

4867

DECLASSIFIED BY NOAA  
PURSUANT TO DOC SYSTEMATIC REVIEW  
GUIDELINES AS DESCRIBED IN SECTION  
3.3(a), EXECUTIVE ORDER 12356.

Diag. Cht. No. 4000

4867

Form 504

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

....., Director

State: Hawaiian Is.

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 4867  
Hydrographic }

LOCALITY

French Frigate Shoals  
West Side Shoals

1928

CHIEF OF PARTY

K.T. Adams

GOVERNMENT PRINTING OFFICE

DECLASSIFIED BY NOAA  
PURSUANT TO DOC SYSTEMATIC REVIEW  
GUIDELINES AS DESCRIBED IN SECTION  
3.3(a), EXECUTIVE ORDER 12356.

DEPARTMENT OF COMMERCE

DECLASSIFIED BY NOAA  
PURSUANT TO DOC SYSTEMATIC REVIEW  
GUIDELINES AS DESCRIBED IN SECTION  
3.3(a), EXECUTIVE ORDER 12356.

REG. NO.



HYDROGRAPHIC TITLE SHEET



4867

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. 11

REGISTER NO. **4867**

State Territory of Hawaii

General locality French Frigate Shoals

Locality West Side of Shoals

Scale 1:40,000 Date of survey August, 19 to Sept. 28, 1928

Vessel Ship GUIDE

Chief of Party K. T. Adams

Surveyed by Ship's Compliment

Protracted by V. M. Gibbens

Soundings penciled by V. M. Gibbens

Soundings in fathoms feet

Plane of reference M. L. L. W.

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated March 25, 1928

Remarks: The work on this sheet is included in 4 sounding volumes,

Forwarded with the sheet is the Descriptive Report, Report for the Verifier, Velocity Correction Tables, Slope Factor Tables, the Tidal Data to be forwarded at a later date.

DECLASSIFIED BY NOAA  
PURSUANT TO DOC SYSTEMATIC REVIEW  
GUIDELINES AS DESCRIBED IN SECTION  
3.3(a), EXECUTIVE ORDER 12356.

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

DESCRIPTIVE REPORT  
to accompany  
HYDROGRAPHIC SHEET NO. 11 4867  
French Frigate Shoals, T.H.

Steamer GUIDE  
1928

K. T. Adams  
Chief of Party

DESCRIPTIVE REPORT  
to accompany  
HYDROGRAPHIC SHEET NO.11  
French Frigate Shoals, T.H.

1. DATE OF INSTRUCTIONS:

This hydrographic sheet has been done in compliance with instructions from the Director, dated March 25, 1928, and is part of the survey of French Frigate Shoals.

2. LIMITS:

This sheet, together with Hydrographic Sheet No. 10, is a survey outside of the great barrier reef, from comparatively shoal depths out to the 1000 fathom curve, except to the northwest, where a bank extends beyond the limits of local control. This sheet makes a junction with this party's hydrographic sheets Nos. 10, 8, and 13.

3. SURVEY METHODS:

The Fathometer was used almost exclusively on this sheet, the exceptions being a few lines in hand-lead depth, and a few lines of tube soundings on days when the Fathometer was inoperative.

Some trouble was encountered in making the Fathometer give correct soundings, it seeming to depend on various adjustments of the relay. These discrepancies were corrected as well as possible in the records and on the smooth sheet, to give correct values.

With the "red light" working, my rule was to obtain "red light" soundings to at least 200 fathoms before using the "white light" soundings, and in general no trouble was encountered in getting this depth and sometimes up to 300 fathoms. However, during the period when the "red light" was inoperative, "white light" soundings were taken into what were supposed to be tube depths. Later it was discovered that these soundings were consistently too deep. Apparently when the echo is so close to the direct signal there is a tendency to read the "white light" too deep. This tendency gradually disappears as the water gets deeper. On the smooth sheet, where soundings overlap, the tube soundings or the "red light" soundings are used and the "white light" soundings rejected or adjusted to fit. Whenever possible, in reading the "white light", the double echo or some other multiple of the echo was read and the correct fraction recorded. This method reduces the error of reading. Unfortunately, in the shoaler depths, no more than the first echo was generally to be heard.

4. CONTROL:

Most of the control was by visual, three point fixes on shore objects and two buoys accurately located.

Radial lines were run, this affording the best development

of a area deepening gradually to seaward. Furthermore, at times, lines had to be run beyond the limits of visual control, and in these cases continuous full speed loops were run and adjusted from the last good fixed position going offshore to the first one coming inshore.

5. DISCREPANCIES:

Various discrepancies have been discussed in paragraph 3 above, but all have been adjusted by our party in the field, they having more knowledge of the actual circumstances under which the discrepancies occurred.

6. DANGERS:

There are no dangers within the limits of this sheet. For adjacent dangers, see descriptive reports for sheets Nos. 8 and 13.

*K. T. Adams*  
K. T. Adams,  
Commanding,  
Steamer GUIDE.

STATISTICS FOR HYDROGRAPHIC SHEET, FIELD NO. 11. (SHIP)

DATE 1928	DAY LETTER	VOL.	STAT.			MILES OF SOUNDINGS			NUMBER OF SOUNDINGS			NO. OF POSITIONS.
			HAND LEAD	FATH. R. LT.	FATH. W. LT.	TUBES	HAND LEAD	FATH. W. LT.	TUBES			
Aug 19	A	1	3.7	6.1			29				24	
20	B	1	4.0	70.0			43				112	
21	C	1	1.8	3.9	11.3		20	28			32	
Sept 8	D	1		14.4							27	
12	E	1	4.2	32.4			51				77	
	F	2			30.1		(VC)1	96			54	
14	G	2			48.0			182			91	
15	H	2			18.3			61			32	
16	J	2	10.3				115				29	
17	K	2			62.7			210			103	
18	L	2			61.4			234			105	
21	M	3			2.7	18.0		28	80		48	
22	N	3		4.6		41.8			204		99	
26	P	3		1.0			(VC)1				6	
28	Q	3			45.5			131			59	
16	J	Launch Volume	5.5					106			16	

TOTALS 15 4 29.5 132.4 280.0 59.8 366 970 284 914

TOTAL MILEAGE 501.7

TOTAL NO. OF SOUNDINGS 1620

REPORT FOR THE VERIFIER  
to accompany  
HYDROGRAPHIC SHEETS Nos. 10 & 11.  
French Frigate Shoals, T. H.

The smooth sheets and the records have been examined by me and are hereby approved.

To assist the verifier the following explanation is furnished.

Toward the end of August we began having trouble with the fathometer red light. When this vessel got out into deep water en route to Honolulu no echo could be heard in more than 700 fathoms. Upon arrival in port, at the Navy Yard, the oscillator shaft was found broken. This was repaired and on leaving port early in September no difficulty was had in getting echos in deep water. However, on the working grounds, trouble was immediately encountered with the red light method. For some time no results at all could be obtained.

The result of this was that white light soundings were carried in to sixty or seventy fathoms, which was to be supplemented later by tube soundings, in case the red light could not be made to work. Two days of tube soundings were done. Then it was discovered that the white light soundings were too deep.

Later toward the end of September the red light method was operative again and several lines of red light soundings were run parallel to the reef over the ends of the white light sounding lines.

When making the smooth sheets, therefore, all hand lead, all tube soundings and all white light soundings deeper than 200 fathoms were put on the sheet first. Then all red light soundings were put on. Then the white light soundings shallower than 200 fathoms were put on one at a time and examined to see how they fit. Where the area was adequately covered by tubes or red light soundings and the white light soundings were obviously too deep, they were rejected in the records.

All red light soundings cross very well. The white light soundings do not always cross so well, but in case where both soundings could not be shown on the sheet the shoaler one was shown.

Where enough comparisons between the red light fathometer soundings and hand lead were available a constant correction to the Fathometer was obtained and entered in red ink in the column for the tidal correction. This correction was always based on all data available for that day, whether on sheet 8, 10 or 11.

The slope corrections on these sheets are the weakest part of the survey. Some of the slopes are very great and when the correction amounts to more than ten percent, the correct value is very problematical. My method was to draw the curves for each hundred fathoms, as accurately as possible, on the boat sheet, and go over it taking off the slope correction between curves each time it changed. Then these were entered in the records. When the slope correction amounted to more than ten percent it was not reduced until after the smooth sheet was plotted and the correction taken from that.

This slope correction is the weakest part of echo

sounding and in areas of steep slopes the correct treatment is very questionable. In my records no slope correction has been applied which would give a ridiculous result by comparison with other soundings. It is questionable if slope corrections of more than ten percent can be checked.

One serial temperature was taken in this vicinity. Surface temperatures were taken daily. For these sheets the average surface temperature was determined and the upper part of the temperature curve was adjusted for the difference between the surface temperature of the serial and the mean surface temperature of the sheets. This difference was applied from the surface down to 53 fathoms and half the difference was applied at 66 fathoms. Below that no correction.

Sheets 10 & 11 should be considered together, as they, combined, form a survey around French Frigate Shoals and the vessel went continually from one sheet to the other.

The log factor for log #194 used on sheets 10 & 11 in connection with the dead reckoning loops was 0.973 to be applied to log readings. The records of the tests cannot be transmitted to the office now. They will form a part of the records of sheet 6 to be transmitted at a much later date.

The record and computations of the compass deviations have already been sent in.

On the boat sheets all hand lead, tube or wire soundings have been inked in black ink and all Fathometer soundings in purple or green ink.

Inasmuch as the same temperature curve was used for both sheets only one smooth copy of this is being transmitted for both sheets.

Respectfully submitted,

*K.T. Adams*

K. T. ADAMS,  
Commanding  
Steamer GUIDE.

KTA/w

TIDAL NOTE

SHEET # 11,  
French Frigate Shoals, T. H.  
1928

---

A portable-automatic tide gauge was established on the edge of the reef at the south-east end of East Island, lat. 23 - 46.96 N, long. 166 - 12.53 W.

Simultaneous Comparisons were made with Honolulu tides for the periods July 11 - 16, August 5 - 21, September 9 - 15, and September 19 - 25, inclusive.

These gave a value of MLLW = 3.12 on the staff at French Frigate Shoals. An independent determination of MLLW gave a value of 3.04. The value MLLW = 3.1 was used for reduction of soundings.

For days when French Frigate Shoals tides were not available, Honolulu tides were used with time 21 minutes earlier and range 0.73, as determined by the Simultaneous Comparison.

A summary of tides used is as follows:

<u>French Frigate Shoals</u>	<u>Honolulu</u>
A day, August 19	D day, September 8
B " " 20	P " " 26
C " " 21	Q " " 28
E " September 12	
F " " 13	
G " " 14	
H " " 15	
J " " 16	
K " " 17	
L " " 18	
M " " 21	
N " " 22	
j " " 16	

*Section of Tides and Currents*

August 22, 1929.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in  
4 volumes of sounding records for

HYDROGRAPHIC SHEET 4867

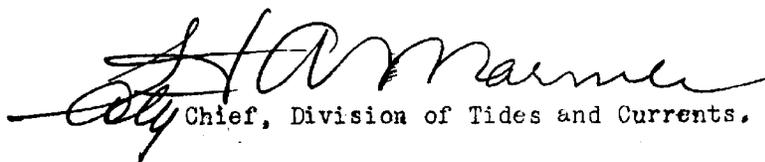
Locality: French Frigate Shoals, T. H.

Chief of Party: K. T. Adams in 1928

Plane of reference is mean lower low water, reading  
3.1 ft. on tide staff at East Island, French Frigate Shoals.  
~~French Frigate Shoals~~

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 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.

## Section of Field Records

Report on sheet no. 4867

Surveyed in 1928 Instructions dated March 25, 1928

Chief of Party - K. J. Adams

Protracted by - V. M. Gibbens

Soundings plotted by - V. M. Gibbens

Verified and inked by - J. T. Burch

1. The records conform to the requirements of the general instructions.

2. The plan and extent of the development fulfil the requirements of the general instructions.

3. The usual dept. curves can be completely drawn within the limits of the sheet.

4. The field platting was completed to the extent prescribed by general instructions.

5. The office draftsman did not have to do over any part of the drafting done by the field party.

6. The junction with H. 4866 is satisfactory. The junction with the other adjacent sheets was not examined as those sheets have not been verified up to this time.

7. Remarks:-

The lines run beyond the limits of visual control are weakly determined, it being difficult to check all of the data for a given position, and obviously the noted courses were not made good, as

determined between the course as it plots thru strong 3 point fix positions and as noted in the records.

Apparently there is a discrepancy between the deviation as noted in the remarks column pages 12, 13 Vol. 2 and the deviation table.

The "no bottom" soundings from positions 51 N to 58 N (tube soundings) are in an area covered by other lines, but the portion of the line 59 N to 62 N is not in an area covered by other lines and leaves a gap in need of the spacing for this portion of the development.

The report to the verifier accompanying the descriptive report for this sheet states the manner in which the discrepancies on the sheet were treated.

Jan. 24, 1930  
Respectfully submitted  
J. C. March

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

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4867

French Frigate Shoals, West Side, H.I.

Surveyed in 1928

Instructions dated March 26, 1928 (GUIDE)

Chief of Party, K. T. Adams.

Surveyed by party of Steamer GUIDE

Protracted and soundings plotted by V. M. Gibbens

Verified and inked by J. H. Church

1. The records and character of the survey conform to the general requirements and specific instructions.
2. The protracting and plotting of soundings were well done.
3. The junctions with the adjoining sheets are adequate.
4. The character and scope of the surveying and field drafting are excellent and no additional work is necessary.
5. Reviewed by E. P. Ellis, June, 1930.

Approved:

*A. M. Sobieralski*  
Chief, Section of Field Records (Charts)

*J. S. Brown*  
Chief, Section of Field Work (H. & T.)

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

AND REFER TO No. 11-DRM

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

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4867

French Frigate Shoals, West Side, H.I.

Surveyed in 1928

Instructions dated March 26, 1928 (GUIDE)

Chief of Party, K. T. Adams.

Surveyed by party of Steamer GUIDE

Protracted and soundings plotted by V. M. Gibbens

Verified and inked by J. H. Church

1. The records and character of the survey conform to the general requirements and specific instructions.
2. The protracting and plotting of soundings were well done.
3. The junctions with the adjoining sheets are adequate.
4. The character and scope of the surveying and field drafting are excellent and no additional work is necessary.
5. Reviewed by E. P. Ellis, June, 1930.

Approved:

Chief, Section of Field Records (Charts)

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

Applied to Chart 4182 8/6/40 CORB Jr.

Applied to chart 4172 Aug 2 1946 ~~LL~~.