

CANADIAN HYDROGRAPHIC SERVICE
MARINE SCIENCES DIRECTORATE
DEPARTMENT OF THE ENVIRONMENT
BURLINGTON, ONTARIO

1972 LAKE OF THE WOODS SURVEY
PROJECT NO. 6600-62-1

BY

J. V. CROWLEY
HYDROGRAPHER-IN-CHARGE
CENTRAL REGION

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STAFF ASSIGNMENTS

MORSON

		<u>Morson</u>	<u>Sub-Party</u>
J.V.Crowley	Hydrographer-in Charge	May 1-Sept.22	
J.M.Gervais	Hydrographer	May 10-Sept.13	
R.K.Beri	Hydrographer	May 15-Sept.13	
D.Kimmett	Hydrographer	May 10-July 16	July 17-Sept.2
R.D.Rose	Student Assistant	May 15-July 17	July 18-Aug.12
N.Bartlett	Student Assistant	July 13-Sept.3	May 15-July 12 Sept.4-Sept.12
R.Desilets	Electronic Technician	May 9-Sept.5	

PLOT 12 SUB-PARTY

J.F.Mc Carthy	Sub-Party Chief	May 12-15 Sept.13-22	May 15-Sept.12
E.I.Norman	Hydrographer	May 17-19	May 20-Sept.12
J.Medendorp	Hydrographer	May 7-May 14 July 12-25	May 15-July 11 July 26-Sept.12
R.Mahaffy	Hydrographer	Aug.14-15	Aug.16-Sept.13
M.Grant	Hydrographer	Aug.16-27	Aug.28-Sept.10

HELICOPTER PERSONNEL (M.O.T.)

A.Perley	Pilot	May 29-June 6	
H.Strolenberg	Engineer	May 29-June 6	

LIST OF CRAFT AND MAJOR EQUIPMENT

CSL GANDER 36' Steel pontoon floating workshop, outboard powered

CSL WOODCOCK 23' Steel hull, Twin OMC V-6 engines, stern drives

CSL PACER 23' Fibreglass, tunnel-drive, Chrysler "250" V-8, inboard

CSL HUNT 21' Fibreglass, twin Volvo "130's" (4 cylinder) Volvo stern drives

CSL HUSKY 21' Fibreglass, Volvo stern drive and Volvo "165" (straight 6) engine

CSL HAWK 21' Fibreglass, Volvo stern drive and Volvo "165" (straight 6) engine

CSL HARPIE 21' Fibreglass, Volvo stern drive and Volvo "130" (4 cylinder) engine

CSL JAY 21' Lapstrake, 80 hp Mercury outboard

BOSTON WHALER 17' Fibreglass, 60 hp Evinrude outboard

STARCRAFT 12' Aluminum, 20 hp Mercury outboard

One Chevrolet Carryall O-183

Three Boat Trailers

One Office Trailer

One Helicopter, CF-DOB (May 29 - June 6)

PLANNING AND PREPARATION

Since "the best laid schemes o' mice and men gang aft a-gley" it is not surprising to find the Lake of the Woods survey unfinished at season's end. Plans and preparations for the 1972 season hardly fell into the "best laid" category but results, nevertheless, were as the bard predicted.

We had intended to survey two full-sized field sheets, 3769 (plot 11), and 3770 (plot 12), on the west side of the lake, as well as one smaller sheet, 3768, (plot 6, Obabikon Lake), which had been overlooked during the 1970 and 1971 seasons. This would have concluded Central Region's commitment in the Lake. A modest geo-technological program to measure hydrodynamic parameters on the western side of the lake was also undertaken. As in past years, accommodation arrangements were made with Mr. L. Cadieux of Fort Frances. He was to supply house trailers and catering service for the main party at Morson as well as house-boat accommodation for an eight man sub-party in the plot 12 area. (See Appendix "A", Sub-Party report.) Storage space, office space and wharfage at Morson were to be obtained from Dalseg's Ltd., a local merchant.

OPERATIONS

Three weeks of on-site preparation were necessary to bring the field party to an operational level on May 17th, with the commencement of the sounding. By this time the sub-party had been established in temporary quarters at Centre Island, with two sounding launches ("Hunt" and "Woodcock") and a 17' Boston Whaler. (The house-boat accommodation plans were among the first plans to be scratched.) The main party, established at the Cadieux trailer complex at Morson, operated three sounding launches ("Harpie", "Hawk" and "Husky"), with the "Pacer", a new "tunnel-drive", operating spasmodically early in the season.

Helicopter Operations

The aerial spotting and bombing of shoals was initiated late in May with the arrival of helicopter CF-DOB. This operation continued until all visible shoals had been marked on aerial photos and all of our shoal buoys were dropped. The largest concentration of this activity was in the plot 12 territory. The helicopter left on June 6th.

Positioning

By the end of June most of the regular sounding coverage had been run on all three sheets and the shoal examination program begun. Drying rocks and aids to navigation were positioned as they were encountered, with each hydrographer being responsible for the completion of a specific territory. Most launches ran with a compliment of three men. One carried four. Positioning was done by the conventional sextant re-section technique, using photo-positioned sounding marks, ends of prominent islands, and points of land for targets. Because of the inherent inaccuracies and distortions in the uncontrolled shoreline plots, it was attempted, wherever possible, to obtain fixes within a triangle, using the nearest land to the launch.

Sounders

Bathymetry profiles were recorded exclusively on Edo 9040 depth sounders. Several launches had holes in the hull into which the transducer was plugged. These craft obtained graphs of comparable quality to those obtained by the craft that had no holes cut in their bottoms. However the transducers that hung through the hulls proved to be susceptible to damage caused by accidental groundings. Rocks frequently abraded and lacerated the rubber shield of the transducer, rendering the transducer inoperative. It is recommended that future transducer installations be of the enclosed "well" type, if the craft is of fibreglass or metal construction and is to be used in shallow waters.

Datum

As in previous years, the sounding datum for Lake of the Woods was taken to be 1058.42 G.S.C., which is the same elevation as 1059.00 L.W.D. as reported by the permanent gauges of the Water Resources Branch. We referenced a new water level staff at Morson to Geodetic control and confirmed the W.R.B. gauge readings at Hanson Bay. This gauge was checked against W.R.B. bench marks. Daily comparisons between these two gauges confirmed the lake level within a tolerance of about one inch. This season the lake level rose from an initial level of three inches below datum to a high reading of 1.2 feet above datum at the end of August.

Hydrodynamics

The hydrodynamics program was handicapped at the start by the late arrival of our two water level gauges, and the subsequent refusal of one of them to hold its pressure. The operative instrument was installed at Camp Bay, on the north shore of Big Island, where it functioned until September 17th. This record has been forwarded to the Geo-Technology group at Central Region.

Field Sheets

On the route to FS 3769, the Morson based launches were required, twice daily, to traverse the area of the previous year's field sheet. During the course of these trips, over a variety of routes, it became apparent that FS 3653 was lacking some rock heights and shoreline detail. A revisory effort was undertaken to determine the extent of this deficiency and to rectify it. Most of the problems subsequently found were more of a topographic nature than strictly hydrographic. Several small islands displayed on the field sheet were not found in the lake. Several islands in the lake were not portrayed on the field sheet.

Many drying rocks, sand bars, and rocks-awash had been omitted from the field sheet. Many elevations of dry rocks had been omitted, indicating by "reference note" that these rocks were wooded. Several elevations of dry rocks were found to be grossly in error. Several new shoals were discovered. Field sheet 3653 has subsequently been amended and submitted to headquarters. It is recommended that in future projects of this type, sufficient emphasis be placed on the thoroughness of the survey coverage, (as distinct from the sounding coverage). Priority resource deployment precluded any attempt on our part to evaluate or revise any other of the previously submitted sheets.

Field sheet 3768 (Obabikon Lake) and 3769 (Falcon Island and Big Island) have been completed at a scale of 1:20,000 and submitted to headquarters. Field sheet 3770, also at a scale of 1:20,000, requires further field work to complete. It will be sent back into the field with the 1973 party.

Launches

No significant problems were experienced with any of our 6 fiberglass hulls, one wooden hull or one steel hull. Engines were a different story. The 4 cylinder Volvo "130's", the OMC V-6's, and the Mercury outboards were the only pieces of machinery that worked right. All of the stern drives, Evinrude outboards, the Chrysler inboard, Volvo 165's and 170's were continually breaking down.

The "Pacer", a new tunnel-drive powered by a V-8 Chrysler "250", worked only 10 days all summer. After breaking push-rods, rocker arms, exhaust manifolds and filling her cylinders with water after a brief encounter with some muskeg gunk, she never worked right. When she developed an oil pressure problem on July 14th, assistance was requested from Ships Division. Two months later a delegation from CCIW arrived to tow her back to Burlington.

The tunnel-drive configuration has not been given a very thorough appraisal. From our 10 days of operation the following observations are offered. She is well layed out for sextant sounding. The transducer, installed in a sealed well amidship, produced a good record. The propeller and rudder remain unscathed.

The "Jay" an old wooden Mason was used as a utility craft for most of the summer. Attempts to acquire a Raytheon sounder to fit her transducer had been unsuccessful. We eventually converted her into an Edo sounding craft by placing a spare Edo transducer and 50 gallons of water in the bilge. Contrary to predictions, a good echo was obtained by shooting through the hull.

DEMOBILIZATION

As the end of the season approached, an effort was made to remove our sounding marks. All of the stations on plots 11 and 12 were removed, as well as most of the ones left over from previous years' work on plots 8, 9 and 10. It is anticipated that in future this type of clean-up operation should become standard practice on hydrographic surveys.

On September 15th, most of the staff and crew left for home. Much of the gear was shipped by CNR to CCIW in Burlington. The remainder was trucked to Winnipeg and Selkirk. All of the launches (save the "Hunt" and "Pacer" which were trailered to Burlington), were trailered to Winnipeg and stored at Northland Freight and Forwarding Company's warehouse. Our office trailer, two boat trailers, and miscellaneous gear were stored at the Hydrographic Depot at Selkirk. Our pontoon craft, "Gander" was steamed to Kenora where it was loaded onto a flat-bed for the trip to Manitoba. It also sits in the government yard at Selkirk.

RECOMMENDATIONS

The Morson based launches were obliged to steam for 1½ to 2½ hours each day to arrive at the working area. Besides taking 3 to 5 hours out of even the best working day, this situation put an unnecessary strain on men and machinery as well as seriously curtailing our operational flexibility. Obviously under these conditions, an early start in the morning was imperative and even minor breakdowns were enough to incapacitate a boat for a day (and sometimes two boats if the first needed a tow). It is recommended that in future some thought might be given to establishing parties of this nature in the work area. This is particularly pertinent where commercial facilities are available.

It is recommended that the Volvo machinery be phased out and that the largest OMC engines and stern drives be installed in all of the launches presently powered by Volvos.

PLOT #12 SUB-PARTY

May 15 to September 12, 1972

Project No. 6600-62-1

Hydrographer-in-Charge

J. F. Mc Carthy

NARRATIVE

Operations Plot #12 Scale 1:20,000

The sub-party of the Lake of the Woods survey was activated on May 15th, and was moved to Centre Island. The building of survey stations commenced on the 16th, and sounding operations with two launches were underway on the 17th. Due to excellent weather conditions and diligent work on the part of the survey staff, production progressed very favourably in the months of May and June, at which time the sounding lines had been completed on Plot #12 (F.S. 3770).

In the month of July, shoal examinations got underway. All bottom samples were taken and the position of all buoys were checked. On July 20th the sub-party moved to Spruce Island Camp. By the end of July it was apparent that with the amount of shoals which were appearing, more help would be required if we were going to come even close to completing Plot #12. At this time a request was made for more boats, and by mid-August the C.S.L. Hawk joined us with staff and crew, and on August 28th the C.S.L. Harpie also joined us with staff and crew.

? ———— September flashed in our faces, and it was quite apparent that the plot would not be completed due to the thousands of shoals in the area. On September 12th, the sub-party moved to Morson for winter lay-up.

All soundings were positioned by sextants and photo identification on aerial plots.

Helicopter D.O.B. (206A - Bell Jet Ranger)

During the first week of June, five hundred and twenty five buoys were dropped on shoals up to a depth of 6 to 7 feet. Unfortunately the limited time factor involved did not permit continuation of this work to its completion, and the visible shoals remaining were identified on aerial photographs.

Electronic Equipment

The Edo 9040 depth recorder worked well throughout the season with just minor breakdowns.

The Marconi C.H. 25 radio in the C.S.L. Hunt worked exceptionally well all season up to 35 miles. The C.H. 25 radio in the C.S.L. Woodcock did not operate well whatsoever and seemingly could not be repaired. All launches also carried Motorola P.T. 300 transceivers with them so that radio contact was always there.

Launches

The C.S.L. Hunt and C.S.L. Woodcock were assigned to the sub-party. Both launches ran exceptionally well as far as engines were concerned. The hulls withstood the hardship which was quite severe on this type of survey. The outdrives on both launches were constantly being repaired due to either mechanical breakdown or being smashed on rocks. The steering in the C.S.L. Woodcock experienced a fair amount of trouble and at one point had to be replaced completely. The C.S.L. Hunt experienced a leak between the lower unit and the engine and was inoperative for three weeks waiting for a bell housing.

The Boston Whaler has damage to its bow after the season's wear and tear. The outboard motors which were used on the Boston Whaler (4) were four to five years old and did not stand up to the wear and tear, and were being changed frequently.

CONCLUSION AND RECOMMENDATIONS

The calibre of the majority of coxswains which worked for the sub-party was well below the acceptable level. These men were just not capable of handling or looking after a launch, and I recommend a more efficient screening of crew before the field season commences.

APPENDIX "B"

S T A T I S T I C S

1972 LAKE OF THE WOODS SURVEY

Project No. 6600-62-1

Hydrographer-in-Charge
J.V. Crowley

Establishment <u>Lake of the Woods Survey</u>				
H.I.C. <u>J. V. Crowley</u>				
	Project Number	Project Number	Project Number	Project Number
Project Name <u>Lake of the Woods</u>	6600-62-1			
Project Name _____				
Project Name _____				
Project Name _____				
<u>Resources :</u>				Tot.
Number of Hydrographers	* 7/894			
Number of Scientists	* NA			
Number of Electronic Technicians	* 1/120			
No. of Student Assistants and Casuals	* 2/97			
No. of support personnel (Ship's Crew etc.)	* 15/1586			
Total Personnel	* 25/2697			
Number of Ships	NA			
Number of Launches	6			
Number of Land Vehicles	1			
Number (and type) of Aircraft	1 Helicopter, 10 days			
Number of Minor Support Staff	3			
Other (specify) Pontoon Workshop	1			

* Should provide two figures separated by a slash. The first figure being the average number on strength and the second being the man days. e.g.-number of Hydrographers: 5/100 (an average of 5 hydrographers spent 100 man days on the project).

YEAR 1972

FROM May 1

TO September 23

APPENDIX "B"

Establishment	Project Number	Project Number	Project Number	Project Number	Total
Lake of the Woods Survey					
H.I.C. J. V. Crowley					
<u>Time:</u>					
Total operational days.	146				
Days actual field work.	96				
Days lost (weather)	3				
Days lost (Sat. Sun. Holidays)	25				
Days lost (Equipment failure)	13				
Days lost in Transit	9				
Days lost in port for Supplies, Bunker, etc.	NA				
Days lost, other causes	NA				
Total Man days in period (staff)	1111				
Total Man days worked (staff)	1069				
Man days:- (staff)					
(a) Sounding	234				
(b) Shoal Examinations	468				
(c) Wharf surveys	NA				
(d) Oceanography	NA				
(e) Geophysics	NA				
(f) Tides & water levels	2				
(g) Collecting bottom samples	3				
(h) Horizontal Control	NA				
(i) Shorelining & Low Watering	NA				
(j) Data processing & office admin.	201				
(k) Sailing directions	NA				
(l) Place Names	3				
(m) Current observations	NA				
(n) Photo-Ident.	5				
(o) Others (specify)	NA				

YEAR 1972

FROM May 1

TO September 23

APPENDIX "B"

Establishment	Lake of the Woods Survey	Project Number	Project Number	Project Number	Project Number	Tot.
H.I.C.	J. V. Crowley					
<u>Sounding (Linear Nautical Miles/KM):</u>						
Ship Sounding		NA				
Launch Sounding		2650				
Other (specify)		NA				
Total sounding		2650				
Reconnaissance (Track) sounding		NA				
Area sounded (N.M ²) (Km ²) N.M ²		170				
<u>Shoals Examined:</u>						
Shoal Examinations (Ship)		NA				
Shoal Examinations (Launch)		1776				
Shoal Examinations (Sweep)		NA				
Shoal Examinations (other) specify		NA				
Shoal Examinations (Total)		1776				
<u>Navigational Aids:</u>						
Shore Aids Positioned (including ranges)		18				
Floating Aids Positioned		56				
Navigational Ranges Sounded		1				
Navigational Ranges Drifted		NA				
Sector Ranges Positioned		NA				
Navigational Aids Established		NA				

YEAR 1972

FROM May 1

TO September 23

APPENDIX "B"

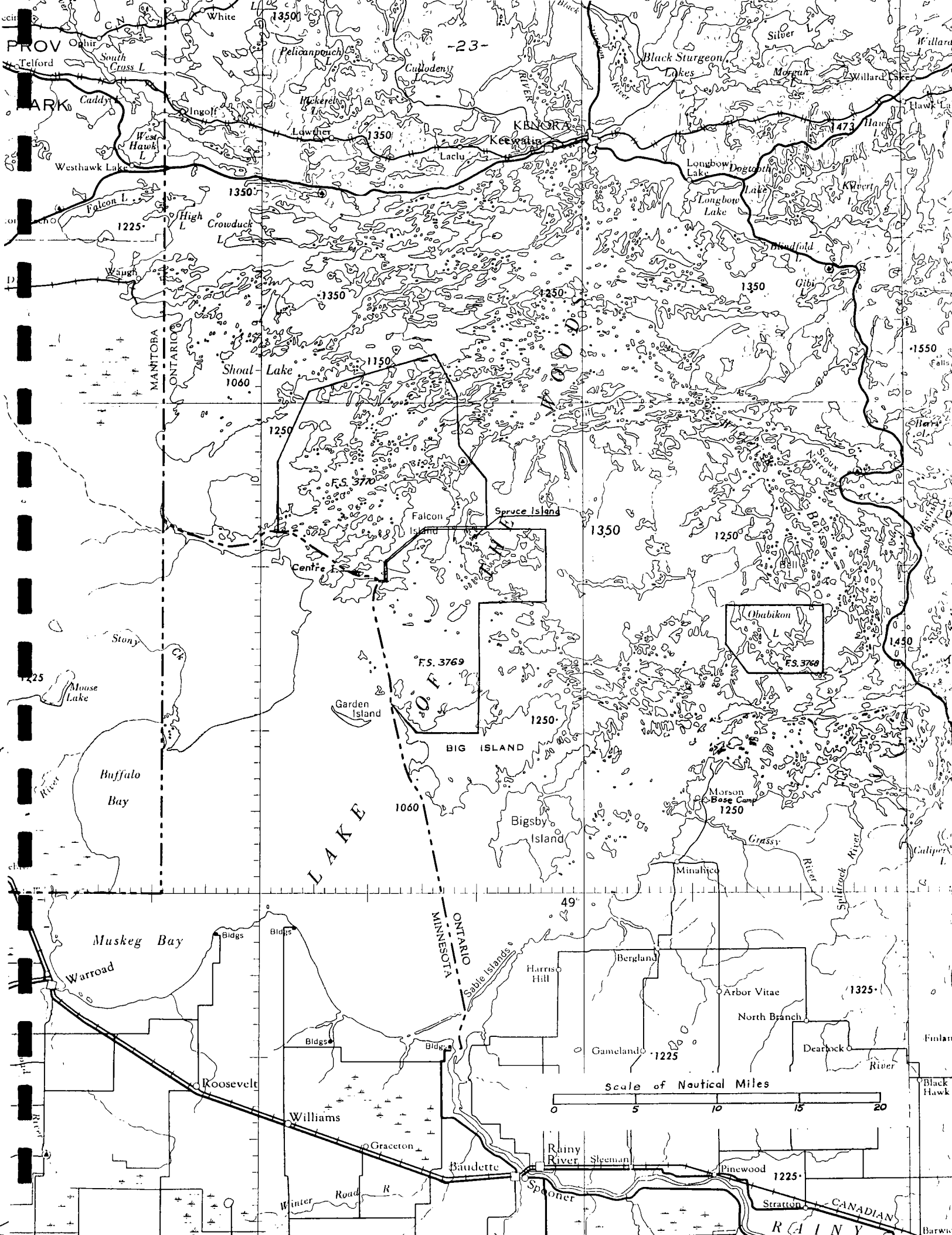
Establishment	Project	Project	Project	Project	Total
H.I.C.	Number	Number	Number	Number	
Lake of the Woods Survey					
J. V. Crowley .					
<u>Tide and Current Data:</u>					
Recording gauges established	1				
Recording gauges recovered	1				
Staff gauges established	3				
Bench Marks Recovered	3				
Bench Marks Established	-				
Bench Marks Levelled	3				
Distance Levelled (N.M.) (KM)	1				
No. of Current Meters Set Out	NA				
No. of Current Meters recovered	NA				
No. of hours of Current Measurements (Other than with Moored Meters)	NA				
<u>Oceanography:</u>					
No. of Oceanographic stations	NA				
Gravity Profiles-survey (N.M.) (KM)	NA				
Gravity Profiles-track, (N.M.) (KM)	NA				
Magnetic Profile-survey (N.M.) (KM)	NA				
Magnetic Profile-track, (N.M.) (KM)	NA				
Seismic Profile-survey (N.M.) (KM)	NA				
Seismic Profile-track (N.M.) (KM)	NA				
Number of Water Samples	NA				

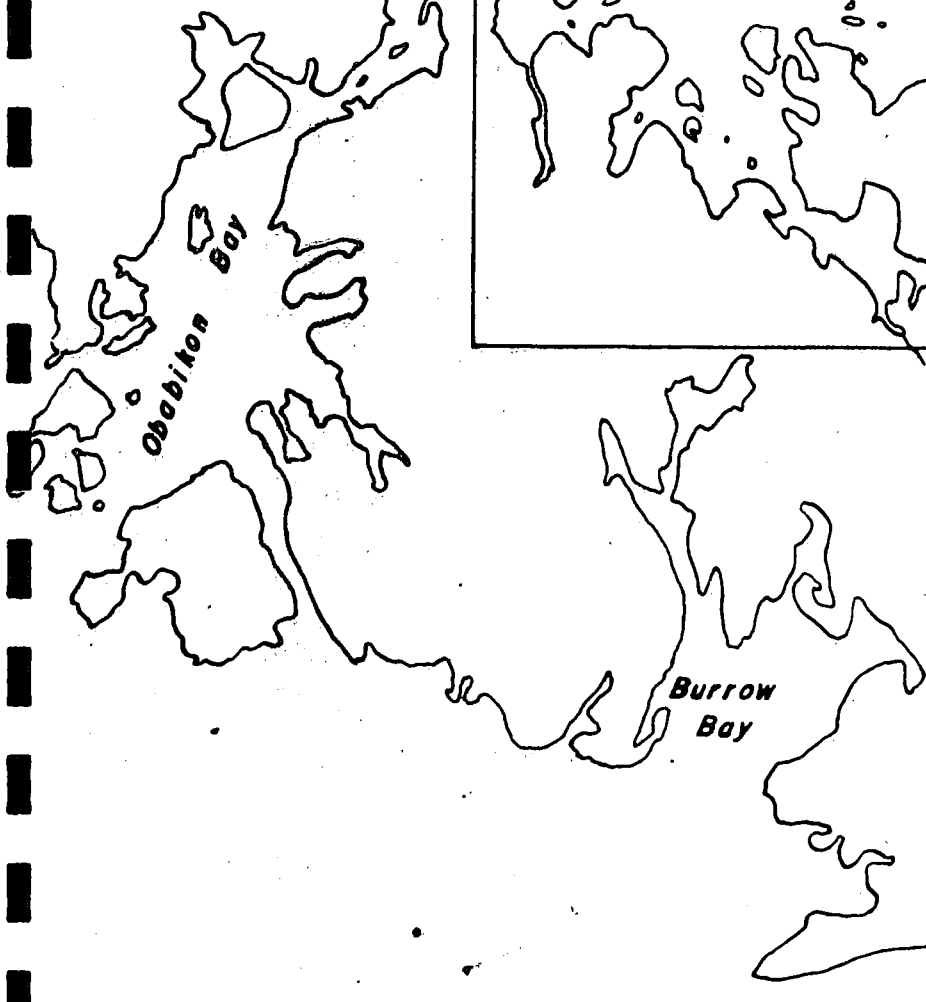
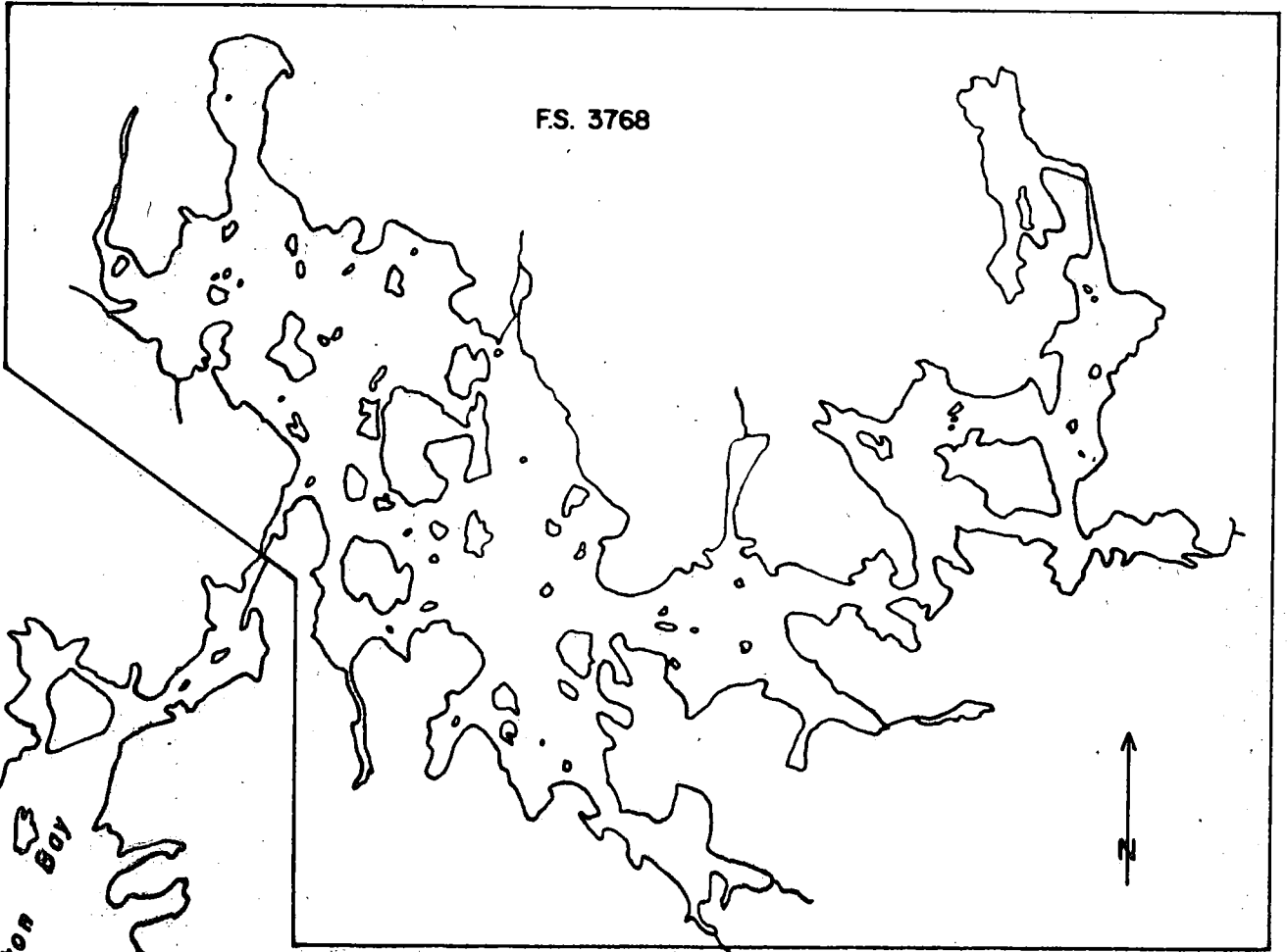
D I A G R A M S

1972 LAKE OF THE WOODS SURVEY

Project No. 6600-62-1

Hydrographer-in-Charge
J.V. Crowley





Obabikon Lake

