

HISTORICAL DESCRIPTION OF THE
NORTHEAST FISHERIES CENTER STATISTICAL AREA DATA BASE

by

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Commercial Weighout Systems

The current NMFS Commercial fishery statistical area boundaries have been in existence since the mid 1940's. In the earlier years, the areas were designated by a Roman numeral - letter combination; the roman numeral signifying the larger, more general area, and the letter delineating the smaller statistical area (Figure 1). Thus, for example area XXI encompassed the Nova Scotia Shelf, while the letters A through S delineated 18 (not all letters between A and S were used) specific fishing areas within area XXI. Similarly, area XXII included all of the Gulf of Maine, Georges Bank, and Southern New England grounds, while the letters B through T further described 15 specific grounds off the New England Coast.

In 1963, the designations were changed from the Roman numeral - letter combination to a 3 digit numerical coding scheme with all areas inside area XXI beginning with a 4 and the areas inside XXII beginning with a 5. Further subdivisions were accomplished using the second and third digits. For example, the Gulf of Maine areas were distinguished from the Georges Bank - Southern New England areas by a 1 in the second digit vs. a 2 for Georges Bank. Thus, the Gulf of Maine encompassed 5 areas designated 511 through 515 and Georges Bank - Southern New England, contained 9 areas designated 521 through 529. In 1968, the Southern New England areas (527-529) were distinguished from the Georges Bank areas (521-526) by a 3 in the second digit. It is important to note that throughout all of these changes in numerical designations, the boundaries remained constant. Thus, statistical summaries for area XXII Q in 1945 can be compared to those made in 1977 for area 537. The current NMFS coding scheme is presented in Table 1 and Figure 2 for the areas most frequently fished by the U.S. fleets.

It can readily be seen from Figure 2 that the ICNAF Subarea and Divisions scheme was built directly from the existing USA and Canadian area boundaries. Thus, all areas on the Scotian shelf (area XXI) and in the Gulf of St. Lawrence (area XIX) became ICNAF Subarea 4. Similarly, all areas in the Gulf of Maine, on Georges Bank and Southern New England became ICNAF Subarea 5. Further, the areas within the Gulf of Maine became ICNAF Division 5Y, those on Georges Bank formed Division 5Ze, and those on the Southern New England grounds formed Division 5Zw (Figures 1 and 2).

Finally, since 1975, the USA weighout records also contain the catch location to nearest 30 minutes of latitude and longitude (Figure 3). However, these quarter degree blocks tend to cross some of the boundaries of the current statistical areas, precluding comparisons between the two sets of data.

Commercial Interview System

A comprehensive interview file for the New England fishery has existed since the early 1960's. This data set contains statistical area designations and location information to the nearest ten minutes of latitude and longitude (Figure 4). Because statistical area boundaries fall on lines of ten minutes of latitude and longitude, statistical summaries of catch and effort for 10 minutes squares are compatible with, and become subsets of, the larger statistical areas. However, interviews exist only for a portion of the fishing fleet. The proportion of interviewed trips varies considerably between ports where vessels land, areas where vessels fish, size of the vessels and species caught. Thus, the total catch and effort for each statistical area can be pro-rated to ten minute squares, but the accuracy of such pro-rations depends considerably on the proportion of interviewed trips from that area.

Foreign Fishery Statistics

Historically, foreign catch and effort data have been separated by ICNAF Divisions, areas considerably larger than the USA statistical areas. However, as stated previously, because of the structure of these Divisions, USA statistical areas can be combined to reflect these larger areas (Figure 2). Recently, for management purposes, and for TAC allocations, Divisions and sometimes whole Subareas have been combined into various stock areas which reflect the best scientific evidence of stock boundaries for certain species.

Since March of 1977, foreign countries fishing within the USA Fishery Conservation Zone have been required to submit their catch and effort data in bi-weekly periods by 30 x 30 minute squares. These data are compatible with USA 30 x 30 minute square data, but not with the historical USA statistical area data nor with the ICNAF Division data since these boundaries cross the 30 x 30 minute square boundaries.

Shifting of Area Boundaries

The effect on historical time series of a shift in the current boundaries of any of these areas depends to a large extent upon the distribution of the species for which the data are being collected. For example, a redefinition of ICNAF Division 5Ze to exclude the southern half of Georges Bank below 41° N latitude would have little effect on a comparison of future and historical redfish catch data since redfish are not caught to any extent in this southern area. However, the effect on yellowtail flounder time series would be considerable.

In any event, a restructuring of statistical area boundaries should take place along the ten minute lines of latitude and longitude. This will allow for US data since 1963 to be reallocated to the new areas based on ratios derived from interviewed trips. However, the time and effort involved in such an exercise will be considerable; and the accuracy which can be achieved in these reallocations of past data depends on the extent of interviewed trips in the area under consideration. For example, an attempt to reallocate catches of cod in the Gulf of Maine may yield fairly inaccurate results since the proportion of cod trips which get interviewed from this area is quite low.

Further, any reassignment of areas beyond current ICNAF Divisions would render the historic ICNAF time series incompatible with future statistics. From the above discussion, it should be evident that any shift in area boundaries should be made with care and that, once changed, these new boundaries shall remain intact in the future. In this way, the dependence on the older timer series becomes less important as new years are added to the new data base. At least one deviation from this philosophy can be seen in the case of a long-lived species such as redfish where a 30-year time series may be needed to adequately describe the fluctuations in stock size.

Computerized Data Files

All New England fishery catch and interview records since 1964 have been subjected to automatic data processing (ADP) techniques for auditing and retrieving information. Data which are currently stored on either magnetic tape or disc include detailed trip records, summary catch and effort files, detailed interview trips records and length frequency samples. The advantage of computerized files for rapid retrieval and analysis of data can only be achieved through the consis-

tent coding of all records. In this way, all information pertaining to a particular trip including length-frequency data, interview data and total catch and effort can be related. Similarly, information for all vessels fishing in an area during the current year can rapidly be compared to existing data from previous years.

Table 1:

IBM STATISTICAL AREA CODES AND SAMPLING AREA CODES

STATISTICAL			SPECIES & SAMPLING AREAS					ICNAF	DESCRIPTION OF AREA
1	2	3	Cod Hadd. Poll.	Red- fish	Flndr	Silver hake	Indus- trial	Division	
3	1	0		36				3K	NE NEWFOUNDLAND
3	2	0		35				3L	N GRAND BANKS
3	3	0		34				3M	FLEMISH CAP
3	4	0		33				3N	SE GRAND BANKS
3	5	0		32				3O	SW GRAND BANKS
3	6	1		31				3P. So.	ST. PIERRE BANK
3	6	2		31				3P. No.	BURGEO BANK
4	1	0		47				4R	E GULF ST. LAWRENCE
4	2	0		47				4S	N GULF ST. LAWRENCE
4	3	0		47				4T	S GULF ST. LAWRENCE
4	4	1	44	46				4V. No.	NE CAPE BRETON
4	4	2	44	46				4V. So.	MISAINE BANK
4	4	3	44	46				4V. So.	BANQUEREAU
4	5	1	43	45				4W	CANSO
4	5	2	43	45				4W	MIDDLE GROUND
4	5	3	43	45				4W	NE SABLE ISLAND B.
4	5	4	43	45				4W	SE SABLE ISLAND BANK
4	5	5	43	44				4W	HORSESHOE GROUND
4	5	6	43	44				4W	SW SABLE ISLAND BANK
4	5	7	43	44				4W	E NOVA SCOTIA
4	5	8	43	44				4W	EMERALD BANK
4	6	1	42	43				4X	C NOVA SCOTIA
4	6	2	42	43				4X	E BROWNS & LA HAVRE
4	6	3	42	43				4X	S NOVA SCOTIA
4	6	4	42	42				4X	W BROWNS
4	6	5	42	42				4X	W NOVA SCOTIA
4	6	6	41	41				4X	S BAY FUNDY
4	6	7	41	41				4X	N BAY FUNDY
5	1	1	55	54		51	56	5Y	E MAINE
5	1	2	55	54		51	56	5Y	C MAINE
5	1	3	55	53		52	55	5Y	W MAINE
5	1	4	54	53	53	53	55	5Y	E MASS
5	1	5	54	52		53	56	5Y	INNER GROUNDS
5	2	1	52	51	53	54	54	5Ze	W SIDE SO. CHANNEL
5	2	2	52	51	52	55	54	5Ze	E SIDE SO. CHANNEL
5	2	3	53	51	52	56	54	5Ze.	N EDGE & PEAK
5	2	4	53	51	52	56	54	5Ze	C & SE GEORGES
5	2	5	52		52	56	54	5Ze	SW GEORGES
5	2	6	52		51	57	53	5Ze	NANTUCKET SHOALS
5	3	7	51		51	57	53	5Zw	OFF WOMANS LAND
5	3	8	51		51	58	52	5Zw	SO. MASS
5	3	9	51		51	58	51	5Zw	R. IS. SHORE

Example: If you had a sample of haddock from 521, you'd look down the haddock column until you came to the number adjacent to 521 which makes the sampling area code 52. For redfish it would be 51, flounder 53, etc.

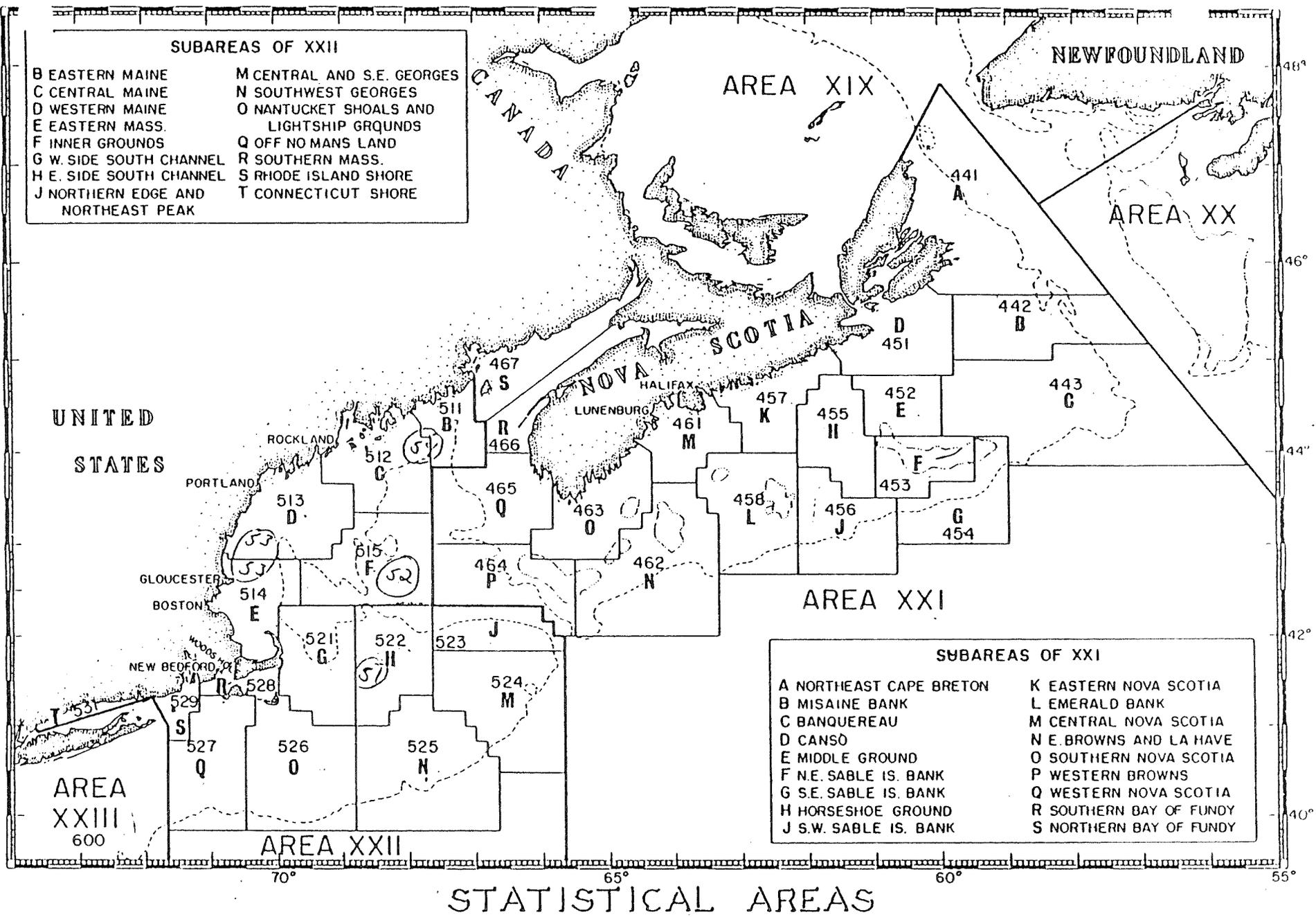


Figure 1

STATISTICAL AREAS
BCF BIOLOGICAL LABORATORY
WOODS HOLE, MASS.

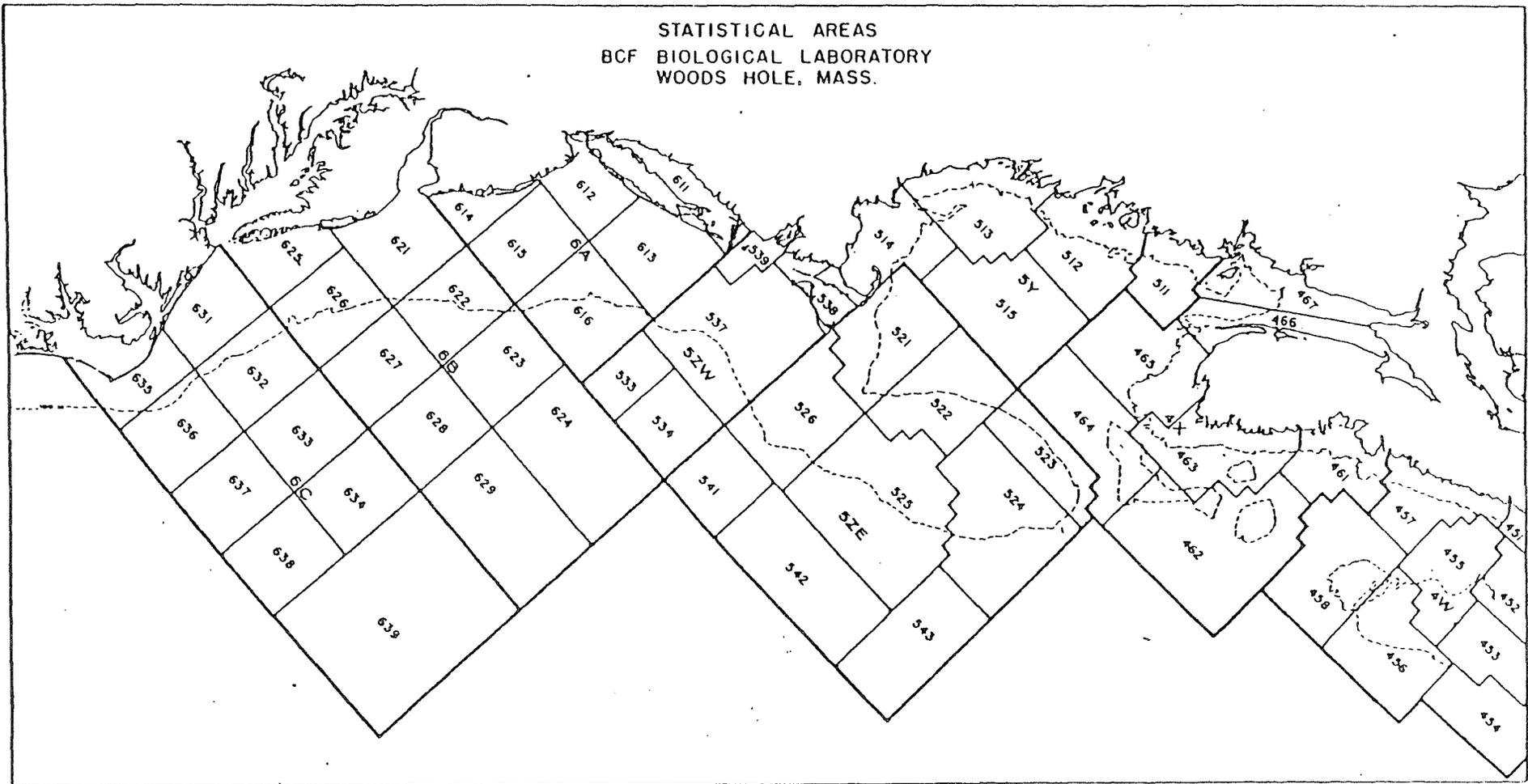


Figure 2

Figure 3:
30x30 Minute Square Chart

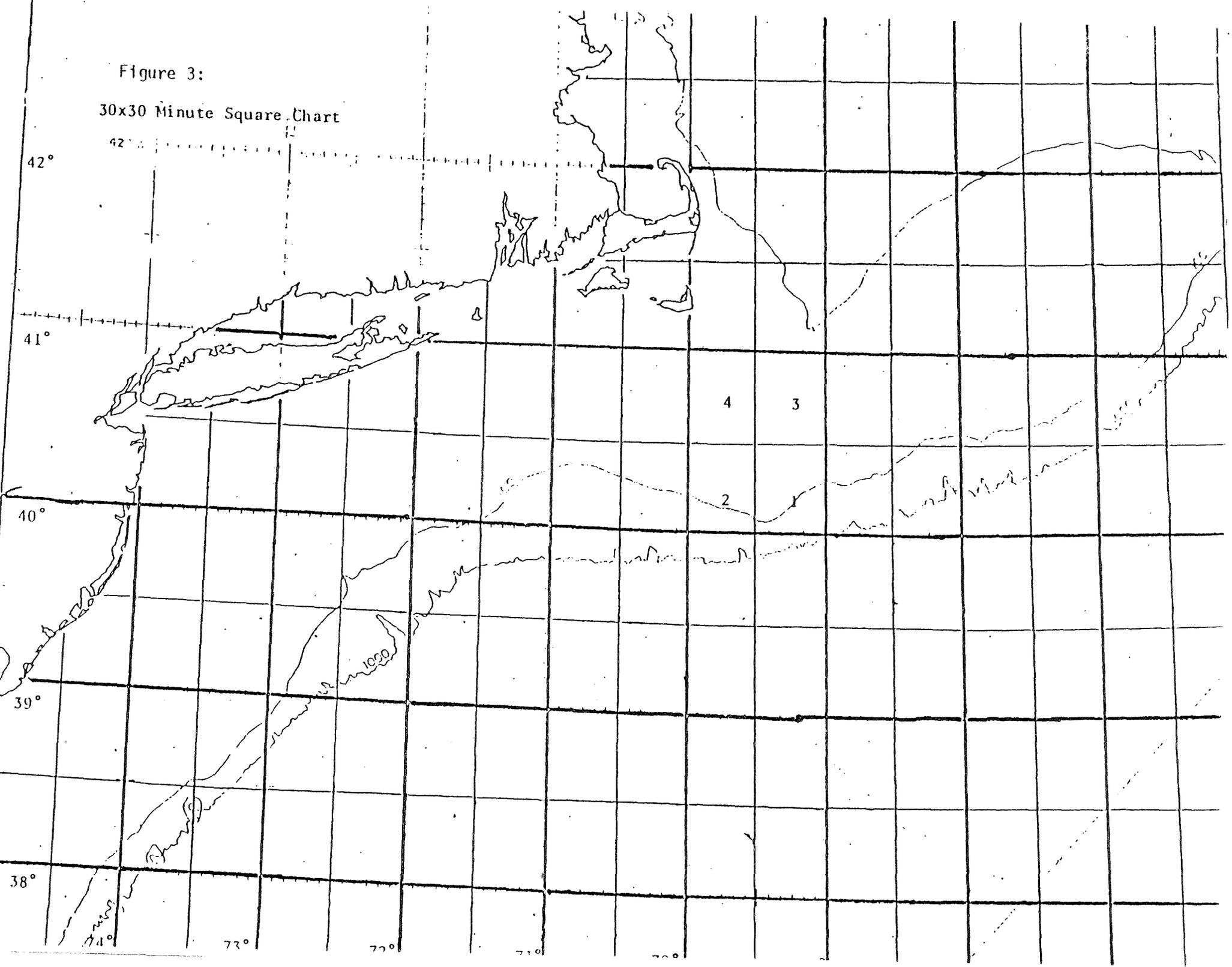


Figure 4:

10x10 Minute Square Chart

