

COMMERCIAL FISHERIES REVIEW

1965

Washington, D. C.

Vol. 27, No. 7

THE U. S. COD FISHERY IN THE NORTHWEST ATLANTIC

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ABSTRACT

The U. S. cod fishery in the Northwest Atlantic has changed greatly during the past 300 years. Originally an inshore fishery with hand lines fished from small boats, it soon moved offshore to the distant banks including the Grand Bank off Newfoundland. Toward the end of the 19th Century, an average of 94 million pounds of cod were landed annually. Most of the catch was salted and dried.

The offshore operations were made more efficient with changes in gear and vessels. The changes also made possible the exploitation of new fishing grounds in inshore waters as well as offshore.

Improvements in handling the catch at sea and ashore and in processing it for market eliminated the salt-cod fishery. The same improvements--filleting and freezing--made other species more popular with consumers and decreased the demand for cod. In recent years, annual U. S. cod landings have been about 35 to 40 million pounds.

Historical and modern details and statistics of the U. S. cod fishery are described. The methods, equipment, and landings are detailed for the New England, Middle Atlantic, and Chesapeake Bay states.

INTRODUCTION

The history of the U. S. fishery for cod (*Gadus morhua*--fig. 1) is intimately associated with the history of our Nation. From earliest times, cod fishing was important as a source of food and later as a source of the dried-salted product that figured in world trade.

The magnitude of the fishery fluctuated greatly over the centuries but generally it has declined, especially during the past 50 years, as other species have become more important to the industry. Cod, however, is still sought by U. S. fishermen and maintains a relatively important but secure position in the annual landings of food fish. In recent years, when haddock abundance has been low, fishermen landed more cod to supply the market demand for fish.

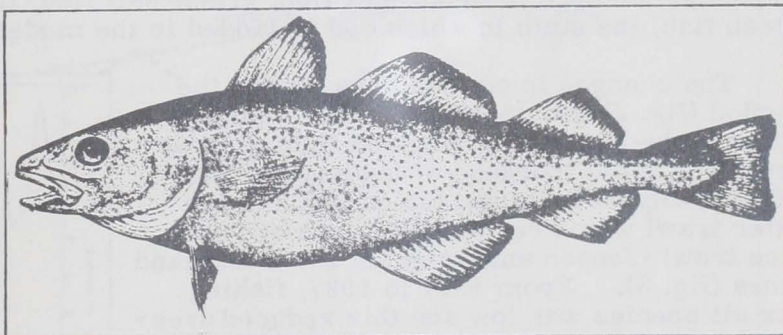


Fig. 1 - Cod (*Gadus morhua*).

HISTORY OF THE FISHERY

Exploitation of the Northwest Atlantic cod resource began in the 16th Century when French and Portuguese vessels fished the Grand Bank off Newfoundland (Taylor 1957). By the early 17th Century, the New England colonists were fishing for cod in the local waters. In 1624, "no more than fifty ships" from Gloucester fished with hand lines in the offing of Maine and Massa-

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Fish and Wildlife Service
Sep. No. 736

chusetts (Babson 1860). By 1708, New England vessels fished the Nova Scotian banks (Innis 1954) and in 1748 the first cod trip from Georges Bank was landed (Goode 1887).

The vessels, however, began to go farther and farther offshore to fish. In 1757, Gloucester vessels ventured to the Grand Bank. Evidently the fishing there was more productive than on the local banks because by 1788 as many as 60 Gloucester vessels were fishing on Grand Bank (Babson 1860).

Without doubt, cod abundance was low in the local waters. It does not seem reasonable that the fishermen would risk a long trip offshore in their tiny vessels if there had been plenty of cod nearby. Some attributed the scarcity of fish to power dams built for textile mills (Baird 1874). The dams, it was said, prevented the runs of alewives (*Alosa pseudoharengus*) on which the cod fed. When alewife abundance declined, cod abundance also declined. Other factors no doubt contributed to the fluctuations in abundance.

Table 1 - Annual Landings of Cod from New England Waters, 1893-1962

Year	Landings 1,000 Lbs.	Year	Landings 1,000 Lbs.	Year	Landings 1,000 Lbs.
1862	32,713	1939	50,802	1916	35,399
1861	32,442	1938	59,575	1915	34,782
1860	26,117	1937	72,937	1914	61,840
1859	30,557	1936	56,550	1913	45,414
1858	29,857	1935	56,640	1912	52,687
1857	24,177	1934	50,682	1911	49,797
1856	24,320	1933	59,101	1910	65,567
1855	22,885	1932	56,897	1909	74,755
1854	22,481	1931	61,226	1908	76,121
1853	20,624	1930	75,924	1907	106,494
1852	25,555	1929	87,991	1906	116,250
1851	35,639	1928	63,808	1905	68,430
1850	37,559	1927	72,240	1904	57,276
1849	45,389	1926	75,565	1903	73,872
1848	46,102	1925	64,669	1902	79,060
1847	43,157	1924	61,501	1901	85,243
1846	55,323	1923	57,468	1900	64,064
1845	52,863	1922	58,125	1899	90,993
1844	51,695	1921	60,381	1898	83,193
1843	49,105	1920	51,257	1897	86,543
1842	45,935	1919	56,441	1896	90,449
1841	57,993	1918	56,151	1895	117,005
1840	44,543	1917	40,193	1894	105,363
				1893	89,363

Note: Drawn or gutted fresh weight.

to the present the data are reliable (table 1). Appropriate conversion factors have been used to change landings of dried-salt fish, green-salt fish, frozen fish, . . . to a standard of gutted fresh fish, the state in which cod is landed in the modern fishery.

The changes in cod landings during the period (fig. 2) generally follow the fluctuations in the entire New England fishing industry. The rapid increase of landings in 1905-06 probably reflects the introduction of the otter trawl which replaced the less efficient line trawl (Jensen and Brigham 1963) and hand lines (fig. 3). From 1914 to 1927, fishing for all species was low and this reduced pressure is reflected in the lower cod landings. During the 1930's, fishing activity experienced a rapid series of ups and downs, caused by several inter-related factors, including a scarcity of fish on the grounds and a tie-up of vessels because of the general economic depression then affecting most American industries.

Landings were reduced in the 1940's because the World War II submarine menace

The success of the cod fisheries varied greatly over the years. Whereas 60 Gloucester vessels fished offshore in 1788, only 8 vessels were fishing offshore 12 years later. By 1819, the fisheries were so depressed that Congress passed a "bounty act" (Earl 1880) a form of subsidy, that put new life in the industry.

Toward the close of the 19th Century, bay fishing, mostly on Georges and Browns Banks was a flourishing industry with 174 dory schooners taking part. In 1879, the equivalent of 90 million pounds of round fresh cod was landed by the "salt bankers" (Earl 1880). In 1880, a record was set when 294 million pounds of cod were landed (Sette 1928).

No accurate statistics are available for cod landings prior to 1893, but from that date

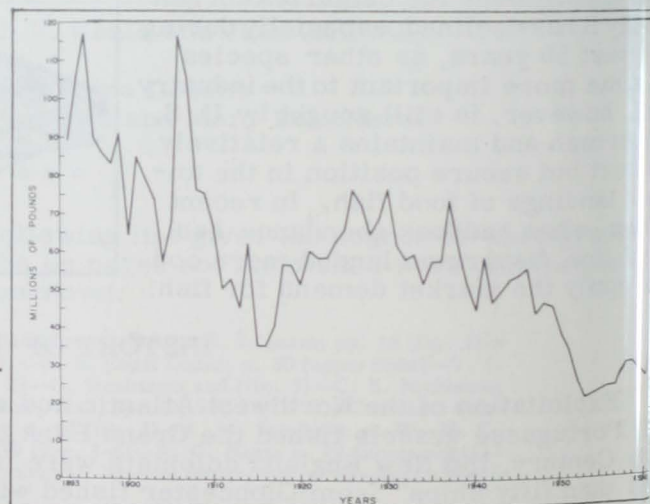


Fig. 2 - Annual New England landings of cod (gutted weight) from New England waters during the period 1893-1962.

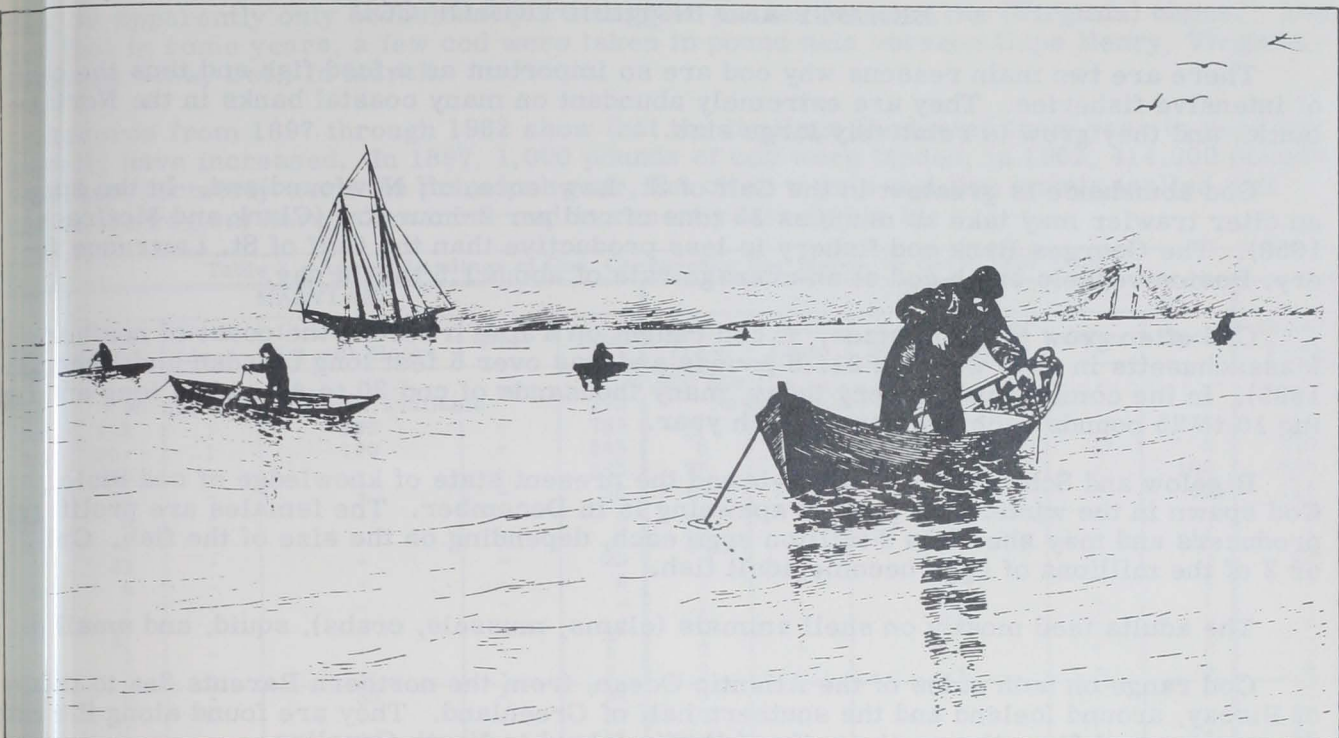


Fig. 3 - Hand-lining for cod on Grand Bank in the 1880's (from Goode 1887).

Many vessels from fishing the offshore banks. In the early 1950's, cod landings again declined when vessels landed more of the abundant--and slightly more valuable--haddock. In the late 1950's, however, cod landings rose when haddock abundance declined drastically. Cod landings during the past 10 years have generally been rising (fig. 4). Of the leading New England groundfish species, cod alone has been landed in ever-increasing quantities during the past decade. Recent annual levels have not reached prewar highs, but the trend has been a slow, steady climb--an average increase of more than one-half million pounds per year.

Most of the cod caught by United States vessels are landed at New England ports. In 1962, the landings amounted to 35 million pounds. Cod are also caught in a winter fishery, off the Middle Atlantic States where landings are on the order of 3 million pounds and the Chesapeake States where recent landings have been about 750,000 pounds. Those fisheries are described in later sections.

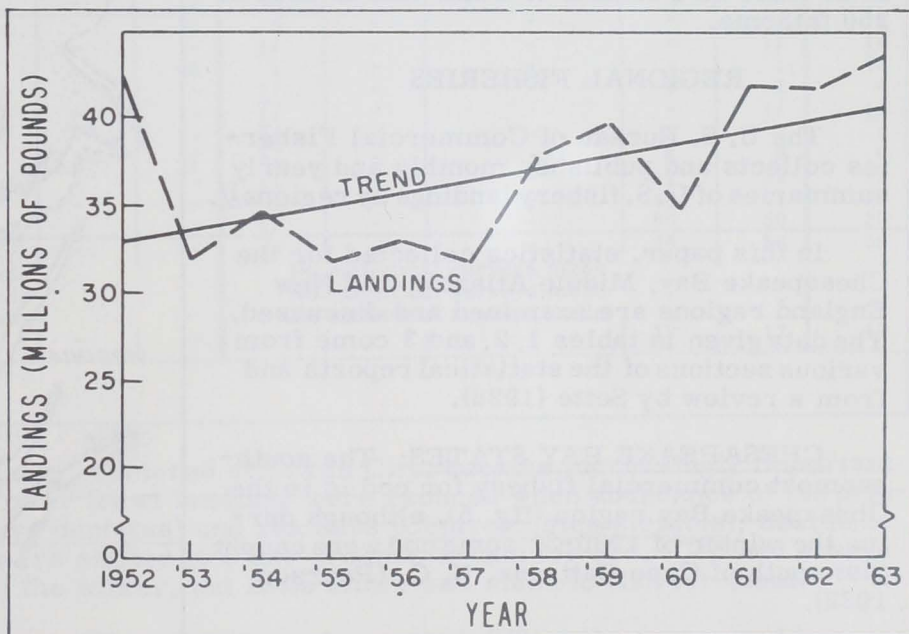


Fig. 4 - Trend in cod landings, 1952-1963 (millions of pounds, round weight).

BIOLOGY AND DISTRIBUTION OF COD

There are two main reasons why cod are so important as a food fish and thus the object of intensive fisheries. They are extremely abundant on many coastal banks in the North Atlantic, and they grow to relatively large size.

Cod abundance is greatest in the Gulf of St. Lawrence, off Newfoundland. In the spring an otter trawler may take as much as 35 tons of cod per 2-hour tow (Clark and McCracken 1958). The Georges Bank cod fishery is less productive than the Gulf of St. Lawrence fishery; Boston vessels catch cod at an average rate of about 1.5 tons a day.

Cod often grow to large sizes. A cod caught on a line trawl off the coast of northern Massachusetts in 1895 weighed 211.5 pounds and was over 6 feet long (Jordan and Evermann 1905). In the commercial fishery today, many thousands of cod 30 to 40 inches long and weighing 10 to 25 pounds each are caught each year.

Bigelow and Schroeder (1953) reviewed the present state of knowledge of cod biology. Cod spawn in the winter; the peak of spawning is in December. The females are prolific producers and may shed 3 to 9 million eggs each, depending on the size of the fish. Only 1 or 2 of the millions of eggs become adult fish.

The adults feed mostly on shell animals (clams, mussels, crabs), squid, and small fish.

Cod range on both sides of the Atlantic Ocean, from the northern Barents Sea to the Bay of Biscay, around Iceland and the southern half of Greenland. They are found along the North American coast from the southern tip of Baffin Island to North Carolina.

Although they are considered groundfish, cod occasionally rise off the bottom, presumably in search of food. Cod have been caught in as little as 1 fathom of water and as deep as 250 fathoms.

REGIONAL FISHERIES

The U. S. Bureau of Commercial Fisheries collects and publishes monthly and yearly summaries of U. S. fishery landings by regions^{1/}.

In this paper, statistics collected for the Chesapeake Bay, Middle Atlantic, and New England regions are examined and discussed. The data given in tables 1, 2, and 3 come from various sections of the statistical reports and from a review by Sette (1928).

CHESAPEAKE BAY STATES: The southernmost commercial fishery for cod is in the Chesapeake Bay region (fig. 5), although during the winter of 1930-31 some cod were caught just south of Cape Hatteras, N. C. (Pearson 1932).

The fishery is seasonal and the annual landings fluctuate greatly. Few cod are caught within Chesapeake Bay. Hildebrand and Schroeder (1928) stated, "The cod is too rare in Chesapeake Bay to be of economic impor-

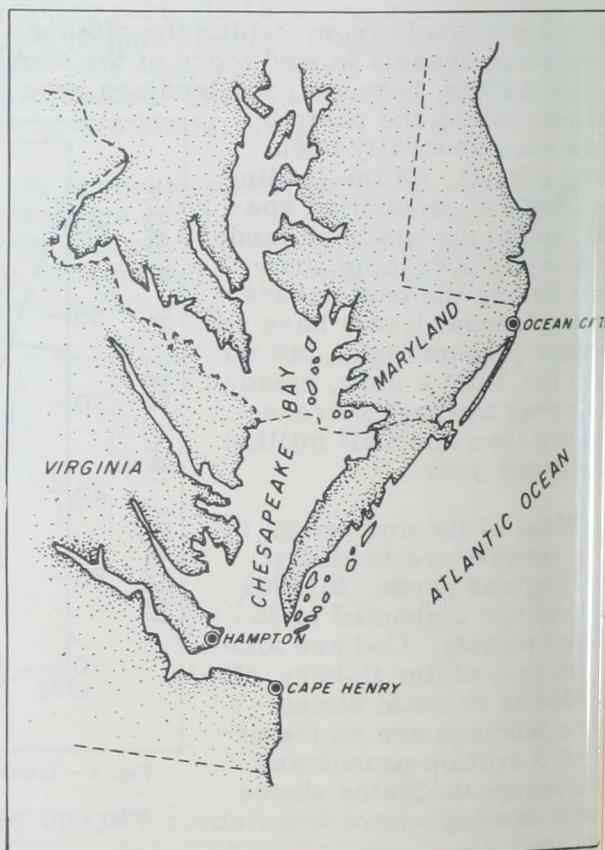


Fig. 5 - Chesapeake Bay states.

^{1/}Fishery Industries of the United States, 1932-1938, U. S. Department of Commerce, Bureau of Fisheries; and, Statistical Digest 1-54, Fishery Statistics of the United States, 1939-1963, U. S. Department of the Interior, Fish and Wildlife Service. See also appendices to the Annual Reports to the Commissioner of Fisheries.

Year	MAINE						NEW HAMPSHIRE					MASSACHU		
	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Gill Nets	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks
1962	1,096	225	223	580	-	2,124	No statistics available					36,424	1,264	1,636
1961	1,163	143	418	783	-	2,507	-	-	30	-	30	33,659	752	2,183
1960	1,362	341	339	855	-	2,897	-	-	20	-	20	27,112	1,027	1,978
1959	1,162	195	429	907	-	2,693	-	-	-	-	-	32,755	438	1,944
1958	1,057	155	382	1,141	-	2,735	-	-	-	-	-	31,168	202	1,219
1957	1,064	49	272	967	-	2,352	-	-	-	-	-	26,581	105	1,269
1956	1,398	55	316	978	-	2,747	-	-	-	-	-	27,064	150	1,531
1955	1,311	178	429	945	-	2,863	-	-	-	-	-	25,606	155	2,138
1954	1,780	513	504	891	1	3,690	-	-	-	-	-	27,180	213	1,894
1953	1,757	333	672	1,007	-	3,769	-	-	-	-	-	23,654	126	2,848
1952	1,875	1,046	860	833	<u>1/</u>	4,614	-	6	10	-	16	32,301	163	3,720
1951	2,258	918	1,097	1,020	<u>1/</u>	5,293	-	4	8	-	12	34,298	168	5,138
1950	2,791	1,171	1,434	1,217	-	6,613	-	2	3	-	5	39,020	305	5,178
1949	2,325	759	1,393	1,599	-	6,076	-	2	1	-	3	42,231	379	6,504
1948	2,356	917	1,567	1,546	-	6,386	-	1	6	-	7	52,405	480	6,364
1947	1,980	340	899	1,376	-	4,595	-	1	6	-	7	50,096	504	5,492
1946	3,109	822	1,655	1,810	-	7,396	No survey					71,065	681	5,610
1945	2,801	657	1,749	1,715	2	6,924	-	2	32	-	34	125,240	526	4,270
1944	1,930	404	1,789	1,449	1	5,573	-	2	38	-	40	75,444	490	7,192
1943	1,759	776	2,257	1,518	10	6,320	-	3	78	-	81	46,609	485	6,591
1942	1,846	1,167	1,259	667	1	4,940	-	-	35	-	35	45,370	743	9,798
1941	No survey						No survey					No survey		
1940	651	206	1,698	633	<u>1/</u>	3,188	-	-	20	-	20	61,239	404	14,271
1939	496	123	2,012	696	<u>1/</u>	3,327	-	-	25	-	25	84,413	399	14,383
1938	500	413	3,076	2,231	-	6,220	-	-	2	-	2	94,266	174	14,589
1937	355	794	3,273	2,627	-	7,049	-	-	1	-	1	106,155	170	16,802
1936	No survey						No survey					No survey		
1935	552	506	3,992	3,358	-	8,408	-	11	3	-	14	77,734	673	27,022
1934	No complete statistics						No complete statistics					No complete st		
1933	766	1,108	3,356	4,106	-	9,336	-	-	29	-	29	51,228	2,205	32,813
1932	596	2,234	4,459	4,815	<u>1/</u>	12,104	-	4	51	-	55	38,000	1,687	28,653
1931	446	2,156	5,551	4,499	<u>1/</u>	12,652	-	36	24	-	60	36,225	1,633	32,367
1930	784	1,797	7,906	2,997	-	13,484	-	-	158	-	158	40,219	3,362	29,647
1929	931	2,720	10,862	3,148	-	17,661	-	-	4	-	4	19,907	3,928	35,831
1928	64	2,282	9,228	4,613	<u>1/</u>	16,187	-	-	25	-	25	13,556	8,837	40,555

1/ Less than 500 pounds.

Note: Drawn or gutted fresh weight.

MASSACHUSETTS							RHODE ISLAND						CONNECTICUT					Grand Total
Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Gill Nets	Pound Nets	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Floating Traps	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Other	Total	All Gear, All New England States
(1,000 Lbs.)																		
36,424	1,264	1,636	490	5	10	39,829	No statistics by gear available					620	No statistics available					Incomplete by gear
33,659	752	2,183	1,555	3	13	38,165	762	117	96	91	-	1,066	364	36	-	-	400	42,168
27,112	1,027	1,978	1,142	2	4	31,265	456	143	78	146	-	823	225	24	-	-	249	35,254
32,755	438	1,944	1,417	4	18	36,576	824	188	190	43	-	1,245	242	1/	-	-	242	40,756
31,168	202	1,219	948	49	6	33,592	522	172	439	114	-	1,247	208	1	-	-	209	37,783
26,581	105	1,269	410	-	24	28,389	385	133	136	185	-	839	329	1	-	-	330	31,910
27,064	150	1,531	372	1/	11	29,128	389	128	106	110	-	733	154	-	-	-	154	32,762
25,606	155	2,138	612	1/	16	28,527	340	33	61	359	-	793	185	1/	-	-	185	32,368
27,180	213	1,894	700	1/	3	29,990	494	238	122	467	-	1,321	239	-	-	-	239	35,240
23,654	126	2,848	832	1/	5	27,465	141	354	49	63	-	607	58	1/	-	-	58	31,899
32,301	163	3,720	720	7	17	36,928	215	367	-	91	1/	673	170	1/	-	-	170	42,401
34,298	168	5,138	1,089	6	13	40,712	383	471	-	307	-	1,161	302	1/	-	1/	302	47,480
39,020	305	5,178	1,272	87	5	45,867	227	849	-	151	-	1,227	256	-	-	-	256	53,968
42,231	379	6,504	1,277	14	14	50,419	489	706	-	513	-	1,708	590	1	-	-	591	58,797
52,405	480	6,364	1,495	1/	1/	60,744	301	149	52	288	-	790	310	7	-	-	317	68,244
50,096	504	5,492	2,388	32	8	58,520	194	243	85	153	-	675	230	13	-	-	243	64,040
71,065	681	5,610	2,902	28	66	80,352	258	253	155	116	-	782	175	16	-	-	191	88,721
25,240	526	4,270	2,549	102	73	132,760	434	491	153	40	-	1,118	235	2	-	-	237	141,073
75,444	490	7,192	3,681	92	66	86,965	430	354	103	19	-	906	272	2	-	-	274	93,758
46,609	485	6,591	4,398	72	54	58,209	75	454	158	19	-	706	222	2	-	1/	224	65,540
45,370	743	9,798	3,293	86	82	59,372	29	423	190	22	-	664	81	-	-	-	81	65,092
No survey							No survey						No survey					
61,239	404	14,271	2,568	45	33	78,560	1	248	196	20	-	465	49	7	-	1/	56	82,289
84,413	399	14,383	2,282	29	13	101,519	2	433	55	23	-	513	34	1/	-	-	34	105,418
94,266	174	14,589	2,191	22	72	111,314	17	612	94	13	-	736	100	11	-	-	111	118,383
06,155	170	16,802	3,140	14	46	126,327	19	863	165	20	-	1,067	157	2	-	-	159	134,603
No survey							No survey						No survey					
77,734	673	27,022	5,143	15	47	110,634	6	403	166	33	-	608	161	4	505	-	670	120,334
No complete statistics							No complete statistics						No complete statistics					
51,228	2,205	32,813	3,085	3	55	89,209	5	610	164	128	1/	907	44	23	80	-	147	99,628
38,000	1,687	28,653	3,111	4	26	71,481	66	461	152	42	1	722	1,482	61	370	-	1,913	86,275
36,225	1,633	32,367	2,928	91	33	73,277	39	581	135	149	1/	904	5,129	76	424	-	5,629	92,522
40,219	3,362	29,647	4,199	42	54	77,523	80	942	188	332	11	1,553	8,829	-	86	-	8,915	101,633
19,907	3,928	35,831	4,344	51	85	64,146	119	1,570	543	273	6	2,511	2,452	86	139	-	2,677	86,999
13,556	8,837	40,555	4,653	45	18	67,664	142	1,562	243	307	2	2,256	3,809	166	226	-	4,201	90,333

... as apparently only occasionally a straggler passes between the (Virginia) capes." They noted that in some years, a few cod were taken in pound nets between Cape Henry, Virginia, and Ocean View, Del., in March.

Records from 1897 through 1962 show that the landings fluctuated from year to year but generally have increased. In 1897, 1,000 pounds of cod were landed; in 1962, 414,000 pounds. Pound nets formerly were the principal gear, but otter trawls and line trawls (called trot lines in the region) have taken more cod in recent years (table 2).

Table 2 - Annual Landings of Cod, Chesapeake Bay States, by Gear, 1897 - 1962

Year	MARYLAND					VIRGINIA					Grand Total		
	Otter Trawl	Hand Lines	Lines Long or Set with Hooks	Other	Total	Otter Trawl	Hand Lines	Lines Long or Set with Hooks	Other	Total			
	(1,000 Lbs.)												
1897	No breakdown by gear available					375	No breakdown by gear available					39	414
1898	125	1	663	-	789	1/	-	30	-	30	819		
1899	354	1	190	-	545	6	1/	2	1/	8	553		
1900	383	-	-	-	383	72	-	28	-	100	483		
1901	52	-	-	-	52	15	-	50	-	65	117		
1902	3	-	-	-	3	-	-	-	-	-	3		
1903	1	-	-	-	1	1/	-	-	-	1/	1		
1904	23	-	-	-	23	-	-	-	-	-	23		
1905	6	-	-	-	6	2	-	-	-	2	8		
1906	-	-	-	-	-	1	-	-	-	1	1		
1907	1/	-	-	-	1/	2	-	-	-	2	2		
1908	1	-	-	-	1	2	-	-	-	2	3		
1909	3	-	-	-	3	3	-	-	-	3	6		
1910	1	-	33	-	34	3	-	-	-	3	37		
1911	57	-	-	-	57	10	1	-	-	11	68		
1912	1	-	20	-	21	14	-	-	-	14	35		
1913	17	-	72	-	89	15	-	-	1/	15	104		
1914	23	-	92	-	115	3	-	-	-	3	118		
1915	8	-	34	-	42	7	1	-	-	8	50		
1916	No statistics available					-	No statistics available					-	
1917	1/	-	-	-	1/	-	-	-	-	-	1/		
1918	No breakdown by gear available					1	No breakdown by gear available					1/	1
1919	2	-	-	-	2	5	-	-	-	5	7		
1920	-	-	-	-	-	4	-	-	-	4	4		
1921	-	-	-	-	-	1/	-	-	-	1/	1/		
1922	-	-	48	-	48	1	-	-	-	1	49		
1923	-	-	-	-	-	1/	-	-	4	4	4		
1924	-	-	-	-	-	1/	-	-	-	1/	1/		
1925	-	-	-	-	-	1/	-	-	1	1	1		
1926	-	-	-	1/	1/	1/	-	-	6	6	6		
1927	-	-	-	-	-	11	-	-	11	22	22		
1928	-	-	-	-	-	1	-	-	40	41	41		
1929	-	-	-	-	-	1/	-	-	50	50	50		
1930	-	-	-	-	-	-	-	-	56	56	56		
1931	No statistical surveys made					-	No statistical surveys made					-	
1932	No statistical surveys made					-	No statistical surveys made					-	
1933	No statistical surveys made					-	No statistical surveys made					-	
1934	-	-	-	-	-	-	-	-	17	17	17		

1/ More than 500 pounds.
 - Statistics available prior to 1925.
 1/ Drawn or gutted fresh weight.

The Maryland trot-line fishery, centered at Ocean City, became increasingly important in the late 1950's. The winter otter trawl landings were reduced when abundance of the principal species, fluke (*Paralichthys dentatus*) and sea bass (*Centropristes striatus*), declined. In the autumn of 1959, the trawlers shifted to other grounds to fish for cod. Cod had always been present in the area during the winter, but little effort was made to fish for them.

William E. Brey (1963, personal communication) reported, "Trot lines are used because they catch more fish than trawlers. With the trawlers the cod are only taken incidental to the catch of other species."

"The trawlers land cod in late November and December, incidental to the taking of fluke and sea bass and some scup (*Stenotomus chrysops*). The trot lines are fished starting about January 1 to avoid dogfish (*Squalus acanthias*) that are present on the grounds until about the 11th week in December."

Cod landings from New England waters fluctuated from a high of 117 million pounds in 1895 to a low of about 21 million pounds in 1953. Landings at New England ports were supplemented, however, with cod caught by U. S. vessels on Browns Bank and other grounds in the offing of Canada. Thus, the low point for cod landed was approximately 32 million pounds in 1953 and again in 1957. Only about 7 percent of the cod landed by U. S. vessels is caught in the high seas off Canada. The landings by gear for the period 1928 to 1962 (table 4) show the same general decline for each of the states.

Although line trawls took most of the cod early in the century, otter trawls have taken an increasingly larger share since about 1908 and today are the most important gear in the New England cod fishery. Hand lines and line trawls still take fair amounts of cod off Massachusetts and Maine and are used to some extent off Rhode Island. Other types of gear include floating traps off Rhode Island, gill nets off Maine and Massachusetts, and pound nets off Massachusetts.

The New England cod fishery is a year-round fishery although the effort shifts seasonally from ground to ground. Most cod are caught by the large otter trawlers (fig. 8) that fish out of Boston for haddock. The most productive grounds are Georges Bank, Browns Bank, and Nantucket Shoals (see Schuck 1952 for a description of those grounds). Medium and small otter trawlers (fig. 9) fish many of the smaller grounds in the offing of Maine and Massachusetts.



Fig. 8 - A Boston large steel otter trawler.



Fig. 9 - A small wooden otter trawler, or dragger.

The principal cod port for many years was Gloucester, but Boston now is the chief port. New Bedford ranks second in volume of cod landed, followed by Gloucester, Provincetown, and Portland, Maine.

MARKET FOR COD

In the beginning of the U. S. cod fishery, the bulk of the catch was split, salted, and dried. Only a small quantity from the shore fisheries, and during the winter from the bank fisheries, was landed fresh. Salt cod was once a staple food on both sides of the North Atlantic and, in addition, great quantities were exported in New England vessels to Africa in exchange for slaves, and to the West Indies (to feed the slaves on sugar cane plantations) in exchange for molasses to be made into rum. Today, no salted cod is produced in the United States; the slight market demand is satisfied with imports from Canada.

UTILIZATION: The evolution from a salt-cod market to a fresh and frozen cod market was largely the result of technological changes at sea and ashore, and ready acceptance of the new products by the public. The important factors that changed the utilization of cod are reviewed by Sette and Fiedler (1929).

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TUNA CREOLE CHOWDER FOR BUSY PEOPLE

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QUICK TUNA CREOLE CHOWDER

- | | |
|---|---------------------------|
| 2 cans (6 1/2 or 7 ounces each) tuna in vegetable oil | 1 can (1 pound) corn |
| 1 small onion, chopped | 1/2 teaspoon salt |
| 1 medium green pepper, chopped | 1/2 teaspoon chili powder |
| 1 clove garlic, minced | 1/4 teaspoon thyme |
| 1 can (10 1/2 ounces) bouillon | 1/4 teaspoon Tabasco |
| 1 can (1 pound) tomatoes | |

Drain 1/4 cup oil from tuna into saucepan. Add onion, green pepper, and garlic; cook until onion is tender but not brown. Stir in remaining ingredients with tuna. Simmer 10 minutes. Makes 4 servings.

A steady downward trend in the landings of salted fish of all species began toward the end of the 19th Century. For example, in 1893, salted fish landings in Gloucester and Boston amounted to about 46 million pounds for all species, but by 1927 they declined to about 6.7 million pounds. The decrease was caused by lower landings of salted cod. In 1893, salted cod amounted to over 34 million pounds, and fresh cod to 20 million pounds. In 1927, salted cod amounted to about 2 million pounds and fresh cod to about 61 million pounds.

Before the development of efficient, inexpensive ways to manufacture ice, fishing vessels carried salt to preserve the catch at sea. The vessels were sailing schooners and the men fished with hand lines or long lines. Thus, it took longer to fill the holds with fish and longer to return to port.

Dramatic changes in the industry resulted from improved equipment to make ice, the introduction of otter trawls early in the present century, and the transition to steam (later diesel) engines for power. The vessels could carry enough ice to last the entire trip, the trawls caught large quantities of fish, and the vessels were able to spend far less time going to and from the banks.

Shortly after World War I, a quick-freezing process, readily adaptable to freezing fish, was developed. The industry began to market quick-frozen, boneless, ready-for-the-pan fillets that quickly changed the public's taste from salted to fresh fish. Those developments also helped contribute to the decline in the market for cod. Haddock, ocean perch or redfish (*Sebastes marinus*), and other species that did not salt well were widely marketed as frozen fillets.

Today, cod are landed in four market categories: scrod, $1\frac{1}{2}$ to $2\frac{1}{2}$ pounds; market, $2\frac{1}{2}$ to 10 pounds; large, 10 to 25 pounds; and extra large, over 25 pounds. The domestic landings are filleted or steaked and sold fresh or frozen. A small quantity is frozen in blocks for manufacture later to fish portions and cooked breaded fish sticks.

Despite the decline in U. S. cod landings, high domestic consumption of the species is satisfied by large imports of cod fillets and blocks, mostly from Canada, Iceland, and Denmark. In 1963, about 180 million pounds of cod fillets and cod fillet blocks were imported.

CONCLUSION

The U. S. cod fishery in the Northwest Atlantic has undergone many changes during the past 300 years. It began as a small boat, inshore fishery, but today is a large boat, offshore fishery. Technological improvements in handling and processing the catch helped decrease consumer demand for cod. Thus, the landings have declined to about one-third of what they were 50 to 75 years ago. The annual volume of the domestic catch, however, plus imports of frozen cod in several forms, suggest that the species plays and will continue to play an important economic role in fishing ports of the New England and Middle Atlantic states.

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