

Economic Impact of Hurricane Katrina on the Alabama Seafood Industry

by  
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## Executive Summary

Total direct losses to the Alabama seafood industry are summarized below.

ES-1. Total Losses from Katrina to the Alabama Seafood Industry

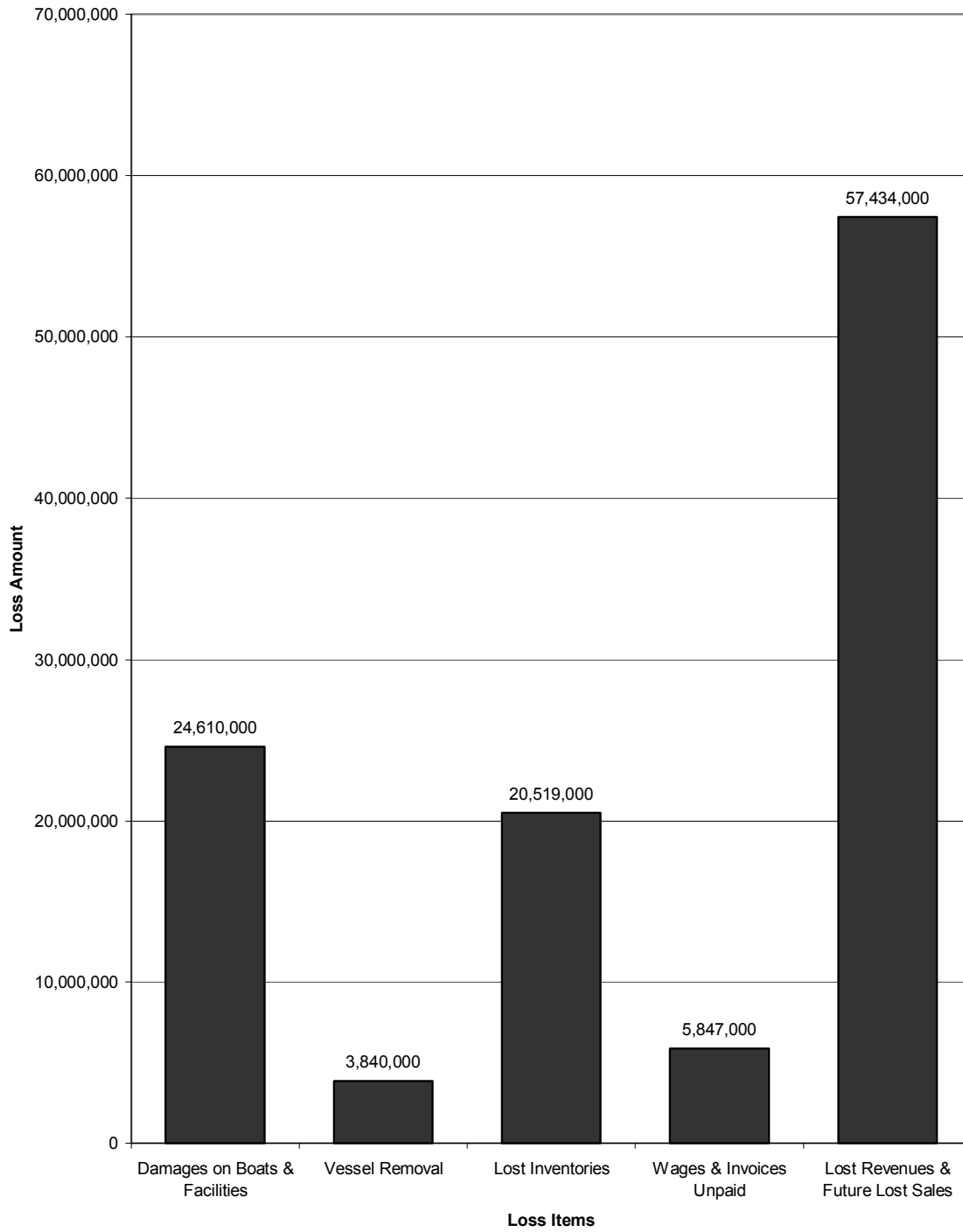
Loss Items	Loss Amount	Sub-category
<u>(A) Estimation of Actual Losses</u>		
Net value of damages on boats & facilities	\$24,610,000	
Damages on boats & facilities		
Dealers & processors		\$19,742,000
Shrimp fishermen		\$ 7,890,000
Other fishermen		\$ 5,613,000
Charter boats		\$ 4,097,000
subtotal		\$37,342,000
Insurance coverage		\$12,732,000
net of insurance coverage		\$24,610,000
Vessel removal	\$ 3,840,000	
Lost inventories	\$20,519,000	
Dealers & processors		\$ 3,409,000
Shrimp fishermen		\$ 9,838,000
Other fishermen		\$ 3,968,000
Charter boats		\$ 3,304,000
subtotal		\$20,519,000
Wages & invoices unpaid	\$ 5,847,000	
Dealers & processors		\$ 3,934,000
Shrimp fishermen		\$ 399,000
Other fishermen		\$ 819,000
Charter boats		\$ 695,000
subtotal		\$ 5,847,000
Lost revenues & future lost sales	\$57,434,000	
Dealers & processors		\$29,393,000
Fishermen		\$18,885,000
Charterboat operators		\$ 9,156,000
subtotal		\$57,434,000
Total Actual Losses	\$112,250,000	
<u>(B) Potential Loss from Loans</u>		
Loans from SBA	\$ 5,809,000	
Loans from Other Sources	\$55,326,000	
total loans	\$61,135,000	

Please note in the summary table above that:

- (A) The availability of assistance will have a direct impact on the loss estimate. If the speed of assistance is delayed, the loss estimate is likely to be higher due primarily to the continued increase of lost sales resulting in the loss of some dealers and/or processors.
- (B) The amount of total losses calculated may overestimate actual losses if a greater number of returned questionnaires were submitted by groups experiencing damages greater than the general population, while the amount may underestimate actual losses to the extent that respondents' perception of future losses are more accurate than the percentages assumed in this study. Percentage losses in the future indicated in the returned questionnaires are significantly greater than those assumed in this study.
- (C) The amount of loans may overestimate actual loans if returned samples came more from those with larger amounts of loans than the general population, while the amount of loans may underestimate actual loans if returned samples came ~~more~~ more from those with smaller amounts of loans than the general population.

Figure 1. Summary of Economic Impact

**Figure 1. Summary of Economic Impact**



## Table of Contents

Acknowledgment .....	i
Executive Summary .....	ii
Section	
1. Introduction .....	1
Katrina and Tri-State Seafood Industry .....	1
Understanding the Post-Katrina Seafood Industry .....	3
Objectives .....	5
2. Methodology .....	6
Estimating Impacts of Natural Disasters .....	6
The Model .....	9
Sources of Data .....	12
3. Estimate of Losses from Existing Data .....	14
Estimation by the Organized Seafood Association .....	14
Adjusting Vessel Removal & Repair Costs .....	15
Adjusting Lost Net Income & Lost Employee Wages of Processors .....	17
Adjusting Lost Production & Lost Crew Shares of Fishermen.....	20
Adjusting Table 3-1 .....	23
4. Estimation of Losses to Charter Boat Owners/Operators by AMRD .....	24
Vessels Surveyed .....	24
Estimating Revenue Losses .....	25
Additional Findings .....	27
5. Loss Estimation from Post-Hurricane Sources: Summary .....	29
6. Adjusting Loss Estimates Using Survey Data .....	30
Summary of Surveys .....	30
Estimation of Total Direct Losses .....	35
Multiplier Effect .....	38
7. Conclusions .....	41
Selected Comments from the Seafood Survey .....	41
References .....	43
Appendices	
1. Cover letters .....	45
2. Survey of Damages on Alabama Seafood Industry .....	48
3. Charter Boat Questionnaire .....	49

List of Tables

ES-1 Total Losses from Katrina to the Alabama Seafood Industry .....ii

3-1. Estimates by the Organized Seafood Association .....14

3-2. Alabama Processed Seafood .....19

3-3. Alabama Landings Annual Total 2004 .....21

3-4. Alabama Landings Monthly Data 2004 .....22

3-5. Adjusted Estimate of Losses.....23

4-1. Charter Boats Surveyed .....24

4-2. Average Revenue Lost per Cancelled Trip .....25

4-3. Number of vessels reporting revenue losses by county .....25

4-4. Calculated lost revenues for the vessel and deckhands due to reported trip  
cancellations after Hurricane Katrina .....27

5-1. Summary of Total Losses from Post-Hurricane Sources .....29

6-1. Summary of Surveys – Dealers & Processors .....31

6-2. Summary of Surveys – Shrimp Fishermen .....32

6-3. Summary of Surveys – Oyster, Crab & Other .....33

6-4. Summary of Surveys – Charter Boats .....34

6-5. Summary of Surveys Combined .....36

6-6. Total Losses from Katrina to the Alabama Seafood Industry .....37

List of Figures

ES 1. Summary of Impact.....iv

## Section 1

### Introduction

Hurricane Katrina hit the coastal areas of Alabama, Mississippi and Louisiana on August 29, 2005. In addition to damages from wind, the surprisingly high storm surges literally wiped out many communities. One industry hit especially hard was the Gulf Coast seafood industry, which includes the Alabama seafood industry. Although damages and losses are significantly concentrated in Bayou La Batre and the surrounding areas of Coden and Irvington where storm surges reached 18 feet, impacts were felt in both coastal counties of Alabama. Bayou La Batre as a city is relatively small with the 2000 census year population of 2,313 of which 770 are Asians who arrived when the Viet Nam war ended late in the 1970s. The poverty rate in Bayou La Batre is nearly twice the national rate at 22.9 percent, with 1999 median household income of \$24,539.

### Katrina and Tri-State Seafood Industry

Immediately after Katrina hit the Gulf states, the damage inflicted on the seafood industry in Alabama, Mississippi and Louisiana caught the attention of the national media that described the damages in the tri-state seafood industry as quoted below.

“Even before Katrina and Rita destroyed or damaged the homes, boats and equipment of Gulf Coast fishermen, the Louisiana seafood industry was struggling with high fuel costs and foreign imports that had been depressing prices. Now, the industry is devastated. Nearly all 4,750 fishing boats in the Louisiana area affected by Hurricane Katrina were damaged or destroyed, ..... Docks, bait shops, fueling stations, freezers for the daily catch and ice stations are gone throughout the Gulf Coast. Many processing plants in Louisiana, Mississippi and Alabama are damaged or destroyed — or have little seafood to process.” [Gary Stoller and Chris Woodyard, “Gulf seafood industry braces for another blow,” USA TODAY October 11, 2005, p. B1]

“A devastated Gulf fishing industry not only affects tens of thousands of jobs but is felt throughout the country. Nearly half of all U.S. shrimp production comes from shrimpers fishing out of, or delivering to, Louisiana, Mississippi and Alabama ports, according to a September damage report by the Congressional Research Service.” [Gary Stoller and Chris Woodyard, “Gulf seafood industry braces for another blow,” USA TODAY October 11, 2005, p. B2]

Alabama’s seafood industry also caught a special attention from the national media: “Alabama's seafood industry, which is centered here, produces a \$350 million annual economic impact, and shipbuilding adds another \$100 million, industry officials say. This nondescript little town 25 miles southwest of Mobile is one of the nation's leaders in seafood processing. It is the USA's No. 1 processor of oysters and crabmeat and a leader in shrimp production, says Ernie Anderson, president of the 150-member Organized Seafood Association of Alabama. The work here is difficult and sometimes pays as little as \$7 an hour. Shrimp boats go out for a month or more. In the processing plants, shucking a bucket of oysters an hour can slice up the hands. Even before Katrina, the industry had been walloped by dumping of foreign shrimp in the U.S. market and by high gasoline prices, says Mickey Johnson, Alabama director of the Southern Shrimp Alliance and a local shrimper. Shrimp prices received by local producers have fallen from \$6.60 a pound for one size in 2000 to \$3.65, Johnson says.” [Larry Copeland, “Alabama town's shellfish industry now in tatters,” USA TODAY, September 9, 2005, p. A4]

### Understanding the Post-Katrina Seafood Industry

The real fabric of the coastal seafood industry is more complicated and the real damages in the seafood industry from Katrina cannot be understood without understanding how the seafood operates in reality.

Clearly, some dealers and fishermen lost their facilities and boats to the extent that they cannot recover without government assistance. Because of the damage that processors suffered, however, many fishermen who survived the hurricane and are capable of harvesting seafood have no way of selling their products. Many fishermen who have no or little damages from Katrina therefore are also experiencing losses from the hurricane.

Numerous media descriptions of damages to the seafood industry are also hurting the Alabama seafood industry that may not have suffered as much as its counterparts in Mississippi and Louisiana. Those dealers who suffered either partial damages or no damages at all, for instance, are losing sales due to national and regional publicity alleging that the seafood industry of the Gulf Coast including Alabama is totally devastated or seafood from these impacted areas are contaminated. This negative publicity may have kept at least some of the pre-hurricane customers away from the Alabama's seafood.

The impact of negative publicity is quite conspicuous in Alabama's charter boat industry. Although some charter boats were damaged from Katrina, other undamaged boats are on a holding pattern with no business because of the negative publicity on devastation and the lack of hotel rooms that prevented out-of-state charter boat customers from contacting Alabama's charter boat operators. Even when they have some businesses, high fuel prices are believed to be wiping out much of their profits.

Alabama landings, as discussed in this report, refer to the seafood sold for the first time directly to Alabama seafood dealers regardless of harvest area. Thus, landings include seafood harvested from both state waters and waters outside Alabama's jurisdiction. Alabama state waters extend into the Gulf of Mexico three nautical miles from the shoreline. Many fishermen, especially shrimpers, harvest seafood from federal waters out to 200 miles from the shore, as

well as from the waters of the other Gulf states. The seafood industry in the Gulf Coast region involves intricate interaction among Florida, Alabama, Mississippi, Louisiana, and Texas. For instance, about 80 - 90 percent of oysters shucked in Alabama come from Mississippi, Louisiana, and Texas. A devastated seafood industry in one state has ripple effects on the seafood industry in other Gulf Coast states.

Finally, the seafood industry is easily impacted by events beyond the control of those who make living in the seafood industry. One example is the 2001 dumping of seafood from Asian countries when European nations refused to import Asian aqua-cultural shrimp. The dumping led many fishermen to bankruptcy. The remnants of the bankruptcy are still clearly visible in Alabama waters through the boats tied on the shore.

Another example is high fuel prices. Because of the distance that many commercial fishermen have to travel, fuel prices constitute the largest cost component of the fishing industry. When fuel prices increased rapidly during 2005, many fishermen simply stopped fishing. This involuntary work stoppage caused by high fuel prices became more conspicuous after Katrina. High fuel prices do not mean higher dockside product prices. Fishermen are paid based on market needs and are often forced to absorb the rising fuel costs. In addition, seafood processors are having difficulty locating workers as many previous employees left their jobs in the seafood industry to find higher-paying recovery jobs posted by FEMA and construction companies operating along the Gulf Coast.

### Objectives

The primary objective of this study was to estimate economic damages and losses to the Alabama's seafood industry, including the charter boat industry, from Hurricane Katrina and, to a lesser extent, Hurricane Rita.



## Section 2

### Methodology

Broad guidelines of estimating damages from natural disasters have been issued by the National Academy of Sciences that established a special ad hoc Committee on Assessing the Costs of Natural Disasters to develop the methodology. These guidelines are reviewed first in this section. [National Academy of Sciences (NAS), *The Impacts of Natural Disasters: A Framework for Loss Estimation*, Washington, DC: National Academy Press, 1999]

#### Estimating Impacts of Natural Disasters

The Committee recommends that “any data collection effort focus on the losses as a result of natural disasters, or negative economic impacts. The *loss* from a disaster is a broader concept than its *cost*, a term that conventionally refers only to the losses that are reimbursed by insurance companies and governments.” [NAS, p. 1] According to the Committee, the *impacts* of a disaster include both market-based effects and non-market effects. Market-based impacts include destruction to property and a reduction in income and sales, while non-market effects include environmental consequences and psychological effects suffered by individuals involved in a disaster. “The *losses* of disasters represent market-based negative economic impacts. These consist of direct losses that result from the physical destruction of buildings, crops, and natural resources and indirect losses that represent the consequences of that destruction, such as temporary unemployment and business interruption. ... Losses suffered by those who are uninsured, those whose losses do not make them eligible for insurance payments, and those who do not receive government relief should be counted in any complete compilation of the impacts of a disaster. ... The *damages* caused by disasters refer to physical destruction, measured by physical indicators, such as the numbers of deaths and injuries or the number of buildings

destroyed. When valued in monetary terms, damages become direct losses.” [NAS, p. 5]

The Committee informs that “The most comprehensive data base of insurance claims payments for property damage is the one compiled by Property Claims Services for catastrophe-triggered events. PCS has collected these data since 1949, using a dollar cost threshold to determine whether an event qualifies as a major disaster.” [NAS, p. 19] “Separately, the Institute for Business and Home Safety (IBHS) in 1994 began to compile more disaggregated catastrophe claims information, using the PCS dollar cost thresholds. ... Neither PCS nor IBHS maintains data on insured claims paid to individuals for injuries and deaths.” [NAS, p. 20] “The main source of federal disaster aid is FEMA, which provides grants to individuals, states, and local governments suffering damage due to presidentially declared disasters.” [NAS, p. 21] “The Small Business Administration (SBA) is another important source of disaster aid, ... compiles its lending data by event and by type of property, “ and “The U.S. Department of Agriculture (USDA) also offers lending assistance to farmers and ranchers for losses to crops and livestock due to disasters declared by the president or governors.” [NAS, p. 22] “Meanwhile, the National Flood Insurance Program (NFIP), provides flood insurance to businesses and individuals in flood-prone areas.” [NAS, p. 23]

The Committee recommends a uniform framework for estimating losses from all types of disasters. Separately for insurers, government, business, individuals and NGOs, the Committee recommends loss estimates of the following classification: [NAS, Table 2-2 on p. 29]

- A. Property:
  - Government: structures & contents
  - Business: structures & contents
  - Residential: structures, contents, & landscapes
- B. Autos, boats and planes
- C. Infrastructure
  - Utilities
  - Transportation

- D. Agricultural products
  - Crops
  - Livestock
- E. Human losses
  - Deaths
  - Injuries
- F. Cleanup and response costs, including police protection
- G. Adjustment costs, temporary living aid, including charities

The Committee identified indirect losses to be included in loss estimation by defining indirect losses as “Induced losses in sales, wages, and/or profits due to loss of function,” and then explains that “The inability to operate may derive from either direct physical damage to commercial structures or from infrastructure failure. Input/output losses to firms forward-linked or backward-linked in production to businesses closed as a result of direct physical damage or infrastructure failure. Slowdowns or shutdowns are induced by reductions in demands for inputs and supplies of outputs from damaged firms.

Spending reductions from the income losses triggered by firm closures or cutbacks—so-called multiplier, or ripple, effects. Employees of the firms experiencing reduced production and sales suffer income losses and subsequently curtail their own expenditures, initiating a new round of firm cutbacks.” [NAS, p. 37]

The Committee also recognizes that disasters may generate short-term gains from: changes in future production, employment, and income and/or changes in these flows outside the damaged area (and the ripple effects thereof. “Current production outside the immediate area of impact or future production within the affected region may compensate for initial disaster-induced losses. Income gains outside the impact area to owners of commodities inflated in price by disaster-induced shortages. Both agricultural commodities lost in a disaster and construction materials demanded during reconstruction are particularly likely to generate these windfall profits outside the region. Positive economic stimuli of jobs and production generated from

cleaning up and rebuilding and the multiplier effect of those increases.” [NAS, p. 37]

Finally, the Committee warns that economic models tend to “overstate both indirect regional economic losses from natural disasters and indirect regional economic gains from reconstruction,” because “regional economic models have been developed over time primarily to forecast future economic conditions or to estimate the effects of a permanent change (e.g., the opening or closing of a manufacturing plant). The abruptness, impermanence, and often unprecedented intensity of a natural disaster does not fit the event pattern upon which most regional economic models are based. The models are thus inappropriate for simulating natural disaster losses.” [NAS, p. 40]

### The Model

Losses (L) to the Alabama seafood industry consist of three broad components: damages in private properties (P), damages to public infrastructures (F), and lost revenues (R) to members of the seafood industry:

$$L = P + F + R$$

Loss to private properties (P) includes losses to seafood processing plants ( $P^T$ ), physical damages to commercial fishing boats ( $P^{B1}$ ) and removal costs of misplaced commercial fishing boats ( $P^{B2}$ ), losses to charter boats ( $P^C$ ), losses to docks & marinas ( $P^D$ ), and inventory losses ( $P^V$ ). Losses to private properties are adjusted for past and future payments from insurance ( $P^N$ ):

$$P = P^T + P^{B1} + P^{B2} + P^C + P^D + P^V - P^N$$

Possible damages to public infra-structures (F) include loss to fishing habitat ( $F^H$ ), ship channel dredging for debris removal ( $F^S$ ), and possible damage to public access to the waterfront ( $F^W$ ):

$$F = F^H + F^S + F^W$$

Lost revenues and cash flows include gross sales revenues lost during the recovery period from the time Hurricane Katrina hit to the time of completing the recovery of damaged private properties ( $R^G$ ) which include unpaid wages and outstanding debts that incurred but remained unpaid during the recovery period due to lack of revenues, and future revenues lost due to the loss of marketing channels ( $R^M$ ):

$$R = R^G + R^M$$

It may be noted that if lost revenues are calculated as a share of past records of annual total revenues for the inactive months caused by the hurricane, the share needs to take harvesting season, changing fuel prices and new laws that may have affected past sales into consideration. Further, the future lost revenues need to be capitalized to the present value. Assuming that “a” represents an adjustment factor for the seasonal nature of harvesting as well as changing fuel prices and new laws, the lost revenue equation changes to:

$$R = aR^G + R^M$$

If losses from lost marketing channels extend over many years, future values need to be converted to the present values.

Total loss (L) to the Alabama’s seafood industry from Hurricanes Katrina and Rita is the sum of the three groups:

$$\begin{aligned} L &= P + F + R \\ &= P^T + P^{B1} + P^{B2} + P^C + P^D + P^V - P^N + F^H + F^S + F^W + aR^G + R^M \end{aligned}$$

In addition to the loss to individual businesses of the Alabama seafood industry, there is a loss to the community through indirect effects, known as the multiplier effect. The loss to the community may be measured by the RIMS II multiplier model, developed for Mobile County with “m” representing the multiplier for the seafood industry. Including the loss to the

community through the multiplier effect (m), the total loss ( $L^T$ ) to the seafood industry as well as to the community in which the industry is located is obtained below. Note that the multiplier effect applies only to lost revenues:

$$L^T = P^T + P^{B1} + P^{B2} + P^C + P^D + P^V - P^N + F^H + F^S + F^W + (aR^G + R^M) \times (1 + m)$$

As a practical matter, estimation of ( $F^H + F^S + F^W$ ) is outside the scope of this study. Note that “Fishermen can’t get into the ocean to catch fish, shrimp and other sea delicacies because they have no money to buy fuel and because fishing will be mostly impossible until the water is cleared of debris from the storm.” [Bob Johnson, “Battered on the Bayou: Seafood industry struggles to get going after being hit by Katrina’s lethal blow,” Mobile Register, October 10 (Monday), 2005, p. B1] Note also that “While some waterways in Mississippi and Louisiana remain clogged with debris, blocking in the boats that survived the storm, Alabama waterways are clear. State waters aren’t clean enough for shrimping, though.” [Russ Henderson, “Battered shrimp business: Area seafood industry opposes tsunami-inspired tariff rollback,” Mobile Register, September 15, 2005, p. B6]

The scope of this study thus is limited to:

$$L^T = P^T + P^{B1} + P^{B2} + P^C + P^D + P^V - P^N + (aR^G + R^M) \times (1 + m)$$

### Sources of Data

Personal interviews of over 50 seafood dealers and processors were conducted by investigators from the University of South Alabama and the Alabama Marine Resources Division asking the seafood dealers and processors to complete a questionnaire designed by the authors to ascertain losses to the seafood industry following Hurricane Katrina.-The questionnaire was also distributed by mail to resident commercial fishermen, charter boat owners/operators, and Mobile and Baldwin County seafood dealers excluding chain grocers. The numbers of the questionnaires

mailed are indicated first by group, and the numbers of responses we received are indicated at the end of the lines by group:

Dealers & processors	189 (all with licenses excluding 50 interviewed personally) --- 69
Charter boat operators	154 (all with licenses) ----- 37
Shrimp fishermen reporting landings	210 (all with licenses) ----- 52
Other fishermen reporting landings	496 (all with licenses) ----- 66

Note that fishermen with commercial fishing licenses who had reported landings to the Alabama Marine Resources Division during 2005 prior to Katrina are believed to be full-time commercial fishermen who make a living by harvesting seafood, whereas fishermen with commercial fishing licenses who have not reported landings are believed to be mostly recreational fishermen whose livelihood may not depend on fishing. Response to this survey was lower than normally expected due no doubt to the failure of mail service in much of the survey area and the lack of time for normal follow-up surveys.

In addition to the mailed questionnaire, the Alabama Marine Resources Division contacted Alabama charter boat owners/operators via telephone to survey incurred damages immediately following Katrina. These results are summarized as table 4-4 in Section 4. The Organized Seafood Association of Alabama surveyed damages through direct survey of its member dealers and processors in Bayou La Batre following Katrina. The results are summarized as table 3-1 in Section 3.

Alabama seafood landings and processed product data were supplied by Alabama Marine Resources Division.

### Section 3

#### Losses to Dealers and Processors from Post-Hurricane Sources

Presented in this section is an estimate of losses to the Alabama's seafood industry, excluding the charter boat industry, from sources other than mail surveys. The primary source of the estimation in this section is one made by the Organized Seafood Association of Alabama, a leading organization of about 150 members, which include fishermen, dealers and processors.

#### Estimation by the Organized Seafood Association

A preliminary estimation of losses to the Alabama's seafood industry from Hurricane Katrina has been made by the Organized Seafood Association of Alabama immediately after the hurricane hit the area. These estimates are made by interviews, hand-delivered questionnaires, and educated guesses of the Organization's leaders, encompassing about 85% of Alabama producing facilities and vessels. These estimates are summarized in table 3-1.

Table 3-1. Estimates by the Organized Seafood Association

---

Dealers and Processors:	
Repair cost for docks & facilities	\$ 7,795,000
Inventory loss	\$ 2,789,500
Lost net income	\$ 8,818,500
Lost employee wages	\$ 3,500,000
Vessels	
Vessel removal & repairs	\$ 8,000,000
Lost production	\$ 4,100,000
Deductibles & uninsured losses	\$ 1,500,000
Lost crew shares	\$ 1,600,000
Total industry losses	<hr/> \$ 38,103,000

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Source: Organized Seafood Association of Alabama, 2005.

Repair cost for docks and facilities (\$7,795,000), lost employee wages (\$3,500,000), are collected by the Association directly from its responding members. Inventory losses

(\$2,789,500) and lost net income of processors (\$8,818,500) are based on survey of leading processors by the Association.. The facilities in Baldwin County suffered little or no damages from Katrina. Removal and repair costs of vessels relate to Bayou La Batre area only.

Initial surveys at the Bayou by the Organized Seafood Association indicated 210 vessels reported offloading to effect facilities of which 60 were reported damaged and 20 not returning due to extensive damage or lack of monies to repair. The cost of removal and repair of vessels on land was estimated at the time approximately at \$100,000 per vessel. The figure \$8,000,000 is obtained by multiplying \$100,000 by 80.

#### Adjusting Vessel Removal & Repair Costs

Removal of stranded vessels continues to be a controversy. “The Federal Emergency Management Agency this week blocked federal contractors on the Gulf Coast from removing hundreds of uninsured boats that remain beached from Alabama to Louisiana by Hurricane Katrina.” [Russ Henderson, “FEMA halts removal of beached vessels,” Mobile Register, November 11, 2005, p. A1] “The primary issue is whether to charge each vessel owner a fee of up to \$60,000 for moving their boat.” [Henderson, A1] “About 48 boats were originally beached in Bayou La Batre by Hurricane Katrina, which made landfall on Aug. 29. Several boats have since been removed by their owners’ insurance companies, and now 32 uninsured vessels remain scattered in groups, many still tied together by dock ropes, along the bayou’s banks.” [Henderson, p. A1] “The conflict’s roots lie in federal law, which requires that FEMA exercise “due diligence” to recoup the salvage fees it incurs. ... That would include the estimated \$60,000 it would take to remove each vessel.” [Henderson, A1] “Originally, the vessels were to be handed over to the city of Bayou La Batre, which would then hand them over directly to the original owners. But ADECA has agreed [with FEMA] to place the boats in its surplus property

program, which includes various procedures for recouping government costs, including auctions.” [Henderson, p. A1] “Federal Emergency Management Agency officials told city leaders Tuesday [November 22, 2005] that the agency will pay to remove only three of the 32 shrimp boats that remain beached in the Bayou after Hurricane Katrina.” [Russ Henderson, “Bayou deplores FEMA’s decision,” Mobile Register, November 23, 2005, p. A1] According to FEMA, the three vessels posed a public health threat because they were close to homes. “Similar post-Katrina salvage operations in Mississippi and Louisiana continued this month without such hindrances,” according to Cost Guard officials who were in charge of the Bayou vessel removal operation.” [Russ Henderson, “Bayou deplores FEMA’s decision,” Mobile Register, November 23, 2005, p. A1]

The Organized Seafood Association initially estimated that about 80 boats were stranded on the shore, while the quoted article indicates that about 48 boats were stranded on to the shore. Also, the Organized Seafood Association estimated the cost of removing and repairing beached boats is \$100,000 per boat, while the quoted article indicates that the cost of removing but without repairing beached boats would be around \$60,000 per boat. Both figures may be consistent in that the Organized Seafood Association’s figure indicates the reality immediately after the hurricane hit the area, while the figures quoted in the article indicate the reality more than two months after the hurricane. During the two-month period, some boat owners were able to take care of beached boats for themselves.

As a compromise, boat removal and repair cost in table 3-1 will be adjusted to the following:

$$(80 + 48)/2 \times \$60,000 = \$3,840,000 \text{ for vessel removal}$$
$$(80 + 48)/2 \times \$40,000 = \$2,560,000 \text{ for vessel repair}$$

Please note that the cost of vessel removal changes almost on a daily basis because

vessels are gradually removed one way or another. Most, if not all, remaining vessels beached have no insurance. It was reported on January 14 that Alabama Governor “Riley’s deputy chief of staff said foreign aid will be used to remove the 25 boats not included in FEMA’s contract” although the source of the foreign aid was not specified. [Sallie Owen and Russ Henderson, “Project to Save Beached Boats,” Mobile Register, January 14, 2006, p.1 and p. 7; quotation from p. 7]

#### Adjusting Lost Net Income & Lost Employee Wages of Processors

Lost net income and lost employee wages of processors are adjusted in this section on the basis of annual amount of processed seafood in Alabama. Estimated loss to Alabama’s seafood processors can be approximated using the value of the processed data by the processors. The estimation is made for the following assumptions:

September	100% loss
October	75% loss
November	50% loss
December	25% loss
2006	25% loss

For seafood processors, annual total is defined as annual total value of seafood processed as summarized in table 3-2. Monthly shares of total value of processed seafood in Alabama are not available. However, one of the largest and highly respected seafood processors in Alabama, made their monthly data for 1993 through 2004 available for this study. According to the data, the monthly minimum share of annual total seafood processed was 5.822 percent (0.05822) in April and the monthly maximum share of annual total seafood processed was 11.186 percent (0.11186) in June with the average being 8.3333 percent (0.083333) and standard deviation of 1.6569 percent (0.016569). Monthly average shares for ten out of 12 months fall within one standard deviation from the mean (0.06676 to 0.09990), while all 12 monthly averages fall

within two standard deviations from the mean (0.05019 to 0.11647). The percentage of April value relative to annual total varied from a low 4.45 percent in 1997 to a high 7.98 percent in 2001, while the percentage of June value relative to annual total varied from a low 7.30 percent in 2002 to a high 15.11 percent in 2000.

Since there is no convincing evidence indicating a clear monthly fluctuation of all seafood combined, it is thus assumed in this study that the total value of seafood processed remains equal each month at  $1/12$  (i.e., 8.3333 percent) of the annual total. Note that seafood processed in Alabama includes seafood from sources outside the state. Annual total value employed in this study is for the year 2004.

Table 3-2. Alabama Processed Seafood

Product	Condition	2001		2002		2003		2004	
		Lbs	Values	Lbs	Values	Lbs	Values	Lbs	Values
Crab Meat	Meat Only	1,330,850	\$12,234,650	1,234,535	\$12,709,850	893,672	\$9,045,119	965,440	\$8,868,010
Crab	Stuffed; Cakes	1,909,675	\$5,073,500	1,414,600	\$3,347,350	2,891,700	\$6,645,926	1,794,450	\$3,969,750
Oyster	Shucked Meat	5,501,400	\$24,568,600	3,384,568	\$14,367,900	4,673,208	\$20,333,889	5,897,976	\$28,518,200
Shrimp	Tails;								
	Breaded; IQF	11,780,850	\$64,492,450	9,707,569	\$45,715,400	8,596,333	\$34,434,173	9,417,714	\$33,088,040
Shrimp	Peeled; Peeled								
	/De-veined	19,387,550	\$60,168,250	18,160,125	\$50,280,611	16,240,779	\$36,825,000	19,546,123	\$50,229,498
Fish Fillets	Stuffed; Breaded	3,191,950	\$6,995,300	3,685,000	\$8,074,150	3,306,398	\$7,752,542	4,257,333	\$10,408,987
Mullet	Yellow Roe								
	(15-17%)Only	256,400	\$1,695,650	118,600	\$566,500	47,855	\$196,461	112,493	\$595,636
Mullet	Gizzards Only	27,850	\$99,000	11,600	\$25,000	4,922	\$12,244	5,251	\$18,114
Total Reporting		43,386,525	\$175,327,400	37,716,597	\$135,086,761	36,654,867	\$115,245,354	41,996,780	\$135,696,235
				n=62		n=62		n=65	

Source: Alabama Marine Resources Division.

Actual calculations of Processed Seafood losses are made below:

$$\begin{aligned} \text{Fishery Loss} = & [(\text{Total Value of Fishery}/12 \text{ months}) \times 100\% \text{ loss for September}] + [(\text{Total Value} \\ & \text{of Fishery}/12 \text{ months}) \times 75\% \text{ loss for October}] + \\ & [(\text{Total Value of Fishery}/12 \text{ months}) \times 50\% \text{ loss for November}] + \\ & [(\text{Total Value of Fishery}/12 \text{ months}) \times 25\% \text{ loss for December}] + \\ & [(\text{Total Value of Fishery}/12 \text{ months}) \times 25\% \text{ loss for 2006}] \end{aligned}$$

$$\begin{aligned} \text{Shrimp} = & 83,317,538 \times 1/12 \times 1 + 83,317,538 \times 1/12 \times 0.75 + 83,317,538 \times 1/12 \times \\ & 0.50 + 83,317,538 \times 1/12 \times 0.25 + 83,317,538 \times 0.25 \\ = & \$38,187,205 \end{aligned}$$

$$\begin{aligned} \text{Crabs} = & 12,837,760 \times 1/12 \times 1 + 12,837,760 \times 1/12 \times 0.75 + 12,837,760 \times 1/12 \times \\ & 0.50 + 12,837,760 \times 1/12 \times 0.25 + 12,837,760 \times 0.25 \\ = & \$5,883,973 \end{aligned}$$

$$\begin{aligned} \text{Fish} = & 11,022,737 \times 1/12 \times 1 + 11,022,737 \times 1/12 \times 0.75 + 11,022,737 \times 1/12 \times \\ & 0.50 + 11,022,737 \times 1/12 \times 0.25 + 11,022,737 \times 0.25 \\ = & \$5,052,088 \end{aligned}$$

$$\begin{aligned} \text{Oyster} = & 28,518,200 \times 1/12 \times 1 + 28,518,200 \times 1/12 \times 0.75 + 28,518,200 \times 1/12 \times \\ & 0.50 + 28,518,200 \times 1/12 \times 0.25 + 28,518,200 \times 0.25 \\ = & \$13,070,842 \end{aligned}$$

$$\text{Total} = \$62,194,108$$

The total figure includes wholesale prices that processors paid to suppliers. Net loss is the total loss from which the share of the total value that represents the materials is subtracted. According

to the U.S. Census Bureau, 2002 Economic Census Table 2 Industry Statistics for Selected States 2002, the share of the cost of materials (\$144,778,000) relative to total value of shipment (\$247,034,000) for fresh and frozen seafood in Alabama was 58.6 percent. This adjustment is needed because the loss estimation in this section pertains to dealers and processors, who usually purchase their raw seafood for processing and resale. Based on personal interviews, however, it is found that many dealers and processors also own their own boats to fish. To account for this observation, 10 percent of the total loss is unaffected by the 58.6 percent share of the cost of materials. Net loss is calculated:

$$\begin{aligned}\text{Net Loss} &= \$62,194,108 \times 0.10 + \$62,194,108 \times 0.90 \times (1 - 0.586) \\ &= \$6,219,411 + \$23,173,525 \\ &= \$29,392,936\end{aligned}$$

#### Adjusting Lost Production & Lost Crew Shares of Fishermen

Alabama has a trip ticket program which seafood dealers, i.e., wholesalers and retailers, use to report the seafood landings of each commercial fisherman by filling out a form (ticket) detailing the primary area of harvest, harvest gear, fishing and trip times, the quantity of each species harvested per condition and count size, and the dockside value of each. Seafood landed in Alabama by resident and non-resident fishermen may have been caught anywhere inside or outside of Alabama's state waters. The amount of landings in Alabama, therefore, is not equal to the amount of catch in Alabama. For the purposes of this report, the seafood landings presented herein are expressed in pounds of live weight (whole, head on) with the exception of oysters. Oysters are presented in pounds of shucked meat (Meat LBS) as this is the fisheries standard. Alabama seafood landings data are available monthly, while processed seafood data are available on an annual basis.

Estimated loss to Alabama's fishermen can be approximated using the value of the

landings by the fishermen. The estimation is made using the following assumptions:

September	100% loss
October	75% loss
November	50% loss
December	25% loss
2006	25% loss

Annual total is the value of annual total landings for fishermen and the value of seafood processed for processors. For fishermen, annual total is defined as annual total landings for 2004 as summarized in table 3-5. Monthly shares of total landings are summarized in table 3-6. Loss to fishermen is calculated below. Note that the monthly share is the share of monthly landings relative to total annual in values, not in pounds.

Table 3-3. Alabama Seafood Landings Annual Total 2004  
(quantity in pounds)

Category	State of Alabama	
	Qty Live	Value
Shrimp	16,353,440	\$29,540,012
Crabs	3,334,022	\$1,806,757
Fish	6,293,958	\$3,897,319
Oyster	908,823	\$2,112,521
Other	9,014	\$39,641
Total	26,899,257	\$37,396,250

Source: Alabama Marine Resources Division. Note that landings data include catches from other states.

Of the total, the total quantity is comprised of 6,197,165 for Baldwin County and 20,702,092 for Mobile County, while the total value is comprised of \$7,243,411 for Baldwin County and \$30,152,839 for Mobile County.

Table 3-4. Alabama Landings Monthly Data 2004

Month	Qty_Live	Percent	Value	Percent
1	895,168	3.3%	\$1,341,368	3.6%
2	641,205	2.4%	1,001,500	2.7%
3	939,663	3.5%	1,327,189	3.5%
4	1,371,031	5.1%	1,466,203	3.9%
5	2,074,478	7.7%	2,547,629	6.8%
6	4,704,917	17.5%	5,117,288	13.7%
7	3,504,227	13.0%	3,476,888	9.3%
8	4,802,008	17.9%	6,955,780	18.6%
9	2,348,206	8.7%	3,775,210	10.1%
10	2,534,395	9.4%	4,801,024	12.8%
11	1,851,480	6.9%	3,119,758	8.3%
12	1,232,479	4.6%	2,466,412	6.6%
total	26,899,257	100%	\$37,396,250	100%

Source: Alabama Marine Resources Division.

Actual calculations of landed seafood losses are as follows:

$$\begin{aligned} \text{Fishery Loss} = & [(\text{Total Value of Fishery}/12 \text{ months}) \times \text{Monthly Share} \times 100\% \text{ loss for} \\ & \text{September}] + \\ & [(\text{Total Value of Fishery}/12 \text{ months}) \times \text{Monthly Share} \times 75\% \text{ loss for October}] + \\ & [(\text{Total Value of Fishery}/12 \text{ months}) \times \text{Monthly Share} \times 50\% \text{ loss for November}] \\ & + \\ & [(\text{Total Value of Fishery}/12 \text{ months}) \times \text{Monthly Share} \times 25\% \text{ loss for December}] \\ & + \\ & [(\text{Total Value of Fishery}/12 \text{ months}) \times 25\% \text{ loss for 2006}] \end{aligned}$$

$$\begin{aligned} \text{Shrimp} = & 29,540,012 \times 0.101 \times 1 + 29,540,012 \times 0.128 \times 0.75 + 29,540,012 \times 0.083 \times \\ & 0.50 + 29,540,012 \times 0.066 \times 0.25 + 29,540,012 \times 0.25 \\ = & \$14,917,706 \end{aligned}$$

$$\begin{aligned} \text{Crabs} = & 1,806,757 \times 0.101 \times 1 + 1,806,757 \times 0.128 \times 0.75 + 1,806,757 \times 0.083 \times 0.50 + \\ & 1,806,757 \times 0.066 \times 0.25 + 1,806,757 \times 0.25 \\ = & \$912,413 \end{aligned}$$

$$\begin{aligned} \text{Fish} = & 3,897,319 \times 0.101 \times 1 + 3,897,319 \times 0.128 \times 0.75 + 3,897,319 \times 0.083 \times 0.50 + \\ & 3,897,319 \times 0.066 \times 0.25 + 3,897,319 \times 0.25 \\ = & \$1,968,146 \end{aligned}$$

$$\begin{aligned} \text{Oyster} = & 2,112,521 \times 0.101 \times 1 + 2,112,521 \times 0.128 \times 0.75 + 2,112,521 \times 0.083 \times 0.50 + \\ & 2,112,521 \times 0.066 \times 0.25 + 2,112,521 \times 0.25 \\ = & \$1,066,823 \end{aligned}$$

$$\begin{aligned} \text{Other} &= 39,641 \times 0.101 \times 1 + 39,641 \times 0.128 \times 0.75 + 39,641 \times 0.083 \times 0.50 + 39,641 \times \\ &0.066 \times 0.25 + 39,641 \times 0.25 \\ &= \$20,019 \end{aligned}$$

Total = \$18,885,107

Adjusting Table 3-1

Based on estimations in this section, table 3-1 is adjusted and table 3-7 is obtained for estimation of losses from Hurricane Katrina to the Alabama's seafood industry, excluding the charter boat industry.

Table 3-5. Adjusted Estimate of Losses

Dealers and Processors:	
Repair cost for docks & facilities	\$ 7,795,000
Inventory loss	\$ 2,789,500
Lost net income & employee wages	\$29,392,936
Fishermen	
Vessel removal & repairs	\$ 6,400,000
Lost production & crew shares	\$18,885,107
Total industry losses*	\$65,262,543

\*Losses to the seafood industry do not include losses incurred by fuel docks, ice plants, or gear suppliers (i.e. net shops).

## Section 4

### Losses to Charter Boat Owners/Operators from Post-Hurricane Sources

During the period September 12 - 22, 2005, the Alabama Marine Resources Division (AMRD) and the Orange Beach Fishing Association contacted 129 of the 185 charter boat owners/operators known to be fishing in Alabama prior to Hurricane Katrina to gather information on the economic impacts Hurricane Katrina may have had on the Alabama for-hire fleet. Findings of the survey are summarized below.

#### Vessels Surveyed

Vessels were divided into two groups; inshore and offshore, for the two Alabama coastal counties and response rates are compared in table 4-1.

Table 4-1. Charter Boats Surveyed.

County	Vessel Type	Total	Responses	% of Responses
Baldwin	Inshore	41	26	63.4
	Offshore	115	79	86.7
Mobile	Inshore	5	3	60.0
	Offshore	24	21	87.5
Totals		185	129	69.7

Over eighty-four percent of all respondents indicated that they had received cancellations because of Katrina, including cancellations due to either bad weather during the hurricane and/or post-hurricane damage. Responses were comparable between both groups of offshore vessels in coastal counties with over eighty-five percent reporting cancelled trips in Baldwin County and over seventy-nine percent of vessel operators in Mobile County reported cancelled trips. During the time of this report [October] operators were still receiving calls to cancel trips.

#### Estimating Revenue Losses

Table 4-2 measures the average revenue lost per cancelled trip for each group by county. The inshore operators for Baldwin County reported mean revenue losses per trip to be \$397.50 while Mobile county operators reported mean revenue losses per trip of \$475.00. As expected operators of offshore vessels reported higher losses per trip with \$1,629.64 and \$ 1,536.67 for Baldwin and Mobile County respectively.

Table 4-2. Average Revenue Lost per Cancelled Trip

County	Vessel Type	Mean No. Trips Cancelled	Mean % Trips Cancelled	Mean Revenues/ Trip
Baldwin	Inshore	11.7	45.3	\$ 397.50
	Offshore	9.7	46.1	\$1629.64
Mobile	Inshore	4.0	65.0	\$ 475.00
	Offshore	9.5	56.3	\$1536.67

Total revenue losses were calculated for each respondent and summarized by county in table 4-3. Of the 129 operators contacted, one hundred and five reported losses of revenue due to cancellations. The majority of these operators (60 %) reported losses up to \$10,000. Fourteen operators reported losses in excess of \$25,000.

Table 4-3. Number of vessels reporting revenue losses by county

Revenue Losses	COUNTY		
	Baldwin	Mobile	Totals
\$0	17	7	24
\$1 - \$2,500	12	2	14
\$ 2,501 - \$ 5,000	15	3	18
\$ 5,001 - \$ 10,000	27	4	31
\$ 10,001 - \$ 15,000	8	3	11
\$ 15,001 - \$20,000	4	2	6
\$ 20,001 - \$ 25,000	10	1	11
> \$ 25,000	12	2	14
Sub-Totals	105	24	129

For each reporting vessel, total revenues and deckhand revenues were estimated as shown in table 4-4. Vessel revenues were calculated by multiplying the number of cancelled trips by

average fare for the cancelled trip. Deckhand revenues were calculated by multiplying the number of trips by 0.15 (tip rate) and adding fish cleaning tips. Fish cleaning tips were generated by multiplying the number of trips cancelled by weight of fish assumed to have been caught on each trip (25 pounds of fish for inshore vessels and 150 pounds of fish for offshore vessels) then multiplying this figure by 0.30, the standard fish cleaning charge per pound of whole fish. Typically, deckhands are not used on inshore vessels but the captain often collects tips for service provided and fish cleaning. Therefore, deckhand revenues were calculated for this group. The largest monetary losses were observed for the offshore group of vessels from both counties. Total trip revenues over \$1.37 million constituted approximately eighty-five percent of the total revenues. The total estimated revenue figure of over \$ 1.6 million dollars is made even more significant when one considers the economic impact of this revenue when it is coupled with lost income for restaurants, hotels/ condominium rentals, bait and tackle shops and other service industries which compliment the for-hire industry. The figure may be less than the actual economic impact because only seventy percent of the operators of known for-hire vessels responded to this questionnaire.

Table 4-4. Calculated lost revenues for the vessel and deckhands due to reported trip cancellations after Hurricane Katrina

County	Vessel Type	Total Trip Revenues Lost	Total Deckhand Revenues Lost	Total Revenues Lost
Baldwin	Inshore	\$ 115,210.00	\$ 19,389.00	\$ 134,599.00
	Offshore	\$1,015,939.00	\$186,545.85	\$1,202,484.85
Mobile	Inshore	\$ 3,750.00	\$ 622.50	\$ 4,372.50
	Offshore	\$ 240,150.00	\$ 45,877.50	\$ 286,027.50
	Total	\$1,375,049.00	\$252,434.85	\$1,627,483.85

Typically, the number of for-hire trips completed in Alabama drops significantly in September. However, from responses to the Questionnaire it appears Hurricane Katrina has exacerbated this trend in 2005. Respondents were asked the percentage of booked trips remaining for the calendar year which have been cancelled. For those operators who reported cancellations nearly half (47.3%) of booked trips were cancelled. A similar situation occurred in the September – October time period of 2004. On September 16, 2004 Hurricane Ivan struck the Alabama coast causing severe damage to the charter fleet infrastructure; docks, hotels/ condominiums and restaurants. The number of estimated trips fell dramatically with less than 25% being reported compared to trips estimated in 2002 and 2003 during the same time period.

#### Additional Findings

As in other storms, owners/operators of for-hire vessels in Alabama heeded the warnings of weather forecasters and took extra precaution in storage/docking of their vessels. Through the course of this Questionnaire, it was discovered that most of the charter fleet remained intact. However, one vessel was completely destroyed and two vessels received major damage as a result of the Hurricane. Contact was made to seventy percent of the known operators of for-hire vessels so other damages may have occurred.

One marina on Dauphin Island received extensive damage, losing most of the decking and pilings associated with the docks supporting the for-hire fleet. This marina began reconstruction soon after the storm and at the time of this article is over fifty percent rebuilt. Several other marinas throughout Baldwin County experienced minor damage which required closure for seven to ten days for repairs. Although the infrastructure for most of the for-hire fleet emerged relatively unscathed, Hurricane Katrina underscored a primary concern for many for-hire operators in Alabama, a lack of dock space available for for-hire use. Hurricane Ivan in September 2004 provided the impetus for many dock/marina owners to sell their property to condominium developers. These sales, in effect, convert valuable and necessary waterfront real estate for for-hire operators to areas of private access which do not support for-hire business interests. Hurricane Katrina may only help to continue this trend as marina owners weigh the costs/benefits of continuing their businesses.

Section 5

Loss Estimation from Post-Hurricane Sources: Summary

Table 5-1 is the summary of total losses to seafood dealers and processors, and charter boat owners and operators in Alabama caused by Hurricane Katrina and estimated on the basis of figures collected by field officials immediately after the hurricane hit the area. Table 5-1 is a combination of tables 3-5 and 4-4.

Table 5-1. Summary of Total Losses from Post-Hurricane Sources

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Dealers and Processors:	
Repair cost for docks & facilities	\$ 7,795,000
Inventory loss	\$ 2,789,500
Lost net income & employee wages	\$29,392,936
Fishermen	
Vessel removal	\$ 3,840,000
Vessel repair	\$ 2,560,000
Lost production & crew shares	\$18,885,107
Total industry losses	<hr/> \$65,262,543
Charter boat owners/operators	\$ 1,627,484
Total Loss	<hr/> \$66,890,027

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## Section 6

### Adjusting Loss Estimates Using Survey Data

Loss estimates obtained in Section 3 for seafood industry, summarized in table 3-5, and Section 4 for charter boat industry, summarized in table 4-4, are further adjusted in this section through additional data obtained from a survey of the Alabama's seafood industry.

#### Summary of Surveys

Table 6-1 is a summary of surveys received from seafood dealers and processors in Alabama. Note that if seafood dealers and processors were also fishermen with fishing licenses, these dealers and processors should be listed in both dealers & processors and fishermen. However, these fishermen are counted only once as dealers and processors in this section to avoid double counting of impact. Out of total 189 dealers and processors and about 50 interviewed personally, 69 responses have been received. The results are summarized in table 6-1. Figures in "Sample Total" are a direct tabulation from the 69 responses. Figures in the "Average" are figures in the sample total divided by 69. Figures in the "All Dealers & Processors" are obtained by multiplying figures in the Average by 239. In lost inventories, one company was reported to have lost \$2,000,000 worth of inventories. All figures in table 6-1 including lost inventories, however, are based strictly on returned questionnaires.

Table 6-1. Summary of Surveys – Dealers & Processors

	Average	All Dealers & Processors
Best estimate of damages:		
Total	\$ 82,601.17	\$ 19,741,679.63
Spent so far	28,473.63	6,805,197.57
Need to spend	54,127.54	12,936,482.06
Insurance coverage	\$ 37,678.26	9,005,104.14
Estimate of lost inventories	\$ 14,263.16	3,408,895.24
Business-related outstanding loans		
Loans from SBA	\$ 4,842.43	1,157,340.77
Loans from other sources	\$ 111,327.68	26,607,315.52
Wages & invoices unpaid	\$ 16,461.00	3,934,179.00
Gross sales revenues in 2003	\$ 1,786,663.69	\$ 427,012,621.91
Gross sales revenues in 2004	\$ 1,527,201.39	\$ 365,001,132.21
Total number of employees:		
Before Katrina	18.0	4,302
After Katrina	7.3	1,745
Percent of business to recover		
By the end of October	28.33%	
By the end of 2005	45.22%	
Expected loss of sales after recovery	55.29%	

Table 6-2 is a summary of surveys received from shrimp fishermen in Alabama. Out of total 210 shrimp fishermen, 52 responses have been received excluding five that had no landings. These five had no names printed on the survey and reported no damages. Figures in the “Average” are direct tabulation from the 52 responses. Figures in the “All Shrimp Fishermen” are figures in the Average are obtained by multiplying figures in the Average by 210.

Table 6-2. Summary of Surveys – Shrimp Fishermen

	Average	All Shrimp Fishermen
Best estimate of damages:		
Total	\$ 37,570.91	\$ 7,889,891.10
Spent so far	4,921.09	1,033,428.90
Need to spend	34,080.71	7,156,949.10
Insurance coverage	\$ 14,814.29	3,111,000.90
Estimate of lost inventories	\$ 46,846.00	9,837,660.00
Business-related outstanding loans		
Loans from SBA	\$ 6,466.37	1,357,937.70
Loans from other sources	\$ 69,682.76	14,633,379.60
Wages & invoices unpaid	\$ 1,898.15	398,611.50
Gross sales revenues in 2003	\$ 76,799.33	16,127,859.30
Gross sales revenues in 2004	\$ 63,997.10	13,439,391.00
Total number of employees:		
Before Katrina	2.0	420
After Katrina	1.3	273
Percent of business to recover		
By the end of October	16.31%	
By the end of 2005	37.29%	
Expected loss of sales after recovery	49.57%	

Table 6-3 is a summary of surveys received from other fishermen excluding shrimp fishermen. These other fishermen include oyster fishermen, crabbers, and finfish fishermen. Note that many fishermen participate in more than one fishery. Out of total 496 mailings, 66 responses have been received. Note that the actual number of fishermen who responded is greater than 66 because some fishermen who reported having a business of dealership and processing are counted as dealers and processors for tabulation purposes. Figures in the “Average” are direct tabulation from the 66 responses. Figures in the “All Other Fishermen” are obtained by multiplying figures in the Average by 496.

Table 6-3. Summary of Surveys – Oyster, Crab & Finfish Fishermen

	Average	All Other Fishermen
Best estimate of damages:		
Total	\$ 11,317.61	\$ 5,613,534.56
Spent so far	1,826.49	905,939.04
Need to spend	8,483.19	4,207,662.24
Insurance coverage	\$ 178.75	88,660.00
Estimate of lost inventories	\$ 8,000.00	3,968,000.00
Business-related outstanding loans		
Loans from SBA	\$ 725.86	360,026.56
Loans from other sources	\$ 4,304.26	2,134,912.96
Wages & invoices unpaid	\$ 1,651.67	819,228.32
Gross sales revenues in 2003	\$ 42,764.53	21,211,206.88
Gross sales revenues in 2004	\$ 18,212.29	9,033,295.84
Total number of employees:		
Before Katrina	1.7	843
After Katrina	0.6	298
Percent of business to recover		
By the end of October	19.23%	
By the end of 2005	42.63%	
Expected loss of sales after recovery	52.11%	

Table 6-4 is a summary of surveys received from charter boat owners and operators in Alabama. Out of total 154 charter boat operators, 37 responses have been received. Figures in the “Average” are direct tabulation from the 37 responses. Figures in the “All Charter Boats” are obtained by multiplying figures in the Average by 154.

Table 6-4. Summary of Surveys – Charter Boats

	Average	All Charter Boats
Best estimate of damages:		
Total	\$ 26,602.29	\$ 4,096,752.66
Spent so far	10,459.43	1,610,752.22
Need to spend	16,687.24	2,569,834.96
Insurance coverage	\$ 3,421.05	526,841.70
Estimate of lost inventories	\$ 21,458.33	3,304,582.82
Business-related outstanding loans		
Loans from SBA	\$ 19,052.63	2,934,105.02
Loans from other sources	\$ 77,597.22	11,949,971.88
Wages & invoices unpaid	\$ 4,512.50	694,925.00
Gross sales revenues in 2003	\$ 104,575.14	16,104,571.56
Gross sales revenues in 2004	\$ 70,775.23	10,899,385.42
Total number of employees:		
Before Katrina	1.3	200
After Katrina	1.1	169
Percent of business to recover		
By the end of October	16.55%	
By the end of 2005	25.03%	
Expected loss of sales after recovery	46.21%	

### Estimation of Total Direct Losses

Survey of summaries shown in table 6-1 for dealers and processors, 6-2 for shrimp fishermen, 6-3 for other fishermen, and 6-4 for charter boat operators are combined in table 6-5 Summary of Surveys Combined on the following page.

It is interesting to observe in table 6-5 that the amount of loans from SBA comprises only a small portion (less than 9.5%) of total loans outstanding in Alabama's seafood industry. Note also that the amount of loans may overestimate actual loans if a higher number of questionnaires were returned from individuals with larger amounts of loans than the general population, while the amount of loans may underestimate actual loans if returned samples came more from those with smaller amounts of loans than the general population.

It is also interesting to observe in table 6-5 that those who make a living in the Alabama's seafood industry believe that only 20.11 percent of their businesses recovered by the end of October 2005, 37.54 percent of their businesses would recover by the end of December 2005, and even after recovery, they expect to lose about 50 percent of their businesses for many reasons, which include the loss of marketing channels.

Total losses from Hurricane Katrina to the Alabama seafood industry are derived in table 6-6. Table 6-6 is derived from tables 5-1 and 6-5. Table 6-6 is included in Executive Summary (ES-1) in the beginning of this report after figures are rounded up to 1,000s.

table 6-5 Summary of Surveys Combined from EXCEL table

Table 6-5. Summary of Surveys Combined

	Dealers & Processors	Shrimp Fishermen	Other Fishermen	Charter Boat	Total
Best Estimate of Damages					
Total	\$19,741,679.63	\$7,889,891.10	\$5,613,534.56	\$4,096,752.66	\$37,341,857.95
Spent so far	\$6,805,197.57	\$1,033,428.90	\$905,939.04	\$1,610,752.22	\$10,355,317.73
Need to spend	\$12,936,482.06	\$7,156,949.10	\$4,207,662.24	\$2,569,834.96	\$26,870,928.36
Insurance coverage	\$9,005,104.14	\$3,111,000.90	\$88,660.00	\$526,841.70	\$12,731,606.74
Estimate of lost inventories	\$3,408,895.24	\$9,837,660.00	\$3,968,000.00	\$3,304,582.82	\$20,519,138.06
Business-related outstanding loans					
Loans from SBA	\$1,157,340.77	\$1,357,937.70	\$360,026.56	\$2,934,105.02	\$5,809,410.05
Loans from other sources	\$26,607,315.52	\$14,633,379.60	\$2,134,912.96	\$11,949,971.88	\$55,325,579.96
Wages & invoices unpaid	\$3,934,179.00	\$398,611.50	\$819,228.32	\$694,925.00	\$5,846,943.82
Gross sales revenues in 2003	\$427,012,621.91	\$16,127,859.30	\$21,211,206.88	\$16,104,571.56	\$480,456,259.65
Gross sales revenues in 2004	\$365,001,132.21	\$13,439,391.00	\$9,033,295.84	\$10,899,385.42	\$398,373,204.47
Total number of employees					
before Katrina	4302	420	843	200	5,765
after Katrina	1745	273	298	169	2,485
Percent of business to recover (%)					Alabama Ave.
by the end of October 2005	28.33	16.31	19.23	16.55	20.11
by the end of December 2005	45.22	37.29	42.63	25.03	37.54
Expected loss of sales after recovery	55.29	49.57	52.11	46.21	50.80

Table 6-6. Total Losses from Katrina to the Alabama Seafood Industry

Loss Items	Loss Amount	Sub-category	Source
Net value of damages on boats & facilities	\$24,610,251.21		
Damages on boats & facilities			
Dealers & processors		\$19,741,679.63	(table 6-5)
Shrimp fishermen		\$ 7,889,891.10	(table 6-5)
Other fishermen		\$ 5,613,534.56	(table 6-5)
Charter boats		\$ 4,096,752.66	(table 6-5)
subtotal		\$37,341,857.95	(table 6-5)
Insurance coverage		\$12,731,606.74	(table 6-5)
Net value excluding insurance coverage		\$24,610,251.21	
Vessel removal	\$ 3,840,000.00		(section 3)
Lost inventories	\$20,519,138.06		
Dealers & processors		\$ 3,408,895.24	(table 6-5)
Shrimp fishermen		\$ 9,837,660.00	(table 6-5)
Other fishermen		\$ 3,968,000.00	(table 6-5)
Charter boats		\$ 3,304,582.82	(table 6-5)
subtotal		\$20,519,138.06	
Wages & invoices unpaid	\$ 5,846,943.82		
Dealers & processors		\$ 3,934,179.00	(table 6-5)
Shrimp fishermen		\$ 398,611.50	(table 6-5)
Other fishermen		\$ 819,228.32	(table 6-5)
Charter boats		\$ 694,925.00	(table 6-5)
subtotal		\$ 5,846,943.82	
Lost revenues & future lost sales	\$57,433,526.40		
Dealers & processors		\$29,392,936.00	(section 3)
Fishermen		\$18,885,107.00	(section 3)
Charter boat operators		\$ 9,155,483.40	(see note*)
subtotal		\$57,433,526.40	
Grand Total	\$112,249,859.49		
<u>Potential Loss from Loans</u>			
Loans from SBA	\$ 5,809,000		
Loans from Other Sources	\$ 55,326,000		
total loans	\$ 61,135,000		

\*The percent of lost revenues and future lost sales relative to total sales in charter boat operators

(i.e.,  $\$10,899,385.42$  from table 6-5  $\times 0.84 = \$9,155,483.40$ ) is assumed to be the same at 84 percent as that in the fishermen (i.e.,  $\$18,885,107 / (\$13,439,391.00 + \$9,033,295.84$  from table 6-5)  $= 0.840$ ).

Please note in table 6-6 that if and how quickly assistance arrives will have a direct impact on the loss estimate. The loss estimates shown in the table are based on the assumption that the assistance arrives soon enough, say, by the end of the first quarter of 2006. If the speed of assistance slows, the loss estimate is likely to be higher due primarily to the continued increase of lost sales resulting in the financial loss of some dealers and/or processors. Also in table 6-6, the amount of total actual losses calculated may overestimate actual losses if a higher number of returned questionnaires were submitted by groups experiencing damages greater than the general population, while the amount may underestimate actual losses to the extent that respondents' perception of future losses are more accurate than the percentages assumed in this study. Percentage losses in the future indicated in the returned questionnaires are significantly greater than those assumed in this study.

#### Multiplier Effect

Broad guidelines of estimating losses and damages from natural disasters issued by the National Academy of Sciences' ad hoc Committee on Assessing the Costs of Natural Disasters mention possible multiplier effects by stating that "Input/output losses to firms forward-linked or backward-linked in production to businesses closed as a result of direct physical damage or infrastructure failure. Slowdowns or shutdowns are induced by reductions in demands for inputs and supplies of outputs from damaged firms.

Spending reductions from the income losses triggered by firm closures or cutbacks—so-called multiplier, or ripple, effects. Employees of the firms experiencing reduced production and sales suffer income losses and subsequently curtail their own expenditures, initiating a new round of

firm cutbacks.” [National Academy of Sciences (NAS), *The Impacts of Natural Disasters: A Framework for Loss Estimation*, Washington, DC: National Academy Press, 1999, p. 37] The Committee does not require any inclusion or an exclusion of the multiplier effect in estimating losses from natural disasters, unlike the OMB Circular A-94 which prohibits inclusion of the multiplier effect in impact estimation by stating that “employment or output multipliers that purport to measure the secondary effects of government expenditures on employment and output should not be included in measured social benefits or costs.” [U.S. Office of Management and Budget, “Circular No. A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs,” Transmittal Memo No. 64 (Washington, DC: GPO, 1994), p. 7]

Importantly, the Committee recognizes that disasters may generate short-term “positive economic stimuli of jobs and production generated from cleaning up and rebuilding and the multiplier effect of those increases.” [NAS, p. 37]

Being a small fishing town with population of 2,313, there was not much room for generating the multiplier effect even before the hurricane. After the hurricane, a significant amount of money has been flowing into Mobile County, generating a large positive economic impact. The City of “Mobile and Mobile County’s sales tax collections for September are way up – 50 percent for the city and 43 percent for the county – compared with the same month the year before,” and “Mobile’s hotel tax collections in the police jurisdiction, which is the area outside the city where some taxes are collected in exchange for police and fire protection, were up 82 percent over the previous year.” [Steve Myers, “Boomtown: Mobile rakes it in after Katrina,” *Mobile Register*, November 13, 2005, p. A1]

The problem is that being such a small town, the multiplier effect on Bayou La Batre is likely very small, if it exists at all. The multiplier effect on the seafood industry, therefore, is not

included in this study.

## Section7

### Conclusions

Hurricane Katrina delivered a devastating blow to Alabama's seafood industry. Based on the findings of this report in conjunction with data from various sources, Alabama's seafood industry comprised of seafood dealers, commercial fishermen, and charter captains should be expected to incur losses of up to \$112 million in the months following Hurricane Katrina. These losses stem from facility and vessel damages, inventory and sales losses, and loss wages to the workforce. Seafood dealers stand to lose valuable market share and processors struggle to locate seafood for processing. Additionally, potential losses of over \$61.1 million due to forfeit or delinquency of encumbered loans could occur.

### Selected Comments from the Seafood Survey

Listed below are selected comments that respondents to our questionnaire added to the questionnaire that they completed. Note that all names, if identified in the comment sheets, are excluded in the following quotations, and that spelling errors are not corrected and comments are printed exactly as they are written:

“Biggest problem is the loss of time in the heart of our season which is the best, that you can't recover, we have lost about six weeks approx. (50,000 to 200,000 gross revenue)”

“Most of our losses were because the majority of our brokers, and suppliers, businesses were destroyed. Shrimpers, oystermen, crab men, could not work, so he was forced to close for a month, before we could even resume back to work, at 50% of our normal inventory.”

“Most economic impact for me after Ivan and Katrina was lost trips because of room availability for out of town guests.”

“I lost a 40 ft. shrimp boat due to hurricane Katrina. I've not gotten no help my boat was a total loss. I'm currently trying to get the coast-guard to help get my boat it's on the dock of a business. I don't have the money to make repairs to salvage the boat any help would be much appreciated fishing and shrimping is all I've ever done suffering a total

loss is tragic to any commercial fishermen. Thank you”

“The channel’s were closed home’s were destroyed including mine and my crew members. All the monie’s I had went to taking car of my four children after the Hurricane. I have no money to haul up my boat to do the repair on the bottom of my boat and other repairs. Sincerely”

“Dear Sir, I own a 32 ft. barge with two 115 Hp 4 stroke Yamaha outboards on it. The total cost was approximentally \$40,000. It was built by me to dredge oysters in Mississippi from Oct. 1 – till April 30. Hurricane Katrina killed the oysters in Mississippi and destroyed the loading docks. This put me out of business with a \$400 dollar note at the bank. Luckily, Alabama has opened up a small area for dredging. Sincerely”

“Since Ivan the Charter Boat Industry in the Orange Beach, Ala area has taken a beating. Gross income is off by a minimum of 50% due to lack of facilities and tourists. In the five years before Ivan my boat ran an average of 131 Charters per year. From the week starting before to date we have run a total of 41 charters. Gross Income since Ivan has come no where near covering everyday expenses such as ship rent, utilities insurance, boat uphoeyes and employee salaries. Out of pocket expenses above gross income has been upward of \$15,000. I am a member and on the Boat of Directors Orange Beach, Al Charter Association. We are the heart of the recreational fishing Industry in Alabama, therefore we create a tremendous service to the local area. Note: once we loose a charter, it is gone. Thanks. Sincerely, Captain [DL]”

“First of all thank you for your concern. I lost 70% of my nets at R&R seafood on the Battleship Parkway. I lost a lot of other gear to. Had to relocate to a place with not to good of docks. My boat was relocated from the storm. But has suffered a lot of damage due to the storm. It would be a blessing if your people could help. I have received nothing from red cross Or any other people. Thank you. P.S. I do have a S.B.A. Loan pending but only borrowing a part of my loss for financial reasons.”

“Put in for a S.B.A. Loan in September haven’t heard a word so we don’t know if we are going to get it. If not we don’t know what we are going to do.”

“I have got hung up on all types of Debris in Gulf Waters. I’ve lost 2 different gill nets 3 ½ and also 3 1/8. I have also hit something running down beach and busted my lower unit and trim motor. It cost me 5300.00 for just lower unit and another 1,400.00 for trim motor and repair boat the whole knot in bottom. My total cost to replace my gill nets are 4,039.65. Thank you”

“We have been in the wholesale business of selling crab meat which we boiled, picked and packaged at our facility in Irvington, Alabama for many years. Our only crab supplier was from Louisiana and was completely wiped out by Hurricane Katrina. Other crab suppliers who were not effected by the hurricanes are committed to providing their catch to those who have bought from them for years. Since many crab suppliers on the gulf coast were wiped out, every crab processing plant in this area with east coast and Texas suppliers

may be hanging on, but there's not enough crab from those areas to supply all of us. We have therefore, closed our business since we no longer have anything for our employees to do. Sincerely"

"We suffer from Economic damage primarily. No tourists this summer (2005). We also had reef damage offshore. Katrina/Rita hurt us even more this year as we were still trying to recover from Hurricane Ivan (Sept. 2004) Thank you."

"Total Sales Lost: I don't know not everybody back to fishing/shrimping. People are still afraid to eat seafood because of the media."

"Our boat is sitting on the beach a total loss. We just don't know what to do with it. Been asking Coast Guard for help or anyone and still haven't received anything. It's sitting on private property and the people are asking for us to remove it. But where it's located we can hardly get to it by foot. It's sitting propped up between two pine trees so what can we do. Please help us. God Bless You. Thank you"

"Just about all damages were due to debris in the Gulf. I lost quite a lot of net because of it. It also cut my time in the Gulf fishing in half, which cost me money. As for damage to my boat. When the hurricanes hit I took my boat and truck north."

"I know this survey is for the statistics of the dollar amount that hurricanes Ivan and Katrina cost. How do you put a dollar amount on someone's livelihood? That is what these hurricanes have cost us."

## References

1. National Academy of Sciences, "The impacts of natural disasters: a framework for loss estimation" National Academy Press, Washington DC, 1999.
2. Semoon Chang, "OMB Circular A-94 and Highway Benefit-Cost Ratios," Journal of Transportation Law, Logistics and Policy, 64 (Spring 1997), 316-326.

Appendices:

- 1 Cover letters
- 2 Survey of Damages on Alabama Seafood Industry
- 3 Charter Boat Questionnaire

Appendix 1

October 24, 2005

Dear Alabama Seafood Dealers/Processors:

This questionnaire survey is intended to assist the Alabama Department of Conservation and Natural Resources in assessing damages to the Alabama seafood industry from Hurricanes Katrina and Rita. The only objective of this survey is to make sure that whatever losses that you may have suffered from this year's hurricanes be included in any recovery programs that the government is working on.

Please note that data of individual businesses will be kept totally confidential. Only the aggregates and averages will be reported to the government. Due to the urgent nature of this survey, please complete the attached one page questionnaire as soon as you receive it and return the completed questionnaire in the enclosed postage-paid envelope, or fax to 251-460-7877, at the latest by November 10 if not before..

Please note that if you already received and returned the same questionnaire, please ignore this questionnaire.

Sincerely,

Semoon Chang, Professor and Director  
Center for Business & Economic Research  
University of South Alabama  
Telephone: 251-460-6156 Fax: 251-460-7877

October 24, 2005

Dear Alabama Charter Boat Operators:

This questionnaire survey is intended to assist the Alabama Department of Conservation and Natural Resources in assessing damages to the Alabama seafood industry from Hurricanes Katrina and Rita. The only objective of this survey is to make sure that whatever losses that you may have suffered from this year's hurricanes be included in any recovery programs that the government is working on.

Please note that data of individual businesses will be kept totally confidential. Only the aggregates and averages will be reported to the government. Due to the urgent nature of this survey, please complete the attached one page questionnaire as soon as you receive it and return the completed questionnaire in the enclosed postage-paid envelope, or fax to 251-460-7877, at the latest by November 10 if not before..

Please complete and return the questionnaire even if you suffered no damages from Katrina and Rita.

Sincerely,

Semoon Chang, Professor and Director  
Center for Business & Economic Research  
University of South Alabama  
Telephone: 251-460-6156 Fax: 251-460-7877

October 24, 2005

Dear Alabama's Commercial Fishermen:

This questionnaire survey is intended to assist the Alabama Department of Conservation and Natural Resources in assessing damages to the Alabama seafood industry from Hurricanes Katrina and Rita. The only objective of this survey is to make sure that whatever losses that you may have suffered from this year's hurricanes be included in any recovery programs that the government is working on.

Please note that data of individual businesses will be kept totally confidential. Only the aggregates and averages will be reported to the government. Due to the urgent nature of this survey, please complete the attached one page questionnaire as soon as you receive it and return the completed questionnaire in the enclosed postage-paid envelope, or fax to 251-460-7877, at the latest by November 10 if not before..

Please complete and return the questionnaire even if you suffered no damages from Katrina and Rita.

Sincerely,

Semoon Chang, Professor and Director  
Center for Business & Economic Research  
University of South Alabama  
Telephone: 251-460-6156 Fax: 251-460-7877

Appendix 2: Survey of Damages from Katrina/Rita on Alabama Seafood Industry

1. Name of company (optional but recommended): \_\_\_\_\_
2. What is the type of your business? – Please check all that apply.
 

<input type="checkbox"/> Seafood processing plant	<input type="checkbox"/> Shrimp boat owner/operator
<input type="checkbox"/> Oystermen	<input type="checkbox"/> Crabber
<input type="checkbox"/> Fishermen – gill net & hooking line	<input type="checkbox"/> Charter boat owner/operator
<input type="checkbox"/> Bait & gear shop	<input type="checkbox"/> Marina owner/operator
<input type="checkbox"/> Seafood dealer	<input type="checkbox"/> Other – specify: _____

Damages on Private Properties

3. Did you suffer any business-related damages:
 

<input type="checkbox"/> Boats
<input type="checkbox"/> Gear
<input type="checkbox"/> Facilities including plants, docks, marinas & buildings
<input type="checkbox"/> No damages
4. If suffered damages, where are the damaged properties primarily located?
 

<input type="checkbox"/> Mobile County
<input type="checkbox"/> Baldwin County
5. If suffered damages, what is your best estimate of damages on your boats and/or facilities that you need to restore to the pre-Katrina level?
 

Total	[\$		]
Spent so far to recover: .....	[\$		]
Still need to spend: .....	[\$		]
6. What is your best estimate of lost inventories? ..... [\$ ]

Insurance/Loans on Damaged Boats and Facilities

7. What is the amount of insurance coverage you expect for the damages?
 

[\$		]
-----	--	---
8. What is the amount of business-related outstanding loans or debts you owe?
 

Loans from SBA	[\$		]
Loans from other sources	[\$		]
Wages & invoices outstanding since hurricanes.....	[\$		]

Estimation of Lost Revenues & Marketing Opportunities

9. Gross sales revenues in 2003 (before Ivan): [\$ ]
10. Gross sales revenues in 2004 (before Katrina): [\$ ]
11. Total number of employees:
 

Before Katrina.....		[		]
After Katrina.....		[		]
12. What percent of your businesses have you recovered or expected to recover from Katrina & Rita:
 

(a) By the end of October [ ] percent (b) By the end of 2005 [ ] percent
13. Once fully recovered, what is your best estimate of the percentage of total sales you expect to lose in comparison to the pre-Katrina level because of lost market channels from Katrina and Rita? [ ] percent
14. Please add any information or data you want to add on separate pages.

Thank you, Center for Business & Economic Research  
University of South Alabama (tel: 251-460-6156)

Appendix 3: Hurricane Katrina Charter Boat Questionnaire

Vessel: \_\_\_\_\_ County: \_\_\_\_\_

Phone #1: \_\_\_\_\_

Representative: \_\_\_\_\_

Phone #2: \_\_\_\_\_

Questionnaire participation: Yes \_\_\_ No \_\_\_

What was the permanent location of 'Vessel Name' prior to Hurricane Katrina?

\_\_\_\_\_

What is the permanent location of 'Vessel Name' after Hurricane Katrina? \_\_\_\_\_

If locations differ, why do they differ? (Check box that is most appropriate):

Marina temporarily closed: \_\_\_ How long will it be closed? \_\_\_ months. Will its closure affect your ability to carry passengers? Yes \_\_\_ No \_\_\_

Marina permanently closed: \_\_\_

Marina will not be used for charter boats (sold): \_\_\_

Lack of dock space available for charter boats: \_\_\_

Cost savings or a better business opportunity: \_\_\_ Other: \_\_\_

Have you received cancellations for trips after Katrina that were booked prior to Katrina?

Yes \_\_\_ No \_\_\_ (If "No", go to next section)

How many trips were cancelled? \_\_\_\_\_ What percentage of the remaining trips for this year's bookings does this number represent? \_\_\_\_\_%

Of these cancelled trips how many trips (or percent of cancelled trips) were from customers directly impacted by Katrina? No. of trips \_\_\_\_\_, percent of cancellations \_\_\_\_%. Don't know

\_\_\_\_\_ For the trips cancelled due to Katrina what was the average cost per trip? \$ \_\_\_\_\_

How many deckhands would have been used for each trip? \_\_\_\_\_

If you experienced cancellations that were not associated with Katrina were these due to one of the following reasons:

Fuel shortage: Yes \_\_\_ or No \_\_\_ If yes, number of cancellations \_\_\_\_\_, percent of cancellations \_\_\_\_%.

Lack of hotel / condo space: Yes \_\_\_ or No \_\_\_ If yes, number of cancellations \_\_\_\_\_, percent of cancellations \_\_\_\_%.

Have you received any cancellations for booked trips because you needed to charge a higher price to cover increased fuel costs? Yes \_\_\_ No \_\_\_\_\_. If yes, how many trips were cancelled? \_\_\_ What percentage of booked trips does this represent? \_\_\_\_%