

TP-01089

TP-01089

NOAA FORM 76-35

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

## DESCRIPTIVE REPORT

<sup>T</sup>  
This Map Edition will not be Field Edited

Type of Survey ... Shoreline .....  
Job No. CM-8008 ..... Map No. TP-01089 .....  
Classification No. III ..... Edition No. ....1.....

### LOCALITY

State ..... Minn - Wisc .....  
General Locality ..... Oliver .....  
Locality ..... St. Louis River .....  
.....

19 80 TO 1981

### REGISTRY IN ARCHIVES

DATE .....

MAP NOT INSPECTED BY  
QUALITY CONTROL OF PHOTOGRAMMETRY DIVISION  
PRIOR TO REGISTRATION

NOAA FORM 76-36A (3-72)		U. S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMIN.	
<b>DESCRIPTIVE REPORT - DATA RECORD</b>		TYPE OF SURVEY <input checked="" type="checkbox"/> ORIGINAL <input type="checkbox"/> RESURVEY <input type="checkbox"/> REVISED	
PHOTOGRAMMETRIC OFFICE  Rockville, Md.		SURVEY TP-01089  MAP EDITION NO. (1)  MAP CLASS III  JOB <del>PH</del> CM-8008	
OFFICER-IN-CHARGE Cdr. Simmons		LAST PRECEDING MAP EDITION TYPE OF SURVEY <input type="checkbox"/> ORIGINAL <input type="checkbox"/> RESURVEY <input type="checkbox"/> REVISED	
JOB PH-		MAP CLASS SURVEY DATES: 19__ TO 19__	

I. INSTRUCTIONS DATED	
1. OFFICE	2. FIELD
Aerotriangulation, October 10, 1980 Refer to; "Vertical Datum Reference for Map Features, Photogrammetric Surveys, Great Lakes" dated July 13, 1976.	Field, April 17, 1981

II. DATUMS							
1. HORIZONTAL: <input checked="" type="checkbox"/> 1927 NORTH AMERICAN	OTHER (Specify)						
2. VERTICAL: <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> MEAN HIGH-WATER           <input type="checkbox"/> MEAN LOW-WATER           <input type="checkbox"/> MEAN LOWER LOW-WATER           <input type="checkbox"/> MEAN SEA LEVEL         </div>	OTHER (Specify) International Great Lake Datum 1955						
3. MAP PROJECTION Conformal Lambert	4. GRID(S) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">STATE</td> <td style="width: 50%;">ZONE</td> </tr> <tr> <td>Wisconsin</td> <td>North</td> </tr> <tr> <td>STATE</td> <td>ZONE</td> </tr> </table>	STATE	ZONE	Wisconsin	North	STATE	ZONE
STATE	ZONE						
Wisconsin	North						
STATE	ZONE						
5. SCALE 1:5,000	STATE						

III. HISTORY OF OFFICE OPERATIONS		
OPERATIONS	NAME	DATE
1. AEROTRIANGULATION BY	S. Solbeck	12/81
METHOD: <u>Analytic</u> LANDMARKS AND AIDS BY	S. Solbeck	12/81
2. CONTROL AND BRIDGE POINTS PLOTTED BY	A. Bethea	1/82
METHOD: <u>Calcomp</u> CHECKED BY	J. Schad	2/82
3. STEREOSCOPIC INSTRUMENT PLANIMETRY BY	J. Schad	2/82
COMPILATION CHECKED BY	P. Dempsey	2/82
INSTRUMENT: <u>B-8</u> CONTOURS BY	N/A	
SCALE: <u>1:5,000</u> CHECKED BY	N/A	
4. MANUSCRIPT DELINEATION PLANIMETRY BY	J. Schad	2/82
CHECKED BY	P. Dempsey	2/82
METHOD: <u>Instrument worksheet</u> CONTOURS BY	N/A	
CHECKED BY	N/A	
HYDRO SUPPORT DATA BY	N/A	
SCALE: <u>1:5,000</u> CHECKED BY	N/A	
5. OFFICE INSPECTION PRIOR TO FIELD EDIT BY	N/A	
6. APPLICATION OF FIELD EDIT DATA BY	N/A	
CHECKED BY	N/A	
7. COMPILATION SECTION REVIEW BY	P. Dempsey	5/82
8. FINAL REVIEW BY	J. Taylor/J. Schad	10/83
9. DATA FORWARDED TO PHOTOGRAMMETRIC BRANCH BY	N/A	
10. DATA EXAMINED IN PHOTOGRAMMETRIC BRANCH BY		
11. MAP REGISTERED - COASTAL SURVEY SECTION BY	E DAUGHERTY	NOV 1984

NOAA FORM 76-36B  
(3-72)U. S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

## COMPILATION SOURCES

TP-01089

## 1. COMPILATION PHOTOGRAPHY

## CAMERA(S)

RC-8 Focal Length 152.71

TYPES OF PHOTOGRAPHY  
LEGEND

## TIME REFERENCE

## TIDE STAGE REFERENCE

☐ PREDICTED TIDES☒ REFERENCE STATION RECORDS☐ TIDE CONTROLLED PHOTOGRAPHY

(C) COLOR

(P) PANCHROMATIC

(I) INFRARED

## ZONE

Eastern

☐ STANDARD

## MERIDIAN

75 th

☒ DAYLIGHT

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
80 E (c) 5788-91	8/31/80	1041	1:15,000	1.0 ft. above Lake Superior Low Water Datum

## REMARKS

Lake Superior Low Water Datum = 600.0 ft.

## 2. SOURCE OF MEAN HIGH WATER LINE:

Shoreline was compiled from the above listed photographs and represents the visible line of contact between the water level and land features.

## 3. SOURCE OF MEAN LOW-WATER OR MEAN LOWER LOW-WATER LINE:

None

## 4. CONTEMPORARY HYDROGRAPHIC SURVEYS (List only those surveys that are sources for photogrammetric survey information.)

SURVEY NUMBER	DATE(S)	SURVEY COPY USED	SURVEY NUMBER	DATE(S)	SURVEY COPY USED

## 5. FINAL JUNCTIONS

NORTH	EAST	SOUTH	WEST
TP-01083	N/A	N/A	TP-01088

## REMARKS

HISTORY OF FIELD OPERATIONS.

TP-01089

1. ☒ FIELD ~~INSPECTION~~ OPERATION

☐ FIELD EDIT OPERATION.

OPERATION	NAME	DATE
1. CHIEF OF FIELD PARTY	R. Tibetts	5/19/81
2. HORIZONTAL CONTROL	RECOVERED BY N/A ESTABLISHED BY J. Dunfries PRE-MARKED OR IDENTIFIED BY N/A	5/19/81
3. VERTICAL CONTROL	RECOVERED BY N/A ESTABLISHED BY N/A PRE-MARKED OR IDENTIFIED BY N/A	
4. LANDMARKS AND AIDS TO NAVIGATION	RECOVERED (Triangulation Stations) BY N/A LOCATED (Field Methods) BY N/A IDENTIFIED BY N/A	
5. GEOGRAPHIC NAMES INVESTIGATION	TYPE OF INVESTIGATION <input type="checkbox"/> COMPLETE <input type="checkbox"/> SPECIFIC NAMES ONLY BY N/A <input checked="" type="checkbox"/> NO INVESTIGATION	
6. PHOTO INSPECTION	CLARIFICATION OF DETAILS BY N/A	
7. BOUNDARIES AND LIMITS	SURVEYED OR IDENTIFIED BY N/A	

II. SOURCE DATA

1. HORIZONTAL CONTROL IDENTIFIED  
One station

2. VERTICAL CONTROL IDENTIFIED  
None

PHOTO NUMBER	STATION NAME	PHOTO NUMBER	STATION DESIGNATION
80 EC 5790 80 EC 5774	Oliver 1981		

3. PHOTO NUMBERS (Clarification of details)

4. LANDMARKS AND AIDS TO NAVIGATION IDENTIFIED

None

PHOTO NUMBER	OBJECT NAME	PHOTO NUMBER	OBJECT NAME

5. GEOGRAPHIC NAMES: ☐ REPORT ☒ NONE

6. BOUNDARY AND LIMITS: ☐ REPORT ☒ NONE

7. SUPPLEMENTAL MAPS AND PLANS

SEE CM-7313-TP-00680

8. OTHER FIELD RECORDS (Sketch books, etc., DO NOT list data submitted to the Geodesy Division)

NOAA Form 76-53(CSL) -1  
76-86 -1  
76-135 -1  
76-170 -2  
75-82A -1

## RECORD OF SURVEY USE

TP-01089

## I. MANUSCRIPT COPIES

COMPILATION STAGES			DATE MANUSCRIPT FORWARDED	
DATA COMPILED	DATE	REMARKS	MARINE CHARTS	HYDRO SUPPORT
Shoreline and Alongshore Detail	2/82	Class III	6-22-84	

## II. LANDMARKS AND AIDS TO NAVIGATION

## 1. REPORTS TO MARINE CHART DIVISION, NAUTICAL DATA BRANCH

NUMBER	CHART LETTER NUMBER ASSIGNED	DATE FORWARDED	REMARKS
I Page		6-22-84	76-40's Landmarks

2. ☐ REPORT TO MARINE CHART DIVISION, COAST PILOT BRANCH. DATE FORWARDED: \_\_\_\_\_3. ☐ REPORT TO AERONAUTICAL CHART DIVISION, AERONAUTICAL DATA SECTION. DATE FORWARDED: \_\_\_\_\_

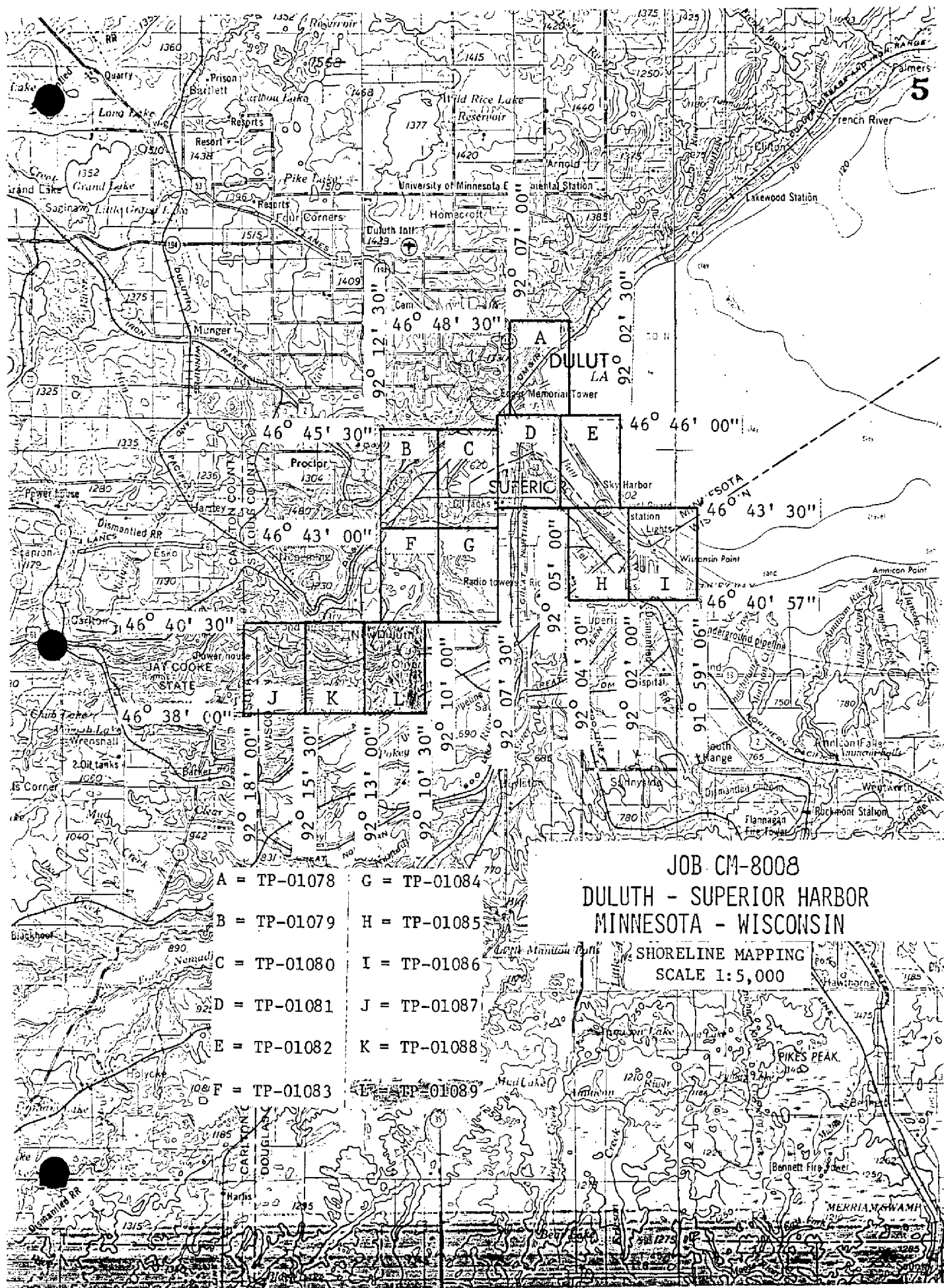
## III. FEDERAL RECORDS CENTER DATA

1. ☐ BRIDGING PHOTOGRAPHS; ☐ DUPLICATE BRIDGING REPORT; ☐ COMPUTER READOUTS.  
 2. ☐ CONTROL STATION IDENTIFICATION CARDS; ☐ FORM NOS 567 SUBMITTED BY FIELD PARTIES.  
 3. ☒ SOURCE DATA (except for Geographic Names Report) AS LISTED IN SECTION II, NOAA FORM 76-36C.  
 ACCOUNT FOR EXCEPTIONS:

4. ☐ DATA TO FEDERAL RECORDS CENTER. DATE FORWARDED: \_\_\_\_\_

## IV. SURVEY EDITIONS (This section shall be completed each time a new map edition is registered)

SECOND EDITION	SURVEY NUMBER TP - _____ (2)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY  MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	
THIRD EDITION	SURVEY NUMBER TP - _____ (3)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY  MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	
FOURTH EDITION	SURVEY NUMBER TP - _____ (4)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY  MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	



SUMMARY  
TP-01089

This map is one of five 1:5,000-scale shoreline maps that comprise Part II of Project CM-8008. There are twelve shoreline maps in this project. The purpose of this job is to provide contemporary shoreline data and alongshore detail for nautical chart revision.

This map portrays the shoreline and alongshore detail of the St. Louis River, Minnesota-Wisconsin from Bear Island to Little Pokegama Bay.

In May 1981, field operations provided horizontal control for the Aerotriangulation Unit for TP-01083, TP-01084, TP-01087, TP-01088, and TP-01089. The field information consisted of the provision of aerial photographs annotated with location of horizontal control station and supplemented with field data records.

Natural color photographs were taken August 31, 1980, with the Wild RC-8(E) camera at 1:15,000 scale which were provided to aerotriangulation and compilation.

Aerotriangulation was performed at the Washington Science Center, Rockville, Maryland. The 1:15,000 natural color photographs were bridged using analytic aerotriangulation methods.

Compilation was performed at the Washington Science Center, Rockville, Maryland, by the Coastal Mapping Section. The interior compilation was limited to detail to the first road adjacent to the shoreline. Detail within this area was kept to a minimum. (See Compilation Report.)

Final Review for this map was performed at the Washington Science Center, Rockville, Maryland, in November 1983. This map complies with the National Standards of Map Accuracy.

A Chart Maintenance Print was prepared during the final review and forwarded to the Marine Chart Branch. Accompanying the above forwarded print are 76-40 forms, listing of landmarks and nonfloating aids to navigation.

The context of this Descriptive Report contains all pertinent reports and listings of data used to compile this final map.

A stable base positive copy of this final map and the Descriptive Report will be registered in the NOS Archives.



PHOTOGRAMMETRIC PLOT REPORT  
Duluth-Superior Harbor  
Minnesota-Wisconsin  
CM-8008  
December 1981

21. Area Covered

The area covered by this report is the shoreline of the St. Louis River from Fond Du Lac, Minnesota, northeast to where the river enters St. Louis Bay at Duluth, Minnesota. The river provides the boundary between Minnesota and Wisconsin. The project is covered by five (5) 1:5,000 scale manuscripts: TP's 01083, 01084, 01087, 01088, and 01089. TP-01081 will also be included in this project.

22. Method

Three strips of 1:15,000 scale color photography were bridged by standard analytic aerotriangulation methods. Strips 1A and 2A were each extended to include that portion of their respective strips which were bridged in December 1980. Strip 1 consisted of photographs 80E(C) 5795 through 5799, and Strip 1A was 80E(C) 5787 through 5796. Strip 2 was 80E(C) 5729 through 5739, and 2A was 80E(C) 5723 through 5731.

Field identified control was provided and supplemented by office identified control. Tie points were used to ensure an adequate junction between the strips and to control Strip 2. The State Plane Coordinates for this project were based on the Wisconsin North Zone.

Ratio values were determined from the bridging photography, which is also to be used for compilation purposes.

23. Adequacy of Control

In May 1981, a field party established five 3rd order control stations to be used to control Strips 1A, 2A, and 5. This photography covers TP-01083, TP-01084, TP-01087, TP-01088, and TP-01089. This control meets the National Standards of Map Accuracy.

Oliver 1981, sub point two, is the centerline end of a pier. It would not fit the other control by 1 foot in X and 10 feet in Y. Jim Shea, Coastal Survey Section, AMC, believes that the pier was rebuilt after the photography was taken. This point was not used in the adjustment.

Photos 7595 and 7596 were used in the adjustment of Strip 2, as well as in the adjustment of Strip 2A. Points on these photos differed by up to 10 feet in the two adjustments. The discrepancy was probably due to the quality of the control (which had an accuracy of 1.0 to 2.0 meters) and the inability to determine the exact image of the photo control point during mensuration of Strip 2.

It was decided to readjust Strips 1 and 1A as one continuous strip, as followed by readjusting Strips 2 and 2A as one continuous strip using tie points from 1 and 1A.

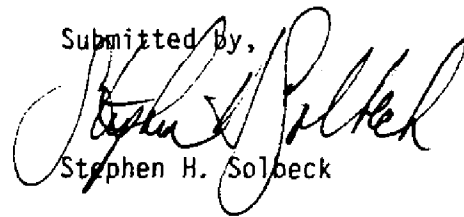
24. Supplemental Data

USGS quads were used to provide vertical control for the adjustments. Nautical Charts were used to locate aids and landmarks.

25. Photography

The coverage, overlap, and quality of the photographs proved adequate for the job.

Submitted by,



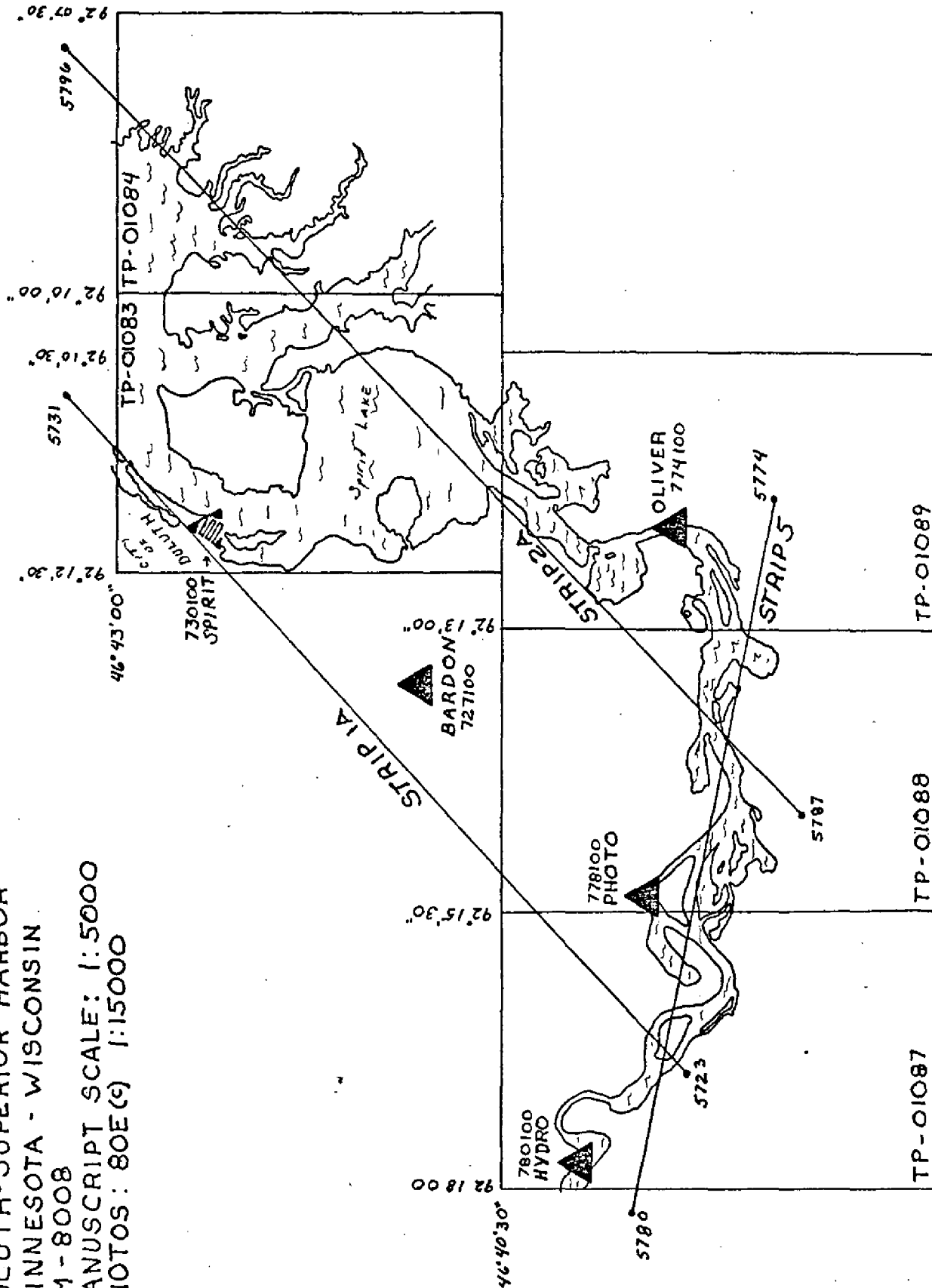
Stephen H. Solbeck

Approved and Forwarded:



Don O. Norman  
Chief, Aerotriangulation Unit

DULUTH-SUPERIOR HARBOR  
 MINNESOTA - WISCONSIN  
 CM-8008  
 MANUSCRIPT SCALE: 1:5000  
 PHOTOS: 80E(9) 1:15000



CM-8008  
FIT TO CONTROL  
(in feet)

STRIP 1 and 1A (combined)		
	<u>X</u>	<u>Y</u>
▲ 780101	-1.077	- .779
780102	- .095	-1.680
723801	1.249	-1.233
723802	1.013	-1.799
723803	.990	-1.527
724801	.873	- .963
724802	.457	- .560
724803	.822	- .283
▲ 778101	1.593	.835
▲ 778102	.519	.195
727101	-1.751	.538
▲ 727102	-1.681	- .108
729869	-3.832	3.134
729870	- .444	2.141
730101	-1.598	.426
▲ 730102	- .623	1.506
731867 (plotted 731467)	2.103	6.988
731868 (plotted 731468)	- .091	2.565
▲ 733124	1.513	-1.115
▲ 733862	.447	-1.298
735855	4.411	5.460
735856	1.109	1.518
736110	.482	2.310
736805	- .310	2.992
738103	-1.406	.891
738801 (plotted 738501)	-9.282	-7.111
▲ 738802 (plotted 738502)	- .690	.764

STRIP 2 and 2A (combined)

724804	1.276	-1.292
▲ 724805	.728	- .749
▲ 725802	- .682	.636
726801	.026	.416
726802	.263	- .041
774101	.578	.936
774102	1.068	-9.104
727801	.840	.606
727802	.053	1.233
▲ 728801	- .398	.862
728802	.610	.162

FIT TO CONTROL  
(continued)

STRIP 2 and 2A (cont)

	<u>X</u>	<u>Y</u>
729801	- .134	.429
729802	- .372	- .505
▲ 730801	.405	- .776
730802	- .206	- .811
731801	- .883	- .503
▲ 732801	- .123	- .435
732802	- .359	.570
733801	.396	-1.004
733802	-1.322	-1.376
797849	-1.899	4.628
756801	-1.359	3.288
▲ 756802	-1.183	2.708
798801	.128	- .784
▲ 798802	.679	- .627
▲ 799801	.579	-1.616

STRIP 5

▲ 774101	- .005	.001
774102	.085	-11.028
778101	.705	-2.271
▲ 778102	.024	- .011
▲ 780101	- .454	.740
▲ 780102	.435	- .730

---

▲ Stations held during bridging



## COMPILATION REPORT

TP-01089

31. Delineation

The map manuscript was delineated using the Wild B-8 stereoplotter and holding to pass points established by the Aerotriangulation Unit.

32. Control

See the Photogrammetric Plot Report for the adequacy of horizontal control. Vertical control was taken from USGS quads and used in the leveling of the stereomodels.

33. Supplemental Data - None34. Contours and Drainage

Contours are not applicable. Drainage was compiled from office interpretation of the photos.

35. Shoreline and Alongshore Details

The shoreline and alongshore detail shown on this manuscript represent the lake level at the time of photography. All shoreline and alongshore details are from office interpretation of the photographs. There was no field inspection prior to compilation.

36. Offshore Detail

All offshore detail was compiled from office interpretation of the photographs.

37. Landmark and Aids

No aids appear on this map. One landmark appears on the map.

38. Control for Future Surveys - None39. Junctions

TP-01089 junctions with TP-01083 to the north, TP-01088 to the west, and none to the east and south.

40 thru 45. Inapplicable

46. Comparison with Existing Maps

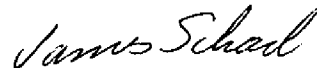
During compilation, a continuous comparison was made with TP-00680. This survey was compiled at a scale of 1:15,000 using the format for chart 14975 and is intended as a new base for this chart, but has yet to be applied. Although, some duplication of features exist, the interior detail shown on TP-01085 consists mainly of features that have been constructed or changed since TP-00680 was compiled. This survey is not intended to supercede the interior portion of TP-00680, but should be used only to add those new features compiled.

Comparison was made with USGS quadrangle map; West Duluth Wisc-Minn, 1954, photorevised 1969 and 1975, scale 1:24,000.

47. Comparison with Nautical Chart

Comparison was made with Nautical Chart 14975, scale 1:30,000, 26th Edition, April 26, 1980.

Submitted by,



James Schad

Approved and Forwarded:



For, Frank Wright  
Chief, Coastal Mapping Section



REVIEW REPORT  
SHORELINE SURVEY  
TP-01089

GENERAL STATEMENT

A final review was performed for this shoreline map and no major discrepancies were encountered. This map is registered as a Class III map. For a complete analysis of the compilation, refer to the Compilation Report bound with this Descriptive Report.

62. COMPARISON WITH REGISTERED TOPOGRAPHIC SURVEYS

None

63. COMPARISON WITH MAPS OF OTHER AGENCIES

Refer to paragraph 46 of the Compilation Report, bound with this Descriptive Report.

64. COMPARISON WITH CONTEMPORARY HYDROGRAPHIC SURVEYS

None

65. COMPARISON WITH NAUTICAL CHARTS

Refer to paragraph 47 of the Compilation Report, bound with this Descriptive Report.

66. ADEQUACY OF RESULTS AND FUTURE SURVEYS

This map complies with photogrammetric instructions for shoreline mapping and meets accuracy required by National Standards of Map Accuracy.

Submitted by:

*James Taylor / James Schad*  
James Taylor/James Schad

Approved:

George M. Ball  
Chief, Photogrammetric Section

Lawrence W. Fritz  
Chief, Photogrammetry Branch

June 27, 1983

GEOGRAPHIC NAMES

FINAL NAME SHEET

CM-8008 (Duluth-Superior Harbor, Minn.-Wis.)

TP-01089

Bear Island

Burlington Northern (RR)

Duluth Messabe and Iron Range (RY)

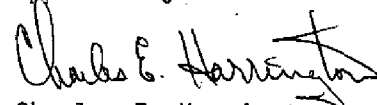
Little Pokegama Bay

Mud Lake

Oliver

St. Louis River

Approved by:



Charles E. Harrington  
Chief Geographer, N/CG2x5

[illegible]

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	
POSITIONS DETERMINED AND/OR VERIFIED	<i>James Schalk</i>
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'	
(Consult Photogrammetric Instructions No. 64.)	
<b>OFFICE</b> <b>I. OFFICE IDENTIFIED AND LOCATED OBJECTS</b> Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75	<b>FIELD (Cont'd)</b> <b>B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.</b> EXAMPLE: P-8-V 8-12-75 74L(C)2982
<b>FIELD</b> <b>I. NEW POSITION DETERMINED OR VERIFIED</b> Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection P - Photogrammetric Vis - Visually 5 - Field identified 6 - Theodolite 7 - Planetable 8 - Sextant A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75	<b>II. TRIANGULATION STATION RECOVERED</b> When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75  <b>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH</b> Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75  <b>**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</b>
*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.	

