

**FLORIDA'S COMMERCIAL FISHERY FOR
CARIBBEAN SPINY LOBSTER
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Data and Methods

The Florida commercial fishery for Caribbean spiny lobster 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 Caribbean Spiny Lobster

Florida's volatile commercial fishery for Caribbean spiny lobster (*Panulirus argus*) has been affected by sharply lower prices in the last two years and by landings that have been the lowest since the early 1960s (Figure 1, Table 1). Ex-vessel prices decreased sharply to \$3.30 / lb (ww) in 09/10, compared with the 22-year high of \$7.94 /lb for 2 years earlier. Economic conditions would have been worse without long-term reductions in fishing effort and consequent

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 spiny lobster and fishing years 97/98 onward, SPLs are put in the place of VESIDs for some 4% (06/07) to 28% (97/98) of the vessels. For the 24 fishing years 1985/1986-2009/2010, there are initially 675,914 trips with landings of spiny lobster of more than 1 lb / trip. For 3.5% of these trips (23,429 trips) data could not be summarized for vessels, because the SPL could not be determined from available data records. This includes 7,080 trips in 85/86 (leaving 18 trips with SPLs; data for Jan-Jun, 1986), 16,340 in 86/87 (leaving 14,355 trips with SPLs), 2 in 87/88, 1 in 88/89, 3 in 90/91, and 3 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).

increases vessel and trip productivity. Median vessel and trip landings have exhibited arguably flat to upward trends since the early-1990s (smoothed data in Figures 2-3).³ The 3-year moving averages in Figures 1b, 2 and 3 tend to put emphasis on trends in that they “smooth” year-to-year differences in the magnitude of the observed values in Table 1.

Based on 5-year averages for 87/88-91/92 and 05/06-09/10, fishing effort is now much lower than it was (Tables 1-3):

- 1) The number of vessels declined from 2,175 to 781 per year.
- 2) The number of trips declined from 39,086 to 15,568 per year.
- 3) The number of hours fished declined from 493,211 to 234,292 per year.
- 4) The number of traps fished on all trips declined from 8.65 to 4.24 million (including duplication, because individual traps are usually fished on more than one trip, unless lost or damaged) (Table 3, column 9; Figure 5).
- 5) Vessel-based estimates for the number of “traps that could be fished” declined from 704,580 to 368,106 traps (excluding duplication attributable to the use of individual traps on multiple trips).⁴ The number of traps that could be fished is a proxy for the number of traps licensed to fish for spiny lobster. The number peaked in 91/92 at 814,864 traps (Table 3, column 4; Figure 4).

Initially, the number of trap certificates was reduced in steps, from 944,000 in 1992 to 543,000 by 1999. Given a decade or so of fisher experience with the program, Shvlini, Ehrhardt, Murray and Kirkley (2004) conducted a survey of fishers and analyzed the economic and social conditions at the fisher level and fisher attitudes about the program. Today, reductions in the total number of certificates occur routinely if certificates are transferred and/or revert to the state because the owner does pay requisite annual fees for three years.⁵ Besides the

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.

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.

⁵Currently, commercial fishers for spiny lobster must affix state-issued tags to their traps, and have trap certificates on account with the FWC (website, April 2010). The trap certificates may be transferred to new owners, at which time they are reduced by 10% in number. The buyer must hold a valid SPL and pay a \$2 transfer fee for each trap certificate to FWC, or if outside of the original certificate holder’s immediate family, then \$5 for each trap certificate or 25% of the actual price paid to the seller. The seller must meet similar requirements, unless leaving the fishery.

Trap Certificate Program, other factors have affected commercial fishing for spiny lobster in Florida, such as gentrification, state and local regulations on the storage of traps, and availability and access to docks and dealers.

Given the long-term reductions in fishing effort in the Florida spiny lobster fishery, median vessel landings of spiny lobster averaged 1,129 pounds in the latest 5 years compared with 353 pounds in 87/88-91/92, while median trip landings averaged 134 pounds compared with 85 pounds, respectively (Table 1). However, the rate of increase for median vessel landings has been low since the mid-1990s, while median trip landings moved upward (Figures 2-3, smoothed data).

Because of the sharp year-to-year fluctuation in observed values for median vessel gross revenue, the smoothed values are used to illustrate long-term trends. These trends were upward earlier and downward in the 2000s (Figure 6). The observed values for median vessel gross (the ex-vessel value of all FTT-reported landings for a vessel) averaged \$3,048 in 87/88-91/92, reached a peak of \$10,608 in 00/01, declined then increased, and then declined sharply to \$5,067 by 09/10 (Figure 6 and Table 2).

In Table 4, the paired sets of five-year averages indicate changes in vessel and trip gross revenue between the late 1980s and mid 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 improvements for vessels at lower than higher gross; i.e., the ratios for vessel gross range between 3.68 at the 25th percentile and 1.28 at the 99th percentile (Table 4). A vessel gross of \$1,796 for the 25th percentile means that the annual gross revenue for 25 percent of the vessels with landings of spiny lobster in Florida averaged less than \$1,796 per vessel per year. On the other hand, the top 25% of vessels grossed at least \$40,159. The maximums for gross revenue per vessel averaged approximately \$380,000, and ranged from \$220,000 to \$600,000.

Annual medians for available data indicate that vessels in the commercial spiny lobster fishery are 33-34 feet long, engines are 300-320 horsepower, crews comprise 2 persons (including the captain), traps are fished at depths of 20-25 feet, fishers remain away from port for 8 hours per trip, and there are 4-6 sets of trap lines per trip.

Over the long term, median trip revenue exhibited an upward trend (Figure 7, smoothed data). The observed values averaged \$559 per trip in 87/88-91/92, peaked at \$1,144 in 06/07 and declined to \$670 in 09/10 (Figure 7 and Table 2). The long-term patterns for median vessel gross and median trip gross are attributable to several factors, including the following:

- 1) Ex-vessel prices followed a more or less upward trend to a peak of \$7.94 / lb in 07/08, which was followed by a sharp decline to \$3.30 / lb in 09/10 (Figure 1).

2) Fishing effort exhibited downward trends beginning in the early 1990s with the Trap Certificate Program (Figures 4-5; Tables 1-3).

3) Fishery landings were relatively low in the 2000s (Figure 1; Table 1).

As the commercial fishing season progresses, monthly trip gross revenue declines, but there is variability (Figure 8). The monthly medians for trip gross in the year 09/10 were below the respective ranges shown in Figure 8, \$733 in August, \$637 in September, \$641 in October, and \$674 in November.

Fishers adjust their use of traps and soak time as the season progresses. From August to March, the monthly totals for traps fished and hours of soak time decline by month, 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.⁶

There is relatively less reduction in median dollars per trap fished than in median dollars per trip as the season progresses (Figures 8 and 11). That is, the average for median gross per trap fished declined by 48% (from \$5.77 per trap in August to \$2.96 in March), while median gross per trip declined by 63% (from \$1,198 per trip in August to \$438 in March). Using fewer traps on trips as the season progresses reduces time spent on setting and hauling trap lines on trips, along with fuel and other trip costs. Allowing more soak time as the season progresses would not seem to affect trip costs all that much, allowing for caveats.

⁶The number of traps fished was 1.11 million in August and 0.18 million in March, while the median for traps per trip increased from 188 in August to 218 in November, and then fell off to 100 by March (Figure 9, data for 03/04-07/08). Soak time declined relatively less than traps fished, from 602,000 hours in September to 287,000 hours in March, and the median soak time per trip increased, from 168 hours in August to 363 in March (Figure 10, data for 01/02-09/10).

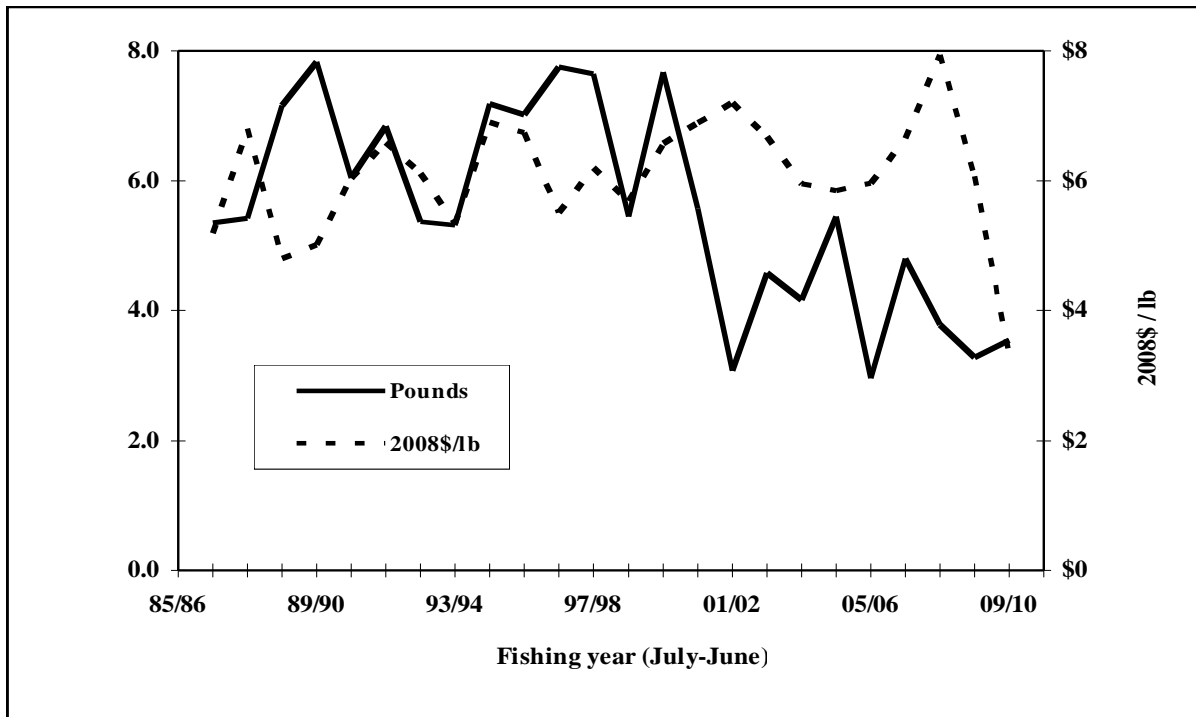
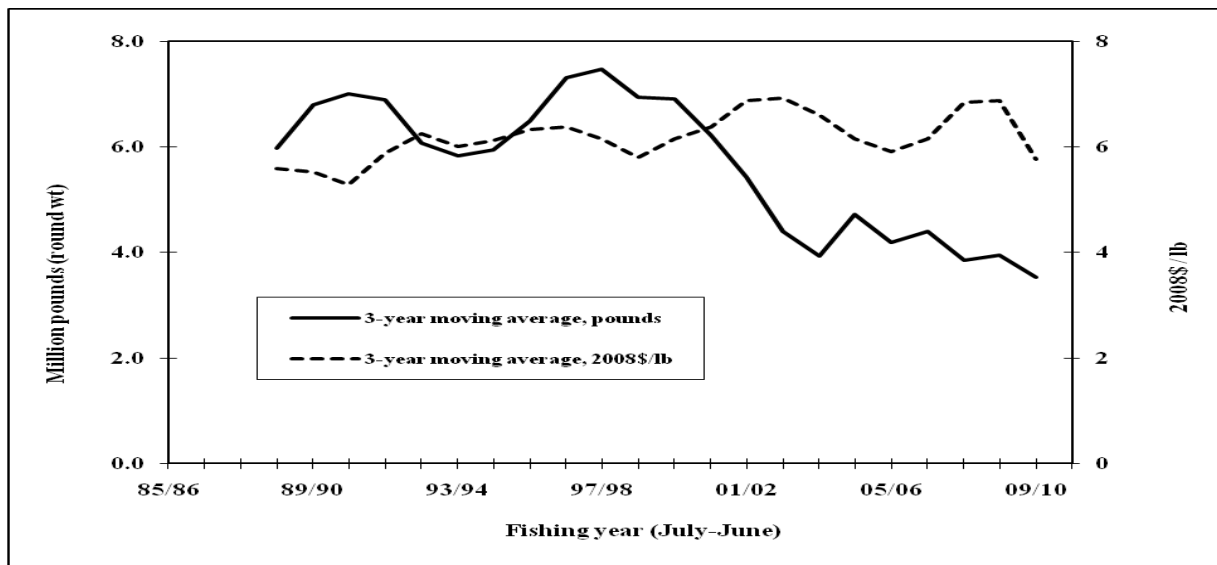


Figure 1a. Florida spiny lobster fishery, landings and ex-vessel prices.



1b. Florida spiny lobster fishery, 3-year moving averages landings and ex-vessel prices.

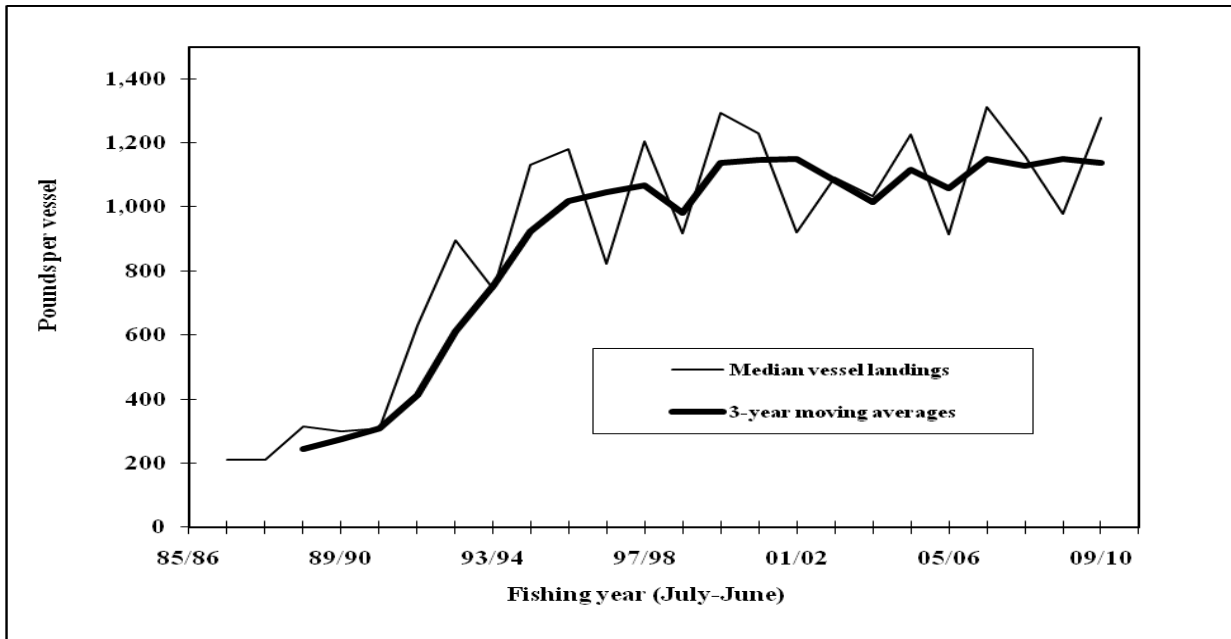


Figure 2. Florida spiny lobster fishery, median vessel landings, observed and smoothed

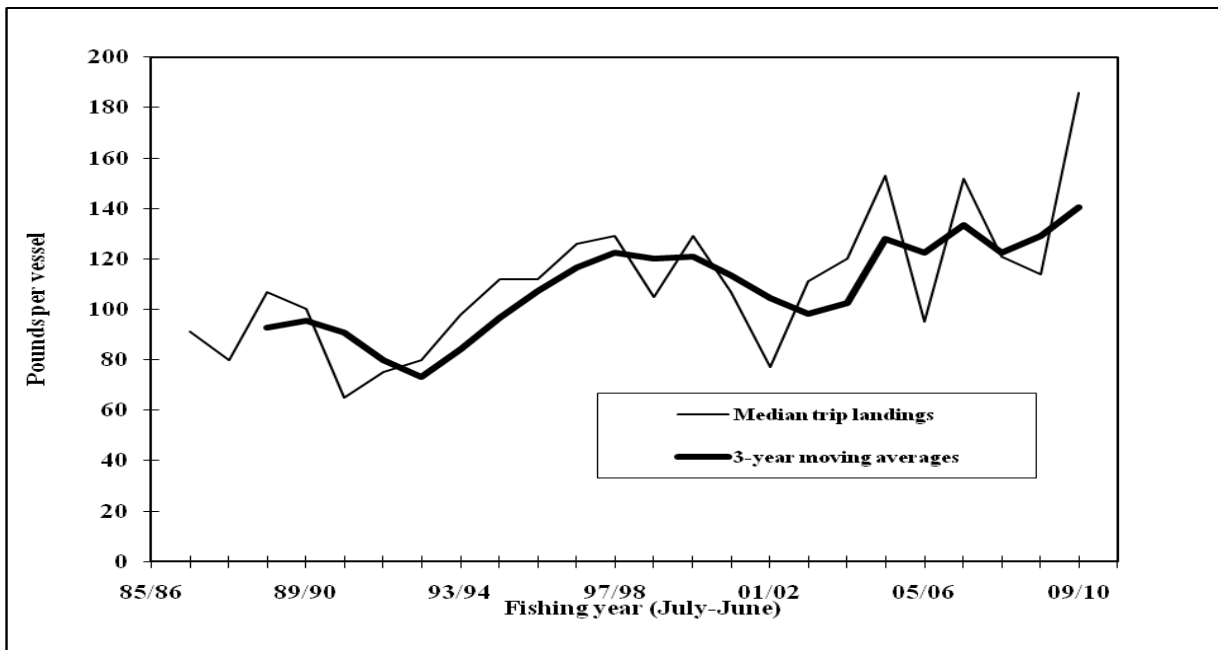


Figure 3. Florida spiny lobster fishery, median trip landings, observed and smoothed.

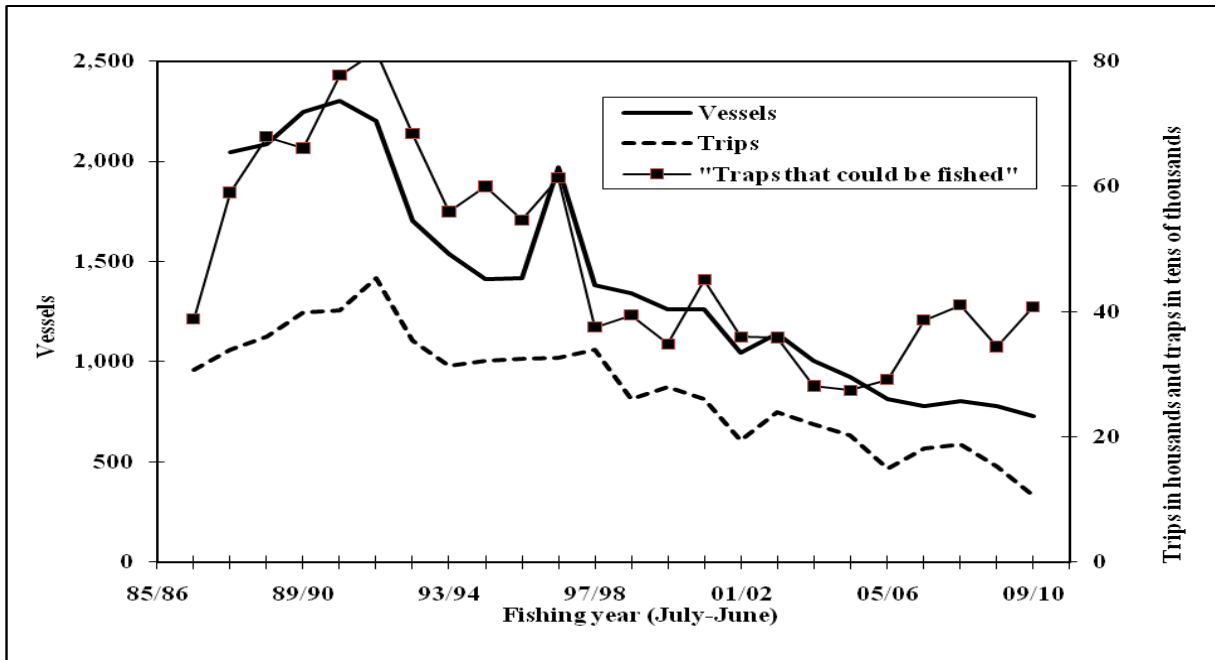


Figure 4. Florida spiny lobster fishery, vessels, trips and “traps that could be fished”.



Figure 5. Florida spiny lobster fishery, hours and traps fished on all trips.

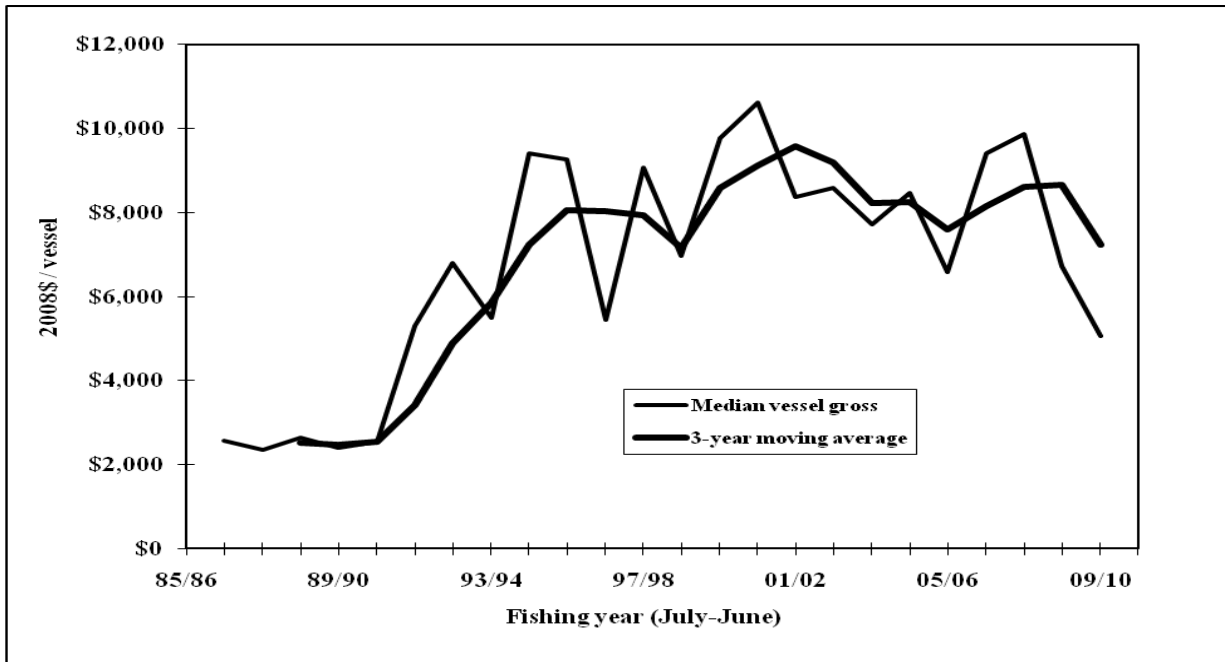


Figure 6. Florida spiny lobster fishery, median vessel gross, observed and smoothed.

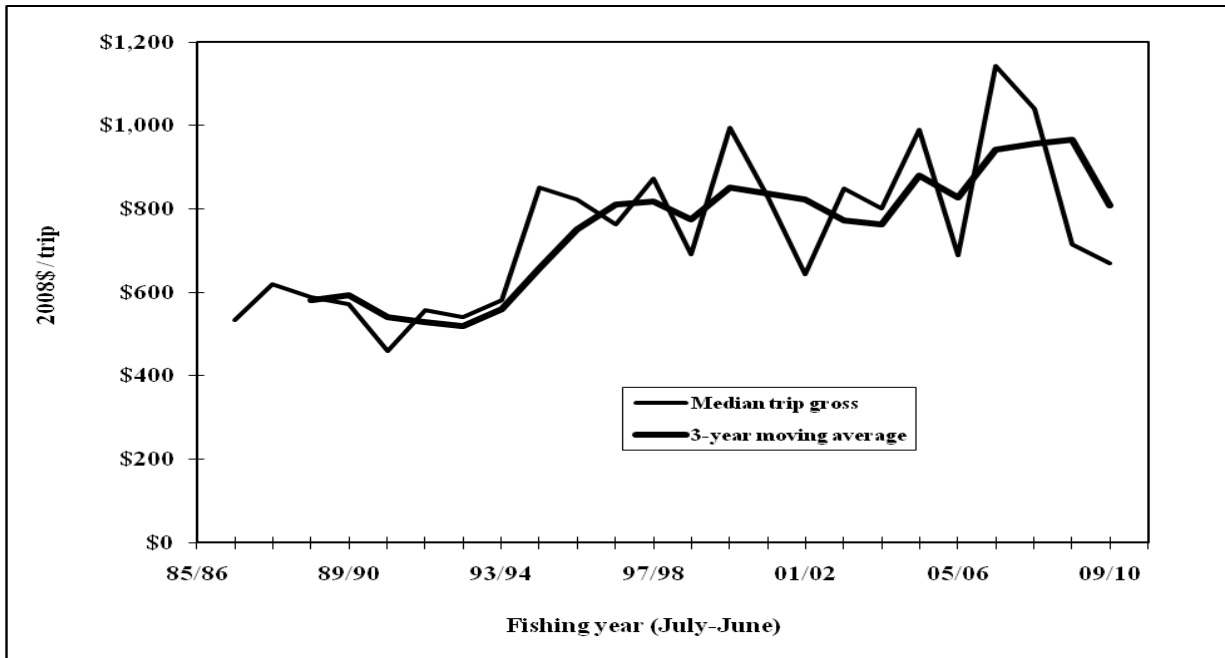


Figure 7. Florida spiny lobster fishery, median trip gross, observed and smoothed.

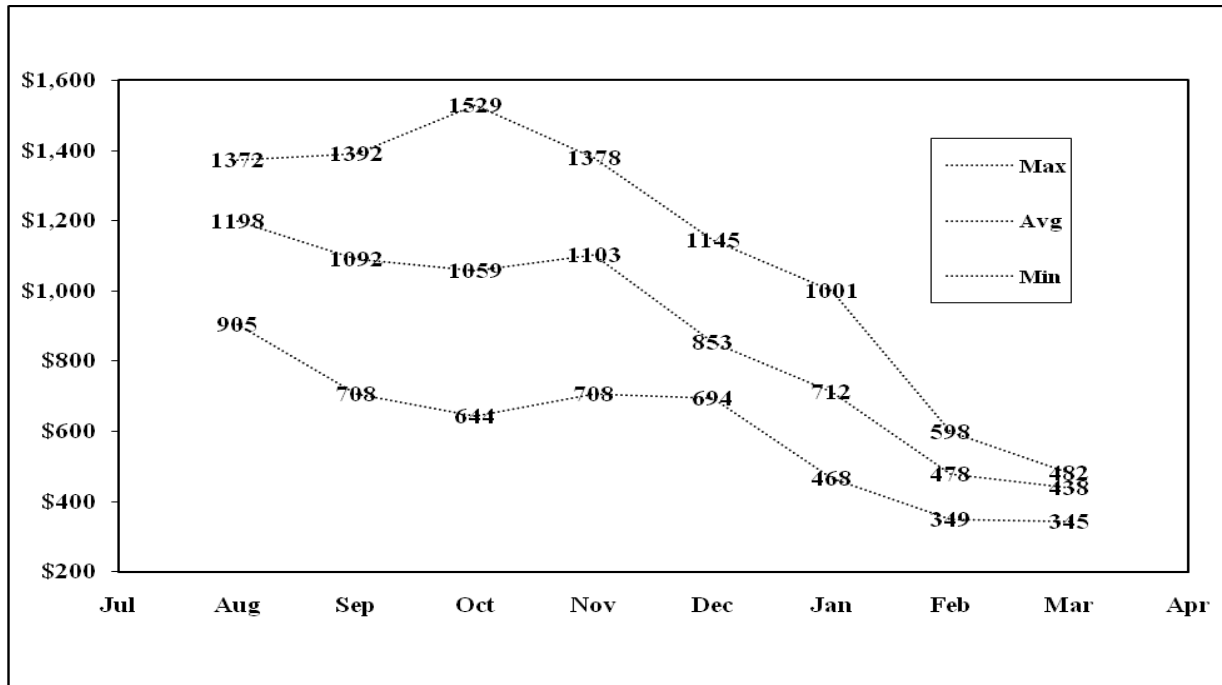


Figure 8. Florida spiny lobster fishery, monthly maximums, averages and minimums for median trip gross revenue, 03/04 – 07/08.

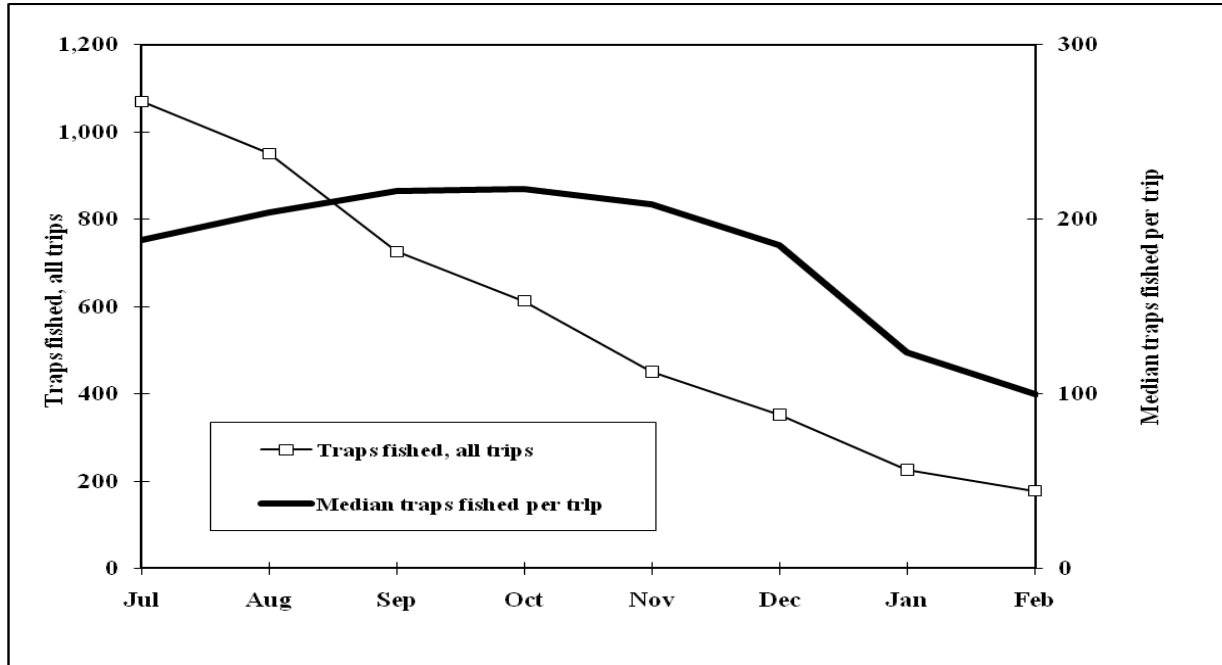


Figure 9. Florida spiny lobster fishery, traps fished, sums and trip medians, 03/04-07/08.

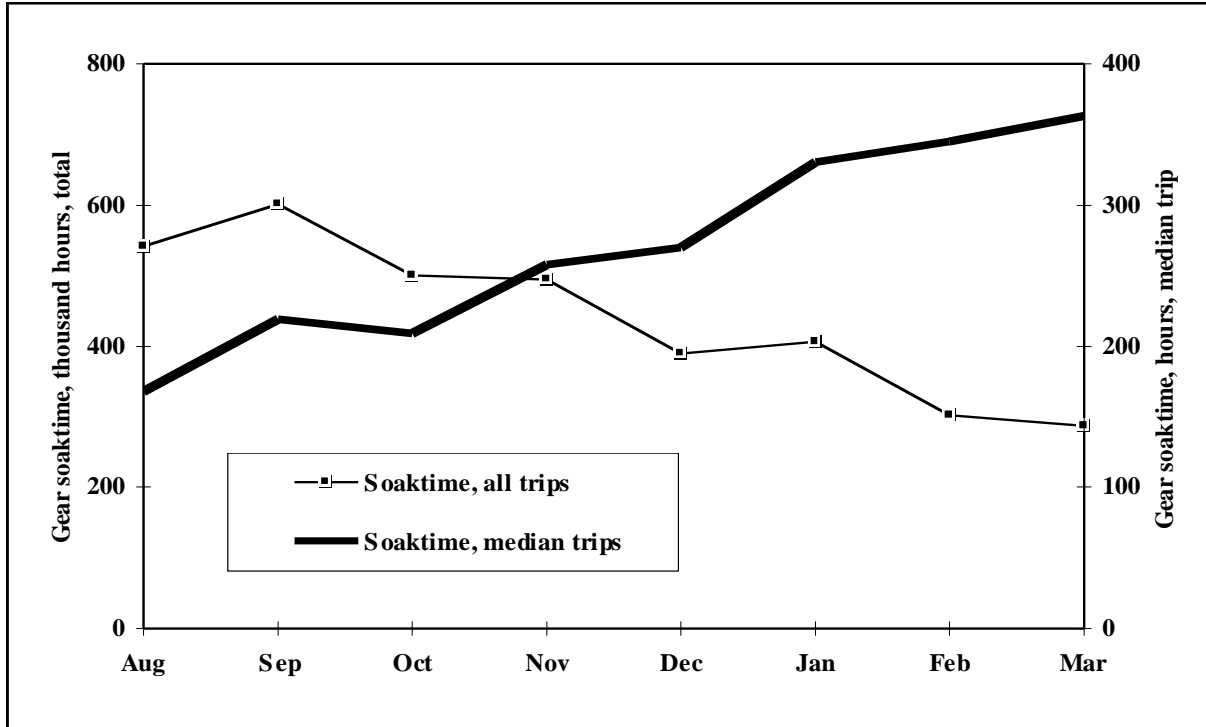


Figure 10. Florida spiny lobster fishery, soak time, sums and trip medians, 01/02-08/09.

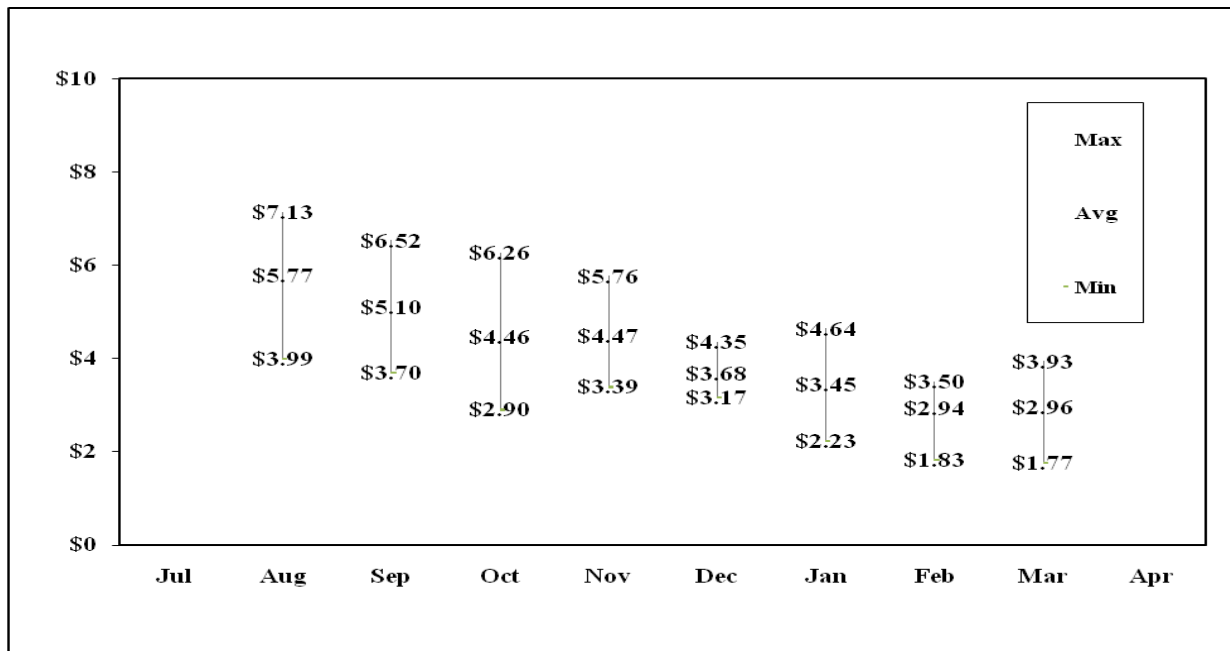


Figure 11. Florida spiny lobster fishery, trip gross per trap fished, maximums, averages and minimums, 03/04-07/08.

Table 1. Florida commercial fishery for Caribbean spiny lobster (*Panulirus argus*).

Fishing year (July-June)	Landings in round (whole) weight, the selected species						
	Thousand pounds	Thousand 2008\$	2008\$ /lb	Vessels with landings	Median lbs / vessel	Trips with landings	Median lbs / trip
Col --->	1	2	3	4	5	6	7
85/86							
86/87	5,351	\$27,786	\$5.19		211	30,696	91
87/88	5,417	\$36,833	\$6.80	2,045	210	34,005	80
88/89	7,154	\$34,327	\$4.80	2,086	316	36,021	107
89/90	7,830	\$39,229	\$5.01	2,244	299	39,935	100
90/91	6,044	\$36,523	\$6.04	2,300	310	40,194	65
91/92	6,834	\$45,018	\$6.59	2,200	629	45,276	75
92/93	5,367	\$32,804	\$6.11	1,702	896	35,387	80
93/94	5,309	\$28,362	\$5.34	1,536	744	31,283	98
94/95	7,181	\$49,553	\$6.90	1,411	1,132	32,093	112
95/96	7,017	\$47,295	\$6.74	1,419	1,180	32,546	112
96/97	7,748	\$42,675	\$5.51	1,968	821	32,591	126
97/98	7,641	\$47,373	\$6.20	1,382	1,204	33,906	129
98/99	5,448	\$30,980	\$5.69	1,342	916	26,012	105
99/00	7,669	\$50,402	\$6.57	1,260	1,294	27,947	129
00/01	5,570	\$38,391	\$6.89	1,259	1,230	26,111	107
01/02	3,081	\$22,186	\$7.20	1,047	921	19,528	77
02/03	4,574	\$30,529	\$6.68	1,140	1,093	23,960	111
03/04	4,161	\$24,773	\$5.95	1,003	1,033	22,088	120
04/05	5,445	\$31,799	\$5.84	926	1,227	20,295	153
05/06	2,964	\$17,666	\$5.96	814	915	14,901	95
06/07	4,799	\$31,913	\$6.65	780	1,312	18,184	152
07/08	3,782	\$30,025	\$7.94	803	1,158	18,858	121
08/09	3,271	\$19,836	\$6.06	780	980	15,238	114
09/10	3,541	\$11,695	\$3.30	727	1,278	10,660	186
10/11							
5-year averages							
87/88-91/92	6,656	\$38,386	\$5.85	2,175	353	39,086	85
95/96-99/00	7,105	\$43,745	\$6.14	1,474	1,083	30,600	120
05/06-09/10	3,671	\$22,227	\$5.98	781	1,129	15,568	134

Table 2. Florida commercial fishery for Caribbean spiny lobster (*Panulirus argus*).

Fishing year (July-June)	Fishery totals			Averages for gross revenue		Medians for gross revenue	
	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		30,696	332,149		\$1,116	\$2,567	\$533
87/88	2,045	34,005	395,286	\$20,775	\$1,249	\$2,340	\$620
88/89	2,086	36,021	447,368	\$19,459	\$1,127	\$2,643	\$588
89/90	2,244	39,935	473,133	\$19,720	\$1,108	\$2,408	\$571
90/91	2,300	40,194	525,073	\$17,464	\$999	\$2,555	\$460
91/92	2,200	45,276	625,194	\$22,185	\$1,078	\$5,296	\$557
92/93	1,702	35,387	519,105	\$21,494	\$1,034	\$6,795	\$540
93/94	1,536	31,283	531,073	\$21,344	\$1,048	\$5,501	\$582
94/95	1,411	32,093	492,236	\$37,523	\$1,650	\$9,399	\$851
95/96	1,419	32,546	500,058	\$35,120	\$1,531	\$9,276	\$822
96/97	1,968	32,591	510,257	\$22,931	\$1,385	\$5,454	\$762
97/98	1,382	33,906	550,105	\$37,006	\$1,508	\$9,066	\$872
98/99	1,342	26,012	426,392	\$24,989	\$1,289	\$6,964	\$691
99/00	1,260	27,947	517,078	\$42,624	\$1,922	\$9,766	\$994
00/01	1,259	26,111	483,834	\$32,950	\$1,589	\$10,608	\$829
01/02	1,047	19,528	363,904	\$23,406	\$1,255	\$8,375	\$643
02/03	1,140	23,960	419,835	\$29,403	\$1,399	\$8,590	\$848
03/04	1,003	22,088	338,207	\$26,782	\$1,216	\$7,709	\$800
04/05	926	20,295	325,008	\$36,277	\$1,655	\$8,464	\$991
05/06	814	14,901	253,071	\$23,799	\$1,300	\$6,592	\$689
06/07	780	18,184	302,303	\$43,297	\$1,857	\$9,398	\$1,144
07/08	803	18,858	261,674	\$39,260	\$1,672	\$9,873	\$1,039
08/09	780	15,238	209,590	\$26,614	\$1,362	\$6,735	\$714
09/10	727	10,660	144,823	\$16,829	\$1,148	\$5,067	\$670
10/11							
5-year averages							
87/88-91/92	2,175	39,086	493,211	\$19,921	1,112	\$3,048	\$559
95/96-99/00	1,474	30,600	500,778	\$32,534	\$1,527	\$8,105	\$828
05/06-09/10	781	15,568	234,292	\$29,960	\$1,468	\$7,533	\$851

Table 3. Florida commercial fishery for Caribbean spiny lobster (*Panulirus argus*), traps.

Fishing year (July-June)	Vessels with landings	Vessels with reported traps	Reported traps for vessels in col 2	Computed traps for vessels in col 1 (a)	Trips with landings	Trips with reported traps	Reported traps fished, thousand	Computed traps fished, thousand (b)
Col -->	1	2	3	4	6	7	8	9
85/86								
86/87					30,696	3,221	712	6,784
87/88	2,045	251	72,451	590,288	34,005	3,619	853	8,012
88/89	2,086	225	73,256	679,165	36,021	3,646	864	8,541
89/90	2,244	310	91,338	661,169	39,935	3,489	773	8,842
90/91	2,300	689	232,887	777,417	40,194	6,573	1,371	8,385
91/92	2,200	1,039	384,838	814,864	45,276	20,185	4,228	9,484
92/93	1,702	901	362,066	683,947	35,387	19,605	4,413	7,966
93/94	1,536	711	258,921	559,357	31,283	17,338	3,735	6,739
94/95	1,411	690	293,224	599,622	32,093	18,088	4,380	7,772
95/96	1,419	790	304,113	546,249	32,546	21,736	5,066	7,586
96/97	1,968	1,457	454,018	613,251	32,591	23,745	5,436	7,461
97/98	1,382	1,379	374,383	375,197	33,906	33,900	6,264	6,265
98/99	1,342	1,340	394,130	394,718	26,012	25,983	5,171	5,177
99/00	1,260	1,250	345,348	348,111	27,947	27,843	5,083	5,102
00/01	1,259	1,259	450,648	450,648	26,111	26,110	5,490	5,490
01/02	1,047	1,047	359,488	359,488	19,528	19,527	4,039	4,039
02/03	1,140	1,139	358,189	358,503	23,960	23,959	5,179	5,179
03/04	1,003	1,003	281,644	281,644	22,088	22,073	4,740	4,743
04/05	926	922	273,335	274,521	20,295	20,269	4,663	4,669
05/06	814	813	291,345	291,703	14,901	14,897	3,051	3,052
06/07	780	779	385,948	386,443	18,184	18,175	5,143	5,146
07/08	803	803	410,803	410,803	18,858	18,852	5,211	5,213
08/09	780	780	343,857	343,857	15,238	15,237	4,140	4,140
09/10	727	727	407,725	407,725	10,660	10,656	3,647	3,648
10/11								
5-year averages								
87/88-91/92	2,175	503	170,954	704,580	39,086	7,502	1,618	8,653
95/96-99/00	1,474	1,243	374,398	455,505	30,600	26,641	5,404	6,318
05/06-09/10	781	780	367,936	368,106	15,568	15,563	4,239	4,240
(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	Frequency distribution percentiles				
	P25	P50	P75	P90	P99
1986/1987-1990/1991	\$489	\$2,503	\$18,167	\$53,772	\$168,558
2005/2006-2009/2010	\$1,796	\$7,533	\$40,159	\$90,320	\$215,722
Ratio	3.68	3.01	2.21	1.68	1.28
5-year averages for fishing years	Frequency distribution percentiles				
	P25	P50	P75	P90	P99
1986/1987-1990/1991	\$246	\$554	\$1,172	\$2,303	\$10,613
2005/2006-2009/2010	\$388	\$851	\$1,770	\$3,089	\$10,230
Ratio	1.58	1.54	1.51	1.34	0.96