

H11031

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. C

Registry No. H-11031

LOCALITY

State Alaska

General Locality Knik Arm

Sublocality Anchorage to 2 miles North of Cairn Point

2001

CHIEF OF PARTY
Frederick W. Iversen

LIBRARY & ARCHIVES

DATE

H-11031**HYDROGRAPHIC TITLE SHEET**INSTRUCTIONS The hydrographic sheet should be accompanied by this form,
filled in as completely as possible, when the sheet is forwarded to the office.

FIELD NO.

CState ALASKAGeneral Locality Cook InletSublocality Anchorage to 2 miles North of Cairn PointScale 1:10,000Date of Survey May 11 - July 31, 2001Instructions Date 6/29/2000Project No. OPR-P385-KR-01Vessel Sea Ducer (AK 0691 P), Jolly Pickle (AK 3472 M)Chief of Party Frederick W. IversenSurveyed by Iverson, Battan, Boulanger, Bergman, Dollard, Englebreck, Esposito,
Farley, Gates, Hocker, Howland, Hussey, Kemp, McCrary, Parent, et allSoundings taken by echo sounder Reson 8101 Multibeam Echo SoundereGraphic record scaled by TERRA PERSONNELGraphic record checked by TERRA PERSONNELEvaluation by B. Mihailov Automated plot by HP Design Jet 1050CVerification by G. Nelson, B. MihailovSoundings in Feet at MLLWREMARKS: The purpose of this work is to provide NOAA with modernand accurate data for Knik Arm to Anchorage.PHB Revision: Report has been evaluated. Comments, revisions,and corrections are entered as endnotes.**ALL TIMES ARE RECORDED IN UTC. UTM Zone 5****TERRA SURVEYS****1930 South Whiting Circle****Palmer, AK 99645**

TABLE OF CONTENTS

Section

A	Area Surveyed	1
B	Data Acquisition and Processing	3
C	Vertical and Horizontal Control	11
D	Results and Recommendations	12 14 DEW
E	Approval Sheet	38

Appendixes

I	Danger to Navigation Reports
II	List of Geographic Names
III	Progress Sketch
IV	Tide and Water Levels
V	Supplemental Survey Records and Correspondence

Separates¹

I	Acquisition and Processing Logs- <i>Delivered in Project Wide Format</i>
II	Side Scan Contact Listing and Images of Significant Contacts- <i>Not Applicable for this survey</i>
III	Sound Velocity Profile Data- <i>Delivered in same binder as Separate V Crossline Comparisons</i>
IV	Hydrographic Survey Letter Instructions/Statement of Work- <i>Not Applicable for this survey</i>
V	Crossline Comparisons- <i>Delivered in same binder as Separate III Sound Velocity Profile Data</i>

Descriptive Report to Accompany Hydrographic Survey H-11031

Sheet C

Scale 1:10,000

May-September 2001

Terra Surveys, LLC

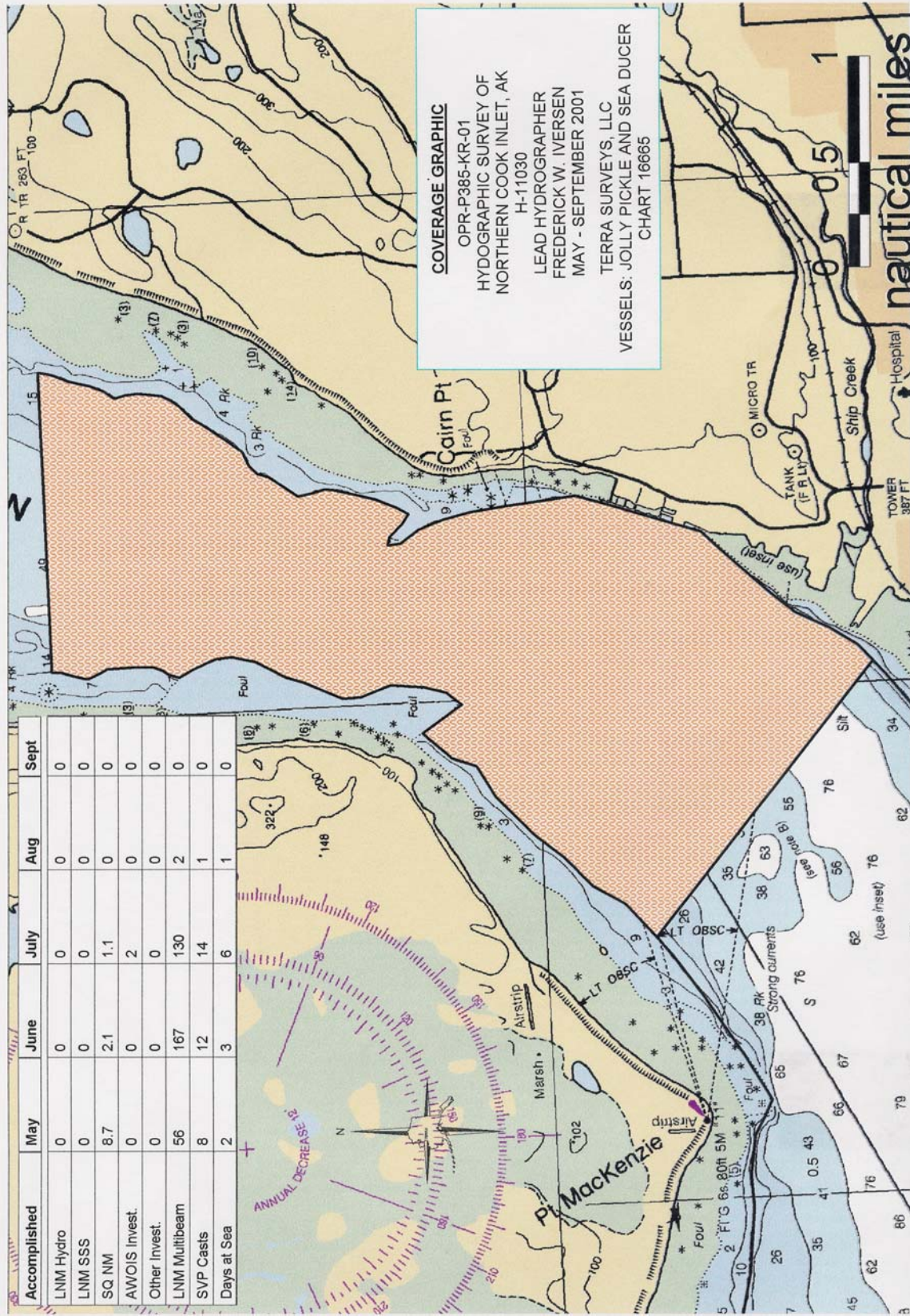
Chief of Party: Frederick Iversen, PLS

A. AREA SURVEYED

This navigable area survey was conducted in accordance with Hydrographic Project Instructions OPR-P385-KR-2001, Approaches to Anchorage, Northern Cook Inlet; Alaska dated March 1, 2001.

The purpose of this contract was to provide NOAA with modern, accurate hydrographic survey data with which to update the nautical charts of this area. Dramatic bottom changes, both shoaling and deepening have been reported. The survey area is approximately 4.6 square nautical miles with the southerly limits two miles South of Cairn Point extending up into Knik Arm, 3.5 miles north of Anchorage. Cook Inlet is a major commercial shipping lane for the Port of Anchorage, which lies on the eastern edge of this project. It has been an established international Port since 1961. A new dock; Port Mackenzie is on the west shore of the survey. Construction for the Port Mackenzie dock began in 1998 and there is a comprehensive plan of development in the near future. These Ports and the ships that use them rely heavily on the accuracy of the nautical chart that covers this area. Both Ports are detailed further in Section D. Additional Results.²

A shallow water, multibeam sonar system was used to locate and determine the least depth over the obstructions, wrecks and shoals as well as to determine the least depths over the entire project area. This survey has a maximum depth of 187 feet and a minimum depth of 0.3 feet above datum.³



Section B Data Acquisition and Processing

B.1 Equipment

Seaducer

One hundred percent of the soundings for this survey were acquired from the motor vessel *SeaDucer*. The *SeaDucer* is a custom built aluminum USCOLA Offshore Pilot vessel. Its overall length is 31 feet, with a beam of 10 feet and a draft of 1-2 feet. Major systems used on the *SeaDucer* are listed on the following table.

VESSEL <i>Seaducer</i>	
LOA: 31 FT, BEAM 10.0 FT, DRAFT: 1-2 FT	
Equipment	Manufacturer & Model
Multibeam sonar	Reson SeaBat 8101
Positioning	Seatex Seapath 200
Sound velocity	Applied Microsystems 3317 3279 4427
Vessel attitude	Seatex Seapath 200

Equipment performance details are provided in the Project-Wide Report, Sections A, Equipment and B, Quality Control.⁴

B2. Quality Control

The internal consistency and integrity of the survey data was found to be good. All of the soundings that appear on the smooth sheet meet or exceed the accuracy requirements in the specifications.

Survey H-11031 (Sheet C) had 274 Nautical Miles of main scheme lines and 11 NM of crosslines. This equates to 4 % of the mainscheme lines and falls just short of the requirements of 5%.⁵

There were 27 crosslines and 254 mainscheme lines in Sheet C. This resulted in 815 junctions where they crossed. A total of 25 crossings were analyzed, each one a different crossline, which complies with the requirements of the SOW.⁶

Statistical analysis of the crossline comparisons was accomplished using the Caris HIPS Quality control report tool. This tool is used to compare the sounding data from the crossline against a reference DTM surface. The reference DTM surface is constructed with soundings from one of the mainscheme survey lines. In most cases the mainscheme line was selected to be close in time to the crossline in order to minimize any failed intersections due to bottom change as opposed to sounder error. The changing seafloor is very apparent in Cook Inlet and is detailed further in the Project Wide Data Acquisition and Processing report. The output from this tool is a text report containing statistical results of the differences between the crossline data and the mainscheme line data. The statistics are grouped by sonar beam number and can be found in Separate V⁷ of this report. A spreadsheet is included which summarizes the range of beams within each crossline comparison which meet or exceed the 95% compliance standard.

The crossline reports generated with the Caris program use a class file that was developed from the NOAA specifications for this project. The table below shows the parameters for this class file.

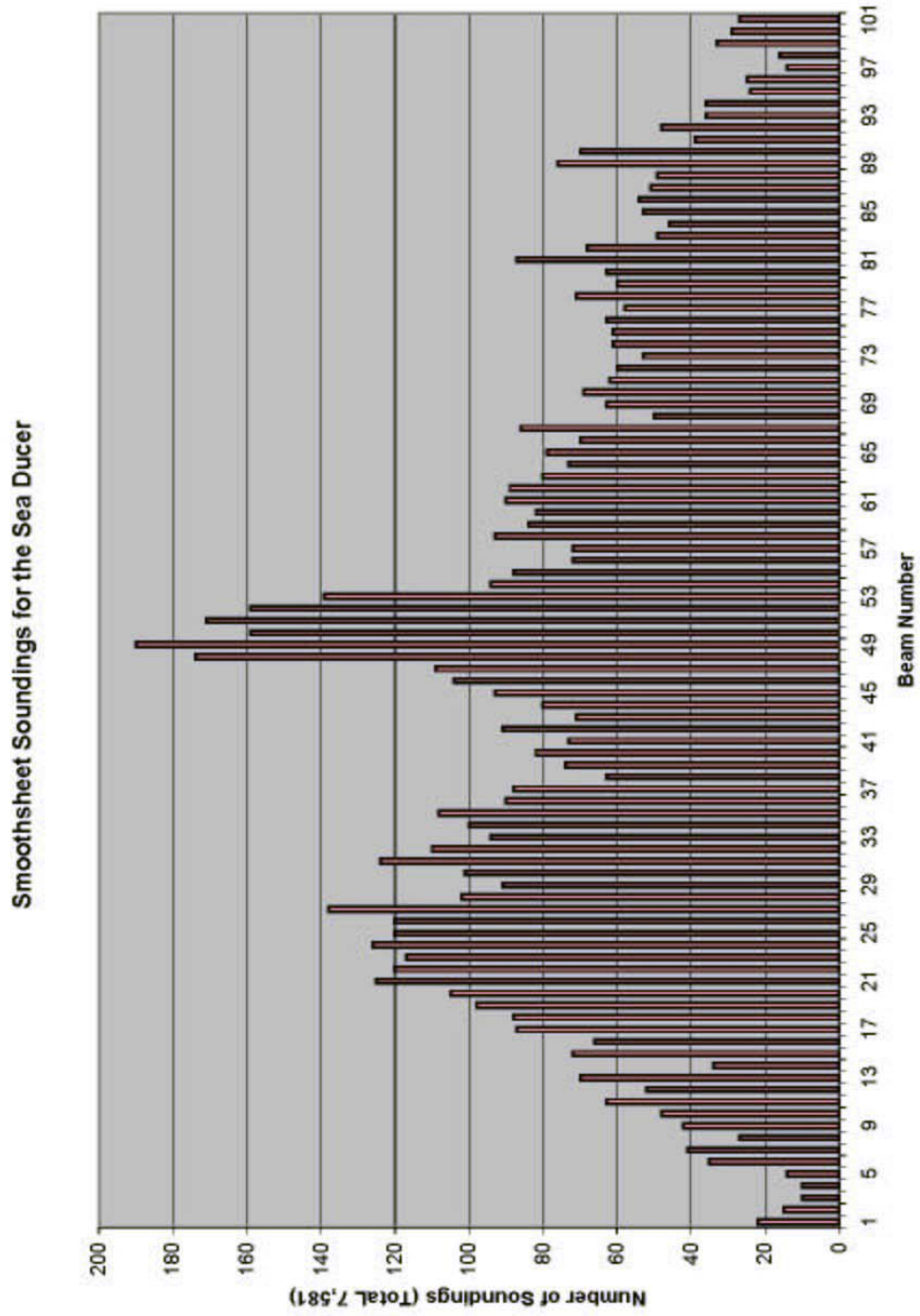
Min. Depth	Max. Depth	Allowable Error
0.0m	-10.00m	0.50m
-10.00m	-20.00m	0.54m
-20.00m	-30.00m	0.60m
-30.00m	-40.00m	0.68m
-40.00m	-50.00m	0.77m
-50.00m	-1000.00m	1.4%

*Each error in the file is for a depth mid way between each group (ex. -10.00 to -20.00 uses -15 depth to compute an allowable error of .54). From -50m on a slope was computed. The computed allowable errors met NOAA specifications for this project.*⁸

A histogram was made from the final smoothsheet soundings, which shows their distribution by beam number. The only sounder used on Sheet C was a Reson 8101 with 101 beams. The beams are numbered from port to starboard, 1-101 with beam 51 representing the nadir beam. There are two anomalies that are obvious in this chart. There are a large number of soundings used that come from the nadir area of the swath. The other irregularity observed in the data is there is a definite bias favoring the midrange beams of the port side.

The above average nadir beam selections is something Terra Surveys, LLC has seen before and is systematic to this sounder. It is called the nadir spiking effect and it can be seen as an artifact in the sun illuminated DTM image. When two lines from this sounder are compared using the crossline analysis tool, the number of acceptable soundings of these beam numbers (48-53) is usually slightly less (less than 5%) than that of their neighbors but still within acceptable tolerance. The shoal biasing of all cells brings these slightly shoaler soundings into the final data set.

The port side bias is probably the result of these soundings being collected during the time when there was sonar noise producing outrides on the collection vessel. The port side data required an extra effort in cleaning and had a wider range of depths than the starboard. All soundings represented on the smooth sheet passed tolerances, but the wider range on the port side produced more smoothsheet soundings upon shoal biasing.⁹



Beam # v.s. # of Soundings on Smoothsheet

<u>Vessel</u>	<u>Beam</u>	<u>Count</u>	<u>Vessel</u>	<u>Beam</u>	<u>Count</u>
Sea Ducer	1	22	Sea Ducer	41	73
Sea Ducer	2	15	Sea Ducer	42	91
Sea Ducer	3	10	Sea Ducer	43	71
Sea Ducer	4	10	Sea Ducer	44	80
Sea Ducer	5	14	Sea Ducer	45	93
Sea Ducer	6	35	Sea Ducer	46	104
Sea Ducer	7	41	Sea Ducer	47	109
Sea Ducer	8	27	Sea Ducer	48	174
Sea Ducer	9	42	Sea Ducer	49	190
Sea Ducer	10	48	Sea Ducer	50	159
Sea Ducer	11	63	Sea Ducer	51	171
Sea Ducer	12	52	Sea Ducer	52	159
Sea Ducer	13	70	Sea Ducer	53	139
Sea Ducer	14	34	Sea Ducer	54	94
Sea Ducer	15	72	Sea Ducer	55	88
Sea Ducer	16	66	Sea Ducer	56	72
Sea Ducer	17	87	Sea Ducer	57	72
Sea Ducer	18	88	Sea Ducer	58	93
Sea Ducer	19	98	Sea Ducer	59	84
Sea Ducer	20	105	Sea Ducer	60	82
Sea Ducer	21	125	Sea Ducer	61	90
Sea Ducer	22	120	Sea Ducer	62	89
Sea Ducer	23	117	Sea Ducer	63	80
Sea Ducer	24	126	Sea Ducer	64	73
Sea Ducer	25	120	Sea Ducer	65	79
Sea Ducer	26	120	Sea Ducer	66	70
Sea Ducer	27	138	Sea Ducer	67	86
Sea Ducer	28	102	Sea Ducer	68	50
Sea Ducer	29	91	Sea Ducer	69	63
Sea Ducer	30	101	Sea Ducer	70	69
Sea Ducer	31	124	Sea Ducer	71	62
Sea Ducer	32	110	Sea Ducer	72	60
Sea Ducer	33	94	Sea Ducer	73	53
Sea Ducer	34	100	Sea Ducer	74	61
Sea Ducer	35	108	Sea Ducer	75	61
Sea Ducer	36	90	Sea Ducer	76	63
Sea Ducer	37	88	Sea Ducer	77	58
Sea Ducer	38	63	Sea Ducer	78	71
Sea Ducer	39	74	Sea Ducer	79	60
Sea Ducer	40	82	Sea Ducer	80	63

Beam # v.s. # of Soundings on Smoothsheet**Vessel Beam Count**

Sea Ducer	81	87
Sea Ducer	82	68
Sea Ducer	83	49
Sea Ducer	84	46
Sea Ducer	85	53
Sea Ducer	86	54
Sea Ducer	87	51
Sea Ducer	88	49
Sea Ducer	89	76
Sea Ducer	90	70
Sea Ducer	91	39
Sea Ducer	92	48
Sea Ducer	93	36
Sea Ducer	94	36
Sea Ducer	95	24
Sea Ducer	96	25
Sea Ducer	97	14
Sea Ducer	98	16
Sea Ducer	99	33
Sea Ducer	100	29
Sea Ducer	101	27
<hr/>		
	Total	7581

Contemporary Survey Junctions

This survey was compared to H-11030 (2001, Scale 1:10,000). The smoothsheet was plotted at the same scale as this survey. It adjoins this survey at the southern limits. Generally the two surveys agreed. However, in the area of $61^{\circ}14'08.07''\text{N}$, $149^{\circ}56'40.54''\text{W}$ there are several soundings that differ by as much as 19 feet¹⁰. Further investigation shows that the data with discrepancies was collected 34 days apart and is an area of dynamic Cook Inlet bottom movement. The DTM in this area clearly shows sand waves. This phenomenon is discussed in detail in the Project Wide Data Acquisition Report and in Section D¹¹ of this report. There are no recommendations and no adjustments were made to account for the rapidly changing bottom.

Quality Control Checks

All of the quality control methods and procedures are detailed in the Project Wide Data Acquisition and Processing Report. There were no unique problems that pertain to this survey. A table of Line Statistics is included in Separate V, Crossline Comparisons¹² that details all required aspects of quality control on each line.¹³

B3. Corrections To Echo Soundings

Hydrographic Survey H-11031 was performed with two other surveys in Project OPR-385-KR-2001¹⁴. Any changes to the corrections to echo soundings affects all three surveys in the area and is described in the project wide Data Acquisition and Processing Report. The tide correction does have some specific notes unique to H-11031 and is explained below. Tide correction methodology is detailed further in Section C of the Data Acquisition and Processing Report.

Static draft was derived by measuring from a Reference Point (RP) on the hull to the waterline. The draft was recorded twice daily. The draft readings were incorporated into a database, which included the date and time, line name, and engine RPM. This static draft was used in conjunction with the settlement and squat data to create a delta-draft file to be used in Caris processing.¹⁵

Tide Issues unique to H-11031

The survey began on DN 131. Tide stations Fire Island (945-5912) and Port Mackenzie (945-5934) began collecting data on DN 148. Survey data collected on or before DN 147 was processed using the provided zoning from LCMF Inc and the Anchorage gauge (945-5920). Standard zoning procedures were used. Data from DN 148 through the end of the job is processed using standard zoning procedures and the Port Mackenzie (945-5934) gauge.¹⁶

C. Vertical and Horizontal Control

Soundings for this survey were tide adjusted using data from NOAA Tide Stations Anchorage 945-5920 and the subordinate station Port Mackenzie 945-5934 installed by Terra Surveys, LLC and LCMF Inc for this project. Anchorage preliminary water level data was downloaded from the NOAA web site (<http://www.co-ops.nos.noaa.gov>) daily. Data collected on or before DN 147 used the Anchorage gauge. Once the subordinate gauge Port MacKenzie began running on DN 148, the data was processed using Port Mackenzie. The final zoning methodology is described in further detail in the Project wide Vertical and Horizontal Control report.¹⁷

The horizontal control datum for this survey is North American Datum of 1983 (NAD 83). The projection used during collection was UTM, Zone 5. United States Coast Guard Stations (USCG) *TSEA* and *Kenai* were used to send correctors to the survey vessels. A 24-hour observation on Cooperative station *CMJV2* was used as a fixed point DGPS performance check on *TSEA*. The observation survey showed the position on *CMJV2* met the required accuracy standards. The 24-hour observation survey is detailed in the Project Wide Vertical and Horizontal Control report. A summary of the daily DGPS confidence checks can be found in the Project Wide Vertical and Horizontal Control report as well.

D1. Chart Comparison

There were no Local Notice to Mariners that affected the survey area. Notice number 36(Monthly Edition-September 2001) was the last notice reviewed for this project.

This survey was compared in Autocad Map and Microstation to the following charts:¹⁸

Chart	Scale	Edition	Date
16660	1:194,154	27 th	April 19,1997
16663	1:100,000	5 th	July 12,1997
16665	1:50,000	7 th	March 31, 2001

This chart comparison showed many changes within the survey. As a result, a Danger to Navigation report was generated and can be found in Appendix I of this report.¹⁹ In addition, the survey found three significant rock fields. They are described below.

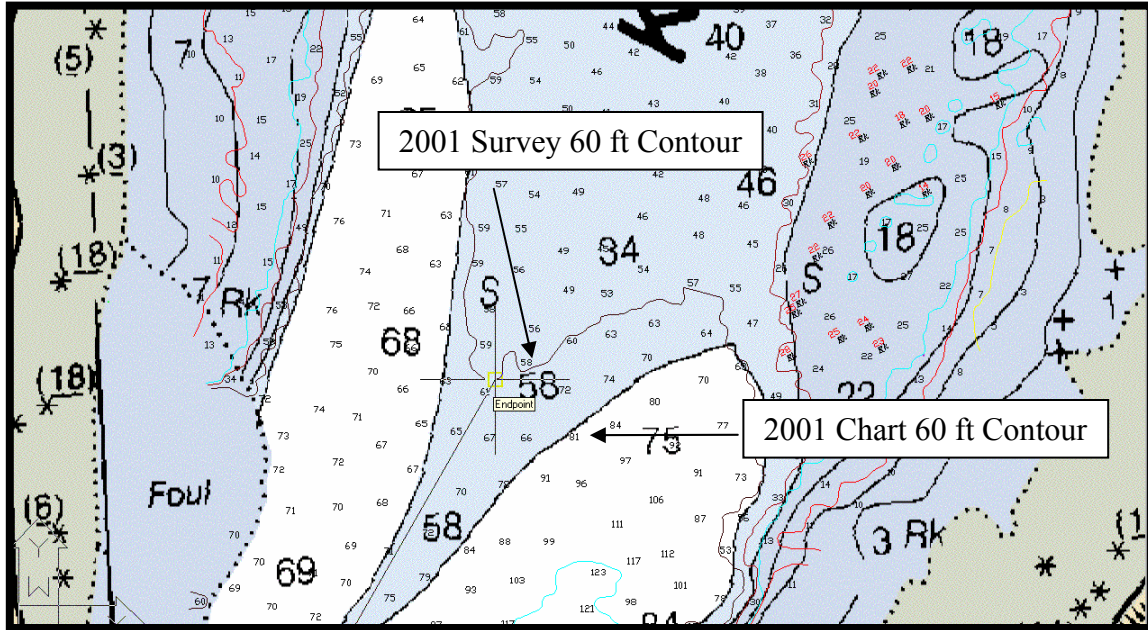
Vicinity	Comment
61°15'04 N and 149°53'38" W	An area of 18 large rocks. Least depths range from 16 to 62 feet. They surround AWOIS Item 50721, a charted submerged wreck. ²⁰
61°15'21" N and 149°53'17" W	A smaller boulder field is approximately at this location with least depths ranging from 11 feet to 34 feet.
61°15'04 N and 149°53'38" W	A 500 meter radius of large rocks with least depths of 15 feet to 28 feet. ²¹

The following page shows a table of soundings and positions that disagree with the chart.²²

Chart Depth	H-11031 Feet	Latitude				Longitude				Comment
		°	'	''	N	°	'	''	W	
71	51	61°	13'	56.74''	N	149°	54'	26.66''	W	
76	50	61°	13'	40.10''	N	149°	55'	07.33''	W	
66	90	61°	13'	57.16''	N	149°	55'	19.59''	W	
50	67	61°	14'	09.41''	N	149°	55'	41.99''	W	
26	19	61°	14'	22.31''	N	149°	57'	15.15''	W	
56	76	61°	14'	23.02''	N	149°	55'	04.74''	W	
78	84	61°	14'	44.38''	N	149°	54'	44.28''	W	
N/A	53	61°	15'	25.05''	N	149°	53'	41.47''	W	Rock
N/A	8	61°	15'	36.14''	N	149°	53'	06.41''	W	Rock
81	63	61°	15'	50.19''	N	149°	54'	34.36''	W	
107	72	61°	16'	02.15''	N	149°	53'	56.25''	W	
N/A	6	61°	16'	05.85''	N	149°	52'	48.57''	W	Rock
N/A	13	61°	16'	23.96''	N	149°	52'	28.58''	W	Rock
72	58	61°	16'	16.78''	N	149°	53'	55.48''	W	
92	75	61°	38'	44.92''	N	149°	56'	44.08''	W	
45	34	61°	16'	43.36''	N	149°	53'	17.75''	W	
N/A	8	61°	17'	10.33''	N	149°	54'	27.66''	W	Rock

The following chartlets address trends in bottom changes this survey has discovered. Suppressed soundings with a radius of 200 meters and all the smoothsheet contours have been superimposed on top of the chart for review.

The 60 foot contour in the vicinity of 61°16'07 N and 149°54'13" W has migrated 900 meters north to a latitude of 61°16'31 N.

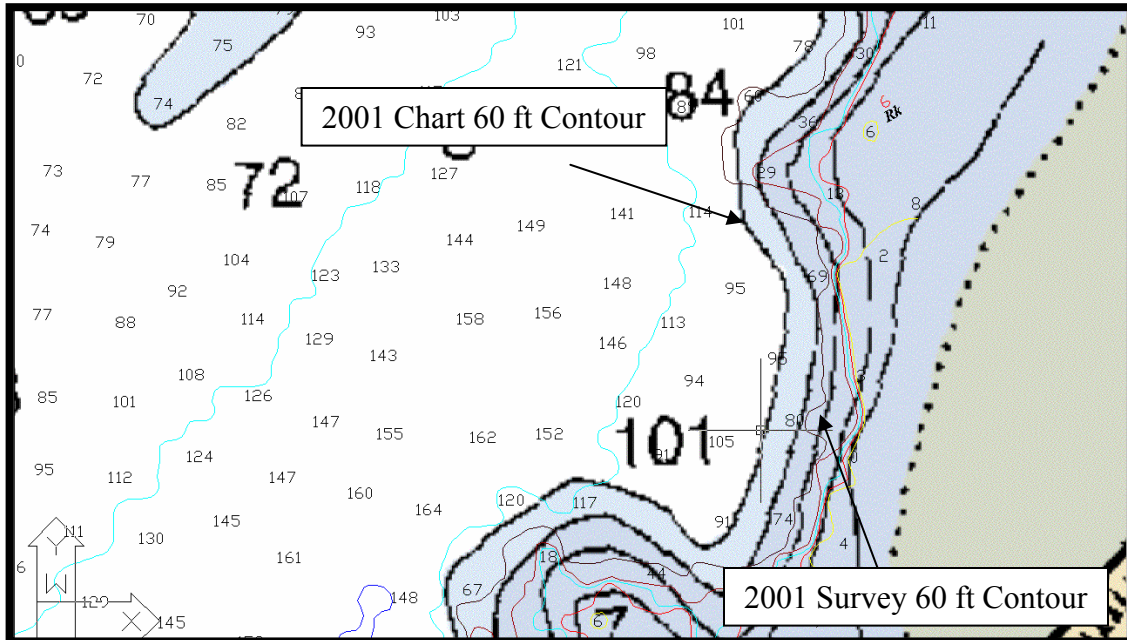


Significant deepening North of Cairn Point (Chart 16665)

Recommendations

The newest editions of affected charts should reflect this change.²³

In the vicinity of 61°15'54 N and 149°53'01"W the 60 foot contour migrates towards the shore to the south east about 100 meters.

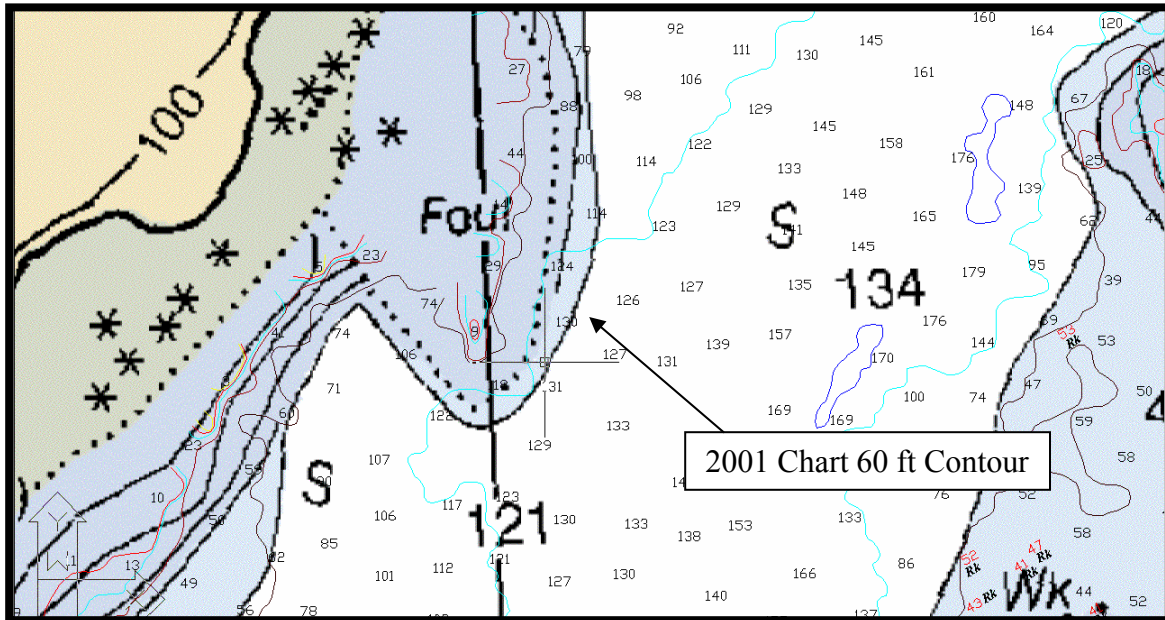


Significant deepening North of Cairn Point (Chart 16665)

Recommendations

The newest editions of affected charts should reflect this change.²⁴

Another area with a deepening trend in the vicinity of $61^{\circ}15'33.2''$ N and $149^{\circ}54'53.3''$ W. The 60 foot curve has move migrated 150 meters west, making the channel wider.

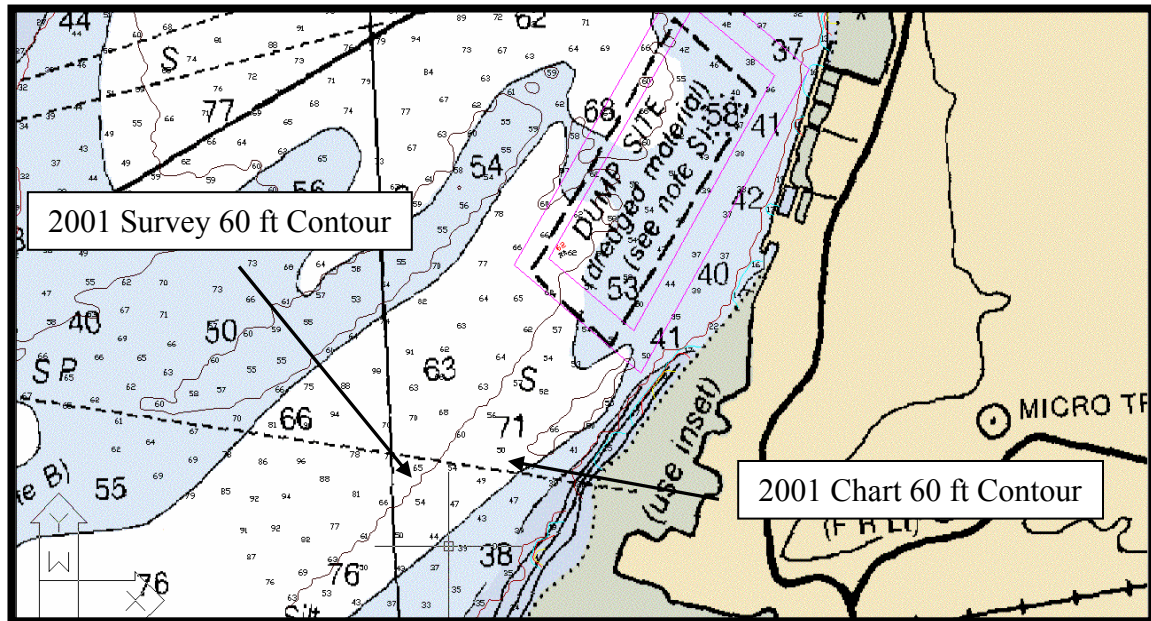


Deepening on the west side of the channel across from Cairn Point (Chart 16665)

Recommendations

The newest editions of affected charts should reflect this change.²⁵

An area with shoaling South of AWOIS item 52653, an abandoned dumpsite at 61°14'24.6"N and 149°53'55.1"W.

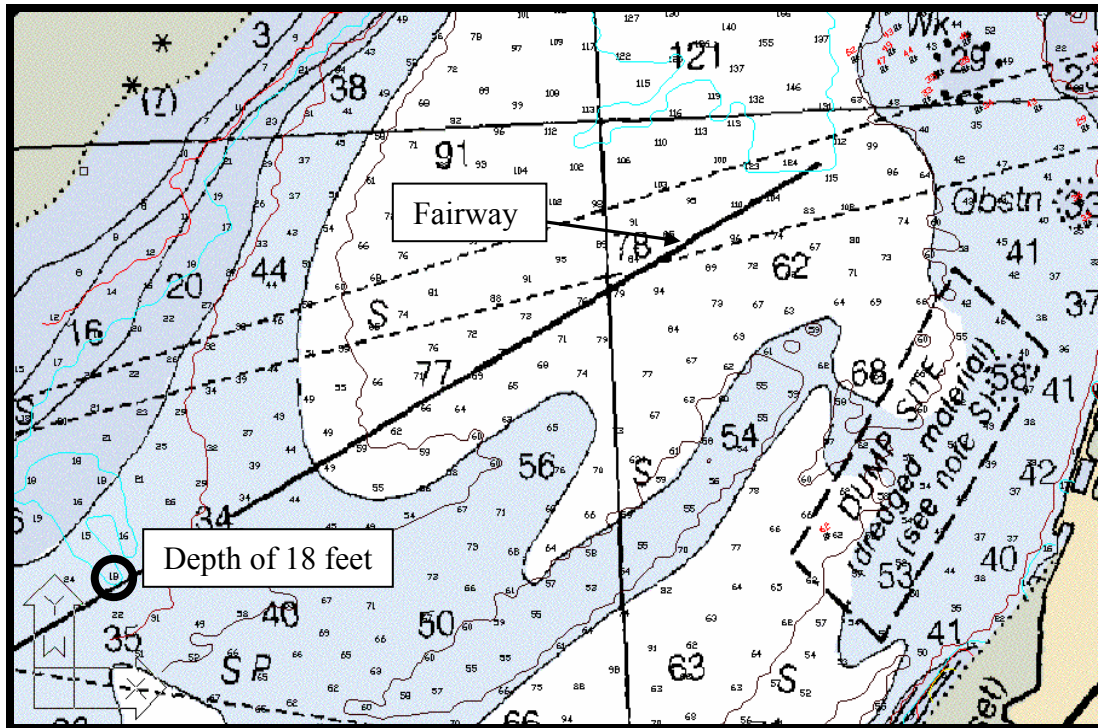


A Shoaling Trend south of the Old Dump Site (Chart 16665)

Recommendations

The newest editions of affected charts should reflect this change.²⁶

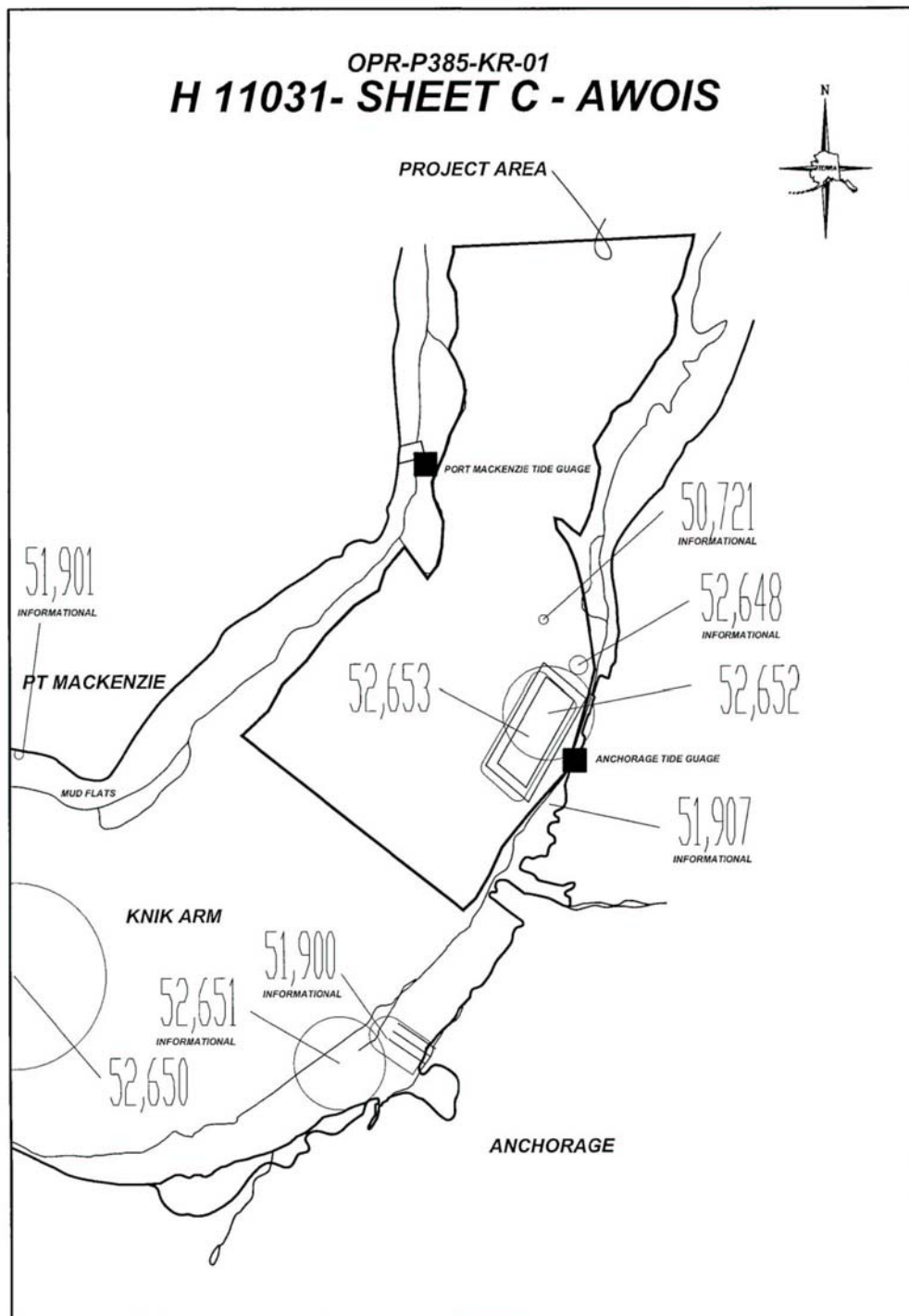
There is a Fairway in the south half of H-11031 that extends to $61^{\circ}14'54.7''\text{N}$ and $149^{\circ}54'13.1''\text{W}$. When depths differed along the Fairway, they are generally deeper than charted. However, at the southern limits of the survey; where the Fairway enters into the sheet, there is a depth of 18 feet. This is 8, 17, and 16 feet shallower than its charted neighbor depths.



The Fairway in H-11031(Chart 16665)

Recommendations

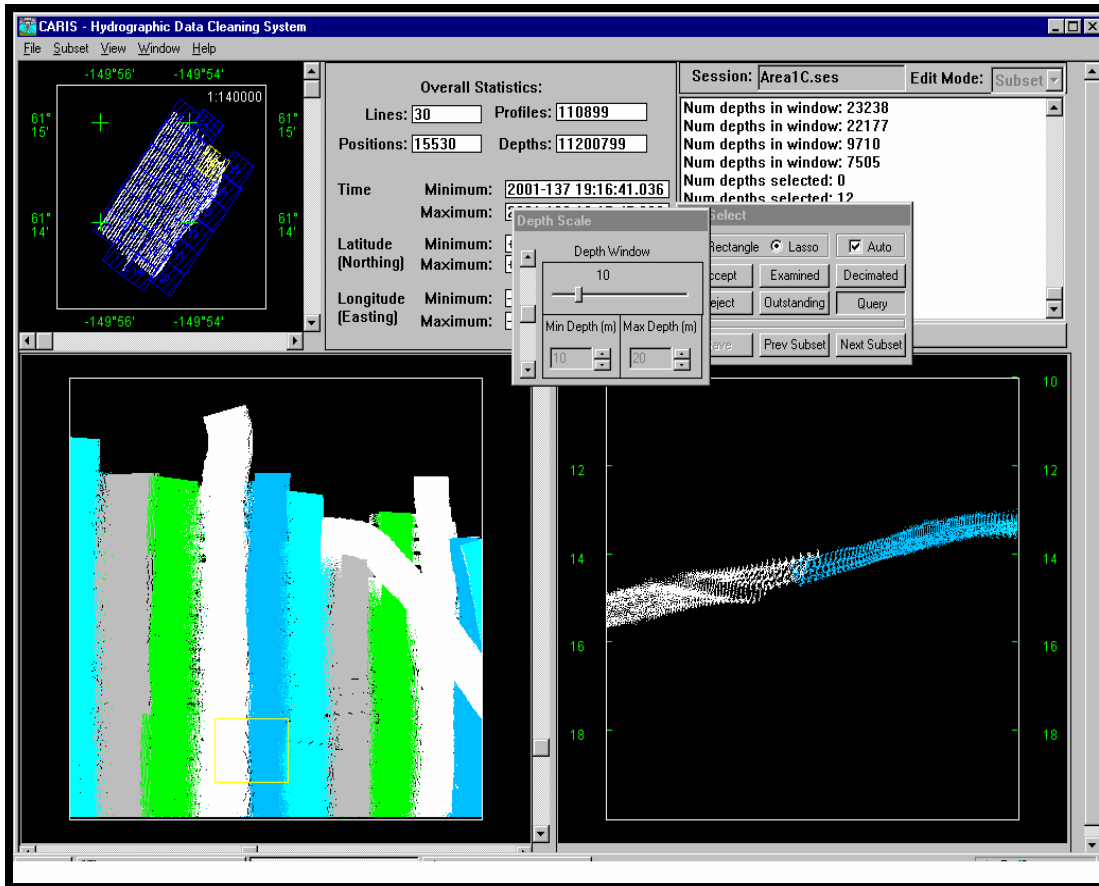
The newest editions of affected charts should reflect this change.²⁷



AWOIS Items

This contract required full investigations of two AWOIS items in H11031. Reports and chart comparisons for each item are given on the following pages.

Record	Description	Comment
52652	Obstruction	The area has full coverage. There is a slight ridge and trench in a depth of 14.5m(47.5 ft) which could be a silted object. No obstruction was found. See screen capture. See AWOIS Figure 1.



AWOIS 52652 as seen in CARIS subset mode

AWOIS Figure 1

Item Investigation Report

Item Description (as charted): Obstruction

Source: AWOIS 52652

Charted Position: Lat 61°14'31.70'' Long 149°53'38.60''

Charts Affected: 16665 7th edition March 2001

Investigation

Date(s)/Day Number(s): 193

Survey Vessel Name: SeaDucer

Position Numbers(ID)/Time: 30366/ 16:27:30

Investigation Method: Shallow Water Multibeam Sonar

Surveyed Position (NAD83): Lat 61°14'32.21'' Long 149°53'37.34''

Position Determined By: Differential GPS

Investigation Summary:

The area has full coverage. There is a slight ridge and trench in a depth of 14.5m(47.5 ft) which could be a silted object. No obstruction was found.

Charting Recommendation

None.

Recommended Least Depth: 35 feet²⁸

Record	Description	Comment
52653	Dump Site	The area has full coverage. The DTM and a review in CARIS HDCS show some material along the west edge of the site. The least depth for the site is ²⁹ 36 feet, and can be found in the north east corner of the site. The carted ³⁰ depth for this area is 58 feet. Compared to the chart this area has not changed much except for some shoaling at the north end. ³¹ See AWOIS Figures 2-5 on following pages.

Additional Dumpsite Information

According to the USACE this dumpsite is no longer in use. Dredge spoils are currently being dumped no less then 3000 feet from the face of the Port of Anchorage Dock

Recommendations

Remove this AWOIS item from the next chart .³²

Item Investigation Report

Item Description (as charted): Dump Site

Source: AWOIS 52653

Charted Position: Lat 61°14'24.00" Long 149°53'53.90"

Charts Affected: 16665 7th edition March 2001

Investigation

Date(s)/Day Number(s): 193

Survey Vessel Name: SeaDucer

Position Numbers(ID)/Time: 628/ 16:21:00

Investigation Method: Shallow Water Multibeam Sonar

Surveyed Position (NAD83): N/A

Position Determined By: Differential GPS

Investigation Summary:

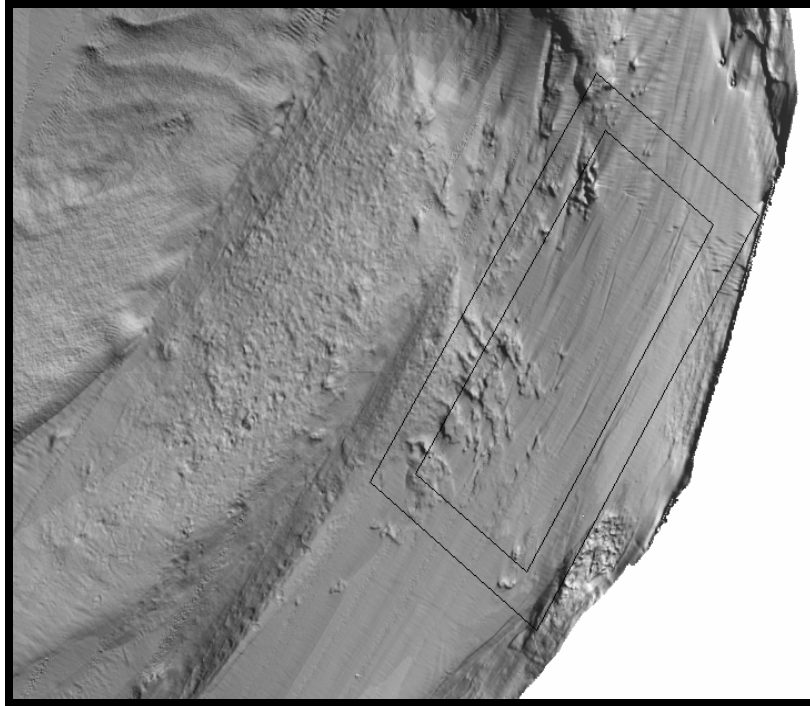
The area has full coverage. The DTM and a review in CARIS HDCS show some material along the west edge of the site. The least depth for the site is 36 feet, and can be found in the north east corner of the site. The charted depth for this area is 58 feet. Compared to the chart this area has not changed much except for some shoaling at the north end.

The USACE has stated this dump is no longer in use. Dredging spoils are now deposited no less than 3000 feet off the face of the Port of Anchorage dock.

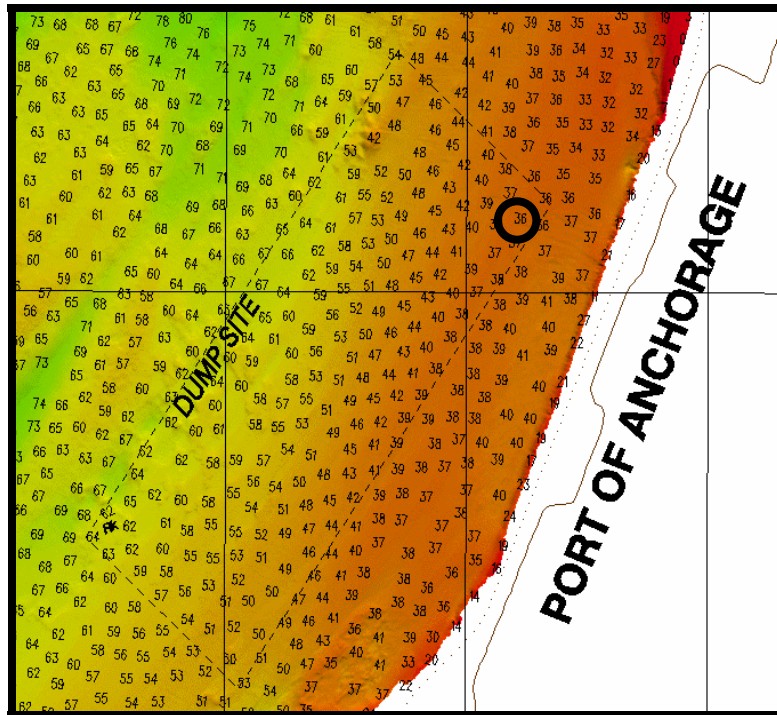
Charting Recommendation

Remove this Item from the next chart edition.

Recommended Least Depth: 36 feet³³

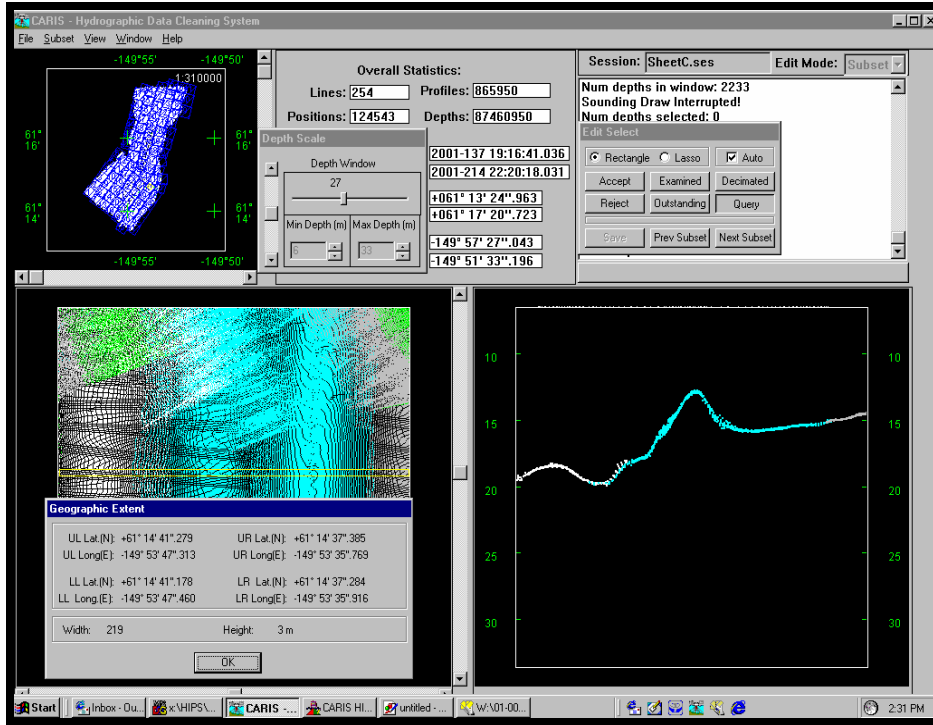


Grey Scale DTM Image with Old Dump Site Overlay, AWOIS Fig. 2

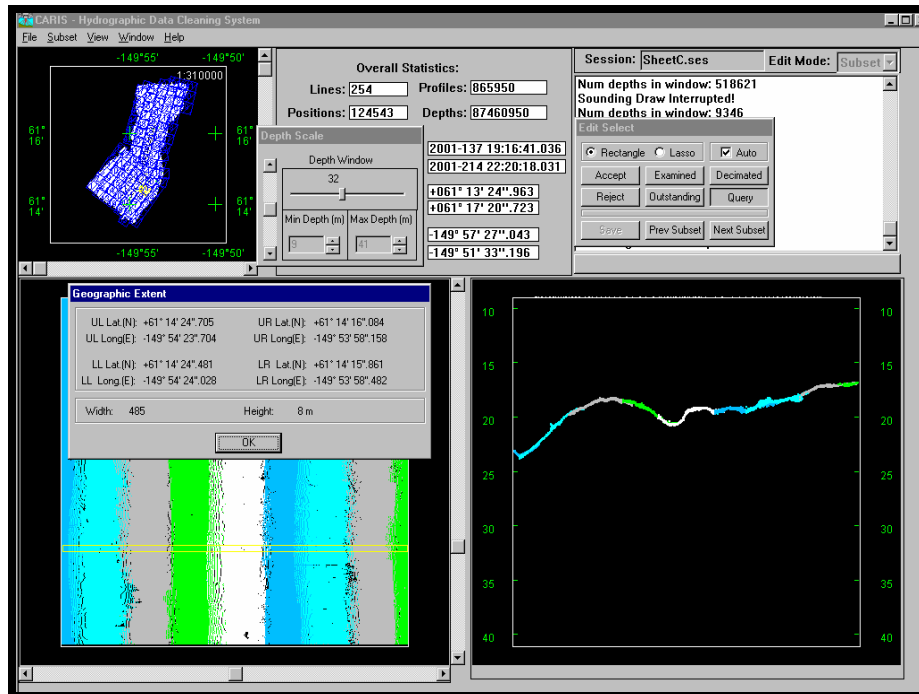


DTM with Old Dump site and Circle Around Shoal Sounding

AWOIS Figure 3



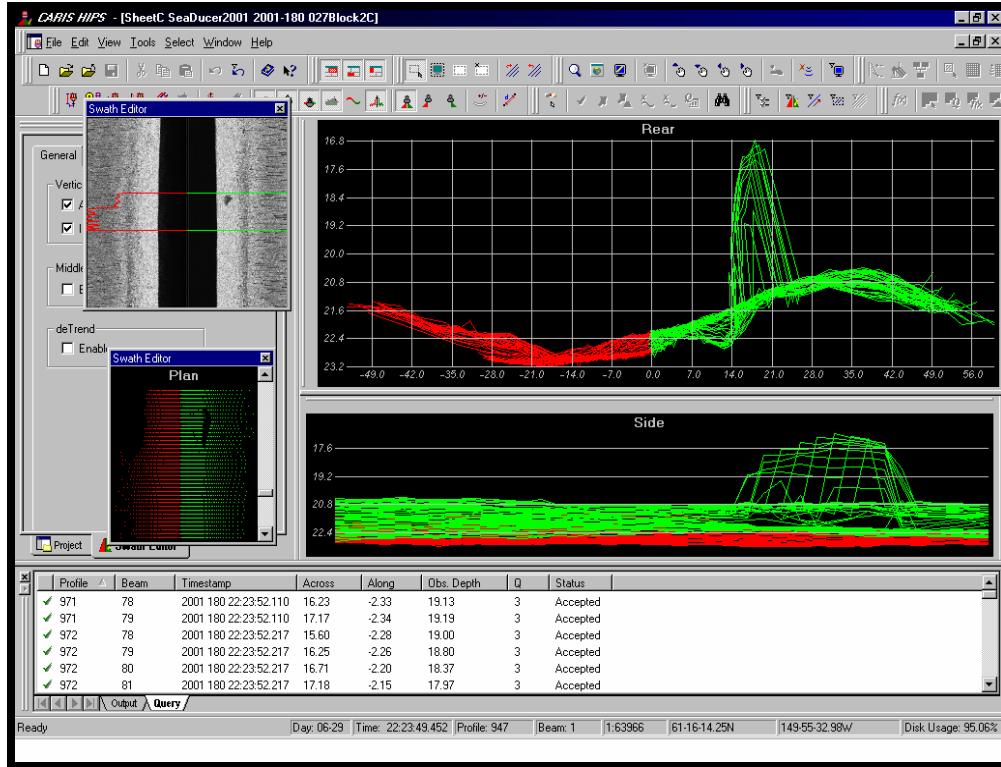
*Looking at the North End of the Old Dump Site in CARIS Subset Mode
 AWOIS Figure 4*



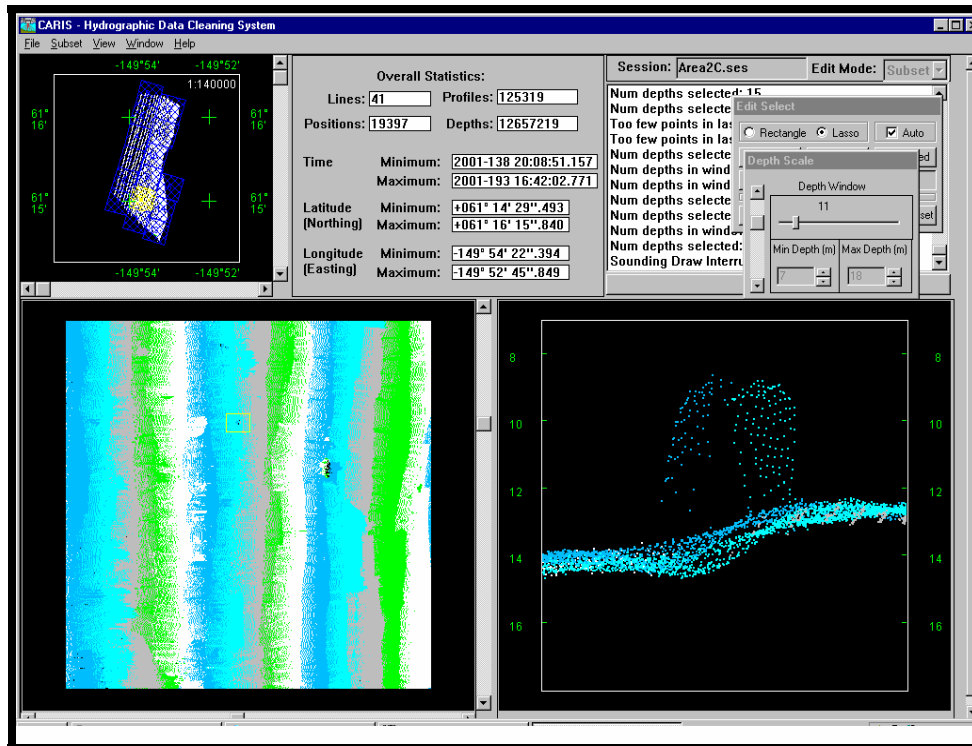
*Looking at the South End of the Old Dump Site in CARIS Subset Mode
 AWOIS Figure 5*

An additional list of three AWOIS items was provided for information only. A review of the three informational items compared to the chart and a digital terrain model produced from the survey is summarized below.

Record	Description	Comment
50721	Submerged wreck	Feature's least depth is 28 feet ³⁴ (AWOIS History is 29 feet). It is located in a large area of rocks. It is approximately 800 meters offshore and South of Cairn Point. Found and marked on the final smoothsheet. See AWOIS Figures 6-7 on the following page.
51907	Wreck	Outside the Area of Hydrography ³⁵
52648	Obstruction	Feature's least depth is 33 feet ³⁶ (agrees with AWOIS history). Found and marked on the smoothsheet. See AWOIS Figures 8-9 on the following pages.



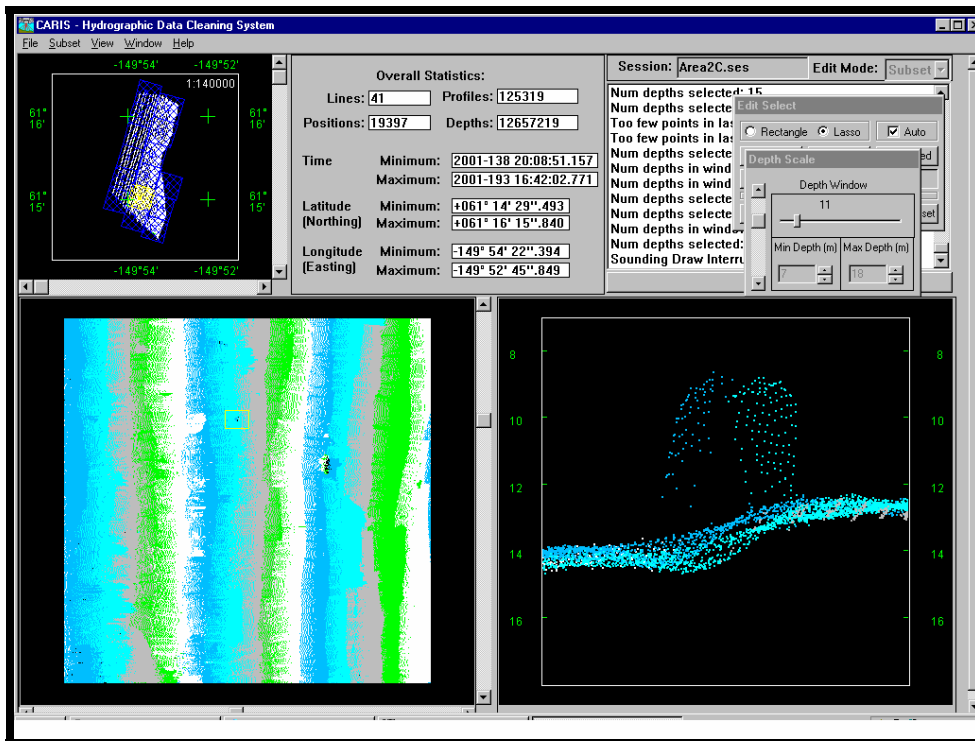
AWOIS Item 50721 as seen in CARIS line mode, AWOIS Fig. 6



*AWOIS Item 50721 as seen in CARIS subset mode
AWOIS Figure 7*



AWOIS Item 52648 as seen in CARIS line mode, AWOIS Fig. 8



AWOIS Item 52648 as seen in CARIS subset mode

AWOIS Figure 9

D2. Additional Results

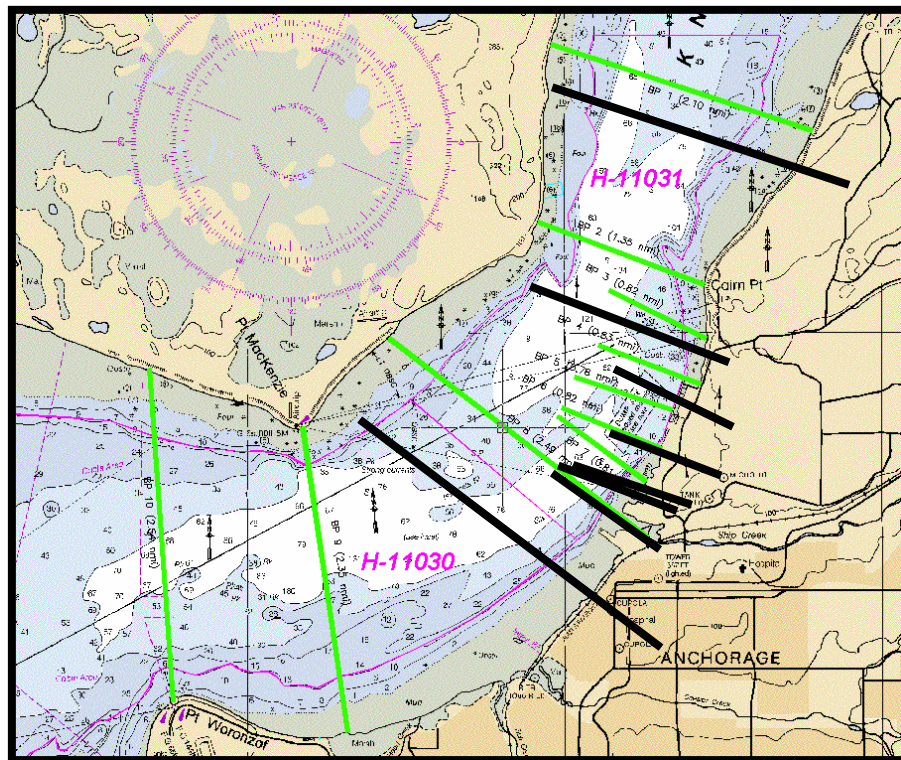
There were no Aids to Navigation in this survey to report. Shoreline verification was not required.³⁷

Information of Significant Value

The Dynamics of Cook Inlet

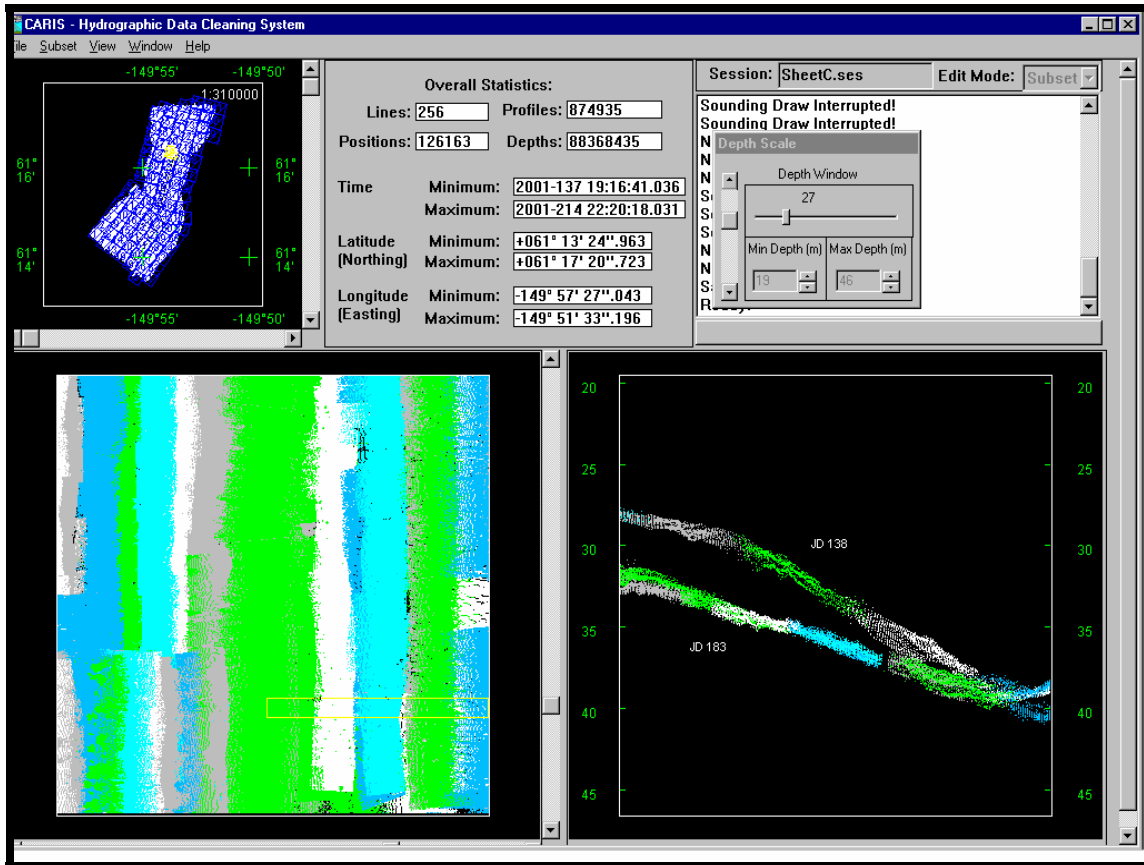
Terra Surveys, LLC is quite intimate with Cook Inlet and have been performing USACE condition surveys near Anchorage since 1994. This year, an extensive analysis was done of three profile surveys of the same area. The following summary clearly shows that there is shoaling, deepening, sand waves and conversely, areas of little change. The time frame of these three surveys spans almost a year. The last two were done during the times of hydrography for NOAA project OPR-P385-KR-2001³⁸. The most likely assumption one can make about Cook Inlet is that the bottom is in a constant state of flux due to tides, currents and bottom type.

The USACE surveys are detailed in the Project Wide Data and Acquisition report,³⁹ Section A. Equipment. The following page shows an example of the bottom changes observed in this survey, H-11031, Sheet C.



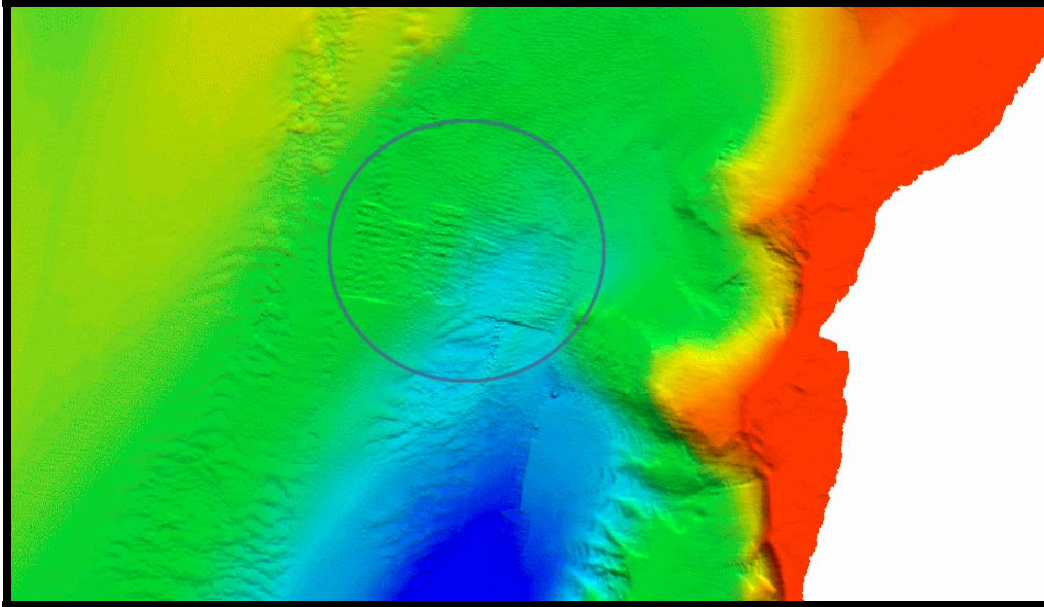
Eight of the USACE Profile Surveys fall in H-11031

The image below is an example of bottom change over a period of 45 days. There is no definitive trend that is bias towards deepening or shoaling over the entire survey. The currents and tides are moving a lot of material around in relatively short periods of time. This particular area has deepened approximately 5 meters from DN 138 to DN 183. This area is in a deep and narrow part of the survey, which may contribute to the deepening effect. More deepening and shoaling trends in H-11031 are detailed in Section D1. Chart Comparison.⁴⁰



A typical change in bottom over 45 days as seen in CARIS HDCS

The image below shows how the change in bottom appears in the digital terrain model.



The Same Area as the Example on the Previous Page
61°16' 11.78"N 149°53' 27.75"W

Commerce in H-11031

This survey has two important Ports of call located within it, The Port of Anchorage and Port Mackenzie. The Port of Anchorage is an established international port that has been in existence since 1961. The construction at Port Mackenzie began in 1998 and is developing quickly as a potential economical boom for the communities on the west shore of Cook Inlet. The safety of Cook Inlet, Anchorage and the surrounding communities rely heavily on the accuracy of the charts in this area.

Port of Anchorage

The port serves 80% of Alaska's populated area, from Homer to the North Slope by means of rail, road and air cargo connections. It handles over 90% of all consumer goods sold in the railbelt, stages 100% of the exports of refined petroleum products from the state's largest refinery in Fairbanks and a share of exports from refineries on the Kenai Peninsula and in Valdez. Anchorage is served regularly by two major carriers, which bring four to five ships weekly from the Pacific Northwest. Petroleum tankers supply jet fuel for airport operations, barges on-load petroleum products for western Alaska and ships from Japan and Korea call frequently transporting pipe, drilling mud, construction materials and automobiles.



A Container Ship at the Port of Anchorage

Port MacKenzie

The Port MacKenzie Dock was opened for limited use on May 15, 2001. It has been used primarily as on loading site for three barges carrying pre made houses and supplies to bush communities. There are construction plans for a ferry route between Anchorage and Port MacKenzie, and a deep draft shipping pier to be built off the dock extending into the inlet five to six hundred feet. There are land transport plans for more roads, rail access, tank farms and conveyor systems to load a variety of commercial materials such as coal, minerals and timber. The permit has been awarded for the ferry dock by the USACE; proof that the plans are moving forward.



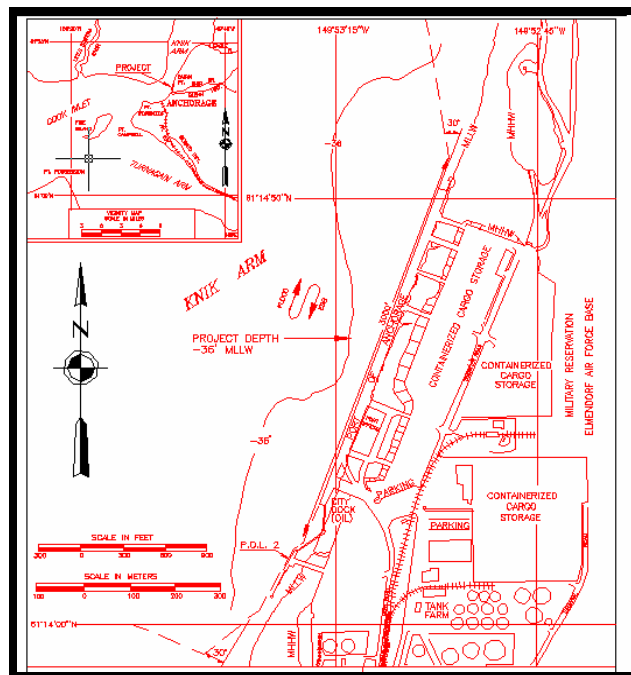
Looking West at Port MacKenzie

**USACE Activities
Cook Inlet Navigation Channel Project**

The USACE has an important hand in Cook Inlet vessel safety.

- Originally called the Knik Arm Shoal Channel, the project is widening to encompass North Point Shoal, Fire Island Shoal and is now called The Cook Inlet Navigation Channel Project.
- Dredging for Knik Arm Shoal began in 1999 and was completed in 2000. It is maintained by USACE. While it is still unknown, at best this will involve major dredging every two to three years.
- USACE maintains an area off the Port of Anchorage to a project depth of 35 feet MLLW. The high sediment load that leads to shoaling keep costs high, about \$2,000,000 annually. The USACE has been conducting a feasibility study to increase the project depth to 45 feet MLLW at the Port of Anchorage. The Corps works with local interests, when they can, on a cost shared basis to fund these studies. Dredging spoils are dumped a minimum of 3000 feet off the face of the dock.

The Corps presence in Cook Inlet is confined to federally authorized projects. The needs of commerce and the users of the Inlet (shippers, ports, and fisherman) drive these projects. Congress must approve any Corp project, and further maintenance in Cook Inlet is limited to the struggle to secure federal dollars.



USACE's Project Area for the Port of Anchorage

Northstar Terminal

Beginning in 1997 the Port of Anchorage was expanded to allow fabrication of oil field facilities for the North Slope. The two-year, \$2 million renovation project included expanding the dock and staging area by about 20 acres, increasing the load-bearing strength of the dock to handle up to 10,000 tons, and reinforcing the dockhead with sheet piling. Site preparations also included extensive installation of electrical and other utilities, construction of shop buildings and acquisition of two 400-ton capacity cranes.

Ship Creek Small Boat Launch

South of the Port of Anchorage, lies the Ship Creek small boat launch. Recently this ramp has been upgraded with berms, bottom tiles, improved parking, public restrooms and a seasonal floating dock. The Port of Anchorage maintains the ramp. This ramp has a bright and busy future but will require a fair amount of dredging due to the heavy silting from Cook Inlet. Local fishermen, residents from across the Inlet, and NOAA research scientists launch their boats here. The ramp's use is limited by the extreme tides and future development will most likely involve deepening the area around the ramp.



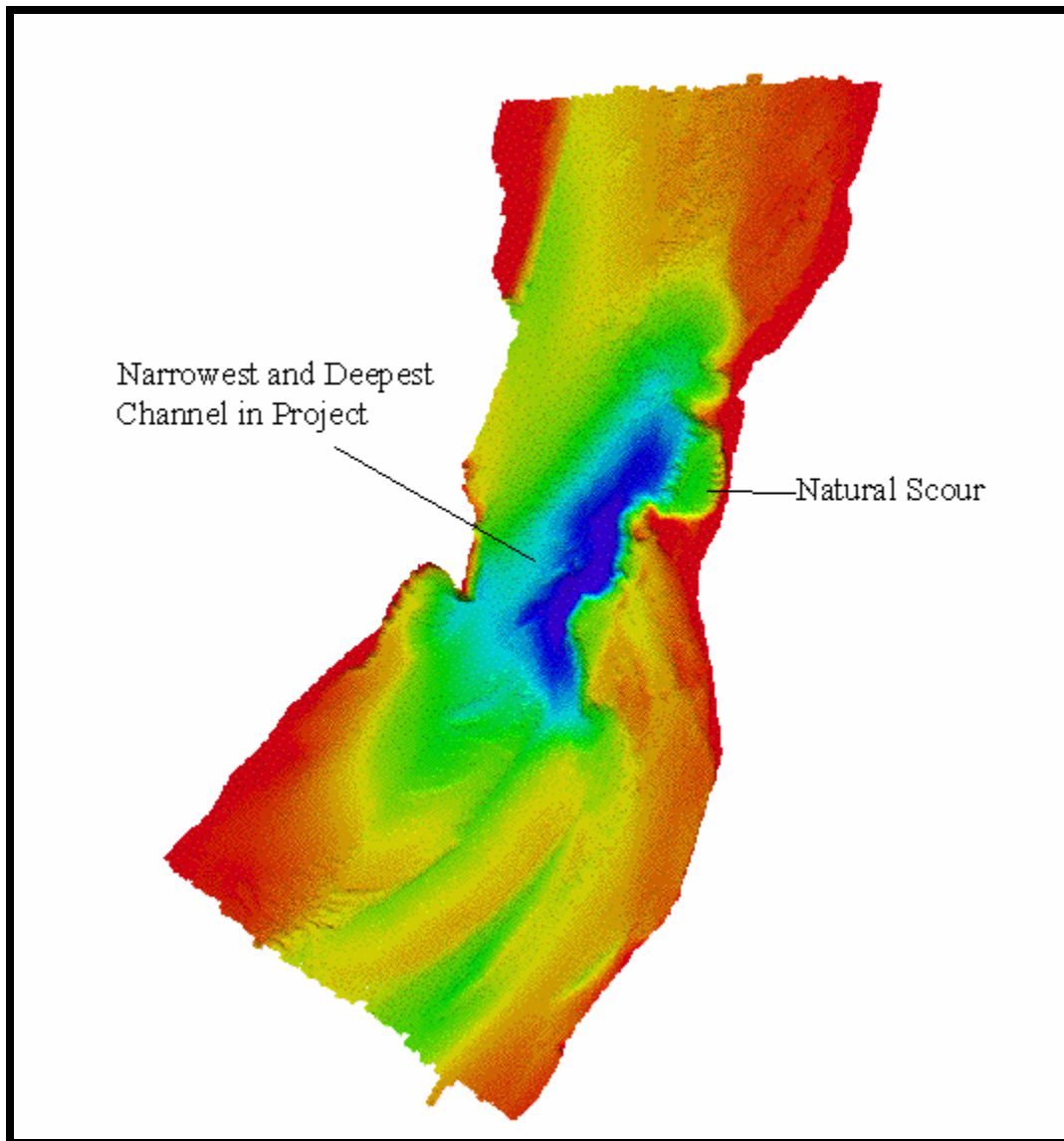
Ship Creek Boat Ramp at Low Tide



Ship Creek Boat Ramp at High Tide

Observations of Interest

There is a narrow and deep channel in H-11031. There is also an interesting scoured feature on the East Side, north of Anchorage. It measures approximately 600 meters north to south and 350 meters east to west. There is no known manmade activity in the area. The shoreline here is made up of large boulders, which suggest this scour is naturally occurring and may have a more solid bottom type than the rest of the survey.



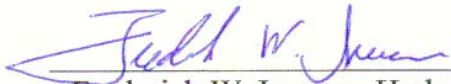
The Digital Terrain Model of H-11031

LETTER OF APPROVAL REGISTRY NO. H-11031

This Report and the accompanying smooth sheet are respectfully submitted.

Field operations contributing to the accomplishment of survey H-11031 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report, smooth sheet, digital data, and accompanying records have been closely reviewed and are considered complete and adequate as per the Statement of Work. Other reports to be submitted with this survey include Data Acquisition and Processing Report, Vertical and Horizontal Report, which were submitted in December 2001.

I believe this survey is complete and adequate for its intended purpose. ⁴¹



Frederick W. Iversen, Hydrographer
Terra Surveys, LLC

Date DEC 7th, 2001

APPENDIX I

Danger To Navigation Reports

This survey produced a Danger to Navigation Report. The report and the associated correspondence are included in this appendix. A list of the correspondence is below.

Date

Recipient

January 4, 2002

Commander Coast Guard District

CC: Gary Nelson NOAA (COTR)

Friday, January 4, 2002

Commander Coast Guard District

P.O. Box 25517

Juneau, Alaska 99802-5517

Reference: NOAA Survey Number H-11031
Contract Number OPR-P385-KR-01

Dear Sir:

While conducting hydrographic surveys operations for the approaches to Anchorage, Alaska (NOAA Survey H-11031), Terra Surveys, LLC found an area of shoaling west of Point MacKenzie and along the eastern shore of Knik Arm in front of Anchorage. Areas were found to be shallower than shown on Chart 16665. Attached is the Danger to Navigation Report.

Differential GPS and Multibeam sonar were used to determine the position and depths. These data are preliminary and subject to office review.

Sincerely,

Terra Surveys, LLC

Thomas S. Newman, PLS

Partner

Enclosures:

CC: Gary Nelson

NOAA (COTR)

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-11031
State: Alaska
General Locality: Knik Arm
Sublocality: Anchorage to 2 Mi. N. of Cairn Point
Project Number: OPR-P385-KR-01

The following was found during hydrographic survey operations:

- Object discovered: Shoaling along fairway
18' Sounding found in an area depicted as 34' on chart. Position of sounding is:

Lat. 61° 14' 15.27" N
Long. 149° 56' 49.86" W

- Object discovered: Shoaling along eastern shore of Knik Arm. Two representative soundings are:
37' Sounding found in an area depicted as 58' on chart. Position of sounding is:

Lat. 61° 14' 30.06" N
Long. 149° 53' 28.81" W

51' Sounding found in an area depicted as 71' on chart. Position of sounding is:

Lat. 61° 13' 56.74" N
Long. 149° 54' 26.66" W

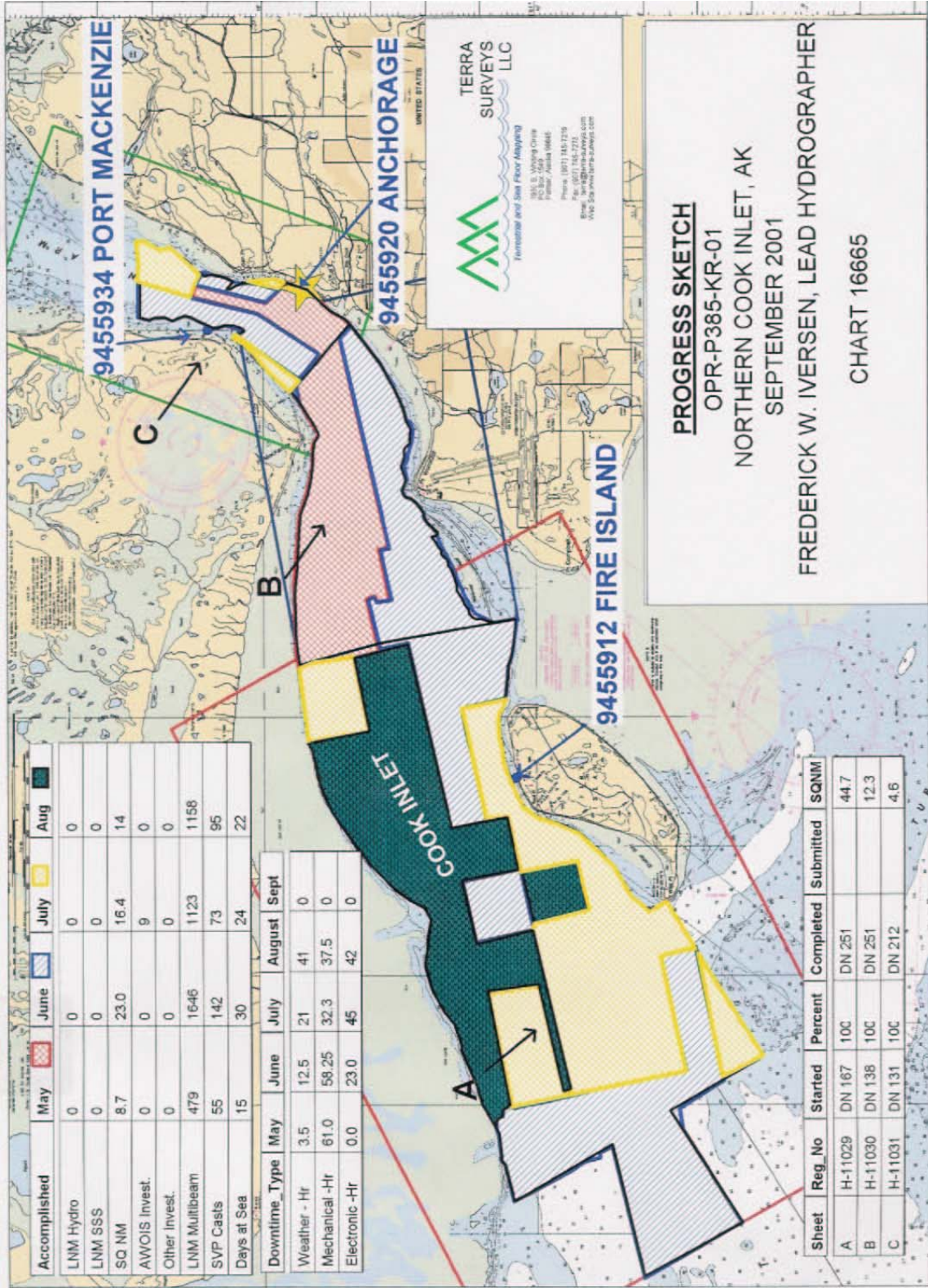
APPENDIX II

List of Geographic Names

No new geographic names, or changes to geographic names, were discovered within the survey area.

APPENDIX III

Progress Sketch



Accomplished	May	June	July	Aug
LNM Hydro	0	0	0	0
LNM SSS	0	0	0	0
SQ NM	8.7	23.0	16.4	14
AWOIS Invest.	0	0	9	0
Other Invest.	0	0	0	0
LNM Multibeam	479	1646	1123	1158
SVP Casts	55	142	73	96
Days at Sea	15	30	24	22

Downtime_Type	May	June	July	August	Sept
Weather - Hr	3.5	12.5	21	41	0
Mechanical -Hr	61.0	58.25	32.3	37.5	0
Electronic -Hr	0.0	23.0	45	42	0

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQNM
A	H-11029	DN 167	100	DN 251		44.7
B	H-11030	DN 138	100	DN 251		12.3
C	H-11031	DN 131	100	DN 212		4.6

TERRA SURVEYS LLC
 International and Sea Floor Mapping
 385 S. Whiting Circle
 PO Box 548
 Prater, Alaska 99581
 Phone: (907) 344-1219
 Email: terra@terra-surveys.com
 Web: www.terra-surveys.com

PROGRESS SKETCH
 OPR-P385-KR-01
 NORTHERN COOK INLET, AK
 SEPTEMBER 2001
 FREDERICK W. IVERSEN, LEAD HYDROGRAPHER
 CHART 16665

APPENDIX IV

Tides and Water Levels

Abstract of Times of Hydrography for Smooth Tides

Project: OPR-385-KR-2001

Registry No.: H-11031

Sheet Letter: C

Inclusive Dates: MAY 11 – JULY 31, 2001

Day (2001)	Time (UTC)	
	Start	End
137	18:05:22	23:50:14
138	00:00:29	21:19:21
179	16:04:58	16:08:57
180	08:02:40	23:54:17
181	00:08:09	23:59:59
182	00:00:00	01:05:15
183	09:51:00	23:59:48
184	00:19:03	11:05:41
193	15:54:02	16:42:35
202	04:45:30	06:17:04
212	00:33:55	04:49:37
214	21:51:49	22:20:37

TIDE PROCEDURES-LCMF, INC.

OPR-P385-KR-2001

Knik Arm, Cook Inlet

Project Planning

In conjunction with NOAA CO-OPS and the hydrographic survey contractor, LCMF developed a tidal zoning scheme in order to cover the project area. LCMF provided Terra Surveys with reconnaissance resources regarding the tide station locations including photographs, maps and GPS coordinates. If the site was a historical tide station, then the historical tide report and datum information was obtained from NOAA CO-OPS.⁴²

Calibration

Terra Surveys performed a calibration of the DAA H350XL/H355 digital tide gauge components prior to deployment and after demobilization. Prior to deployment, each tide gauge was run through a series of measurements in a controlled environment. The tide gauge orifice line was marked at one meter intervals and then lowered into a column of fresh water contained in a 9-meter long PVC pipe. Tide gauge depth readings were recorded every meter as the water column level was lowered and raised. The difference between the reference depth and the observed depth was calculated. After, demobilization, LCMF personnel brought the tide gauges to the NOS Pacific Regional Office for calibration by comparison to a Paroscientific transducer.

Installation

Using the information acquired in the project planning stages, Terra Surveys personnel determined a final location for the tide stations with regard to the ease of access, protection from open seas, freedom from obstructions for transmission to GOES satellites and the type of shoreline.

The tide gauges at both installations were powered by 12 volt 65 amp hour marine batteries with a solar cell for recharging. The tide gauges at Fire Island were housed in an 8' x 8' Weatherport tent. The tide gauge orifices at Fire Island were anchored to 700lb. welded railroad tie anchors and slung into the water by a helicopter. The tide gauges at Port MacKenzie were housed in a Rubbermaid garden hut and the orifices were attached to a bracket and welded to the dock. Nitrogen tanks were used to purge the orifice tubing before beginning operation. Three hours of staff shots were performed to confirm that the gauges were operating correctly.

At Port MacKenzie, six NOS benchmarks were installed using either standard NOS caps or ¾" stainless steel drive rod driven to refusal. Third order levels were double run through the benchmarks at both sites to

NOS specifications. Two 5-hour GPS sessions with dual frequency geodetic quality receivers were performed on the primary benchmark at each site.

Field Maintenance Operation

Terra field personnel made two or three visits per week to each tide station to ensure that the tide gauges were operating properly. During a tide station visit on hour of staff shots was performed and the gauge settings and diagnostics were inspected and recorded. Staff shots were analyzed at the tide station to check for outliers and changes to the staff constant that might indicate malfunctions or an unstable orifice. Water density readings were recorded during each visit in order to update the gauge with a current slope constant.

Tide gauge data on flash cards was brought back to the Terra office in Palmer and emailed to the processing center at the LCMF office in Anchorage.

Data Processing and Quality Control

Tide data arrived in the LCMF office either from a GOES transmission downloaded through the DAPS telnet site or by email from the Terra office in Palmer. As a preliminary quality control check, office personnel graphed the data and inspected the tide curve for gaps, jumps and outliers. The data from the multiple backup gauges at each site were compared to ensure consistency. The tide data from the primary gauge was then smoothed using a 5th degree polynomial curve fit program, reduced to MLLW datum and converted to the file format required by the contractor. The MLLW files were then emailed to the hydrographic survey processing team and posted on a secure ftp site.

After several weeks of tide data collection, a preliminary datum was computed through the method of simultaneous comparisons at each tide station based on the control station for the project. A tide-by-tide simultaneous comparison was computed for each 30-day water level series for each station using the primary gauge at the station. Comparisons by monthly means were also tabulated for each calendar month.

Demobilization

After the completion of the hydrographic survey Terra Surveys field personnel demobilized the tide stations. Final staff shots were performed and closeout levels were run through all of the benchmarks.

Final Delivery

LCMF was responsible for submitting to NOAA a tide report detailing the work completed which included the tide data and field information provided by Terra Surveys. The final report contains a chart section, vicinity map, tide station report, benchmark descriptions, field book information, photographs, gauge calibrations and the computations for determining the final datum at each tide station.

2001 FIELD and FINAL TIDE NOTE

Hydrographic Sheet: H-11031

Knik Arm

Anchorage to 2 Mi. N. of Cairn Pt.

NOAA Project No:	OPR-P385-KR-2001 Alaska			
NOAA Contract No:	50-DGNC-0-90003			
The Anchorage, Alaska tide station (945-5920) served as control for the subordinate stations for this project. Datum determinations were made for the subordinate station at Fire Island (945-5912) and for the subordinate station at Port MacKenzie (945-5934). The NTDE 1960-78 was utilized.				
Location and Time Meridian	Name:	Lat (NAD 83)	Long (NAD 83)	Time Meridian:
	Anchorage:	61° 14' 18"	149° 53' 24"	0° (UTC)
	Fire Island:	61° 10' 21"	150° 12' 19"	0° (UTC)
	Port MacKenzie:	61° 16' 03"	149° 55' 01"	0° (UTC)
Time Period and Datum Reference	Name:	Established:	Removed:	MLLW MHW units
	Anchorage:	<i>established and operated by NOS</i>		0.000 10.549 meters
	Fire Island:	05/24/2001	09/14/2001	0.000 7.953 meters
	Port MacKenzie:	05/22/2001	09/07/2001	0.000 8.609 meters
Tide observer	LCMF Incorporated 139 E. 51st Ave. Anchorage, Alaska 99503 (under subcontract to Terra Surveys LLC, Palmer, AK)			
Gauges	Design Analysis H350XL/355 bubbler systems at tertiary tide stations.			
Installation	Each gauge was secured inside a waterproof case, and fastened vertically to a wooden brace above the high water line. A tent covered the gauges at Fire Island. A pre-built shelter covered the installation at Port MacKenzie. Refer to the tide station packages for additional site specific details of installation.			
Tide staff	None. At Fire Island, spirit leveling was observed between a nearby tidal bench mark and the water. The survey rod was outfitted with a stilling well to dampen wave action. At Port MacKenzie, a galvanized wire rope marked at 0.5m increments with a large iron disk at the end was lowered to the water.			
Benchmarks	The following benchmarks were installed at these sites: Fire Island: none Port MacKenzie: 5934 A 2001, 5934 B 2001, 5934 C 2001, 5934 D 2001, 5934 E 2001, 5934 F 2001 The following benchmarks were recovered at these sites: Fire Island: Rife 1960, BM 12 1974, BM 13 1974, 5912 C 1998, 5912 D 1998, 5912 E 1998 Port MacKenzie: none			
Levels	Benchmarks were leveled at the installation and removal of each tidal station. The benchmarks and station datums were connected through frequent leveling to the water. The level runs closed within NOS tolerance.			
Final Tidal Zoning	The final tidal zoning from 11/1/01 follows this report (AutoCAD map with notes). This zoning was developed from a numerical analysis of historical bathymetric data.			
Reduction of Multibeam data	Terra Surveys LLC (the prime contractor) was provided preliminary datums developed by LCMF during July 2001 and MLLW correctors throughout the field season. In September, LCMF finalized datums and forwarded all data necessary to reduce soundings to the prime contractor.			

APPENDIX V

Supplemental Survey Records and Correspondence

Tuesday, July 08, 2003

Rodger Graves
Port of Anchorage
Municipality of Anchorage
2000 Anchorage Port Road
Anchorage, Alaska 99501

Reference: Upper Cook Inlet Charting

Dear Mr. Graves,

Terra Surveys, LLC performed three surveys near Anchorage in support of NOAA's nautical charting efforts this past season. These surveys are now complete, have been through a preliminary review by NOAA and we have received authorization to release a preliminary copy to interested parties. LCDR Doug Baird of NOAA asked that we get a set of these drawings to you and your organization. Please understand these sheets are preliminary and have NOT received final approval by NOAA. In spite of their preliminary nature, the magnitude of changes found in this area of the inlet led to their early release on a limited basis.

Please call if you have any questions.

Sincerely,

Terra Surveys, LLC

Thomas S. Newman, PLS

enclosures

Friday, January 04, 2002

Captain Vince Tillion
South West Alaska Pilots Association
P.O. Box 977
Homer, Alaska 99603-0977



Reference: Upper Cook Inlet Charting

Dear Captain Tillion,

Terra Surveys, LLC performed three surveys near Anchorage in support of NOAA's nautical charting efforts this past season. These surveys are now complete, have been through a preliminary review by NOAA and we have received authorization to release a preliminary copy to interested parties. LCDR Doug Baird of NOAA asked that we get a set of these drawings to you and your organization. Please understand these sheets are preliminary and have NOT received final approval by NOAA. In spite of their preliminary nature, the magnitude of changes found in this area of the inlet led to their early release on a limited basis.

Please call if you have any questions.

Sincerely,



Terra Surveys, LLC
Thomas S. Newman, PLS

enclosures

Revisions Compiled During Office Processing and Certification

-
- ¹ PHB Revision – All Separates are filed with the field data.
- ² PHB Revision-attached to this report.
- ³ Revision –minimum depth of 0 feet at datum.
- ⁴ PHB Revision –Filed with the survey records.
- ⁵ PHB Revision – Although the 5% requirement was not met the number of crosslines run was sufficient to perform a proper analysis for quality control.
- ⁶ PHB Revision –Concur.
- ⁷ PHB Revision –Filed with the survey records in the same binder labeled Separate III.
- ⁸ PHB Revision – concur.
- ⁹ PHB Revision –See the Project Wide Data Acquisition and Processing Report for OPR-P385-KR-2001 which is filed with the survey records.
- ¹⁰ PHB Revision – Strikeout ~~19~~ replace with 9.
- ¹¹ PHB Revision – Filed with the survey records.
- ¹² PHB Revision –Filed with the survey records along in the same binder as Separate III.
- ¹³ PHB Revision – Concur.
- ¹⁴ PHB Revision-Strikeout ~~OPR-385-KR-2001~~ and replace with OPR-P385-KR-01
- ¹⁵ PHB Revision – Filed with the survey records.
- ¹⁶ PHB Revision – A review of the data in CARIS showed all data were within specifications.
- ¹⁷ PHB Revision – Filed with the survey records.
- ¹⁸ PHB Revision –PHP compared chart 16665, 7th Ed. dated March 31, 2001.
- ¹⁹ PHB Revision – One DTON letter was submitted by the contractor and reviewed by PHB. PHB reported one DTON letter to the USCG, NIMA, and N/CS261. This DTON letter is attached to this report.
- ²⁰ PHB Revision-Selected depths have been noted as “Rk”.
- ²¹ PHB Revision- Selected depths have been noted as “Rk”.

-
- ²² PHB Revision-Chart areas as shown on smooth sheet.
- ²³ PHB Revision-Concur.
- ²⁴ PHB Revision-Concur.
- ²⁵ PHB Revision-Concur.
- ²⁶ PHB Revision-Concur.
- ²⁷ PHB Revision-Concur.
- ²⁸ PHB Revision-Do not concur least depth within the search radius is 32 feet. Remove 58 *Obstn* and danger circle. Chart area as shown on smooth sheet`.
- ²⁹ PHB Revision- Strikeout ~~for the site is~~ insert within the search radius.
- ³⁰ PHB Revision- Strikeout ~~charted~~ and replace with charted.
- ³¹ PHB Revision-Concur.
- ³² PHB Revision-Concur.
- ³³ PHB Revision-Concur, chart area as shown on smooth sheet.
- ³⁴ PHB Revision-Concur, chart 28 foot *WK* at the smooth sheet position.
- ³⁵ PHB Revision-Concur.
- ³⁶ PHB Revision-Concur Chart 33 feet *Obstn* at survey position.
- ³⁷ PHB Revision-Concur.
- ³⁸ Revision-Strikeout ~~OPR-385-KR-2001.~~ and replace with OPR-P385-KR-01
- ³⁹ PHP Revision-Filed with the survey records.
- ⁴⁰ PHB Revision-See endnote 16
- ⁴¹ PHB Revision – The data, reports, and smooth sheet are within specifications. The survey is adequate to supercede prior surveys within the common area.
- ⁴² PHB Revision – No formal review of tidal data was conducted by CO-OPS

RECRD VESSLTERMS CHART AREA
CARTOCODE SNDINGCODE DEPTH

LAT83 LONG83 NATIVDATUM
LATDEC: LONDEC: GPQUALITY
GPSOURCE

PROJECT ITEMSTATUS SEARCHTYPE
RADIUS INIT ASSIGNED
TECNIQ
Techniqnote

History GIVEN IN LAT 61-15-04.25N, LONG 149-53-38.80W(NAD83). DIVE NOT ACCOMPLISHED, POSITIVE IDENTIFICATION NOT DETERMINED, ECHO SOUNDER DEPTH 8.9M(29FT) AT MLLW. (UPDATED 1/94 RWD)"/>

Fieldnote

Proprietary

YEARSUNK NIMANUM

RECRD
 VESSLTERMS
 CHART
 AREA

 CARTOCODE
 SNDINGCODE
 DEPTH

LAT83
 LONG83
 NATIVDATUM

 LATDEC:
 LONDEC:
 GPQUALITY

 GPSOURCE

PROJECT
 ITEMSTATUS
 SEARCHTYPE

 RADIUS
 INIT
 ASSIGNED

 TECNIQ

Techniqnote

History

Fieldnote

 DATE(S): 5/11/01 - 07/31/01

 VN: SEADUCER TIME: N/A

 INVESTIGATION METHODS USED: 100% MULTIBEAM

 SURVEYED POSITION: LAT. 61-14-47.64 N LON. 149-53-14.51 W

 POSITION DETERMINED BY: DIFFERENTIAL GPS

 INVESTIGATION SUMMARY: THE AWOIS ITEM WAS NOT ASSIGNED FOR INVESTIGATION. IT WAS FOUND DURING THE SURVEY.

 CHARTING RECOMMENDATION (HYDROGRAPHER): NONE

 EVALUATOR COMMENTS: CHART 33' OBSTN AT THE SURVEYED POSITION.

Proprietary

YEARSUNK
 NIMANUM

RECRD VESSLTERMS CHART AREA
CARTOCODE SNDINGCODE DEPTH

LAT83 LONG83 NATIVDATUM
LATDEC: LONDEC: GPQUALITY
GPSOURCE

PROJECT ITEMSTATUS SEARCHTYPE
RADIUS INIT ASSIGNED
TECNIQ

Techniqnote

History

Fieldnote

Proprietary

YEARSUNK NIMANUM

RECRD VESSLTERMS CHART AREA
CARTOCODE SNDINGCODE DEPTH

LAT83 LONG83 NATIVDATUM
LATDEC: LONDEC: GPQUALITY
GPSOURCE

PROJECT ITEMSTATUS SEARCHTYPE
RADIUS INIT ASSIGNED
TECNIQ

Techniqnote

History

Fieldnote

Proprietary

YEARSUNK NIMANUM

MEMORANDUM FOR: Jeffrey Ferguson, NOAA
Contracting Officer's Technical Representative

FROM: Gary C. Nelson *Gary C. Nelson*
Assistant Contracting Officer's Technical Representative
Pacific Hydrographic Branch

SUBJECT: 30-DAY Acceptance Review of H-11031

The Pacific Hydrographic Branch has conducted a 30-day acceptance review of the following contract hydrographic survey:

Registry No: H-11031
State: Alaska
General Locality: Cook Inlet
Locality: Anchorage to 2 nm North of Cairn Pt.
Contractor: Terra Surveys, LLC
Project: OPR-P385-KR-01
Contract No: 50-DGCN-0-90003
Date Received by PHB: March 23, 2002
30 Day Review by: April 22, 2002

The data submitted for H-11031 was reviewed for compliancy with the Statement of Work.

The 30-day review included but was not limited to the following:

1. An inventory of specified deliverables
2. A review of the SWMB Patch Test data to confirm proper bias values
3. A qualitative review of SWMB cross line comparison data.
4. An examination of the DTM, created by Terra Surveys, with the smooth sheet overlaid to ensure shoal areas were portrayed correctly on the smooth sheet.
5. A CARIS workfile of selected shoal soundings was created to compare with the smooth sheet. The comparison was used to verify valid shoal soundings were carried through to the smooth sheet.
6. A preliminary comparison of prior surveys and appropriate nautical charts with the smooth sheet was completed.
7. The data were reviewed for appropriate application of biases, sound velocity, and tides.
8. A preliminary review of the Descriptive Report and smooth sheet. (Note: The results of the final review will be detailed in the Evaluation Report).

Based upon the review, it is concluded that H-11031 has no major deficiencies that would deem it out of compliance with the Statement of Work. It is recommended that H-11031 be accepted.

cc: John Lowell
Dennis Hill

HYDROGRAPHIC SURVEY STATISTICS

H-11031

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES					
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					
SHORELINE DATA					
SHORELINE MAPS (List):					
PHOTOBATHYMETRIC MAPS (List):					
NOTES TO THE HYDROGRAPHER (List):					
SPECIAL REPORTS (List):					
NAUTICAL CHARTS (List):					

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			
	TIME-HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET			21
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT			52
GEOGRAPHIC NAMES			
OTHER (Chart Compilation)			78
USE OTHER SIDE OF FORM FOR REMARKS	TOTALS		151

Pre-processing Examination by	Beginning Date	04/22/2002	Ending Date	
Verification of Field Data by Contract Compliance By G. Nelson	Time (Hours)	21	Ending Date	
Verification Check by	Time (Hours)		Ending Date	
Evaluation and Analysis by G. Nelson, B. Mihailov	Time (Hours)	52	Ending Date	06/26/2003
Inspection by G. Nelson	Time (Hours)	10	Ending Date	06/29/2003

APPROVAL SHEET
H11031

Initial Approvals:

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

Bruce A. Ombresani
for Dennis Hill
Chief, Cartographic Team
Pacific Hydrographic Branch

Date: 7/1/03

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Descriptive Report.

J. E. Lowell Jr.
John E. Lowell Jr.
Commander, NOAA
Chief, Pacific Hydrographic Branch

Date: 7/9/03

AWD15 ✓ SURF ✓ 7-15-03 by MBA

