

**FISHERIES RESEARCH BOARD
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**MANUSCRIPT REPORT SERIES
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No. 141

**Canadian Drift Bottle Releases and Recoveries
in the
North Pacific Ocean**

by

A. J. Dodimead and H. J. Hollister

**Pacific Oceanographic Group
Nanaimo, B.C.**

October 22, 1962

*of D & H., May 1958
of
Aug '58 - April '58*

**Programmed
by
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Photograph of drift bottle and information card which is sealed inside the bottle

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Introduction

Following Project NORPAC in 1955 (NORPAC Committee, 1960), a program was undertaken to study the oceanography of the northeast Pacific Ocean (eastern Subarctic Pacific Region). It was designed to define the principal oceanographic features in this area, and to determine their seasonal and yearly variations. As an aid in the study of surface currents, drift bottle releases were initiated in August 1956 and were continued until August 1959. Dodimead and Hollister (1958) and Hollister (1958) reported on the results of releases made up to December 1957. They showed that there were marked seasonal and yearly changes in the drift of the bottles, and that their movement was in agreement with the geopotential topography (calculated currents), allowing for a component of movement generally to the right across the isobars. The purpose of this report is to present a complete summary of the results of the drift bottle program.

The drift bottles

The drift bottles are 12-ounce, brown, beer bottles containing a card indicating the recovery information required (Frontispiece). They were sealed with a cork and the necks dipped in "waterworks" tar, and packaged in cardboard cartons of 30 (later 24 for ease in handling). The bottles were generally released in lots of 1000 (final releases were made in lots of 500 or less) by breaking the tape-seal on the cartons and dropping the

cases and contents overboard. The cartons soon broke up, especially in a slight sea, releasing the bottles. It was generally observed that they floated on their sides. Some of the bottles were in the sea for periods of about $3\frac{1}{2}$ years, and travelled as far as 9000 miles. Very few returned information cards showed signs of moisture damage.

Drift bottle releases and returns

Forty-two releases (33,869 bottles) were made. Twenty-three releases (19,449 bottles) were made at Ocean Station "P" (lat. 50°N, long. 145°W) at approximately 6-week intervals from August 1956 to April 1959. Because these releases were made on nearly the same date each month in successive years, they are extremely useful for showing the yearly variations in drift currents between Ocean Station "P" and the North American coast.

In addition to the releases at Ocean Station "P", nineteen releases (14,420 bottles) were made during the course of oceanographic surveys: August 1956 (MS, 1957), February 1957 (MS, 1957), August 1957 (MS, 1957), March 1958 (MS, 1958), July 1958 (MS, 1958) and August 1959 (MS, 1959). The positions of all the releases are shown in Fig. 1.

A summary of the releases and recoveries is given in Table 1, in which the information is arranged in two sections: releases on oceanographic surveys and releases at Ocean Station "P". The dates and positions of individual recoveries from each release are presented in Tables 3 to 44, which are arranged in the report in the chronological order of release. The general geographic regions in which the recoveries were made are also listed in Tables 3 to 44. The limits of these regions are described in Table 2 and are shown in Fig. 2.

The probable courses of the drift bottles are shown in Fig. 3 to 44; each figure being associated with a similarly indexed table of recoveries. The course of the drift bottles from the point of release was plotted along a reasonable path based on the distribution of the recoveries. The total number of recoveries is indicated on the main drift path, and this total is apportioned by further numbering on the branching drift paths. Paths of single recoveries are unnumbered. The dates and calculated speed of drift of the first recovery is indicated in a box drawn near the recovery position. Other recovery dates and speeds along the estimated paths are also shown.

The figure plates were prepared by Mr. W.R. Harling.

References

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Table 1. Summary of drift bottle releases and recoveries.

Position of release	Date of release	No. bottles released	No. of recoveries	Percentage recoveries
Oceanographic Survey Releases				
53°10'n; 156°46'w	Aug. 23/56	995	53	5.3
48°25'n; 152°11'w	Aug. 25/56	998	127	12.8
4) 44°49'n; 148°56'w	Aug. 26/56	990	9	0.9
40°00'n; 145°00'w	Aug. 27/56	980	20	2.1
52°55'n; 160°37'w	Feb. 5/57	1000	22	2.2
45°40'n; 154°34'w	Feb. 8/57	950	197	20.4
✓ 55°35'n; 142°40'w	Feb. 17/57	1000	71	7.1
41°45'n; 140°37'w	Feb. 28/57	1000	16	1.6
53°00'n; 156°02'w	Aug. 4/57	1008	52	5.2
✓ 45°22'n; 153°55'w	Aug. 7/57	1008	40	4.0
55°43'n; 142°21'w	Aug. 17/57	1008	6	0.6
49°41'n; 141°16'w <i>by St. Catherine's</i>	Dec. 13/57	973	42	4.3
49°36'n; 136°11'w <i>by St. Catherine's</i>	Mar. 7/58	1000	94	9.4
44°29'n; 146°20'w	Jul. 2/58	456	67	14.7
46°21'n; 149°54'w	Jul. 3/58	550	14	2.5
1) 49°59'n; 147°59'w	Aug. 9/59	96	4	4.2
2) 45°00'n; 148°00'w	Aug. 10/59	120	4	3.3
3) 43°00'n; 148°02'w	Aug. 11/59	144	6	4.2
4) 40°00'n; 147°00'w	Aug. 12/59	144	40	27.8
Totals	19 releases	14,420	884	6.1

Table 1 cont'd

Position of release	Date of release	No. bottles released	No. of recoveries	Percentage recoveries
Ocean Station "P" (lat. 50°00'N, long. 143°00'W)	Aug. 25/56	998	114	11.4
	↳ Sep. 29/56	1000	91	9.1
	Nov. 2/56	1000	78	7.8
	↳ Dec. 18/56	1000	33	3.3
	Jan. 25/57	986	42	4.3
	↳ Mar. 9/57	1000	38	3.8
	Apr. 19/57	1000	20	2.0
	↳ May 31/57	1007	17	1.6
	Jul. 12/57	1008	29	2.9
	Aug. 24/57	1008	39	3.9
	Sep. 27/57	1008	92	9.1
	↳ Nov. 2/57	1008	22	2.2
	Jan. 25/58	1008	58	5.8
	Apr. 19/58	1008	31	3.1
	May 30/58	1003	27	2.7
	↳ Jul. 13/58	887	26	2.9
	Aug. 23/58	504	10	2.0
	↳ Sep. 27/58	504	17	3.4
	Oct. 31/58	500	23	4.6
	↳ Dec. 13/58	504	26	5.2
	Jan. 25/59	504	32	6.3
	↳ Mar. 7/59	504	21	4.2
	Apr. 17/59	500	31	6.2
Totals	23 releases	19,449	917	4.7
Grand totals	44 releases	33,869	1,801	5.3

Table 2. Description of geographical regions used to indicate recovery regions in Tables 3 to 44 (cf. Fig. 2).

Name of region	Description of boundaries
California	Shoreline of the State of California, extending northward from the Baja California coast to latitude 42°n.
Oregon	Shoreline of the State of Oregon, extending from latitudes 42° to 46°n.
Washington	Shoreline of the State of Washington, extending from latitudes 46° to 48°30'n and including the American shoreline of the Juan de Fuca Strait.
West Coast	Shoreline of the west coast of Vancouver Island, extending into the Juan de Fuca Strait, and that portion of the British Columbia mainland shoreline extending northward to latitude 51°30'n.
Charlottes	Shoreline of the Queen Charlotte Islands and of the British Columbia mainland between latitudes 51° 30' and 54° 30'n.
Southeast	Shorelines of the islands and mainland of Southeast Alaska, extending northward from latitude 54°30'n to where longitude 138°w intersects the shoreline, near Lituya Bay.
Gulf	Northern shoreline of the Gulf of Alaska, extending from longitude 138° to where longitude 150°w intersects the shoreline of Kenai Peninsula.
Kodiak	Shorelines of Kodiak Island, Cook Inlet, and the Alaska Peninsula, extending from longitude 150° to where longitude 160°w intersects the shoreline of the Peninsula near the Shumagin Islands.
Aleutians	Shorelines of the Aleutian Islands, extending to longitude 170°e near Attu Island, and of the Alaskan coast of the Bering Sea.
Hawaii	Shorelines of the Hawaiian Islands.
Marshalls	Shorelines of the Marshall Islands.

Table 2 cont'd

Name of region	Description of boundaries
• Philippines	Shorelines of the Philippine Islands, extending from Mindanao to Luzon.
• Japan	Shorelines of the main and offshore islands of Japan, including Okinawa.
• Kure, Midway, Truk, Wake	Shorelines of the islands named.

Table 3. Record of recoveries of drift bottles released August 23, 1956 at the position 53° 10'N, 156° 46'W; 995 bottles released, 53 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 12, 1956	59° 26'	146° 10'	Gulf
Jan. 9, 1957	"	"	"
12	"	"	"
12	"	"	"
19	"	"	"
27	"	"	"
Feb. 2	57 55	152 26	Kodiak
Mar. 10	59 32	139 51	Gulf
16	"	"	"
Apr. 3	57 25	152 20	Kodiak
13	57 20	152 24	"
14	56 32	154 05	"
19	60 05	147 23	Gulf
May 4	57 47	152 25	Kodiak
8	57 46	152 16	"
12	57 35	152 26	"
12	60 05	147 19	Gulf
20	56 33	154 04	Kodiak
21	55 46	155 35	"
27	58 27	154 03	"
29	57 37	152 25	"
30	55 48	155 43	"
Jun. 3	58 38	153 41	"
12	55 48	155 43	"
13	57 26	152 20	"
15	"	"	"
15	56 54	153 42	"
22	57 36	152 29	"
24	54 20	161 47	Aleutians
28	56 54	153 42	Kodiak
28	57 09	152 52	"
Jul. 15	59 15	154 08	"
Aug. 3	58 57	138 03	Gulf
4	53 29	167 16	Aleutians
18	52 55	168 47	"
22	57 46	152 21	Kodiak
Sep. 18	53 22	167 45	Aleutians
24	60 02	143 32	Gulf
25	52 44	174 07 E	Attu
Dec. 4	57 32	152 15	Kodiak
Apr. 17, 1958	53 26	167 34	Aleutians
21	60 23	145 48	Gulf
May 16	54 26	164 33	Aleutians

Table 3 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
May 30, 1958	57° 28'	152° 27'	Kodiak
Jul. 1	53 19	167 27	Aleutians
Sep. 5	59 11	138 16	Gulf
Nov. 20	52 49	169 06	Aleutians
Jan. 15, 1959	46 05	123 56	Washington
30	59 31	139 32	Gulf
May 2	55 49	155 38	Kodiak
Oct. 16	46 21	124 04	Washington
May 28, 1960	55 21	162 48	Aleutians
Jun. 4	59 51	147 35	Kodiak

Table 4. Record of recoveries of drift bottles released August 25, 1956 at the position 48° 25'N, 152° 11'W; 998 released, 127 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Mar. 28, 1957	49° 58'	127° 18'	West coast
28	47 54	124 38	Washington
28	46 56	124 03	"
Apr. 3	46 56	124 03	"
13	"	"	"
19	48 10	124 44	"
23	46 28	124 03	"
24	45 36	123 57	Oregon
26	45 40	123 55	"
26	47 04	124 10	Washington
27	46 35	123 58	"
28	46 49	124 05	"
28	46 43	124 02	"
29	48 31	122 55	West coast
29	54 09	132 54	Charlottes
29	54 13	132 59	"
May 1	54 54	131 13	Southeast
2	46 54	124 08	Washington
8	46 21	124 04	"
9	45 57	123 59	Oregon
11	46 21	124 03	Washington
12	54 37	130 52	Charlottes
16	46 37	123 57	Washington
20	50 29	128 05	West coast
21	52 39	129 29	Charlottes
23	46 20	124 03	Washington
25	45 30	123 55	Oregon
25	46 21	124 03	Washington
26	46 35	124 04	"
31	48 09	124 44	"
Jun. 8	48 22	124 37	"
9	46 54	124 08	"
10	46 32	124 04	"
13	45 21	123 59	Oregon
13	44 59	124 01	"
13	45 17	123 58	"
13	45 00	124 01	"
14	45 43	123 56	"
14	45 37	123 57	"
14	45 37	123 57	"
14	"	"	"
14	46 02	123 56	Washington
14	45 12	123 58	Oregon
15	45 40	123 58	"
15	45 48	123 58	"
15	45 24	123 57	"

Table 4 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jun. 15, 1957	45° 08'	123° 58'	Oregon
15	45 14	123 58	"
16	45 41	123 56	"
18	45 50	124 04	"
20	45 40	123 56	"
20	46 28	124 03	Washington
20	47 58	124 40	"
23	46 46	124 06	"
23	46 21	124 03	"
25	46 20	124 03	"
29	48 23	124 40	"
29	46 17	124 06	"
30	46 21	124 03	"
Jul. 3	46 21	124 03	"
4	46 48	124 06	"
9	53 58	131 43	Charlottes
10	53 58	130 41	"
10	48 46	125 21	West coast
12	46 26	124 03	Washington
13	50 39	128 08	West coast
15	45 43	123 56	Oregon
15	"	"	"
17	46 21	124 03	Washington
18	45 36	124 03	Oregon
19	50 06	127 46	West coast
19	48 09	124 44	Washington
20	44 35	124 04	Oregon
21	48 20	124 40	Washington
31	54 42	130 34	Southeast
Aug. 2	50 46	128 24	West coast
13	46 36	124 02	Washington
14	48 08	124 42	"
14	50 06	127 36	West coast
26	48 43	125 04	"
28	46 47	124 06	Washington
Sep. 1	46 05	123 52	"
4	46 21	124 04	"
7	47 36	124 22	"
8	46 57	124 10	"
8	49 48	126 58	West coast
23	55 36	131 51	Southeast
25	50 30	128 02	West coast
29	52 29	128 42	Charlottes
Nov. 15	45 12	124 12	Oregon
20	47 14	124 12	Washington
Dec. 2	45 52	123 58	Oregon
3	46 42	123 58	Washington
7	46 57	124 10	"

Table 4 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 9, 1957	52° 06'	128° 23'	Charlottes
14	46 12	124 00	Washington
15	54 48	132 36	Southeast
20	46 30	124 03	Washington
21	47 07	124 11	"
21	46 49	124 06	"
23	47 05	124 10	"
23	49 03	125 43	West coast
Jan. 2, 1958	46 57	124 11	Washington
11	45 25	123 56	Oregon
12	45 34	123 56	"
24	45 26	123 57	"
28	60 24	146 05	Gulf
Mar. 1	43 27	124 17	Oregon
2	46 21	124 04	Washington
9	48 55	125 31	West coast
28	53 33	132 59	Charlottes
Apr. 5	43 02	124 27	Oregon
22	47 29	124 21	Washington
May 14	58 27	154 04	Gulf
15	49 31	126 33	West coast
Jun. 10	59 06	138 30	Gulf
Aug. 22	21 20	157 05	Hawaii
Sep. 24	59 25	139 31	Gulf
Feb. 24, 1959	21 25	157 45	Hawaii
Mar. 4	9 25	170 00 E	Marshalla
16	45 26	123 57	Oregon
Apr. 1	50 47	128 21	West coast
Aug. 6	23 30	120 00 E	Taiwan
Feb. 29, 1960	13 42	123 31 E	Philippines
Apr. 30	52 16	131 22	Charlottes
May 18	54 13	133 01	"
Nov. 28	27 23	128 33 E	Okinawa

Table 5. Record of recoveries of drift bottles released August 25, 1956 at the position 50° 03'N, 144° 43'W (Ocean Station "P"); 998 released, 114 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 16, 1956	50° 32'	128° 13'	West coast
Jan. 16, 1957	50 29	128 06	"
16	50 32	128 13	"
29	51 56	127 28	Charlottes
Feb. 16	47 05	124 10	Washington
Mar. 24	46 30	124 03	"
Apr. 9	46 25	124 04	"
13	47 02	124 10	"
14	49 24	126 28	West coast
17	53 28	132 40	Charlottes
18	47 51	124 33	Washington
19	46 00	123 56	"
19	48 10	124 44	"
21	46 13	123 59	"
24	46 31	124 03.5	"
26	49 00	125 40	West coast
28	48 18	124 40	Washington
29	50 07	127 55	West coast
29	48 35	124 42	"
30	50 00	127 25	"
May 5	49 08	125 56	"
12	48 34	122 43	"
12	47 35	124 22	Washington
13	48 19	124 40	"
18	45 34	123 56	Oregon
18	45 54	123 58	"
19	50 02	127 23	West coast
19	49 16	126 08	"
19	46 21	124 04	Washington
20	50 29	128 05	West coast
23	52 56	128 27	Charlottes
23	51 56	128 26	"
25	46 21	124 04	Washington
26	48 06	124 41	"
29	47 05	124 10	"
29	46 21	124 04	"
Jun. 1	48 17	124 23	"
1	54 04	131 50	Charlottes
8	47 54	124 38	Washington
9	53 03	129 26	Charlottes
11	48 09	122 47	Washington
12	47 12	124 13	"
12	45 54	123 58	Oregon
13	47 14	124 13	Washington

Table 5 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jun. 13, 1957	47° 06'	124° 10'	Washington
13	45 37	123 57	Oregon
14	45 37	123 57	"
15	46 06	123 56	Washington
15	50 45	126 43	West coast
21	46 20	124 04	Washington
23	46 27	124 04	"
23	48 34	124 25	West coast
24	46 07	124 04	Washington
28	50 02	127 22	West coast
Jul. 1	46 34	124 08	Washington
1	49 11	126 01	West coast
2	47 21	124 03.5	Washington
2	46 21	124 03	"
6	50 34	128 14	West coast
6	54 04	131 41	Charlottes
10	50 08	127 54	West coast
10	50 08	127 54	"
15	45 21	123 58	Oregon
15	45 12	123 57	"
17	49 52	127 08	West coast
20	50 47	128 26	"
22	50 41	128 21	"
24	50 08	127 55	"
27	52 14	128 22	Charlottes
28	45 37	123 57	Oregon
28	45 33	123 57	"
29	59 30	146 20	Gulf
Aug. 1	48 20	124 40	Washington
3	52 39	129 41	Charlottes
11	47 15	124 13	Washington
11	54 06	131 44	Charlottes
11	46 43	124 01	Washington
11	46 43	124 02	"
12	46 56	124 10	"
12	53 15	130 17	Charlottes
15	46 21	124 03.5	Washington
25	46 18	124 05	"
25	46 21	124 04	"
28	46 43	124 02	"
30	52 20	131 17	Charlottes
Sep. 1	46 38	124 03	Washington
20	49 11	125 57	West coast
Oct. 5	55 24	131 44	Southeast
20	46 38	124 03	Washington
Nov. 3	43 44	124 08	Oregon
12	46 10	123 55	Washington

Table 5 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 8, 1957	49° 06'	125° 53'	West coast
9	47 10	124 09	Washington
12	48 23	124 38	"
22	46 28	124 03	"
26	42 24	124 26	Oregon
29	47 08	124 11	Washington
Jan. 8, 1958	46 02	123 56	"
25	48 34	124 37	West coast
31	44 22	124 06	Oregon
Feb. 26	44 53	124 02	"
Mar. 1	52 24	131 35	Charlottes
1	42 57	124 29	Oregon
3	48 51	125 42	West coast
14	53 34	131 55	Charlottes
23	53 01	131 46	"
May 31	48 12	124 42	Washington
Jun. 22	50 28	128 05	West coast
Oct. 13	20 51	156 49	Hawaii
Jan. 28, 1959	21 40	157 56	"
May 24	52 19	131 17	Charlottes
Jul. 29	50 05	127 48	West coast
Aug. 12, 1960	11 30	125 30 E	Philippines
Aug. 15, 1961	51 10	127 45	West coast

Table 6. Record of recoveries of drift bottles released
 August 26, 1956 at the position 44° 49' N,
 148° 56' W; 990 released, 9 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Mar. 23, 1958	21° 31'	157° 47'	Hawaii
Apr. 18	44 30	124 05	Oregon
Jun. 4	22 09	159 18	Hawaii
Sep. 10	21 01	156 37	"
May 1, 1959	23 45	166 10	"
Sep. 15	7 20	151 38 E	Truk
Dec. 23	27 04	142 10 E	Japan
Feb. 22, 1960	12 23	124 04 E	Philippines
Feb. 27, 1961	8 03	134 34 E	"

Table 7. Record of recoveries of drift bottles released August 27, 1956 at the position 40° 00'N, 145° 00'W; 980 released; 20 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Apr. 13, 1958	39° 55'	123° 57'	California
Jul. 15	43 13	124 24	Oregon
Aug. 10	20 54	156 28	Hawaii
19	20 51	156 50	"
23	18 57	155 39	"
24	22 13	159 23	"
26	22 02	159 20	"
26	21 21	157 42	"
Sep. 13	22 03	159 20	"
Oct. 28	21 21	157 42	"
Nov. 21	21 36	158 06	"
30	21 25	157 48	"
Jan. 19, 1959	21 05	157 02	"
Feb. 26	21 28	157 51	"
Mar. 9	22 02	159 20	"
Dec. 24	13 10	124 00 E	Philippines
Apr. 30, 1960	45 21	124 00	Oregon
Sep. 28	41 26	141 28 E	Japan
Jan. 20, 1961	19 16	121 28 E	Philippines
Feb. 1	10 09	125 30 E	"

Table 8. Record of recoveries of drift bottles released September 29, 1956 at the position 50° 00' N, 145° 00' W (Ocean Station "P"); 1000 released, 91 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 9, 1957	54° 03'	132° 10'	Charlottes
12	54 03	131 52	"
13	54 05	132 18	"
15	54 05	132 18	"
Feb. 1	54 32	133 08	"
1	54 05	131 47	"
1	54 04	131 49	"
3	53 11	131 47	"
8	54 05	132 15	"
8	"	"	"
9	"	"	"
9	"	"	"
9	"	"	"
9	"	"	"
9	"	"	"
10	"	"	"
10	"	"	"
17	52 35	131 26	"
Mar. 10	53 56	132 08	"
Apr. 4	54 13	133 00	"
4	"	"	"
4	"	"	"
7	54 13	132 59	"
14	55 09	131 44	Southeast Charlottes
15	54 07	132 19	"
20	53 16	131 49	"
24	52 27	131 16	"
26	54 09	132 56	"
26	"	"	"
26	"	"	"
26	"	"	"
27	"	"	"
27	54 10	132 59	"
27	54 09	132 54	"
27	"	"	"
27	"	"	"
27	"	"	"
27	"	"	"
28	"	"	"
28	"	"	"
28	"	"	"
28	"	"	"
29	"	"	"
29	"	"	"
29	54 13	132 54	"

Table 8 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Apr. 30, 1957	54° 09'	132° 54'	Charlottes
30	"	"	"
30	"	"	"
30	"	"	"
May 2	"	"	"
8	54 04	132 15	"
12	53 54	133 09	"
20	55 54	132 26	Southeast
21	54 03	131 41	Charlottes
23	54 04	132 35	"
26	47 13	124 12	Washington
29	54 08	132 38	Charlottes
29	"	"	"
Jun. 1	54 08	132 48	"
1	"	"	"
1	"	"	"
3	54 07	132 35	"
3	"	"	"
3	"	"	"
15	54 07	132 36	"
15	"	"	"
15	59 58	147 42	Gulf
18	58 28	154 05	Kodiak
20	46 20	124 04	Washington
23	60 02	144 04	Gulf
Jul. 3	54 09	132 54	Charlottes
3	"	"	"
14	54 04	131 50	"
15	54 10	131 39	"
20	54 13	133 03	"
25	60 29	152 16	Kodiak
30	54 08	132 35	Charlottes
31	60 47	146 19	Kodiak
Sep. 29	54 07	132 19	Charlottes
Nov. 14	53 37	131 56	"
20	53 33	132 59	"
Dec. 10	56 17	158 25	Kodiak
Apr. 25, 1958	54 11	133 05	Charlottes
May 10	54 13	133 00	"
Jun. 22	53 28	130 55	"
24	53 51	130 43	"
May 12, 1959	54 06	133 04	"
Jul. 26	54 07	132 36	"
Apr. 24, 1960	22 00	159 20	Hawaii
Jun. 18, 1961	54 09	132 55	Charlottes

Table 9. Record of recoveries of drift bottles released November 2, 1956 at the position 49° 45'N, 142° 48'W (Ocean Station "P"); 1000 released, 78 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 5, 1957	57° 34'	136° 05'	Southeast
18	55 39	133 36	"
Feb. 16	57 04	135 20	"
23	57 10	135 45	"
28	59 35	139 45	Gulf
Mar. 9	59 30	146 20	"
31	"	"	"
Apr. 5	"	"	"
15	59 09	138 23	"
19	57 05	135 38	Southeast
21	59 09	138 23	Gulf
25	57 59	136 32	Southeast
May 2	57 25	152 20	Kodiak
6	57 40	154 11	"
13	57 03	135 22	Southeast
14	56 50	135 27	"
25	56 54	153 43	Kodiak
29	58 09	153 15	"
30	57 26	152 23	"
31	59 10	138 42	Gulf
Jun. 2	59 55	141 46	"
2	57 40	154 09	Kodiak
4	59 02	138 16	Gulf
5	59 11	138 32	"
5	"	"	"
7	59 20	139 13	"
8	59 11	138 32	"
8	"	"	"
15	57 26	152 19	Kodiak
16	57 02	135 20	Southeast
20	58 27	154 09	Kodiak
21	58 28	154 09	"
23	59 28	146 21	Gulf
24	59 18	139 07	"
24	55 48	155 43	Kodiak
27	57 36	152 26	"
30	55 14	133 23	Southeast
Jul. 1	59 27	139 34	Gulf
3	58 54	137 58	Southeast
8	58 01	152 47	Kodiak
17	56 38	158 00	"
17	59 32	139 48	Gulf
20	58 41	137 42	Southeast
23	52 54	168 49	Aleutians
25	60 29	152 16	Kodiak

Table 9 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jul. 25, 1957	60° 29'	152° 16'	Kodiak
25	"	"	"
28	59 30	146 20	Gulf
Aug. 2	59 16	138 56	"
3	53 29	167 16	Aleutians
7	56 18	158 25	Kodiak
21	59 12	138 32	Gulf
Sep. 18	59 07	138 29	"
28	57 12	153 23	Kodiak
Dec. 14	57 05	153 10	"
Jan. 5, 1958	59 22	139 30	Gulf
23	57 08	153 13	Kodiak
Feb. 5	57 32	154 32	"
12	59 28	139 34	Gulf
24	54 15	133 04	Charlottes
Mar. 5	60 24	146 08	Gulf
7	59 11	138 18	"
20	58 03	153 09	Kodiak
27	57 56	153 18	"
Apr. 4	57 04	135 22	Southeast
May 21	57 00	135 39	"
23	60 00	143 48	Gulf
23	"	"	"
26	57 37	152 10	Kodiak
Jun. 12	59 06	138 17	Gulf
14	56 00	158 48	Kodiak
17	57 39	154 07	"
Jul. 6	56 52	154 01	"
30	59 14	151 04	"
Mar. 27, 1959	59 21	151 57	"
May 25	55 21	162 40	Aleutians
Jun. 22	59 04	138 23	Gulf
Aug. 15, 1961	56 32	154 39	Kodiak

Table 10. Record of recoveries of drift bottles released December 18, 1956 at the position 49° 54'N, 145° 07'W (Ocean Station "P"); 1000 released, 33 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
May 22, 1957	59° 26'	146° 22'	Gulf
30	55 50	155 34	Kodiak
Jun. 1	55 51	155 34	"
12	56 34	154 04	"
Jul. 9	55 48	155 43	"
12	57 35	152 10	"
21	58 18	154 10	"
25	60 29	152 16	"
Aug. 10	54 10	133 02	Charlottes
Sep. 15	60 05	147 19	Gulf
30	57 48	136 20	Southeast
Oct. 5	59 28	139 41	Gulf
Nov. 4	59 24	139 31	"
7	56 54	153 43	Kodiak
15	60 04	148 00	Gulf
Jan. 11, 1958	57 49	152 25	Kodiak
28	60 24	146 05	Gulf
Feb. 1	59 36	150 10	Kodiak
Mar. 5	60 24	146 08	Gulf
20	58 00	152 46	Kodiak
Apr. 27	60 24	146 11	Gulf
May 23	60 00	143 48	"
Jun. 29	60 32	148 17	"
Jul. 2	55 49	155 44	Kodiak
Mar. 17, 1959	49 02	125 41	West Coast
May 1	58 27	154 04	Kodiak
Sep. 4	60 17	146 40	Gulf
Feb. 15, 1960	61 13	149 54	Kodiak
Mar. 23	57 27	152 44	"
May 15	57 22	156 25	"
Jul. 4, 1961	60 05	147 19	Gulf
Aug. 3	58 51	153 16	Kodiak
3	58 51	153 16	"

Table 11. Record of recoveries of drift bottles released January 25, 1957 at the position 49° 47'N, 144° 50'W (Ocean Station "P"); 986 released, 42 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
May 19, 1957	48° 18'	124° 40'	Washington
22	48 18	124 40	"
Aug. 8	46 21	124 04	"
23	59 32	139 47	Gulf
23	"	"	"
Sep. 11	59 36	139 49	"
19	59 09	138 24	"
Oct. 2	57 02	135 37	Southeast
4	59 32	139 49	Gulf
4	43 10	131 39	Charlottes
6	59 33	139 48	Gulf
12	59 26	146 23	"
13	59 31	139 38	"
20	56 51	135 37	Southeast
21	59 21	139 18	Gulf
24	59 32	139 46	"
Jan. 5, 1958	59 22	139 20	"
8	59 33	139 47	"
8	59 31	139 42	"
18	46 11	123 55	Washington
19	59 33	139 43	Gulf
20	60 24	146 05	"
28	60 24	146 05	"
29	59 32	139 50	"
Feb. 4	60 23	146 07	"
4	60 23	146 07	"
10	"	"	"
12	59 24	139 26	"
Mar. 19	60 01	144 23	"
Apr. 27	60 24	146 11	"
May 14	58 27	154 04	Kodiak
23	59 32	139 46	Gulf
Jun. 25	58 19	154 06	Kodiak
26	60 18	145 01	Gulf
Jul. 2	56 37	154 06	Kodiak
27	58 30	153 55	"
27	58 30	153 55	"
Aug. 16	58 17	136 43	Southeast
May 25, 1959	59 09	138 15	Gulf
Jul. 11	57 07	135 47	Southeast
Mar. 26, 1960	55 33	133 06	"
Aug. 20, 1961	58 57	138 04	Gulf

Table 12. Record of recoveries of drift bottles released February 5, 1957 at the position 52° 55'N, 160° 37'W; 1000 released, 22 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 3, 1957	59° 21'	151° 55'	Kodiak
21	58 26	146 20	Gulf
Jan. 8, 1958	60 04	142 23	"
28	60 24	146 05	"
28	59 36	150 10	Kodiak
Mar. 5	60 24	146 00	Gulf
20	59 11	150 58	Kodiak
Apr. 10	60 39	147 25	Gulf
27	60 24	146 11	"
May 10	57 49	153 35	Kodiak
17	60 02	143 32	Gulf
23	60 00	143 48	"
Jun. 11	55 51	159 24	Kodiak
Aug. 5	59 32	153 41	"
30	59 18	150 55	"
Sep. 2	60 05	142 50	Gulf
Feb. 4, 1959	52 52	169 00	Aleutians
Jul. 9	59 44	140 55	Gulf
Aug. 20	60 00	147 23	"
May 7, 1960	58 34	152 35	Kodiak
Aug. 10	56 47	157 21	"
Mar. 11, 1961	46 32	124 04	Washington

Table 13. Record of recoveries of drift bottles released February 8, 1957 at the position 45° 40'N, 124° 34'W; 950 released; 197 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 20, 1957	46° 48'	124° 06'	Washington
20	45 44	123 58	Oregon
21	45 27	123 57	"
22	45 50	123 57	"
22	46 10	123 58	Washington
22	42 25	124 26	Oregon
22	42 48	124 32	"
23	49 03	125 43	West coast
23	46 04	123 56	Oregon
23	46 03	124 56	"
23	42 20	124 26	"
24	46 21	124 03	Washington
24	46 54	124 08	"
24	46 38	124 03	"
24	46 31	124 04	"
24	46 31	124 04	"
24	46 24	124 03	"
24	46 21	124 03	"
24	46 22	124 03	"
25	46 31	124 04	"
25	46 29	124 04	"
25	46 42	123 59	"
25	46 04	123 55	"
26	47 10	124 12	"
26	"	"	"
26	47 18	124 14	"
26	"	"	"
26	47 07	124 11	"
26	46 43	124 03	"
26	47 13	124 12	"
26	"	"	"
26	46 02	123 56	"
26	46 08	123 58	"
26	46 02	123 56	"
26	43 08	124 25	Oregon
26	46 30	124 04	Washington
26	"	"	"
26	43 07	124 25	Oregon
26	41 52	124 13	California
26	46 13	124 00	Washington
27	46 48	124 06	"
27	46 02	123 56	"
27	46 08	123 58	"
27	47 04	124 09	"
27	47 03	124 09	"
27	46 36	124 04	"

Table 13 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 27, 1957	46° 30'	124° 04'	Washington
27	46 13	124 00	"
27	42 52	124 03	Oregon
27	43 26	124 17	"
27	45 25	123 57	"
27	43 24	124 18	"
27	43 24	124 18	"
28	46 09	123 58	Washington
28	47 32	124 21	"
28	46 43	124 05	"
28	46 54	124 07	"
28	43 26	124 17	Oregon
28	47 05	124 12	Washington
28	47 07	124 11	"
28	47 05	124 12	"
28	47 30	124 21	"
28	43 40	124 13	Oregon
28	47 03	124 11	Washington
28	47 02	124 11	"
28	"	"	"
28	42 55	124 30	Oregon
28	43 45	124 11	"
28	"	"	"
28	43 53	124 09	"
28	47 40	124 24	Washington
29	46 35	124 04	"
29	46 34	124 04	"
29	47 07	124 11	"
29	49 03	125 30	West coast
29	43 52	124 09	Oregon
29	48 21	124 40	Washington
29	46 02	123 56	"
29	47 55	124 37	"
29	47 55	124 37	"
30	46 31	124 04	"
30	46 01	123 56	"
30	46 48	124 06	"
30	"	"	"
30	"	"	"
30	47 14	124 12	"
30	46 22	124 03	"
30	46 57	124 10	"
30	46 48	124 06	"
30	47 14	124 13	"
30	46 05	123 55	"
30	45 43	123 56	Oregon
31	48 21	124 40	Washington
31	46 02	123 54	"

Table 13 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 1, 1958	46° 00'	123° 56'	Washington
1	"	"	"
1	47 14	124 13	"
1	45 54	123 48	Oregon
1	46 21	124 04	Washington
1	42 47	124 32	Oregon
2	46 40	124 04	Washington
3	47 21	124 18	"
3	43 42	124 12	Oregon
3	43 55	124 09	"
5	44 53	124 02	"
6	46 02	123 55	Washington
15	42 50	124 33	Oregon
22	53 14	131 48	Charlottes
23	47 00	124 10	Washington
23	46 59	124 10	"
25	46 38	124 04	"
26	42 55	124 30	Oregon
28	46 25	124 03	Washington
30	46 43	124 02	"
30	45 12	123 58	Oregon
31	45 14	123 58	"
Feb. 1	46 13	124 00	Washington
1	47 02	124 10	"
1	44 22	124 06	Oregon
1	46 34	124 04	Washington
1	46 33	124 04	"
1	47 04	124 10	"
3	47 01	124 10	"
8	46 43	124 02	"
12	53 14	131 48	Charlottes
14	53 14	131 48	"
15	53 15	131 48	"
15	"	"	"
15	49 23	126 32	West coast
16	53 15	131 48	Charlottes
16	54 07	131 40	"
16	46 43	124 02	Washington
18	43 52	124 09	Oregon
20	46 51	124 07	Washington
21	38 00	123 02	California
22	53 35	131 56	Charlottes
23	53 10	131 47	"
23	47 05	124 10	Washington
23	"	"	"
25	45 12	123 58	Oregon
25	45 19	123 58	"
25	44 53	124 02	"
25	45 32	123 57	"

Table 13 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Feb. 26, 1958	45° 53'	123° 58'	Oregon
26	46 00	123 55	Washington
26	45 13	123 58	Oregon
26	45 43	123 56	"
26	45 10	123 58	"
26	42 45	124 29	"
26	45 43	123 56	"
27	53 19	131 58	Charlottes
Mar. 1	54 10	131 47	"
1	53 37	131 55	"
1	43 26	124 17	Oregon
7	47 03	124 10	Washington
8	47 01	124 10	"
14	53 23	131 55	Charlottes
14	53 37	131 55	"
21	53 15	131 49	"
23	52 57	131 37	"
29	38 00	123 00	California
Apr. 4	33 33	117 47	"
6	42 57	124 29	Oregon
8	53 13	131 48	Charlottes
9	36 48	122 02	California
11	53 42	131 52	Charlottes
18	48 19	124 40	Washington
18	52 35	131 25	Charlottes
19	33 15	119 30	California
25	48 48	125 17	West coast
25	48 37	124 44	"
26	48 03	124 42	Washington
26	53 00	131 36	Charlottes
26	53 25	131 55	"
30	33 02	117 17	California
May 10	56 51	135 32	Southeast
11	54 04	131 48	Charlottes
Jun. 10	57 26	152 29	Kodiak
10	54 09	132 55	Charlottes
Aug. 7	59 59	148 12	Gulf
Sep. 1	60 23	146 25	"
Oct. 12	54 03	131 52	Charlottes
Feb. 24, 1959	53 21	131 56	"
Apr. 28	43 20	124 22	Oregon
May 12	54 06	133 04	Charlottes
Jul. 1	59 44	140 55	Gulf
Aug. 23	47 30	124 21	Washington

Table 13 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Aug. 23, 1959	47° 30'	124° 21'	Washington
Jan. 12, 1960	10 12	124 59 E	Philippines
24	57 55	152 50	Kodiak
3	55 12	132 50	Southeast
Feb. 5	14 02	122 13 E	Philippines
Jun. 9	57 30	154 38	Kodiak
22	27 22	128 35 E	Japan
Jul. 14	32 07	130 08 E	"
Aug. 27	26 40	128 05 E	"
May 10, 1961	54 35	131 05	Southeast

Table 14. Record of recoveries of drift bottles released February 17, 1957 at the position 55° 35'N, 142° 40'W; 1000 released; 71 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
May 6, 1957	57° 34'	154° 27'	Kodiak
18	57 27	152 19	"
26	57 35	152 27	"
26	57 46	152 19	"
26	55 52	155 39	"
30	57 36	152 11	"
30	55 54	155 33	"
Jun. 1	55 51	155 34	"
2	57 26	152 23	"
2	"	"	"
2	"	"	"
4	55 52	155 39	"
7	57 40	154 09	"
8	54 27	162 42	Aleutians
13	52 55	168 52	"
22	57 23	154 42	Kodiak
28	57 09	152 52	"
28	55 21	160 23	Aleutians
28	57 46	152 16	Kodiak
30	57 39	152 30	"
30	57 46	152 23	"
Jul. 2	53 24	167 53	Aleutians
3	54 27	162 42	"
3	57 36	152 26	Kodiak
5	57 25	156 22	"
18	52 55	168 49	Aleutians
18	57 25	152 20	Kodiak
18	58 14	152 15	"
20	52 56	168 52	Aleutians
21	55 55	159 04	Kodiak
27	57 37	152 26	"
Aug. 2	53 15	167 40	Aleutians
4	57 46	152 15	Kodiak
16	53 15	168 25	Aleutians
17	52 55	168 50	"
20	57 44	152 29	Kodiak
22	54 08	165 47	Aleutians
30	56 33	169 40	"
Sep. 1	52 55	168 47	"
12	52 56	168 42	"
29	54 23	162 37	"
29	54 23	162 37	"
Oct. 6	59 51	153 02	Kodiak
27	51 25	179 19 E	Aleutians
Nov. 14	57 44	152 30	Kodiak
14	54 28	162 40	Aleutians

Table 14 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Nov. 14, 1957	54° 51'	163° 23'	Aleutians
14	54 28	162 42	"
Apr. 20, 1958	56 55	154 13	Kodiak
May 11	55 20	162 43	Aleutians
30	57 55	152 26	Kodiak
Jun. 1	52 51	168 50	Aleutians
28	55 27	162 32	"
Aug. 18	56 35	159 40	"
Dec. 2	57 55	152 45	Kodiak
19	57 52	153 18	"
Jan. 5, 1959	54 06	166 05	Aleutians
19	46 02	123 55	Washington
Feb. 5	46 24	124 03	"
10	44 53	124 02	Oregon
Mar. 21	43 39	124 13	"
Apr. 7	38 05	122 57	California
10	47 21	124 19	Washington
23	51 28	179 09 E	Aleutians
May 11	41 11	124 08	California
Jun. 21	60 02	144 02	Gulf
Aug. 17	59 14	150 59	Kodiak
Dec. 7	21 37	157 55	Hawaii
Jun. 18, 1960	54 10	133 02	Charlottes
Jul. 20	59 27	139 34	Gulf
Sep. 28	19 20	166 35 E	Wake

Table 15. Record of recoveries of drift bottles released February 28, 1957 at the position 41° 45'N, 140° 37'W; 1000 released, 16 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jun. 2, 1958	21° 12'	156° 59'	Hawaii
Aug. 17	21 27	157 48	"
21	21 39	157 56	"
27	21 51	160 10	"
Sep. 7	21 28	157 51	"
Oct. 18	21 30	157 51	"
19	22 07	159 20	"
Nov. 1	22 02	159 20	"
Jan. 1, 1959	21 24	157 44	"
10	22 06	159 19	"
23	21 52	160 09	"
May 20, 1960	24 30	124 00 E	Japan
Jul. 7	31 10	130 10 E	"
Sep. 8	28 25	178 27	Kure
Oct. 7	28 20	130 00 E	Japan
Nov. 8	27 10	128 50 E	"

Table 16. Record of recoveries of drift bottles released March 9, 1957 at the position 50° 06'N, 144° 48'W (Ocean Station "P"); 1000 released, 38 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jun. 3, 1957	54° 07'	132° 35'	Charlottes
Jul. 9	54 03	133 11	"
10	54 08	131 42	"
15	54 13	132 59	"
19	54 10	133 02	"
20	54 05	131 45	"
Aug. 10	53 33	132 59	"
10	53 33	132 59	"
12	54 13	133 00	"
16	54 13	133 02	"
23	59 32	139 47	Gulf
26	54 05	131 49	Charlottes
Sep. 17	54 10	131 40	"
17	"	"	"
Oct. 6	57 51	136 26	Southeast
13	54 02	132 03	Charlottes
15	58 08	136 18	Southeast
Nov. 20	52 59	132 07	Charlottes
Jan. 5, 1958	59 22	139 20	Gulf
8	59 33	139 45	"
22	59 21	139 20	"
Mar. 5	60 24	146 08	"
5	"	"	"
15	55 26	132 08	Southeast
Apr. 25	54 41	132 31	"
May 23	60 00	143 48	Gulf
30	57 55	136 34	Southeast
Aug. 2	55 54	155 34	Kodiak
9	53 45	133 00	Charlottes
May 12, 1959	54 06	133 04	"
24	54 04	131 47	"
29	54 10	133 02	"
31	60 23	146 07	Gulf
Aug. 11	59 32	153 41	Kodiak
May 1, 1960	58 17	136 43	Southeast
20	60 23	145 47	Gulf
26	57 59	136 33	Southeast
Jun. 7, 1961	59 43	140 53	Gulf

Table 17. Record of recoveries of drift bottles released April 19, 1957 at position 49° 58'N, 144° 40'W (Ocean Station "F"); 1000 released, 20 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 16, 1957	59° 26'	146° 20'	Gulf
16	"	"	"
Jan. 3, 1958	43 53	124 09	Oregon
8	59 33	139 47	Gulf
28	56 54	153 43	Kodiak
Mar. 5	60 24	146 08	Gulf
20	59 11	150 58	Kodiak
Apr. 5	53 37	131 55	Charlottes
19	55 20	160 31	Aleutians
27	60 24	146 11	Gulf
May 6	60 23	145 46	"
25	60 02	143 38	"
29	55 31	133 44	Southeast
Jun. 2	59 33	139 40	Gulf
16	58 30	153 54	Kodiak
20	52 05	173 14	Aleutians
Mar. 27, 1959	52 07	174 30	"
May 7, 1960	54 10	133 02	Charlottes
Jun. 15	53 46	132 59	"
Jul. 29	54 07	131 40	"

Table 18. Record of recoveries of drift bottles released on May 31, 1957 at the position 49° 56'N, 144° 19'W (Ocean Station "7"); 1007 released, 17 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 20, 1958	53° 08'	129° 46'	Charlottes
20	53 25	130 20	"
Feb. 15	52 47	129 21	"
Mar. 1	52 10	131 13	"
Apr. 5	57 39	152 30	Kodiak
14	57 35	156 00	"
19	57 47	152 20	"
24	54 11	133 05	Charlottes
May 15	54 07	132 50	"
15	53 29	130 37	"
Jul. 9	59 18	153 31	Kodiak
9	57 25	156 22	"
15	57 15	156 20	"
Aug. 9	53 45	133 00	Charlottes
24	54 52	132 38	Southeast
Aug. 1, 1960	54 42	132 01	"
Jul. 14, 1961	54 03	131 41	Charlottes

Table 19. Record of recoveries of drift bottles released on July 12, 1957 at the position 50° 01'N, 144° 52'W (Ocean Station "P"); 1008 released, 29 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 20, 1958	57° 10'	135° 46'	Southeast
Feb. 1	52 12	131 22	Charlottes
5	52 12	131 22	"
10	52 24	131 35	"
10	52 12	131 22	"
Mar. 17	58 09	151 18	Kodiak
18	57 15	152 56	"
19	57 55	152 47	"
May 5	55 16	133 38	Southeast
11	57 55	152 33	Kodiak
Jun. 3	58 12	152 21	"
7	53 08	132 55	Charlottes
12	53 13	132 34	"
12	"	"	"
12	53 13	132 33	"
Jul. 9	55 53	134 15	Southeast
10	57 25	156 22	Kodiak
Aug. 4	55 54	155 34	"
Feb. 5, 1959	54 13	133 02	Charlottes
May 10	52 26	131 33	"
13	54 06	133 04	"
15	53 56	133 10	"
26	53 59	133 08	"
Apr. 26, 1960	53 56	133 09	"
May 8	53 33	132 58	"
May 27, 1961	53 55	133 08	"
July 21, 1962	53 56	133 10	"
21	53 56	133 10	"
21	"	"	"

Table 20. Record of recoveries of drift bottles released on August 4, 1957 at the position 53° 00'N, 156° 02'W; 1008 released, 52 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Nov. 26, 1957	57° 26'	152° 24'	Kodiak
29	57 25	152 30	"
Jan. 27, 1958	56 54	153 43	"
Feb. 5	57 27	152 20	"
24	57 35	152 26	"
24	"	"	"
26	57 32	152 15	"
26	"	"	"
Mar. 1	57 11	153 12	"
7	57 28	152 27	"
8	57 45	152 30	"
8	57 11	153 11	"
Apr. 20	54 36	164 56	Aleutians
25	56 33	154 04	Kodiak
May 20	57 40	152 30	"
Jun. 1	52 51	168 50	Aleutians
16	59 26	146 20	Gulf
20	52 56	168 52	Aleutians
27	55 51	155 34	Kodiak
28	55 54	155 34	"
Jul. 8	57 12	170 14	Aleutians
17	56 44	157 29	Kodiak
30	55 38	160 23	Aleutians
Sep. 6	58 33	152 30	Kodiak
7	54 13	165 36	Aleutians
23	56 25	158 25	Kodiak
Oct. 9	55 53	155 34	"
20	58 12	152 03	"
24	55 55	161 21	Aleutians
Jan. 23, 1959	57 47	152 24	Kodiak
Feb. 7	53 03	168 48	Aleutians
Mar. 15	57 28	152 19	Kodiak
Apr. 28	55 05	162 09	Aleutians
May 3	60 05	147 19	Gulf
31	56 43	136 07	Southeast
Jun. 19	60 22	146 12	Gulf
20	57 00	135 42	Southeast
30	56 43	139 16	Aleutians
Jul. 24	56 39	132 56	Southeast
Oct. 14	56 25	160 10	Aleutians
Mar. 10, 1960	42 50	124 34	Oregon
May 9	55 48	160 01	Aleutians

Table 20 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
May 15, 1960	57° 26'	152° 20'	Kodiak
Jun. 5	55 55	133 46	Southeast
Sep. 15	56 30	154 30	Kodiak
Oct. 30	57 05	153 11	"
Feb. 2, 1961	57 30	157 40	Aleutians
Mar. 25	56 50	158 42	"
Aug. 15	56 32	154 39	Kodiak
15	"	"	"
Nov. 5	56 32	154 20	"
Jun. 2, 1962	50 48	128 38	West coast

Table 21. Record of recoveries of drift bottles released on August 7, 1957 at the position 45° 22'N, 153° 55'W; 1008 released, 40 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 30, 1958	59° 30'	146° 20'	Gulf
31	59 26	139 34	"
Feb. 7	59 24	139 30	"
15	57 46	152 19	Kodiak
16	57 39	152 29	"
17	57 42	152 35	"
Mar. 2	57 46	152 20	"
3	58 00	152 47	"
12	57 54	152 24	"
19	57 09	152 52	"
31	58 33	152 30	"
Apr. 15	56 44	157 29	"
17	56 44	157 33	"
17	"	"	"
28	59 31	139 32	Gulf
May 10	56 44	157 29	Kodiak
14	58 27	154 04	"
15	58 27	154 03	"
15	56 33	154 04	"
Jun. 20	52 56	168 52	Aleutians
Jul. 9	57 25	156 22	Kodiak
9	"	"	"
9	"	"	"
9	"	"	"
10	"	"	"
10	"	"	"
10	"	"	"
10	"	"	"
10	"	"	"
22	57 14	156 23	"
Aug. 3	57 15	156 22	"
24	57 49	152 20	"
Sep. 2	57 44	155 38	"
Jul. 24, 1959	59 17	154 08	"
Aug. 3	57 01	156 49	"
Jul. 9, 1960	57 23	156 19	"
Mar. 1, 1962	56 30	154 07	"
Apr. 7	57 47	152 24	Kodiak
Jun. 3	46 49	124 06	Washington

Table 22. Record of recoveries of drift bottles released on August 17, 1957 at the position 55° 43'N, 142° 21'W; 1008 released, 6 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 3, 1957	59° 21'	151° 55'	Kodiak
8	57 34	154 29	"
Jan. 25, 1958	59 36	150 10	"
Feb. 26	57 32	152 15	"
Oct. 5, 1960	59 23	150 31	"
Jul. 30, 1961	55 49	155 31	"

Table 23. Record of recoveries of drift bottles released on August 24, 1957 at the position 50° 02'N, 144° 55'W (Ocean Station "P"); 1008 released, 39 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 3, 1957	59° 26'	146° 20'	Gulf
3	"	"	"
3	"	"	"
3	"	"	"
3	"	"	"
3	"	"	"
3	"	"	"
3	"	"	"
7	"	"	"
Jan. 6, 1958	59 27	146 18	"
27	56 54	153 43	Kodiak
30	56 53	153 43	"
Feb. 2	57 06	153 10	"
4	57 32	152 15	"
16	57 39	152 29	"
21	57 36	152 27	"
28	52 55	168 47	Aleutians
Mar. 1	58 00	152 46	Kodiak
4	56 50	153 47	"
4	"	"	"
8	57 11	153 11	"
20	57 10	153 17	"
25	59 11	151 48	"
31	58 33	152 30	"
Apr. 15	56 33	154 04	"
May 14	58 27	154 04	"
14	"	"	"
25	58 31	153 55	"
Jun. 26	55 50	155 32	"
Jul. 6	55 04	163 12	Aleutians
Aug. 2	58 19	154 11	Kodiak
6	59 13	151 00	"
15	56 15	158 20	"
30	59 18	150 55	"
Sep. 26, 1958	59 26	146 20	Gulf
Nov. 6	54 08	165 45	Aleutians
Oct. 27, 1959	54 24	162 27	"
Feb. 12, 1960	56 38	154 08	Kodiak
Jun. 27	53 05	168 26	Aleutians

Table 24. Record of recoveries of drift bottles released on September 27, 1957 at the position 50° 00'W, 144° 09'W (Ocean Station "F"); 1008 released, 92 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 25, 1957	60° 03'	142° 11'	Gulf
Jan. 5, 1958	59 22	139 30	"
5	59 22	139 20	"
5	"	"	"
5	"	"	"
5	"	"	"
8	59 31	139 42	"
8	59 33	139 45	"
11	"	"	"
15	59 26	139 35	"
15	"	"	"
15	"	"	"
15	"	"	"
16	59 31	139 42	"
18	60 04	142 22	"
18	"	"	"
18	60 04	142 21	"
18	60 04	142 22	"
18	"	"	"
18	"	"	"
18	"	"	"
18	"	"	"
19	60 04	142 20	"
19	"	"	"
19	"	"	"
19	"	"	"
19	60 04	142 22	"
19	60 04	142 20	"
19	"	"	"
19	"	"	"
19	60 04	142 21	"
19	60 04	142 22	"
19	60 04	142 21	"
19	60 03	142 16	"
19	60 04	142 22	"
19	"	"	"
19	59 32	139 51	"
20	60 06	142 32	"
21	60 06	142 33	"
24	60 04	142 23	"
25	60 03	142 13	"
29	59 24	139 30	"
29	"	"	"
29	"	"	"
29	"	"	"
29	"	"	"

Table 24 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 29, 1958	59° 24'	139° 30'	Gulf
29	59 32	139 50	"
30	59 24	139 30	"
30	59 22	139 20	"
30	"	"	"
30	59 24	139 30	"
30	59 24	139 30	"
30	59 22	139 20	"
31	59 32	139 51	"
31	"	"	"
31	59 26	139 34	"
Feb. 6	59 22	139 20	"
6	59 24	139 30	"
12	59 24	139 26	"
15	60 04	142 26	"
15	"	"	"
Mar. 1	59 33	139 50	"
12	60 01	142 24	"
12	"	"	"
12	"	"	"
12	"	"	"
14	"	"	"
14	"	"	"
14	"	"	"
20	59 11	150 58	Kodiak
22	59 28	139 37	Gulf
Apr. 7	60 04	142 25	"
7	"	"	"
20	59 55	147 31	"
May 11	60 06	142 47	"
20	60 02	143 24	"
21	"	"	"
23	60 00	143 48	"
23	"	"	"
23	"	"	"
28	59 32	139 49	"
Jul. 2	59 23	139 24	"
15	59 26	139 30	"
Sep. 1	60 23	146 25	"
5	60 05	142 50	"
Apr. 13, 1959	60 01	142 24	"
15	60 04	142 23	"
Nov. 13, 1960	60 01	142 24	"
Jul. 10, 1961	"	"	"
Aug. 15	59 32	139 47	"
Apr. 20, 1962	60 05	142 29	"

Table 25. Record of recoveries of drift bottles released on November 2, 1957 at the position 50° 05'N, 145° 00'W (Ocean Station "P"); 1008 released, 22 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Feb. 1, 1958	59° 26'	146° 21'	Gulf
6	57 46	152 20	Kodiak
26	57 32	152 15	"
Mar. 3	57 46	152 25	"
Apr. 15	56 33	154 04	"
22	58 24	152 08	"
May 17	58 21	154 02	"
July 4	57 04	135 36	Southeast
9	57 25	156 22	Kodiak
10	"	"	"
15	57 15	156 20	Kodiak
Aug. 11	53 28	132 50	Charlottes
Mar. 31, 1959	58 22	152 12	Kodiak
June 8	53 56	133 12	Charlottes
8	"	"	Charlottes
May 7, 1960	53 33	132 58	"
7	"	"	"
7	"	"	Charlottes
7	"	"	Charlottes
June 26	60 00	144 13	Gulf
July 6, 1961	57 15	156 22	Kodiak
Mar. 12, 1962	56 35	153 20	"

Table 26. Record of recoveries of drift bottles released on December 13, 1957 at the position 49° 41'N, 141° 16'W; 973 released, 42 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
May 23, 1958	59° 32'	139° 46'	Gulf
June 2	59 34	139 48	"
July 22	57 14	156 23	Kodiak
25	59 27	139 34	Gulf
Aug. 10	56 51	135 32	Southeast
23	54 10	133 02	Charlottes
25	53 04	132 31	"
27	54 11	133 00	"
Sept. 1	54 05	131 47	"
4	59 37	151 25	Kodiak
6	60 06	149 27	Gulf
14	59 26	146 20	"
15	54 05	131 47	Charlottes
Oct. 7	54 11	132 59	"
Oct. 20	46 00	123 55	Washington
21	45 28	123 58	Oregon
29	56 39	133 43	Southeast
Nov. 23	57 39	152 31	Kodiak
29	45 14	123 58	Oregon
Dec. 22	57 50	136 26	Southeast
Feb. 19, 1959	55 45	132 16	"
Apr. 20	54 12	133 00	Charlottes
25	56 32	154 05	Kodiak
May 16	59 26	151 43	"
23	59 32	139 48	Gulf
31	60 24	146 09	"
June 15	59 33	139 55	"
16	50 48	128 35	West Coast
Oct. 4	54 04	131 50	Charlottes
Apr. 15, 1960	46 42	123 58	Washington
June 18	55 51	155 39	Kodiak
July 6	57 09	135 47	Southeast
15	58 00	136 33	"
20	58 58	138 07	Gulf
Aug. 9	59 15	138 57	"
28	52 13	131 22	Charlottes
29	52 26	131 33	"
Oct. 28	59 57	148 47	Gulf
Dec. 23	55 30	133 26	Southeast
June 3, 1961	60 20	146 15	Gulf
Aug. 11	59 08	151 48	Kodiak
Nov. 2	53 46	132 15	Charlottes

Table 27. Record of recoveries of drift bottles released on January 25, 1958 at the position 49° 55'N, 144° 52'W (Ocean Station "P"); 1008 released, 58 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Aug. 24, 1958	54° 05'	131° 48'	Charlottes
24	54 06	131 43	"
Oct. 10	54 01	132 10	"
Nov. 1	46 05	123 56	Washington
12	47 04	124 10	"
13	46 54	124 06	"
14	46 33	124 02	"
14	45 54	123 57	Oregon
16	44 53	124 02	"
17	45 21	124 00	"
19	47 01	124 09	Washington
21	48 08	124 43	"
Dec. 3	49 03	125 44	West coast
8	47 21	124 19	Washington
21	43 45	124 11	Oregon
28	55 32	132 25	Southeast
28	46 57	124 08	Washington
28	54 09	131 40	Charlottes
Jan. 3, 1959	49 03	125 43	West coast
13	47 01	124 10	Washington
15	46 05	123 56	"
17	54 10	131 40	Charlottes
18	46 24	124 03	Washington
20	45 15	123 58	Oregon
24	46 13	124 00	Washington
25	46 56	124 10	"
29	45 50	123 58	Oregon
29	45 13	123 59	"
30	44 34	124 04	"
31	44 00	124 06	"
Feb. 5	46 24	124 03	Washington
6	45 43	123 56	Oregon
7	43 37	123 56	"
10	43 12	124 24	"
14	44 40	124 04	"
22	38 17	123 01	California
Mar. 1	45 54	123 57	Oregon
5	47 01	124 10	Washington
12	47 13	124 12	"
14	48 07	124 42	"
21	43 07	124 25	Oregon
May 10	54 05	132 15	Charlottes
July 26	54 07	132 36	"
Aug. 24	50 50	128 13	West Coast

Table 27 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Sept. 19, 1959	53° 02'	132° 28'	Charlottes
21	52 13	131 22	"
Nov. 4	21 21	157 42	Hawaii
Dec. 13	46 13	124 00	Washington
17	52 48	129 20	Charlottes
Jan. 16, 1960	21 40	157 56	Hawaii
Apr. 16	21 12	157 09	"
May 14	49 24	126 33	West Coast
June 11	54 10	133 02	Charlottes
Feb. 5, 1961	13 59	124 19 E	Philippines
Sept. 10	28 20 N	129 30 E	Japan
Nov. 27	54 03	131 53	Charlottes
Jan. 21, 1962	26 30 N	127 00 E	Japan
Mar. 11	13 08 N	123 44 E	Philippines

Table 28. Record of recoveries of drift bottles released on March 7, 1958 at the position 49° 36' N, 136° 11' W; approx. 1000 released, 94 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 18, 1959	46° 23'	124° 03'	Washington
23	45 12	123 58	Oregon
28	45 06	123 59	"
28	45 44	123 56	"
29	47 04	124 10	Washington
30	45 54	123 57	Oregon
31	45 12	123 58	"
31	44 42	124 04	"
31	46 59	124 10	Washington
Feb. 1	45 03	124 00	Oregon
1	42 44	124 30	"
2	44 21	124 06	"
3	45 29	123 58	"
4	45 37	123 56	"
5	46 30	124 03	Washington
5	46 21	124 03	"
7	45 23	123 59	Oregon
7	45 21	123 59	"
10	44 59	124 04	"
20	44 38	124 03	"
21	46 05	123 56	Washington
23	45 26	123 57	Oregon
23	46 21	124 03	Washington
25	46 42	123 59	"
26	47 07	124 10	"
27	46 43	124 02	"
Mar. 1	46 27	124 03	"
2	46 13	124 00	"
3	48 49	125 11	West Coast
3	46 02	123 55	Washington
4	46 54	124 08	"
4	46 21	124 03	"
5	47 04	124 10	"
5	46 21	124 03	"
6	"	"	"
7	48 22	124 41	"
8	47 07	124 10	"
8	46 05	123 56	"
8	45 21	124 00	Oregon
9	46 21	124 03	Washington
9	46 21	124 03	"
9	46 21	124 03	"
9	45 37	123 56	Oregon
9	46 56	124 08	Washington
10	46 43	124 02	"
12	48 12	124 42	"
12	46 16	124 00	"

Table 28 cont'd

Recovery Date		Recovery Position Latitude N Longitude W		Recovery Region
Mar.	13, 1959	49° 03'	125° 43'	West Coast
	14	44 42	124 04	Oregon
	14	48 07	124 42	Washington
	17	49 02	125 41	West Coast
	17	"	"	"
	17	"	"	"
	17	49 03	125 43	"
	17	"	"	"
	18	43 07	124 25	Oregon
	18	44 38	124 03	"
	19	44 10	124 07	"
	20	46 38	124 04	Washington
	21	48 06	124 41	"
	22	45 34	123 56	Oregon
	24	45 32	123 57	"
	26	43 00	124 28	"
	27	47 13	124 12	Washington
	28	43 52	124 09	Oregon
	29	44 52	124 03	"
	30	44 26	124 04	"
	31	43 39	124 13	"
	31	46 02	123 55	Washington
Apr.	1	46 12	124 09	"
	4	43 51	124 01	Oregon
	26	39 32	123 46	California
	30	47 03	124 10	Washington
May	7	44 05	124 08	Oregon
	10	47 37	124 22	Washington
	22	41 01	124 07	California
	29	44 38	124 03	Oregon
	11	48 51	125 12	West Coast
Nov.	10	21 10	157 01	Hawaii
Dec.	15	46 21	124 03	Washington
	22	21 21	157 42	Hawaii
	23	21 06	157 09	"
	31	21 20	157 57	"
Jan.	14, 1960	22 09	159 20	"
Feb.	11	43 42	123 11	Oregon
	20	21 27	157 45	Hawaii
	22	42 59	124 28	Oregon
Apr.	20	21 21	157 42	Hawaii
May	21	28 16	177 30	Midway
	31	21 52	160 09	Hawaii
May	7, 1961	24 31 N	124 17 E	Japan
Nov.	24	25 00 N	125 30 E	"
Dec.	11	34 03	139 33 E	"
Feb.	3, 1962	14 52	122 03 E	Philippines

Table 29. Record of recoveries of drift bottles released on April 19, 1958 at the position 50° 10' N, 145° 00' W. (Ocean Station "P"); 1008 released, 31 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Aug. 15, 1958	59° 26'	146° 20'	Gulf
28	"	"	"
28	"	"	"
30	"	"	"
30	"	"	"
30	59 18	150 55	Kodiak
Sept. 19	59 21	151 55	"
Oct. 8	60 16	147 07	Gulf
12	59 46	151 52	Kodiak
13	59 29	139 43	Gulf
15	58 30	152 26	Kodiak
22	60 05	147 20	Gulf
Jan. 15, 1959	60 24	146 09	"
31	57 47	152 20	Kodiak
Apr. 28	56 32	154 05	"
May 1	58 27	154 04	"
June 15	59 56	147 26	Gulf
19	60 22	146 12	"
21	57 27	152 29	Kodiak
21	60 12	144 40	Gulf
Aug. 1	59 26	146 20	"
Sept. 21	59 34	151 31	Kodiak
Oct. 3	59 26	146 20	Gulf
Nov. 3	59 23	150 24	Kodiak
Dec. 1	59 56	147 27	Gulf
2	59 48	147 55	"
May 20, 1960	59 30	139 49	"
June 1	58 02	152 45	Kodiak
1	"	"	"
June 1, 1961	57 08	153 10	"
June 13, 1962	57 24	152 17	"

Table 30. Record of recoveries of drift bottles released on May 30, 1958 at the position 49° 58'N, 144° 27' W, (Ocean Station "P"); 1003 released, 27 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Oct. 4, 1958	59° 33'	139° 45'	Gulf
15	57 10	135 42	Southeast
19	56 51	135 32	"
Nov. 4	57 30	134 55	"
10	57 02	134 33	"
15	59 33	139 45	Gulf
Mar. 1, 1959	57 00	135 50	Southeast
Apr. 3	57 06	135 46	"
30	60 00	144 20	Gulf
May 8	57 39	136 11	Southeast
13	57 11	135 30	"
13	54 06	133 04	Charlottes
June 7	59 26	146 20	Gulf
10	55 58	133 37	Southeast
15	59 33	139 55	Gulf
28	59 00	138 07	"
July 15	55 52	134 18	Southeast
Aug. 14	58 58	138 05	Gulf
Jan. 28, 1960	56 23	133 53	Southeast
Feb. 28	59 32	139 50	Gulf
May 20	59 30	139 49	"
29	57 10	135 42	Southeast
July 1	59 15	138 57	Gulf
20	58 58	138 07	"
19	57 09	135 47	Southeast
Aug. 16	59 57	141 38	Gulf
24	59 24	139 27	"

Table 31. Record of recoveries of drift bottles released on July 2, 1958 at the position 44° 29'N, 146° 20'W; 456 released, 67 recovered.

Recovery Date		Recovery Position		Recovery Region
		Latitude N	Longitude W	
Jan.	2, 1959	44° 26'	124° 03'	Oregon
	8	44 28	124 05	"
	13	46 00	123 55	Washington
	13	44 30	124 05	Oregon
	13	47 04	124 10	Washington
	14	46 02	123 55	"
	15	46 13	124 00	"
	23	46 05	123 56	"
	23	46 43	124 02	"
	24	46 49	124 06	"
	25	46 53	124 06	"
Feb.	1	46 11	123 59	"
	7	45 22	123 59	Oregon
	10	44 38	124 04	"
	14	45 12	123 58	"
	14	44 38	124 04	"
	15	43 40	124 03	"
	25	47 04	124 10	Washington
Mar.	1	48 16	124 41	"
	2	54 05	131 45	Charlotte
	3	49 01	125 41	West Coast
	5	47 41	124 29	Washington
	7	49 53	124 36	"
	8	46 28	124 03	"
	8	46 54	124 06	"
	8	46 18	124 04	"
	8	47 55	124 38	"
	8	47 01	124 10	"
	8	46 55	124 08	"
	8	50 02	127 22	West Coast
	9	46 30	124 03	Washington
	10	48 20	124 40	"
	11	50 30	128 03	West Coast
	11	46 03	123 55	Washington
	12	46 31	124 04	"
	13	49 03	125 43	West Coast
	13	49 03	125 43	"
	13	43 44	124 05	Oregon
	13	48 12	124 42	Washington
	14	48 20	124 40	"
	15	47 55	124 37	"
	15	48 12	124 42	"
	17	49 03	125 43	West Coast
	17	"	"	"
	17	"	"	"
	17	"	"	"

Table 31 cont'd

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Mar. 17, 1959	49° 02'	125° 41'	West Coast
18	50 30	128 03	"
19	46 33	124 02	Washington
19	49 03	125 43	West Coast
21	48 09	124 43	Washington
22	48 11	124 42	"
22	48 09	124 44	"
22	48 06	124 41	"
27	47 41	124 29	"
Apr. 9	48 09	123 26	"
9	49 09	125 59	West Coast
12	49 10	126 01	"
May 1	47 03	124 10	Washington
14	53 49	130 38	Charlottes
23	48 02	124 41	Washington
June 20	46 54	124 06	"
July 30	50 07	127 44	West Coast
30	50 00	127 27	"
Sept. 23	48 47	125 10	"
Nov. 12	46 58	124 10	Washington
Feb. 3, 1960	47 17	124 16	"

Table 32. Record of recoveries of drift bottles released on July 3, 1958 at the position 46° 21' N, 149° 54' W; 550 released, 14 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Dec. 15, 1958	53° 19'	131° 57'	Charlottes
Feb. 28, 1959	59 26	146 20	Gulf
Mar. 1	53 37	131 55	Charlottes
6	46 21	124 03	Washington
Apr. 27	52 50	131 43	Charlottes
May 2	54 06	131 44	"
21	50 52	129 05	West Coast
June 2	59 11	151 34	Kodiak
16	57 14	153 17	"
19	58 21	152 22	"
July 15	54 13	131 40	Charlottes
Oct. 10	53 56	131 45	"
May 17, 1960	53 27	166 32	Aleutians
Sept. 1, 1961	52 11	131 07	Charlottes

Table 33. Record of recoveries of drift bottles released on July 13, 1958 at the position 50° 00'N, 145° 00'W. (Ocean Station "F"); 887 released, 26 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Oct. 18, 1958	56° 15'	134° 39'	Southeast
Dec. 10	58 00	152 47	Kodiak
18	58 33	152 30	"
22	56 16	134 40	Southeast
28	59 26	146 20	Gulf
Mar. 18, 1959	52 12	174 06	Aleutians
May 1	58 27	154 04	Kodiak
12	54 06	133 04	Charlottes
13	"	"	"
13	"	"	"
27	57 03	134 29	Southeast
29	55 50	134 17	"
June 16	55 13	133 23	"
24	59 24	139 26	Gulf
July 20	60 01	144 23	"
Aug. 16	59 35	139 31	"
Nov. 8	54 03	131 53	Charlottes
Dec. 28	55 28	133 30	Southeast
May 20, 1960	59 30	139 49	Gulf
22	58 13	153 05	Kodiak
June 17	60 04	147 20	Gulf
20	56 51	135 32	Southeast
July 20	59 15	138 57	Gulf
20	53 55	133 01	Charlottes
31	59 30	139 50	Gulf
Nov. 29	59 59	143 54	"

Table 34. Record of recoveries of drift bottles released on August 23, 1958 at the position 49° 54' N, 145° 23' W. (Ocean Station "P"); 504 released, 10 recovered.

Recovery Date	Recovery Latitude N	Recovery Position Longitude W	Recovery Region
Dec. 13, 1958	56° 15'	134° 39'	Southeast
Jan. 30, 1959	57 26	152 20	Kodiak
Feb. 1	59 34	139 48	Gulf
Apr. 22	55 30	133 35	Southeast
May 25	55 13	133 26	"
July 27	55 18	133 39	"
Aug. 15	54 49	132 58	"
Sept. 19	53 02	132 28	Charlottes
May 8, 1960	53 39	132 57	"
30	55 30	133 40	Southeast

Table 35. Record of recoveries of drift bottles released on September 27, 1958 at the position 50° 00' N, 145° 00' W. (Ocean Station "P"); 504 released, 17 recovered.

Recovery Date	Recovery Latitude N	Recovery Position Longitude W	Recovery Region
Jan. 22, 1959	57° 39'	152° 31'	Kodiak
29	57 35	152 27	"
29	"	"	"
30	57 26	152 20	"
31	57 37	152 10	"
Apr. 23	56 32	154 05	"
May 13	58 02	152 43	"
July 9	59 44	140 55	Gulf
17	60 02	144 08	"
July 28	57 26	152 20	Kodiak
Aug. 5	59 02	138 15	Gulf
Nov. 1	54 26	162 39	Aleutians
Feb. 27, 1960	59 13	151 00	Kodiak
June 26	60 00	144 13	Gulf
Oct. 14, 1961	60 03	143 27	"
21	60 05	151 38	Kodiak
June 17, 1962	56 30	154 25	"

Table 36. Record of recoveries of drift bottles released on October 31, 1958 at the position 49° 53'N, 142° 32' W. (Ocean Station "P"); 500 released, 23 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Jan. 4, 1959	54° 14'	133° 04'	Charlottes
4	"	"	"
Apr. 18	59 26	146 20	Gulf
May 2	54 10	133 01	Charlottes
26	59 15	154 05	Kodiak
30	59 14	151 30	"
31	60 23	146 07	Gulf
June 4	57 13	134 05	Southeast
19	54 11	133 05	Charlottes
28	57 23	156 19	Kodiak
July 1	39 44	140 55	Gulf
12	58 00	152 47	Kodiak
Aug. 6	58 07	152 35	Kodiak
20	59 37	151 28	"
Sept. 12	57 05	153 12	"
15	59 55	147 31	Gulf
Nov. 8	56 53	153 44	Kodiak
Dec. 21	59 32	139 51	Gulf
Feb. 19, 1960	60 21	146 12	"
Mar. 10	52 51	169 03	Aleutians
Apr. 15	60 21	146 12	Gulf
June 3	54 27	162 49	Aleutians
5	54 10	133 02	Charlottes

Table 37. Record of recoveries of drift bottles released on December 13, 1958 at the position 50° 00'N, 145° 00'W (Ocean Station "P"); 504 released, 26 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Apr. 6, 1959	57° 10'	135° 45'	Southeast
25	58 51	137 58	"
May 3	60 05	147 19	Gulf
15	59 48	149 28	"
June 6	58 02	152 43	Kodiak
16	58 00	152 54	"
17	60 22	145 00	Gulf
21	60 11	144 18	"
21	60 17	145 00	"
28	57 32	154 03	Kodiak
July 1	59 44	140 55	Gulf
4	60 06	152 35	Kodiak
9	59 44	140 55	Gulf
10	60 04	149 27	"
11	60 33	145 46	"
15	59 26	146 20	"
15	"	"	"
15	60 23	146 25	"
17	60 02	144 08	"
21	57 45	155 20	Kodiak
Aug. 1	59 48	147 55	Gulf
Sept. 12	60 05	147 21	"
Oct. 12	60 01	142 24	"
Oct. 30, 1960	57 05	153 11	Kodiak
June 12, 1961	57 30	152 18	"
Dec. 1	45 59	123 55	Oregon

Table 38. Record of recoveries of drift bottles released on January 25, 1959 at the position 49° 52'N, 145° 06'W (Ocean Station "P"); 504 released, 32 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
April 11, 1959	56° 17'	134° 38'	Southeast
May 4	55 57	133 49	"
12	54 06	133 04	Charlottes
12	"	"	"
20	55 50	133 20	Southeast
22	55 30	133 40	"
22	"	"	"
26	53 43	132 56	Charlottes
30	57 43	136 23	Southeast
June 7	54 09	131 39	Charlottes
7	"	"	"
10	54 15	133 04	"
15	53 36	132 53	"
17	53 47	133 08	"
17	"	"	"
20	54 04	133 04	"
July 10	55 22	133 38	Southeast
15	54 10	133 02	Charlottes
Aug. 9	59 26	146 20	Gulf
9	55 22	133 37	Southeast
23	56 00	133 47	"
26	59 22	139 23	Gulf
Sept. 3	54 14	133 04	Charlottes
Oct. 1	57 25	152 29	Kodiak
4	58 12	152 03	"
Dec. 2	56 53	153 44	"
Feb. 21, 1960	53 18	132 38	Charlottes
May 20	59 23	139 27	Gulf
June 14	60 18	144 58	"
Oct. 12	65 00	178 00 E	Bering Sea
Apr. 30, 1961	55 13	133 23	Southeast
June 15, 1962	56 43	154 03	Kodiak

Table 39. Record of recoveries of drift bottles released on March 7, 1959 at the position 50° 00' N, 145° 00' W (Ocean Station "P"); 504 released, 21 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
June 24, 1959	53° 46'	133° 05'	Charlottes
Aug. 25	59 06	138 30	Gulf
Sept. 13	59 26	146 20	"
18	55 55	135 20	Southeast
20	52 25	131 32	Charlottes
26	59 26	146 20	Gulf
27	44 20	124 06	Oregon
28	56 20	124 03	Washington
Oct. 8	57 49	151 21	Kodiak
27	54 10	133 02	Charlottes
30	59 30	150 45	Kodiak
Nov. 12	54 07	132 19	Charlottes
Dec. 13	44 16	124 07	Oregon
Feb. 7, 1960	48 59	125 37	West Coast
Mar. 19	43 38	124 12	Oregon
Apr. 14	57 18	152 57	Kodiak
30	56 51	135 32	Southeast
May 20	55 54	134 19	"
May 14, 1961	57 28	152 28	Kodiak
July 21	59 27	139 37	Gulf
Oct. 7	61 13	149 54	"

Table 40. Record of recoveries of drift bottles released on April 17, 1959 at the position 49° 56'N, 144° 08'W (Ocean Station "P"); 500 released, 31 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
July 7, 1959	44° 34'	124° 04'	Oregon
Aug. 23	54 02	131 56	Charlottes
25	54 13	132 58	"
27	54 10	133 02	"
Sept. 3	54 13	133 02	"
3	54 14	133 04	"
13	54 06	131 43	"
14	54 05	131 45	"
14	"	"	"
15	53 56	133 08	"
20	54 04	131 49	"
20	54 13	133 03	"
20	"	"	"
Oct. 4	54 08	131 41	"
8	52 25	131 32	"
15	54 14	133 04	"
21	59 26	146 20	Gulf
27	54 10	133 02	Charlottes
27	"	"	"
27	"	"	"
27	"	"	"
Nov. 8	54 03	131 53	"
Dec. 7	48 43	125 06	West Coast
23	55 49	132 08	Southeast
31	54 05	131 48	Charlottes
Feb. 23, 1960	54 02	132 06	"
Mar. 14	60 24	146 07	Gulf
Apr. 30	52 28	128 46	Charlottes
June 11	54 10	133 02	"
25	54 06	132 22	"
July 18	55 31	131 51	Southeast

Table 41. Record of recoveries of drift bottles released on August 9, 1959 at the position 49° 59'N, 147° 59'W; 96 released, 4 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Feb. 22, 1960	59° 31'	139° 41'	Gulf
May 8	53 39	132 57	Charlottes
July 17	53 34	132 55	"
May 6, 1961	59 56	147 26	Gulf

Table 42. Record of recoveries of drift bottles released on August 10, 1959 at the position 45° 00'N, 148° 00'W; 120 released, 4 recovered.

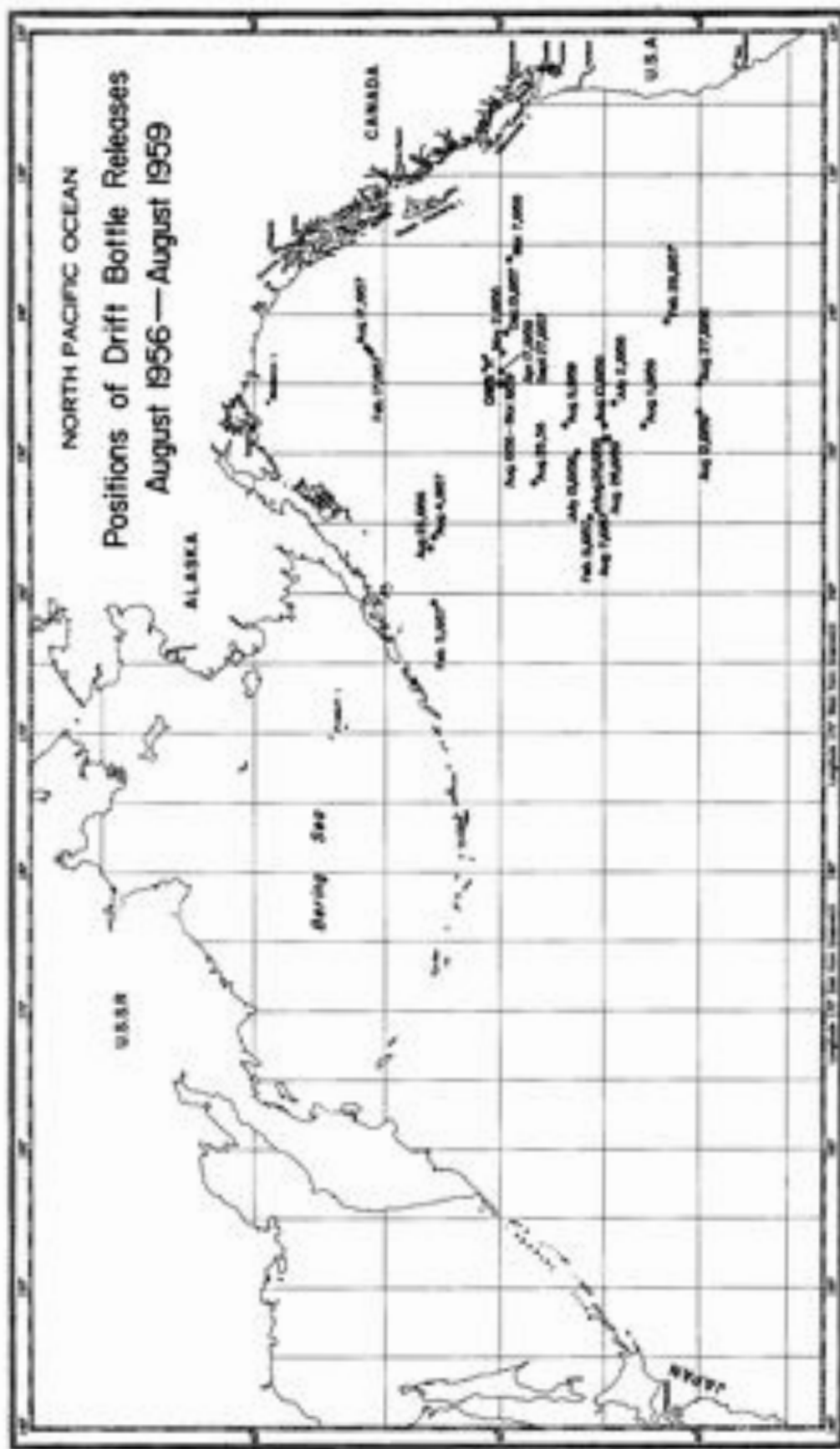
Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Apr. 16, 1960	57° 27'	152° 59'	Kodiak
May 15	57 37	152 10	"
20	57 47	152 20	"
May 6, 1961	59 56	147 20	Gulf

Table 43. Record of recoveries of drift bottles released on August 11, 1959 at the position 43° 00'N, 148° 02'W; 144 released, 6 recovered.

Recovery Date	Recovery Position		Recovery Region
	Latitude N	Longitude W	
Apr. 16, 1960	48° 20'	124° 40'	Washington
17	48 06	124 41	"
23	50 06	127 46	West Coast
May 16	45 48	123 58	Oregon
June 14	55 03	131 31	Southeast
Sept. 9	52 07	131 08	Charlottes

Table 44. Record of recoveries of drift bottles released on August 12, 1959 at the position 40° 00'N, 147° 00'; 144 released, 40 recovered.

Recovery Date		Recovery Position Latitude N Longitude W		Recovery Region
Apr.	4, 1960	45° 37'	123° 56'	Oregon
	5	45 54	123 57	"
	12	45 26	123 57	"
	13	46 05	123 56	Washington
	13	46 29	124 03	"
	14	45 26	123 57	Oregon
	14	45 29	123 58	"
	15	44 26	124 04	"
	15	45 46	123 58	"
	16	47 18	124 16	Washington
	19	48 21	123 49	West Coast
	19	47 14	124 12	Washington
	20	45 17	124 00	Oregon
	20	45 43	123 56	"
	20	45 54	123 57	"
	20	44 26	124 03	"
	21	45 14	123 58	"
	22	46 14	124 00	Washington
	23	43 23	124 19	Oregon
	23	50 06	127 46	West Coast
	30	44 20	124 06	Oregon
May	4	44 11	124 07	"
	10	47 21	124 18	Washington
	13	44 45	124 04	Oregon
	13	42 25	124 25	"
	14	44 59	124 01	"
	17	44 02	124 08	"
	17	44 21	124 06	"
	18	44 32	124 04	"
	19	47 54	124 38	Washington
	20	44 06	124 07	Oregon
	21	44 45	124 04	"
22	43 43	124 11	"	
June	1	46 10	123 58	Washington
	9	52 40	129 00	Charlotte
	18	40 45	124 14	California
July	9	48 02	124 41	Washington
Aug.	6, 1961	21 37	157 54	Hawaii
Oct.	7	42 43	124 28	Oregon
May	20, 1962	47 24	122 20	Washington



Map of the North Pacific Ocean showing the positions of drift bottle releases in August 1956. The map is based on the International Hydrographic Office chart of the North Pacific Ocean, 1956.

Figure 1

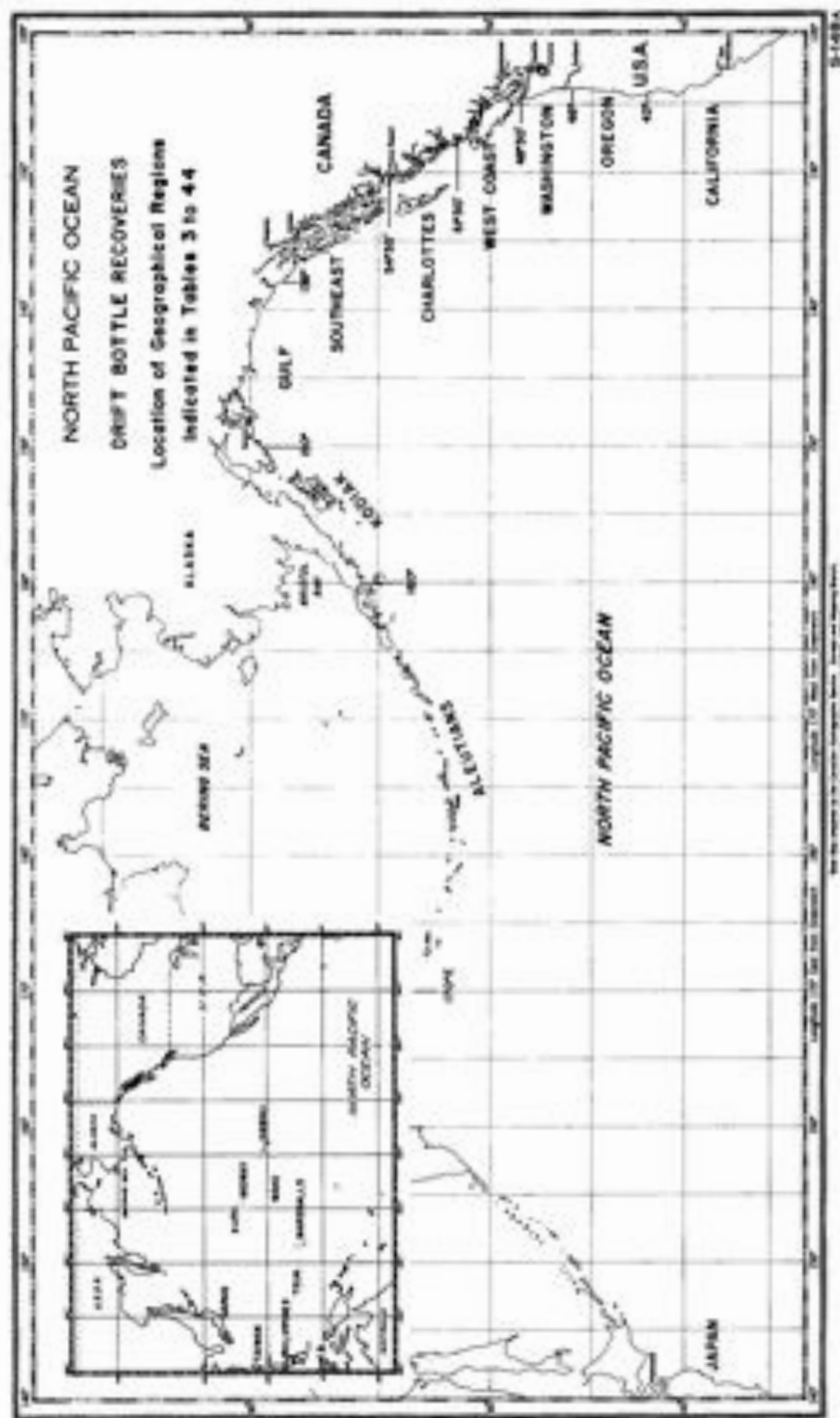
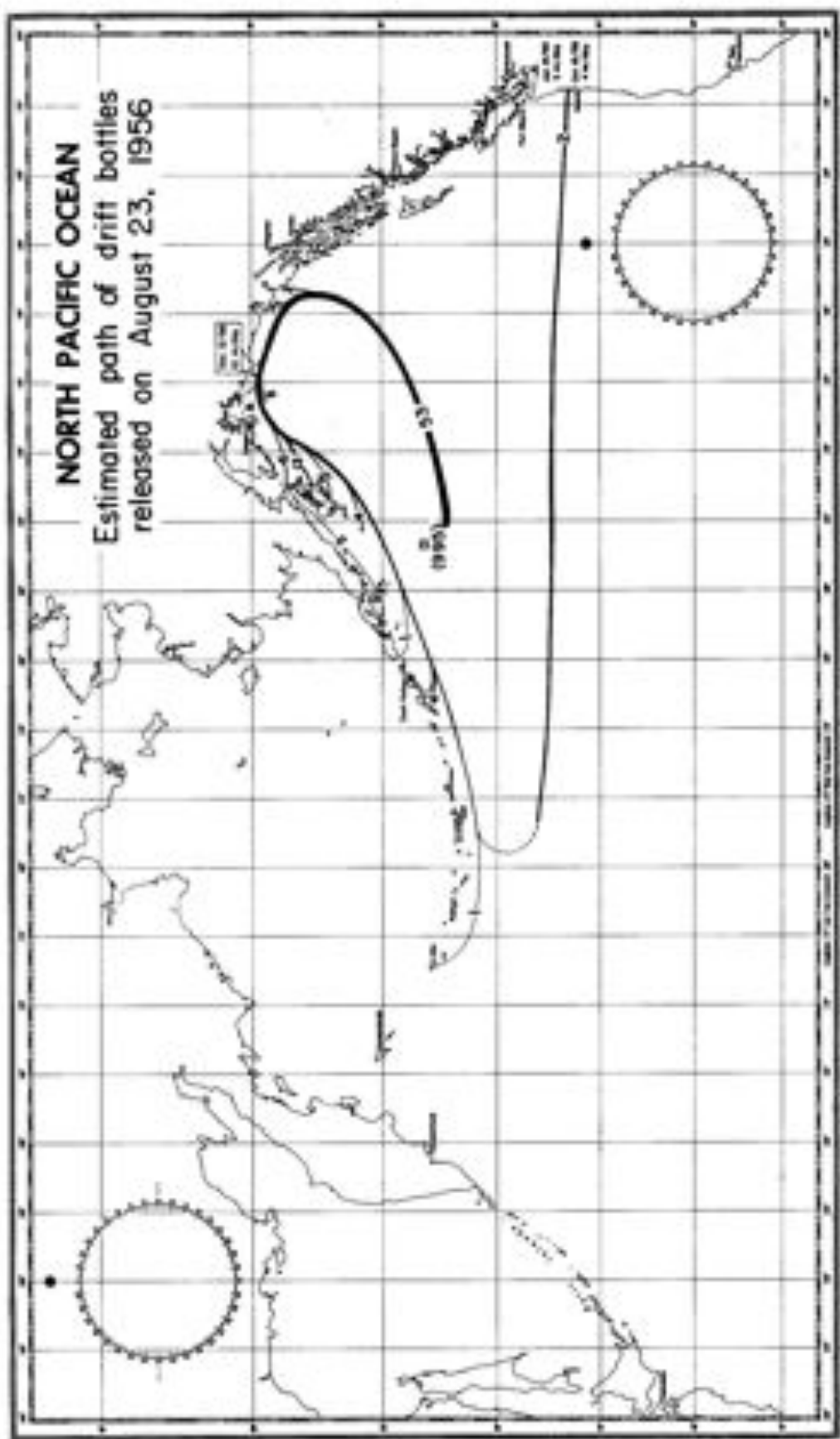


Figure 2



5-1484

THE PATH SHOWN IS AN ESTIMATED PATH, BASED ON OCEANOGRAPHIC DATA AVAILABLE AT THE TIME OF THE RELEASE.

Figure 3

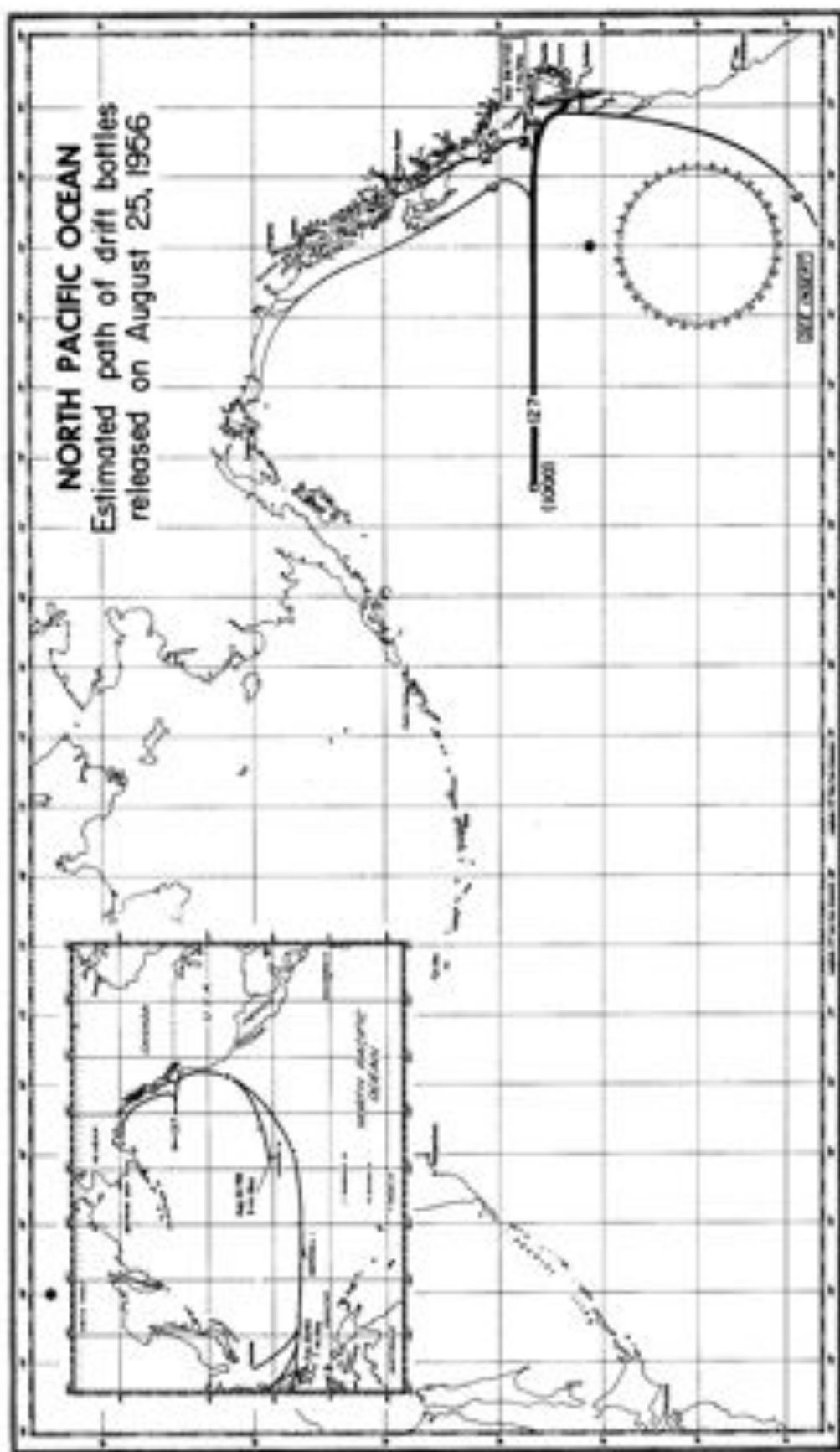


FIGURE 4
 ESTIMATED PATH OF DRIFT BOTTLES RELEASED ON AUGUST 25, 1956

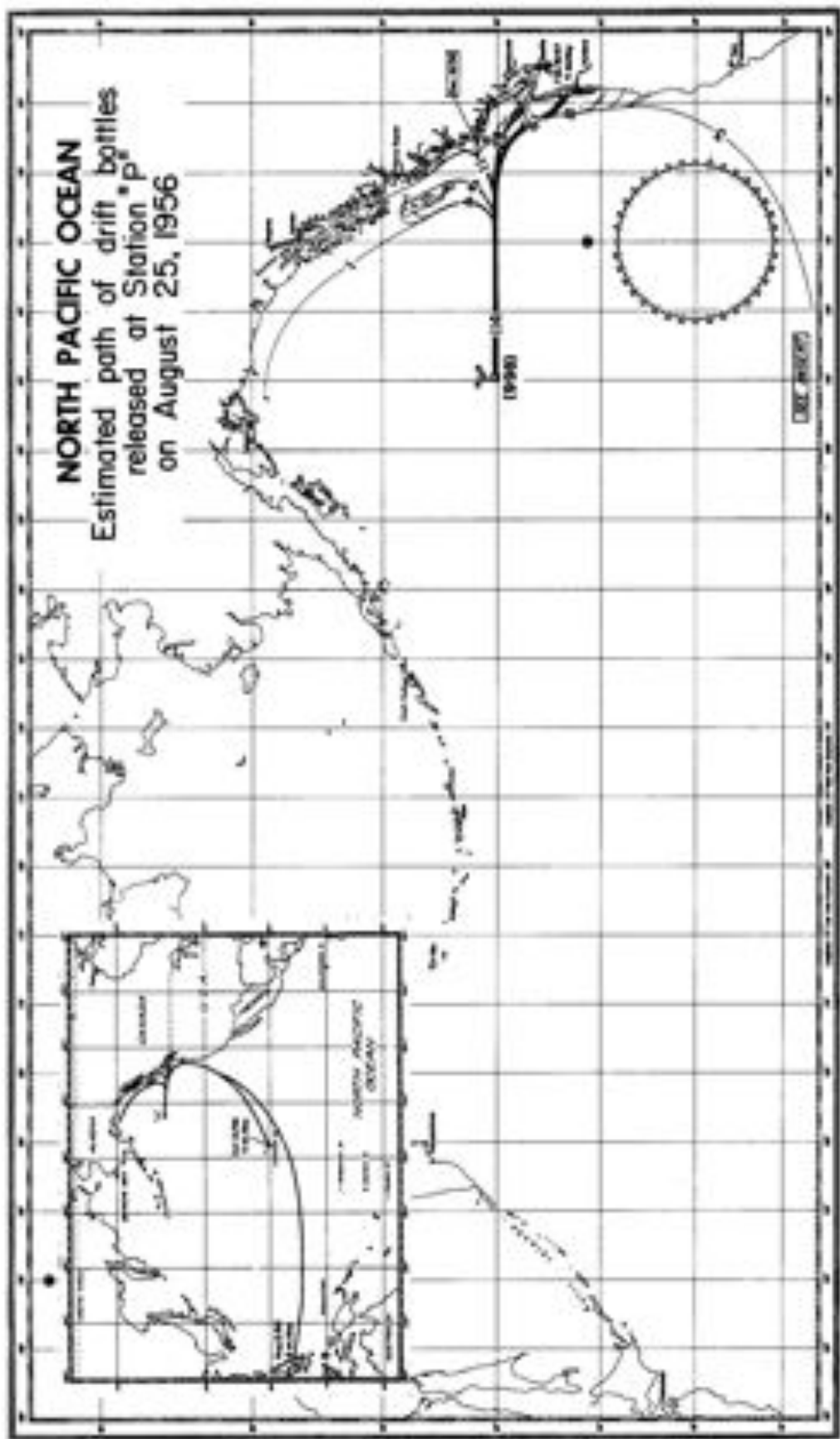


Figure 3

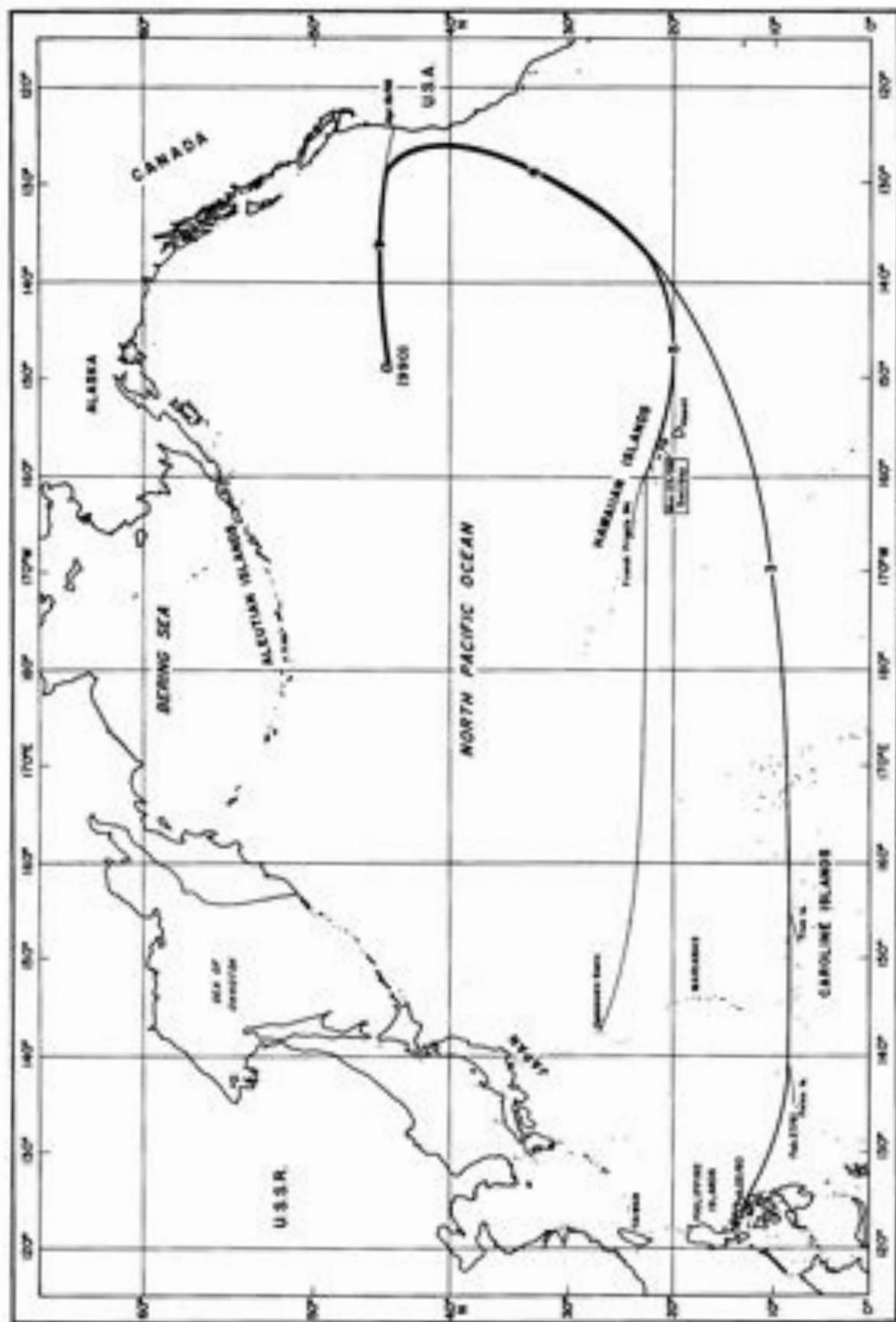


Figure 6. Estimated path of drift battles released on August 26, 1954.

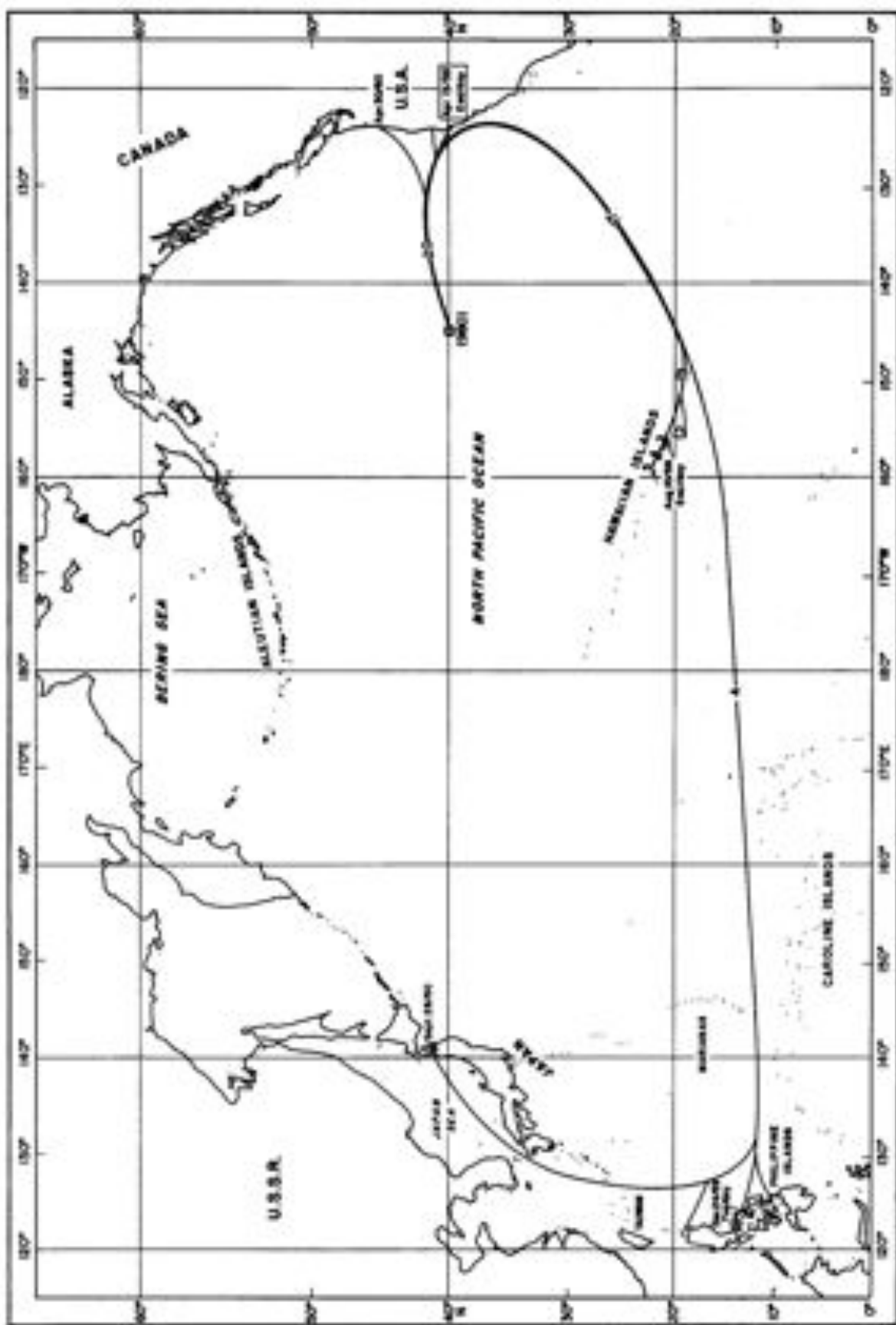


Figure 7. Estimated path of drift bottles released on August 27, 1956.

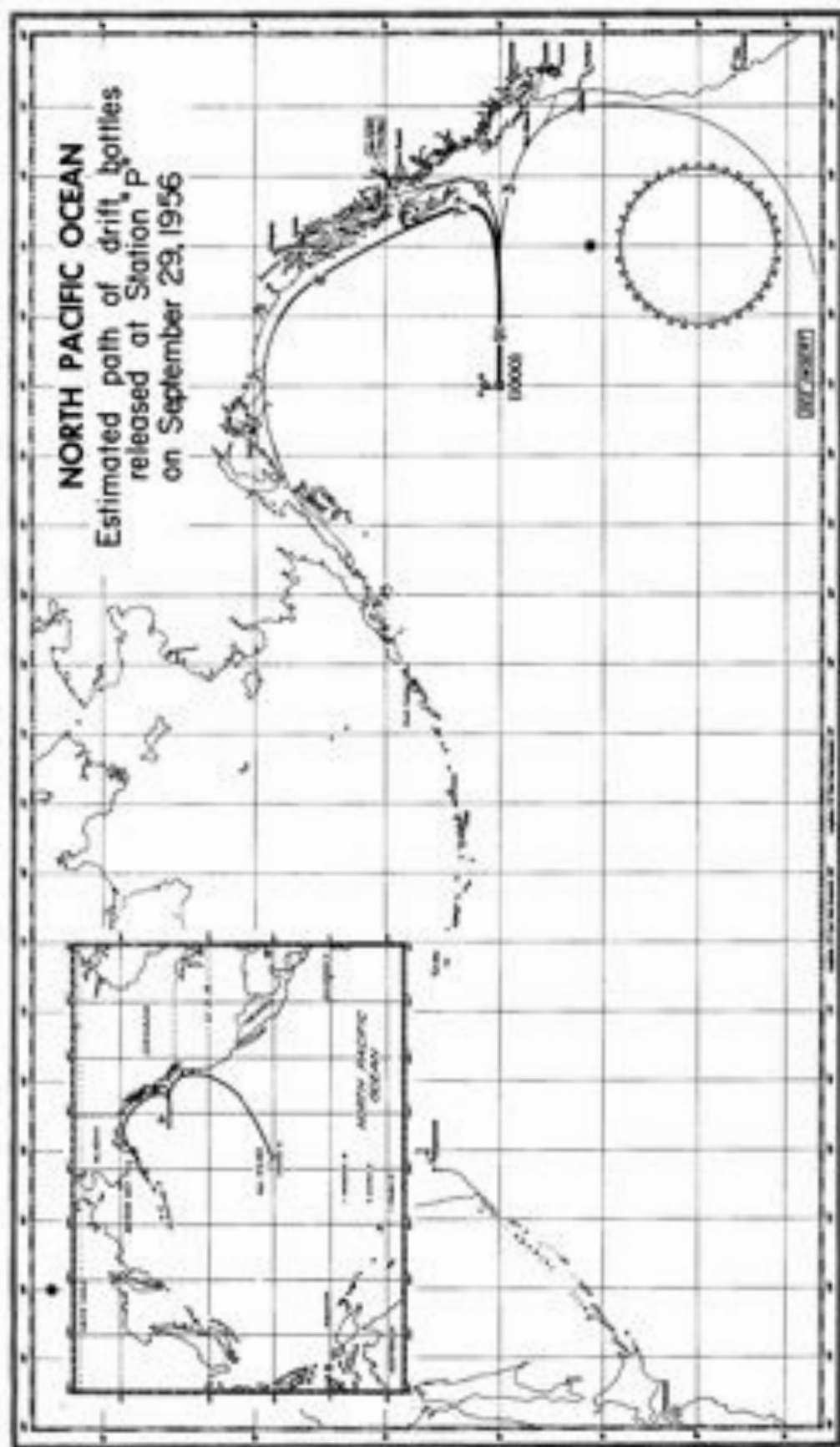
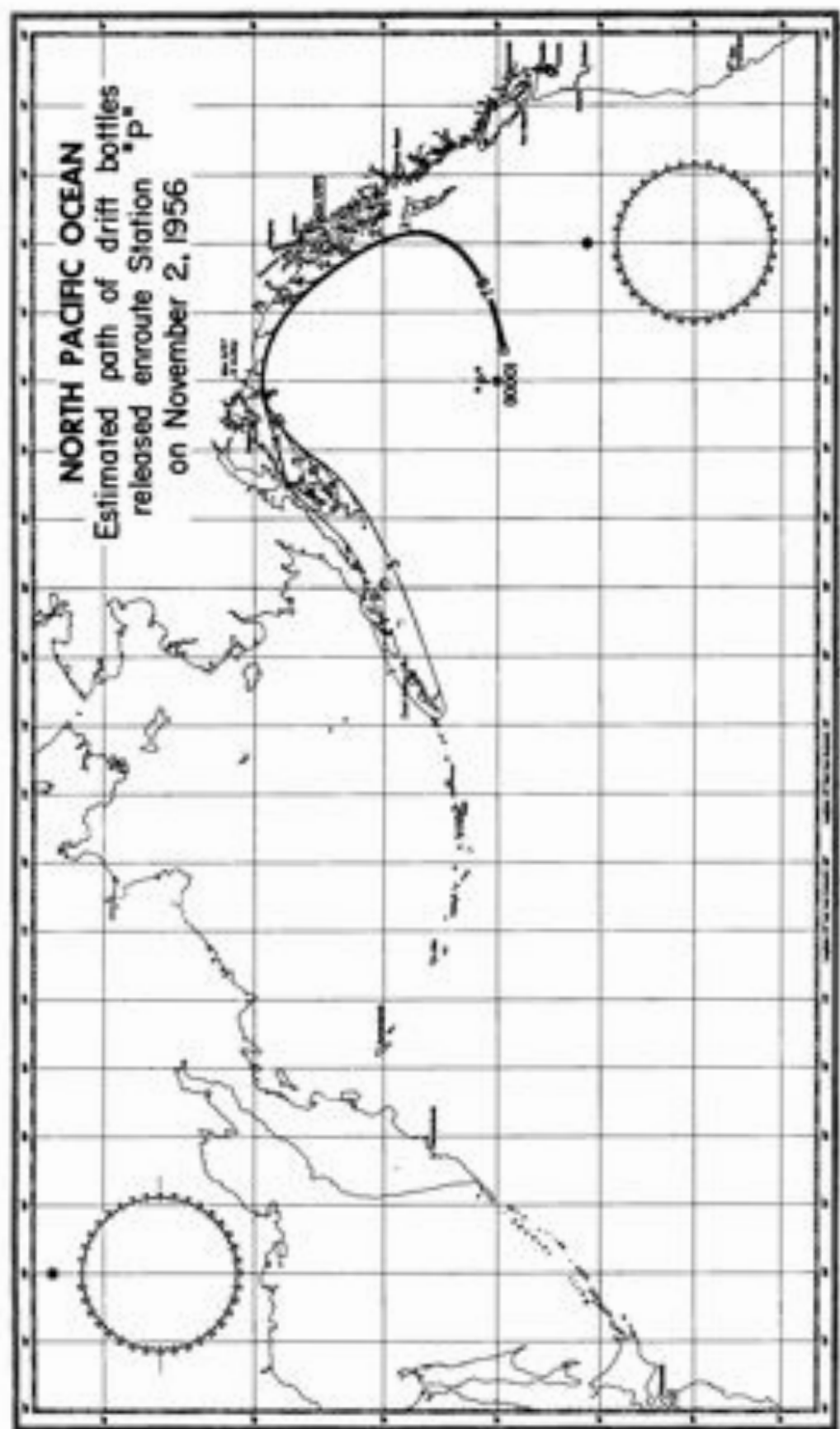


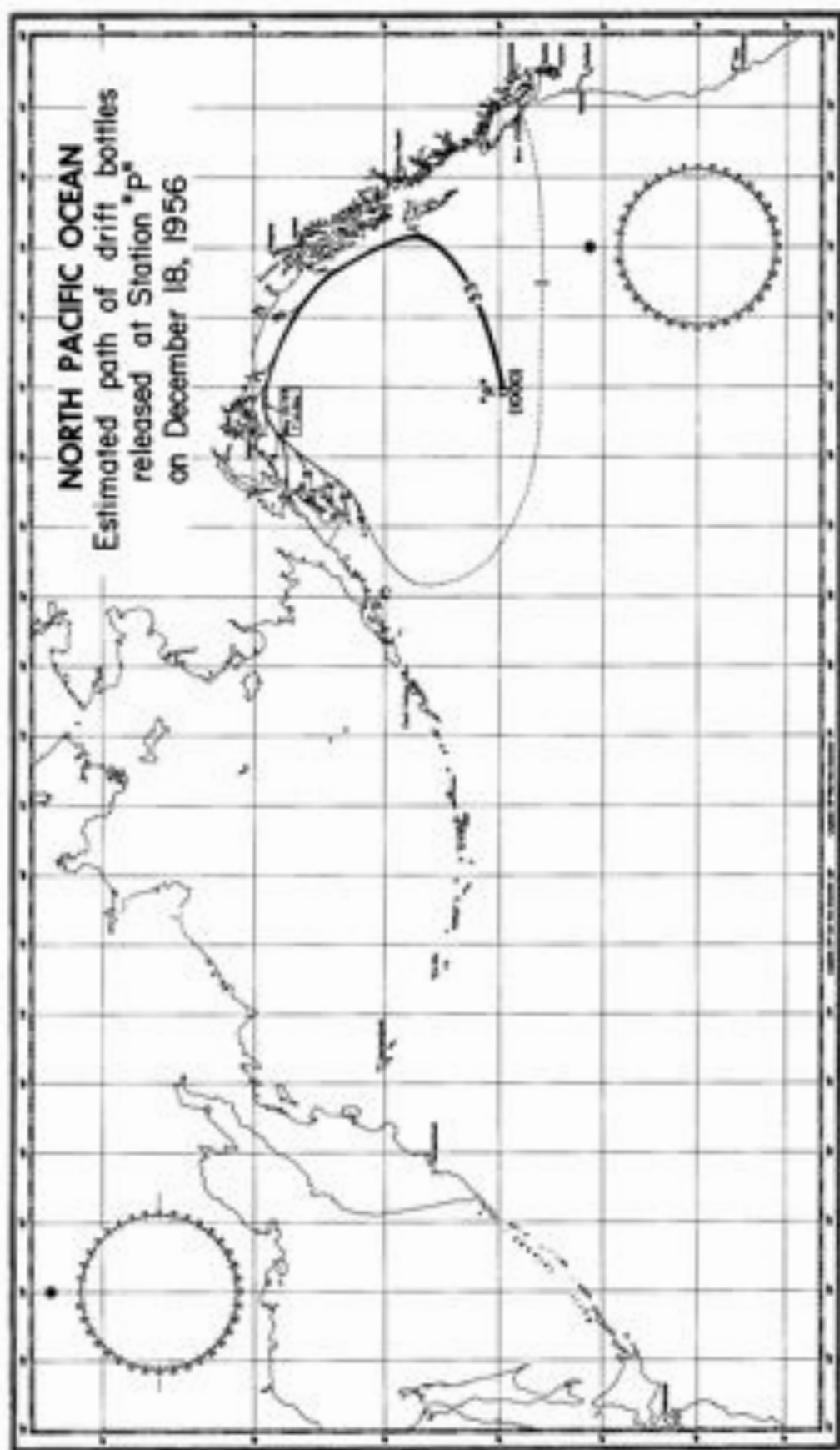
Figure 8
 THE MAP SHOWN IS BASED ON DATA FROM THE U.S. FLEET OCEANOGRAPHIC OFFICE, WASHINGTON, D.C.



8-14821

NO. 10. NORTH PACIFIC OCEAN. ESTIMATED PATH OF DRIFT BOTTLES RELEASED ENROUTE STATION P ON NOVEMBER 2, 1956.

Figure 8



Figures 10

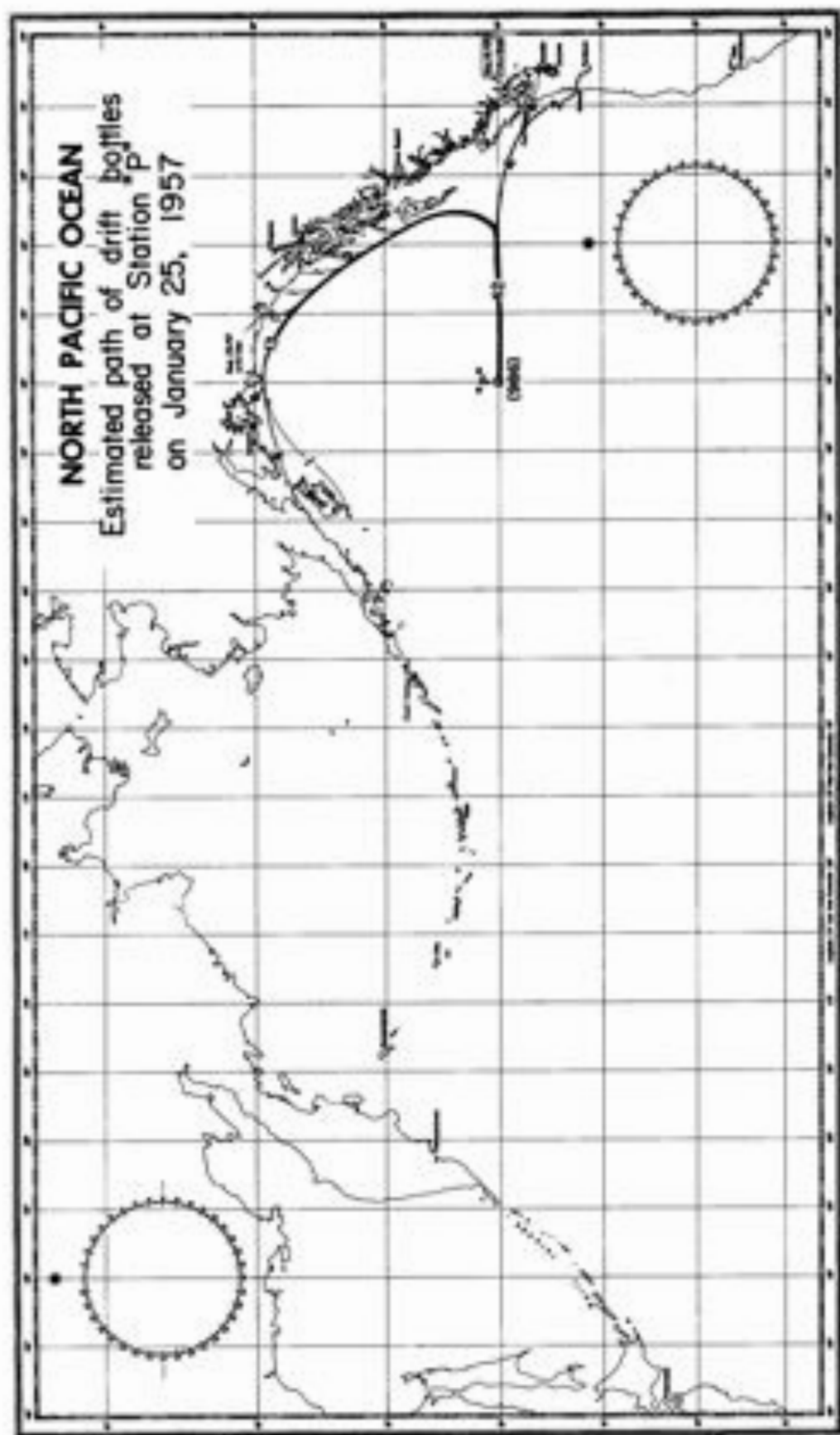


Figure 11
 Estimated path of drift bottles released at Station P on January 25, 1957.

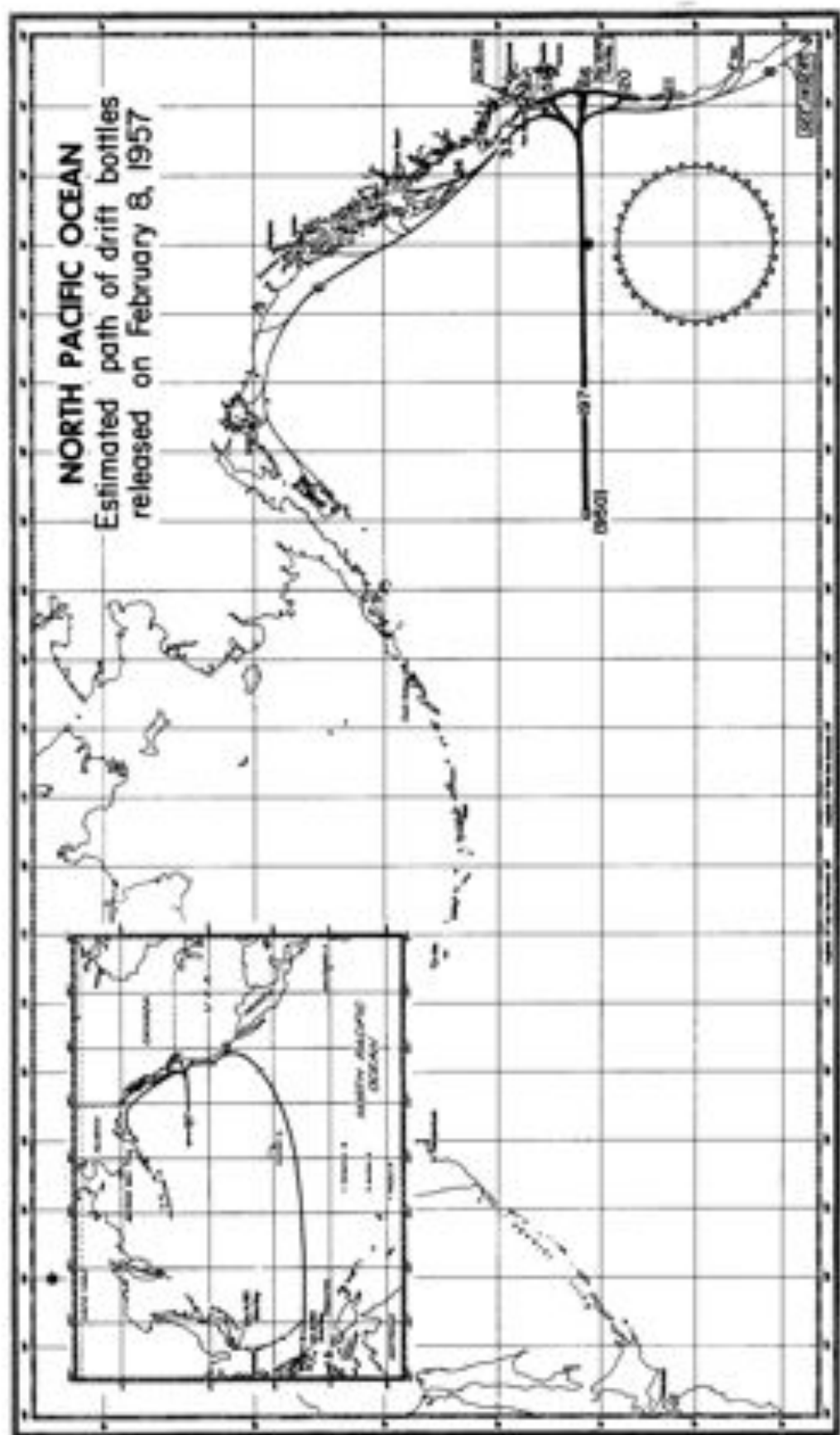
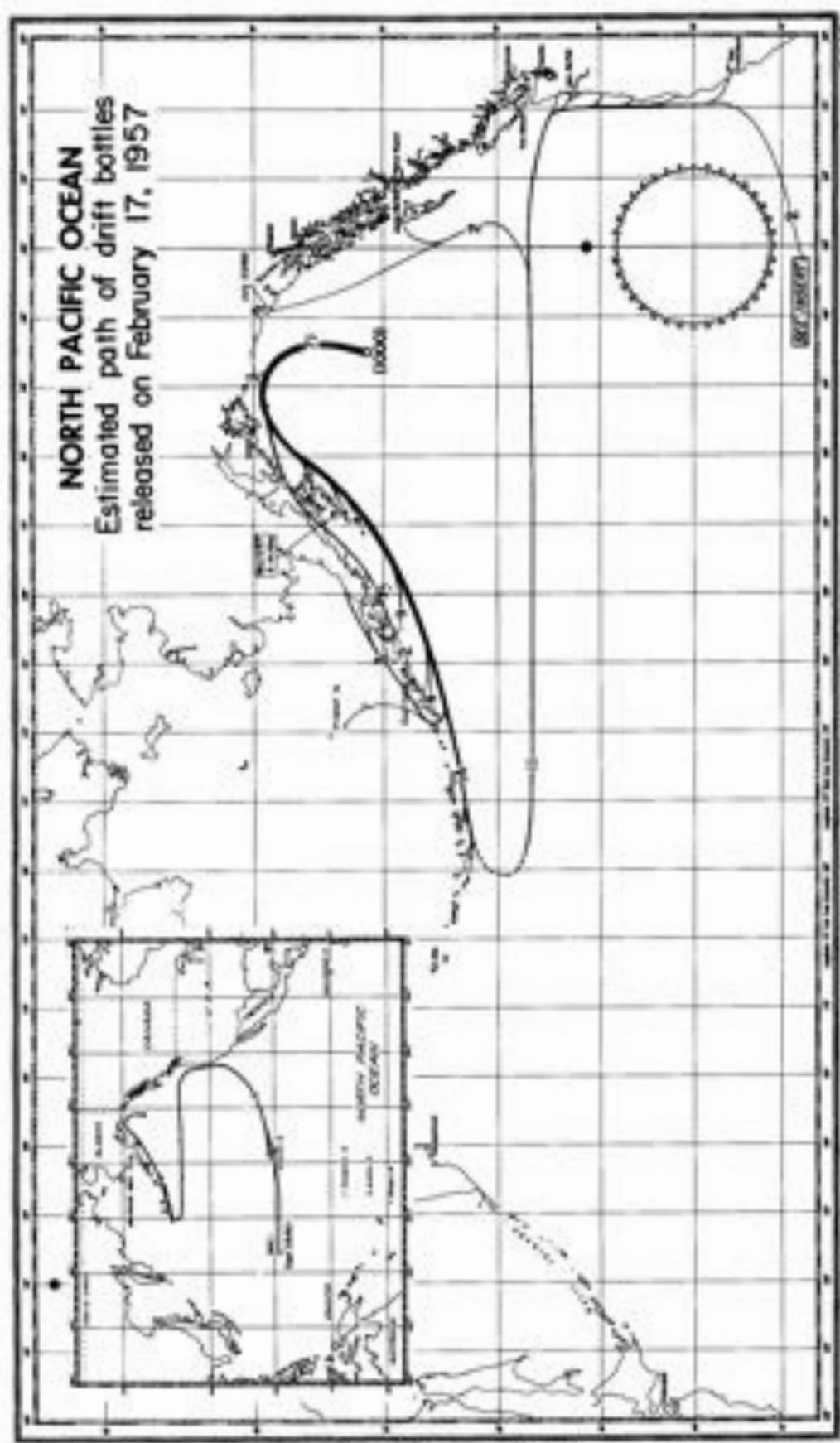


Figure 13
 Estimated path of drift bottles released on February 8, 1957



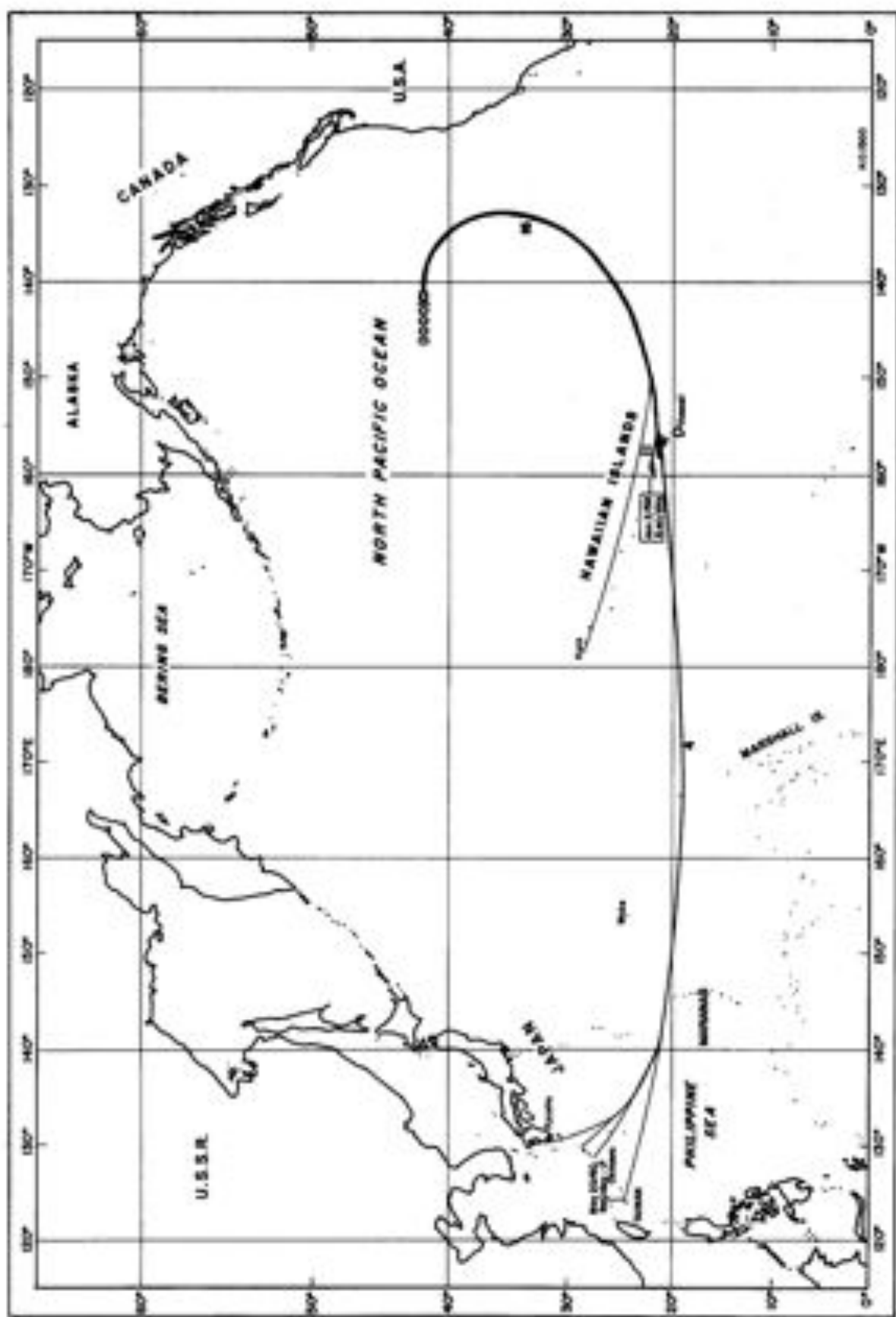
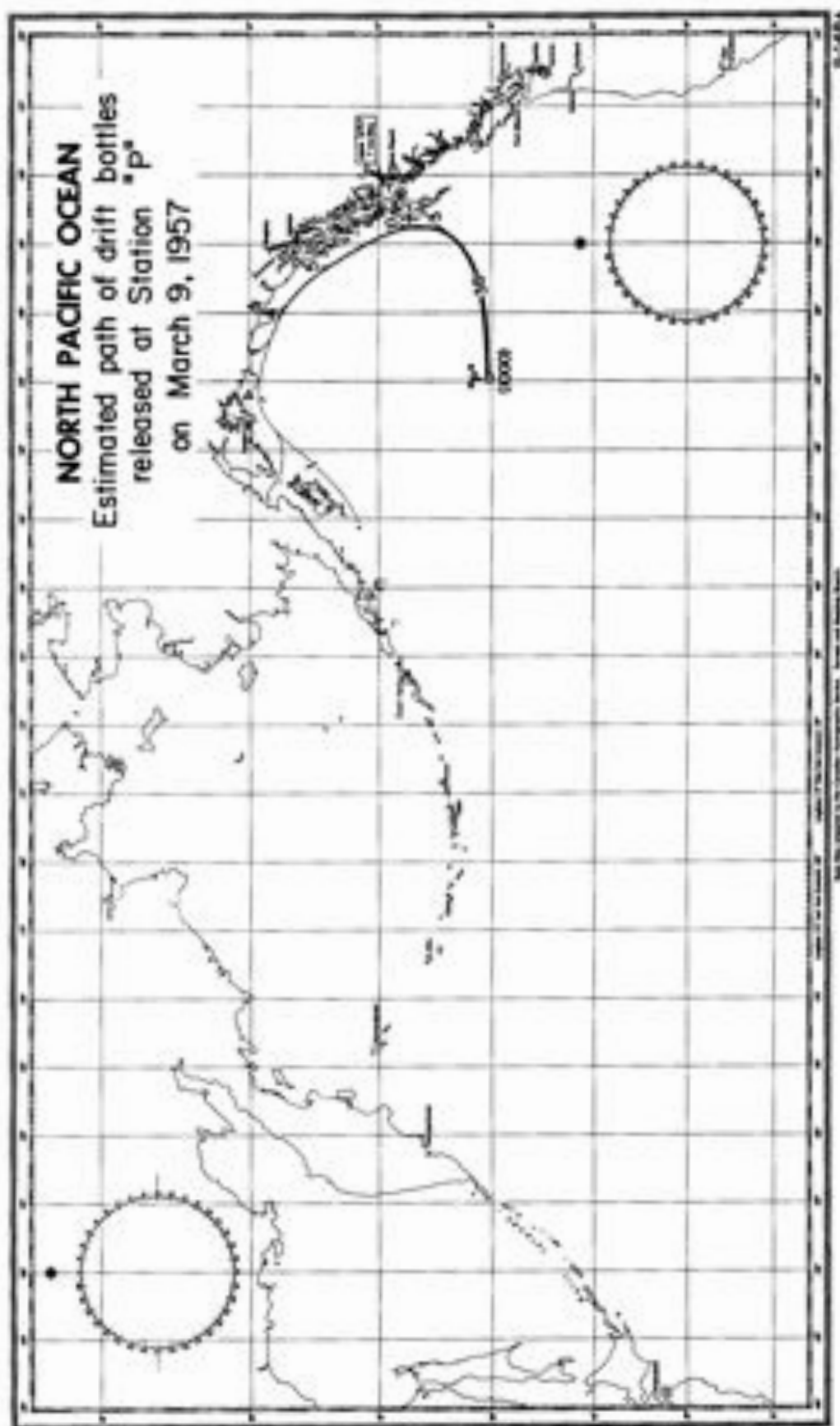


Figure 15. Estimated path of drift bottles released on February 28, 1957.



9-1481A

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Figure 16

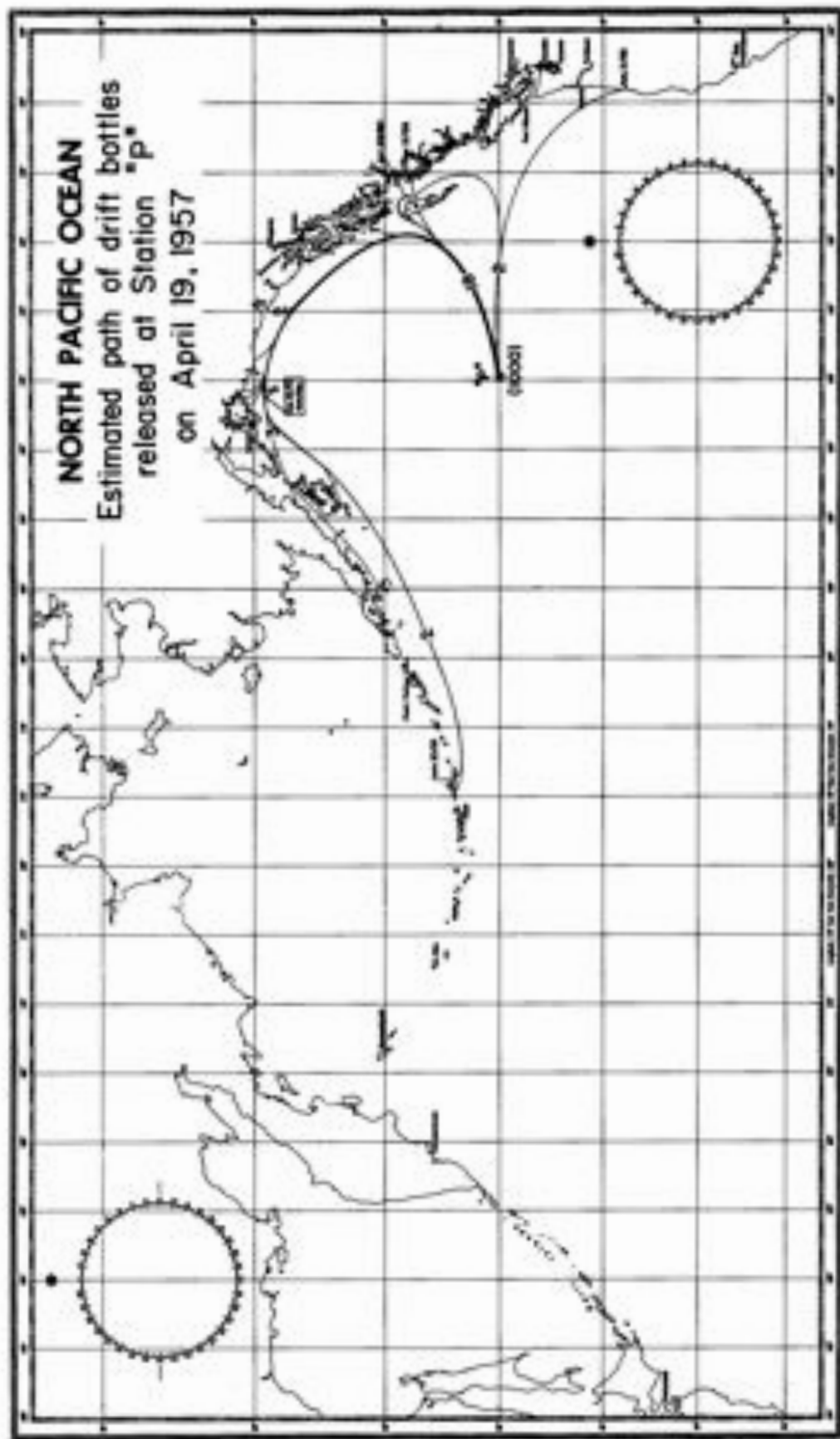


Figure 17

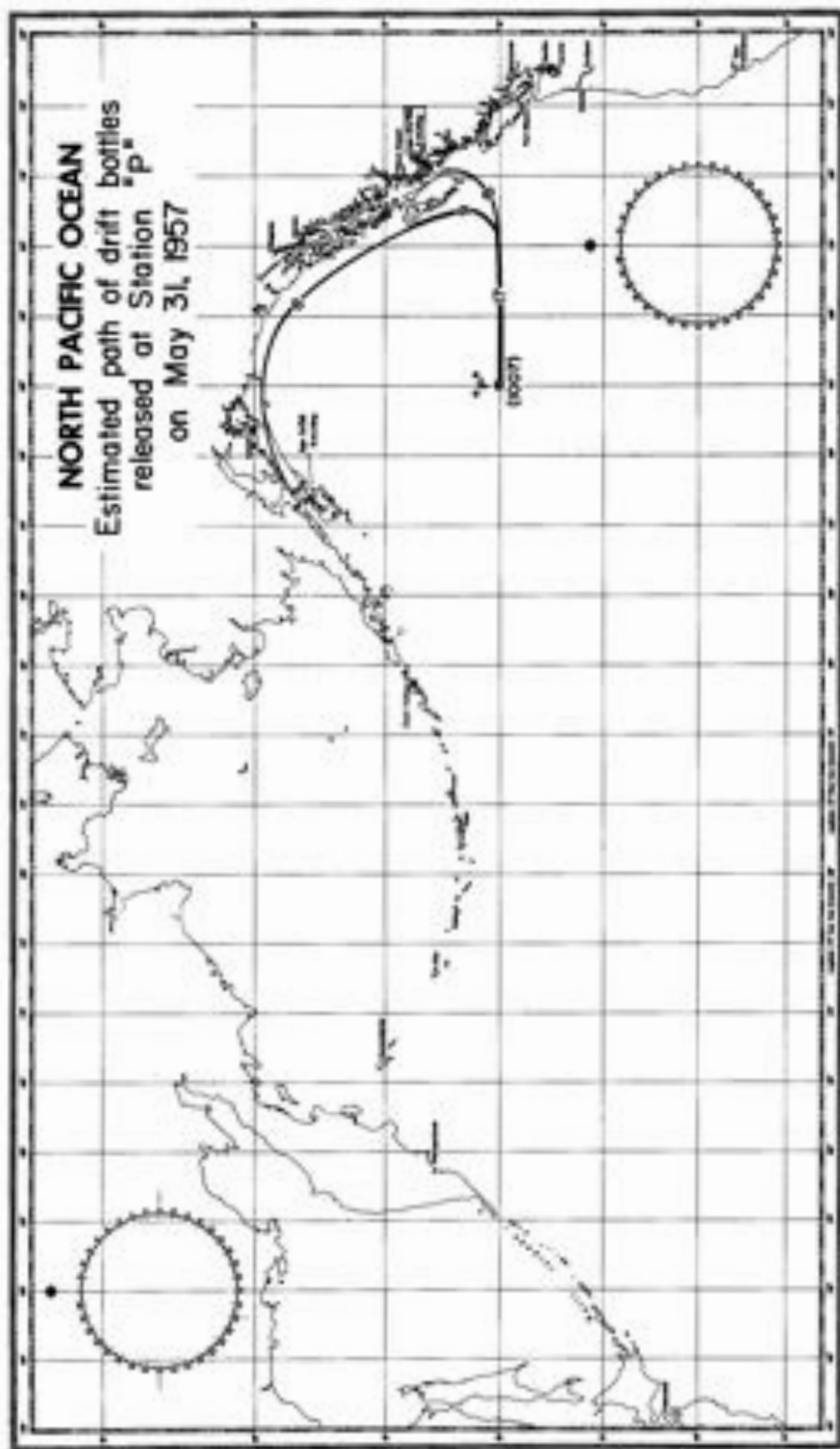


FIGURE 8
 ESTIMATED PATH OF DRIFT BOTTLES RELEASED AT STATION "P" ON MAY 31, 1957

8-1485A

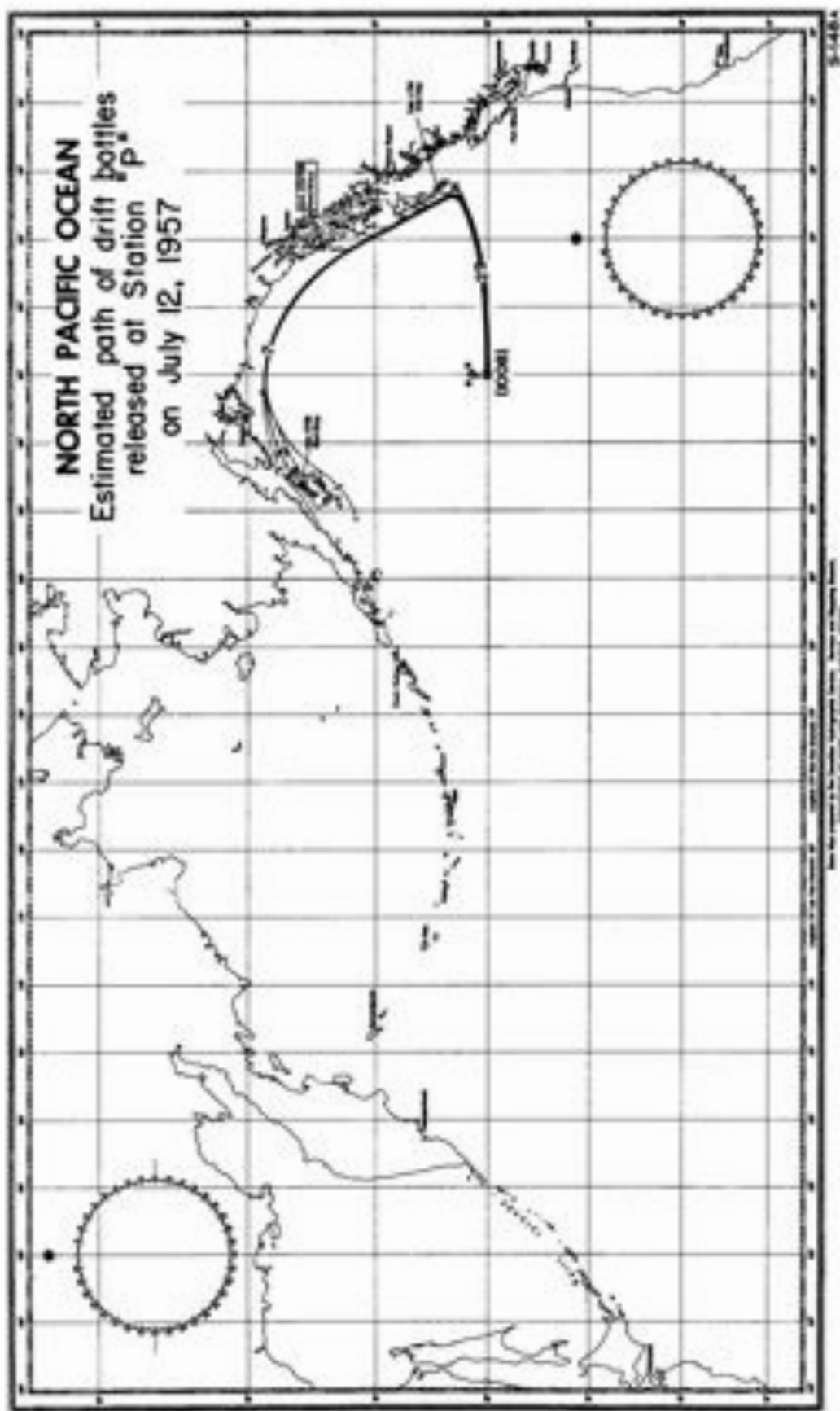


Figure 10

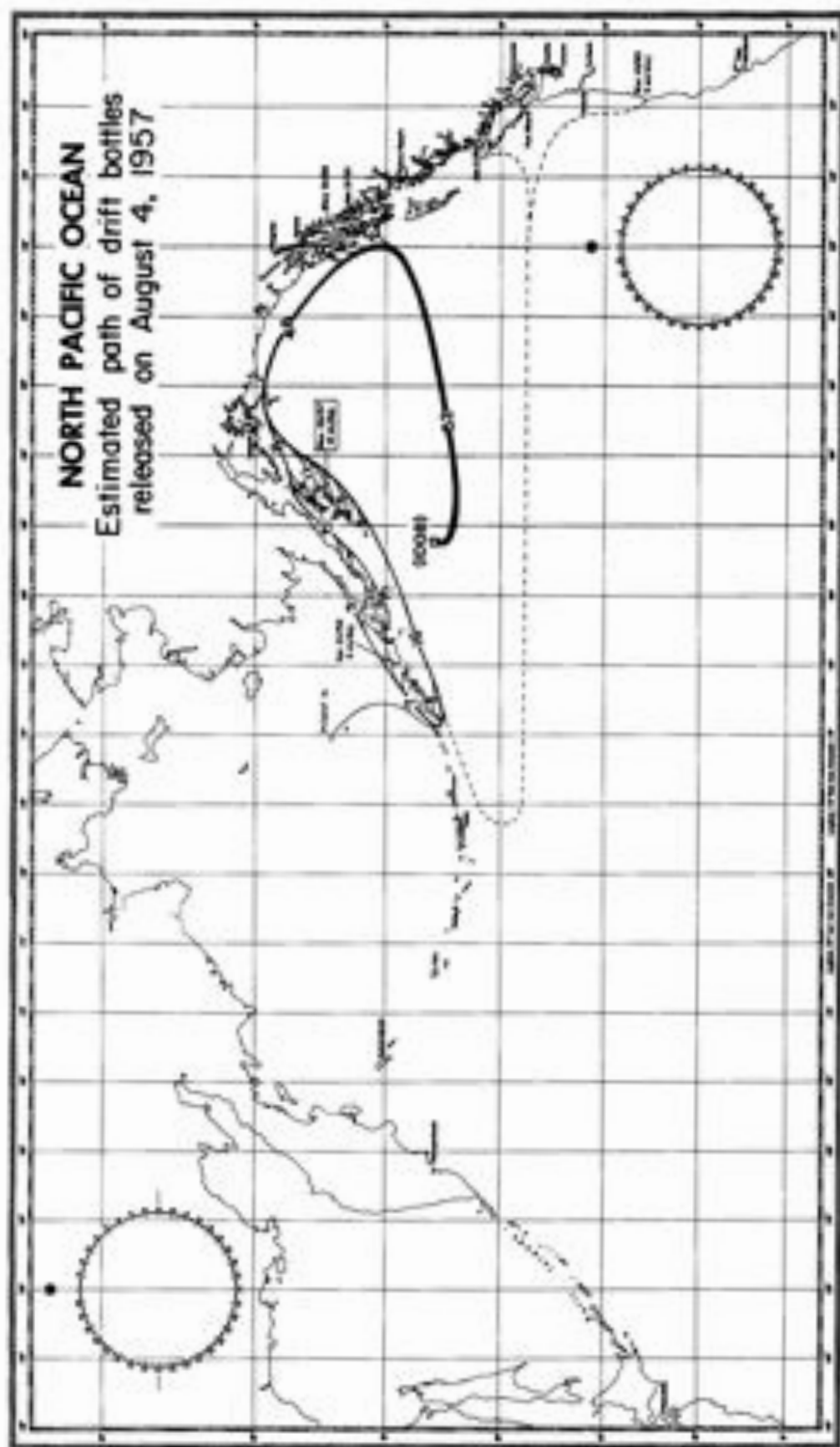
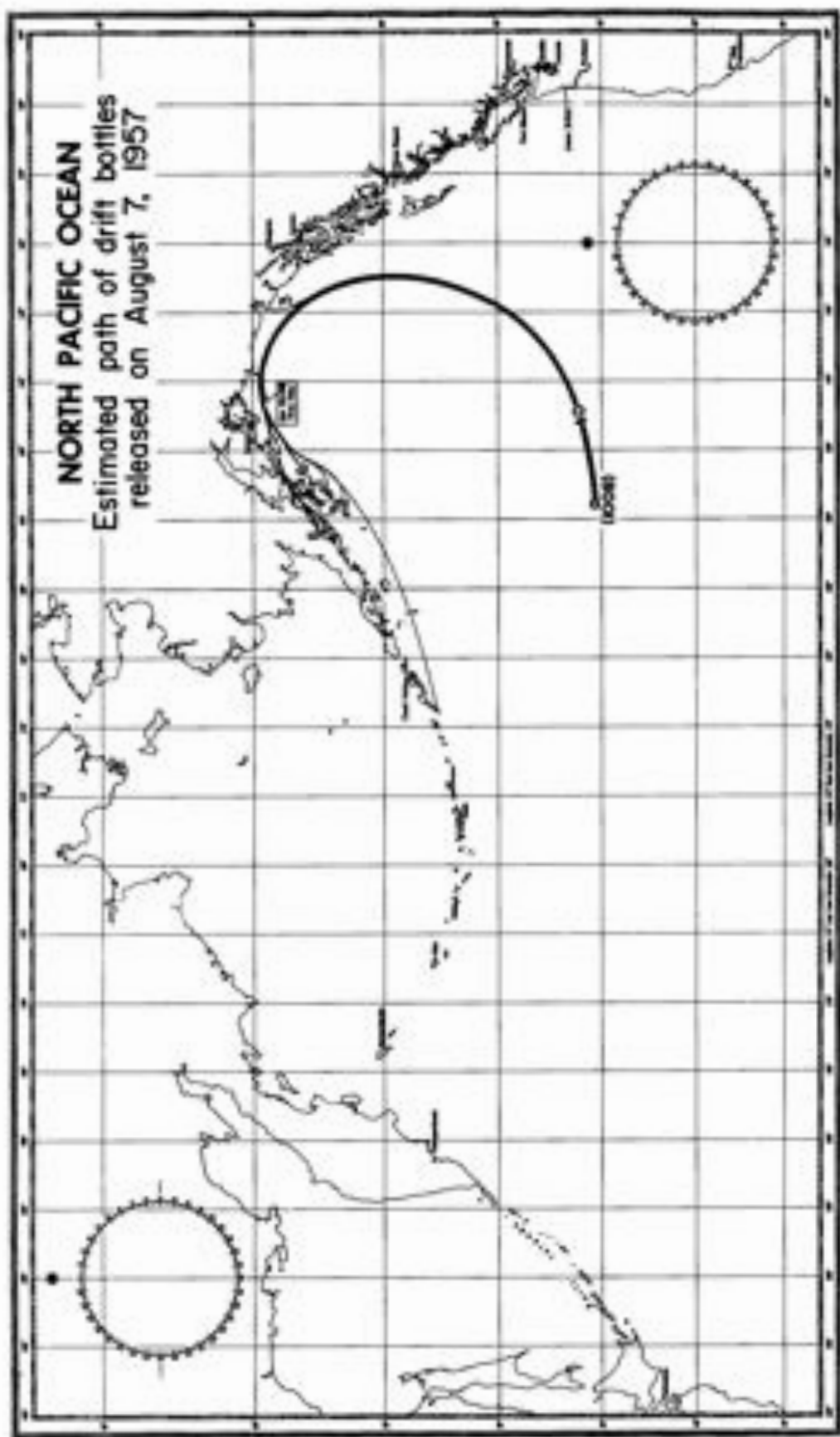


Figure 20
 THE NORTH PACIFIC OCEAN, showing the estimated path of drift bottles released on August 4, 1957. The path is based on the observations of the drift bottles and the estimated drift of the bottles. The path is shown in solid lines, and the estimated drift of the bottles is shown in dashed lines. The circular diagrams with serrated edges are also shown.



5-14874

Map of the Pacific Ocean showing the estimated path of drift bottles released on August 7, 1957. The map is based on data from the U.S. Navy's Operation TONGAREVA.

Figure 21

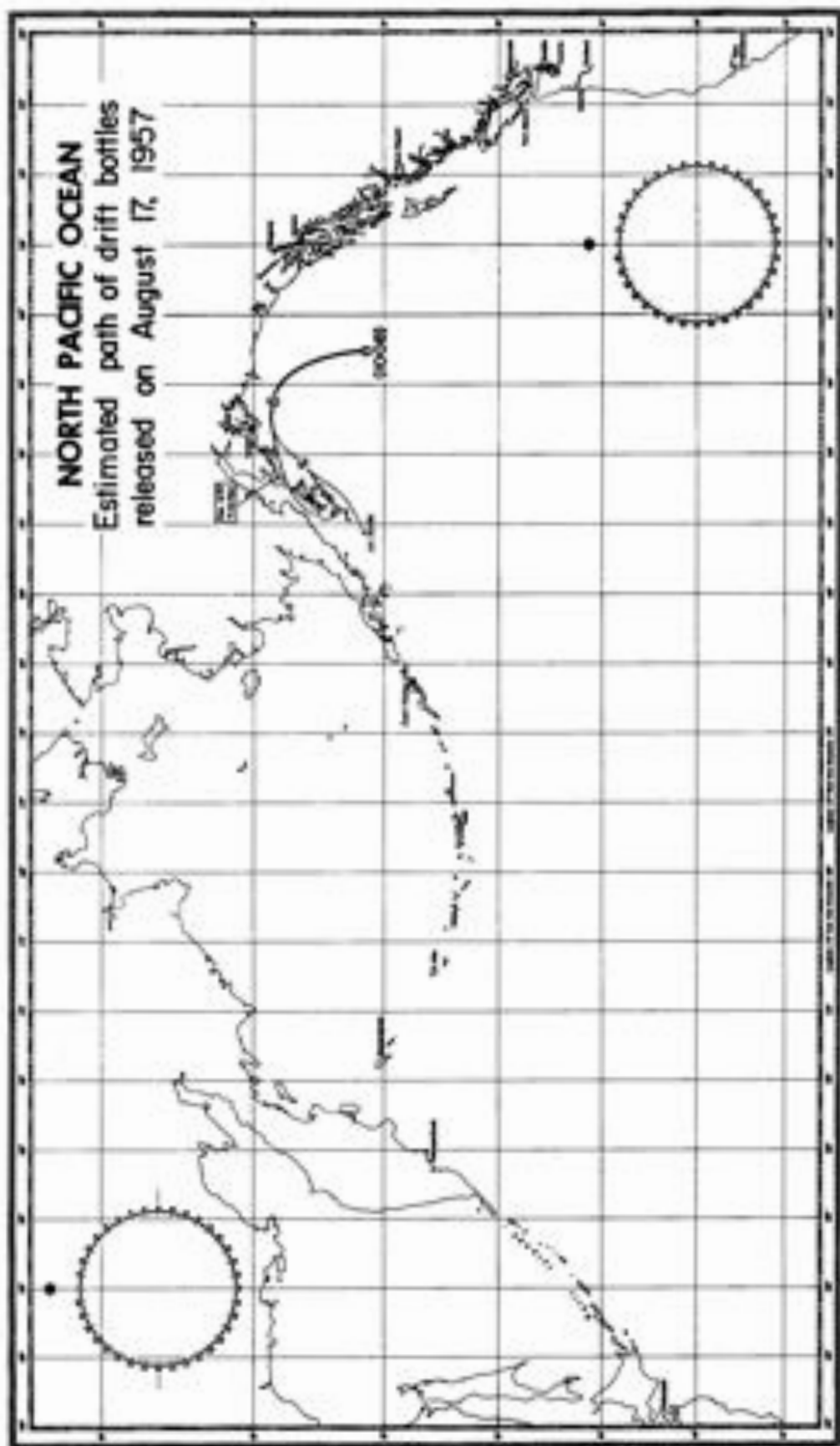
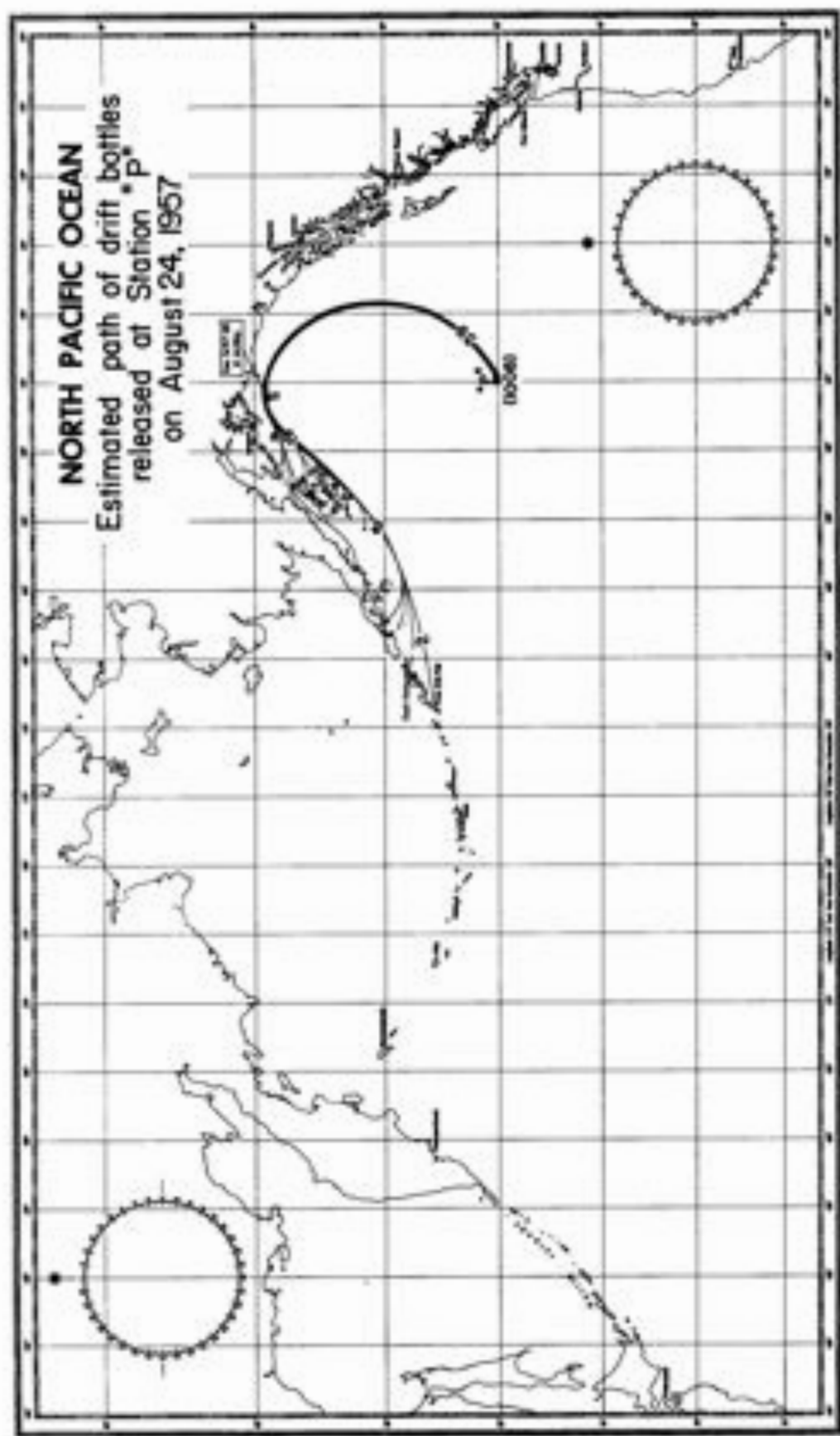


FIGURE 22
 Estimated path of drift bottles released on August 17, 1957, in the North Pacific Ocean. The path is shown as a dashed line. The circular symbols represent the estimated positions of the bottles at the time of their release. The map is based on data from the U.S. Navy's Operation High Jump, 1946-47.



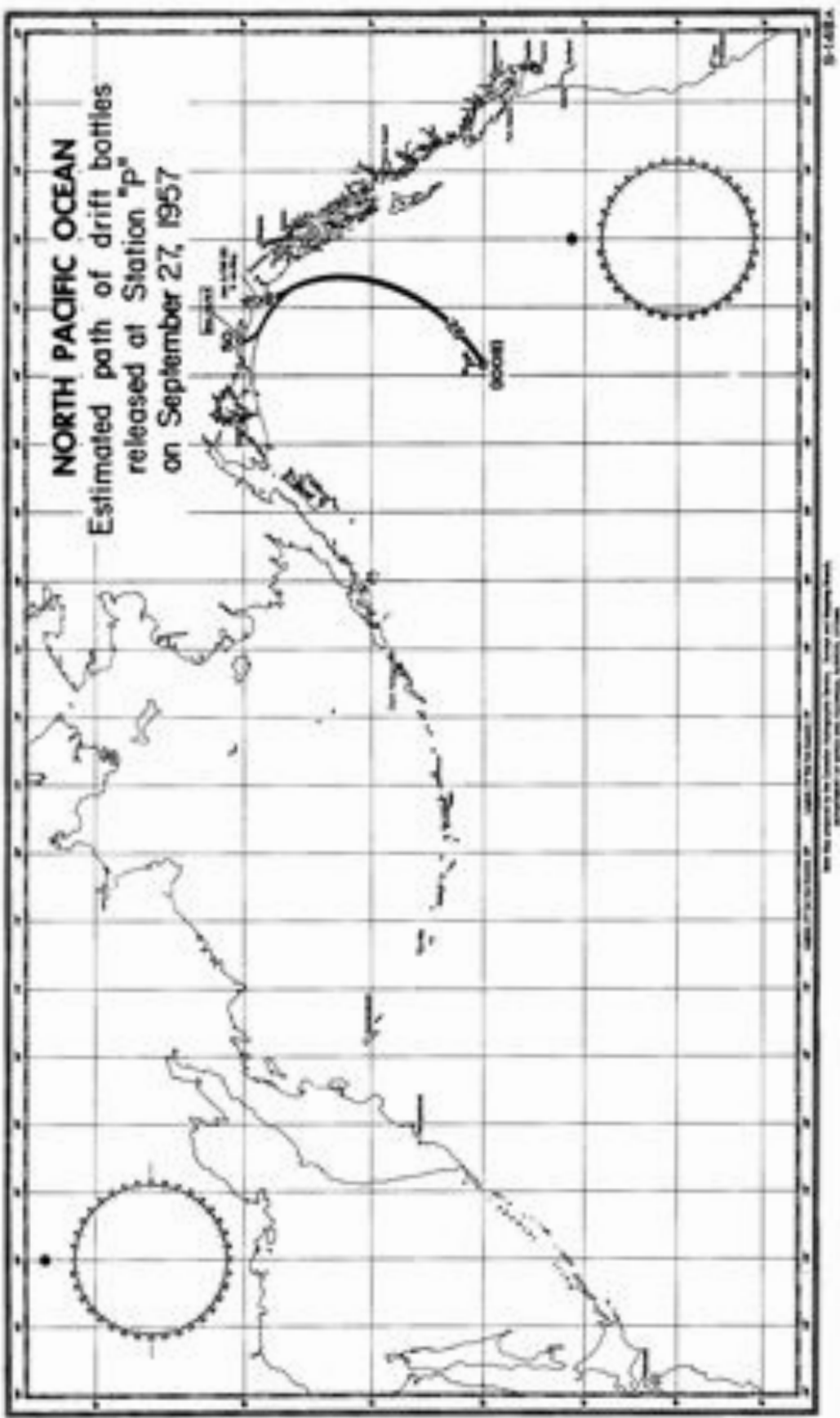


Figure 24

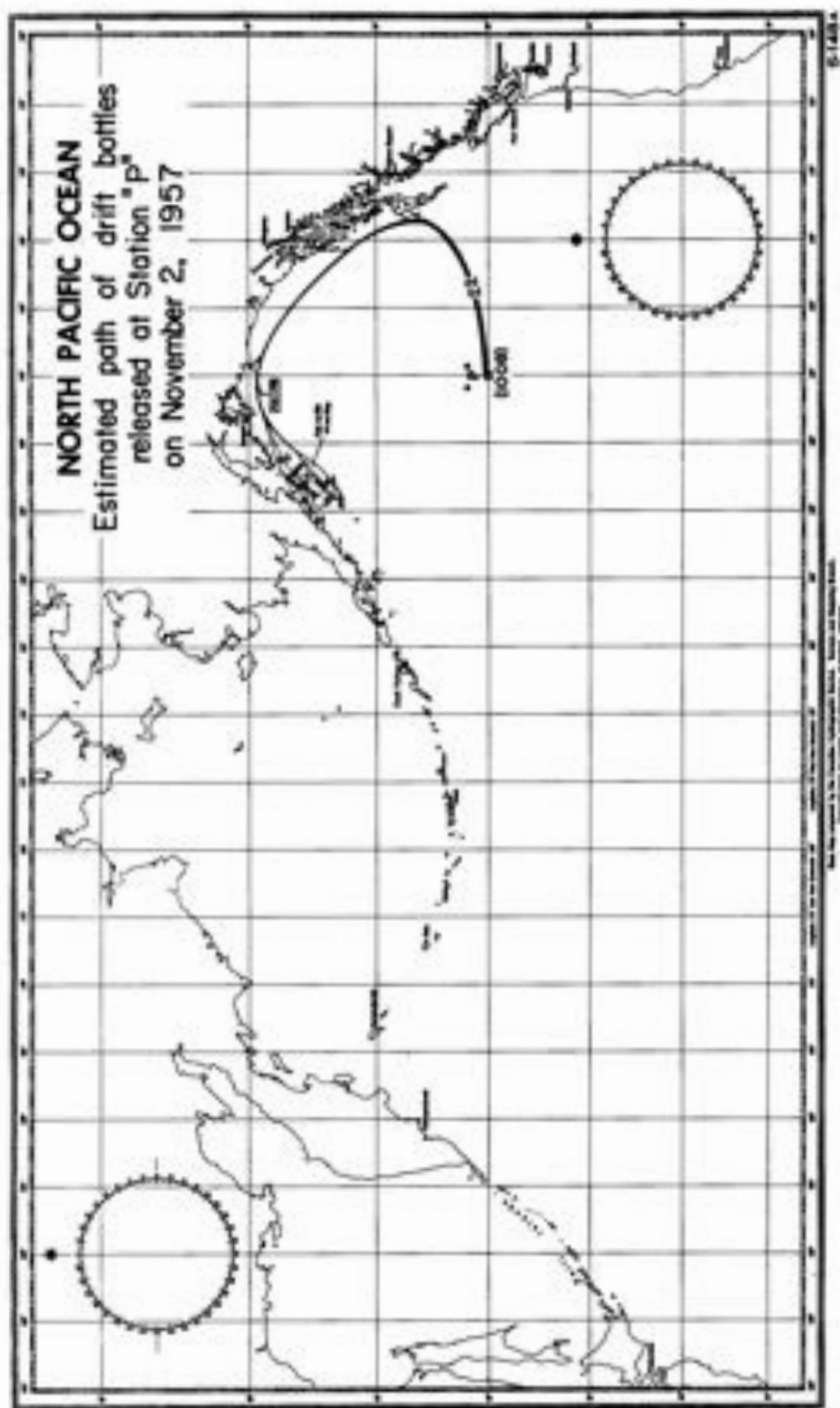
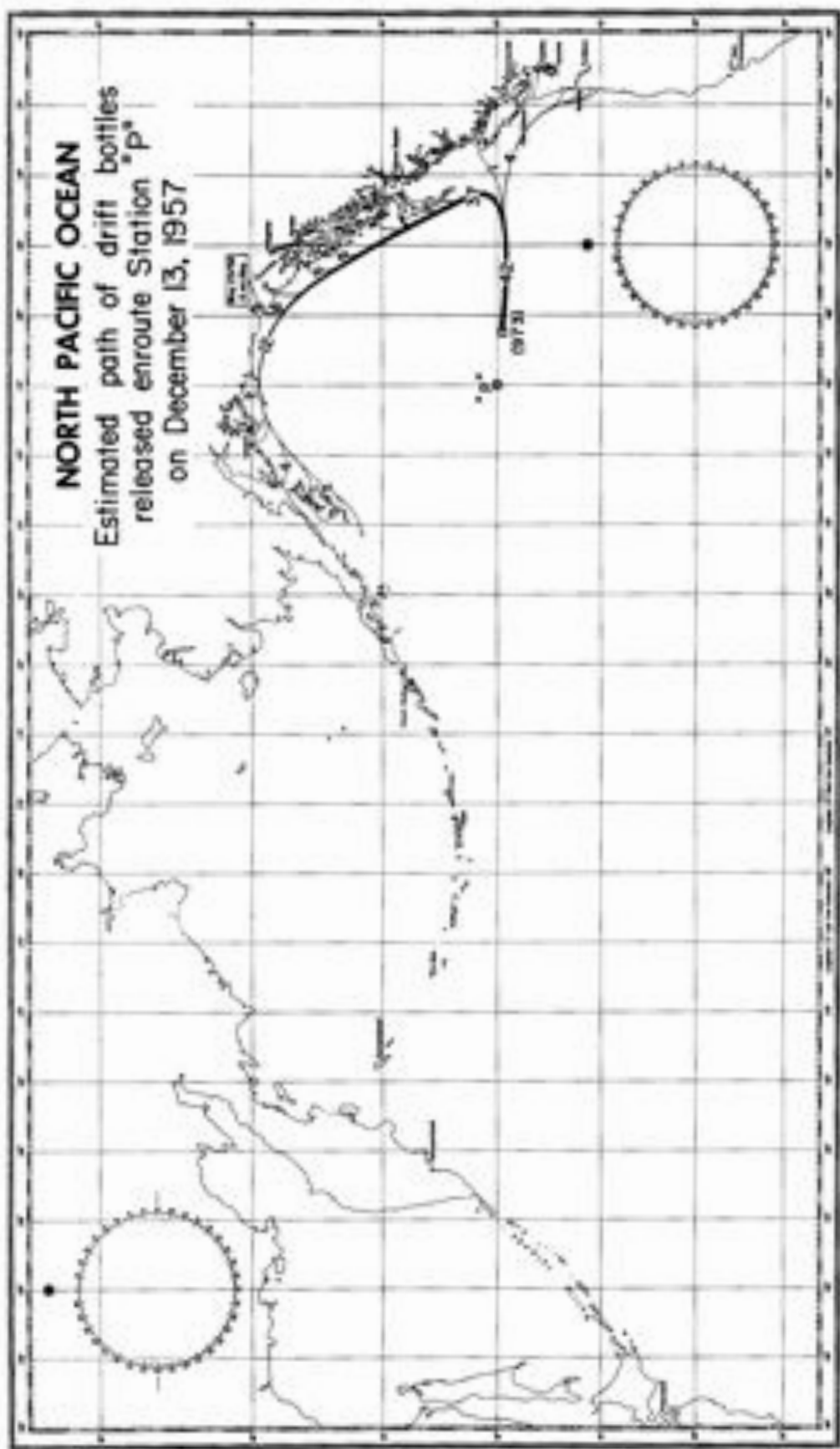


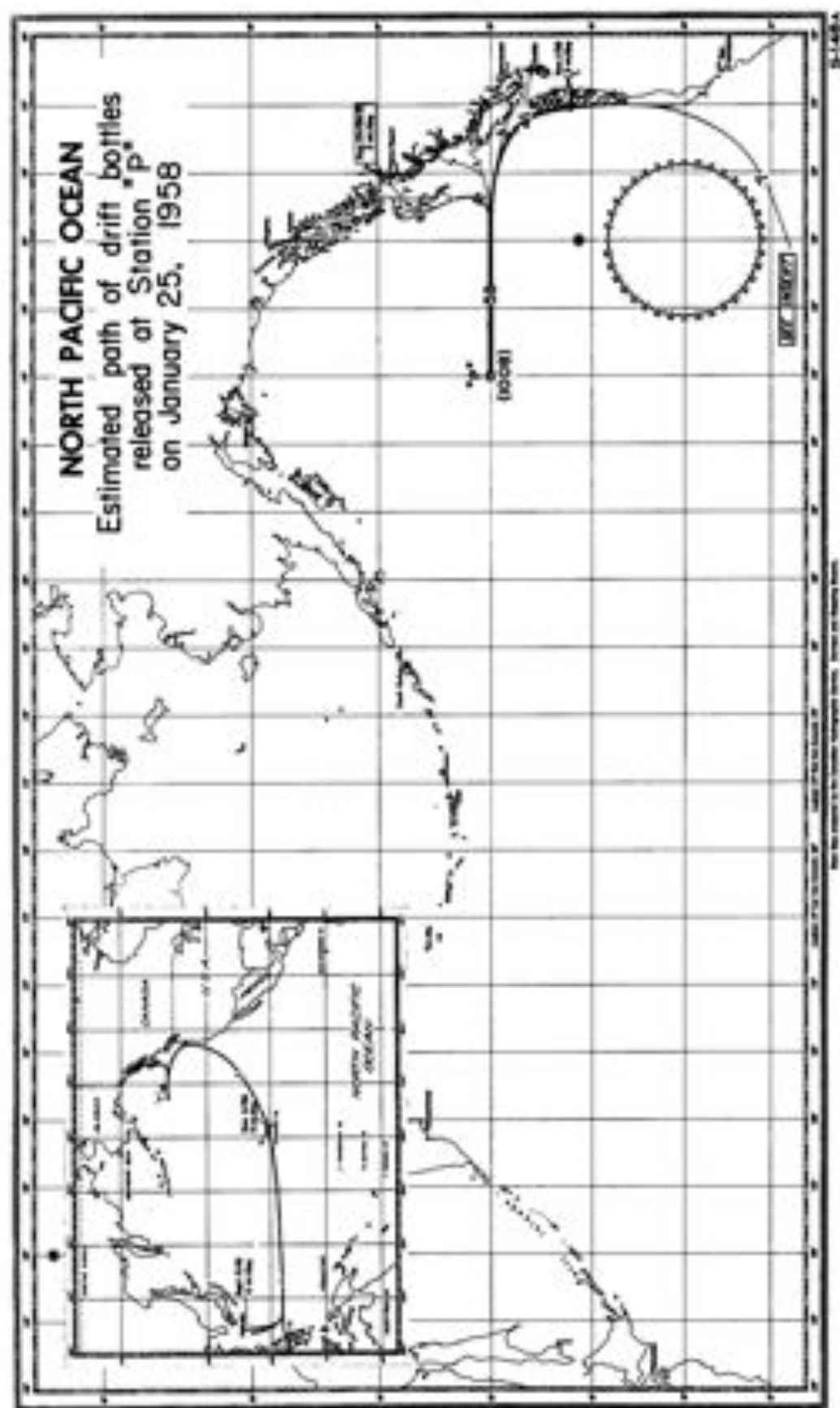
Figure 25
 Estimated path of drift bottles released at Station "P" on November 2, 1957



S-1464

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Figure 25



NO. 1485
 ESTIMATED PATH OF DRIFT BOTTLES RELEASED AT STATION 'P' ON JANUARY 25, 1958

Figure 27

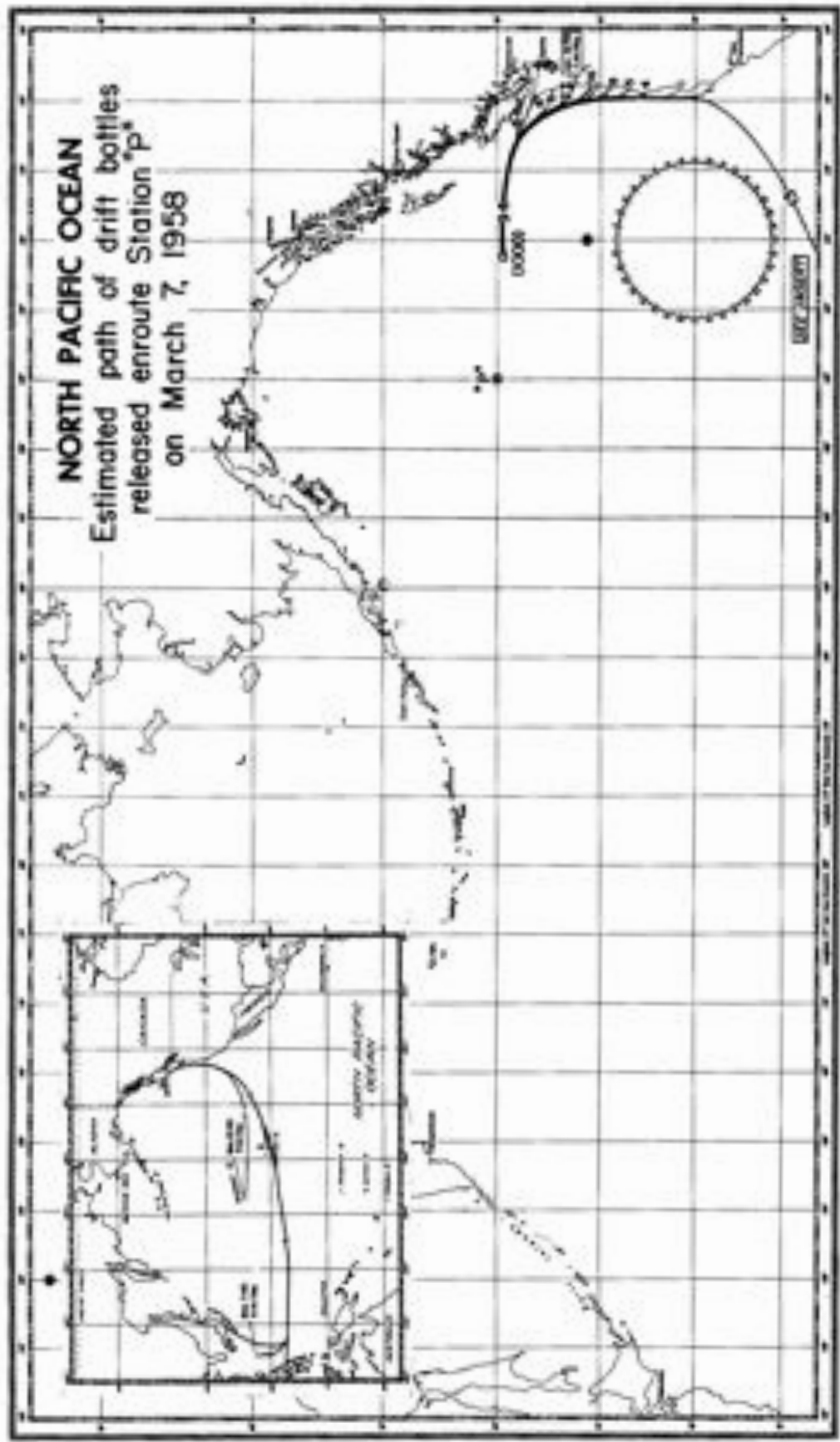


Figure 28

5-14884

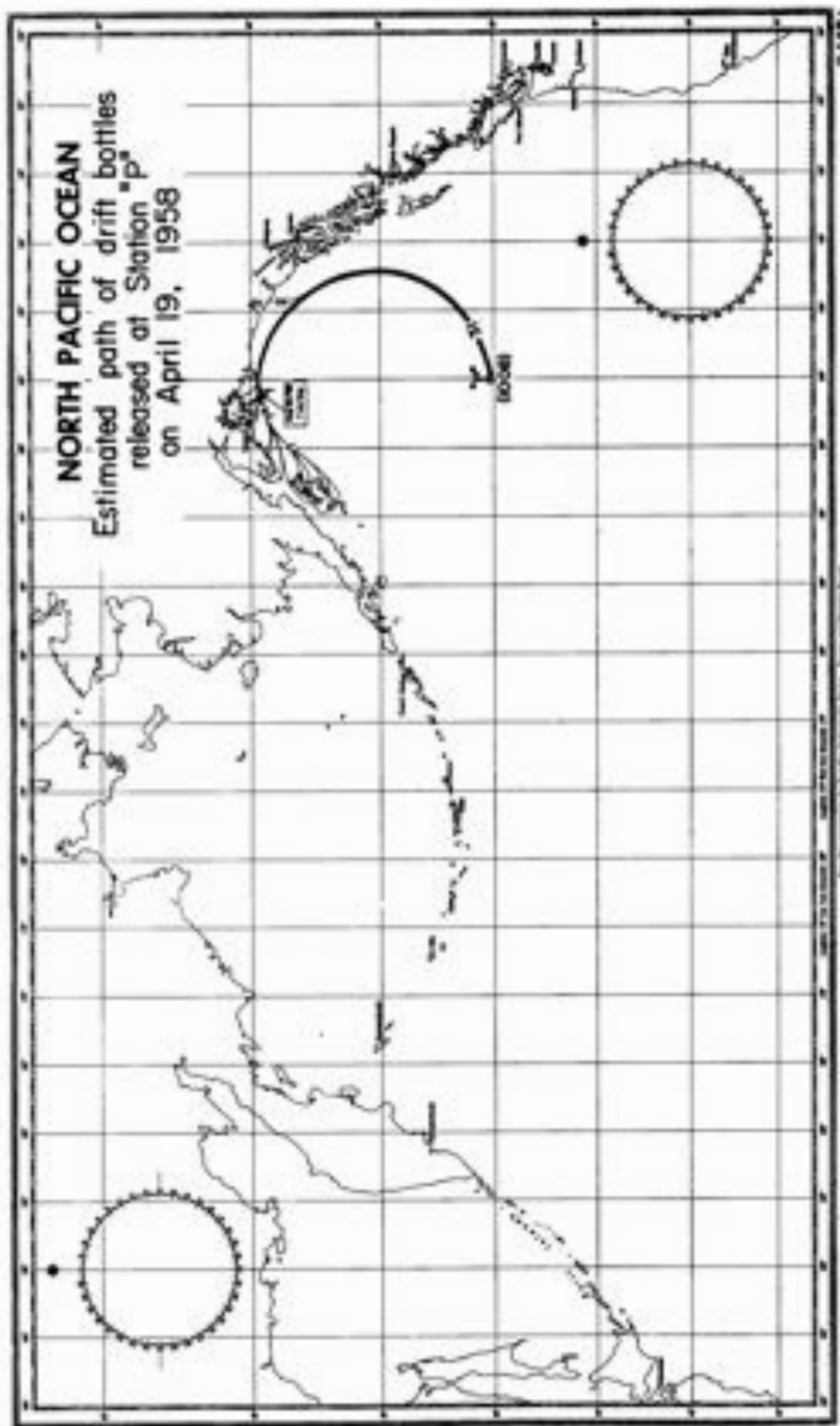


FIGURE 29
 ESTIMATED PATH OF DRIFT BOTTLES RELEASED AT STATION "P" ON APRIL 19, 1958

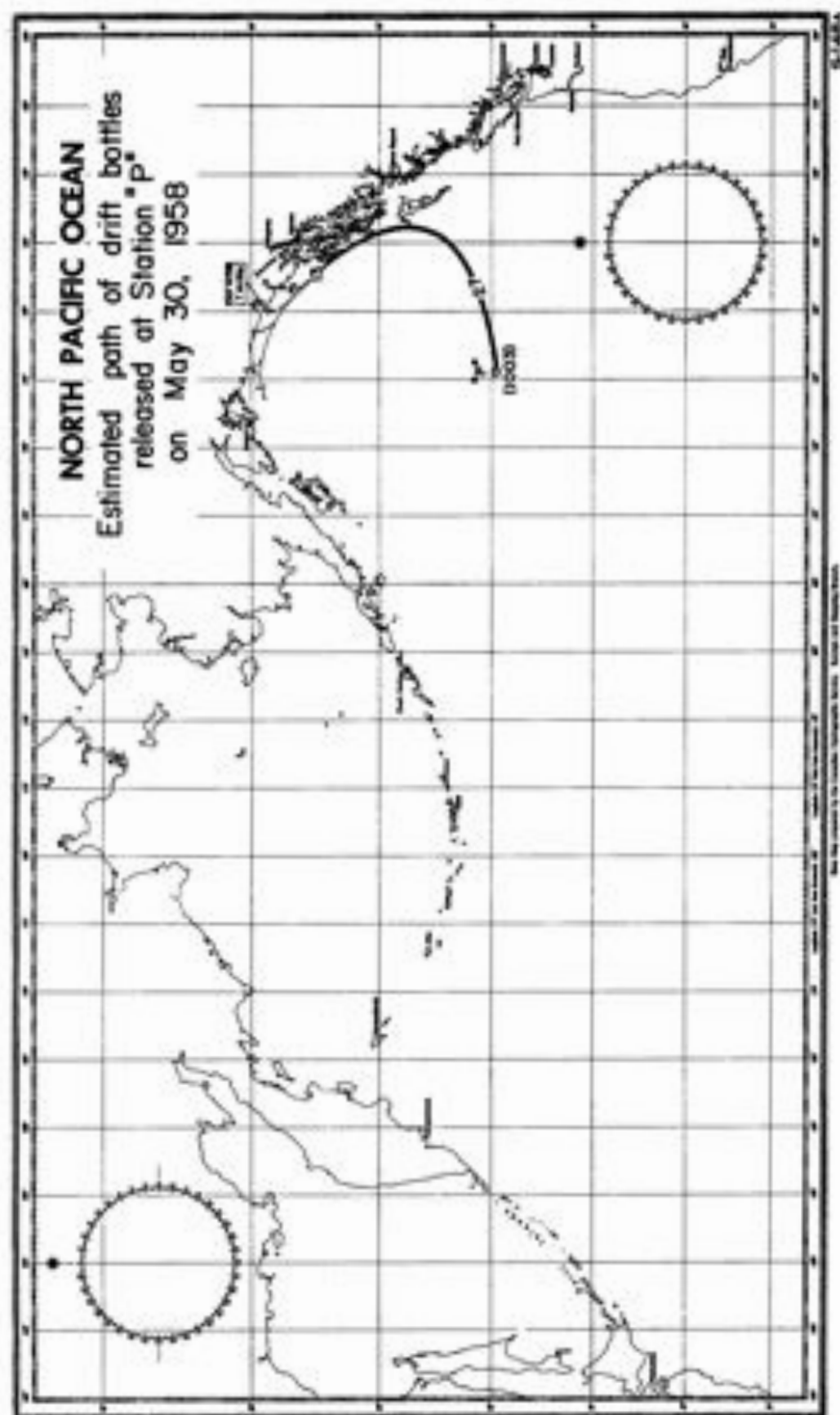
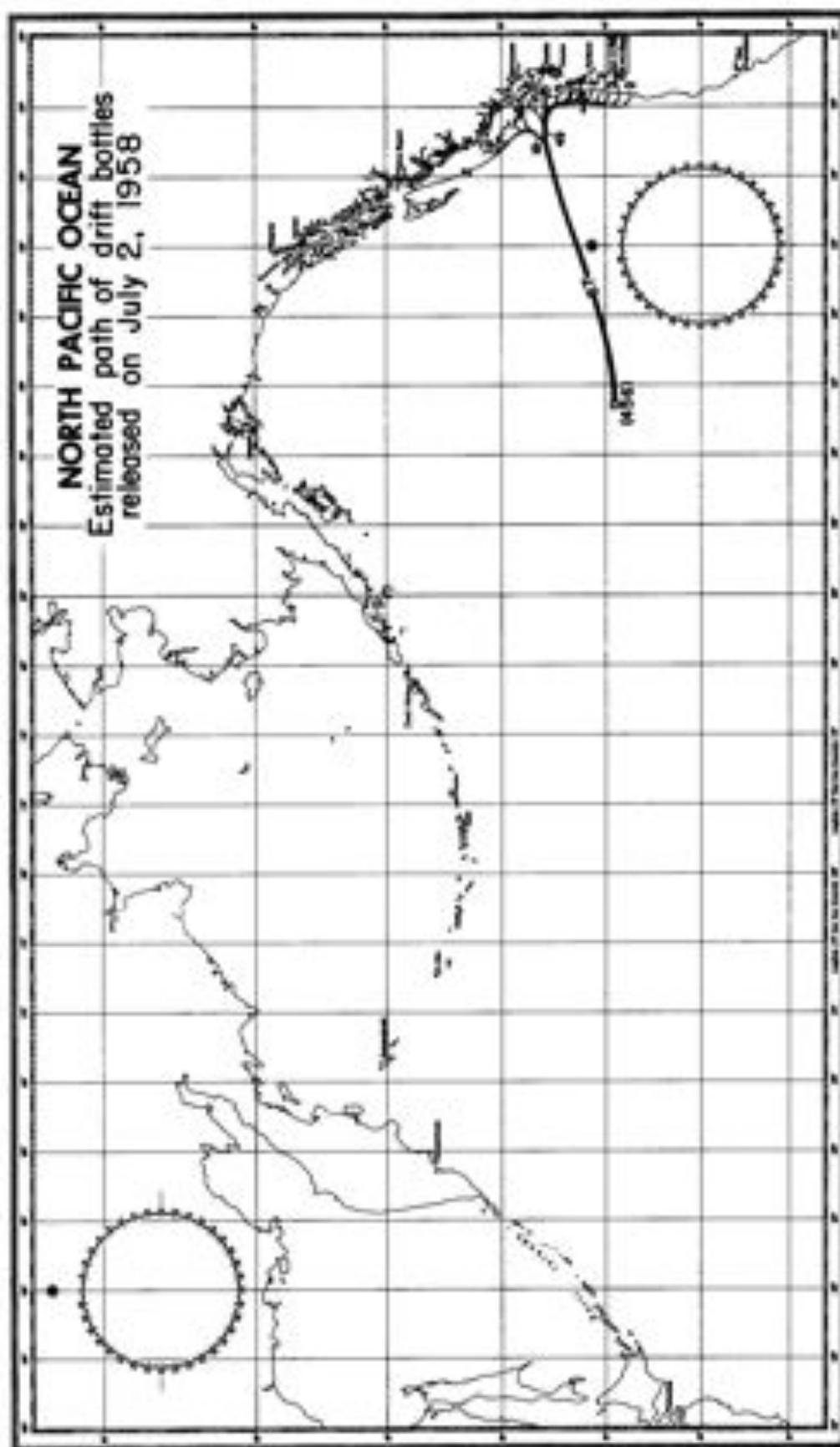
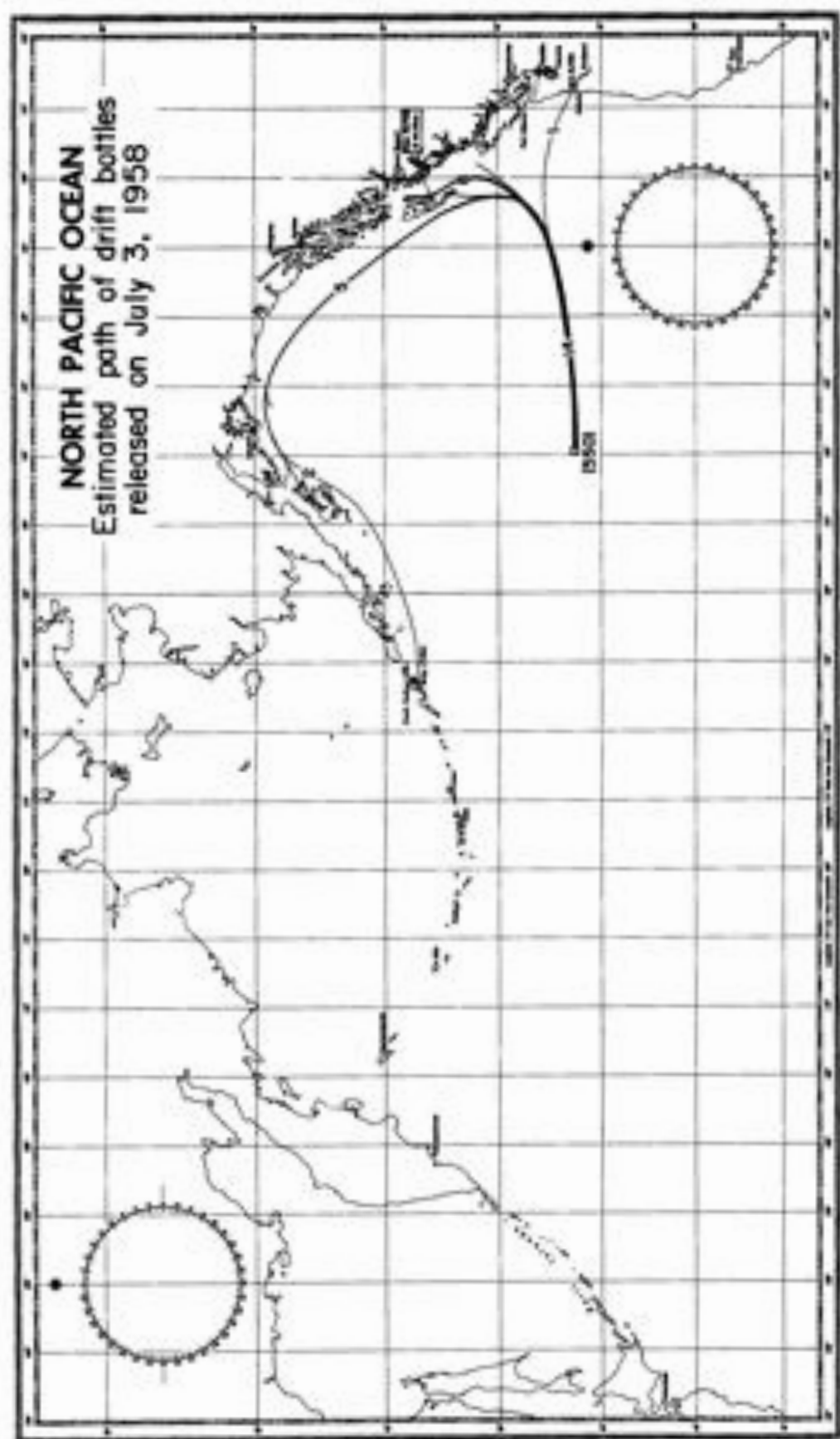


Figure 30

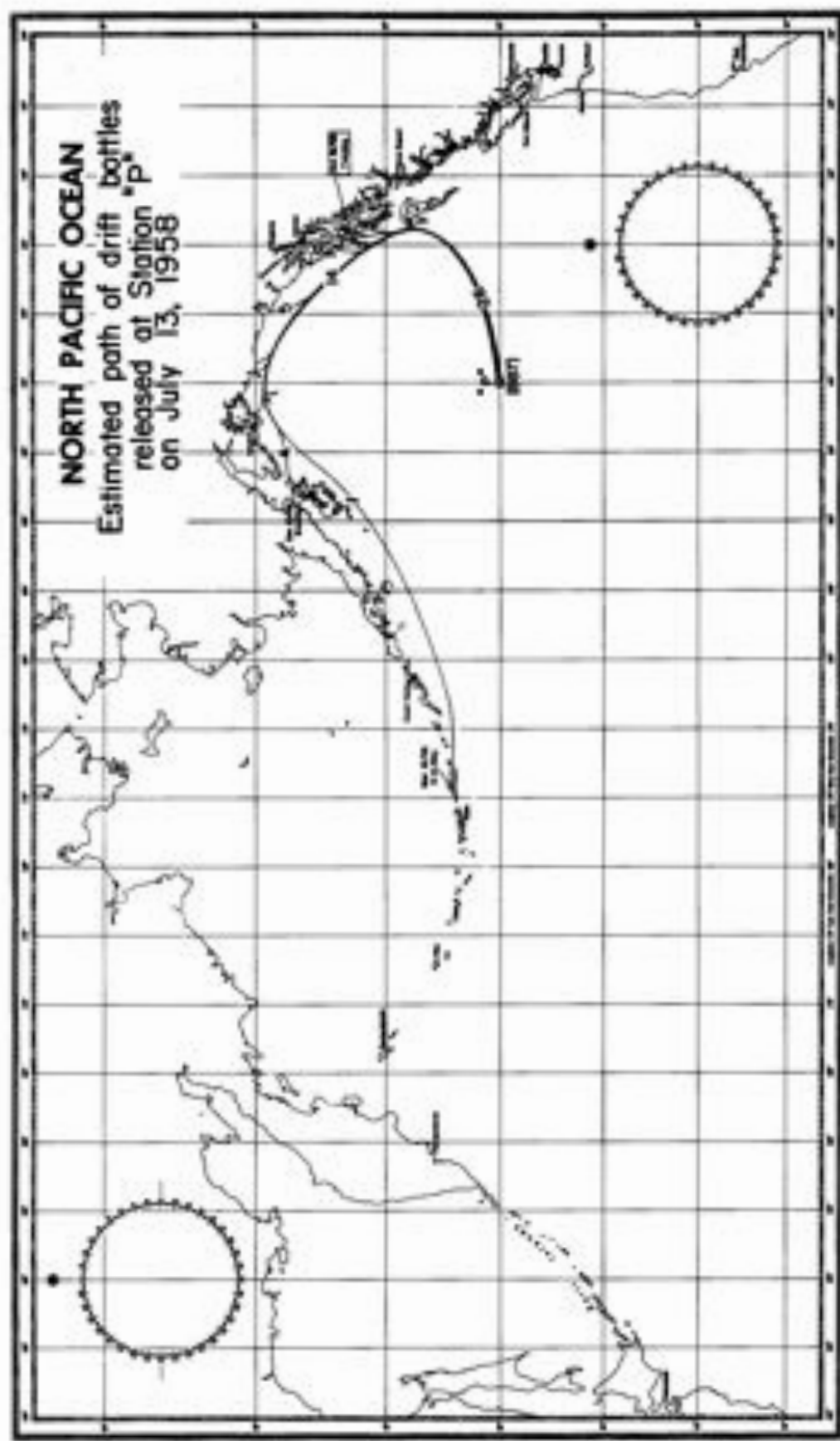




Map prepared by the Hydrographic Office, United States Navy
 under the authority of the Hydrographic Office, United States Navy

Figure 32

9-14834

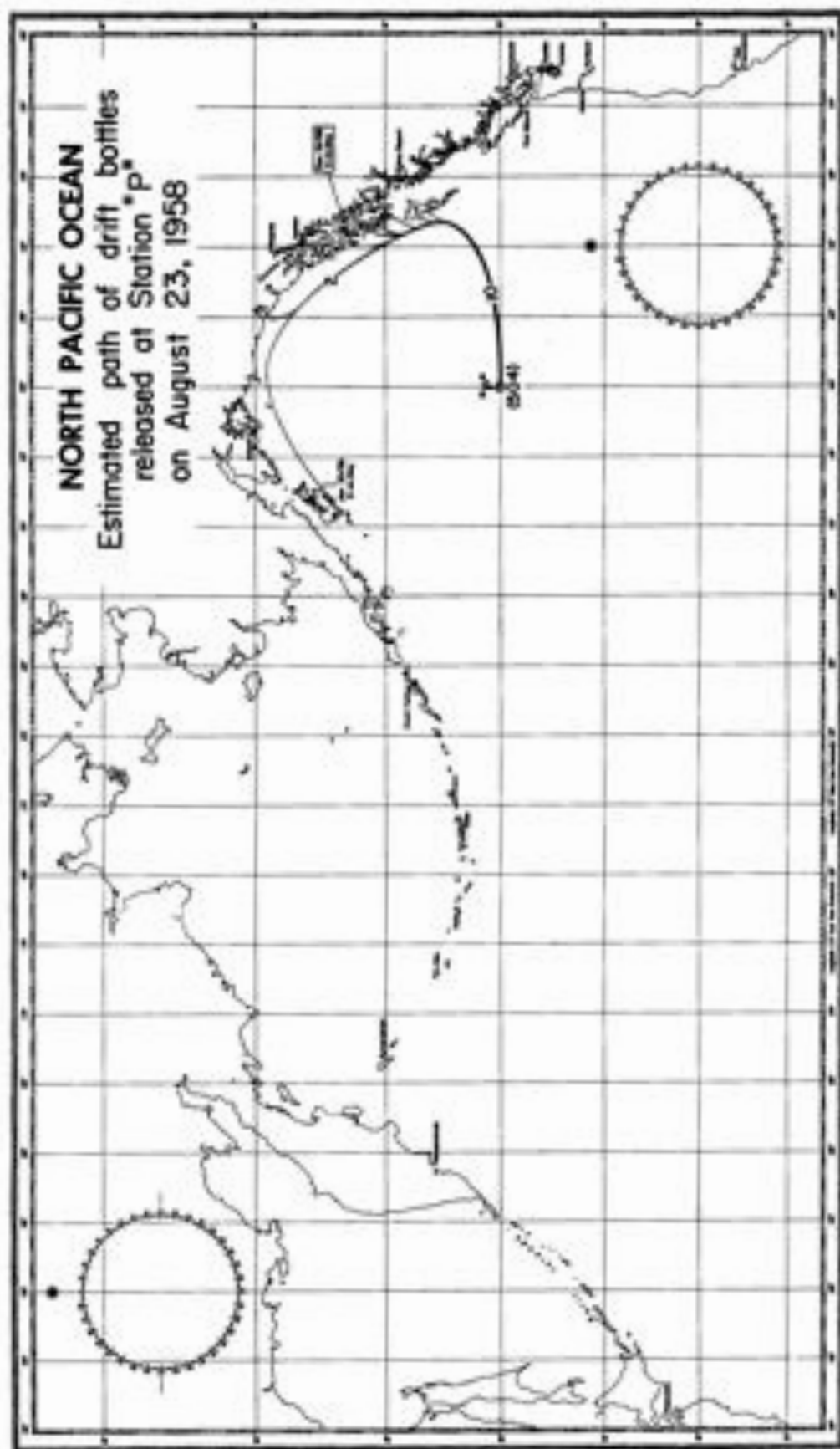


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Figure 13

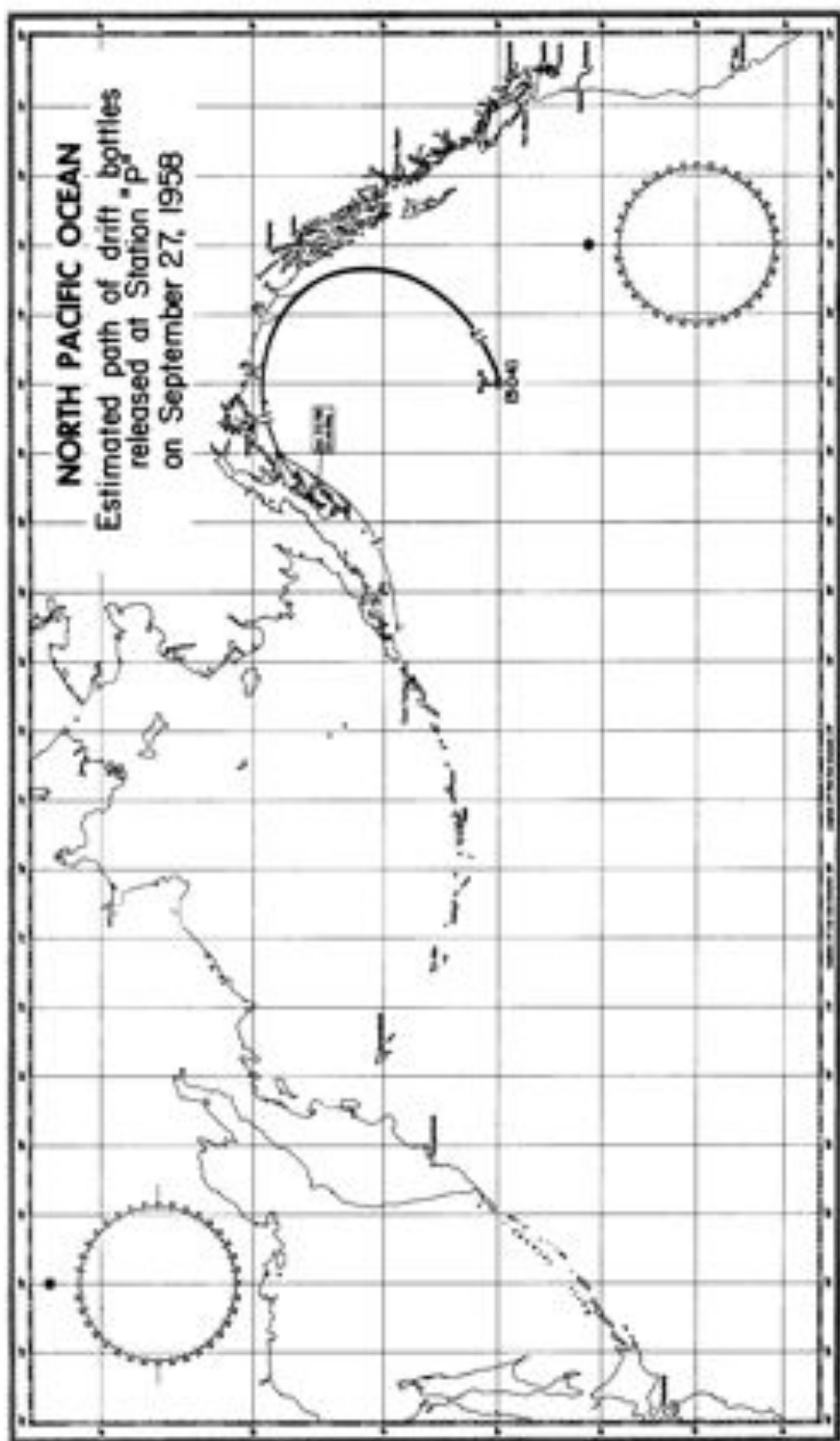
13-48281A



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Figure 34



SI-MNH-35

U.S. DEPARTMENT OF COMMERCE, BUREAU OF OCEANOGRAPHY
 WASHINGTON, D. C. 20540

Figure 30

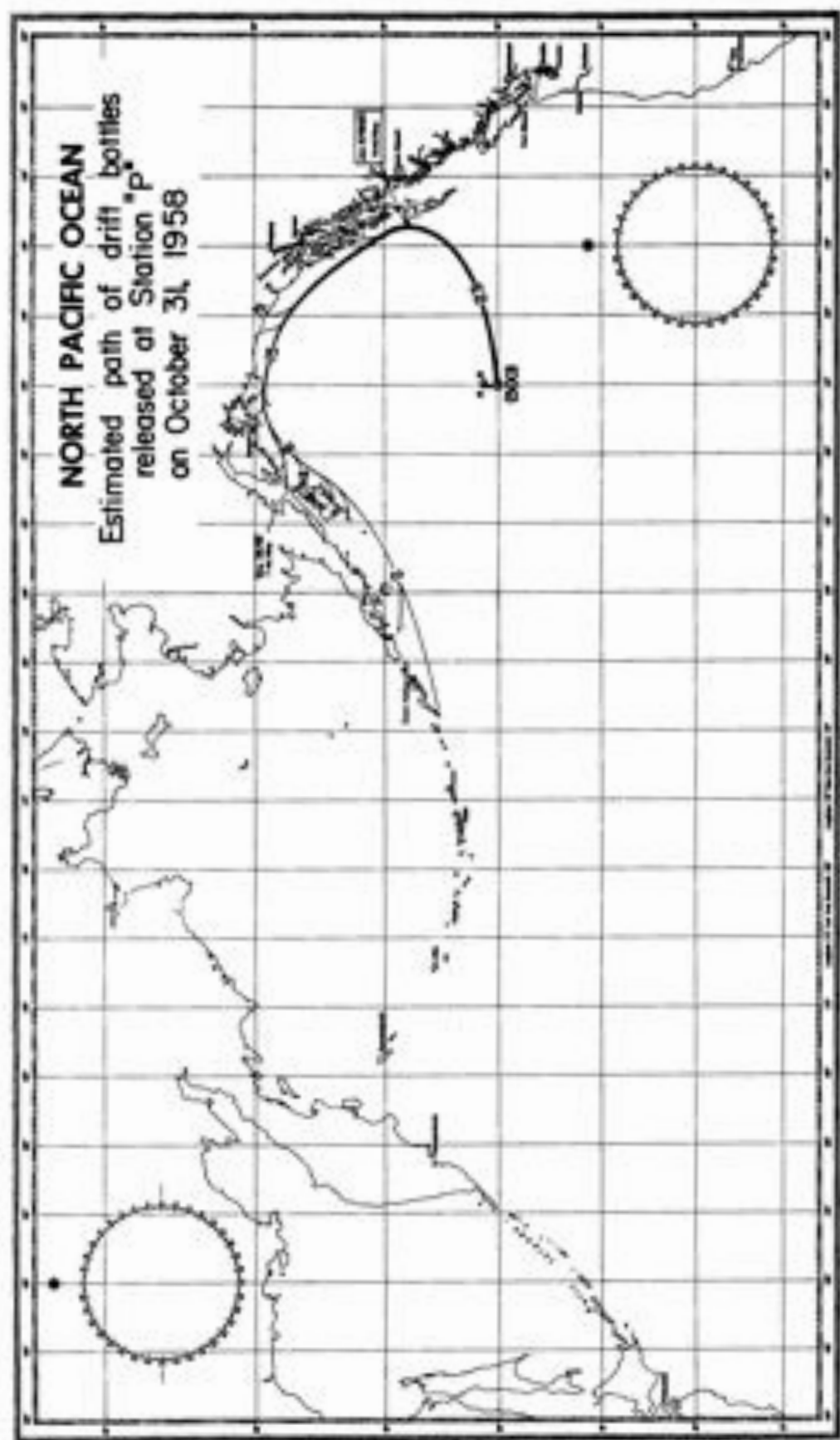
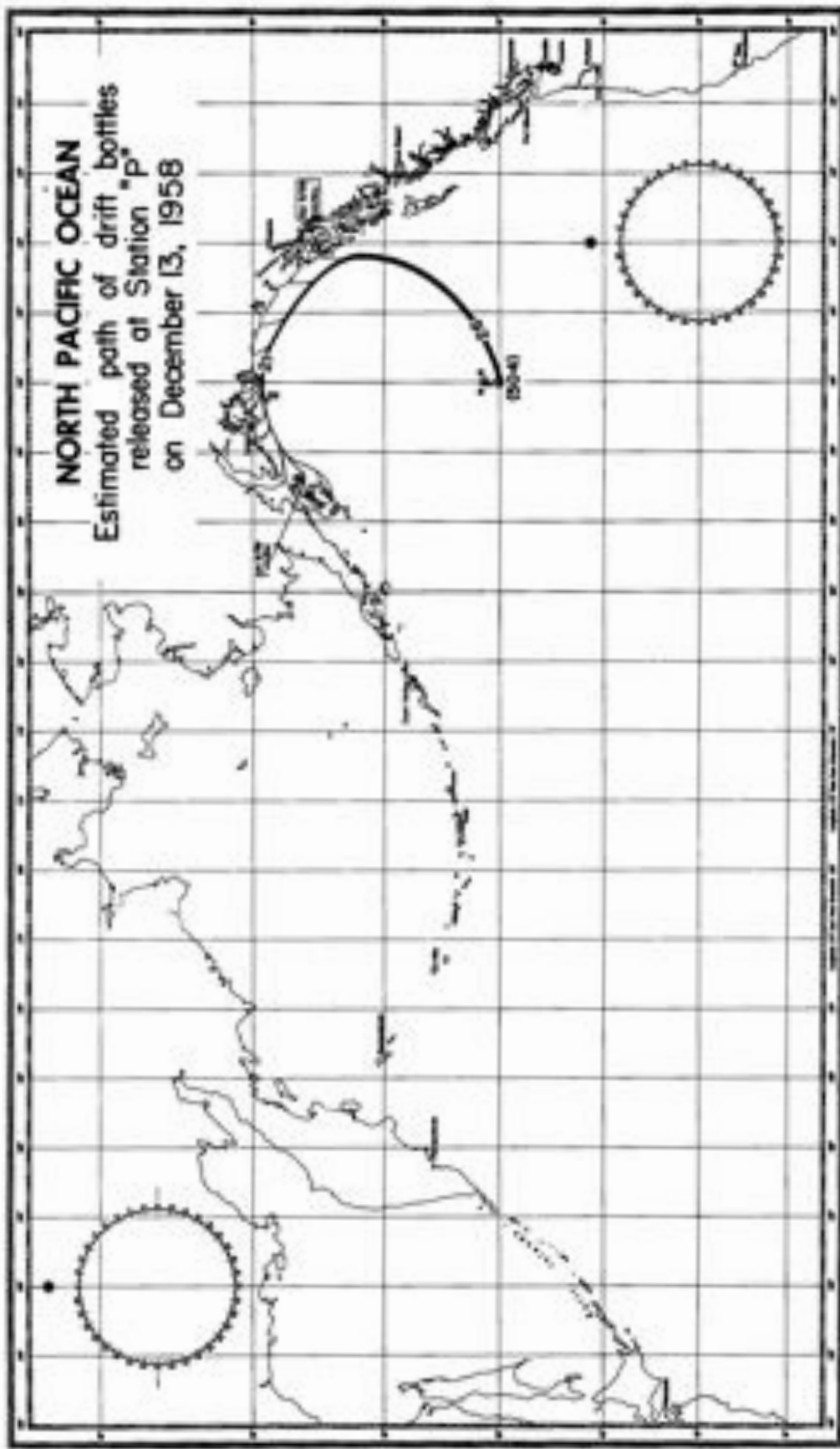


Figure 36
 U.S. GOVERNMENT PRINTING OFFICE: 1959

9-14874



S-1408

NOAA Technical Memorandum NMFS-37
 Prepared by the Pacific Fisheries Laboratory, Seattle, Washington

Figure 37

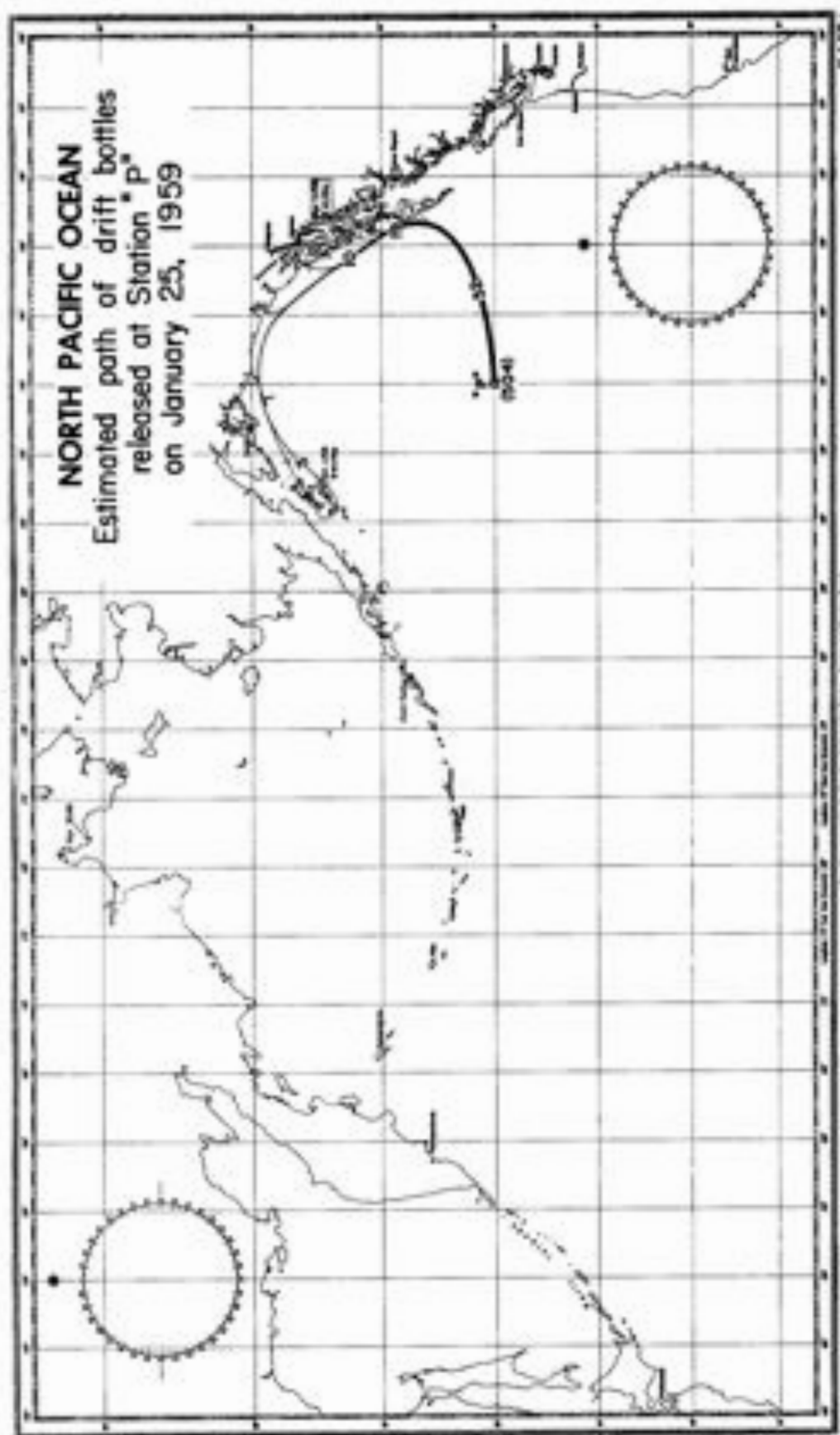
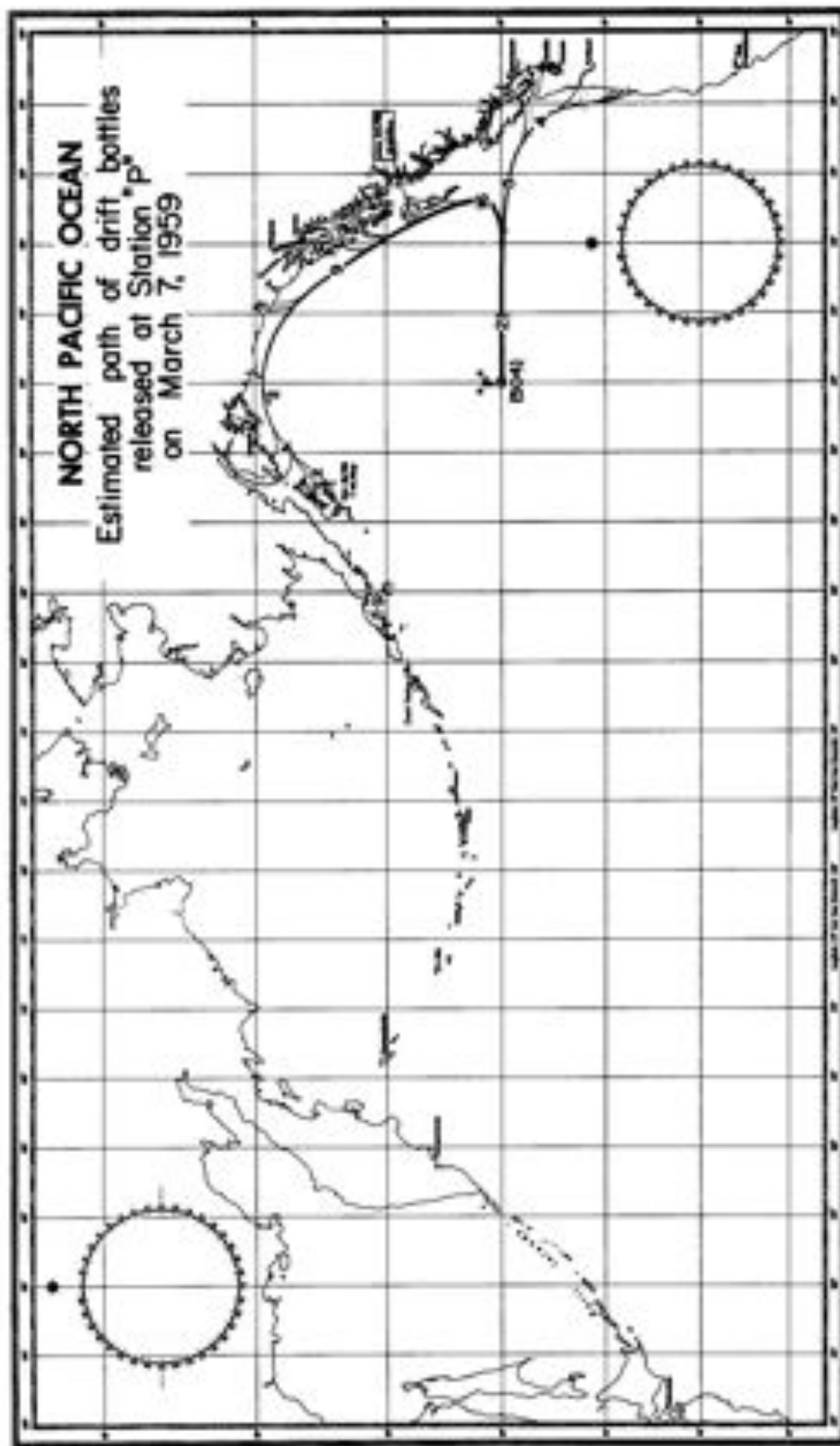
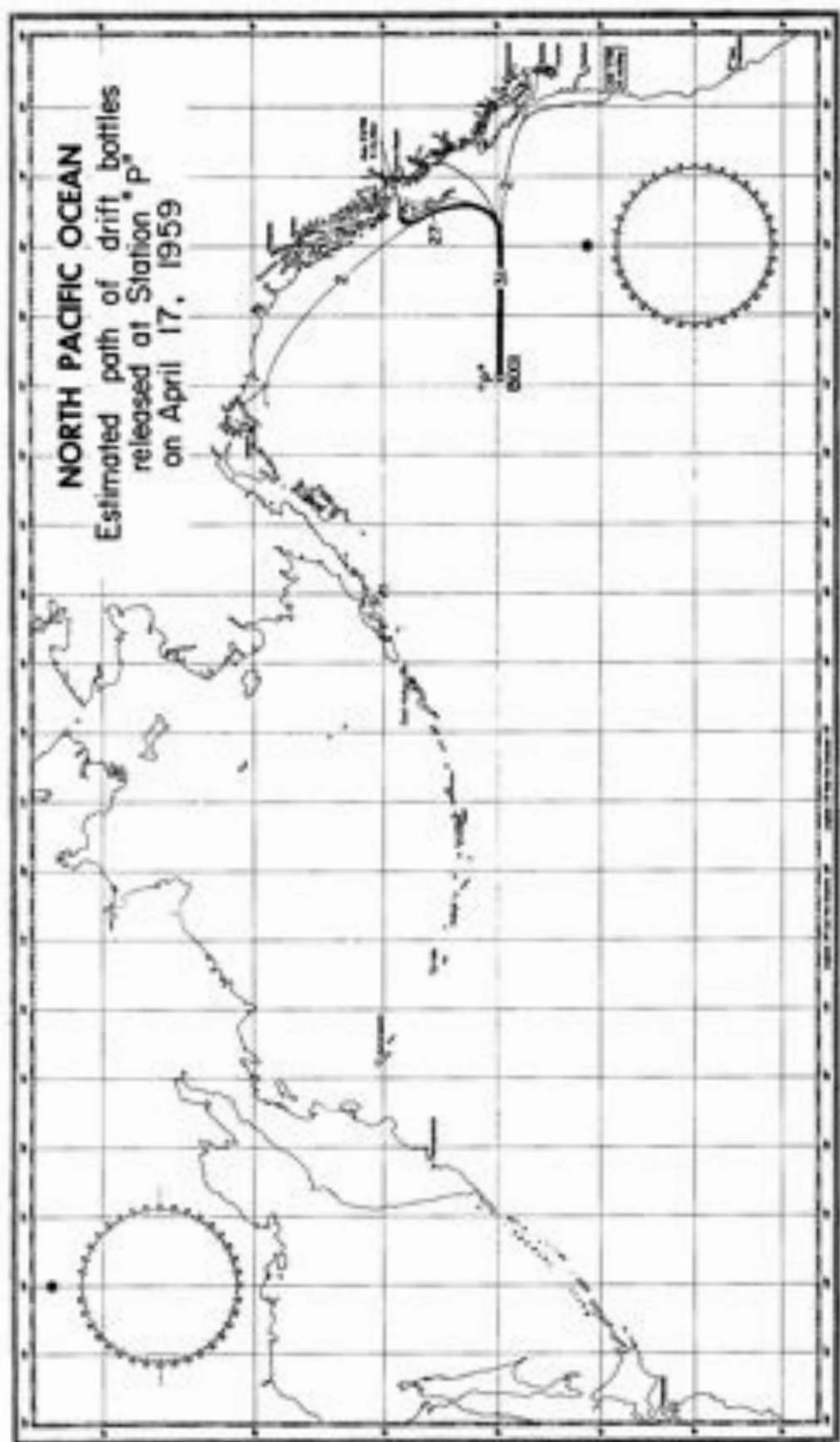


Figure 38
 ESTIMATED PATH OF DRIFT BOTTLES RELEASED AT STATION "P" ON JANUARY 25, 1959



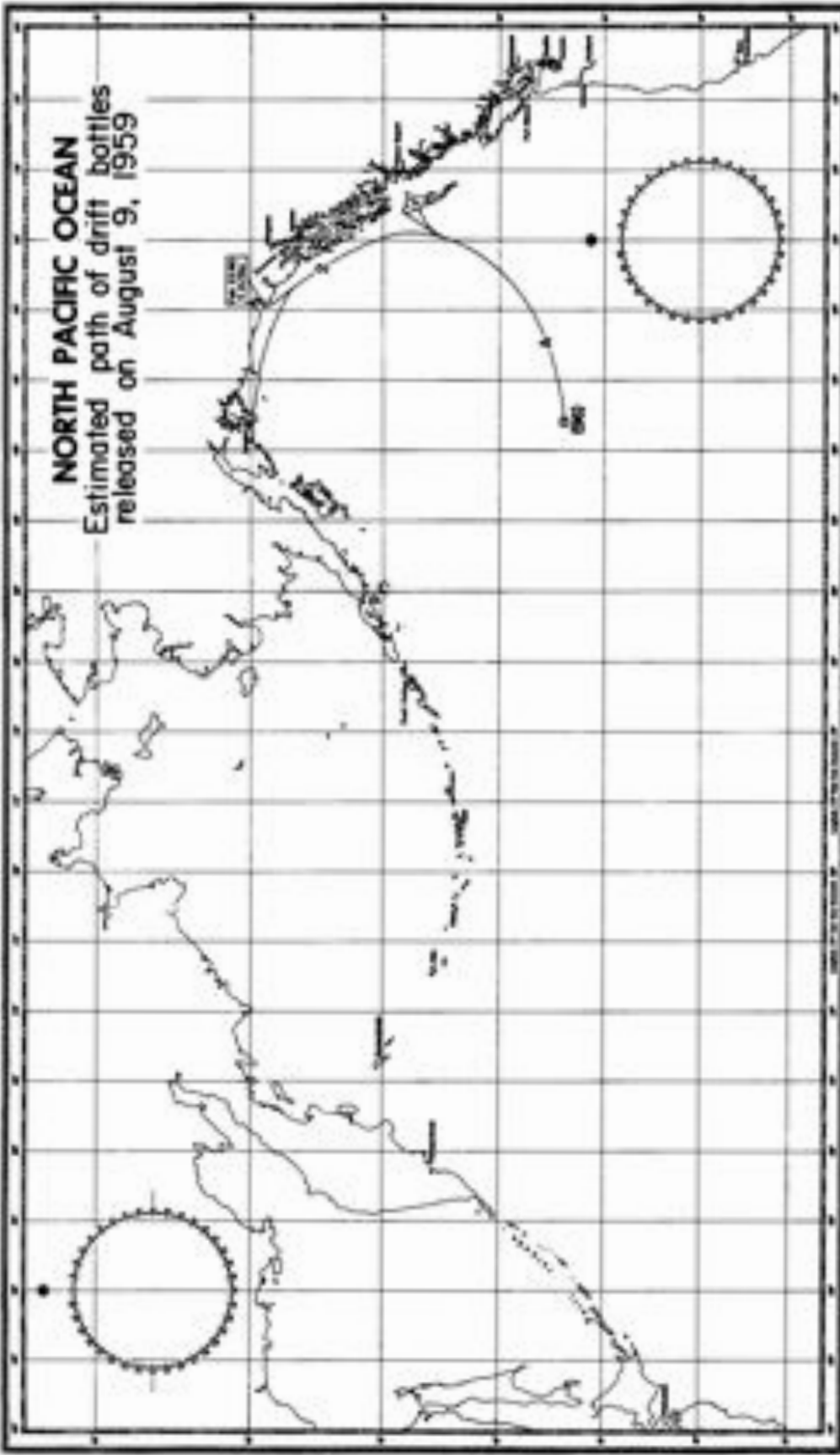
U.S. GOVERNMENT PRINTING OFFICE: 1959 O-511881
 Figure 29



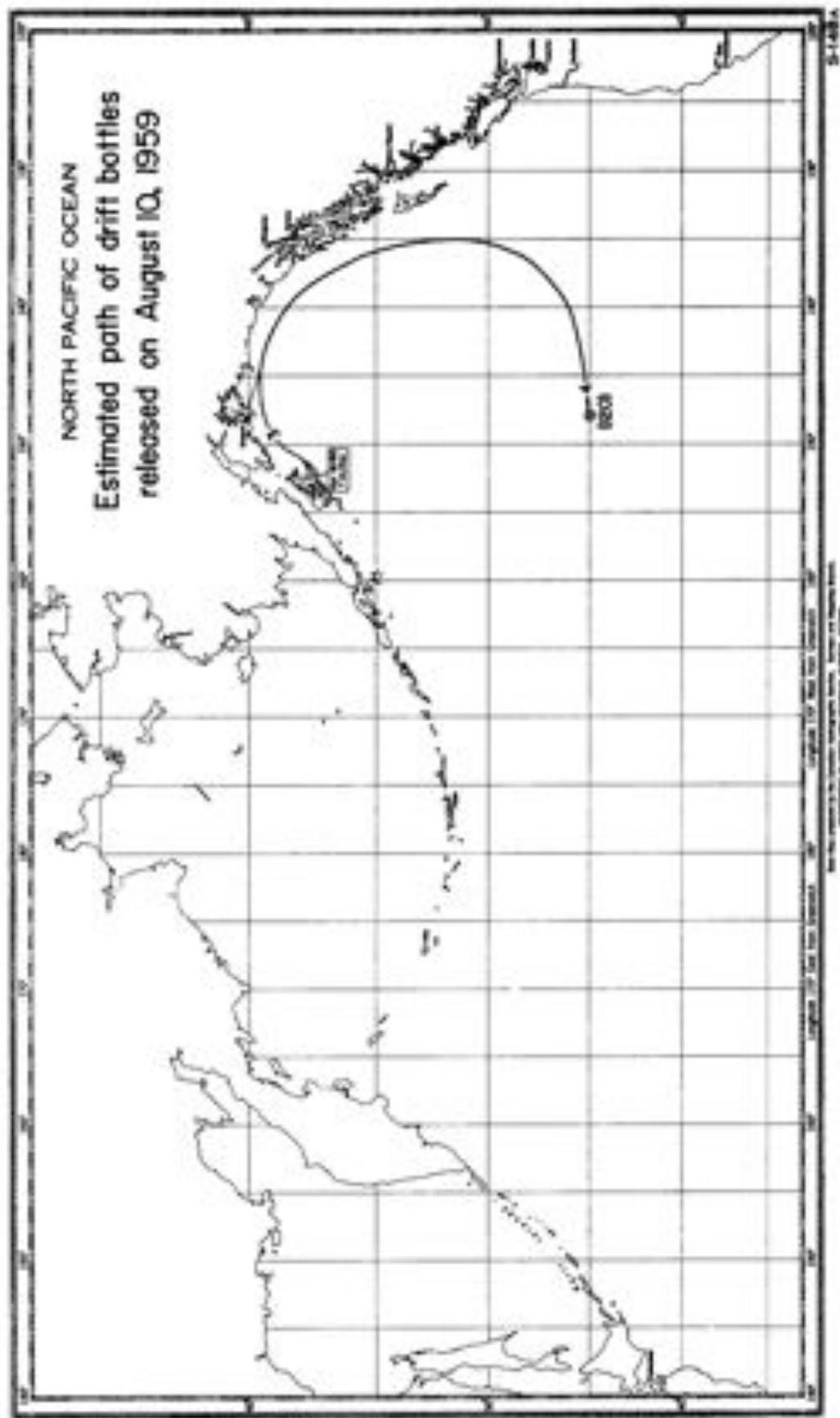
NO. 140
 UNITED STATES GOVERNMENT PRINTING OFFICE: 1959

Figure 40

9-140*



NO. 14
FIGURE 4
ESTIMATED PATH OF DRIFT BOTTLES RELEASED ON AUGUST 9, 1959



NO. 1000 TO 1001, AUGUST 10, 1959. SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF OCEANOGRAPHY.

Figure 42

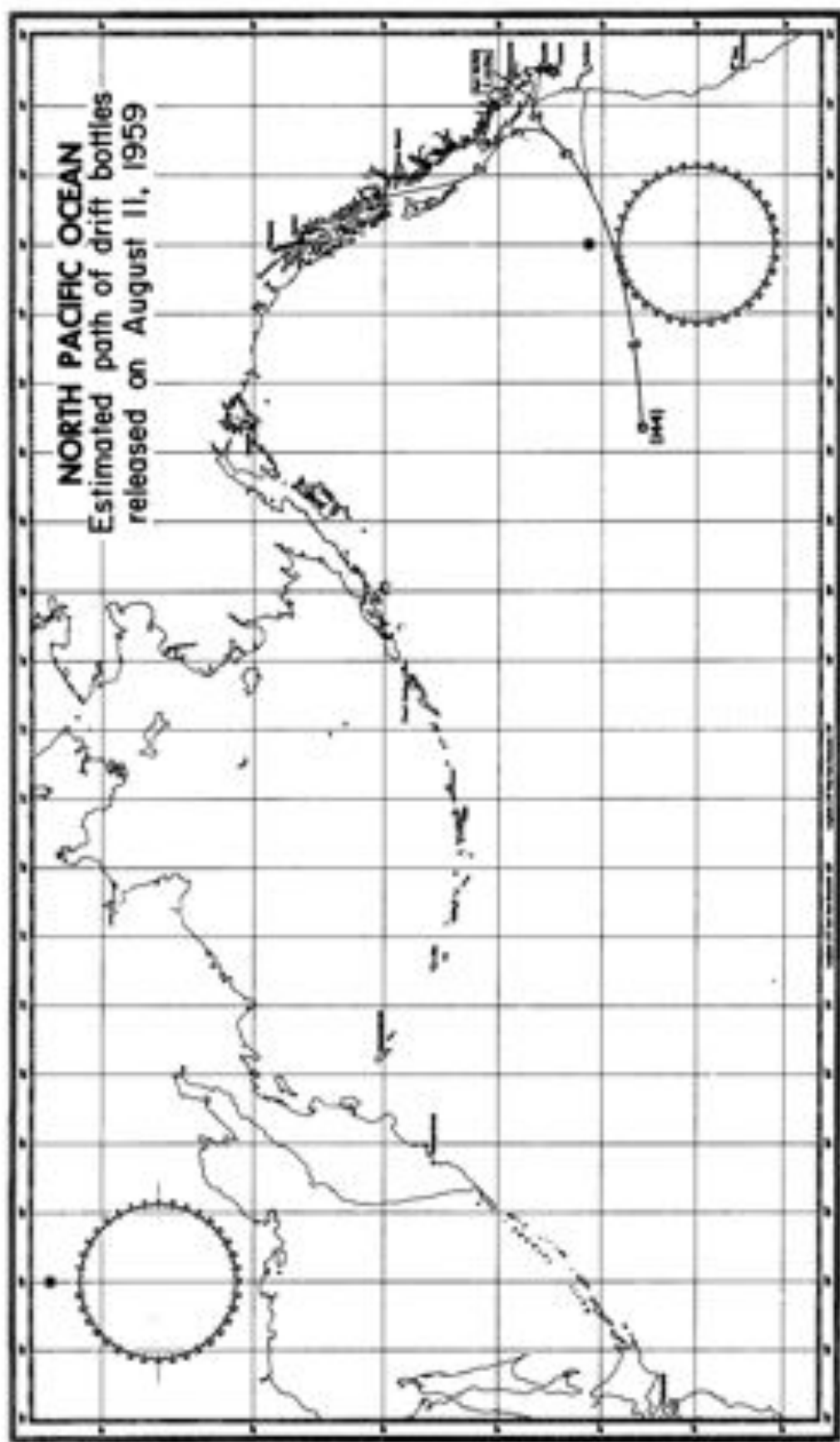


Figure 43
 Estimated path of drift bottles released on August 11, 1959

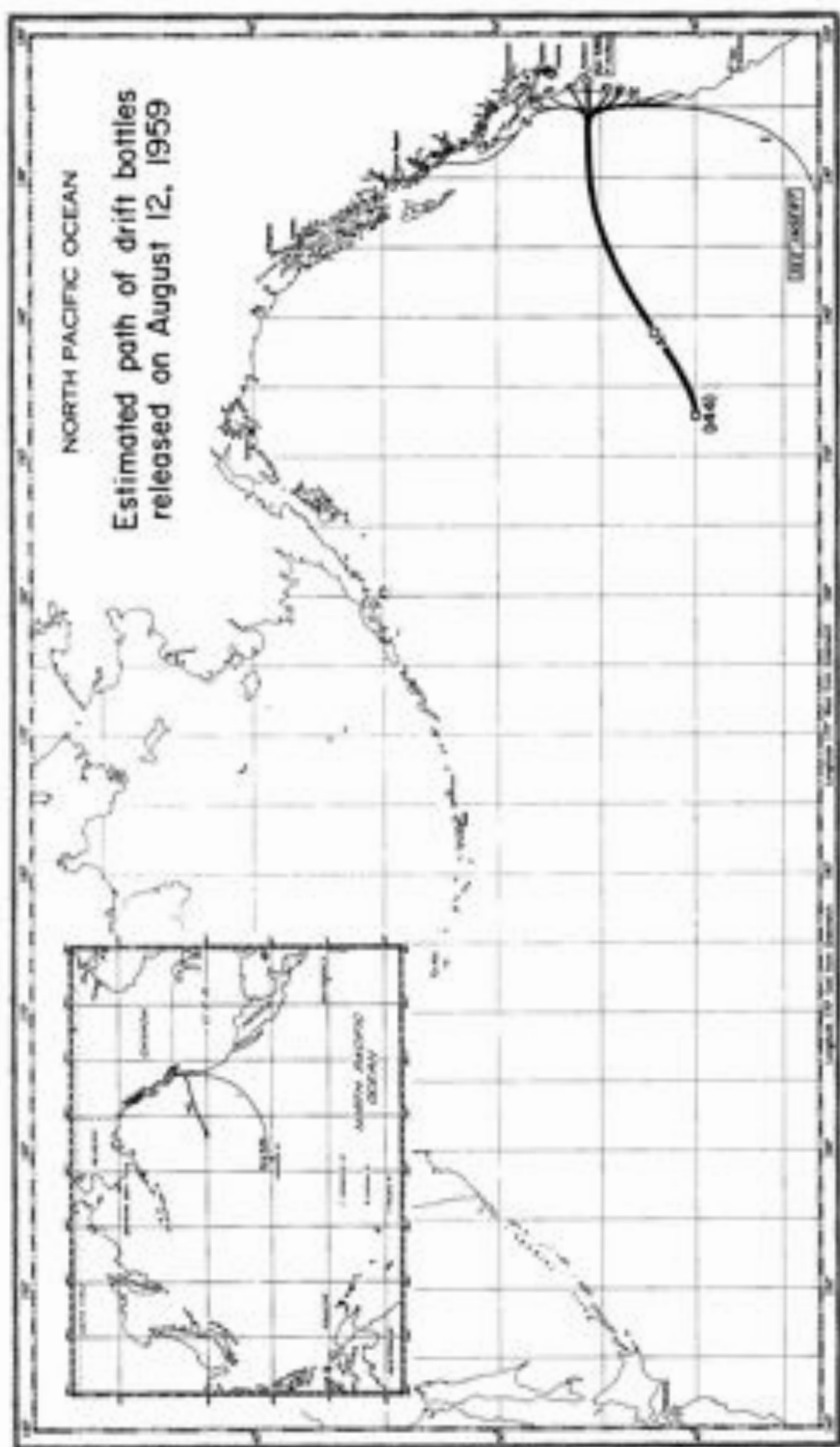


Figure 44