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U. S. COAST AND GEODETIC SURVEY
DEPARTMENT OF COMMERCE
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Department of Commerce and Cabor COAST AND GEODETIC SURVEY

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Positions for sheets #'s ______ Sheet No. 3418

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DEPARTMENT OF COMMERCE

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Coast and Geodetic Survey

O. H. Tittmann, Superintendent

HAWAIIAN ISLANDS

Maui Island, North Coast

Original Hydrographic Sheet "B"
KEKAA POINT TO NAHIKU

Surveyed in January, February and March, 1913 by the party on the C. & G. S. Steamer PATTERSON

James B. Miller, Assistant, C. & G. S., Chief of Party and in charge of hydrographic party.

John W. Maupin, Assistant, C. & G. S., also in charge of hydrographic party.

Scale: 1: 60 000

Positions plotted by O. W. Swainson, Aid checked by G. C. Mattison, Aid

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DEPARTMENT OF COMMERCE

Coast and Geodetic Survey

0. H. Tittmann, Superintendent

HAWAIIAN ISLANDS

Maui Island, East Coast

Original hydrographic Sheet "A"
NAHIKU TO LA PEROUSE BAY

Surveyed in January, February and March, 1913 by the party on the C. & G. S. Steamer PATTERSON

James B. Miller, Assistant, C. & G. S., Chief of Party\(and in charge of hydrographic Party. \)

John W. Maupin, Assistant, C. & G. S., also in charge of hydrographic party.

Scale: 1: 60 000

Positions plotted by O. W. Swainson, Aid. checked by G. C. Mattison, Aid.

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0. H. Tittmann, Supt.

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HAWAIIAN ISLANDS

A DESCRIPTIVE REPORT ON HYDROGRAPHIC SHEETS A AND B. 3418 +3419

34/9 SHEET A. - EAST MAUI, KEANAE TO LA PEROUSE BAY - SCALE, 1:60000

Surveyed in January, February and March, 1913 by the Steamer " PATTERSON".

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2, 2 2. Methods, Intervals.

3. General Form of the Sea Bottom.

4. Shoals.

5. Courses, Aids to Navigation.

3, " 6. Anchorages.

7. Tides and Currents.

8. Trade and Commerce.

4, " 9. Previous Chart and Sailing Directions.

10. Geographic Positions, Names, Magnetic Variation.

11. Records.

1. REPORTS. LIMITS.

I have the honor to report as follows on the hydrography of Maui Island, in the Hawaiian Group, as shown on sheets A and B, executed in January, February, and March, 1913, by the Steamer PATTERSON. Sheet B connects at Kekaa Point, West Maui, with the work of another party in 1900, and extends around the northwest point of Maui and along the north and northeast coasts to Keanae, where it connects with sheet M. From Keanae Sheet Mextends around the east end of Maui and along the southeast and south coasts to La Perouse or Keoneoio Bay, where it connects with another party in 1905. The sounding on sheets A and B connects with the inshore work by the launch in 25 fathoms, which is 1/3 to 1 mile offshore, and extends from there a distance of 6 to 11 miles offshore. Between Maui and Molokai Islands the sounding extends within 2 miles of the Molokai Coast. On sheet Ma small portion remains unfinished, from Nuu to to La Perouse Bay: only a few sounding lines were run in this vicinity, which give a general idea of the bottom; and there was not sufficient time remaining to complete the work.

2. METHODS AND INTERVALS.

The soundings shown on sheets A and B were made with the ship: using a hand lead on shoals; the Bassnett and the Tanner-Blish pressure tubes to depths of 50 to 70 fathoms; and vertical casts with a Cosmos and a Sigsbee machine with a registering sheave in greater depths. In making soundings with the pressure tubes, especial care was taken to secure accuracy, and the tubes were read by an officer in charge of the machine: a vertical cast was taken at each tenth sounding to verify the tube. The record books show this in all cases, as well as the correction to be added to the tube reading for the length of the stray line. The performance of the tubes was highly satisfactory. Sounding lines were run at the following intervals, and soundings were spaced at the same or closer intervals along the lines: 20 to 30 fathoms. 1/6 mile or closer: 30 to 100 fathoms. 1/3 mile: 100 to 300 fathoms. 1 mile; 300 fathoms and upwards, 2 miles; on shoals, special development and detached soundings. Lines were run parallel to the shore, as this proved to be the only possible way of handling the ship under the conditions encountered. 3. GENERAL FORM OF THE SEA BOTTOM.

The coast of Maui Island is steep and abrupt; much of it is bordered by cliffs 100 to 400 feet high, and only in a few places is there a coral reef. The sea breaks directly on the face of the cliff or on the rocks and debris at its base, all round the northwest point of Maui, from Hawea Point to Waihee, and from near Paia eastward to Nahiku, and also along most of the east and south coasts of Maui. Thus the 100 fathom curve is usually found within 1 1/2 miles of shore, and often much closer: the exceptions are as follows: off Kekaa Point, where comparitively shallow water extends across to Lanai Island: off Kahului, where there is a shore reef extending from Kahului to Paia, and comparatively shallow water entirely across the bight between Kahakuloa and Pauwela Points; and at the eastern side of La Perouse Bay, where there is shallow water and coral bottom. The slope of the bottom is generally less than 400 fathoms per mile, but at one place 2 miles northeast of Hana a slope of 700 fathoms per mile was found. Off Hana the 1000 fathom line was found 7 to 10 miles offshore. The bottom is uniformly coarse and fine sand mixed with fine shells and bits of brown lava; in one or two cases mud was found at depths of 300 fathoms or more. 4. SHOALS.

There are no detached shoals or dangers which are not included on the inshore sheets, with the following exceptions: the 9 fathom spot 1.7 miles north of Kahului, which is also plotted on sheet 70; Cameron Rock, off Alau Island, which is also shown on sheet 74; and the 14 fathom spot 1 mile off Hamoa.

5. COURSES: AIDS TO NAVIGATION.

All courses for navigating these waters are best measured from the chart, as there are no fine courses to be recommended, and one should only keep a reasonable distance offshore. There are several small lights, which are very reliable, and often show much farther and brighter than would be expected, on account of the clear air. On Hawea Point is a white flashing light; on Nakalele Point is a white fixed light; on Pauwela Point is a red whistling buoy, and a black bell buoy, and a flashing white light on the breakwater about half way between the shore and the end of the breakwater; there is also a range of beacons sonsisting of red and white diamonds on high tripods, which are very difficult to pick up, which carries one clear of the

reef northward and eastward of the breakwater; and there is a lighted range, into the harbor and behind the breakwater. Neither of these ranges is of any assistance until one is within a mile of the breakwater. The courses for passing Cameron Rock, off Alau Island, are given also in the report on sheet 74; the rock is 2.2 miles S 14 E (true) from the red light on Kauiki Head, and 0.6 mile S 47 E (true) from the peak of Alau Island: the light in range with the high cliffs along the shore northward of Hana Cove, (near Pukaulua Point) clears the rock. One may also pass between it and Alau Island, but this is not recommended; the rock itself consists of five coral heads, scattered over an area about 250 yards square, and the least depth over it is 9 1/2 feet.

6. ANCHORAGES. safe

There are no anchorages for harbors any where around Maui Island, and one must constantly observe weather conditions and remain ready to put to sea. There are many places where a vessel can lie to an anchor off the coast in moderate weather, and this is constantly done by small vessels taking cargo at various places, at the risk of injuring the ship or losing ground as the bottom is foul and irregular. Kahului Harbor and Hana Cove are both too small for maneuvering a vessel, although in moderate weather ships may be handled by means of their anchors and the mooring buoys.

7. TIDES AND CURRENTS.

Tides were observed at Kahului with a marigraph during the entire season, and at Hana Cove for one week for comparison. The range and time were found to differ only slightly between the two and reducers for soundings on either sheet are obtained from Kahului when needed. * Currents were observed at various stations along the coast; there are no tidal currents, but a strong steady current was found, of 1 to 1 3/4 knots, which at this season of the year, at least, strikes on the southeast point of Maui, at Hamoa, causing moderate tide rips there, and divides; the two parts follow the two coasts and unite again off the northwest point of Maui, and a branch of the southwestern stream also divides around Molokai Island similarly. Thus off Hana there is a strong northerly set, which is strongest at high water and weakest at low water; and a strong eddy between Alau Island and Kauiki Head. Off all the points along the northern coast of Maui there is a similar westerly and west-northwesterly current. Along the south coast there is likewise a westerly and west-northwesterly current, and off Lahaina there is a strong northwest current, strongest at high water and weakest at low water. From Lahaina to Honolua the current follows the coast northerly. Along the east coast of Molokai Island the current follows the coast northerly, and along the south coast of Molokai there is a strong westerly current, which doubles round Ka Lae o Ka Laau Point and forms a strong tide rip with breakers six feet high when the wind is northerly

8. TRADE AND COMMERCE.

The small Inter-Island steamers are seen constantly around the coasts of Maui, and occasional sailing vessels from the Pacific Coast; and at Kahului there are almost always one or more large oversea steamers or ships discharging supplies for the four large plantations at Puu Nene, Paia, Wailuku and Waihee. Oversea vessels also moor at Kaanapali Landing, Kekaa Point, to discharge and load for the Lahaina district. Beginning at Kaanapali Landing, the smaller landings are as follows:

boat wharf, occasional Inter-Island steamers. Honolua:

Honokahau: no wharf . rarely Kahakuloa: no wharf

Ino landing made here since the Kahului Railroad was extended. Paia no wharf

Maliko : no wharf

Honopou (Huelo Landing) boat wharf, occasional Inter-Lsland steamers.

. regular Inter-Island steamers twice a week. no wharf Nahiku

Hana (Hana Cove), wharf for lighters; regular Inter-Island steamers twice a week and occasional oversea vessels.

: no wharf . occasional Inter-Island Steamers.

regular Inter-Island steamers, twice a week. Kipahulu:

occasional Inter-Island steamers. Kaupo

: boat wharf, rarely Inter-Island steamers. Nuu 9. PREVIOUS CHART AND SAILING DIRECTIONS.

The present work consists wholly of additions to the previous chart and sailing directions, there are no corrections or revisions, and whatever information had been shown by either was found correct as far as it extends. The one exception is in the plan of Hana Cove, compiled from old sources. where an average of 2 fathoms more water was found than had been shown, in certain places; this is described in the report on sheet No. 74. GEOGRAPHIC POSITIONS: NAMES, MAGNETIC VARIATION.

No original work was done for locating signals for the hydrography. as many excellent points had been determined by the topography done by another party recently; the geographic positions used will thus be found on topographic sheets Reg. No. 1. 3269, 3270, 3271, 3272, 3273, 3274, 3275 and 3276; and in the records of triangulation done by previous parties. No original work was done, likewise, in ascertaining geographic names, as the existing information is both highly accurate and abundant; Cameron Rock is named from a former island navigator who is said to have placed a buoy on it at one time. No observations of magnetic elements was made, as there is likewise abundant information available on this subject. 11. RECORDS.

Sounding records for sheets A and B are found in Vols. 1 - 4 sheet A, and 1 - 6 sheet B; two ship boat sheets also accompanying the records.

Respectfully submitted,

To the Superintendent of the baset and Meditic Envy, J. Miller, Machington. Machington.

Chief of Party.

At Sea,

March 19, 1913.

Hyd = 3518

The work on this sheet shows the off shore) hydrography from Kekaa Pt. to Keanae-West Mari, H.D.

Soundings were plotted in the field, verified and inked in the office.

Sounding lines were run parallel to the shore and no cross lines taken for reasons given, the descriptive report of the chief of the party.

B. Sh. Kean

Soundings gestted i forthours.

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C. & G. SURVEY, LIBBARY AND ABCHIVES MAY 26 1913

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	175	(39 m	eter:	s), ph	is ho	orizon	tal o	ffset	from			336	332	328	323
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	195													372	368	369
	200													382	378	374

Sheet "A"

Locality: Maui Island, T. H.

C. & G. SURVEY,
MAY 2.2 1913

Ace No.

Date		Boat		Vol.	Hours	Positions	Sdgs	Miles
(19)		PATTERSON		1	1	9	9	2.0
(19 Jan.		ч	В	1	4.5	34	65	21.4
ŧŧ	28	и	С	1	4.5	24	43	16.4
Feb.	11	tf.	D	1	3.0	18	55	14.4
ti	12	u	E	1	11.0	87	247	38.3
tt	13	н	F	2	11.0	39	108	29.3
Ħ	19	Ħ	G	2	9.5	48	177	30.0
13	20	tt .	Н	2	9.5	31	105	31.6
11	21	ti	I	2&3	10.5	75	228	45.0
11	24	H.	J	3	11.0	33	66	44.1
ti ,	25	н	K	3	10.5	43	171	35 .2
11	26	н	L	3	10.5	19	19	31.0
u	27	u	M	3	2.5	4	4	5.7
Mar.	5	18	N	3&4	11.0	58	167	47.1
11	6	u	0	4	4.0	24	64	7.4
11	7	Ħ	₽	4	2.5	5	5	9.6
				. 1886 - redr. 1886 gara, redr. 1886 18	116.5	551	 1533	408.5

Square Miles (Statute) 319

Locality: Maui Island, T. H.

MAY 2 2 1913
Acc. No.

Dat	е	Boat	Letter	Vol.	Hours	Positions	Sdgs.	Miles(stat.
(1913		D 4 mm DD C ON	Λ	1	9.5	60	130	46.2
Jan.		PATTERSON	A					
	22	11	В	1	5.0	5 7	138	17.4
er er	23	Ħ	C	1	10.5	114	327	45.2
- 11	24	1f ·	D	2	10.0	121	403	31.9
2 W	25	ti	E	2	4.5	56	166	19.5
11	27	tt	F	2&3	4.5	31	87	26.4
A.	28	Ħ	G	3	6.0	57	117	32,9
ŧŧ	29	tt	Н	3	9.0	61	159	28.7
ij	30	Ħ	I	3&4	10.0	87	278	32.0
11	3,1	10	J	4	7.5	5 2 ·	173	29.4
Feb.	5	ti	K	4	11.0	76	112	58.1
9f	6	Ħ	L	4	4.5	39	49	17.3
H	7	ti	M	4&5	10.5	93	146	38.7
If	8	ti	N	5	8.0	5 5	180	21.4
H	10	11	0	5	10.0	78	17Ż	46.9
11	11	tf	P	5	2.5	23	83	12.6
×11	14	11	Q	6	11.0	70	81	55.6
H	18	tt ·	R	6	10.5	33	41	20.8
ti	19	†1	s	6	0.5	5	23	2.2
ij	28	11	T	6	11.0	83	83	54.1
Mar.	7	Ħ	U -	6	5.0	15	15	25.5
u ·	8	Ħ	V	6	4.0	11,	11	21.9
					165.0	1277	2974	684.7

Square Miles (Statute) 488



HYDROGRAPHIC SHEET 3518.

Coast of Maui Island, Hawaiian Islands, by
Assistant J. B. Miller in 1913.

TIDES.

Kahului Maui Island.

ft.

Mean lower low water, or plane of reference on staff,	3.0
Lowest tide observed " "	2.0
Highest * * *	6.5
Mean range of tide,	1.6

East Coast of Maui Island, Hawaiian Islands, by Assistant J. B. Miller in 1913.

TIDES.

	Kahului ft.	Hana ft.
Mean lower low water, or plane of reference on staff	3.0	5.1
Lowest tide observed " "	2.0	5.2
Highest " " " "	6.3	7.8
Mean range of tide	1.6	1.8

Hyde 3519.

The work on this sheet shows the offshore hydrography between Keanne and La Perouse Bay, East Mani, H.O.

Soundings were plotted in the field, verified and inked in the effice:

Sounding lines were run paroillel to the shore and no cross-lines taken for reasons given in the description report of the Party.

The records throughout the work were kept

J.B. Shream

Soundings platted in fortherns.

Sex-8-1914.

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NAUTICAL CHARTS BRANCH

SURVEY NO. 3518

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
2/4/46	4124	g. K. Emminiza	After Verification and Review Completely.
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M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.