

Florida SEAMAP Summer 2011 Survey Cruise Report (6/8/11 – 6/25/11 & 7/29 – 7/31/11)
Cruise Number 171103 using the R/V Tommy Munro

Prepared by:
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Introduction

Florida shrimp and groundfish trawl surveys are conducted to provide fisheries-independent data on the distribution and abundance of fishes and macroinvertebrates in the eastern Gulf of Mexico as part of the coordinated and cost-efficient SEAMAP program. Fisheries-independent data, which are collected without the direct reliance on information provided by commercial and recreational fishers, are essential to the assessment and management of fisheries resources in Florida and the nearshore Gulf of Mexico. Data collected by these surveys will be used to improve existing single-species assessments for managed species as well as further develop an ecosystem-based approach to managing fisheries resources in the eastern Gulf of Mexico.

The long-term goal of the Florida SEAMAP trawl program is to collect a full complement of seasonal trawl samples in the eastern Gulf of Mexico encompassing NMFS statistical zones 3 – 10. Before fully implementing the Florida SEAMAP trawl program in 2010, two years of exploratory surveys were conducted to validate the feasibility of sampling these zones as well as the most appropriate season (summer or fall) within which to conduct trawl surveys. Based on a preliminary examination of data collected in 2008 and 2009, it was decided that from 2010 onward the Florida SEAMAP trawl survey will occur in summer. Although trawling in fall was logistically feasible, overall catch and species diversity was greatest in summer, and so summer surveys will likely provide the most comprehensive data set. Fall catch rates were higher for select taxa (i.e., red snapper), and so the implementation of a recurring fall Florida SEAMAP trawl survey (funding is available for fall 2011) is recommended should additional funds become available.

Objectives

1. Conduct a trawl survey to collect information on shrimp and groundfish abundance/distribution with standard SEAMAP 42-ft trawls.
2. Select sampling stations from NMFS-generated universe of known bathymetric data.
3. Identify, weigh, count and measure all species according to protocols outlined in the NMFS SEAMAP Operations Manual.
4. Collect information on environmental parameters (salinity, temperature, dissolved oxygen, wind speed and direction, wave height, precipitation) in conjunction with trawl sampling.
5. Code all data according to approved NMFS SEAMAP Operations Manual guidelines, and enter data on the NMFS SEAMAP data entry system.
6. Submit data to the Gulf States Marine Fisheries Commission/NMFS Data Manager.

Methods

Beginning in 2010, a new survey design was implemented for the Gulf-wide SEAMAP trawl survey. Overall sampling effort was allocated proportionally among NMFS statistical reporting zones based on proportional availability of sampling habitat (5 – 60 fathoms). Within each NMFS zone, specific sampling sites were chosen following a simple random survey design.

At each sampling station, trawl samples were collected using standard 42-foot SEAMAP trawls (1.58 inch stretched mesh towed at a 5:1 cable length to water depth ratio). At sites where the bottom composition was unknown, an exploratory survey of the bottom using the fathometer on the R/V Tommy Munro was conducted prior to deploying the trawl. Trawls were towed at a speed of 3 knots for a standard duration of 30 minutes. Sample workup and data processing were conducted in accordance with the SEAMAP Operational Manual guidelines. In addition, specimens were retained to validate field identifications and provide biological material for various life-history studies (i.e., age and growth, reproduction, diet, mercury concentration). Environmental data (temperature, salinity, pH, and dissolved oxygen) were measured in association with each trawl event using a CTD or YSI.

Results

During the summer 2011 survey, Florida sampled a total of 143 stations, 136 stations with reportable catches and seven stations with zero catches due to gear damage. Total catch weight for the trip was 9,437 kg. Individual trawl catch weights ranged from 0.8 kg to 544 kg. Over 78,000 animals were collected, including 3327 pink shrimp, 103 brown shrimp, 55 red snapper, 7 gag, and 40 red lionfish. In addition to following standard SEAMAP sampling protocols, we collected ancillary material for various life history studies (to be processed at the Fish and Wildlife Research Institute) at no additional cost to SEAMAP. Otoliths were removed from 768 managed fishes for ageing analyses, including 442 lutjanids and 17 serranids. In addition, 2 heads were removed from gag grouper for otolith microchemistry and 548 spines were removed from managed fishes for alternative aging techniques. Gonads were removed from 509 fish for reproductive staging and 118 fin clip or tissue samples were taken for genetic analysis. Tissue samples were collected from 1,850 fish for mercury analyses and 2,713 stomachs were removed for dietary analyses from a wide variety of managed and non-managed species. In addition to the various samples for researchers at FWRI, 221 samples were collected for cooperative research requests from various federal and state institutions. These samples include whole fish and otoliths for the National Marine Fisheries Service Panama City Lab, fin clip and tissue samples for the Gulf Coast Research Lab, whole fish for the University of Massachusetts Amherst Department of Environmental Conservation, and gills and otoliths for the National Ocean Services Center for Coastal Fisheries and Habitat Research.

Quality Control

A total of 4,443 animals were frozen or preserved and brought back to FWRI. Of those animals 1,196 fishes were kept as representative samples and an additional 1,115 fishes were brought back to be further identified in the lab. In addition to fishes, 2,132 invertebrates were brought back for confirmation of identification.

Deviations

Fifty-four stations were not sampled due to inclement weather, bad bottom, or gear damage. All stations sampled were completed according to the NMFS SEAMAP protocol.

Cruise participants

Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute
Personnel collected all samples. Sample summary and data entry were completed by Jenna Tortorelli.

Submitted By:

Robert McMichael
SEAMAP Coordinator

Table 1. Florida SEAMAP Summer 2011 Shrimp/Groundfish Cruise Summary

| <i>SEAMAP Station Number</i> | <i>Date and Time (GMT)</i> | <i>Latitude (DD MM.SS)</i> | <i>Longitude (DD MM.SS)</i> | <i>Depth (Ftms)</i> | <i>Tow Time (Mins)</i> | <i>Total Catch (Kg)</i> | <i>Weight (Kg)</i> | <i>Fish (Kg)</i> | <i>Crustaceans (Kg)</i> | <i>Other (Kg)</i> |
|----------------------------------|--------------------------------|--------------------------------|---------------------------------|-------------------------|----------------------------|-----------------------------|------------------------|----------------------|-----------------------------|-----------------------|
| E0911 | 07/31/2011 6:51:41 | 29 31.2886 | 01.26 | 32 | 30.35 | 11.726 | 11.232 | 0.442 | 0.052 | |
| E0910 | 07/31/2011 8:34:41 | 29 35.0186 | 02.89 | 32 | 30.40 | 16.542 | 12.352 | 3.952 | 0.238 | |
| E0909 | 07/31/2011 10:56:56 | 29 36.5986 | 15.06 | 38 | 30.17 | 139.381 | 135.926 | 0.000 | 3.455 | |
| E0908 | 07/30/2011 4:10:18 | 29 39.8086 | 02.11 | 23 | 30.05 | 12.334 | 10.102 | 0.796 | 1.436 | |
| E0907 | 07/30/2011 1:56:22 | 29 48.4686 | 03.91 | 22 | 30.00 | 7.842 | 6.590 | 0.562 | 0.690 | |
| E0906 | 07/30/2011 0:17:38 | 29 52.6086 | 05.61 | 21 | 30.02 | 12.618 | 11.754 | 0.024 | 0.840 | |
| E0905 | 07/29/2011 22:42:27 | 29 55.7186 | 07.76 | 20 | 29.97 | 3.200 | 2.968 | 0.004 | 0.228 | |
| E0904 | 07/29/2011 20:47:33 | 29 59.5086 | 13.47 | 23 | 30.43 | 1.956 | 1.806 | 0.005 | 0.145 | |
| E0903 | 06/09/2011 3:47:07 | 30 04.2786 | 00.82 | 15 | 30.18 | 37.803 | 30.632 | 1.554 | 5.617 | |
| E0902 | 06/08/2011 17:24:06 | 30 05.6786 | 42.75 | 28 | 30.05 | 30.800 | 13.636 | 0.084 | 17.080 | |
| E0901 | 06/08/2011 21:52:19 | 30 15.3886 | 10.23 | 14 | 30.52 | 99.313 | 8.512 | 0.006 | 90.795 | |
| E0816 | 07/30/2011 21:45:54 | 28 52.4685 | 15.86 | 45 | 30.30 | 20.248 | 18.542 | 0.018 | 1.688 | |
| E0815 | 07/30/2011 16:13:02 | 28 55.2985 | 13.46 | 35 | 30.05 | 1.542 | 1.082 | 0.000 | 0.460 | |
| E0814 | 07/31/2011 1:19:25 | 29 01.2085 | 32.33 | 46 | 30.15 | 19.168 | 17.046 | 0.276 | 1.846 | |
| E0813 | 06/09/2011 22:01:07 | 29 00.7285 | 02.84 | 2.3 | 30.35 | 14.328 | 12.926 | 0.330 | 1.072 | |
| E0812 | 07/30/2011 13:42:53 | 29 03.1485 | 20.85 | 25 | 29.97 | 1.422 | 1.392 | 0.000 | 0.030 | |
| E0811 | 07/30/2011 11:09:25 | 29 12.0785 | 27.74 | 27 | 30.00 | 0.786 | 0.628 | 0.114 | 0.044 | |
| E0810 | 06/09/2011 19:40:28 | 29 13.9885 | 09.04 | 17 | 30.30 | 10.758 | 10.192 | 0.000 | 0.566 | |
| E0809 | 06/09/2011 17:07:30 | 29 25.3785 | 15.57 | 14 | 30.40 | 4.344 | 4.078 | 0.046 | 0.220 | |
| E0808 | 07/30/2011 7:24:04 | 29 26.5185 | 48.07 | 20 | 30.13 | 42.848 | 40.302 | 1.150 | 1.396 | |
| E0807 | 06/09/2011 11:51:46 | 29 30.4685 | 35.74 | 10.7 | 30.43 | 2.576 | 2.530 | 0.000 | 0.046 | |

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|-------|---------------------|------------------|-----|-------|---------|--------|-------|--------|
| E0806 | 06/09/2011 15:30:21 | 29 33.1385 12.13 | 6.4 | 28.97 | 13.778 | 13.310 | 0.208 | 0.260 |
| E0805 | 06/09/2011 9:36:02 | 29 43.7685 26.74 | 6.9 | 30.37 | 14.110 | 10.314 | 2.514 | 1.282 |
| E0804 | 06/09/2011 8:23:43 | 29 44.5085 26.74 | 6.9 | 30.33 | 16.442 | 11.225 | 4.751 | 0.466 |
| E0803 | 06/09/2011 1:40:27 | 30 06.3185 59.33 | 15 | 29.88 | 105.682 | 46.617 | 1.601 | 57.464 |

| <i>SEAMAP Station Number</i> | <i>Date and Time (GMT)</i> | <i>Latitude (DD MM.SS)</i> | <i>Longitude (DD MM.SS)</i> | <i>Depth (Ftms)</i> | <i>Tow Time (Mins)</i> | <i>Total Catch (Kg)</i> | <i>Weight (Kg)</i> | <i>Fish (Kg)</i> | <i>Crustaceans (Kg)</i> | <i>Other (Kg)</i> |
|----------------------------------|--------------------------------|--------------------------------|---------------------------------|-------------------------|----------------------------|-----------------------------|------------------------|----------------------|-----------------------------|-----------------------|
| E0801 | 06/09/2011 0:08:29 | 30 13.0785 | 57.99 | 11 | 30.22 | 26.799 | 26.382 | 0.028 | 0.389 | |
| E0721 | 06/10/2011 0:43:34 | 28 59.5784 | 43.14 | 21 | 30.22 | 33.474 | 29.169 | 0.771 | 3.534 | |
| E0720 | 06/22/2011 17:59:21 | 29 02.1383 | 29.03 | 7.9 | 30.37 | 14.646 | 3.960 | 0.008 | 10.678 | |
| E0716 | 06/22/2011 20:58:42 | 29 11.4683 | 44.37 | 10.3 | 30.33 | 48.278 | 21.320 | 0.050 | 26.908 | |
| E0633 | 06/21/2011 19:14:31 | 28 03.0584 | 27.01 | 38 | 30.33 | 2.810 | 1.978 | 0.002 | 0.830 | |
| E0632 | 06/11/2011 17:51:49 | 28 02.1983 | 31.75 | 16 | 30.47 | 42.246 | 38.151 | 0.645 | 3.450 | |
| E0630 | 06/11/2011 14:07:58 | 28 03.9783 | 47.02 | 20 | 30.07 | 37.512 | 35.070 | 0.339 | 2.103 | |
| E0629 | 06/19/2011 22:47:03 | 28 12.2082 | 58.30 | 5 | 30.02 | 24.558 | 4.398 | 0.080 | 20.080 | |
| E0627 | 06/11/2011 10:14:36 | 28 12.9283 | 58.99 | 22 | 30.13 | 296.200 | 122.273 | 0.512 | 173.415 | |
| E0626 | 06/11/2011 8:17:30 | 28 10.0484 | 03.01 | 23 | 30.58 | 73.844 | 60.971 | 8.928 | 3.945 | |
| E0625 | 06/11/2011 11:56:37 | 28 13.7183 | 52.98 | 21 | 30.12 | 41.934 | 27.690 | 0.023 | 14.221 | |
| E0624 | 06/11/2011 6:15:19 | 28 17.1884 | 01.43 | 20 | 30.60 | 46.047 | 36.906 | 5.603 | 3.538 | |
| E0623 | 06/22/2011 3:12:40 | 28 16.9184 | 18.59 | 28 | 30.05 | 25.371 | 18.192 | 4.134 | 3.045 | |
| E0620 | 06/22/2011 0:27:21 | 28 21.6384 | 20.13 | 26 | 30.03 | 4.557 | 3.508 | 0.092 | 0.957 | |
| E0619 | 06/21/2011 22:30:32 | 28 24.3884 | 25.83 | 29 | 30.03 | 6.396 | 4.702 | 0.023 | 1.671 | |
| E0618 | 06/11/2011 4:34:17 | 28 21.6883 | 58.42 | 20 | 30.60 | 66.062 | 43.413 | 1.407 | 21.242 | |
| E0618 | 06/11/2011 2:45:38 | 28 23.9783 | 50.17 | 17 | 30.32 | 76.609 | 54.770 | 1.602 | 20.237 | |
| E0617 | 06/11/2011 0:39:38 | 28 26.5084 | 03.91 | 20 | 30.07 | 31.908 | 26.400 | 2.010 | 3.498 | |
| E0616 | 06/10/2011 23:14:13 | 28 28.9884 | 05.05 | 20 | 30.02 | 14.151 | 13.542 | 0.005 | 0.604 | |
| E0615 | 06/10/2011 21:41:48 | 28 31.2584 | 02.63 | 19 | 30.45 | 30.884 | 19.366 | 0.090 | 11.428 | |
| E0614 | 06/22/2011 8:22:52 | 28 31.4183 | 39.61 | 14 | 30.45 | 85.828 | 23.313 | 1.816 | 60.699 | |
| E0613 | 06/10/2011 5:10:52 | 28 53.9184 | 28.62 | 19 | 30.85 | 164.255 | 60.378 | 11.299 | 92.578 | |
| E0612 | 06/10/2011 19:23:15 | 28 39.2983 | 57.47 | 16 | 30.50 | 190.490 | 43.402 | 0.260 | 146.828 | |

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|-------|---------------------|------------------|----|-------|---------|--------|-------|---------|
| E0611 | 06/10/2011 13:45:56 | 28 41.8384 09.30 | 19 | 29.72 | 70.156 | 68.110 | 0.011 | 2.035 |
| E0610 | 06/10/2011 17:45:13 | 28 42.2784 01.37 | 16 | 30.45 | 173.670 | 12.420 | 0.064 | 161.186 |
| E0609 | 06/10/2011 15:21:50 | 28 44.5584 04.34 | 18 | 30.07 | 177.498 | 38.242 | 0.032 | 139.224 |
| E0608 | 06/24/2011 4:05:45 | 28 46.7884 48.63 | 26 | 30.28 | 52.816 | 41.716 | 1.614 | 9.486 |

| <i>SEAMAP Station Number</i> | <i>Date and Time (GMT)</i> | <i>Latitude (DD MM.SS)</i> | <i>Longitude (DD MM.SS)</i> | <i>Depth (Ftms)</i> | <i>Tow Time (Mins)</i> | <i>Total Catch (Kg)</i> | <i>Weight (Kg)</i> | <i>Fish (Kg)</i> | <i>Crustaceans (Kg)</i> | <i>Other (Kg)</i> |
|----------------------------------|--------------------------------|--------------------------------|---------------------------------|-------------------------|----------------------------|-----------------------------|------------------------|----------------------|-----------------------------|-----------------------|
| E0606 | 06/22/2011 11:13:37 | 28 49.8783 | 46.21 | 13 | 30.17 | 29.251 | 2.210 | 0.005 | 27.036 | |
| E0605 | 06/10/2011 11:14:44 | 28 52.1084 | 13.72 | 16 | 30.05 | 69.825 | 24.100 | 0.040 | 45.685 | |
| E0604 | 06/10/2011 8:37:52 | 28 52.7284 | 15.25 | 16 | 30.33 | 69.122 | 45.069 | 18.850 | 5.203 | |
| E0603 | 06/10/2011 2:56:31 | 28 53.8384 | 37.79 | 21 | 30.02 | 32.298 | 26.258 | 2.794 | 3.246 | |
| E0602 | 06/24/2011 1:39:21 | 28 56.2284 | 47.10 | 23 | 29.72 | 120.477 | 83.224 | 18.704 | 18.548 | |
| E0530 | 06/18/2011 0:37:10 | 27 00.3082 | 51.06 | 14 | 29.97 | 79.305 | 75.036 | 0.410 | 3.859 | |
| E0528 | 06/17/2011 22:20:43 | 27 03.5882 | 37.38 | 8.3 | 30.07 | 90.981 | 55.423 | 0.138 | 35.420 | |
| E0527 | 06/18/2011 2:48:57 | 27 09.7383 | 02.23 | 15 | 30.02 | 135.871 | 131.990 | 2.633 | 1.248 | |
| E0525 | 06/21/2011 8:02:28 | 27 14.5083 | 59.03 | 39 | 30.42 | 31.486 | 26.004 | 0.160 | 5.322 | |
| E0523 | 06/18/2011 4:27:19 | 27 17.8782 | 58.82 | 12 | 30.40 | 66.763 | 44.634 | 1.427 | 20.702 | |
| E0521 | 06/18/2011 5:32:28 | 27 21.4182 | 57.70 | 11 | 30.60 | 79.530 | 59.686 | 0.335 | 19.509 | |
| E0520 | 06/21/2011 3:25:14 | 27 21.5783 | 41.67 | 26 | 30.07 | 35.117 | 31.655 | 1.844 | 1.618 | |
| E0519 | 06/12/2011 4:26:46 | 27 23.8283 | 09.68 | 15 | 30.17 | 76.148 | 74.897 | 0.999 | 0.252 | |
| E0518 | 06/21/2011 5:22:24 | 27 24.8183 | 50.32 | 30 | 30.48 | 27.450 | 23.450 | 0.790 | 3.210 | |
| E0517 | 06/12/2011 2:39:31 | 27 30.8883 | 16.39 | 17 | 30.13 | 37.333 | 29.090 | 5.924 | 2.319 | |
| E0516 | 06/21/2011 1:18:27 | 27 31.8683 | 33.85 | 23 | 30.02 | 51.109 | 37.424 | 2.869 | 10.816 | |
| E0515 | 06/12/2011 1:17:00 | 27 33.0483 | 16.22 | 17 | 30.12 | 163.432 | 159.837 | 0.993 | 2.602 | |
| E0514 | 06/21/2011 11:19:18 | 27 35.5483 | 54.77 | 28 | 30.08 | 9.623 | 8.132 | 0.009 | 1.482 | |
| E0512 | 06/20/2011 21:58:21 | 27 39.0983 | 09.71 | 13 | 30.27 | 62.760 | 23.882 | 0.026 | 38.852 | |
| E0511 | 06/11/2011 23:23:04 | 27 38.7683 | 21.41 | 17 | 30.20 | 35.000 | 32.997 | 0.072 | 1.931 | |
| E0509 | 06/11/2011 22:07:43 | 27 42.0183 | 22.61 | 16 | 30.45 | 107.254 | 106.528 | 0.222 | 0.504 | |
| E0508 | 06/21/2011 14:07:52 | 27 42.8884 | 10.84 | 30 | 30.08 | 78.048 | 0.888 | 0.007 | 77.153 | |
| E0506 | 06/21/2011 16:38:01 | 27 46.8284 | 22.29 | 43 | 30.43 | 4.001 | 1.942 | 0.001 | 2.058 | |

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|-------|---------------------|------------------|-----|-------|--------|--------|-------|-------|
| E0504 | 06/19/2011 19:56:00 | 27 51.9582 59.75 | 5.8 | 30.27 | 2.932 | 2.220 | 0.006 | 0.706 |
| E0503 | 06/11/2011 19:50:12 | 27 54.4983 25.49 | 15 | 30.77 | 60.171 | 58.678 | 0.077 | 1.416 |
| E0432 | 06/13/2011 6:20:02 | 26 01.6083 38.72 | 36 | 30.25 | 29.154 | 23.398 | 1.144 | 4.612 |
| E0430 | 06/13/2011 7:58:04 | 26 03.2183 35.57 | 37 | 30.45 | 30.184 | 26.806 | 0.661 | 2.717 |

| <i>SEAMAP Station Number</i> | <i>Date and Time (GMT)</i> | <i>LatitudeLongitudeDepth (DD MM.SS) (DD MM.SS)</i> | <i>Tow Time (Ftms)</i> | <i>Total Catch Weight (Mins) (Kg)</i> | <i>Fish (Kg)</i> | <i>Crustaceans (Kg)</i> | <i>Other (Kg)</i> |
|----------------------------------|--------------------------------|---|----------------------------|---|----------------------|-----------------------------|-----------------------|
| E0429 | 06/16/2011 23:05:02 | 26 04.2682 01.00 | 6.5 | 30.07 | 198.867 150.037 | 0.019 | 48.810 |
| E0428 | 06/13/2011 4:29:23 | 26 03.4483 46.33 | 50 | 30.38 | 21.476 17.037 | 0.909 | 3.530 |
| E0425 | 06/13/2011 2:04:05 | 26 17.1683 49.03 | 53 | 30.08 | 20.800 17.626 | 1.058 | 2.116 |
| E0423 | 06/12/2011 23:11:55 | 26 21.4883 34.38 | 34 | 30.22 | 5.020 3.328 | 0.018 | 1.674 |
| E0422 | 06/17/2011 2:24:34 | 26 22.8782 20.22 | 8 | 30.02 | 167.133 93.421 | 1.389 | 72.323 |
| E0419 | 06/17/2011 7:54:59 | 26 27.6082 56.56 | 20 | 30.25 | 250.117 66.607 | 2.399 | 181.111 |
| E0417 | 06/17/2011 5:05:44 | 26 30.2482 35.64 | 12 | 30.38 | 70.167 52.324 | 0.345 | 17.498 |
| E0414 | 06/12/2011 20:56:45 | 26 31.4583 36.96 | 35 | 30.05 | 5.191 4.296 | 0.055 | 0.840 |
| E0413 | 06/12/2011 18:26:57 | 26 32.8683 49.97 | 45 | 30.35 | 11.865 7.988 | 0.021 | 3.856 |
| E0412 | 06/17/2011 9:58:36 | 26 34.7183 01.14 | 20 | 30.50 | 139.238 135.278 | 0.450 | 3.510 |
| E0411 | 06/12/2011 16:53:57 | 26 35.0383 49.71 | 45 | 30.42 | 11.114 9.610 | 0.012 | 1.492 |
| E0410 | 06/17/2011 18:11:41 | 26 40.0682 32.27 | 11 | 30.47 | 30.077 11.577 | 0.170 | 18.330 |
| E0409 | 06/17/2011 16:34:57 | 26 41.4282 40.21 | 12 | 30.45 | 31.476 11.638 | 0.056 | 19.782 |
| E0407 | 06/12/2011 15:03:27 | 26 42.6283 42.54 | 37 | 30.10 | 2.886 2.646 | 0.008 | 0.232 |
| E0406 | 06/17/2011 14:51:03 | 26 44.4982 47.36 | 14 | 30.03 | 57.716 46.320 | 0.042 | 11.354 |
| E0405 | 06/12/2011 11:34:49 | 26 47.9083 16.71 | 25 | 30.10 | 8.415 8.018 | 0.050 | 0.347 |
| E0404 | 06/17/2011 12:28:11 | 26 49.4983 00.95 | 19 | 30.05 | 103.765 101.689 | 0.253 | 1.822 |
| E0403 | 06/12/2011 9:59:16 | 26 52.5883 11.29 | 23 | 30.40 | 22.568 20.554 | 0.704 | 1.310 |
| E0402 | 06/12/2011 8:17:54 | 26 54.7883 15.48 | 24 | 30.40 | 46.489 44.365 | 1.796 | 0.328 |
| E0401 | 06/17/2011 20:40:46 | 26 56.7382 30.73 | 7.4 | 30.23 | 43.801 24.592 | 0.026 | 19.183 |
| E0339 | 06/14/2011 3:23:03 | 25 01.3583 35.40 | 40 | 30.22 | 12.224 10.132 | 0.253 | 1.839 |
| E0338 | 06/14/2011 20:33:56 | 25 02.7682 41.17 | 21 | 30.48 | 7.600 2.910 | 0.444 | 4.246 |
| E0337 | 06/14/2011 2:03:37 | 25 02.9383 32.18 | 39 | 30.02 | 16.180 12.074 | 1.036 | 3.070 |

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|-------|---------------------|------------------|-----|-------|---------|--------|-------|---------|
| E0336 | 06/15/2011 14:12:33 | 25 05.2381 36.29 | 6.4 | 30.27 | 397.484 | 73.076 | 0.000 | 324.408 |
| E0335 | 06/15/2011 12:25:41 | 25 06.7681 45.47 | 7.6 | 30.05 | 113.552 | 70.996 | 0.000 | 42.556 |
| E0334 | 06/14/2011 18:32:30 | 25 06.9482 47.89 | 23 | 29.92 | 30.304 | 7.930 | 0.403 | 21.971 |
| E0332 | 06/16/2011 2:51:05 | 25 10.3982 29.74 | 18 | 30.05 | 86.257 | 42.878 | 5.386 | 37.993 |

| <i>SEAMAP Station Number</i> | <i>Date and Time (GMT)</i> | <i>Latitude (DD MM.SS)</i> | <i>Longitude (DD MM.SS)</i> | <i>Depth (Ftms)</i> | <i>Tow Time (Mins)</i> | <i>Total Catch (Kg)</i> | <i>Weight (Kg)</i> | <i>Fish (Kg)</i> | <i>Crustaceans (Kg)</i> | <i>Other (Kg)</i> |
|----------------------------------|--------------------------------|--------------------------------|---------------------------------|-------------------------|----------------------------|-----------------------------|------------------------|----------------------|-----------------------------|-----------------------|
| E0331 | 06/15/2011 17:45:09 | 25 11.5381 | 39.60 | 7.2 | 30.58 | 187.513 | 75.332 | 0.031 | 112.150 | |
| E0330 | 06/13/2011 23:51:01 | 25 13.3183 | 23.73 | 35 | 30.02 | 5.824 | 4.926 | 0.046 | 0.852 | |
| E0329 | 06/13/2011 22:32:35 | 25 15.8083 | 20.65 | 34 | 29.98 | 17.316 | 4.360 | 0.076 | 12.880 | |
| E0325 | 06/16/2011 4:56:26 | 25 19.5082 | 35.50 | 19 | 30.72 | 87.361 | 37.832 | 0.236 | 49.293 | |
| E0323 | 06/15/2011 22:13:40 | 25 22.3181 | 57.67 | 8.9 | 30.25 | 411.459 | 44.463 | 0.156 | 366.840 | |
| E0321 | 06/15/2011 19:52:47 | 25 22.6281 | 44.68 | 6.7 | 30.55 | 261.855 | 114.587 | 0.046 | 147.221 | |
| E0316 | 06/16/2011 7:25:11 | 25 31.4082 | 31.90 | 18 | 30.52 | 93.585 | 40.446 | 2.397 | 50.742 | |
| E0314 | 06/13/2011 19:45:23 | 25 31.9883 | 12.59 | 31 | 30.33 | 123.301 | 6.662 | 0.82 | 116.557 | |
| E0313 | 06/13/2011 17:10:12 | 25 34.3183 | 27.70 | 36 | 30.18 | 5.990 | 2.952 | 0.012 | 3.026 | |
| E0311 | 06/16/2011 9:29:50 | 25 39.7682 | 37.69 | 18 | 30.63 | 544.012 | 52.468 | 0.936 | 490.608 | |
| E0310 | 06/16/2011 18:58:15 | 25 47.0482 | 04.20 | 10.2 | 30.78 | 47.694 | 20.066 | 0.044 | 27.584 | |
| E0309 | 06/16/2011 11:48:12 | 25 48.9882 | 39.51 | 19 | 30.28 | 457.918 | 27.614 | 0.482 | 429.822 | |
| E0307 | 06/13/2011 14:24:11 | 25 49.3383 | 21.00 | 33 | 30.17 | 257.618 | 6.246 | 0.000 | 251.372 | |
| E0306 | 06/16/2011 16:34:39 | 25 49.0482 | 17.84 | 13 | 30.47 | 375.814 | 32.914 | 0.108 | 342.792 | |
| E0305 | 06/13/2011 11:49:18 | 25 52.3583 | 34.52 | 38 | 30.05 | 15.479 | 14.500 | 0.004 | 0.975 | |
| E0304 | 06/16/2011 13:40:03 | 25 53.4582 | 33.82 | 18 | 30.02 | 92.518 | 52.682 | 0.028 | 39.808 | |
| E0303 | 06/16/2011 21:09:08 | 25 54.9682 | 00.54 | 7.7 | 30.10 | 70.056 | 59.806 | 0.040 | 10.210 | |
| E0301 | 06/13/2011 9:57:44 | 25 57.9783 | 26.98 | 34 | 30.40 | 13.882 | 5.660 | 0.018 | 8.204 | |
| E0211 | 06/14/2011 11:02:58 | 24 29.1383 | 14.10 | 43 | 30.08 | 51.084 | 12.390 | 0.012 | 38.682 | |
| E0210 | 06/14/2011 8:57:02 | 24 34.4183 | 19.16 | 35 | 30.15 | 29.072 | 12.887 | 0.849 | 15.336 | |
| E0209 | 06/14/2011 7:02:21 | 24 44.4183 | 19.20 | 34 | 30.45 | 10.653 | 7.776 | 1.281 | 1.596 | |
| E0208 | 06/15/2011 0:37:55 | 24 46.8882 | 31.20 | 15 | 30.15 | 26.762 | 3.632 | 20.002 | 3.128 | |
| E0207 | 06/15/2011 8:54:05 | 24 47.2582 | 02.39 | 10.6 | 30.05 | 45.626 | 43.902 | 1.522 | 0.202 | |

| | | | | | | | | |
|-------|---------------------|------------------|----|-------|--------|--------|-------|-------|
| E0206 | 06/14/2011 15:28:27 | 24 47.8582 54.87 | 22 | 29.95 | 23.868 | 23.400 | 0.020 | 0.448 |
| E0205 | 06/15/2011 6:38:50 | 24 50.2182 18.02 | 13 | 30.22 | 36.929 | 34.762 | 0.369 | 1.798 |
| E0204 | 06/15/2011 5:28:05 | 24 52.2082 16.18 | 13 | 29.97 | 35.669 | 34.498 | 1.170 | 0.001 |
| E0203 | 06/15/2011 3:00:14 | 24 54.9982 19.18 | 14 | 30.00 | 44.389 | 38.384 | 0.973 | 5.032 |

| <i>SEAMAP Station Number</i> | <i>Date and Time (GMT)</i> | <i>LatitudeLongitudeDepth (DD MM.SS) (DD MM.SS)</i> | <i>Tow Time (Ftms)</i> | <i>Total Catch Weight (Mins) (Kg)</i> | <i>Fish (Kg)</i> | <i>Crustaceans (Kg)</i> | <i>Other (Kg)</i> | |
|----------------------------------|--------------------------------|---|----------------------------|---|----------------------|-----------------------------|-----------------------|-------|
| E0202 | 06/15/2011 4:15:48 | 24 55.2682 15.03 | 13 | 30.12 | 25.116 | 23.014 | 2.036 | 0.066 |
| E0201 | 06/14/2011 22:17:07 | 24 57.3482 37.64 | 19 | 30.08 | 7.602 | 5.974 | 1.172 | 0.456 |

