

# 7192a&b

Diag'd. on Diag. Ch. No. 5502-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

## DESCRIPTIVE REPORT

Type of Survey ..... HYDROGRAPHIC

Field No. **A & B** ..... Office No. **H-7192a & b**

### LOCALITY

State **California**

General locality **Lake County**

Locality **Clear Lake**

1948-'49

CHIEF OF PARTY

**H. E. Finnegan**

LIBRARY & ARCHIVES

DATE .....

B-1870-1 (1)

7192a&b

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

H-7192a & b

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.

REGISTER NO. H-7192a & b

Field No. ....

State California

General locality Lake County

Locality Clear Lake

Scale 1:31,250 Date of survey 16 November 1948 - 6 Jan. 1949

Instructions dated 28 October 1948

Vessel Chartered Vessel, Pioneer's Personnel

Chief of party H.E. Finnegan

Surveyed by E.E. Jones

Soundings taken by fathometer, ~~graphic recorder, dredge lead, wire~~

Fathograms scaled by E.E. Jones, H.W. Keith & D.G. Rushford

Fathograms checked by E.E. Jones, H.W. Keith & D.G. Rushford

Protracted by E.E. Jones, H.W. Keith & D.G. Rushford

Soundings penciled by .....

Soundings in ~~fathoms~~ feet ~~at Wood Blk~~ referred to lake level of 1318.64 ft. above Mean Sea level.

REMARKS: .....  
.....  
.....  
.....  
.....

Vol. Clear Lake excluding Rodman Slough  
determined by Benson 7/25/60 to be 821,206 acre-ft.  
Surface area, zero Rumsey is 39,497.6 acres.

Descriptive Report  
To Accompany Hydrographic Survey  
CLEAR LAKE, CALIFORNIA

A. PROJECT

No project number or formal instructions were issued, the survey being authorized by the Director's letter 22/MEK D-1-W dated 28 October 1948 to the Supervisor, Western District and his reply 616 dated 5 November 1948. The purpose of the survey is to furnish the Lake County Mosquito Abatement District with the volume and distribution of water in Clear Lake to assist them in determining the amount of larvacide required and where to spread it to eliminate gnats. Close control is necessary to kill gnats without destroying the fish. Standard U.S. Coast and Geodetic Survey methods were used so far as seemed economical to achieve accurate results. Figure of 853,624 acre-feet <sup>(Volume)</sup> sent to Supervisor 3/11/49.

B. SURVEY LIMITS AND DATES

The survey covers all of Clear Lake, Lake County, California in two sheets and was accomplished between 16 November 1948 and 6 January 1949. Progress was hampered by winter weather unusually severe for California. The boat was damaged by ice and resulted in some delay, but repairs were made promptly at a small boat-yard on the lake.

within 3 1/2  
of original estimated figure  
of 853,624 acre feet  
10/2

C. VESSEL AND EQUIPMENT

A surplus Navy 26-foot Plane Personnel boat belonging to a Lake County School was chartered by the Mosquito Abatement District and furnished the survey party. The Coast Survey equipped it with a model 808-J depth recorder, serial 129-S, which was used throughout the survey and checked against leadline and bar checks. The bar consisted of a 10-inch by 4-foot steel plate 1/4 inch thick, to which a piece of 2x4-foot corrugated roofing steel was added for improved fathometer returns. For comparisons, one standard leadline and one with a flange 10 inches in diameter attached to the bottom of the lead were used. The latter was used to detect a layer of soft sediment as amplified in paragraph H.

D. LAKE LEVEL AND CURRENTS

The hydrography was referenced to the staff known as the "Rumsey Gage" at the Municipal Wharf in Lakeport. Zero of the staff has been fixed at 1318.64 feet elevation. No levels were run by the surveying party. Levels to nearby bench marks were checked during hydrography by the County Surveyor who makes periodic checks during the year because legal cases are based on this staff for determination of the lake level.

Failure to include 0.4 feet of fastening chain in the measurement of the bar check lines was not discovered until late in the survey. The reference plane used for the boat sheets is therefore 1318.24 feet, minus 0.4 feet on the "Rumsey Staff". However, in the Reduced Soundings, Office column of the Sounding Records and on the smooth sheets, a correction was applied to reduce all soundings to 0.0 on the "Rumsey Staff", 1318.64 feet elevation.

0.4 ft.  
added to  
sdgs.  
✓

No current stations were occupied. However, local residents testified that while fishing they encountered marked currents in the narrows and lower reaches of the lake. This may account for the fact that some of the deeper places in the lake were found close inshore.

#### E. SMOOTH SHEET

Two draftsmen furnished by the Mosquito Abatement District assisted in reducing the sounding records and plotted Smooth Sheets in the field office concurrent with the hydrography. However, since they were reduced to the wrong datum and the soundings inked, new smooth sheets were prepared after the survey was completed. Since the original smooth sheets were carefully plotted under supervision in the field, the positions on the final smooth sheets were not replotted but obtained by careful transfer from the original sheets.

#### F. CONTROL STATIONS

Location of the hydro signals was accomplished by plane table directly on the buff boat sheets. Triangulation stations PINNACLE, BUSH, and KONOCTI, provided the origin of control on the sheet of the upper lake; and a three-point fix at topo station "Gal" on triangulation stations PLUTH, KONOCTI, and BUSH was the origin for the lower reaches of the lake. The triangulation was accomplished by the U.S. Geological Survey in 1932 and 1941.

As the result of conferences with Norman E. Sylar, doing triangulation reconnaissance in the area, several hydro signals were built in locations where he planned to establish triangulation control. He was furnished with tracings showing all the signals used for hydrography.

#### G. SHORELINE AND TOPOGRAPHY

The Wasington Office furnished boat sheets with shoreline applied. No discrepancies were noted while locating signals by plane table cuts, except near the outlets of the lower areas of the lake.

The lake level is kept within a range of 7.5 feet, if possible, the lower level being 0.0 feet on the official Rumsey Gage, or 1318.64 feet above mean sea level. The only flats in the upper lake falling within this range lie along the southern shore and constitute a very small percentage of the total area or volume of the lake.

There are considerable areas of flats in the two Eastern reaches of the south end of the lake, which could not be entered with the boat used for hydrography. In this area the low waterline was estimated and sketched from the boat while engaged in hydrography. The lake remained at 0.6 to 1.0 feet above zero level throughout the survey, so the zero water line could not be developed with the launch. It is estimated that the volume of water over these areas constitutes a minor percentage of the total volume of the lake.

No low  
line  
shown  
on  
boat  
sheet

## H. SOUNDINGS

Overlying the bottom of the lake is a layer of extremely soft material, except close inshore across the mouth of Konocti Bay and at the eastern-most arms of the lower lake, where the bottom is firmer with some rock. Two layers were evident in the soft bottom areas. The first, felt with the bar check, was of such soft ooze that it could not be felt with a hand lead and would not consistently return a fathometer echo, raising the question of just where the bottom of the lake was to be defined. Normally, about 2 to 3 feet below this ooze, appeared a layer which offered the first noticeable resistance to the hand lead and which gave fathometer returns.

In order to facilitate detection and study of this top layer of material, samples were obtained and examined. The material appeared to be partially organic in composition, very light, and largely free from dirt or grit. Samples baked free of water in an oven revealed a water content of 83% by weight and approximately 90% by volume and left a residue of light material similar to volcanic ash cemented into a hard mass. Local residents testified that in the early Fall of every year the lake surface was covered with a floating green material described variously as algae or "tule pollen". The survey party noticed that when a small lump of the material was broken up, it settled toward the bottom. It is assumed that part of the layer of ooze has been formed in this way. The coxswain of the boat, also a local resident, told how he dived for a sunken aquaplane in about fifteen feet of water and could hardly feel the top layer, being able to walk through it. He found the aquaplane with his feet, resting under this top layer.

For the purpose of this study, the top of the layer of underlying mud, which gave consistent fathometer echoes and offered the first noticeable resistance to the hand-lead, is used as the bottom of the lake. Overlying this bottom is the layer of ooze whose thickness varies from 0.5 feet near the shore to about 2.5 feet in the center of the upper basin of the lake. In the lower reaches of the lake, its thickness and density is more variable and reached about three feet in thickness. After the hydrography was completed and before the smooth sheets were plotted, the fathograms were studied thoroughly and a final interpretation made according to the experience gained in the field and study of the samples. Where the fathograms showed a second reflection; the top layer of ooze was considered too thin to define as bottom. Excellent examples of this type of fathogram were obtained on "a" and "g" days and 73 to 76 "d" day on sheet B. Crossings were studied on the fathograms to verify the interpretations made.

On calm days natural gas could be seen bubbling from large areas of the lake. Local residents variously described this gas as carbon dioxide or soda gas, with some claiming it was inflammable.

U. MISCELLANEOUS

The lake water being fresh, the fathometer, a model 808-J, was operated with slow or left-hand reed vibrating, which is calibrated for 4678 feet per second. The remaining velocity correction was made according to bar checks. The bar checks were averaged for three different periods; "a" day, "b" through "h" days, "i" and "j" days upper lake with "a" thru "g" days lower lake. Curves were drawn and echo corrections applied. "e" day consists of bar checks only.

While underway at 2000 R.P.M., the boat "squatted" in the water 0.2 feet as noted in the record Vol. 2, page 4, sheet A.

V. PERSONNEL

The project was accomplished with personnel from the Ship PIONEER supplemented by employees furnished by Lake County. Lieutenant Emerson E. Jones headed the group from 16 November to 24 November 1948 in order to organize the party and establish routine. Working with the chairman of the Mosquito Abatement District, he obtained the boat, office space, personnel, directed signal building, the boat preparation, and started the hydrography. From 3 January to 6 January he inspected the party and assisted closing the field work. Ensign Samuel D. Parkinson accomplished the control and the remaining hydrography on sheet A and all of sheet B. A fathometer observer and a sextant observer were furnished from the Ship PIONEER, and a recorder, Coxswain, and two draftsmen were furnished by the county in addition to several part time drivers and signal builders.

After Mr. Parkinson was transferred to the east coast the smooth sheets and tracings were made by Lieut. Jones and Ensigns Hubert W. Keith, Jr. and Dewey G. Rushford.

Z. TABULATION OF APPLICABLE DATA

Smooth Sheets (A&B) of Clear Lake, California-----	2 each
Boat " " " " " "-----	2 each
Blue Line Prints " " " "-----	2 each
Vinylite Sheets " " " "-----	3 each
Sounding Volumes " " " "-----	4 each
Fathograms " " " "-----	18 each
Observations, Horizontal Angles-----	<del>6 sheets</del> 1 book
Computation of Position of Gal-----	6 sheets
Velocity Corrections-----	5 sheets

Respectfully submitted,

*Emerson E. Jones*  
Emerson E. Jones  
Lieut., USC&GS

LIST OF SIGNALS \* SHEET A

WITH DESCRIPTIONS

List of stations used in Hydro Survey	Origin of stations (Boat Sheet)	Description of Stations
Abe	A & B	Offshore aircraft range light on pilings
Bag	A & B	Small white house on beach
Bob	A & B	Signal cloth on road cut
Brown	A	Brown Building
BUSH	BUSH (USCGS) 1932	Triangulation, top of hill near a cross
Cab	B	White wash on road cut
Cone	A	Highest tree of group on hill top
Cut	A	White wash on bluff
Dance	A	Pilot house of dance boat (afloat)
Day	B	Dressed tripod on shore
Dead	A	Center of 2 tall dead trees
Fin	A	Tripod dressed signal
Gal	A	Signal flag in fork of highest Oak tree
Gas	A	Center of 4 large gasoline tanks
Hot	A	Tallest spire of Hotel
Ida	B	Dressed tripod on North end of Islet, in a tree
Jun	A	Dressed tripod on hill
Mar	A	Center of large yellow building on lake shore
Nice	A	Boat works, 4 meter west from outer corner of wharf
Park	A	Dressed signal
Pie	A & B	Triangular signal cloth on <sup>"Danger"</sup> piling
Rock	A	White wash on bluff
Rum	A	Dressed tripod, Rumsey Point
Shag	A & B	White wash on Shag Rock
Slide	A	Top of Aqua-chute
Soda	A	Square frame covered with signal cloth
Tank	A	Silver tank
Tule	A	Square frame on piling offshore
Wag	A	White wash on rock
Wat	A	High silver tank
Vet	A	Square cloth signal on shore

LIST OF SIGNALS \* SHEET B

WITH DESCRIPTIONS

List of stations used in Hydro Survey	Origin of stations (Boat Sheet)	Description of Stations
Abe	A & B	Off shore Aircraft range light on pilings
Audrey	B	Peak of Bald Mountain
Bag	A & B	Small white house on beach
Bat	B	White house
Bay	B	Dressed tripod on point
Bob	A & B	Signal cloth on road cut
Cab	B	White wash on road cut
Cam	B	
Cone	B	Highest tree of group on hilltop
Dav	B	20 x 10 feet Sign board
Day	B	Dressed tripod on shore
Deb	B	
Doc	B	End of dock
Eat	B	White wash on road cut
Eel	B	
End	B	Signal in tree on North end of Islet
Far	B	Tallest white house ( 3 stories)
Fat	B	
Fog	B	White wash on bluff.
Gag	B	White wash on road cut
Gal	B	Signal flag in fork of highest Oak tree.
Gar	B	
Gin	B	Dressed tripod on point
Gray	B	Gray building
Ham	B	
Hat	B	White wash
Hem	B	
Hex	B	White wash on off lying rock
Ice	B	
Ida	B	Dressed tripod on North end of islet, in a tree
Jap	B	White wash on top of 30 ft. bluff
Jar	B	Top of windmill tower
Jim	B	Tree strip
Key	B	Dressed tripod on point
KONOCTI	KONOCTI (USCGS) 1932	South leg of wooden tower, Triangulation station



LIST OF SIGNALS \* SHEET B

WITH DESCRIPTIONS

List of stations used in Hydro Survey	Origin of stations (Boat Sheet)	Description of Stations
Nat	B	
Oak	B	
Out	B	
Pie	A & B	Triangular cloth on "Danger" piling
Pin	B	Lone, dead, tall, pine tree
Pirate	B	Flag on oak tree on fire trail
PLUTH	PLUTH (USCGS) 1941	Triangulation Station
Red	B	Red boat house
Shag	A & B	White wash on Shag Rock
She	B	
Tan	B	Tank in orchard
Tav	B	Al Davis Tavern
Wac	B	Gable, gray barn
Whe	B	Dressed tripod
Wheeler	B	Weighted down signal cloth on hill- side
Win	B	Dressed tripod
Yam	B	Dressed tripod
Zoo	B	

APPROVAL SHEET TO ACCOMPANY  
SURVY OF CLEAR LAKE, CALIFORNIA

LIST OF SIGNALS \* SHEET A

List of stations  
used in Hydro Survey

Origin of Stations  
( Boat Sheet)

Abe	A & B
Bag	A & B
Bob	A & B
Brown	A
BUSH	BUSH (USCGS) 1932
Cab	B
Cone	A
Cut	A
Dance	A
Day	B
Dead	A
Fin	A
Gal	A
Gas	A
Hot	A
Ida	B
Jun	A
Mar	A
Nice	A
Park	A
Pie	A & B
Rock	A
Rum	A
Shag	A & B
Slide	A
Soda	A
Tank	A
Tule	A
Wag	A
Wat	A
Vet	A

LIST OF SIGNALS \* SHEET B

List of stations  
used in Hydro Survey

Origin of Stations  
(Boat Sheet)

Abe A & B

Audrey B

Bag A & B

Bat B

Bay B

Bob A & B

Cab B

Cam B

Cone B

Dev B

Day B

Deb B

Doc B

Eat B

Eel B

End B

Far B

Fat B

Fog B

Gag B

Gal B

Gar B

Gin B

Gray B

Han B

Hat B

Hen B

Hex B

Ice B

Ida B

Jap B

Jar B

Jim B

Key B

KONOCTI KONOCTI (USCAGS) 1932

Nat B

LIST OF SIGNALS \* SHEET B (Cont'd)

List of stations  
used in Hydro Survey

Origin of Stations  
(Boat Sheet)

Oak	B
Out	B
Pie	A & B
Pin	B
Pirate	B
PLUTH	PLUTH (USCGS) 1941
Red	B
Shag	A & B
She	B
Tan	B
Tav	B
Wac	B
Whe	B
Wheeler	B
Win	B
Yan	B
Zoo	B

Statistics For Hydrographic Survey  
(1948-1949)

Boat, School District Personnel

UPPER CLEAR LAKE -- Sheet A

<u>Day</u>	<u>Vol. No.</u>	<u>Date</u>	<u>No. Positions</u>	<u>No. Stat. Mi.</u>
a	1	22 Nov.	16	5.7
b	1	23 Nov.	64	24.8
c	1	24 Nov.	68	23.7
d	1	26 Nov.	60	22.1
f	2	30 Nov.	66	19.7
g	2	1 Dec.	27	9.5
h	2	2 Dec.	23	6.9
i	2	20 Dec.	13	3.4
j	2	21 Dec.	32	10.3
k	2	6 Jan.	7	0.0

LOWER CLEAR LAKE -- Sheet B

a	1	20 Dec.	36	11.5
b	1	21 Dec.	26	7.2
c	2	22 Dec.	50	13.7
d	1	23 Dec.	77	23.0
e	2	3 Jan.	80	21.1
f	1	4 Jan.	64	13.7
g	2	5 Jan.	7	2.1

	<u>No. of Positions</u>	<u>Statute Miles</u>	<u>Square Statute Miles</u>
Sheet A Totals:	376	126.1	40.0
Sheet B Totals:	340	92.3	16.0
Totals:	716	218.4	56.0

GEOGRAPHIC NAMES  
 Survey No. H-7192a & b

Name on Survey	Source										
	A	B	C	D	E	F	G	H	K		
<u>California</u>										USGB	1
<u>Lake County</u>											2
<u>Clear Lake</u>											3
a:											4
<u>Rodman Slough</u>											5
<u>Lakeport</u>											6
<u>Soda Bay</u>											7
<u>Buckingham Point</u>											8
<u>The Narrows</u>											9
b:											10
<u>Sulphur Bank Point</u>											11
<u>Fraser Point</u>											12
<u>Konokti Bay</u>											13
											(not Konokti)
<u>Monitor Point</u>											14
<u>Wheeler Point</u>											15
<u>Luebaw Point</u>											16
<u>Rattlesnake I</u>											17
<u>Clearlake Oaks</u>											18
											19
											20
a:											21
<u>Lucerne</u>											22
<u>Nice</u>											23
<u>Long Tule Pt.</u>											24
<u>Buckingham Park</u>											25
											26
											27

= Point of land on w. side of The Narrows (U.S.G.S. "Bartlett Springs")

Names underlined in red are approved. 3/2/49 L. Heck  
 Further names checked 12-14-49 L.H.

= area, of which Buckingham Pt (above) is north eastern extremity

Hydrographic Surveys (Chart Division)

H-7192a & b

HYDROGRAPHIC SURVEY NO. ....

Records accompanying survey:

Boat sheets ..2.; sounding vols. 4....; wire drag vols. ....; 18 envel.  
 bomb vols. ....; graphic recorder rolls ....;  
 special reports, etc. ...2 B.P. - 3 Vinylite Sheets - 1 Observations,  
 Horizontal Angles - Sheets, Computations of Position GAL  
 ..... Velocity Corrections (sheets).....

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

Number of positions on sheet	.....	716
Number of positions checked	.....	269
Number of positions revised	.....	15
Number of soundings revised (refers to depth only)	.....	7
Number of soundings erroneously spaced	.....	10
Number of signals erroneously plotted or transferred	.....	0
Topographic details	Time	.....0
Junctions	Time	.....0
Verification of soundings from graphic record	Time	.....5

Verification by *Joaquin R. Diquiatco* ..... Total time 228 ..... Date 6-17-49  
*A.J. Clark* ..... 48 ..... 8-4-49

Reviewed by *I. M. Zeskind* ..... Time 10 ..... Date 12-13-49



DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-7192a & b

FIELD NO. A & B

California - Lake County - Clear Lake  
Surveyed in Nov. 1948 - January 1949      Scale 1:31,250  
Instructions 28 Oct., 1948

Soundings:

Fathometer  
Hand lead

Control:

Sextant fixes on shore signals

Chief of Party - E. E. Jones  
Surveyed by - E. E. Jones, H. W. Keith and D. G. Rushford  
Protracted by - E. E. Jones, H. W. Keith and D. G. Rushford  
Soundings plotted by - E. E. Jones, H. W. Keith and D. G.  
Rushford  
Verified and inked by - J. R. Diquiatco and A. J. Clark  
Reviewed by - I. M. Zeskind, December 13, 1949  
Inspected by - R. H. Carstens

1. Shoreline and Signals

The shoreline originates with the following U. S. Geological Survey, California Quadrangles; - Bartlett Springs (1944), Lower Lake (1947) and Lakeport (1948).

The origin of the control is given in the Descriptive Report.

2. Sounding Line Crossings

Depths at crossings are in adequate agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves were adequately delineated, except in several places near the shore where the widely spaced sounding lines do not provide adequate development of the curves.

A passage known as The Narrows divides the lake into two parts. The western part has a generally smooth bottom which slopes gradually from the shores to depths of 25-30 ft. The eastern part consists of a northern and a southern reach. The bottom in these reaches is generally smooth but is occasionally marked by irregularity. The slope of the bottom is abrupt from the shore to depths as great as 45-50 feet in the center of the reaches.

4. Junctions with Contemporary Surveys

No other surveys by this Bureau join the present survey.

5. Comparison with Prior Surveys

No prior surveys of the area have been made by this Bureau.

6. Comparison with Charts

A. Hydrography

There are no charts of the area by this Bureau.

B. Aids to Navigation

There are no aids to navigation within the limits of the present survey.

7. Condition of Survey

- a. The Sounding Records and Descriptive Report are complete and comprehensive.
- b. The field plotting was accurately done.
- c. No bottom characteristics are recorded in the sounding records; however, the character of the bottom is adequately discussed in the Descriptive Report.

8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions.

9. Additional Field Work Recommended.

This is an excellent survey and adequately serves the purpose intended.

Examined and approved:

*H. R. Edmonson*

H. R. Edmonson  
Chief, Nautical Chart Branch

*Casper M. Durgin*

Casper M. Durgin  
Chief, Division of Charts

*K. G. Crosby*

K. G. Crosby  
Chief, Section of Hydrography

*W. M. Scaife*

W. M. Scaife  
Chief, Division of Coastal Surveys



7192 b All Soundings Inked by J.R. DiQuiateo, Philippine Trancee

7192a Soundings Inked until 51d