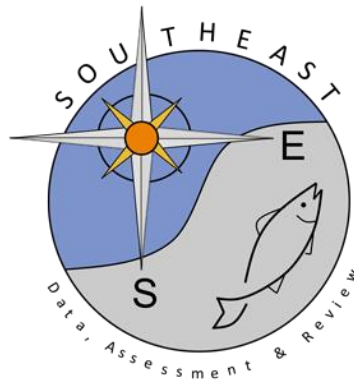


Commercial Landings of Gulf of Mexico Spanish Mackerel (*Scomberomorus maculatus*) 1887-2021

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SEDAR81-WP-04

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Introduction

Commercial landings statistics are the quantities and value of seafood products caught by fishermen in the U.S. and sold to established (licensed) wholesale and retail seafood dealers. These data have been collected as early as the late 1890s. Currently, these data are collected by trip ticket programs (TTPs) managed by state agencies. In addition to the quantity and value, basic information on the gear used to catch the fish, the area where the fishing occurred and the county and state where the catch was landed are recorded (Gloeckner, 2014).

Commercial landings of Spanish Mackerel for the Gulf of Mexico are provided in whole weight (in pounds) for the period 1887-2021.

Methods

Commercial landings for Gulf of Mexico Spanish Mackerel, from now referred to as the landings, were compiled using several data sources. Most of the data were accessed from an Oracle database housed at the Southeast Fisheries Science Center (SEFSC) in Miami, Florida. A materialized view in the database provides standardized and aggregated landings data (hereafter referred to as MV landings). This is the first SEDAR utilizing MV landings.

Data Sources

Historical landings prior to 1926 were obtained from Holliday and O'Bannon (1990).

The Accumulated Landings System (ALS) is an Oracle database maintained by SEFSC. This database contains landings data from 1926 to present with data prior to 1962 considered historical. Historical landings are summarized annually. Beginning in 1977, landings were consistently provided as monthly summaries, while a few states for some species began reporting monthly in 1972. For more information on data collection of landings prior to the implementation of a state TTP (Trip Ticket Program) and ALS database structure, refer to Gloeckner (2014).

Data from state TTPs begin in various years, depending on the state (Donaldson, 2004). In the Gulf of Mexico, trip ticket data were available through the Gulf of Mexico Fisheries Information Network (GulfFIN) housed at the Gulf States Marine Fisheries Commission (GSMFC). Where data were available from state trip ticket programs, those data were used in lieu of data from ALS.

The Florida General Canvass dataset, within the ALS database, contains annual landings 1976-1996. These data were submitted by federal port agents responsible for a particular county within Florida (Gloeckner, 2014). The General Canvass data provides estimated proportions of the landings by gear and area.

Stock Boundary

Commercial landings for Gulf of Mexico Spanish Mackerel were compiled from Texas through West Florida (Figure 1). This boundary follows the Gulf of Mexico Fisheries Management Council (GMFMC) boundary which is a line from Riley's Hump, the Tortugas and US 1, where the North of US1 is assigned to the GMFMC and South of US 1 is considered outside of the GMFMC region and is assigned to the South Atlantic FMC region.

Gear Groups

Similar to the previous assessment (SEDAR 28), commercial landings were summarized into three gears (gillnet, vertical/hand line, and other). Table 1 highlights the NMFS and FIN gear codes associated with each gear group. Since SEDAR 28, some gear codes have been updated to the appropriate gear group after review i.e. NMFS codes 445, and 530 to gill net and 645 to vertical line, respectively. These had been assigned to the gear group Other in SEDAR 28.

Data Compilation

The SEFSC maintained materialized view in ORACLE (known here as MV landings) appropriately joins all data sources based on best practices. All data housed within ALS are in the NMFS coding system, whereas TTP data are provided in the Fisheries Information Network (FIN) standard. A powerful aspect of this materialized view is that all gear, area, county, state, and species information are translated to the common FIN standard. MV landings contains data from 1926-present.

This is the first SEDAR where MV landings will be used as the standard method for providing commercial landings. The following data were used for each respective state:

Texas

- ALS from 1926-2013
- Trip ticket from 2014-present

Louisiana

- ALS from 1926-1999
- Trip ticket from 2000-present

Mississippi

- ALS from 1926-2013
- Trip ticket from 2014-present

Alabama

- ALS from 1926-2001
- Trip ticket from 2002-present

Florida

- ALS from 1926-1984
- Trip ticket from 1985-present
- General Canvass to proportion landings by gear and area from 1977-1996

The Florida General Canvass data contain annual landings totals by county on a percentage basis to create the estimated proportions of catch by the gear and area (Gloeckner, 2014). These proportions are applied to ALS landings for Florida from 1977-1984 to estimate landings by gear and area. From 1985-1996, when gear or area information are missing from the trip ticket, General Canvass data are used to impute gear or area. This standard method of using General Canvass data for Florida data from 1977-1996 was implemented in MV landings across all species.

From 1929-1940, Florida landings for Spanish Mackerel are classified only as inland Florida. Therefore, Holliday and O'Bannon (1990) was used to apportion to data into east and west Florida (Table 2). The annual proportion of data associated with western Florida was applied to landings from inland Florida from 1929-1940.

Area fished, county landed, and state landed are used to filter to data to the stock boundary (Figure 1). With just county or state landed information, one cannot assume landings are a part of Gulf of Mexico, South Atlantic, or foreign catch (Gloeckner, 2014). Therefore, area of capture is preferred when assigning catch to the appropriate region. However, when area information is not available or missing, then the recorded county and/or state landed is used to assign landings to the Gulf of Mexico to account for these removals from the stock biomass. When area information is missing, Monroe County, Florida is considered as part the Gulf of Mexico landings.

All landings with the reported historical area code 7994 were previously assigned to the Gulf of Mexico for SEDAR28 Spanish Mackerel. However, since this last assessment, the method for assigning 7994 to a region (Gulf of Mexico vs. South Atlantic) has been standardized and applied to MV landings across all species.

Further investigation into how area code 7994 was translated from several previously used waterbody codes revealed mainly two codes, 0024 and 6000. Due to lacking documentation, it was decided to treat landings from 7994 as an “unknown” waterbody unless the old waterbody code was 0024, in which case historic code is known to be used only in the South Atlantic. Otherwise, when the reported area code is 7994, then the county landed will be used to assign landings to the appropriate region (Gulf of Mexico vs. South Atlantic). In contrast to SEDAR 28, only landings reported from 7994 that do not have an old waterbody code of 0024 and were landed in a Gulf of Mexico county are included for SEDAR 81 Gulf of Mexico Spanish Mackerel landings. Based on the above analysis it was decided that the 7994 landings from 1962 did belong to the South Atlantic.

In Florida trip ticket data from 1985-1996, there are thirteen dealers reporting in Monroe County that were hard-coded to the South Atlantic when no area fished was reported. This decision was based on conversations with staff from the Florida Fish and Wildlife Conservation Commission (FWC) and discussed during the SEDAR 28 Data Workshop. It was assumed these landings were caught in South Atlantic waters for these 13 dealers. Additionally, the most recent South Atlantic Spanish Mackerel assessment (SEDAR 78) used this same method. Therefore, to avoid double-counting of landings for Spanish Mackerel, the same method from FWC was applied for

SEDAR 81. This is a deviation from SEDAR 28 where ALS data were used until 1996 which would not reflect this change in Monroe County dealers.

Gear information reported for historical landings prior to 1962 was considered unreliable during SEDAR 28 Data Workshop. Therefore, total landings from 1962-1975 were used to calculate the proportion of landings by gear group (Table 3). These values are used to apportion the total landings (from 1887-1961) for each year into the three gear groups.

Results

Commercial landings by gear are provided in Table 4 and Figure 2. Most Gulf of Mexico Spanish Mackerel landings are coming from the gillnet fishery. Additionally, landings are summarized by state landed (Table 5 and Figure 3). For confidentiality purposes, Texas, Louisiana, and Mississippi landings are aggregated for the entire time series. Western Florida contributes to a majority of the landings of Gulf of Mexico Spanish Mackerel, although more recently Alabama has constituted a significant proportion of the landings. The landings provided here generally agree with those provided in SEDAR 28, with the exception of certain years which have been impacted by changes to the data compilation methodology. The main differences in landings between SEDAR 28 and the current assessment (SEDAR 81) are detailed below.

Changes from SEDAR 28

- Because of the reassignment of landings reported with historic area code 7994, landings for 1962 differ from the previous assessment.
- SEDAR 28 did not include landings from 1972-1976 for Texas, Louisiana, Mississippi, and Alabama.
- Landings from thirteen Florida dealers from 1985-1996 are excluded in SEDAR 81 because when the area is not reported, this catch is assumed to be in the South Atlantic.
- Some updates to the TTP database were conducted post-SEDAR 28 that results in differences in landings in Alabama.
- Gear group distributions changed due to assignment of NMFS gear codes 445 and 530 to gill net and NMFS gear 645 to vertical line. These had been prior assigned to the gear group other. Accordingly, the gear distributions changed for the whole data series further stressing importance of gill net for this fishery.

An additional plot has been included at the end of the report showing the average price per pound of Spanish Mackerel through time adjusted for inflation (Figure 4). This plot is included for reference purposes.

Literature Cited

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Tables

Table 1. Gear groupings. This table provides a list of all gears observed in the dataset and their respective gear groupings used to aggregate the data.

Gear Group	NMFS	FIN	Gear Description
	Gear Code	Gear Code	
GILL NET	400	200	ENTANGLING NETS (GILL) UNSPC
GILL NET	425	207	GILL NETS, OTHER
GILL NET	430	204	GILL NETS, SINK/ANCHOR, OTHER
GILL NET	445	200	GILL NETS
GILL NET	470	200	GILL NETS, DRIFT, OTHER
GILL NET	475	205	GILL NETS, DRIFT, RUNAROUND
GILL NET	480	206	GILL NETS, STAKE
GILL NET	530	210	TRAMMEL NETS
HAND LINE	600	700	TROLL & HAND LINES CMB
HAND LINE	610	700	LINES HAND, OTHER
HAND LINE	611	300	ROD AND REEL
HAND LINE	612	301	REEL, MANUAL
HAND LINE	613	303	REEL, ELECTRIC OR HYDRAULIC
HAND LINE	645	320	TROLL LINES
HAND LINE	660	320	LINES TROLL, OTHER
HAND LINE	661	320	LINES POWER TROLL OTHER
OTHER	0	0	NOT CODED 000
OTHER	15	0	NOT CODED 000
OTHER	20	10	HAUL SEINES, BEACH
OTHER	30	10	HAUL SEINES, LONG
OTHER	100	30	ENCIRCLINLING NETS (PURSE)
OTHER	125	30	PURSE SEINES, MENHADEN
OTHER	145	30	PURSE SEINES, OTHER
OTHER	175	40	LAMPARA & RING NETS, OTHER
OTHER	187	116	TRAWL, SKIMMER
OTHER	189	118	BUTTERFLY NETS
OTHER	192	80	BEAM TRAWLS, SHRIMP
OTHER	200	110	TRAWLS, UNSPECIFIED
OTHER	201	115	TRAWL, ROLLER FRAME
OTHER	210	92	OTTER TRAWL BOTTOM, FISH
OTHER	215	95	OTTER TRAWL BOTTOM, SHRIMP
OTHER	217	100	OTTER TRAWL, TWIN
OTHER	230	97	OTTER TRAWL MIDWATER
OTHER	235	113	TRAWL BOTTOM, PAIRED
OTHER	300	130	POTS AND TRAPS, CMB
OTHER	330	132	POTS AND TRAPS, CRAB, BLUE
OTHER	333	130	POTS AND TRAPS, CRAB, OTHER
OTHER	345	139	POTS AND TRAPS, FISH

Table 1. continued.

Gear Group	NMFS	FIN	Gear Description
	Gear Code	Gear Code	
OTHER	355	140	POTS AND TRAPS, SPINY LOBSTER
OTHER	379	150	POTS AND TRAPS, OTHER (INCLUDE
OTHER	614	401	BUOY GEAR, VERTICAL
OTHER	675	400	LINES LONG SET WITH HOOKS
OTHER	676	403	LINES LONG, REEF FISH
OTHER	678	402	LINES LONG DRIFT WITH HOOKS
OTHER	680	405	LINES TROT WITH BAITS
OTHER	735	551	CAST NETS
OTHER	760	660	SPEARS
OTHER	953	750	BY HAND, DIVING GEAR
OTHER	989	801	UNSPECIFIED GEAR
OTHER	999	802	COMBINED GEARS

Table 2. Total pounds landed in inland Florida (1929-1939), and the percentage of those pounds apportioned to western Florida.

Year	Total pounds landed	Percentage landed in western Florida
1929	5,965,000	58.1 %
1930	6,140,000	67.0 %
1931	4,835,000	47.6 %
1932	6,338,000	45.5 %
1934	6,734,000	49.7 %
1936	8,936,000	57.9 %
1937	6,150,000	63.7 %
1938	6,835,000	61.3 %
1939	7,052,000	59.7 %
1940	6,236,000	58.1 %

Table 3. The percentage of Gulf of Mexico Spanish Mackerel landings by gear for 1962-1975. The calculated percentages are applied to landing totals for historic data (1887-1961) to get yearly estimated gear totals.

Gear Group	Total pounds landed	Percentage of landings by Gear Group
GILL NET	76,243,757	83.5 %
HAND LINE	4,199,633	4.6 %
OTHER	10,862,271	11.9 %

Table 4. Gulf of Mexico annual Spanish Mackerel landings in pounds (whole weight) by gear group.

YEAR	GILL NET	HAND LINE	OTHER	GRAND TOTAL
1887	133,606	7,359	19,035	160,000
1888	260,532	14,351	37,117	312,000
1889	499,353	27,505	71,142	598,000
1890	578,682	31,875	82,443	693,000
1897	627,114	34,542	89,343	751,000
1902	1,322,701	72,857	188,442	1,584,000
1908	1,240,867	68,349	176,784	1,486,000
1918	2,941,006	161,996	418,998	3,522,000
1923	3,227,424	177,772	459,804	3,865,000
1927	3,984,693	219,483	567,690	4,771,866
1928	2,758,935	151,967	393,059	3,303,961
1929	2,985,262	164,433	425,303	3,574,999
1930	3,503,319	192,969	499,110	4,195,397
1931	1,987,643	109,483	283,175	2,380,301
1932	2,450,325	134,968	349,092	2,934,385
1934	2,952,279	162,616	420,604	3,535,499
1936	4,396,834	242,185	626,407	5,265,426
1937	3,327,462	183,282	474,056	3,984,800
1938	3,435,495	189,233	489,447	4,114,175
1939	3,582,618	197,337	510,407	4,290,361
1940	3,085,266	169,942	439,551	3,694,758
1945	77,408	4,264	11,028	92,700
1948	749,280	41,272	106,748	897,300
1949	3,236,777	178,287	461,136	3,876,200
1950	2,165,339	119,270	308,491	2,593,100
1951	5,436,770	299,466	774,564	6,510,800
1952	3,771,953	207,765	537,381	4,517,100
1953	2,491,922	137,259	355,018	2,984,200
1954	2,410,423	132,770	343,407	2,886,600
1955	1,358,942	74,853	193,605	1,627,400
1956	2,437,478	134,260	347,262	2,919,000
1957	3,046,806	167,823	434,071	3,648,700
1958	3,231,182	177,979	460,339	3,869,500
1959	3,917,250	215,769	558,081	4,691,100
1960	4,565,824	251,493	650,482	5,467,800
1961	3,352,346	184,653	477,601	4,014,600
1962	3,450,000	253,400	377,800	4,081,200
1963	4,925,300	297,600	224,300	5,447,200
1964	3,506,100	160,000	289,800	3,955,900
1965	4,241,300	258,400	405,800	4,905,500
1966	6,167,500	301,800	597,000	7,066,300

Table 4. continued.

YEAR	GILL NET	HAND LINE	OTHER	GRAND TOTAL
1967	4,865,200	235,900	875,000	5,976,100
1968	5,966,400	218,400	1,046,600	7,231,400
1969	7,177,700	190,400	974,100	8,342,200
1970	6,771,800	220,000	1,277,900	8,269,700
1971	6,047,600	219,500	1,390,900	7,658,000
1972	5,268,031	335,987	1,618,332	7,222,350
1973	5,619,919	120,829	716,829	6,457,577
1974	7,231,030	647,057	676,349	8,554,436
1975	5,005,877	740,360	391,561	6,137,798
1976	7,178,246	791,182	371,836	8,341,264
1977	1,845,152	580,366	210,859	2,636,377
1978	1,006,946	511,902	186,091	1,704,939
1979	1,770,545	57,655	293,769	2,121,969
1980	1,480,475	75,850	376,437	1,932,763
1981	2,877,075	157,368	674,624	3,709,067
1982	2,913,381	155,258	386,952	3,455,591
1983	1,804,632	123,738	337,619	2,265,989
1984	3,302,723	49,140	153,852	3,505,715
1985	1,763,372	55,486	237,837	2,056,695
1986	2,176,265	95,738	340,183	2,612,187
1987	2,292,950	220,319	42,948	2,556,217
1988	1,950,308	22,870	124,947	2,098,125
1989	2,507,767	53,527	205,429	2,766,723
1990	2,258,655	16,132	221,940	2,496,727
1991	2,970,872	124,495	310,314	3,405,681
1992	2,971,087	24,597	265,269	3,260,952
1993	2,238,722	15,154	321,022	2,574,898
1994	2,407,421	29,926	239,628	2,676,974
1995	1,356,724	26,963	110,791	1,494,478
1996	405,947	36,878	18,935	461,761
1997	486,496	39,732	13,988	540,216
1998	344,134	44,958	71,499	460,591
1999	750,054	55,675	66,626	872,355
2000	817,321	39,915	53,720	910,955
2001	1,006,204	72,671	104,044	1,182,919
2002	857,613	39,116	63,550	960,278
2003	1,390,227	42,351	40,724	1,473,302
2004	1,058,416	40,104	37,319	1,135,839
2005	1,540,021	34,221	14,053	1,588,295
2006	1,209,365	52,648	198,707	1,460,719
2007	942,583	29,412	7,714	979,709

Table 4. continued.

YEAR	GILL NET	HAND LINE	OTHER	GRAND TOTAL
2008	1,197,191	84,191	18,131	1,299,512
2009	1,717,067	76,192	22,469	1,815,727
2010	1,067,599	140,661	43,395	1,251,654
2011	1,112,305	113,583	94,018	1,319,905
2012	1,531,291	76,703	44,253	1,652,247
2013	1,145,710	67,656	119,853	1,333,219
2014	683,710	103,051	54,294	841,054
2015	928,013	110,118	32,585	1,070,716
2016	1,068,781	130,377	33,531	1,232,690
2017	493,164	95,388	40,626	629,178
2018	958,177	56,713	136,000	1,150,890
2019	774,569	76,066	44,856	895,490
2020	400,347	70,509	52,384	523,240
2021	321,098	37,754	60,835	419,687

Table 5. Gulf of Mexico Spanish Mackerel landings by year and state landed, for confidentiality purposes, Mississippi, Louisiana, and Texas have been combined into a single group.

YEAR	MS-LA-TX	FL	AL	GRAND TOTAL
1887	160,000	0	0	160,000
1888	171,000	141,000	0	312,000
1889	195,000	345,000	58,000	598,000
1890	215,000	434,000	44,000	693,000
1897	162,000	503,000	86,000	751,000
1902	77,000	1,473,000	34,000	1,584,000
1908	54,000	1,419,000	13,000	1,486,000
1918	55,000	3,463,000	4,000	3,522,000
1923	92,000	3,772,000	1,000	3,865,000
1927	179,452	4,570,207	22,207	4,771,866
1928	119,677	3,179,945	4,339	3,303,961
1929	98,074	3,467,053	9,872	3,574,999
1930	77,444	4,112,145	5,808	4,195,397
1931	65,408	2,301,940	12,953	2,380,301
1932	41,540	2,884,817	8,028	2,934,385
1934	175,500	3,348,099	11,900	3,535,499
1936	16,700	5,175,826	72,900	5,265,426
1937	41,500	3,920,000	23,300	3,984,800
1938	80,300	3,994,875	39,000	4,114,175
1939	44,900	4,208,761	36,700	4,290,361
1940	11,000	3,621,058	62,700	3,694,758

Table 5. continued.

YEAR	MS-LA-TX	FL	AL	GRAND TOTAL
1945	23,200	0	69,500	92,700
1948	9,800	0	887,500	897,300
1949	8,700	3,445,000	422,500	3,876,200
1950	6,700	2,313,400	273,000	2,593,100
1951	3,600	6,267,100	240,100	6,510,800
1952	5,400	4,360,800	150,900	4,517,100
1953	1,400	2,908,900	73,900	2,984,200
1954	2,200	2,847,700	36,700	2,886,600
1955	1,300	1,575,700	50,400	1,627,400
1956	2,200	2,876,800	40,000	2,919,000
1957	800	3,610,000	37,900	3,648,700
1958	5,800	3,829,700	34,000	3,869,500
1959	3,000	4,669,800	18,300	4,691,100
1960	10,600	5,435,100	22,100	5,467,800
1961	11,200	3,988,100	15,300	4,014,600
1962	3,900	4,039,100	38,200	4,081,200
1963	3,400	5,404,800	39,000	5,447,200
1964	2,200	3,879,600	74,100	3,955,900
1965	7,800	4,883,400	14,300	4,905,500
1966	8,100	7,004,200	54,000	7,066,300
1967	83,600	5,867,400	25,100	5,976,100
1968	127,000	7,065,700	38,700	7,231,400
1969	82,400	8,174,600	85,200	8,342,200
1970	72,200	8,099,900	97,600	8,269,700
1971	218,900	7,383,300	55,800	7,658,000
1972	599,383	6,532,000	90,967	7,222,350
1973	187,328	6,194,300	75,949	6,457,577
1974	233,457	8,267,200	53,779	8,554,436
1975	424,581	5,621,300	91,917	6,137,798
1976	513,163	7,783,000	45,101	8,341,264
1977	231,865	2,393,359	11,153	2,636,377
1978	76,864	1,600,292	27,783	1,704,939
1979	63,172	1,946,297	112,500	2,121,969
1980	111,636	1,770,352	50,775	1,932,763
1981	102,234	3,549,920	56,913	3,709,067
1982	117,727	3,287,326	50,538	3,455,591
1983	120,290	2,087,435	58,264	2,265,989
1984	20,660	3,475,647	9,408	3,505,715
1985	50,603	1,949,293	56,799	2,056,695
1986	63,991	2,451,556	96,640	2,612,187
1987	115,576	2,365,621	75,020	2,556,217
1988	56,163	1,919,960	122,002	2,098,125

Table 5. continued.

YEAR	MS-LA-TX	FL	AL	GRAND TOTAL
1989	62,005	2,639,271	65,447	2,766,723
1990	47,547	2,302,529	146,651	2,496,727
1991	44,241	3,225,252	136,188	3,405,681
1992	62,796	3,051,704	146,452	3,260,952
1993	29,705	2,427,496	117,697	2,574,898
1994	120,316	2,315,583	241,075	2,676,974
1995	28,537	1,097,341	368,600	1,494,478
1996	15,032	207,869	238,860	461,761
1997	6,014	186,173	348,029	540,216
1998	4,286	238,443	217,862	460,591
1999	5,998	622,904	243,453	872,355
2000	12,305	514,901	383,749	910,955
2001	11,710	665,472	505,737	1,182,919
2002	13,580	188,624	758,074	960,278
2003	8,631	607,365	857,306	1,473,302
2004	9,053	213,609	913,176	1,135,839
2005	4,102	1,016,668	567,525	1,588,295
2006	7,825	534,112	918,782	1,460,719
2007	5,764	356,743	617,202	979,709
2008	9,262	368,981	921,269	1,299,512
2009	9,519	1,388,609	417,599	1,815,727
2010	9,645	508,650	733,360	1,251,654
2011	11,813	469,150	838,943	1,319,905
2012	8,959	266,732	1,376,556	1,652,247
2013	3,109	357,736	972,374	1,333,219
2014	5,407	404,704	430,943	841,054
2015	5,797	447,498	617,421	1,070,716
2016	9,885	364,205	858,599	1,232,690
2017	27,344	161,575	440,259	629,178
2018	35,721	167,638	947,531	1,150,890
2019	17,840	135,540	742,110	895,490
2020	14,089	200,351	308,800	523,240
2021	4,705	184,669	230,313	419,687

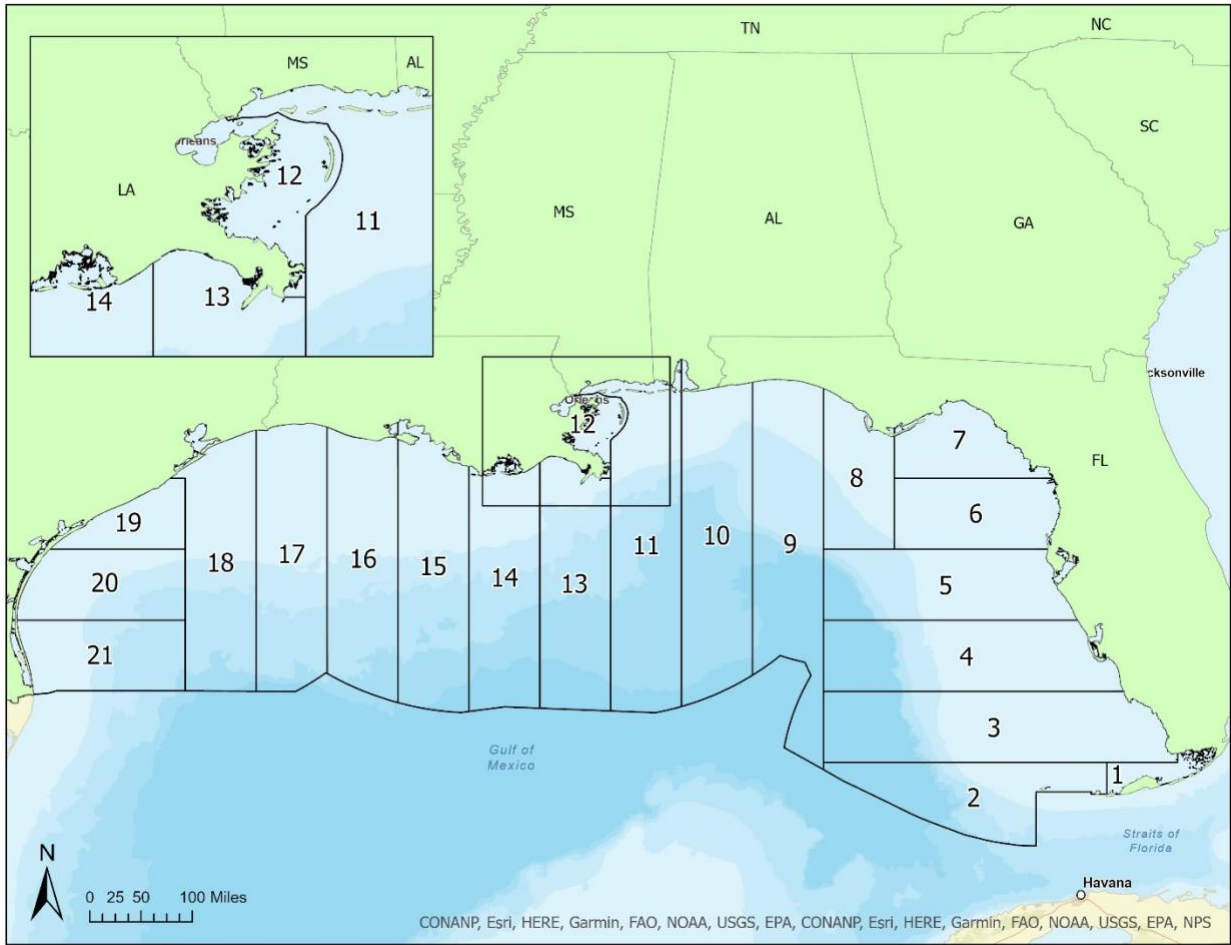


Figure 1. Gulf of Mexico commercial fishing areas.

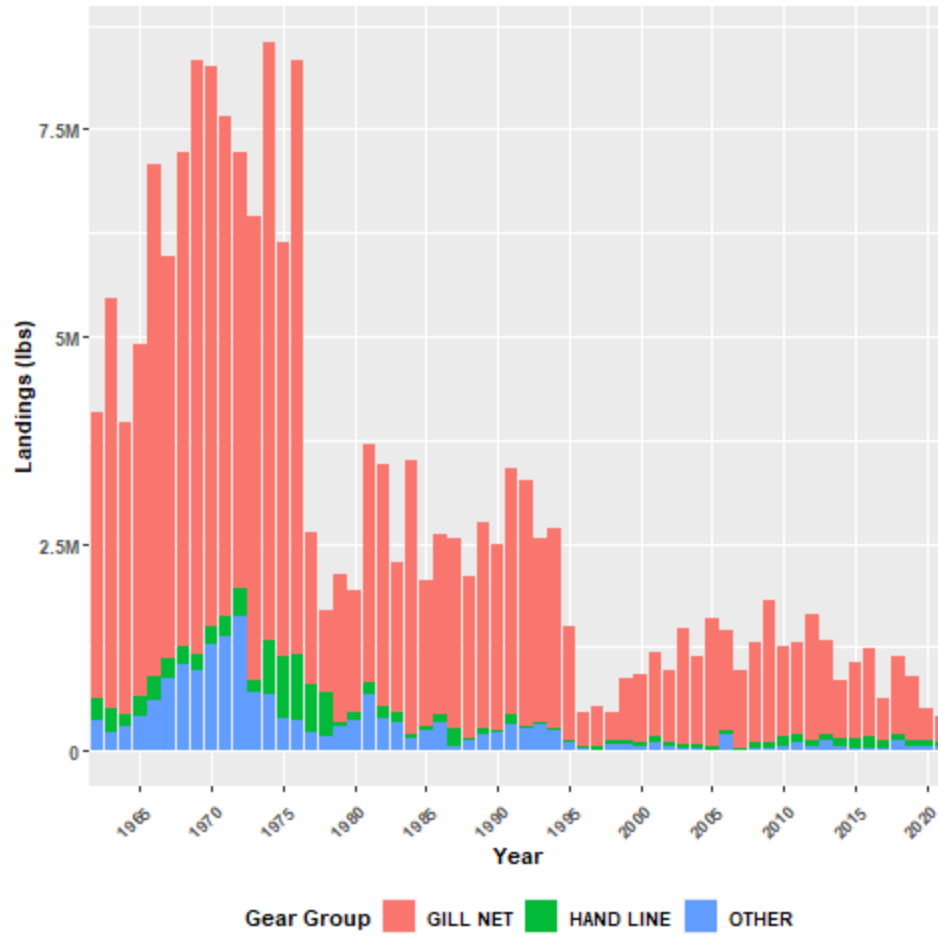


Figure 2. Gulf of Mexico Spanish Mackerel landings by year and gear group for 1962-2021.

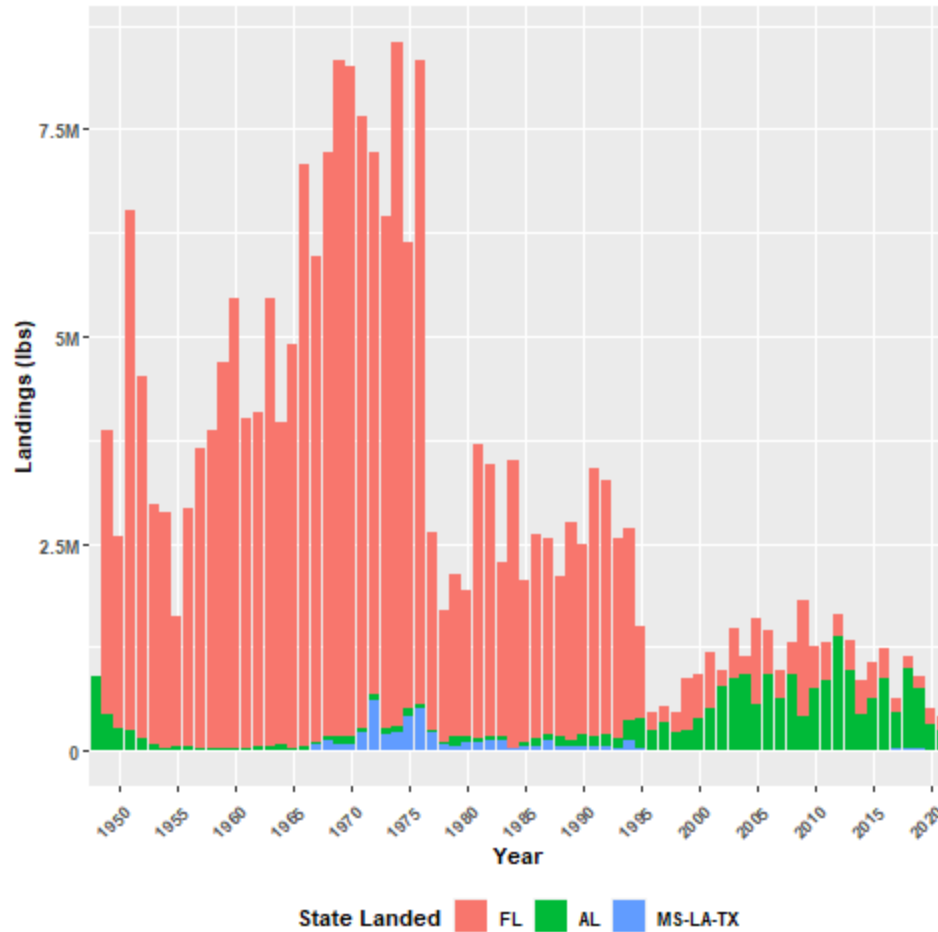


Figure 3. Gulf of Mexico Spanish Mackerel landings by state and year from 1948-2021. Only data from 1948 onward are shown, as there were several missing years prior to 1948. Mississippi, Louisiana, and Texas have been combined for confidentiality. For the majority of the fishery, Florida has dominated the landings, however, recent years (1996-2021) show a shift towards a majority share of the total catch coming from Alabama.

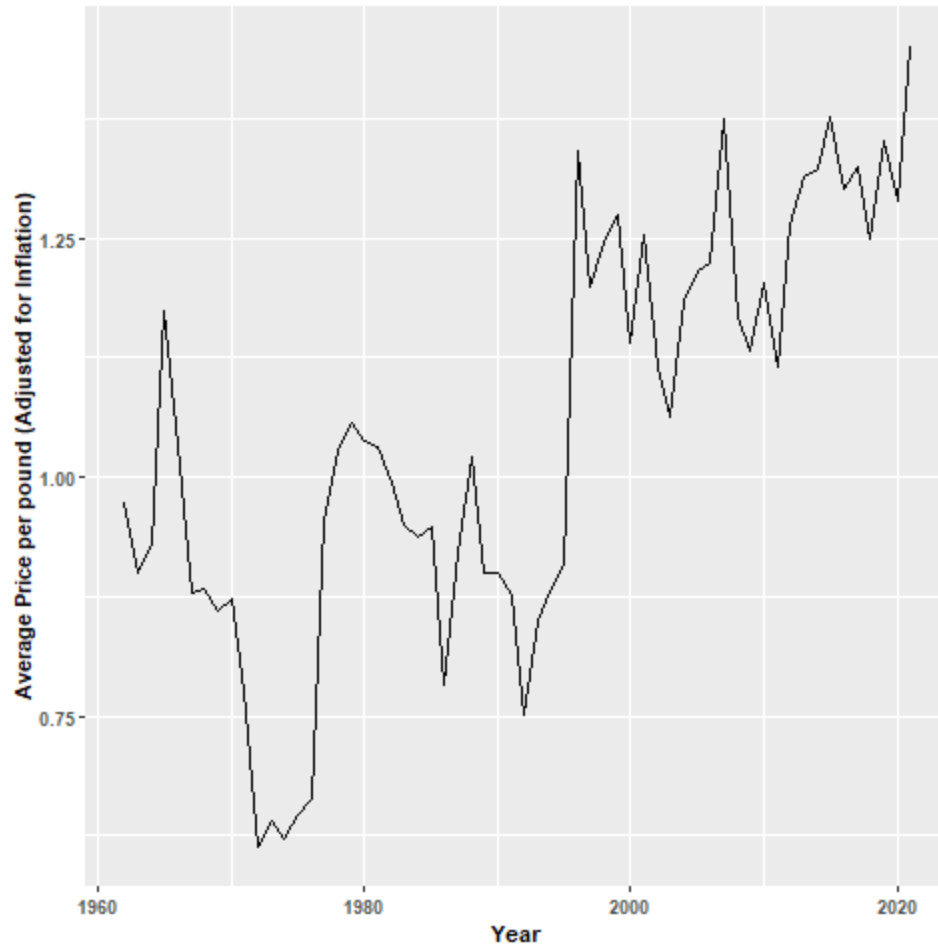


Figure 4. Average price per pound for Gulf of Mexico Spanish Mackerel after adjusting for inflation. Inflation information can be found at <https://www.bls.gov/>.