

**FLORIDA'S COMMERCIAL FISHERY
FOR STONE CRAB
SERO-FSSB-2010-03
June 2010**

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Data and Methods

The Florida commercial fishery for stone crab is analyzed in this report at the vessel and trip levels of aggregation, based on state-collected trip ticket data. Primary sources of data include the NOAA Fisheries Service (NMFS), SEFSC-managed Florida Trip Ticket (FTT) System (for 1986-2009, as downloaded on 19Mar10), and the Accumulated Landings System (ALS, also called the SEFSC General Canvass).

In this report, units are expressed in terms of whole weight (ww) and 2008 dollars (2008\$).¹ A data record is used only if trip landings for the selected species exceed one pound (ww). If the vessel can be identified using the U.S. Coast Guard or state assigned VESID, or via the Saltwater Products License number (SPL) in place of the VESID, then the data is used in vessel summaries.² The VESID is used to merge FTT data and SERO-managed permits system to obtain vessel length and engine horsepower.

Florida's Commercial Fishery for Stone Crab

Although Florida's commercial fishery for stone crab is volatile year-to-year, it has had relatively flat trends since the late 1980s for landings and ex-vessel prices, along with downward trends since the late 1990s for vessels, trips, hours fished, and "traps that could be fished." In comparison with the spiny lobster fishery, the stone crab fishery has exhibited a flatter trend in landings since the mid-1980s, though prices have been more volatile (Figure 1; Table 1). Both

¹For all FTT data records, ex-vessel values must be computed [ex-vessel value = unfactored weight * price], using data record fields for landed weight and prices paid to fishermen by seafood dealers (first buyers). Any missing values for 1986-1996 are estimated [ex-vessel value = ALS price * FTT pounds (ww)], and [FTT pounds (ww) = unfactored weight * conversion factor]. The ALS prices are computed for pounds (ww) [ALS ex-vessel price = ALS ex-vessel value / ALS pounds]. To offset the effects of general price inflation in the U.S. economy over time, a "deflator" is used to translate "current" dollars into 2008 dollars by month (U.S. Bureau of Labor Statistics (BLS) index for producer prices, all commodities, not seasonally adjusted).

²The Saltwater Products License number (SPL) is put in the place of the VESID in all cases for calendar years 1986-1996, if available. For stone crab in fishing years 97/98 onward, SPLs are put in the place of VESIDs for some 7% (2000/2001) to 36% (1997/1998) of the vessels. For the 24 fishing years 1985/1986-2009/2010, there are initially 682,777 trips with landings of stone crab of more than 1 lb / trip. For 3.5% of these trips (23,638 trips) data could not be summarized for vessels, because the SPL could not be determined from available data records. This includes 15,516 trips in 85/86 with no SPLs, 8,074 trips in 86/87 with no SPLs, 11 in 87/88, 2 in 88/89, and 35 in 91/92.

The SPLs must be renewed annually (FWC, website, April 2010). Renewal prices paid to the state are highest for SPLs for individual crew, followed by SPLs for vessels and SPLs for individuals. For each of these 3 tiers, prices are highest for aliens (no green card), followed by non-residents, and residents; e.g., \$600, \$400 and \$100 for vessels, respectively. In addition, a restricted species endorsement for spiny lobster must be purchased for an SPL each year (\$125 with trap tags).

fisheries experienced sharp declines in prices in the last two years. For stone crab, prices in 08/09 were \$3.22 / lb (ww), and this is quite close to what they were in the early 1990s.

The rate of increase in median vessel landings of stone crab has declined since 00/01, while the rate of increase for median trip landings has been much higher since 05/06 than previously (Figures 2-3, smoothed data).³ The 3-year moving averages shown in Figures 2-3 tend to put emphasis on trends in that they “smooth” year-to-year differences in the magnitude of the observed values. Median vessel landings averaged 1,212 pounds in the latest 5 years compared with 309 pounds in 87/88-91/92, while median trip landings averaged 164 pounds compared with 92 pounds, respectively (Table 1).

The trend in median vessel gross revenues (the ex-vessel value of all FTT-reported landings for a vessel) was clearly upward in earlier years, and flatter but still upward in the 2000s (Figure 4, smoothed data; Table 2). The observed values for median vessel gross averaged \$2,675 in 87/88-91/92, reached a peak of \$9,898 in 06/07, and then declined sharply to \$5,049 by 08/09.

Table 4 shows the paired sets of five-year averages for vessel and trip gross revenue between the late 1980s and late 2000s for selected frequency distribution percentiles (P25, P50, P75, P90 and P99). The ratios indicate relatively greater improvements over time in gross revenue for vessels than for trips, and relatively greater improvement for vessels at lower than higher gross revenue levels, i.e., the ratios for vessel gross range between 3.49 at the 25th percentile and 1.31 at the 99th percentile (Table 4). A vessel gross of \$2,028 for the 25th percentile means that the annual gross revenue for 25 percent of the vessels with landings of stone crab in Florida averaged less than \$2,028 per vessel per year. On the other hand, the 75 percentile is \$30,379, meaning that top 25 percent of the vessels grossed at least this amount. The maximum vessel gross revenue averaged nearly \$400,000, and ranged from approximately \$325,000 to \$480,000.

Annual medians from available data indicate that stone crab vessels are 32-34 feet long, have engines with 300-360 horsepower, crews comprise 4-6 persons (including the captain), traps are fished at depths of 20-25 feet, fishers remain away from port for 24 hours per trip, and 4-6 sets of trap lines are set per trip.

Over the long term, median trip revenue exhibited an upward trend (Figure 5, smoothed data). The observed values averaged \$576 per trip in 87/88-91/92, peaked at \$970 in 07/08 and declined to \$834 in 09/10 (Table 2). The less dramatic drop in trip gross than in vessel gross in

³If the values for a variable are arranged by size, half of the values are larger than the median and half are smaller. Medians are used in place of averages because of 1) the greater influence of extreme values on sums and arithmetic averages, 2) the skewed frequency distributions for most of the variables used, and 3) the need for more effort to examine data records and statistical properties of some variables.

08/09 is associated with the relatively greater reduction in numbers of trips than in numbers vessels (Figures 4-7; Tables 1-2).

The 22-year low of \$300 per trip for trip gross in 96/97 is associated with 22-year maximums in the numbers for vessels, trips, hours fished, and “traps that could be fished.” This vessel-based estimate for traps that could be fished is a stock concept and is intended to exclude duplication attributable to the use of individual traps on multiple trips. This measure is intended to approximate the maximum number of traps that could be fished by the vessels, if needed or desired. The number of traps that could be fished peaked at 2.14 million traps in 96/97, and averaged 1.36 million traps in 04/05-08/09 (Table 3, column 4).⁴

A separate estimate of the number of traps fished on all trips is a flow concept and includes duplication because an individual trap is usually fished on more than one trip, unless lost or damaged. This trip-based estimate for the number for traps fished leveled off for a few years after 96/97, but then moved to a higher, more volatile range, peaking at 34.8 million traps in 06/07 and averaging 30.5 million traps in 04/05-08/09 (Figure 7 and Table 3, column 9).

As the commercial fishing season for stone crab progresses, trip gross revenue declines (Figure 8). Fishers adjust their use of traps and soak time during the season. The monthly totals for traps fished and hours of soak time decline, but the medians for traps fished per trip hold steady until the last three or four months, and the medians for hours of soak time per trip increase (Figures 9-10). That is, individual traps are soaked longer and longer as the season progresses.⁵

⁴The vessel-based estimate for “traps that could be fished” is based on data for one trip per vessel per fishing year, the trip with the maximum number of traps fished by a vessel.

⁵The number of traps fished was 3.7 million in September, 5.7 million in October and 1.3 million in May, while the median for traps per trip fell from 850 in October to 640 in May (Figure 9, data for 04/05-08/09). Soak time declined relatively less than traps fished, from 1.35 million hours in October to 767,000 hours in May, and the median soak time per trip increased, from 447 hours in October to 582-600 in April-May (Figure 10, data for 01/02-08/09).

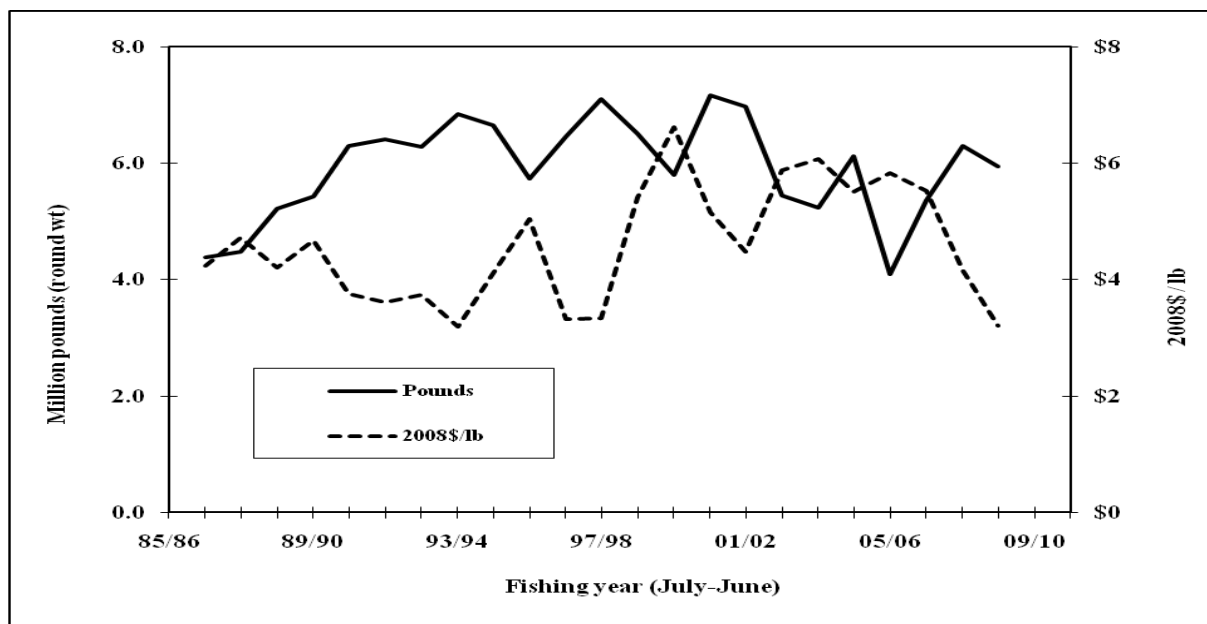


Figure 1a. Florida stone crab fishery, landings and ex-vessel prices

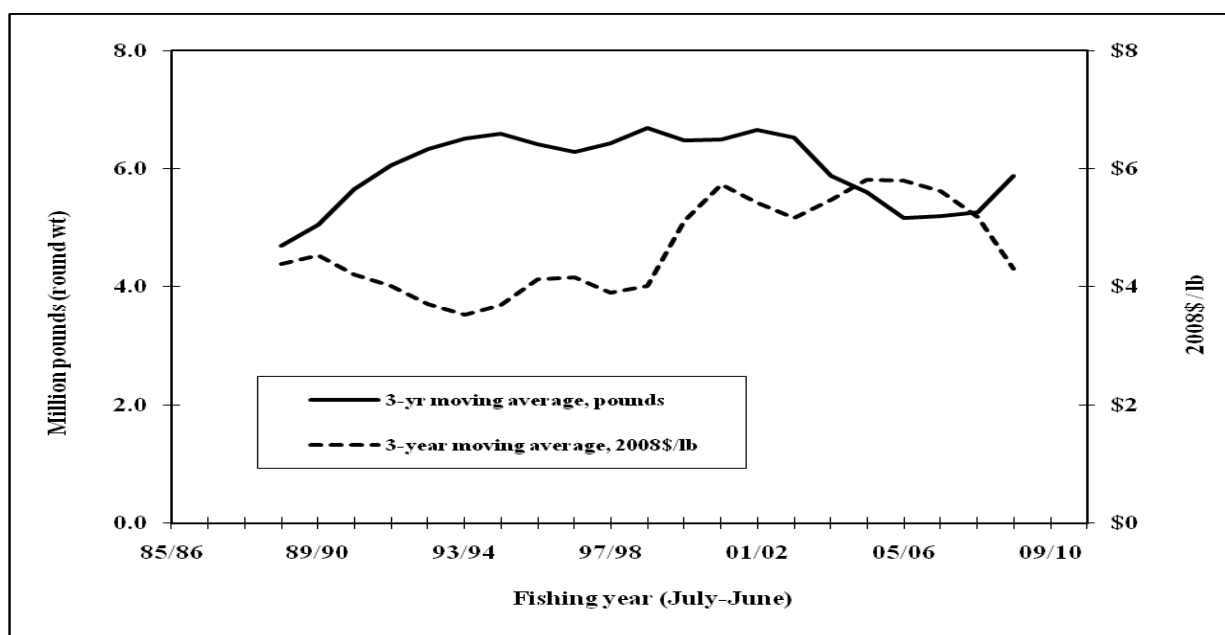


Figure 1b. Florida stone crab fishery, landings and ex-vessel prices, 3-year moving averages.

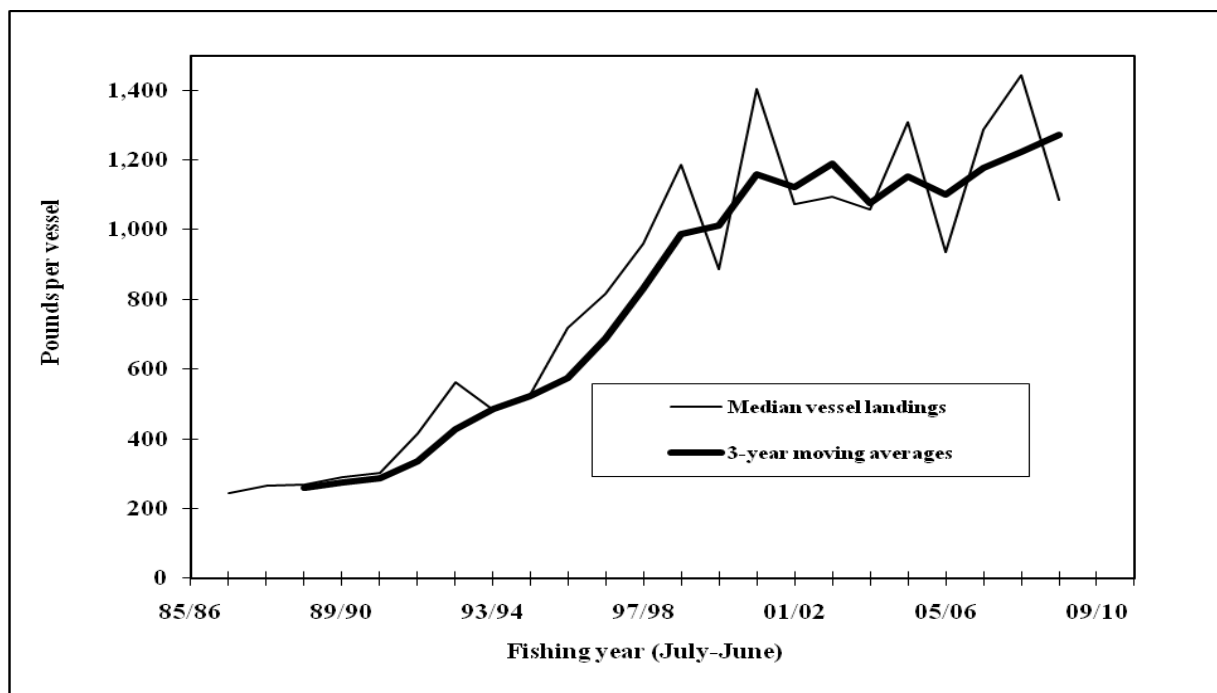


Figure 2. Florida stone crab fishery, median vessel landings, observed and smoothed.

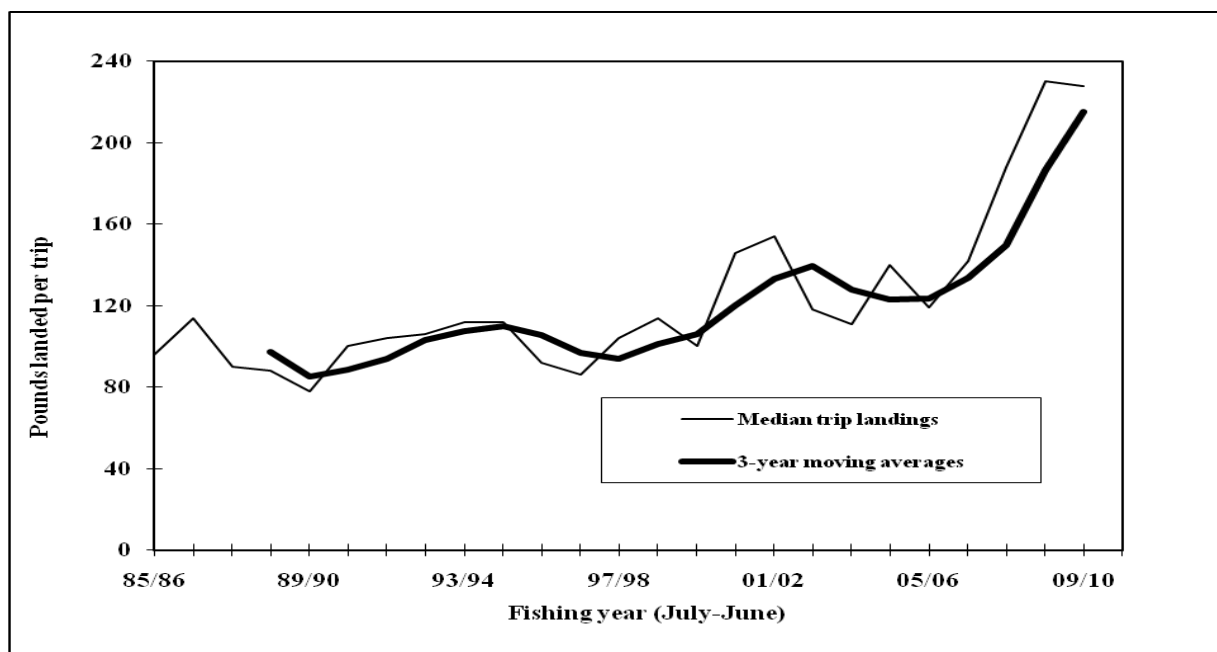


Figure 3. Florida stone crab fishery, median trip landings, observed and smoothed.

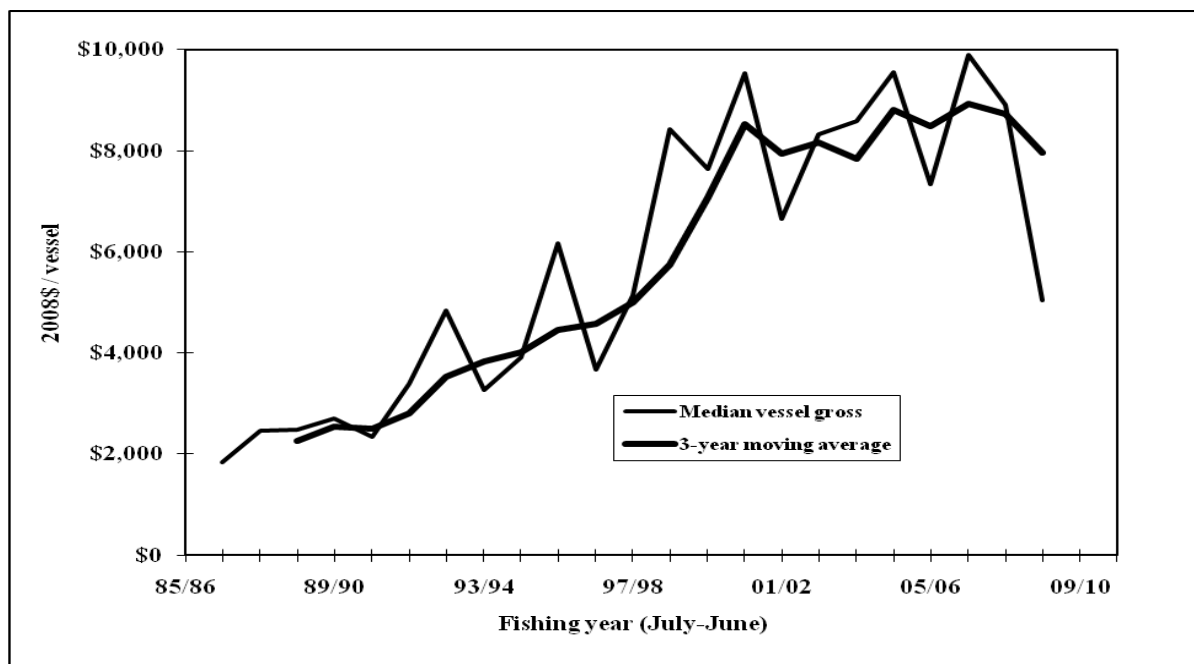


Figure 4. Florida stone crab fishery, median vessel gross, observed and smoothed.

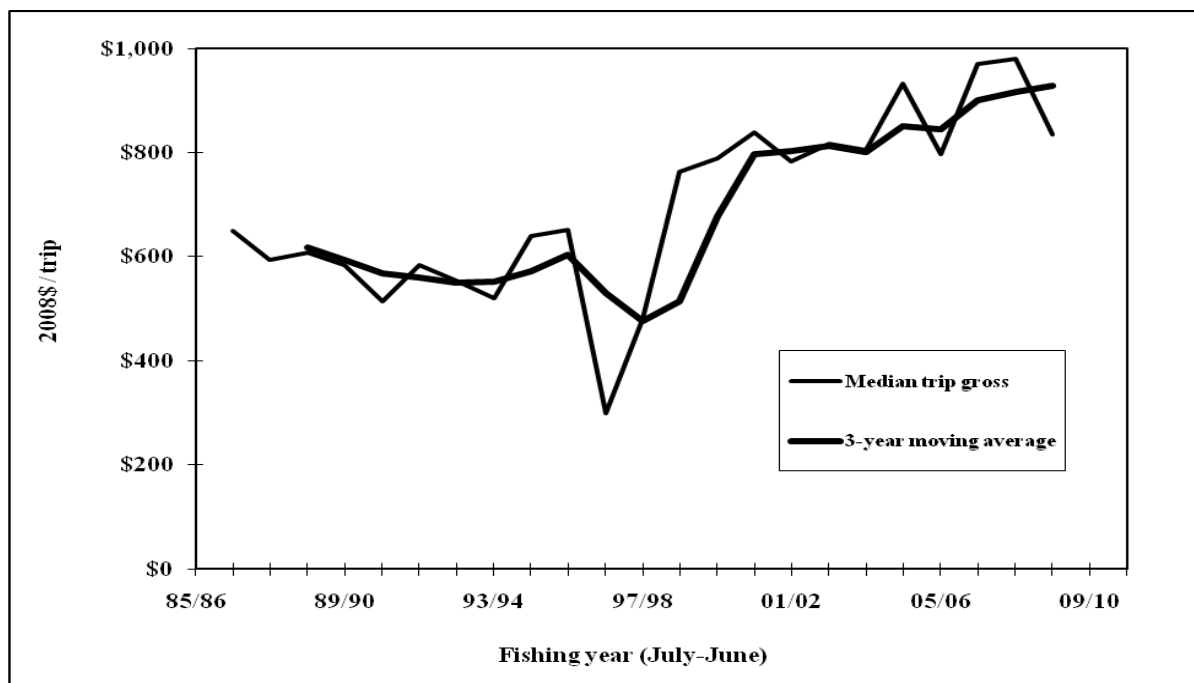


Figure 5. Florida stone crab fishery, median trip gross, observed and smoothed.

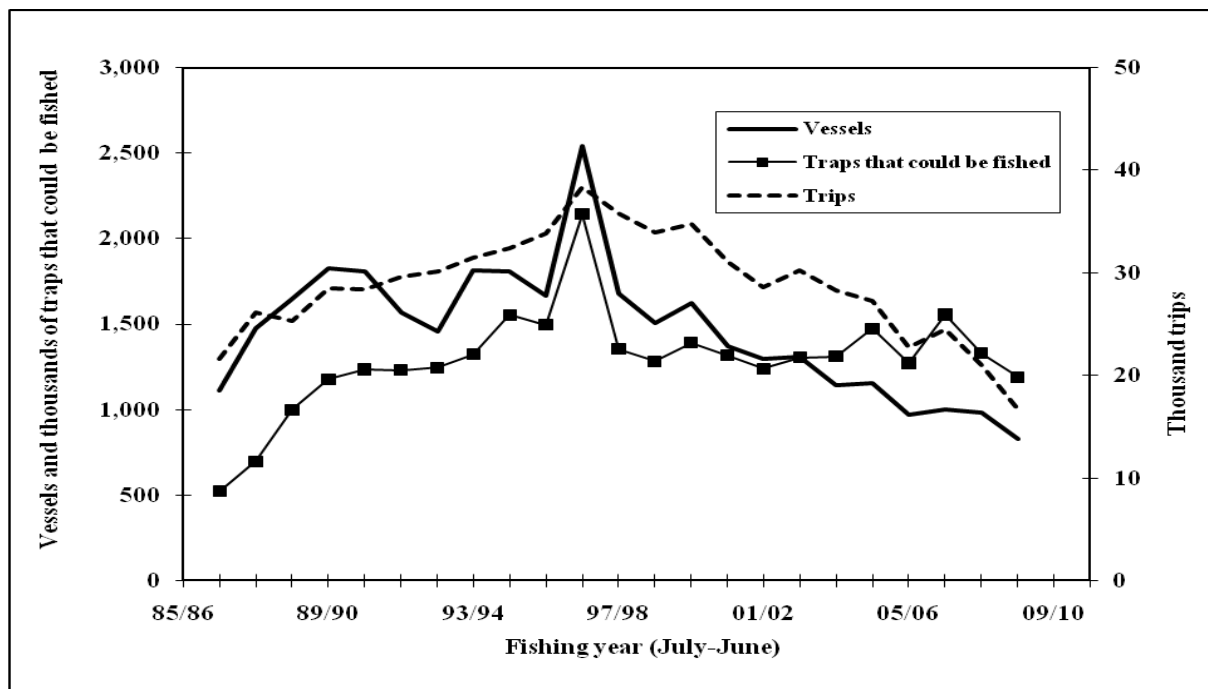


Figure 6. Florida stone crab fishery, vessels, trips and “traps that could be fished”.

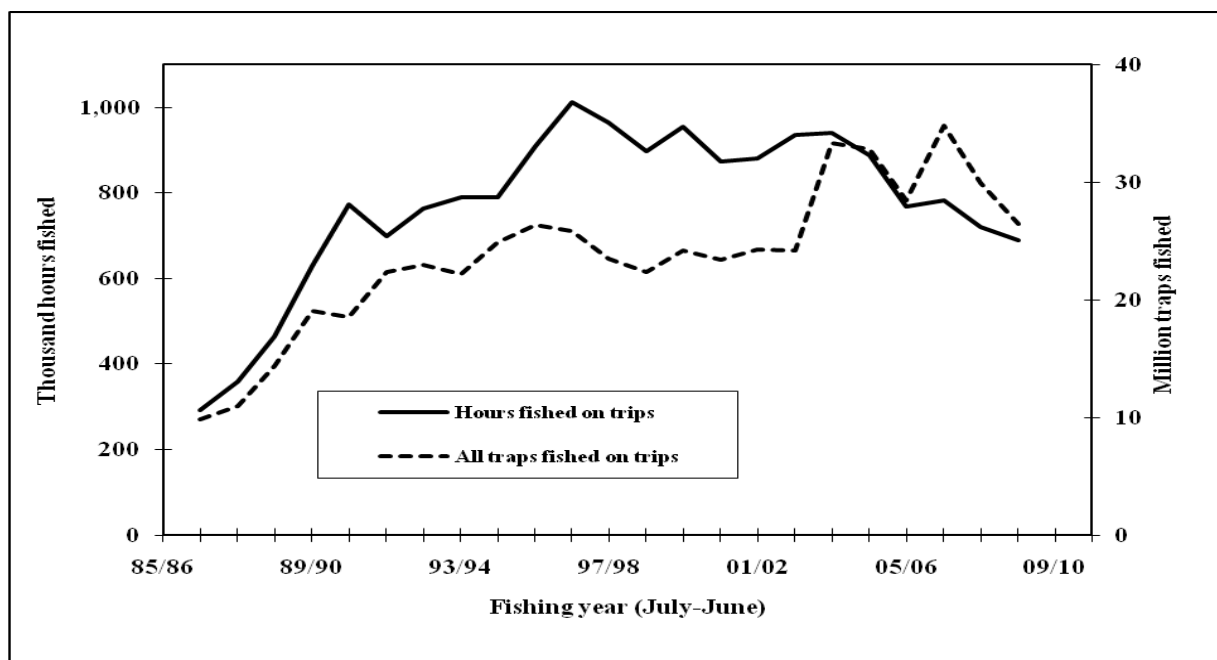


Figure 7. Florida stone crab fishery, hours and traps fished.

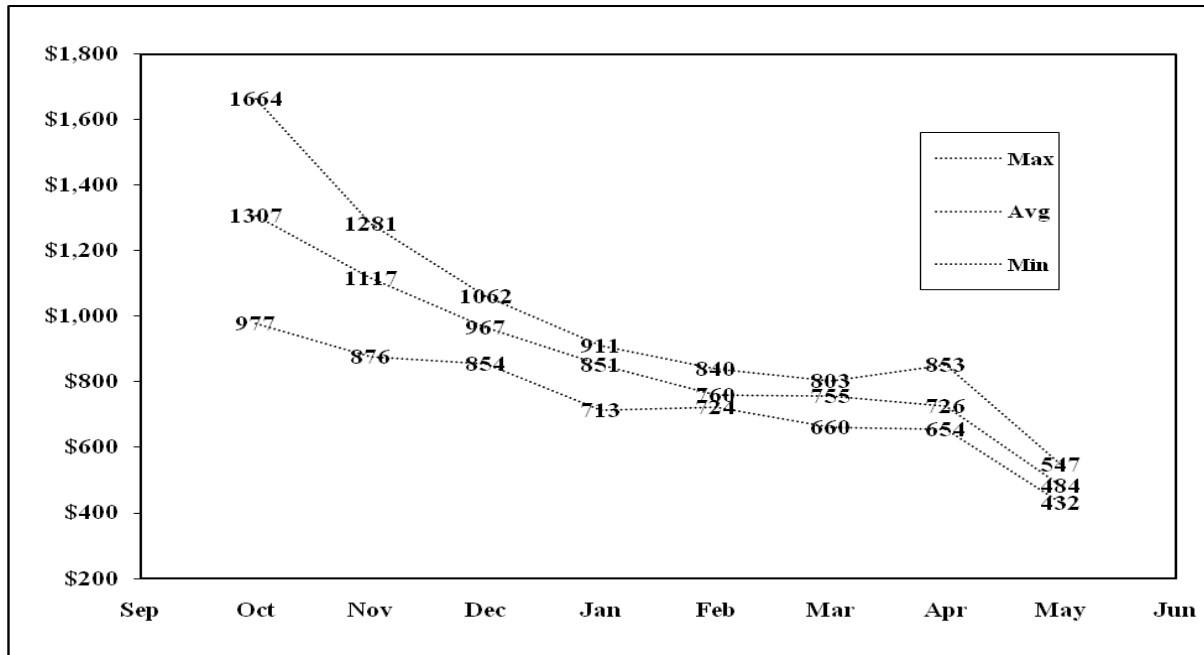


Figure 8. Florida stone crab fishery, monthly median trip gross, maximum, mean and minimum, 04/05 -08/09.

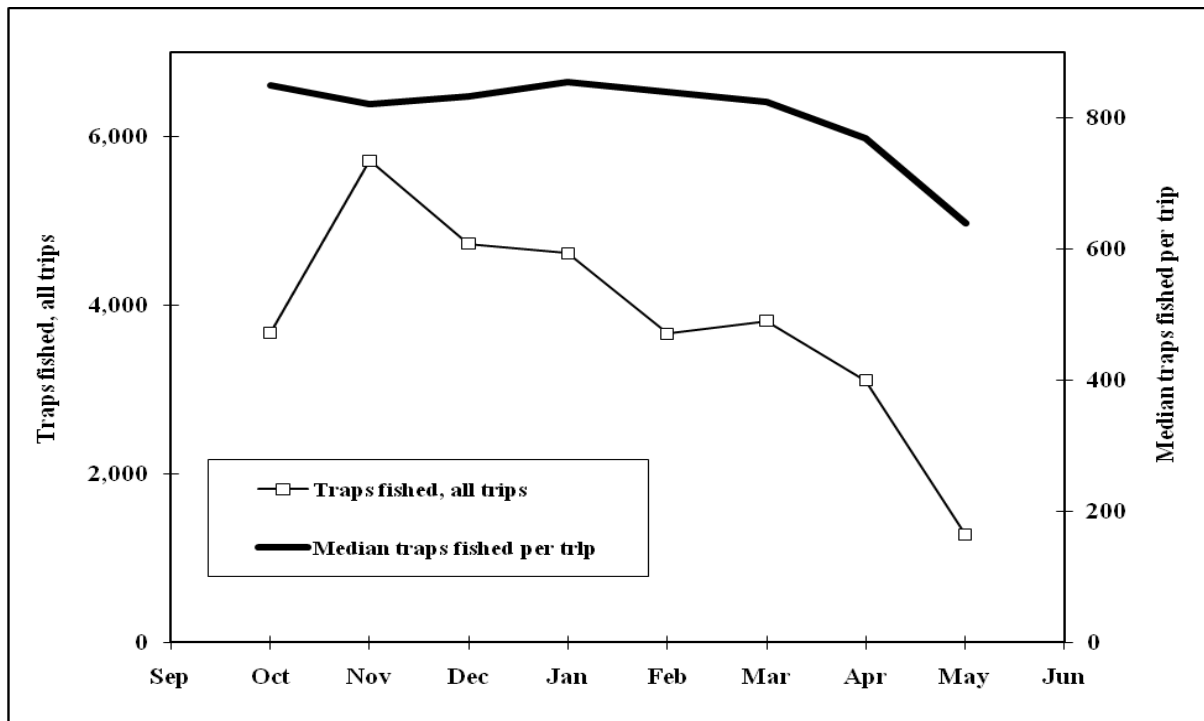


Figure 9. Florida stone crab fishery, traps fished, sums and averages for trip medians, 04/05-08/09.

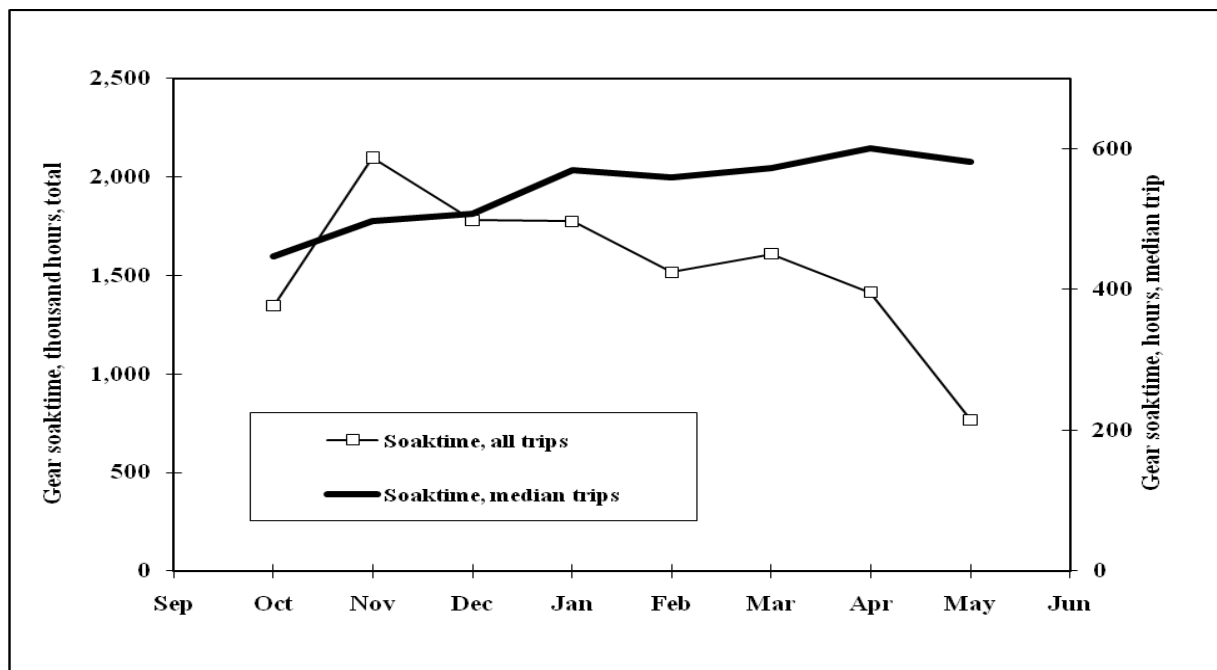


Figure 10. Florida stone crab fishery, soak time, sums and averages for trip medians, 01/02-08/09.

Table 1. Florida commercial fishery for stone crab.

Fishing year (July-June)	Landings in round (whole) weight, the selected species						
	Thousand pounds	Thousand 2008\$	2008\$ /lb	Vessels with landings	Median lbs landed per vessel	Trips with landings	Median lbs landed per trip
Col --->	1	2	3	4	5	6	7
85/86							96
86/87	4,382	\$18,586	\$4.24	1,112	245	21,575	114
87/88	4,482	\$21,177	\$4.72	1,474	267	26,137	90
88/89	5,229	\$21,982	\$4.20	1,646	269	25,301	88
89/90	5,439	\$25,466	\$4.68	1,827	290	28,457	78
90/91	6,309	\$23,753	\$3.76	1,806	302	28,387	100
91/92	6,419	\$23,236	\$3.62	1,565	416	29,630	104
92/93	6,291	\$23,584	\$3.75	1,455	562	30,183	106
93/94	6,845	\$21,925	\$3.20	1,816	482	31,519	112
94/95	6,657	\$27,417	\$4.12	1,811	526	32,353	112
95/96	5,742	\$28,985	\$5.05	1,666	719	33,807	92
96/97	6,457	\$21,422	\$3.32	2,543	816	38,390	86
97/98	7,113	\$23,717	\$3.33	1,679	960	35,793	104
98/99	6,504	\$35,199	\$5.41	1,507	1,186	33,958	114
99/00	5,810	\$38,451	\$6.62	1,625	888	34,713	100
00/01	7,178	\$37,023	\$5.16	1,373	1,404	31,034	146
01/02	6,973	\$31,222	\$4.48	1,297	1,074	28,550	154
02/03	5,444	\$32,000	\$5.88	1,309	1,094	30,200	118
03/04	5,245	\$31,843	\$6.07	1,141	1,059	28,326	111
04/05	6,131	\$33,757	\$5.51	1,154	1,310	27,303	140
05/06	4,099	\$23,909	\$5.83	970	936	22,773	119
06/07	5,371	\$29,728	\$5.53	1,001	1,287	24,472	142
07/08	6,308	\$26,267	\$4.16	985	1,443	21,039	188
08/09	5,950	\$19,142	\$3.22	826	1,086	16,710	230
09/10							228
10/11							
5-year averages							
87/88-91/92	5,576	23,123	\$4.20	1,664	309	27,582	92
95/96-99/00	6,325	\$29,555	\$4.75	1,804	914	35,332	99
04/05-08/09	5,572	\$26,560	\$4.85	987	1,212	22,459	164

Table 2. Florida commercial fishery for stone crab.

	Fishery totals			Averages for gross revenue		Medians for gross revenue	
Fishing year (July-June)	Vessels with landings	Trips with landings	Hours fished (trips)	2008\$ / vessel	2008\$ / trip	2008\$ / vessel	2008\$ / trip
Column --->	1	2	3	4	5	6	7
85/86							
86/87	1,112	21,575	291,234	\$15,279	\$1,017	\$1,829	\$650
87/88	1,474	26,137	359,706	\$16,928	\$955	\$2,459	\$593
88/89	1,646	25,301	464,162	\$16,204	\$1,054	\$2,475	\$608
89/90	1,827	28,457	630,268	\$16,634	\$1,068	\$2,705	\$583
90/91	1,806	28,387	772,047	\$14,891	\$948	\$2,339	\$515
91/92	1,565	29,630	698,156	\$17,589	\$929	\$3,397	\$583
92/93	1,455	30,183	763,782	\$18,971	\$914	\$4,839	\$554
93/94	1,816	31,519	790,737	\$14,294	\$824	\$3,270	\$520
94/95	1,811	32,353	790,260	\$17,905	\$1,002	\$3,906	\$640
95/96	1,666	33,807	908,273	\$20,908	\$1,030	\$6,168	\$651
96/97	2,543	38,390	1,012,281	\$10,317	\$683	\$3,675	\$300
97/98	1,679	35,793	965,177	\$17,622	\$827	\$5,141	\$480
98/99	1,507	33,958	897,606	\$25,538	\$1,133	\$8,425	\$764
99/00	1,625	34,713	953,987	\$26,345	\$1,233	\$7,638	\$789
00/01	1,373	31,034	873,328	\$29,254	\$1,294	\$9,527	\$839
01/02	1,297	28,550	880,131	\$25,563	\$1,161	\$6,656	\$784
02/03	1,309	30,200	934,765	\$27,145	\$1,177	\$8,317	\$816
03/04	1,141	28,326	940,080	\$30,545	\$1,231	\$8,579	\$806
04/05	1,154	27,303	887,447	\$32,035	\$1,354	\$9,551	\$933
05/06	970	22,773	767,219	\$26,327	\$1,121	\$7,348	\$797
06/07	1,001	24,472	782,139	\$34,129	\$1,396	\$9,898	\$970
07/08	985	21,039	720,287	\$30,324	\$1,420	\$8,916	\$981
08/09	826	16,710	689,565	\$24,234	\$1,198	\$5,049	\$834
09/10							
10/11							
5-year averages							
87/88-91/92	1,664	27,582	\$584,868	\$16,449	\$991	\$2,675	\$576
95/96-99/00	1,804	35,332	947,465	\$20,146	\$981	\$6,209	\$597
04/05-08/09	987	22,459	769,331	\$29,410	\$1,298	\$8,152	\$903

Table 3. Florida commercial fishery for stone crab, traps.

Fishing year (July- June)	Vessels				Trips			
	Vessels with landings	Vessels with reported traps	Reported traps, thousands	Computed traps (a), thousands	Trips with landings	Trips with reported traps	Reported traps, thousand	Computed traps (b), thousands
Col -->	1	2	3	4	6	7	8	9
85/86								
86/87	1,112	197	93	523	21,575	3,002	1,370	9,843
87/88	1,474	253	120	698	26,137	3,152	1,325	10,990
88/89	1,646	247	150	999	25,301	3,141	1,781	14,350
89/90	1,827	269	173	1,178	28,457	3,002	2,015	19,098
90/91	1,806	853	583	1,235	28,387	9,619	6,274	18,517
91/92	1,565	1,087	855	1,231	29,630	18,778	14,200	22,406
92/93	1,455	1,126	964	1,245	30,183	21,841	16,655	23,017
93/94	1,816	1,328	968	1,323	31,519	22,832	16,087	22,208
94/95	1,811	1,445	1,239	1,553	32,353	25,382	19,540	24,906
95/96	1,666	1,438	1,292	1,497	33,807	29,558	23,074	26,391
96/97	2,543	2,369	1,996	2,142	38,390	36,117	24,354	25,887
97/98	1,679	1,679	1,355	1,355	35,793	35,792	23,481	23,482
98/99	1,507	1,506	1,282	1,282	33,958	33,951	22,385	22,390
99/00	1,625	1,573	1,347	1,391	34,713	34,220	23,845	24,188
00/01	1,373	1,373	1,317	1,317	31,034	31,034	23,372	23,372
01/02	1,297	1,297	1,238	1,238	28,550	28,550	24,289	24,289
02/03	1,309	1,309	1,305	1,305	30,200	30,200	24,171	24,171
03/04	1,141	1,141	1,312	1,312	28,326	28,326	33,306	33,306
04/05	1,154	1,154	1,473	1,473	27,303	27,298	32,831	32,837
05/06	970	970	1,271	1,271	22,773	22,755	28,408	28,431
06/07	1,001	1,001	1,556	1,556	24,472	24,458	34,769	34,788
07/08	985	985	1,329	1,329	21,039	21,028	29,908	29,924
08/09	826	826	1,189	1,189	16,710	16,707	26,488	26,493
09/10								
10/11								
5-year averages								
87/88-91/92	1,664	542	376	1,068	27,582	7,538	5,119	17,072
95/96-99/00	1,804	1,713	1,454	1,534	35,332	33,928	23,428	24,468
04/05-08/09	987	987	1,364	1,364	22,459	22,449	30,481	30,495
(a) Computation: [column 1 * (column 4 / column 3)].								
(b) Computation: [column 7 * (column 9 / column 8)].								

Table 4. Vessel gross revenue, 5-year averages for frequency distribution data.

5-year averages for fishing years, vessels	Selected frequency distribution percentiles				
	P25	P50	P75	P90	P99
1987/1988-1991/1992	\$582	\$2,675	\$12,422	\$42,721	\$202,542
2004/2005-2008/2009	\$2,028	\$8,152	\$30,379	\$85,218	\$264,976
Ratio	3.49	3.05	2.45	1.99	1.31
5-year averages for fishing years, trips	Selected frequency distribution percentiles				
	P25	P50	P75	P90	P99
1987/1988-1991/1992	\$242	\$576	\$1,278	\$2,352	\$5,691
2004/2005-2008/2009	\$408	\$903	\$1,751	\$2,824	\$6,156
Ratio	1.69	1.57	1.37	1.20	1.08