NOAA Ship MILLER FREEMAN R-223 Commander Robert J. Pawlowski, NOAA Commanding Officer

# CRUISE REPORT

Eastern Bering Sea and Shelikof Strait MF94-08 (FOCI 8MF94)

Leg 1 16 - 23 September, 1994 Richard Brodeur Chief Scientist NOAA Alaska Fisheries Science Center (AFSC)

Leg 2
23 - 29 September, 1994
William Parker
Chief Scientist
NOAA Pacific Marine Environmental Lab. (PMEL)

## NOAA Ship MILLER FREEMAN R-223

Eastern Bering Sea and Shelikof Strait MF94-08 (FOCI 8MF94) 16-30 September, 1994

## 1.0 Introduction

Fisheries Oceanography Coordinated Investigations (FOCI) is a joint effort by scientists at PMEL and AFSC to understand the biological and physical processes which cause variability of recruitment to commercially valuable fish and shellfish stocks in Alaskan waters. The FOCI program is presently studying the effects of the biotic and abiotic environment on the early life stages of walleye pollock spawned in the Bering Sea and Shelikof Strait. There are two aspects to the study: the acquisition and analysis of time-series data, and specific research topics to be covered on a cruise-by-cruise basis. This cruise represented a joint effort of FOCI and investigators from other laboratories to examine the geographic distribution of juvenile pollock in relation to oceanographic features around the Pribilof Islands. This report represents the summary of only the FOCI objectives.

The objectives of this cruise were:

- (1) to continue acquisition of long-term biological and physical time series;
- (2) to conduct a juvenile walleye pollock survey around the Pribilof Islands and collect biological data on pollock;
- (3) to collect adult pollock and other fish predators to investigate vertebrate predation on pollock juveniles;
- (4) to collect information on acoustic backscattering and target strength measurements with a 38 kHz system;
- (5) to recover four moorings containing physical and biological sensors;
  - (6) to conduct gear comparison experiments;
  - (7) to map surface distribution of phytoplankton pigments.

## 2.0 Operations

#### LEG 1

Proceeded from Dutch Harbor on September 16 and did acoustic survey and marine mammal survey on the way to the Pribilof Islands. Rendezvous with R/V Surveyor on September 17 south of St. Paul Island. Transferred scientists and equipment to Surveyor and proceeded to Middle Front Transect (Fig. 1). At each station CTD casts were made and chlorophylls, nutrients, and microzooplankton were collected at selected stations and then conducted a 38 kHz acoustic transect along the CTD line following the Surveyor. Two successful bottom trawls, an IKMT/MPS trawl and an anchovy trawl were completed on this transect.

On 19 September, began CTD transect of inner shelf Front A on north side of St. Paul Island and followed with a daytime acoustic transect (Fig. 1). Strong scattering layers were observed throughout the transect at several depths. Three anchovy trawls caught almost exclusively age-0 pollock and jellyfish. A bottom trawl before dusk caught relatively few large predators. The acoustic transect was repeated during night and was followed by two anchovy trawls, a Methot and neuston net tow.

Proceeded to inner shelf Front B south of St. Paul Island and repeated the CTD transect and day and night acoustic transects with the <u>Surveyor</u> (Fig. 1). Strong acoustic signals were observed again along this transect but rough sea conditions and the presence of much crab fishing gear precluded making a full set of trawls along this transect. Three anchovy trawls were made during the day and one anchovy and Methot trawl were made at night. Both ships moved to inner shelf Front D north of St. George Island (Fig. 1) and conducted the CTD transect and the day acoustic transect only. The <u>Miller Freeman</u> made one tow each with the neuston net, Methot trawl, anchovy trawl and the bottom trawl.

The last joint operations involved an acoustic transect on the inner shelf front south of St. George to the head of the Pribilof Canyon (Fig. 1). A concentrated school was located at the shelf break in about 230 m of water during the transect but it could not be located again for sampling. Both an anchovy and bottom trawl were made at the shelf edge. The anchovy trawl caught some age-0 pollock but mostly jellyfish and the bottom trawl caught mainly Pacific Ocean perch. We returned up on the shelf and began sampling an area which showed distinct layering of acoustic targets. We sampled this layer over a diel period using anchovy and bottom trawls and a low-light video camera attached to the CTD rosette to look at diel differences in vertical distribution and aggregation patterns and predation.

#### LEG 2

Departed St Paul, English Bay on September 24 in route to the Peggy Mooring location. Completed one neuston tow during Recorded a CTD and ADCP backtrack L before Peggy transit. recovery on the 24th. Started transit to Shelikof Strait with a. neuston tow taken during transit. In Shelikof Strait, we recovered six subsurface moorings and three surface moorings (M-2 had broken from its anchor two days before recovery). CTD casts were completed prior to each mooring recovery. The Gore Point CTD line (7 stations) was also completed on this leq. neuston tow was done and an ARGOS Drifting buoy was deployed during the CTD line. In the attempt to recover F-9436, the acoustic release failed to function when the release command was transmitted. After defining the mooring location, a drag cable was deployed and circled the mooring. The mooring and all equipment was recovered by using this technique. A search for two moorings (F-9401,F-9403) that were reported as lost was conducted with no positive results and the Miller Freeman arrived in Kodiak on September 29.

### 3.0 Summary

Frontal structure was observed in the CTD sections done jointly with the <u>Surveyor</u> along all transects. Large concentrations of echosign were observed on all transects, particularly those north of St. Paul and St. George Islands and in the Middle Shelf Domain. Trawls through the depths of maximum echosign caught mainly age-0 pollock (mostly 35-85 mm) and large gelatinous zooplankton. At the diel station, age-0 pollock underwent a distinct diel vertical migration and were found near the bottom during the day and in midwater and near-surface waters at night. Many potential predators were collected in the bottom trawls, including adult pollock, arrowtooth flounder, Pacific cod and Pacific halibut, and preliminary at-sea examination of stomach contents revealed some predation on age-0 pollock.

## 4.0 Personnel

Richard Brodeur	NOAA/AFSC	9/16-9/23
Matt Wilson	NOAA/AFSC	9/16-9/23
Morgan Busby	NOAA/AFSC	9/16-9/23
Rex Phillips	NOAA/AFSC	9/16-9/23
Dave Kachel	NOAA/PMEL	9/16-9/23
Leslie Lawrence	NOAA/PMEL	9/16-9/23
William Pearcy	Oregon State Univ.	9/16-9/23
Frank Morado	NOAA/AFSC	9/16-9/23
Beth Sinclair	NOAA/NMML	9/16-9/23
Geoff Lang	NOAA/AFSC	9/16-9/23
William Parker	NOAA/PMEL	9/23-9/30
Carol Dewitt	NOAA/PMEL	9/23-9/30
Rick Miller	NOAA/PMEL	9/16-9/30
Judy Oetting	Teacher at Sea	9/16-9/30
Jeff Napp	NOAA/AFSC	9/16-9/17
Lisa Britt	NOAA/AFSC	9/16-9/17
Roger Hewitt	NOAA/SWFSC	9/16-9/17
David Demer	Scripps Inst.	9/16-9/17
Jim Overland	NOAA/PMEL	9/16-9/17

### 5.0 Cruise Statistics

CTD Casts	33
<pre>   Chlorophyll Samples Taken </pre>	212
Microzooplankton Collections	68
SNutrient Collections	52
<pre>IKMT/MPS Collections</pre>	5
<pre>S Neuston Collections</pre>	4
Anchovy Trawls	20
Bottom Trawls	8
Camera Deployments	4
SPredator Stomach Samples Collected	418
SPathology Collections	1000
Marine Mammal Prey Collections	50

Immunoassay Collections	40
Nautical Miles Surveyed	1125
Expendable bathythermographs	6
Moorings Recovered	10
ARGOS Drifter Buoy	1

## 6.0 Acknowledgements:

We would like to thank the C.O. Robert Pawlowski and the officers and crew of the MILLER FREEMAN for their cooperation and assistance in meeting all the cruise objectives and much more. Special thanks to Micheal Lemon, Field Operations Officer, Dennis Seems, the Executive Officer, Chief Survey Tech Bill Floering and Assistant Survey Tech Phillip White for the long hours and extra effort they gave us. We also appreciate the skill and hard work shown by Rick Pietrusiak and the deck crew in keeping us on a tight fishing schedule under sometimes adverse conditions.

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20         2         20         2:47         57         33.88         169         54.84         53         72         Methot Trawl           21         1         20         5:05         57         25.34         170         4.38         40         63         Anchovy Trawl 07           22         1         20         6:58         57         18.56         170         11.07         38         52         Anchovy Trawl 08           23         1         20         9:54         57         5.28         170         14.14         25         29         CTDB 10           24         1         20         10:58         57         2.58         170         16.74         47         56         CTDB 11           25         1         20         11:56         56         59.98         170         18.37         58         64         CTD 12           26         1         20         12:30         56         56.77         170         21.55         75         85         CTDB 13           27         1         20         13:18         56         54.77         170         21.55         75         85         CTDB 13      <											
21         1         20         5:05         57         25.34         170         4.38         40         63         Anchovy Trawl 07           22         1         20         6:58         57         18.56         170         11.07         38         52         Anchovy Trawl 08           23         1         20         9:54         57         5.28         170         14.14         25         29         CTDB 10           24         1         20         10:58         57         2.58         170         16.74         47         56         CTDB 11           25         1         20         11:56         56         59.98         170         18.37         58         64         CTD 12           26         1         20         12:30         56         56.77         170         21.55         75         85         CTDB 13           27         1         20         13:18         56         54.77         170         23.94         88         93         CTD 14           28         1         20         15:09         57         5.30         170         15.22         34         34         Transect 4 Start											
22         1         20         6:58         57         18.56         170         11.07         38         52         Anchovy Trawl 08           23         1         20         9:54         57         5.28         170         14.14         25         29         CTDB 10           24         1         20         10:58         57         2.58         170         16.74         47         56         CTDB 11           25         1         20         11:56         56         59.98         170         18.37         58         64         CTD 12           26         1         20         12:30         56         56.77         170         21.55         75         85         CTDB 13           27         1         20         13:18         56         54.77         170         23.94         88         93         CTD 14           28         1         20         15:09         57         5.30         170         15:22         34         34         Transect 4 Start           29         1         20         17:54         56         53.05         170         26:22         54         98         Anchovy Trawl 09											
23         1         20         9:54         57         5.28         170         14.14         25         29         CTDB 10           24         1         20         10:58         57         2.58         170         16.74         47         56         CTDB 11           25         1         20         11:56         56         59.98         170         18.37         58         64         CTD 12           26         1         20         12:30         56         56.77         170         21.55         75         85         CTDB 13           27         1         20         13:18         56         54.77         170         23.94         88         93         CTD 14           28         1         20         15:09         57         5.30         170         15.22         34         34         Transect 4 Start           19         17:03         56         47.45         170         31.17         105         105         Transect 4 End           29         1         20         17:54         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         <											
24         1         20         10:58         57         2.58         170         16:74         47         56         CTDB 11           25         1         20         11:56         56         59.98         170         18:37         58         64         CTD 12           26         1         20         12:30         56         56.77         170         21:55         75         85         CTDB 13           27         1         20         13:18         56         54.77         170         23.94         88         93         CTD 14           28         1         20         15:09         57         5.30         170         15:22         34         34         Transect 4 Start           29         1         20         17:54         56         53.05         170         26:22         54         98         Anchovy Trawl 09           30         1         20         17:54         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         1         20         22:24         57         2.81         170         11:21         50         64         Methot Trawl											
25         1         20         11:56         56         59.98         170         18:37         58         64         CTD 12           26         1         20         12:30         56         56.77         170         21:55         75         85         CTDB 13           27         1         20         13:18         56         54.77         170         23.94         88         93         CTD 14           28         1         20         15:09         57         5.30         170         15:22         34         34         Transect 4 Start           19         17:03         56         47.45         170         31.17         105         105         Transect 4 End           29         1         20         17:54         56         53.05         170         26.22         54         98         Anchovy Trawl 09           30         1         20         17:54         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         1         20         22:24         57         2.81         170         11.21         50         64         Methot Trawl           3											
26         1         20         12:30         56         56.77         170         21.55         75         85         CTDB 13           27         1         20         13:18         56         54.77         170         23.94         88         93         CTD 14           28         1         20         15:09         57         5.30         170         15.22         34         34         Transect 4 Start           19         17:03         56         47.45         170         31.17         105         105         Transect 4 End           29         1         20         17:54         56         53.05         170         26.22         54         98         Anchovy Trawl 09           30         1         20         20:44         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         1         20         22:24         57         2.81         170         11.21         50         64         Methot Trawl           32         1         20         23:30         57         2.92         170         16.76         52         52         Transect 5 Start											
27         1         20         13:18         56         54.77         170         23.94         88         93         CTD 14           28         1         20         15:09         57         5.30         170         15:22         34         34         Transect 4 Start           19         17:03         56         47.45         170         31.17         105         105         Transect 4 End           29         1         20         17:54         56         53.05         170         26.22         54         98         Anchovy Trawl 09           30         1         20         20:44         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         1         20         22:24         57         2.81         170         11.21         50         64         Methot Trawl           32         1         20         23:30         57         2.92         170         16.76         52         52         Transect 5 Start           21         1:00         56         50.21         170         28.21         101         101         Transect 5 End           33         1 </td <td></td>											
28         1         20         15:09         57         5.30         170         15:22         34         34         Transect 4 Start           19         17:03         56         47.45         170         31.17         105         105         Transect 4 End           29         1         20         17:54         56         53.05         170         26.22         54         98         Anchovy Trawl 09           30         1         20         20:44         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         1         20         22:24         57         2.81         170         11.21         50         64         Methot Trawl           32         1         20         23:30         57         2.92         170         16.76         52         52         Transect 5 Start           21         1:00         56         50.21         170         28.21         101         101         Transect 5 End           33         1         21         2:29         56         53.34         170         26.81         48         97         Anchovy Trawl 11           34		1	20	12:30	56	56.77	170	21.55	75	85	CTDB 13
19 17:03 56 47.45 170 31.17 105 105 Transect 4 End 29 1 20 17:54 56 53.05 170 26.22 54 98 Anchovy Trawl 09 30 1 20 20:44 56 59.62 170 13.41 35 69 Anchovy Trawl 10 31 1 20 22:24 57 2.81 170 11.21 50 64 Methot Trawl 32 1 20 23:30 57 2.92 170 16.76 52 52 Transect 5 Start 21 1:00 56 50.21 170 28.21 101 101 Transect 5 End 33 1 21 22:29 56 53.34 170 26.81 48 97 Anchovy Trawl 11 34 1 21 6:22 56 37.26 169 35.14 43 51 CTDB 15 35 1 21 7:05 56 38.68 169 34.75 68 76 CTDB 16 35 1 21 7:45 56 38.88 169 34.87 0 76 Neuston Net 36 1 21 8:40 56 39.68 169 34.87 0 76 Neuston Net 36 1 21 9:11 56 40.93 169 34.83 72 79 CTDB 18 38 1 21 9:49 56 37.19 169 34.78 52 52 Transect 6 Start 21 11:07 56 50.08 169 34.92 68 68 Transect 6 End 39 1 21 12:12 56 47.01 169 35.00 48 72 Anchovy Trawl 12		1			56	54.77	170	23.94	88	93	CTD 14
29         1         20         17:54         56         53.05         170         26.22         54         98         Anchovy Trawl 09           30         1         20         20:44         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         1         20         22:24         57         2.81         170         11.21         50         64         Methot Trawl           32         1         20         23:30         57         2.92         170         16.76         52         52         Transect 5 Start           21         1:00         56         50.21         170         28.21         101         101         Transect 5 End           33         1         21         2:29         56         53.34         170         26.81         48         97         Anchovy Trawl 11           34         1         21         6:22         56         37.26         169         35.14         43         51         CTDB 15           35         1         21         7:45         56         38.88         169         34.87         0         76         Neuston Net	28	1		15:09	57	5.30	170	15.22	34	34	Transect 4 Start
29         1         20         17:54         56         53.05         170         26.22         54         98         Anchovy Trawl 09           30         1         20         20:44         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         1         20         22:24         57         2.81         170         11.21         50         64         Methot Trawl           32         1         20         23:30         57         2.92         170         16.76         52         52         Transect 5 Start           21         1:00         56         50.21         170         28.21         101         101         Transect 5 End           33         1         21         2:29         56         53.34         170         26.81         48         97         Anchovy Trawl 11           34         1         21         6:22         56         37.26         169         35.14         43         51         CTDB 15           35         1         21         7:45         56         38.88         169         34.87         0         76         Neuston Net			19	17:03	56	47.45	170	31.17	105	105	Transect 4 End
30         1         20         20:44         56         59.62         170         13.41         35         69         Anchovy Trawl 10           31         1         20         22:24         57         2.81         170         11.21         50         64         Methot Trawl           32         1         20         23:30         57         2.92         170         16.76         52         52         Transect 5 Start           21         1:00         56         50.21         170         28.21         101         101         Transect 5 End           33         1         21         2:29         56         53.34         170         26.81         48         97         Anchovy Trawl 11           34         1         21         6:22         56         37.26         169         35.14         43         51         CTDB 15           35         1         21         7:05         56         38.68         169         34.87         0         76         Neuston Net           36         1         21         7:45         56         39.68         169         34.83         72         79         CTDB 18           3		1	20	17:54							
31         1         20         22:24         57         2.81         170         11.21         50         64         Methot Trawl           32         1         20         23:30         57         2.92         170         16.76         52         52         Transect 5 Start           21         1:00         56         50.21         170         28.21         101         101         Transect 5 End           33         1         21         2:29         56         53.34         170         26.81         48         97         Anchovy Trawl 11           34         1         21         6:22         56         37.26         169         35.14         43         51         CTDB 15           35         1         21         7:05         56         38.68         169         34.75         68         76         CTDB 16           35         1         21         7:45         56         38.88         169         34.87         0         76         Neuston Net           36         1         21         8:40         56         39.68         169         34.83         72         79         CTDB 18           38	30	1									
32         1         20         23:30         57         2.92         170         16.76         52         52         Transect 5 Start           33         1         21         1:00         56         50.21         170         28.21         101         101         Transect 5 End           33         1         21         2:29         56         53.34         170         26.81         48         97         Anchovy Trawl 11           34         1         21         6:22         56         37.26         169         35.14         43         51         CTDB 15           35         1         21         7:05         56         38.68         169         34.75         68         76         CTDB 16           35         1         21         7:45         56         38.88         169         34.87         0         76         Neuston Net           36         1         21         8:40         56         39.68         169         34.83         72         79         CTDB 18           37         1         21         9:19         56         37.19         169         34.83         72         79         CTDB 18 <td>31</td> <td></td>	31										
21 1:00 56 50.21 170 28.21 101 101 Transect 5 End  33 1 21 2:29 56 53.34 170 26.81 48 97 Anchovy Trawl 11  34 1 21 6:22 56 37.26 169 35.14 43 51 CTDB 15  35 1 21 7:05 56 38.68 169 34.75 68 76 CTDB 16  35 1 21 7:45 56 38.88 169 34.87 0 76 Neuston Net  36 1 21 8:40 56 39.68 169 34.68 71 76 CTD 17  37 1 21 9:11 56 40.93 169 34.83 72 79 CTDB 18  38 1 21 9:49 56 37.19 169 34.78 52 52 Transect 6 Start  21 11:07 56 50.08 169 34.92 68 68 Transect 6 End  39 1 21 12:12 56 47.01 169 35.00 48 72 Anchovy Trawl 12	32										
33         1         21         2:29         56         53.34         170         26.81         48         97         Anchovy Trawl 11           34         1         21         6:22         56         37.26         169         35.14         43         51         CTDB 15           35         1         21         7:05         56         38.68         169         34.75         68         76         CTDB 16           35         1         21         7:45         56         38.88         169         34.87         0         76         Neuston Net           36         1         21         8:40         56         39.68         169         34.68         71         76         CTD 17           37         1         21         9:11         56         40.93         169         34.83         72         79         CTDB 18           38         1         21         9:49         56         37.19         169         34.78         52         52         Transect 6 Start           21         11:07         56         50.08         169         34.92         68         68         Transect 6 End           39 <t< td=""><td></td><td></td><td>1</td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>			1		1						
34         1         21         6:22         56         37.26         169         35.14         43         51         CTDB 15           35         1         21         7:05         56         38.68         169         34.75         68         76         CTDB 16           35         1         21         7:45         56         38.88         169         34.87         0         76         Neuston Net           36         1         21         8:40         56         39.68         169         34.68         71         76         CTD 17           37         1         21         9:11         56         40.93         169         34.83         72         79         CTDB 18           38         1         21         9:49         56         37.19         169         34.78         52         52         Transect 6 Start           21         11:07         56         50.08         169         34.92         68         68         Transect 6 End           39         1         21         12:12         56         47.01         169         35.00         48         72         Anchovy Trawl 12	33	1									
35         1         21         7:05         56         38.68         169         34.75         68         76         CTDB 16           35         1         21         7:45         56         38.88         169         34.87         0         76         Neuston Net           36         1         21         8:40         56         39.68         169         34.68         71         76         CTD 17           37         1         21         9:11         56         40.93         169         34.83         72         79         CTDB 18           38         1         21         9:49         56         37.19         169         34.78         52         52         Transect 6 Start           21         11:07         56         50.08         169         34.92         68         68         Transect 6 End           39         1         21         12:12         56         47.01         169         35.00         48         72         Anchovy Trawl 12					1						
35         1         21         7:45         56         38.88         169         34.87         0         76         Neuston Net           36         1         21         8:40         56         39.68         169         34.68         71         76         CTD 17           37         1         21         9:11         56         40.93         169         34.83         72         79         CTDB 18           38         1         21         9:49         56         37.19         169         34.78         52         52         Transect 6 Start           21         11:07         56         50.08         169         34.92         68         68         Transect 6 End           39         1         21         12:12         56         47.01         169         35.00         48         72         Anchovy Trawl 12											
36         1         21         8:40         56         39.68         169         34.68         71         76         CTD 17           37         1         21         9:11         56         40.93         169         34.83         72         79         CTDB 18           38         1         21         9:49         56         37.19         169         34.78         52         52         Transect 6 Start           21         11:07         56         50.08         169         34.92         68         68         Transect 6 End           39         1         21         12:12         56         47.01         169         35.00         48         72         Anchovy Trawl 12											
37         1         21         9:11         56         40.93         169         34.83         72         79         CTDB 18           38         1         21         9:49         56         37.19         169         34.78         52         52         Transect 6 Start           21         11:07         56         50.08         169         34.92         68         68         Transect 6 End           39         1         21         12:12         56         47.01         169         35.00         48         72         Anchovy Trawl 12											
38     1     21     9:49     56     37.19     169     34.78     52     52     Transect 6 Start       21     11:07     56     50.08     169     34.92     68     68     Transect 6 End       39     1     21     12:12     56     47.01     169     35.00     48     72     Anchovy Trawl 12											
39 1 21 11:07 56 50.08 169 34.92 68 68 Transect 6 End 39 1 21 12:12 56 47.01 169 35.00 48 72 Anchovy Trawl 12					1						
39 1 21 12:12 56 47.01 169 35.00 48 72 Anchovy Trawl 12	20	- 1									
/ / / Michely Hawi 12	30	-,-									
40 1 21 15:30 36 41.32 169 35.75 75 79 Bottom Trawl 4											
	40	1	21	12:26	20	41.52	169	35.75	75	79	Bottom Trawl 4

Table 1. MF 94-08 Cruise Summary.

				START START		DEPTH (M)				
		DAY	TIME	LAI	TTUD	LONGITUDE		GEAR		
	HAUL	(ADT)			MM	DD	MM	MAX.	BOTTOM	OPERATION
41	1	21	15:20	56	38.69	169	35.68	50	75	Methot Trawl
42	1	21	18:34	56	26.43	169	37.66	94	94	Transect 7 Start
`		21	20:09	56	10.95	169	30.29	478	478	Transect 7 End
43	1	21	21:52	56	16.94	169	34.30	180	205	Anchovy Trawl 13
44	1	21	23:58	56	17.03	169	32.20	211	221	CTD 19
44	2	22	2:55	56	16.11	169	38.35	197	200	Bottom Trawl 5
45	1	22	6:25	56	21.64	169	44.87	30	118	Anchovy Trawl 14
45	2	22	8:00	56	22.08	169	44.88	110	115	CTD 20
45	3	22	9:56	56	23.92	169	45.53	30	104	Anchovy Trawl 15
45	4	22	11:33	56	24.59	169	45.35	98	100	Bottom Trawl 6
45	5	22	14:00	56	24.69	169	44.85	93	99	CTD 21
45	6	22	15:44	56	26.07	169	45.54	56	94	Anchovy Trawl 16
45	7	22	17:44	56	24.18	169	44.57	42	103	Anchovy Trawl 17
45	8	22	18:44	56	23.69	169	44.62	99	103	CTD 22
45	9	22	19:46	56	24.74	169	44.33	97	101	Bottom Trawl 7
45	10	22	22:22	56	24.58	169	45.82	42	100	Anchovy Trawl 18
45	11	23	0:13	56	24.35	169	43.32	25	104	Anchovy Trawl 19
45	12	23	1:41	56	25.09	169	43.09	28	96	Anchovy Trawl 20
45	13	23	3:00	56	25.65	169	42.95	92	95	Bottom Trawl 8

