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The Flow of South Carolina Harvested Seafood Products through South Carolina Markets

by

Mark S. Henry
Co-Director
EDA University Center for Economic Development
Department of Applied Economics and Statistics
Clemson University

Raymond J. Rhodes
Research Professor
Department of Economics and Finance
College of Charleston

Daniel Eades
Research Associate
EDA University Center for Economic Development
Clemson University

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EDA University Center for Economic Development
Department of Applied Economics and Statistics
Clemson University, Clemson, South Carolina
www.clemson.edu/uced

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I. INTRODUCTION

The South Carolina (SC) seafood market place has changed markedly over the last 30 years. Technological changes (e.g. expansion of modern mariculture technology in China and Vietnam, use of brine freezers on SC trawlers, etc.), shifts in consumer demand (e.g. increased seafood consumption away from home), and retail consolidation have reshaped the traditional market relationships between producers, processors, wholesalers, retailers, and foodservice outlets. Moreover, regulatory agencies (e.g. the South Atlantic Fishery Management Council, the SC Department of Natural Resources, etc.) involved in state and regional fisheries management remain concerned with the potentially negative impacts of fishery regulations, not only on commercial fishing operations, but also potentially negative secondary regulatory impacts on other market channel members (e.g. domestic processors, small seafood distributions, etc. (See Keithly and Martin 1997**).**

The most recent research on South Carolina seafood market channels was conducted in 1972 (Laurent *et al.* 1975, Rhodes 1974). Consequently, over time, fishery management policy makers, SC non-government organizations (NGOs) such as the SC Seafood Alliance, and others have become more dependent upon fragmented and sometimes questionable anecdotal evidence when attempting to understand and anticipate the secondary impacts of regulations and other policies (e.g. generic seafood promotion programs) on SC seafood market channel firms and related businesses.

The purpose of this report is to provide a current view of SC harvested seafood product flows. To characterize and quantify the flow of major South Carolina marine harvested seafood products through market channels, the report summarizes research that:

1. Defines and describes major South Carolina market channel members and their role in the flow of major marine South Carolina seafood products (e.g. blue crabs, oysters, shrimp, etc.) and applicable substitutes (i.e. domestic and/or foreign derived products) imported into the state.

2. Estimates the flows (i.e. physical quantities and the appropriate market level value) of South Carolina's major harvested seafood products and related substitutes at major levels of the SC seafood market channels.

3. Summarizes seafood market knowledge from key South Carolina market channel members on product flows.

The research proceeded in the several phases. First, a SC seafood industry focus group and other sources (e.g. research literature, informants, etc.) were used to document the role of SC major market channel members (e.g. brokers, primary wholesalers, distributors, seafood buyers for SC restaurants). Second, a sample survey collected product flow data and other information from SC retail and restaurant market channels. Data sources for identifying the population of market channel groups to be surveyed included the South Carolina Department of Natural Resources (SCDNR) license records, telephone directories, the Harris Infosource database, and Internet based seafood supplier lists. SCDNR aggregated data regarding annual seafood landings were also reviewed.

In the remaining sections of this report, marketing channels are documented for SC seafood products, consumption patterns are reviewed, and the interplay between consumption patterns, SC seafood landings and imported seafood products are explored.

II. SUPPLY OF SEAFOOD PRODUCTS IN SOUTH CAROLINA

Three primary sources of seafood products are consumed in South Carolina:

1. Landings (unloadings) of wild caught seafood at South Carolina ports and other facilities (e.g. boat ramps),
2. Food products originating from SC commercial aquaculture ponds and shellfish leases (permitted areas),
3. Imported seafood – from other states and foreign sources.

Each of these sources has a set of marketing channels with some overlap and the relative importance of these sources of seafood for SC consumers has changed substantially over the past decades.

A. LANDINGS OF SEAFOOD AT SOUTH CAROLINA DEALERS

In South Carolina a person or business that buys or handles saltwater species landed in South Carolina to be packed, shipped, consigned, or bought to be sold at the wholesale level must purchase a "wholesale seafood dealer license" from the SC Department of Natural Resources (SCDNR 2008). These licensed seafood dealers, many of which are located in the coastal counties of South Carolina, are usually the initial or "first tier" buyer and/or shipper of various seafood species harvested in and off of South Carolina and subsequently unloaded in the SC coastal area.

Using the SC trip ticket system, these licensed seafood dealers are also required to routinely report on seafood sold to them by SC harvesters. These data are audited, compiled and aggregated by the SCDNR's Marine Resources Division (MRD) and used to help manage SC commercial fisheries. Additionally, these aggregated landings data derived from SC seafood dealers are forwarded to the Fisheries Statistics Division in the National Marine Fisheries Service (NMFS). Consequently, SC annual and monthly commercial fisheries landings by species, and including ex-vessel values as reported by the NMFS, are derived from SC seafood dealers.

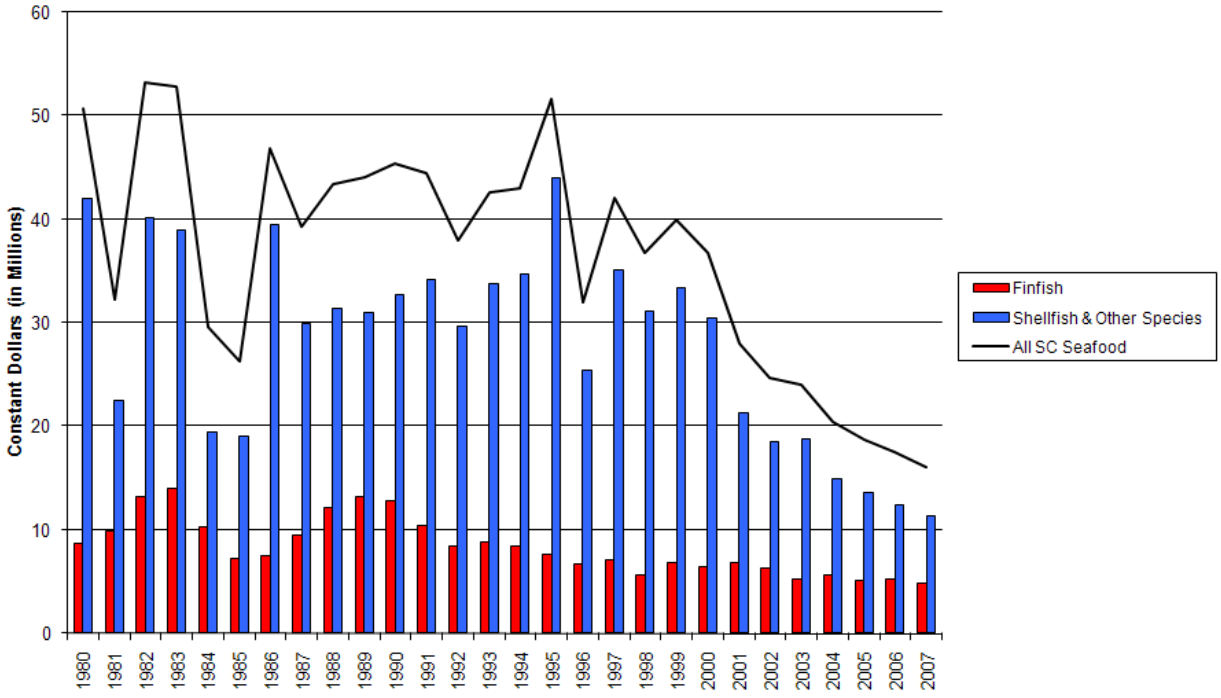
Inflation adjusted[1] ex-vessel ("dockside") values of SC seafood landings from 1980 to 2007 are displayed in Figure 1. The value of seafood landings in real terms (constant 2007 prices) was cyclical around $40 million throughout the 1980s and 1990s. A few years were about $10 million above this benchmark (1980, 1982, 1983 and 1995), and a few years were about $10 million

[1] Dollar values were adjusted to a base year 2007 value using the Bureau of Labor Statistics' Consumer Price Index, U.S. city average, for all items. Available at: www.bls.gov/CPI/#tables. Dollar values are adjusted to 2007 dollars.

below $40 million in seafood landings (1984, 1985 and 1995). But there was a cycle of ups and downs around $40 million in landings during the 1980s and 1990s.

In sharp contrast to this cyclical pattern, a steady downward trend in the real value of landings took hold in 2000 with landings declining from about $37 million in 2000 to about $15 million in 2007. This decline in the value of landings at South Carolina dealers is, in part, a result of the lower profitability of owning and operating fishing vessels. Profits have eroded from the cost side from substantial increases in the cost of diesel fuel while ex-vessel prices for many seafood products have been under downward pressure from large increases in seafood imports over the last decade. The result of these market forces has been to reduce the size of the fishing fleet that lands seafood in South Carolina (see Section D. SC Seafood Dealers and Seafood Distribution). For those vessels that maintain profitability, any increases in physical landings have been more than offset by lower 'ex-vessel' prices. These downward pressures on 'ex-vessel' seafood prices persist despite some anti-dumping tariffs imposed on shrimp and other seafood products, and marketing efforts to promote domestic, wild caught seafood as superior quality to imported farm-raised seafood.[2]

Figure 1. Constant 2007 Dollar Values of South Carolina Commercial Landings: Finfish Landings, and Shellfish and Other Species Landings, 1980-2007



*National Marine Fisheries Service; 2007 landings are preliminary eatimates. Excludes catches not intended for human consumption.

[2] See for example, Wild American Shrimp Inc, WASI, www.wildamericanshrimp.com
"WASI devotes its resources to raising public awareness about the many health and economic benefits of wild-caught American shrimp. It is designed to educate consumers about the advantages of asking for Wild American shrimp, shrimp that grows naturally, is caught fresh and supports the seafood industry of eight southern states – Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Texas. Its goal is to market Wild American shrimp through grocery store promotions, restaurant programs and other marketing efforts."
http://www.ncfish.org/article.asp?id=129

In 2007, annual seafood landings in South Carolina were comprised of a wide variety of finfish and shellfish as shown in Table 1. The total nominal ex-vessel value of SC landings was $15.574 million with marine shrimp comprising about 29% of the total and various "offshore" finfish accounting for 26% of the total ex-vessel value of landings. The 4.1 million pounds of Blue Crab landings made up 44.1% of the 9.1 million pounds of total landings and ranked second of all species in the value of landings.

The top ten species in Table 1, ranked by highest ex-vessel value of SC landings in 2007, were:

1. Shrimp (Brown, White and other marine shrimp)
2. Blue Crab
3. Eastern Oysters
4. Grouper
5. Scamp
6. Snapper group
7. Clams, Northern Quahog
8. Hind
9. American Shad
10. Leatherjackets

(Note: Scamp and Hind species are also in the overall sea bass/grouper family; in seafood markets, they may be lumped together with "Grouper.")

Table 1. South Carolina 2007 annual landings and ex-vessel values (Source: Personal communication, National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD).

	All Landed Species				"Offshore" Finfish	
SC Landings by Species	Pounds	%, Total Lbs.	Ex-vessel Value	Ex-vessel Price	Pounds	Ex-vessel Value
AMBERJACK	84,207	0.9%	84,396	$ 1.00	84,207	84,396
AMBERJACK, GREATER	12,159	0.1%	11,014	$ 0.91	12,159	11,014
BONITO, ATLANTIC	1,225	0.0%	709	$ 0.58	1,225	709
CLAM, NORTHERN QUAHOG	134,014	1.5%	690,444	$ 5.15		
COBIA	3,686	0.0%	8,871	$ 2.41	3,686	8,871
CRAB, BLUE	4,071,336	44.7%	3,176,306	$ 0.78		
CRAB, BLUE, PEELER	63,637	0.7%	333,133	$ 5.23		
CRAB, STONE CLAWS	21,334	0.2%	48,973	$ 2.30		
DOLPHINFISH	51,856	0.6%	105,107	$ 2.03	51,856	105,107
EEL, CONGER	333	0.0%	216	$ 0.65	333	216
FINFISHES, UNC FOR FOOD	37,738	0.4%	44,646	$ 1.18	37,738	44,646
FINFISHES, UNC GENERAL	128,965	1.4%	252,466	$ 1.96		
FLATFISH	1,379	0.0%	2,202	$ 1.60	1,379	2,202
GROUPER, GAG	254,125	2.8%	1,017,110	$ 4.00	254,125	1,017,110
GROUPER, SNOWY	12,677	0.1%	39,712	$ 3.13	12,677	39,712
GROUPER, YELLOWEDGE	593	0.0%	2,157	$ 3.64	593	2,157
GROUPER, YELLOWFIN	4,830	0.1%	18,088	$ 3.74	4,830	18,088
HIND, RED	122,210	1.3%	410,047	$ 3.36	122,210	410,047
HIND, ROCK	20,045	0.2%	79,178	$ 3.95	20,045	79,178
HOGFISH	13,164	0.1%	37,504	$ 2.85	13,164	37,504
JACK, ALMACO	51,338	0.6%	45,988	$ 0.90	51,338	45,988
KING WHITING	22,549	0.2%	21,760	$ 0.97		
LEATHERJACKETS	128,226	1.4%	195,016	$ 1.52	128,226	195,016
MACKEREL, KING & CERO	34,008	0.4%	57,652	$ 1.70	34,008	57,652
OCTOPUS	428	0.0%	524	$ 1.22		
OYSTER, EASTERN	277,752	3.0%	1,347,470	$ 4.85		
POMPANO, AFRICAN	716	0.0%	1,108	$ 1.55	716	1,108
PORGY, KNOBBED	8,830	0.1%	9,374	$ 1.06	8,830	9,374
PORGY, RED	40,428	0.4%	82,333	$ 2.04	40,428	82,333
ROSEFISH, BLACKBELLY	3,811	0.0%	4,984	$ 1.31	3,811	4,984
RUDDERFISH, BANDED	14,998	0.2%	9,492	$ 0.63	14,998	9,492
SCAMP	192,824	2.1%	787,027	$ 4.08	192,824	787,027
SEA BASS, BLACK	82,738	0.9%	169,452	$ 2.05	82,738	169,452
SHAD, AMERICAN	223,915	2.5%	203,563	$ 0.91		
SHARK, ATL. SHARPNOSE	26,197	0.3%	17,824	$ 0.68	26,197	17,824
SHARK, SANDBAR	27,939	0.3%	8,907	$ 0.32	27,939	8,907
SHARK, TIGER	2,479	0.0%	858	$ 0.35	2,479	858
SHARKS	43,397	0.5%	47,099	$ 1.09	43,397	47,099
SHELLFISH	955	0.0%	1,613	$ 1.69		
SHRIMP, BROWN	814,358	8.9%	1,025,448	$ 1.26		
SHRIMP, MARINE, OTHER	104,627	1.1%	219,757	$ 2.10		
SHRIMP, WHITE	1,704,459	18.7%	4,174,318	$ 2.45		
SNAPPER, CUBERA	2,434	0.0%	6,066	$ 2.49	2,434	6,066
SNAPPER, GRAY	379	0.0%	947	$ 2.50	379	947
SNAPPER, MUTTON	4,317	0.0%	11,649	$ 2.70	4,317	11,649
SNAPPER, RED	14,521	0.2%	53,169	$ 3.66	14,521	53,169
SNAPPER, VERMILION	224,096	2.5%	686,254	$ 3.06	224,096	686,254
SNAPPER, YELLOWTAIL	318	0.0%	916	$ 2.88	318	916
SPOT	6,357	0.1%	2,799	$ 0.44		
SQUIDS	5,292	0.1%	3,682	$ 0.70		
TILEFISH, BLUELINE	3,819	0.0%	5,176	$ 1.36	3,819	5,176
TUNA, YELLOWFIN	214	0.0%	518	$ 2.42	214	518
WAHOO	3,189	0.0%	7,598	$ 2.38	3,189	7,598
WHELK, KNOBBED	4,385	0.0%	1,107	$ 0.25		
2007 TOTAL:	**9,115,806**	100%	**$15,573,727**	**$ 1.71**	**1,531,443**	**$4,070,364**
Marine Shrimp, All Species:	**2,623,444**	28.8%	**$ 5,419,523**	**Offshore Finfish, Ex-vessel Price/Lb.**		**$ 2.66**

B. VALUE OF AQUACULTURE PRODUCTION IN SOUTH CAROLINA

The most recent Census of Aquaculture in 2005 documents rapid growth of aquaculture activity in South Carolina with the total number of aquaculture farms expanding from 27 in 1998 to 85 farms in 2005. Ex-pond value of aquaculture production data for 2007 is not available from the U.S. Dept. of Agriculture, and there may be underreporting of these values in earlier Census data. However, estimates from Clemson University aquaculture specialists suggest that the value of aquaculture production in South Carolina including non-food market aquatic products (e.g. Carp) was about $11.250 million in 2007. As shown in Table 2, the leading species were clams (especially seed clams) and oysters.

Table 2. EX-POND (WHOLESALE) VALUE OF COMMERCIAL AQUACULTURE PRODUCTION IN

SPECIES	VALUE OF SALES
Clams	$6,000,000
Catfish	$400,000
Shrimp	$100,000
Oysters	$1,300,000
Gamefish*	$900,000
Tilapia	$400,000
Bait*	$700,000
Crawfish	$150,000
Carp*	$400,000
Redfish	$100,000
Hybrid Bass	$300,000
Soft Shell Crabs	$500,000
TOTAL	**$11,250,000**
Food-Market Species	**$9,250,000**

Source: Personal Communication, J. Whetstone, Clemson University.

Since there are no mandatory reporting requirements by the state of South Carolina for aquaculture production on an annual basis, the estimates (Table 2) were based on experts in the aquaculture industry that maintain contact with producers of aquaculture products. Note that some of this production is for fish to stock ponds and lakes and for bait rather than for commercial food-markets sales. Still, one would expect that aquaculture production of clams (except seed clams), oysters, shrimp, soft shell crabs[3] and some finfish – tilapia, for example – to supplement and/or substitute for the supply of wild caught species in South Carolina. Indeed, compare the values for clams in Table 1 ($690,444) with the estimated of harvested clams in Table 2 ($6,000,000). For oysters (about $1.3 million in each table), the "wild" oysters harvested from leases are also included in SC aquaculture production. Regardless, it is clear that farm raised (mariculture) clams are a dominant supply source in South Carolina. The 2005 Census of

[3] It should also be noted that some of the peeler blue crabs, a SC wild harvest product, reported in SC landings (e.g. Table 1) were probably used in the SC production of soft shell crabs as listed in Table 2.

Aquaculture indicates that total Mollusks sales from South Carolina farms were $2.505 million while all aquaculture sales were $4.773 million in 2005.

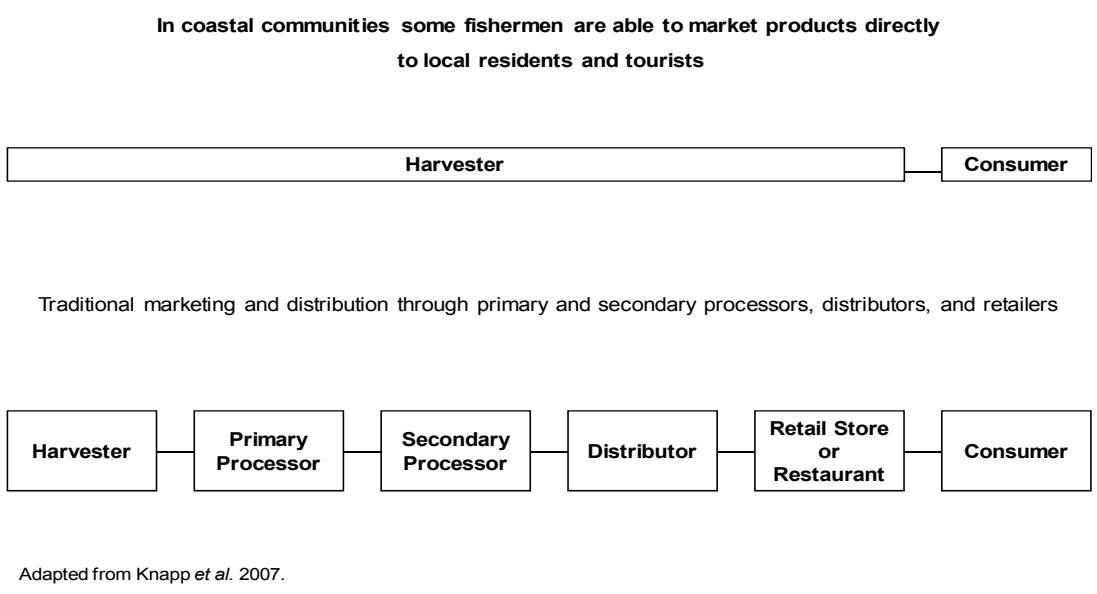
In sum, the total value of seafood landings at South Carolina dealers in 2007 was about $15.574 million while aquaculture operations in the state were estimated to produce about $11.250 million worth of seafood in 2007. Since about $2 million of farmed seafood is used for stocking or bait purposes, a reasonable estimate is that about $25 million in seafood products landed or farmed in South Carolina enters the market channels for distribution to state consumers or for sale out of state. We turn next to a discussion of marketing channels that distribute South Carolina seafood and imported seafood products to consumers in the state.

C. MARKETING CHANNELS – THE OLD AND THE NEW

Overview of Seafood Marketing Channels

Figure 2 provides a generalized generic diagram of traditional marketing channels for seafood products adapted from Knapp *et al*. 2007. The harvester sells directly to the consumer or to a "primary processor." In South Carolina, direct sales to consumers illustrated in the upper half of Figure 2 are most likely to be from commercial dealers that sell shrimp landed at their dock or from "peddlers" that sell shrimp landed in South Carolina from roadside stands.

Figure 2. Traditional Seafood Marketing Channels



Adapted from Knapp *et al.* 2007.

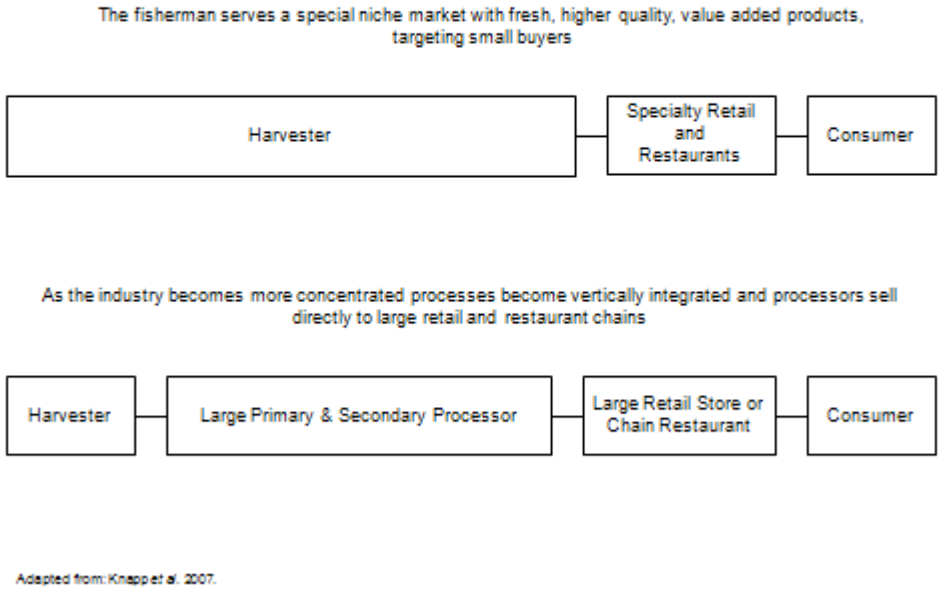
The lower half of Figure 2 can be simplified in some cases in SC where seafood dealers sell the catch they concentrate (assemble[4]) from harvesters directly to the primary processor (e.g. "Breaders" or out of state processors that may sort, head, peel and devein and freeze SC landings). For example, in 1972, Rhodes (1974) estimated that about 56% of SC shrimp landings were sold to Southeastern shrimp processors in Florida and other states with ~29% of SC landed shrimp being sold to primary wholesalers in the Mid-Atlantic or New England states. These processors sell to secondary wholesalers/distributors that store the frozen shrimp and sell to retail and restaurant outlets across the nation. Additionally, during the 1970's, most of the blue crabs caught by harvesters was sold to one of the three SC crab processors (Rhodes 1974) while much of the offshore finfish species (e.g. Black Sea Bass) landed in SC was shipped to wholesalers in the Mid-Atlantic states.

It is still common for SC shrimp dealers to "head" (remove the shrimp heads) shrimp (or pay more to harvesters for headed shrimp), sort shrimp by size groups, and sell fresh on ice or store in dockside freezers. In these cases, dealers skip processing (peeled and deveined, for example) and sell seafood directly to SC customers, including distributors, seafood retailers, etc. Some of these dealers also ship shrimp on ice to processors in Florida, Alabama and Mississippi to be headed, sorted, and frozen. The dealers may then pay to have the frozen shrimp packaged and transported back to their freezer for sale to local wholesale and retail outlets.

[4] Historically, SC shrimp dealers actually functioned as market assemblers, i.e. assembling and temporarily storing shrimp catches from individual vessels for shipping to out of state buyers. Like other types of market assemblers, these dealers often shipped these shrimp on consignment and only purchased a minor portion of the assembled catch for their own marketing purposes.

Figure 3 shows newer distribution channels for seafood as they have evolved over the past decades.

Figure 3. "New" Seafood Marketing Channels Featuring Vertical Integration and Value-Added Products



Adapted from: Knapp et al. 2007.

A South Carolina example of the "value added" product is wild caught local shrimp marketed under the Wild American Shrimp, Inc (WASI) certification program (See www. wildamericanshrimp.com). The WASI effort promotes both a quality premium like "Certified Angus Beef" and a buy local program like "Jersey Fresh" produce. In addition to the WASI marketing efforts, there are other local efforts (Peng, 2007, p. 7):

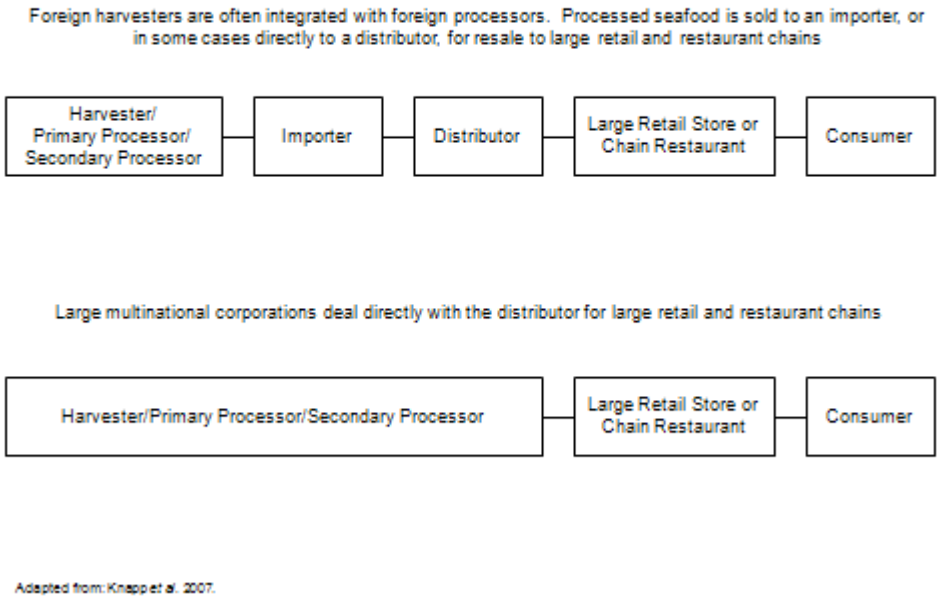
"According to one account, shrimpers in Port Royal Island, South Carolina, pursued a niche market approach. The main ideas were:

- Not to compete with the Gulf of Mexico or the Gulf of Tonkin (Vietnam) on price;
- Promote shrimp as a high-quality niche product sold fresh to restaurants;
- Retail or wholesale fresh rather than frozen;
- Encourage fishermen to keep tow times and fishing trips short with incentives;
- Pick up customers one at a time and find more niches;
- Not to sell shrimp to breaders or packers in Alabama or Louisiana, who pay lower prices than other outlets—shrimp processed for prepared food is indistinguishable from foreign imports and sometimes even mixed with them." From DeSantis, 2003 as cited in Peng.

Indeed, there continues to be some local processing of fresh shrimp landed in SC into headless, shell-on frozen product with local branding and marketing through traditional and internet channels. It is too early to judge the success or failure of these "niche" market efforts in sustaining the South Carolina shrimp fisheries. However, in the case of shrimp trawlers, the number of active shrimp trawlers has declined steadily over the past five years or so (See Section D).

Finally, Figure 4 illustrates the distribution channels for imported seafood products.

Figure 4. Seafood Marketing Channels for Imported Seafood



Adapted from: Knapp *et al.* 2007.

Walk into any chain grocery store in South Carolina and inspection of frozen (or recently thawed seafood) products by country of origin, and the surprise will be if U. S. (much less South Carolina) seafood products are available. Most of the seafood will be imported and most of that will be farm raised. Indeed if Wal-Mart or Costco is the retailer, the lower half of Figure 4 is most likely to represent the marketing channel. Still, the relative dominance of imported seafood products over domestic supply varies by species. We turn in the next section to a qualitative description of the marketing channels of seafood products relevant to the SC harvest.

Market Channel Panel Results: SC Seafood Marketing Channels for Major Species

In July 2007, a panel of six representatives of major seafood distributors and wholesalers currently (2007) active in South Carolina was held in Charleston. This day long workshop provided the industry insights needed to document current practices in moving seafood products from the harvester to the final consumer in South Carolina[5].

In the tables that follow, the marketing channels for each of the major seafood products were described by industry experts across six dimensions: Form, Size, Buyers, Suppliers Location, Suppliers Form and Product Origen:

Form: This is the physical form of the seafood product – the top three types were considered for each species.
Size: This is the physical size (packaging) of the seafood product as typically sold.
Buyers: These are the three major destination markets for the seafood products In SC
Suppliers' Location: This is the state/country where the supplier of the seafood to South Carolina customers is located**.**
Supplier Form: This is the type of supplier in the marketing channel of the seafood**.**
Product Origin (Country and/or US State): This is where the seafood itself is landed or farmed.

Across the columns in each of the marketing channel tables are the three most common variations of market channels for each species from the perspective of these seafood distributors.

Shrimp. In Table 3, Shrimp #1 (Domestic "Green" shrimp) have minimal processing (perhaps headed and frozen IQF or on ice). The Form of the shrimp is fresh with heads off (tails) or whole shrimp and the size varies from very small (100 count per pound) to very large (10 to 15 count per pound). These buyers then sell the shrimp to processors (these are out of state processors with the exception of one SC based processor) the local retail market, or to other distributors of seafood products. The suppliers of the fresh shrimp are located in the states of SC, NC, GA and FL. These primary suppliers are shrimp dealers or seafood wholesalers in these states that are selling domestic East Coast wild shrimp, or in the case of IQF (individually quick frozen) shrimp, the shrimp could have been caught in the Gulf of Mexico. Shrimp #1 in SC are wild caught shrimp landed in SC. These shrimp may or may not be headed and some are packed in ice for delivery to processing plants (See Section D). Local landings may be kept for local retail outlets – dockside (walk-up) sales, SC restaurants, various retailers and to *ad hoc* road side stands ("peddlers").

In contrast, the Shrimp #2 section of Table 3, reveals the source of shrimp that have been subject to processing beyond basic heading and sorting – peeled and deveined (P&D), etc. These shrimp are of various sizes and are bound for 'white table cloth" restaurants, as well as casual dining establishments and seafood retailers. For simple processing like shell-on tails or even (P&D) shrimp, suppliers are now in the processing states of the Gulf Coast, while the shrimp comes

[5] By design, the market panel session preceded the SC seafood supplier (dealer) survey described in Section D. Consequently, panel members were not aware of the survey's results.

from throughout the United States. Some of the lower priced forms (PUD) peeled and un-deveined, as well as larger shrimp bound for restaurants are imported from Indonesia, Thailand, Ecuador, and Mexico. Panelists noted that sales of breaded seafood products have apparently declined. This was attributed to: 1) white-table cloth chefs viewing selling pre-breaded product as an inferior product, and 2) fast food establishments and chain family restaurants frequently breading and package the product in-house.

Table 3. Shrimp #1 minimal processing			
	#1	#2	#3
Form	Fresh head off or on;	Fresh Bulk packed	IQF— (brine frozen on boat)
Size	100 ct. H/O 10-15 ct. H/O	Bulk packed—50lb to 700lb vats	50-60lb sacks
Buyers	Processor Retail Market Distributors	Wholesale / Processor	Processor
Suppliers' Location	SC, GA, FL, NC	SC, GA, FL, NC	SC, GA, FL, NC
Supplier Form	Shrimp Dealers	Shrimp Dealers	Wholesalers / Dealers
Product Origin (Country or State)	Domestic–East Coast	Domestic–East Coast	United States

Table 3. Shrimp #2 added processing			
	#1	#2	#3
Form	Shell on tails	P & D (shell off)	P & D (tail on) PUD (peeled undeveined) --Undeveined are cheaper
Size	U12 → 60-70	26→150	16→36
Buyers	White Table Cloths Casual (Family Style) Retailers (Specialty)	White Table Cloths Casual (Family Style & Fast Food) Retailers (Specialty)	White Table Cloths Casual (Family Style) Fast food primarily by PUD (cost)
Suppliers' Location	LA, AL, MS, TX	Gulf Coast (LA)	World wide
Supplier Type	Packer / Processor	Packer / Processor	Packer / Processor
Product Origin (Country or State)	Domestic–East Coast, West Coast, and Gulf Imports	Domestic–East Coast, West Coast, and Gulf Imports	Indonesia, Thailand, Ecuador, Mexico

Mollusks. Looking next at the marketing channels for Oysters in the shell in Table 4, both wild and farmed (cultured) oysters are purchased to supply retail and restaurant needs in SC. The panelists stated that the leading sources of Eastern Oysters in 2007 for South Carolina markets were dispersed among producers and wholesalers in LA, MS, AL, SC, NC. It is also common for Eastern Oysters harvested in the Gulf states to be shucked in NC with the shell being sold locally for paving and architectural purposes.

The second ranking source of supply was imported oysters from Canada as well as shipped from the Mid-Atlantic and New England states. According to the panelists, oysters provided by producers in the U.S. Pacific states (mainly Pacific Oysters) and Canada's Pacific maritime providence, British Columbia, also entered the oyster supply chain but only as a third choice by the panelists. For oyster (live) shell stock, specialty sales come from all over the country; specialty oysters are frequently farmed—Malpeque region of Nova Scotia was frequently mentioned. Sources of Clams and Mussels (Shell Stock) are described in Table 5. Fresh hard clam (Northern Quahog) sources include South Carolina, North Carolina and Mid-Atlantic state producers (wild and farmed) while most mussels, i.e. Blue Mussel, originate in Canadian Atlantic maritime providence of Prince Edward Island (PEI). A specialty half shell frozen product based on the farmed Green Mussel is imported from New Zealand. Processed mollusk meat products come from a wide range of suppliers across the U.S. and Canada as shown in Table 6. For clam shell stock, they were most often purchased in 100 count bags. Wild "little necks" were the most predominant form sold, followed by farm raised #4s and #3s. Mussels were usually vertically integrated in the industry where the wholesaler/distributor was usually also the harvester.

Table 4. Oysters (Shell Stock)			
	#1	#2	#3
Species	Eastern Oysters	NE Oysters	NW Oysters (eg. Washington)
Size	Bushels / Lbs. / Counts	Counts	Counts
Buyers	White Table Cloths Casual Caterers	White Table Cloths Casual Caterers	White Table Cloths Casual Caterers
Supplier Type	Harvesters / Wholesalers / Producers	Wholesale Producer / Broker / Secondary Wholesalers	Wholesale Producer / Broker / Secondary Wholesalers
Product Origin (Country or State)	LA, MS, AL, SC, NC Both wild and farmed	Canada (PEI, Nova Scotia) New Brunswick NY, MA, NJ, VA	AK, Canada (BC), WA, OR

Table 5. Clams & Mussels (Shell Stock)			
	#1	#2	#3
Species & Form	Clams—Fresh 100 ct. bags	Mussels (PEI-Blue Mussels) Fresh 10 lb. bag	Half-Shell – Meats Attached Frozen ½ Shell
Size	Wild #1 (littlenecks) Farmed #4 Farmed #3	18-24 ct.	Small and Large
Buyers	White Table Cloths Casual Retail (Specialized & Super Markets.)	White Table Cloths Casual	White Table Cloths Casual
Supplier Type	Harvesters Mariculturists / Growers Primary Wholesalers	Harvester Distributor / Processor	Importer
Product Origin (Country or State)	SC and NC	Canada (PEI)	New Zealand Greens

Table 6. Oysters / Clams / Mussels (Processed)			
	#1	#2	#3
Species	Oysters (gallons)	Clams (minced / sliced) --Surf / Ocean	Mussel meats (fresh) --Cultivated
Size (Grade)	Selects (25-30 ct.) Standard (over 30 ct.) Extra Selects (20-25 ct.)	Containerized (gallon / 4 lb. tub) 4-5 lb. boxes Canned	Gallons
Buyers	White Table Cloths Casual (Family Style)	White Table Cloths Casual (Family Style)	White Table Cloths Casual (Family Style)
Suppliers' Location	LA, MS, AL, NC	MA, RI, NJ, MD, NY	Canada, ME
Supplier Type	Wholesalers / Processors	Primary and Secondary Processors	Primary and Secondary Processors
Product Origin (Country or State)	East & Gulf Coast	NE States	Canada (PEI, Nova Scotia) Maine

Crabs. Turning next to Crabs, the market channels for processed products are summarized in Table 7. There are three major forms of crab: domestic live Blue Crabs, domestic processed using Blue Crabs, and imported processed crabmeat derived from Asian swimming crab species. Imported crabmeat products are the number one seller. Imported processed crab is primarily "pasteurized" picked meat. Second in sales are Snow Crab products that come from Alaska, Canada and Russia. Third in importance are domestically produced Blue Crab meat products. Blue crabs come from the Gulf and Mid-Atlantic states and processing is done in the Southeast (except for South Carolina). In the domestic processed category, Snow and King crab are predominant species. Domestic crab has fallen to 3rd in sales because 1) pasteurized product lasts longer and 2) cost. Domestic products have seen a slight increase in retail sales through niche marketing / "buy local" (domestic, not necessarily SC or regional product) programs.

Table 7. Crabs			
	#1	#2	#3
Species	Pasteurized, Imported --Portunid spp. / other spp. --Jumbo lump --Claw meat	Snow Crab / King Legs / Dungeness (frozen and cooked) --Legs --Clusters	Fresh, Domestic, Blue Crab (non-pasteurized) --Jumbo lump --Claw meat --Other
Size (Grade)	1 lb. packages	Snow (30-40 lb. box) (5-8 oz. cluster) (8-10 oz. cluster) Dungeness (20-25 lb. cases)	12 oz. and 1 lb. containers
Buyers	White Table Cloths (Jumbo and Claw) Casual (Claw)	Casual (Family Style) White Table Cloths (King) Retail (Walk-in)	White Table Cloths Casual (Family Style) Retail (Walk-in) Local niche marketing
Suppliers' Location		AK and Canada Russia (King)	LA, AL, VA, MD, NC, FL
Supplier Type	Harvesters / Processors	Processors Brokers Wholesalers	Processors Primary Wholesalers
Product Origin (Country or State)	Indonesia, Thailand, India (Portunid) Vietnam, China (Other spp)	AK and Canada (Snow) Russia, Canada, AK (King) Chile AK (Dungeness)	Gulf and Mid-Atlantic

The live blue crab market channel is summarized in Table 8. Hard Blue Crab was the number one selling product. Industry experts noted that companies often did special orders only as the product is difficult to buy and sell due to perishability. Indeed, some companies bought and sold mostly cooked and ready to eat. South Carolina hard and soft shell blue crab products are important to the supply, but much of the live Blue Crab harvest is sold to buyers in the Mid-Atlantic States (See Section D).

Table 8. Live Crabs		
	#1	#2
Species & Form	Blue Crab (Hard) --live and cooked --bushel (50 lb gross) or dozen (for retail)	Blue Crab (Soft) --90% live (not frozen) --3 dozen per tray --9 dozen per cage
Size (Grade)	#1 (Large male crabs) #2 #3	Whales Jumbos Primes Hotels
Buyers	Casual (Family Style) Retail --both live & cooked	White Table Cloths Retail Casual (Family Style)
Suppliers' Location	SC	East Coast (SC, NC, VA) – supply moves south to north
Supplier Type	Harvesters Primary Wholesaler	Harvesters / Processors
Product Origin (Country or State)	East / Gulf Coast SC (Mt. Pleasant and Georgetown)	East Coast LA

Finfish. A wide variety of finfish is landed in South Carolina as shown in Table 1. The marketing channels for the biggest sellers of finfish are summarized in Table 9 (Fresh) and in Table 10 (Frozen). According to the panelists, the four leading species in for the fresh fish market segment in SC are not available (e.g. Atlantic salmon) or not commonly sourced in SC: Atlantic salmon, Tilapia, Yellowfin tuna, and Grouper. The number one seller, Atlantic salmon, mainly comes from Canada and Chile while the number two seller, Tilapia, is primarily from farms in Latin America, mainly Ecuador and Costa Rica. Similarly, Yellowfin tuna is mostly imported with the exception of some supply from Gulf States. For both Atlantic salmon and Tilapia, the imported supply comes from integrated farms, processors, and exporters. Grouper is a bit different with South Carolina as an important source of the finfish along with imports. However, processing and brokering Grouper may be centered in Florida and New Jersey. For headed and gutted product (H&G), the following species rank highest in area sales:

* Fresh sales:	1) salmon & grouper	2) tilapia	3) tuna
* Frozen sales:	1) flounder (very little domestic product)	2) whiting	3) catfish

Finally, Table 10 lists the leading market channels for frozen finfish. Imported flounder and whiting are the two leading products with domestic (Mississippi and North Carolina) catfish competing with imported catfish from China in the number three spot.

Table 9. Finfish (Fresh)				
	#1	#2	#3	(Grand Strand Area)
Species	Atlantic Salmon (Farmed) --Fresh --Fillet	Tilapia (Farmed) --Fresh --Filet	Tuna (Yellowfin) --Fresh --Loins	Grouper --Fresh --Skinless / Bone-out fillet --Gag, Scamp, Black
Size (Grade)	2-3 and 3-4 lb. Processed to order 10 or 35 lb.	5-7 and 7-9 oz. 10 lb. styro	40-60 and 60-90 lb. (Loins) (H&G) --70% yield, 28-42 lb.	Personal portion (Restaurant) Whole fillet (Retail) Suppliers ship in 10-20 lb. &/or 8-10 piece box
Buyers	White Table Cloths Casual (Family Style)	Retail (Super Markets) = #1 buyer White Table Cloths Casual (Family Style)	Food Service = #1 buyer White Table Cloths Casual (Family Style	Retail and Restaurants
Suppliers' Location	Chile, Canada	Costa Rica and Ecuador	Domestic (LA and TX) Trinidad, Brazil, Venezuela, Oman, Costa Rica, Ecuador, Canada (in spring)	Miami / FL, NJ
Supplier Type	Grower (also primary importer) -- vertically integrated product	Grower (also primary importer) -- vertically integrated product	Primary and Secondary Processors	Importer / Broker
Product Origin (Country or State)	Chile and Canada	Same as Suppliers' Location	Same as Suppliers' Location	Local (SC) when available Gulf Mexico, Pacific Panama and Ecuador

Table 10. Finfish (Frozen)			
	#1	#2	#3
Species & Form	Flounder (skin on / skin off)	Whiting (skin on / skin off)	Catfish --Fillet (skinless) --H&G
Size	3-5, 5-8, 8+ ounces	4-6, 6-8 oz. 40 lb.	2-3, 3-5 oz. 15 lb. IQF
Buyers	White Table Cloths Casual (Family and Fast Food) Cafeterias	Casual (Fast Food) Cafeterias NOT a major item for fine dining	Casual (Fast Food) Cafeterias Casual (Family) NOT a major item for fine dining
Supplier Type	Importers / Brokers	Importers / Brokers	Processors Importers Brokers
Product Origin (Country or State)	Argentina Iceland	Harvested in Chile but company based in U.S.	MS, NC China (formerly)

Summary. The market channel panelists described the sources and product types of seafood that move through marketing channels to consumers in South Carolina and the region. These descriptions are summarized in Tables 3 through 10. They illustrate the diverse nature of suppliers and the geography of moving seafood from the harvester to the consumer. They also show the international linkages that are in play in the industry. Moreover, the expert seafood panel provided qualitative verification of the dependency of the entire market channel on sourcing foreign produced seafood species as well as species not normally produced in South Carolina such as Atlantic salmon and Blue Mussels.

Next, we focus on SC seafood dealers, the first tier distributors of various seafood products that are landed in South Carolina. The objective is to gauge where the SC landings enter the marketing channels –sales to local consumers, exports, or sales to processors and distributors in other states.

D. SOUTH CAROLINA SEAFOOD DEALERS AND THE DISTRIBUTION OF SEAFOOD

As noted in the previous section, much of the seafood consumed in SC is imported from nearby states as well as from international sources. However, about $15.6 million worth of seafood was landed in South Carolina in 2007. In this section, we report the results from a survey of all major dealers in seafood that are located in South Carolina. The objective is to describe and quantify where these dealers obtain the seafood they sell and where they sell their seafood holdings.

Methods. In South Carolina Fiscal Year 2007 (i.e. licenses sold from July 1, 2006 through June 30, 2007), 232 seafood dealer licenses were sold by the SCDNR (Personal communication, K. McLawhorn, Marine Resources Division, SCDNR). Estimating the market outlet of major seafood species landed in South Carolina was based upon surveying the entire population of licensed SC seafood dealers regarding the quantities of major seafood species they directly purchased from SC commercial harvesters and estimating the approximate percent of these landings sold through different market outlets during 2007. A self-administered "paper-pencil" questionnaire was designed and pretested in the Fall of 2007. The approach used in this questionnaire (See Appendix) was to determine the quantity (Question 6) of each major seafood species normally landed in SC that a given dealer purchased from various sources (Question 7) including wholesalers and processors as well as direct purchases from SC harvesters. In addition to asking the dealers to approximate the quantities purchased and/or shipped, each dealer was asked to estimate the approximate percent of their purchases sold to various buyer types (Question 8) such as other wholesalers, restaurants and retailers. Consequently, responses from dealers were expected to include those that do not normally purchase seafood products landed in South Carolina.

Starting during the first two weeks of January, 2008, the supplier questionnaires were mailed to 228 seafood dealers licensed during FY07-08. In addition, major seafood dealers, i.e. dealers that have historically purchased substantial quantities (e.g., more than ~100,000 pounds of shrimp) from SC harvesters were contacted by phone. Those dealers that were contacted were briefed on the purpose of the survey, encouraged to respond, and in some cases, the dealer forwarded their responds via e-mail attachments.

Results. A total of 44 usable SC dealer (supplier) questionnaires were collected via the mail and follow- up phone calls for an overall response rate of 19% (44/228). The dealer response rate was low; however, those responding collectively represented about 68% of the major seafood species groups targeted in this study, i.e. Blue Crabs, Hard Clams, Eastern Oysters, wild-caught marine shrimp and offshore finfish species (e.g. snapper-group, complex species, etc.).

For responding SC seafood dealers that purchased major seafood species from SC harvesters during 2007, their responses indicate that these dealers "sourced" over 90% of their oysters and hard blue crabs by purchasing these species directly from SC harvesters (Table 11).

Table 11. Estimated major sources of seafood groups purchased and/or shipped by SC seafood dealers during 2007. NOTE: These percentages are based upon responding seafood dealers that directly purchased one or more of the listed species from SC harvesters during 2007.

SEAFOOD GROUPS	Harvesters Unloading in SC	Other Sources[1]
Hard Blue Crabs	98%	2%
Hard Clams[2]	59.7%	40%
Eastern Oysters	91.1%	9%
Shrimp[3]	33.4%	67%
"Offshore" Finfish[4]	74.8%	25%
Average:	71%	29%

[1]Includes species purchased from processors, US wholesalers and importers.
[2]A.K.A. Northern Quahog Clams
[3]Includes purchases of imported shrimp and/or domestic shrimp landed in other states.
[4]Excluding fish species such as American shad, king whiting and spot.

In contrast, it appears that SC seafood dealers only obtain or directly "source" about 33% of their shrimp from harvesters landing shrimp in South Carolina (Table 11). SC harvesters provided about 60% and 75% of the hard clams and offshore finfish, respectively, of SC seafood dealer sources during 2007 (Table 11).

The apparent dependency of SC seafood dealers on purchasing from non-South Carolina shrimp sources is consistent with pre-test observations as well as the focus group results. Specifically, some SC seafood dealers, like others market channel members (e.g. seafood distributors, super market chains, etc.), have become more dependent on purchasing imported shrimp for their customers for several reasons including:

- Decreasing quantities of shrimp available for purchase from SC harvesters;
- The seasonal nature of SC commercial shrimp harvest;
- The cost of processing and storing SC harvested shrimp for "offseason" sales especially relative to low wholesale prices of imported shrimp.

The overall declining availability of SC harvested shrimp is consistent with a general decline in the SC trawler fleet during the current decade. The number of commercial shrimp trawler

licenses (resident and non-resident) purchased from the SCDNR between 2000 and 2006[6] fell from 687 to 369 licenses, a 46% decrease. This reduction in licenses is symptomatic of several factors: adverse U.S. shrimp market conditions, limited in-state processing facilities, and difficulties securing docking space due to conversion of working waterfronts to more profitable non-commercial fisheries-oriented uses. (Rhodes, *et al.* 2008).

The major dependency of SC seafood dealers on sourcing of blue crabs from SC harvesters is consistent with the perishability of live blue crabs and the general stability of the SC harvest sector. SC seafood dealers sourcing of SC oyster and hard clams is partially symptomatic of some dealers also being major shellfish leaseholders. In contrast, the focus group and other industry interviews indicate that wholesalers, SC restaurants as well as seafood distributors often purchase oysters harvested in other states and Canada.

Given that the responding SC seafood dealers represented a substantial percentage of the major seafood species groups, 2007 SC annual commercial fisheries landings (see Table 11) were used to estimate the total pounds associated with major buyers types purchasing major species during 2007 (Table 12). The percents estimated in Table 12 are based upon aggregating the estimated quantities for each species group that a given dealer directly purchased from SC harvesters.

The extrapolation of survey results (Table 12) indicated that much of the blue crab (79%) and offshore finfish species (75%) landed in SC, respectively, are directly exported to wholesalers and/or processors to out of state buyers. Factors contributing to this exporting probably include the proximity of SC to robust wholesale market demand generally north of SC and the lack of shore-side processing facilities (e.g. crab processors) to mitigate the perishability of these species. Interviews of dealers revealed that there is a season demand for live crabs by wholesale buyers in other states (e.g. North Carolina, Maryland and Virginia). The exporting of offshore finfish species landed in SC is also partially related to the proximity of SC harvesters compared to Florida and Gulf of Mexico producers as well as the historical market ties of the remaining SC snapper-group fleet to wholesale buyers in other Atlantic coastal states and major Canadian cities (e.g. Toronto).

[6] The 2001 and 2006 license data are actually based on SCDNR license sales during S.C. Fiscal Years 2002 (e.g. July 1, 2001 to June 30, 2002) and S.C.FY 2007, respectively, but it is assumed that many of the S.C. trawler licenses are usually sold during the first six months of a Fiscal Year.

Table 12. Estimated quantities[1] of major seafood groups purchased by major buyer types and landed in South Carolina during 2007.

	Purchases by In-State Buyers:				Out of State	All
BUYER TYPES/SEAFOOD GROUPS	Consumers (Direct Purchase)	SC Retailers[1]	Foodservice	Wholesalers & Processors	Wholesalers & Processors	**Totals**
SHELLFISH:						
Hard Blue Crabs						
Percent	10.3%	0.8%	1.0%	8.5%	79.4%	100.0%
Quantities	418,707	33,325	40,073	347,037	3,232,194	4,071,336
Hard Clams[2]						
Percent	20%	36%	10%	21%	13%	100%
Quantities	27,431	47,864	13,070	27,789	17,860	134,014
Eastern Oysters						
Percent	48%	13%	4%	34%	1%	100%
Quantities	133,891	36,262	10,947	93,722	2,930	277,752
Wild Shrimp						
Percent	35%	15%	6%	26%	18%	100%
Quantities	915,746	404,779	152,068	679,868	471,312	2,623,773
"Offshore" Finfish[3]						
Percent	2%	1%	7%	15%	75%	100%
Quantities	36,814	11,415	105,092	226,885	1,151,174	1,531,380
All of the Above:						
Percent	18%	6%	4%	16%	56%	100%
Quantities	1,532,590	533,644	321,249	1,375,302	4,875,470	8,638,255

Footnotes:

[1] SC landings are shown in round weight, except mollusks which are in estimated meat weight.

[2] Includes specialty seafood retailers and super markets.

[3] A.K.A. Northern Quahog Clams

[4] Excluding fish species such as American shad, king whiting and spot.

In contrast to Blue Crabs and offshore finfish, apparently less than 20% of the Hard Clams and shrimp are directly exported to buyers (Table 12). The percentage, 18%, of SC shrimp landings directly exported by SC seafood dealers probably reflects a major shift of marketing by SC shrimp dealers and due to the major impacts of expanding imported shrimp supplies on the US market for more than 30 years. Rhodes (1974) estimated that in 1971 approximately 85% (~5.1 million pounds) of the SC shrimp landings were exported to processors and wholesalers in other states. This apparent shift way from exporting SC shrimp landings by SC seafood dealers is probably related to several interacting supply-demand factors in recent years including the decline in the SC trawler fleet as previously discussed, the expanding in-state demand (wholesale and direct sales to consumers) for shrimp due to income and population growth and perhaps dealer efforts to expand in-state market sales because of the relatively low prices offered by US processors.

Alternatively, SC dealers still continue to ship some shrimp on ice to out-of state establishments, ~18% in 2007 (See Table 12). In-state processing of shrimp in 2007 was limited to heading with some sorting, freezing and storage. Additionally, shrimp sold by SC dealer to instate wholesaler type buyers, about 26% (Table 12) in 2007 may be shipped by these buyers to wholesalers and/or processors to other states.

Although the quantities of SC landed shrimp sold to outstate processors/wholesalers has declined substantially in recent decades, it remains evident that significant quantities of shrimp landed in SC are shipped out of state while major quantities of processed domestic shrimp and imported shrimp are shipped into SC for use by final consumers in retail outlets and restaurants in South Carolina. This cross-hauling of shrimp may seem inefficient. However, with the exception of a single first stage processer (heading, sorting, and freezing) in South Carolina, all frozen shrimp products are processed out of state because low marketing margins require processors to increase volume (scale) and to operate year round with a combination of domestic shrimp and imports. In addition, panelists felt that shrimp sizes and the relatively small seasonal quantities of shrimp landed in South Carolina as well as related processing/storage costs are major constraints to SC dealers selling more SC caught shrimp to instate distributors, retailers and restaurants.

Finally, survey results indicated a small quantity of SC harvested oysters was exported to other states during 2007. This result appears consistent with the lack of demand for SC "cluster" oysters in other states. Also, a major SC seafood dealer and leaseholder reported that North Carolina's current regulation requiring harvested oysters to have a shell length of no less than 3.0 inches[7] has prevented him from shipping SC oysters to North Carolina wholesale buyers.

In summary, it is readily apparent that the historical market channel structure for SC landed shrimp and hard blue crabs compared to the 1970's (see Laurent *et al*. 1975; Rhodes 1974) has shifted away from seafood processors being the first-level major buyer of SC harvested product. For shrimp harvester (trawler owners)/seafood dealers, this shift was probably accelerated by the

[7] In North Carolina, the size limit for oysters is set by proclamation but can be no less than a shell length of 2.5 inches. Oysters less than the legal size limit, dead shell, and any oyster cultch material must be culled from the catch where the harvest took place. A 10 percent tolerance limit by volume is allowed. Oysters imported for shucking purposes are exempt from this rule.

substantial decline in SC ex-vessel shrimp prices since 2001 as well as long-term reduction in shore-side infrastructure (Rhodes et al. 2008). For crab harvesters, it appears that more hard blue crabs than ever are being shipped to out of state wholesalers including the remaining domestic blue crab processors. This shift is consistent with the exit of the SC domestic blue crab processing sector during previous decades, an exit usually attributed to the expanded supply of imported swimming crab crabmeat products. Alternatively, the dominant market outlet for offshore finfish species (e.g. snapper-grouper species) landed in South Carolina has generally remained out of state wholesalers. While recognizing the efforts of these SC finfish harvesters to profitably tap instate markets, out of state demand for US caught finfish currently remains robust enough to at least offset the short-term harvesting costs, including those impacted by fishery regulatory actions and pricing of imported species.

Determining major market changes related to the hard clam production in recent decades is problematic because there are apparently no major benchmark studies for comparison purposes. The substantial expansion of SC mariculture clams is generally a positive development regardless of the major buyers although culture clam producers are still impacted by supply induced price fluctuation from both wild and farmed clam harvesting. Although the harvest of oysters has fluctuated after the closure of the last SC oyster cannery in 1986 (Burrell 2003), various instate buyers remain the major outlet for SC oysters, especially given the inferior product image of SC so-called "cluster" oysters.

In the next section of the report, we turn to the questions of the total potential demand for seafood products in South Carolina and the level of direct economic activity associated with the seafood industry in the state.

III. DEMAND FOR SEAFOOD IN SOUTH CAROLINA

In this section, estimates are presented of total seafood consumption and estimates of the potential shares of South Carolina landings to meet SC consumer demand. Consumers include both residents of South Carolina and tourists. We estimate that imported seafood (from other states and the rest of the World) provides at least 80% of the fresh and frozen seafood demanded by consumers in South Carolina.

Taking stock of the total consumer demand in South Carolina for seafood requires several layers of analysis. At the state level, recent activity in economic sectors (at the 5 digit NAICS[8] level) that are directly involved in harvesting, processing, wholesaling and retailing seafood is summarized in Table 13.

[8] The North American Industry Classification System (NAICS) is a six-digit industry classification system that groups establishments based on the production activities in which they are primarily engaged. NAICS covers all economic activities in the United States, goods producing and service providing. The system is composed of 20 sectors and 1,175 industries.

TABLE 13. SALES OF SEAFOOD RELATED SECTORS IN SOUTH CAROLINA ($ THOUSANDS)

Region Name	NAICS	Industry Name	2007 Margins	Gross Sales	Seafood share*
State of South Carolina	**11411**	**Fishing**		**$33,038.777**	**$33,038.777**
State of South Carolina	31171	Seafood Product Preparation and Packaging		$10,404.209	$10,404.209
State of South Carolina	**42246**	**Fish and Seafood Wholesalers**	**$38,473.936**	**$139,905.22**	**$139,905.22**
State of South Carolina	44511	Supermarkets and Other Grocery (exc	$3,007,356.959	$10,935,843.49	$390,409.61
State of South Carolina	44512	Convenience Stores	$131,924.923	$479,726.99	$17,126.25
State of South Carolina	44522	Fish and Seafood Markets	$12,165.386	$44,237.77	$1,579.29
		SUB TOTAL RETAIL FOOD/BEVERAGE SALES:		**$11,459,808.251**	**$409,115.15**
State of South Carolina	**72211**	**Full-Service Restaurants**		**$2,767,977.090**	**$228,358.11**
State of South Carolina	72221	Limited-Service Eating Places		$2,236,273.305	**$184,492.55**
State of South Carolina	**72231**	**Food Service Contractors**		**$225,579.069**	**$18,610.27**
State of South Carolina	72232	Caterers		$47,115.349	**$3,887.02**
State of South Carolina	**72233**	**Mobile Food Services**		**$7,549.528**	**$622.84**
		SUB TOTAL AWAY FOOD SALES:		**$5,284,494.343**	**$435,970.78**
		TOTAL RETAIL AND RESTAURANT		**$16,744,302.593**	**$845,085.938**

NOTES: WHOLESALE AND RETAIL SECTORS ARE MARGINS (.275 OF GROSS SALES)
SOURCE: REDYN 2008

Seafood share at retail is from the Consumer Expenditure Survey(CES) BLS, U.S. Dept. of Labor, 2006 Food at home is $3417 per conumer unit and Seafood at home is $122 per consumer unit per year or 3.57% of total.

Seafood share at restuarants is .0825; assumes cost of seafood is .33 of plate cost and .25 of all meals served are seafood based.

These total sales estimates by sector are in thousands of dollars. The Fishing Industry (NAICS 11411) is estimated to have sales of about $33 million in 2007 which is close to the estimated value of landings plus aquaculture production. Processing of seafood (NAICS 31171) in SC generated sales of about $10 million according to Regional Economic Dynamics (REDYN). Wholesale margins (NAICS 42246) that reflect the value added by dealers in South Carolina are estimated to be $38 million. At the retail level, Fish and Seafood markets (NAICS 44522) add about $12 million in margin activity.

The remaining sectors listed in Table 13 also sell seafood products – but only as a component of their larger set of products and services. Supermarkets (NAICS 44511) and Convenience stores (NAICS 44512) report margin activities of $3 billion and $131 million, respectively. Note that

like wholesaling these values do not represent total gross sales, but only the trade margins at retail stores.

To convert margin sales to gross sales, IMPLAN[9] margins of .275 of gross sales at food and beverage stores are used. We estimate that gross sales of food and beverage retailers in SC were about $11.5 billion in 2007 with seafood accounting for about $409 million.

Full Service Restaurants (NAICS 72211) with sales of $2.768 billion and Limited Service Eating Places (NAICS 72221) with sales of $2.236 billion do reflect gross sales to consumers in 2007. Gross sales of other food based service sectors include: Food Service Contractors (NAICS 72231) with sales of $226 million, Caterers (NAICS 72232) with sales of $47 million and finally Mobile Food Services (NAICS 72233) with sales of $7.5 million. From the total gross sales of $5.3 billion in these food service sectors, we estimate that the seafood components alone of these meals accounted for approximately $436 million of seafood products.

Per capita estimates of demand for seafood in South Carolina. An alternative method to estimate total seafood demand in South Carolina is to focus on consumption of seafood in physical rather than dollar amounts. Per capita consumption trends of seafood in the U.S are displayed in Table 14 (provided by David Harvey, Economic Research Service, USDA). U.S. per capita consumption of fish and shellfish was 16.5 pounds (edible meat) in 2006. Per capita consumption of fresh and frozen products was 12.3 pounds. Fresh and frozen finfish accounted for 6.5 pounds while fresh and frozen shellfish consumption was 5.8 pounds per capita.

Table 14. **Fishery products (edible weight): Total and per capita availability[1]**

Year	U.S.	Fresh and frozen						Canned		Cured		Total	
		Fish		Shellfish		Total							
		Total	Per cap	Total	Per cap	Total	Per cap	Total	Per cap	Total	Per cap	Total	Per cap
	Population	Million		Million		Million		Million		Million		Million	
	Millions	pounds	Pounds	pounds	Pounds	pounds	Pounds	pounds	Pounds	pounds	Pounds	pounds	Pounds
2000	***282.407***	1,589	5.6	1,287	4.6	***2,876***	***10.2***	***1,333***	***4.7***	***82***	***0.3***	***4,291***	***15.2***
2001	***285.339***	1,617	5.7	1,304	4.6	***2,921***	***10.2***	***1,191***	***4.2***	***85***	***0.3***	***4,197***	***14.7***
2002	***288.189***	1,725	6.0	1,438	5.0	***3,165***	***11.0***	***1,250***	***4.3***	***85***	***0.3***	***4,500***	***15.6***
2003	***290.941***	1,650	5.7	1,651	5.7	***3,301***	***11.3***	***1,361***	***4.7***	***87***	***0.3***	***4,749***	***16.3***
2004	***293.609***	1,608	5.5	1,842	6.3	***3,450***	***11.8***	***1,316***	***4.5***	***88***	***0.3***	***4,854***	***16.5***
2005	***296.329***	1,801	6.1	1,625	5.5	***3,426***	***11.6***	***1,270***	***4.3***	***88***	***0.3***	***4,784***	***16.1***
2006	***299.157***	1,938	6.5	1,740	5.8	***3,678***	***12.3***	***1,163***	***3.9***	***97***	***0.3***	***4,938***	***16.5***

Numbers in italics are linked.

NA = Not available. -- = Less than 0.05 pound.

[1]The

Source: U.S. Department of Commerce/National Marine Fisheries Service. ERS computed per capita figures. Data updated as of March 15, 2008.

[9] IMPLAN is the Impact Model for Planning. It is an inter-industry model used to estimate the contributions of each industry to the state's economy. See www.implan.com.

Table 15 shows the estimated population for each region of South Carolina and the implied total seafood consumption using the NMFS per capita estimates in Table 14.

Table 15. South Carolina Seafood Consumption by Residents of SC

				Consumpton (pounds)				
				Fresh and Frozen			Canned	Grand
		Population		Fish	Shellfish	Total	and Cured	Total
		2006	Per capita:	6.5	5.8	12.3	4.2	16.5
South Carolina	**Total**	4,330,108		28,145,702	25,114,626	53,260,328	18,186,454	71,446,782
SC Coast		1,177,490		7,653,685	6,829,442	14,483,127	4,945,458	19,428,585
SC Midlands		1,502,849		9,768,519	8,716,524	18,485,043	6,311,966	24,797,009
SC Upstate		1,649,769		10,723,499	9,568,660	20,292,159	6,929,030	27,221,189

Sources; REIS for population and NMFS/ERS for Per Capita Consumption (see Table 14).
Note: county details for each region are in the Appendix.

Fresh and Frozen fish and shellfish consumption by SC residents alone is about 53 million pounds of edible meat. Comparing this demand estimate with landings of 9.1 million pounds of all species in SC as shown in Table 1 is one indication of the key role that imports play in providing fresh and frozen seafood to SC residents. Of course, this is a crude comparison as it ignores the demand for fresh and frozen seafood by visitors and tourists to South Carolina. On the supply side, the contributions of aquaculture products in SC could be added, but most of these products are mollusks with a low edible meat to total weight ratio. Accordingly, it is unlikely that aquaculture adds more than a few million pounds of edible meat to the seafood supply. Even ignoring tourist demand for seafood, it seems that SC has the potential to supply only about 21% (11 million pounds SC supply/53 million pounds SC resident demand) of SC resident demand for fresh and frozen seafood products.

No data exist that document consumption of seafood by tourists/visitors to South Carolina. Of course, their spending is reflected in retail and restaurant sales of seafood along with spending by SC residents – a topic discussed in the prior section. However, there is some sample survey data collected (see McElroy, *et al*, 2007) that document the propensities of tourists for different species of seafood during their time in SC. The data in Table 16 (provided by Laurie Jodice, Dept. of Parks, Recreation and Tourism Management, Clemson University) that nearly all coastal tourists in 2004 ate seafood. The top five species were shrimp, crab, flounder, salmon and scallops, followed by lobster, canned tuna, grouper, oysters and snapper. It is likely that shrimp, crab, flounder, grouper, oysters and snapper were, at least in part, supplied by local landings.

With approximately 12 million trips to SC in 2007 (PRT 2008) by tourists and visitors, the non-resident demand for seafood is substantial. Since about one-third of visits are from in-state residents, the non-resident visits would be 8 million. The data in Table16 indicate most tourists (at least in coastal counties) eat seafood. With a pragmatic assumption of 8 oz of fresh and frozen seafood per visit, a non-resident demand for seafood is approximately 4 million pounds of edible meat. Added to the domestic estimate of 53 million pounds suggests that total annual consumption of fresh and frozen seafood was about 57 million pounds of edible meat in 2006.

Table 16. 2004 South Carolina Coastal Tourism Survey						
	Coastal Tourist Survey		Beaufort Festival Survey		Both combined	
Do you eat seafood?	n	% (n=357)	n	% (n=238)	n	% (n=595)
no	22	6.2	0	.0	22	3.7
yes	335	93.8	238	100.0	573	96.3
Total	357		238		595	
Type of seafood you eat	n	% (n=335)	n	% (n=238)	Total	% (n=595)
shrimp	317	94.6	233	97.9	550	92.4
crab	271	80.9	205	86.1	476	80.0
flounder	258	77.0	189	79.4	447	75.1
salmon	244	72.8	190	79.8	434	72.9
scallops	232	69.3	187	78.6	419	70.4
lobster	223	66.6	178	74.8	401	67.4
tuna (canned)	192	57.3	152	63.9	344	57.8
grouper	173	51.6	168	70.6	341	57.3
oysters	183	54.6	158	66.4	341	57.3
mahi mahi	185	55.2	155	65.1	340	57.1
snapper	177	52.8	152	63.9	329	55.3
tuna(filet)	178	53.1	149	62.6	327	55.0
clams	165	49.3	150	63.0	315	52.9
trout	161	48.1	148	62.2	309	51.9
catfish	162	48.4	134	56.3	296	49.7
halibut	128	38.2	127	53.4	255	42.9
fish and chips	150	44.8	105	44.1	255	42.9
sea bass	122	36.4	132	55.5	254	42.7
calamari	121	36.1	127	53.4	248	41.7
orange roughy	128	38.2	106	44.5	234	39.3
swordfish	119	35.5	113	47.5	232	39.0
mussels	106	31.6	97	40.8	203	34.1
crawfish	76	22.7	85	35.7	161	27.1
fish sticks	77	23.0	55	23.1	132	22.2
shark	44	13.1	60	25.2	104	17.5
bluefish	35	10.4	50	21.0	85	14.3
monkfish	41	12.2	44	18.5	85	14.3
snails	41	12.2	39	16.4	80	13.4
other (cod, octopus, redrum, clams, langostinos, snow crab,	21	6.3	34	14.3	55	9.2

Source: McElroy et al. (2007)

Where do South Carolina retailers and restaurants purchase seafood? To address this question, a self-administered (mail) "paper-pencil" questionnaire was sent to a sample of some 1,000 randomly selected restaurants and food retailers in south Carolina in early January, 2008 (see the Appendix for the questionnaire). Follow up letters were sent in early February, 2008 along with phone call backs to a subsample and selected site visits. Despite these efforts, response was poor with usable returns of only 25 Restaurants and 5 grocery stores for a return rate of usable surveys of approximately 3%. Needless to say, this poor response makes generalizations about the restaurant and retail sectors difficult. Reported below in Tables 17 and 18 are summaries of the responses received. These estimates should be viewed as case study results – not generalizations to the population. They are suggestive of the origin of seafood purchases; however, estimates of the flow of seafood products from landings to marketing channels is best gleaned from surveys of SC seafood dealers in section II.

The estimates in Table 17 show the sources of seafood purchased by this set of SC restaurants.

Table 17. Seafood Purchases by Selected SC Restaurants

	SHARES FROM EACH TYPE OF SUPPLIER:							
Restaurants (n=24)	Shrimp, Fresh	Shrimp, Frozen	Crab Meats	Raw Oysters	Oyster Meats	Clam Meats	Finfish, Fresh	Finfish, Frozen
SC Harvested, Purchased Directly from Dock/Dealer	48.3%	3.8%	0.0%	12.0%	0.0%	0.0%	1.3%	0.0%
Parent Company, Warehouse SC	0.0%	22.5%	37.5%	28.0%	57.1%	75.0%	43.4%	34.8%
Parent Company, Warehouse NOT SC	1.7%	11.5%	4.4%	0.0%	0.0%	0.0%	2.6%	10.9%
SC Distributor--SC Product	16.7%	17.3%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%
SC Distributor--Imported Product	16.7%	30.0%	58.1%	60.0%	14.3%	0.0%	52.6%	43.5%
Out of State U.S. Dealer	16.7%	5.0%	0.0%	0.0%	14.3%	25.0%	0.0%	10.9%
Direct from SC Processor	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Direct, Out of State Processor	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Direct, Foreign Importer/Processor	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

As expected, fresh shrimp purchases are mostly (48%) from local dealers/dealers with SC based distributors. Other distributors of SC landings and imports comprised about 17% each of supplies to restaurants. The remaining 17% of fresh shrimp supplies came from dealers in other states. In contrast to fresh shrimp, most other species (and frozen shrimp) were purchased (or delivered from parent company warehouses either located in SC or outside the state. However, SC based distributors using imported products (from other states or international sources) accounted for the plurality of frozen shrimp, crab meats, raw oysters, and frozen finfish. These case study results indicate a key role of imports in providing SC restaurants with seafood, as suggested in the results from Tables 14 and 15.

Table 18. Seafood Purchases by SC Grocery Stores

	SHARES FROM EACH TYPE OF SUPPLIER:							
GROCERY (n=6)	Shrimp, Fresh	Shrimp, Frozen	Crab Meats	Raw Oysters	Oyster Meats	Clam Meats	Finfish, Fresh	Finfish, Frozen
SC Harvested, Purchased Directly from Dock/Dealer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Parent Company, Warehouse SC	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%
Parent Company, Warehouse NOT SC	0.0%	40.0%	100.0%	0.0%	0.0%	0.0%	0.0%	33.3%
SC Distributor--SC Product	0.0%	20.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
SC Distributor--Imported Product	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Out of State U.S. Dealer	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%
Direct from SC Processor	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Direct, Out of State Processor	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Direct, Foreign Importer/Processor	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	0.0%	100.0%	100.0%	0.0%	100.0%	0.0%	0.0%	100.0%

Turning next to the grocery store returns for the case study sample, Table 18 indicates that this set of grocery stores did not purchase fresh shrimp but rather frozen shrimp with 40% of the frozen purchases from the parent company warehouses located outside the state. However, 20% of the grocer purchases were SC landings from SC distributors and 20% of grocer purchases were imported product supplied by SC distributors. Finally, the remaining 20% of grocer purchases were from U.S. based dealers outside SC. All crab meat in this set of grocers was purchased from parent company warehouses outside SC while oyster meats were purchased from SC distributors. Finally, frozen finfish was purchased from parent company warehouses in SC (33%) and outside SC (33%) with the remaining 33% from out of state dealers.

In the final section of the report, we consider some issues that are likely to affect seafood marketing channels in South Carolina in the future.

IV. FUTURE ISSUES.

As documented in this report, marketing channels for seafood products are complex and involve producers and distributors both in SC, the rest of the United States, and in countries ranging from Southeast Asia to Central America. The demand for seafood products by SC residents and visitors to SC will grow with the resident population and tourism. Moreover, seafood is increasingly viewed as a healthy component of household diets and is likely to gain share of the food budget over time as household incomes rise.

SC Landed Seafood. Locally grown food has taken on an increasingly important niche in the market place. In the case of seafood, wholesalers are frequently or sometimes asked if fish is caught or produced locally in about 62% of the negotiations between seafood buyers and seafood wholesalers (Seafood Choices Alliance, 2007, p.24). The "good news" is that industry experts in South Carolina suggest that local seafood can command a price premium of about 20% over imports. Comments from the panelists regarding sourcing and selling local seafood included:

- If you can get it, we can sell it…and at a higher price than in the past.

- Many present agreed that they could get 20% price premium for local product.

- There has been an increase in buyer (chef and consumer) pressure for more local and/or domestic caught products; fine dining has been a leading driver.

- Tighter domestic supplies (especially snapper and grouper) drive the need for increased imports.

- Hard to compete with shrimp imports: they are hand peeled, deveined and may sell for $1.50 less per pound than domestic shrimp.

It is important to recognize that locally landed seafood in SC may not be available on a consistent year round basis needed by retail and restaurant buyers in SC. There are several reasons for this. One, there is limited freezer capacity at most dealers in SC. Second, related processing infrastructure of seafood in SC is very limited. Therefore, to provide the supply of seafood needed throughout the year, buyers must turn to domestic and foreign imports. As we have documented in this report, dealers and wholesalers in SC and in proximate states buy seafood from around the world to supply the products needed in SC throughout the year. Third, local seafood landings in SC are not sufficient to supply more than about 20% of state needs, even if it was profitable for SC harvesters, which it is not, to sell all of their production in SC.

South Carolina seafood dealers remain the corner-stone of the market channel because they often participate in several of the facets of the industry. For example, South Carolina dealers receive most of the shrimp landings in SC. Most pack the shrimp in ice (mainly heads-on, H/O) and pay shrimpers after deductions for ice, fuel and groceries they provided to the shrimpers. They may charge $.20 to $.30 per pound for packing fresh shrimp and $.10 per pound for bagging and storage fees for IQF shrimp that are landed by "freezer" boats. For smaller shrimp (41-50 and smaller) sold Head-on to a variety of buyers including out-of-state processors via local wholesalers that will collect the shrimp from the dealers that have iced the shrimp in large plastic vats and transport to processors/wholesalers in Florida, Georgia, Mississippi, Alabama and Louisiana. Since most domestic shrimp are landed from the Gulf area, most processors are also located nearby. However, as noted in earlier sections, larger SC landed shrimp may be headed and sold in dockside retail outlets, sold to peddlers, restaurants, or other wholesale and retail outlets in the area.

The problem of limited SC processing and freezer storage is an old one in SC (See Laurent, *et al,* 1975). In the case of shrimp, downward pressures on shrimp prices from imports means that processing margins are narrowing so that added scale is needed to maintain profitability of processing plants. The competition from imports is unlikely to diminish despite anti-dumping rulings against six major sources of shrimp imports in the U.S. Moreover, many restaurants prefer frozen products that require little but defrosting before preparation for the consumer. Some restaurants purchase local shrimp that has been headed and freeze it for up to a year in their own freezers. However, most rely on SC dealers and wholesalers to deliver on a need-to-have basis to reduce their own storage costs. In contrast, the downsizing of the SC harvest sector

(trawler fleet) has also motivated harvesters and dealers to develop new market outlets – especially niches for branded "wild caught domestic" products.

Large national chains of seafood restaurants and mass retailers contract with broad-spectrum food system distributors (e.g. SYSCO) and/or seafood distributors for steady deliveries throughout the year. Like the national chains, SC dealers have also become more dependent upon purchasing shrimp from non-SC sources including imported shrimp for their various customers. In today's markets, about 85 % of final consumption is imported products (primarily farm raised) and 15% domestic shrimp (primarily wild caught).

Influence of Fishery Regulations.
Government's role in the fishing industry is also widespread. South Carolina's Department of Natural Resources (DNR) has a Marine Resources Division that carries out research, gathers trip ticket data and enforces SC law regulating "when, where and how" in both the commercial and recreational (shrimp baiting) fisheries. Health issues at the dealer side are the concern of the FDA and South Carolina's DHEC. Processing and distribution to consumers from both domestic and imports of shrimp are under the watch of a wide range of Federal agencies. Trade issues and fisheries management are of particular concern to the National Marine Fisheries Service (NMFS), NOAA, USDOC.

At the end of the market channel panel session, panelists were asked to comment on the direct and indirect impact (positive and/or negative) of current and proposed fishery regulations. Most of their comments focused on policies of the National Marine Fisheries Service that influence the South Atlantic and Gulf of Mexico "snapper-grouper fisheries. Highlights of those comments include:

- The undocumented catches of recreational anglers are a problem because the panelists believed it was underestimated in various management plans and related catch allocating schemes.

- Closure of the Gulf of Mexico in January tightens domestic (US) snapper/grouper supplies.

- Although the reductions in total allowable catch (TAC) of finfish would have no major effect on the supply used by panel member businesses, since the majority of their product was imported, they felt the sourcing of US caught finfish species to meet rising demand for domestic species will become more and more problematic.

- Moreover, the current market structure and supplies for snapper-grouper species have been significantly shaped by fishery regulations (not necessarily buyers' choice) and generally forced buyers to seek out and become more dependent on imported product over time.

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APPENDIX

Table 15. South Carolina Seafood Consumption by Residents of SC								
				Consumpton (pounds)				
				Fresh and Frozen			Canned	Grand
		Population		Fish	Shellfish	Total	and Cured	Total
		2006	Per capita:	**6.5**	**5.8**	**12.3**	**4.2**	**16.5**
South Carolina	**Total**	**4,330,108**		**28,145,702**	**25,114,626**	**53,260,328**	**18,186,454**	**71,446,782**
	Beaufort	143,614		**933,491**	**832,961**	**1,766,452**	**603,179**	**2,369,631**
	Berkeley	158,614		**1,030,991**	**919,961**	**1,950,952**	**666,179**	**2,617,131**
	Charleston	340,806		**2,215,239**	**1,976,675**	**4,191,914**	**1,431,385**	**5,623,299**
	Colleton	38,878		**252,707**	**225,492**	**478,199**	**163,288**	**641,487**
	Dorchester	117,752		**765,388**	**682,962**	**1,448,350**	**494,558**	**1,942,908**
	Georgetown	60,007		**390,046**	**348,041**	**738,086**	**252,029**	**990,116**
	Hampton	21,106		**137,189**	**122,415**	**259,604**	**88,645**	**348,249**
	Horry	239,754		**1,558,401**	**1,390,573**	**2,948,974**	**1,006,967**	**3,955,941**
	Jasper	21,568		**140,192**	**125,094**	**265,286**	**90,586**	**355,872**
	Williamsburg	35,391		**230,042**	**205,268**	**435,309**	**148,642**	**583,952**
SC Coast		**1,177,490**		**7,653,685**	**6,829,442**	**14,483,127**	**4,945,458**	**19,428,585**
	Aiken	150,220		**976,430**	**871,276**	**1,847,706**	**630,924**	**2,478,630**
	Allendale	10,577		**68,751**	**61,347**	**130,097**	**44,423**	**174,521**
	Bamberg	15,657		**101,771**	**90,811**	**192,581**	**65,759**	**258,341**
	Barnwell	23,006		**149,539**	**133,435**	**282,974**	**96,625**	**379,599**
	Calhoun	14,821		**96,337**	**85,962**	**182,298**	**62,248**	**244,547**
	Chesterfield	42,627		**277,076**	**247,237**	**524,312**	**179,033**	**703,346**
	Clarendon	32,769		**212,999**	**190,060**	**403,059**	**137,630**	**540,689**
	Darlington	66,885		**434,753**	**387,933**	**822,686**	**280,917**	**1,103,603**
	Dillon	30,712		**199,628**	**178,130**	**377,758**	**128,990**	**506,748**
	Fairfield	23,626		**153,569**	**137,031**	**290,600**	**99,229**	**389,829**
	Florence	130,852		**850,538**	**758,942**	**1,609,480**	**549,578**	**2,159,058**
	Kershaw	57,067		**370,936**	**330,989**	**701,924**	**239,681**	**941,606**
	Lee	20,161		**131,047**	**116,934**	**247,980**	**84,676**	**332,657**
	Lexington	238,330		**1,549,145**	**1,382,314**	**2,931,459**	**1,000,986**	**3,932,445**
	Marion	34,089		**221,579**	**197,716**	**419,295**	**143,174**	**562,469**
	Marlboro	28,954		**188,201**	**167,933**	**356,134**	**121,607**	**477,741**
	Newberry	37,434		**243,321**	**217,117**	**460,438**	**157,223**	**617,661**
	Orangeburg	89,804		**583,726**	**520,863**	**1,104,589**	**377,177**	**1,481,766**
	Richland	351,164		**2,282,566**	**2,036,751**	**4,319,317**	**1,474,889**	**5,794,206**
	Sumter	104,094		**676,611**	**603,745**	**1,280,356**	**437,195**	**1,717,551**
SC Midlands		**1,502,849**		**9,768,519**	**8,716,524**	**18,485,043**	**6,311,966**	**24,797,009**
	Abbeville	25,517		**165,861**	**147,999**	**313,859**	**107,171**	**421,031**
	Anderson	177,086		**1,151,059**	**1,027,099**	**2,178,158**	**743,761**	**2,921,919**
	Cherokee	53,830		**349,895**	**312,214**	**662,109**	**226,086**	**888,195**
	Chester	32,656		**212,264**	**189,405**	**401,669**	**137,155**	**538,824**
	Edgefield	25,177		**163,651**	**146,027**	**309,677**	**105,743**	**415,421**
	Greenville	416,509		**2,707,309**	**2,415,752**	**5,123,061**	**1,749,338**	**6,872,399**
	Greenwood	67,974		**441,831**	**394,249**	**836,080**	**285,491**	**1,121,571**
	Lancaster	71,723		**466,200**	**415,993**	**882,193**	**301,237**	**1,183,430**
	Laurens	69,419		**451,224**	**402,630**	**853,854**	**291,560**	**1,145,414**
	McCormick	10,131		**65,852**	**58,760**	**124,611**	**42,550**	**167,162**
	Oconee	69,993		**454,955**	**405,959**	**860,914**	**293,971**	**1,154,885**
	Pickens	114,585		**744,803**	**664,593**	**1,409,396**	**481,257**	**1,890,653**
	Saluda	18,775		**122,038**	**108,895**	**230,933**	**78,855**	**309,788**
	Spartanburg	269,902		**1,754,363**	**1,565,432**	**3,319,795**	**1,133,588**	**4,453,383**
	Union	28,060		**182,390**	**162,748**	**345,138**	**117,852**	**462,990**
	York	198,432		**1,289,808**	**1,150,906**	**2,440,714**	**833,414**	**3,274,128**
SC Upstate		**1,649,769**		**10,723,499**	**9,568,660**	**20,292,159**	**6,929,030**	**27,221,189**
Sources; REIS for population and NMFS/ERS for Per Capita Consumption (see Table 14).								

SEAFOOD RETAILER & RESTAURANT ECONOMIC IMPACT SURVEY

The information received though this survey will be used by Clemson University to estimate the **total economic impact of the seafood industry in South Carolina**. **Please contact Professor Mark Henry at 864 656 5774 or mhenry@clemson.edu if you have questions about this survey.**

Please note that individual responses questions will not be revealed in any documents. Survey data collected will be used to estimate the total economic impact of the SC seafood **industry, which includes the value added benefits of South Carolina restaurants and retail businesses.**

Please take time out from your busy schedule to complete this survey and **return it using the enclosed postage-paid envelope.** The following two questions relate to **sources of your seafood products.**

1. For each species group or product form listed below, please estimate the total quantity (e.g. pounds, bushels, etc.) purchased during 2007 and your approximate total cost (wholesale value) for purchasing each product:

Seafood Products Purchased By Your Store or Restaurant in 2007 by Species Group or Product Forms: ↓	**Approx. Total Quantity Purchased (for example, Lbs) For Each in 2007**	**Approx. Total Wholesale Value for each in 2007**
Shrimp, Frozen Shell-on ("Tails"):	**Lbs**	**$**
Shrimp, Frozen Peeled & Deveined (P&D) :	**Lbs**	**$**
Shrimp, Frozen P & D Tail-on:	**Lbs**	**$**
Shrimp, Fresh (Head off or tails):	**Lbs**	**$**
Shrimp, Other-Describe:_____	**Lbs**	**$**
Blue Crab Meats (e.g. pasteurized):	**Lbs**	**$**
Other Crab Meats (e.g. snow crab)	**Lbs**	**$**
Live Blue Crabs:	**Baskets**	**$**
Soft-shell Blue Crabs:	**Dozens**	**$**
Oyster meats (canned, shucked, etc.):	**Gallons**	**$**
Live Oysters (e.g. raw oyster bar use):	**Bushels**	**$**
Clam Meats:	**Gallons**	**$**
Clams in the Shell (Live or Frozen)	**Lbs**	**$**
Fresh Finfish (e.g. Snapper, Mahi, etc.)		**$**
Frozen Finfish (e.g. flounder fillets):	**Lbs**	**$**
Other-Describe:_____		**$**

For the species group or seafood products you purchased during 2007, please estimate percentages purchased from various SUPPLIER TYPES using the table below

[Percentages in a given column should total to 100%.]

EXAMPLE: Using estimated percentages by supplier type (see below), your total frozen shrimp purchases might have been provided by the following type of suppliers during 2007:

SC Harvested Seafood Purchased Directly from SC Coastal Dealers: **5%**

South Carolina Distributors/Brokers/Wholesalers of *Species Harvested in South Carolina*: **20%**

SC Distributors/…Wholesalers of *Imported Species/Products (foreign or other US states)*: **75%**

For a COLUMN TOTAL of 100%

2. FOR EACH SEAFOOD GROUP/PRODUCT LISTED BELOW, PLEASE ESTIMATE PERCENT PURCHASED FROM VARIOUS SEAFOOD SUPPLIERS TYPES DURING 2007:

SEAFOOD GROUP:→ Purchased from: (Supplier Type)↓	**Shrimp Fresh**	**Shrimp, Frozen[10]**	**Crab Meat**	**Raw (Live) Oyster**	**Oyster Meats**	**Clam Meat**	**Finfish Fresh**	**Finfish, Frozen**
South Carolina Harvested (e.g. SC boats) Seafood Purchased Directly from SC Coastal Dealers								
Parent Company with a Warehouse in South Carolina								
Parent Company with Warehouse outside South Carolina:								
South Carolina Distributors/ Brokers/Wholesalers of *Species/Products Harvested in South Carolina*:								
South Carolina Distributors/ Brokers/Wholesalers of *Imported Species/Products (foreign or other US states)*:								

[10] In this question, "Frozen shrimp" includes P & D shrimp product forms as well as frozen shell-on tails.

Other (out of state) U.S. Dealers/ Brokers/Wholesalers:								
Direct from SC Processors:								
Direct from other (out of state) U.S. processors:								
Direct from Foreign processor/importer/wholesaler								
A COLUMN TOTAL SHOULD BE 100%	**100%**	**100%**	**100 %**	**100%**	**100%**	**100 %**	**100%**	**100%**

3. Please describe the problems you have, if any, when trying to purchase (source) South Carolina harvested seafood species for your customers in the area below: ⬇

☐ **Please check this box if you would like to receive a summary of survey results.**

THANK YOU FOR TAKING YOUR TIME TO FILL OUT THIS QUESTIONNAIRE. PLEASE PUT IT INTO THE **ENCLOSED POSTAGE-PAID ENVELOPE** AND **MAIL IT BACK TO US AS SOON AS POSSIBLE**. If you do not have a postage-paid envelope, please mail to: **Mark Henry, Barre 254, Clemson U., Clemson, SC 29634 0313**

THANK YOU!

Please feel free to make additional comments and/or add information about sourcing and purchasing your seafood products for your business in the area below: ⬇

S.C. SEAFOOD SUPPLIER DIRECTORY AND ECONOMIC IMPACT SURVEY

Ray Rhodes at the College of Charleston has contacted you about this survey and he will be calling you to arrange or complete your phone interview. You can contact Ray at 843-209-7659.

Please take time out from your busy schedule to complete this survey and **return it; electronically or using the enclosed postage-paid envelope.** The information received through this survey will be used by Clemson University to prepare a **directory of SC seafood suppliers** and to estimate the **total economic impact of the seafood industry in South Carolina**. Please contact **Professor Mark Henry at 864-656-5774 or mhenry@clemson.edu** if you have questions about this survey. Please note that individual responses to **questions marked with an asterisk (*), i.e. Questions 2B, 6, 7 & 8, will NOT be included in the directory and will NOT be revealed in any documents.** They will be used only to estimate the total economic impact of the SC seafood industry.

PLEASE TYPE OR CAREFULLY PRINT YOUR RESPONSES

Company Name: _____
Contact Person/Title: _____
Mailing Address: _____
_____
Shipping Address (if different): _____
_____
Business Phone: **Ext.** _____ **Cell:** _____ **FAX:** _____
E-mail: _____ **Website:** _____

1. Do you want your company listed in the 2008 SC Seafood Supplier Directory?
YES ☐ **NO** ☐ **Not sure** ☐ (Please contact Mark Henry for more details)

2. A. Years in business B. ***In 2007**, Number of full-time employees: Part-time:

3. Type of Company: Please check **ALL** that apply to your company (See Page 3, for category descriptions[1])

☐ Harvester ☐ Primary Packer/Buyer ☐ Primary Wholesaler
☐ Secondary Wholesaler/Distributor ☐ Retailer/Restaurant ☐ Processor
☐ Aquaculturist ☐ Other (Please Describe) _____

4. Species (products) your company offers for sale. Please list by categories those species you offer on a routine basis with the **greater volume first**.

Shellfish (e.g. shrimp,oysters)	Finfish (e.g. gag, swordfish)	Bait Species

5. What kinds **of in-house processing** do you offer, if any? (CHECK **ALL** THAT APPLY)

☐ Shrimp Heading ☐ Shrimp peeling/deveining ☐ Fish Cutting (e.g. fillets)

☐ Freezer Storage ☐ IQF Freezing ☐ Vacuum Packaging
☐ Canning ☐ Other (Please describe): _____

The following questions relate to sources and buyers of your products. We need this information to estimate the economic impact of seafood on the SC economy. Even if you purchase seafood product from out of state sources, your value-added involvement in selling and/or re-selling seafood products to buyers needs to be counted in estimating the economic impact of the seafood industry in South Carolina. Again, **questions marked with an asterisk (*) will not be included in the directory and will only be summarized for estimating the economic impact of the SC seafood industry.**

6. ***For the products/species listed below, please estimate the **total quantity** (e.g. pounds, bushels, etc.) and value you sold or handled (e.g. shrimp shipped to Gulf processors) during **2007**:

Product Your Company Sold or Handled (2007)	**Approx. Total Quantity (e.g. lbs)**	**Approximate TOTAL VALUE in 2007 (Optional)**
Shrimp, Fresh (Head-On and/or Off):	Lbs	
Shrimp, Frozen (e.g. 5 lb boxes):	Lbs	
Blue Crabs, Hard:	Baskets	
Soft-shell Blue Crabs:	Dozens	
Oysters:	Bushels	
Hard Clams:	Number	
Finfish, Fresh:	Lbs	
Finfish, Frozen:	Lbs	
Other (Describe):		
Other (Describe):		

7. *Based upon the products/species you sold or handled (e.g. shipped) (see table above, Question 6), please estimate percentages by ***SUPPLIER TYPES*** including boats unloading at your facilities **during 2007**.

NOTE: Percentages in a given column should total 100%. [**EXAMPLE**: Your fresh shrimp sources might be 50% from boats unloading at your dock; 20% purchased from SC dealers and 30% from shrimp importers for a total of 100%] Please include species you **shipped**, but may not have purchased.

MAJOR SUPPLIERS OF YOUR SEAFOOD PRODUCTS DURING 2007

SUPPLIED BY: [e.g. Purchased from]	**Shrimp Fresh**	**Shrimp Frozen**	**Blue Crabs**	**Oysters**	**Hard Clams**	**Finfish Fresh**	**Finfish Frozen**
Boats you own unloading at your dock/facility							
Other boats unloading at your dock/facility							
Boats unloading at other SC locations/docks							
Other SC Dealers							
Other Non-SC Dealers							
Brokers/Wholesalers of Species Harvested in U.S.							
Brokers/Wholesalers of Imported Species							
Other Suppliers:							
TOTAL (Should be 100%)	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

8. *Based upon the products/species you sold or **handled** (e.g. shipped) during **2007**, please estimate the percentage of total purchases by various ***TYPES OF BUYERS*** during **2007**.

[**EXAMPLE**: You had 10,000 lbs of fresh shrimp pass through your facility (dock) and approx. 50% (5,000 lbs) was picked up by Gulf processors; you sold 25% (2,500 lbs) to local SC restaurants, and 25% (2,500 lbs) was sold directly to "walk-up" retail customers.]

MAJOR BUYERS OF YOUR SEAFOOD PRODUCTS DURING 2007

TYPES OF BUYERS: (Sold To)	Shrimp Fresh	Shrimp Frozen	Blue Crabs	Oysters	Hard Clams	Finfish Fresh	Finfish Frozen
SC Processors							
Non-SC Processors (e.g. Gulf breader)							
Sold Directly to "Walk-up" Retail Customers							
SC Wholesalers/Distributors							
Non-SC Wholesalers/Distributors							
SC Restaurants							
Non-SC Restaurants							
Retail Grocery Chain							
Seafood Retail Chain							
Other:							
FROZEN for 2008 Sales							
TOTAL (Should be 100%)	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

☐ Please check this box if you would like to receive a summary of this survey results.

THANK YOU FOR TAKING YOUR TIME TO FILL OUT THIS QUESTIONAIRE. PLEASE RETURN IT AS SOON AS POSSIBLE, **EITHER ELECTRONICALLY OR IN THE ENCLOSED POSTAGE PAID ENVELOPE.** If you do not have a postage paid envelope, please mail to:

Mark Henry
Department of Applied Economics and Statistics
254 Barre Hall
Clemson University
Clemson, SC 29634-0313

OR

MHENRY@CLEMSON.EDU

THANK YOU!

Please feel free to give any comments you desire in the area below: ⬇

[1]**Category Descriptions for Question 3** (More than one category could apply to your company):

Harvester- you harvest your own wild product. **Primary Packer/Buyer**-purchase product (fish, shrimp, oysters, etc.) directly from fishermen. **Primary Wholesaler**-purchase product primary packer/buyer. **Processor**-peels, fillets, picks, shucks, cooks, etc. **Secondary Wholesaler/Distributor**-purchase product from both primary packer/buyer & primary wholesaler. **Retailer/Restaurant**-sells product directly to final consumer & includes "walk-up" consumers. **Aquaculturist**- harvest your own cultured product (e.g. mariculture clams).