

H11009

NOAA FORM 70-35A

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. D

Registry No. H-11009

LOCALITY

State ALASKA

General Locality TONGASS NARROWS

Sublocality SOUTHERN APPROACHES TO TONGASS NARROWS

2000

CHIEF OF PARTY

Gerald Douthit

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET**H-11009**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.

DState AlaskaGeneral Locality Tongass NarrowsSublocality Southern Approaches to Tongass NarrowsScale 1:10,000Date of Survey Sept. 7 - Sept. 30, 2000Instructions Date April 15, 2000Project No. OPR-O302-KR-00Vessel Zeus, Jolly Pickle and DucerChief of Party Gerald DouthitSurveyed by T. Howland, C. Kemp, B. Hocker, D. Batton, A. Dollard, F. White
D. Moistner, C. Cooper, B. TaylorSoundings taken by echo sounder, hand lead, pole Reson 8101, 8124

Graphic record scaled by _____

Graphic record checked by _____

Evaluation by R. DaviesAutomated plot by HP Designjet 750CVerification by R. DaviesSoundings in Fathoms and tenths

at

MLLWREMARKS: Time in UTC.**Revisions and annotations appearing as endnotes were****generated during office processing.****All separates are filed with the hydrographic data.****As a result, page numbering may be interrupted or non-sequential****All depths listed in this report are referenced to mean lower****low water.**

Descriptive Report to Accompany Hydrographic Survey H-11009

Sheet D

Scale 1:10,000

September 2000

Terra Surveys, LLC

Chief of Party: Gerald Douthit

A. AREA SURVEYED

This navigable area and shoreline verification survey was conducted in accordance with Hydrographic Project Instructions OPR-0302-KR, southern approaches to Tongass Narrows, Tongass Narrows, Alaska dated April 15, 2000.¹

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.² Obstructions and shoaling have been reported.³ The project area is approximately 16.7 square nautical miles with the southerly limits located at Halfway Pt. on Annette Island in southeastern Alaska.⁴ The survey area covers the southern approaches to Tongass Narrows, bound by Revillagigedo Island on the northwesterly shore and Gravina Island on the easterly shore, and by the northern shores of Annette Island.⁵ Tongass Narrows is transited by over 450 cruise ships annually, the Alaska State Marine Highway ferry system, commercial and sport fishing boats, log barges, recreational boaters (motor, sail and kayaks) and heavy float plane traffic. Ketchikan is a maritime community that depends on the accuracy of NOAA charts.

Two shallow water, multibeam sonar systems were 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.⁶ Concurrently, a limited shoreline and near shoreline feature verification survey was conducted.⁷ The shoreline survey verified the general location of the MHW shoreline, the MLLW line and all features seaward of MLLW.⁸ Every effort was made to ensure that the survey products could be traced to and reconstructed from the raw data.⁹

Section B Data Acquisition and Processing
B.1 Equipment

Zeus

Approximately ninety-eight percent of the soundings for this survey were acquired from the motor vessel *Zeus*, with the remaining data collected from the jet boat *Jolly Pickle*. The *Zeus* is an aluminum retrofitted Vulcan crab vessel with an overall length of forty-four feet, a beam of thirteen and a half feet and a draft of five feet. Major systems used on the *Zeus* are listed on the following table.

VESSEL <i>ZEUS</i> LOA: 44 FT, BEAM 13.5 FT, DRAFT: 5 FT	
Equipment	Manufacturer & Model
Multibeam sonar	Reson SeaBat 8101
Positioning	Seatex Seapath 200
	Trimble 7400
Sound velocity	Applied Microsystems 3317 3279 4425
Vessel attitude	Seatex Seapath 200 SG Brown Meridian Gyro

Because of the Seapath unit's apparent sensitivity to elevated solar activity, project hydrographers used the Trimble 7400 as primary positioning aboard the *Zeus*. The Seatex Seapath 200 was used for roll, heave, and pitch data, with increased confidence provided by a SG Brown Meridian Gyro. Equipment performance details are provided in the Project-Wide Report, Sections A, Equipment and B, Quality Control.¹⁰

Jolly Pickle

The *Jolly Pickle* is a twenty-four foot Almar aluminum jet boat with an 8-foot beam and a draft of 1 ft. Major systems used on the *Jolly Pickle* are listed on the following table.

VESSEL JOLLY PICKLE LOA: 24 FT, BEAM 8 FT, DRAFT: 1 FT	
Equipment	Manufacturer & Model
Multibeam sonar	Reson SeaBat 8124
Positioning	Seatex Seapath 200 Trimble AG120 DGPS
Sound velocity	Applied Microsystems 3317 3279 77-3 4279
Vessel attitude	Seatex Seapath 200

Ducer

The motor vessel *Ducer*, a 19-foot aluminum Grayling Scamp, was employed for all shoreline verification in the survey area. The *Ducer* has a beam of seven feet and draft of one foot. Major systems used on the *Ducer* are listed in the following table.

VESSEL <i>DUCER</i> LOA: 19 FT, BEAM 7 FT, DRAFT: 1 FT	
Equipment	Manufacturer & Model
Singlebeam sonar	Odom 3100
Positioning	Trimble AG120 DGPS
Sound velocity	N/A
Vessel attitude	N/A

As noted in the Project-Wide Report, singlebeam sonar on the *Ducer* was coordinated with predicted tides for monitoring water depths in nearshore areas in the course of limited shoreline verification. Singlebeam sonar data was not utilized for project depth soundings.¹¹

B2. Quality Control

The internal consistency and integrity of the survey data was found to be good.¹² All soundings on the smooth sheet meet or exceed the accuracy requirements in the specifications.¹³

Survey H-11009 (Sheet D) had 750.00 Nautical Miles of main scheme lines and 30.05 NM of crosslines, 4.0% of the mainscheme lines. This falls short of the 5% specified in the statement of work. Originally, the sheet was completely surveyed with line spacing based on a 60-degree swath width. The swath width was reduced to 45 degrees to ensure extra coverage and redundancy, and few holiday lines were needed to fill the resulting gaps. These holiday lines were not accounted for in the crossline planning.

Analysis of the crosslines was done by comparing each line in totality to a DTM of soundings made from the mainscheme lines. Crossline reports were generated from a DTM of the entire area of Sheet D. All showed general trends as well as inconsistencies. (See Separate V. Crossline Comparisons)¹⁴

Two different methods of comparison were used. An analysis of individual beams was considered as well as soundings grouped by angle from nadir. Both categories were also grouped by depth in 10-meter classes. Crossline reports were generated with the Caris program Makehist.exe using a class file which specified the acceptable NOAA specifications for this project. This is the class file used for these reports:

Min. Depth	Max. Depth	Allowable Error
0.0m	-10.00m	0.52m
-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.

The analysis of the soundings grouped by angle from nadir was undertaken primarily to determine a useable filtering setting for line editing. Using the reports as a guideline, it was decided to filter out all beams collected outside of 60 degrees from nadir. Individual beam numbers were not necessarily eliminated. On the Reson 8101, this would effectively eliminate beams 1-9 and 92-101 if the vessel was level. The natural roll of the vessel during collection accounts for the small number of accepted soundings seen in the Smoothsheet histogram outside of 10-91.

The histogram showing the number of soundings on the smooth sheet for each beam demonstrates a smile trend, with the outer beams contributing more heavily. This is probably the result of standard deviations increasing as the angle off nadir is increased. Because of this, soundings from outer beams with higher standard deviations would more likely be selected in a shoal bias sounding set. It can also be seen from the histogram that the starboard channel (beams >51) contributes more than the port channel (beams < 51), with beam 91 contributing almost twice as much as any other beam. We believe that this is because almost all near-shore lines were run with the starboard side to the beach to protect the sonar. For the most part, this would result in all soundings shoreward of our most shoreward trackline being contributed by the starboard channel. Beam 91 contributes the most because it is the outermost remaining beam on the starboard side after the initial 60-degree beam filtering. The same situation occurs with beam 80, but with the Pickle rather than the Zeus.

The results also show a decreasing number of acceptable beams as depth increases. This was confirmed by observation of the soundings in subset mode. The probable cause of this phenomenon is compounding error caused by rays bending over increasing distances while depending on less than perfect SVP data. During subset editing it could be seen that especially on downward slopes, dispersion in soundings would increase with depth. A depth dependant angle from nadir filter would have been ideal in this case unfortunately one is not available at this time. In practice the subset editor would begin by filtering out beams greater than 60 degrees. There were cases where port and starboard swaths were filtered differently when one side was considerably deeper. A line, which was in relatively deep water (over 50m), would be filtered at 50 degrees before editing.

Several factors contributed to the inconsistencies in the crossline analysis. On several lines (001_Dblock2_X3, 001_Dblock2_X6, 001_Dblock4_X1, 001_Dblock4_X4) the samples were relatively small in the 0-30m range. The lines ran perpendicular to the main channel; as a result few soundings were collected in the transition from the shore to the deeper channel. This transition is often very steep, where even valid soundings may have standard deviations greater than one. Lastly, it appears there was bad sensor data on lines 001_Dblock4_X4, 001_Dblock4_X2, 001_Dblock3_X2, 001_Dblock2_X7 and 001_Dblock1_X3. False heave values appeared during the first part of the lines.

Moreover, the Block 7 statistics show the best results and the most consistent number of beams that meet the 95% criteria. It has been concluded that this area in block 7, having the smallest sounding range of -44.502(m) to -0.904(m), provided the most reliable results as compared to Blocks 1 and 2 that had ranges exceeding 350 meters.

Generally, other than the few inconsistencies mentioned above, crossline analysis showed an expected and acceptable trend of slight data degradation as depth and the angle from nadir increased.¹⁵

B3. Corrections To Echo Soundings

Hydrographic Survey H-11009 was performed with three other surveys in Project OPR-O302-KR. Any changes to the corrections to echo soundings affects all four surveys in the area and is described in the project wide Data Acquisition and Processing Report.¹⁶

Vertical and Horizontal Control

Soundings for this survey were tide adjusted using data from Tide Station Ketchikan 945-0460. Preliminary water level data was downloaded daily from the NOAA web site (<http://www.co-ops.nos.noaa.gov>) and applied as the data was processed in CARIS. Verified tide data from the Ketchikan gage was then downloaded off the Internet site and applied to the final smoothsheet soundings.¹⁷

The horizontal control datum for this survey is North American Datum of 1983(NAD 83). The projection used during collection was UTM, Zone 9. Control station *Penthouse* was established and used to send correctors to the survey vessels. A 24-hour observation on USGS Monument *WRONG* was used as a fixed point DGPS performance check on *Penthouse*. The observation survey showed the position on “Penthouse” to meet the required accuracy standards. The control survey to establish *Penthouse* and the 24-hour observation survey is detailed in the Project Wide Vertical and Horizontal Control report.¹⁸ In addition to station *Penthouse*, the United States Coast Guard (USCG) DGPS Beacon at Annette Island was used during hydrographic operations for the Shoreline Verification Survey and for daily confidence cross checks. A summary of the daily DGPS confidence checks can be found in the Project Wide Vertical and Horizontal Control report.¹⁹

D1. Chart Comparison²⁰

The last Notice to Mariners to cover the time surveyed was the December monthly edition, Notice number 49. There were no items that prompted chart comparison.²¹ There was no Danger to Navigation reports submitted for this survey.²² This survey was compared in Autocad Map to the following charts:²³

Chart	Scale	Edition	Date
17428	1:40,000	7 th	February 25, 1995

General agreement between the chart and this survey was good.²⁴ There appears to be a deepening trend in Annette Bay and on the North side of Annette Island between Race Point and Reef Point²⁵. There also appears to be a significant deepening trend on the West side of Carroll Point.²⁶ The rest of the sheet varies in places and the most notable differences are listed in the following table.²⁷

Chart Depths fathoms/tenths	Depths fathoms/tenths	Lat	Long	Comment On Agreement With Chart
4.1	2.7	55 17 20.17	131 40 39.58	
5.3	11.6	55 17 26.02	131 40 48.62	
6.5	4.4	55 17 07.26	131 39 06.78	
7.2	10.3	55 17 57.86	131 34 31.78	
9.1	7.9	55 16 08.82	131 40 30.96	
11	16.9	55 17 59.11	131 40 10.45	
12	6	55 15 34.12	131 36 07.43	
12	15.3	55 14 17.69	131 36 47.56	
13	17.1	55 15 49.52	131 35 50.31	
13	11.7	55 16 16.56	131 40 16.22	
15	33	55 16 09.34	131 33 38.30	
18	14.4	55 16 31.93	131 36 52.87	
23	49	55 16 03.45	131 33 17.59	
23	20.8	55 15 50.78	131 29 30.40	
24	39	55 15 32.88	131 36 43.83	
25	35	55 17 00.52	131 33 07.36	
26	23	55 16 15.48	131 40 31.96	
27	40	55 16 14.87	131 34 12.93	
29	24	55 16 12.74	131 37 48.82	
30	34	55 16 51.15	131 37 38.87	
30	50	55 17 12.78	131 31 55.13	
33	37	55 17 11.71	131 34 46.26	
34	27	55 14 22.01	131 37 02.67	
35	41	55 16 40.79	131 35 32.06	
39	46	55 16 34.01	131 33 34.01	
51	49	55 16 08.99	131 39 20.56	
52	63	55 15 32.67	131 38 43.34	
61	129	55 17 48.45	131 29 02.64	
69	62	55 16 30.79	131 31 32.14	

Chart Depths	Depths	Lat	Long	Comment On Agreement With Chart
fathoms/tenths	fathoms/tenths			
71	82	55 16 26.90	131 29 03.50	
81	96	55 17 26.69	131 32 42.01	
	24	55 16 52.87	131 37 26.07	Between 50 contour & 30 fa
	23	55 16 31.83	131 38 15.43	Inside 20 fathom contour
	21	55 15 24.50	131 36 10.39	Inside 20 fathom contour
	109	55 16 33.37	131 30 16.43	On 100 fathom contour
	141	55 17 30.29	131 28 59.14	On 100 fathom contour
	13.8	55 16 51.04	131 39 58.90	On 20 fathom contour
	34	55 16 32.00	131 32 10.21	On 20 fathom contour
	63	55 17 13.65	131 33 17.84	On 50 fathom contour
	58	55 17 11.69	131 31 13.92	On 50 fathom contour
	59	55 14 43.82	131 40 18.65	On 50 fathom contour
	46	55 14 40.52	131 37 02.98	On 50 fathom contour
	58	55 17 06.07	131 36 54.32	On 50 fathom contour
	49	55 16 07.77	131 39 31.76	Outside 50 contour
	-0.9	55 16 26.97	131 36 44.41	Rock near 10 Contour
	0.7	55 15 14.04	131 36 00.88	Rock near 1fa 5ft
	1.8	55 14 49.28	131 36 15.93	Rock near 4 Fathom
	135	55 17 40.35	131 29 01.08	Well inside 100 Contour
	25	55 17 16.10	131 34 04.22	Well inside 20 Contour
	27	55 17 56.94	131 33 39.13	Well inside 20 Contour
	26	55 17 41.91	131 33 11.02	Well inside 20 Contour
	56	55 15 09.31	131 39 56.58	Well inside 50 Contour
	9.9	55 16 59.47	131 39 08.32	Well inside 50 Contour
	122	55 17 56.35	131 29 04.14	Well inside 50 Contour
	55	55 16 24.14	131 31 53.64	Well inside 50 Contour

AWOIS Items

There were no AWOIS items in this survey.²⁸

D.2 Additional Results

Shoreline Investigation Results²⁹

Limited shoreline verification was conducted from the *Jolly Pickle* along all shores in the survey area to confirm nearshore features. Three categories of results derived from limited shoreline verification of the survey area: Verification of nearshore structures, verification of shorelines and natural features, and discovery of new, uncharted features. Each is discussed below.

Nearshore Structures

Nearshore structures on Sheet D existed almost exclusively within a short area of shoreline along Mountain Point on Revillagigedo Island. Structures depicted in the Shoreline Verification Aids were visually verified.³⁰

Shorelines and Natural Features

Shoreline types generally agreed with chart depictions and were annotated in the Shoreline Verification Aids, DSL-1 through DSL-21³¹. Note that although the Shoreline Verification Aid DSL-22 exists, its coverage area is outside the survey limits. DSL-22 was not used.³²

New Features

Two new features were discovered inside the survey limits, both within the reserved waters of the Annette Island Indian Reservation, shown in Figure D.2.1.¹ These features were not designated Items to Be Investigated within the scope of the survey, and no standard detached positions were taken.³³ The new features were positioned and digitally photographed in the course of Limited Shoreline Verification.³⁴ The information is included in the MapInfo database under the Workspace file *Ketch_ITBI.wor* and is summarized below in Table D.2.1.³⁵

¹ The reservation and surrounding 3000 feet of coastal waters are regulated by the Metlakatla (Tsimshian) Indian Community. (See map on following page.) *Department of Community & Economic Development, Research & Analysis Section, Alaska Community Database, Metlakatla Community Overview.*

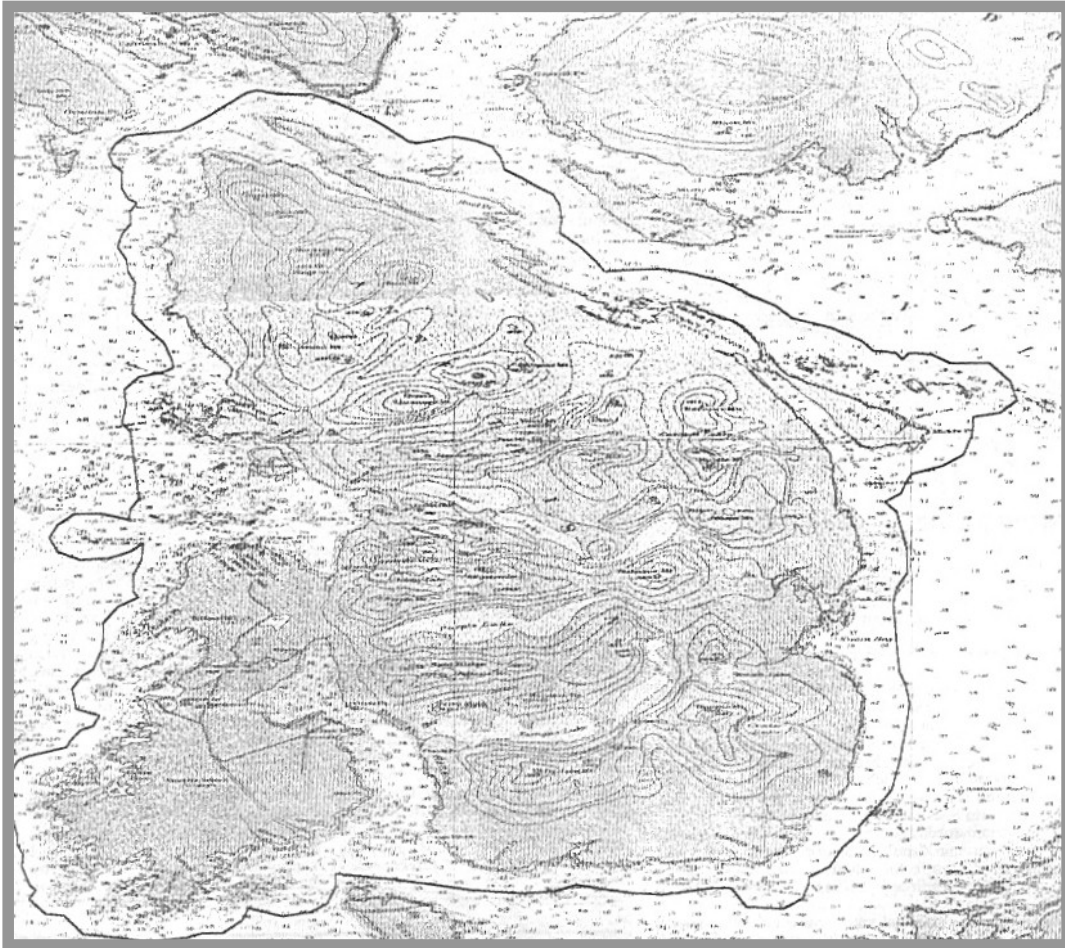




Figure D.2.1: Boundary of Annette Island and Reserved Waters

Map depicting boundary of Annette Island and Reserved Waters. The boundary, created by presidential proclamation in 1916, was established by the Bureau of Land Management in the early 1990's. It encompasses an area 3000 feet seaward from MLLW at Annette, Ham, Walker, Lewis, Spire, and Hemlock Islands, as well as adjacent rocks and islets. *Courtesy Annette Island Reserve Forestry Department and Ketchikan Daily News.*

**Table D.2.1
H-11009**

New Features

ID	Sub-sheet	Description	Latitude	Longitude	Photo File	Image
D1	DSL-9	Detached floating dock ³⁶	55°15'22.16282" 55°15'22.48195"	131°31'56.66643" 131°31'58.51908"	DSL-9Mvc-006f.jpg	
D2	DSL-9	Floating dock and ramp ³⁷	55°15'10.97440"	131°31'20.56683"	DSL-9Mvc-005f.jpg	

Disprovals

An NGS remotely-sensed item in Annette Bay was described in ArcInfo file "OBSTRUCTION_LINEAR.TAB" as "Floating Barrier, Undetermined." Coordinates given for center mass of this item were 55° 15' 9.6048" N. - 131° 31' 19.81956" W. No floating barrier was found at this location during limited shoreline verification or multibeam survey.³⁸

Aids to Navigation

Aids to navigation in the survey area, shown in Table D.2.2,³⁹ served their intended purpose and their characteristics matched those given in the Chart and Light List. All aids to navigation in the survey area were fixed.

Table D.2.2
H-11009
Aids to Navigation⁴⁰

NAME	INFORMATION	CHARACTERISTIC	USCG NO.	DESCRIPTION	LATITUDE	LONGITUDE
Spire Island Reef Light SI	Lighted FI Grn	FI G 4s	21965	SG on Square Truncated Conc. Pyramid	55° 16.1'	131° 30.0'
Cutter Rocks Light CR	Lighted FI Red	FI (2+1) R 6s	21970	JR on Skeleton Tower	55° 17.3'	131° 31.5'
Mountain Point Daybeacon 2			21973	TR on Skeleton Tower (Daybeacon)	55° 17.6'	131° 32.5'
Mountain Point Light	FI W Part Obsc	FI W 6s	21975	Marine Light on Tower	55° 17.6'	131° 32.9'
Bailey Rock Daybeacon 2			22115	TR on Spindle	55° 15.4'	131° 36.1'
Blank Island Light	Lighted FI W	FI W 2.5s	22120	NR on Skeleton Tower	55° 16.0'	131° 38.4'
Walden Rock Light 6	Lighted FI Red	FI R 6s	22125	TR on Pile	55° 16.3'	131° 36.4'

Bridges, Cables and Pipelines

No bridges, overhead cables, or overhead pipelines were charted or discovered in the survey area.⁴¹ Submarine cable areas depicted on Chart 17428 were without signage or water entry points in the survey area, and no uncharted cable signage or water entry points were found.⁴²

Discussion⁴³

Two uncharted items of practical value to mariners were discovered during the Shoreline Verification of the area. These new features are discussed in detail above. No new information of significant scientific value resulted from the survey. Anomalous tidal conditions were not encountered.⁴⁴

Environmental conditions bearing directly on the hydrographic data included the presence of bull kelp throughout many areas shoreward of the four-meter curve, as well as some areas seaward of the four-meter curve. Kelp beneath the sonar head may have caused occasional interference in bottom acquisition; however, in general such interference is readily detectable in processing. A further condition affecting data acquisition was an eleven-year peak in sunspot activity which resulted in various

intermittent effects on the survey vessels' DGPS positioning. Solar activity and its effects are discussed in detail in section B.2, Quality Control.

Planned Construction and Need for New Surveys

The survey area comprised the northern sections of Nichols Passage and Revillagigedo Channel, including the southern entrances to George Inlet and Carroll Inlet.

Revillagigedo Channel sees heavy seasonal use by cruise ships, with over 450 cruise ship visits made to Ketchikan each year between May and September.² Nichols Passage is the preferred route of AMHS ferries. Both channels are used by fishing vessels, shipping interests, private watercraft, and float planes. Although many of the surveyed waters were deeper than forty meters, the area has a number of shoals, and its active use by the maritime community points to the need for current, reliable charts.

A large portion of the shoreline was within, and regulated by, the Annette Island Reservation. Decisions regarding shoreline development on Annette are made at the discretion of the Metlakatla (Tsimshian) Indian Community. The area of most active shoreline development within the survey limits was the southern tip of Revillagigedo Island, including Mountain Point. Currently there are no known plans for construction which would indicate the need for a new survey.

² Ketchikan Visitors Bureau

Revisions Compiled During Office Processing and Certification

¹ Concur

² Concur

³ No obstructions or shoaling were reported during survey operations.

⁴ Concur

⁵ Concur

⁶ Concur

⁷ Concur

⁸ Shoreline verification conducted by the hydrographer was analyzed during office processing and shown on the smooth sheet as warranted.

⁹ Concur

¹⁰ Filed with the hydrographic records.

¹¹ Concur

¹² Concur

¹³ Concur

¹⁴ Filed with the hydrographic records.

¹⁵ Concur, all data meet or exceeds sounding specifications described in the Statement of Work for OPR-O302KR-00.

¹⁶ Filed with the hydrographic records.

¹⁷ Concur

¹⁸ Filed with the hydrographic records.

¹⁹ Filed with the hydrographic records.

²⁰ The following prior surveys are common to the survey limits of survey H11009.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H08758	1963	1:10,000
H09066	1969	1:10,000
H09069	1969	1:10,000

Only one prior survey, H08758, was available for comparison at the time of office processing. The soundings from this prior survey compare poorly with the present survey. Soundings vary between 1 to 5 fathoms, with some extreme differences of 10 fathoms. Bottom samples were not taken during this survey. These bottom characteristics have been transferred to the chart from the prior survey and compiled in red. Features shown in green on the H-Drawing could not be specifically identified with a source and should be retained as charted. It is recommended that the prior survey be superseded in the common area except for the bottom characteristics brought forward from the prior survey.

²¹ Concur

²² Concur

²³ During office processing this survey was compared to chart 17428, 8th Edition, dated November 1, 2004.

²⁴ Do not concur, see endnote 20.

²⁵ Concur

²⁶ Concur

²⁷ Survey depths noted in the following table were checked during office processing. This area should be charted based on the present survey information.

²⁸ Concur

²⁹ Shoreline verification conducted by the hydrographer was analyzed during office processing and shown on the smooth sheet as warranted.

³⁰ Concur

³¹ Filed with the hydrographic records.

³² Concur

³³ Do not concur, the detached positions were taken, see table D.2.1 and the smooth sheet for the depiction of these features.

³⁴ Concur, these two features are drawn in red at their surveyed position.

³⁵ Attached to this report.

³⁶ It is recommended that this feature be charted as a floating pier.

³⁷ It is recommended that this feature be charted as a floating pier and ramp.

³⁸ It is recommended that this feature be removed from the chart.

³⁹ Table D.2.2 is attached to this report.

⁴⁰ It is recommended that these aids to navigation be charted with the most recent information from the US CG. District 17.

⁴¹ Concur

⁴² Concur

⁴³ The mylar smooth sheet which the contractor submitted did not match the digital file submitted. Several levels including several rocks were not visible. The evaluator used the digital smooth sheet file for the compiling of the chart.

⁴⁴ Concur

LETTER OF APPROVAL REGISTRY NO. H-11009

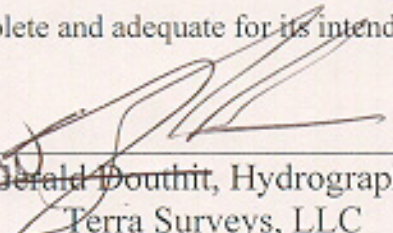
This Report and the accompanying smooth sheet are respectfully submitted.

Field operations contributing to the accomplishment of survey H-11009 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 on 00/00/00.

6/5/01. TSJ

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

THOMAS S. NEWMAN


Gerald Douthitt, Hydrographer
Terra Surveys, LLC

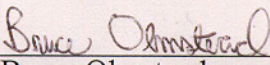
Date

6/5/01

APPROVAL SHEET
H11009

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 Olmstead
Cartographic Team
Pacific Hydrographic Branch

Date: 2/14/2005

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.



Donald W. Haines
LCDR, NOAA
Chief, Pacific Hydrographic Branch

Date: 18 FEB 2005

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H 11009

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
17430	1/20/05	Russ DAVIES	Full Part Before After Marine Center Approval Signed Via Full Application Drawing No. of soundings, curves and features from the smooth sheet.
17428	1/20/05	Russ DAVIES	Full Part Before After Marine Center Approval Signed Via Full Application Drawing No. of soundings, curves and features from the smooth sheet.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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