



NOAA Technical Memorandum NMFS-F/NEC-66

Guidelines for Estimating Lengths at Age for 18 Northwest Atlantic Finfish and Shellfish Species

**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts**

May 1989

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Guidelines for Estimating Lengths at Age for 18 Northwest Atlantic Finfish and Shellfish Species

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INTRODUCTION

This report provides estimates of mean lengths at age for 18 species of Northwest Atlantic finfish and shellfish, together with maximum ages observed for selected finfish species collected during Northeast Fisheries Center (NEFC) bottom trawl surveys (Table 1). If growth rates are sufficiently different between sexes or geographical areas, separate mean lengths are given for each sex or area for which data are available. The information used to prepare this report was taken from published sources and unpublished data files archived at the Woods Hole Laboratory in Woods Hole, Massachusetts (all included in the references to this paper). Since some of this information is based on incomplete data sets or has not been updated for many years, estimated lengths at age are meant to be used only in a general sense and are not intended for use in generating growth equations for analytical purposes. The intent is to provide a general guide for use in estimating the average age of a finfish or shellfish specimen at a given length. It is rarely possible to assign exact ages to specimens without examining actual age structures (scales, otoliths, chondrophores, etc.), but the tables and graphs should provide an approximation of the age of any given specimen. For example, a 19.7 in. (50.0 cm) female American plaice would be estimated as being approximately nine years old.

Each table and corresponding graph gives information on estimated lengths at age in units of both inches and centimeters. By convention, a birthdate of January 1 is assumed. This means that although an individual is not one-year old biologically until one year from the time it was hatched, normal age determination convention considers it to be one-year old the following January 1. This is done to simplify assignment of individual fish to year classes for stock status assessments and other research. The lengths at age given in the tables represent the estimated lengths on the assigned birthdate. For example, six-year-old male American plaice would be on average 15.1 in. (38.4 cm) long in January.

Table 1. Maximum ages observed for various finfish species collected during Northeast Fisheries Center research vessel survey cruises, 1963 - 1988

Species	Years	Maximum age
Alewife	1973-1985	14
American plaice	1976-1984	24
Atlantic cod	1970-1988	18
Atlantic herring	1963-1988	18
Atlantic mackerel	1973-1987	19
Blueback herring	1982-1985	12
Bluefish	1985-1987	10
Butterfish	1977-1988	6
Haddock	1963-1988	14
Pollock	1970-1988	19
Redfish	1975-1980	58
Red hake	1970-1985	14
Scup	1977-1980	11
Silver hake	1973-1987	14
Summer flounder	1975-1988	12
White hake	1987 only	18
Winter flounder	1976-1988	14
Witch flounder	1980-1988	30
Yellowtail flounder	1963-1988	17

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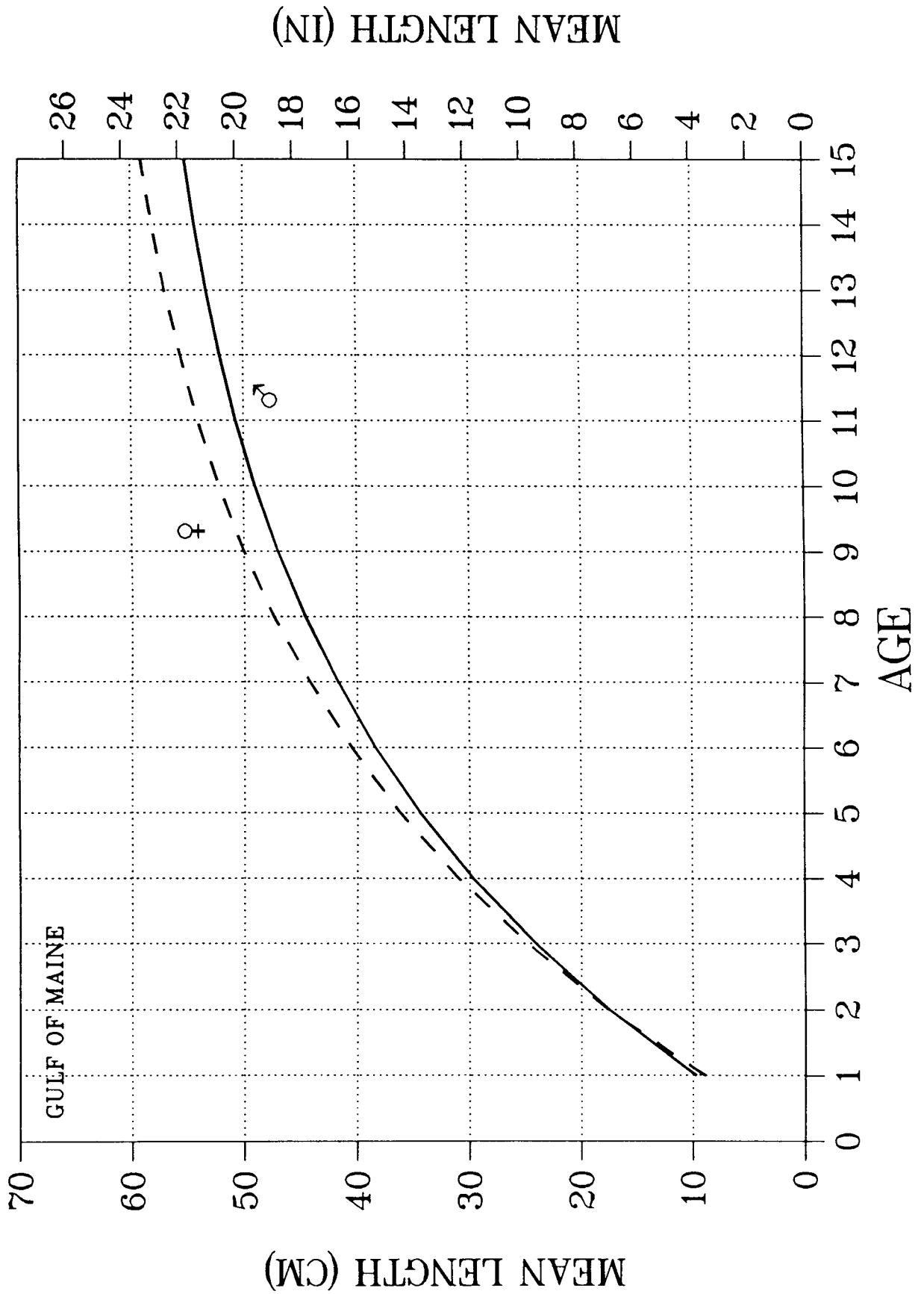
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**PAIRED TABLES AND FIGURES:
ESTIMATED LENGTH (SHELL HEIGHT) AT AGE**

American plaice, Gulf of Maine

Age	Male		Female	
	Length (in)	Length (cm)	Length (in)	Length (cm)
1	3.8	9.7	3.5	8.9
2	6.9	17.5	6.9	17.6
3	9.5	24.1	9.8	24.8
4	11.7	29.7	12.2	31.0
5	13.5	34.4	14.3	36.2
6	15.1	38.4	15.9	40.5
7	16.4	41.7	17.4	44.2
8	17.5	44.6	18.7	47.4
9	18.5	47.0	19.7	50.0
10	19.3	49.0	20.6	52.2
11	20.0	50.7	21.3	54.1
12	20.5	52.1	21.9	55.6
13	21.0	53.3	22.4	57.0
14	21.4	54.3	22.9	58.1
15	21.7	55.2	23.3	59.1

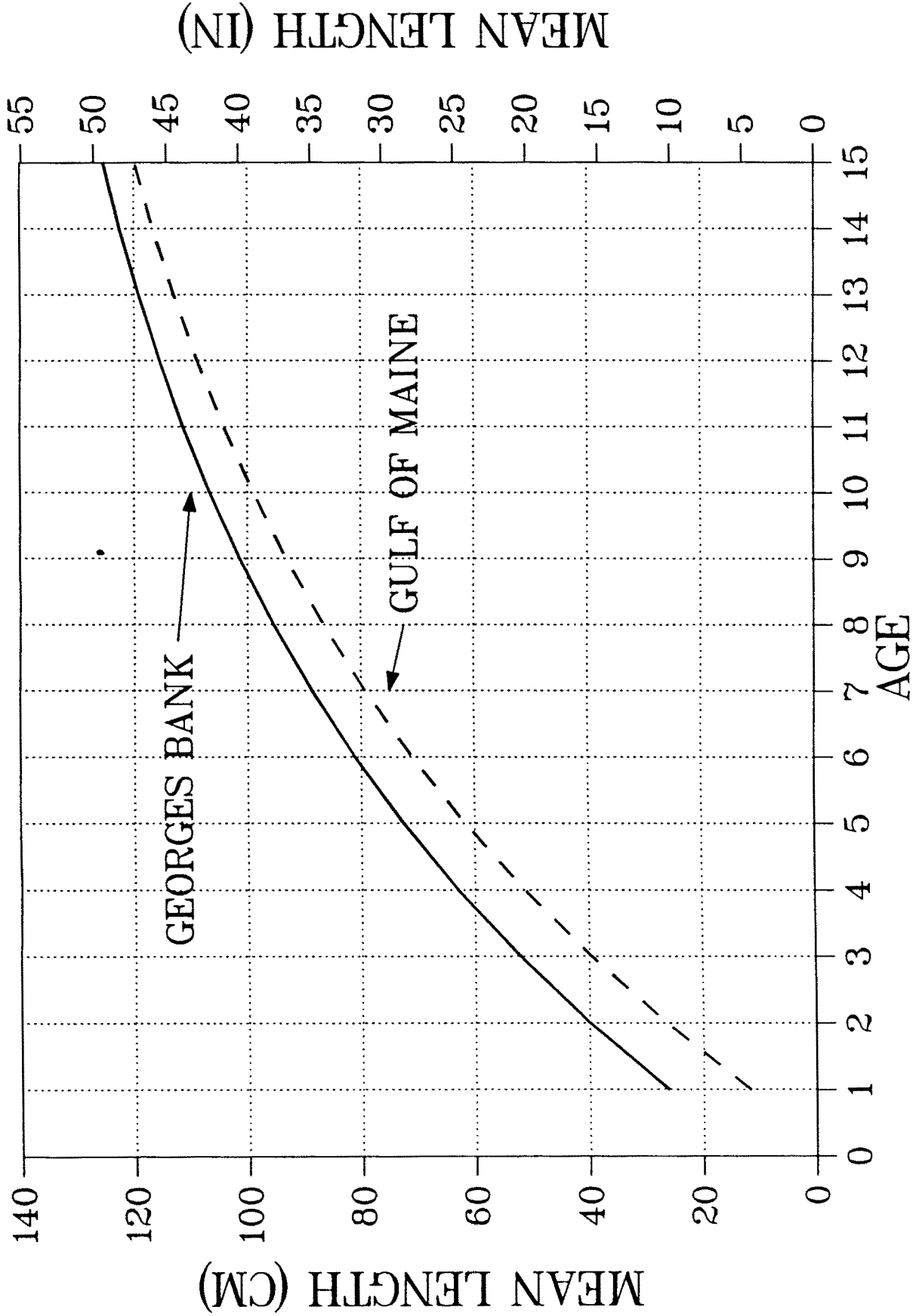
AMERICAN PLAICE



Atlantic cod

Age	Georges Bank		Gulf of Maine	
	Length (in)	Length (cm)	Length (in)	Length (cm)
1	10.3	26.1	4.6	11.7
2	15.7	39.9	10.4	26.4
3	20.5	52.1	15.6	39.6
4	24.8	63.0	20.2	51.3
5	28.6	72.6	24.3	61.7
6	31.9	81.1	28.0	71.0
7	34.9	88.7	31.2	79.3
8	37.6	95.4	34.1	86.6
9	39.9	101.4	36.7	93.2
10	42.0	106.7	39.0	99.0
11	43.9	111.4	41.0	104.2
12	45.5	115.5	42.9	108.9
13	45.9	119.2	44.5	113.0
14	48.2	122.5	45.9	116.7
15	49.4	125.4	47.2	119.9

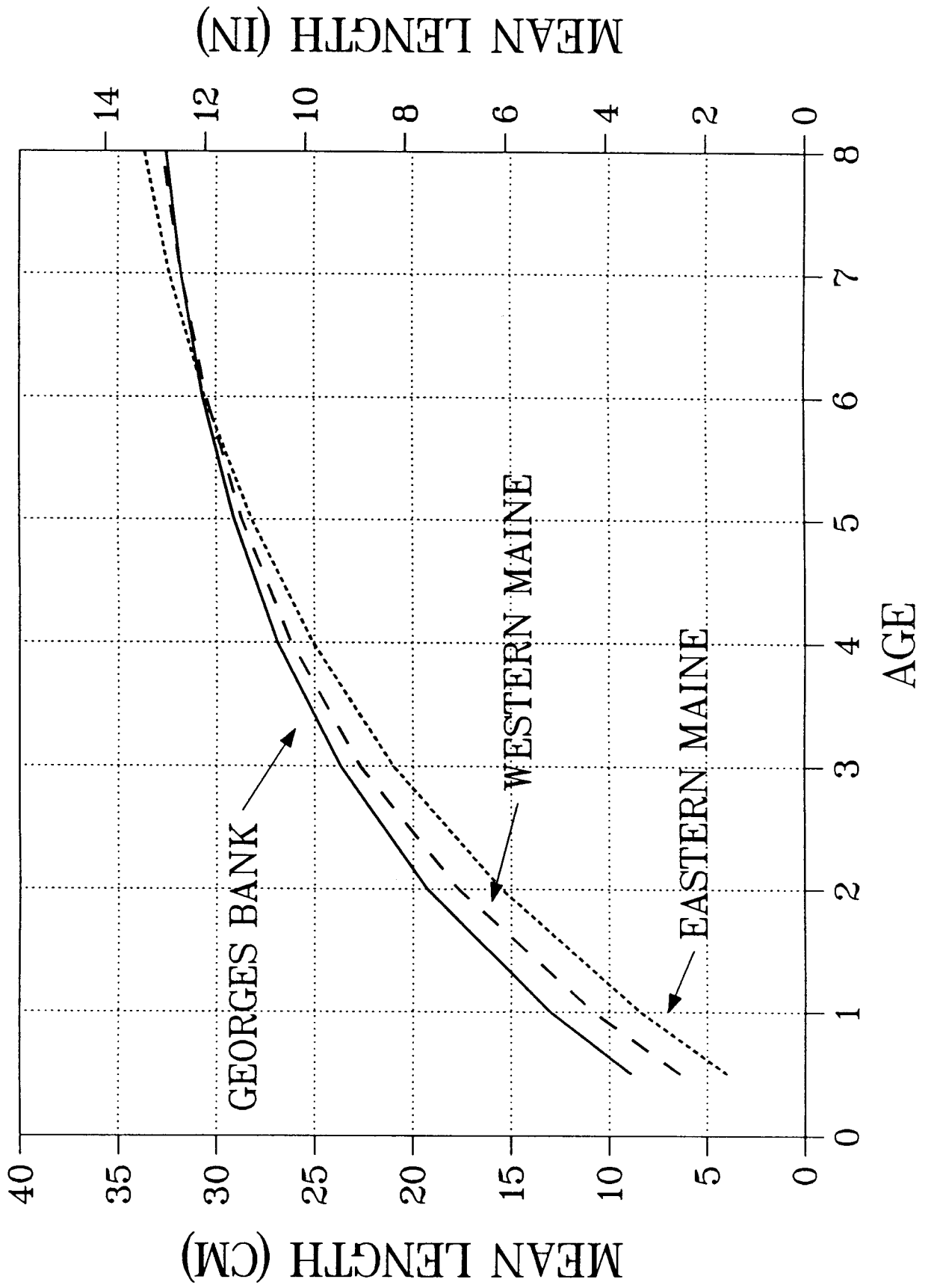
ATLANTIC COD



Atlantic herring

Age	Georges Bank		Western Maine		Eastern Maine	
	Length (in)	Length (cm)	Length (in)	Length (cm)	Length (in)	Length (cm)
1	5.1	13.0	4.3	10.8	3.3	8.4
2	7.6	19.3	7.0	17.7	6.1	15.5
3	9.3	23.7	8.9	22.7	8.3	21.0
4	10.6	26.9	10.3	26.2	9.9	25.1
5	11.5	29.1	11.3	28.7	11.1	28.2
6	12.1	30.7	12.0	30.5	12.0	30.6
7	12.5	31.8	12.5	31.8	12.8	32.4
8	12.8	32.6	12.9	32.8	13.3	33.7

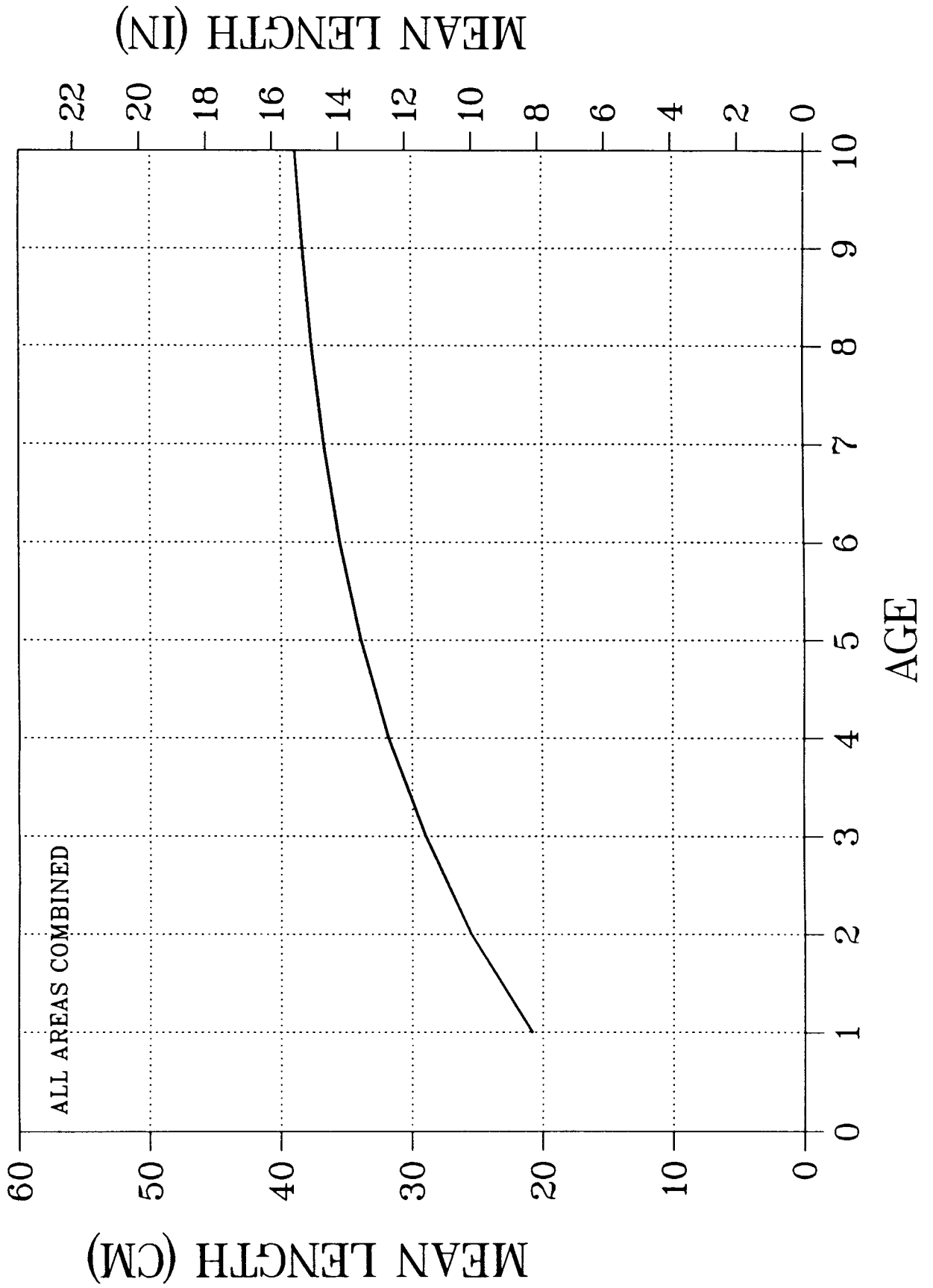
ATLANTIC HERRING



Atlantic mackerel, all areas combined

Age	Length (in)	Length (cm)
1	8.2	20.8
2	10.0	25.5
3	11.4	29.0
4	12.5	31.8
5	13.3	33.9
6	14.0	35.5
7	14.4	36.7
8	14.8	37.6
9	15.1	38.3
10	15.3	38.9

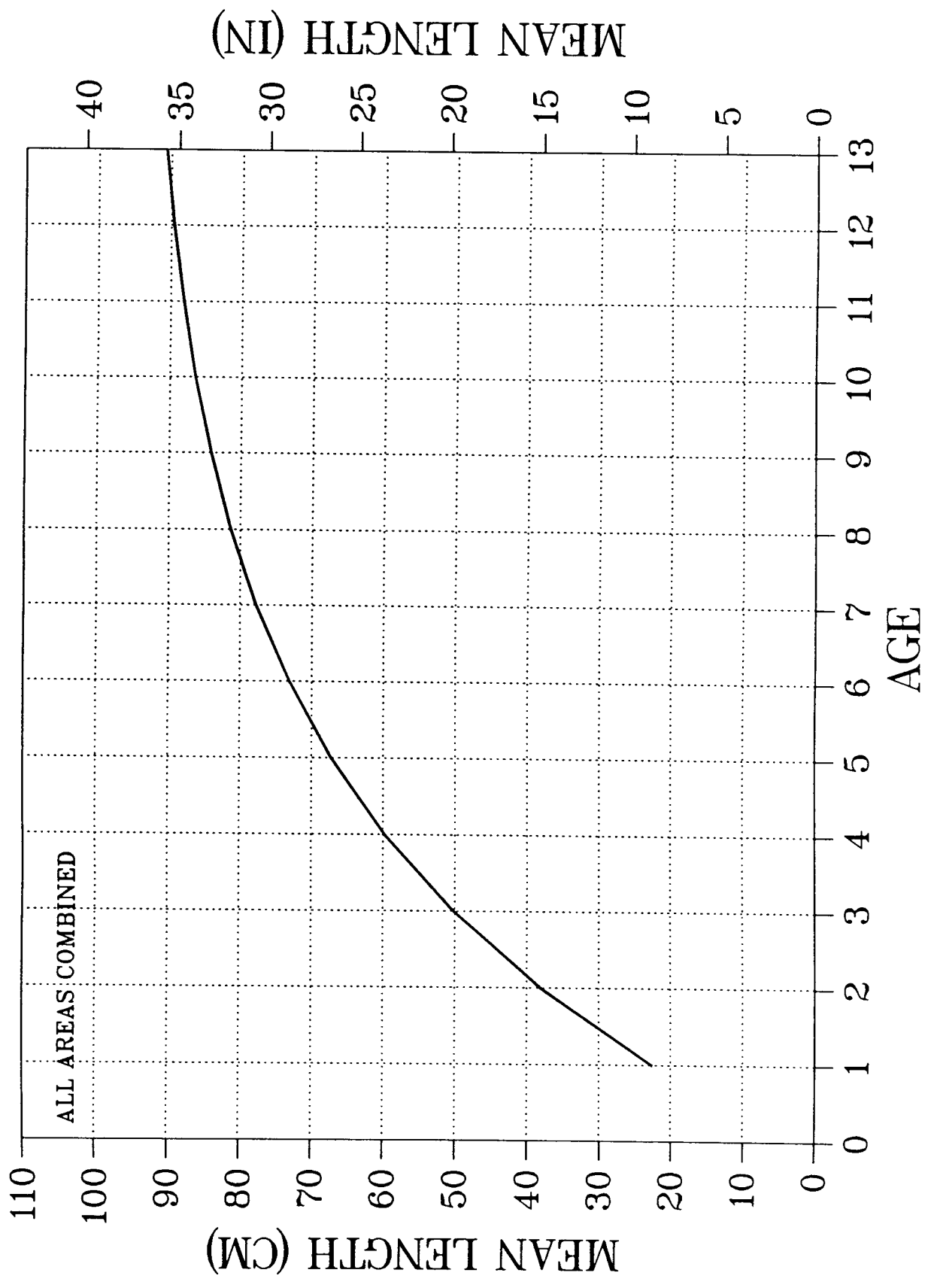
ATLANTIC MACKEREL



Bluefish, all areas combined

Age	Length (in)	Length (cm)
1	8.9	22.6
2	15.0	38.1
3	19.8	50.2
4	23.5	59.8
5	26.5	67.3
6	28.8	73.1
7	30.6	77.8
8	32.0	81.4
9	33.1	84.2
10	34.1	86.5
11	34.7	88.2
12	35.3	89.6
13	35.7	90.7

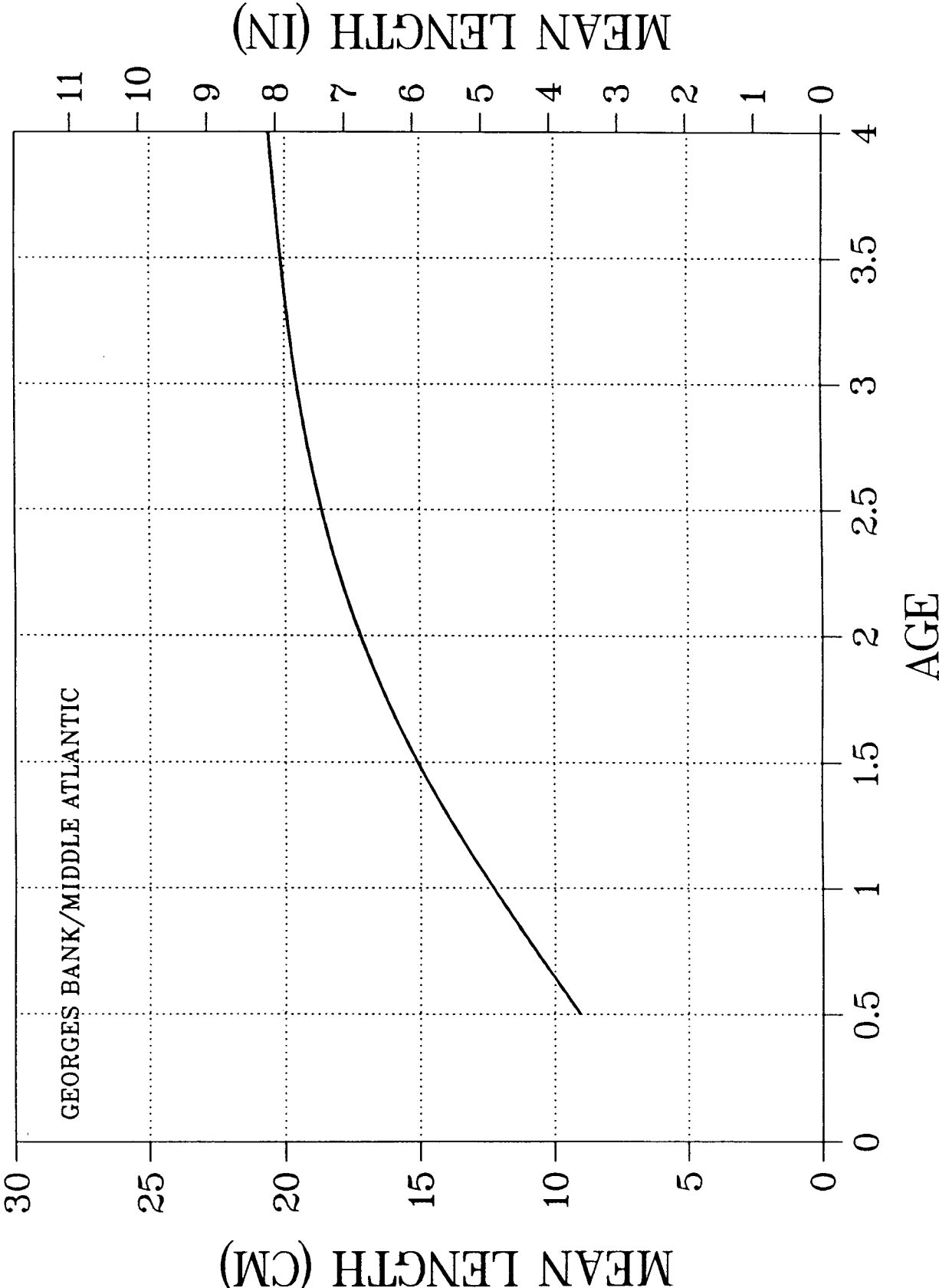
BLUEFISH



Butterfish, Georges Bank - Middle Atlantic

Age	Length (in)	Length (cm)
1	5.0	12.7
2	6.9	17.5
3	7.7	19.5
4	8.0	20.4

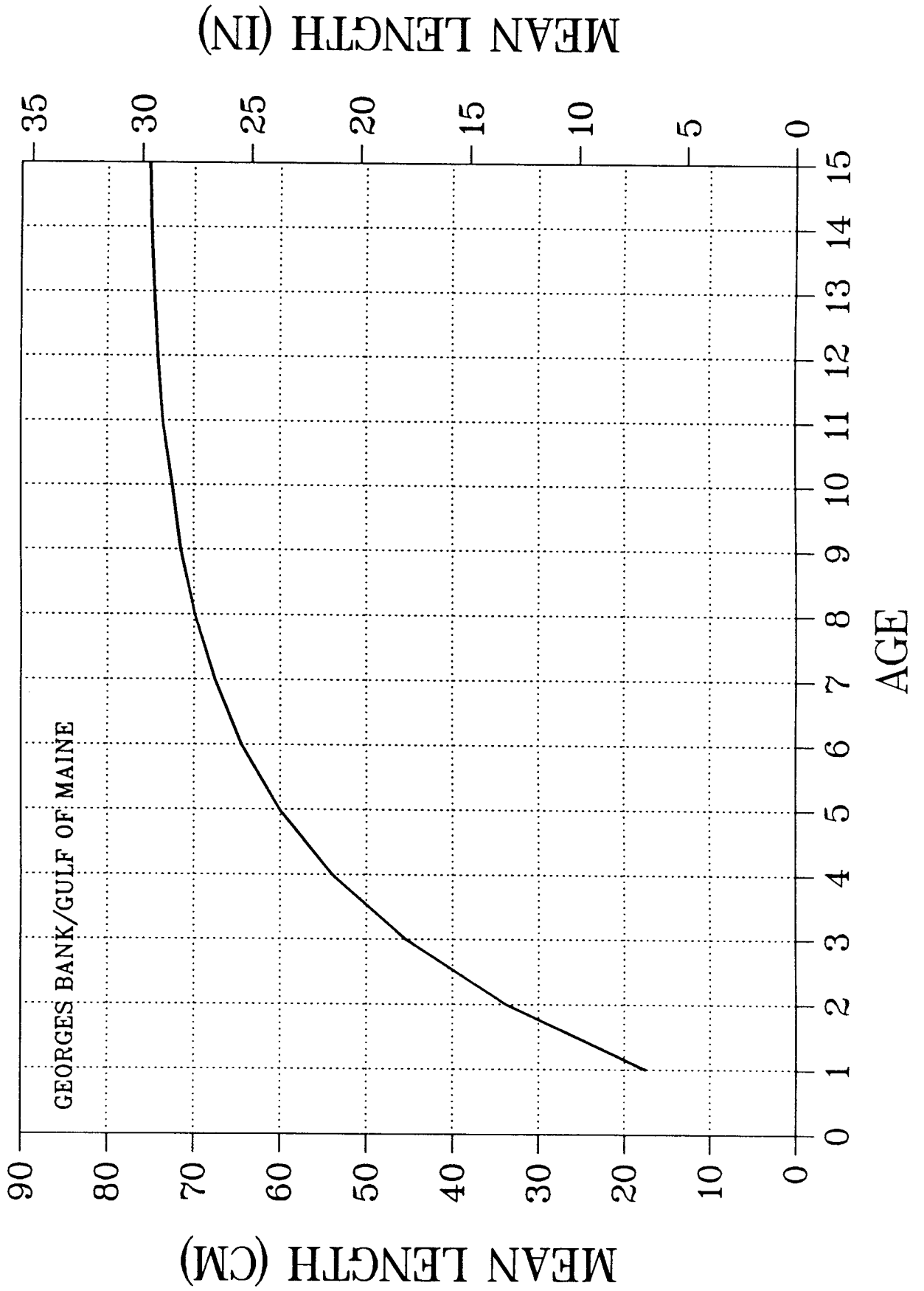
BUTTERFISH



Haddock, Georges Bank - Gulf of Maine

Age	Length (in)	Length (cm)
1	6.9	17.5
2	13.3	33.8
3	17.9	45.5
4	21.3	54.0
5	23.7	60.1
6	25.4	64.5
7	26.6	67.6
8	27.5	69.9
9	28.1	71.5
10	28.6	72.7
11	29.0	73.6
12	29.2	74.2
13	29.4	74.6
14	29.5	75.0
15	29.6	75.2

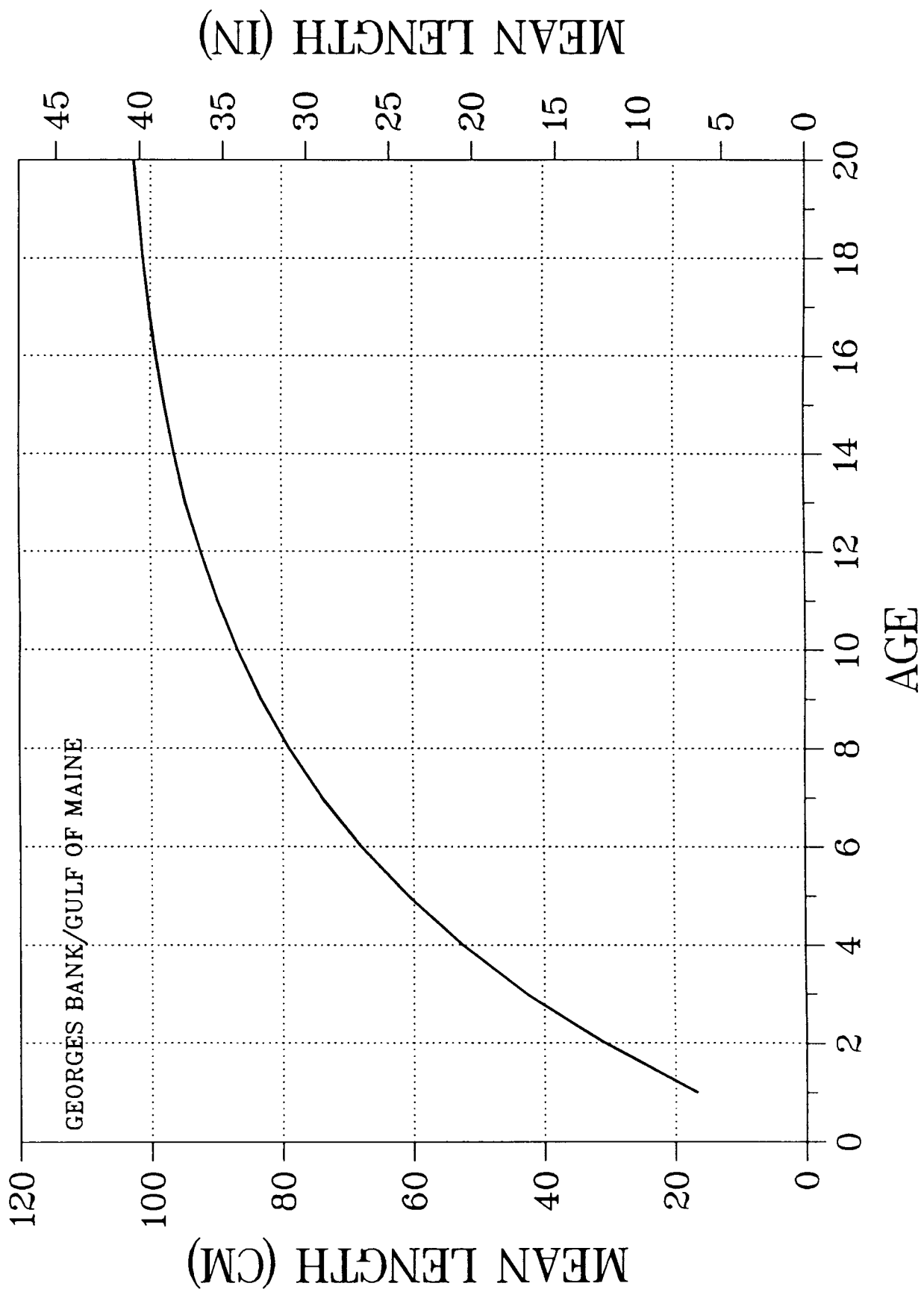
HADDOCK



Pollock, Georges Bank - Gulf of Maine

Age	Length (in)	Length (cm)
1	6.6	16.7
2	12.1	30.7
3	16.8	42.6
4	20.7	52.5
5	24.0	60.9
6	26.8	68.0
7	29.1	74.0
8	31.1	79.0
9	32.8	83.3
10	34.2	86.9
11	35.4	89.9
12	36.4	92.4
13	37.3	94.7
14	38.0	96.4
15	38.5	97.9
16	39.1	99.2
17	39.5	100.3
18	39.8	101.2
19	40.1	101.9
20	40.4	102.6

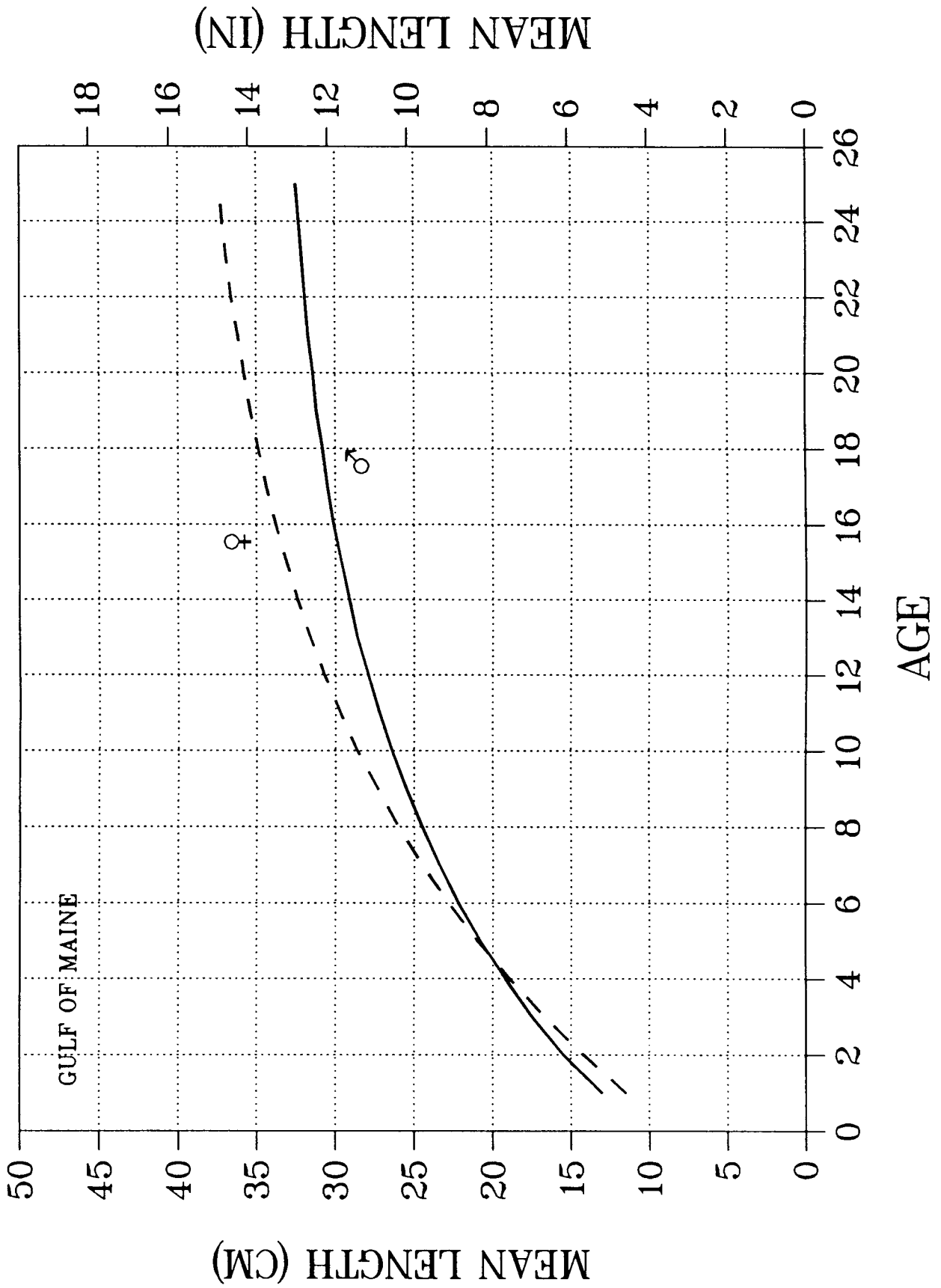
POLLOCK



Redfish, Gulf of Maine

Age	Male		Female	
	Length (in)	Length (cm)	Length (in)	Length (cm)
1	5.2	13.2	4.6	11.7
2	6.1	15.5	5.6	14.2
3	6.9	17.5	6.6	16.7
4	7.6	19.2	7.4	18.9
5	8.2	20.8	8.3	21.0
6	8.7	22.2	9.0	22.8
7	9.2	23.4	9.6	24.5
8	9.6	24.5	10.2	26.0
9	10.0	25.5	10.7	27.3
10	10.4	26.4	11.3	28.6
11	10.7	27.2	11.7	29.7
12	11.0	27.9	12.1	30.7
13	11.3	28.6	12.4	31.6
14	11.5	29.1	12.8	32.4
15	11.7	29.6	13.0	33.1
16	11.9	30.1	13.3	33.8
17	12.0	30.5	13.5	34.4
18	12.1	30.8	13.7	34.9
19	12.3	31.2	13.9	35.4
20	12.4	31.4	14.1	35.8
21	12.5	31.7	14.3	36.2
22	12.6	31.9	14.4	36.6
23	12.6	32.1	14.5	36.9
24	12.7	32.3	14.6	37.2
25	12.8	32.5	14.7	37.4

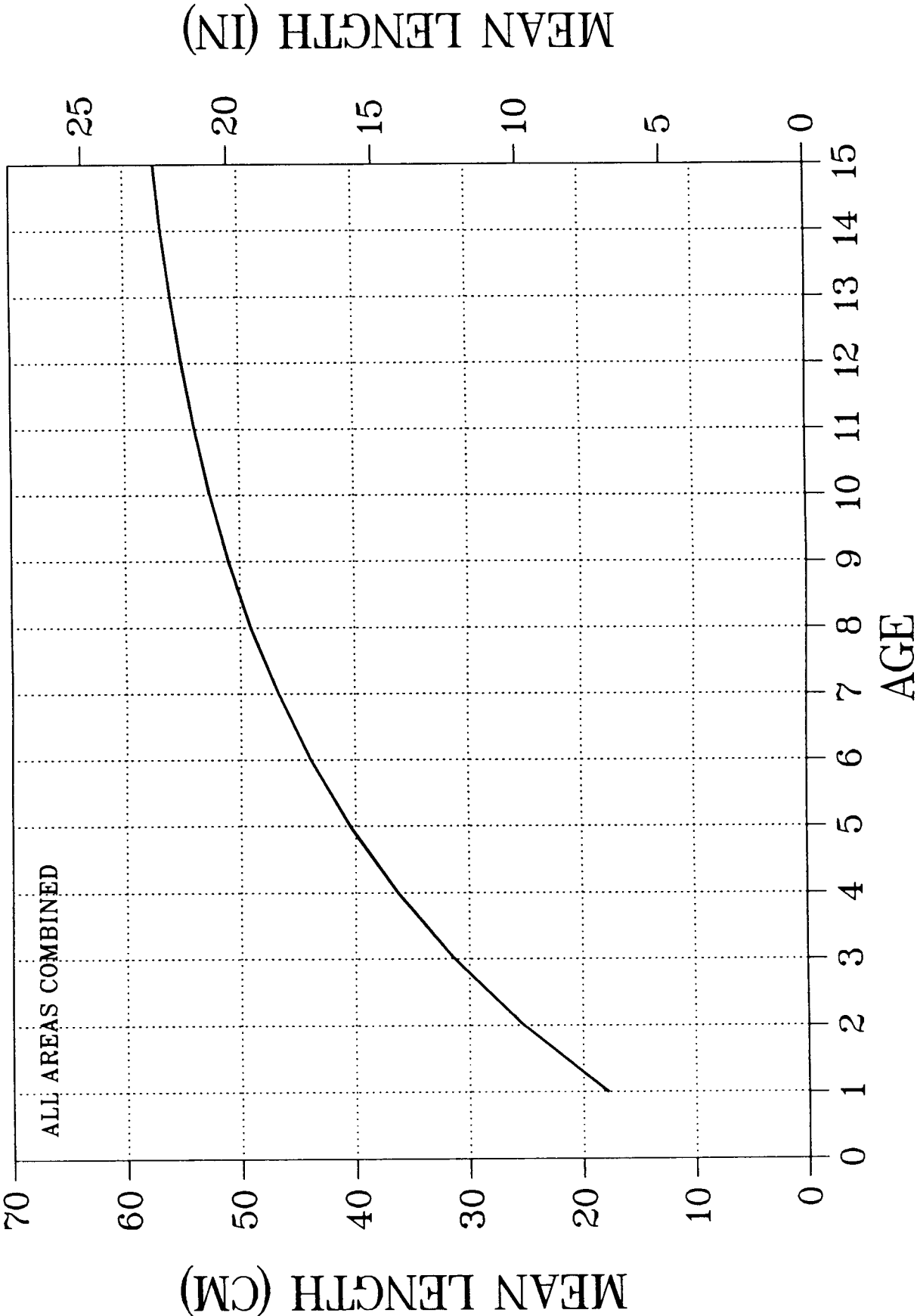
REDFISH



Red hake, Gulf of Maine - Middle Atlantic

Age	Length (in)	Length (cm)
1	7.0	17.8
2	9.9	25.2
3	12.3	31.3
4	14.3	36.3
5	15.9	40.5
6	17.3	43.9
7	18.4	46.7
8	19.3	49.1
9	20.1	51.0
10	20.7	52.6
11	21.2	53.9
12	21.7	55.0
13	22.0	55.9
14	22.3	56.7
15	22.6	57.3

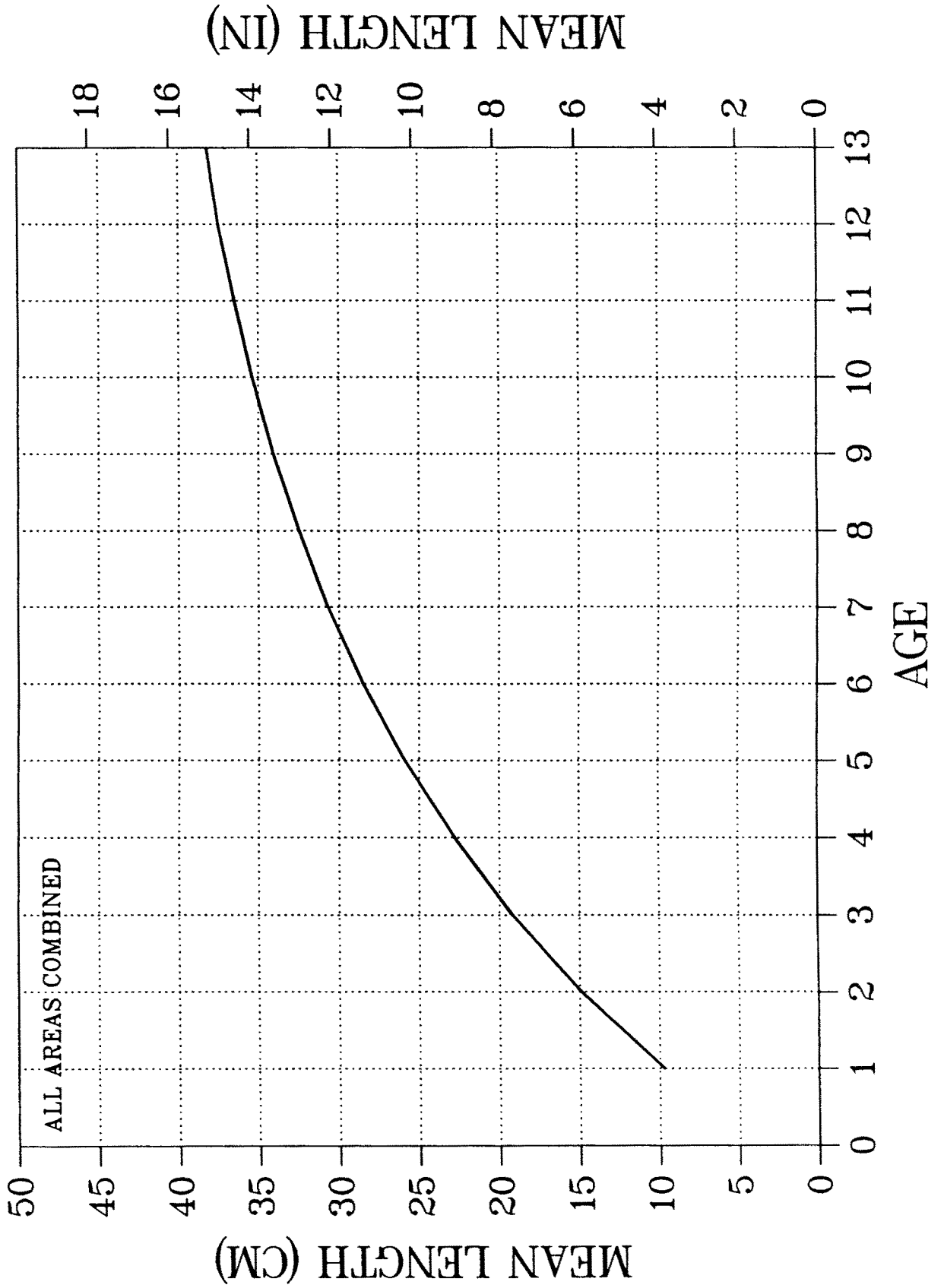
RED HAKE



Scup, all areas combined

Age	Length (in)	Length (cm)
1	3.8	9.7
2	5.9	14.9
3	7.6	19.2
4	9.0	22.8
5	10.2	25.9
6	11.2	28.5
7	12.1	30.7
8	12.8	32.5
9	13.4	34.1
10	13.9	35.4
11	14.4	36.5
12	14.8	37.5
13	15.0	38.2

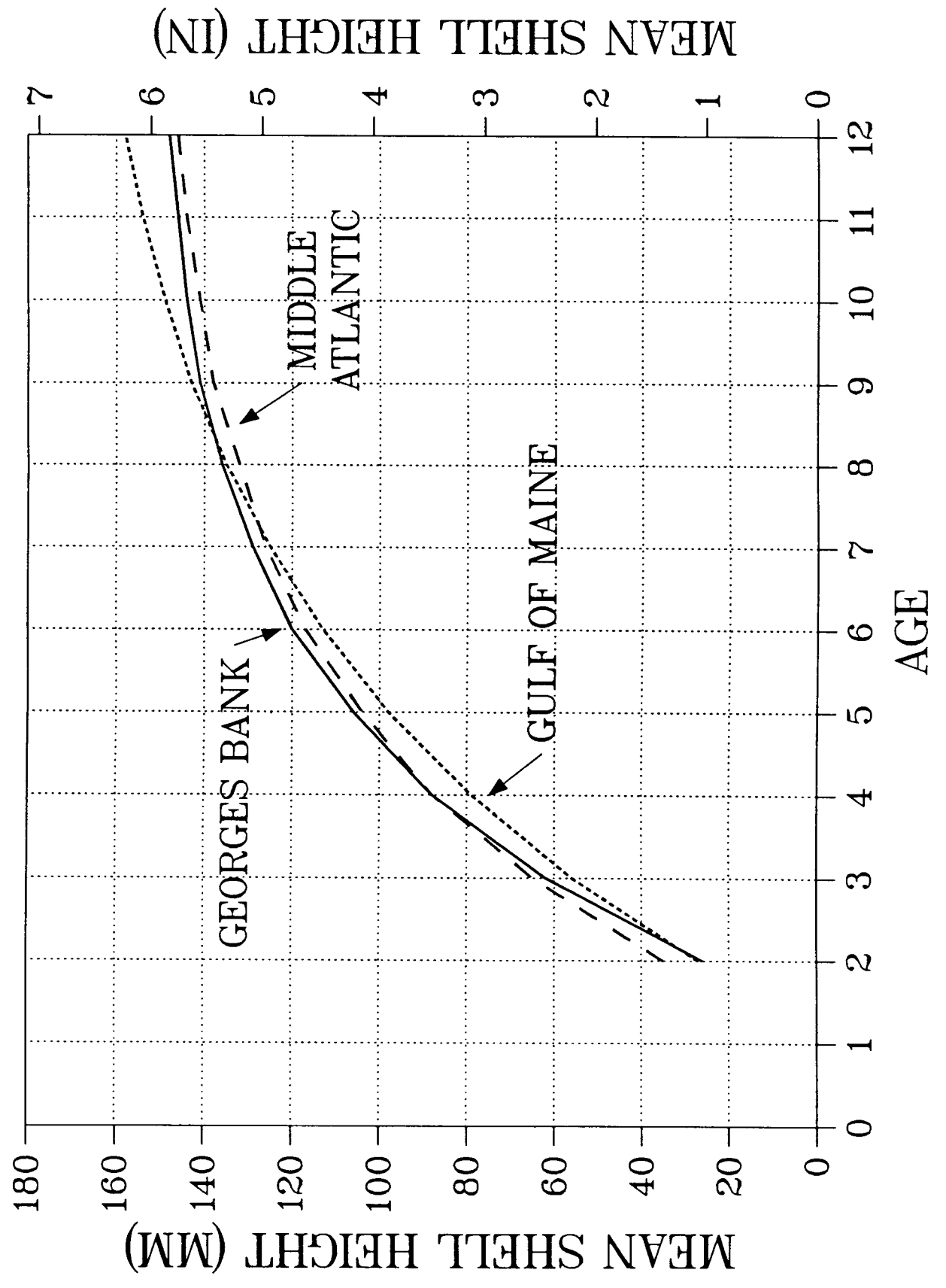
SCUP



Sea scallop

Age	Georges Bank Shell Height		Middle Atlantic Shell Height		Gulf of Maine Shell Height	
	(in)	(mm)	(in)	(mm)	(in)	(mm)
2	1.0	26	1.4	35	1.1	27
3	2.4	62	2.6	65	2.2	56
4	3.5	88	3.5	88	3.1	79
5	4.2	106	4.1	104	3.9	98
6	4.7	120	4.6	117	4.4	113
7	5.1	129	5.0	126	4.9	125
8	5.4	136	5.2	132	5.3	135
9	5.6	141	5.4	138	5.6	143
10	5.7	144	5.6	141	5.9	149
11	5.7	146	5.7	144	6.1	154
12	5.8	148	5.7	146	6.2	158

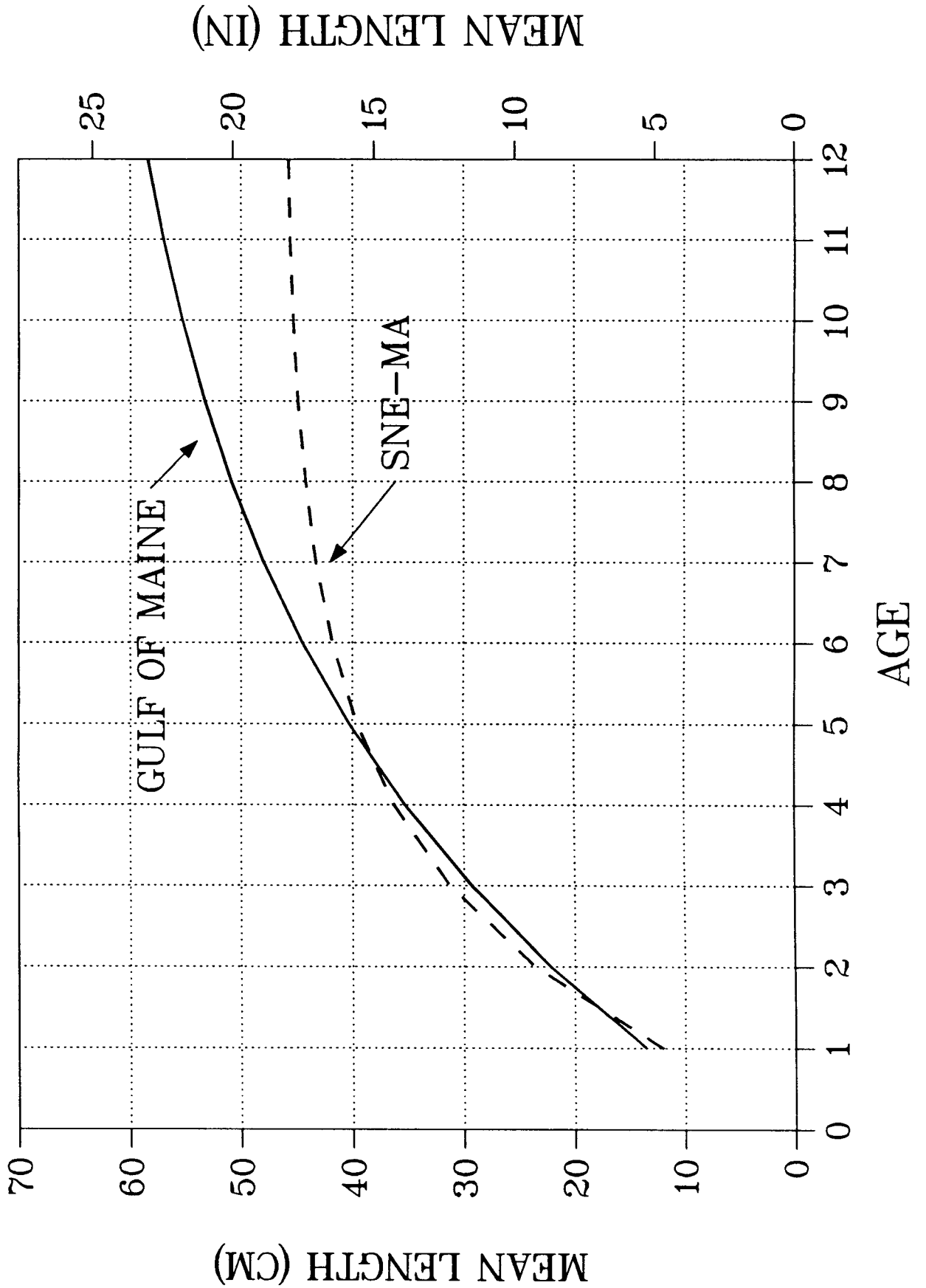
SEA SCALLOPS



Silver hake

Age	Gulf of Maine		Southern New England- Middle Atlantic	
	Length (in)	Length (cm)	Length (in)	Length (cm)
1	5.3	13.5	4.7	12.0
2	8.7	22.2	9.3	23.6
3	11.5	29.3	12.3	31.3
4	13.9	35.3	14.3	36.3
5	15.9	40.3	15.6	39.6
6	17.5	44.5	16.5	41.8
7	18.9	48.0	17.0	43.3
8	20.0	50.9	17.4	44.2
9	21.0	53.3	17.7	44.9
10	21.8	55.3	17.8	45.3
11	22.4	57.0	18.0	45.6
12	23.0	58.4	18.0	45.7

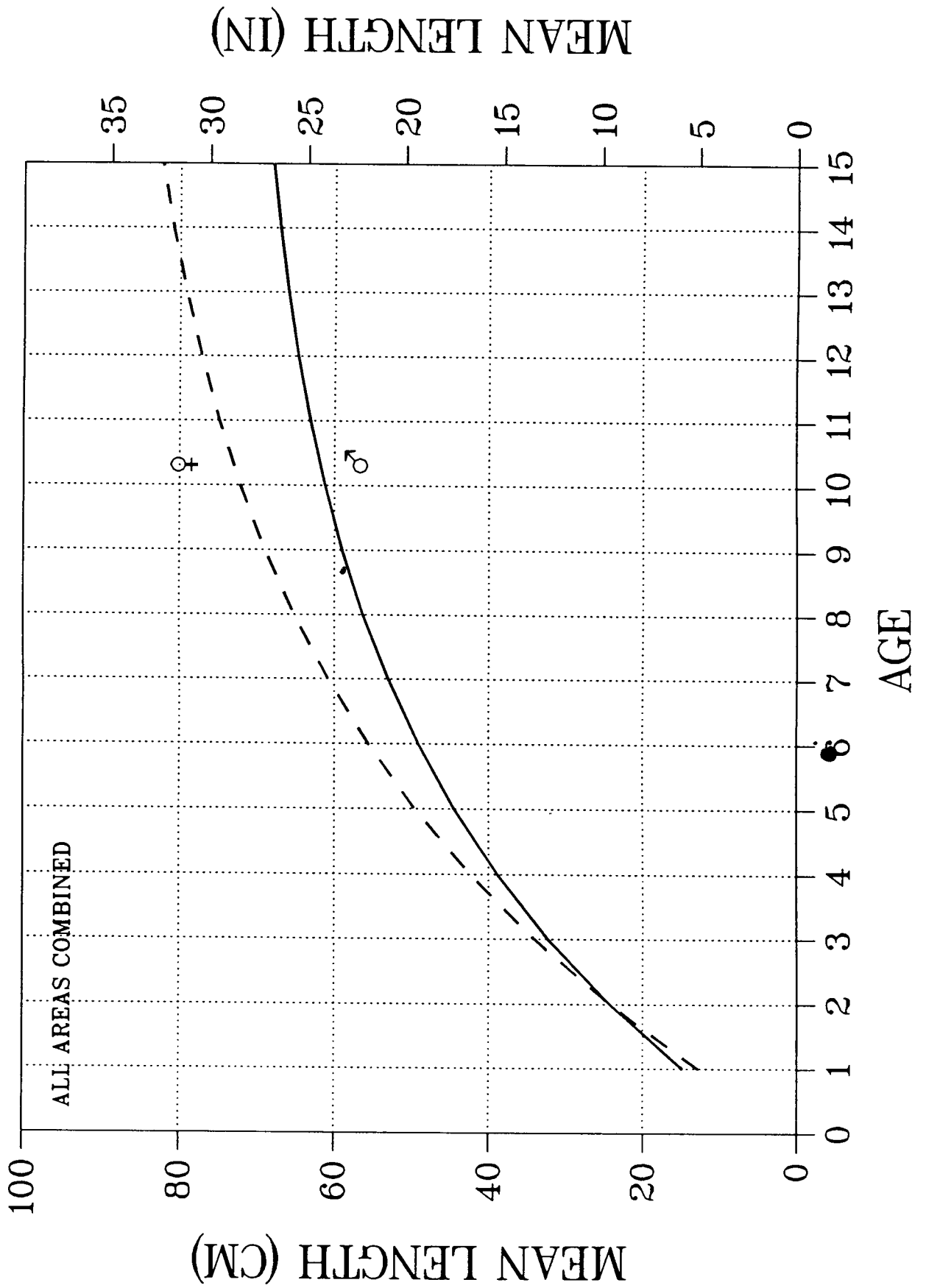
SILVER HAKE



Summer flounder., all areas combined

Age	Male		Female	
	Length (in)	Length (cm)	Length (in)	Length (cm)
1	5.8	14.8	5.0	12.8
2	9.6	24.3	9.6	24.3
3	12.7	32.3	13.4	34.1
4	15.3	38.9	16.7	42.4
5	17.5	44.5	19.5	49.6
6	19.3	49.1	21.9	55.6
7	20.9	53.0	23.9	60.8
8	22.2	56.3	25.7	65.2
9	23.2	59.0	27.2	69.0
10	24.1	61.2	28.4	72.2
11	24.8	63.1	29.5	74.9
12	25.5	64.7	30.4	77.2
13	26.0	66.0	31.2	79.2
14	26.4	67.1	31.9	80.9
15	26.8	68.0	32.4	82.3

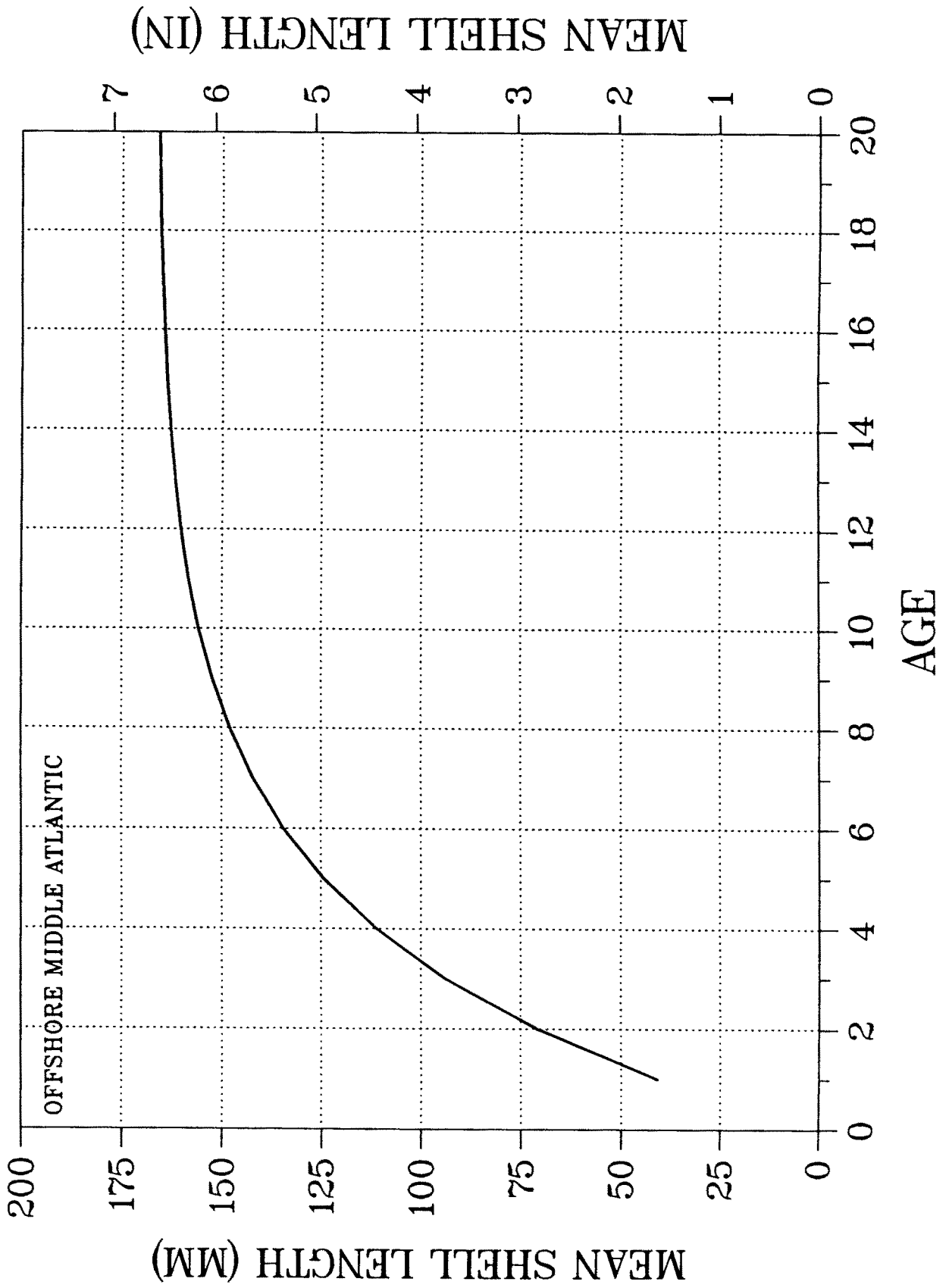
SUMMER FLOUNDER



Surf clam, offshore Middle Atlantic - Georges Bank

Age	Length (in)	Length (mm)
1	1.6	41
2	2.8	71
3	3.7	94
4	4.4	111
5	4.9	124
6	5.3	135
7	5.6	142
8	5.8	148
9	6.0	153
10	6.1	156
11	6.2	158
12	6.3	160
13	6.4	162
14	6.4	163
15	6.5	164
16	6.5	165
17	6.5	165
18	6.5	165
19	6.5	166
20	6.5	166

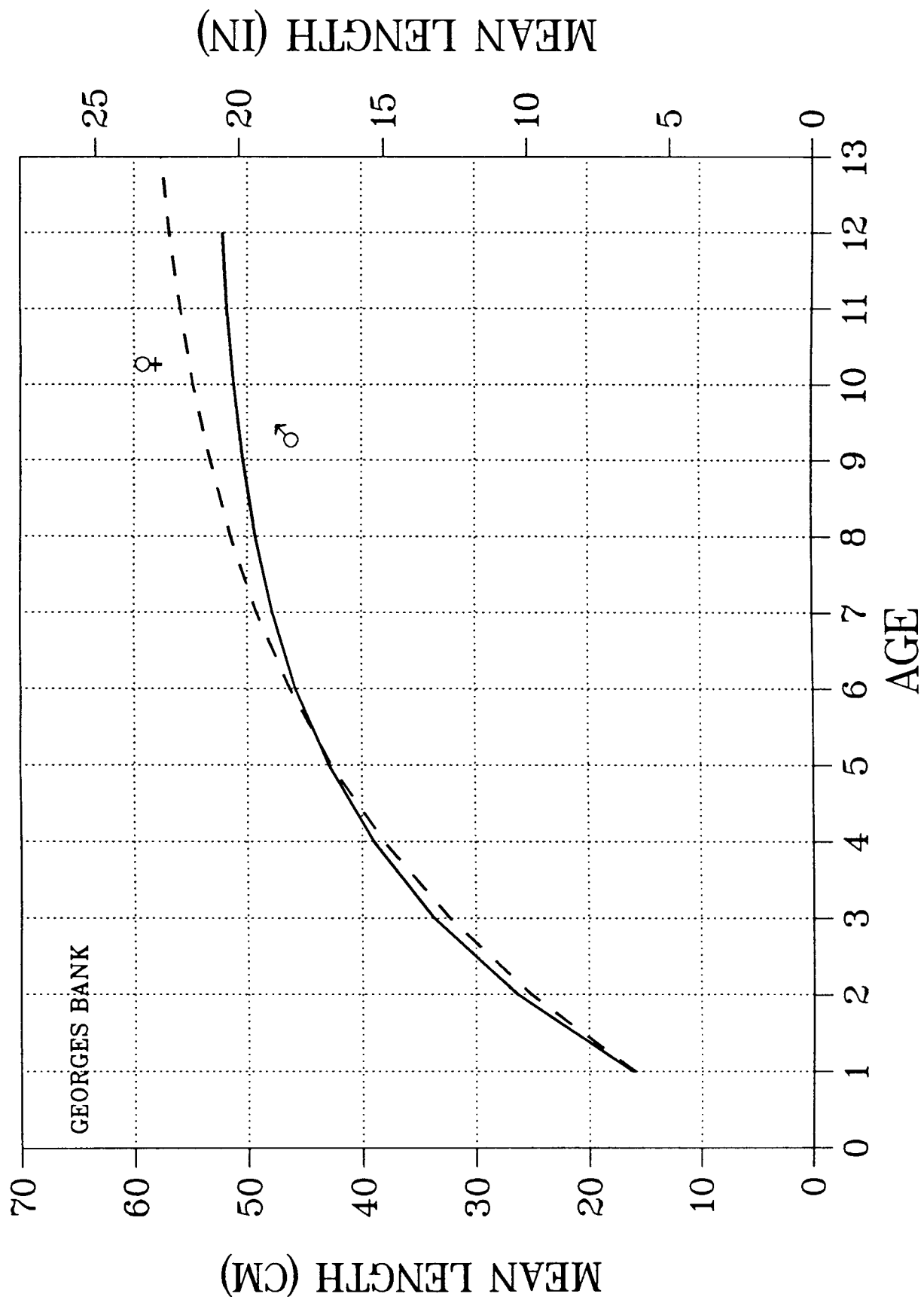
SURF CLAMS



Winter flounder, Georges Bank

Age	Male		Female	
	Length (in)	Length (cm)	Length (in)	Length (cm)
1	6.3	16.1	6.3	15.9
2	10.4	26.3	9.9	25.1
3	13.3	33.7	12.7	32.3
4	15.4	39.0	15.0	38.1
5	16.9	42.9	16.8	42.7
6	18.0	45.8	18.2	46.3
7	18.8	47.8	19.4	49.2
8	19.4	49.3	20.3	51.5
9	19.8	50.4	21.0	53.3
10	20.2	51.2	21.6	54.8
11	20.4	51.8	22.0	55.9
12	20.6	52.2	22.4	56.9
13			22.7	57.6

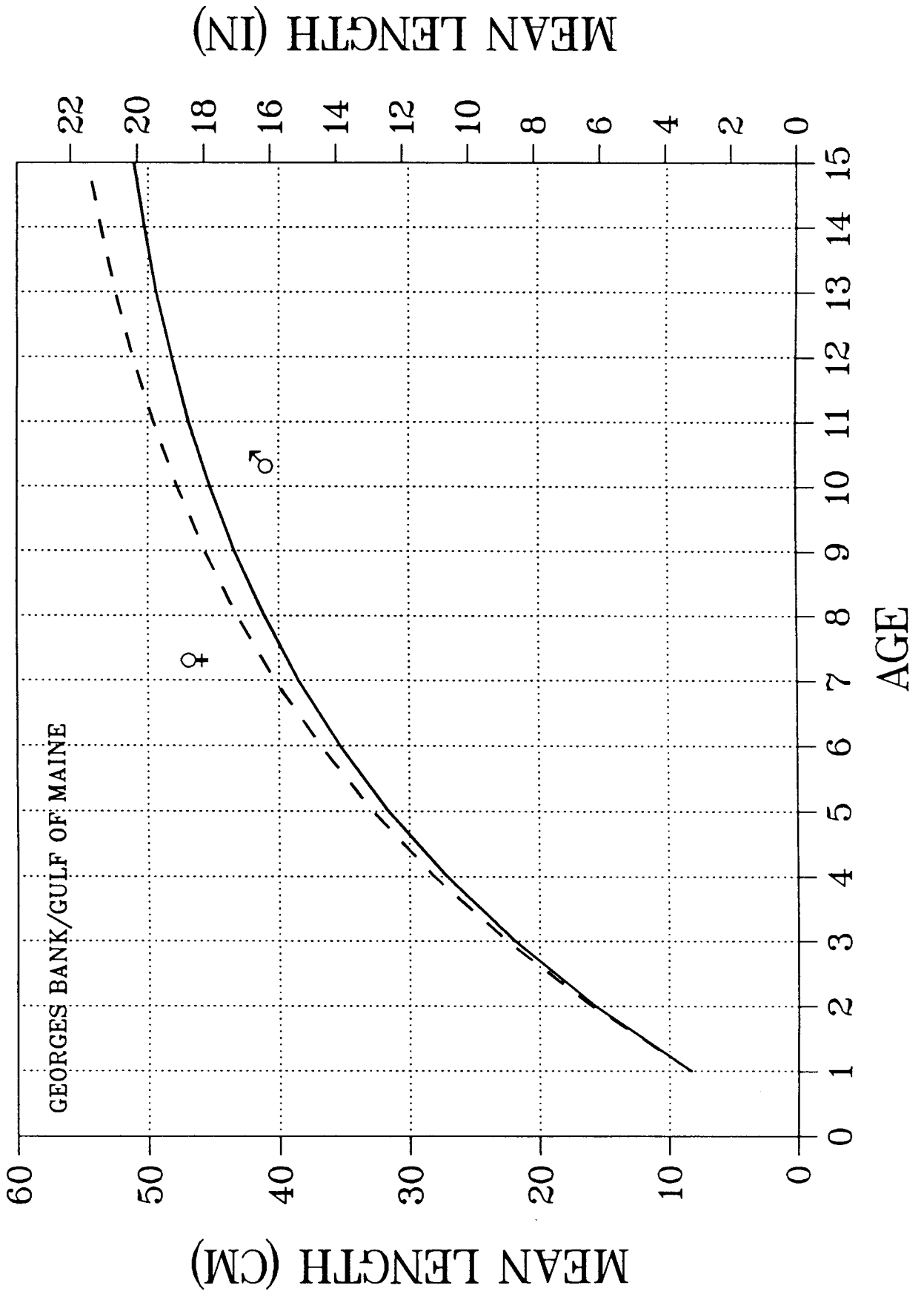
WINTER FLOUNDER



Witch flounder, Georges Bank - Gulf of Maine

Age	Male		Female	
	Length (in)	Length (cm)	Length (in)	Length (cm)
1	3.3	8.3	3.3	8.3
2	6.2	15.7	6.3	16.0
3	8.6	21.9	8.9	22.5
4	10.7	27.1	11.1	28.1
5	12.4	31.6	12.9	32.8
6	13.9	35.3	14.5	36.8
7	15.2	38.5	15.9	40.3
8	16.2	41.1	17.0	43.2
9	17.1	43.4	18.0	45.7
10	17.8	45.3	18.8	47.8
11	18.5	46.9	19.5	49.6
12	19.0	48.2	20.2	51.2
13	19.4	49.4	20.7	52.5
14	19.8	50.3	21.1	53.6
15	20.1	51.1	21.5	54.6

WITCH FLOUNDER



Yellowtail flounder

Age	Southern New England		Georges Bank		Cape Cod	
	Length (in)	Length (cm)	Length (in)	Length (cm)	Length (in)	Length (cm)
1	3.3	8.3	3.3	8.5	5.5	13.9
2	9.3	23.5	10.3	26.1	9.4	23.9
3	12.4	31.4	13.7	34.7	12.4	31.6
4	14.0	35.5	15.4	39.0	14.8	37.6
5	14.8	37.6	16.1	41.0	16.6	42.2
6	15.3	38.8	16.5	42.0	18.0	45.8
7	15.5	39.4	16.7	42.5	19.1	48.6
8	15.6	39.7	16.9	42.8	20.0	50.7
9	15.7	39.8	16.9	42.9	20.6	52.4
10	15.7	39.9	16.9	43.0	21.1	53.6
11					21.5	54.6
12					21.8	55.4

YELLOWTAIL FLOUNDER

