

FE217

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Diagram No.8252-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT (HYDROGRAPHIC)

Type of Survey Field Examination
Field No. DA-2.5-1-76
Office No..... FE-217

LOCALITY

State Alaska
General Locality Peril Strait
Locality Vicinity of Serguis Narrows

1976

CHIEF OF PARTY
C. Andreason

LIBRARY & ARCHIVES

DATE August 2, 1976

☆ U.S. GOV. PRINTING OFFICE: 1976-669-441

NOTE: A new system for registering Field Examinations (FE's) was established in 1980. All FE's are now consecutively numbered as shown hereon. The date shown in the new format is the actual date of survey. This material was previously registered as;

FE No.3 1976

FE217

FE No.3 1976

Shaw

Diag. Cht. No. 8252-2.

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT (HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC

Field No. DA-2.5-1-76

Office No. FE No.3 (1976)

LOCALITY

State ALASKA

General Locality PERIL STRAIT

Locality VICINITY OF SERGIUS NARROWS

19 76

CHIEF OF PARTY

..... C. Andreason

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DATE 8/2/76

**FE No.3
1976**

*Area 6
Chart:
8248
8252*



HYDROGRAPHIC TITLE SHEET

FE 3 (1976)

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.

DA-2.5-1-76

State Alaska

General locality Peril Strait

Vicinity of Sergius Narrows

Scale 1:2500 Date of survey 21-27 May 1976

Instructions dated 11 May 1976 Project No. SP-PMC-5-DA-76

Vessel NOAA Ship DAVIDSON's Launch DA-1 (3131)

Chief of party C. Andreasen, CDR, NOAA, Commanding Officer DAVIDSON

Surveyed by CDR C. Andreasen, LCDR R. Arnold, LT D. Eilers, LTJG M. Wencker, ENS M. Kenny, ENS G. Wheaton, ENS S. Snyder

Soundings taken by echo sounder, hand lead, pole Ross Fathometer Model 5000, S/N 1048 Lead Line, S/N DA-05

Graphic record scaled by Ross Digitizing Fathometer and Ship's Personnel

Graphic record checked by Ship's Personnel

Protracted by RW DeKoracion PDP8/e Automated plot by COMLOT Plotter, S/N 3750-3

Verification soundings penciled by RW DeKoracion

Soundings in ~~XXXXXX~~ feet at ~~XXXXXX~~ MLLW

REMARKS: Survey Time Zone: 000° GMT

Mean Survey Longitude: 135° 38' 15" W.

Applied to stds 9/2/76
CB

Printouts filed with fathograms

DESCRIPTIVE REPORT

to Accompany Hydrographic Survey

SP-PMC-5-DA-76

DA-2.5-1-76

Scale	1:2500
Year	1976
Vessel	DAVIDSON
Chief of Party	C. Andreasen, CDR, NOAA

DESCRIPTIVE REPORT

to Accompany Hydrographic Survey
 FE 3 (1976)
 (SP-PMC-5-DA-76J)

DA-2.5-1-76

A. PROJECT

This Special Investigation survey (DA-2.5-1-76) was conducted from May 21-27, 1976 in accordance with Project Instructions SP-PMC-5-DA-76, Special Investigation, Sergius Narrows, Peril Strait, Alaska, dated May 11, 1976 -- amended by PMC message DA-21 (day time group: 191845Z May 76). A copy of message DA-21 is appended to this report. There were no other supplements to these instructions. No depth unit was prescribed. Soundings were recorded in feet, so that a comparison could be made with prior survey SP-PMC-7-DA-75.

B. AREA SURVEYED

The project area is the part of Peril Strait known as Sergius Narrows. The area is bounded on the northwest by Point Sinbad, on the southeast by Rapids Island, and on the southwest by Suloia Point. During the survey, two shoal areas were developed with 10 meter line spacing. The first development was along the southern edge of Sergius Channel-- bounded by latitudes 57°24'20" N and 57°24'30" N, and longitudes 135°37'30" W and 135°37'55" W. The second development was over the northern part of West Francis Rock -- bounded by latitudes 57°24'13" N and 57°24'25" N, and longitudes 135°37'55" W and 135°38'20" W.

C. SOUNDING VESSELS

Launch DA-1 (3131) was the only sounding vessel used in this survey. Launch hydrography was conducted during periods while the current was strong, because all slack water periods were used for diving operations. This procedure led to the production of crooked, irregular crosslines and development lines in the shoal areas. When possible, lines were run into the current.

Color coding was used on computer plots of the data. The codes are as follows:

<u>COLOR</u>	<u>USE</u>
Red	Positions and Soundings, Electronic
Green	Vessel Track, Electronic
Black	Soundings on Final Field Sheet

D. SOUNDING EQUIPMENT

Launch DA-1 (3131) is equipped with a Ross FINELINE Fathometer, Model 5000. The serial numbers are as follows:

<u>EQUIPMENT</u>	<u>SERIAL NUMBER</u>
Recorder	1048
Digitizer	1048
R/T	1036

Sounding depths ranged from 9.8 to 234 feet. No fathometer problems were encountered during this survey. The survey was conducted, employing the digitizing fathometer in conjunction with a PDP8/e computer and COMLOT plotter, in the Range-Range mode (HYDROLOT program RK 111).

HYDROLOT serial numbers are as follows:

<u>EQUIPMENT</u>	<u>SERIAL NUMBER</u>
PDP8/e	10756
Reader and Punch	2455
HYDROLOT Controller	700026
COMLOT Plotter	3750-3
Teletype I	542683
Teletype II	542473

All fathograms were scanned. Peaks and deeps were incorporated into the master tape as necessary.

Daily phase calibrations and bar checks were obtained. "Bar check" and "hand" lead lines were calibrated with a steel tape in February 1976 and at the conclusion of this survey. No correctors were noted for the lead lines. TRA and velocity correctors were compiled using the daily bar checks. Strong currents assured complete water column mixing and permitted a linear extrapolation of bar check data. Refer to the Corrections to Echo Sounders Note for additional information. Velocity correctors were not applied to the soundings on the final field sheet.

The draft of launch DA-1 was determined by measurement of the distance from the lower edge of the transducer to the waterline. The draft of launch DA-1 is 1.31 feet. Note that the draft correction applied to the preliminary field sheet was 1.50 feet, while a draft correction of 1.30 feet was applied to the final field sheet.

E. BOAT SHEET

All field sheets for the survey were prepared using DAVIDSON's HYDRO-LOT system. Field soundings were plotted on one sheet at the scale

of 1:2500. An enlargement at 1:1000 scale was made to improve the legibility of soundings in areas where there were many soundings. PDP8/e computer (S/N 10756) and COMLOT plotter (S/N 3750-3) were employed for the plotting of the field sheets.

F. STATION CONTROL

10 triangulation stations were recovered to establish horizontal control for this survey.

G. POSITION CONTROL

Electronic positioning of the hydrography was provided by Motorola MINIRANGER III. The horizontal control stations used in the 1975 survey were also used for this project's hydrography. MINIRANGER data was logged on the PDP8/e computer-reader/punch system. Pre and post-hydrography MINIRANGER calibrations were made to check the transponder correctors established by the baseline calibration conducted prior to the beginning of this project. Daily calibrations were made employing a "three-point" sextant fix and check angle while the launch was held in a fixed position. The daily calibration correctors were applied to the hydrography for that day. For further information see the Electronic Control Note.

The equipment used for navigational control of the hydrography is:

EQUIPMENT	SERIAL NUMBER
MINIRANGER R/T	719
MINIRANGER Console	710
Sextant	901
Sextant	973
Sextant	3612

Horizontal control for the lead line detached positions was by three point sextant fix with a check angle.

H. SHORELINE

No photogrammetric support was available for this survey. No shoreline was applied to the final field sheet.

I. CROSSLINES

Crossline soundings of the developments of West Francis Rock and the southern edge of Sergius Channel agreed with "main scheme" soundings.

J. JUNCTIONS

Due to the nature of this survey, junctions with prior surveys were not required.

K. COMPARISON WITH PRIOR SURVEYS

Eleven crosslines were run in accordance with Item 2d of the Project Instructions. An average absolute difference of 4 feet was noted when comparing the soundings shown on the smooth sheet from SP-PMC-7-DA-75 and the final field sheet of the present survey. This discrepancy is attributable to the irregular character of the bottom topography in addition to the difference in the source of the tide correctors that were applied to produce the respective smooth sheets. Predicted tides for Sergius Narrows from Tide Tables 1976 were used to reduce the soundings on the final field sheet of the present survey; whereas reducers for the prior survey's smooth sheet were computed from mari-grams collected from tide gages that were in operation while hydrography was being conducted. F.E. NO. 2
(1976)

In general, deeper least depths were found by divers than were determined by electronic soundings from either the prior survey or the present one. This circumstance is attributable to the kelp on the shoals that causes the echo sounder to read less than the true depth. The lone exception to this finding is that the depth over East Francis Rock has proven to be shoaler after a diver's examination. Least depths, as determined by lead line soundings at detached positions, based on diver searches are listed below. pos. 7004

<u>LOCATION</u>	<u>LEAST DEPTH (feet)</u>	<u>POSITION</u>	<u>FIX No.</u>
West Francis Rock	22.84	57°24'16.75" N 135°38'14.18" W	7077 7002
			See also pos. 212404 21.2 feet
East Francis Rock	9.8	57°24'07.12" N 135°38'07.71" W	7004
Southern edge of Sergius Channel	17.4165 17.4	57°24'23.84" N 135°37'48.48" W	7006
Least depth, north- east section of southwest develop- ment <i>Pinnacle NE of West Francis Rock</i>	21.2	57°24'19.52" N 135°38'07.33" W	7014

A description of the least depth features is provided in the Diving Note.

Depth curves on the final field sheet for this project were drawn by incorporating soundings from the 1975 survey's smooth sheet with the soundings from the present survey.

L. COMPARISON WITH CHART

Comparison with Chart No. 17323, Salisbury Sound and Peril Strait, shows that shoaler depths are depicted on the chart along the southern edge of Sergius Channel and West Francis Rock. This is expected since

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the charted depths were based on data from Survey SP-PMC-7-DA-75. The depth of water over East Francis Rock was found to be ~~shallower than~~ ^{the same as} indicated on the chart. See Section K, Comparison with Prior Surveys for least depths and positions of these features and one additional significant feature near West Francis Rock.

Other than the features cited above, the present survey agrees favorably with Chart No. 17323.

It should be noted that a final comparison could not be accurately made because all final field sheet soundings were reduced using predicted tides for Sergius Narrows (No. 1561, Tide Tables 1976). Hourly heights were tabulated from the tide marigrams so a rough datum comparison could be made in the field; however, since the Pacific Marine Center requested that the data be submitted expeditiously, field sheets were not replotted.

M. ADEQUACY OF SURVEY

This special survey is complete as specified in the Project Instructions and is adequate ~~to supersede prior surveys~~ for charting. The master tapes have been edited and all peaks and deeps have been placed on the tapes. However, it should be carefully noted that the shoal echo sounder depths over peaks have not been deleted from the master tape even though subsequent diver search/lead line soundings provide the actual representation of the least depth at these points. Further comments concerning the plotting of the final field sheet are contained in Item P, Miscellaneous, of this report. *Rescanned 6/76*

N. AIDS TO NAVIGATION

Three buoys, N "6", N "6A", and N "8" were located by sextant fixes and check fixes. The buoys were located one hour before slack during a flood current of two knots. The Coast Guard Cutter CLOVER provided data on the length of chain attached to each of the buoys. The positions of the buoys are as follows:

<u>NAME</u>	<u>CHARACTERISTICS</u>	<u>POSITION</u>	<u>CHAIN LENGTH</u>	<u>FIX NO.</u>
West Francis Rock Lighted Buoy	F1 R 2.5s N "6"	57°24'17.55" N 135°38'17.23" W	180 ft	7016 L.N.M. 8/76
Sergius Narrows Buoy	R N "6A"	57°24'24.00" N 135°37'49.10" W	120 ft	7017 L.N.M. 18/76
Wayanda Ledge Buoy	R N "8"	57°24'26.06" N 135°37'37.57" W	90 ft	7018

O. STATISTICS

The statistics for this survey are as follows:

Sounding Lines	5.0 N.M.
Crosslines	2.0 N.M.
Positions (Electronic Control	178
Detached Positions (Visual Control	16
% Crosslines	40%
Survey Area	1.4 NM ²

P. MISCELLANEOUS

Project Instructions called for the installation of four tide gages to aid in the zoning of this complex, high current area. Ship's personnel were able to connect the three gages on the north side of Sergius Narrows with a line of levels. This should be a great help in zoning the area. For more details, refer to the attached Field Tide Note.

In areas where depths on the fathogram were questionable due to kelp, divers were sent down with lead lines to determine true least depths. In most instances, the true least depths as determined by divers with lead lines, were deeper than the depths that were originally scanned from the fathograms and plotted on the preliminary field sheets. For the final field sheet, the fathogram depths were left on the master tape and plotted. The least depth positions, as determined by divers with lead lines, were then plotted on the final field sheet, flagged, and a leader run from each to a box containing the fix number, Julian day, and lead line depth based on predicted tides. *shown differently on smooth sheet*

Q. RECOMMENDATIONS

It is recommended that the Daily Calibration Correctors be used in place of the Baseline Calibration values for plotting purposes. See the Electronic Control Note for details. *so done for SS*

R. REFERENCE TO REPORTS

FIELD TIDE NOTE	(attached)
ELECTRONIC CONTROL NOTE	(attached)
VELOCITY CORRECTION NOTE	(attached)
DIVING REPORT	(attached)

S. DATA PROCESSING TECHNIQUES

All field sheets were produced with a PDP8/e computer S/N 10756 and COMLOT plotter S/N 3750-3. The final field sheet is plotted at the scale of 1:2500 (DA-2.5-1-76) as prescribed in the Project Instructions. Tide reducers, for plotting purposes, were computed by Program AM 500. Predicted Tide reducers for Sergius Narrows (No. 1561,

Tide Tables 1976) and the Electronic correctors were applied to the soundings on the final field sheet DA-2.5-1-76. The computer programs used to process this survey are as follows:

	<u>PROGRAM</u>	<u>VERSION</u>
RK 111	Range-Range Real Time Hydroplot	1/30/76
RK 201	Grid, Signal and Lattice Plot	4/18/75
RK 211	Range/Range Plot	1/15/76
RK 300	Utility Computation	2/10/76
RK 330	Reformat and Data Check	3/12/76
AM 500	Predicted Tides Generator	11/10/72
AM 602	Elinore -- Line Oriented Editor	5/21/75

DIVING NOTE

SP-PMC-5-DA-76, SPECIAL INVESTIGATION,

SERGIUS NARROWS, PERIL STRAIT, ALASKA

ABSTRACT

This report is forwarded as a supplement to DESCRIPTIVE REPORT SP-PMC-5-DA-76. It provides a discussion on the techniques that were used in this project to determine least depths through the use of lead lines in conjunction with SCUBA divers. A description of marine growth and bottom configuration of the areas investigated is also presented.

INTRODUCTION

It has been found that diving operations in and around Sergius Narrows, an area where strong and turbulent currents are found, can be conducted in a safe and efficient manner. The currents were only a hindrance by limiting the time during which diving could be done and by making diving physically more strenuous. Most diver descents were made on a buoyed line that was anchored to the bottom. Once the diver was on the bottom, no real difficulties were encountered because of the current. The irregular rock bottom tended to reduce the magnitude of the current near the bottom and provided numerous handholds. "Slack water" never lasted for more than a few minutes; however, divers had no serious difficulty working within the period between + 30 minutes of slack water. In general, all dives were made within this time frame, since it offered the best working conditions. Working in periods of stronger current, around the numerous stands of dense kelp, was made difficult because the kelp tended to snarl and tangle around the lead line that was used for sounding -- making vertical soundings and communication with the lead line tender at the water's surface difficult.

All pinnacles or rocky areas that were investigated possessed prominent stands of a predominately broad, long-leafed kelp growing in various densities and lengths. This kelp, incorrectly called genus Egregia by DAVIDSON personnel in 1975, consists of a holdfast, stem, and blade and varies in length from 4 ft. to 40 ft.

Good visibility was essential for safe and successful diving operations in Sergius Narrows. Fortunately, excellent horizontal visibility was encountered during the major portion of the time while diving operations were being conducted. The best visibility (25 ft. - 30 ft.) was observed during a flood current, while the worst visibility (10 ft.) was encountered along the bottom in Sergius Narrows Channel during an ebb current.

Diving operations were generally conducted with 3 divers (one of which acted as a safety diver and remained at the water's surface), one launch, and one skiff. The launch served to locate and mark areas for investigation, while the skiff served as the diver support boat, because of its maneuverability in the current. A total of 48 operational dives were logged by DAVIDSON divers on this project.

METHODS

The general method of operation was to locate pinnacles by navigating the launch with a Motorola MINIRANGER III while conducting a fathometer search for the pinnacle. Once over the suspected pinnacle, an anchor (50 lb.) with a buoyed line was deployed. Divers descended along the line and conducted a limited (50 ft. maximum radius) search. The radius of the search depended upon visibility, current, and kelp. Because of the dense kelp, a search using a tag line from the anchor was impossible. The search area was limited by the distance from which one was able to maintain visual contact with the anchor.

High points were determined visually, on obvious pinnacles or by depth gage differences in areas where there were subtle differences in the relative vertical displacement of the features under investigation. Initially, the procedure followed was to mark each high point. Then a lead line was either lowered to the divers, or one diver maintained his position while the other diver went to the surface, obtained a lead line, and returned to the spot being investigated. These procedures had the disadvantage of tangling the lead line in the kelp. Divers subsequently carried a lead line with them, and, while one diver positioned the lead, the other diver uncoiled the line while

surfacing through the kelp to the water's surface where skiff personnel were standing by to receive the lead line. Once the lead line was passed to skiff personnel, this diver swam, or drifted, away from the area and was retrieved by the launch. The skiff, which was manned by a coxswain, three "angle men" and a lead line tender, then maneuvered at slow speed over the subsurface diver to maintain position directly above the pinnacle. Since vertical visibility was excellent, the subsurface diver signalled to the skiff when it was in the correct position. Through a further series of "line signals" to skiff personnel, a lead line sounding and three-point sextant fix with check angle were obtained while the skiff was over the pinnacle. A final signal was then given to the diver -- signalling that operations were complete. The skiff then drifted away from the site. The diver surfaced and was taken aboard the skiff.

WEST FRANCIS ROCK

It was initially hoped that with good visibility, a definite pinnacle could be located on West Francis Rock. However, the first dive revealed a large area of small reefs composed of jagged rock, strewn with boulders up to 3 ft. in diameter. interspersed with stones and gravel -- in short, the rubble that is presumed to have been created by the blasting of West Francis Rock but missed in the clamshell excavation of debris from the site after the blasting.

The entire area defined as West Francis Rock is covered with the leaf kelp mentioned in the introduction. It grows to such lengths (approximately 40 ft.) in this area that at slack water the ends float on the surface. The remainder of the time the kelp streams over the rock at varying heights, depending upon current velocity. Thirty to forty minutes after slack, the kelp produced a canopy over the area that was approximately 6 to 10 ft. above the actual bottom. This dense (1 ft. or less spacing between leaves) kelp canopy made Ross fathometer depths over the area questionable -- albeit on the conservative side. The kelp also created problems with lead line sounding in higher currents, as mentioned earlier. Although an overhead canopy of kelp was created during non-slack periods, divers were able to make a thorough search by "snaking" their way among the kelp's holdfasts and

stems, which were not nearly as dense as the cover created by the blades.

The kelp prevented a tagline search, and two alternate methods were used to investigate West Francis Rock. The first method required that divers make a visual search over the entire area -- marking the shoaler points of the reef, as determined with diver's depth gages, with buoys. Although the depths indicated by a depth gage could not be used as a true depth, a difference in depth of one foot could be detected. The highest point in the search area could then be selected for lead line investigation. The second method for determining least depths was to investigate specific soundings obtained by the launch in its hydrographic developments. All shoal soundings (i.e., the 19 to 20 ft. soundings plotted on the final field sheet) were relocated by the launch with the aid of the MINIRANGER. When the shoal soundings were found, marker buoys were dropped, and divers made a search in the immediate area (within a 5 meter radius). Upon determining the shoalest point in the area with the aid of a depth gage, a lead line sounding was obtained. In all investigations of West Francis Rock, lead line soundings produced deeper depths than those obtained with the fathometer. See pos. 212404. 21.2 feet.

Reduced to 23.8 ft (not the shoalest HL depth)
The shoalest sounding obtained over West Francis Rock was 22.8 ft. MLLW (fix #7011) after being reduced using predicted tides for Sergius Narrows from TIDE TABLES 1976. This sounding was taken with the lead placed atop a jagged boulder which rose approximately 3 ft. above the general bottom contour. The boulder was 4 to 5 ft. long and 3 ft. wide. All other lead line soundings on West Francis Rock were taken on the high points of small boulders, stones, or rubble that protruded no more than 1 to 1.5 ft. above the general bottom contour in the area of soundings.

← Fathometer sdng.
pos. 212404
21.2 feet

There were a total of 30 logged dives over the area around West Francis Rock in four days of diving. This included 6 slack water periods with approximately 1 hour of search time per slack in good visibility.

PINNACLE: Southern Edge of Sergius Channel

Diving was conducted in this area on two different days. This area possessed the strongest currents that were

encountered in the project. Dives were conducted within 15 minutes of slack water, which was observed to last no longer than a couple of minutes. The pinnacles to be investigated were initially located on the fathometer and marked with a buoy. Although visibility (15 ft.) was not as good as experienced in other areas of Sergius Narrows, it was adequate to locate these very prominent pinnacles. The northeasternmost of the pinnacles rose 10 to 12 ft. from the general bottom contour, which in itself was jagged and irregular with steep slopes. The pinnacle is composed of rock approximately 3 meters across at the top and 6 meters across at the bottom. Although the area around the pinnacle, and below the pinnacle's summit lacked any substantial seaweed growth, the pinnacle itself was topped with kelp that was approximately 6 ft. long. This kelp obscured the actual rock and streamed over the pinnacle in heights that varied with the velocity of the current. The curious phenomenon of marine plant growth existing only on the top of a pinnacle was characteristic of all pinnacles inspected in this Special Investigation, and is noted here as a botanical curiosity. The diver positioned lead line least depth of this pinnacle, after being reduced using predicted tides for Sergius Narrows from TIDE TABLES 1976, was ~~20.0~~ ft. MLLW (refer to fix # 7003 and fix # 7007). ^{19.0 smooth tides}
18.9 ← 19.5 ← Reduced to

The second and shoalest pinnacle in this area was found south west of the previously mentioned pinnacle. This pinnacle appeared to be the northern extreme of a ridge extending from the south. Again kelp 6 to 8 ft. long was found growing atop the pinnacle, but not over the immediate surrounding area. A diver positioned lead line least depth of ~~17.4~~ ft. MLLW, using predicted tides for Sergius Narrows from TIDE TABLES, 1976, was ^{Reduced to 16.5 - final tides} obtained on this pinnacle (refer to fix no. 7006). It should be noted that although these two pinnacles are quite close to each other, they are distinct and separate features. There is a distance of 10 to 15 ft. between them, and depth curves should reflect this.

EAST FRANCIS ROCK

The general area around the pinnacle at East Francis Rock was initially located by a launch fathometer search and then marked by a buoy. Divers descended into water with excellent visibility (25 to 30 ft.). Although seaweed and kelp were dense over this rock, the pinnacle was easily located because of its steep slope and its well-defined peak (1-2 meters wide). Another prominent peak is about 5 meters northwest but is approximately 3 feet below it. The kelp, which is 10 to 15 ft. long, lies on the surface at slack water and is concentrated near the apex of the rock. A search around East Francis

Rock at a depth of 40 ft. was made with no further indication of shoals in the vicinity. The diver positioned lead line resulted in a least depth of 9.8 feet MLLW using predicted tides for Sergius Narrows from TIDE TABLES, 1976 (refer to fix no. 7004).

PINNACLE: Northeast of West Francis Rock

During the hydrographic development of the shoal area northeast of West Francis Rock, a ~~23~~^{21.0} ft. sounding was obtained by fathometer. Divers were sent to investigate. A very definite pinnacle was easily located in excellent visibility (25 to 30 ft.). The top of the pinnacle is no more than 1 to 2 meters wide, and depths drop very rapidly to 40 ft. on all sides of the pinnacle. A diver held lead line sounding produced a least depth of 21.2 ft. MLLW using predicted tides for Sergius Narrows from, TIDE TABLE, 1976 (refer to fix no. 7014). A search around the pinnacle at a depth of 40 ft. could find no further indications of shoaling in the immediate vicinity. The bottom in this area is jagged and strewn with a few very large boulders and rock. The pinnacle, a natural rock formation, had a small amount of kelp approximately 6 ft. long attached at, and near, the top.

Reduced to
21.5'

SP-PMC-5-DA-76
SIGNAL TAPE PRINTOUT

001	7	57	23	53272	135	39	25494	250	0000	000000	ILAND RMI, 1950
002	7	57	23	35376	135	37	46238	250	0000	000000	CABAL, 1950
003	1	57	24	20757	135	39	02303	139	0000	000000	BOON 2, 1950
004	1	57	24	27713	135	37	57296	139	0000	000000	SERGIUS 2, 1950
005	7	57	24	03341	135	37	53408	139	0000	000000	CRAG 1895-1950
006	1	57	24	35840	135	37	22469	139	0000	000000	SHOAL 2, 1950
007	7	57	24	33054	135	36	17929	139	0000	000000	MOUNTAIN 2, 1950
008	6	57	24	13633	135	36	49585	250	0000	000000	SHE 2, 1950
009	3	57	23	25643	135	38	52639	139	0000	000000	SULOIA 2, 1950
010	3	57	24	28853	135	37	45153	139	0000	000000	SERGIUS NARROWS LT. 1950
011	7	57	24	28784	135	37	45242	139	0000	000000	STROP, 1950

SERGIUS NARROWS

ELECTRONIC CONTROL NOTE

INTRODUCTION

Horizontal control of survey SP-PMC-5-DA-76 was by MINIRANGER supplemented by visual methods at detached positions.

The project area was well suited for MINIRANGER control. The survey area is heavily wooded and provided no reflective surfaces. As a result no multipath returns were encountered and MINIRANGER data was very clean.

Maximum ranges were under one mile; thus very strong signals were received throughout the survey area. Line of sight requirements for signal path were met everywhere by using three MINIRANGER shore stations to cover the survey area.

BASELINE CALIBRATIONS

Baseline calibrations were accomplished per PMC OORDER instructions. One MINIRANGER calibration was performed prior to beginning this project. This calibration was made in Seattle, Washington on the baseline from Pier A at PMC, across water, to the Lake Union Building. End of project baseline calibrations had not been correlated at the time this report was being compiled. The results of the calibrations will be forwarded at a later date. Field calibration checks agreed within three meters of the mean baseline calibration correctors. These values fall within the limits specified per PMC OORDER for a 1:5000 scale survey. Due to the larger scale of this survey, 1:2500, it is recommended that the Daily Calibration Correctors be used in plotting.

FIELD CALIBRATION CORRECTORS

Calibrations were made before and after each day of hydrography. Visual three-point sextant fixes with check angles were observed simultaneously with MINIRANGER patterns to obtain the Daily Calibration Correctors (DCC). All DCC's are within one meter of the mean DCC's. Console/R-T unit 710/719 with codes 1,3 and 4 was used for this survey. Shown below is the summary of baseline calibrations and daily field calibrations.

BASELINE CALIBRATION CORRECTORS

SERIAL NO
CONSOLE/R-T

XPNDR CORRECTOR
CODE BLC 5-7 MAY 1976

710/719

1 -1 ISLAND -3
3 -8 SHE -4
4 -2 CABAL 0

DAILY CALIBRATION CORRECTORS

CODE

DAY/TIME VALUE

1 146/AM -3
1 146/PM -4
1 147/AM -3
1 147/PM -4

CODE 1 MEAN = -3 ✓

3 146/AM -6
3 146/PM -7

CODE 3 MEAN = -6 ✓

4 146/AM -1
4 146/PM -3
4 147/AM -1
4 147/PM -3

CODE 4 MEAN = -2 ✓

ADD'L DATA

SERGIUS NARROWS

ELECTRONIC CONTROL NOTE

INTRODUCTION

Horizontal control of survey SP-PMC-5-DA-76 was by MINIRANGER supplemented by visual methods at detached positions.

The project area was well suited for MINIRANGER control. The survey area is heavily wooded and provided no reflective surfaces. As a result, no multipath returns were encountered and MINIRANGER data was very clean.

Maximum ranges were under one mile; thus very strong signals were received throughout the survey area. Line of sight requirements for signal path were met everywhere by using three MINIRANGER shore stations to cover the survey area.

BASELINE CALIBRATIONS

Baseline calibrations were accomplished per PMC OORDER instructions. The beginning calibration was accomplished at PMC from Pier A to the Lake Union Building. The ending calibration was accomplished in Cordova, Alaska, after the project had been completed. Field calibration checks agreed within three meters of the mean baseline calibration correctors. These values fall within the limits specified by PMC OORDER for a 1:5000 scale survey. Due to the larger scale of this survey, 1:2500, it is recommended that the Daily Calibration Correctors be used in plotting.

FIELD CALIBRATION CORRECTORS

Calibrations were made before and after each day of hydrography. Visual three-point sextant fixes with check angles were observed simultaneously with MINIRANGER patterns to obtain the Daily Calibration Correctors (DCC). All DCC's are within one meter of the mean DCC's. Console/R-T unit 710/719 with codes 1, 3, and 4 was used for this survey. Shown below is the summary of baseline calibrations and daily field calibrations.

BASELINE CALIBRATION CORRECTORS

<u>SERIAL NO.</u> <u>CONSOLE/R-T</u>	<u>XPNDR</u> <u>CODE</u>	<u>CORRECTOR</u> <u>BLC 5-7 May, '76</u>	<u>XPNDR</u> <u>CODE</u>	<u>CORRECTOR</u> <u>BLC 14 June, '76</u>
710/719	1	-3	1	-2
	3	-4	3	-2
	4	0	4	2

DAILY CALIBRATION CORRECTORS

<u>CODE</u>	<u>DAY/TIME</u>	<u>VALUE</u>
1	146/AM	-3
1	146/PM	-4
1	147/AM	-3
1	147/PM	-4
		<u>-3 = CODE 1 MEAN</u>
3	146/AM	-6
3	146/PM	-7
		<u>-6 = CODE 3 MEAN</u>
4	146/AM	-1
4	146/PM	-3
4	147/AM	-1
4	147/PM	-3
		<u>-2 = CODE 4 MEAN</u>

VELOCITY CORRECTOR NOTE

SERGIUS NARROWS, PERIL STRAIT, ALASKA

SP-PMC-5-DA-76

SPECIAL INVESTIGATION

Velocity correctors were extrapolated from the curve generated by daily bar checks. Because of the strong currents in the area, bar checks were taken in a sheltered area west of Sergius Point. It was assumed that the turbulence from the strong currents assured a thorough mixing of the water column; and therefore that the velocity curve was linear.

Velocity correctors were applied to soundings from 0 to 235 feet at 0.2 foot intervals, as specified in section 4.5.7.1, table 3, Provisional Hydrographic Manual, change No. 9, 9/29/75.

Launch DA-1 (3131), is equipped as follows:

<u>Equipment</u>	<u>Serial No.</u>
ROSS FINELINE Recorder, Model 5000	1048
Digitizer 6000	1081
R/T unit	1036

VELOCITY CORRECTOR ABSTRACT

SERGIUS NARROWS, PERIL STRAIT, ALASKA

SP-PMC-5-DA-76

DA-1 (3131) (feet)

Fathometer Depth

Velocity Correction

15	0.0
42	0.2
70	0.4
98	0.6
125	0.8
153	1.0
180	1.2
209	1.4
235	1.6

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

-10

0.0

+1.0

+2.0

+3.0

CORRECTIONS IN FEET, FATHOMS

FORM C&GS-117
(4-62)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

VELOCITY CORRECTIONS

Ship DAVIDSON

CDR C. ANDRESEN Comdg.

These corrections are to be used

between 21 MAY 1976 and 27 MAY 1976

in the locality SERGIVS NARROWS

for hydrographic surveys Nos. SP-PMC-5-DA-76

OBSERVATION: EXTREME MIXING
BY CURRENTS PROVIDED A
HOMOGENEOUS WATER COLUMN.
FROM THIS, A LINEAR CURVE
WAS DRAWN.

(For deep water add a 0 to these figures)

DEPTHS IN FATHOMS FEET

10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

VELOCITY CORRECTIONS

VELOCITY AND DRAFT CORRECTIONS

VELOCITY

CORRECTIONS:

TO DEPTH

CORRECTION

15 ft.	0.0 ft
42	0.2
70	0.4
98	0.6
125	0.8
153	1.0
180	1.2
209	1.4
235	1.6
236	0.0

TRANSDUCER DRAFT MEASUREMENT

SERGIUS NARROWS, PERIL STRAIT, ALASKA

SP-PMC-5-DA-76

<u>Vessel</u>	<u>Days</u>	<u>Transducer Draft</u>
DA-1 (3131)	All	1.3 feet

BAR CHECK AVERAGE

SP-PMC-5-DA-76

SERGIUS NARROWS, PERIL STRAIT,

SOUTHEAST ALASKA

DA-1 (3131) (feet)

<u>TRUE</u>	<u>SONIC</u>	<u>TRUE-SONIC</u>
6.00	4.66	1.34
12.00	10.63	1.37
18.00	16.59	1.41
24.00	22.47	1.53
30.00	28.42	1.58
36.00	34.44	1.56
42.00	40.54	1.46
48.00	46.54	1.46
54.00	52.50	1.50



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Pacific Marine Center

May 11, 1976

Commanding Officer
NOAA Ship DAVIDSON

PROJECT INSTRUCTIONS: SP-PMC-5-DA-76, Special Investigation, Sergius Narrows, Peril Strait, Alaska

1. DAVIDSON conducted a thorough hydrographic survey of Sergius Narrows, Peril Strait, Alaska, during October 1975 because of pinnacles reported to exist in the area. High currents precluded wire drag operations and rendered leadline investigations inaccurate, and consequently the minimum depth over West Francis Rock was not conclusively established.
2. Enroute to Prince William Sound you shall complete the Sergius Narrows investigation by accomplishing the following:
 - ✓ a. Determine the least depth over West Francis Rock.
 - ✓ b. Determine the least depth in the vicinity of the 15-foot sounding along the southern edge of Sergius Channel.
 - ✓ c. Determine the least depth over East Francis Rock.
 - ✓ d. Run several crosslines through the area of 1975 hydrography to verify that 1975 and 1976 position control and tidal datums are in agreement.
 - ✓ e. Develop hydrographically the two shoal areas, shown on the copy of the smooth sheet furnished separately, which lie along the southern edge of the navigation channel.
3. Although the above five requirements are listed in order of priority, it should be feasible to accomplish hydrography in conjunction with the diving. Absolute determination of the least depth over West Francis Rock is the most critical requirement of the investigation.
4. Determination of least depths shall be by SCUBA divers unless prohibited by safety considerations. The Commanding Officer shall closely monitor all diving operations to ensure the safety of personnel in this area of swift currents.
5. Hydrography shall be run on an overlay to the smooth sheet at a scale of 1:2500.
6. Electronic control, if utilized, shall be supplemented with visual control. Horizontal control data have been furnished.

7. The reference station for predicted tides shall be Sitka, Alaska. Tide gages shall be installed at the following locations:

Gage	STATION	NO.	LAT.	(Approx.) LONG.
C	Sergius Narrows (Shoal Point)	945-1853	57°24.6' 24'32"	135° 37.6' 37'39"
A	Rapids Island (west side)	N/A	57°24.2' 24'12"	135° 37.9' 37'54"
	Point Sinbad	945-1849	57°24.4'	135° 39.0'
B	Sergius Point	N/A	57°24.5' 24'27"	135° 38.0' 37'57"

Sergius Narrows and Point Sinbad gages shall be operated for a minimum of 30 days in order to establish datum relationships between the open bay and the narrows. This requirement is necessary due to the importance of obtaining as accurate a datum as possible. Tide station reports and tidal bench mark data have been furnished for these two sites.

Rapids Island and Sergius Point gages will be used for zoning purposes and shall be operated during the entire period of hydrography and/or diving. The Rapids Island gage must be installed on the west side of the island.

Marigrams from all four gages shall be removed prior to departing the area and forwarded to PMC in accordance with the OPORDER. Contact should be made with the Sitka tide observer to ensure that his gage is working properly during the investigation and that his tidal records are submitted promptly in the routine manner.


8. Two personnel of the Alaska District, Corps of Engineers will be aboard during the project to observe operations.

9. Upon completion of the project and prior to departure from the area, contact PMC (CPM1) by telephone or radio with a summary of operations.

10. Monthly accomplishment shall be reported under Work Identification Code 0132050 (Hydrographic Surveys).

11. A progress sketch shall be submitted at the scale of chart 17323.

12. Receipt of these project instructions shall be acknowledged.


 H. R. Lippold, Jr., RADM, NOAA
 Director, Pacific Marine Center

FIELD TIDE NOTE

SP-PMC-5-DA-76

SERGIUS NARROWS

Field tide reductions of soundings on the Final Field Sheet are based on Sitka predicted tides, corrected to Sergius Narrows, #1561. They were interpolated using the PDP8/e computer and AM 500 program. All times of both predicted and observed tides are based on Greenwich Mean Time.

Four Bristol Bubbler tide gages were installed as directed by project instructions. Two gages were left operating in the area as per instructions contained in teletype message DA-21 dated 19 May, 1976. Operational periods for all four gages are as follows:

<u>SITE - GAGE</u>	<u>LOCATION</u>	<u>PERIOD</u>
Sergius Narrows 945-1853	57° 24.6'N 135° 37.6'W	21 May - still operating
Rapids Island (Temporary Gage)	57° 24.2'N 135° 37.9'W	25 May - 27 May
Point Sinbad 945-1849	57° 24.4'N 135° 39.0'W	21 May - still operating
Sergius Point (Temporary Gage)	57° 24.5'N 135° 38.0'W	24 May - 27 May

Sergius Narrows: Gage S/N 63A17966 and staff were installed and began operating on 21 May, 1976. On 22 May at 0715 GMT, the paper stopped advancing. On 24 May, at 1745 GMT, the gage's paper drive was restarted. Hydrography was not run while the gage was not operating. The gage is expected to be in operation for 90 days. Fourteen staff/gage comparisons were made. Readings on the marigram are 3.5 feet higher than the staff readings.

Rapids Island: Gage S/N 67A16208 was installed and began operating on May 25, 1976. The staff was installed and leveled to on May 24, 1976. The gage was removed on May 27, 1976. The values of the high tides from 0336 GMT to 2138 GMT on 25 May were lost. It is believed that this occurred because of a leak around the threaded plug in the top of the transparent bubble chamber. A smooth curve was achieved by increasing the bubble rate. The plug was not tightened for fear of stripping the threads. Nine staff/gage comparisons were made. Readings on the marigram are 9.7 feet higher than the staff readings.

Point Sinbad: Gage S/N 73A230 and staff were installed and began operating on 21 May, 1976. The gage is expected to be in operation for 90 days. No problems were encountered from 21 May to 27 May. Twelve staff/gage comparisons were made. The readings on the marigram are 7.0 feet higher than the staff readings.

Sergius Point: Gage S/N 64A11028 and staff were installed and began operation on 24 May, 1976. The gage was removed on 27 May. The clock gained approximately 25 minutes from 2345 GMT 26 May to 1752 GMT 27 May. The heights were interpolated for that period. Twelve staff/gage comparisons were made. Readings on the marigram are 7.4 feet higher than staff readings.

Leveling:

The Sergius Narrows staff was leveled to five existing bench marks. Since the gage is still in operation, no closing leveling was done. The staff is bolted to solid rock; hence no staff movement is anticipated.

The Rapids Island staff was leveled to three temporary bench marks. Closing leveling on removal of the gage indicated no staff movement.

The Point Sinbad staff was leveled to five bench marks. They are two newly established bench marks, triangulation station BOONE 2 1950, and the two reference marks for BOONE 2 1950. The gage is still in operation, so no closing leveling was done. The staff is bolted to solid rock; hence no staff movement is anticipated.

The Sergius Point staff was leveled to three temporary bench marks. Closing leveling on removal of the gage indicated no staff movement.

Project Instructions for SP-PMC-5-DA-76 called for the installation of four tide gages in the vicinity of Sergius Narrows, three on the north side of Sergius Narrows and one on the south side of Sergius Narrows on Rapids Island. Ship's personnel were able to run a line of levels on the north side of the Narrows, and thus relate readings from those three gages. Using the results of those levels, all observed tides could be reduced to the same datum. By using the published MLLW elevation for BM 7 (12.59 feet) at Sergius Narrows, the following results were obtained:

<u>GAGE</u>	<u>ELEVATION ABOVE MLLW</u>	<u>0.0 MARK ON STAFF ABOVE MLLW</u>	<u>0.0 MARK ON MARIGRAM BELOW MLLW</u>
Sergius Narrows BM 7=12.59 feet 945-1853 (published)		0.26 feet	3.2 feet
Sergius Point TBM 2=11.68 feet (temp. Gage)		1.08 feet	6.3 feet
Point Sinbad BM 2=12.96 feet 945-1849		1.19 feet	5.8 feet

The Rapids Island gage could not be connected by leveling. However, by overlaying the marigrams from the Rapids Island gage and the Sergius Point gage, it was discovered that the two curves were almost identical throughout the three day observation period. Thus, for all practical purposes, it could be assumed that the height of the tide at any given time was the same at both places.

135° 39' W

SERGIUS NARROWS

PERIL STRAIT

SP-PMC-5-DA-76

57° 25' N

135° 37'

57° 25' N

CHICHAGOF ISLAND

SERGIUS NARROWS
TIDE STATION

Shoal Pt

Sergius Channel

POINT SINBAD

SERGIUS POINT
TIDE STATION

Sergius Pt

POINT SINBAD
TIDE STATION

Prague Rock

Rapids I.

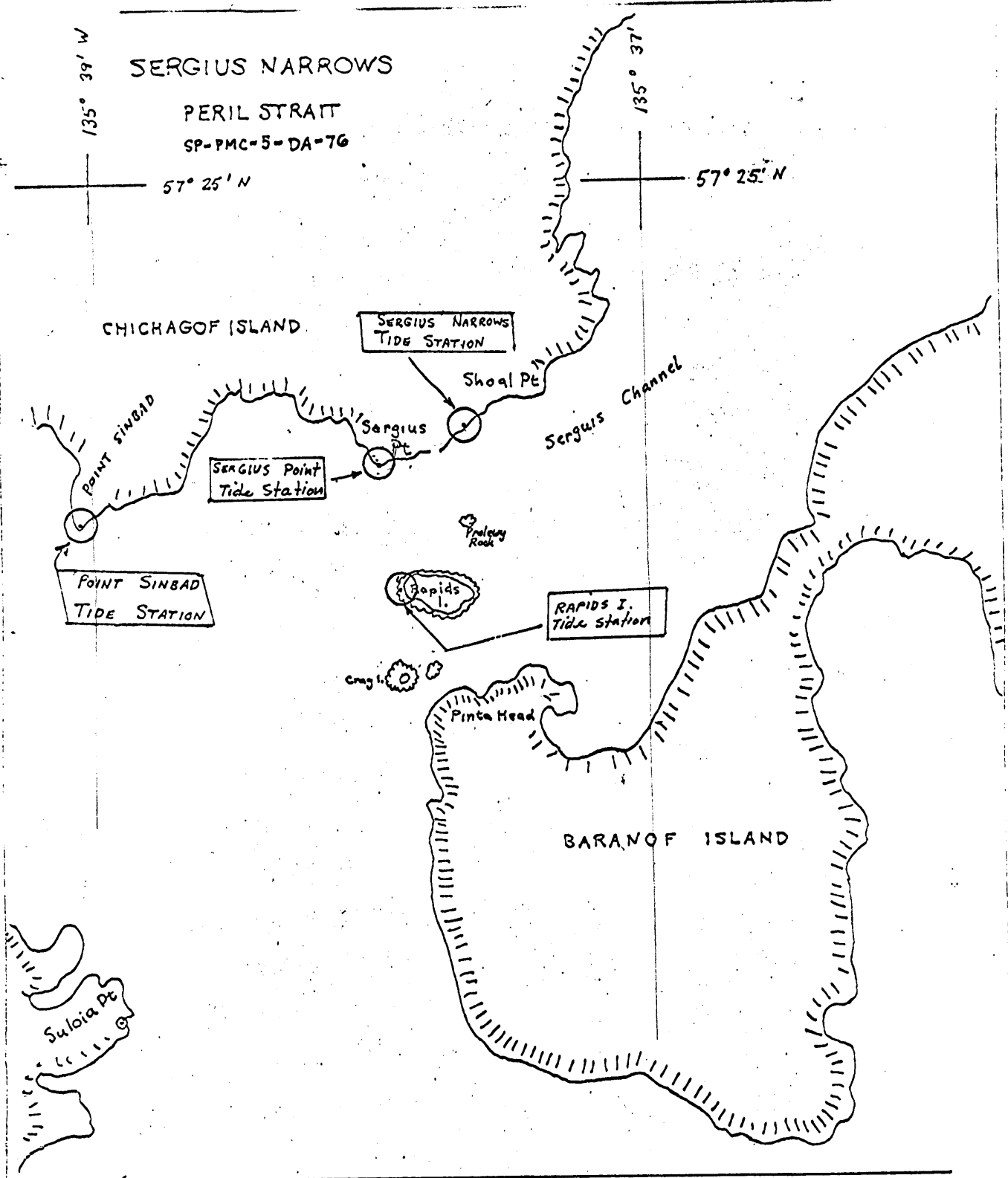
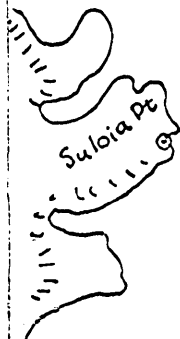
RAPIDS I.
TIDE STATION

Crag I.

Pinta Head

BARANOF ISLAND

Sulcia Pt



6/17/76

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): Sergius Narrows, Sergius Point, Rapids Island

Period: May 25 - 27, 1976

HYDROGRAPHIC SHEET:

QRRX SP-PMC-5-DA-76

Locality: Sergius Narrows, Peril Strait, Alaska

Plane of reference (mean lower low water): 3.0 ft. Sergius Narrows
7.6 ft. Sergius Point
9.5 ft. Rapids Island

Height of Mean High Water above Plane of Reference:

(1) 12.2 ft. (2) 9.9 ft.

Remarks: Recommended zoning:

- (1) East of $135^{\circ}37.9'$ Direct on Sergius Narrows Sergius
"C"
- (2) West of $135^{\circ}37.9'$ Direct on Sergius Point (Day 146) "B"
- Direct on Rapids Island (Days 147 & 148) "A"

James R. Hubbard
Chief, Tides Branch

HYDROGRAPHIC SURVEY STATISTICS
HYDROGRAPHIC SURVEY NO. F.E. No. 3 (1976)

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	BOAT SHEETS ^{3 parts} (2 paper, 1 mylar)		1	
DESCRIPTIVE REPORT		1	OVERLAYS ^{No PNO for this sheet}		0	
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES						
CAHIERS *	1		*			
VOLUMES	2					
BOXES						

T-SHEET PRINTS (List)

None

SPECIAL REPORTS (List)

*Includes "Final Tabulation" of soundings and positions, raw data tapes, raw data printouts, master tapes, raw position overlay.

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				200
POSITIONS CHECKED		43		
POSITIONS REVISED		0		
DEPTH SOUNDINGS REVISED or added		110		
DEPTH SOUNDINGS ERRONEOUSLY SPACED		0		
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		0		
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		-		
JUNCTIONS		-		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		25		
SPECIAL ADJUSTMENTS		-		
ALL OTHER WORK		65		
TOTALS		90		
PRE-VERIFICATION BY	BEGINNING DATE		ENDING DATE	
VERIFICATION BY <i>Robert W. Derkazarian</i>	June 16, 1976		July 8, 1976	
REVIEW BY	BEGINNING DATE		ENDING DATE	

W.C. Cassens 8h-5 7/23/76

Sergius Narrows (1976)

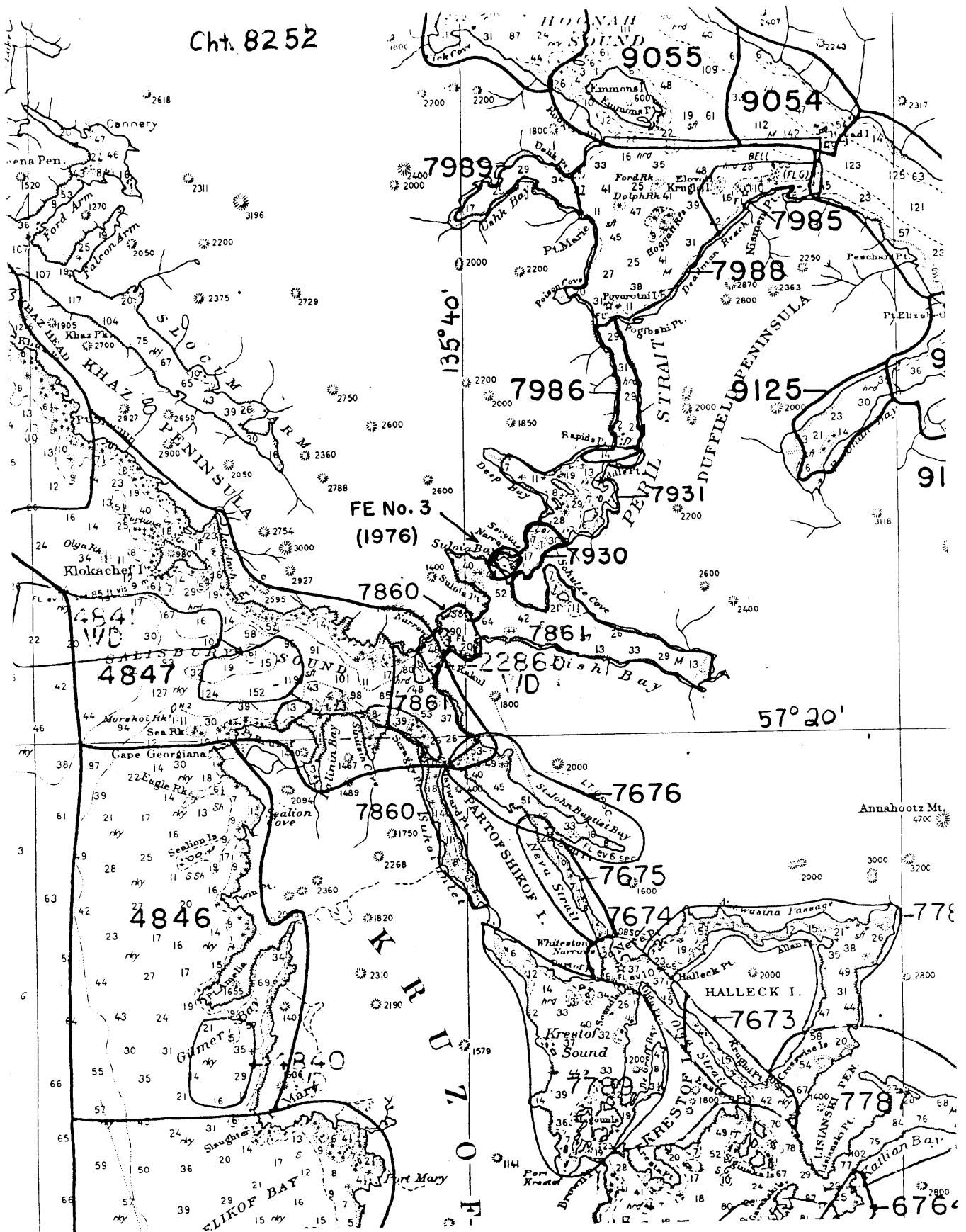
Detached Positions

7001-7022

									TIDE Feet	COR. SDBG		
	3138	76	146	0	010	MAY 25, 1976						
	000300	0000	0000	000000	000	000	000	000				
West Francis RK	000300	00281	07001	121230	037060	003	004	007	WEST FRAN. RK	B-3.7	24.4	24
	001900	00260	07002	118290	037280	003	004	007		B-3.6	22.4	22
*	235200	00250	07003	136570	062500	001	010	007*		C-6.1	18.9	19
	3138	76	147	0	010	MAY 26, 1976						
	002000	0000	0000	000000	000	000	000	000				
E. FRAN. RK	002000	00140	07004	091470	123280	002	001	004	EAST FRAN. RK	B-4.2	9.8	10
*	184000	00250	07006	069240	099520	001	004	006*		C-8.5	16.5	16
*	184400	00280	07007	067240	101300	001	004	006*		C-8.5	19.5	19
W. FRAN. RK	185600	00340	07008	122430	055040	003	004	008	WEST FRAN. RK	A-7.3	26.7	26
•	191100	00332	07009	118230	058310	003	004	008		A-7.5	25.7	25
	3138	76	148	0	010	MAY 27, 1976						
	000600	0000	0000	000000	000	000	000	000				
**	000600	00280	07010	122040	042490	003	004	007**		A-4.9	23.1	23
W. FRAN. RK	003400	00280	07011	120520	035400	003	004	007	WEST FRAN. RK	-4.2	23.8	24
•	004200	00277	07012	118470	037050	003	004	007		-4.1	23.6	23
•	010400	00290	07013	119160	037450	003	004	007		-3.6	25.4	25
•	011800	00250	07014	121000	043350	003	004	007**		-3.5	21.5	21
Buoys	174500	99999	07016	120010	029500	003	004	007		-3.7		
	175000	99999	07017	070330	100230	001	004	006	BUOYS	-3.8		
	175500	99999	07018	038120	120520	001	004	006		-4.0		
•	183800	00300	07021	112350	043000	003	004	007		-5.7	24.3	24
•	185900	00320	07022	120150	038330	003	004	007		A-6.4	25.6	25

- * 7003 Pinnacle - southern edge of Sergius Channel
- 7007
- 7006 ledge ← Rock
- ** 7010 Pinnacle - Northeast of West Francis Rock
- 7014
- Vicinity of West Francis Rock

Cht. 8252



VERIFIER'S REPORT

DA-2.5-1-76

F.E. NO. 3 (1976)

This survey was plotted and verified at the Washington Science Center, Rockville, Maryland.

I. INTRODUCTION

This special investigation of Sergius Narrows, Peril Strait, Alaska, was made to further develop several shoals previously investigated last field season on F.E. No. 2 (1976) and to investigate them by divers. The present investigation supplements the previous investigation.

II. PROJECTION, CONTROL AND SHORELINE

The polyconic smooth sheet projection was machine plotted using a Cal Comp 748 plotter.

The control is adequately discussed in paragraph G of the Descriptive Report with attention noted that the electronic and visual control stations were transferred by hand from F.E. No. 2 (1976) with one station added, Mountain 2, 1950. Control station Boon 2, 1950 and projection line latitude $57^{\circ}24'20''$ were found to be misplaced on the boat sheet of the present survey by approximately 1 mm.

No contemporary shoreline manuscript was available for this survey.

III. HYDROGRAPHY

A. Depths at crossings are in good agreement considering the nature of the bottom.

B. The depth curves were drawn also to reflect information from F.E. No. 2 (1976).

C. The development of the bottom configuration and the investigation of least depths is considered adequate. A full detailed diver's report is included in the Descriptive Report. Differences of several feet were noted between diver/lead line soundings and adjacent fathometer soundings. These differences probably are caused by depths being obtained on different irregularities on the bottom. See paragraph VI of this report for further information.

IV. CONDITION OF SURVEY

The field work and sounding records are considered adequate but attention should be directed to the following:

A. An electronic control arc overlay was not included as part of this survey. The arc overlay accompanying the previously mentioned survey F.E. No. 2 (1976) should be utilized in any further examination of this survey.

B. No final sounding, position, or tide printout is included with this survey. The "Final Tabulation" as so labeled includes all the raw sounding and control data with annotated corrector values given for the electronic control, approved tides, TRA, velocity, and includes the final reduced soundings.

C. A smooth position number overlay is not included with this survey, but the position numbers have been inked on the smooth sheet. It should be noted that positions 2020-2200 have been renumbered for clarity to positions 20-200.

D. Tidal data was zoned between two areas using three gauges. Zone 1 used Sergius Narrows gauge (C) east of longitude 135°37.9'; zone 2 used Rapids Island gauge (A) and Sergius Point gauge (B) west of this longitude. A correction of less than .2 foot exists between Rapids Island and Sergius Point gauges, but intermittent operation of the gauges led to the need to use both gauges.

V. JUNCTIONS

There are no junctions made on this field examination.

VI. COMPARISON WITH PRIOR SURVEYS

H-7930	(1951)	5,000
<u>F.E. 2 (1976)</u>	<u>(1975)</u>	<u>2,500</u>

Extensive removal of rock on West Francis Rock and in Sergius Channel has occurred since H-7930 (1951) was surveyed. In other areas, no important differences were noted. Changes revealed by the present survey should be reflected on the chart.

The present field examination is in good agreement with field examination F.E. 2 (1976) which provides a detailed survey of the common areas. The present field examination should be used to supplement F.E. 2 (1976) in charting this area.

Attention is directed to the following features:

A. West Francis Rock was originally shown on F.E. No. 2 (1976) with a least depth of 16 feet. Diver/lead line investigation on the present field examination shows 22-25 feet in the nearby vicinity and 21-22-foot

fathometer soundings within 30 meters as the shoalest depths on this feature. The 16 foot is considered disproved by this investigation. Prior interpretation of the fathogram was apparently faulty because of traces from heavy kelp.

B. Shoal northeast of West Francis Rock is shown on F.E. No. 2 (1976) with a least depth of 26 feet. Diver/lead line investigation has found a 21- and 23-foot sounding on this feature.

C. East Francis Rock is shown on F.E. No. 2 (1976) with a least depth of 12 feet. Diver/lead line found the shoalest depth as 10 feet on this feature.

D. Southern edge of Sergius Channel is shown on F.E. 2 (1976) with a least depth of 15 feet which is considered valid. The present diver/lead line investigation on this feature shows a depth of 16 feet on this pinnacle rock. Two 19-foot shoals have been sounded in the vicinity of latitude $57^{\circ}24'25''$, longitude $135^{\circ}37'37''$.

VII. COMPARISON WITH CHART 17323 (8248) latest print date December 7, 1974

A. Hydrography

Charted hydrography originates with prior survey H-7930 (1951). The changes determined by the present field examination and F.E. 2 (1976) have been reported through subsequent Notices to Mariners except for the rejection of the 16 foot in latitude $57^{\circ}24'16.9''$, longitude $136^{\circ}38'13''$. This depth should be disregarded.

B. Controlling Depths

The changes determined by the present field examination and F.E. 2 (1976) are adequately reported in subsequent Notices to Mariners.

C. Aids to Navigation

Two charted floating aids to navigation have been repositioned subsequent to charting and another permanently added (LNM 18/76). These have been reported in Notices to Mariners.

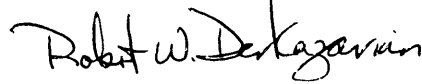
VIII. COMPLIANCE WITH PROJECT INSTRUCTIONS

This survey adequately complies with project instructions.

IX. ADDITIONAL FIELD WORK

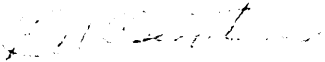
This field examination is considered to be very good and no additional work is recommended.

Respectfully submitted,



Robert W. DerKazarian
Cartographer
July 6, 1976

Examined and Approved:



R. H. Carstens
Deputy Chief
Marine Surveys Division



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C35x1

July 28, 1976

TO: *A. J. Patrick*
A. J. Patrick
Chief, Marine Surveys Division

THUR: Chief, Quality Control Branch

FROM: *R. H. Carstens*
R. H. Carstens
Quality Evaluator

SUBJECT: Quality Evaluation of F.E. 3 (1976), Sergius Narrows, Alaska

This field examination was inspected with respect to data acquisition, determination of least depths, sounding line crossings, verification and review and in general was found to adequately conform to NOS standards and serve the purpose intended.

This investigation provided a visual examination by divers and a limited amount of development by echo sounder of several critical shoals. On West Francis Rock the least depth by divers using a lead line was 22 feet and the least depth by echo sounder was 21 feet. These soundings are not at the same location and represent least depths on different portions of the feature. These soundings together with F.E. 2 (1976) are considered to provide a good determination of the least depth on West Francis Rock.

F.E. 3 (1976) should be used to supplement F.E. 2 (1976) in delineating the bottom in this area.

CC:
C351



RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. FE No. 3 (1976)

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
8248	10/5/76	D.J.K.	Full Part Before After Verification Review Inspection Signed Via Drawing No. 12 Fully app'd hydro in area after Q.C.
8252	12/20/76	A.J. Borawski	Full Part Before After Verification Review Inspection Signed Via Drawing No. Fully App'd Thru Chart 8248 After QC Insp.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
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