TP-01080

TP-01080

NOAA FORM 76-35

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

DESCRIPTIVE REPORT

Type of Survey Shoreline

Job No. CM-8008 *Map No.* TP-01080

Classification No. *Edition No.* I

Class III Final

LOCALITY

State Wisconsin, Minnesota

General Locality Duluth

Locality Grassy Point

19 80 TO 19

REGISTRY IN ARCHIVES

DATE

☆ U.S. GOVERNMENT PRINTING OFFICE: 1974-762-901

NOAA FORM 76-36A (3-72) — U. S. DEPARTMENT OF COMMERCE, NATIONAL OCEANIC AND ATMOSPHERIC ADMIN.

DESCRIPTIVE REPORT - DATA RECORD

TYPE OF SURVEY: [X] ORIGINAL [ ] RESURVEY [ ] REVISED

SURVEY TP- 01080
MAP EDITION NO. (1)
MAP CLASS III Final
JOB PH- CM-8008

PHOTOGRAMMETRIC OFFICE
Coastal Mapping, Section
Rockville, MD

OFFICER-IN-CHARGE
Walter S. Simmons

LAST PRECEEDING MAP EDITION
TYPE OF SURVEY: [ ] ORIGINAL [ ] RESURVEY [ ] REVISED
JOB PH- ____
MAP CLASS ____
SURVEY DATES: 19__ TO 19__

I. INSTRUCTIONS DATED

1. OFFICE	2. FIELD
Aerotriangulation October 16, 1980	FIELD 17, 1981

II. DATUMS

1. HORIZONTAL: [X] 1927 NORTH AMERICAN — OTHER (Specify)

2. VERTICAL: [ ] MEAN HIGH-WATER [ ] MEAN LOW-WATER [ ] MEAN LOWER LOW-WATER [ ] MEAN SEA LEVEL — OTHER (Specify): International Great Lake Datum, 1955

3. MAP PROJECTION: Lambert Conformal

4. GRID(S): STATE: Wisconsin; ZONE: North

5. SCALE: 1:5,000 — STATE: ; ZONE:

III. HISTORY OF OFFICE OPERATIONS

OPERATIONS		NAME	DATE
1. AEROTRIANGULATION METHOD: Analytic	BY	R. Kelly 80/S. Solbeck 81	Dec 80/Dec 81
	LANDMARKS AND AIDS BY		
2. CONTROL AND BRIDGE POINTS METHOD: Coradomat	PLOTTED BY	J. Taylor	Jan 81
	CHECKED BY		
3. STEREOSCOPIC INSTRUMENT COMPILATION INSTRUMENT: B-8 SCALE: 1:5,000	PLANIMETRY BY	J. Taylor	Mar 81
	CHECKED BY	C. Lewis	" "
	CONTOURS BY	NA	
	CHECKED BY		
4. MANUSCRIPT DELINEATION METHOD: Grafically Smooth Drafted SCALE: 1:5,000	PLANIMETRY BY	J. Taylor 81/J. Moler 82	Mar 81/Feb 82
	CHECKED BY	C. Lewis/81/F. Wright 82	Apr 81/ " "
	CONTOURS BY	NA	
	CHECKED BY		
	HYDRO SUPPORT DATA BY	J. Taylor	Apr 81
	CHECKED BY	C. Lewis	" "
5. OFFICE INSPECTION PRIOR TO FIELD EDIT	BY	C. Lewis	" "
6. APPLICATION OF FIELD EDIT DATA	BY	J. Schad	Sept. 81
	CHECKED BY	F. Wright	" "
7. COMPILATION SECTION REVIEW	BY	F. Wright	" "
8. FINAL REVIEW	BY	R. Kelly	July 82
9. DATA FORWARDED TO PHOTOGRAMMETRIC BRANCH	BY		
10. DATA EXAMINED IN PHOTOGRAMMETRIC BRANCH	BY	R. Kelly (Signed)	July 82
11. MAP REGISTERED - COASTAL SURVEY SECTION	BY	Howard D. Wolfe	OCT 4 1983

NOAA FORM 76-36A — SUPERSEDES FORM C&GS 181 SERIES

* U.S. G.P.O. 1972-769382/582 REG.#6

NOAA FORM 76-36B
(3-72)

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

COMPILATION SOURCES

TP-01080

1. COMPILATION PHOTOGRAPHY

CAMERA(S): Wild RC-8 (E)
Focal Length=152.71 mm

TIDE STAGE REFERENCE
- [ ] PREDICTED TIDES
- [X] REFERENCE STATION RECORDS
- [ ] TIDE CONTROLLED PHOTOGRAPHY

TYPES OF PHOTOGRAPHY LEGEND
- (C) COLOR
- (P) PANCHROMATIC
- (I) INFRARED

TIME REFERENCE
ZONE: Central — [ ] STANDARD
MERIDIAN: 75th — [X] DAYLIGHT

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
80-EC-5732 thru 5735	8/31/80	09:44	1:15,000	+1.0 feet above Lake
80-EC-5795 thru 5796	8/31/80	10:43	1:15,000	Superior low water datum

REMARKS

Lake Superior Low Water Datum = 600.00 feet

2. SOURCE OF [illegible] Shoreline

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:

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
N/A	TP-01081	N/A	TP-01079

REMARKS

NOAA FORM 76-36B
(3-72)

NOAA FORM 76-36C
(3-72)

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

TP-01080

HISTORY OF FIELD OPERATIONS

I. ☐ FIELD INSPECTION OPERATION ☒ FIELD EDIT OPERATION

OPERATION		NAME	DATE
1. CHIEF OF FIELD PARTY		CDR Frank P. Rossi	
2. HORIZONTAL CONTROL	RECOVERED BY	E. Steigerwald	7/81
	ESTABLISHED BY		
	PRE-MARKED OR IDENTIFIED BY		
3. VERTICAL CONTROL	RECOVERED BY	NA	
	ESTABLISHED BY		
	PRE-MARKED OR IDENTIFIED BY		
4. LANDMARKS AND AIDS TO NAVIGATION	RECOVERED *(Triangulation Stations)* BY	E. Steigerwald, L. Neterer	6/81
	LOCATED *(Field Methods)* BY		
	IDENTIFIED BY		
5. GEOGRAPHIC NAMES INVESTIGATION	TYPE OF INVESTIGATION ☐ COMPLETE ☐ SPECIFIC NAMES ONLY ☒ NO INVESTIGATION	BY	
6. PHOTO INSPECTION	CLARIFICATION OF DETAILS BY	E. Steigerwald, L. Neterer	6/81
7. BOUNDARIES AND LIMITS	SURVEYED OR IDENTIFIED BY	NA	

II. SOURCE DATA

1. HORIZONTAL CONTROL IDENTIFIED

PHOTO NUMBER	STATION NAME
80EC5733	Duluth College Clock Tower Duluth Minnesota Power and Light Co. Stack

2. VERTICAL CONTROL IDENTIFIED
NA

PHOTO NUMBER	STATION DESIGNATION

3. PHOTO NUMBERS *(Clarification of details)*

80EC5732, 5734, 5735, 5733, 5795

4. LANDMARKS AND AIDS TO NAVIGATION IDENTIFIED

PHOTO NUMBER	OBJECT NAME
80EC5734	Chimney
5734	Stack
5733	Tank
5733	Chimney
5733	Chimney
5732	Stack
5795	Towers(2)

PHOTO NUMBER	OBJECT NAME
5733	St. Louis Bay N. Channel Range Front & Rear Lights
5733	St. Louis Bay S. Channel Light 14
5795	St. Louis River Range Front & Rear Lights

5. GEOGRAPHIC NAMES: ☐ REPORT ☒ NONE

6. BOUNDARY AND LIMITS: ☐ REPORT ☒ NONE

7. SUPPLEMENTAL MAPS AND PLANS

None

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

Master Field Edit Print, Plane Table Print, Photos 80EC5732, 5733, 5734, 5735, 5795, Form 76-40's (3), Field Edit Report.

*U.S. GOVERNMENT PRINTING OFFICE:1977-765-092

NOAA FORM 76-36D
(3-72)

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

RECORD OF SURVEY USE

TP-01080

I. MANUSCRIPT COPIES

COMPILATION STAGES			DATE MANUSCRIPT FORWARDED	
DATA COMPILED	DATE	REMARKS	MARINE CHARTS	HYDRO SUPPORT
Shoreline, offshore, alongshore, hydro positions	April 81	Class III Manuscript		April 1981
Supplemental Field Data applied	Sept 81	Class III Manuscript		
Recompiled S.E. corner of map, datum shift	Feb 82	Aerotriangulation readjustment Class III		
Final Review	June 1982	Class III - Final Map	Aug 1982	Aug 1982

II. LANDMARKS AND AIDS TO NAVIGATION

1. REPORTS TO MARINE CHART DIVISION, NAUTICAL DATA BRANCH

NUMBER	CHART LETTER NUMBER ASSIGNED	DATE FORWARDED	REMARKS
Pages 4	76-40(s)	Aug 1982	

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:

** All indicated data will be forwarded to the Federal Record Center upon completion of the entire project.

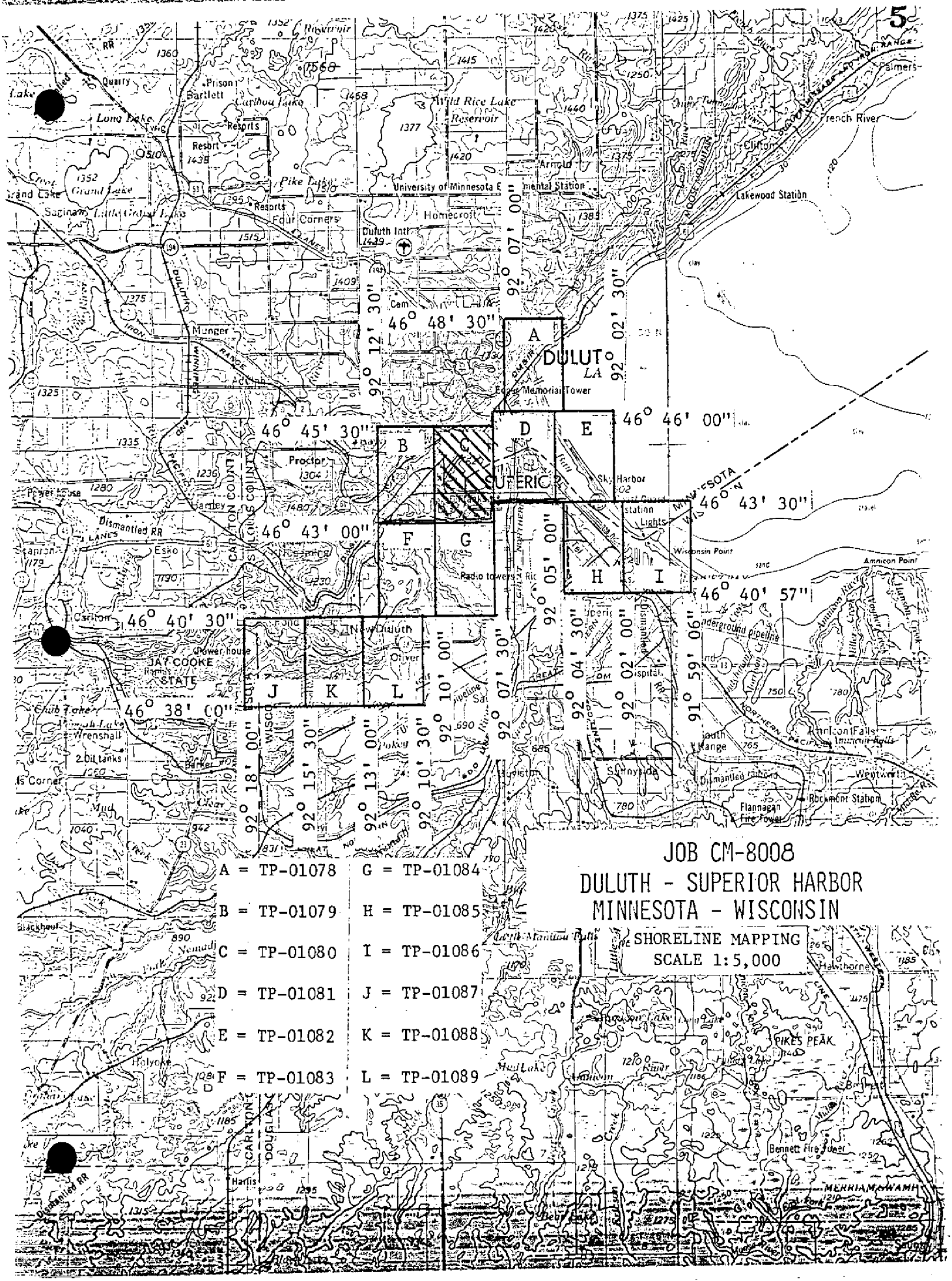
4. ☐ DATA TO FEDERAL RECORDS CENTER. DATE FORWARDED: SEPTEMBER 14, 1982

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

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

NOAA FORM 76-36D

☆U. S. GOVERNMENT PRINTING OFFICE: 1973--778075/1077 REGION NO. 6



A = TP-01078
B = TP-01079
C = TP-01080
D = TP-01081
E = TP-01082
F = TP-01083
G = TP-01084
H = TP-01085
I = TP-01086
J = TP-01087
K = TP-01088
L = TP-01089

JOB CM-8008
DULUTH - SUPERIOR HARBOR
MINNESOTA - WISCONSIN

SHORELINE MAPPING
SCALE 1:5,000

Summary

TP-01080

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 contempary shoreline data for the support of hydrographic operations and to furnish data for nautical chart revision.

This map protrays 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 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 scale 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.

TP-01078 through TP-01082, TP-01085 and TP-01086 were compiled using control taken from CM-7313, TP-00680, established in 1972. Control was adequate for compilation except for the southeast portion of TP-01080 and the southern portion of TP-01081 which was resolved by using the May 1981 control. A class III copy of this map was forwarded to the Hydrographic Survey Division in April 1981.

A limited field edit was performed in June 1981. The majority of the offshore features on this map were not verified or disproved. Because of the limited field edit, this map will be registered as a Class III map.

Field data information that was forwarded to this office (Rockville, Md.) was used as supplemental data.

Final Review for this map was performed at the Washington Science Center, Rockville, Maryland, in May 1981 by the Quality Control Group. 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 will supercede 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 Class III Map.

A stable base positive copy of this Class III Map and the Descriptive Report will be registered in the NOS Archives.

TP-01080

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

Robert B. Kelly

Approved and Forwarded:

Don O. Norman

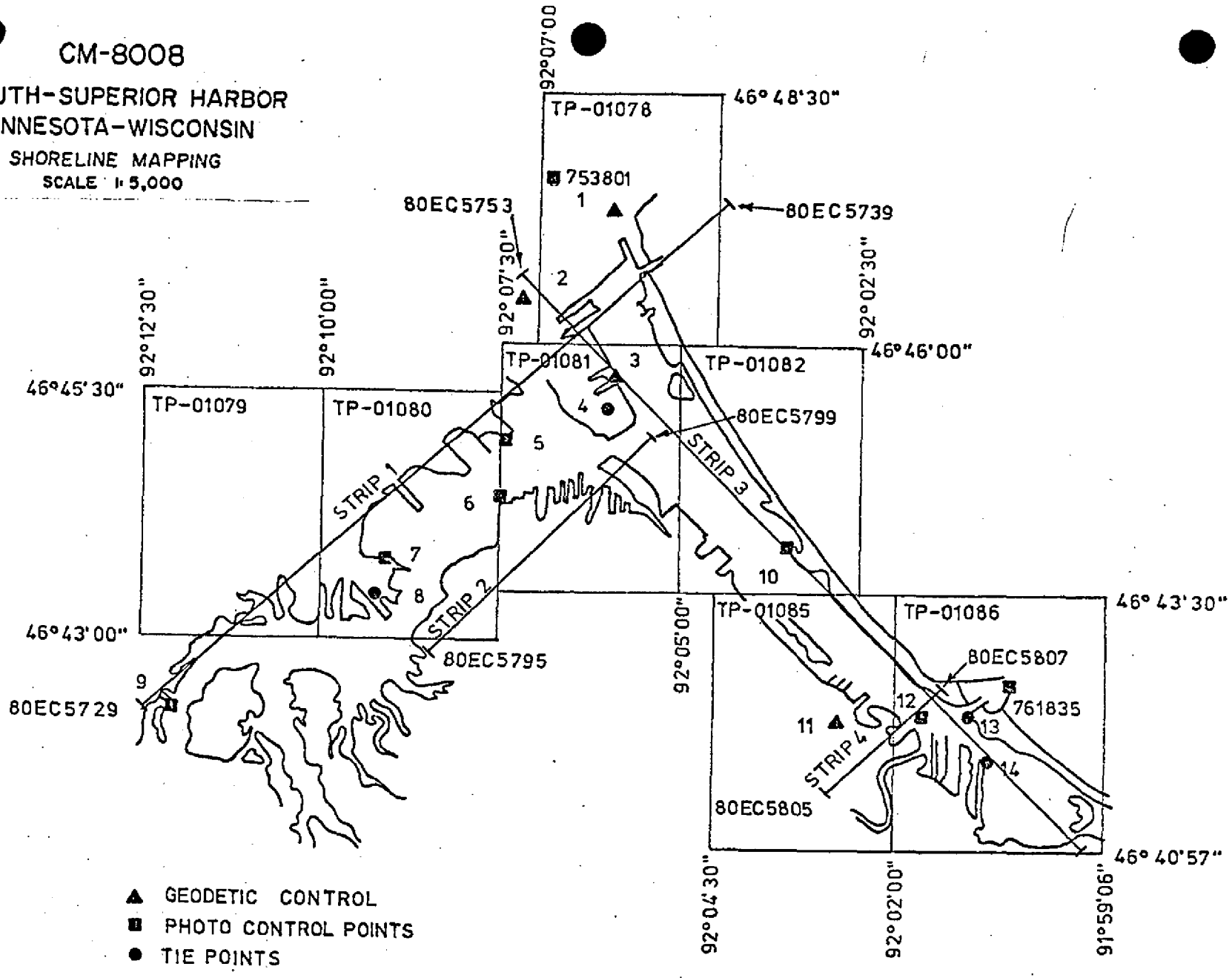
Don O. Norman
Chief, Aerotriangulation Section

CM-8008

DULUTH-SUPERIOR HARBOR
MINNESOTA-WISCONSIN

SHORELINE MAPPING

SCALE 1:5,000



Closures to Control
(in feet)

Strip 1

		X	Y
729870	South Corner Middle Dock	0.0	0.1
733862	Minn. Power & Light Co. Tk.	-0.3	-1.0
735856	West Corner Lakehead Dock	0.1	1.1
738103	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
806137	Superior St. Francis Xavier Cath. Church Spire, 1952	2.9	0.9
763831	Tie Point	-0.8	-1.3

Strip 4

806137	Superior St. Francis Xavier Cath. Church Spire, 1952	0.0	0.0
761843	End Northern Pacific Ry Wall	0.0	0.0
761804	Tie Point	0.0	0.0

ADDUNDUM TO CM-8008
DULUTH-SUPERIOR HARBOR
MINNESOTA-WISCONSIN
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

		X	Y
753801	DULUTH TV STA. WEBC MAST	-1.7	2.3
736120	DULUTH ENGER MEMORIAL TOWER	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

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, 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-01087, TP-01088 and TP-01089. The control was adequate and will probably meet NOS manuscript requirements.

Oliver 1981, sub point two, is the center line 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 discrepency 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 continous strip, followed by readjusting Strips 2 and 2A as one continous strip using tie points from 1 and 1A. These adjustments may not meet NOS manuscript requirements in areas not influenced by control established in May 1981.

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 photography proved adequate for the job.

Submitted by,

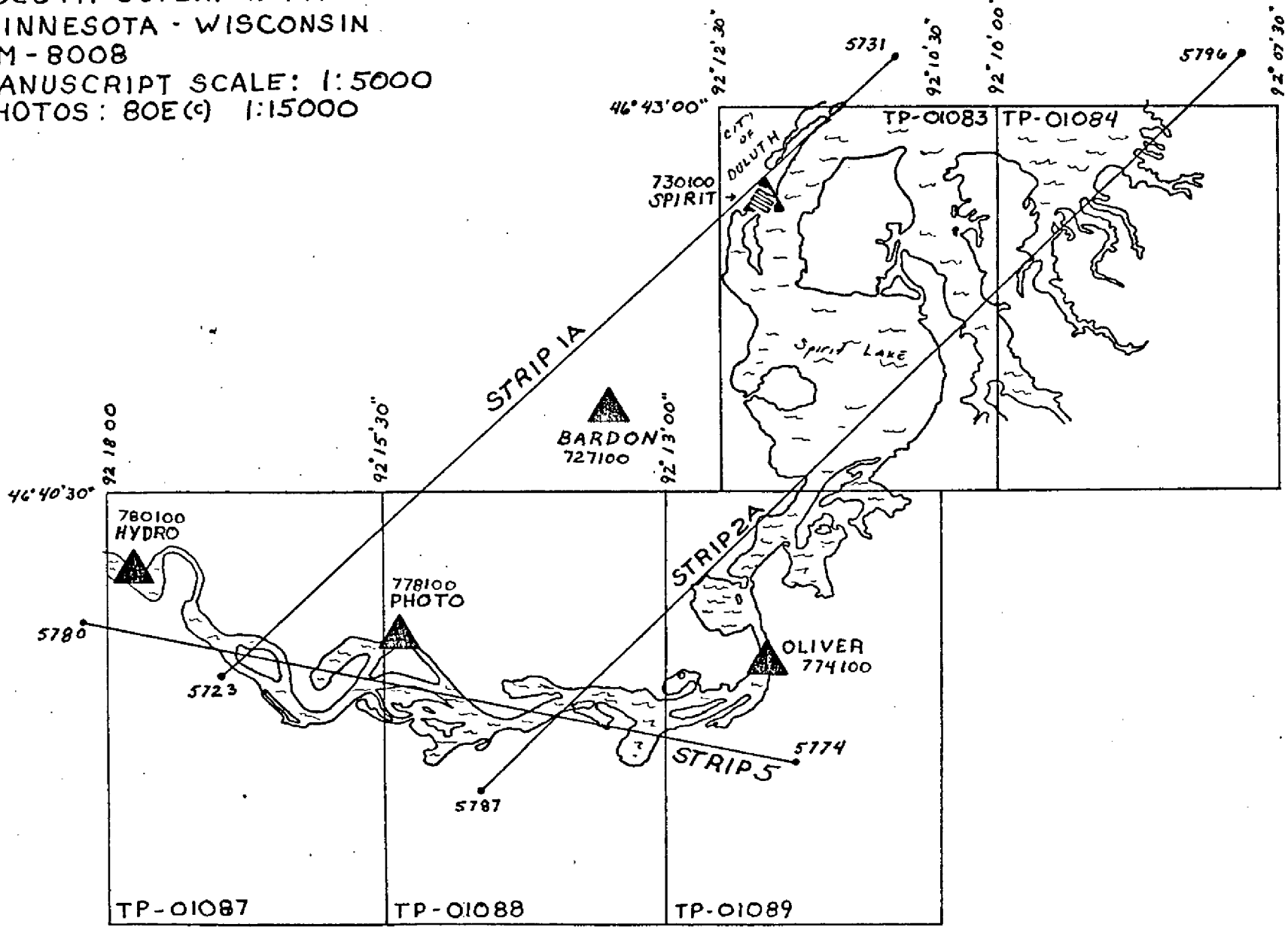
Stephen H. Solbeck

Approved and Forwarded:

Don O. Norman

Don O. Norman
Chief, Aerotriangulation Section

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



CM-8008
FIT TO CONTROL
(in feet)

STRIP 1 and 1A (combined)	X	Y
▲ 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)	X	Y
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

NOAA FORM 76-41
(6-75)

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

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.	JOB NO.	GEODETIC DATUM	ORIGINATING ACTIVITY
TP-01080	CM-8008	NA 1927	COMPILATION

STATION NAME	SOURCE OF INFORMATION (Index)	AEROTRI-ANGULATION POINT NUMBER	COORDINATES IN FEET STATE WISCONSIN ZONE NORTH	GEOGRAPHIC POSITION φ LATITUDE λ LONGITUDE	REMARKS
DULUTH COLLEGE CLOCK TOWER, 1952	460921 1043	126	x= 1 458 947.29 y= 584 144.22	φ 46° 44' 54.24" λ 92° 09' 30.27"	
DULUTH, MINNESOTA POWER AND LIGHT COMPANY STACK, 1952	460921 1050	124	x= 1 460 413.75 y= 579 430.21	φ 46° 44' 08.12" λ 92° 09' 07.39"	
UPPER CHANNEL, 1980	UNADJUSTED FIELD		x= y=	φ 46° 43' 42.32" λ 92° 08' 45.73"	
ARROWHEAD, 1980	UNADJUSTED FIELD		x= 1 462 284.65 y= 572 977.83	φ 46° 43' 04.96" λ 92° 08' 38.04"	
			x= y=	φ λ	
			x= y=	φ λ	
			x= y=	φ λ	
			x= y=	φ λ	
			x= y=	φ λ	
			x= y=	φ λ	

COMPUTED BY	DATE	COMPUTATION CHECKED BY	DATE
LISTED BY J. TAYLOR	DATE 3-81	LISTING CHECKED BY C. LEWIS	DATE 3-81
HAND PLOTTING BY	DATE	HAND PLOTTING CHECKED BY	DATE

SUPERSEDES NOAA FORM 76-41, 2-71 EDITION WHICH IS OBSOLETE.

8

Compilation Report
TP-01080

31. Delineation

This manuscript was compiled using the B-8 stereoplotter and holding to pass points that were established by the aerotriangulation section. The limits of detail shown is a narrow band adjacent to the shoreline. The amount of compilation shown was kept to a minimum (refer to Item 46. of this report).

32. Control

See the aerotriangulation plot report for the adequacy of the horizontal control. Vertical control for leveling the stereomodels was taken from USGS quads. and pass points from aerotriangulation.

33. Supplemental Data - None

34. Contour and Drainage

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

35. Shoreline and Alongshore Detail

The shoreline and alongshore detail shown on this manuscript is at the lake level at the time of photography. The lake level at the time of photography was (1) foot above the Lake Superior Low Water Datum. All shoreline and alongshore features are from office interpretation of the photos.

36. Offshore Detail

Offshore detailed compiled was areas of grass in water, piling, obstructions and foul areas to be verified by the field edit party.

37. Landmarks and Aids

There are a total of ten landmarks on this map of which two have geodetic positions (one verified during aerotriangulation and one during compilation), three were located and positioned during aerotriangulation, and five were located during the compilation of this map.

There are a total of seven aids on this map and they were located and positioned during aerotriangulation.

38. Control for Future Surveys

Photo-hydro points were established by the compilation section and the positions were determined by analytical methods. These positions are to

be given to the hydro-field party and a copy bound with this report.

39. Junctions

Junctions were made with TP-01081 to the east and with TP-01079 to the west. There are no junctions to be made to the north and south at this time.

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 from 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-01080 consists mainly of features that have been constructed since TP-00680 was compiled. TP-01080 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 quads:

Duluth Heights, Minn., 1953, 1:24,000 scale, photorevised 1969.
West Duluth, Wis-Minn., 1954, 1:24,000 scale, photorevised 1969.

47. Comparison with Nautical Charts

Comparison was made with chart 14975, scale 1:15,000, 26th Edition, dated April 26, 1980.

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

Submitted by,

James H. Taylor

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

Review Report

Shoreline Survey
TP-01080

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. Comparison with Maps of Other Agencies

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:

George M. Ball
Chief, Photogrammetric Branch

for Walter S. Simmons
Chief, Photogrammetry Division

GEOGRAPHER NAMES

FINAL NAME SHEET

CM-8008 (Minnesota-Wisconsin, Lake Superior)

TP-01080

Burlington Northern (RR)

Duluth

Duluth Missabe and Iron Range (RY)

Grassy Point

St. Louis Bay

St. Louis River

Soo Line (RR)

Superior

Approved by:

Charles E. Harrington

Charles E. Harrington
Chief Geographer, C3x5

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

SVY TP01080	RPT UNIT CMD, ROCKVILLE MD.	PAGE 1 OF 4	
JOB CM8008	STATE MINNESOTA-WISCONSIN		
PRJ .	LOCALITY DULUTH SUPERIOR HBR	ORIGINATING ACTIVITY	
DTM NA1927	DATE 04/06/81	COMPILATION	

OBJECTS INSPECTED FROM SEAWARD	E.STEIGERWALD, L.NETERER	HYDROGRAPHIC PARTY
POSITIONS DETERMINED AND/OR VERIFIED BY FIELD AND OFFICE ACTIVITIES	E.STEIGERWALD, W.DEWHURST	FIELD REPRESENTATIVE
	JAMES H.TAYLOR	OFFICE COMPILER
	N/A	DIGITIZER
	ALFRED BETHEA	DATA PROCESSER

KEY FOR ENTRIES UNDER METHOD AND DATE OF LOCATION

OFFICE

1. OFFICE IDENTIFIED AND LOCATED OBJECTS. THE NUMBER AND DATE (INCLUDING MONTH, DAY AND YEAR) OF THE PHOTOGRAPH USED TO IDENTIFY AND LOCATE THE OBJECT ARE SHOWN.
   EXAMPLE 75E(C)6042
   8-12-77

FIELD

1. NEW POSITION DETERMINED OR VERIFIED
   KEY TO SYMBOLS

F-FIELD	P-PHOTOGRAMMETRIC
L-LOCATED	VIS-VISUALLY
V-VERIFIED	
1-TRIANGULATION	5-FIELD IDENTIFIED
2-TRAVERSE	6-THEODOLITE
3-INTERSECTION	7-PLANETABLE
4-RESECTION	8-SEXTANT

   A. FIELD POSITIONS* SHOW THE METHOD OF LOCATION AND DATE OF FIELD WORK.
   EXAMPLE F-2-6-L
   8-12-76

*FIELD POSITIONS ARE DETERMINED BY FIELD OBSERVATIONS BASED ENTIRELY UPON GROUND SURVEY METHODS

FIELD(CONT,D)

   B. PHOTOGRAMMETRIC FIELD POSITIONS** SHOW THE METHOD OF LOCATION OR VERIFICATION, DATE OF FIELD WORK AND NUNBER OF PHOTOGRAPH USED TO LOCATE AND IDENTIFY THE OBJECT.
   EXAMPLE P-8-V
   8-12-77
   74L(C)2982

2. TRIANGULATION STATION RECOVERED
   WHEN A LANDMARK OR AID WHICH IS ALSO A TRIANGULATION STATION IS RECOVERED, A TRIANG. REC. WITH DATE OF RECOVERY IS SHOWN.
   EXAMPLE TRIANG. REC.
   8-12-76

3. POSITION VERIFIED VISUALLY ON PHOTOGRAPH SHOWN BY V-VIS AND DATE.
   EXAMPLE V-VIS
   8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS ARE DEPENDENT ENTIRELY, OR IN PART, UPON CONTROL ESTABLISHED BY PHOTOGRAMMETRIC METHODS.

NOTE: WHERE THE NAME OF AN AID INCLUDES THE IMMEDIATE GEOGRAPHIC HEADING UNDER WHICH IT IS LISTED, A DASH (-) IS USED TO INDICATE THE GEOGRAPHIC HEADING WHICH IS PART OF THE OFFICIAL NAME.

SVY TP01080		RPT UNIT CMD. ROCKVILLE MD.	PAGE 2 OF 4
JOB CM8008	NONFLOATING AIDS FOR CHARTS TO BE REVISED	STATE MINNESOTA-WISCONSIN	
PRJ .		LOCALITY DULUTH SUPERIOR HBR	ORIGINATING ACTIVITY
DTM NA1927		DATE 04/06/81	COMPILATION

THE FOLLOWING OBJECTS HAVE NOT BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS

CHARTING NAME	DESCRIPTION RECORD REASON FOR DELETION PUT TRIANGULATION NAMES IN ( )	POSITION LATITUDE LONGITUDE	DM OP	CMD ALTEK DGTZD	METHOD AND DATE OF LOCATION OFFICE	FIELD	CHARTS AFFECTED
	DULUTH-SUPERIOR HARBOR						
	ST. LOUIS BAY NORTH CHANNEL						
-LIGHT	RANGE FRONT LIGHT	46 44 09.37 92 08 40.02	289.3 849.7	NOT DGTZD	80EC5733 08/31/80	F-3-7-V 07/13/81	14975
-LIGHT	RANGE REAR LIGHT SAME AS ST. LOUIS BAY SOUTH	46 44 03.84 92 08 48.38	118.6 1027.2	NOT DGTZD	80EC5733 08/31/80	F-3-7-V 07/13/81	14975
	CHANNEL RANGE REAR LIGHT						
	ST. LOUIS BAY SOUTH CHANNEL						
-LIGHT 14	SAME AS ST. LOUIS BAY SOUTH CHANNEL RANGE FRONT LIGHT	46 44 06.32 92 08 39.99	195.2 849.0	NOT DGTZD	80EC5733 08/31/80	F-3-7-V 07/13/81	14975
	ST. LOUIS RIVER						
-LIGHT	RANGE FRONT LIGHT	46 43 12.33 92 08 36.02	380.7 765.0	NOT DGTZD	80EC5795 08/31/80	V-VIS 07/ /81	14975
-LIGHT	RANGE REAR LIGHT	46 43 13.41 92 08 21.80	414.1 463.0	NOT DGTZD	80EC5795 08/31/80	V-VIS 07/ /81	14975

76-40 LISTIN

PHOTOGRAMMETRIC BRANCH
PHOTOGRAMMETRY DIVISION

NATIONAL OCEAN SURVEY NOAA
DEPARTMENT OF COMMERCE USA

DATATAB VERSION 782707

SVY TP01080			RPT UNIT	CMD. RCCKVILLE MD.		PAGE 3 OF 4			
JOB CM8008	LANDMARKS FOR CHARTS		STATE	MINNESOTA-WISCONSIN					
PRJ .	TO BE REVISED		LOCALITY	DULUTH SUPERIOR HBR		ORIGINATING ACTIVITY			
DTM NA1927			DATE	04/06/81		COMPILATION			

THE FOLLOWING OBJECTS HAVE BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS

CHARTING NAME	DESCRIPTION RECORD REASON FOR DELETION PUT TRIANGULATION NAMES IN ( )	POSITION LATITUDE LONGITUDE	DM DP	CMD ALTEK CGTZD	METHOD AND DATE OF LOCATION OFFICE	FIELD	CHARTS AFFECTED
STACK		46 44 54.58 92 09 31.77	1685.4 674.4	NOT CGTZD	80EC5734 08/31/80	F-3-7-V 07/13/81	14975
CLOCK TOWER	(DULUTH COLLEGE CLOCK TOWER, 1952)	46 44 54.24 92 09 30.27	1674.9 642.5	NOT CGTZD	TRIANG	TRIANG REC 07/13/81	14975
STACK	(DULUTH,MINNESOTA POWER AND LIGHT COMPANY,STACK,1952)	46 44 08.12 92 09 07.38	250.7 156.7	NOT CGTZD	TRIANG	TRIANG REC 07/13/81	14975
TANK		46 44 08.15 92 09 06.36	251.7 135.0	NOT CGTZD	80EC5733 08/31/80	F-3-7-V 07/13/81	14975
CHY		46 44 09.42 92 09 08.51	290.9 180.7	NOT CGTZD	80EC5733 08/31/80	F-3-7-V 07/13/81	14975
CHY		46 44 08.88 92 09 08.60	274.2 182.6	NOT CGTZD	80EC5733 08/31/80	F-3-7-V 07/13/81	14975
STACK		46 43 35.92 92 09 59.14	1109.2 1255.8	NOT CGTZD	80EC5732 08/31/80	F-3-7-V	14975
TOWER		46 43 27.61 92 08 43.61	852.6 926.1	NOT CGTZD	80EC5795 08/31/80	F-3-7-V	14975
TOWER		46 43 27.55 92 08 23.84	850.7 506.3	NOT CGTZD	80EC5795 08/31/80	F-3-7-V	14975

76-40 LISTIN

PHOTOGRAMMETRIC BRANCH
PHOTOGRAMMETRY DIVISION

NATIONAL OCEAN SURVEY NOAA
DEPARTMENT OF COMMERCE USA

DATATAB VERSION 782707

SVY TP01080		RPT UNIT CMD, ROCKVILLE MD.	PAGE 4 OF 4		
JOB CM8008	LANDMARKS FOR CHARTS	STATE MINNESOTA-WISCONSIN			
PRJ .	TO BE DELETED	LOCALITY DULUTH SUPERIOR HBR	ORIGINATING ACTIVITY		
DTM NA1927		DATE 04/06/81	COMPILATION		

THE FOLLOWING OBJECTS HAVE BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS

CHARTING NAME	DESCRIPTION RECORD REASON FOR DELETION PUT TRIANGULATION NAMES IN ( )	POSITION LATITUDE LONGITUDE	DM DP	CMD ALTEK DGTZD	METHOD AND DATE OF LOCATION OFFICE	FIELD	CHARTS AFFECTED
TANK	DESTROYED	46 44 30.00 92 09 36.00	926.4 764.2	NOT DGTZD		V-VIS 07/ /81	14975
CHY	NOT OF LANDMARK VALUE	46 45 00.26 92 08 27.48	8.0 583.3	NOT DGTZD	80EC5734 08/31/80		

FORM C&GS-8352
(3-25-63)

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
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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			Drawing No.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P63