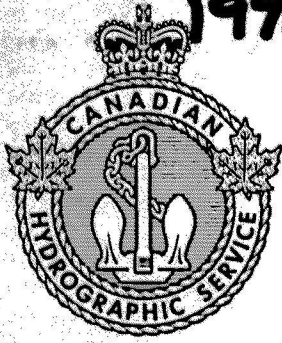
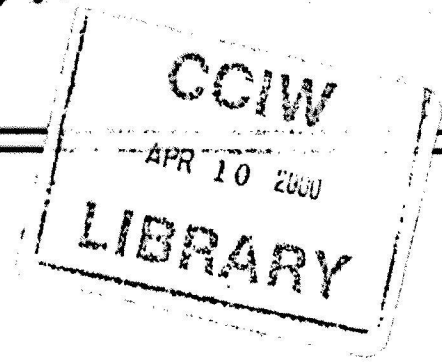


CANADIAN HYDROGRAPHIC SERVICE. Technical Rept
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CENTRAL REGION



ANNUAL REPORT
POLAR CONTINENTAL SHELF PROJECT
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LIAISON OFFICER

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CANADIAN HYDROGRAPHIC SERVICE
MARINE SCIENCES DIRECTORATE
DEPARTMENT OF THE ENVIRONMENT

ANNUAL REPORT

by: H.W. PULKKINEN, LIAISON OFFICER

POLAR CONTINENTAL SHELF PROJECT

1972

FORWARD:

In 1966 the Regional Hydrographer of Central Region in Ottawa, Mr. M. Bolton, assigned me to the P.C.S.P. hydrographic survey section. Since then I have taken part in P.C.S.P. supported winter and summer hydrographic field surveys.

In 1970, when the Hydrographic Section of Marine Sciences Branch moved to Burlington, Ontario, an agreement was made between Hydrographic and P.C.S.P. administration that I remain with P.C.S.P. in Ottawa as a liaison officer in hydrography, to conduct studies of transportation methods and equipment and collect data on arctic research activities and communications.

During the past six years I have become more and more involved in the different kinds of activities at Polar Shelf such as information on arctic data concerning not only the technical and research areas, but information concerning on the type of clothing, food, accommodations in arctic environment, transportation, as well as translation of technical papers and articles in foreign languages. I also am responsible for recording, by means of photography, all arctic activity in the field. The Department of Public Relations and Information use this photography and movie material in T.V. presentations on technical sessions and symposiums, technical presentations in school lectures and hydrographic reports, et cetera.

The dissemination of information and exchange of data is concerned not only with Canadian scientific branches, private agencies, universities, et cetera, but also abroad. Many other countries are interested in the arctic and are taking an active part in arctic research programs in conjunction

with P.C.S.P. as Canadian co-ordinating unit. Up to 75 different scientific and research groups participate in P.C.S.P. activities every year with more than 350 scientists and technical support personnel take part in the arctic program. Communications and personal contacts in this wide variety of activity occurred through correspondence, telephone conversations, personal visits, seminars, conventions, symposiums and annual meetings.

Throughout the seven years with P.C.S.P. 4 to 5½ months of each year is spent in the field, primarily on hydrographic surveys. This is a very brief outline of my activities with the Polar Continental Shelf Project.

The following is a summary of monthly activities for 1972.

FROM DIARY

JANUARY:

1. Continuation in conjunction with National Research Council of Canada on progress of fixed strut modification system which was in the last stage of being redesigned on which I am keeping Dr. Roots, the Polar Shelf Co-ordinator, regularly informed. Dr. Roots requested that I maintain communication with N.R.C. on the project's progress.

The fixed strut system being completely redesigned, I suggested that new tests should be conducted in order to evaluate the performance of the system. Dr. Roots fully supported my view as well as the designer of the fixed strut.

This of course required finding a hovercraft suitable for the trials. The location and arrangements for use of the A.C.V. took a whole year to achieve. (See enclosed correspondence and reports).

2. Editing 16 mm movie coverage for AIDJEX activities at ice camp C-200 during the winter survey operation, 1971. The Arctic Ice

Dynamic Joint Experiment of the University of Washington, U.S.A. conducted combined oceanographic and atmospheric pilot studies in conjunction with hydrographic and gravity surveys for future scientific research work.

3. Establishing a file of technical reports, scientific papers and publication on arctic research in general, charts, maps, photos, etc.

4. Drafting letters for Dr. Roots concerning technical information primarily foreign correspondence.

5. Attending sessions with M.O.T. on A.C.V. programs for the future use of A.C.V.'s in the arctic.

6. Personal visits to N.R.C., C.D.C., Earth Physics Branch, Hydrographic H.Q., **National** Film Board, Film Studios, Tellurometer Can. Ltd., Head Office of E.M.R. and other establishments. All these visits were for the purpose of discussing matters concerning my assignments.

FEBRUARY:

The hydrographic winter project which, according to previous plans, was to start at the usual time in March was postponed until May. In line with these changes, Dr. Roots asked if I would manage Polar Base in Tuktoyaktuk until May and, after replacement, join the hydrographic group in Alert with Mr. Wade. There was very short notice of my assignment. In a few days it was necessary to make final arrangements with N.R.C. on a completion date for the fixed strut modifications, find out most suitable time to N.R.C. engineers for the trials, and make the final payment for work and materials used for fixed strut redesigning.

Several letters were written to persons concerning the possibility of obtaining the hovercraft for trials. The problem was that only one hovercraft in Canada -- the Canadian Coast Guard Hovercraft SRN-5 of Depart-

ment of Transport in Vancouver, B.C., was suitable for fixed strut assembly, mounting and operation.

Making the estimates for expenses of Polar Base operations included over twenty different detailed accounts, and a request for a bank account, cheque books and cash advance.

At the same time Mr. G.D. Hobson was appointed A/Co-ordinator of P.C.S.P. replacing Dr. Roots.

Before my departure to Tuktoyaktuk, I presented to Mr. Hobson a memo briefing him on my immediate program and plans and also informed him of the fixed strut project and possible hovercraft trials. (See memo to G.D. Hobson of February 7, 1972). On February 10th, I left for Tuktoyaktuk. A stopover in Edmonton for 2 days was necessary to order the meat supply from Canada Packers Limited, make arrangements with N-W Transportation on shipment of the equipment and food to Yellowknife.

I visited the Meteorological Branch of D.O.T. concerning the assignment of a technician to Tuk. for setting up the meteorological equipment for weather recordings and instructing the radio operators in the proper recording of weather reports. February 13th: arrived in Tuk. with engineers C. Barmig and W. Resley, the temperature was -57° . From the very moment of arrival the long days on base operation began. I required 4 days to heat the buildings to the normal temperature, clear the snow around the buildings, which was piled up to eave level, clear the landing area for aircraft and helicopters, make contact with local government administrators and business men concerning transportation, water supply, telephone connection, hire kitchen staff and labourers, do immediate repairs around the base, and report to the R.C.M.P. the break-in of the building. All this work was done in short order, so that the base would be ready in time to receive the research groups and guests. By February 17th everything was in order. The Flag was raised and Polar Base was ready

for operations for 1972 field season. This was my 40th marriage anniversary!

February 18th, radio operators arrived (3 men).

February 19th, Decca crew (9 men) arrived. February 20th, the first aircraft landed at base. February 24th, communication was established with Pt. Barrow, Alaska. February 27th, radio contact with AIDJEX ice camp and with all aircraft supporting the Polar Shelf program.

February 28th. The first visitors arrived at Polar Base, the Honourable Dr. Richard Stanbury, Minister of Communications Canada in company with his daughter and 12 members of his ministerial staff. After giving them a brief talk about our base operation and Polar Shelf activity in the Canadian arctic, and after dinner they continued their arctic tour.

MARCH 2nd

The first scientific group arrived, Dr. Keigo Iizuka with two assistant professors from the university of Toronto, for testing the very sophisticated instruments for measuring ice thickness electronically from the air. I assisted him in a reconnaissance flight to investigate the ice conditions for experimental testing. March 8th: Dr. N. Snow, with four men, arrived from the Winnipeg Fishery Research Laboratory. March 9th: Professor of Zoology, Art Martell, University of Alberta, and gravity group from Earth Physics Branch arrived at Tuk.

The base was, by this time, engaged in a daily routine operation. Long hours, from early morning to late night and quite often during the night, when aircraft were flying, were required. The duty of base manager is a 24 hour job. Twelve, fourteen hours are necessary each day for paper work, making salary paylists, bills, expense state-

ments, correspondence and all complexities of financial operations, work which cannot be conducted during busy daytime hours.

March 10: Decca stations in operation. The C-130 made several flights between Polar Base and the AIDJEX Ice camp with equipment and supplies for the Canadian research team.

March 12: I went to Herschel I where the Decca Green slave station was in operation, with two men from Vienna, Austria, who are making a documentary film of the arctic on contract to the AIDJEX project. Herschel I has a special historical interest as everyone knows, and therefore is of particular significance to writers, artists and movie makers.

March 18: -- a bad day. Aircraft OHD grounded - heater U/S. The landing gear did not work properly. B.Q.H. helicopter - Decca receiver U/S, one of the labourers injured back by lifting a fuel drum. March 19, all fixed-wing aircraft airborne again except the helicopter.

March 20: Gravity group finished the first phase of project at Atkinson Pt. and moved camp to Herschel I.

March 21: Dr. Snow, Fisheries Research, completed his project.

March 25 - 31: Working on final statement for the 1971 financial fiscal year and making new estimates for year 1972-73.

March 27: Dr. Roots arrived from Ottawa with Professor Tuzo Wilson and his wife on their way to visit the AIDJEX ice camp. Dr. J.T. Wilson is well known in the scientific world as Professor of Geophysics and Director of the Institute of Earth Sciences at the University of Toronto. March 28th: Dr. Rotts and Dr. Wilson left for AIDJEX camp. March 30th, they returned from AIDJEX and left for the south. Dr. Roots expressed his satisfaction on the successful operation of the base and wished me further success. He also informed me

that the AIDJEX camp will be visited by Russian scientists sometime in April and that he would like myself and Dr. Hans Weber to represent the Canadian Arctic research group and to greet our Russian guests.

APRIL

Operations proceeding similarly as in February and March. The Decca crew commenced establishing the new Decca site on Baillic I, and marked the point for Decca transmitting mast.

April 6th: I went with F. Hunt to Baillic I to carry out a control survey in order to obtain the data for computation of the co-ordinates of Decca master site. Two control positions were recovered, three new stations for observation were erected and triangulated with tellurometer distance measurements.

April 18th: I received a radio message from AIDJEX camp that the Russian guests were on their way and DHT (the twin otter) was coming to transport me to the AIDJEX camp. On April 19th I arrived at ice camp. The weather was excellent, but the Russians' arrival was delayed because of bad weather off the Russian coast. April 21st was the first direct radio communication established with Russian North Pole station No. 19. The conversation was carried out in Russian language. Finally, on April 24th, the three Russian scientists of the Arctic and Antarctic Scientific and Research Institute of Leningrad arrived by C-130 via N.P. 19 and T-3 stations.

April 26th: I returned to Tuk. by Beechcraft "ATE" via Pt. Barrow. The co-ordinator of the AIDJEX camp, Dr. N. Untersteiner expressed his gratitude to me in Russian - English conversations. I presented a report to Dr. Roots of details about my two-day meeting with Russian arctic experts.

There is a large variety of responsibility in making the

right decision at the right time, especially in planning daily operational program for research parties, correct utilization of aircraft, flight plans, particularly when several projects are often in progress at the same time.

To satisfy every one, you have to make some compromises, because it is difficult in the field to determine which project has first priority for use of the aircraft or helicopters.

During my period in charge of the base from February 10th to June 1st, twenty-four different scientific and research groups with totaled 110 men, not counting the visitors and guests which was up to 220 persons, passed through Tuk. "Polar Base".

In service under seasonal contract were three helicopters, and three fixed-wing aircrafts. In addition to this, we used charter aircraft and helicopters.

My replacement by the first of May was not accomplished, because Ed Chapman, the base manager from Resolute Bay, was unable to get his replacement and this forced me to remain in Tuk. until June, which kept me from joining the hydrographic survey in Hares Strait.

My return to the Ottawa office June 5th did not release me from my management duties because the financial operation was still on my responsibility. I became so-to-speak the treasurer, not only for Tuktoyaktuk base, but for all field expenditure operations of Polar Shelf; paying salaries of all casual employees across the arctic and this work alone required daily attention.

From June 11th to June 14th I attended the sixth air cushion Technology Symposium in London, Ontario. I am a member of the Canadian Aeronautics and Space Institute.

On my way back to Ottawa from London, I stopped in Burlington at the Central Region's office and gave an oral report of my activity

to Mr. H.R. Blandford and to Mr. T.D.W. McCulloch.

On my return to Ottawa, I presented Mr. Paul Brunavs the Nautical Geodesy section with the observation notes for Baillic I, and wrote descriptions of the newly erected stations. The latter part of June was spent on salary paylists. Payment of salaries for casual employees was behind schedule because of delays in receiving the time sheets and to speed up payments from June 19 up to June 25, worked in office up to 7 p.m. some evenings.

During the last part of June and July, I was involved in more definite arrangements with MOT concerning use of the C.C.G. Hovercraft for trials of the fixed strut assembly. My earlier plan to visit the C.C.G. Unit in Vancouver was not realized because of the delay in returning to Ottawa from Tuk. On July 1st, I wrote a report for G.D. Hobson on my future involvement on this matter. (See report of June 28, 1972.) On July 17th, I left Ottawa for Tuk. to continue the control survey in Amundsen Gulf for the Decca sites; Baillic I, Pearce Pt. and Cape Baring. However, on my arrival at Tuk. the plan was changed. First Mr. F. Hunt was not available to participate in the survey and secondly, the helicopter was not available because of a prior commitment to move the Decca equipment to new sites and to fly to the Eastern Arctic, members of the Palaeontology groups, National Museum.

The co-ordinator, G. Hobson, was at the base at that time and asked me to take charge of the base so that Ed Chapman would be able to go on leave.

These duties I carried out until August the 6th, after which Ed Chapman returned from holiday. It was agreed that I return to Ottawa because the helicopter would not be available until September, so, in the meantime, I was able to make final arrangements concerning

the hovercraft and visit Vancouver for final arrangements.

On August 6th, I left Tuk. for Edmonton with a stop over in Edmonton for a day at the invitation of Dr. Roots to meet the delegates of the A66 International Geological World Congress at the University of Alberta. The 80 scientists from 24 different nations under direction of Dr. Roots made an 11 day flight tour across the Canadian Arctic.

On August 8th, I left for Vancouver to meet the commanding officer of C.C.G. Unit, Capt. Wiseman, and officials of the Department of Transport to discuss the possibilities to using the hovercraft for the trials. The discussion was very productive.

August 10th: I took the opportunity of visiting the Pacific Region Hydrographic Office in Victoria. During the conversation with Mr. M. Bolton and N. Anderson concerning the trials, the suggestion was made that we use the motorola RPS system for the purpose of determining a more accurate speed for the craft. In this respect, Mr. Bolton very kindly offered his full support of the project, and to provide equipment and men to install the RPS on the hovercraft and set up two transponders on established control points.

On August 12th, I returned to Ottawa and again continued with the payment of salaries and accounts, and writing reports to Mr. Hobson on developments concerning hovercraft arrangements (see report of August 15, 1972).

I have written several formal letters concerning the estimate of cost for trials, make final payment to N.R.C. for modification work and materials on fixed strut, and costs of trial participation by N.R.C. personnel, as well as shipment of the fixed strut equipment to Vancouver.

September 6th: I left Ottawa for Tuk, hoping to complete the control survey for Decca chain, in Amundsen Gulf. On arrival at Tuk., the first two days was busy paying the bills and salary.

September 10th: With F. Hunt, left on survey work using XRV, (205A helicopter).

September 14th: Returned to Tuk., observed positions for Decca master, 2nd Station was recovered, 5th Station built and observed.

The proposed traverse, about 40 miles from Baillic I Decca Green slave to Frankling Bay was required in order to tie the preliminary position to the main geodetic net. This project required camping out because the helicopter was required by the Decca crew to put the Decca stations in operation. I reported the situation to Mr. Brunavs, the Nautical Geodesy section, by telephone to Ottawa, and he suggested that if traverse could not be completed, would it be possible to take a sun azimuth at Baillic master tower to get an additional check on positions. That same day I landed on Billic I to obtain sun observation. I remained for 7 days, and during these 7 days the sun appeared only once through the clouds for a few minutes, giving time for only a couple of shots.

September 21st: I returned to Tuk. On September 22nd I left for Vancouver to meet the chief engineer of C.C.G. unit to clarify some misunderstanding in technical matters concerning the trials and final arrangements, and shipping time for the fixed strut equipment. I also had a telephone conversation with N. Anderson in Victoria concerning the coming trials. On September 24th, I returned to Ottawa.

OCTOBER:

Presented observations for Decca control survey to

Mr. Brunavs, wrote up station descriptions for nautical geodesy files. Continued financial responsibilities as usual. Continued negotiation with NOT, N.R.C. and Hovercraft unit, by telephone, by mail and personal discussing. Considered the possibilities of how and where to produce the Decca sheets for Amundsen Gulf, because through the C.D.C. the work becomes very expensive and therefore arrangements were made that when the co-ordinates of the Decca stations become available, the computation and compilation of the master sheet would be done by Mr. H. Furuya. The charting Development Division of Marine Sciences Branch in Ottawa requested 300 copies of this sheet from Surveys and Mapping Branch.

November 12th - 19th: Scientific sessions were held in Ottawa on a program of arctic research between Russia and Canada based on an agreement for scientific and technical exchanges. Dr. Roots, the co-ordinator of these discussions, asked me to take part in these sessions on topics of concerning co-operation in arctic research between P.C.S.P. and AASRI in Leningrad. Plans were made as far ahead as 1980 on scientific data and technological exchanges.

Finally after a long period on communications and by means of channels we confirmed the hovercraft reservations. The green light was given by Capt. J. Green, A/Commandant of the Canadian Coast Guard, Department of Transport, hovercraft would be available for our use. Capt. Wiseman the OIC of the C.C.G. unit came to Ottawa and I had a meeting with him to set the date for trials, which was for December 11th. From that moment every thing followed as planned. All estimates for for trial expenses were made up. I made a payment to N.R.C. for shipment of 200 lb. to Vancouver, for engineers to travel and a 10 day stay in hotels. By earlier request I received Edo sounder and transducer for trials from Hydrographic Office in Burlington.

Persons who might be interested in observing the trials were notified. A letter from Mr. Bolton confirmed that hydrographer P. Lee was ready to go to Vancouver on request on the date set and also that a technician would be on hand to install the RPS on hovercraft.

December 10th - Off for Vancouver for trials. Trial Period: December 11th - 18th. On December 19th, left Vancouver for Ottawa. (My golly, 62 years old today.) December 20th - 29th on leave. The trials were very successful with good results. The actual report on trials will follow as soon as all data on trials become available from N.R.C.

CONCLUSION:

Looking back in my report, I was unable to separate my duties between the Hydrographic Service and Polar Shelf. My service as base manager seems directly concerned with Polar Shelf, however in purely administrative work. I have been involved in a variety of technical functions; assisting research groups, for example; because of my past experience I am able to relay information and make suggestions regarding many practical proposals, knowledge of arctic ice structure and conditions for obtaining working results with electronic equipment were helpful.

All this gives me great personal satisfaction and provides me an opportunity to learn more which I consider to be my training through practise.

H.W. Pulkkinen
Polar Continental Shelf Project.