NOAA FORM 76-35

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

DESCRIPTIVE REPORT

Job No. CM-80	008 . Final	Map No. TP-01079 Edition No									
General Locality	LOCALITY State Minnesota-Wisconsin General Locality St. Louis River Locality Indian Point Park										
	GISTRY IN A										

♦ U.S. GOVERNMENT PRINTING OFFICE: 1973-761-775

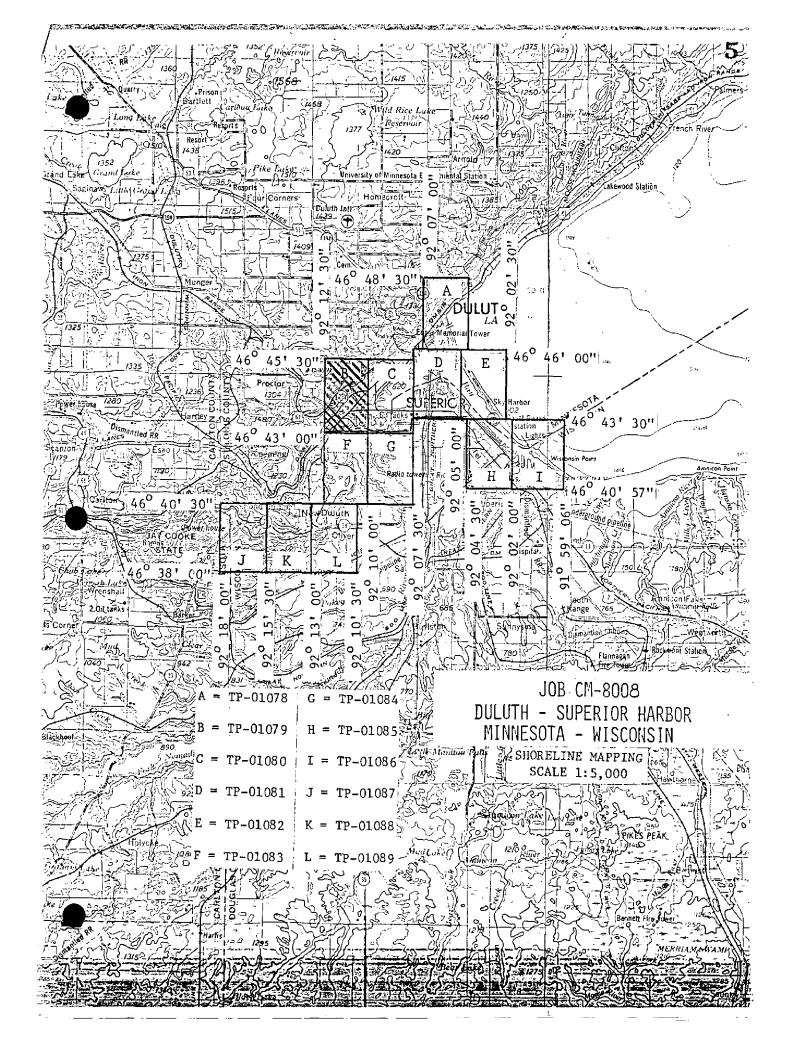
NOAA FORM 76-36A (3-72) NATIONAL	U. S. DEPARTMENT OF COMMERCE OCEANIC AND ATMOSPHERIC ADMIN.	TYPE OF SURVEY	survey TP. 01079			
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DESCRIPTIVE REI	PORT - DATA RECORD	RESURVEY	MAP CLASS Final			
DESCRIPTIVE REI	FORT - DATA RECORD	RÉVISED	лов фи .СМ_8008			
PHOTOGRAMMETRIC OFFICE						
Coastal Mapping			ING MAP EDITION			
Rockville, MD		TYPE OF SURVEY	JOB PH			
OFFICER-IN-CHARGE		RESURVEY	SURVEY DATES:			
Walter S. Simmons	S	REVISED	19TO 19			
I. INSTRUCTIONS DATED						
<u>ı.</u>	OFFICE	2.	FIELO			
Aerotriangulation	October 16, 1980	FIELD - 17, 19	981			
II. DATUMS						
1. HORIZONTAL:	1927 NORTH AMERICAN	OTHER (Specify)				
2. VERTICAL:	MEAN HIGH-WATER MEAN LOW-WATER MEAN LOWER LOW-WATER MEAN SEA LEVEL	OTHER (Specify) International Datum, 1955	Great Lakes			
3. MAP PROJECTION		4. GRID(S)				
Lambert Conformal		Wisconsin	North			
5. SCALE 1:5,000		STATE	ZONE			
III. HISTORY OF OFFICE OPER	ATIONS	<u></u>	<u> </u>			
OPE	RATIONS	NAME	DATE			
1. AEROTRIANGULATION	BY	R. Kelly	Dec 1980			
метнор: Analytic	LANDMARKS AND AIDS BY					
2. CONTROL AND BRIDGE POIN METHOD: Calcomp	ITS PLOTTED BY CHECKED BY	J. Taylor	Jan 1981			
3. STEREOSCOPIC INSTRUMENT	T PLANIMETRY BY	R. Travis	March 1981			
COMPILATION	CHECKED BY	P. Dempsey				
INSTRUMENT: B-8	CONTOURS BY	NA				
scale: 1:5,000 4. MANUSCRIPT DELINEATION	CHECKED BY	NA R. Iravis	March 1981			
- MANUSCRIPT DELINEATION	PLANIMETRY BY CHECKED BY	P. Dempsey	April 1981			
A 6.2		NA NA				
метноо: Graphically	Smooth Drafted CHECKED BY	NA				
scale: 1:5,000	HYDRO SUPPORT DATA BY	R. Travis P. Dempsey	March 1981 April 1981			
5. OFFICE INSPECTION PRIOR	TO FIELD EDIT BY	P. Dempsey				
6. APPLICATION OF FIELD ED	IT DATA	J. Schad	Sept.1981			
7. COMPILATION SECTION REV	IEW BY	F. Wright	H H			
8. FINAL REVIEW	ВУ	R. Kelly	July 1982			
9. DATA FORWARDED TO PHOT	· · · · · · · · · · · · · · · · · · ·					
10. DATA EXAMINED IN PHOTOG		R. Kell (Signed)	00 July 1982			
11. MAP REGISTERED - COASTA		$Howard\ D$. Wolfe 4 1002			
NOAA FORM 76-36 A	SUPERSEDES FORM C&GS 181 SERIES		-v			

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(3-72)				NA	TIONAL OCE		ATMOSPI	TERIÇ A	OF COMMERCE OMINISTRATION OCEAN SURVEY	
		CON	PILATIO	N SOUR	CES				JOEAN GONVE	
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	RC-8(E)	m	TYPE	S OF PHO	TOGRAPHY		TIME	REFER	ENCE	
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REMARKS Lake S	Superior (Low Water:Dat	tum = 60	00.00 1	eet					
Shoreline was compiled from the above list of photographs and represents the visible line of contact between the water level and land features.										
3. SOURCE OF MEAN	LOW-WATER C	OR MEAN LOWER LO	OW-WATER (LINE:						
4. CONTEMPORARY	HYDROGRAPHI	C SURVEYS (List of	only those su	irveys the	are sources i	or photogran	nmetric s	urvey inf	ormation.)	
SURVEY NUMBER	DATE(S)	SURVEY CO	Y USED	SURVEY	NUMBER	DATE(S)		SURVEY	COPY USED	
5. FINAL JUNCTIONS	<u> </u>					!	i			
No Survey	E/	TP-01080		SOUTH	No Surve	у	WEST	No Su	rvey	
REMARKS										

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Final	Review	June 1982	Final Map	p		` <u>Au</u> g̀>1982	Aug	1982	2	
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IV. SURV	EY EDITIONS (This section s SURVEY NUMBER	JOB NUMBE		a eartion is r		TYPE OF SURVEY				
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Summary

[∞]TP-01079

This map is one of twelve 1:5,000 scale shoreline maps that comprise Job CM-8008. The purpose of this job is to provide contemporary shoreline data for the support of hydrographic operations and to furnish data for nautical chart revision.

This map portrays the shoreline and alongshore detail of Duluth Superior Harbor, Minnesota and Wisconsin.

Field operations were not planned for TP-01078 through TP-01082, TP-01085 and TP-01086 prior to aerotriangulation. It was anticipated that geodetic intersection stations and photo points established in 1972, by the Lake Survey for CM-7313, TP-00680 be used for horizontal control. In May 1981 field operations provided horizontal control for the lower portion of CM-8008 for the aerotriangulation of TP-01083, TP-01084 and TP-01087 through TP-01089.

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 was limited to detail to the first road adjacent to the shoreline. Detail within this area was kept to a minimum.

Field edit was performed in June 1981 by personnel assigned to the Atlantic Marine Center. Refer to the Field Edit Report bound with this Decriptive Report.

Application of field edit was performed at the Washington Science Center, Rockville, Maryland.

Final Review for this map was performed at the Washington Science Center, Rockville, Maryland, in May 1981. 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 Division. Also, a print copy with notes to the hydrographer was forwarded to the Hydrographic Survey Division, which supercedes the Class III print forwarded April 1981. Accompanying the

above forwarded print copies, are 76-40 forms, listings 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.

TP-01079

FIELD INSPECTION

There was no field inspection prior to compilation. Field work accomplished was limited to the photo coverage for aerotriangulation and compilation.

Photogrammetric Plot Report

Duluth-Superior Harbor Minnesota-Wisconsin

> CM-8008 December 1980

21. Area Covered

This report covers seven 1:5,000 scale sheets, TP-01078, TP-01079, TP-01080, TP-01081, TP-01082, TP-01085 and TP-01086 of Duluth-Superior Harbor, Minnesota-Wisconsin.

22. Method

Four strips of 1:15,000 scale photography were bridged by analytic aerotriangulation methods and adjusted to ground on the Wisconsin State Plane Coordinate System, Wisconsin North Zone. These four strips provided horizontal and vertical control for compilation. Aids and landmarks were located during the bridging. Using photo control point 31 South Cover Land Spit (761831) as a terminal control point to adjust strip three, it was determined that there is some field discrepancy in the position of this point. Strip three was again adjusted using photo point 35 South Breakwater Light (762804) as a terminal control point. In this adjustment a position for tie point 761804 was established to be used as a terminal control station in adjusting strip four.

Since 761831 is common to strips three and four, strip four was bridged measuring 761831 to provide a terminal control point position for adjusting strip three.

23. Adequacy of Control

Photo control points position within 1.0 and 2.0 meters provided by Great Lakes Revisory Section, geodetic control and tie points were office identified. Although, control held within the accuracy required by National Standards of Maps at 1:15,000 scale, it did not meet NOS requirements. To meet NOS requirements it will be necessary for a photo field party to establish and photoidentify control or to panel control and refly the project.

24. Supplemental Data

Local shoreline and US Geological Survey quadrangles were used to provide vertical elevations for vertical adjustments of bridges.

25. Photography

RC-8 EC photography was used for the four bridging strips. Photography was adequate as to coverage and definition.

Submitted by,

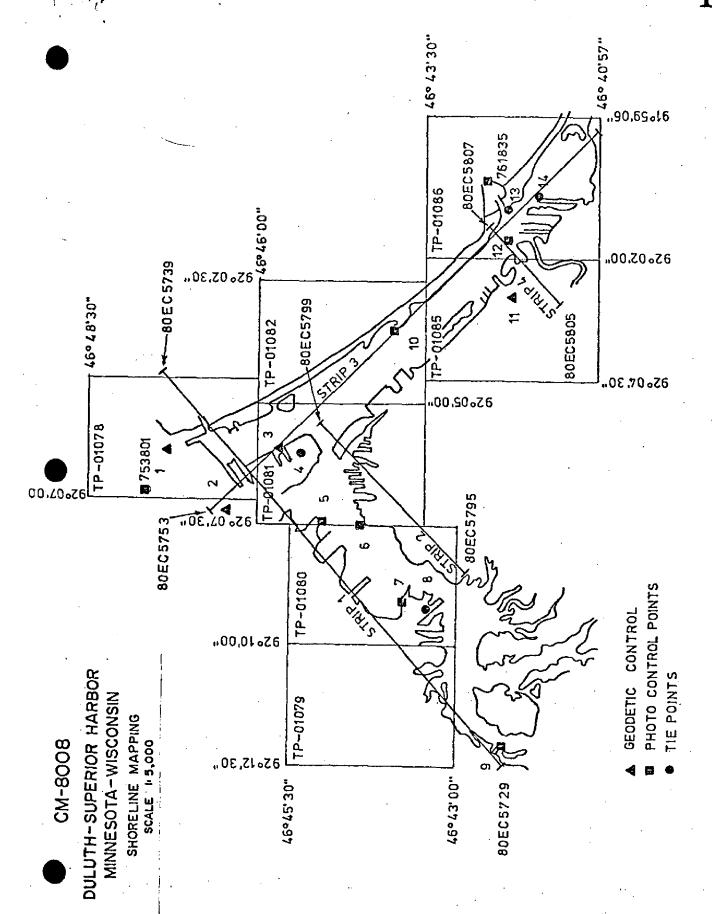
Robert B, Kelly

Approved and Forwarded:

Don O. Norma

Don O. Norman

Chief, Aerotriangulation Section



Closures to Control (in Feet)

Strip 1		·	•
- 729870	South Corner Middle Dock	X 0.0	Y 0.1
733862	Minn. Power & Light Co. Tk.	-0.3	-1.0
735856	West Corner Lakehead Dock	0.1	1.1
7 381 03	Duluth Centrol High Sch. Cupola Spire	0.0	-0.2
Strip 2			
732801	Tie Point	0.0	0.0
797849	West Corner Superior Terminal Dock	0.0	0.0
799801	Tie Point	0.0	0.0
Strip 3			
753120	Duluth Enger Memorial Tower	-0.3	-0.1
736110	Duluth Peavey Elevator Co. Stack, 1921	1.2	0.4
759817	Corner Park Dock	-3.0	0.1
	Superior St. Francis Xavier Cath. Church Spire, 1952	2,9	0.9
76383 1	Tie Point	8.0-	-1,3
Strip 4	·		
	Superior St. Francis Xavier Cath. Church Spire, 1952	0.0	0.0
7 61843	End Northern Pacific Ry Wall	0.0	0.0
761804	Tie Point	0.0	0.0

ADDUNDUM TO CM-8008 DULUTH-SUPERIOR HARBOR MINNESOTA-WISCONS IN APRIL 1981

Strip three was remeasured and adjusted to determine positions for hydrographic points and additional landmarks.

Strip four should not be used, because of inadequacy of control.

CLOSURES TO CONTROL FOR STRIP THREE

753 801	DULUTH TV STA. WEBC MAST	X -1.7	Y 2.3
736120	DULUTH ENGER NEMORIAL TOVER	1.2	-1.3
736110	DULUTH PEAVEY ELEVATOR CO. STACK, 1921	3.2	-1.0
759817	CORNER PARK DOCK	-4.0	-0.3
806137	SUPERIOR ST. FRANCIS XAVIER CATH. CHURCH SPIRE, 1952	1.3	-0.3
761835	SOUTH BREAKWATER LIGHT	1.3	0.4

NOAA FORM 76-41 (6-75)		DESCRIPTIV	DESCRIPTIVE REPORT CONTROL RECORD	NATION	RTMENT OF COMMERCE
MAP NO. TP-01079	LOB NO.	8008	GEODETIC DATUM VA 1927	PORIGINATING ACTIVITY ROCK UITLE	Md.
STATION NAME	SOURCE OF INFORMATION (Index)	AEROTRI- ANGULATION POINT NUMBER	STATE WISCONSIN	GEOGRAPHIC POSITION φ LATITUDE λ LONGITUDE	REMARKS
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Compilation Report TP-01079 March 1981

31. Delineation

This map manuscript was compiled using the B-8 stereoplotter holding to pass points established by the Aerotriangulation Section. Compilation was limited to a narrow band adjacent to the shoreline. Detail within this area was kept to a minimum (Refer to Item 46.).

32. Control

See Aerotriangulation Report for adequacy of horizontal control. Vertical control taken from USGS quad was adequate in the leveling of stereomodels.

33. Supplemental Data

None

34. Contour and Drainage

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

35. Shoreline and Alongshore Details

The shoreline and alongshore details were compiled from office interpretation of aerial photographs. The water level on the date of the photography was one (1) foot above the Low Water Datum, no adjustment was made.

36. Offshore Details

Offshore details compiled consisted of areas of grass in water, piling, and obstructions. The obstructions are to be investigated by field party.

37. Landmarks and Aids

Three landmarks were located by the Aerotriangulation Section. A tank was located during compilation and is to be verified for landmark value by field party.

No aids were located on this sheet.

38. Control for Future Surveys

Photo-hydro points were established by compilation section and position determined by analytical methods. A list of the positions are bound with this report.

39. <u>Junctions</u>

TP-01079 junctions with TP-01080 to the east. There are no junctions to the north, west, and south of TP-01079.

40. through 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, but has yet to be applied. Although, some duplication of features exist, the interior detail shown on TP-01079 consists mainly of features that have been constructed or changed since TP-00680 was compiled. This survey is not intended to supersede the interior portion of TP+00680, but should be used only to add those new features compiled. Comparison was also made with the following USGS 7.5 minute topographic quadrangles:

West Duluth-Wisconsin-Minnesota Duluth Heights-Minnesota

47. Comparison with Nautical Charts

Comparison was made with the following Nautical Chart:

Nautical Chart 14975, 26th Edition, April 26, 1980 Refer fo Item 46.

Items to be applied to Nautical Charts immediately - None Items to be carried forward - None

Submitted by,

& Travio

R. Travis

Approved and Forwarded:

Frank Wright

Chief, Coastal Mapping Section

ADDENDUM TO COMPILATION REPORT

Photogrammetric data previously furnished (during the 1981 field season) for use as possible hydrographic control signal sites in the Duluth-Superior Harbor area should not be used and was not bound with this report.

Robert B. Kelly

FIELD EDIT REPORT TP-01079

51. Method

A 19 foot MonArk outboard boat was used to inspect the entire shoreline from the water. All changes were noted on the master field edit print and photograph 80EC5732. A plane table survey was used to verify landmarks and fixed aids to navigation.

52. Adequacy of Compilation

Compilation of this manuscript was very good. The scale of the photography, and the fact that it was flown so recently helped make the field edit go smoothly. The biggest discrepancy was in areas which had been compiled as grassy areas, but turned out to be simply shallow water. There were also some minor discrepancies in the shoreline interpretation of areas in ruin, but these were easily resolved by field inspection.

53. Map Accuracy

Refer to Photogrammetric Plot Report, CM-8008 for statement of map accuracy of horizontal control.

54. Recommendations

Photo centers should be shown on all manuscripts. This will make it easier for the field editor to orient the photos, and to determine which photos to use to locate features.

Some chronopaque photos for this manuscript were not sent with the project. All these photos should be supplied.

Assistance with field edit by office compilers should be conginued.

Office personnel will benefit from the field experience, and can offer valuable expertise to the ships.

55. Examination of Proof Copy

No statement.

Chief of Party

CDR Frank P. Rossi

Respectfully submitted,

Lowell a hetereh.
Lowell O. Neterer, Jr.

Elizabeth A. Steigerwald, ENS NOAA

Review Report

Shoreline Survey TP-01079

61. General Statement

A final review was performed for this shoreline map. No major discrepancies were encountered. For a complete analysis of compilation, refer to the Compilation Report bound with this Descriptive Report.

- 62. Comparison with Registered Topographic Surveys None
- 63. <u>Comparison with Maps of Other Agencies</u>

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

- 64. Comparison with Contemporary Hydrographic Surveys None
- 65. Comparison with Nautical Charts

Refer to the Compilation Report, paragraph 47, 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 Maps.

Submitted by,

Robert B. Kelly Final Reviewer

Approved:

Geørge M. Ball

Chief, Photogrammetric Branch

Walter S. Simmons

Chief, Photogrammetry Division

GEOGRAPHIC NAMES

FINAL NAME SHEET

CM-8008 (Minnesota-Wisconsin, Lake Superior)

TP-01079

Burlington Northern (RR)

Duluth

Dulüth Missabe and Iron Range (RY)

Indian Point Park

Kingsburg Creek

St. Louis River

Approved by:

Charles E. Harrington Chief Geographer, C3x5

7.

Information on Dissemination of Project Material CM-8008

Duluth-Superior Harbor Minnesota & Winconsin National Archives/Federal Record Center

Aerotriangulation Photographs
Plot Report
Computer Printouts
Control Identification Cards (Horizontal)
NOAA Form(s) 76-41 (Descriptive Report Control Record)
Master Field Edit Sheets
Project Diagrams
Listing of Hydrographic Control Points
Listing of Plotted Points
Ratio Photographs

Bureau Archives

Registered Maps Descriptive Reports

Reproduction Division

8X Reduction Negative of Each Map

Office of Staff Geographer
Geographer Names Standard

Marine Chart Division
Chart Maintenance Print

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PHOTOGRAMMETRIC BRANCH PHOTOGRAMMETRY DIVISION



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NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO.

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.

2. In "Remarks" column cross out words that do not apply.

3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
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FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

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