eastern Canada and New England. Studies conducted from the portable laboratory produced research papers that helped to convince the federal government to build a permanent marine laboratory in St. Andrews.

In 1908, the first permanent buildings were built at Brandy Cove on Passamaquoddy Bay. The original Quebec and Ontario began to explore the diversity of the surrounding waters and stocked the pounds for lobster and oyster culture in Passamaquoddy Bay and P.E.I. The beginnings of collaborations with U.S. scientists were also established in that first year.

Only a summer station at first

Originally researchers working at the Biological Station were professors and students affiliated with universities in Eastern Canada and the facility was only open during the summer field season.

Archibald Gowanlock Huntsman became the first scientific employee at the station in 1912. He continued to commute between the University of Toronto in the winter and St. Andrews in the summer.

Born in Thorah, Ont., in 1883, Huntsman studied at the university initially intending to pursue a medical

Hachey, who later became Chief Oceanographer for Canada, worked through the winter of 1928-29.

The laboratory building, which had been expanded in 1922, was destroyed by fire in March 1931. Since funding would have been almost impossible to obtain during the Depression, Huntsman, who was director at the time, redirected research funds and assigned staff salaries to reconstruct the building, which was in operation by the following year.

In 1967-68 a major expansion more than doubled the size of the main laboratory building. Over the years, various additions and renovations have been carried out and some aquatic laboratory facilities have been added.

Now the station is looking forward to invoice into some new facilities. It was announced in 2007 that the main building and some of the aquatic laboratory facilities would be rebuilt and two new buildings should be completed by 2010 or 2011. Those new facil-

Biological Station anniversary gives pause to reflect, reason to look forward

By BARB RAYNER
barbrayn@nbnet.nb.ca

ST. ANDREWS – This week's two-day workshop held as part of the 100th anniversary celebrations of the Biological Station was an opportunity to look back at the history of the station but also at the future of

research done mainly by university staff and students who visited in the summer and received some travel and living expenses.

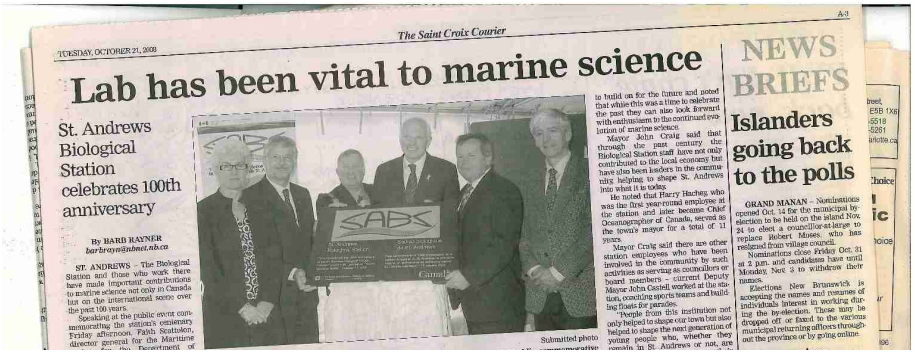
Dr. A.G. Huntsman, who was director from 1912 to 1934, was the station's first permanent employee. Both St. Andrews and the Pacific biological station, said Stephenson,

to the development of activity on the one hand versus environmental monitoring and research which resulted in restriction of these same activities."

Stephenson spoke of the interaction of public science and universities and said the station had been a nursery ground not only for marine

springboard to look ahead at the future of marine science in Canada.

In his talk, Dr. Eric Mills spoke about the beginnings of marine science in Canada and noted that the fisheries were regarded as being over exploited in the late 19th Century and there was a need for fisheries regulations. There was a need for knowl-



The Saint Croix Courier

TUESDAY, OCTOBER 21, 2008

A-3

Lab has been vital to marine science

St. Andrews Biological Station celebrates 100th anniversary

By BARB RAYNER
barbrayn@nbnet.nb.ca

ST. ANDREWS – The Biological Station and those who work there have made important contributions to marine science not only in Canada but on the international scene over the past 100 years.

Speaking at the public event commemorating the station's centenary Friday afternoon, Faith Scattolon, director general for the Maritime

Submitted photo

is build on for the future and noted that while this was a time to celebrate the past they can also look forward with enthusiasm to the continued operation of marine science.

Mayor John Craig said that through the past century the Biological Station staff have not only contributed to the local economy but have also been leaders in the community helping to shape St. Andrews into what it is today.

He noted that Harry Hachey, who was the first year-round employee at the station and later became Chief Oceanographer of Canada, served as the town's mayor for a total of 11 years.

Mayor Craig said there are other station employees who have been involved in the community by such activities as serving as councillors or board members – current Deputy Mayor John Castell worked at the station, coaching sports teams and building floats for parades.

"People from this institution not only helped to shape our town but also helped to shape the next generation of young people who, whether they remain in St. Andrews or not, are

NEWS BRIEFS

Islanders going back to the polls

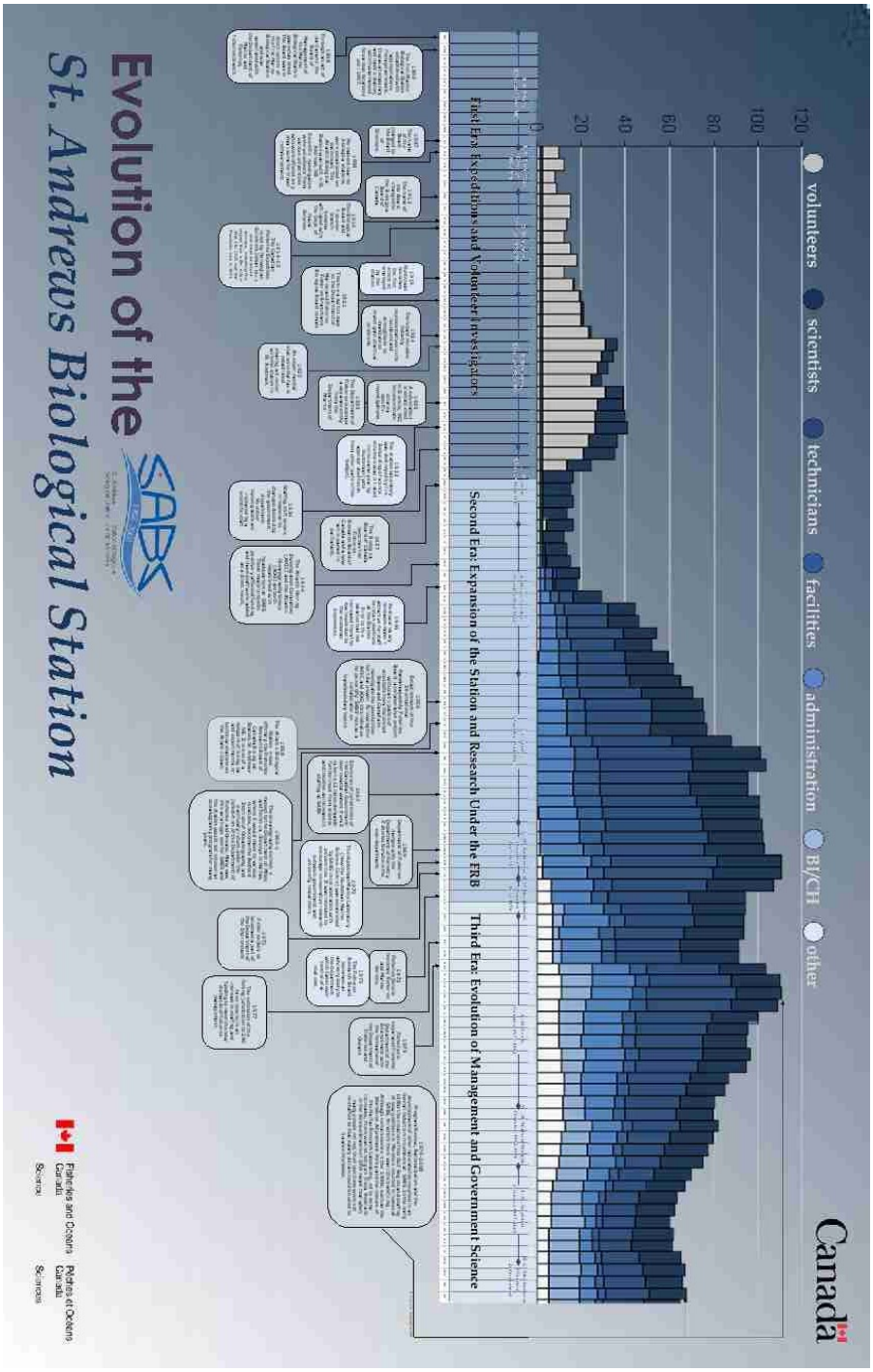
GRAND MANAN – Nominations opened Oct. 14 for the municipal by-election to be held on the island Nov. 30 to elect a councillor-at-large to replace Robert Moses, who has resigned from village council.

Nominations close Friday Oct. 31 at 2 p.m. and candidates have until Monday, Nov. 3 to withdraw their names.

Elections New Brunswick is accepting the names and resumes of individuals interest in working during the by-election. These may be dropped off or faxed to the various municipal returning officers throughout the province or by going online

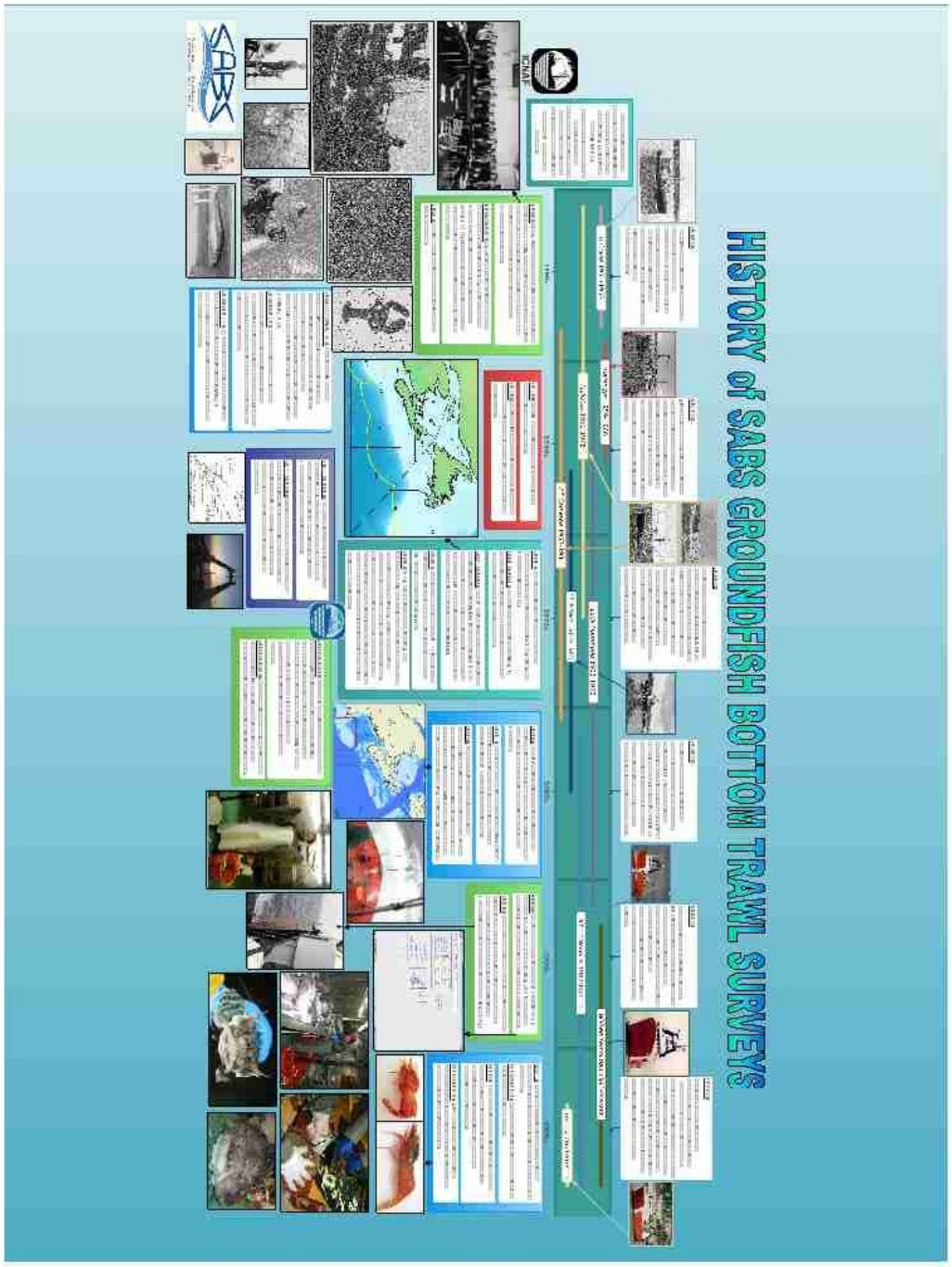
APPENDIX A

SABS TIME-LINE



LARGE PELAGIC STUDIES TIME-LINE

SURVEYS TIME-LINE



SABS HISTORY POSTER

APPENDIX B

WORKSHOP AGENDA

The Evolution of Marine Science in Canada
St. Andrews NB, October 15/16, 2008

Oct 15	Author	Title/Subject
9:00	Rob Stephenson	Introduction, context and objectives for the workshop
9:30	Eric Mills	Science in Canada: The Context of the Biological Board of Canada and its St. Andrews Biological Station
10:30	BREAK	
10:45	Jennifer Hubbard	Hjort, Huntsman and the Mystery of MSY: Its Origins and Implications for Fisheries science
11:45	Mike Sinclair	SABS and the Canadian Fisheries Expedition
12:00	LUNCH	Provided
12:30	Tim Foulkes	Marine Technology
13:00	Jennifer Martin	Paralytic Shellfish Poisoning – 70 years in Retrospect
13:30	Don Clark and T.D. MacDonald	An Historical Review of the Standardized Survey Program
14:00	Dave Aiken, Susan Waddy	The Great Lobster Disappearance
14:30	Tillmann Benfey	Physiological Studies
15:00	BREAK	
15:30	Dave Wildish and Shawn Robinson	Experimental Flow Studies at SABS
16:00	John Neilson, Julie Porter, Leah McConkey	A Historical Review of the Large Pelagics Research at SABS: From Storing the catch to Satellite Tracking
16:30	Rob Stephenson	The Herring Program as an example of the Evolution of Fin Fisheries Research

	Dinner	On our own, a group booking at the Rossmount Inn is available- Information can be obtained at the registration desk

Oct 16	Author	Title/Subject
9:00	Mary Arai	Some Contributions of Women to the Early Study of Marine Biology of Canadian Waters
10:00	Ray Lauzier	A History of PBS
10:30	BREAK	
11:00	John Caddy	A Personal Perspective on the History of the Scallop Investigations at the SABS up until the 1970's— with some ideas for future research
11:30	Howard Powles	The St. Andrews Diaspora: SABS as an Incubator for World Aquatic Sciences
12:00	LUNCH	Provided
12:30	Peter Wells	Contributions to Ecotoxicology at SABS
13:00	Fred Page, Blythe Chang	A History of Oceanographic Research at SABS
13:30	Bob Cook	A Review of the Historic Role of SABS in Aquaculture Research and Development
14:00	Rob Stephenson	Directors and Directions – Introduction to the Panel of Directors
14:15	John Anderson, Ralph Brinkhurst, Bob Cook, Wendy Watson-Wright, Tom Sephton	Directors' Panel (moderated by Rob Stephenson)
16:00	Tim Smith	Summary reflection
		Workshop photo
17:00	Reception at the Fairmount Algonquin's Carleton Rotunda	Reception with cash bar, Fairmount Algonquin's Carleton Rotunda

20:00	Giles Walker	Screening of the 1972 film - 'Down to the Sea' (Arena Theatre)

		St. Andrews Biological Station Historical Display

		(conference room & hotel lobby)
Posters	Eva Gavaris	History of Expansion and Contraction of SABS
	T.D. MacDonald	History of SABS Groundfish Bottom Trawl Surveys
	Leah McConkey	A Century of SABS Large Pelagic Research
	Charlotte McAdam and Joanne Cleghorn	St. Andrews Biological Station Photo Archives A display of key historical references

LIST OF ATTENDEES

History Workshop- Registration List					
	Totals				
Last Name	First Name	Title	Last Name	First Name	Title
Aiken	Dave	Staff	Martin	Jennifer	Staff
Anderson	John	Guest Presenter	Martin-Robichaud	Debbie	Staff
Arai	Mary	Guest Presenter	McAdam	Charlotte	Staff
Beattie	Mike	Guest	Melvin	Gary	Staff
Beckett	Jim		Mills	Eric	Guest Presenter
Benfey	Tillmann	Guest Presenter	Mills	Ann	(Eric's wife)
Blanchard	Marc	Staff	Neil	Steve	Staff
Bourque	Francine	(with Howard Powles)	Neilson	John	Staff
Brinkhurst	Ralph	Guest Presenter	Page	Fred	Staff
Burridge	Les	Staff	Pitcher	Roland	Guest
Buzeta	Maria	Emeritus	Pohle	Gerhard	ARC
Caddy	John	Alumni	Porter	Julie	Staff
Carney	Carla	Staff	Power	Mike	Staff
Castell	John	Alumni	Powles	Bev	(Perce's Wife)
Chang	Blythe	Staff	Powles	Perce	Alumni
Chase	Shawn	Staff	Powles	Howard	Guest Presenter
Clark	Don	Staff	Reid	Gregor	Staff
Clark	Kirsten	Staff	Robichaud	David	Staff
Cleghorn	Joanne	Staff	Robinson	Shawn	Staff
Cook	Bob	Guest Presenter	Saunders	Steve	(Dick's Son)
Coombs	Karen	NB DAA	Saunders	Michele	Staff

Cooper	Lara	Staff	Saunders	Dick	Alumni
Cooper	Andrew	Staff	Scott	Bev	Alumni
Courtenay	Simon	Guest of Les	Sephton	Tom	Staff
Dempsey	Terry	NBCC Trades & Aquaculture Program Director (replacing Diane Burt)	Shepheard	Peter	Alumni
Dickson	Clayton	Alumni	Shepheard	Magdalene	Alumni
Fenety	Peter	Alumni	Sinclair	Mike	Staff
Foulkes	Tim	Guest Presenter	Singh	Rabindra	SWNB
Gavaris	Eva	Contract	Smedbol	Kent	Staff
Gavaris	Stratis	Staff	Smith	Tim	Guest Presenter
Gidney	Sheila	Staff	Smith	Jamey	NBSGA
Hamilton-Gibson	Natalie	Staff	Stephenson	Rob	Staff
Hanke	Alex	Staff	Stephenson	Helen	(Robs Wife)
Hatte	Bette	Staff	Stone	Heath	Staff
Haya	Kats	Staff	Strong	Mike	Alumni
Hooper	Tony	Connors	Taylor	Suzanne	Staff
Hopkins	Trish	Staff	Trippel	Ed	Staff
Hord	Harris	Alumni	Vance	Angela	Staff
Hubbard	Jennifer	Guest Presenter	VanGuelpen	Lou	ARC
Kohler	Carl	Alumni	Vezina	Alain	BIO Staff
Lalonde	Jacqueline	Staff	Waddy	Susan	Staff
Lauzier	Ray	Guest Presenter	Waiwood	Brenda	Alumni
Lawton	Peter	Staff	Walker	Giles	Alumni
Leadbeater	Steve	Staff	Watson-Wright	Wendy	Staff
Leim	Sandy	A. H. Leim's son	Wells	Peter	Guest Presenter
MacIntyre	Art	Staff	Wildish	Dave	Alumni

APPENDIX C

COMMEMORATION EVENT AGENDA

COMMEMORATION EVENT

Friday, October 17, 2008

AGENDA

1:00 p.m.	Welcome and Opening remarks by Rob Stephenson MC Introduces the Head Table Asks Faith Scattolon, RDG to podium
1:10 - 1:15	RDG Comments
1: 15	MC thanks RDG invites Dr. Whoriskey to podium
1:15 - 1:20	Dr. Whoriskey Comments
1:20	MC thanks Whoriskey and invites Mayor Craig to podium
1:20- 1:25	Mayor Craig Comments
1:25	MC thanks Mayor Craig, introduces Minister Thompson **(insert Minister Doucet here if he speaks - add 5 minutes to the agenda)**
1:25- 1:30	Minister Thompson Comments
1:30	MC thanks Minister Thompson Invites all speakers to side for Plaque unveiling
1:35	Cake cutting (ALL)
1:40	Closing remarks by MC

MOVIE RE-SCREENING POSTER

Down to the Sea **is a time capsule of what was state-of-the-art for exploring fisheries in the inner space of the ocean 37 years ago.**

Like all time-capsules, it presents a mix of prescience, nostalgia and unintended humour too. A collapse of the herring-weir fishery is predicted, as is the calamitous decline in ground-fish stocks. There is a timeless reminder, from Carl Medcof, that the inspiration for research, indeed the origins of life, are still to be found on the mud-flats of Passamaquoddy Bay. And there is cutting-edge work with submersibles, even a look at a big new IBM computer system, punch cards and all!

Film-maker Giles Walker will be present at the screening. *Down to the Sea* was his very first film in what turned out to be a 38-year career in film-making. Following the screening, there will be a discussion about the state of the fisheries some 40 years later, the progress of fisheries research and how it is conducted today. Discussion will also include some of the "stars" of the film.

Thursday, October 16 8:00 pm
at the W. C. O'Neill Arena
Complex Theatre

Presented by the St. Andrews Biological Station
in conjunction with the St. Andrews Film Society

"They that go down to the sea in ships, that do business in great waters, these see the works of the Lord and his wonders in the deep."

MUSIC EVENT POSTER

Pls Post

Folk & Jazz

SABS Centenary Celebration

featuring

HOMEMADE BREAD

Shawn Robinson (1998 -) : Guitar/Vocals
Jeff Piercy (2002 -) : Electric bass/ Vocals

PETE SHEPHEARD

(1969 – 1971) : Melodeon/ Vocals

EUREKA JAZZ BAND

Ian Lee : Trumpet/ Keyboard
Rob Rayner : Clarinet/Tenor Saxophone/Keyboard
Adam Olmstead : Tenor banjo
Rob Stephenson (1984 -) : Cello
Dave Wildish (1969 – 2005) : Drums

at
W.C. O'NEILL ARENA THEATRE, ST.ANDREWS

2.00 pm, SATURDAY, 18TH OCTOBER

ADMISSION : FREE