

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD  
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1983 RESEARCH VESSEL PROGRAMME 1983

REPORT: RV CIROLANA: CRUISE 8.

STAFF:

D Harding SIC  
L Woolner  
B J Knight  
T Boon  
Mrs J Hunton  
B D Rackham  
Miss L Thurston  
E Shreeve/M Fulcher (Part Time)  
Dr G Cranmer (Luton)

DURATION:

17 August-14 September

LOCALITY:

North Sea

AIMS:

See cruise programme.

NARRATIVE:

RV CIROLANA left Grimsby at 11.15 hrs GMT, 17 August and after calibrating ships instruments in the mouth of the Humber river sailed to the first fishing station south-east of Flamborough Head. Fishing commenced at 16.05 hrs GMT and at this station the routine was established for handling an Agassiz trawl and a towed body containing a Guildline CTD and Chelsea-Oriel Aquatracker. Shipboard sensors including the Guildline shallow water CTD, Turner fluorometer and HIAC particle counter were tested prior to moving off to the southern-bight of the North Sea to begin the survey proper. All electronic instruments except the HIAC particle counter and the Aquatracker were linked to the computer and logged while in operation.

The pattern of work proposed for the cruise was the same as that carried out in 1982, alternate lanes of stations were to be worked east-west, northward from the southern bight to  $61^{\circ} 30'N$ , then for the second half of the cruise the intermediate lanes of stations were to be worked southward, ending the survey in the southern bight. Unfortunately weather conditions and calls to the ports of Esbjerg and Aberdeen disrupted this schedule.

AEP 1 requirements for sampling water for Caesium analysis were accomplished by sampling at or 'en route' to fishing stations, and fish samples for Caesium analysis were obtained from selected trawl hauls within designated areas.

Benthos samples were obtained from the main trawl at each fishing station and from the Agassiz trawl, which was deployed morning and evening each day. Photographs of the sea bed were obtained from a camera attached to the headline of the Granton trawl at each fishing station. Plankton was also collected using a coarse mesh net attached to the headline of the Granton or Agassiz trawls to determine the location of late stages of planktonic larvae of benthic organisms.

Environmental sensors measuring temperature, salinity, chlorophyll 'a' and particle size distribution were operated throughout the cruise by pumping water to sensors deployed on deck or in the hydrographic laboratory. While a towed body with depth, temperature, salinity, oxygen and chlorophyll 'a' sensors was deployed at nearly every fishing station to measure the depth distribution of these variables.

The Koden colour sounder was run throughout the cruise and permanent records made at timed intervals or as required.

Computer failure on the 19 August prevented all data logging and only a small part of the storage was available for programming. CIROLANA put into Esjberg on 25 August and sailed the following day after the computer had been repaired by a Hewlett Packard engineer. Thereafter all sensors and ships instruments could be monitored and full use of the computer was possible, allowing software to be developed to cope with the new input documents which have been designed as part of the groundfish survey data base. The Guildline towed CTD was logged successfully and programmes written to utilise the HP graphics terminal and line-printer to plot the results from each profile.

On 29 August the ship made a brief diversion to Aberdeen where Mr Shreeve was exchanged for Mr Fulcher via the pilot boat.

Thereafter the programme continued into the northern North Sea, where bad weather curtailed the full work programme for two days before the Cirolana returned to the southeast and southern North Sea to complete the fishing programme.

Following the last AEP 1 water station near the Silver Pit the ship sailed to Bridlington Bay to lay overnight. On 13 September a transect was made across the Flamborough temperature front using the CTD, Aquatracker and Plankton camera to profile the water column at selected stations.

As the ship sailed north to the Tyne the gear was dismantled and packed, the laboratories cleaned and data summaries compiled for all fish and benthos using the software developed during the cruise.

CIROLANA lay off the Tyne overnight and entered the dry-dock at Wallsend at 7.00 hrs on 14 September, thus concluding the seventh annual ground-fish survey of the North Sea.

#### RESULTS:

Aim 1. 74 fishing stations were worked successfully including all but two of the primary stations. Figure 1 shows the cruise track and figure 2 the fishing stations.

At each station fished by the Granton trawl the weight of each species of fish and shell-fish of commercial importance was recorded. Length distributions of all fish species were taken and numbers calculated from the length sub-samples. A total weight of benthos was obtained and counts made of each species. All this data was input to the computer, validation checks made and data summaries compiled (Table 1A.)

Length distributions and otoliths were collected for all fish of commercial importance so that age/length keys could be obtained and numbers at age calculated from the length distributions.

No stomach contents were collected but some haddock stomachs were examined at sea.

Aim 2. Surface samples of sea water for Cs analysis were collected at 63 stations and Niskin samples of bottom water at 6 stations on a line at approximately 57°N.

Aim 3. On line sensors were run continuously in pumped sea surface water and records of particle size distribution, chlorophyll 'a' temperature and salinity obtained either as chart records or via the data logger in the computer.

Aim 4. The towed body containing environmental sensors worked very successfully giving profiles of temperature, salinity, oxygen and chlorophyll 'a'. In the northern and central North Sea strong thermoclines were recorded and in the eastern part of the central North Sea the thermocline was also the boundary between low salinity surface water of coastal origin and mixed central North Sea water of higher salinity. Water below the thermocline was also low in oxygen in this region.

Aim 5. Data logging of surface and profiling sensors was possible only after the computer had been repaired at Esjberg.

Aim 6. Benthos was sampled qualitatively and quantitatively by Granton and Agassiz trawls, and by the headline camera. The Agassiz trawl was fitted with a fine mesh liner and sampled a range of sizes of benthos not taken in the Granton Trawl. All sample counts of the numbers of organisms were entered to the computer and summaries made using the same software as that used for the fish samples. (Table 1B).

A wide range of benthic organisms were collected to aid identification of fish stomach contents.

All benthos samples were photographed and photographs were also taken of individual organisms to update the North Sea benthos catalogue.

Aim 7. All data is in the computer and the new software developed on this cruise will allow summaries to be made in the usual way. These programmes will be linked to the data base being developed for future fishing surveys.

Ad hoc collections made on this cruise are listed in table 2.

D Harding  
21 September 1983

Seen in draft:—G Sinclair (Captain)  
E W Pearce (Skipper)  
D J Garrod (D Director)

INITIALLED: DJG

DISTRIBUTION:

Basic List+

D Harding

L Woolner

B J Knight

T Boon

Mrs J Hunton

B D Rackham

Miss L Thurston

E Shreeve/M Fulcher (Part time)

Dr G Cranmer (Luton)

Table 2. *Table 2. Fish collection data for the 1970-1971 season. The table lists the species, the number of boxes, and the number of samples collected. The species are listed in the first column, the number of boxes in the second column, and the number of samples in the third column.*

1. Fry - 15 boxes of O-Groups.
2. Herring (J. Wood) - 4 samples (approximately 100F in each) from  

St. 21	Rect. 36F3
33	38E9
68	40F6
201	39F4
3. Scad (D Eaton) - 2 samples (146 and 95 F respectively) from  

IV B/C - St. 54	Rect. 40F2
58	40F3
209	36F2
IVA - 160	50F3
4. Mackerel (W Dawson) - 100 F from St. 88 Rect. 43F2
5. I-Group Whiting (A Child) - 4 samples (40F in each) from  

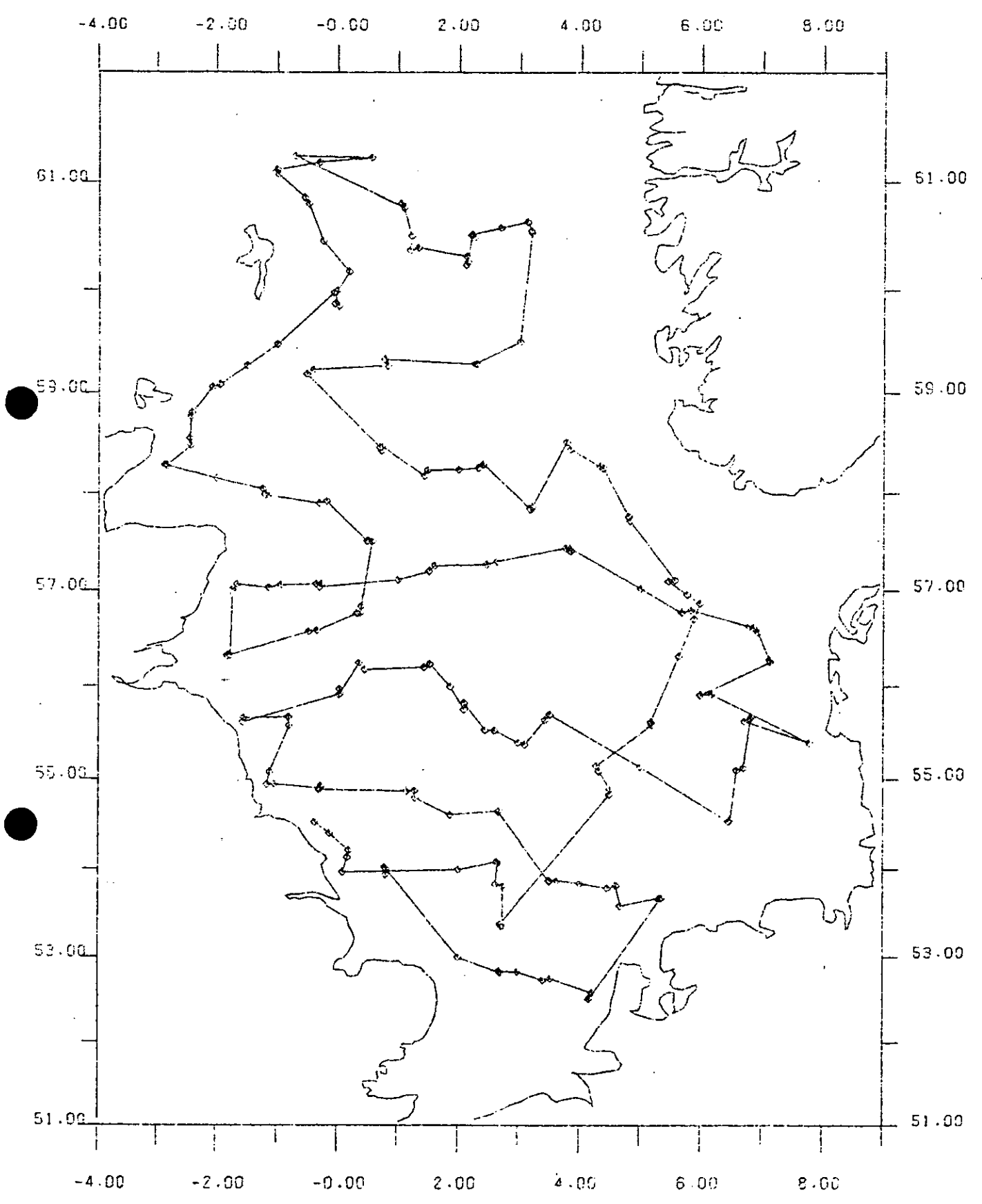
Rectangles:	(45 46, E7 E8)
	(41 42, E7 E8)
	(35 36, F1 F2)
	(37 38, F5 F6)
6. Diseased fish - 1 whiting (head abrasions) - St. 127 Rect. 47 E7 - and  
 1 haddock (tail abrasions).
7. Fish Identification Courses - 24 specimens (Dabs, LR Dab, B Whiting, Herring, Megrin, Tusk, Whiting, Plaice, Saithe, Smelts, Rays, S Viviparous, Sprats, N Pout, Solenettes, Cod, Monk, L Sole, Witch, Haddock, Scad, Sandeel, Velvet belly, Chimaera).
8. Crustacea and Echinoderms were collected for the Crustacea Department, of the BMNH at the Zoology Department of Exeter University.

SPECIES NAME	CATCH WEIGHT	CATCH NUMBER
Raja radiata	297.5551	504
Raja naevus	52.6400	48
Raja montagui	4.2300	4
Raja clavata	24.5600	21
Chimaera monstrosa	12.5000	19
Clupea harengus	1076.6226	46259
Sprattus (Clupea) sprattus	124.0250	7753
Engrulis encrasicolus	.0400	
Argentina silus	6.1700	25
Argentina sphyraena	25.1638	851
Mauroliscus Muellieri	.2100	90
Lophius piscatorius	124.4600	52
Gadus morhua	1931.8323	9092
Pollachius virens	1291.2563	740
Pollachius pollachius	374.1552	115
Brosme brosme	5.2000	5
Melanogrammus aeglefinus	6686.0400	68341
Merlangius merlangus	3307.2754	73742
Trisopterus luscus	3.7500	27
Trisopterus esmarki	1439.5122	129017
Trisopterus minutus	79.7300	2004
Gadiculus argenteus	8.5850	1025
Micromesistius poutassou	177.9650	7800
Molva molva	101.0200	32
Molva dypterygia	.5600	1
Gaidropsarus vulgaris	1.2900	39
Rhinonemus cimbrius	7.0000	188
Merluccius Merluccius	34.6917	30
Zeus faber	.0550	1
Sebastes Marinus	3.0000	2
Sebastes Viviparus	14.1426	97
Eutrigla Gurnardus	967.2587	9172
Aspitrigla cuculus	.2500	1
Trigla lucerna	28.0115	97
Myoxocephalus scorpius	.6000	1
Agonus cataphractus	.2100	24
Cyclopterus lumpus	.0400	1
Trachurus trachurus	612.8031	7529
Spondyliosoma cantharus	.0500	1
Mullus surmeletus	5.7000	74
Trachinus vipera	32.0522	2383
Anararchus lupus	128.1000	39
Lumpenus lampretaeformis	.5000	25
Ammodytes spp	65.2830	1938
Callionymus lyra	9.6371	232
Perciformes-Cobioides	.0250	4
Scomber scombrus	336.5913	905
Scophthalmus maximus	.9000	1
Scophthalmus rhombus	4.7000	6
Arnoglossus laterna	.1050	5
Lepidorhombus whiffiagonis	10.0150	26

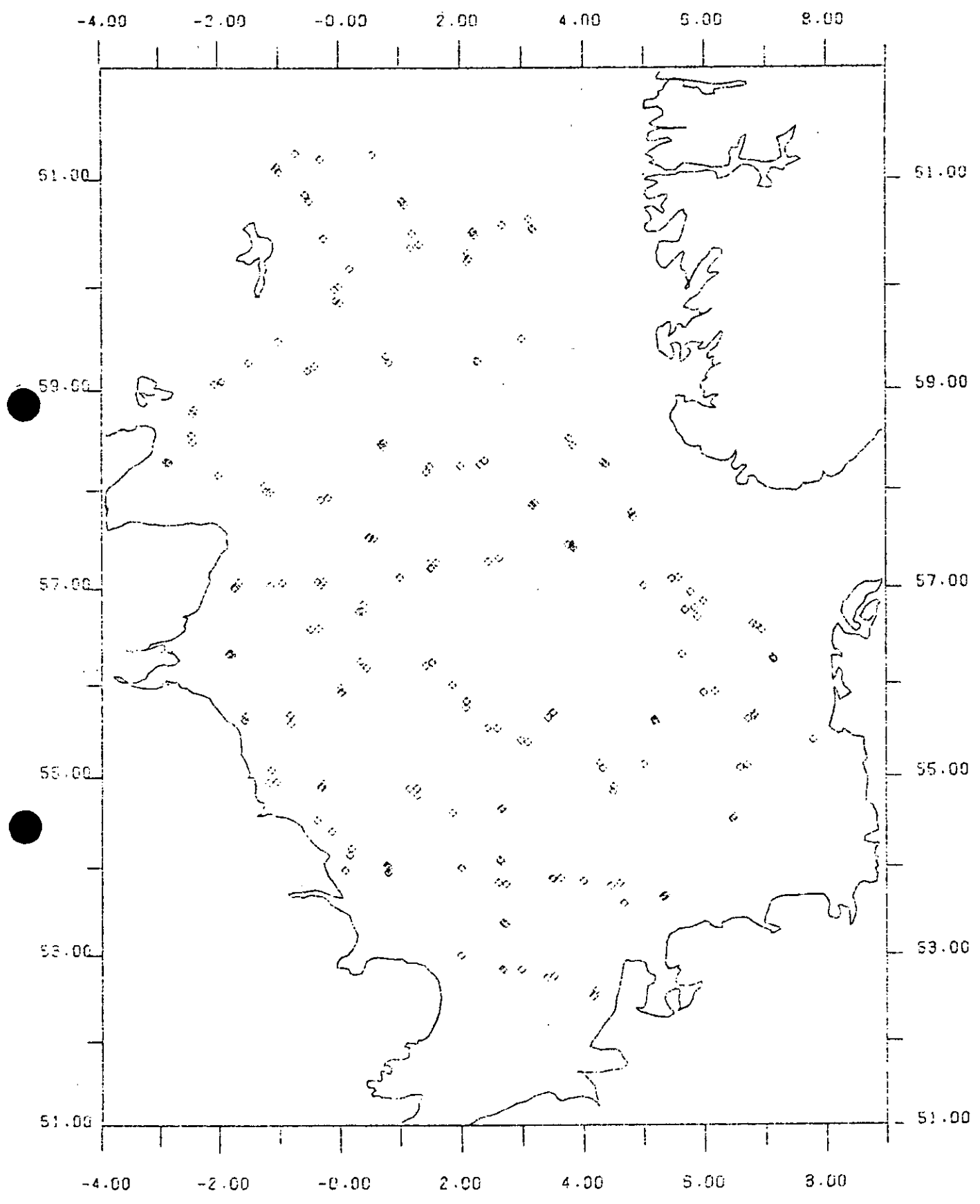
TOTAL CATCH FOR ALL GRANTON TRAWLS CONTD

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

4 -- 7



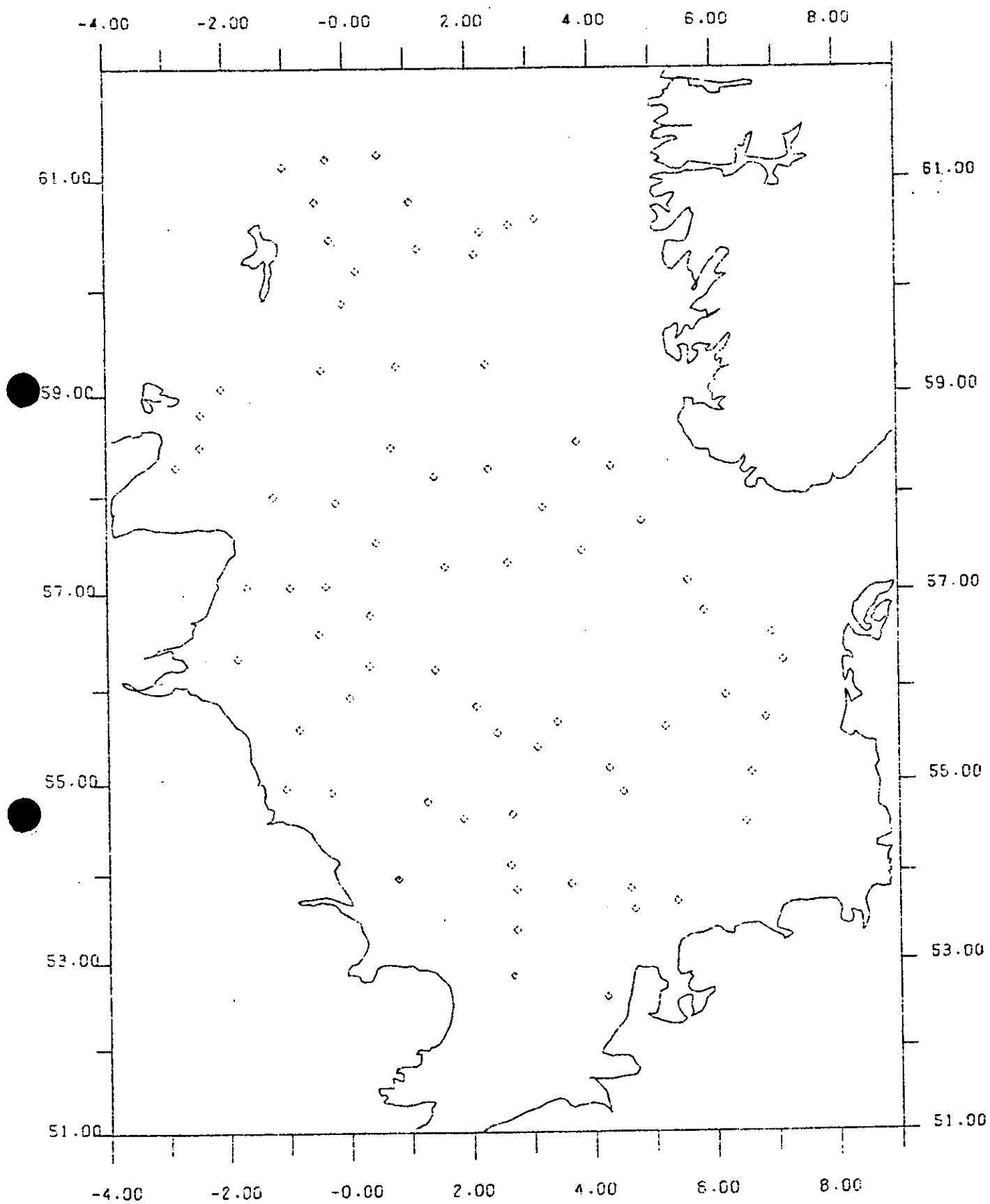
CRUISE TRACK



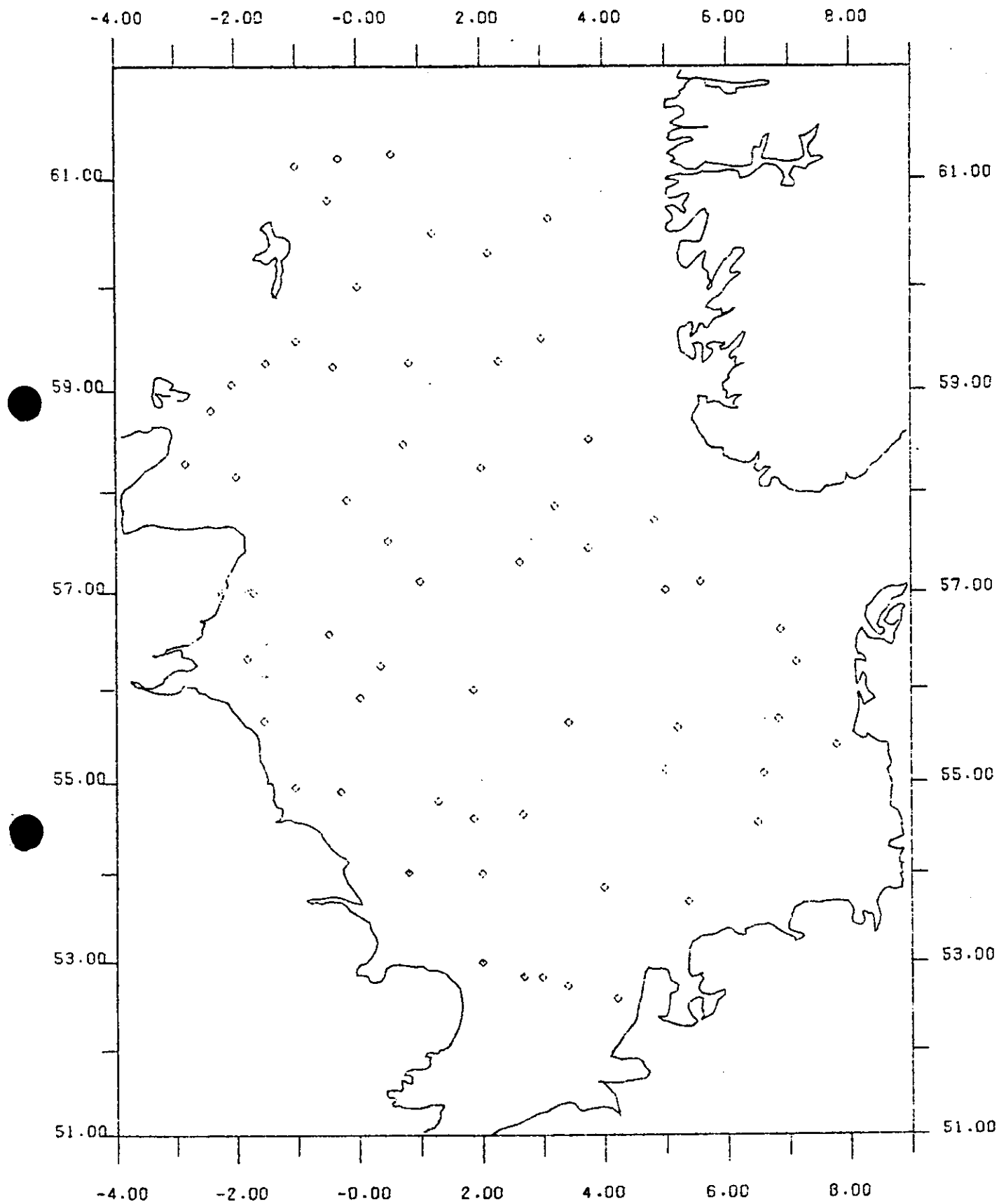
ALL STATIONS



90-190  
05-10



TRAWL STATION POSITIONS



AEP1 WATER STATIONS