

# 4549ab

# 4549ab

Form 504  
Rev. Dec. 1933  
DEPARTMENT OF COMMERCE  
U.S. COAST AND GEODETIC SURVEY  
R. S. PATTON, Director

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 4549a&b  
Hydrographic }

State California

LOCALITY

Southern Coast

West of San Clemente I. and  
Outer Santa Barbara Passage and  
Cortez Bank

1925

CHIEF OF PARTY

T. J. Maher



DEPARTMENT OF COMMERCE  
U.S. COAST AND GEODETIC SURVEY  
Col. E. Lester Jones, Director.

DESCRIPTIVE REPORT TO COVER HYDROGRAPHIC SHEET OF THE  
AREA WEST OF SAN CLEMENTE ISLAND, CALIF.

Surveyed during 1925.

Str. GUIDE  
1925

Thos. J. Maher  
CHIEF OF PARTY.

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DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SHEET \_\_\_\_\_

OF THE AREA WEST OF SAN CLEMENTE ISLAND, CALIFORNIA,

SURVEYED DURING 1925.

Authority, Limits, Party, Dates, Scale.

Authority for this work is contained in ORDERS from the Director dated November 21, 1924. The northern limit of the work is a line drawn from the north end of San Clemente Island and running  $245^{\circ}$  true out to the 1000 fathom curve. The eastern limit is a little beyond the 100 fathom curve west of San Clemente Island, and this line continued to the southeast. The southern limit of the work is a line drawn about  $245^{\circ}$  true from latitude  $32^{\circ} 15'$  North, longitude  $118^{\circ} 20'$  West, and running out to the 1000 fathom curve. The western limit is just beyond the 1000 fathom curve. Cortes Bank to the southeast of Bishop Rock Buoy was developed out to the 100 fathom curve. This work has been plotted on another sheet with scale of 1:20000, which is being submitted. Several lines were run over Tanner Bank, but a complete development was left for the next season's work. The survey was made by the party on the Ship GUIDE, Lieut. Comdr. R. F. Luce, commanding from January 10, 1925 to February 10, 1925, and Lieut. Comdr. T. J. Maher, commanding from February 11, 1925 to the end of the season on May 24, 1925.

Survey Methods, Reliability of Work.

Radio Acoustic Ranging stations were established on San Clemente Island, one near the north end in West Cove, and one near the south end, in the cove north of China Point. These stations with the three point fix method furnished excellent control for most of the work between San Clemente Island and Tanner Bank and Cortes Bank. T day from position 5 to 36, V day from position 63 to 93,

W day from position 8 to 54, X day from position 7 to 49 and D' day from position 90 to 1-1/2 E' are adjusted dead reckoning lines between the positions named. X day has check distances from the south Radio Acoustic Ranging station on positions 15 and 25, while D' day has check distances from the north Radio Acoustic Ranging station for positions 107 and 112. The crossings of these lines over other well determined lines check very well. Soundings over 80 fathoms were made with the sonic sounding device checked at intervals by vertical casts with the usual sounding machine. Soundings less than 80 fathoms were gotten with the improved type of Rude-Fischer tubes, for which graph corrections were made from tests of the tube at different depths against vertical casts made with the sounding machine, with registering sheave, which had been carefully calibrated. The sonic soundings between 74G and 78G are questionable and it is believed that the second stage was used here and the soundings should be twice those recorded. This is borne out by the vertical cast at 78G, where apparently the original sonic sounding reported to the bridge was 108 fathoms and which was later changed to 216 fathoms. These have been rejected. The soundings taken on 98V and the one before and just after this position seem to be in error for the same reason, and have been rejected.

For the detailed development of Cortes Bank to the southeast of Bishop Rock Buoy, this buoy was accurately located by bearings taken with the standard compass, with the ship at anchor at three positions determined by distances from both the Radio Acoustic Ranging stations. Then another buoy of the one barrel type was planted about 2 miles to the southeast of Bishop Rock Buoy and located by bearings taken with the standard compass to Bishop Rock Buoy, to triangulation station Thirst and by a distance from the south Radio Acoustic Ranging station. Radial lines were run to and from this one barrel buoy, and dead reckoning closures adjusted. Most of these radial lines were checked on the outer ends by Radio Acoustic Ranging fixes.

*Revised observations, etc.*

The work outside of Tanner and Cortes Banks was controlled by dead reckoning beginning and ending on well determined positions in the vicinity of these banks. The dead reckoning was checked by astronomical sights, whenever these were obtainable. A one barrel buoy of the floating type was planted on the 12 fathom spot shown on chart 5102 about 4 miles northwest of Bishop Rock Buoy. This was located by a distance gotten from the north Radio Acoustic Ranging station and a careful bearing taken to Bishop Rock Buoy, with standard compass. This location was also checked by a dead reckoning run from Bishop Rock Buoy. The work outside of the two Banks from Q' day to the end of the season was done by taking a departure from this floating buoy, early in the morning, and closing with a return to the buoy at night. The bottom from Tanner and Cortes Banks out to the 100 fathom curve is extremely irregular and crossings are poor in many instances. Between 42Q and 43Q there is a difference of 336 fathoms in about a half mile, while between 84 and 85R' there is a difference of 366 fathoms in less than a half mile. Differences of nearly the same amount between consecutive soundings were gotten on other lines in this vicinity and show conclusively that the slopes are very steep and changes in the bottom very abrupt. Slight differences in the location of lines over critical places are bound to make crossings poor, unavoidable without better control than is now available in this locality.

From a study of the depth curves in this vicinity, it is believed that the lines 76B' to 72C', and 40H' to 102H' should be rejected. X' day was rejected and is not plotted on the sheet as it was impossible to make the crossings on this day check within themselves. Positions 62Z to 99Z have also been rejected, for altho the star sights and the distance from the north Radio Acoustic Ranging station check well at 99Z, the star sights and distances on intermediate positions do not check at all.

To accept this line would mean that all other lines between 83% and 99% are in error, as the soundings on the Z day line do not check the other sounding lines.

#### Log Factors.

Four log rotators were used for the work done on this sheet. The factors for these rotators were obtained by runs between visual and bomb fixes under varying conditions of wind and sea, and the average value which was used is believed the best obtainable. A summary of the tests for log factors follows:

Rotator No.	No. of days on which tests were made.	Total miles run in determination of log factor.	Log factor	Days rotator was used in dead reckoning of this sheet.
0	10	270	1.068	1/22-2/11
1	10	220	1.037	2/12-3/24
5	10	300	1.033	3/25-4/16
6	3	70	1.008	4/17-5/24

#### Hydrophone Locations.

Two hydrophones were located at the north Radio Acoustic Ranging station. No.1 was used for the work from January 20 to March 3; while No.2 was used from March 4 to the end of the season. Four hydrophones were located at the south Radio Acoustic Ranging station. No.1 was used from January 21 to February 17, No.2 from February 18 to February 24, and No.3 from February 25 to the end of the season. Nos.1 and 3 were planted in the same place. No.4 hydrophone was planted on May 5 but was used for experimental purposes only.

Currents.

Currents were observed using current pole and line on four nights that the ship was anchored in the vicinity of the buoy planted to the south-east of Bishop Rock Buoy, one night while the ship was anchored in the vicinity of the buoy planted to the northwest of Bishop Rock Buoy and one night while the ship was anchored off China Point on San Clemente Island. A summary of the adjustment made for current and leeway, in adjusting the dead reckoning lines, follows. It should be noted that the terms "drift" and "set" used in this summary mean not only the effect of the current but the leeway as well.

Date	Pos.Nos.	Total elapsed time hours.	Drift knots per hr.	Set Degrees true.	Remarks.
1925					
Feb.					
12-13	67P-67Q	19.8	.26	232	Up east side Cortes bank, across out to 1000 fm. curve and return south of Bank.
19-20	28U-63V	24.2	.07	223	Outside and southwest Cortes Bank.
20	63V-93V	6.4	.29	105	Cortes Bank to San Clemente Island.
24	8W-60W	8.8	.50	108	Southwest of San Clemente.
Mar.					
3	1X-49X	8.4	.32	123	" " " "
5	25Y-57Y	5.3	.09	133	Across Tanner Bank along west side Cortes Bank.
5-6	84Y-45Z	10.0	.42	98	Southwest Cortes Bank
10	23A'-43A'	17.6	.22	131	" " "
11-12	76B'-72C'	28.8	.15	120	" " "
12-13	86C'-42D'	13.1	.71	150	Southwest Tanner and Cortes Banks.
13	45D'-89D'	7.4	.13	182	West of above Banks.

Date	Pos.Nos.	Total elapsed time hours	Drift knots per hr.	Set degrees true.	Remarks.
1925					
Mar.					
13	91D'-1E'	4.5	.62	102	Cortes Bank to north end San Clemente Island.
26-27	1G'-38G'	24.1	.14	137	Southwest of Cortes and Tanner Banks.
27	57H'-99H'	11.0	.13	137	Southwest of Tanner Bank.
Apr.					
24	1R'-101R'	13.8	.26	163	" " " "
28	2S'-26S'	3.5	.38	198	San Clemente Island to south end Cortes Bank.
29	1T'-74T'	11.2	.12	198	Southwest of Tanner Bank.
30	1U'-101U'	14.6	.37	188	" " " "
May					
1	1V'-81V'	10.3	.26	202	" " " "
6	1W'-59W'	8.0	.38	161	" " " "
7	1X'-100X'	13.1	.68	165	" " " "
8	1Y'-59Y'	9.0	.38	305	Cortes Bank.
8	62Y'-104Y'	6.0	.65	115	Cortes Bank.
Feb.					
4	104K-104K	2.1	.61	119	13 miles SW of Dome Hill, San Clemente Island.

It may be noted that on March 11 and 12 there was an exceptionally strong northwest wind registering by anemometer up to 40 miles per hour with the ship stopped.

Sound Velocity in Sea Water for Radio Acoustic Ranging.

A velocity of 1483 meters per second was used in determining fixes obtained by the method of Radio Acoustic Ranging. This velocity was obtained by scaling the distances from the respective stations as given by fixes determined by the three point method and dividing this distance by the time elapsed between the time of firing and the time the sound was re-



ceived at the stations as shown by the chronograph records taken on the ship.

A summary of these determinations follows.

Date	Pos.	Scaled Distance		Time		Velocity	
		North	South	North	South	North	South
Jan. 23	10E (648)	20560	-	13.64	-	1507	-
23	15E (187)	28759	33674	19.41	22.69	1482	1484
	19E (866)	38357	42577	26.06	28.95	1472	1471
	22E (849)	47090	51364	32.02	34.87	1471	1473
	55E (865)	45012	-	30.43	-	1479	-
	65E (643)	31224	30146	21.14	20.34	1477	1482
Mar. 5	13Y (809)	24800	33967	16.44	22.79	1508	1491
Mean value . . . . .						1483	

Surface temperatures were obtained at 74 different places on the sheet and at various times during the season. The average of these temperatures was 13.5° Centigrade. From the table of velocities and with an assumed salinity of 33, the theoretical velocity would have been about 1493 meters a second. This indicates that temperatures should be taken at some depth below the surface if the tables are to be used in obtaining a velocity to be applied to the method of Radio Acoustic Ranging. What this depth should be is apparently a matter for further study.

#### Compass Deviations.

On February 12, 1925, the deviations for the standard compass were obtained by a complete ship's swing with right and left rudder, just east of Cortes Bank. Bearings on the sun were taken for the determination of the true azimuth. The deviation table so obtained is to be used for the work from the beginning of the season to and including February 16, 1925.

On February 17, 1925, the standard compass was adjusted and another ship's swing made in the vicinity of San Clemente Island. The deviations obtained on this day are to be used for the work of February 17, 1925, only. On the following day, February 18, 1925, the compass was readjusted and the deviations obtained in the same manner as before. The deviations obtained on this day are to be used from February 18, 1925 to the end of the season. At various times during the season the deviation on different headings was obtained in the regular course of the work. In general these checked the deviation table quite closely. The variation used in computing the deviations was taken from Chart No. 5102.

Details of Adjustments made to Dead Reckoning Lines.

In general the method of determining the positions of the dead reckoning lines was as follows. After reducing the compass courses to true courses and multiplying the logged distances by the proper log factor, each position on the dead reckoning line where a change of course occurred or a lengthy stop had been made, was plotted. No allowance, in this first plotting was made for either current or leeway. After the closing error was determined, this was distributed in proportion to the time elapsed from the point of departure. The adjusted dead reckoning positions were then compared with the astronomical positions if these had been obtained, and in general equal value was given to the astronomical position and the adjusted dead reckoning position. A point midway between these two positions was usually accepted as the position sought. While this method is not absolutely correct, it is believed that it is the best now obtainable for the work. A detailed description of the adjustments made to each dead reckoning line follows.

From 1G to 52 G there was a closure of 2.54 miles north and south,

and 1.66 miles east and west in a run of 58 miles. Adjustment according to time was made at 22G and 19G. On J-K days the log was fouled from 29J to 32J and the distance run was determined from the reading of the revolution counter. The factor to be used with the revolution counter was determined by the run from 1J to 29J. From 17J to 83-1/2K, a run of 18 hours, there was an error of closure in distance of 7.52 miles and 3.62 miles in azimuth. Adjustment was made according to the elapsed time from 17J. After this adjustment, 47K differed from a sun sight by 1.1 mile in latitude and 2.56 in departure, and 53K differed from the sun sight by 1.1 mile in latitude and 3.14 in departure. Positions 47K and 53K were then readjusted by giving equal weight to the sun sights and the adjusted dead reckoning. Using these readjusted positions, the line was readjusted from 17J to 47K. Then assuming 55K as fixed and 83-1/2K as fixed, the line from 55K to 83-1/2K was readjusted. From 67P to 67Q, there was an error of closure of 5.25 miles,  $232^{\circ}$  true, for which an adjustment in accordance with time elapsed was made. The crossing of Summer lines of sights on Arcturus and Polaris at 87P were given the same weight as the dead reckoning adjusted position, and a point between these two positions was accepted as the position of 87P. A point midway between the astronomical fix at 37Q and the adjusted dead reckoning position of 37Q was accepted as the final location of this point. Then after holding 67P, 87P, 37Q, and 67Q as fixed points, separate readjustments of the positions between them was made in the same manner as the first dead reckoning adjustment. The final line checks well with astronomical sights at 33Q, 45Q and 59Q. From 5T to 35T a closing error of .60 miles in latitude and .50 miles in departure was found. This was distributed in accordance with time elapsed from the point of departure. From 28U to 63V accepted as fixed points, there was an error of closure 1.67

miles,  $223^{\circ}$  true in 24.2 hours, which was distributed in accordance to time from 28U. Sun sights at 49V and 51V check very well with the accepted positions. The sights at 34-1/2V, 36V, and 43V do not check as well, but no further adjustment was made. For the work on W day, 8W was assumed as fixed by dead reckoning, and 58W by bearings and angles taken to triangulation stations on San Clemente Island. The error of closure in this line was 4.65 miles in 9 hours and  $108^{\circ}$  true. Adjustment was made according to time elapsed from 8W. The intermediate positions between 40-1/2W and 58W were plotted on the line between these positions and with the single angle taken Guds to Thirst. The error in closure from 1X to 49X, of 2.67 miles  $123^{\circ}$  true, was distributed so that the courses  $183^{\circ}$  and  $188^{\circ}$  had double the correction of the  $356^{\circ}$ psc course. Positions 15X and 25X have bomb distances from the south station. From the dead reckoning position with the correction for these respective positions as a radius, strike an arc cutting these distance arcs. These intersections are accepted as the final location of these positions. This method is not accurate, but is as accurate as any that can be used. 25Y is fixed by Radio Acoustic Ranging distances, and 57aY determined by bearings on Bishop Rock Buoy and distances run between these bearings. The error of closure of .49 miles  $133^{\circ}$  true was adjusted in the usual manner. From 84Y to 45Z the error of closure was 4.2 miles,  $98^{\circ}$  true, and was distributed in the usual manner. 62Z to 99Z was rejected for reasons given in a previous paragraph. From 23A' to 43 B' the error in closure was 3.9 miles,  $131^{\circ}$  true. The usual dead reckoning adjustment was then made. Then 33A' was held since the astronomical fix and the dead reckoning fix are good checks. The final position of 41A' was accepted as midway between the astronomical fix and the adjusted dead reckoning position. The final position of 2B' was determined in the same manner.

11B' was also accepted as a point midway between the astronomical fix and the dead reckoning adjusted position. The lines were then readjusted between these fixed points. The line 76B' to 72C' was run under very unfavorable conditions, and astronomical sights do not check among themselves to the extent that is desired. The method of adjustment for this line follows, altho it is believed that the line should be rejected. The usual dead reckoning adjustment was made. Then the final positions of 102B', 111B' and 119B' was accepted as a point midway between the dead reckoning position after adjustment and the best checking astronomical fix, where more than two stars were observed at one position. 16C' was accepted as  $\frac{3}{4}$ ths the way from the dead reckoning adjusted position to the astronomical fix, while 40C' was determined in the same manner. Readjustment of the line was then made between the above points accepted as fixed. From 86C' a bomb fix to 42D' a bomb fix the error of closure was 8.32 miles  $150^{\circ}$  true, which was adjusted in the usual manner and the adjusted dead reckoning positions accepted as final. The position of 50D' was determined by bearings on Bishop Rock Buoy and distances run. 89D' was determined by adjusting the line 89D' to 91D' so that 89D' was on the bearing taken to Bishop Rock Buoy, and 91D' was on the arc of distance from the north Radio Acoustic Ranging station. For the line 91D' to 112D', 91D' was determined as given in the sentence preceding, while 112D' was found by adjusting the line 112D'-3E' so that 112D' is on the distance arc from the north Radio Acoustic Ranging station and 3E' is on the bearing as noted in the record. 107D' is placed at the intersection of the arc from the north Radio Acoustic Ranging station and the line between 91D' and 112 D'. The distance at 99D' is rejected as only one signal was received and this does not check the dead reckoning position. The following method was used in plotting

the line 2G' to 38H'. The latter position was determined by bearings on Bishop Rock Buoy and distances between them. It is noted in the smooth log that the start was made at 6:15 a.m. from the anchorage of the previous night. The course from the anchorage as noted there was  $140^{\circ}$ psc and log at start as 84.82. 2G' was accepted as the dead reckoning position as run from the anchorage at 29E' determined by bomb fix on the night before. The error in closure of the dead reckoning run from 2G' to 38H' was 3.42 miles,  $137^{\circ}$  true, and the adjusted dead reckoning line was determined in the usual manner. The sight at 17G' was run up to the noon sight at 21G', while the sight at 25G' was run back to the same position. A meridian latitude had been determined at 21G'. The center of gravity of the triangle formed by these three lines was assumed as the astronomical fix of 21G'. The final position of 21G' was accepted as midway between the adjusted dead reckoning position and the astronomical fix. The lines were then readjusted, keeping 2G', 21G' and 38H' as fixed points. Most of the other astronomical sights taken check well with the accepted position of the line. For the line 57H' to 99H', 57H' was determined by bearings and distances on Bishop Rock Buoy and distances run. The bearing on 100H' was rejected and 99H' gotten by plotting back from 101H'. The dead reckoning closure of 1.19 miles,  $137^{\circ}$  true, was distributed in the usual manner. Sights taken on this day seem to check the accepted positions but the soundings do not agree with work of other days. The work on Q'- R'- T'- U'- V'- X' and Y' were run by taking a departure from the floating buoy planted northwest of Bishop Rock and closing at the same position. Adjustment of the dead reckoning line was made in accordance with time since the departure was taken. X' day was not plotted for reasons given in previous para -

graphs. The methods used in the adjustments of the lines mentioned is not considered as accurate but it is believed that the positions are as well determined as by any other method now available.

Miscellaneous.

To locate the objects in West Cove that had been used as signals for locating hydrophones planted there, and for a direct location of hydrophone No.2, a topographic traverse was run without any projection, and later fitted to a projection on sheet being submitted with the hydrographic sheet. In doing this work a set-up was made at North Head and an azimuth taken to Point A, from which a resection was made by sighting on Harbor and West Rocks. From A the traverse was run locating the signals Red Shack, Old Shack, Radio Shack and Hydrophone No.2. Their location and description follows.

Object and Description.	Latitude	D.M.	Longitude	D.P.
Old Shack, seaward gable, (deserted, unpainted shack on edge of beach.)	33-01	1752	118-35	1477
Red Shack, seaward gable, (red painted house occu- pied by fishermen.)	33-01	1795	118-35	1118
Radio Shack, seaward door	33-01	1582	118-35	993
Hydrophone No.2	33-01	1312	118-35	1323
West Cove, 1925.				

For location of other hydrophones angles were taken and recorded in a sounding record kept separate and marked Hydrophone Locations. The record is included with other records pertaining to the sheet.

Statistics Sheet \_\_\_\_\_

Date 1925	Letter	Vol.	Pos.	Soundings		Stat. Miles	Vessel	
				Tube	Sonic Wire			
Jan. 15	A	1	60		112	5	62.0	GUIDE
19	B	1	39		66	3	34.3	"
21	C	1	21		35	3	19.5	"
22	D	1	52		109	5	61.1	"
23	E	1	85	4	171	13	104.0	"
28	F	2	22		59	5	30.5	"
29	G	2	82	25	220	11	114.0	"
30	H	2	33	9	77	5	45.8	"
Feb. 3	J	2	42	8	79	4	49.7	"
4	K	2	75	8	200	9	) - 145.0	"
4	K	3	29	20	65	3		"
5	L	3	54		157	7	76.5	"
9	M	3	19		54	2	29.0	"
11	N	3	29		79	3	43.0	"
12	P	3	77		224	15	110.1	"
12	P	4	13		33	5	19.0	"
13	Q	4	110	10	305	16	158.5	"
16	R	4	3		6		2.3	"
17	S	4	23		38		21.8	"
18	T	4	40		109	5	56.7	"
19	U	4	48		145	7	76.6	"
19	U	5	20		57	1	33.4	"
20	V	5	98		285	18	152.0	"
24	W	5	60		167	1	89.0	"
Mar. 3	X	5	50		140	2	72.0	"
5	Y	5	22		37	2	37.9	"
5	Y	6	72	27	164	9	85.5	"
6	Z	6	99		144	12	134.0	"
10	A'	6	46		177	8	85.0	"
11	B'	7	119		328	10	164.0	"
12	C'	7	91	46	271	1	103.0	"
13	D'	7	30	9	110		49.0	"
13	D'	8	83	18	227	4	126.0	"
14	E'	8	6		18		8.9	"
25	F'	8	29		62	2	42.0	"
26	G'	8	62		149	8	109.0	"
27	H'	9	121		367	5	180.0	"



## Statistics Sheet \_\_\_\_\_

Date 1925	Letter	Vol.	Pos.	Soundings		Stat. Miles	Vessel	
				Tube	Sonic Wire			
Apr. 9	J'	9	25	19	43	1	38.0	GUIDE
10	K'	10	85	157		3	39.0	"
14	L'	10	101	192	39		53.0	"
14	L'	11	10	29		1	5.0	"
15	M'	11	131	164	19	1	46.0	"
16	N'	11	93	171	23	-	43.0	"
16	N'	12	38	69	13	2	19.0	"
23	Q'	12	49	23	50		22.0	"
24	R'	12	100		245	1	125.0	"
28	S'	13	31		66		43.5	"
29	T'	13	74		172	1	106.9	"
30	U'	13	103		252		138.9	"
May 1	V'	13	32		86		37.4	"
1	V'	14	49		112		58.5	"
6	W'	14	61		126	1	69.3	"
7	X'	14	100		224		114.4	"
8	Y'	14	60	5	114		77.6	"
8	Y'	15	48	32	49	1	62.7	"
Totals . . . . .			3154	1478	6256	222	3829.0	

The tide gauge was located at La Jolla, Calif.

Plans of reference: mean lower low water.

Tidal reductions on this sheet were referred directly to observed tides at La Jolla, Calif., without any correction for either time or height of tide being made.

Leroy P. Raymond

*Shapley*  
*Comy the gauge*  
 May 18, 1926

POST-OFFICE ADDRESS:

Str. GUIDE, Astoria, Oregon.

TELEGRAPH ADDRESS:

EXPRESS OFFICE:

MAY 24 9 11 AM '26

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

Str. GUIDE,  
May 19, 1926.

*Field Records*

*14 Recd*

*R10*

To: Director, Coast and Geodetic Survey, Washington, D. C.  
From: Commanding Officer, Str. GUIDE, Oakland, Calif.  
Subject: Hydrographic work west of San Clemente Island during 1925.

There will be forwarded to you to-day, with proper transmitting letter to cover, five packages containing fifteen volumes of sounding records pertaining to the work in the above area. This work has been completed by Mr. Raynor. Most of it is controlled by dead reckoning, which method we found not very satisfactory for the reason that Tanner and Cortes Banks cause very irregular currents. The depth of the water was such that we could not anchor the ship for the purpose of getting information relative to the velocity and direction of these currents.

During 1925 we found it impossible to get R.A.R. fixes when we were to the westward of these banks. At times we obtained what we thought were fixes, but these seem unreliable, and I have since ascertained that the shore operators sometimes tripped the R.A.R. apparatus by hand when they heard what they thought were the bomb explosions. Numerous astronomical sights were obtained, but these are not satisfactory, as refraction, poor horizon and other causes introduce errors.

During 1926 we established a station on St. Nicholas Island hoping to get some control from that section, but shoals lying between that place and our working grounds gave us the same trouble, and we obtained no results.

We covered the area thoroughly, and I instructed Mr. Raynor to reject any work which appeared more uncertain than the average dead reckoning sounding lines. I am retaining the sheet on board so as to plot some additional lines run during 1926.

*Thos. G. Maher*  
Thos. G. Maher,  
COMMANDING OFFICER,  
Str. GUIDE.

TJM-m

*To Supplement Description Reports*

*This letter refers to vols. for sheets 4549a + 4549b for which no time Ref. was received*

September 16, 1926.

(11)

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in  
15 volumes of sounding records for

HYDROGRAPHIC SHEET NO. 4549A and B.

Locality: Coast of California.

Chief of Party: T. J. Maher in 1925.

Plane of reference is M L L W  
3.6 ft. on tide staff at San Diego  
3.8 " ----- do ----- La Jolla

For reduction of soundings, condition of records satisfactory  
except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted
3. Time meridian not given at beginning of day's work.
4. Time (whether A. M. or P. M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.



Chief, Division of Tides and Currents.

Hyp. sheets 4549a & 4549b (Scales 140,000 & 20,000)  
Mass Coast Survey Clements & Foster's Parallel Sounding Passage

On 0' of J' L' days Oct 18, March 5, April 9, 10, 14, 15, 16  
M' N' K' of 1925

The reduced sdy records show that no corrections from graphs were applied to the tube readings on the days noted above. Nor do the sdy records show that any comparative sdy were made on the above days.

Forward to the Office the ship's log covering the above dates.

Unless the deficiencies noted above can be supplied it may be necessary to reject most of the tube work done on this survey.

No descriptive reports were submitted with these sheets. In view of the size and complexity of these surveys, and the numerous and considerable discrepancies in positions and depths, detailed descriptive reports should have been sent to the Office.

None of the records nor transmitting letters noted the full numbers of the sheets.

E.P.C.

Oct. 12, 1926

Collier will write for further data

IN REPLY ADDRESS THE DIRECTOR  
U. S. COAST AND GEODETIC SURVEY  
AND NOT THE SIGNER OF THIS LETTER

AND REFER TO NO.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

WASHINGTON

November 26, 1926.

REPORT ON VERIFICATION OF  
HYDROGRAPHIC SHEETS Nos. 4549 a & b.

This sheet was inked with the positions as plotted by the field party.

The soundings were spaced according to the time intervals.

The drafting conforms to the general instructions for field work.

The following soundings were not inked due to their disagreement with adjacent lines.

76 P to end of line  
1 to 37 Q  
1 to 15 X  
46 to 51 X  
61Z to end of line

*H. R. Edmonston*

H. R. Edmonston.

No comparative soundings were taken for tube work done on 0' y J' L' M' N' A' days. As it was <sup>not</sup> possible to apply a correction from barometer and thermometer the soundings were inked as given in the records.

Soundings were not rejected that exceeded the allowable percentage of error.

IN REPLY ADDRESS THE DIRECTOR  
U. S. COAST AND GEODETIC SURVEY  
AND NOT THE SIGNER OF THIS LETTER

AND REFER TO No. 11-DEM

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
WASHINGTON

January 18, 1927.

To accompany Descriptive Report, H. 4549<sup>A</sup>.

This sheet is adequate eastward of Cortes Bank, where the hydrography is controlled by Radio Acoustic Ranging. The hydrography westward of this bank is classed as reconnaissance due to lack of definite control. It is recommended that all banks included in the latter area be developed and that sufficient additional lines be run to develop the bottom contours.

It is also recommended that the adjustments made by the field party for the area westward of Cortes Bank be accepted as being adequate for the conditions under which the development was executed.

Certain lines showing wide differences from two or more adjacent lines have been omitted in the verification due to uncertainties in the Dead Reckoning.

A. L. G.  
L. O. R.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

AND REFER TO No. 11-DEM

WASHINGTON

November 2, 1927.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheets Nos. 4549 a and b.

West of San Clemente Island and Outer Santa Barbara Passage, Calif.

Surveyed in 1925

Instructions dated January 12, 1924 and November 21, 1924 (GUIDE)

Chiefs of Party, R. F. Luce and T. J. Maher.

Surveyed by R. F. L., T. J. M.

Protracted by I. Rittenberg, L. P. Raynor.

Soundings plotted by L. P. R.

Verified and inked by H. R. Edmonston.

1. The records conform to the requirements of the General Instructions with the exception that on a number of days when tube work was done no comparative readings were taken. (See verifier's report.)
2. The plan and extent of development conform to the requirements of the specific instructions except as follows:
  - a. The southeastern end of Cortez Bank out to the 200 fathom curve should have been closer developed.
  - b. Between Cortez and Tanner Banks and south of the limits of H. 4551a additional lines should have been run at least to the 200 fathom curve.
  - c. In latitude  $32^{\circ} 35'$ , longitude  $119^{\circ} 30'$  additional development should have been made around the 165 fathom sounding. There are indications here of another bank. The development here should extend as far as the 300 fathom curve.
3. The sounding line crossings east of Tanner and Cortez Banks are generally satisfactory for this class of work. Most of this work

being controlled by R. A. R. distances, no discrepancies in the crossings were occasioned as a result of erroneous location of sounding lines. To the westward of Cortez Bank, however, the ship's position was controlled entirely by astronomic sights combined with dead reckoning, and the result was that some of the lines were clearly out of position, due perhaps to the approximations that were necessary in the adjustment of the lines on account of lack of information as to the varying currents in the vicinity. Bearing in mind the steep slopes encountered in certain portions of this locality and with due regard to the irregular character of the bottom in many places, some of the lines that were clearly out of position were rejected. This method of reconciling lines of soundings results, it is believed, in as faithful a representation of the bottom as is possible with the methods that are available at the present time for locating the ship's position when out of sight of land. No attempt was made at readjusting any of the lines as it was considered the field party's decision in such cases should control.

4. Taking all the existing surveys made since 1923 as a whole, adequate information is had for drawing the usual depth curves. However, the 10 fathom curve in the vicinity of Bishop Rock on Cortez Bank still remains undeveloped.
5. The usual field plotting was done by the field party. As has already been stated, the office cartographer made no attempt at checking any of the positions as laid down by the field party. The customary verification of soundings was made, however. It should be noted that although the field party recommends the rejection of the line from 76B' to 72C' (see descriptive report, page 3) this was not followed as it agreed for the most part with soundings on adjacent lines. It was therefore only rejected in part.
6. The junction with H. 4265a (surveyed in 1923) is satisfactory. The bank found on the 1923 survey was picked up on the new survey in approximately the same position (latitude  $32^{\circ} 22'$ , longitude  $118^{\circ} 27'$ ). The gap between these two surveys shown on the diagram southeast of Cortez Bank does not require additional work as the spacing between the limiting lines on the two surveys falls within the requirements of the specific instructions for such depths.

The junction with H. 4366 (surveyed in 1924) is adequate except for an area about 15 miles southeast of San Clemente Island



where a considerable gap exists in depths between 500 and 1000 fathoms. This should be covered by 1 or 2 lines.

The junction with H. 4560 is satisfactory.

The junction with H. 4447 is satisfactory. Wherever sounding lines on the two surveys crossed each other the soundings agreed remarkably well. It is to be noted that both surveys picked up the Tanner Bank ridge in practically the same position, notwithstanding the fact that one used dead reckoning control (H. 4447) while the other used R. A. R. control (H. 4549a).

The junction with H. 4551 (a and b) is satisfactory considering the irregularity of the bottom and the approximate methods of control that were used in the two surveys in this vicinity (dead reckoning and astronomic fixes). It should be noted that the 16 fathom sounding (already charted) on Tanner Bank does not agree in location with the shoalest soundings obtained on the bank on H. 4551 (a and b), but plots about 1 mile to the north-east and in about 40 fathoms of water. It is believed this is due to an error in the location of the sounding lines and not that two shoals exist on the Bank. On account of the great detail in this vicinity on H. 4551 a and b, it is recommended that the 16 fathom sounding be omitted from the charts when the other sheets in this area are applied and these sheets should be given preference for all work on Tanner Bank wherever a conflict exists that is not explained by the irregularity of the bottom.

The work on H. 4561 for the most part overlaps the work on the present survey. Both surveys in this locality were controlled by astronomic sights and dead reckoning. The soundings in the main agree well. There are some discrepancies, due no doubt to the lines being slightly out of position.

A junction was effected with the old surveys H. 1429 and H. 1430 around San Clemente Island. The soundings at the junctions with these surveys are good. However, the lines were not extended far enough inshore to actually verify the old surveys as is apparently required by Paragraph 6 of the specific instructions of January 12, 1924. Furthermore, on the west side of San Clemente Island (H. 1429) no additional lines were run to make the spacings of lines inside the 50 fathom curve conform to the requirements of Paragraphs 6 and 9 a of the above instructions which call for 1/4 mile lines whereas the spacings are actually 1100 meters.

7. Additional work will be required as mentioned in paragraphs 2 and 6, and in the following places:
  - a. A development of the 136 fathom sounding in latitude  $32^{\circ} 37'$ , longitude  $119^{\circ} 35'$ .
  - b. The 31 fathom sounding (from H. 1429) in latitude  $32^{\circ} 46'$ , longitude  $118^{\circ} 24'$ . This is surrounded by deeper water and should be investigated.
  - c. The 30-60 fathom bank in latitude  $32^{\circ} 00'$ , longitude  $119^{\circ} 15'$  should be investigated. This bank was found by the Navy survey ship "Hull & Corry". It has never been charted.
8. Attention is called to the following:
  - a. The bank mentioned in paragraph 10 of the specific instructions of January 12, 1924, in latitude  $32^{\circ} 05'$ , longitude  $119^{\circ} 45'$  has been investigated and disproved on H. 4561.
  - b. The location of Bishop Rock buoy and the 12 fathom sounding about 4 miles to the northwest of the buoy agrees with the determination made on H. 4267, which proves that the previous locations on the charts were in error.
  - c. There are a number of soundings on this survey below 100 fathoms that were taken with the sonic depth finder. These were retained on the sheet for the reason that they were applied to the charts before the sheet was reviewed and in order not to cause any confusion in the future as to the authority for such soundings it was thought best not to expunge them from the sheet.
9. In summarizing the work on this sheet it should be said that it represents perhaps the best results possible with the present available methods of surveying. To the eastward of Cortez and Tanner Banks the work meets the requirements for good surveying in deep water. To the westward of these banks, however, where control depended entirely upon astronomic observations and dead reckoning, the work, while adequate for navigation purposes, should from a surveying standpoint be classed as reconnaissance only. If at any time in the future more precise methods for locating the ship's position offshore are available, that portion of the work should be resurveyed. The advantage of the echo method of sounding is well exemplified by this survey. The numerous soundings that are possible with this method in a given interval of time make it almost certain that no important banks or shoals will be missed.

10. Character and scope of surveying - excellent.  
Field drafting - excellent.
11. Reviewed by A. L. Shalowitz, October, 1927.

Approved:

Chief, Section of Field Records (Charts)

*L. O. Gilbert*

Chief, Section of Field Work (H. & T.)

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO. 4549a

HYDROGRAPHIC TITLE SHEET

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. 4549

REGISTER NO. **4549a**

State California

General locality Southern California

Locality West of San Clemente Island and Outer Santa Barbara Passage

Scale 1:140,000 Date of survey January - May, 1925.

Vessel GUIDE

Chief of Party R. F. Luce,  
T. J. Maher

Surveyed by R. F. Luce  
T. J. Maher

Protracted by I. Bittenberg - L. P. Raynor

Soundings penciled by L. P. R.

Soundings in fathoms fms

Plane of reference Mean lower low water

Subdivision of wire dragged areas by \_\_\_\_\_

Inked by \_\_\_\_\_

Verified by \_\_\_\_\_

Instructions dated November 21, 1924.

Remarks: 15 Sounding records, 1 Hydrophone location, 3 vol. R.A.R. computations, 2 vol. Astronomical sights, 1 Current record, 1 Serial temp., 1 set Chronograph sheets, 1 set Tape records, chronograph, Descriptive report, 1 vol. Log tests, 11 Tube sheets, 1 Hydrographic smooth sheet 1:140,000, 1 boat sheet 1:140,000, 1 Smooth sheet 1:20,000 Cortes Bank, 1 Topographic sheet, north end San Clemente Is. 1:20,000.

\* Not a Survey - used only for location of hydrophone  
E.V.S.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO. 4549b

HYDROGRAPHIC TITLE SHEET  
(Prepared in Office)

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. \_\_\_\_\_

REGISTER NO. 4549b

State California

General locality Southern Coast - Offshore

Locality Cortez Bank

Scale 20,000 Date of survey Apr. - May, 1925

Vessel Guide

Chief of Party T. J. Maher

Surveyed by T. J. M.

Protracted by Field Party

Soundings penciled by " "

Soundings in fathoms ~~feet~~

Plane of reference Mean lower low water

Subdivision of wire dragged areas by \_\_\_\_\_

Inked by \_\_\_\_\_

Verified by \_\_\_\_\_

Instructions dated \_\_\_\_\_, 192

Remarks: Soundings included in 15 Vols. filed 4549a-4549b

IN REPLY ADDRESS THE DIRECTOR  
U. S. COAST AND GEODETIC SURVEY  
AND NOT THE SIGNER OF THIS LETTER

AND REFER TO No. 11-DHM

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
WASHINGTON

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4549a (Additional Work)

Additional Work in 1928

Instructions dated December 16, 1927

Chief of Party, F. G. Engle.

Surveyed by F. G. E.

Protracted and soundings plotted by T. B. Reed.

Verified and inked by J. C. MacNab.

1. The record conforms to the requirements of the General Instructions with the following exception:

The descriptive report says that a log factor of 1.000 was used and that this factor was determined by a log test on Point Vicente mile course and log runs on long courses between various points. No other data were submitted. The large closures on dead reckoning lines indicate that the log probably was in error. A more careful determination of the log factor probably would have eliminated these large closures.

2. The plan and character of development fulfill the requirements of the General Instructions.
3. The plan and extent of development satisfy the Specific Instructions although the work had to be adjusted by the office. (See paragraph 6.)
4. In the areas noted in the Specific Instructions, Paragraph 5 (c) and (f) the sounding line crossings are adequate. However, in the areas (a) and (b) (of the same paragraph) careful investigation and an adjustment was necessary to render the crossings acceptable.
5. The usual depth curves can be drawn.
6. The work was plotted by the field party did not cover the areas specified in the instructions under paragraph 5 (a) and (b). It was evident that the soundings were taken in the area specified and some attempt should have been made by the field party to make the necessary adjustment. The descriptive report does not indicate that any such discrepancy was noted by the field party.

7. The junctions with adjacent sheets are satisfactory.
8. This report does not in any way disprove the assertion in the earlier report of Mr. Shalowitz that the work westward of Cortez and Tanner Banks be classed as "reconnaissance only."

The results of the additional work show a least depth of 79 fathoms in the locality of latitude  $32^{\circ} 41'$ , longitude  $119^{\circ} 35'$  and a least depth of 123 fathoms in the locality of latitude  $32^{\circ} 35'$  and longitude  $119^{\circ} 30'$ .

9. Remarks:

(a) The additional work southeast and east of Cortez Bank was verified and inked as plotted by the field party without further adjustment.

(b) The additional work to the northwest of Cortez Bank was adjusted to agree with soundings and depth curves on the original sheet in the locality between latitude  $32^{\circ} 25'$ , longitude  $119^{\circ} 25'$  and latitude  $32^{\circ} 45'$ , longitude  $119^{\circ} 35'$ . The 300 fathom and 500 fathom curves, as determined by the original work, were held fixed and the additional work moved about 2 miles eastward and northward from the position plotted by the field party in order to cover this ridge.

(c) Certain soundings on the original sheet crossed out in red ink were thoroughly investigated and in each case some evidence was found to indicate that the plotting was open to question and on account of their disagreement with the additional work were discredited and therefore rejected.

Near the center of Cortez Bank on the west edge a group of soundings were investigated and rejected, making the 100 fathom curve of H. 4267 control in this locality.

(d) Part of the development of the 79 fathom bank, referred to in paragraph 8 in this report, was plotted by the field party on H. 4447. This part was replotted and adjusted (paragraph 8) to agree with the part of the same development plotted by the field party on this sheet (H. 4549a).

10. Reviewed by J. C. MacKab, January 9, 1929.

Approved:

  
Chief, Section of Field Records (Charts)

---

Chief, Section of Field Work (H. & T.)

The verification and review of the additional work on this sheet were made under the direct supervision of the Chief of Section of Field Records. While some of the adjustments made were arbitrary, no other method could be devised to make the two surveys agree. The records for both the original work and the additional work are lacking in data which should have been submitted with dead reckoning work, such as log tests, etc. For this reason, the arbitrary adjustments made are justified.

*A. M. Sobieralski*  
Chief, Section of Field Records



4549a Add'l Wk.

4549a Add'l Wk.

Form 504

**DEPARTMENT OF COMMERCE**  
U. S. COAST AND GEODETIC SURVEY

E. Lester Jones, Director

C. & G. SURVEY
L. S. A.
APR 27 1928
Acc. No.

State: California

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**DESCRIPTIVE REPORT**

~~Topographic~~ Hydrographic } Sheet No. 4549a  
4549a Add'l Wk.

LOCALITY

Coast of Southern California.

Vicinity of Cortes Bank.

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192 8

CHIEF OF PARTY

F. G. Engle, H. & G. E.

DESCRIPTIVE REPORT

T O A C C O M P A N Y

HYDROGRAPHIC SHEET NO. 4549a - - - - - SCALE 1:140,000

COAST OF SOUTHERN CALIFORNIA - - - - - VICINITY OF CORTES BANK.

ADDITIONAL WORK DONE BY DISCOVERER IN 1928.

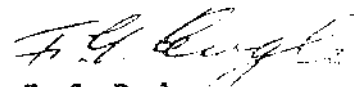
The work on this sheet was done in accordance with Par., 5(a), (b), (c) and (f) of Director's Instructions of Dec., 16, 1927.

All soundings are by Fathometer. The index or constant and the temperature corrections were from the curves filed with sheet 4560.

The dead reckoning was plotted using the deviations obtained from the ship swing of Jan., 26, 1928 and a log factor of 1.000 the mean of a log test on Point Vicente mile course and log runs on long courses between various points.

A straight time adjustment was made between Pos., 1 and 41 A day, 1 and 47 B day, 1 and 21 and 24 and 42 C day. Pos., 13 D day was arbitrarily moved 0.5 mile 83 degrees true to make soundings cross with those on B day. The line from 1 to 13 was then adjusted. From Pos., 13 the line was carried on Sheet 4447.

Respectfully submitted,

  
F. G. Engle,  
H. & G. Engineer,  
Chief of Party.

STATISTICS FOR HYDROGRAPHIC SHEET NO. 4549a

COAST OF SOUTHERN CALIFORNIA - - - - - VICINITY OF CORTES BANK.

<u>Date</u>	<u>1928:</u>	<u>Letter:</u>	<u>Volume:</u>	<u>Positions:</u>	<u>Soundings:</u>	<u>Miles(st.):</u>	<u>Vessel</u>
Mar. 1	:	A	: 1	: 41	: 153	: 31.0	: Ship
" 14	:	B	: 1	: 47	: 268	: 114.0	: "
" 15	:	C	: 1	: 42	: 316	: 76.0	: "
" 16	:	D	: 1	: 13	: 89	: 13.0	: "
	:	:	:	:	:	:	:
				Totals -----	143	: 826	: 234.0

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
WASHINGTON

AND REFER TO NO. 11-DRM

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4549a (Additional Work)

Additional Work in 1928

Instructions dated December 16, 1927

Chief of Party, F. G. Engle.

Surveyed by F. G. E.

Protracted and soundings plotted by T. B. Reed.

Verified and inked by J. C. MacNab.

1. The record conforms to the requirements of the General Instructions with the following exception:

The descriptive report says that a log factor of 1.000 was used and that this factor was determined by a log test on Point Vincents mile course and log runs on long courses between various points. No other data were submitted. The large closures on dead reckoning lines indicate that the log probably was in error. A more careful determination of the log factor probably would have eliminated these large closures.

2. The plan and character of development fulfill the requirements of the General Instructions.
3. The plan and extent of development satisfy the Specific Instructions although the work had to be adjusted by the office. (See paragraph 6.)
4. In the areas noted in the Specific Instructions, Paragraph 5 (c) and (f) the sounding line crossings are adequate. However, in the areas (a) and (b) (of the same paragraph) careful investigation and an adjustment was necessary to render the crossings acceptable.
5. The usual depth curves can be drawn.
6. The work as plotted by the field party did not cover the areas specified in the instructions under paragraph 5 (a) and (b). It was evident that the soundings were taken in the area specified and some attempt should have been made by the field party to make the necessary adjustment. The descriptive report does not indicate that any such discrepancy was noted by the field party.

7. The junctions with adjacent sheets are satisfactory.
8. This report does not in any way disprove the assertion in the earlier report of Mr. Shalowitz that the work westward of Cortez and Tanner Banks be classed as "reconnaissance only."

The results of the additional work show a least depth of 79 fathoms in the locality of latitude  $32^{\circ} 41'$ , longitude  $119^{\circ} 35'$  and a least depth of 123 fathoms in the locality of latitude  $32^{\circ} 35'$  and longitude  $119^{\circ} 30'$ .

9. Remarks:

(a) The additional work southeast and east of Cortez Bank was verified and inked as plotted by the field party without further adjustment.

(b) The additional work to the northwest of Cortez Bank was adjusted to agree with soundings and depth curves on the original sheet in the locality between latitude  $32^{\circ} 25'$ , longitude  $119^{\circ} 25'$  and latitude  $32^{\circ} 45'$ , longitude  $119^{\circ} 35'$ . The 300 fathom and 500 fathom curves, as determined by the original work, were held fixed and the additional work moved about 2 miles eastward and northward from the position plotted by the field party in order to cover this ridge.

(c) Certain soundings on the original sheet crossed out in red ink were thoroughly investigated and in each case some evidence was found to indicate that the plotting was open to question and on account of their disagreement with the additional work were discredited and therefore rejected.

Near the center of Cortez Bank on the west edge a group of soundings were investigated and rejected, making the 100 fathom curve of H. 4267 control in this locality.

(d) Part of the development of the 79 fathom bank, referred to in paragraph 8 in this report, was plotted by the field party on H. 4447. This part was replotted and adjusted (paragraph 8) to agree with the part of the same development plotted by the field party on this sheet (H. 4549a).

10. Reviewed by J. C. MacNab, January 9, 1929.

Approved:

---

Chief, Section of Field Records (Charts)

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Chief, Section of Field Work (H. & T.)

The verification and review of the additional work on this sheet were made under the direct supervision of the Chief of Section of Field Records. While some of the adjustments made were arbitrary, no other method could be devised to make the two surveys agree. The records for both the original work and the additional work are lacking in data which should have been submitted with dead reckoning work, such as log tests, etc. For this reason, the arbitrary adjustments made are justified.

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Chief, Section of Field Records

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO. 45492 Add'l Wk.

HYDROGRAPHIC TITLE SHEET

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. \_\_\_\_\_

REGISTER NO. 4549a Add'l Wk.  
on orig. Sheet

State California

General locality Southern Coast OFF San Diego

Locality Cortes Bank

Scale 1-140,000 Date of survey March 1 - 16, 1928

Vessel DISCOVERER

Chief of Party F. G. Engle

Surveyed by F. G. E.

Protracted by T. B. Reed

Soundings penciled by T.B.R.

Soundings in fathoms ~~XXXXX~~

Plane of reference \_\_\_\_\_

Subdivision of wire dragged areas by \_\_\_\_\_

Inked by J.C. MacNeil

Verified by J.C.M.

Instructions dated December 16, 1927

Remarks: \_\_\_\_\_

Copy for Section of Field Records files

May 26, 1928.

(11)

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in  
1 volume of sounding records for

HYDROGRAPHIC SHEET 4549a add'l.

Locality: SOUTHERN CALIFORNIA.

Chief of Party: F. G. Engle, 1928.  
Plane of reference is M L L W  
3.5 ft. on tide staff at Los Angeles Harbor

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

Chief, Division of Tides and Currents.