

C.S.S. BAFFIN

(Notes from a Presentation in 1992)

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If I were to talk about all that the *C.S.S. Baffin* has achieved in her lifetime, I would be here for hours instead of only a few minutes.

When she was built by Canadian Vickers in 1956, the *Baffin* was an example of the highest 'state-of-the-art' technology. At 87 m. in length and 3,700 tons (4,987 tonnes) displacement, with a Class 1 icebreaker hull and a 76-day endurance rate, she was specifically designed for surveying in the Arctic and off-shore waters of Canada, a task she carried out for the next 34 years.

The *Baffin* was not only the major hydrographic survey ship of the Atlantic Region of the Canadian Hydrographic Service, but she carried out several hydrographic and training surveys overseas under CIDA sponsorship, and 21 multi-disciplinary surveys with the Atlantic Geoscience Centre, B.I.O. In her time, she and her launches carried over 170 hydrographers, surveyed over a million kms. of sounding lines, examined almost 17,000 shoals, obtained nearly 14,000 bottom samples, were the first vessels into many uncharted areas, participated in several Search & Rescue operations and Medevacs; she has also been a Fisheries patrol base on the annual seal-hunt - and was the first ship to circumnavigate North America.

Even before *Baffin* arrived in Dartmouth, she chalked up the first of her many 'firsts'. After being commissioned in Quebec City in January of 1957, she made her way through heavy ice to Halifax Harbour, to complete the first winter crossing of the Gulf of St. Lawrence from Quebec by any hydrographic vessel. During the next month she also assisted a DOT vessel in heavy ice on the west coast of Nfld., even before beginning her offshore sounding career in April, 1957.

Ironically, some of her 'state-of-the-art' technology was responsible for one of *Baffin's* earliest and most embarrassing incidents. Before heading north on her maiden voyage to the Arctic, the *Baffin* was on a shakedown cruise in July 1957, surveying off the South Shore of Nova Scotia with the new 2-range Decca positioning system on board. At the end of a sounding line one foggy afternoon, the ship was approaching Black Rock, off Cape LaHave, which was seen on the ship's radar and brought to the hydrographers' attention by the First Officer. They, however, preferred to believe in their brand-new equipment – not knowing that the system had 'jumped' a lane in a rainstorm that morning and was more than a mile in error - and the *Baffin* had an ignominious start to a promising career by running aground (with such 'enthusiasm') that it took five days to refloat her again. She then spent so much time in drydock for repairs that she did not go north that season and had to wait until the following year, 1958, for her first voyage into the Arctic where she surveyed Frobisher Bay.

In 1960 came another milestone when her work in Parry Channel was the most northerly

survey ever done by a hydrographic vessel to that date. On her homeward voyage *Baffin* sailed into the Gulf of Boothia, where she made the first west-to-east passage through Fury and Hecla Strait, to complete the first circumnavigation of *Baffin* Island by a survey ship, and only the second by any ship, the first of which had occurred a little earlier - in 1856.

In May '62, *Baffin* was outfitted with a new automated plotting system and, as a press release of the time stated, "...she will be the first ship of any country to plot both the depth of the water and her relative position automatically." In the next year, the *Baffin* helped Topographic Surveys to accurately position Sable Island - or at least to where it was then - and on a later survey in that year of the Tail of the Bank, she was the first B.I.O. ship to use the 2-range Decca Lambda system.

In the dead of winter of 1964, the *Baffin* sailed into a completely different environment. From January until May she surveyed in Aruba and the British Virgin Islands, working with the Dept. of External Affairs and the Hydrographic Office of the British Admiralty. Working days were from 7 a.m. to 12 midnight, but the fact that *Baffin* "was not a suitable vessel for surveying in the Caribbean" - due to a want of air-conditioning - apparently did not prevent her from surveying in the tropics for at least part of every year for each of the 5 years between 1966 and '70.

The first multi-disciplinary cruise was in the Bay of Fundy in 1964, and the *Baffin* was also used in the investigation of the newly discovered Orpheus (magnetic) anomaly east of Cape Breton. We suspect she made a trip to the Azores around about this time, but were unable to find any reports to support this.

Her 1965 survey on the Tail of the Bank was cut short enroute to Sable Island when her propulsion gearing failed 9 days into the trip, forcing her return to Halifax on one engine. The following year on the same survey, she was plagued with "a lot of adverse weather", culminating with hurricane "Faith", which affected her parallel (or multi-craft) sounding efforts with the launches, to a considerable degree.

Baffin continued this multi-disciplinary survey in 1967, with the *Kapusksing* operating in parallel as a satellite vessel. Software was developed on a PDP-8 computer to convert 2-range Decca Lambda lanes to geographic positions, and an experimental data logging system, the precursor to BIODAL, was tried for the first time, using punched paper tape. High tech had arrived!

In 1968, as well as coping with hurricane "Gladys", *Baffin* calibrated the Decca-Lambda system and evaluated the ITT satellite positioning system, using one of the first satellite receivers available for commercial use, in the multi-disciplinary survey of the Gulf of St. Lawrence. This operation continued through the 1969 survey season.

1970 was one of *Baffin's* most celebrated years. She became the first ship to circumnavigate North America, while the *CSS Hudson* was becoming the first ship to circumnavigate both the Americas, and in fact they worked together in the Beaufort Sea.

In June *Baffin* left Halifax, travelling to Victoria, BC, via the Panama Canal, evaluating digital depth tracking systems on the way, and then headed north towards the Beaufort Sea in company with the *CSS Parizeau*. In the Beaufort Sea sounding lines were run at a 1/4-mile line

spacing, with parallel sounding by launches when the weather permitted. Shoal examinations were done with a uniqueness dictated by the Arctic in an area without a proper positioning system. *Baffin* would guide her launches using Decca and radar fixes. These would then place a buoy on the least depth found, and then *Baffin* would steam alongside the buoy and position it with her own Decca system, since only one of the launches was so equipped.

It was on this survey that the existence of pingo-like features on the bottom was confirmed (78 of them, in fact), which presented definite hazards to navigation in an area where the bottom should have been flat.

The passage between Prince of Wales Strait and Resolute was through 7/10 to 10/10 ice, and here the *Baffin* was positioned at arm's length by the *Hudson's* satnav system. In Resolute, however, *Baffin* took on her own Magnavox satnav system, backed up by Loran-A, and continued on to Thule, Greenland, after 83 continuous days at sea, having become, on Sept.29, the first EM&R vessel to traverse the North-West Passage, much to the dismay of the staff and crew on *Hudson*.

In 1971, she commenced the multi-disciplinary survey of the Grand Banks of Newfoundland and Flemish Cap, where rho-rho Loran-C, synchronized to Satnav, was tested, and found superior to Decca Lambda during periods of poor signal conditions. This system was to become the standard for positioning on offshore surveys for many years to come.

Baffin's 1972 survey season saw HAAPS used for the first time, with limited success, in the Hopedale area of Labrador. In addition, the Range Positioning System, an ancestor of Mini-Ranger, was installed on buoys positioned by Hi-Fix to complete a detailed survey of the Virgin Rocks, southeast of Cape Race, Newfoundland.

In 1973, part of *Baffin's* usual busy schedule had her positioning all the offshore islands, islets and rocks, and fixing control in the Cape Chidley area. She also investigated shoal areas in and around the 'inside' route of the Labrador Coast, which she then did for several years in a row, although the next year again saw her in rather different surroundings.

In the winter of 1974 the *Baffin* was involved in a CIDA-sponsored GEBCO survey of the coast of Guyana. Only a few months later she was back in the St. Lawrence River estuary, where "...as a sounding vehicle *Baffin* is very poor, especially during periods of strong winds and moderate sea.... (if the use of HAAPS is to be continued...(the Development Section) should investigate the market for a more suitable sounder, a less sensitive digitizer and a faster computer." Things still haven't changed!

1976 saw another multi-disciplinary, CIDA-sponsored survey, this time of Senegal & the Gambia, but later she returned to the offshore islands of the Labrador Coast in order to determine Canada's baseline limits for the proposed International 200-mile limit boundary.

The interdependence of the *Baffin* and her launches was once again called upon in 1978 during a survey of the approaches to Davis Inlet. Since the charts gave no indication of the depths in the unsurveyed areas of an extremely uneven underwater topography with depths

that would vary rapidly from 200m to 20m without warning, three launches had to run in parallel a quarter of a mile in front of the ship and relay the clearance back to the *Baffin* by radio. A few weeks later they began surveying in Ungava Bay, most of which had never been sounded, a project which was to continue for the next couple of years.

Baffin worked with *Hudson* again in 1980 on a joint multi-disciplinary survey in Davis Strait, with a side trip to Godthaab, in Greenland. A revised version of BIONAV was installed in the *Baffin* while she was in Brevoort Harbour, the first time it had been used on a production basis during a survey. There were also problems with the Loran-C transmission tower at Saglek, Labrador. The *Baffin* had previously helped with the transportation for the building of the tower in 1979, and this year, when the tower finally collapsed in an ice-storm, she was responsible for bringing home the remaining pieces.

Some of you may have seen the book 'The Chartmakers', by Sandy Sandilands, a history of chartmaking in Canada. It's appropriate that the *Baffin* is on the cover, and in the photo-section on the Arctic. They were taken in 1981 when *Baffin* did a full-scale survey of the Fury and Hecla Strait, this time to determine its feasibility as an alternative tanker route to and from the Arctic oilfields. The survey was barely finished when The Narrows became clogged with ice, and the rest of the Strait rapidly filled up.

Baffin completed her mid-life re-fit in 1982, although that year's alterations took longer than expected and she was late getting back to sea, with work being done on her new davits and launch electronics right up until sailing time. The plotting room had been extended to cover the top deck, and her oceanographic capability had been enhanced by converting the officer's mess to a wet lab (a very unpopular decision!), and installing a much larger winch room on the port side. In addition, she could now carry six launches instead of the previous five. She then proceeded to carry out conventional surveys around Sable Island, and near Davis Inlet, Labrador.

In 1983, Trinity Bay gave poor weather with numerous icebergs and fishnets in the Bay, hampering survey efforts to a certain degree, a sentiment echoed a year later in Passamaquoddy Bay, although there everyone had to cope with lobster nets and buoys as well as dense and continuing fog, rather than icebergs. Due to extreme ice conditions, *Baffin's* 1983 Arctic program in Jones Sound was severely restricted, but she made up for it the following year.

Conventional surveys on the Scotian Shelf, in Trinity Bay and Conception Bay followed in 1984, while the offshore survey program in the fall began to build up a hydrographic/geophysical data bank in support of the International Boundary claims between Canada and France over the continental shelf around St. Pierre and Miquelon, a large, detailed program which was completed the following year. (The culmination of this dispute was just announced on June 10). During the course of this survey, the first sea trials of DOLPHIN were also carried out, and continued through to 1987.

In 1985, *Baffin* completed Loran-C calibrations on the newly established International Boundary on Georges Bank, and carried out the VLCC route survey in the vicinity of Cameron Island, N.W.T.

In 1986, she continued her normal pattern of working in southern waters around Grand Manan before heading north in July for Jones Sound.

The following year, 1987, *Baffin* returned to Passamaquoddy Bay to fulfill Canada's commitment to the U.S.N.O.S. agreement on joint charting of boundary waters. The proliferation of lobster fishing gear hampered launch operations somewhat, but no one seemed to complain too much. The fog-and-lobster pot season continued in 1988.

Later in '88 *Baffin* crossed the Arctic Circle for the last time to chart part of the proposed deep draft tanker route to Bridport Inlet and the North-West Passage south of Bathurst Island. Following the completion of this project, she surveyed along the east coast of Baffin Island, collecting in the order of 23,300 kms of soundings, which permitted the completion of one entire new chart. (I was privileged to have been the Hydrographer-in Charge on this last Arctic cruise.)

Surveys along the northern Labrador Coast continued in 1989, and conventional surveying in Bonavista Bay was carried out in 1990.

During the period 1988-1990, the offshore, multi-disciplinary survey program was carried out on the Scotian Shelf at a denser line spacing (2 kms) than had been previously used. These surveys were conducted in the fall when launch operations would not be feasible due to the usual, seasonably inclement weather.

It was near the termination of her 1990 offshore survey program (December 5th) that *Baffin* had parallel parking problems coming alongside at B.I.O. during a storm, which resulted in her never going to sea again under her own power.

I think it is a fitting tribute given to the *Baffin* in "The Chartmakers" that she "was ... the supremely complete hydrographic ship operating in Canada." Despite her initial setback on Black Rock in 1957, *Baffin* was always in the forefront of testing, evaluating and using the latest navigation, positioning, sounding and data processing equipment, and was the testbed for several systems now currently in use by the CHS, other Hydrographic offices and private industry.

Baffin was, above all else, the ultimate workhorse for hydrographic surveying, and excelled on Arctic and offshore operations. The larger the scope of the survey, the more she produced, and I don't think it's possible for anyone who sailed on her not to feel some regret in seeing her demise, for this ship's retirement marks the end of an era that will never be repeated.

In closing, I would like to thank: Elizabeth Crux, for the many hours she spent in researching Final Field Reports and in assisting with the preparation of this presentation, and Jake Kean for the wealth of information that he provided. As there were a number of reports that could not be located, I sincerely apologize for any errors or omissions.