

Gulf Seafood Landings by Species & Geographic Area after the 2010 Oil Spill and Equitable Compensation from the Seafood Compensation Program

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The Deepwater Horizon oil spill and subsequent use of dispersants and freshwater diversions resulted in lost harvest revenues, oyster mortality, and damage to oyster beds. We estimated Gulf-wide revenue losses and oyster lease property damages from 2010-2012 totaling approximately \$282 million. Estimated compensation payments of \$997 million had previously been distributed to the fishery groups considered in this report, equaling an overall ratio of 3.5 times estimated losses and damages, with estimated ratios ranging from 0.6 to 5.8 for various fishery groups. We recommended that subsequent distributions be modified to achieve a uniform total distribution/damage ratio for all fishery groups.

INTRODUCTION

The Deepwater Horizon offshore oil drilling rig was destroyed by an explosion and fire on April 20, 2010. The damaged Macondo well leaked an estimated 200 million gallons of oil over the next 87 days, before being successfully capped on July 15, 2010 (Upton, 2011).

In addition to the leaked oil spread throughout the water column, approximately 1.8 million gallons of chemical dispersants were used over the course of the incident (The Federal Interagency Solutions Group, 2010). Dispersants had never been used in this volume before, and had never been injected into the oil plume at such depths, raising additional questions about their effects on the Gulf marine environment and fishery resources (United States, 2010).

Widespread commercial fishery closures began shortly after the spill. Table 1 lists the commercial seafood fishery closures (and subsequent adjustments/re-openings) in Federal waters from 5/2/2010 to 11/15/2010 (NOAA Fisheries, 2011).

The peak amount of Federal waters closed to fishing occurred on 6/2/2010, when almost 89,000 square miles, or 36.6 percent of all Federal waters in the Gulf of Mexico, were closed to fishing.

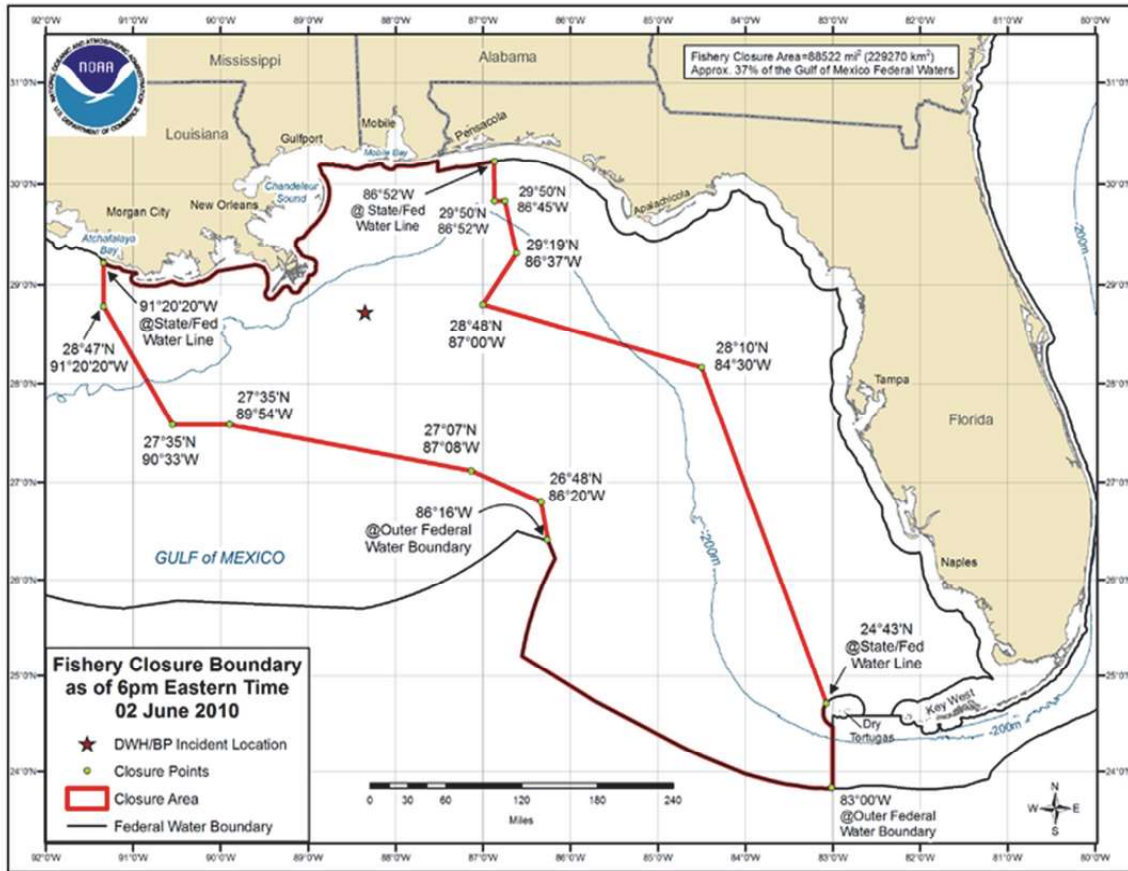
TABLE 1
LIST OF GULF OF MEXICO DEEPWATER HORIZON-RELATED FEDERAL WATERS
COMMERCIAL FISHING CLOSURES AND RE-OPENINGS BY DATE

Date of Closure/ Re-Opening	Area (sq mi)	Area (sq km)	Percent Coverage of Gulf EEZ	Percent Change in Coverage
5/2/2010	6,817	17,648	2.8	--
5/7/2010	10,807	27,989	4.5	58.5
5/11/2010	16,027	41,511	6.6	48.3
5/12/2010	17,651	45,717	7.3	10.1
5/14/2010	19,377	50,187	8	9.8
5/17/2010	24,241	62,784	10	25.1
5/18/2010	45,728	118,435	18.9	88.6
5/21/2010	48,005	124,333	19.8	5
5/25/2010	54,096	140,109	22.4	12.7
5/28/2010	60,683	157,169	25.1	12.2
5/31/2010	61,854	160,200	25.6	1.9
6/1/2010	75,920	196,633	31.4	22.7
6/2/2010	88,522	229,270	36.6	16.6
6/4/2010	78,182	202,491	32.3	-11.7
6/5/2010	78,603	203,582	32.5	0.5
6/7/2010	78,264	202,703	32.3	-0.4
6/16/2010	80,806	209,286	33.4	3.2
6/21/2010	86,985	225,290	35.9	7.6
6/23/2010	78,597	203,564	32.5	-9.6
6/28/2010	80,228	207,790	33.2	2.1
7/4/2010	81,181	210,259	33.5	1.2
7/12/2010	84,101	217,821	34.8	3.6
7/13/2010	83,927	217,371	34.7	-0.2
7/22/2010	57,539	149,026	23.8	-31.4
8/10/2010	52,395	135,703	21.7	-8.9
8/27/2010	48,114	124,614	19.9	-8.2
9/2/2010	43,000	111,369	17.8	-10.6
9/3/2010	39,885	103,303	16.5	-7.2
9/21/2010	31,915	82,659	13.2	-20
10/1/2010	26,287	68,083	10.9	-17.6
10/5/2010	23,360	60,502	9.7	-11.1
10/15/2010	16,481	42,686	6.8	-29.4
10/22/2010	9,444	24,461	3.9	-42.7
11/15/2010	1,041	2,697	0.4	-89
Source: NOAA Fisheries (2011)				

As shown in Figure 1, the closed area extended along the state/Federal-water boundary from south of Morgan City, Louisiana eastward to a point south of Navarre, Florida, from the state/federal water boundary all the way to the 200-mile outer limit of U.S. waters.

Affected states also closed portions of their state waters – three miles and less from shore – beginning April 30 in Louisiana, June 2 in Alabama, June 4 in Mississippi, and June 14 in Florida.

FIGURE 1
FEDERAL WATERS FISHERY CLOSURE BOUNDARY AS OF JUNE 2, 2010



Source: NOAA Fisheries (2010)

The Federal and state closures had immediate and direct impacts on the livelihoods of commercial fishermen from all of the Gulf states, as their means of earning revenue were immediately stopped or curtailed. For some species fishermen could travel to more distant (more costly) and/or less productive fishing grounds and continue to earn a reduced net income, but for other species this was not an option.

In addition to the immediate impacts of the closures, the massive quantities of oil and dispersants spread through such a vast area of the Gulf are believed to have possibly killed larval and/or juvenile members and/or suppressed the spawning success rate of some species (Upton, 2011). These impacts may affect future landings of those species.

Finally, the State of Louisiana began diverting freshwater from the Mississippi River into the marsh areas on April 30, 2010 in an attempt to keep the oil away from the sensitive estuaries. Additional diversions were opened in the first 10 days of May on both sides of the River, and the diversions continued flowing until August 10, 2010.

The massive amounts of freshwater introduced into the saltwater and brackish estuaries lowered salinity levels to the point that some species were pushed out of these productive spawning and feeding grounds, and killed most of the oysters on beds located in the diversion areas (Buskey, 2012).

While enough time hasn't transpired from the spill to accurately gauge the long-term effects of the spill and response efforts, this study will analyze the immediate loss of income to Gulf commercial fishermen in 2010 from the closures and initial resource mortality from the spill and freshwater diversions, and will attempt to gauge how various species in various areas recovered in 2011 and 2012.

It is beyond the scope of this study to analyze or discuss the myriad biological factors involved in the quantity of commercial landings of the various species either before the Deepwater Horizon spill or since, and the study will not attempt to fix causality on any factor(s).

This study will instead

1. present and analyze the landings of various species in the five Gulf states (Alabama, Florida, Louisiana, Mississippi, and Texas) pre- and post-spill,
2. compare and contrast the estimated impacts on landings between the states and between various basins within Louisiana,
3. utilize these estimated impacts by species and area, combined with analysis and scenario-modeling already done by GO FISH, to analyze the equitability of first-round payments from the Seafood Compensation Program (SCP), and
4. propose modifications for Round 2 SCP payments to remedy any inequalities discovered in Step 3 (if necessary).

Species will be discussed in the order they are presented in the SCP – shrimp, oyster, finfish, and blue crab/other seafood. This study will not analyze or discuss the seafood crew compensation component of the SCP, nor will it analyze losses or compensation of vessel owners vs. vessel lessees vs. boat captains. This study does not measure total economic impacts to the state or regional economy or fishing industry. This study simply analyzes the lost landings and foregone estimated gross and net revenue for each species group compared to the total species compensation outlined in the SCP.

Landings data for all species discussed in this report were obtained from the National Marine Fisheries Service Commercial Fisheries Statistics (NMFS) web page (National Marine Fisheries Service, 2013), the Gulf States Marine Fisheries Commission (GSFMC) online database (Gulf States Marine Fisheries Commission, 2013), or from direct communication with staff of the GSMFC and Louisiana Department of Wildlife and Fisheries (LDWF), and have been converted into uniform product forms:

- Shrimp = whole (head-on, shell-on)
- Oysters = meat weight
- Blue crabs = whole, live
- Finfish = whole (“round”).

SHRIMP

Shrimp are by far the largest fishery in the Gulf of Mexico, four to six times larger (by value) than the oyster, menhaden, or total finfish fisheries in a typical year, and seven to nine times as large as the blue crab fishery.

Gulf-wide Commercial Shrimp Landings (All species)

As illustrated in Table 2 and Figure 2, total Gulf shrimp landings have been trending downward since 2000, but with much year-to-year variation. The 4-year average shown is a moving average of the current year plus the three prior years. Some of the downward trend may be due to effects of a moratorium on shrimping permits in Federal waters beginning in 2002/03.

The decline in landings in 2005 was at least partially due to the powerful hurricanes – Katrina and Rita - that decimated many Gulf coast communities and shrimping fleets.

This was followed by a very strong year in 2006, with landings significantly above the moving average.

The sharp drop in shrimp landings in 2008 was due to a combination of factors, including the massive amounts of freshwater flowing out of and released from the Mississippi River during the floods of June 2008, and a succession of hurricanes and tropical storms (e.g. Gustav, Ike, etc.) in the Gulf from July through September.

The four-year period from 2006-2009 represents the most recent “normal” period for Gulf of Mexico fisheries, falling between Hurricanes Katrina/Rita in 2005 and the 2010 oil spill. Included in this period

were one good year for Gulf shrimp landings (2006), one bad year (2008), and two fairly “normal” years (2007 & 2009).

The 2006-2009 average Gulf-wide shrimp landings were approximately 239 million pounds. Actual landings in 2010 totaled approximately 179 million pounds, a decline of approximately 60 million pounds (25.0 percent) from the 2006-09 average. At the 2006-09 average market price of \$1.53/pound (calculated from volume and value data from National Marine Fisheries Service, 2013), this translates into lost gross revenue of approximately \$91.2 million at the dockside level.

In order to calculate foregone net revenue, trip costs must be subtracted from the estimate of lost gross revenue. The SCP uses estimated trip cost percentages for shrimpers ranging from 39 to 54 percent, depending on vessel size and whether the vessel is an ice or freezer boat. A fixed estimated trip cost percentage of 45 percent will be used as a proxy for all shrimp calculations throughout this report.

Adjusting the estimated 2010 gross shrimp losses of \$91.2 million for the assumed 45 percent trip costs would equal foregone net revenue of approximately \$50.2 million.

Total Gulf-wide commercial landings in 2011 rebounded to approximately 222.3 million pounds, but were still below the 2006-09 4-year average of 238.6 million pounds. Again using the 2006-09 average market price, the 16.3 million pound shortfall would have an estimated gross value of \$24.8 million dollars, and an estimated net value of \$13.7 million after subtracting the 45 percent estimated trip costs.

Although 2012 landings from NMFS were not available, preliminary 2012 total Gulf shrimp landings reported by GSMFC equaled approximately 213.6 million pounds, approximately 24.9 million pounds below the 2006-09 average. This shortfall in landings would have an estimated gross value of \$38.1 million based on the 2006-09 average price. After subtracting 45 percent estimated trip costs, the 2012 estimated foregone net revenue would be \$21.0 million.

Estimated landings reductions and foregone revenue for the Gulf-wide shrimp fishery are summarized in Table 3. The standard deviation of 2006-09 landings is included for informational purposes.

TABLE 2
TOTAL VOLUME OF GULF-WIDE SHRIMP LANDINGS: 2000-2012
(Actual annual landings and 4-yr. moving average)

<u>Year</u>	<u>Actual Landings</u>	<u>4-yr Moving Avg.</u>
2000	288,628,113	252,180,842
2001	257,088,244	263,177,711
2002	233,759,225	255,564,688
2003	256,356,593	258,958,044
2004	255,782,130	250,746,548
2005	216,287,037	240,546,246
2006	288,971,522	254,349,321
2007	225,160,617	246,550,327
2008	188,786,766	229,801,486
2009	251,290,419	238,552,331
2010	178,884,339	
2011	222,307,678	
2012 (Preliminary)	213,615,843	
Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.		
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013.		
These are commercial landings as reported by Gulf states to NMFS and/or GSMFC. They do not include commercial landings kept for home consumption or recreational landings.		

FIGURE 2
GULF-WIDE SHRIMP LANDINGS: VOLUME
 (2000-2012 Actual Annual Landings and 4-yr. Moving Average)

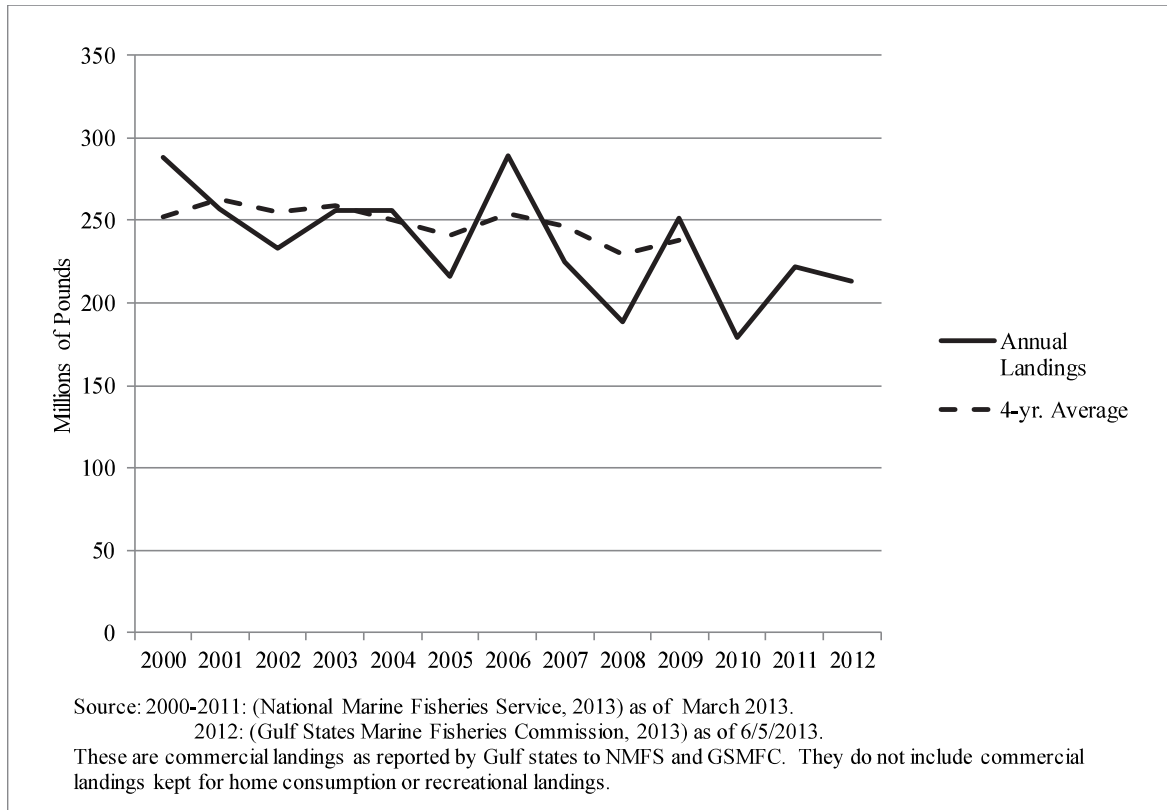


TABLE 3
ESTIMATED LANDINGS REDUCTIONS AND FOREGONE REVENUES – GULF-WIDE
COMMERCIAL SHRIMP FISHERY: 2010-2012.
 (Revenue losses calculated using 2006-09 average price)

Year	Actual Landings	2006-09 Average Landings	Std. Dev. of 2006-09 Landings	Estimated Reduction in Landings	Estimated Foregone Gross Revenue	Estimated Foregone Net Revenue
2010	178,884,339	238,552,331	42,270,175	59,667,992	\$91,207,404	\$50,164,072
2011	222,307,678	238,552,331	42,270,175	16,244,653	\$24,831,280	\$13,657,204
2012	<u>213,615,843</u>	<u>238,552,331</u>	42,270,175	<u>24,936,488</u>	<u>\$38,117,460</u>	<u>\$20,964,603</u>
Totals	614,807,860	715,656,993		100,849,133	\$154,156,145	\$84,785,880

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013.
 These are commercial landings as reported by Gulf states to NMFS and/or GSMFC. They do not include commercial landings kept for home consumption or recreational landings.
 Landings standard deviation, decline, average price, and revenue loss calculations by authors.

Gulf-wide Commercial Brown Shrimp Landings

The two predominant species in the Gulf of Mexico shrimp fishery are northern brown shrimp (brown shrimp) and northern white shrimp (white shrimp), which combined made up 88 percent to 94 percent of the annual value of all Gulf commercial shrimp landings for the period 2000-2012. Brown and white shrimp have differing life cycles which affect when and where they spend the various stages of their development, and thus may differ in their responses to and impacts from the oil spill event.

Table 4 and Figure 3 illustrate 2000-2012 Gulf-wide commercial landings of brown shrimp and the 4-yr. moving average.

The 2006-09 average brown shrimp landings were approximately 115 million pounds. The actual 2010 brown shrimp landings totaled approximately 73 million pounds, a difference of 42 million pounds below the 4-year average.

Using the 2006-09 average brown shrimp dockside price of \$1.38 per pound, the reduction in brown shrimp landings of 42 million pounds represents foregone gross revenue of approximately \$58.2 million. Assuming trip costs of 45 percent, this equals lost net revenue of approximately \$32.0 million at the dockside level.

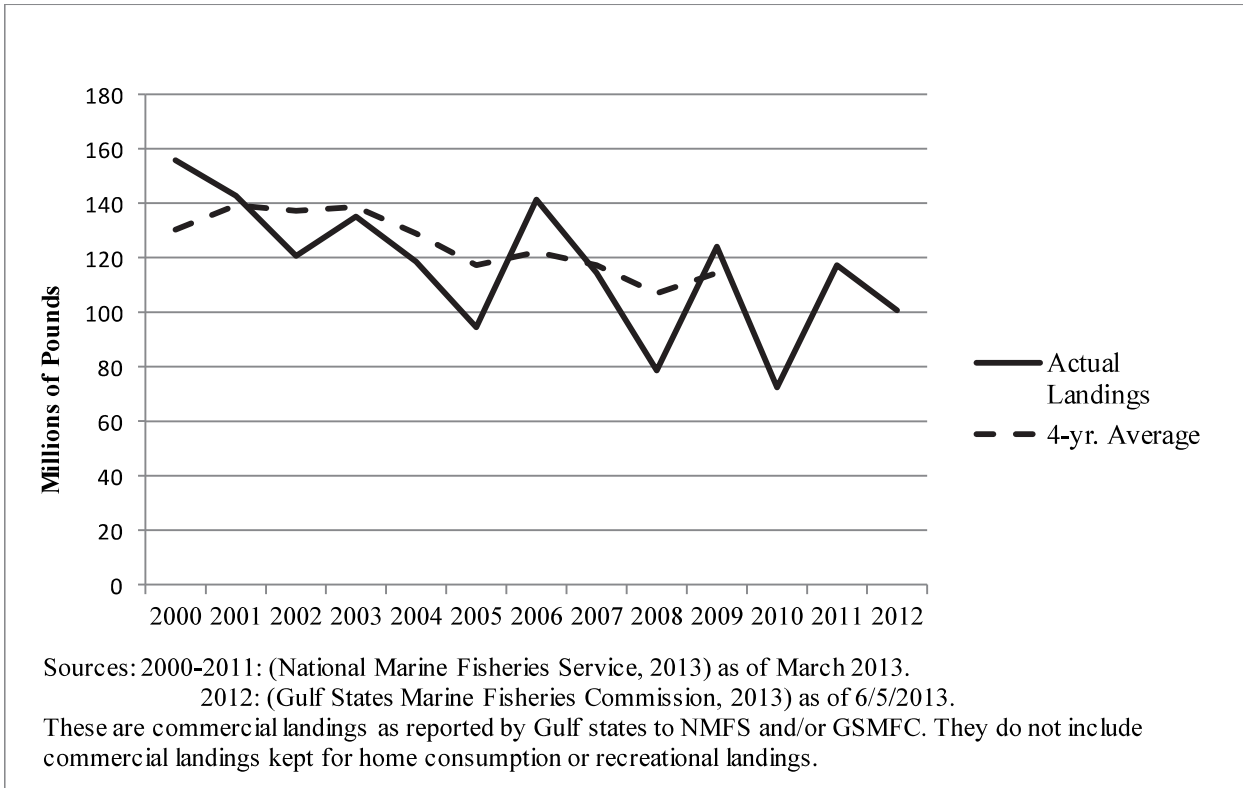
Brown shrimp landings in 2011 were higher than 2006-09 average landings. Landings in 2012 totaled approximately 100.8 million pounds, approximately 14 million pounds below the 2006-09 average of 114.9 million. Using the 2006-09 average price for brown shrimp, this reduction in landings translates to foregone gross and net revenue of approximately \$19.4 and \$10.7 million, respectively.

TABLE 4
TOTAL VOLUME OF GULF-WIDE COMMERCIAL BROWN SHRIMP LANDINGS: 2000-2012
 (Actual landings and 4-yr. moving average)

<u>Year</u>	<u>Actual Landings</u>	<u>4-yr Moving Avg.</u>
2000	155,957,132	130,596,855
2001	143,188,659	139,613,921
2002	120,582,104	137,741,388
2003	135,199,665	138,731,890
2004	118,866,496	129,459,231
2005	94,447,301	117,273,892
2006	141,673,780	122,546,811
2007	114,455,412	117,360,747
2008	79,066,734	107,410,807
2009	124,209,468	114,851,349
2010	72,689,003	
2011	117,802,384	
2012 (Preliminary)	100,830,109	

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013.
 These are commercial landings as reported by Gulf states to NMFS and/or GSMFC. They do not include commercial landings kept for home consumption or recreational landings.

FIGURE 3
GULF-WIDE COMMERCIAL LANDINGS OF BROWN SHRIMP



Gulf-wide Commercial White Shrimp Landings

Table 5 and Figure 4 illustrate the actual Gulf-wide commercial landings of white shrimp for the period 2000-2012 and the 4-year moving average.

The 2009 4-year average landings of white shrimp were just under 112 million pounds, approximately 20 million pounds higher than the 92 million pounds landed in 2010.

At the 2006-09 average market price for white shrimp of \$1.60 per pound, this reduction in landings equates to approximately \$32.3 million of lost gross revenue. Assuming 45 percent trip costs, foregone net revenue in 2010 for the white shrimp fishery was approximately \$17.8 million.

As shown in Table 5 and Figure 4, commercial white shrimp landings continued to be depressed in 2011, declining another 1.6 million pounds to approximately 90 million pounds, almost 22 million pounds below the 2006-09 average. Again using the 2006-09 average white shrimp price of \$1.60 per pound, this translates to lost gross revenue of approximately \$34.9 million at dockside. Assuming trip costs of 45 percent, this would equate to foregone net revenue of approximately \$19.2 million.

Note: The reduction in commercial landings and revenue for the brown and white shrimp fisheries do not sum to the total impacts for “all shrimp” because of increased landings of pink shrimp and rock shrimp in 2010 and 2011. Only Florida fishermen catch significant quantities of these two species, and their landings do not appear to have been impacted.

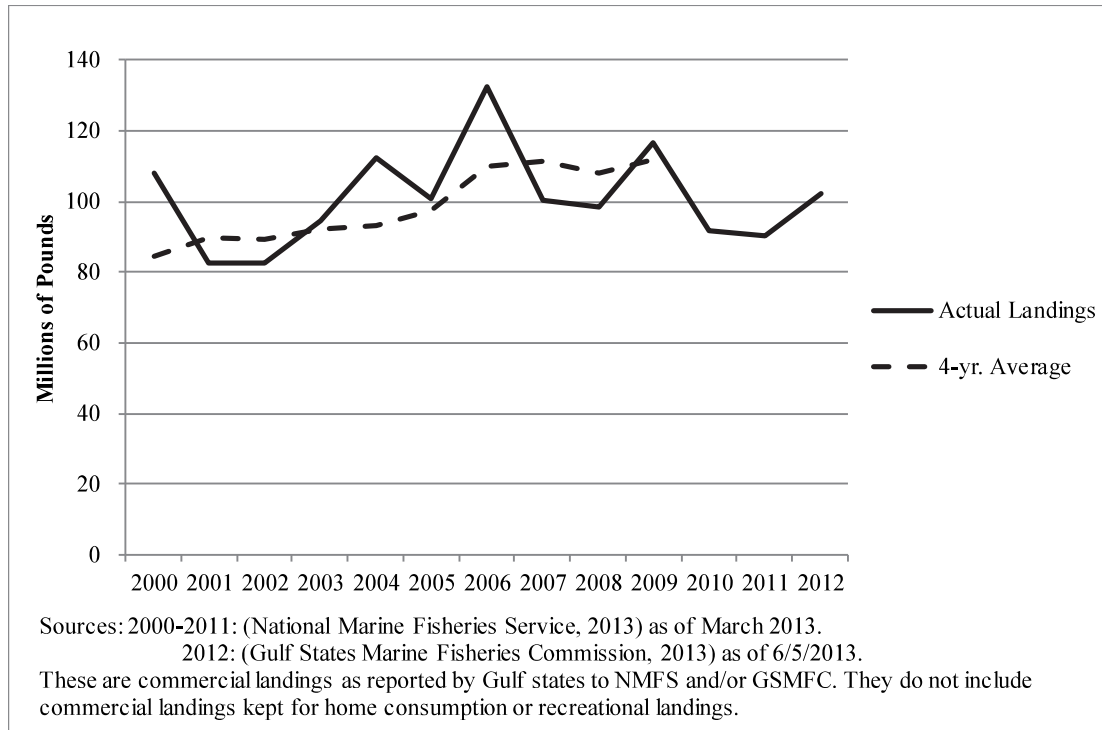
White shrimp landings rebounded somewhat in 2012 to approximately 102 million pounds, approximately 10 million pounds below the 2006-09 average of 112 million. Using the 2006-09 average dockside price, this landings reduction translates to foregone gross revenue of approximately \$16.0 million, and foregone net revenues after trip costs of \$8.8 million.

TABLE 5
TOTAL VOLUME OF GULF-WIDE COMMERCIAL WHITE SHRIMP
LANDINGS: 2000-2012
 (Actual landings and 4-yr. moving average)

<u>Year</u>	<u>Actual Landings</u>	<u>4-yr Moving Avg.</u>
2000	108,158,099	84,413,400
2001	82,337,419	89,933,244
2002	82,721,825	89,475,612
2003	94,308,791	91,881,534
2004	112,072,964	92,860,250
2005	100,729,096	97,458,169
2006	132,594,035	109,926,222
2007	100,355,964	111,438,015
2008	98,294,953	107,993,512
2009	116,599,055	111,961,002
2010	91,848,989	
2011	90,235,175	
2012 (Preliminary)	101,981,999	

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013.
 These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
 They do not include commercial landings kept for home consumption or recreational landings.

**FIGURE 4
GULF-WIDE COMMERCIAL LANDINGS OF WHITE SHRIMP**



Summary of Brown and White Shrimp Foregone Revenues

The estimated foregone revenues for brown and white shrimp, Gulf-wide, are summarized in Table 6. The white shrimp fishery suffered slightly more cumulative losses over the three-year period, accounting for 51.7 percent of combined losses.

**TABLE 6
SUMMARY OF ESTIMATED GULF-WIDE FOREGONE NET REVENUES
FOR THE BROWN AND WHITE SHRIMP FISHERIES: 2010-2012**

<u>Year</u>	Est. Foregone Net Revenue: <u>Brown Shrimp</u>	Est. Foregone Net Revenue: <u>White Shrimp</u>	Est. Foregone Net Revenue: <u>Brown Shrimp + White Shrimp Combined</u>
2010	\$32,027,907	\$17,750,658	\$49,778,565
2011	--	\$19,174,994	\$19,174,994
2012	\$10,650,996	\$8,807,366	\$19,458,362
Total	\$42,678,902	\$45,733,018	\$88,411,920
% of Total	48.3%	51.7%	100.0%

Estimated net losses are somewhat larger than the \$84.8 million shown in Table 3 because a) other shrimp species that showed landings increases in 2010-12 are not included in Table 6 and b) the above-average brown shrimp landings in 2011 are excluded from Table 6.

Shrimp Landings by State

As illustrated by the map in Figure 1, the Federal fishery closures related to the Deepwater Horizon oil spill were primarily located off the coasts of Louisiana, Mississippi, and Alabama. However, because many species migrate during their life cycles, and because shrimpers from all Gulf states may have traditionally shrimped in the affected areas, shrimp landings were analyzed for each Gulf state to ascertain varying impacts (Table 7 and Figure 5).

Commercial shrimp landings in Alabama in 2010 were down 11.7 million pounds (-55 percent) from the 2006-09 average, representing a loss of approximately \$20.9 million of gross revenue based on the average 2006-09 Alabama price (\$1.78/lb). Assuming a trip cost percentage of 45 percent, this equates to a loss of net revenue of approximately \$11.5 million.

Alabama landings in 2011 were down 1.9 million pounds (-9 percent) compared to the 2006-09 average, and landings in 2012 were down even more – off 3.8 million pounds (-18 percent) from the 2006-09 average.

Using the 2006-09 average Alabama shrimp price, these landings declines equate to foregone gross revenue of approximately \$3.3 million in 2011 and \$6.7 million in 2012. After subtracting estimated trip costs, these gross revenue losses would equal foregone net revenue of \$1.8 million and \$3.7 million in 2011 and 2012, respectively.

Landings in Florida actually increased in 2010 and 2011 compared to 2006-09, due to increases in pink and rock shrimp landings. However, Florida commercial shrimp landings declined substantially in 2012 to 9.0 million pounds, 1.9 million pounds under the 2006-09 average of 10.9 million pounds. At Florida's 2006-09 average dockside price of \$2.30 per pound, these foregone landings had a gross value of approximately \$4.3 million, and a net value after estimated trip costs of approximately \$2.4 million.

Louisiana's commercial shrimp landings in 2010 were off approximately 37.7 million pounds (-33 percent) from the 2006-09 average, representing lost gross revenue of approximately \$44.9 million at the 2006-09 Louisiana average price of \$1.19/pound. Assuming trip costs of 45 percent, this decline in landings represents foregone net revenue of approximately \$24.7 million.

Commercial shrimp landings in Louisiana in 2011 were down 20.8 million pounds (-18 percent) from the 2006-09 average. Again using the 2006-09 average market price (\$1.19/lb.), this represents a loss of approximately \$24.8 million of gross dockside revenue, or \$13.6 million of foregone net revenue after subtracting trip costs.

TABLE 7
COMMERCIAL SHRIMP LANDINGS BY STATE FOR THE PERIOD 2000-2012 AND
ESTIMATED 2010-12 REDUCTIONS COMPARED TO 2006-09 AVERAGES

Year	Alabama	FL (West Coast)	Louisiana	Mississippi	Texas
2000	20,103,457	14,905,643	145,384,533	14,814,147	93,420,333
2001	16,565,677	17,471,317	124,812,770	15,948,923	82,289,557
2002	14,857,115	19,128,123	107,794,921	16,821,526	75,157,540
2003	15,769,627	18,130,684	125,730,160	17,560,228	79,165,894
2004	16,064,334	18,258,386	133,369,886	17,992,022	70,097,502
2005	16,260,061	19,297,158	102,575,839	7,848,037	70,305,942
2006	24,201,154	14,175,864	137,838,637	8,379,963	104,375,904
2007	21,247,118	8,627,544	110,859,553	10,421,292	74,005,110
2008	17,154,274	9,941,728	89,268,011	8,570,081	63,852,672
2009	22,840,788	10,673,293	114,726,513	10,106,694	92,943,131
2010	9,625,271	12,892,387	75,500,164	4,134,793	76,731,724
2011	19,502,017	12,644,810	92,376,527	10,045,683	87,738,641
2012	17,603,134	8,992,219	100,674,822	12,987,632	73,358,037
'06 – '09 avg.	21,360,834	10,854,607	113,173,179	9,369,508	83,794,204
'06 – '09 std. dev.	3,053,182	2,370,428	19,896,462	1,043,707	18,264,723
2010 - '06/'09 avg.	(11,735,563)	2,037,780	(37,673,015)	(5,234,715)	(7,062,480)
2011 - '06/'09 avg.	(1,858,817)	1,790,203	(20,796,652)	676,176	3,944,437
2012 - '06/'09 avg.	(3,757,700)	(1,862,388)	(12,498,357)	3,618,125	(10,436,167)
Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013. 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013, except TX = 7/19/2013. These are commercial landings as reported by Gulf states to NMFS and/or GSMFC. They do not include commercial landings kept for home consumption or recreational landings. Landings reductions calculated by authors.					

Louisiana commercial shrimp landings in 2012 (based on GSMFC preliminary data) continued to be depressed, off 12.5 million pounds (-11 percent) from the 2006-09 average. Using the 2006-09 average market price, this equals foregone gross and net revenue of \$14.9 and \$8.2 million, respectively.

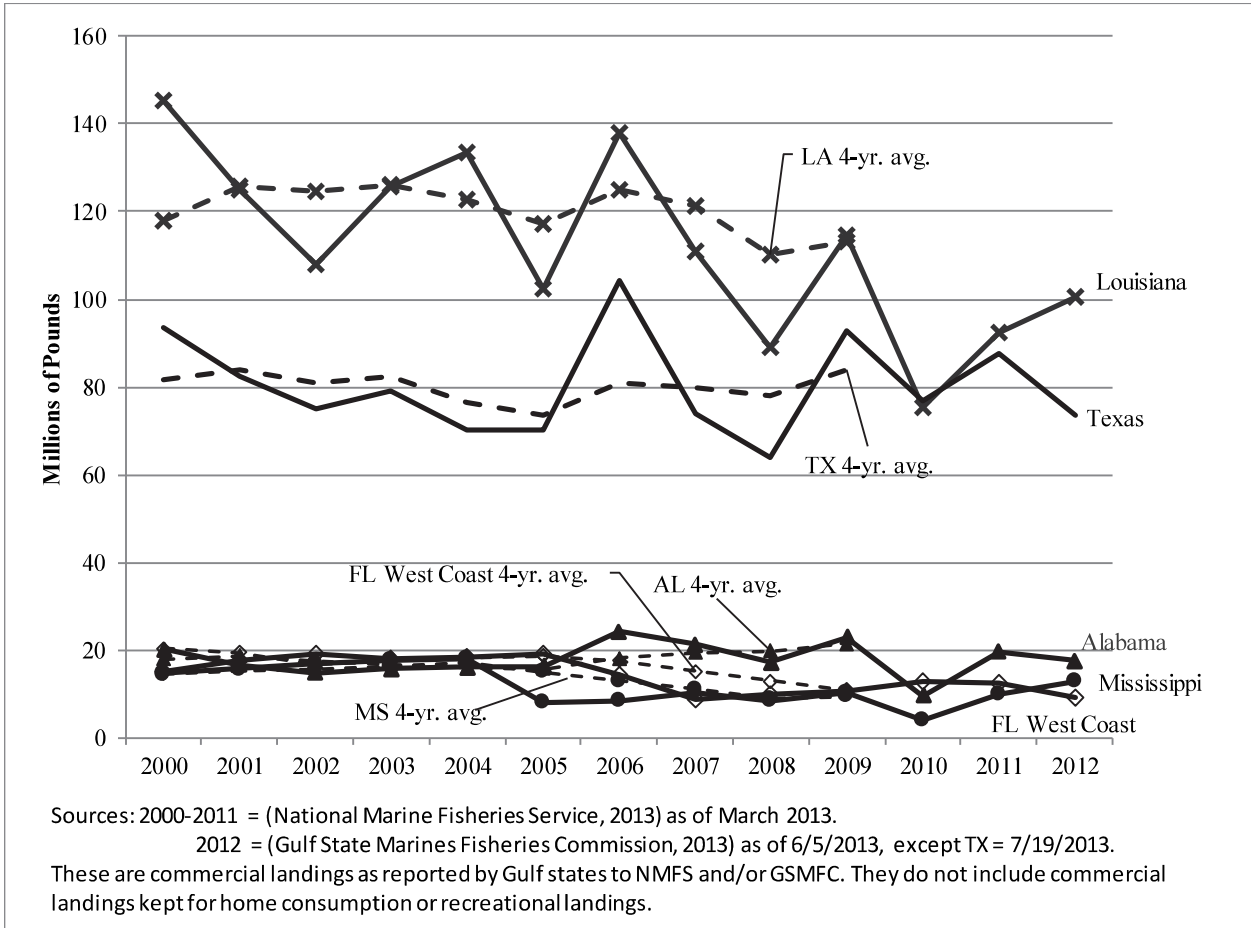
Commercial shrimp landings in Mississippi experienced the largest percentage decline in 2010 among Gulf states, down 5.2 million pounds (-56 percent) from the 2006-09 average. Using Mississippi's 2006-09 average market price (\$1.55/lb) and assumed trip costs of 45 percent, this represents lost gross and net revenue to Mississippi shrimpers of approximately \$8.1 and \$4.5 million, respectively.

Mississippi commercial shrimp landings in 2011 and 2012 rebounded strongly, with landings in both years above the 2006-09 average.

Shrimp landings in Texas in 2010 were down approximately 7.1 million pounds compared to the 2006-09 average, which would translate to a gross dockside value of \$12.8 million using Texas' 2006-09 average price of \$1.82/pound. After subtracting the 45 percent estimated trip costs, this would equate to \$7.1 million of foregone net revenue.

Texas landings rebounded in 2011 to above the 2006-09 average, but 2012 landings declined to 73.3 million pounds, 10.4 million pounds below the 2006-09 average. Again using the 2006-09 Texas average price of \$1.822/pound, this would represent gross and net revenue losses of \$19.0 and \$10.4 million, respectively.

**FIGURE 5
COMMERCIAL SHRIMP LANDINGS BY STATE**



(Note: Only four Texas counties – Chambers, Galveston, Jefferson, and Orange – were included in the SCP. However, landings data by county were not able to be obtained within the time frame allowed for this study, so all analyses will be for the state of Texas as a whole.)

Summing the losses by state (in descending order of cumulative loss) yields the results in Table 8.

Louisiana and Alabama were the only two states reporting landings declines in all three years (2010-2012). Texas reported depressed landings in 2010 and 2012, and Mississippi and Florida each had below-average landings for one of the three years.

**TABLE 8
ESTIMATED 2010-2012 COMMERCIAL SHRIMPING NET REVENUE LOSSES**

<u>State</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>Total by State</u>	<u>% of Total Losses</u>
Louisiana	\$ 24,697,680	\$ 13,633,872	\$ 8,193,675	\$ 46,525,227	53.0%
Texas	\$ 7,057,744		\$ 10,429,169	\$ 17,486,913	19.9%
Alabama	\$ 11,501,891	\$ 1,821,805	\$ 3,682,879	\$ 17,006,575	19.4%
Mississippi	\$ 4,451,887			\$ 4,451,887	5.1%
FL West Coast			\$ 2,353,978	\$ 2,353,978	2.7%
Totals by Year	\$ 47,709,204	\$ 15,455,677	\$ 24,659,700	\$ 87,824,581	100.0%

Louisiana accounted for approximately 53 percent of the total cumulative loss, while Texas and Alabama experienced about 20 and 19 percent, respectively. These three states together represent 92 percent of the estimated losses to commercial shrimpers.

Commercial Shrimp Landings by Louisiana Basin

Because of Louisiana's proximity to the Deepwater Horizon spill site and the length and diverse composition of Louisiana's coastline, the authors felt it worthwhile to analyze impacts on fisheries in various locations off of Louisiana's coast.

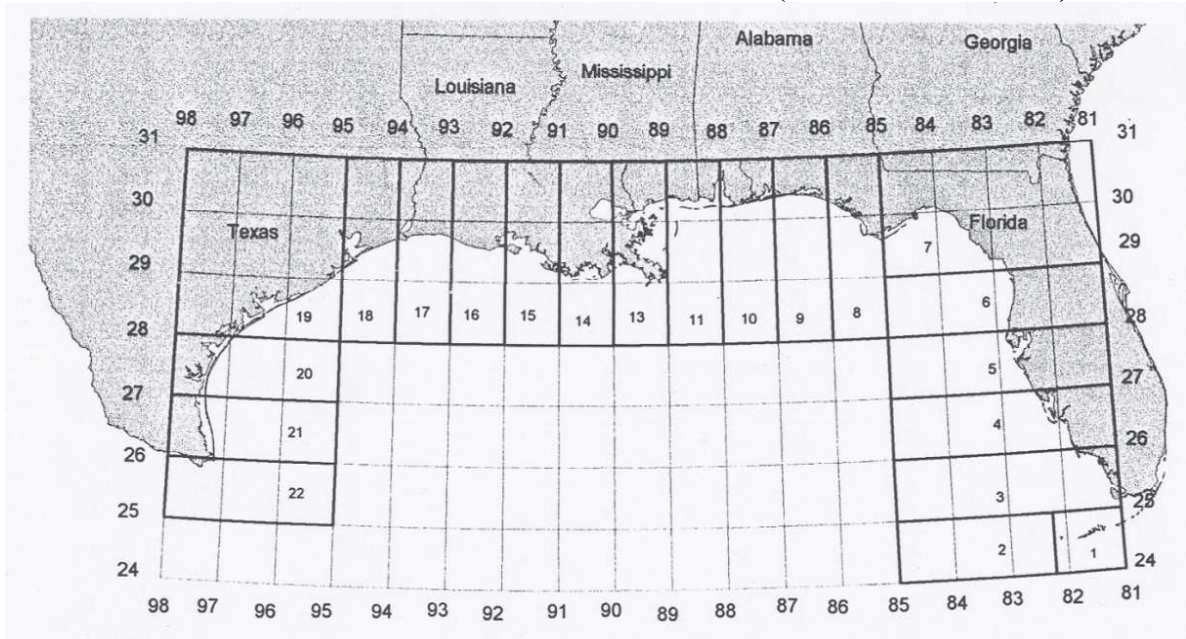
The Louisiana Department of Wildlife and Fisheries (LDWF) collects commercial landings data through its Trip Ticket Program. Seafood dealers submit seafood transaction reports to LDWF based on each trip by commercial fishermen, which include date of transaction, quantity and price of each species purchased by the dealer, condition (whole, headless, etc.), harvest location, and assorted other information.

Locations in Louisiana state waters are designated by river basin (Figure 6) and locations in Federal waters (outside the 3-mile state jurisdiction) are designated by "grid" number (Figure 7).

**FIGURE 6
LOUISIANA RIVER BASINS**



**FIGURE 7
GULF OF MEXICO OFFSHORE GRID BLOCKS (FEDERAL WATERS)**



Commercial landings data for six important species, including brown and white shrimp, by river basin/grid for 2006 through 2012 were obtained by GO FISH and supplied to the authors of this study. At least one month of data was supplied for 13 different river basins and five offshore grid blocks.

However, because LDWF cannot release data for month/location combinations with fewer than three data points - due to confidentiality concerns - some of the basins/grid blocks have multiple month/location combinations for which the landings information cannot be released. These month/location cells are marked “CONFIDENTIAL” in the data, so it is obvious that landings have occurred, but there is no way to determine the quantity or value of those landings.

Because of these missing data points, alternative data for commercial landings by Louisiana basin were obtained from the Gulf States Marine Fisheries Commission for 2006 -2012 (D. Bellais, personal communication, 3/1/2013 (2006-11 data) and 5/2/2013 (2012 data)). These data are on an annual basis, and the landings are reported by fewer geographic areas than the LDWF data.

The GSMFC basins used in this study and the corresponding LDWF basins and grid blocks that make them up are listed in Table 9.

Only brown shrimp and white shrimp, the two primary shrimp species in Louisiana, will be included in the basin analyses.

Estimated 2010 Shrimp Impacts by Basin

As illustrated in Table 10 and Figures 8 and 9, the Atchafalaya–Vermillion–Teche Basin and the Mississippi River–Barataria Basin experienced the greatest declines in brown and white landings in 2010, down 51.8 and 56.9 percent, respectively, from their 2006-09 averages.

Landings in the Terrebonne and Lake Pontchartrain – Pearl River basins were also down in 2010 from the 2006-09 average, but by relatively smaller percentages – 20.6 percent in the Terrebonne Basin and 4.3 percent in the Lake Pontchartrain – Pearl River Basin. Landings in the Mermentau River Basin and Calcasieu – Sabine River Basin increased in 2010 relative to their 2006-09 averages.

**TABLE 9
GSMFC BASIN DESIGNATIONS AND CORRESPONDING LDWF BASINS AND GRID
BLOCKS**

GSMFC Basin	=	LDWF Basin(s)	+ Grid Block
Atchafalaya – Vermilion – Teche River Basin	=	Atchafalaya River Basin + Vermilion – Teche River Basin	+ Grid Block 15
Calcasieu – Sabine River Basin	=	Calcasieu River Basin + Sabine River Basin	+ Grid Block 17
Lake Pontchartrain – Pearl River Basin	=	Lake Pontchartrain Basin + Pearl River Basin	+ --
Mermentau River Basin	=	Mermentau River Basin	+ Grid Block 16
Mississippi River – Barataria Basin	=	Mississippi River Basin + Barataria Basin	+ Grid Block 13
Terrebonne Basin	=	Terrebonne Basin	+ Grid Block 14

**TABLE 10
LOUISIANA COMMERCIAL LANDINGS OF BROWN + WHITE SHRIMP BY BASIN**

Basin	2006-09 Average Landings (lbs.)	2010 Landings	% Diff. 2010 vs. 2006-09 Average	2011 Landings	% Diff. 2011 vs. 2006-09 Average	2012 Landings	% Diff. 2012 vs. 2006-09 Average
Mississippi River - Barataria	49,082,550	23,661,184	-51.8%	33,304,212	-32.1%	33,788,712	-31.2%
Terrebonne	32,987,792	26,186,204	-20.6%	34,163,756	3.6%	35,373,193	7.2%
Atchafalaya - Vermilion - Teche River	15,223,968	6,561,498	-56.9%	9,272,830	-39.1%	13,460,712	-11.6%
Lake Pontchartrain - Pearl River	6,463,002	6,187,274	-4.3%	5,047,772	-21.9%	8,269,836	28.0%
Mermentau River	5,086,815	5,545,480	9.0%	5,065,117	-0.4%	5,863,813	15.3%
Calcasieu - Sabine River	3,472,230	3,785,987	9.0%	2,977,325	-14.3%	2,449,820	-29.4%

Source: D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-2011 data) and 5/2/2013 (2012 data). Commercial landings reported through Louisiana trip-ticket program. No recreational landings or commercial landings kept for home consumption included. Landings change calculations by authors.

Table 11 details the estimated 2010 gains or losses of gross and net revenues by commercial shrimpers in six Louisiana basins based on 2006-09 average basin market prices. The Mississippi River – Barataria Basin sustained 58.4 percent of the estimated loss of net revenue from the four basins with losses, and the Atchafalaya - Vermilion - Teche River Basin accounted for 26.5 percent. The Terrebonne Basin experienced 14.5 percent of total losses and the Lake Pontchartrain - Pearl River Basin the remaining 0.7 percent.

FIGURE 8
LOUISIANA COMMERCIAL BROWN + WHITE SHRIMP LANDINGS BY BASIN:
LINE CHART

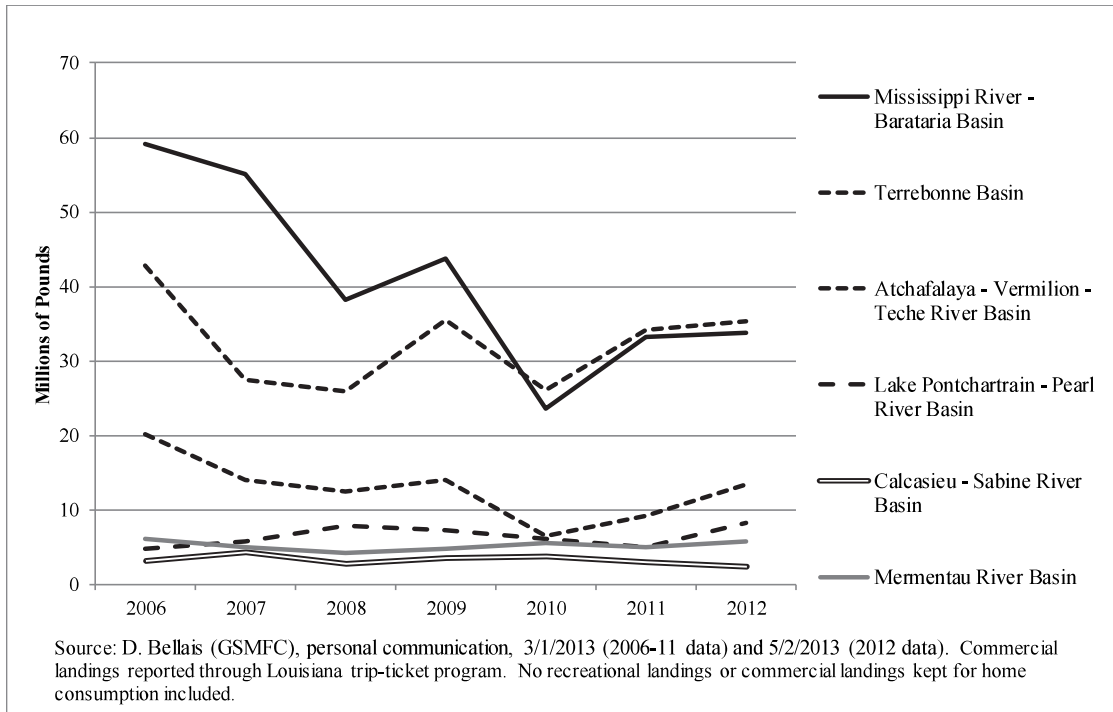


FIGURE 9
LOUISIANA COMMERCIAL BROWN + WHITE SHRIMP LANDINGS BY BASIN:
BAR CHART

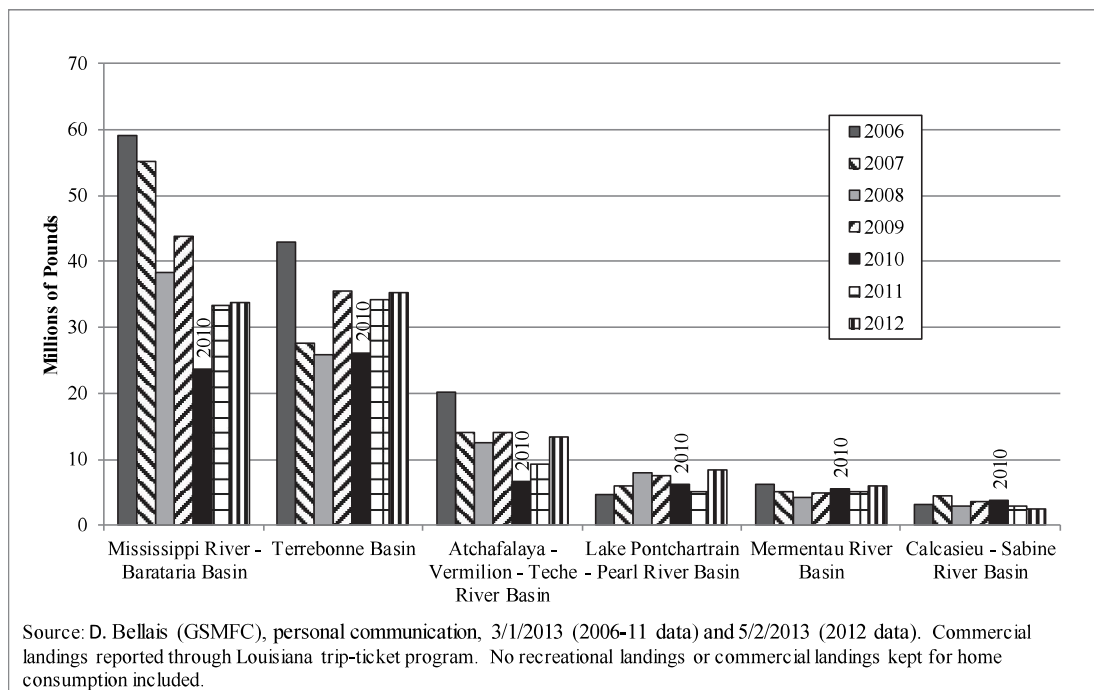


TABLE 11
ESTIMATED FOREGONE GROSS AND NET DOCKSIDE REVENUE FROM
DECREASED COMMERCIAL BROWN + WHITE SHRIMP LANDINGS IN 2010,
BY LOUISIANA BASIN

<u>Basin</u>	2006-09 avg. - 2010 actual <u>landings (lbs)</u>	Avg. basin price/lb. (2006-09)	Gross revenue <u>loss</u>	Net Revenue loss assuming 45% trip costs
Mississippi River - Barataria	25,421,366	\$1.18	\$29,922,792	\$ 16,457,536
Atchaf.- Verm. – Teche River	8,662,469	\$1.56	\$13,549,787	\$ 7,452,383
Terrebonne	6,801,588	\$1.09	\$ 7,417,073	\$ 4,079,390
Lake Pont. - Pearl River	<u>275,728</u>	\$1.22	<u>\$ 336,019</u>	<u>\$ 184,810</u>
Totals	41,161,151		\$51,225,670	\$ 28,174,119

Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013.
Landings decline, average price, and revenue loss calculations by authors.

Estimated 2011 Shrimp Impacts by Basin

Five of the six basins reported 2011 landings of brown and white shrimp below their 2006-09 averages, with the Atchafalaya – Vermillion – Teche River and Mississippi River – Barataria basins showing the largest reductions -- 39.1 and 32.1 percent, respectively.

The Mermentau River and Calcasieu – Sabine River basins, who had reported 2010 landings higher than their 2006-09 averages, both had below-average landings in 2011.

The Terrebonne Basin moved from a landings deficit in 2010 to 2011 landings that were above its 2006-09 average, the only basin reporting above-average landings in 2011.

Estimated gross and net revenue losses for 2011 by basin are detailed in Table 12.

The Mississippi River – Barataria Basin again displayed the largest estimated losses in 2011, approximately \$18.6 million of gross revenue and \$10.2 million of net revenue after trip costs. This represents approximately 61.8 percent of the total losses from basins reporting declines.

The Atchafalaya – Vermilion – Teche River Basin had estimated net losses in 2011 of approximately \$5.1 million – 31.0 percent of losses.

These two basins accounted for almost 93 percent of estimated losses.

Estimated 2012 Shrimp Impacts by Basin

Three basins reported 2012 landings that were below their 2006-09 averages (Table 13).

The Mississippi River – Barataria Basin reported 2012 landings approximately 15.3 million pounds below its 2006-09 average, representing foregone gross and net dockside revenues of \$18.0 million and \$9.9 million, respectively, using the 2006-09 average basin price of \$1.18/pound. This represents over 83 percent of the total losses from the basins reporting below-average landings.

The Atchafalaya – Vermilion – Teche River Basin reported landings approximately 1.8 million pounds below average, representing foregone gross and net revenue of \$2.8 and \$1.5 million, respectively, accounting for approximately 13 percent of losses from the basins reporting below-average landings.

The Calcasieu – Sabine River Basin reported 2012 commercial shrimp landings approximately 1.0 million pounds below its 2006-09 average, yielding estimated gross and net dockside revenue losses of \$0.9 and \$0.5 million.

Note that the sum of landings, landings deficits, and foregone revenues shown in Tables 10-13 are different from the totals shown for all of Louisiana in Tables 7 and 8. Tables 7 and 8 include all shrimp

species (not just brown and white), are based on a different data set than Tables 10-13, and include basins where landings may have increased.

TABLE 12
ESTIMATED FOREGONE GROSS AND NET REVENUE FROM DECREASED
COMMERCIAL BROWN + WHITE SHRIMP LANDINGS IN 2011,
BY LOUISIANA BASIN

<u>Basin</u>	2006-09 avg. -2011 actual <u>landings (lbs)</u>	Avg. basin price/lb. (2006-09)	Gross <u>revenue loss</u>	Net Revenue loss assuming <u>45% trip costs</u>
Mississippi River - Barataria	15,778,338	\$1.18	\$ 18,572,248	\$ 10,214,737
Atchaf. – Verm. - Teche River	5,951,137	\$1.56	\$ 9,308,736	\$ 5,119,805
Lake Pont. - Pearl River	1,415,230	\$1.22	\$ 1,724,683	\$ 948,575
Calcasieu - Sabine River	494,906	\$0.86	\$ 424,037	\$ 233,220
Mermentau River	<u>21,698</u>	\$1.38	<u>\$ 29,968</u>	<u>\$ 16,482</u>
Totals	23,661,308		\$ 30,059,672	\$ 16,532,820

Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013.
Landings decline, average price, and revenue loss calculations by authors.

TABLE 13
ESTIMATED FOREGONE GROSS AND NET REVENUE FROM DECREASED
COMMERCIAL BROWN + WHITE SHRIMP LANDINGS IN 2012,
BY LOUISIANA BASIN

<u>Basin</u>	2006-09 avg. - 2012 actual <u>landings (lbs)</u>	Avg. basin price/lb. (2006-09))	Gross <u>revenue loss</u>	Net revenue loss assuming <u>45% trip costs</u>
Miss. River - Barataria	15,293,838	\$1.18	\$ 18,001,957	\$ 9,901,076
Atchaf. – Verm. - Teche River	1,763,256	\$1.56	\$ 2,758,075	\$ 1,516,941
Calcasieu - Sabine River	<u>1,022,411</u>	\$0.86	<u>\$ 876,005</u>	<u>\$ 481,803</u>
Totals	18,079,505		\$ 21,636,037	\$ 11,899,820

Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-11 data) and 5/2/2013 (2012 data).
Landings decline, average price, and revenue loss calculations by authors.

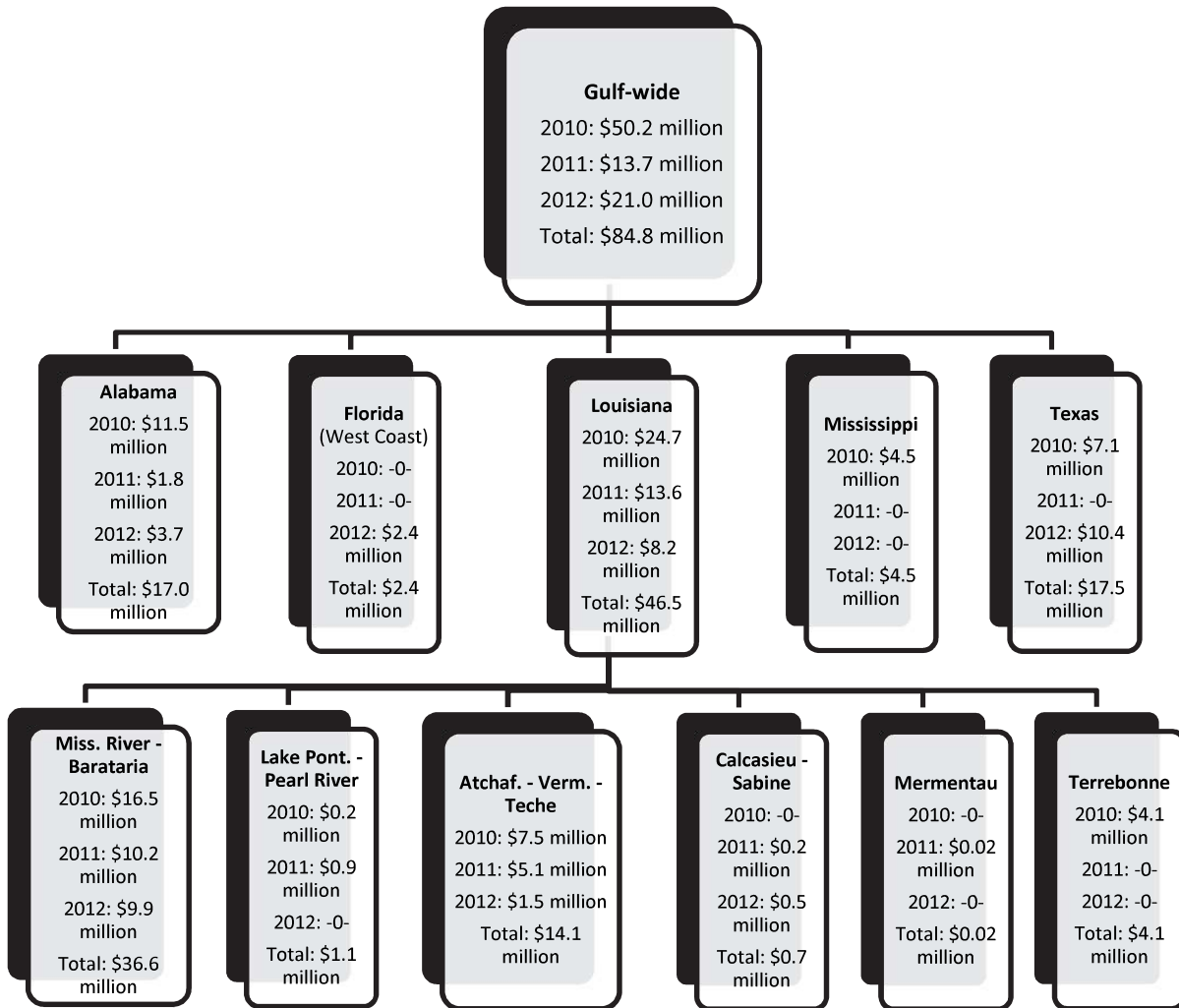
Summary of Estimated Shrimp Losses

Estimated net revenue losses by location and year are summarized in Figure 10.

Due to the inclusion of state/basin landings increases at the higher (more aggregated) levels, losses at the lower levels of the diagram cannot be summed to equal the losses at higher levels. This illustrates how analysis solely at aggregated geographic levels can mask revenue losses at finer geographies.

Cumulative 2010-12 losses analyzed by the six impacted Louisiana basins totaled approximately \$57 million, compared to \$47 million when the state is analyzed as a whole (Table 8). The Mississippi River – Barataria Basin suffered the brunt of the landings declines, accounting for 64.6 percent (\$36.6 million) of the total losses. The Atchafalaya-Vermilion-Teche River Basin was the second most-impacted, with cumulative losses of \$14.1 million, or 24.9 percent of the total. Combined, these two basins accounted for almost 90 percent of estimated shrimping losses.

FIGURE 10
SUMMARY OF ESTIMATED FOREGONE NET REVENUE FROM COMMERCIAL SHRIMPING: 2010-2012



Re-Allocation of Shrimping Effort & Landings per Trip

The number of trip-tickets by basin and offshore grid block were obtained from LDWF by GO FISH for the period 2006-2012 to analyze any geographic re-allocation of effort as a result of the 2010 oil spill, and also to gain some insight into possible spill impacts on catch per unit effort (CPUE).

While number of trip tickets is an inexact approximation of effort without accompanying measures of hours or days per trip, the authors felt that number of trips could serve as a useful proxy for measuring shifts in effort, and that average volume landed per trip ticket could give some indication of trends in CPUE.

The locations of the various river basins are illustrated in Figure 6 and the offshore grid block designations used by LDWF are illustrated in Figure 7.

The number of shrimp trip tickets reported for each basin or grid block are shown in Table 14 in descending order of 2006-09 average number of trips.

There were only 24-27 percent as many shrimping trips that reported harvesting shrimp in Block 13 in 2011 and 2012 as the average number of trips reporting harvesting trips in the 2006-09 period, while there were 43 percent more in 2012 in the Lake Pontchartrain basin.

TABLE 14
NUMBER OF SHRIMP TRIP TICKETS REPORTING EACH BASIN/OFFSHORE GRID
BLOCK AS PRIMARY HARVEST LOCATION

<u>Basin/Grid block</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	2006-09	<u>2010</u>	<u>2011</u>	<u>2012</u>
					<u>Avg.</u>			
Terrebonne	20,718	17,522	12,072	17,305	16,904	15,526	18,176	16,825
Barataria	16,029	16,958	11,930	14,190	14,777	8,626	14,681	12,969
Lake Pontchartrain	3,286	4,956	6,393	7,036	5,418	4,831	6,101	7,742
Calcasieu River	4,123	4,687	3,736	3,623	4,042	4,553	3,813	3,263
Mississippi River	4,325	2,858	2,615	2,739	3,134	1,234	3,001	3,278
Louisiana Grid 13	1,733	2,162	1,587	1,880	1,841	119	443	506
Vermilion-Teche River	1,452	2,014	1,533	1,589	1,647	2,262	2,056	1,540
Louisiana Grid 15	1,790	1,612	1,478	1,506	1,597	872	1,039	1,595
Louisiana Grid 14	1,423	961	776	726	972	332	614	731
Mermentau River	271	217	163	427	270	138	313	239
Louisiana Grid 16	400	156	160	232	237	242	150	263
Atchafalaya River	171	178	92	97	135	83	70	198
Sabine River	*	22	8	45	19	146	65	11
Louisiana Grid 17	35	19	*	*	14	32	2	*
Other/Unknown	<u>7</u>	<u>*</u>	<u>*</u>	<u>21</u>	<u>7</u>	<u>19</u>	<u>7</u>	<u>8</u>
Total	55,763	54,322	42,543	51,416	51,011	39,015	50,531	49,168

Source: Louisiana Department of Wildlife and Fisheries, personal communication, 5/5/2013.
* Not reportable due to confidentiality restrictions.

In order to calculate the average volume of shrimp landed per trip, the basin/grid blocks used by LDWF on the trip tickets had to be matched to the basin designations used in the landings data from GSFMC. As shown in Table 15, shrimp landings per trip in 2011 and 2012 were lower than the 2006-09 average for several of the basins.

Table 16 helps to illustrate the various reasons behind the decreased shrimp landings per trip (CPUE) for some of the basins.

Landings per trip for 2011 and 2012 in the Mississippi River – Barataria/Grid 13 basin were 74 and 82 percent, respectively, of the 2006-09 average, because total landings were only 68-69 percent of their 2006-09 average, while the number of trips in 2011 and 2012 were 92 and 85 percent, respectively, of the 2006-09 average. Effort declined less than catch, thus CPUE declined.

In the Lake Pontchartrain – Pearl River basin, 2012 total volume of landings (catch) was 128 percent of the 2006-09 average, but the number of trips (effort) was 143 percent of the 2006-09 average. Effort increased more than catch, so CPUE declined.

In the Mermentau/Grid 16 basin, volume of landings in 2012 was over the 2006-09 average, while the number of trips was slightly lower. Catch increased while effort decreased, so CPUE was higher in 2012 than the 2006-09 average.

TABLE 15
AVERAGE POUNDS OF SHRIMP LANDED PER TRIP TICKET BY GSFMC BASIN

<u>Basin/Grid block</u>	2006-09					<u>2010</u>	<u>2011</u>	<u>2012</u>
	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Avg.</u>			
Terrebonne/Grid 14	1,939	1,491	2,020	1,970	1,855	1,651	1,818	2,015
Miss. River – Barataria/Grid 13	2,678	2,508	2,375	2,326	2,472	2,371	1,837	2,017
Lake Pont. & Pearl River	1,445	1,186	1,225	1,051	1,227	1,281	827	1,068
Calc.-Sabine/Grid 17	753	919	776	956	851	800	767	748
Verm-Teche/Grid 15	6,216	3,882	4,170	4,559	4,707	2,094	2,996	4,294
Mermentau/Grid 16	<u>9,332</u>	<u>13,493</u>	<u>13,153</u>	<u>7,290</u>	<u>10,817</u>	<u>14,593</u>	<u>10,940</u>	<u>11,681</u>
Overall	2,453	2,069	2,163	2,127	2,203	1,848	1,780	2,026

Sources: Number of trip tickets – Louisiana Department of Wildlife and Fisheries, personal communication, 5/5/2013.
Volume of landings – D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-2011 data) and 5/2/2013 (2012 data).
Landings per trip ticket calculated by authors.

TABLE 16
PERCENTAGE OF 2010, 2011, AND 2012 TOTAL BASIN VOLUME OF COMMERCIAL SHRIMP LANDINGS, NUMBER OF TRIPS, AND LANDINGS PER TRIP VS. 2006-09 AVGS.

<u>Basin/Grid block</u>	Volume Landed			Number of Trips			Landings/Trip		
	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Terrebonne/Grid 14	79%	104%	107%	89%	105%	98%	89%	98%	109%
Miss. River – Barataria/ Grid 13	48%	68%	69%	51%	92%	85%	96%	74%	82%
Lake Pont. & Pearl River	96%	78%	128%	89%	113%	143%	104%	67%	87%
Calc.- Sabine/Grid 17	109%	86%	71%	116%	95%	80%	94%	90%	88%
Verm – Teche/Grid 15	43%	61%	88%	97%	95%	97%	44%	64%	91%
Mermentau/Grid 16	109%	100%	115%	75%	91%	99%	135%	101%	108%
Overall	64%	80%	88%	76%	99%	96%	84%	81%	92%

Sources: Number of trip tickets – Louisiana Department of Wildlife and Fisheries, personal communication, 5/5/2013.
Volume of landings – D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-2011 data) and 5/2/2013 (2012 data).
Landings per trip ticket and all percentages calculated by authors.

Shrimpers who have always fished in the basins now drawing “outside” shrimpers face increased competition for the shrimp in their home basins, leading to reduced catch per trip (CPUE), even though total basin landings may be unchanged or increase.

The geographic shifts in effort have likely meant longer travel times for those shrimpers traveling to new basins, leading to higher fuel and labor costs per trip. Shrimpers who have had to relocate to different home ports in new fishing areas may also have faced additional costs for dockage, lodging, food, etc.

OYSTERS

The Gulf of Mexico commercial oyster fishery provides the majority of oysters harvested in the United States (based on data from National Marine Fisheries Service, 2013).

The Gulf states typically harvest 85 - 90 percent of all Eastern oysters landed in the U.S., and Eastern oysters make up approximately two-thirds of total U.S. oyster landings (with volumes approximately twice those of the Pacific oyster), which means the Gulf states provide approximately 55 – 60 percent of the total domestic oyster harvest (based on data from National Marine Fisheries Service, 2013).

While oysters are mobile in their larval stage, they soon attach to fixed substrates and are sedentary for the remainder of their life cycle. This makes them particularly susceptible to water quality issues or changes in salinity.

Gulf-wide Commercial Oyster Landings

As shown in Table 17 and Figure 11, Gulf-wide commercial oyster landings fluctuated within a range of 24 to 27 million pounds from 2000-2004, then declined somewhat to a range of 20 to 23 million pounds annually from 2005-2009.

The 2006-09 average landings were approximately 21.4 million pounds. Actual 2010 Gulf-wide commercial oyster landings equaled 15.8 million pounds, a decline of 5.6 million pounds from the 4-year average. Given that the depressed landings led to higher market prices for Gulf oysters, the 2006-09 average price will be used for all loss calculations. Multiplying the 5.6 million reduction in pounds landed in 2010 by the 2006-09 average market price of \$3.10 per pound yields an estimate of foregone gross revenue of \$17.4 million.

To calculate net revenue losses, gross revenue must be reduced by average trip costs. The SCP uses an oyster variable trip cost estimate of 12 percent.

Based on the \$17.4 million of gross revenue lost in 2010, and using the oyster trip cost percentage of 12 percent, the estimated foregone net revenue in 2010 for Gulf of Mexico oyster harvesters was approximately \$15.3 million.

Actual 2011 Gulf commercial oyster landings rebounded somewhat to approximately 18.4 million pounds, but were still 3.1 million pounds below the 2006-09 average. Using the 2006-09 average price of \$3.10/pound, this reduction in landings equals foregone gross and net revenue of \$9.5 and \$8.3 million, respectively, in 2011.

Based on GSMFC data, Gulf-wide oyster landings in 2012 increased to 20.1 million pounds, approximately 1.3 million pounds below the average of 2006-09.

Based on the 2006-09 average price of \$3.10 per pound, the 1.3 million pounds of lost landings in 2012 would equate to foregone gross and net revenues of \$4.1 and \$3.6 million, respectively.

Landings reductions and estimated foregone revenues are summarized in Table 18. Total estimated Gulf-wide landings reductions for 2010-2012 equal approximately 10 million pounds of oyster meats, with a gross dockside value of almost \$31 million. After subtracting estimated variable trip costs, net revenue losses total approximately \$27.2 million.

Commercial Oyster Landings by State

Louisiana is by far the largest producer of oysters among the Gulf states, contributing between 49 and 66 percent of the total Gulf harvest from 2000-2009 (based on data from National Marine Fisheries Service, 2013). Texas produced from 12 to 25 percent over the same period, while the west coast of Florida accounted for 7 to 13 percent.

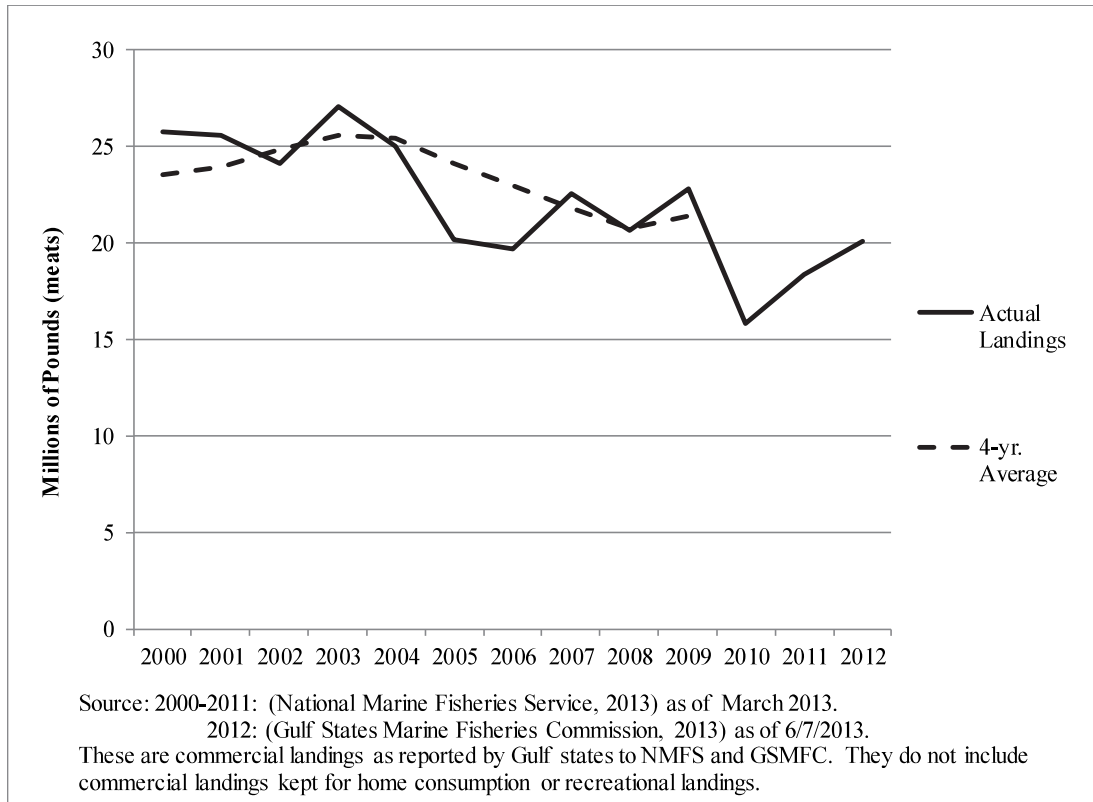
Mississippi produced up to 15 percent of Gulf landings in earlier years (2003), but had no commercial oyster landings in 2006, following the devastation of Hurricane Katrina in 2005. Alabama has been the smallest producer of oysters among Gulf states over the last decade, contributing a maximum of five percent of the total harvest in 2005, but Alabama’s harvest declined to very small amounts (less than 0.5 percent) in 2008 and 2009 for reasons unrelated to the oil spill (Johnson, 2017).

TABLE 17
TOTAL VOLUME OF GULF-WIDE OYSTER LANDINGS: 2000-2012
 Actual landings and 4-yr. moving average

<u>Year</u>	<u>Actual Landings (lbs. of meats)</u>	<u>4-yr Moving Avg.</u>
2000	25,766,524	23,578,704
2001	25,620,520	23,990,869
2002	24,110,188	24,878,343
2003	27,032,548	25,632,445
2004	25,051,863	25,453,780
2005	20,174,364	24,092,241
2006	19,673,937	22,983,178
2007	22,518,049	21,854,553
2008	20,654,719	20,755,267
2009	22,832,768	21,419,868
2010	15,817,743	
2011	18,368,340	
2012	20,103,110	

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/7/2013.
 These are commercial landings as reported by Gulf states to NMFS and GSMFC. They do not include commercial landings kept for home consumption or recreational landings.

**FIGURE 11
GULF-WIDE COMMERCIAL OYSTER LANDINGS**



**TABLE 18
ESTIMATED GULF-WIDE COMMERCIAL OYSTER LANDINGS REDUCTIONS
AND FOREGONE REVENUES: 2010-2012**

<u>Year</u>	<u>Std. Deviation of 2006-09 Landings</u>	<u>2006-09 Avg. Landings - Actual Landings</u>	<u>2006-09 Average Price/Pound</u>	<u>Estimated Foregone Gross Revenue</u>	<u>Estimated Foregone Net Revenue</u>
2010	1,509,527	5,602,125	\$3.10	\$17,354,950	\$15,272,356
2011	1,509,527	3,051,528	\$3.10	\$9,453,398	\$8,318,990
2012	1,509,527	<u>1,316,758</u>	\$3.10	<u>\$4,079,214</u>	<u>\$3,589,709</u>
Total		9,970,412		\$30,887,563	\$27,181,055

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/7/2013.
These are commercial landings as reported by Gulf states to NMFS and GSMFC. They do not include commercial landings kept for home consumption or recreational landings.
Landings decline, average price, and revenue loss calculations by authors.

As detailed in Table 19 and illustrated in Figure 12, any effect of the oil spill on Alabama oyster landings cannot be discerned. Alabama's landings in 2010-12 were higher than the very low landings in 2008 and 2009.

Note that 2008-09 averages are used in Table 19 and Figure 12 for Alabama and Mississippi, rather than the 2006-09 averages used for the other three states, because of anomalies in prior year landings in

Alabama and Mississippi caused by meteorological events such as hurricanes, tropical storms, flooding, drought conditions, etc.

Alabama's oyster fishery collapsed in 2008 and 2009, down over 90 percent from 2007 landings. Because of this severe decline, including 2007 and earlier landings in Alabama's prior years' average would have been misleading. The opposite situation exists in Mississippi's landings, which went to zero in 2006 following Hurricane Katrina. The oyster fishery was just barely starting recovery in 2007, but was fairly strong in 2008 and 2009, so including 2006-2007 landings in the Mississippi prior-year average would artificially depress the trend of their landings.

Louisiana experienced the largest absolute and percentage decline in 2010, down 6.2 million pounds (47 percent) from its 2006-09 average. Mississippi's 2010 commercial oyster landings declined approximately 950,000 pounds (39 percent) from its 2008-09 average, and Florida's Gulf-coast oyster landings were off approximately 500,000 pounds (19 percent) from its 2006-09 average.

Texas' oyster landings in 2010 were substantially higher than the state's 2006-09 average. Florida's commercial oyster landings were very close to average in 2011 and 2012 - two percent over and two percent under the 2006-09 average, respectively. Louisiana's landings partially recovered in 2011 and 2012, but were still down 1.8 – 1.9 million pounds (14 percent) from the 2006-09 average.

Mississippi's commercial oyster landings plummeted in 2011, down from 2.2 million pounds in 2009 and 1.5 million pounds in 2010 to approximately 250,000 pounds in 2011. Mississippi's landings increased in 2012, but were still 82 percent below its 2008-09 average.

At the 2006-09 Louisiana average market price of \$3.19 per pound of oyster meats, the estimated 6.2 million pounds of harvest decline in 2010 would have a gross value of approximately \$19.6 million.

A large (and increasing) proportion of Louisiana's oysters are harvested from private leases. The SCP uses a standard percentage of 33 percent to represent the leaseholders' share of the harvest. Accordingly, leaseholders bear a share of the "cost" of reduced landings. This leaseholder share of foregone revenue will be calculated in a later section.

According to data from LDWF (Patrick Banks (LDWF), personal communication, 4/5/2013) approximately 71 percent of Louisiana oysters in 2010 were harvested on private grounds (see Table 29). Multiplying 71 percent by the 33 percent leaseholder share cost rate results in an estimated leaseholder share rate of approximately 23 percent ($.71 \times .33 = .2343$) for all oyster landings. Combining this 23 percent with the 12 percent estimated variable trip costs yields a total variable cost rate of 35 percent for all Louisiana oyster harvesters.

TABLE 19
COMMERCIAL OYSTER LANDINGS (LBS. OF MEATS) AND ESTIMATED 2010-2012
REDUCTIONS COMPARED TO 2006-09 AVERAGES (*2008-09 averages for
AL/MS)

Year	Alabama	FL – West Coast	Louisiana	Mississippi	Texas
2000	791,908	2,520,120	12,718,438	3,548,240	6,187,818
2001	574,902	2,559,242	15,132,631	2,653,270	4,700,475
2002	759,194	1,943,608	13,961,579	2,737,839	4,707,968
2003	815,530	1,752,848	13,608,565	4,042,136	6,813,469
2004	908,181	1,643,552	13,901,869	3,029,391	5,568,870
2005	1,041,332	1,416,522	12,098,654	610,384	5,007,472
2006	939,662	2,394,096	11,417,297	0	4,922,882
2007	768,823	2,959,059	12,857,667	299,088	5,633,412
2008	72,776	2,501,475	12,790,912	2,610,349	2,679,207
2009	22,976	2,876,952	15,010,250	2,189,440	2,733,150
2010	119,787	2,164,858	6,867,406	1,452,712	5,265,189
2011	313,215	2,746,181	11,135,298	247,384	3,943,434
2012	267,638	2,628,622	11,183,478	425,496	5,597,876
2006-'09 avg.*	47,876	2,682,896	13,019,032	2,399,895	3,992,163
2006-'09 std. dev.*	35,214	277,034	1,484,204	297,628	1,513,154
2010 - '06/'09 avg.*	71,911	(518,038)	(6,151,626)	(947,183)	1,273,026
2011 - '06/'09 avg.*	265,339	63,286	(1,883,734)	(2,152,511)	(48,729)
2012 - '06/'09 avg.*	219,762	(54,274)	(1,835,553)	(1,974,399)	1,605,713
Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013. 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/7/2013. These are commercial landings as reported by Gulf states to NMFS and GSMFC. They do not include commercial landings kept for home consumption or recreational landings. * 2008-09 average landings and standard deviations for AL and MS. Landings reductions and statistics calculated by authors.					

Using the estimated Louisiana oyster variable costs percentage of 35 percent, this would translate to foregone net revenue to Louisiana oyster harvesters of \$12.7 million (\$19.6 million * .65 = \$12.74 million). The 23 percent overall leaseholder share would equal \$4.5 million (\$19.6 million gross loss * .23 = \$4.508 million).

The 1.9 million pound estimated harvest decline in Louisiana in 2011 (see Table 19) would equal foregone gross revenue of approximately \$6.0 million using the 2006-09 average price.

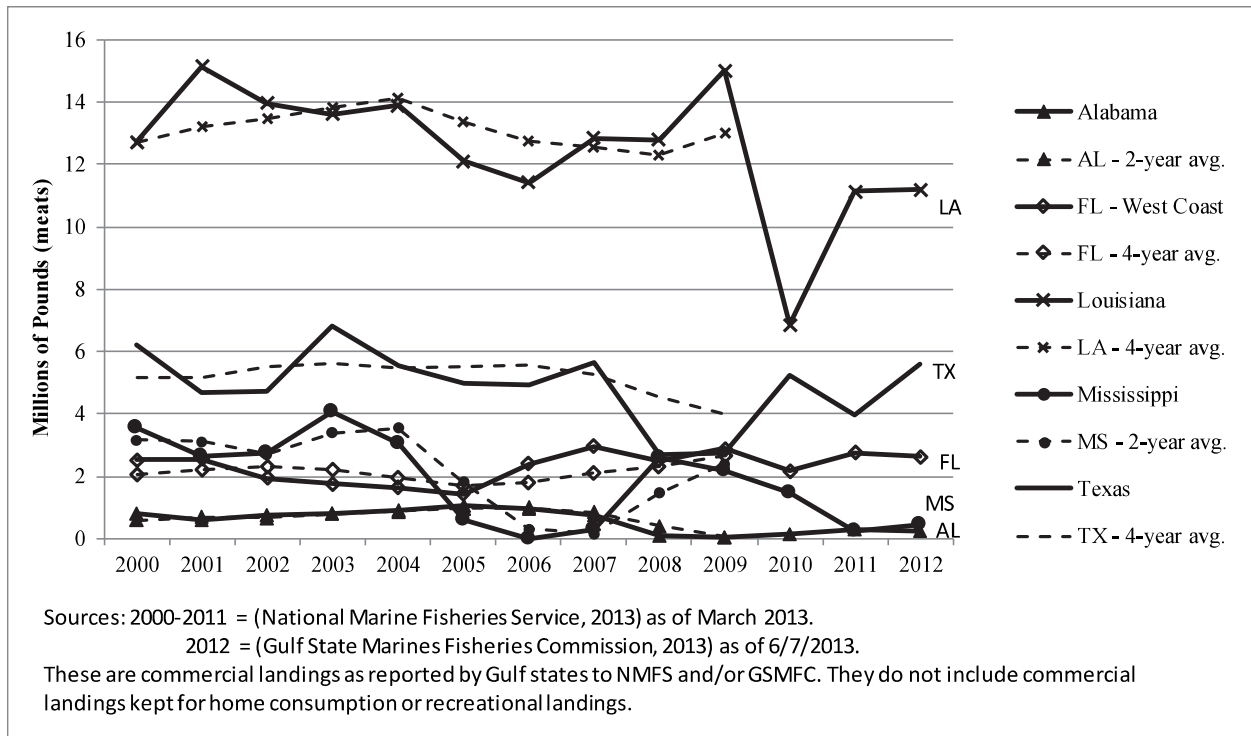
According to data from LDWF (Patrick Banks (LDWF), personal communication, 4/5/2013), approximately 81 percent of Louisiana oysters landed in 2011 came from private leases. Multiplying 81 percent times the 33 percent leaseholder share rate gives an estimated overall leaseholder share rate of 27 percent. Added to the 12 percent estimated trip costs results in estimated total variable costs of 39 percent.

This lost gross revenue estimate, reduced by 39 percent variable costs, would yield estimated 2011 Louisiana foregone net revenue of \$3.7 million. The 27 percent overall leaseholder share would equal \$1.6 million.

Louisiana's estimated loss of 1.8 million pounds of oyster harvest in 2012 would have a gross value of \$5.8 million using the 2006-09 average price of \$3.19 per pound.

Preliminary trip-ticket data from LDWF shows that approximately 96 percent of Louisiana oyster landings in 2012 came from private leases. Applying this harvest share to the 33 percent standard leaseholder percentage yields an overall Louisiana leaseholder cost share estimate of approximately 32 percent. Combining this leaseholder share with the 12 percent trip cost estimate results in a total variable cost estimate of 44 percent.

**FIGURE 12
COMMERCIAL OYSTER LANDINGS BY STATE: 2000 - 2012**



Using this 44 percent variable cost rate, Louisiana’s gross foregone revenue of \$5.8 million in 2012 would equate to a net revenue loss to harvesters of \$3.3 million. The 32 percent overall leaseholder share would equal foregone leaseholder revenue of \$1.9 million.

While all Gulf states have programs set up to lease state-owned water bottoms to private individuals, no data was available to gauge the share of total commercial oyster harvest obtained from private leases in states other than Louisiana, so it was not possible to calculate the effective leaseholder share rate.

Therefore, net loss calculations for the other Gulf states will only account for the 12 percent oyster trip cost estimate from the SCP. This also means that all revenue losses in the other states will be attributed to oyster harvesters.

The estimated decrease in Mississippi commercial oyster landings in 2010 of approximately 950,000 pounds would equal lost gross revenue of \$2.6 million using the 2008-09 average price of \$2.70/pound. This estimated gross revenue decline would equate to a net revenue loss of \$2.3 million.

Mississippi’s 2.2 million pounds of lost 2011 oyster landings would equal a gross revenue loss of \$5.8 million using the 2008-09 average price, equaling estimated foregone net revenue of \$5.1 million.

Mississippi’s estimated lost 2012 oyster landings of 2.0 million pounds would have a gross value of \$5.3 million using the 2008-09 average price. This would equal an estimated loss of net revenue of \$4.7 million.

Florida’s estimated 2010 harvest loss of approximately 518,000 pounds would equal foregone gross revenue approximately \$1.2 million using the 2006-09 average dockside price of \$2.28/pound. This gross

revenue reduction would equate to a net revenue loss of \$1.0 million after deducting 12 percent for variable costs.

Florida's 2011 landings were above its 2006-09 average, then fell to 54,274 pounds below the 2006-09 average in 2012. This reduction in landings in 2012 would have an estimated gross dockside value of \$0.12 million, equaling foregone net revenue of \$0.11 million.

Texas experienced above-average landings in both 2010 and 2012, while 2011 landings fell 48,729 pounds below the 2006-09 average. At Texas' 2006-09 average market price of \$3.43/pound, this landings shortfall yields foregone gross and net revenue estimates of \$0.17 million and approximately \$0.15 million.

Tables 20-22 summarize the estimated commercial oyster revenue losses by state for 2010, 2011, and 2012, respectively. Cumulative losses are summarized in Table 23 and Figure 15.

Louisiana's estimated harvester plus leaseholder losses totaled to \$27.7 million, representing 67.5 percent of the \$41 million total. Mississippi's estimated oyster harvest losses totaled \$12.1 million, 29.4 percent of the total.

**TABLE 20
ESTIMATED 2010 COMMERCIAL OYSTER HARVEST REVENUE LOSSES IN
THREE IMPACTED GULF STATES BASED ON 2006-09 AVERAGE MARKET PRICES
(2008-09 FOR MS)**

<u>State</u>	<u>Est. Gross Loss (millions)</u>	<u>Est. Net Harvester Loss (millions)</u>	<u>Est. Net Leaseholder Loss (millions)</u>	<u>% of Total Net Harvest Loss</u>
Louisiana	\$19.6	\$12.7	\$4.5	84.0%
Mississippi	\$ 2.6	\$ 2.3		11.0%
Florida	<u>\$ 1.2</u>	<u>\$ 1.0</u>		<u>5.1%</u>
Total	\$23.3	\$16.0	\$4.5	100.0%

**TABLE 21
ESTIMATED 2011 COMMERCIAL OYSTER HARVEST REVENUE LOSSES IN
THREE IMPACTED GULF STATES BASED ON 2006-09 AVERAGE MARKET PRICES
(2008-09 FOR MS)**

<u>State</u>	<u>Est. Gross Loss (millions)</u>	<u>Est. Net Harvester Loss (millions)</u>	<u>Est. Net Leaseholder Loss (millions)</u>	<u>% of Total Net Harvest Loss</u>
Louisiana	\$ 6.0	\$3.7	\$1.6	50.1%
Mississippi	\$ 5.8	\$5.1		48.5%
Texas	<u>\$ 0.2</u>	<u>\$0.1</u>		<u>1.4%</u>
Total	\$12.0	\$8.9	\$1.6	100.0%

TABLE 22
ESTIMATED 2012 COMMERCIAL OYSTER HARVEST REVENUE LOSSES IN
THREE IMPACTED GULF STATES BASED ON 2006-09 AVERAGE MARKET PRICES
(2008-09 FOR MS)

<u>State</u>	<u>Est. Gross Loss</u> <u>(millions)</u>	<u>Est. Net Harvester</u> <u>Loss (millions)</u>	<u>Est. Net Leaseholder</u> <u>Loss (millions)</u>	<u>% of Total Net</u> <u>Harvest Loss</u>
Louisiana	\$ 5.8	\$3.3	\$1.9	51.7%
Mississippi	\$ 5.3	\$4.7		47.2%
Florida	<u>\$ 0.1</u>	<u>\$0.1</u>		<u>1.1%</u>
Total	\$11.2	\$8.1	\$1.9	100.0%

TABLE 23
CUMULATIVE ESTIMATED 2010-2012 COMMERCIAL OYSTER NET HARVEST
REVENUE LOSSES IN IMPACTED GULF STATES
 (combined harvester & leaseholder losses, in millions)

<u>State</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>Totals</u>	<u>% of Total</u>
Louisiana	\$17.2	\$5.3	\$5.1	\$27.7	67.5%
Mississippi	\$2.3	\$5.1	\$4.7	\$12.1	29.4%
Florida	\$1.0	-0-	\$0.1	\$1.1	2.8%
Texas	-0-	<u>\$0.1</u>	-0-	<u>\$0.1</u>	<u>0.2%</u>
Totals	\$20.5	\$10.5	\$9.9	\$41.0	100.0%

Commercial Oyster Landings by Louisiana Basin

Commercial oyster landings for five Louisiana basins are illustrated in Table 24, Figure 13, and Figure 14.

Landings from the Atchafalaya – Vermilion – Teche River Basin had collapsed to almost zero in 2009, preceding the oil spill, and increased from 2010-2012. Although landings in 2010 and 2011 were below the 2006-09 average, it would be inappropriate to associate these deficits with the 2010 oil spill, since the Atchafalaya – Vermilion – Teche oyster fishery had collapsed prior to the spill. Therefore, no foregone revenues will be estimated for this basin.

Landings from the Calcasieu-Sabine River Basin grew from the 260,000 – 270,000 pound range in 2006-07 to a peak of approximately 1 million pounds in 2010, then declined to approximately 610,000 and 220,000 pounds in 2011 and 2012, respectively.

The other three basins in Table 24 all showed commercial oyster landings declines in 2010. The Lake Pontchartrain – Pearl River Basin saw a decline of 3.8 million pounds, or approximately 60 percent, from its 2006-09 average of 6.3 million pounds.

Landings in the Mississippi River – Barataria Basin declined by 1.5 million pounds (55 percent) in 2010 and the Terrebonne Basin was down approximately 660,000 pounds, or 27 percent from its 2006-09 average.

Estimated dockside gross and net revenue losses for the three basins impacted in 2010, using 2006-09 average prices per pound of oyster meats and 35 percent variable costs, are detailed in Table 25.

In 2011 commercial oyster landings in the Mississippi River – Barataria and Terrebonne basins showed signs of recovery, with landings above their 2006-09 averages.

However, commercial oyster landings in the Lake Pontchartrain – Pearl River Basin declined even further in 2011 and 2012. LDWF officials noted that reproduction and spat set in that area were still far below normal in late 2012 and into 2013 (Louisiana Department of Wildlife and Fisheries, 2013a).

TABLE 24
COMMERCIAL OYSTER LANDINGS (LBS. OF MEATS) AND ESTIMATED 2010-2012
REDUCTIONS COMPARED TO 2006-09 AVERAGES: BY LOUISIANA BASIN

<u>Year</u>	Lake Pontchartrain - <u>Pearl River Basin</u>	Mississippi River - <u>Barataria Basin</u>	Terrebonne <u>Basin</u>	Calcasieu - Sabine River <u>Basin</u>	Atchaf- Verm-Teche <u>River Basin</u>
2006	4,398,791	2,366,742	2,507,089	271,035	1,067,045
2007	5,456,830	2,525,872	2,660,940	264,765	1,238,711
2008	7,375,716	1,944,782	2,141,179	419,851	336,498
2009	7,833,795	3,765,169	2,361,363	692,449	3,144
2010	2,510,263	1,181,399	1,761,095	1,018,941	337,042
2011	2,314,824	3,380,067	4,406,371	609,235	348,332
2012	1,789,751	3,940,314	4,374,111	223,995	779,687
2006-'09 avg.	6,266,283	2,650,641	2,417,643	412,025	661,350
2006-'09 std. dev.	1,615,619	782,427	221,204	200,218	587,848
2010 - '06-'09 avg.	(3,756,020)	(1,469,242)	(656,547)	606,916	(324,308)
2011 - '06-'09 avg.	(3,951,460)	729,425	1,988,728	197,209	(313,018)
2012 - '06-'09 avg.	(4,476,532)	1,289,673	1,956,468	(188,030)	118,337
Source: D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-2011 data) and 5/2/2013 (2012 data). Commercial landings reported through Louisiana trip-ticket program. No recreational landings or commercial landings kept for home consumption included.					

FIGURE 13
LOUISIANA COMMERCIAL OYSTER LANDINGS BY BASIN: VOLUME (LINE CHART)

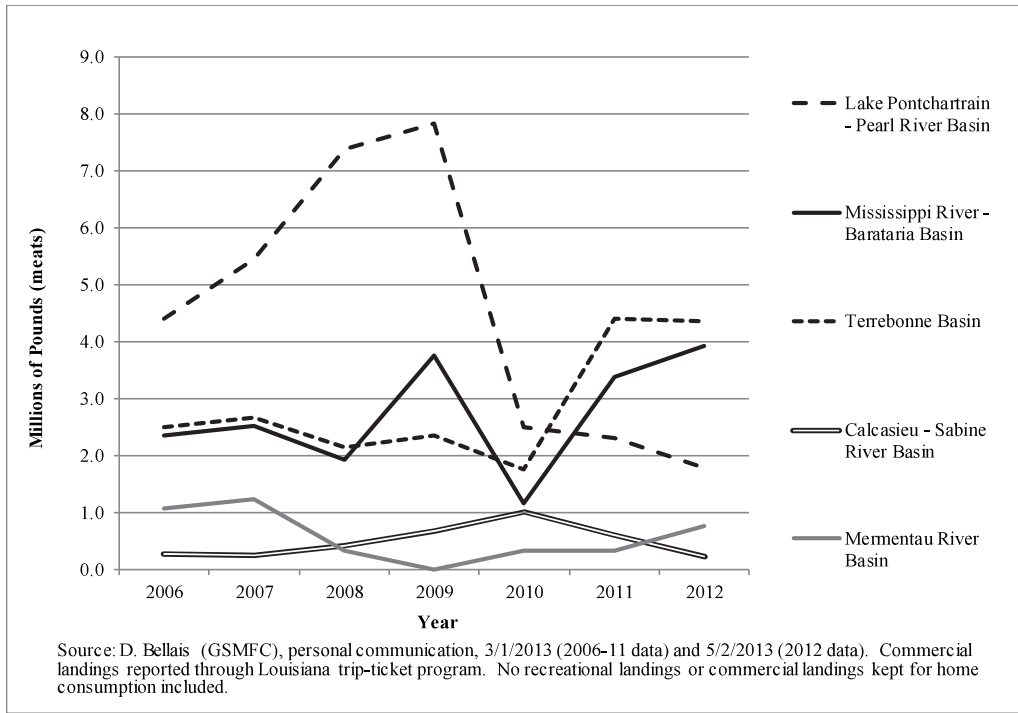


FIGURE 14
LOUISIANA COMMERCIAL OYSTER LANDINGS BY BASIN: VOLUME (BAR CHART)

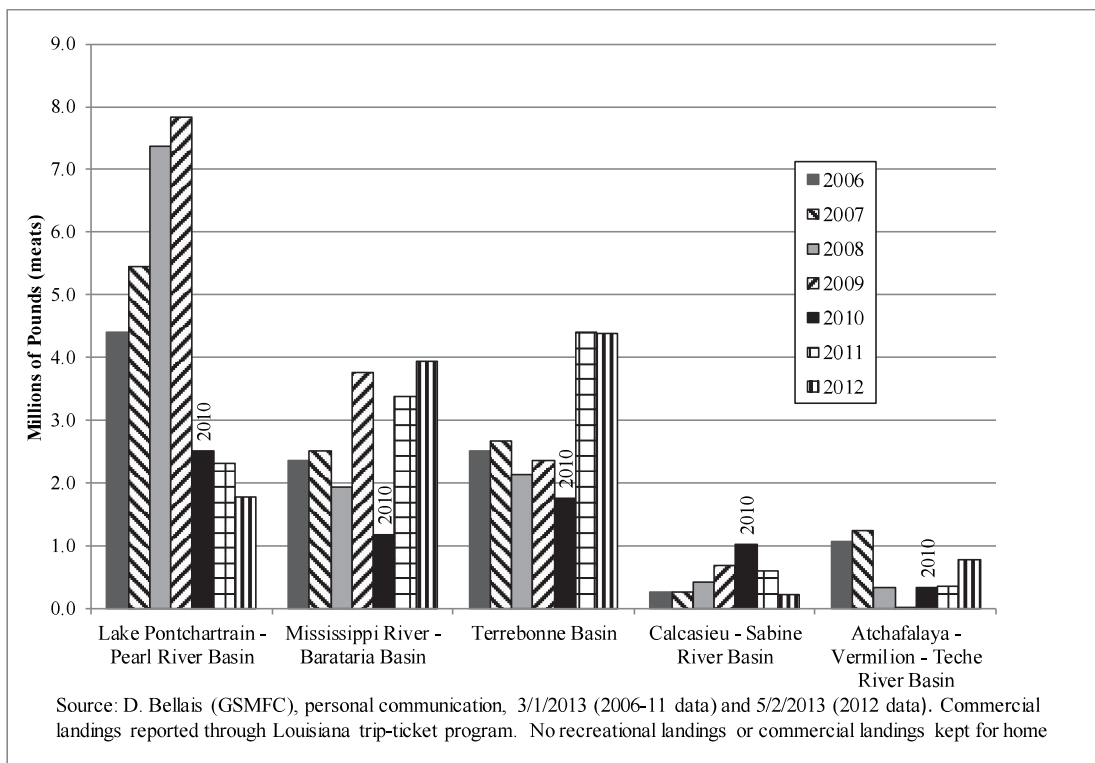


TABLE 25
ESTIMATED 2010 COMMERCIAL OYSTER HARVESTER DOCKSIDE
REVENUE LOSSES IN FOUR IMPACTED LOUISIANA BASINS USING 2006-09
BASIN AVERAGE MARKET PRICES

<u>Basin</u>	<u>2006-09 Avg.</u> <u>Market Price</u>	<u>Est. Gross Loss</u> <u>(millions)</u>	<u>Est. Net Loss</u> <u>(millions)</u>	<u>% of Total</u> <u>Net Losses</u>
Lake Pont. - Pearl River	\$3.37	\$12.7	\$ 8.2	65.2%
Miss. River - Barataria	\$3.51	\$ 5.1	\$ 3.3	26.4%
Terrebonne	\$2.48	<u>\$ 1.6</u>	<u>\$ 1.1</u>	<u>8.4%</u>
Total		\$19.4	\$12.6	100.0%

Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013.
Landings decline, average price, and revenue loss calculations by authors.

The estimated 4.0 million pounds of lost landings in 2011 translates to foregone gross revenue of \$13.3 million and foregone net revenue of \$8.1 million (Table 26).

The estimated 4.5 million pounds of foregone harvest in the Lake Pontchartrain - Pearl River Basin in 2012 equated to estimated gross revenue losses of \$15.1 million and net losses of \$8.4 million (Table 27).

TABLE 26
ESTIMATED 2011 COMMERCIAL OYSTER HARVESTER DOCKSIDE
REVENUE LOSSES IN THE LAKE PONTCHARTRAIN – PEARL RIVER BASIN
(USING THE 2006-09 BASIN AVERAGE MARKET PRICE)

<u>Basin</u>	<u>2006-09 Avg.</u> <u>Market Price</u>	<u>Est. Gross Loss</u> <u>(millions)</u>	<u>Est. Net Loss</u> <u>(millions)</u>	<u>% of Total</u> <u>Net Losses</u>
Lake Pont. - Pearl River	\$3.37	<u>\$13.3</u>	<u>\$ 8.1</u>	<u>100.0%</u>
Total		\$13.3	\$ 8.1	100.0%

Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013.
Landings decline, average price, and revenue loss calculations by authors.

TABLE 27
ESTIMATED 2012 COMMERCIAL OYSTER HARVESTER DOCKSIDE
REVENUE LOSSES IN TWO IMPACTED BASINS
(USING THE 2006-09 BASIN AVERAGE MARKET PRICES)

<u>Basin</u>	<u>2006-09 Avg.</u> <u>Market Price</u>	<u>Est. Gross Loss</u> <u>(millions)</u>	<u>Est. Net Loss</u> <u>(millions)</u>	<u>% of Total</u> <u>Net Losses</u>
Lake Pont. - Pearl River	\$3.37	\$15.1	\$ 8.4	94.3%
Calc. – Sabine River	\$3.10	<u>\$ 0.6</u>	<u>\$ 0.5</u>	<u>5.7%</u>
Total		\$15.7	\$ 9.0	100.0%

Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-11 data) and 5/2/2013 (2012 data).
Landings decline, average price, and revenue loss calculations by authors.

Commercial oyster landings also declined in the Calcasieu – Sabine River Basin in 2012 to levels below its 2006-09 average. The approximately 188,000 pound shortfall had an estimated gross dockside value of \$0.6 million using the Basin’s 2006-09 average market price. Because there are no private oyster

leases in the Calcasieu – Sabine River Basin, only the 12 percent SCP estimated trip costs are subtracted from the gross foregone revenue estimate to calculate the net loss estimate of \$0.5 million.

Estimated net oyster harvester losses by basin for the 2010-12 period are summarized in Table 28 and Figure 15.

**TABLE 28
CUMULATIVE ESTIMATED 2010-2012 COMMERCIAL OYSTER
HARVESTER NET DOCKSIDE REVENUE LOSSES BY BASIN**

<u>Basin</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>Totals</u>	<u>% of Total</u>
Lake Pontchartrain - Pearl River	\$ 8.2	\$ 8.1	\$ 8.4	\$24.8	83.5%
Mississippi River - Barataria	\$ 3.3			\$3.3	11.2%
Terrebonne	\$ 1.1			\$1.1	3.6%
Calcasieu – Sabine River	<u>\$ 0.5</u>			<u>\$0.5</u>	<u>1.7%</u>
Totals	\$12.6	\$ 8.1	\$ 8.4	\$29.7	100.0%

Louisiana Oyster Ground Leaseholder Losses

Louisiana’s oyster harvest comes from both public grounds located throughout the coastal areas of the state and private grounds that are leased from the state. Individuals participating in the oyster grounds leasing program in Louisiana pay the State \$2.00 per acre per year, and leases are written with 15-year durations. Leases are typically renewed by the same individual or passed down to succeeding generations.

Some leaseholders are also oyster harvesters, while many others sub-lease their oyster grounds to oyster harvesters in exchange for a share of the oysters harvested from their lease (typically 33 percent). Some individuals do both, working part of their leases themselves and sub-leasing the rest.

Louisiana Oyster Leaseholder Income Losses by Basin

Although data on the volume of Louisiana oyster landings from private and public grounds were not available by basin, the statewide share of harvest from private and public grounds can be used to estimate the loss to leaseholders in each basin that has private lease acreage.

As discussed in preceding sections, LDWF provided estimates of the share of the total oyster harvests in 2010-2012 which came from private and public grounds (Table 29).

Using these percentages across all basins with private lease acreage, estimated foregone landings by basin, and the 33 percent standard leaseholder share, estimated losses to oyster leaseholders by basin for 2010, 2011, and 2012 using 2006-09 average market prices (see Table 25) are shown in Table 30.

Annual estimated leaseholder income losses for the state of Louisiana and each basin are included in the summary of oyster harvest losses in Figure 15.

**TABLE 29
ESTIMATED SHARE OF TOTAL LOUISIANA OYSTER
LANDINGS FROM PRIVATE AND PUBLIC OYSTER GROUNDS**

<u>Year</u>	Share of Harvest from <u>PRIVATE Reefs</u>	Share of Harvest from <u>PUBLIC Reefs</u>
2010	70.9%	29.1%
2011	80.8%	19.2%
2012 (prelim.)	96%	4%
Source: Patrick Banks (LDWF), personal communication, 4/5/2013.		

TABLE 30
ESTIMATED 2010-2012 OYSTER LEASEHOLDER FOREGONE REVENUE
(IN MILLIONS) IN THREE IMPACTED LOUISIANA BASINS USING 2006-
2009 AVERAGE BASIN MARKET PRICES

<u>Basin</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>Total</u>
Lake Pontchartrain - Pearl River	\$ 3.0	\$ 3.6	\$ 4.8	\$ 11.3
Mississippi River - Barataria	\$ 1.2			\$ 1.2
Terrebonne	<u>\$ 0.4</u>			<u>\$ 0.4</u>
Total	\$ 4.5	\$ 3.6	\$ 4.8	\$ 12.9

Other Louisiana Oyster Leaseholder Expenses

In addition to foregone income from lost leaseholder harvest shares, many of Louisiana’s private oyster leaseholders suffered (or will face) expenses associated with restoring their damaged oyster leases. Restoration activities typically involve 1) “working” the reef to uncover cultch material from beneath layers of sediment, and 2) collecting, transporting, and depositing small “seed” oysters from public reefs to replace oysters killed by the oil spill or associated responses.

Estimates of the costs associated with these restoration activities could not be located by the authors.

The Private Oyster Lease Rehabilitation (POLR) Program administered by the Louisiana Department of Wildlife and Fisheries from 2007-2010 was funded by a National Oceanic and Atmospheric Administration (NOAA) grant to assist Louisiana oyster leaseholders with restoration of oyster resources damaged by Hurricanes Katrina and Rita in 2005.

The POLR Program reimbursed oyster leaseholders up to either \$28.10 or \$42.16 per acre leased, depending on location (Louisiana Department of Wildlife and Fisheries, 2010). According to oyster industry experts, only 40-50 percent of most leases are actually utilized for oyster production (Meitrodt and Kuriloff, 2003). These utilized acres would be the only ones subject to restoration efforts, so the amount paid per acre worked would be approximately \$62 or \$94 (assuming a 45 percent utilization rate).

These reimbursement amounts were likely based more on funding limitations than actual costs of the activities, and many oyster leaseholders would probably have undertaken the restoration activities whether or not the reimbursement program existed, so these amounts can’t be considered representative of the cost of restoration expenses. Still, they may be useful as establishing a baseline of expenses per acre for basic restoration efforts.

If the reefs were damaged by the oil spill or freshwater diversions to the point that a layer of new cultch material was necessary, approximately 100 cubic yards of new cultch material per acre would be required to renovate existing reefs (Mississippi Department of Environmental Quality, 2012). Recent cultch material purchases by LDWF in 2011 and 2012 had “delivered” prices per cubic yard ranging from \$47.15 to \$59.49 (Patick Banks (LDWF), personal communication, 3/28/2013), which would result in per acre renovation costs of \$4,715 to \$5,949.

Assuming that 45 percent of the typical oyster lease is useable reefs, this would equate to a renovation cost of \$2,122 to \$2,677 per leased acre.

Leaseholder Property Damage Compensation Payments

The SCP provides Oyster Leaseholder Interest (Property Damage) Compensation of \$2,000, \$1,000, or \$400 per acre of leasehold, depending on geographic location (Zones A, B, and C, respectively – see Figure 16). Zones along the southeast Louisiana coast specifically are shown in Figure 17.

FIGURE 15
SUMMARY OF ESTIMATED NET OYSTER HARVEST LOSSES FOR THE GULF OF MEXICO, BY STATE, AND BY LOUISIANA BASIN

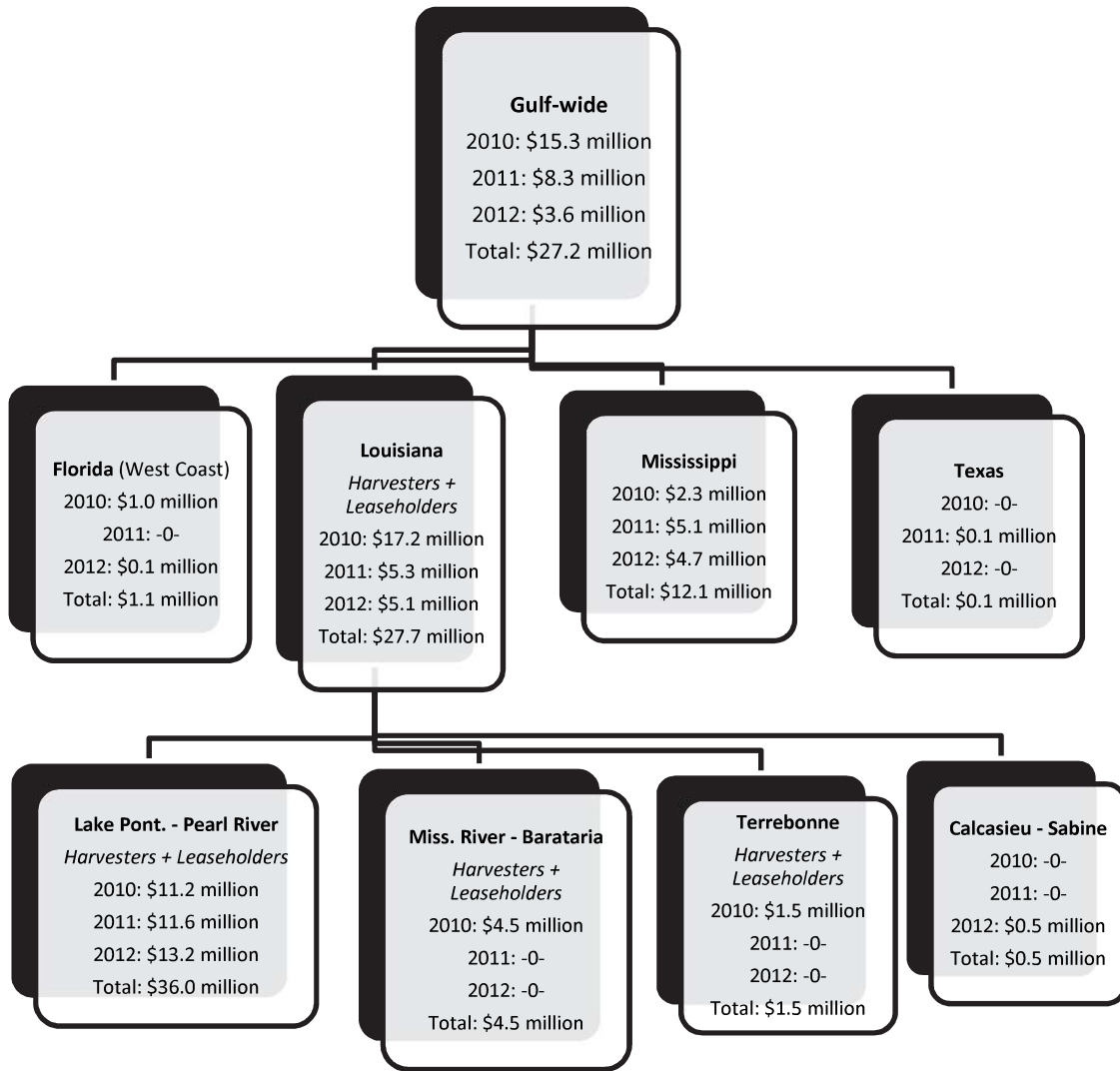


FIGURE 16
SCP OYSTER LEASEHOLDER COMPENSATION ZONE MAP

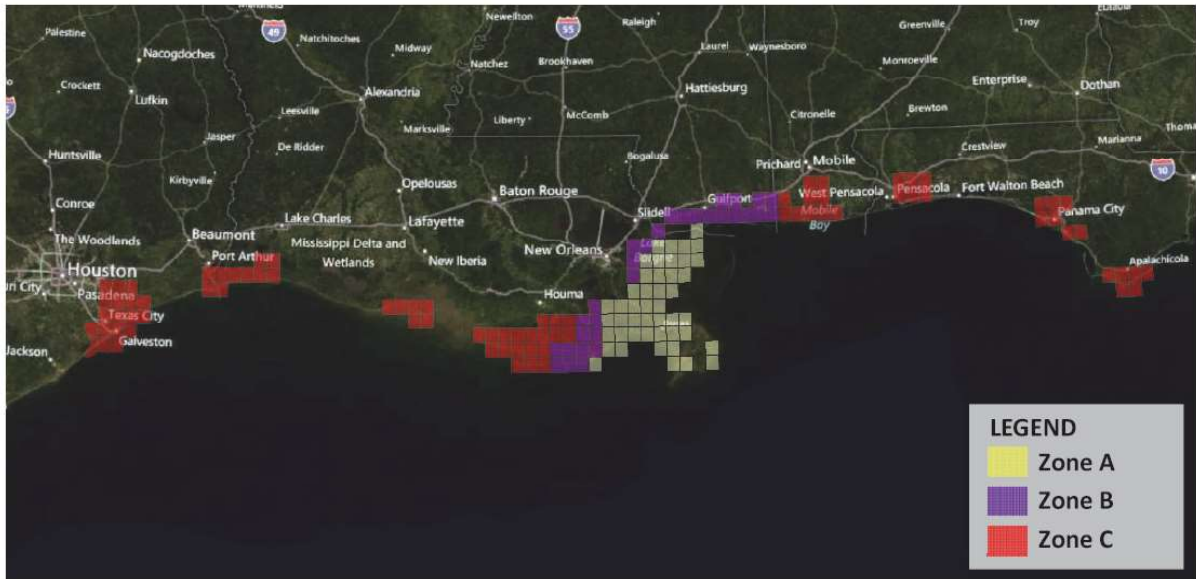


FIGURE 17
SCP OYSTER LEASEHOLDER COMPENSATION ZONE MAP: SOUTHEAST LOUISIANA



Data on active Louisiana oyster leases were downloaded from the LDWF Oyster Lease Survey Section in March 2013 (Louisiana Department of Wildlife and Fisheries, 2013b). Active leases totaled 392,822 acres.

When active leases were summed by Compensation Zone and the relevant SCP compensation rates applied, potential SCP Oyster Leaseholder Property Damage Compensation totaled \$579,740,400, as shown in Table 31.

TABLE 31
POTENTIAL SCP OYSTER LEASEHOLDER PROPERTY DAMAGE
COMPENSATION BASED ON MARCH 2013 ACTIVE STATE
LEASES AND SCP COMPENSATION ZONES

<u>Compensation Zone</u>	<u>Acres Leased</u>	<u>Compensation Rate/acre</u>	<u>Potential Compensation</u>
A	255,958	\$2,000	\$511,916,000
B	21,798	\$1,000	\$21,798,000
C	<u>115,066</u>	\$400	<u>\$46,026,400</u>
All	392,822		\$579,740,400

In an effort to analyze how this potential oyster leaseholder property damage compensation may be correlated with actual productive oyster reef damage, using post-spill oyster production as a proxy, the authors visually matched up the oyster lease quads shown in Figure 17 with a map of the various Louisiana river basins (Figure 6) to estimate potential compensation by basin (Table 32).

It should be noted that this was an imprecise, visual procedure, and several lease quads contain portions of two river basins, so the results in Table 32 should only be viewed as a rough approximation of potential compensation by basin.

Leaseholders in the Mississippi River – Barataria basin could potentially receive an estimated \$267.4 million, or 46 percent of the total leaseholder interest compensation.

Referring back to Table 30, leaseholders in the Mississippi River – Barataria basin were estimated to have lost approximately \$1.2 million in foregone revenue from decreased oyster harvests, or about nine percent of the total 2010-2012 estimated leaseholder income loss of \$12.9 million.

TABLE 32
ESTIMATED POTENTIAL SCP OYSTER LEASEHOLDER PROPERTY DAMAGE
COMPENSATION BY BASIN BASED ON MARCH 2013 ACTIVE STATE LEASES AND SCP
COMPENSATION ZONES

<u>Basin</u>	<u>Potential Zone A Compensation</u>	<u>Potential Zone B Compensation</u>	<u>Potential Zone C Compensation</u>	<u>Potential Total Compensation</u>
Atchaf. – Verm. – Teche	\$ -	\$ -	\$ 11,112,800	\$ 11,112,800
Lake Pont. – Pearl River	\$ 246,661,000	\$ 3,841,000	\$ -	\$250,502,000
Miss. River – Barataria	\$ 265,255,000	\$ 2,145,000	\$ -	\$267,400,000
Terrebonne	\$ -	\$ 15,812,000	\$ 34,913,600	\$ 50,725,600
All	\$ 511,916,000	\$ 21,798,000	\$ 46,026,400	\$579,740,400

The potential leaseholder property damage compensation for leaseholders in the Mississippi River – Barataria basin represents approximately 223 times their estimated foregone revenues.

Leaseholders in the Lake Pontchartrain – Pearl River basin could potentially receive approximately \$250.5 million in leaseholder interest compensation, or approximately 43 percent of the total.

As shown in Table 30, leaseholders in the Lake Pontchartrain – Pearl River basin were estimated to have lost approximately \$11.3 million in foregone revenues, or 88 percent of total leaseholder income losses.

The estimated leaseholder property damage compensation of \$250.5 million for leaseholders in the Lake Pontchartrain – Pearl River basin represents approximately 22 times their 2010-2012 revenue losses. At the present time, however, harvests in the Lake Pontchartrain – Pearl River basin show no signs of recovery, and leaseholder income losses may continue for the foreseeable future.

Oyster leaseholders in the Terrebonne Basin had estimated revenue losses of \$381,000, or about three percent of total estimated income losses.

As shown in Table 32, it is estimated that leaseholders in the Terrebonne Basin could potentially receive approximately \$51 million in oyster leaseholder interest compensation payments, or about nine percent of total payments.

The \$51 million in compensation payments represents approximately 133 times the estimated 2010-2012 Terrebonne Basin revenue losses.

Because of the pre-spill collapse of the oyster fishery in the Atchafalaya – Vermilion – Teche River Basin, no estimated revenue losses were calculated for leaseholders there. However, they are included in the SCP, and may potentially receive approximately \$11 million in leaseholder property damage compensation payments, approximately two percent of the \$580 million total.

Re-Allocation of Oyster Effort & Landings per Trip

While private lease oyster resources are fixed geographically to some degree, oysters can be shuttled to leases in other basins if desired or dictated by water-quality or other habitat issues.

In addition, the State maintains 1.7 million acres of public reefs throughout the state’s coastal areas that are open to any properly-licensed oyster harvester. These reefs are utilized both for seed-oyster and sack-oyster (market-ready) production. Harvest effort and landings on the public reefs may shift between basins in response to weather events, water-quality issues, or catastrophic events such as the 2010 oil spill.

The number of oyster trip-tickets by basin were obtained from LDWF by GO FISH for the period 2006-2012 to analyze if there had been any geographic re-allocation of effort as a result of the 2010 oil spill, and also to gain some insight into spill-related impacts on catch per unit effort (CPUE).

While the number of trip tickets is an inexact approximation of effort without accompanying measures of hours or days per trip, the authors felt that number of trips could serve as a useful proxy for measuring shifts in effort, and that average volume landed per trip ticket could give some indication of trends in CPUE.

The locations of the various river basins are illustrated in Figure 6.

The number of oyster trip tickets reported for each basin are shown in Table 33 in descending order of 2006-09 average number of trips, and illustrated in Figure 18.

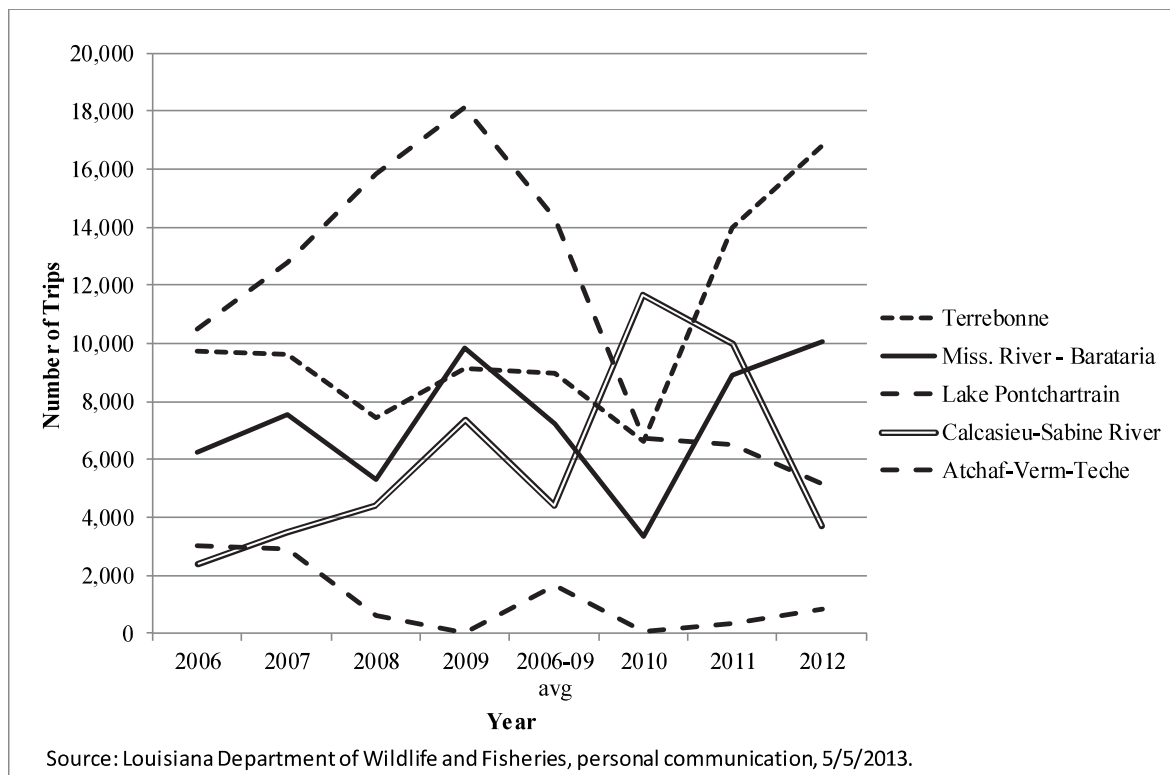
The number of oyster trips in the Lake Pontchartrain Basin had been on a steep upward climb from 2006 through 2009, increasing from 10,500 to 18,109 (+72 percent). Trip counts in 2010 fell to 47 percent of the 2006-09 average, and continued to decline in 2011 and 2012 to 45 and 36 percent, respectively.

**TABLE 33
NUMBER OF OYSTER TRIP TICKETS REPORTING EACH BASIN AS PRIMARY
HARVEST LOCATION**

Basin	2006	2007	2008	2009	2006-09			
					<u>Avg.</u>	2010	2011	2012
Lake Pontchartrain	10,500	12,807	15,833	18,109	14,312	6,742	6,486	5,143
Terrebonne	9,711	9,632	7,437	9,116	8,974	6,601	13,993	16,819
Miss. River-Barataria	6,233	7,524	5,305	9,842	7,226	3,364	8,893	10,057
Calcasieu-Sabine	2,408	3,485	4,420	7,353	4,417	11,643	9,975	3,700
Atchaf-Verm-Teche	<u>3,037</u>	<u>2,895</u>	<u>634</u>	*	1,642	<u>91</u>	<u>367</u>	<u>857</u>
All	31,889	36,343	33,629	44,420	36,570	28,441	39,714	36,576

Source: Louisiana Department of Wildlife and Fisheries, personal communication, 5/5/2013.
* Not reportable due to confidentiality restrictions.

FIGURE 18
NUMBER OF OYSTER TRIP-TICKETS BY BASIN: 2006-2012



Oyster trips in the Mississippi River – Barataria Basin fell an equivalent amount in 2010, to 47 percent of the 2006-09 average, but rebounded in 2011 and 2012 to 123 and 139 percent, respectively, of the 2006-09 average.

Oyster trips with the majority of landings from the Terrebonne Basin fell to a lesser degree, to 74 percent of the Basin’s 2006-09 average, then increased sharply to 156 and 187 percent in 2011 and 2012, respectively.

The number of Calcasieu – Sabine River Basin oyster trips more than tripled from 2006-09, increasing from 2,408 in 2006 to 7,353 in 2009. The rate of increase climbed even more in 2010, to a peak of 11,643, 264 percent of the 2006-09 average.

Calcasieu – Sabine oyster trips fell somewhat to 9,975 in 2011, then plummeted to 3,700 in 2012, 16 percent below the 2006-09 average of 4,417.

In summary, it would appear that effort shifted immediately in 2010 from the eastern oyster grounds to the Calcasieu – Sabine River Basin on the western edge of the state, away from the oil spill and its closures. Then, in 2011 and 2012, effort shifted to the Terrebonne and Mississippi River – Barataria basins, both from the Calcasieu – Sabine River and Lake Pontchartrain basins.

Table 34 highlights one reason for the shifts in effort – declining quantities of oysters landed per trip in the Lake Pontchartrain and Calcasieu - Sabine River basins.

Oyster meats harvested per trip in the Lake Pontchartrain Basin averaged 438 pounds from 2006-09, dropped to 372 in 2010, then continued to decline to 357 and 348 pounds in 2011 and 2012, respectively.

Oyster landings per trip in the “all public reef” Calcasieu – Sabine River Basin averaged 93 pounds from 2006-2009, dropped somewhat to 88 pounds in 2010, then fell 30 percent to 61 pounds in both 2011 and 2012. Oystermen fishing the public reefs in the Calcasieu-Sabine River Basin are subject to daily harvest limits of 25 sacks per day, which effectively caps landings per trip at 150 – 200 pounds.

TABLE 34
AVERAGE POUNDS OF OYSTER MEATS LANDED PER TRIP TICKET BY GSMFC
BASIN

<u>Basin</u>	2006-09							
	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Avg.</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Lake Pontchartrain	419	426	466	433	438	372	357	348
Terrebonne	258	276	288	259	269	267	315	260
Miss. River -								
Barataria	380	336	367	383	367	351	380	392
Calcasieu-Sabine	113	76	95	94	93	88	61	61
Atchaf-Verm-Teche	<u>351</u>	<u>428</u>	<u>531</u>	n/a	403	<u>3,704</u>	<u>949</u>	<u>910</u>
Overall	333	334	363	330	339	239	278	304

Sources: Number of trip tickets – Louisiana Department of Wildlife and Fisheries, personal communication, 5/5/2013.
Volume of landings – D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-2011 data) and 5/2/2013 (2012 data).
Landings per trip ticket calculated by authors.

FINFISH

Although the Gulf of Mexico is better known for its shrimp, oyster, and blue crab fisheries, it also provides an abundant variety of commercial finfish species. Average total landings of all saltwater finfish species from 2006-09 equaled approximately 47 million pounds, worth approximately \$76 million at dockside (National Marine Fisheries Service, 2013).

From 2006-2009, Gulf commercial landings of yellowfin tuna, striped mullet, and red snapper represented approximately 34 percent, 78 percent, and 94 percent of total U.S. landings of these species, respectively, with annual Gulf landings values of \$7.9 million, \$6.5 million, and \$9.7 million, respectively (National Marine Fisheries Service, 2013).

The authors analyzed landings data for over 150 species of saltwater finfish. Because it was impossible to discuss all 150+ species in this document, the authors chose eight of the largest fisheries with the most dramatic landings declines to highlight in this report. These eight species had a combined annual landings value of approximately \$34 million in 2006-09.

Because commercial saltwater finfish species vary widely in habitat (marsh, near shore, reef, blue water, etc.), gear (rod and reel, bandit rigs, nets, longlines, etc.), and required permits and licenses, finfish fishermen tend to be fairly specialized, with much of their effort spent pursuing one or a small group of species.

Therefore, the limited number of species analyzed in this report may ignore smaller fisheries, and their participating fishermen, that may have been significantly impacted. Even though the overall value of those fisheries may be small in comparison to the species selected for this report, the impact on fishermen who focus on, and rely on, those smaller fisheries may have been severe.

The eight saltwater finfish species chosen to be analyzed in this report are:

- Striped mullet
- Yellowfin tuna
- Red grouper
- Yellowedge grouper
- Swordfish
- Dolphinfish
- Florida pompano
- Scamp

(Gag grouper is another large fishery that has shown landings declines since 2010, but the decline appears to have started prior to and for reasons unrelated to the oil spill (The Pew Charitable Trusts, 2012). The spill may indeed have exacerbated or continued the decline, but the authors chose to leave out gag grouper due to the many extenuating questions.)

Gulf-wide Landings of Selected Saltwater Finfish Species

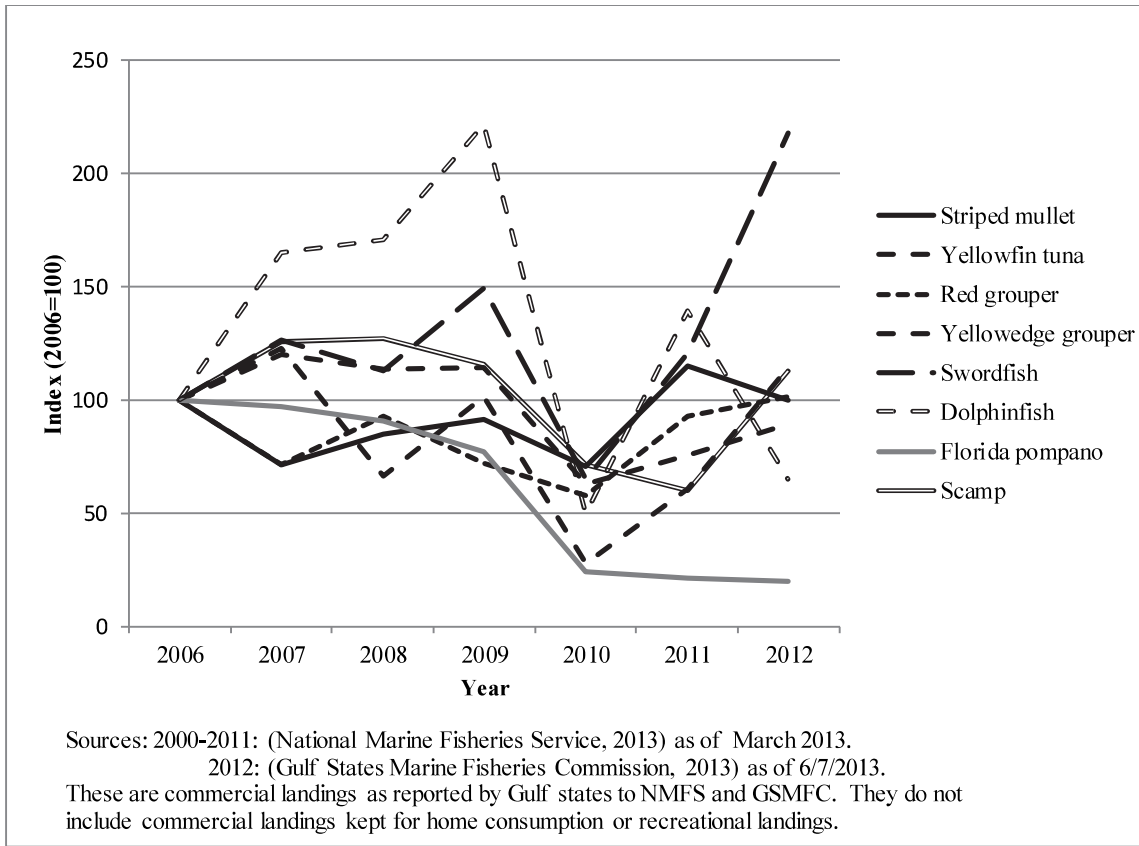
Gulf-wide landings of the eight selected saltwater finfish species are detailed in Table 35 and illustrated in Figure 19. Because of the wide range of landings volumes of the eight species (from ~300,000 to ~ 11 million pounds), Figure 19 presents landings indexed to 2006 for ease of comparison on a common graph.

**TABLE 35
GULF-WIDE LANDINGS (POUNDS) OF EIGHT SELECTED SALTWATER
FINFISH SPECIES**

<u>Species</u>	<u>2006-09 Average</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Striped mullet	10,606,818	8,593,534	14,031,806	12,230,291
Yellowfin tuna	2,364,357	665,705	1,468,391	2,754,287
Red grouper	5,109,043	3,488,974	5,634,694	6,141,950
Yellowedge grouper	960,423	539,009	651,794	767,897
Swordfish	718,970	383,782	710,527	1,283,742
Dolphinfish	369,403	112,790	312,932	145,842
Florida pompano	311,197	83,090	72,967	67,948
Scamp	303,155	185,312	154,759	292,598

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013.
These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
They do not include commercial landings kept for home consumption or recreational landings.

FIGURE 19
INDEXED GULF-WIDE LANDINGS OF EIGHT SELECTED SALTWATER FINFISH
SPECIES: 2006=100



All eight of the selected species had landings declines in 2010. Six species in 2011 and four in 2012 continued to report landings below their 2006-09 averages.

The declines in volume of landings for each species/year combination from 2006-09 averages are shown in Table 36. The standard deviations of 2006-09 landings for each species are included for informational purposes.

The estimated foregone gross and net revenue using 2006-09 average prices and the 27 percent finfish variable trip cost estimate from the SCP are shown in Table 37.

Of the eight selected finfish fisheries, the yellowfin tuna fishery suffered the largest amount of foregone net revenue in both 2010 and 2011, at \$4.1 and \$2.2 million, respectively. The Florida pompano fishery had the largest net foregone revenue in 2012 at approximately \$0.5 million.

Combined, the eight selected fisheries totaled foregone net revenues of \$10.4, \$3.8, and \$1.2 million in 2010, 2011, and 2012, respectively. (Note: Some of the finfish species analyzed are strictly managed with quotas, limited-entry permits, etc. There may be extenuating regulatory changes of which the authors were unaware which impacted landings during this time period.)

Landings of Selected Saltwater Finfish Species by State

Tables 38 through 44 detail the landings declines by state for each of the eight selected saltwater finfish species. The data for 2006-2011 were downloaded from the NMFS Commercial Fisheries Statistics website and the 2012 data was downloaded from the GSMFC database.

**TABLE 36
DECLINES IN LANDINGS (LBS.) FROM 2006-09 AVERAGES FOR EIGHT
SELECTED GULF OF MEXICO FINFISH SPECIES**

Species	2006-09			
	Std. Dev.	2010	2011	2012
Striped mullet	1,473,173	(2,013,284)		
Yellowfin tuna	562,120	(1,698,652)	(895,966)	
Red grouper	871,908	(1,620,069)		
Yellowedge grouper	72,427	(421,414)	(308,629)	(192,526)
Swordfish	123,947	(335,188)	(8,443)	
Dolphinfish	111,738	(256,613)	(56,471)	(223,561)
Florida pompano	35,077	(228,107)	(238,230)	(243,249)
Scamp	32,442	(117,843)	(148,396)	(10,557)

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
These are commercial landings as reported by Gulf states to NMFS and GSMFC.
They do not include commercial landings kept for home consumption or recreational landings.
Landings declines calculated by authors.

**TABLE 37
ESTIMATED FOREGONE GULF-WIDE GROSS AND NET FOREGONE REVENUE FROM
EIGHT SELECTED FINFISH FISHERIES USING 2006-09 AVERAGE MARKET PRICES AND
VARIABLE COST ESTIMATE OF 27 PERCENT**

	2006-09 avg. \$/lb.	2010		2011		2012	
		Gross	Net	Gross	Net	Gross	Net
Striped mullet	\$0.62	\$1,240,865	\$ 905,831				
Yellowfin tuna	\$3.34	\$5,673,693	\$4,141,796	\$2,992,629	\$2,184,619		
Red grouper	\$2.42	\$3,924,361	\$2,864,784				
Yellowedge grouper	\$3.01	\$1,269,031	\$ 926,393	\$929,394	\$678,458	\$579,765	\$423,228
Swordfish	\$2.17	\$ 725,989	\$ 529,972	\$18,287	\$13,350		
Dolphinfish	\$1.59	\$ 407,603	\$ 297,550	\$89,698	\$65,480	\$355,103	\$259,225
Florida pompano	\$2.97	\$ 676,735	\$ 494,016	\$706,767	\$515,940	\$721,658	\$526,810
Scamp	\$3.11	\$ 365,996	\$ 267,177	\$460,888	\$336,448	\$32,788	\$23,935
						\$1,689,3	
All		\$14,284,273	\$10,427,519	\$5,197,664	\$3,794,295	14	\$1,233,199

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
These are commercial landings as reported by Gulf states to NMFS and GSMFC.
They do not include commercial landings kept for home consumption or recreational landings.
Landings declines, average prices, and foregone revenue calculated by authors.

Striped Mullet Landings by State

Alabama’s striped mullet landings were down from the 2006-09 average approximately 38 percent in 2010 and 29 percent in 2011, before rebounding in 2012 to a level above the 2006-09 average (Table 38).

Striped mullet landings for the west coast of Florida and Mississippi were down slightly in 2010 compared to their 2006-09 averages, but were above average in both 2011 and 2012.

Although 2010 striped mullet landings in Louisiana were much lower than the 2006-09 average, the Louisiana mullet fishery had been in steep decline for several years, making the 2006-09 average misleading. Louisiana’s striped mullet landings in 2009 had fallen to 194,000 pounds, from 3.4 million in 2006. This precipitous pre-spill drop rendered the 2006-09 average unusable for the purposes of this study, so no landings decline associated with the post-spill period could be calculated.

Texas’ striped mullet landings were higher in all three years (2010-2012) than its 2006-09 average.

**TABLE 38
LANDINGS (POUNDS) OF STRIPED MULLET BY GULF STATE: 2010-12**

<u>State</u>	<u>2006-09 Average</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Alabama	1,729,056	1,077,832	1,238,166	1,948,264
Florida (west coast)	7,199,133	7,082,079	11,300,285	8,776,181
Louisiana	1,607,007	361,671	1,385,105	1,393,665
Mississippi	63,810	58,796	92,639	98,686
Texas	<u>7,813</u>	<u>13,156</u>	<u>15,611</u>	<u>13,495</u>
All	10,606,818	8,593,534	14,031,806	12,230,291

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
They do not include commercial landings kept for home consumption or recreational landings.

Yellowfin Tuna Landings by State

All three Gulf states reporting non-confidential yellowfin tuna landings (FL, LA, and TX) experienced declines in 2010 landings from their 2006-09 averages (Table 39). Florida’s landings recovered quickly, exceeding its 2006-09 average in both 2011 and 2012.

Louisiana’s depressed landings continued in 2011 before recovering in 2012.

Texas’ landings, while small compared to the other states, fell to 851 pounds in 2010, and to zero in both 2011 and 2012.

Red Grouper Landings by State

Florida is the only Gulf state with substantial landings of red grouper (Table 40), with Alabama and Louisiana reporting very small or undisclosable annual totals.

Florida’s 2010 red grouper landings declined by 32 percent from its 2006-09 average before recovering strongly in 2011 and 2012 to levels above the 2006-09 average.

Alabama’s 2006-09 average is skewed by landings of over 11,000 pounds in 2006, compared to landings ranging between approximately 1,300 and 1,900 pounds in 2007-09. Therefore, the 2007-09 average of 1,557 pounds was used to calculate Alabama’s foregone landings.

TABLE 39
LANDINGS (POUNDS) OF YELLOWFIN TUNA BY GULF STATE: 2010-12

<u>State</u>	<u>2006-09</u>			
	<u>Average*</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Alabama	Confidential	Confidential	Confidential	Confidential
Florida (west coast)	495,942	224,950	568,529	742,466
Louisiana	1,852,220	439,904	899,862	2,011,821
Mississippi	--	--	--	--
Texas	<u>32,390</u>	<u>851</u>	<u>0</u>	<u>0</u>
All	2,380,552	665,705	1,468,391	2,754,287

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
They do not include commercial landings kept for home consumption or recreational landings.
* Texas = 2008-09 average due to confidential data in 2006-07

TABLE 40
LANDINGS (POUNDS) OF RED GROUPER BY GULF STATE: 2010-12

<u>State</u>	<u>2006-09*</u>			
	<u>Average</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Alabama	1,557	1,002	646	479
Florida (west coast)	5,104,959	3,487,972	5,634,048	6,141,471
Louisiana	284	Confidential	Confidential	0
Mississippi	0	0	0	Confidential
Texas	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All	5,106,800	3,488,974	5,634,694	6,141,950

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
They do not include commercial landings kept for home consumption or recreational landings.
* AL = 2007-09 average

Yellowedge Grouper Landings by State

Florida is the leading Gulf state for landings of yellowedge grouper, reporting 76 percent of Gulf-wide landings in 2006-09 (Table 41). Florida's landings declined from its 2006-09 average in all three years following the Deepwater Horizon oil spill, down approximately 50 percent, 48 percent, and 23 percent in 2010, 2011, and 2012, respectively.

Louisiana's landings were below average in 2010 and 2012, as were those of Texas (albeit only 86 pounds off the average in 2012).

Alabama's landings averaged over 17,000 pounds for 2006-09, but were not reportable in 2010-2012 due to confidentiality restrictions.

**TABLE 41
LANDINGS (POUNDS) OF YELLOWEDGE GROUPEY BY GULF STATE: 2010-12**

<u>State</u>	<u>2006-09 Average</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Alabama	16,961	Confidential	Confidential	Confidential
Florida (west coast)	733,737	369,508	382,268	562,316
Louisiana	93,525	76,423	143,417	89,468
Mississippi	0	0	0	0
Texas	<u>116,199</u>	<u>93,078</u>	<u>126,109</u>	<u>116,113</u>
All	960,423	539,009	651,794	767,897

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
They do not include commercial landings kept for home consumption or recreational landings.

Swordfish Landings by State

Florida and Louisiana have the only disclosable swordfish landings among Gulf states, and both were down significantly in 2010 (Table 42). Mississippi has no landings, and those in Alabama and Texas are not disclosable due to confidentiality restrictions.

Florida’s landings recovered in 2011, while Louisiana’s remained depressed until 2012.

**TABLE 42
LANDINGS (POUNDS) OF SWORDFISH BY GULF STATE: 2010-12**

<u>State</u>	<u>2006-09 Average</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Alabama	Confidential	Confidential	Confidential	Confidential
Florida (west coast)	180,533	124,245	346,193	465,847
Louisiana	538,438	259,537	364,334	817,896
Mississippi	0	0	0	0
Texas	<u>Confidential</u>	<u>Confidential</u>	<u>Confidential</u>	<u>Confidential</u>
All	718,970	383,782	710,527	1,283,742

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
They do not include commercial landings kept for home consumption or recreational landings.

Dolphinfish Landings by State

Florida lands the largest share of commercial dolphinfish in the Gulf, with 81 percent of reported landings for 2006-09 (Table 43). Louisiana followed with approximately 17 percent, and the other states make up the remaining two percent.

Florida’s dolphinfish landings were significantly depressed in 2010 and 2012, with 2011 landings slightly below the 2006-09 average.

Louisiana’s landings declined severely in 2010, off 93 percent from the 2006-09 average, and continued to be depressed substantially from the 2006-09 average in both 2011 and 2012.

TABLE 43
LANDINGS (POUNDS) OF DOLPHINFISH BY GULF STATE: 2010-12

<u>State</u>	<u>2006-09</u> <u>Average</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Alabama	1,615	Confidential	5,505	3,542
Florida (west coast)	299,693	107,646	282,671	111,986
Louisiana	61,458	4,156	23,975	29,665
Mississippi	Confidential	Confidential	Confidential	Confidential
Texas	<u>6,698</u>	<u>988</u>	<u>781</u>	<u>649</u>
All	369,464	112,790	312,932	145,842

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
 These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
 They do not include commercial landings kept for home consumption or recreational landings.

Florida Pompano Landings by State

Florida also lands the largest share of Florida pompano, accounting for 83 percent of 2006-09 commercial landings (Table 44). Louisiana followed with approximately 14 percent.

Florida's landings of Florida pompano declined 75 percent in 2010, and then dropped even further in 2011, when they equaled only five percent of the 2006-09 average. Landings climbed somewhat in 2012, but still equaled only nine percent of the 2006-09 average.

Louisiana's pompano landings collapsed in 2010, off 71 percent, but then recovered strongly in 2011. Landings fell back somewhat in 2012, to approximately five percent below the 2006-09 average.

TABLE 44
LANDINGS (POUNDS) OF FLORIDA POMPANO BY GULF STATE: 2010-12

<u>State</u>	<u>2006-09</u> <u>Average</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Alabama	9,108	4,753	5,668	3,281
Florida (west coast)	259,264	65,678	13,117	23,950
Louisiana	42,499	12,243	54,182	40,528
Mississippi	Confidential	Confidential	Confidential	Confidential
Texas	<u>436</u>	<u>416</u>	<u>Confidential</u>	<u>189</u>
All	311,306	83,090	72,967	67,948

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
 These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
 They do not include commercial landings kept for home consumption or recreational landings.

Scamp Landings by State

Commercial landings of scamp in 2010 were down in all four Gulf states with disclosable landings, from 32 percent in Texas to 61 percent in Alabama (Table 45). Landings were even more depressed in 2011, ranging from 39 percent in Florida to 100 percent in Louisiana – where no landings were reported in 2011.

Commercial scamp landings in 2012 recovered in Florida to above the 2006-09 average, but continued to be significantly depressed in the other three states.

**TABLE 45
LANDINGS (POUNDS) OF SCAMP BY GULF STATE: 2010-12**

<u>State</u>	<u>2006-09</u>			
	<u>Average</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Alabama	10,217	3,945	4,157	4,103
Florida (west coast)	233,404	149,268	142,190	254,728
Louisiana	41,391	19,819	0	21,086
Mississippi	Confidential	Confidential	Confidential	Confidential
Texas	<u>18,143</u>	<u>12,280</u>	<u>8,412</u>	<u>12,681</u>
All	303,155	185,312	154,759	292,598

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/20/2013.
 These are commercial landings as reported by Gulf states to NMFS and/or GSMFC.
 They do not include commercial landings kept for home consumption or recreational landings.

Estimated Foregone Finfish Revenue by State

The estimated foregone gross and net revenue for all eight selected saltwater finfish species for each state, based on 2006-09 state average market prices and the 27 percent variable cost percentage from the SCP, are listed in Tables 46 – 50.

**TABLE 46
ESTIMATED FOREGONE ALABAMA GROSS AND NET REVENUE FROM EIGHT
SELECTED FINFISH FISHERIES USING 2006-09 AVERAGE MARKET PRICES AND
VARIABLE COST ESTIMATE OF 27 PERCENT**

<u>Species</u>	<u>2006-09 avg. \$/lb.</u>	<u>2010</u>		<u>2011</u>		<u>2012</u>	
		<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>
Striped mullet	\$0.53	\$342,207	\$249,811	\$257,954	\$188,307		
Yellowfin tuna							
Red grouper	\$2.68	\$1,488	\$1,086	\$2,442	\$1,782	\$2,889	\$2,109
Yellowedge grouper							
Swordfish							
Dolphinfish							
Florida pompano	\$3.42	\$14,874	\$10,858	\$11,749	\$8,576	\$19,901	\$14,528
Scamp	\$3.17	<u>\$19,880</u>	<u>\$14,513</u>	<u>\$19,208</u>	<u>\$14,022</u>	<u>\$19,380</u>	<u>\$14,147</u>
All Eight Species		\$378,449	\$276,268	\$291,353	\$212,687	\$42,170	\$30,784

Sources of landings data: 2006-2011 – (National Marine Fisheries Service, 2013) as of March 2013.
 2012 – (Gulf States Marine Fisheries Commission, 2013) as of 6/20/2013.
 Landings declines, average prices, and foregone revenue calculated by authors.

TABLE 47
ESTIMATED FOREGONE FLORIDA GROSS AND NET REVENUE FROM EIGHT
SELECTED FINFISH FISHERIES USING 2006-09 AVERAGE MARKET PRICES AND
VARIABLE COST ESTIMATE OF 27 PERCENT

<u>Species</u>	<u>2006-09</u> <u>avg. \$/lb.</u>	<u>2010</u>		<u>2011</u>		<u>2012</u>	
		<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>
Striped mullet	\$0.65	\$76,222	\$55,642				
Yellowfin tuna	\$3.32	\$900,675	\$657,493				
Red grouper	\$2.42	\$3,916,988	\$2,859,401				
Yellowedge grouper	\$2.98	\$1,087,163	\$793,629	\$1,049,077	\$765,826	\$511,663	\$373,514
Swordfish	\$2.97	\$167,333	\$122,153				
Dolphinfish	\$1.72	\$331,073	\$241,684	\$29,345	\$21,422	\$323,591	\$236,222
Florida pompano	\$2.92	\$565,861	\$413,078	\$719,499	\$525,234	\$687,835	\$502,120
Scamp	\$3.20	<u>\$269,094</u>	<u>\$196,439</u>	<u>\$291,732</u>	<u>\$212,964</u>		
All Eight Species		\$7,314,410	\$5,339,519	\$2,089,653	\$1,525,446	\$1,523,090	\$1,111,856

Sources of landings data: 2006-2011 – (National Marine Fisheries Service, 2013) as of March 2013.
2012 – (Gulf States Marine Fisheries Commission, 2013) as of 6/20/2013.
Landings declines, average prices, and foregone revenue calculated by authors.

TABLE 48
ESTIMATED FOREGONE LOUISIANA GROSS AND NET REVENUE FROM EIGHT
SELECTED FINFISH FISHERIES USING 2006-09 AVERAGE MARKET PRICES AND
VARIABLE COST ESTIMATE OF 27 PERCENT

<u>Species</u>	<u>2006-09</u> <u>avg. \$/lb.</u>	<u>2010</u>		<u>2011</u>		<u>2012</u>	
		<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>
Striped mullet							
Yellowfin tuna	\$3.34	\$4,721,131	\$3,446,425	\$3,183,570	\$2,324,006		
Red grouper							
Yellowedge grouper	\$2.98	\$51,000	\$37,230			\$12,099	\$8,832
Swordfish	\$1.90	\$528,619	\$385,892	\$329,990	\$240,893		
Dolphinfish	\$0.90	\$51,336	\$37,475	\$33,580	\$24,514	\$28,483	\$20,792
Florida pompano	\$3.15	\$95,186	\$69,486			\$6,199	\$4,525
Scamp	\$2.67	<u>\$57,642</u>	<u>\$42,078</u>	<u>\$110,599</u>	<u>\$80,737</u>	<u>\$54,257</u>	<u>\$39,607</u>
All Eight Species		\$5,504,913	\$4,018,586	\$3,657,740	\$2,670,150	\$101,037	\$73,757

Sources of landings data: 2006-2011 – (National Marine Fisheries Service, 2013) as of March 2013.
2012 – (Gulf States Marine Fisheries Commission, 2013) as of 6/20/2013.
Landings declines, average prices, and foregone revenue calculated by authors.

TABLE 49
ESTIMATED FOREGONE MISSISSIPPI GROSS AND NET REVENUE FROM EIGHT
SELECTED FINFISH FISHERIES USING 2006-09 AVERAGE MARKET PRICES AND
VARIABLE COST ESTIMATE OF 27 PERCENT

<u>Species</u>	<u>2006-09 avg. \$/lb.</u>	<u>2010</u>		<u>2011</u>		<u>2012</u>	
		<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>
Striped mullet	\$0.47	\$2,370	\$1,730				
Yellowfin tuna							
Red grouper							
Yellowedge grouper							
Swordfish							
Dolphinfish							
Florida pompano							
Scamp							
All Eight Species		\$2,370	\$1,730	\$0	\$0	\$0	\$0

Sources of landings data: 2006-2011 – (National Marine Fisheries Service, 2013) as of March 2013.
2012 – (Gulf States Marine Fisheries Commission, 2013) as of 6/20/2013.
Landings declines, average prices, and foregone revenue calculated by authors.

TABLE 50
ESTIMATED FOREGONE TEXAS GROSS AND NET REVENUE FROM EIGHT SELECTED
FINFISH FISHERIES USING 2006-09 AVERAGE MARKET PRICES AND VARIABLE COST
ESTIMATE OF 27 PERCENT

<u>Species</u>	<u>2006-09 avg. \$/lb.</u>	<u>2010</u>		<u>2011</u>		<u>2012</u>	
		<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>	<u>Gross</u>	<u>Net</u>
Striped mullet							
Yellowfin tuna	\$3.53	\$111,483	\$81,383	\$114,492	\$83,579	\$114,492	\$83,579
Red grouper							
Yellowedge grouper	\$3.21	\$74,324	\$54,257			\$277	\$202
Swordfish							
Dolphinfish	\$1.94	\$11,052	\$8,068	\$11,452	\$8,360	\$11,708	\$8,547
Florida pompano	\$1.80	\$35	\$26			\$445	\$325
Scamp	\$2.87	<u>\$16,820</u>	<u>\$12,279</u>	<u>\$27,918</u>	<u>\$20,380</u>	<u>\$15,670</u>	<u>\$11,439</u>
All Eight Species		\$213,715	\$156,012	\$153,862	\$112,319	\$142,591	\$104,092

Sources of landings data: 2006-2011 – (National Marine Fisheries Service, 2013) as of March 2013.
2012 – (Gulf States Marine Fisheries Commission, 2013) as of 6/20/2013.
Landings declines, average prices, and foregone revenue calculated by authors.

Cumulative net finfish revenue losses for all eight species in 2010-12 by state are summarized in Table 51.

Florida's estimated net finfish losses totaled \$8.0 million, representing 51 percent of the total of \$15.6 million. Louisiana's cumulative net finfish losses totaled \$6.8 million, 43 percent of the total.

Combined, net revenue losses in Florida and Louisiana accounted for 94 percent of the total estimated Gulf finfish losses.

TABLE 51
CUMULATIVE ESTIMATED 2010-2012 COMMERCIAL
FINFISH NET REVENUE LOSSES BY STATE FOR EIGHT
SELECTED SPECIES (MILLIONS)

<u>State</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>Totals</u>	<u>% of Total</u>
Florida	\$5.3	\$1.5	\$1.1	\$8.0	51.0%
Louisiana	\$4.0	\$2.7	\$0.1	\$6.8	43.3%
Alabama	\$0.3	\$0.2	\$0.0	\$0.5	3.3%
Texas	\$0.2	\$0.1	\$0.1	\$0.4	2.4%
Mississippi	<u><\$0.1</u>	<u>\$0.0</u>	<u>\$0.0</u>	<u><\$0.1</u>	<u>0.0%</u>
Totals	\$9.8	\$4.5	\$1.3	\$15.6	100.0%

BLUE CRABS/OTHER SEAFOOD

From 2006 to 2009, Gulf of Mexico blue crab landings accounted for 30 to 41 percent of total U.S. landings, with total dockside values of \$40 to \$46 million (National Marine Fisheries Service, 2013). Louisiana contributed 78 to 87 percent of total Gulf blue crab landings over this period.

The SCP combines “Other Seafood” in the section with blue crab. The only two species specifically mentioned as “Other Seafood” in the SCP Exhibit 10 are stone crab and spiny lobster. Stone crabs are unique among crab species in that fishermen detach one claw from captured crabs and then return the crabs to the water to grow a replacement, so only the claws are landed.

From 2006-09, the Gulf landed 98 percent of total U.S. commercial landings of stone crab claws and 90 percent of Caribbean spiny lobster. Among the Gulf states, the west coast of Florida contributed over 99 percent of stone crab claws, and 100 percent of Caribbean spiny lobster.

Gulf-wide Landings of Blue Crab

As shown by Table 52 and Figure 20, Gulf-wide blue crab landings have been on a slightly downward trend since 2000, with substantial year-to-year variation.

The decline in landings in 2005 was likely attributable to the impacts and effects of Hurricanes Katrina and Rita. This was followed by a year of strong landings in 2006.

The decline in blue crab landings in 2008 was due to a combination of factors, including the massive amounts of freshwater flowing out of and released from the Mississippi River during the floods of June 2008, and a succession of hurricanes and tropical storms in the Gulf from July through September.

Landings recovered strongly in 2009, before the effects of the Deepwater Horizon oil spill and related fisheries closures in April 2010.

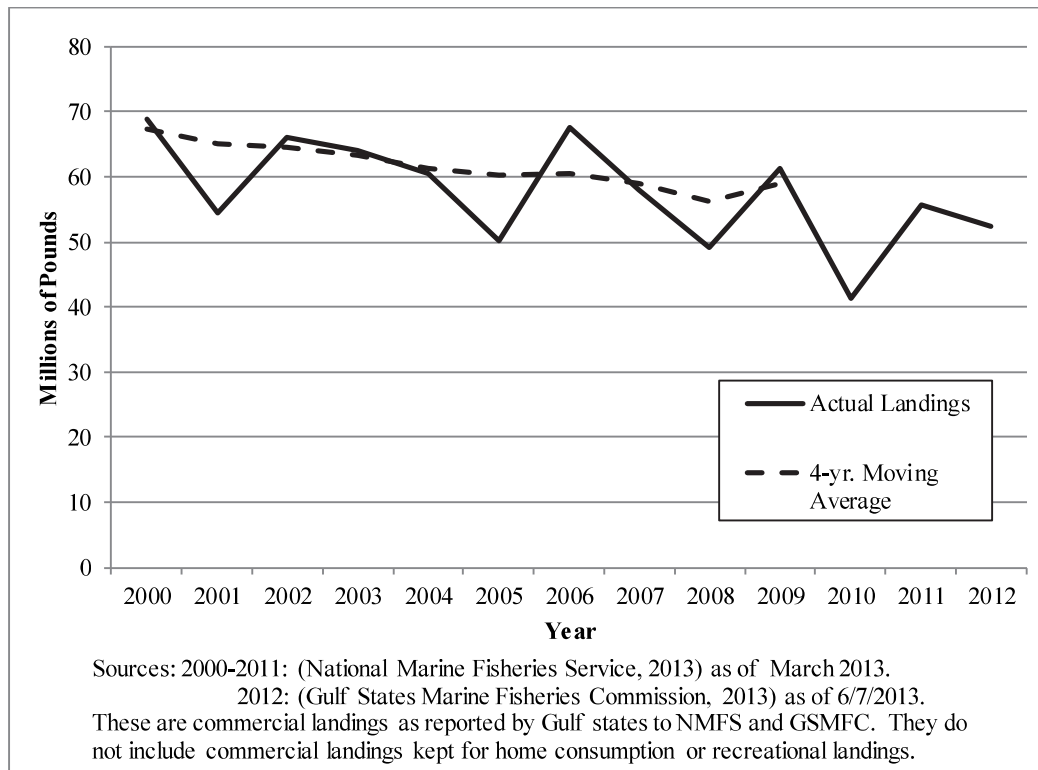
2006-09 average landings equaled approximately 59 million pounds. Actual landings in 2010 totaled 41.2 million pounds, a drop of 17.8 million pounds from the 2006-09 average landings.

TABLE 52
TOTAL VOLUME OF GULF-WIDE BLUE CRAB LANDINGS: 2000-2012
 (Actual landings and 4-yr. moving average)

<u>Year</u>	<u>Actual Landings (pounds)</u>	<u>4-yr Moving Avg.</u>
2000	68,897,503	67,393,799
2001	54,500,377	64,993,336
2002	66,018,714	64,603,099
2003	63,960,570	63,344,291
2004	60,580,786	61,265,112
2005	50,041,176	60,150,312
2006	67,481,146	60,515,920
2007	57,964,361	59,016,867
2008	49,259,928	56,186,653
2009	61,272,176	58,994,403
2010	41,212,251	
2011	55,573,132	
2012	52,501,262	

Sources: 2000-2011: (National Marine Fisheries Service, 2013) as of March 2013.
 2012: (Gulf States Marine Fisheries Commission, 2013) as of 6/7/2013.
 These are commercial landings as reported by Gulf states to NMFS and GSMFC. They do not include commercial landings kept for home consumption or recreational landings.

FIGURE 20
GULF-WIDE BLUE CRAB LANDINGS: VOLUME
 (2000-2012 Actual Annual Landings and 4-yr. Moving Average)



At the 2006-09 average dockside price of \$0.74/pound, the 17.8 million pounds of lost landings in 2010 would have a gross dockside value of approximately \$13.2 million. After removing the 35 percent variable trip costs estimated in the SCP, the net foregone revenue for Gulf blue crab fishermen in 2010 would be \$8.6 million.

Actual landings in 2011 and 2012 were 55.6 and 52.5 million pounds, 3.4 and 6.5 million pounds below the 2006-09 average, respectively. Using the 2006-09 average dockside price and 35 percent estimated trip costs, these landings reductions would equal gross and net revenue reductions of \$2.5 and \$1.6 million, respectively, in 2011 and \$4.8 and \$3.1 million, respectively, in 2012.

Gulf-wide blue crab losses are summarized in Table 53. Gulf-wide landings shortfalls for 2010-12 totaled 27.7 million pounds, with an estimated gross dockside value of \$20.5 million and an estimated net revenue after trip costs of \$13.3 million.

TABLE 53
ESTIMATED GULF-WIDE COMMERCIAL BLUE CRAB LANDINGS REDUCTIONS
AND FOREGONE REVENUES: 2010-2012

<u>Year</u>	<u>Std. Deviation of 2006-09 Landings</u>	<u>Actual Landings minus 2006-09 Avg. Landings</u>	<u>2006-09 Average Price/Pound</u>	<u>Estimated Foregone Gross Revenue</u>	<u>Estimated Foregone Net Revenue</u>
2010	7,594,604	(17,782,152)	\$0.74	(\$13,162,505)	(\$8,555,628)
2011	7,594,604	(3,421,271)	\$0.74	(\$2,532,455)	(\$1,646,095)
2012	7,594,604	(6,493,141)	\$0.74	(\$4,806,280)	(\$3,124,082)
Total		(27,696,563)	\$0.74	(\$20,501,239)	(\$13,325,805)

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.

2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/7/2013.

These are commercial landings as reported by Gulf states to NMFS and GSMFC.

They do not include commercial landings kept for home consumption or recreational landings.

Landings declines, average prices, and foregone revenue calculated by authors.

Blue Crab Landings by State

Table 54 details annual blue crab landings by state from 2000-2012, and compares 2010-2012 landings with the 2006-09 averages.

Alabama, Louisiana, and Mississippi all reported significantly reduced blue crab landings in 2010, down 55 percent, 36 percent, and 49 percent, respectively, from their 2006-09 averages.

Alabama's blue crab landings recovered somewhat in 2011 and 2012, but were still 21 and 37 percent, respectively, below the 2006-09 average.

Louisiana's landings also recouped some of their decline in 2011 and 2012, but were still about 9 percent below average in each year.

Mississippi's blue crab landings were only slightly improved in 2011, and still 49 percent below its 2006-09 average. Mississippi's 2012 landings rebounded to a level above the 2006-09 average.

Florida and Texas both had above-average landings in 2010 and 2011, but then saw landings fall off in 2012 – to 19 percent below the 2006-09 average in Florida and 32 percent below in Texas.

Using 2006-09 average prices, gross foregone blue crab revenue for 2010 in Louisiana, Alabama, and Mississippi equaled \$12.5 million, \$0.8 million, and \$0.3 million, respectively, for total gross losses of \$13.6 million (Table 55). After subtracting 35% variable trip costs, net revenue losses are estimated to have been \$8.1 million, \$0.5 million, and \$0.2 million, respectively, for a total of \$8.8 million.

Louisiana accounted for 92.0 percent of the estimated losses, Alabama 5.6 percent, and Mississippi the remaining 2.4 percent.

**TABLE 54
COMMERCIAL BLUE CRAB LANDINGS BY STATE FOR THE PERIOD 2000-2012 AND
COMPARISONS TO 2006-09 AVERAGES**

Year	Alabama	FL (West Coast)	Louisiana	Mississippi	Texas
2000	4,783,861	6,587,833	52,047,403	840,243	4,653,306
2001	2,457,532	4,654,309	41,775,961	433,656	5,163,132
2002	2,577,341	5,571,255	50,121,422	716,628	7,037,012
2003	2,813,459	7,230,392	48,068,704	876,521	4,811,275
2004	3,328,653	8,171,464	44,392,126	812,106	3,960,838
2005	1,024,295	7,401,564	38,116,854	429,231	3,119,000
2006	2,384,234	8,610,150	53,394,262	1,126,806	1,965,694
2007	2,556,594	6,109,825	45,106,808	737,442	3,453,692
2008	1,798,718	2,663,096	41,712,977	450,037	2,635,100
2009	1,458,468	3,364,214	53,059,903	545,328	2,844,263
2010	925,688	5,758,668	30,725,544	366,334	3,436,017
2011	1,615,471	6,833,206	43,862,113	369,786	2,892,587
2012	1,298,279	4,191,590	44,159,484	782,114	1,842,304
2006-09 Average	2,049,504	5,186,821	48,318,488	714,903	2,724,687
2010 Act. - 06-09 Avg.	(1,123,816)	571,847	(17,592,944)	(348,569)	711,330
2011 Act. - 06-09 Avg.	(434,033)	1,646,385	(4,456,375)	(345,117)	167,900
2012 Act. - 06-09 Avg.	(751,225)	(995,231)	(4,159,003)	67,211	(882,383)
2006-09 Std. Deviation	510,360	2,724,102	5,836,442	299,489	613,689

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013.
These are commercial landings as reported by Gulf states to NMFS and/or GSMFC. They do not include commercial landings kept for home consumption or recreational landings.

**TABLE 55
ESTIMATED 2010 COMMERCIAL BLUE CRAB REVENUE LOSSES IN THREE
IMPACTED GULF STATES ASSUMING 35% VARIABLE TRIP COSTS**

State	2006-09 Avg. – 2010 Actual Landings	2006-09 Avg Price/lb.	Est. Gross Loss	Est. Net Loss	% of Total Net Loss
Louisiana	17,592,944	\$ 0.71	\$12,484,862	\$8,115,160	92.0%
Alabama	1,123,816	\$ 0.67	\$757,243	\$492,208	5.6%
Mississippi	348,569	\$ 0.94	\$327,726	\$213,022	2.4%
Total	19,065,328		\$13,569,832	\$8,820,391	100.0%

Source: (National Marine Fisheries Service, 2013) as of March 2013.
Landings decline, average price, and foregone revenue calculations by authors.

Gross and net losses in 2011 for the same three impacted states are detailed in Table 56. Landings were higher and losses much lower in Louisiana and Alabama than in 2010, but Mississippi reported almost identical landings for 2011 as in 2010.

Net losses in the three states totaled \$2.5 million in 2011, with Louisiana accounting for 83.7 percent, Mississippi 8.6 percent, and Alabama 7.7 percent.

TABLE 56
ESTIMATED 2011 COMMERCIAL BLUE CRAB REVENUE LOSSES IN THREE
IMPACTED GULF STATES ASSUMING 35% VARIABLE TRIP COSTS

<u>State</u>	2006-09 Avg. – <u>2011</u> <u>Actual Landings</u>	2006-09 Avg <u>Price/lb.</u>	Est. Gross <u>Loss</u>	Est. Net <u>Loss</u>	% of Total <u>Net Loss</u>
Louisiana	4,456,375	\$0.71	\$3,162,474	\$2,055,608	83.7%
Alabama	434,033	\$0.67	\$292,458	\$190,097	7.7%
Mississippi	<u>345,117</u>	\$0.94	<u>\$324,481</u>	<u>\$210,913</u>	<u>8.6%</u>
Total	5,235,524		\$3,779,412	\$2,456,618	100.0%

Source: (National Marine Fisheries Service, 2013) as of March 2013.
Landings decline, average price, and foregone revenue calculations by authors.

Four of the five Gulf states reported below-average blue crab landings in 2012, with Florida and Texas joining Alabama and Louisiana in reporting losses, but Mississippi reporting above-average landings (Table 57).

Louisiana continued to report the largest loss, with a net loss of \$1.9 million equaling 58 percent of the total 2012 net loss of \$3.3 million.

Florida’s 2012 blue crab landings were almost a million pounds below their 2006-09 average, which equated to a net loss in revenue of \$0.6 million, or 18 percent of the total.

Texas and Alabama accounted for the remaining 24 percent of net losses, with Texas showing a net loss in revenue of \$0.5 million (14 percent) and Alabama \$0.3 million (10 percent).

TABLE 57
ESTIMATED 2012 COMMERCIAL BLUE CRAB REVENUE LOSSES IN FOUR
IMPACTED GULF STATES ASSUMING 35% VARIABLE TRIP COSTS

<u>State</u>	2006-09 Avg. – <u>2012 Actual Landings</u>	2006-09 Avg. <u>Price/lb.</u>	Est. Gross <u>Loss</u>	Est. Net <u>Loss</u>	% of Total <u>Net Loss</u>
Louisiana	4,159,003	\$0.71	\$2,951,444	\$1,918,438	57.6%
Florida	995,231	\$0.94	\$935,721	\$608,219	18.3%
Texas	882,383	\$0.83	\$730,087	\$474,557	14.2%
Alabama	<u>751,225</u>	\$0.67	<u>\$506,186</u>	<u>\$329,021</u>	<u>9.9%</u>
Total	6,787,842		\$5,123,438	\$3,330,235	100.0%

Sources: 2006-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013.
Landings decline, average price, and foregone revenue calculations by authors.

Total cumulative blue crab revenue losses for all states are summarized in Table 58. Louisiana accounted for approximately \$12.1 million (82.8 percent) of the \$14.6 million total cumulative losses.

Blue Crab Landings by Louisiana Basin

All six major Louisiana river basins reported significant declines in blue crab landings in 2010 (Table 59 & Figure 21), ranging from 17 percent below the 2006-09 average in the Lake Pontchartrain - Pearl River Basin to 49 percent in the Mississippi River – Barataria Basin.

Landings quickly showed signs of recovery in the Lake Pontchartrain – Pearl River Basin, with both 2011 and 2012 landings exceeding the 2006-09 average.

**TABLE 58
SUMMARY OF ESTIMATED 2010-12 COMMERCIAL BLUE CRAB NET
REVENUE LOSSES**

<u>State</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>Total by State</u>	<u>% of Total Net Losses</u>
Louisiana	\$8,115,160	\$2,055,608	\$1,918,438	\$12,089,207	82.8%
Alabama	\$492,208	\$190,097	\$329,021	\$1,011,327	6.9%
Florida	\$0	\$0	\$608,219	\$608,219	4.2%
Texas	\$0	\$0	\$474,557	\$474,557	3.2%
Mississippi	\$213,022	\$210,913	\$0	\$423,935	2.9%
	\$8,820,391	\$2,456,618	\$3,330,235	\$14,607,244	100.0%

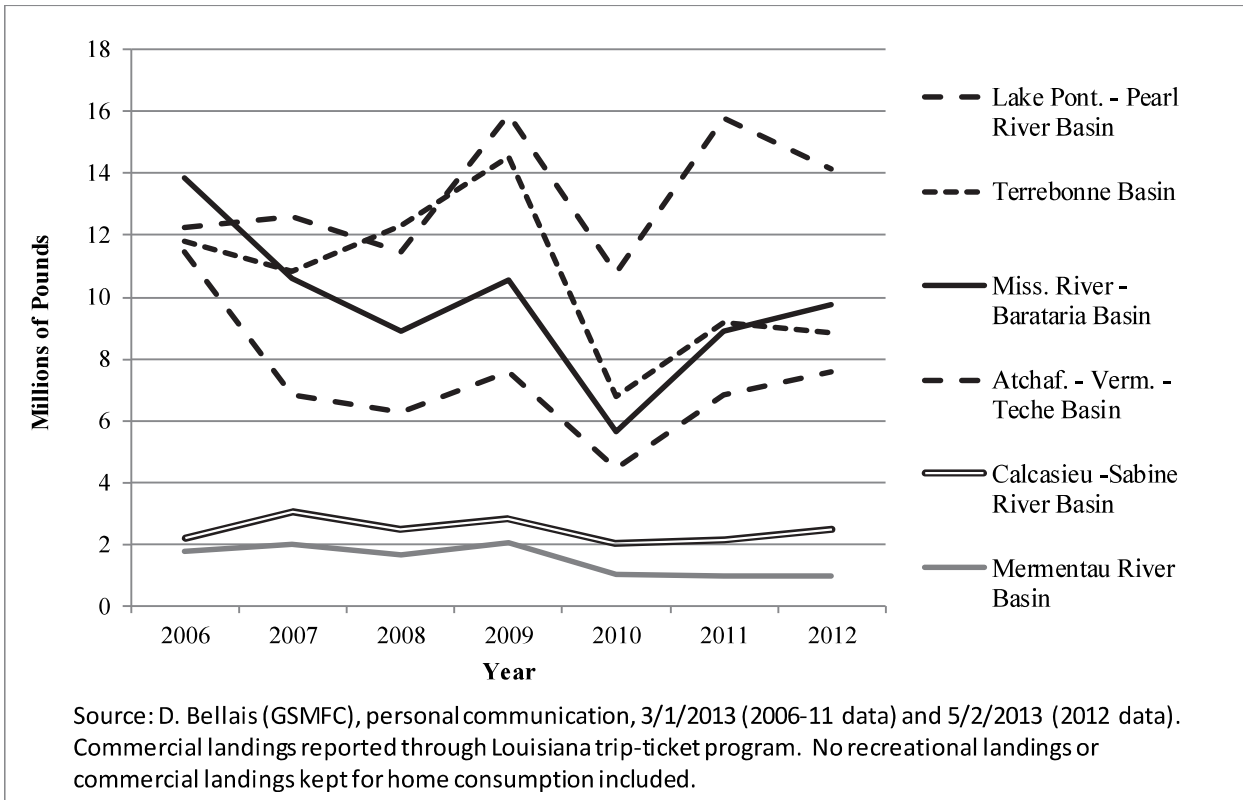
**TABLE 59
COMMERCIAL BLUE CRAB LANDINGS (POUNDS) AND ESTIMATED 2010-2012
DIFFERENCES COMPARED TO 2006-09 AVERAGES: BY LOUISIANA BASIN**

<u>Year</u>	<u>Lake Pont. - Pearl River</u>	<u>Terrebonne</u>	<u>Miss. River – Barataria</u>	<u>Atchaf. – Vermilion - Teche River</u>	<u>Calcasieu - Sabine River</u>	<u>Mermentau River</u>
2006	12,283,052	11,814,802	13,844,016	11,467,658	2,200,979	1,806,197
2007	12,582,063	10,852,037	10,610,546	6,830,575	3,056,996	2,031,576
2008	11,455,347	12,297,071	8,871,581	6,293,424	2,502,156	1,655,488
2009	15,920,230	14,537,779	10,564,673	7,568,160	2,828,994	2,055,987
2010	10,801,349	6,764,690	5,633,176	4,478,208	2,044,831	1,035,017
2011	15,791,678	9,184,388	8,919,870	6,874,080	2,133,545	997,246
2012	14,133,243	8,865,363	9,748,986	7,578,176	2,514,505	968,400
2006-'09 avg.	13,060,173	12,375,422	10,972,704	8,039,954	2,647,281	1,887,243
2010 – '06-'09 avg.	(2,258,824)	(5,610,732)	(5,339,528)	(3,561,746)	(602,450)	(852,295)
2011 – '06-'09 avg.	2,731,505	(3,191,034)	(2,052,834)	(1,165,874)	(513,736)	(890,066)
2012 – '06-'09 avg.	1,073,070	(3,510,059)	(1,223,717)	(461,778)	(132,777)	(918,912)
2006-09 std. dev.	1,965,358	1,561,722	2,078,204	2,344,121	374,670	191,124
Source: D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-2011 data) and 5/2/2013 (2012 data).						
Commercial landings reported through Louisiana trip-ticket program. No recreational landings or commercial landings kept for home consumption included.						
Averages, differences, and statistics calculated by authors.						

Landings in the other five basins remained below their 2006-09 averages in 2011 and 2012.

Table 60 details the estimated 2010 losses of gross and net revenues by commercial blue crabbers by basin. Gross and net losses totaled \$12.7 and \$8.3 million, respectively.

**FIGURE 21
BLUE CRAB LANDINGS BY LOUISIANA BASIN: 2006 - 2012**



**TABLE 60
ESTIMATED FOREGONE GROSS AND NET REVENUE FROM DECREASED
COMMERCIAL BLUE CRAB LANDINGS IN 2010, BY LOUISIANA BASIN**

Basin	2006-09 avg. minus 2010 actual landings (lbs)	Avg. 2006-09 basin price/lb.	Gross revenue loss	Net revenue loss assuming 35% trip costs
Mississippi River - Barataria	5,339,528	\$0.69	\$3,666,704	\$2,383,358
Terrebonne	5,610,732	\$0.65	\$3,640,811	\$2,366,527
Atchaf. - Vermilion - Teche	3,561,746	\$0.72	\$2,581,982	\$1,678,288
Lake Pont. - Pearl River	2,258,824	\$0.75	\$1,684,920	\$1,095,198
Mermentau River	852,295	\$0.83	\$704,095	\$457,662
Calcasieu - Sabine River	602,450	\$0.72	\$435,827	\$283,288
Total	18,225,575		\$12,714,340	\$8,264,321

Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013.

Landings decline, average price, and revenue loss calculations by authors.

The Mississippi River – Barataria and Terrebonne basins sustained the greatest blue crab losses in 2010, accounting for 28.8 and 28.6 percent of total losses, respectively. The Atchafalaya – Vermilion - Teche River and Lake Pontchartrain - Pearl River basins accounted for 20.3 percent and 13.2 percent of

2010 losses, respectively. The Mermentau River Basin revenue losses made up 5.5 percent of the total, and the Calcasieu – Sabine River Basin 3.4 percent.

As previously mentioned, the Lake Pontchartrain – Pearl River Basin reported above-average landings in 2011, but the other five basins continued to experience landings below their 2006-09 averages. Table 61 details the estimated revenue shortfalls by basin for 2011.

The Terrebonne and Mississippi River – Barataria basins continued to report the heaviest declines, with losses of net revenue of \$1.3 and \$0.9 million, respectively. These two basins made up approximately 64 percent of the estimated net revenue loss.

The Atchafalaya – Vermilion – Teche River and Mermentau River Basin basins had estimated net revenue losses of approximately \$0.5 million each, followed by the Calcasieu – Sabine River at \$0.2 million.

TABLE 61
ESTIMATED FOREGONE GROSS AND NET REVENUE FROM DECREASED
COMMERCIAL BLUE CRAB LANDINGS IN 2011, BY LOUISIANA BASIN

<u>Basin</u>	2006-09 avg. minus 2011 actual <u>landings (lbs)</u>	Avg. 2006-09 basin <u>price/lb.</u>	Gross <u>revenue loss</u>	Net Revenue loss assuming <u>35% trip costs</u>
Terrebonne	3,191,034	\$0.65	\$2,070,666	\$1,345,933
Miss. River - Barataria	2,052,834	\$0.69	\$1,409,700	\$916,305
Atchaf. - Vermilion - Teche	1,165,874	\$0.72	\$845,166	\$549,358
Mermentau River	890,066	\$0.83	\$735,299	\$477,944
Calcasieu - Sabine River	<u>513,736</u>	\$0.72	<u>\$371,649</u>	<u>\$241,572</u>
Totals	7,813,554		\$5,432,480	\$3,531,112
Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013.				
Landings decline, average price, and revenue loss calculations by authors.				

In 2012 the Lake Pontchartrain – Pearl River again reported landings above the 2006-09 average, while the other five basins continued reporting landings below their 2006-09 averages (Table 62).

Terrebonne Basin, whose landings were down from 2011, again reported the largest foregone net revenue - \$1.5 million, or 53 percent of 2012 losses. The Mississippi River – Barataria Basin accounted for approximately 20 percent of 2012 losses, the Mermentau River Basin approximately 18 percent, and the Atchafalaya – Vermilion – Teche River Basin approximately nine percent.

Table 63 tabulates the 2010-12 cumulative blue crab revenue losses by basin. The Terrebonne Basin accounted for 35.5 percent (\$5.2 million) of the \$14.6 million total net blue crab losses. The Mississippi River – Barataria Basin was next at 26.3 percent (\$3.8 million).

The Atchafalaya – Vermilion – Teche River Basin suffered estimated net losses of \$2.4 million, representing 16.7 percent of the total.

TABLE 62
ESTIMATED FOREGONE GROSS AND NET REVENUE FROM DECREASED
COMMERCIAL BLUE CRAB LANDINGS IN 2012, BY LOUISIANA BASIN

Basin	2006-09 avg. minus 2012 actual landings (lbs)	Avg. 2006-09 basin price/lb.	Gross revenue loss	Net revenue loss assuming 35% trip costs
Terrebonne	3,510,059	\$0.65	\$2,277,682	\$1,480,493
Miss. River - Barataria	1,223,717	\$0.69	\$840,338	\$546,220
Mermentau River	918,912	\$0.83	\$759,129	\$493,434
Atchaf. - Vermilion - Teche	461,778	\$0.72	\$334,753	\$217,589
Calcasieu - Sabine River	<u>132,777</u>	\$0.72	<u>\$96,054</u>	<u>\$62,435</u>
Totals	6,247,244		\$4,307,956	\$2,800,171
Source: Landings volume and value data provided by D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-11 data) and 5/2/2013 (2012 data). Landings decline, average price, and revenue loss calculations by authors.				

TABLE 63
ESTIMATED 2010-2012 BLUE CRAB NET FOREGONE REVENUE (IN MILLIONS) IN
SIX IMPACTED LOUISIANA BASINS USING 2006-2009 AVERAGE BASIN MARKET
PRICES AND 35% TRIP COSTS

<u>Basin</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>Cumulative</u>	<u>% of Total</u>
Terrebonne	\$2,366,527	\$1,345,933	\$1,480,493	\$5,192,953	35.5%
Miss. River - Barataria	\$2,383,358	\$916,305	\$546,220	\$3,845,883	26.3%
Atchaf.- Verm.- Teche	\$1,678,288	\$549,358	\$217,589	\$2,445,235	16.7%
Mermentau River	\$457,662	\$477,944	\$493,434	\$1,429,040	9.8%
Lake Pont. - Pearl	\$1,095,198	\$0	\$0	\$1,095,198	7.5%
Calc. - Sabine River	<u>\$283,288</u>	<u>\$241,572</u>	<u>\$62,435</u>	<u>\$587,295</u>	<u>4.0%</u>
Total	\$8,264,321	\$3,531,112	\$2,800,171	\$14,595,604	100.0%

Summary of Estimated Blue Crab Losses

Estimated blue crab net revenue losses by location and year are summarized in Figure 22.

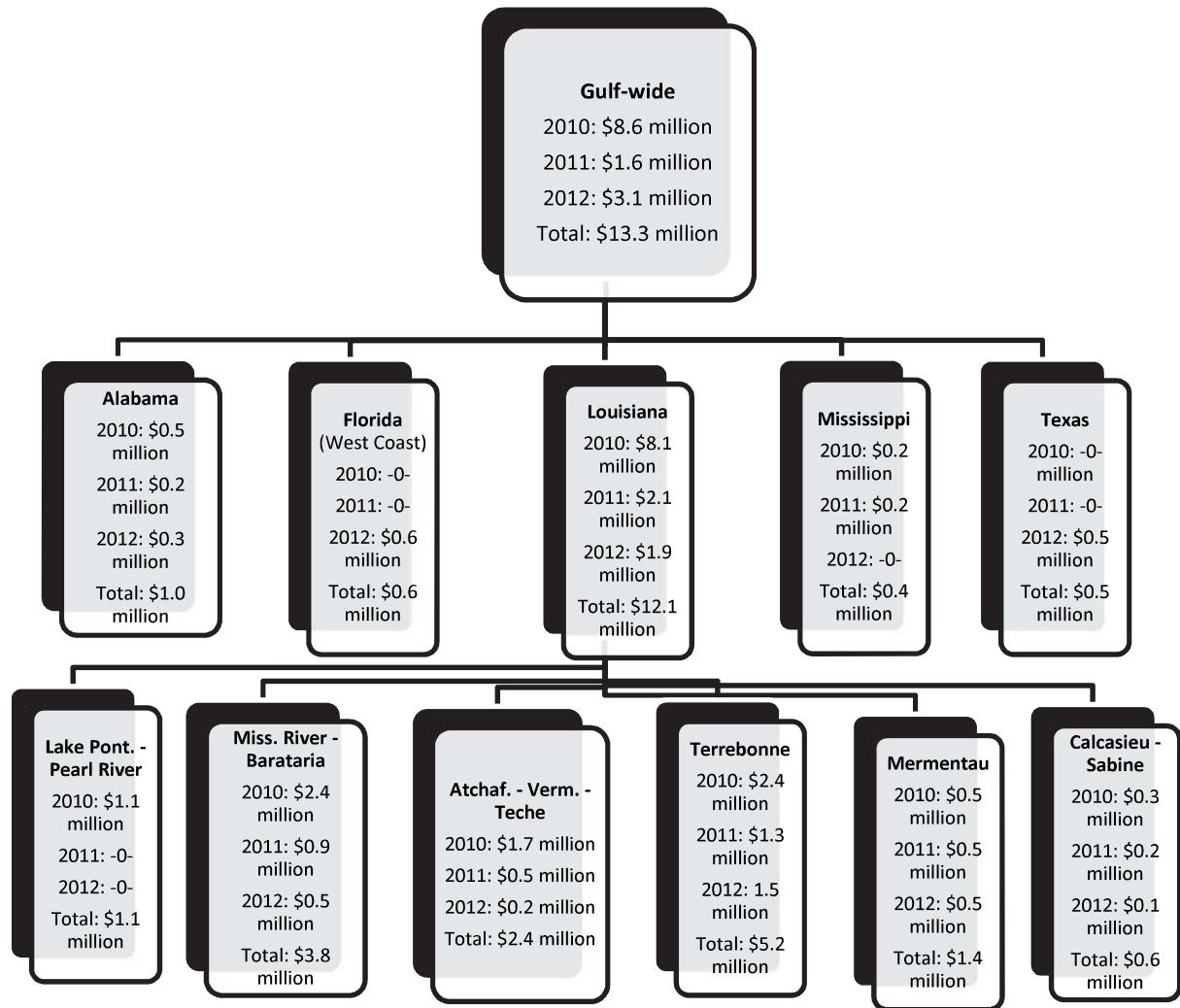
When analyzed at the Gulf-wide level, blue crab cumulative net losses totaled \$13.3 million. When separated by state, the total for all states was \$14.6 million, with Louisiana's \$12.1 million accounting for 82.8 percent of total losses.

When landings and losses were segregated by basin, Louisiana's losses climbed to \$14.6 million, led by Terrebonne Basin's \$5.2 million.

Re-Allocation of Blue Crab Effort & Landings per Trip

As detailed in Table 64 and illustrated in Figure 23, there has been a shift in blue crab fishing effort since 2010 to the Lake Pontchartrain Basin. Trips where the majority of blue crabs landed came from the Lake Pontchartrain Basin increased by 51 percent and 41 percent in 2011 and 2012, respectively, over the 2006-09 average number of trips.

FIGURE 22
SUMMARY OF ESTIMATED FOREGONE NET REVENUE FROM COMMERCIAL BLUE
CRABBING: 2010-2012



As revealed in Table 65 and Figure 24, even though 2011 and 2012 total landings of blue crab from the Lake Pontchartrain Basin increased over its 2006-09 average, effort increased by a larger percentage, causing harvest per trip to decline to 80 percent and 77 percent of the 2006-09 average in 2011 and 2012, respectively.

Total landings in 2010-12 in the Atchafalaya – Vermilion – Teche River and Calcasieu – Sabine River basins were 94 – 95 percent of their pre-spill averages, but the number of trips were above average all three years in the Calcasieu – Sabine River Basin and in 2012 in the Atchafalaya – Vermilion – Teche River Basin, causing landings per trip (CPUE) to decline to 75 to 87 percent of pre-spill averages.

The largest decline in landings per trip was in the Mermentau River Basin, where total landings declined to 51 – 55 percent of pre-spill averages, but number of trips only fell to 64 to 77 percent of pre-spill averages. Landings per trip fell to 71 percent of the 2006-09 average in 2010 and 2012.

TABLE 64
NUMBER OF BLUE CRAB TRIP TICKETS REPORTING EACH BASIN AS PRIMARY
HARVEST LOCATION

Basin	2006	2007	2008	2009	2006-09	2010	2011	2012
					Avg.			
Lake Pontchartrain	15,466	21,697	19,898	26,782	20,961	21,447	31,661	29,594
Terrebonne	26,551	30,567	25,892	30,018	28,257	16,109	20,109	21,447
Miss. River - Barataria	23,996	25,486	19,797	22,545	22,956	13,343	19,699	19,376
Atchaf-Verm-Teche	20,858	17,626	15,060	19,453	18,249	13,675	17,922	22,838
Calcasieu-Sabine River	4,792	7,275	6,652	6,459	6,295	6,384	6,754	7,828
Mermentau	<u>3,939</u>	<u>5,384</u>	<u>4,833</u>	<u>5,905</u>	<u>5,015</u>	<u>3,849</u>	<u>3,221</u>	<u>3,617</u>
All	95,602	108,035	92,132	111,162	101,733	74,807	99,366	104,700

Source: Louisiana Department of Wildlife and Fisheries, personal communication, 5/5/2013.

FIGURE 23
NUMBER OF BLUE CRAB TRIP-TICKETS BY BASIN PER YEAR: 2006-2012

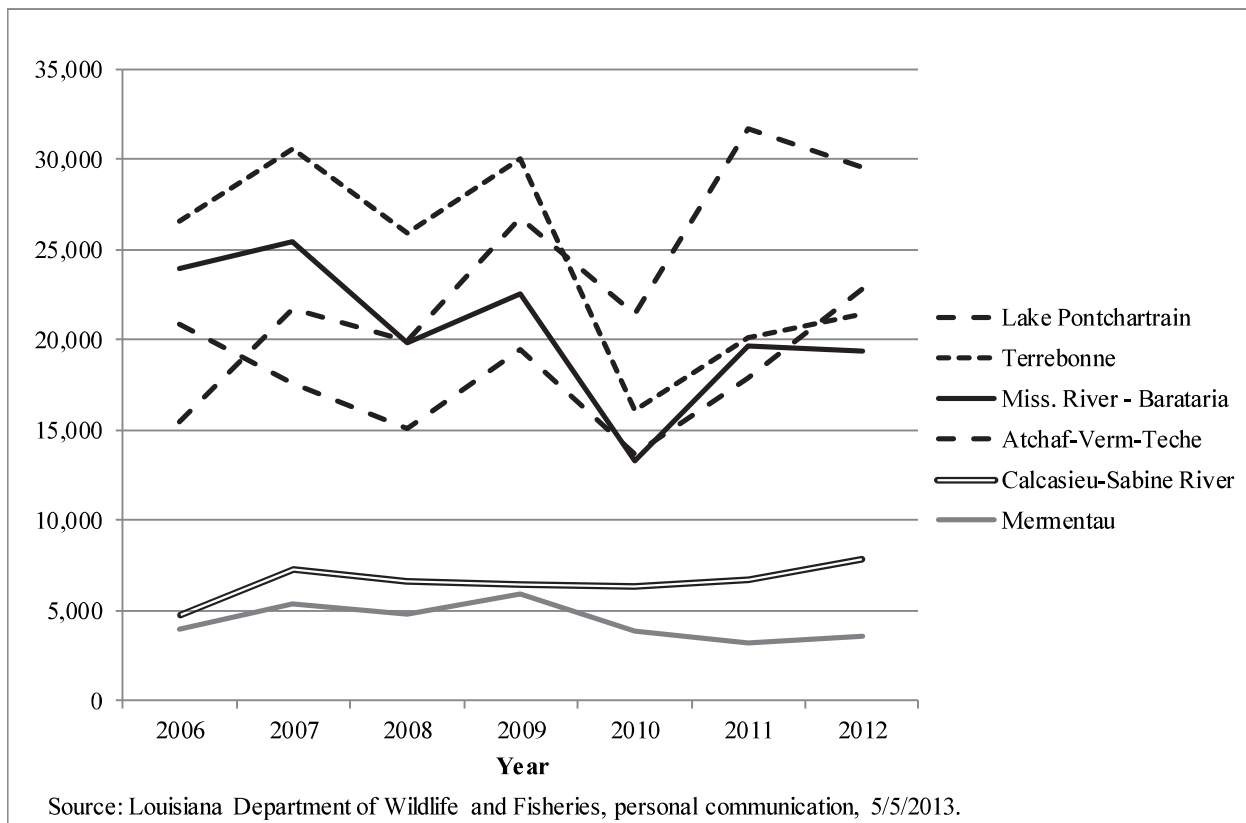
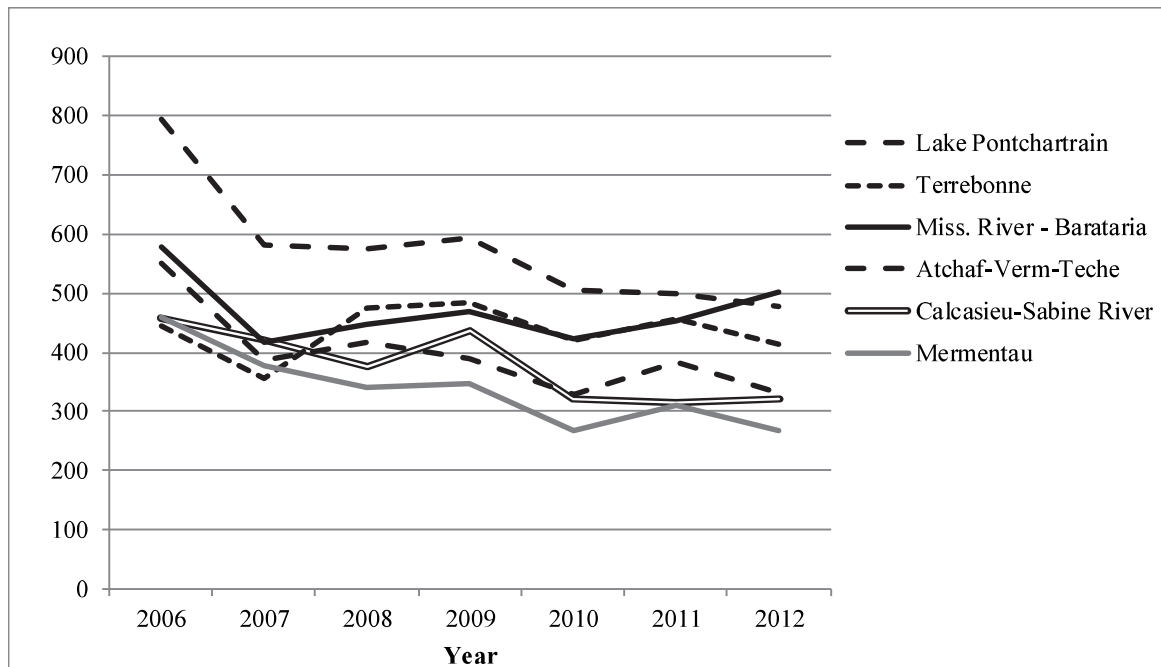


TABLE 65
PERCENTAGE OF 2010, 2011, AND 2012 TOTAL BASIN VOLUME OF COMMERCIAL
BLUE CRAB LANDINGS, NUMBER OF TRIPS, AND LANDINGS PER TRIP VS. 2006-09
AVERAGES

Basin	Volume Landed			Number of Trips			Landings/Trip		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
Lake Pontchartrain	83%	121%	108%	102%	151%	141%	81%	80%	77%
Terrebonne	55%	74%	72%	57%	71%	76%	96%	104%	94%
Miss. River - Barataria	51%	81%	89%	58%	86%	84%	88%	95%	105%
Atchaf – Verm - Teche	56%	85%	94%	75%	98%	125%	74%	87%	75%
Calc. - Sabine River	77%	81%	95%	101%	107%	124%	76%	75%	76%
Mermentau	55%	53%	51%	77%	64%	72%	71%	82%	71%
Overall	63%	90%	89%	74%	98%	103%	85%	92%	87%

Sources: Number of trip tickets – Louisiana Department of Wildlife and Fisheries, personal communication, 5/5/2013.
Volume of landings – D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-2011 data) and 5/2/2013 (2012 data).
Landings per trip ticket and percentages calculated by authors.

FIGURE 24
AVERAGE POUNDS OF BLUE CRAB LANDED PER TRIP BY BASIN:
2006-2012 VS. 2006-09 AVG.



Sources: Number of trip tickets – Louisiana Department of Wildlife and Fisheries, personal communication, 5/5/2013.
Volume of landings – D. Bellais (GSMFC), personal communication, 3/1/2013 (2006-2011 data) and 5/2/2013 (2012 data).
Average landings per trip ticket calculated by authors.

Gulf-wide Landings of Other Seafood

Stone Crab Claws

As shown in Table 66 and Figure 25, stone crab claw landings in the Gulf declined moderately in 2010, then increased a small amount in 2011 to a level near the 2006-09 average.

Using the 2006-09 average price to value the landings reductions, the Gulf stone crab fishery experienced gross revenue losses of \$1.7 million in 2010 and \$0.2 million in 2011. After removing the 35 percent variable cost estimate used in the SCP, net revenue losses were estimated at \$1.0 million and \$0.2 million in 2010 and 2011, respectively.

Landings of stone crab claws then collapsed in 2012 to 2.6 million pounds, down 54 percent from the 2006-09 average.

Compared to 2006-09 average landings, stone crab claw landings in 2012 were down by approximately 3 million pounds. When multiplied by the 2006-09 average price of \$3.92/pound, this decline translates to a loss of gross revenue of \$11.7 million. After removing the 35 percent variable costs, the net foregone revenue equals \$7.6 million.

The cumulative net loss over the 2010-12 period for the stone crab fishery is estimated at \$8.8 million.

TABLE 66
TOTAL VOLUME OF GULF-WIDE STONE CRAB CLAW LANDINGS: 2000-2012
 (Actual landings and 4-yr. moving average)

<u>Year</u>	<u>Actual Landings (pounds)</u>	<u>4-yr Moving Avg.</u>
2000	6,848,406	6,465,675
2001	6,681,978	6,540,560
2002	6,432,700	6,404,358
2003	5,292,310	6,313,849
2004	5,970,519	6,094,377
2005	4,534,149	5,557,420
2006	4,806,369	5,150,837
2007	5,892,747	5,300,946
2008	6,122,887	5,339,038
2009	5,335,356	5,539,340
2010	5,111,808	
2011	5,476,825	
2012	2,562,755	

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/7/2013.
 These are commercial landings as reported by Gulf states to NMFS and GSMFC. They do not include commercial landings kept for home consumption or recreational landings.

Caribbean Spiny Lobster

Gulf of Mexico landings of Caribbean spiny lobster appear to have been unaffected by the 2010 oil spill. As shown in Table 67 and Figure 26, landings increased sharply in 2010 and 2011, then returned to a level equal to the 2006-09 average in 2012.

Because there is no evident Gulf-wide impact, and Florida is the only state with landings, no state-by-state analysis will be included in this report.

FIGURE 25
GULF-WIDE STONE CRAB CLAW LANDINGS: VOLUME
 (2000-2012 Actual Annual Landings and 4-yr. Moving Average)

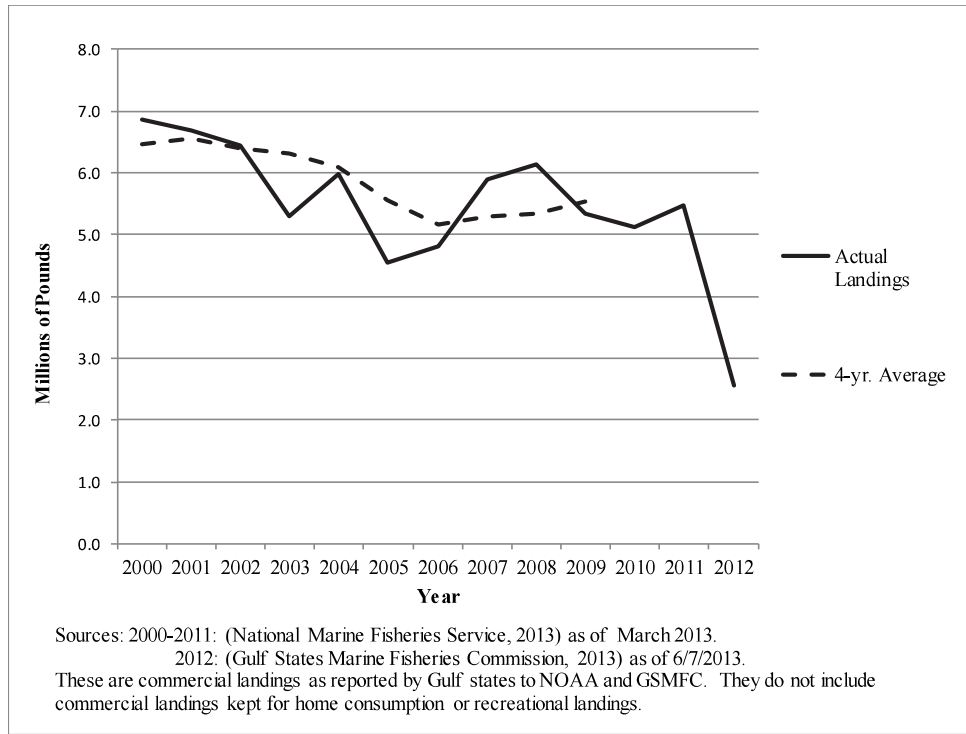
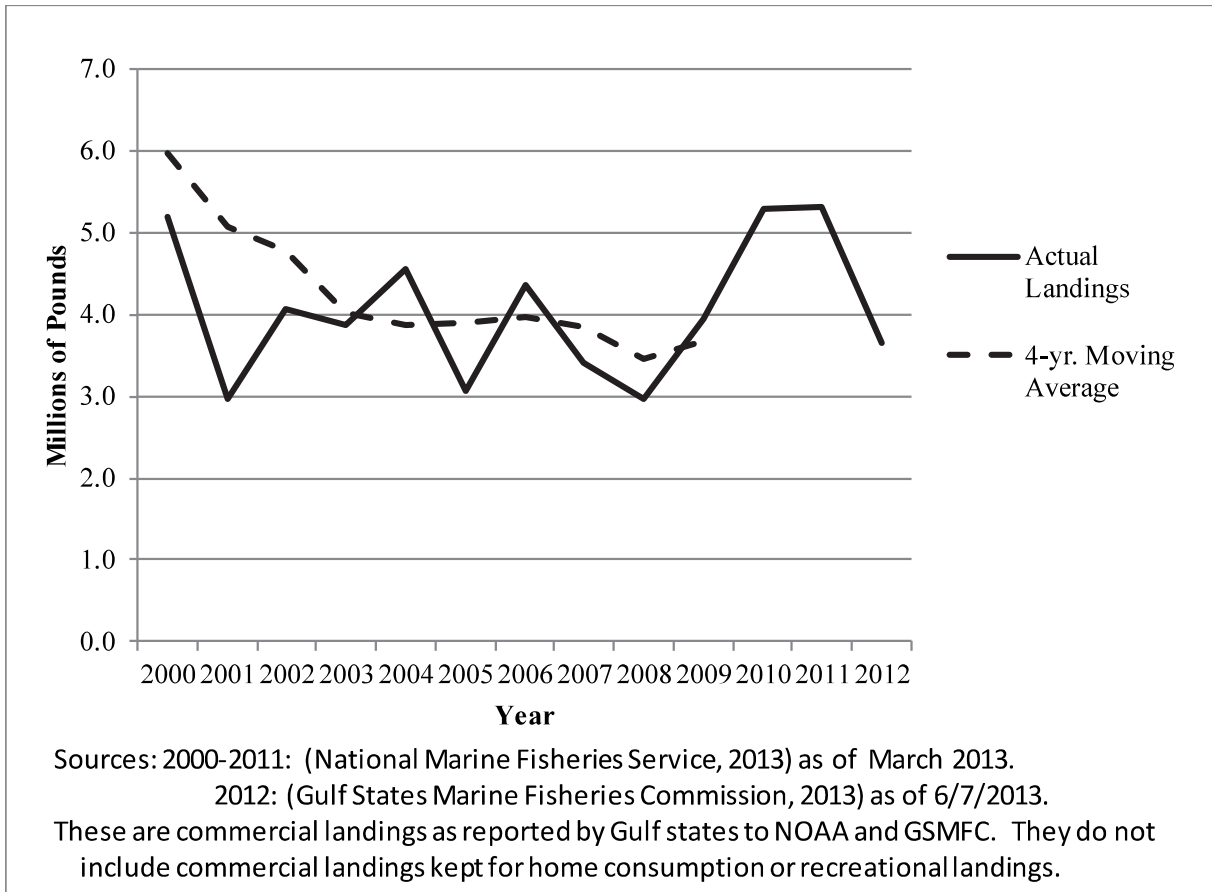


TABLE 67
TOTAL VOLUME OF GULF-WIDE SPINY LOBSTER LANDINGS: 2000-2012
 (Actual landings and 4-yr. moving average)

<u>Year</u>	<u>Actual Landings</u> (pounds)	<u>4-yr Moving Avg.</u>
2000	5,177,299	5,959,406
2001	2,958,491	5,075,108
2002	4,072,033	4,769,503
2003	3,875,303	4,020,782
2004	4,550,751	3,864,145
2005	3,054,554	3,888,160
2006	4,367,510	3,962,030
2007	3,401,629	3,843,611
2008	2,975,154	3,449,712
2009	3,950,009	3,673,576
2010	5,285,518	
2011	5,298,974	
2012	3,641,766	

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/7/2013.
 These are commercial landings as reported by Gulf states to NMFS and GSMFC. They do not include commercial landings kept for home consumption or recreational landings.

FIGURE 26
GULF-WIDE CARIBBEAN SPINY LOBSTER LANDINGS
 (2000-2012 Actual Annual Landings and 4-yr. Moving Average)



Landings of Other Seafood by State

Stone Crab Claws

Table 68 details actual 2000-12 landings of stone crab claws by Gulf state, the 2006-09 average landings, and the difference in 2010-12 actual landings and the 2006-09 average.

All three states with stone crab fisheries reported below-average landings in 2010.

As shown in Table 69, estimated 2010 foregone dockside net revenues, using 2006-09 average prices and the 35 percent variable cost estimate from the SCP, totaled approximately \$1.1 million, with 99.3 percent of the loss occurring in Florida.

In 2011 using the same prices and trip cost assumption, estimated foregone net revenues were approximately \$178,000 in Florida and approximately \$1,600 in Louisiana (Table 70).

In 2012 (Table 71), the 56 percent drop in Florida stone crab landings led to net foregone revenues of \$7.6 million. Louisiana also reported a small loss of approximately \$4,500.

Cumulative losses from below-average stone crab landings for the period 2010-12 are summarized in Table 72. Florida accounted for 99.8 percent of the estimated net losses.

**TABLE 68
COMMERCIAL STONE CRAB CLAW LANDINGS BY STATE FOR THE
PERIOD 2000-2012 AND COMPARISONS TO 2006-09 AVERAGE
LANDINGS**

Year	FL (West Coast)	Louisiana	Texas
2000	6,746,548	50,750	51,108
2001	6,594,203	26,619	61,156
2002	6,385,189	8,130	39,381
2003	5,253,464	12,278	26,568
2004	5,933,180	1,688	35,651
2005	4,501,615	650	31,884
2006	4,784,447	1,635	20,287
2007	5,884,223	4,253	4,271
2008	6,117,145	2,397	3,345
2009	5,310,352	1,737	23,267
2010	5,100,013	955	10,840
2011	5,454,357	1,628	20,840
2012	2,544,908	0	17,847
2006-09 Average	5,277,396	2,506	12,793
2010 Act. – '06-'09 Avg.	(424,029)	(1,551)	(1,953)
2010 Act. – '06-'09 Avg.	(69,685)	(878)	8,048
2010 Act. – '06-'09 Avg.	(2,979,134)	(2,506)	5,055
Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013. 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/5/2013.			
These are commercial landings as reported by Gulf states to NOAA and/or GSMFC. They do not include commercial landings kept for home consumption or recreational landings. .			

**TABLE 69
ESTIMATED 2010 COMMERCIAL STONE CRAB REVENUE LOSSES IN THREE
IMPACTED GULF STATES ASSUMING 35% VARIABLE TRIP COSTS**

State	2006-09 Avg. Landings – 2010 Actual Landings	2006-09 Avg. Price/lb.	Est. Foregone Gross Revenue	Est. Foregone Net Revenue	% of Total Net Loss
Florida	424,029	\$ 3.92	\$1,663,901	\$1,081,536	99.3%
Louisiana	1,551	\$ 2.77	\$4,297	\$2,793	0.3%
Texas	1,953	\$ 4.14	\$8,079	\$5,252	0.5%
Total	427,532		\$1,676,277	\$1,089,580	100.0%
Source: (National Marine Fisheries Service, 2013) as of March 2013. These are commercial landings as reported by Gulf states to NMFS and GSMFC. They do not include commercial landings kept for home consumption or recreational landings. Landings declines, average prices, and foregone revenues calculated by authors.					

TABLE 70
ESTIMATED 2011 COMMERCIAL STONE CRAB REVENUE LOSSES IN TWO IMPACTED GULF STATES ASSUMING 35% VARIABLE TRIP COSTS

<u>State</u>	<u>2006-09 Avg. Landings – 2011 Actual Landings</u>	<u>2006-09 Avg. Price/lb.</u>	<u>Est. Foregone Gross Revenue</u>	<u>Est. Foregone Net Revenue</u>	<u>% of Total Net Loss</u>
Florida	69,685	\$ 3.92	\$273,445	\$177,739	99.1%
Louisiana	878	\$ 2.77	\$2,432	\$1,581	0.9%
Total	70,562		\$275,877	\$179,320	100.0%

Source: (National Marine Fisheries Service, 2013) as of March 2013.
 These are commercial landings as reported by Gulf states to NMFS and GSMFC. They do not include commercial landings kept for home consumption or recreational landings.
 Landings declines, average prices, and foregone revenues calculated by authors.

TABLE 71
ESTIMATED 2012 COMMERCIAL STONE CRAB REVENUE LOSSES IN TWO IMPACTED GULF STATES ASSUMING 35% VARIABLE TRIP COSTS

<u>State</u>	<u>2006-09 Avg. Landings – 2012 Actual Landings</u>	<u>2006-09 Avg. Price/lb.</u>	<u>Est. Foregone Gross Revenue</u>	<u>Est. Foregone Net Revenue</u>	<u>% of Total Net Loss</u>
Florida	2,979,134	\$ 3.92	\$11,690,208	\$7,598,636	99.9%
Louisiana	2,506	\$ 2.77	\$6,943	\$4,513	0.1%
Total	2,981,639		\$11,697,152	\$7,603,149	100.0%

Sources: 2000-2011 = (National Marine Fisheries Service, 2013) as of March 2013.
 2012 = (Gulf State Marines Fisheries Commission, 2013) as of 6/7/2013.
 These are commercial landings as reported by Gulf states to NMFS and/or GSMFC. They do not include commercial landings kept for home consumption or recreational landings.
 Landings declines, average prices, and foregone revenues calculated by authors.

TABLE 72
ESTIMATED 2010-12 CUMULATIVE COMMERCIAL STONE CRAB REVENUE LOSSES USING 2006-09 AVERAGE PRICES AND ASSUMING 35% VARIABLE TRIP COSTS

<u>State</u>	<u>2010 Foregone Net Revenues</u>	<u>2011 Foregone Net Revenues</u>	<u>2012 Foregone Net Revenues</u>	<u>2010-12 Cumulative Foregone Net Revenues</u>
Florida	\$1,081,536	\$177,739	\$7,598,636	\$8,857,911
Louisiana	\$2,793	\$1,581	\$4,513	\$8,887
Texas	\$5,252	\$0	\$0	\$5,252
Total	\$1,089,580	\$179,320	\$7,603,149	\$8,872,049

SUMMARY OF ESTIMATED FOREGONE REVENUES AND COMPARISON TO SCP DISTRIBUTIONS

Summary of Estimated Foregone Revenues by State and Fishery

Table 73 summarizes the estimated net foregone revenues for all fisheries for 2010-2012, Gulf-wide and by state. The Gulf-wide estimates are included to illustrate the problem with analyzing landings and revenue losses on an aggregated, Gulf-wide basis. Geographic agglomeration of landings data can mask true impacts.

One state or basin may have suffered severe landings declines due to the oil spill and/or related fishery closures, while another state or basin may have experienced landings increases due to biological, management, or weather-related factors.

Combining these diverse areas into one Gulf-wide measure may show no change or even an increase in landings, hiding the hardship suffered by fishermen in affected areas. In certain cases, the opposite may occur, and analysis of Gulf-wide landings may over-estimate impacts.

As shown in Table 73, when Gulf-wide fisheries impacts were analyzed, the result was total estimated foregone net revenue of \$157.6 million. However, when the individual states were analyzed and then summed together, the result totaled \$167.5 million.

The agglomeration problem can also mask important differences in impacts between Louisiana's various basins. Louisiana has a long and diverse coastline, with the Mississippi River serving as a divider and major influence. Depending on river flows, rainfall amounts, tropical storms and hurricanes, Gulf currents, etc., fisheries in one part of Louisiana can experience vastly different outcomes than fisheries in other parts of the state.

It would not seem fair to "hide" the misfortune of fishermen in one part of the state who have experienced a collapse of their fishery by offsetting their losses with landings increases of fishermen in another part of the state.

Some fisheries are geographically-based (oysters), and even for fisheries that are not, it may not be logistically possible or economically viable for fishermen from one basin to shift their fishing efforts to other basins.

Table 74 compares the estimated foregone revenue for the six primary Louisiana basins with the estimated losses when the state is analyzed as a whole. (Note that finfish losses by basin were not calculated, so statewide estimates were substituted for basin totals.)

When analyzed by basin, leaving out the partially offsetting effects of basins with landings increases, the estimated foregone net revenue for Louisiana climbs to \$120.5 million, versus \$93.1 million when statewide fisheries are analyzed.

Table 75 substitutes the six-basin totals for Louisiana's statewide totals in a state-by-state summary table which will serve as the basis for the SCP equitability analysis.

Estimated foregone revenues by state ranged from \$16.9 million in Mississippi to \$120.5 million in Louisiana, and from \$12.9 million for oyster leaseholders to \$97.9 million for shrimpers. Total estimated losses across all states and all fisheries totaled \$195.0 million.

Table 76 details the percentage of the total foregone revenue by state and fishery. Louisiana, the state nearest to the oil spill, accounted for 61.8 percent of total estimated losses. Florida sustained the second greatest estimated losses with 10.7 percent of the total (\$20.9 million).

The Gulf shrimp fishery accounted for approximately one-half (50.2 percent) of the estimated foregone net revenue, followed by oyster harvesters at 22.1 percent. The blue crab & other seafood category accounted for 13.1 percent of total estimated losses, and the eight selected finfish species summed to 8.0 percent.

Estimated foregone income of oyster leaseholders accounted for the remaining 6.6 percent of total losses.

TABLE 73
SUMMARY OF ESTIMATED FOREGONE NET REVENUES (MILLIONS) - GULF-WIDE
AND BY STATE: 2010-2012

	Gulf-wide	AL	FL	LA	MS	TX	Sum of All Affected States
SHRIMP							
2010	\$50.2	\$11.5		\$24.7	\$4.5	\$7.1	\$47.7
2011	\$13.7	\$1.8		\$13.6			\$15.5
2012	<u>\$21.0</u>	<u>\$3.7</u>	<u>\$2.4</u>	<u>\$8.2</u>		<u>\$10.4</u>	<u>\$24.7</u>
Total Shrimp	\$84.8	\$17.0	\$2.4	\$46.5	\$4.5	\$17.5	\$87.8
OYSTERS							
2010	\$15.3		\$1.0	\$12.7	\$2.3		\$16.0
2011	\$8.3			\$3.7	\$5.1	\$0.1	\$8.9
2012	<u>\$3.6</u>		<u>\$0.1</u>	<u>\$3.3</u>	<u>\$4.7</u>		<u>\$8.1</u>
Total Oysters	\$27.2	\$0.0	\$1.1	\$19.7	\$12.1	\$0.1	\$33.0
OYSTER LEASEHOLDERS							
2010	\$4.5*			\$4.5			\$4.5
2011	\$1.6*			\$1.6			\$1.6
2012	<u>\$1.9*</u>			<u>\$1.9</u>			<u>\$1.9</u>
Total Leaseholders	\$8.0*			\$8.0			\$8.0
FINFISH							
2010	\$10.4	\$0.3	\$5.3	\$4.0	\$0.0	\$0.2	\$9.8
2011	\$3.8	\$0.2	\$1.5	\$2.7		\$0.1	\$4.5
2012	<u>\$1.2</u>	<u>\$0.0</u>	<u>\$1.1</u>	<u>\$0.1</u>		<u>\$0.1</u>	<u>\$1.3</u>
Total Finfish	\$15.5	\$0.5	\$8.0	\$6.8	\$0.0	\$0.4	\$15.6
BLUE CRABS/OTHER							
Blue Crabs							
2010	\$8.6	\$0.5		\$8.1	\$0.2		\$8.8
2011	\$1.6	\$0.2		\$2.1	\$0.2		\$2.5
2012	<u>\$3.1</u>	<u>\$0.3</u>	<u>\$0.6</u>	<u>\$1.9</u>			<u>\$2.9</u>
Sub-total Blue Crabs	\$13.3	\$1.0	\$0.6	\$12.1	\$0.4	\$0.0	\$14.1
Other (Stone Crab)							
2010	\$1.1		\$1.1	\$0.0		\$0.0	\$1.1
2011	\$0.2		\$0.2	\$0.0			\$0.2
2012	<u>\$7.6</u>		<u>\$7.6</u>	<u>\$0.0</u>			<u>\$7.6</u>
Sub-total Other	\$8.8	\$0.0	\$8.9	\$0.0	\$0.0	\$0.0	\$8.9
Total Blue Crabs/Other	\$22.2	\$1.0	\$9.5	\$12.1	\$0.4	\$0.0	\$23.0
SUMMARY							
Shrimp	\$84.8	\$17.0	\$2.4	\$46.5	\$4.5	\$17.5	\$87.8
Oyster	\$27.2	\$0.0	\$1.1	\$19.7	\$12.1	\$0.1	\$33.0
Oyster Leaseholder	\$8.0	\$0.0	\$0.0	\$8.0	\$0.0	\$0.0	\$8.0
Finfish	\$15.5	\$0.5	\$8.0	\$6.8	\$0.0	\$0.4	\$15.6
Blue Crab/Other	<u>\$22.2</u>	<u>\$1.0</u>	<u>\$9.5</u>	<u>\$12.1</u>	<u>\$0.4</u>	<u>\$0.0</u>	<u>\$23.0</u>
Totals	\$157.6	\$18.5	\$20.9	\$93.1	\$16.9	\$18.0	\$167.5

* Oyster leaseholder losses were only calculated for Louisiana, so this amount is substituted for the Gulf-wide estimate.

TABLE 74
COMPARISON OF ESTIMATED NET FOREGONE REVENUE FOR COMMERCIAL
FISHERIES IN SIX LOUISIANA BASINS VS. THE STATE AS A WHOLE: 2010-2012

	Lake Pont./ Pearl River	Miss. River - Barataria	Terrebonne	Atchaf/ Vermil /Teche	Mer men- tau River	Calc. - Sabine River	Sum of Affected Basins	LA
SHRIMP								
2010	\$0.2	\$16.5	\$4.1	\$7.5			\$28.2	\$24.7
2011	\$0.9	\$10.2		\$5.1	\$0.0	\$0.2	\$16.5	\$13.6
2012		<u>\$9.9</u>		<u>\$1.5</u>		<u>\$0.5</u>	<u>\$11.9</u>	<u>\$8.2</u>
Total Shrimp	\$1.1	\$36.6	\$4.1	\$14.1	\$0.0	\$0.7	\$56.6	\$46.5
OYSTERS								
2010	\$8.2	\$3.3	\$1.1				\$12.6	\$12.7
2011	\$8.1						\$8.1	\$3.7
2012	<u>\$8.4</u>					\$0.5	<u>\$9.0</u>	<u>\$3.3</u>
Total Oysters	\$24.8	\$3.3	\$1.1	\$0.0	\$0.0	\$0.5	\$29.7	\$19.7
OYSTER LEASEHOLD.								
2010	\$3.0	\$1.2	\$0.4				\$4.5	\$4.5
2011	\$3.6						\$3.6	\$1.6
2012	<u>\$4.8</u>						<u>\$4.8</u>	<u>\$1.9</u>
Total Leasehold.	\$11.3	\$1.2	\$0.4	\$0.0	\$0.0	\$0.0	\$12.9	\$8.0
FINFISH								
2010							\$4.0*	\$4.0
2011							\$2.7*	\$2.7
2012							<u>\$0.1*</u>	<u>\$0.1</u>
Total Finfish							\$6.8*	\$6.8
BLUE CRABS/ OTHER								
Blue crabs								
2010	\$1.1	\$2.4	\$2.4	\$1.7	\$0.5	\$0.3	\$8.3	\$8.1
2011		\$0.9	\$1.3	\$0.5	\$0.5	\$0.2	\$3.5	\$2.1
2012		<u>\$0.5</u>	<u>\$1.5</u>	<u>\$0.2</u>	\$0.5	\$0.1	\$2.8	<u>\$1.9</u>
Total Blue Crabs/Other	\$1.1	\$3.8	\$5.2	\$2.4	\$1.4	\$0.6	\$14.6	\$12.1
SUMMARY								
Shrimp	\$1.4	\$42.3	\$4.8	\$17.9	\$0.0	\$0.6	\$56.6	\$46.5
Oyster	\$24.8	\$3.3	\$1.1	\$0.0	\$0.0	\$0.5	\$29.7	\$19.7
Oyster Leasehldr.	\$11.3	\$1.2	\$0.4	\$0.0	\$0.0	\$0.0	\$12.9	\$8.0
Finfish	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$6.8	\$6.8
Blue Crabs/Other	<u>\$1.1</u>	<u>\$3.8</u>	<u>\$5.2</u>	<u>\$2.4</u>	<u>\$1.4</u>	<u>\$0.6</u>	<u>\$14.6</u>	<u>\$12.1</u>
Total	\$38.6	\$50.6	\$11.4	\$20.4	\$1.5	\$1.7	\$120.5	\$93.1
* Finfish losses by basin not calculated. Statewide foregone revenue substituted for basin totals.								

**TABLE 75
SUMMARY OF ESTIMATED FOREGONE NET REVENUES (MILLIONS) BY STATE AND
FISHERY: 2010-2012**

	Alabama	Florida (west coast)	Louisiana*	Mississippi	Texas	All States
Shrimp	\$17.0	\$2.4	\$56.6	\$4.5	\$17.5	\$97.9
Oyster Harvester	\$0.0	\$1.1	\$29.7	\$12.1	\$0.1	\$43.0
Oyster Leaseholder	\$0.0	\$0.0	\$12.9	\$0.0	\$0.0	\$12.9
Finfish	\$0.5	\$8.0	\$6.8	\$0.0	\$0.4	\$15.6
Blue Crab/Other						
Seafood	<u>\$1.0</u>	<u>\$9.5</u>	<u>\$14.6</u>	<u>\$0.4</u>	<u>\$0.0</u>	<u>\$25.5</u>
Total	\$18.5	\$20.9	\$120.5	\$16.9	\$18.0	\$195.0

* Six-basin totals substituted for all Louisiana statewide totals except finfish and “other seafood”.

**TABLE 76
PERCENTAGE OF TOTAL ESTIMATED FOREGONE NET REVENUES BY STATE AND
FISHERY: 2010-2012**

	Alabama	Florida (west coast)	Louisiana*	Mississippi	Texas	All States
Shrimp	8.7%	1.2%	29.0%	2.3%	9.0%	50.2%
Oyster Harvester	0.0%	0.6%	15.2%	6.2%	0.1%	22.1%
Oyster Leaseholder	0.0%	0.0%	6.6%	0.0%	0.0%	6.6%
Finfish	0.3%	4.1%	3.5%	0.0%	0.2%	8.0%
Blue Crab/Other						
Seafood	<u>0.5%</u>	<u>4.9%</u>	<u>7.5%</u>	<u>0.2%</u>	<u>0.0%</u>	<u>13.1%</u>
Total	9.5%	10.7%	61.8%	8.7%	9.2%	100.0%

* Six-basin totals substituted for all Louisiana statewide totals except finfish and “other seafood”.

Comparison of Estimated Foregone Revenues by Fishery to SCP Distributions

Table 77 compares an analysis of potential first round SCP distributions by fishery compiled by Joel Waltzer for GO FISH (personal communication, 2013) with the estimated foregone revenues and percentages from Tables 75 and 76. (Payments to IFQ owners and deckhands are not included in this analysis.) Although blue crab and “other seafood” (stone crab) were combined in Tables 75 and 76, they are separated in Table 77 for clearer comparisons.

Joel Waltzer (personal communication, 2013) has also calculated estimated actual first round payouts to date using data released by the Deepwater Horizon Claims Center and estimated percentages of commercial fishermen (50 percent) and leaseholders (10 percent) who signed releases and are thus not eligible to participate in the SCP. Comparison of these estimated actual payouts with this report’s estimated foregone revenues will yield a more accurate picture of where the equitability between payouts to various fisheries currently stands (Table 78).

TABLE 77
COMPARISON OF POTENTIAL FIRST ROUND SCP DISTRIBUTIONS (MILLIONS) BY FISHERY WITH ESTIMATED FOREGONE REVENUES FROM 2010-2012

Fishery/Group	Maximum Potential First Round Payout	Percentage of Total Potential Payout	Total Estimated 2010-12 Foregone Net Revenues	Percentage of Total Est. 2010-12 Foregone Revenues	Multiple of Pot. Payout to Est. 2010-12 Foregone Revenues
Shrimp	\$818	45.6%	\$97.9	50.2%	8.4
Oyster Harvester	\$154	8.6%	\$43.0	22.1%	3.6
Finfish	\$90	5.0%	\$15.6	8.0%	5.4
Blue Crab	\$82	4.6%	\$16.6	8.5%	5.2
Other Seafood	\$16	0.9%	\$8.9	4.6%	1.8
Oyster Leaseholders					
Income	\$55	3.1%	\$12.9	6.6%	4.3
Prop. Damage	<u>\$580</u>	<u>32.3%</u>			
Total	\$1,795	100.0%	\$195.0	100.0%	

Source: Potential first round payouts calculated by Joel Waltzer (personal communication, 2013). Does not include payments to IFQ owners or deckhands.

TABLE 78
COMPARISON OF ESTIMATED FIRST ROUND SCP DISTRIBUTIONS (MILLIONS) TO DATE BY FISHERY WITH ESTIMATED FOREGONE REVENUES FROM 2010-2012

Fishery/Group	Estimated First Round Payouts to Date	Percentage of Payouts to Date	Total Est. 2010-12 Foregone Net Revenues	% of Total Est. 2010-12 Foregone Revenues	Multiple of Payouts to Date to Est. 2010-12 Foregone Revenues
Shrimp	\$294	29.5%	\$97.9	50.2%	3.0
Oyster Harvester	\$55	5.6%	\$43.0	22.1%	1.3
Finfish	\$32	3.3%	\$15.6	8.0%	2.1
Blue Crab	\$30	3.0%	\$16.6	8.5%	1.8
Other Seafood	\$6	0.6%	\$8.9	4.6%	0.6
Oyster Leaseholders					
Income	\$50	5.0%	\$12.9	6.6%	3.9
Prop. Damage	<u>\$529</u>	<u>53.1%</u>			
Total	\$997	100.0%	\$195.0	100.0%	

Source: First round payouts to date estimated by Joel Waltzer (personal communication, 2013). Does not include \$95 million to IFQ owners or deckhands.

Multiples of estimated income replacement payouts to date compared to estimated foregone 2010-12 revenues range from 0.6 for “Other Seafood” (stone crab) to 3.9 for oyster leaseholders.

However, thus far only foregone revenues and income replacement payments have been compared. As shown in Tables 77 and 78, the property damage component for oyster leaseholders equals approximately 32 percent of the total potential first round payout, and an estimated 53 percent of the actual payouts thus far. In order to gain a complete picture of payouts to all of the fishery groups and their relative equitability, some estimate of property damage losses suffered by oyster leaseholders must be derived.

It is difficult to calculate oyster lease property damage values for an analysis of this type. Some leases suffered only from harvesting closures and/or the death of existing oysters, losses from both of which would be included in foregone revenues.

Some leases may have required “working” to return them to production, including dredging to clean and expose cultch material and transplanting seed oysters to replace those killed. No accurate estimates of costs associated with these activities could be located by the authors.

Some leases may have been contaminated to the point that they required restoration or relocation, or perhaps were no longer capable of being used for oyster production.

Three basins showed depressed oyster landings in 2010, but landings from two of those basins returned to normal in 2011 and 2012, indicating that there were only disruptions to harvesting, and no long-term damage to the reefs.

The Lake Pontchartrain – Pearl River basin is the only basin to display continued depressed landings in 2011 and 2012. Oyster reproduction has failed to a large degree in that basin, for reasons which have not been determined (Louisiana Department of Wildlife and Fisheries, 2013a).

If one assumed that leases in the Lake Pontchartrain – Pearl River basin had been rendered unusable, so that all future income had been lost, one could estimate the value of the property “lost” by calculating the present value of the future income stream which would have been received.

As shown in Table 79, oyster leases returned an estimated average of \$23.40 per acre to the leaseholder from 2006-09.

After subtracting the \$2.00/year lease fee, leaseholders received average net revenue of \$21.40 per acre from 2006-09.

If the leases in the Lake Pontchartrain – Pearl River Basin were rendered unusable by the 2010 oil spill, the lost revenue stream of \$21.40 per acre per year for all future years, discounted at 4.5 percent, would have a present value of \$476 per acre.

There are an estimated 127,172 acres leased in the Lake Pontchartrain – Pearl River Basin. If every one of those leased acres were deemed unusable, and accorded the property damage value of \$476 calculated above, the total property damage claim would be \$60.5 million.

In order to account for the costs of “working” the remaining 265,650 leased acres in the other basins, a cost of \$100 per leased acre will be assumed, for a total of \$26.6 million. (This would be equivalent to \$200 per acre actively utilized.)

If these property damage amounts (\$60.5 million + \$26.6 million = \$87.1 million) are included with the estimates of foregone revenues in Table 78, the revised comparison of estimated actual first round SCP payouts to this study’s estimates of losses is shown in Table 80.

With the fairly dramatic assumption that every acre of oyster leases in the Lake Pontchartrain – Pearl River Basin have been rendered permanently unusable (with the resulting \$476/acre of property loss), and with a fairly generous “charge” of \$100 per leased acre (\$200 per actively-farmed acre) for lease maintenance in all other basins, oyster leaseholder property damage in Table 80 represents the second-largest estimated loss, at \$87.1 million (30.9 percent of the now \$282.1 million total).

However, even with those substantial loss assumptions, the amount of estimated payouts oyster leaseholders have received thus far in the first round of SCP make them the most highly compensated group in Table 80, at 6.1 times their estimated property damage losses and 3.9 times their foregone revenues.

TABLE 79
ESTIMATED REVENUE TO LOUISIANA OYSTER LEASEHOLDERS: 2006-2012

Year	Total Value of Oyster Landings	% from Private Leases	Est. Revenue from Private Leases	33% Leaseholder Share	Approx. Number of Leased Acres	Leaseholder Revenue per Acre
2006	\$35,998,590	72.9%	\$26,245,857	\$8,661,133	392,822	\$22.05
2007	\$40,148,461	62.5%	\$25,106,450	\$8,285,128	392,822	\$21.09
2008	\$38,851,710	53.2%	\$20,653,770	\$6,815,744	392,822	\$17.35
2009	\$50,959,149	77.4%	\$39,417,590	\$13,007,805	392,822	\$33.11
2010	\$24,962,549	70.9%	\$17,699,615	\$5,840,873	392,822	\$14.87
2011	\$41,568,419	80.8%	\$33,595,568	\$11,086,538	392,822	\$28.22
2012	\$41,297,332	96.0%*	\$39,660,859	\$13,088,083	392,822	\$33.32
2006-09 Avg. per Acre						\$23.40
Sources: 2006-11 landings values: (National Marine Fisheries Service, 2013) as of March 2013 2012 landings value: (Gulf States Marine Fisheries Commission, 2013) Percent landings from private leases: (Patrick Banks (LDWF), personal communication, 4/5/2013) * = preliminary estimate based on trip tickets						

TABLE 80
COMPARISON OF ESTIMATED SCP DISTRIBUTIONS (MILLIONS) TO DATE BY FISHERY WITH ESTIMATED FOREGONE REVENUES FROM 2010-2012 PLUS OYSTER LEASE PROPERTY DAMAGE VALUES

Fishery/Group	Estimated First Round Payouts to Date	Percentage of Payouts to Date	Est. 2010-12 Foregone Net Revenues + Oyster Bed Damage	% of Total Est. 2010-12 Foregone Revenues + Damages	Multiple of Payouts to Date to Estimated 2010-12 Foregone Revenues/Damages
Shrimp	\$294	29.5%	\$97.9	34.7%	3.0
Oyster Harvester	\$55	5.6%	\$43.0	15.3%	1.3
Finfish	\$32	3.3%	\$15.6	5.5%	2.1
Blue Crab	\$30	3.0%	\$16.6	5.9%	1.8
Other Seafood	\$6	0.6%	\$8.9	3.1%	0.6
Oyster Leaseholders					
Income	\$50	5.0%	\$12.9	4.6%	3.9
Property Damage	<u>\$529</u>	<u>53.1%</u>	<u>\$87.1</u>	<u>30.9%</u>	6.1
Total	\$997	100.0%	\$282.1	100.0%	3.5
Source: First round payouts to date estimated by Joel Waltzer (personal communication, 2013). Does not include \$95 million distribution to IFQ owners or deckhands.					

The lowest compensated group are those in the "Other Seafood" category (stone crab fishermen), who have thus far received only 60 percent of their estimated losses.

If the same proportions and protocols are used in Round 2 of the SCP as have been used in Round 1, the differences in relative payouts by fishery will only be exacerbated.

Suggested Round 2 SCP Distributions to Achieve Equitability between Fisheries

If the GO FISH estimate of the to-date total of \$1,092 million (Joel Waltzer, personal communication, 2013) is close to the final payout under Round 1 of the SCP (\$997 + \$95 million to IFQ owners and deck hands), there will be approximately \$1.158 billion remaining after accounting fees, etc. to be distributed in Round 2.

Assuming that Round 2 payments are in the same proportions with regard to the fishermen/oyster leaseholders compared to the IFQ holders and deckhands, fishermen and oyster leaseholders would receive an additional \$1.070 billion in Round 2, while IFQ owners and deckhands would receive the other \$88 million.

Thus, for Round 1 and Round 2 combined, the fishermen and oyster leaseholders are estimated to receive a total of \$2.067 billion (\$997 million + \$1.070 billion). When divided by the estimated foregone revenues and property damages of \$282.1 million shown in Table 80, this total represents a multiple of 7.327 (\$2,067/\$282.1).

In order for all fishery groups to be compensated equally at this multiple, Round 2 of SCP distributions will have to be distributed in different proportions than Round 1.

Table 81 details the necessary distributions in Round 2 to achieve equitability. All fishery groups would receive additional disbursements in Round 2, but the proportions would be shifted to balance out inequalities from Round 1.

**TABLE 81
ESTIMATED ROUND 2 SCP DISTRIBUTIONS (MILLIONS) BY FISHERY NECESSARY
TO ACHIEVE EQUAL MULTIPLES OF ESTIMATED FOREGONE REVENUES FROM
2010-2012 PLUS OYSTER LEASE PROPERTY DAMAGE VALUES**

Fishery/Group	Estimated First Round SCP Payouts to Date	Second Round SCP Payouts Necessary for Equitability	Total SCP Payouts	Estimated 2010-12 Foregone Net Revenues + Oyster Bed Damage	Multiple of Total SCP Payouts to Est. 2010-12 Foregone Revenues & Oyster Bed Damage
Shrimp	\$294	\$423	\$717	\$97.9	7.327
Oyster Harvester	\$55	\$260	\$315	\$43.0	7.327
Finfish	\$32	\$82	\$115	\$15.6	7.327
Blue Crab	\$30	\$92	\$122	\$16.6	7.327
Other Seafood	\$6	\$59	\$65	\$8.9	7.327
Oyster Leaseholders					
Income	\$50	\$44	\$94	\$12.9	
Property Damage	<u>\$529</u>	<u>\$109</u>	<u>\$638</u>	<u>\$87.1</u>	7.327
Total	\$997	\$1,070	\$2,067	\$282.1	7.327

Source: First round payouts to date estimated by Joel Waltzer (personal communication, 2013). Does not include payments to IFQ owners or deck hands.

The Round 2 payments proposed in Table 81, added to the estimated distributions in Round 1, would result in each fishery group receiving a multiple of 7.327 times their estimated 2010-12 foregone revenue and property damage losses.

The proportion of Round 2 payouts for each fishery group relative to Round 1 are shown in Table 82.

TABLE 82
RATIO OF SUGGESTED ROUND 2 DISTRIBUTIONS TO ROUND 1 PAYOUTS

Fishery/Group	Estimated SCP Round 1 Payouts	Suggested SCP Round 2 Payouts	Ratio of Round 2/ Round 1
Shrimp	\$294	\$423	1.44
Oyster Harvester	\$55	\$260	4.69
Finfish	\$32	\$82	2.54
Blue Crab	\$30	\$92	3.13
Other Seafood	\$6	\$59	10.29
Oyster Leaseholders			
Income	\$50	\$44	0.89
Property Damage	<u>\$529</u>	<u>\$109</u>	0.21
Total	\$997	\$1,070	1.07

Overall, the ratio of the anticipated Round 2 distribution of \$1,070 million is 1.07 times the Round 1 distribution of \$997 million. Round 2/Round 1 distribution ratios for individual groups under the suggested distribution would range from 0.21 for oyster leaseholders to 10.29 for “Other Seafood” (stone crab) fishermen in order to achieve equitability of total payouts between groups.

If the final tallies of Round 1 payments are different than those assumed in these calculations, the suggested Round 2 payments would need to be adjusted so that the combined SCP payouts equal the totals by fishery shown in Table 81.

Geographic Equitability in SCP Distributions

Tables 75 and 76 showed the dollar amount and percentages of net foregone revenues, respectively, by state and fishery.

If these two tables are revised to include the oyster leaseholder property damage estimate, the results would be Tables 83 and 84.

These percentages can be applied to the \$2.067 billion estimated total SCP payout fishermen and leaseholders to calculate the amount of distributions that should go to each fishery in each state, as shown in Table 85.

Data were not available at the time of publication to determine the amount of Round 1 distributions paid by state, so the authors were unable to calculate the Round 2 distributions necessary to achieve total SCP equitability by state and fishery. Once Round 1 distributions have been completed and analyzed by state and fishery, Round 2 distributions can be adjusted to achieve the totals in Table 85.

TABLE 83
SUMMARY OF ESTIMATED FOREGONE NET REVENUES AND PROPERTY DAMAGES
(MILLIONS) BY STATE AND FISHERY: 2010-2012

	<u>Alabama</u>	<u>Florida</u> <u>(west coast)</u>	<u>Louisiana*</u>	<u>Mississippi</u>	<u>Texas</u>	<u>All</u> <u>States</u>
Shrimp	\$17.0	\$2.4	\$56.6	\$4.5	\$17.5	\$97.9
Oyster Harvester	\$0.0	\$1.1	\$29.7	\$12.1	\$0.1	\$43.0
Oyster Leaseholder						
Income	\$0.0	\$0.0	\$12.9	\$0.0	\$0.0	\$12.9
Finfish	\$0.5	\$8.0	\$6.8	\$0.0	\$0.4	\$15.6
Blue Crab	\$1.0	\$0.6	\$14.6	\$0.4	\$0.0	\$16.6
Other Seafood	<u>\$0.0</u>	<u>\$8.9</u>	\$0.0	<u>\$0.0</u>	<u>\$0.0</u>	\$8.9
Oyster Leaseholder						
Property Damage			<u>\$87.1</u>			<u>\$87.1</u>
Total	\$18.5	\$20.9	\$207.6	\$16.9	\$18.0	\$282.1

* Six-basin totals substituted for all Louisiana statewide totals except finfish and "other seafood".

TABLE 84
PERCENTAGE OF TOTAL ESTIMATED FOREGONE NET REVENUES AND PROPERTY
DAMAGES BY STATE AND FISHERY: 2010-2012

	<u>Alabama</u>	<u>Florida</u> <u>(west coast)</u>	<u>Louisiana*</u>	<u>Mississippi</u>	<u>Texas</u>	<u>All</u> <u>States</u>
Shrimp	6.0%	0.8%	20.1%	1.6%	6.2%	34.7%
Oyster Harvester	0.0%	0.4%	10.5%	4.3%	0.1%	15.3%
Oyster Leaseholder						
Income	0.0%	0.0%	4.6%	0.0%	0.0%	4.6%
Finfish	0.2%	2.8%	2.4%	0.0%	0.1%	5.5%
Blue Crab	0.4%	0.2%	5.2%	0.2%	0.0%	5.9%
Other Seafood	0.0%	3.1%	0.0%	0.0%	0.0%	3.1%
Oyster Leaseholder						
Property Damage			<u>30.9%</u>			<u>30.9%</u>
Total	6.6%	7.4%	73.6%	6.0%	6.4%	100.0%

* Six-basin totals substituted for all Louisiana statewide totals except finfish and "other seafood".

TABLE 85
EQUITABLE DISTRIBUTION OF TOTAL SCP PAYOUT (ROUND 1 + ROUND 2)
BY STATE AND FISHERY

	<u>Alabama</u>	Florida <u>(west coast)</u>	<u>Louisiana</u>	<u>Mississippi</u>	<u>Texas</u>	<u>All States</u>
Shrimp	\$124.6	\$17.3	\$414.8	\$32.6	\$128.1	\$717.5
Oyster Harvester	\$0.0	\$8.4	\$217.6	\$88.4	\$1.1	\$315.5
Oyster Leaseholder						
Income	\$0.0	\$0.0	\$94.3	\$0.0	\$0.0	\$94.3
Finfish	\$3.8	\$58.5	\$49.6	\$0.0	\$2.7	\$114.6
Blue Crab	\$7.4	\$4.5	\$107.0	\$3.1	\$0.0	\$121.9
Other Seafood	\$0.0	\$64.9	\$0.1	\$0.0	\$0.0	\$65.0
Oyster Leaseholder						
Property Damage			<u>\$638.3</u>			<u>\$638.3</u>
Total	\$135.9	\$153.5	\$1,521.6	\$124.1	\$132.0	\$2,067.1

Distribution of Louisiana SCP Payments by Basin

Louisiana’s proposed share of the total SCP distribution (\$1.5216 billion) can also be allocated geographically by estimated losses by basin.

Table 86 details the estimated foregone revenue and property damage losses by basin and fishery group. Property damage values for oyster leaseholders, as described in an earlier section, are calculated as \$476 total loss for every leased acre in the Lake Pontchartrain Basin, and \$100 for every leased acre in the other basins having oyster leases.

Table 87 lists the percentage of total revenue/property damage losses by basin and fishery. The Lake Pontchartrain and Mississippi River – Barataria basins, the two basins nearest the site of the Deepwater Horizon oil spill, account for 46.4 and 30.7 percent of total estimated losses, respectively. These two basins combined total over three-fourths - 77.1 percent - of estimated losses.

Table 88 allocates Louisiana’s proposed \$1.5216 billion total SCP distribution by fishery and basin based on the loss percentages in Table 87.

Just as for the states, no data was available on Round 1 payouts by basin, so no proposed Round 2 payouts could be calculated. For equitable distribution based on the loss estimates from this study, total Round 1 and Round 2 payments should sum to the amounts shown in Table 88 (or be based on the percentages in Table 87).

TABLE 86
SUMMARY OF LOUISIANA’S ESTIMATED FOREGONE NET REVENUES AND
PROPERTY DAMAGES (MILLIONS) BY BASIN AND FISHERY

	Lake <u>Pont.</u>	Miss. River <u>- Barataria</u>	Terre- <u>bonne</u>	Atchaf.- Verm.- <u>Teche</u>	Mermen- <u>tau</u>	Calc. - <u>Sabine</u>	All Six <u>Basins</u>
Shrimp	\$1.1	\$36.6	\$4.1	\$14.1	\$0.0	\$0.7	\$56.6
Oyster Harvester	\$24.8	\$3.3	\$1.1	\$0.0	\$0.0	\$0.5	\$29.7
Oys. Lshldr.							
Income	\$11.3	\$1.2	\$0.4	\$0.0	\$0.0	\$0.0	\$12.9
Finfish*	\$2.3	\$2.7	\$0.6	\$1.0	\$0.1	\$0.1	\$6.8
Blue Crab	\$1.1	\$3.8	\$5.2	\$2.4	\$1.4	\$0.6	\$14.6
Other Seafood*	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Oys. Lshldr.							
Prop. Damage	<u>\$60.5</u>	<u>\$13.5</u>	<u>\$10.3</u>	<u>\$2.8</u>	=	=	<u>\$87.1</u>
Total	\$101.1	\$61.1	\$21.7	\$20.3	\$1.5	\$1.9	\$207.6

* Finfish and “Other Seafood” not analyzed by basin. Proportions from sum of all other species used as proxies.

TABLE 87
PERCENTAGE OF LOUISIANA’S ESTIMATED FOREGONE NET REVENUES AND
PROPERTY DAMAGES BY BASIN AND FISHERY

	Lake <u>Pont.</u>	Miss. River - <u>Barataria</u>	Terre- <u>bonne</u>	Atchaf.- Verm.- <u>Teche</u>	Mermen- <u>tau</u>	Calc. - <u>Sabine</u>	All Six <u>Basins</u>
Shrimp	0.5%	17.6%	2.0%	6.8%	0.0%	0.3%	27.3%
Oyster Harvester	11.9%	1.6%	0.5%	0.0%	0.0%	0.2%	14.3%
Oys. Lshldr. Income	5.4%	0.6%	0.2%	0.0%	0.0%	0.0%	6.2%
Finfish*	1.1%	1.3%	0.3%	0.5%	0.0%	0.1%	3.3%
Blue Crab	0.5%	1.9%	2.5%	1.2%	0.7%	0.3%	7.0%
Other Seafood*	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Oys. Lshldr. Prop.							
Damage	<u>29.1%</u>	<u>6.5%</u>	<u>5.0%</u>	<u>1.3%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>41.9%</u>
Total	48.7%	29.4%	10.4%	9.8%	0.7%	0.9%	100.0%

* Finfish and “Other Seafood” not analyzed by basin. Proportions from sum of all other species used as proxies.

TABLE 88
EQUITABLE DISTRIBUTION OF LOUISIANA’S TOTAL SCP PAYOUT (ROUND 1 +
ROUND 2) BY BASIN AND FISHERY (MILLIONS)

	<u>Lake Pont.</u>	Miss. River <u>- Barataria</u>	Terre- <u>bonne</u>	Atchaf.- Verm.- <u>Teche</u>	Mermen <u>-tau</u>	Calc. - <u>Sabine</u>	All Six <u>Basins</u>
Shrimp	\$8.31	\$268.06	\$29.90	\$103.27	\$0.12	\$5.24	\$414.90
Oyster Harvester Oys. Lshldr.	\$181.75	\$24.39	\$7.75	\$0.00	\$0.00	\$3.74	\$217.63
Income	\$82.76	\$8.78	\$2.79	\$0.00	\$0.00	\$0.00	\$94.32
Finfish*	\$16.70	\$19.58	\$4.67	\$7.20	\$0.63	\$0.79	\$49.57
Blue Crab	\$8.03	\$28.19	\$38.06	\$17.92	\$10.47	\$4.30	\$106.98
Other Seafood* Oys. Lshldr.	\$0.02	\$0.03	\$0.01	\$0.01	\$0.00	\$0.00	\$0.07
Prop. Damage	<u>\$443.43</u>	<u>\$98.78</u>	<u>\$75.56</u>	<u>\$20.36</u>			<u>\$638.14</u>
Total	\$740.99	\$447.81	\$158.74	\$148.76	\$11.23	\$14.08	\$1,521.61

* Finfish and “Other Seafood” not analyzed by basin. Proportions from sum of all other species used as proxies.

SUMMARY

It appears that slightly less than half of the total SCP fund will be distributed in Round 1 payouts. The default distribution method for Round 2, as specified in the SCP documents, is to use the same proportional formulas as utilized in Round 1.

However, additional landings data have become available since the SCP was formalized that have added clarity regarding which fisheries have been most impacted, and in which locations the impacts have been more severe.

Given this additional and updated data, the authors believe it would be unjust to base the second round payouts on formulas derived from earlier, often speculative, data and assumptions.

We would suggest that the administrators of the SCP use the opportunity afforded by the necessity of the Round 2 distributions to help even out, rather than exacerbate, funding discrepancies in the Round 1 distributions.

The authors have tried to take a balanced and comprehensive view, using all available data and making conservative assumptions when necessary. We trust that this resulting document will be beneficial in the upcoming deliberations.

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