

**The commercial landings of red snapper in the Gulf of Mexico
from 1872 to 1962**

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Introduction

Red snapper (*Lutjanus campechanus*) have been harvested in the Gulf of Mexico since at least 1850 (Collins 1887). During the early years the take was rather small and limited to local use, but this changed shortly after the Civil War when ice could be imported from New England and used to ship red snapper out of state. The commercial fishery effectively began in 1872 when Mr. S.C. Cobb brought four New England live-well “smacks” down to Pensacola, Florida and built the first fish house for handling and shipping red snapper (Jarvis 1935). Subsequently the fishery grew rapidly reaching its peak of over 12 million pounds in 1902 (Figure 1).

The fishery was initially prosecuted along the continental shelf out to about 40 fathoms between Mobile Bay, Alabama, and Cape St. George, Florida.. Reduced catches forced the Pensacola fleet to travel south to the Florida Middle Grounds, but by 1883 these waters appear to have been depleted as well. Stearns (1883), for example, remarked "Most of the old fishing grounds are barren, and smacks have to go farther each year to find new ones." In 1885 new snapper grounds were discovered even further south off Tampa and the Dry Tortugas by the research vessel *Albatross* (Collins 1885). At about the same time new grounds were also discovered off Texas (Camber 1955). These discoveries fostered continued growth and new fish houses were established throughout the Gulf of Mexico.

In the early 1890's a few vessels began making trips to the Campeche Banks off the Yucatan Peninsula, Mexico. Preserving the catch, however, proved difficult until about the turn of the century when cheap ice became widely available. By 1910 most of the vessels in the fishery were spending at least part of their time fishing off the Campeche Banks or elsewhere in Mexico, usually during the winter when the threat of hurricanes was over (Camber 1955). Jarvis (1935) estimated that during the 1920's and early 1930's about 75% of the red snapper taken by vessels over 5 tons were caught in Mexican waters (Jarvis 1935). From the late 1930's through the 1960's the fraction coming from outside U.S. waters generally fluctuated around 50% (Camber 1955, Carpenter 1965).

Landings information is available for this fishery from 1880 to the present, with several gaps during the early years when census taking was sporadic. Unfortunately, prior to 1963 the statistics are available only for the port of landing, not the water body where the catch was taken. This of course makes it difficult to determine the fraction of the landings taken east or west of the Mississippi or from outside of U.S. waters. Fortunately, there are several clues in historical references that allow one to make reasonable guesses where hard data are unavailable. This paper reports on one attempt to do just that.

Methods

Red snapper landings in U.S. Gulf states

The total reported landings of red snapper (including landings from outside of U.S. waters) were initially tabulated by Schirripa and Legault (1999). For this report those statistics were re-extracted from various sources and then manipulated as documented below (Figure 1). The sources were:

1880-1923. Anonymous (1990).

1927-1961. Electronic data base National Marine Fisheries Service, Silver Spring, MD
1929-1932, 1934, 1936-1938. Alabama and west Florida. Anonymous-FIUS
1939-1940. Alabama and west Florida.. Anonymous-FSUS
1945. West Florida. Anonymous-FSUS
1948. Alabama. Anonymous-FSUS
1962 Poffenberger and Turner (2004)

Red snapper landings from U.S. waters

This section describes how the fractions of U.S. red snapper landings coming from U.S. waters in 1872-1962 were derived from spotty historical references. The derived fractions and information supporting them are summarized in Table 1. The assumptions behind the derivations, indicated in the table by the column labeled “explanatory bullets”, are detailed below:

1) 1872-1890. Historical references consistently report that U.S. fleets were limited to U.S. waters until late in 1890 when a few vessels began fishing on the Campeche Banks.

2) 1891-1910. Linear interpolation from 1.0 in 1890 to 0.25 in 1910 reflecting the increasing participation of U.S. vessels on Campeche Banks (Camber 1955) and Jarvis’ (1935) estimate that 75% of the catch of red snapper made by vessels over 5 tons were taken off Mexico (the catch by smaller boats was negligible until about 1923). Although vessels from Texas, Florida and Alabama actively fished off Mexico during this time, we found nothing in the literature to suggest the proportion coming from Mexico differed among states. Apparently no vessels operating in foreign waters were based in Mississippi or Louisiana at this time (Table 2). This is an important period of uncertainty considering it includes the highest landings in the historical record.

3) 1911-1923. Linear interpolation to point where smaller boats fishing locally begin to contribute substantially to the catch, changing the effective fraction from U.S. waters (see Table 2).

4) 1923-1932. Data from Jarvis (1935) on catch by boats (fishing locally) and vessel (75% of catch from Mexican waters) is used to reconstruct the fraction taken from U.S. waters (see Table 2).

5) 1933-1951. Fraction red snapper landed in West Florida that came from the Campeche Banks based on Camber’s (1955) analysis of fish house records, which he considered to be quite accurate. No similar information was uncovered for Texas, however Camber (1955, p. 39) noted that 24 out of 75 vessels from Florida fished regularly off the Campeche Banks (32%). Camber (1955) also reported that 5 Texas vessels fished regularly off the Campeche Banks. The U.S. Fishery statistics bulletin for 1951 indicates that there were a total of 18 vessels operating out of Texas (possibly including a few large head boats), suggesting then that the percentage fishing Campeche was similar to that for Florida (at least 28%). Moreover, the U.S. fractions recorded for Texas and Florida during the 1963-1966 period are also quite

similar (about 62% and 70%, respectively). Accordingly, the fractions from Camber (1955) for West Florida were also applied to Texas.

6) 1933-1962, Alabama. The U.S. Fishery statistics indicate that from 1963 to 1966 only 6% of the catch from Alabama vessels came from U.S. waters. The U.S. fraction for Florida and Texas vessels, however, remained similar to the 1951 value of 63% reported by Camber (1955). Thus, a linear transition is assumed from the value of 33% in 1932 (see Table 2) to 6% in 1963.

7) 1957-1962, Mississippi. Mississippi catches remained negligible until 1957, presumably reflecting a small local fishery as indicated by Jarvis' (1935) data. However in 1958 the Mississippi landings began to increase rapidly. The U.S. fishery statistics from 1963-1966 indicate an average of only 27% of the catch was taken in U.S. waters. It is therefore assumed that the increase in catch after 1957 largely reflects an increase in the number of vessels landing foreign-caught red snapper in Mississippi.

8) 1952-1962, Texas and Florida. The fraction of Gulf red snapper landing coming from U.S. waters during this period is reported for all Gulf States combined by Carpenter (1965) and the U.S. Fishery Statistics (1958-1963). The fractions for Texas and Florida (F_{Tx} and F_{Fl}) were determined from this Gulf-wide statistic using the landings by state (C), the interpolated fractions for Mississippi and Alabama described above, and assuming the ratio of the fractions for Texas and Florida r was constant at the 1963-1966 average (0.89):

$$F_{Fl,y} = \frac{F_{total,y} C_{total,y} - F_{Al,y} C_{Al,y} - F_{Ms,y} C_{Ms,y} - F_{La,y} C_{La,y}}{C_{Fl,y} + rC_{Tx,y}}$$

$$F_{Tx,y} = rF_{Fl,y}$$

9) 1963, Alabama. The specific water body (statistical area which usually indicates a one degree square) where the catch was taken was recorded in 1963 for all states except Alabama; for Alabama only a general Gulf of Mexico designation was recorded. The 1964-1966 weighted average proportion (0.94 from Mexican waters) was used for 1963.

Red snapper landings from U.S. waters east and west of the Mississippi River

This section describes how the red snapper landings from U.S. waters are further divided among the regions east and west of the Mississippi River. The derived fractions and information supporting them are summarized in Table 3. The assumptions behind the derivations, indicated in the table by the column labeled "explanatory bullets", are detailed below:

1) 1872-1891. Although discovered in the 1880's, the banks west of the Mississippi river (e.g. Galveston lumps) were not a major source of red snapper until about 1892 (Figure 1 in Camber 1955). The catches coming from that region were made mostly by smaller boats operating out of Texas (Galveston, Freeport and Brownsville), therefore it is assumed that all of the red snapper taken in U.S. waters and landed in Texas or Louisiana were caught west of the Mississippi River.

2) 1892-1949. The western snapper banks became increasingly important after 1892 (as shown by the increase in landings from Texas after that time). Nevertheless the large fleets operating out of Alabama and Florida do not seem to have spent much time fishing in these areas, preferring instead to fish between Mobile and the Dry Tortugas with frequent expeditions to the Campeche Banks (Warren 1998). Furthermore, in discussing the period from 1937 to 1951, Camber (1955) indicates that waters east of the Mississippi River were fished exclusively by boats operating out of ports from that region (e.g., Pascagoula, Mobile, Pensacola, Panama City, Tampa) and that the waters west of the Mississippi River were fished by vessels operating out of Galveston, Freeport, Brownsville and Pascagoula). Only vessels operating out of Pascagoula (Ms) are cited as fishing on both sides of the river. The 1963-1966 U.S. fishery statistics indicate that only a small fraction (about 5 percent) of the Mississippi landings from U.S. waters were taken east of the river. It is unclear whether an equally small fraction applies to the earlier years of the fishery, but the Mississippi landings are small until the mid 1950's and any errors introduced by this assumption should have a negligible impact on the final catch series.

3) 1950-1962. Camber (1955) states that in recent years (presumably the early 1950's) appreciable quantities of red snapper were caught on the "western grounds," located near the 100 fathom lime (200 m) off Texas and Louisiana. He also mentions that vessels from Pensacola and Mobile fished in this area (as well as vessels from Galveston). In the absence of any other information, it is assumed that the fraction of the catch taken by eastern-based fleets from western waters matches the mean fraction from the years 1964-1966 (30% for Florida and 9% for Alabama).

Other adjustments

Three other adjustments were made to the landings data, one to account for cases where the landings were recorded in dressed (gutted) weight rather than whole weight, another to account for the fraction of the red snapper landings that were actually red snapper (i.e., *Lutjanus campechanus*) and a third to extrapolate from 1880 to 1872. In regards to the first, Camber (1955) reported that red snapper were landed whole prior to 1934 and dressed after that. It appears that the dressed landings had been converted to whole weight in the U.S. fishery statistics for all years and all states except for Florida during the years 1956 to 1961 (Florida landings continued to be reported in dressed weight through 1985, but Poffenberger and Turner (2004) converted those landings to whole weight). The values for Florida were therefore converted accordingly.

Dealers frequently market other species as "red snapper," including silk snapper (yellow eye snapper, *Lutjanus vivanus*), gray snapper (*L. Griseus*), lane snapper (*L. synagris*), mutton snapper (*L. analis*) and vermilion snapper (*Rhomboplites aurorubens*). However, Camber (1955) noted that typically 95% or more of the landings were in fact *L. campechanus* (then called *L. aya*). He adjusted the landings statistics of Florida producers from 1880 to 1951 based on his review of fish house records and samples of the catch. His results are summarized in Table 4. Here it assumed with no further information that these fractions apply equally to the landings in other areas. The value of 96% is assumed to continue until 1984, when port agents began making a concerted effort to distinguish the red snapper catch by species.

The final step in the reconstruction process was to estimate the catches that occurred prior to 1880 (the earliest census). To do this we assumed the average catch per vessel from 1872-1879 was similar to in 1980. At that time the only vessels participating in the fishery operated locally out of Pensacola. According to Jarvis (1935) and Camber (1955) the fishery started with four vessels in 1872 and from 1875 to 1880 grew to 11, 13, 11, 10, 11, and 14 vessels, respectively. The effort for 1873 and 1874 was linearly interpolated (6 and 9 vessels, respectively). The catches for 1872 to 1879 were computed as the catch per vessel in 1880 multiplied by the number of vessels operating that year.

Results and Discussion

Estimates of the annual landings of red snapper caught in the U.S. Gulf of Mexico (east and west of the Mississippi River) are given Table 4 and Figure 2.

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Table 1. Fraction of the landings in each state that came from U.S. waters from 1872 to 1963 (the inception of the commercial fishery to the point where the U.S. fishery statistics routinely included the water body from which the catch was taken. The numbers under the column labeled explanatory bullets refer to the enumerated text detailing the data and assumptions used to derive the estimated fractions.

year	State where catch was landed					Explanatory bullets
	Tx	La	Ms	La	Fl	
1872-1890	1.00	1.00	1.00	1.00	1.00	1
1891	0.96	1.00	1.00	0.96	0.96	2
1892	0.93	1.00	1.00	0.93	0.93	2
1893	0.89	1.00	1.00	0.89	0.89	2
1894	0.85	1.00	1.00	0.85	0.85	2
1895	0.81	1.00	1.00	0.81	0.81	2
1896	0.78	1.00	1.00	0.78	0.78	2
1897	0.74	1.00	1.00	0.74	0.74	2
1898	0.70	1.00	1.00	0.70	0.70	2
1899	0.66	1.00	1.00	0.66	0.66	2
1900	0.63	1.00	1.00	0.63	0.63	2
1901	0.59	1.00	1.00	0.59	0.59	2
1902	0.55	1.00	1.00	0.55	0.55	2
1903	0.51	1.00	1.00	0.51	0.51	2
1904	0.48	1.00	1.00	0.48	0.48	2
1905	0.44	1.00	1.00	0.44	0.44	2
1906	0.40	1.00	1.00	0.40	0.40	2
1907	0.36	1.00	1.00	0.36	0.36	2
1908	0.33	1.00	1.00	0.33	0.33	2
1909	0.29	1.00	1.00	0.29	0.29	2
1910	0.25	1.00	1.00	0.25	0.25	2
1911	0.25	1.00	1.00	0.25	0.26	3
1912	0.25	1.00	1.00	0.25	0.27	3
1913	0.25	1.00	1.00	0.25	0.28	3
1914	0.25	1.00	1.00	0.25	0.29	3
1915	0.25	1.00	1.00	0.25	0.30	3
1916	0.25	1.00	1.00	0.25	0.31	3
1917	0.25	1.00	1.00	0.25	0.31	3
1918	0.25	1.00	1.00	0.25	0.32	3
1919	0.25	1.00	1.00	0.25	0.33	3
1920	0.25	1.00	1.00	0.25	0.34	3
1921	0.25	1.00	1.00	0.25	0.35	3
1922	0.25	1.00	1.00	0.25	0.36	3
1923	0.25	1.00	1.00	0.25	0.37	4
1924	0.25	1.00	1.00	0.25	0.37	4
1925	0.25	1.00	1.00	0.26	0.38	4
1926	0.25	1.00	1.00	0.26	0.38	4
1927	0.25	1.00	1.00	0.26	0.39	4

1928	0.28	1.00	1.00	0.35	0.38		4
1929	0.32	1.00	1.00	0.28	0.44		4
1930	0.33	1.00	1.00	0.27	0.40		4
1931	0.29	1.00	1.00	0.26	0.47		4
1932	0.32	1.00	1.00	0.33	0.49		4
1933	0.37	1.00	1.00	0.32	0.46		5, 6
1934	0.43	1.00	1.00	0.31	0.43		5, 6
1935	0.50	1.00	1.00	0.30	0.50		5, 6
1936	0.54	1.00	1.00	0.29	0.54		5, 6
1937	0.50	1.00	1.00	0.28	0.50		5, 6
1938	0.56	1.00	1.00	0.28	0.56		5, 6
1939	0.65	1.00	1.00	0.27	0.65		5, 6
1940	0.58	1.00	1.00	0.26	0.58		5, 6
1941	0.49	1.00	1.00	0.25	0.49		5, 6
1942	0.52	1.00	1.00	0.24	0.52		5, 6
1943	0.44	1.00	1.00	0.24	0.44		5, 6
1944	0.47	1.00	1.00	0.23	0.47		5, 6
1945	0.42	1.00	1.00	0.22	0.42		5, 6
1946	0.53	1.00	1.00	0.21	0.53		5, 6
1947	0.55	1.00	1.00	0.20	0.55		5, 6
1948	0.52	1.00	1.00	0.19	0.52		5, 6
1949	0.57	1.00	1.00	0.19	0.57		5, 6
1950	0.52	1.00	1.00	0.18	0.52		5, 6
1951	0.63	1.00	1.00	0.17	0.63		5, 6
1952	0.49	1.00	1.00	0.16	0.55	0.48	6, 8
1953	0.47	1.00	1.00	0.15	0.53	0.46	6, 8
1954	0.41	1.00	1.00	0.14	0.46	0.40	6, 8
1955	0.37	1.00	1.00	0.14	0.42	0.39	6, 8
1956	0.48	1.00	1.00	0.13	0.54	0.50	6, 8
1957	0.45	1.00	0.89	0.12	0.51	0.48	6, 7, 8
1958	0.72	1.00	0.79	0.11	0.81	0.70	6, 7, 8
1959	0.70	1.00	0.68	0.10	0.80	0.65	6, 7, 8
1960	0.79	1.00	0.58	0.10	0.89	0.70	6, 7, 8
1961	0.72	1.00	0.47	0.09	0.81	0.64	6, 7, 8
1962	0.76	1.00	0.37	0.08	0.85	0.65	6, 7, 8
1963	0.74	1.00	0.26	0.06	0.66	0.57	9
1963-1966	0.62	1.00	0.27	0.06	0.70		mean values

Table 2. Estimates of the catch of vessels over 5 tons and of smaller boats adapted from Jarvis (1935). The fraction coming from U.S. waters assumes the smaller boats fished locally and that 75% of the catch from fishing boats in the vessel category came from Mexico (as per Jarvis 1953).

catch by state and operating units										
	Fl		Al		Ms		La		Tx	
year	Vessels	Boats	Vessels	Boats	Vessels	Boats	Vessels	Boats	Vessels	Boats
1923	7964907	1506360	970000				103618		175000 1008960	
1927	7609494	1703173	1037722	20928			218706		72000	1234026 3280
1928	6492700	1398503	1131245	169277			97328		48000	1019452 35710
1929	5797225	1902918	1184488	43113			90864		80000	732337 71803
1930	3983215	1018457	820441	27477			188725		76400	835136 94442
1931	3132965	1260027	849451	13750			68236		78835	650827 39837
1932	3096876	1442589	612938	68635			36812		66884	895637 89654

fraction of landings from U.S. waters						
	Fl	Al	Ms	La	Tx	Gulf-wide
1923	0.37	0.25	1.00	1.00	0.25	0.36
1927	0.39	0.26	1.00	1.00	0.25	0.38
1928	0.38	0.35	1.00	1.00	0.28	0.38
1929	0.44	0.28	1.00	1.00	0.32	0.42
1930	0.40	0.27	1.00	1.00	0.33	0.40
1931	0.47	0.26	1.00	1.00	0.29	0.43
1932	0.49	0.33	1.00	1.00	0.32	0.45

Table 3. Fraction of landings in each state that came from the adjacent region (i.e., from the same side of the Mississippi River as the port was located). Here the state of Mississippi is considered to lie in the eastern region.

Year	TX	LA	MS	AL	wFL	Explanation bullets
1872-1891	1.00	1.00	0.05	1.00	1.00	1
1892-1949	1.00	1.00	0.05	1.00	1.00	2
1950-1962	1.00	1.00	0.05	0.91	0.70	3

Table 4. A reconstructed history of red snapper catches from U.S. waters.

year	Red Snapper and others		Proportion L. campechanus (Gulf-wide)	Red Snapper (L. campechanus)	
	East	West		East	West
1872			0.99	521326	0
1873			0.99	781989	0
1874			0.99	1172984	0
1875			0.99	1433647	0
1876			0.99	1694310	0
1877			0.99	1433647	0
1878			0.99	1303315	0
1879			0.99	1433647	0
1880	1843000	900000	0.99	1824641	891034
1881	2073000	810000	0.99	2052381	801943
1882	2305000	719000	0.99	2282108	711859
1883	2535000	640667	0.99	2509861	634313
1884	2765000	562333	0.99	2737622	556765
1885	2995000	483000	0.99	2965390	478225
1886	3227000	404667	0.99	3195145	400672
1887	3457000	206000	0.99	3422926	203970
1888	3310000	215000	0.99	3277425	212884
1889	3518000	272000	0.99	3483431	269327
1890	4235000	245000	0.99	4192327	242531
1891	3861120	272280	0.99	3822273	269541
1892	4051080	296150	0.99	4010384	293175
1893	4174100	315130	0.99	4132232	311969
1894	4270400	328150	0.99	4227631	324863
1895	4166961	337210	0.99	4125291	333838
1896	4209814	344340	0.99	4167613	340888
1897	4180260	344100	0.99	4138252	340642
1898	4659200	550200	0.99	4612379	544671
1899	5198820	729960	0.99	5146576	722625
1900	5731740	899010	0.99	5674141	889976
1901	6088210	1030730	0.99	6027029	1020372
1902	6347000	1137400	0.99	6283575	1126034
1903	5779830	1070490	0.99	5722123	1059802
1904	5340000	1021920	0.99	5286731	1011726
1905	4803920	950400	0.99	4756040	940928
1906	4283600	876400	0.99	4240944	867673
1907	3780720	799560	0.99	3743104	791605
1908	3397020	743160	0.99	3363251	735773
1909	2919918	639302	0.99	2890857	632940
1910	2461225	543525	0.99	2436701	538109
1911	2480214	532836	0.99	2455472	527520
1912	2498392	523098	0.99	2473439	517874
1913	2516239	513611	0.99	2491078	508475
1914	2532707	503873	0.99	2507351	498829
1915	2548314	494136	0.99	2522773	489183

1916	2563013	483447	0.99	2537294	478596
1917	2504421	473709	0.99	2479260	468950
1918	2517878	463972	0.99	2492553	459305
1919	2746567	476173	0.99	2718931	471382
1920	2984466	488374	0.99	2954424	483458
1921	3231473	501777	0.99	3198932	496724
1922	3487302	513978	0.99	3452171	508800
1923	3745059	526179	0.99	3707316	520876
1924	3658191	508289	0.99	3621389	503176
1925	3664111	490399	0.99	3627316	485474
1926	3568101	472259	0.99	3532334	467525
1927	3896569	591829	0.99	3857579	585907
1928	3478754	431155	0.99	3444187	426871
1929	3695890	421321	0.99	3658800	417093
1930	2256050	559149	0.99	2233495	553559
1931	2272708	346288	0.99	2249781	342794
1932	2440472	415464	0.99	2416037	411305
1933	2206394	452138	0.99	2184361	447623
1934	1984628	469415	0.99	1964863	464740
1935	2487622	696578	0.97	2411025	675130
1936	2924981	918821	0.95	2773983	871388
1937	2617159	1007687	0.94	2458439	946575
1938	3278843	964290	0.97	3180371	935330
1939	3848275	880925	0.97	3732701	854469
1940	2584635	844521	0.97	2496953	815871
1941	2365624	768369	0.96	2271791	737892
1942	1862612	557896	0.98	1818353	544639
1943	1485178	381378	0.97	1446274	371388
1944	1713572	286982	0.97	1670030	279690
1945	1495131	157959	0.97	1455205	153741
1946	2408258	335732	0.96	2319802	323401
1947	2521047	495650	0.96	2432194	478181
1948	2698655	618327	0.96	2598682	595421
1949	3216999	900182	0.97	3108401	869794
1950	1758548	1533090	0.96	1693118	1476048
1951	2101727	1539669	0.96	2016917	1477540
1952	2339443	1723733	0.96	2245040	1654176
1953	2111681	1415720	0.96	2026470	1358592
1954	1962378	1423421	0.96	1883191	1365982
1955	2195235	1554778	0.96	2106652	1492039
1956	2626866	2102251	0.96	2520865	2017420
1957	2357002	2098184	0.96	2261891	2013517
1958	3881203	3498566	0.96	3724587	3357390
1959	3551149	3575899	0.96	3407851	3431602
1960	3977319	3752609	0.96	3816825	3601182
1961	3651607	4427633	0.96	3504256	4248967
1962	3764624	4305332	0.96	3612712	4131601

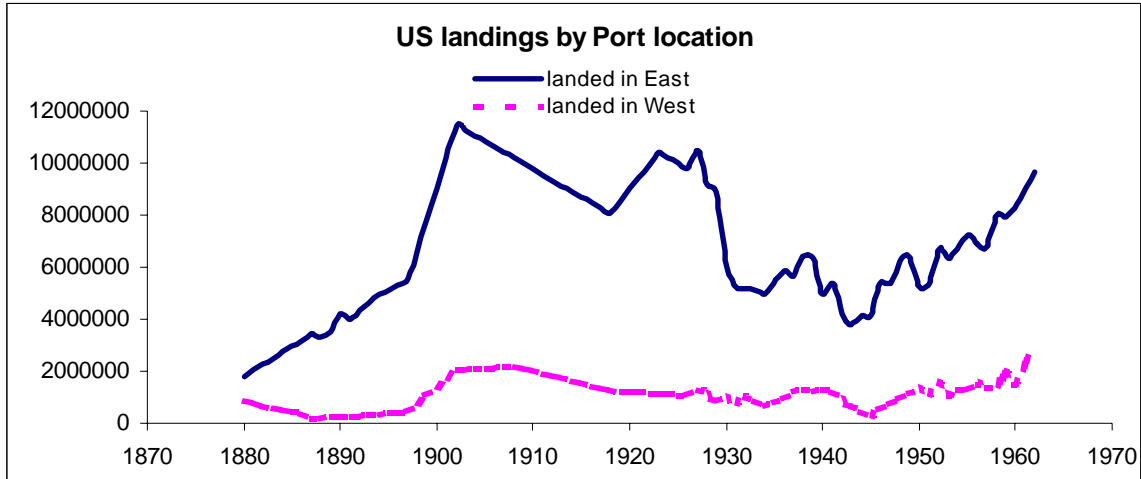


Figure 1. Landings of red snapper by region from 1880 to 1962 (ports located either east or west of the Mississippi River) without regard to the location of capture.

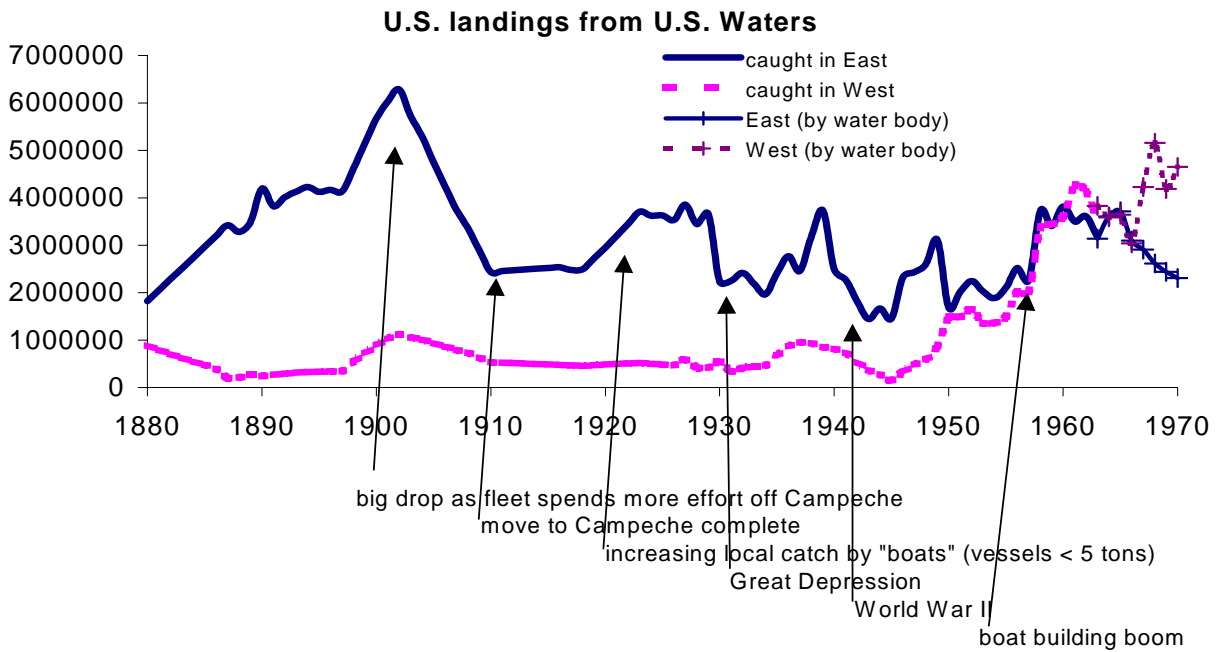


Figure 2. Reconstructed landings of red snapper caught in the U.S. Gulf of Mexico (east or west of the Mississippi River) for the years 1872-1962 (lines without symbols) compared to similar statistics for 1963 through 1970 when water body information was recorded (lines with + symbols). Arrows connect trends with important historical events.