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# Workin' from Cain to Cain't: Challenges within Florida's Gulf Coast Oyster Industry

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Workin' from Cain to Cain't:  
Challenges within Florida's Gulf Coast Oyster Industry

by

Diane Marie Wakeman

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Liberal Arts  
Department of Florida Studies  
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Challenges to Florida's Gulf Oyster Industry

Diane M. Wakeman

ABSTRACT

Oyster tongers are a cultural icon of Florida's maritime heritage and geography. Challenged for generations by the vagaries of weather, including catastrophic storms and years-long droughts, and economic uncertainties this maritime heritage is fading fast. While Florida's north and west coasts produce 90 percent of the Florida oyster harvest and ten percent of oysters consumed in the United States, the industry is at risk today for reasons including a declining demand for Florida oysters because of health concerns; water pollution; population growth and its accompanying development of condominiums, gated communities, and retail shopping centers; and declining interest in the hard work of oystering as a livelihood.

This work investigates those challenges to Florida's Gulf Coast oyster industry through the lens of a twenty-first century consumer. I examine why the U.S. Department of Agriculture considers raw oysters a significant challenge to public health and how local, state, and federal government regulations, along with cooperative efforts of the seafood industry, offset the potential for oysters to convey foodborne illness to human consumers. The fact that raw oysters carry a high propensity for conveying bacterial disease makes them a unique marketing challenge, especially outside of months that have an *r* in them. As a subject of culinary tourism, Florida oystering maintains an iconic

maritime heritage. The labor force of the commercial oystering business has ranged widely—from migrant mothers working with toddlers at their side and their school-age children forgoing education for shucking oysters at the turn of the twentieth century to a new, Hispanic work force whose strong work ethic heartily satisfies oyster processors as local interest for the hard work in the industry declines. The threat to sustainability of both the working traditions of the Apalachicola oyster folk, and the oysters themselves as a bountiful resource, grows in direct proportion to the environmental pressures fostered by rapid and poorly-regulated population growth. A legitimate question might be, given the difficulties of the work and challenges to the industry, is it worth the state's effort to help sustain this industry?

## Introduction

I arrived in the small coastal town of Apalachicola, Florida, one late October evening in 2008. Closed signs hung crookedly on the doors of the local seafood diners. I sighed in disappointment at having to postpone indulging my appetite for freshly shucked, salt-tinged local oysters on the half-shell. The wait for tomorrow's supper only intensified my desire for the tasty bivalves.



**Figure 1.** A husband and wife oystering team make an early morning start into Apalachicola Bay from Eastpoint. *Photo by author.*

As morning sun spread along the watery horizon, a dozen or more small wooden skiffs skim across the shallow water of Apalachicola Bay. Each skiff cradles one or two lean and sun-leathered adults. About one-half mile offshore, every boat stops abruptly at some predetermined point—a marker not visible to an outsider. With wind-battered and weather-faded hats drawn low against the sun's persistent glare, the fisherpeople balance



on walk boards lining a skiff's length, knees loosely poised to ride in lazy swells. Then, in long-practiced rhythm, rough hands grasp long, worn but sturdy wooden poles fashioned into rusty iron-forged scissored rakes.

With a vise-like grip, the oysterman plunges tongs into murky water feeding the ten-foot length toward the bottom's resistance, sending urgent ripples along the surface. Shuffling the rakes, the oysterman shifts his weight and in one swift motion swings a dripping load of shells and sand and debris up in a low arc. He jerks the tongs open, and the little boat reverberates with the crack and rattle of oysters falling against the culling boards braced on the width of the boat.

As he works his goal of ten 60-pound bags of oysters, he let the boat drift just a few feet further. This oysterman is lucky to have help today. As he positioned his rake to repeat the weighty process of plunging, reaching, grabbing, and lifting, an equally tanned and lean woman, crows feet carved deep into her face, scrabbled into the catch, quickly culling and tossing overboard debris and oysters too small to meet the legal size limit. Then, plying with a heavy culling iron, she chips away at clusters of shells bound in growth over time. Some of the load yielded marketable oysters, and the oysterwoman handily piles up the takeable harvest. The scene is repeated again and again, proven by the growing mound of sodden burlap bags of oysters balanced along the sagging skiff. The sun's midday heat reminded the weary fisherpeople that they must soon cease their work. The warm temperatures may destroy the oysters, which must be kept cool enough to keep them alive.

Watching from the banks of Apalachicola Bay, with telephone poles and power lines to my back, I viewed the scene before me as timeless. I imagined that I could be in

this same place at this same time of the day in 1909 or 2009. In this mega-profit driven age of high productivity and cutting edge technologies, oyster folk cultivated and sustained ancient crafts in whatever physical conditions nature grants them. Tonight both locals and tourists will enjoy the fruits of their labor at home or at one of many restaurants in the region. Like other curious epicures, I admit that my gastronomic-inspired visit to this so-called Forgotten Coast of Florida would have been less satisfying without seeing scattered oyster skiffs plying their way slowly across the bay.<sup>1</sup>

What a life, I thought. Why do they do it? What are the challenges? How do they survive? What, if anything, *has* changed over time for these Florida fisher folk and their industry? What lies between their effort and the oysters on my plate? How much of a gamble with one's health is there in eating raw oysters? This thesis attempts to answer these questions and more.

My investigation of Florida's Gulf Coast oyster industry involved many rich primary source resources. It was no hardship for me to make multiple trips to Apalachicola to interview oyster tongers and their families, shuckers, packers and distributors, and business representatives. Stalking clues in the cozy confines of Apalachicola's Public Library, I flipped through folder upon folder of cuttings and notes. Then, I quizzed many persons who had some recollection of the region's oystering tradition. In Florida's state capital, Tallahassee, representatives of the Aquaculture Division of the Florida Department of Agriculture and Consumer Services gave me insights to the complexities of regulatory measures to ensure public health and safety. In

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<sup>1</sup> The Forgotten Coast of the Florida panhandle is a term commonly applied to the east coast of Bay County and all of Gulf and Franklin Counties; in other words from about the town of Mexico Beach in the west to the town of Carrabelle in the east. "Forgotten Coast" is also applied as a marketing term by the local tourism and business trade organizations in the same region.

the depths of the State Archives, enthusiastic staff permitted me to prowl through numerically identified boxes of correspondence and turn pages of fragile ledgers. The staff of the Apalachicola National Estuarine Research Reserve patiently answered my questions about Apalachicola Bay and its feeder rivers, and librarians at the University of South Florida's Shimberg Health Sciences Library indulged my curiosity about public health resources. Discussions with marine biologists and culinary tourism experts yielded stimulating ideas for wide consideration of sustainability issues. I found valuable treasures in newspapers such as the *New York Times*, *Apalachicola Advertiser*, *Tampa Tribune*, and *St. Petersburg Times*. The research effort has been a bountiful and exciting route of firsthand discovery of a special aspect of Florida's maritime heritage.

Chapter One provides a historical and biological overview of oysters with a focus that shifts from an international view to North America, and finally to Florida. In addition to protecting the raw creature, the oyster's shell provides a variety of practical uses, from road fill to fertilizer, which I will introduce through a Florida lens.

Raw oysters are among the most dangerous foods people can eat. How do they make people sick? Who is most likely to succumb to illness as a result of eating oysters? Who eats raw oysters? What are the benefits of cooking oysters before consuming them? How does the oyster industry market a product of such notoriety? What drives the culture of suspicion surrounding oysters? What kind of government regulation assures their safe consumption? Chapter Two addresses these questions.

Ninety percent of Florida's oyster harvest occurs in the waters in and around Apalachicola Bay.<sup>2</sup> In recent years, development pressure, hurricane destruction, and river water allocation conflicts between Florida, Georgia, and Alabama have challenged

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<sup>2</sup> Kevin McCarthy, *Apalachicola Bay* (Sarasota: Pineapple Press, 2004), 65.

the viability of oysters in this region. Chapter Three examines these environmental stresses to this rich estuarine ecosystem on Florida's north coast.

Chapter Four probes the lives and community of Apalachicola oyster folk as well as the cultural traditions that encourage tourists to visit this "Forgotten Coast." The maritime heritage of the region is inherent to Florida's Gulf Coast, but is it doomed because of environmental, economic, and cultural stresses? Will the picturesque view of oyster tongers bobbing on the water's surface under the midday sun disappear from the tourist marketing literature? Will this glimpse of time gone by vanish? Indeed, given the difficulty of working in the oyster business relative to other ways of making a living today, is it worth the effort to sustain this way of life?

I always recommended that diners ask for Apalachicola oysters by name from their local seafood retailer. I used to suggest not bothering to cook them, but rather to dress them lightly with freshly squeezed lemon juice, tilt the half shell, and slurp them down with gusto. Little did I know that by the end of my research for this thesis I would temper my recommendations by reminding people to consider their current state of health before indulging in any raw oysters. Nor do I concur with the argument that oysters are safe to eat if they are cooked according to public-health safety recommendations. While I believe people must determine for themselves whether they might be at high-risk for oyster-borne illness, for those who crave these tasty morsels of the sea, I recommend seeking oysters certified as having received post-harvest treatments to reduce harmful pathogens.

However, the delight of indulging in freshly-caught local oysters at a water-side table in an Apalachicola restaurant is a strong magnet for many people. Consideration of

the long-time tradition of the region's oyster harvest adds to the pleasurable experience, so, by exploring the Florida oyster industry in depth, we might decide whether it is worth saving.

## Chapter One

### Biological and Historical Perspectives

A loaf of bread, the walrus said, is what we chiefly need; pepper and vinegar besides are very good indeed—  
Now if you're ready, oysters, dear, we can begin to feed!  
*Through the Looking Glass*, by Lewis Carroll

Australian aboriginals indulge in plump witjuti grubs plucked straight from the tree; Ethiopians enjoy honeycombs laced with live bee larvae; the Masai drink cattle blood; and modern Florida coastal dwellers, like the Calusa Indians centuries before us and much of humankind since first walking upon Earth, delight in the primal feasting of oysters.<sup>3</sup> As early as 5000 BC, various Indian tribes throughout Florida, living on or near the coast, consumed enormous quantities of shellfish and discarded huge numbers of shells in massive middens, some as high as forty feet near the St. Johns River.<sup>4</sup>

Intimate, sensual, natural...this is how oyster hedonists describe the raw oyster eating experience. “You are eating the sea, that’s it, only the sensation of a gulp of sea water has been wafted out of it by some sorcery,”<sup>5</sup> espouses one enthusiast. While oyster meat provides an easily obtainable, uniquely nutritious source of protein and minerals, particularly for people who live in a coastal ecosystem, the shells can be recycled and

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<sup>3</sup>The Calusa were a North American aboriginal society that inhabited the Gulf Coast of Florida south of Charlotte Harbor and were among the first Native American peoples encountered by European explorers during the middle of the 16<sup>th</sup> century. Archaeologists describe the Calusa as a complex sociopolitical society that primarily subsisted on fish and shellfish. Their remarkable population, estimated between 4,000 and 7,000, is an indicator of the bountiful carrying capacity of their seafood-rich environment. Randolph J. Widmer, *The Evolution of the Calusa: A Nonagricultural Chiefdom on the Southwest Florida Coast* (Tuscaloosa: University of Alabama Press, 1988), 3-11; Felipe Fernandez-Armesto, *Near a Thousand Tables: A History of Food*, (New York: The Free Press, 2002), 2.

<sup>4</sup> Wilfred T. Neill, “Odds are 12,000 to 1 but there are pearls in Florida oysters,” *St. Petersburg Times*, 30 December 1979.

<sup>5</sup> *Ibid.*

reprocessed in a myriad of ways. The oyster is part of humankind's longest alimentary story. Ever-changing water environments and concurrently changing cultural traditions have shaped its sporadic popularity over time.

In some eras, oysters were often a delicacy reserved for the elite. In other times, oysters served as the mainstay food of the commoner and peasant. According to historian Felipe Fernandez-Armesto, "Foods shift places in the hierarchy of social acceptability with bewildering ease and rapidity. Sometimes, the shift is induced by changes in availability...oysters...leapt up the social scale as their breeding grounds shrank."<sup>6</sup> A 1940 press release of the U.S. Fish and Wildlife Service reported that while other countries considered the oyster a luxury food because of limited availability, the 1938 U.S. harvest of 17 thousand bushels, or 87 million pounds of oyster meat, qualified the bivalve as "a staple article of food, at prices within the reach of all classes of people."<sup>7</sup>

In Europe, from ancient times to present day, oysters have been considered a delicacy. In Mid-Atlantic colonial America, "country gentlemen drew succulent treats from the rivers, inlets, and bays...think of southern-fried oysters, pickled oysters, oysters farcis, pan-broiled oysters, scalloped oysters, oysters wrapped in bacon...."<sup>8</sup> An abundance of oysters in nineteenth-century America supplied burgeoning oyster bars and even had vendors selling the tasty sea morsels from pushcarts in city streets. In 1877, patrons consumed fifty thousand oysters daily at New York's Fulton Fish Market.<sup>9</sup> A

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<sup>6</sup> Fernandez-Armesto, *Near a Thousand Tables*, 125.

<sup>7</sup> U.S. Dept. of the Interior Fish and Wildlife Service, Press Release, P.N. 112875, 1 September 1940. 1938's harvest numbers were the latest available to the agency in 1940.

<sup>8</sup> *The American Heritage Cookbook and Illustrated History of American Eating and Drinking* (American Heritage Publishing Co., Inc., 1964), 124.

<sup>9</sup> *Ibid.*, 352.

similarly plentiful supply in late-nineteenth-century Britain provided even the most common man with his fill of the treasure from the sea.<sup>10</sup>

Americans of all walks of life were partial to their oysters. Mark Twain, dissatisfied with the food he experienced during a trip to Europe in 1878, spent part of his return voyage listing the American foods he had most missed and was anxious to eat upon his return. He listed oysters multiple times: fried oysters, stewed oysters, Blue Points on the half shell, oyster soup, and oysters roasted in shell, Northern style.<sup>11</sup> The abundance of American oysters during the nineteenth-century provided an egalitarian period of oyster enjoyment nationwide. Joan Reardon, author of *Oysters, A Culinary Celebration*, tells us that in 1857 an English visitor to the United States, observed, “The rich consume oysters and champagne; the poorer classes consume oysters and lager bier, and that is one of the principal social differences between the two sections in each community.”<sup>12</sup> It was during the late nineteenth century when development and expansion of Henry Plant and Henry Flagler’s railroads in Florida, along with the recently developed refrigerated train cars, allowed Apalachicola oysters to be shipped beyond the state’s boundaries where they were considered a delicacy as far north as New England.

In her 1880 descriptions of local St. Augustine foods, Sylvia Sunshine reported that seafood was plentiful: “Fine Matanzar oysters are kept for sale in or out of the shell,

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<sup>10</sup> Fernandez-Armesto, *Near a Thousand Tables*, 126.

<sup>11</sup> *American Heritage Cookbook*, 370-371.

<sup>12</sup> Joan Reardon, *Oysters, A Culinary Celebration* (Guildford, CT: The Lyons Press, 2004), 4.



as the purchaser may choose. If any appearance of starvation has ever faced visitors here, no one has perished here from hunger.”<sup>13</sup>

Despite impressive harvest numbers, no oysters of any kind currently rank in the top five species of U.S. commercial fishing harvest (see Figure 2). Of the mollusk family, only scallops rank in the top five species in dollar value. It is interesting to note that in 2007 the live weight of world-wide fisheries, including all farmed and captured species, was 309.5 billion pounds, of which the United State’s share equaled only 3.8 percent, or 7.1 billion pounds.<sup>14</sup>

Rank	Species	Lbs (Million)	%	Rank	Species	\$ (Million)	%
1	Pollack	2298	28	1	Crabs	562	13
2	Menhaden	1341	16	2	Shrimp	442	10
3	Flatfish	663	8	3	Salmon	395	9
4	Salmon	668	8	4	Scallops	372	8
5	Hakes	550	7	5	Lobsters	337	8
n/a	Oysters*	30	8	n/a	Oysters	132	n/a

\*U.S. Commercial landings of oysters in edible meat weight only

**Figure 2.** 2008 U.S. Domestic Landings - Top Five Species Groups Ranked by Weight and Dollar Value Compared to Oysters

Source: NMFS Fisheries Statistics Division, *Statistical Highlights, Fisheries of the United States, 2008*. Available at <http://www.st.nmfs.noaa.gov/st1/fus/fus08/highlight2008.pdf>, 1; and NMFS Commercial Statistics available at [http://www.st.nmfs.noaa.gov/st1/fus/fus08/02\\_commercial2008.pdf](http://www.st.nmfs.noaa.gov/st1/fus/fus08/02_commercial2008.pdf), 4.

Along the east coast of North America, the most abundantly harvested oyster is *Crassostrea virginica*, commonly called the Eastern or American oyster. Figure 3 illustrates the distribution of the entire U.S. harvest of the Eastern oyster. Note the small amount of Eastern oyster commercial harvested in the Pacific region of the U.S. An import from Japan, *Crassostrea gigas*, or the Pacific oyster, is the predominant oyster of

<sup>13</sup> Sylvia Sunshine, *Petals Plucked from Sunny Climes*, 1880. (Gainesville: University Press of Florida, 1976), 206.

<sup>14</sup> National Marine Fisheries Services, Statistics Division, *Statistical Highlights, Fisheries of the United States, 2008*. Available at <http://www.st.nmfs.noaa.gov/st1/fus/fus08/highlight2008.pdf>, 1.

commercial harvest along North America’s Pacific coast. Prolific on the California coast until the late 1800s when overharvesting annihilated its population, the smaller native oyster, *Ostreola conchophila*, commonly known as the Olympia oyster, is making a comeback in the San Francisco Bay area. Figure 4 reveals how the popularity of the Pacific oyster, and its productive adaptation to the environment of the Washington coastline, have made it a serious contender in the state’s economy.

Year	Gulf		Chesapeake		South Atlantic		Mid-Atlantic		New England		Pacific	
	Lbs	\$	Lbs	\$	Lbs	\$	Lbs	\$	Lbs	\$	Lbs	\$
1998	20.56	46.31	2.68	8.29	0.52	1.77	0.94	4.04	1.60	9.73	n/a	n/a
1999	24.02	48.57	2.79	8.08	0.52	2.03	0.48	1.96	1.43	11.69	n/a	n/a
2000	25.77	53.12	2.53	7.67	0.53	2.04	0.35	2.28	0.75	5.54	n/a	n/a
2001	25.62	52.00	1.48	4.36	0.57	2.26	0.73	4.23	0.49	4.20	n/a	n/a
2002	24.11	53.29	0.66	2.49	0.55	2.14	1.05	7.33	0.31	3.13	n/a	n/a
2003	27.03	61.63	0.24	0.97	0.59	2.35	1.26	7.93	0.35	3.52	n/a	n/a
2004	25.05	60.85	0.09	0.38	0.69	2.91	0.77	5.29	0.27	3.02	0.00	0.02
2005	20.17	56.51	0.74	3.43	0.73	3.30	0.46	3.27	0.20	4.57	0.03	0.13
2006	19.67	62.32	0.29	1.35	0.81	3.85	0.69	5.14	0.42	9.63	0.03	0.16
2007	22.52	69.53	0.49	4.33	0.77	3.80	0.65	5.35	0.58	12.88	0.03	0.15
2008	20.41	59.51	0.60	4.96	0.84	3.97	0.75	5.83	0.19	7.10	0.10	0.05
Totals	254.94	621.38	12.59	46.31	7.09	30.44	8.14	52.63	6.58	75.01	0.19	0.50

**Figure 3. U.S. Eastern Oyster Harvest (Millions of Pounds and Dollars) by Region**

New England=Maine to Connecticut

Mid-Atlantic=New York, New Jersey, Pennsylvania, Delaware

Chesapeake=Maryland, Virginia

South Atlantic=North Carolina, South Carolina, Georgia, East Florida

Gulf=West Florida, Alabama, Mississippi, Louisiana, Texas

Source: NOAA National Marine Fisheries Commercial Landings Statistics at [www.st.nmfs.noaa.gov/st1/commercial/landings/annual\\_landings.html](http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html)

In fact, the state of Washington hosts the most oyster farms in North America; commercial oyster harvesting in California and Oregon is minor compared to that in Washington.<sup>15</sup> Those farms mostly cultivate the Pacific, or Japanese oyster, *Crassostrea*

<sup>15</sup> Jay Harlow, “Oysters: Grand Crus on the Half Shell.” Sally’s Place website, <http://www.sallys-place.com/food/columns/harlow/oysters.htm>. For the sake of reasonable comparison because of the very

*gigas*, which tolerates the colder and saltier waters of the Pacific coast and its deeper estuaries. The area provides a terrific yield of various flavored oysters for west coast consumers, in much the same way environmental conditions alter the flavors of Florida’s oysters. Former Tampa restaurateur Robert Richards claims, however, the Pacific oysters have a bitter taste, probably due to a higher salt content.<sup>16</sup>

Florida’s Gulf Coast harvest of the Eastern Oyster in 2008 (see Figure 5) of just about 2.5 million pounds makes Washington’s 2008 Eastern Oyster harvest of 104 thousand pounds look poor. However, the weight of Washington’s 2008 Pacific Oyster harvest was significantly more than that of Florida’s Eastern oyster harvest.

Year	Eastern Oyster		Pacific Oyster	
	Lbs	\$	Lbs	\$
1998			6.49	17.0
1999			6.75	17.4
2000			8.44	22.1
2001			9.43	24.6
2002			9.92	25.3
2003			9.63	25.8
2004	0.00	0.02	11.00	30.9
2005	0.03	0.01	12.10	33.1
2006	0.03	0.16	12.20	36.9
2007	0.03	0.15	11.70	34.8
2008	0.10	0.05	10.10	28.9
<b>Totals</b>	<b>0.20</b>	<b>0.50</b>	<b>107.76</b>	<b>296.8</b>

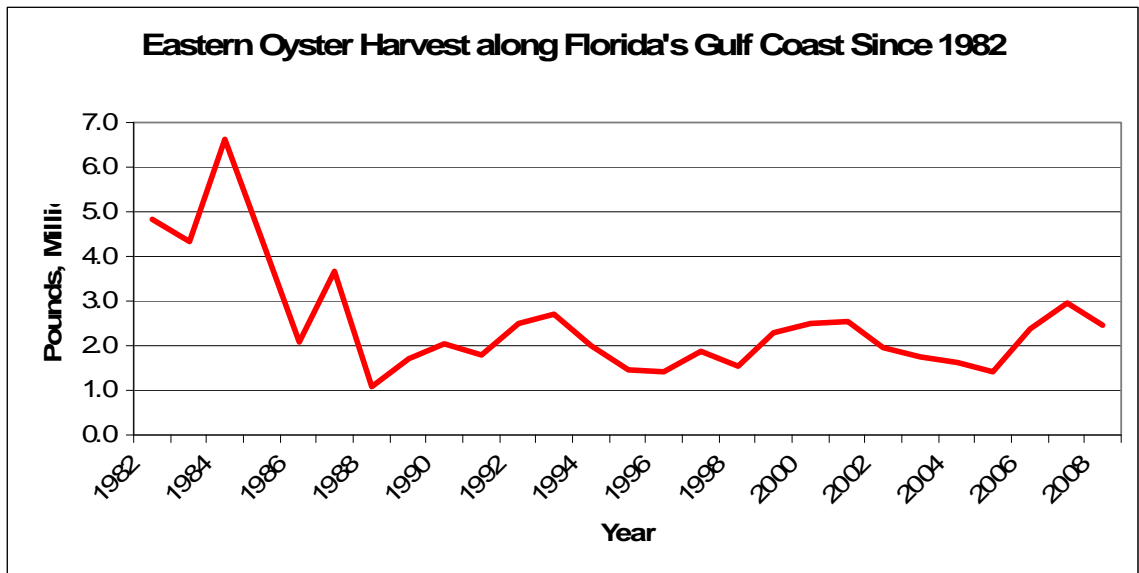
**Figure 4.** Washington State Commercial Oyster Landings (Millions)  
Source: NOAA National Marine Fisheries Commercial Landings Statistics at [www.st.nmfs.noaa.gov/st1/commercial/landings/annual\\_landings.html](http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html)

low amounts of commercial oysters harvested in California and Oregon, I chose to concentrate my comparison of Florida’s Gulf Coast commercial oyster harvest with Washington state’s commercial oyster harvest.

<sup>16</sup> Telephone interview with Robert Richards, a 75-year old Tampa Bay native who was raised “on the water” and who is a former owner of The Seabreeze Restaurant, a long-time favorite seafood restaurant on the Causeway in South Tampa, August 2007.

The Eastern Oyster is Florida’s only commercial oyster, and ninety percent of the Florida harvest takes place in Apalachicola Bay in Florida’s northwest panhandle. The *St. Petersburg Times* described the area as “the richest oyster ground for its size in the United States—supplying ten percent of the nation’s oysters.”<sup>17</sup> Meanwhile, the rich estuarine waters of the Suwannee River in Dixie and Levy Counties provide most of Florida’s remaining commercial oyster harvest.<sup>18</sup>

Figure 5 illustrates the oyster harvest on Florida’s Gulf Coast over the last 25 years, which had seen an abrupt downward trend until 1989; but a series of droughts and several seasons of hurricanes in the early decade of 2000 to 2009 cut the commercial harvest significantly. Hurricane Elena in 1985 was particularly devastating in its destruction of the region’s oyster beds and it took several years for them to recover.



**Figure 5.** Eastern Oyster Harvest along Florida’s Gulf Coast Since 1982  
 Source: NOAA Commercial Landings Statistics at [http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual\\_landings.html](http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html)

<sup>17</sup> Janis D. Smith, “Oysters,” *St. Petersburg Times*, 10 January 1985, D1.

<sup>18</sup> Personal interview with David Heil, Assistant Director, Division of Aquaculture, State of Florida, in Tallahassee, Florida, on 13 August 2009.

Today aquaculture provides over 95 percent of the global oyster harvest; only five percent is wild-caught. The United States accounts for 88 percent of the global oyster harvest with the Gulf Coast states providing most landings.<sup>19</sup> An argument can be made that oysters harvested in the Gulf of Mexico are the product of aquaculture because it is customary to broadcast spawning oysters (eggs and sperm) into natural oyster beds, where the spat will attach to their ideal cultch—oyster shell—or to broadcast the spat itself. This practice is especially useful after oyster beds have been negatively affected by hurricanes, or disease. “Shell planting” or “cultch planting” as well as oyster relaying and transplanting count as oyster aquaculture because, according to the Florida Department of Agriculture and Consumer Services (DACS) Division of Aquaculture these practices “mitigate resource losses, enhance productivity, and contribute direct economic benefit to the oyster fishery.”<sup>20</sup> It is a program the state of Florida has maintained since the early 1900s, and it relies heavily on collection of shucked oyster shells from oyster processors for depositing in reefs as an ideal cultch to which spat will attach.<sup>21</sup>

Another type of oyster aquaculture, off-bottom, exists in a few areas of the U.S.—the practice of containing oyster spat in, say, net bags that are suspended from a fixed point in estuarine waters. As the oysters grow, they are relayed into containers to better accommodate lesser density which provides them with adequate access to food sources—

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<sup>19</sup> Jesse Marsh, *Eastern Oyster-Final Report*, Southeast Region, Seafood Watch, Seafood Report, 21 April 2004, Monterey Bay Aquarium, accessed at

[http://www.mbayaq.org/cr/cr\\_seafoodwatch/content/media/MBA\\_SeafoodWatch\\_EasternOysterReport.pdf](http://www.mbayaq.org/cr/cr_seafoodwatch/content/media/MBA_SeafoodWatch_EasternOysterReport.pdf)

<sup>20</sup> “Oyster Resource Development,” Florida Department of Agriculture and Consumer Services Division of Aquaculture, accessed at [http://www.floridaaquaculture.com/bad/bad\\_oysterplant.htm](http://www.floridaaquaculture.com/bad/bad_oysterplant.htm).

<sup>21</sup> Ibid.

diatoms—in the waters in which they are submerged.<sup>22</sup> Wild caught oysters, on the other hand, have existed naturally in their ecosystem for thousands of years and can be readily harvested from that environment. I would argue that Apalachicola oysterfolk practice a sustaining balance between aquaculture and wild caught oysters. The oysters have long existed naturally in the bay’s waters and can be harvested, off-bottom, with simple equipment. However, the region’s oyster beds are regularly nourished with recycled oyster shell and spat may be released to attach to this ideal substrate. But, Apalachicola oyster “farmers” do not, as a rule, “plant” and then “transplant” oysters from one container to another as they grow to harvestable size, a more recognizable practice of “aquaculture.”

Year	Gulf Coast		Atlantic Coast	
	Lbs	\$	Lbs	\$
1998	1.5	2.4	0.04	0.10
1999	2.3	3.6	0.04	0.10
2000	2.5	3.9	0.05	0.14
2001	2.5	3.9	0.04	0.10
2002	1.9	3.1	0.04	0.10
2003	1.8	2.9	0.04	0.11
2004	1.6	2.9	0.04	0.12
2005	1.4	2.8	0.04	0.13
2006	2.4	5.4	0.06	0.19
2007	3.0	6.6	0.03	0.12
2008	2.4	5.3	0.05	0.19
<b>Totals</b>	<b>23.3</b>	<b>42.8</b>	<b>0.47</b>	<b>1.40</b>

**Figure 6.** Florida Commercial Oyster Landings (Millions) by Region  
 Source: NOAA National Marine Fisheries Annual Commercial Landing Statistics at [http://www.stnmfs.noaa.gov/st1/commercial/landings/annual\\_landings.html](http://www.stnmfs.noaa.gov/st1/commercial/landings/annual_landings.html)

<sup>22</sup> Ibid.; “Eastern Oyster (Farmed), Blue Ocean Institute, accessed at <http://www.blueoceaninstitute.org/seafood/species/68.html>.

Figure 6 illustrates the disparity between the commercial oyster harvest on the west versus the east coast of Florida. An industry worth several million dollars to Florida annually, oystering continues to be subsidized by the state and sometimes even federal governments channeled through the Florida Department of Agriculture and Consumer Services. State funding provides continued ability to seed new oyster beds or transplant oysters to beds where they will be more likely to mature to harvest size. However, today's consumers do their part to sustain this unique Florida institution and maintain a tradition of oyster consumption that existed even before the Calusa built their shell mounds.

Although deaths associated with contaminated water threw oysters out of culinary favor in Florida during the 1970s, they regained their status in the mid-1980s.<sup>23</sup> "Raw, roasted or fried, they're the chic seafood—and some of the best come from Florida," declared the *St. Petersburg Times* in 1985.<sup>24</sup> Yet as we will discover, generations of coastal Floridians have long considered the readily available mollusk a staple food item.

To appreciate the subtleties of variation in oyster flavor, it helps to understand how it grows. Oysters develop en masse attached to a solid surface in bodies of tidal water rich with nutrients. They feed by pumping and filtering between 25 and 100 gallons of water in a 24-hour period.<sup>25</sup> Dependent on water currents for food, oysters thrive in clean water containing a balance of salinity and nutrients; however, they will

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<sup>23</sup>Smith, "Oysters."

<sup>24</sup> Ibid.

<sup>25</sup> My research found a wide variation in the amount of water pumped by an oyster in a 24-hour period. For example, McClane, on page 210 in *The Encyclopedia of Fish Cookery*, claimed "as much as 25 gallons of water every 24 hours." But Cook, in *The Changeable World of the Oyster*, exclaims on page 16, "Scientists studying *Crassostrea* have noted that one oyster can pump more than a hundred gallons of water in one day!" Neither said to which oyster they referred.

tolerate occasional sudden changes in salinity and sediment.<sup>26</sup> Estuaries provide a particularly productive location for oyster beds where occasional muddy effluents characteristically full of molluscan nutrients nourish the beds. These fertile waters host one-celled plants called diatoms, or plankton, that provide food for the oyster, a bivalve (two-shell) vegetarian mollusk. In turn, water-borne minerals supply nourishment for the diatoms. In addition to water temperature and salinity, the balance of minerals contained in the diatoms directly influences the quality of the oyster, in particular its flavor, color, and nutritional value.<sup>27</sup> In France, for example, diatoms in the Atlantic coastal waters of the Marennes region are very rich in plankton and tinge the meat of local oysters green, providing a flavor and texture highly prized in the Paris market.<sup>28</sup> In the Tampa Bay area, however, restaurateurs reject Cedar Key oysters for a similar green tinge and slightly bitter taste. In Apalachicola, locals can discern whether oysters were harvested on the east or west side of the bay from their flavor and texture.<sup>29</sup>

However, Gulf of Mexico oysters do not garner rave reviews from all modern molluscan critics. Gulf oysters are not as salty as those on the Atlantic Coast, which may be part of their broader appeal to Southern oyster connoisseurs. The ready availability of Gulf of Mexico oysters is a convenience for restaurants and bars and provides almost year-round culinary pleasure for consumers nationwide. Despite their assignment as the “premier ‘oyster appellation’ of the Gulf Coast” by food writer Robb Walsh,

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<sup>26</sup> Joseph J. Cook, *The Changeable World of the Oyster* (New York: Dodd, Mead and Co., 1974), 9-10.

<sup>27</sup> A. J. McClaine, *The Encyclopedia of Fish Cookery* (New York: Holt, Rinehart and Winston, 1977), 210.

<sup>28</sup> Ibid.

<sup>29</sup> Telephone interview with Robert Richards, a 75-year old Tampa Bay native who was raised “on the water” and who is a former owner of The Seabreeze Restaurant, a long-time favorite seafood restaurant on the Causeway in South Tampa, August 2007. Telephone interview with Anita Grove, Executive Director, Apalachicola Chamber of Commerce on 25 August 2009.



Apalachicola oysters often invoke adjectives such as “mild” or “milky.”<sup>30</sup> In a recent book entitled *The Oyster Guide: A Geography of Oysters*, Rowan Jacobsen argues “that Gulf oysters don’t change in flavor throughout the years as much as northern oysters. They are a little fatter in winter, a little thinner in summer, but always mild and somewhat soft...[and] are usually sold as generic oysters.”<sup>31</sup> Warmer weather, and therefore warmer waters, stimulates reproduction in oysters; so, during the spawning period, the animals are more lean and watery than those harvested during the fall and winter. In *The Encyclopedia of Fish Cookery*, A.J. McClaine describes it this way:

Although all oysters are edible during their spawning season or the months without an “r” in them, the production of glycogen (an animal starch) is excessive at that time, giving the meat a milky appearance and a *blah* taste. Northern oysters are at their best in the fall and winter months, while Gulf bivalves are firm and ripe from December onward.<sup>32</sup>

Along with the seemingly predictable seasonal differences in its culinary character, the Gulf oyster provides some economic stability to the maritime communities vested in their harvest. Gulf Coast commercial oystermen practice pragmatic sustainability when it comes to maintaining a viable oyster product and harvest. Most practice some type of aquaculture, or oyster farming: depositing substrate or recycled shells in established oyster beds to which spat (young oysters) attach themselves, and from which they feed and grow until harvest. Or, oyster farmers might transfer, or *relay*,

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<sup>30</sup> Robb Walsh, *Sex, Death & Oysters: A Half-Shell Lover’s World Tour* (Berkeley, CA: Counterpoint, 2009), 25.

<sup>31</sup> “Gulf Coast” map and description in Rowan Jacobsen’s online discussion of his book, *The Oyster Guide: A Geography of Oysters: The Connoisseur’s Guide to Oyster Eating in North America* (New York: Bloomsbury, 2008). Accessed at <http://www.oysterguide.com/maps/gulf-coast>; In 2003, the state of California banned the sale of oysters harvested in Gulf of Mexico between April 1 and October 31, unless the oysters are certified as having undergone post-harvest treatments to eliminate pathogens. “Restrictions on Raw Gulf Oysters.” Public Notice. Food and Drug Branch, California Department of Public Health, accessed under Regulations and Statutes at <http://www.cdph.ca.gov/programs/Pages/FDB%20ShellfishSeafoodSafety.aspx>.

<sup>32</sup> McClaine, *The Encyclopedia of Fish Cookery*, 211.

oysters for different reasons, say, from polluted to cleaner waters to undergo natural purification, or from cooler waters that inhibit growth to warmer waters that stimulate growth. While oyster shell is the preferred substrate for spat, farmed oysters will often grow on a variety of cultch (the solid material on which oysters attach) including smooth tiles, bundles of sticks or bamboo, or even broken building blocks.<sup>33</sup> Ultimately, productive oyster beds will form naturally on whatever solid material happens to be available. Now in his seventies, Robert Richards, long-time owner of The Seabreeze, seafood restaurant, recalls hearing stories of how dredging in Tampa Bay during the 1920s affected the oyster supply. When the dredge swing chains wore out, tugboats dragged them clear of shipping lanes and deposited them in nearby DeLaney Creek, south of Tampa's 22nd Street bridge. Within a few months, spat became attached to the chains, and the underwater dump became a rich oyster bed.<sup>34</sup> The spat can grow rapidly from just a fraction of an inch to three inches—the legal harvesting size, within 18 months. By contrast, a Chesapeake Bay oyster takes three years to grow to the three-inches because cooler waters inhibit rapid growth.<sup>35</sup>

Despite the old wives' tale advising against consumption of oysters in months without an *r* in them, modern refrigeration and distribution makes oysters readily available at any time of year. Cook speculates the admonition is a consequence of the historic challenge to safely transporting oysters during summer months. Still, culinary perfectionists will insist that eating an oyster harvested during the summer signals lack of culinary discernment.<sup>36</sup>

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<sup>33</sup> Cook, *The Changeable World*, 64; Rebecca Stott, *Oyster* (London: Reaktion Books, 2004), 28.

<sup>34</sup> Richards interview.

<sup>35</sup> Smith, "Oysters."

<sup>36</sup> Cook, *The Changeable World*, 73.

Warm weather and the consequential warmer waters bring another challenge—higher temperatures stimulate often harmful, or even deadly, water-borne bacteria that, once ingested by oysters, can remain with them from harvest to the consumer’s table. The oyster’s heightened potential for transmitting foodborne illness makes the oyster industry the most highly regulated food business in the nation.<sup>37</sup> More discussion will follow on public health and safety issues pertaining to the Gulf’s shellfish industry.

Harvesting in a productive reef, an oysterman, or oysterwoman, might lift as much as thirty pounds per scoop as he or she works the 16 to 18-tooth tonging rakes and dumps that load onto a culling board in the boat.<sup>38</sup> Once oystermen dump the contents of their tonging efforts into the boat, they measure, cull, and then bag the oysters as 60-pound bushels. Federal law mandates tagged identification of each bag. The states of Louisiana and Texas allow the use of mechanical dredgers to harvest oysters. Florida does not because of the potential permanent damage to its rich natural oyster beds. Yet skiffs and tongs, and boats and dredgers are not the only ways to collect oysters. Because of their easy accessibility in intertidal waters, coon oysters provide a ready excuse for a family outing culminating in an oyster roast. A Gulf coast favorite, the coon oyster is so named because of its ready availability to both humans, and, particularly, raccoons for whom oysters provide a tasty treat.<sup>39</sup> Some claim the coon oyster is nothing more than a

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<sup>37</sup> Heil interview.

<sup>38</sup> Most people consider oyster harvesting with tongs the work of men; however, while some women tong for oysters, more women work as a culling partner to men, often their husband or another male family member. Some men work individually to tong and cull their own harvest; other men work in pairs periodically relieving each other of the heavy lifting by doing the easier culling. For the sake of ease in writing, I will refer to *all* oyster harvesters as “oystermen.”

<sup>39</sup> McClain, *The Encyclopedia*, 210.

smaller and narrower version of the *Crassostrea virginica* oyster.<sup>40</sup> Precise oyster species identification can be challenging; some suggest the coon oyster belongs to the species *Crassostrea rhizophorae*, commonly referred to as the “Mangrove” or “Caribbean” oyster.<sup>41</sup> These smaller oysters grow in clusters attached to mangrove roots and tolerate tidal flows that leave the oysters exposed to air for hours at a time. In Florida coon oysters are easy to harvest because they are closer to shore—within wading distance and often exposed at low tide—and therefore within reach of raccoons as well as humans. On Florida’s east coast, the great quantity of readily available coon oysters compelled Frederick J. Townsend, a British newcomer to the region in 1875, to write after an uncomfortable night of thunderstorms, mosquitoes, and sand flies:

At last the welcome daylight arrived, and it was with no little astonishment that we found ourselves surrounded by a forest every tree of which was covered, root and branch, with thick clusters of oysters. Rising to a height of forty or fifty feet above the water and mud, a dense growth of mangroves clothed the shore and studded the lagoon with forest islets. The lower branches, stems, and spider-like limbs of every mangrove tree, within reach of high-tide, were completely crusted with a compact mass of oysters, of a species known in Florida as “coon” oysters. We gathered a branch and ate some, but found the flavor bitter; the raccoons, however, are very fond of these tree-oysters, and devour them greedily, whence they get the name of “coon” oysters. Not only did these oysters cover the trees, but on every mud-bank as well as on the shores they lay in heaps three or four feet in depth.<sup>42</sup>

Today, anthropogenic forces impact the environment and the resulting availability of edible oysters along Florida’s coast. Natural and synthetic water-borne contaminants threaten oyster beds. Indeed, oysters are an environmental indicator species for the quality of local waters affected by pollution. Thriving oyster beds signal clean water and

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<sup>40</sup> V.G. Burrell, Jr. 1986. *Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic)—American Oyster*. U.S. Fish Wildlife Service Biol. Rep 82(11.57). U.S. Army Corps of Engineers TR EL-82-4, 1.

<sup>41</sup> McClain, *The Encyclopedia of Fish Cookery*, 210

<sup>42</sup> Frederick J. Townsend, *Wildlife in Florida* (London: Hurst and Blackett, 1875), n/p.

abundant opportunities for harvesting, whereas dying oyster beds indicate the opposite. Of course, monitoring of water quality occurs regularly at the local, state, and federal government levels, and I will discuss this more in the section on public health and government regulation.

Weather might be the most consistent influence not only on oyster productivity but also on the ability to harvest. While freshets—sudden influxes of fresh water due to heavy rainfall—are vital to oyster development, excessive levels of inland fresh-water flushing into bays causes damage to, and reduces productivity of, developing oyster beds. Incoming river flows bring nutrients, but they can also bring harmful pollutants like fecal coliform bacteria, fertilizers, and petroleum products. If too much rain flushes too much fresh river water into oyster bars, this reduces the water’s salinity, jeopardizing the optimum salinity balance for oysters, which is between 20 to 30 parts salt per thousand parts water (ppt). Too little rain reduces freshwater runoff and increases the salinity of oyster dependent waters, potentially raising acidity too high for oyster viability. While the average salinity of seawater is about 33 ppt, salinity levels below 10 ppt and above 30 ppt stunt oyster development. Additionally, increased salinity creates a welcoming environment for predatory oyster drills. Drills feed on and kill oysters by boring into its shell and consuming the flesh. The current interstate dispute among Florida, Georgia, and Alabama over the manipulation of water flows via dams along the Apalachicola, Flint, and Chattahoochee Rivers (ACF) is one example of how important fresh water flow is to the successful production of the Apalachicola Bay oyster harvest.

Despite their mostly submerged settings, Florida’s Gulf oyster reefs are not immune from the fury of tropical storms. Hurricanes, in particular, increase the potential

for toxin-laden storm runoff. Storm surge backwash may deposit ruins of boats, piers, and buildings atop oyster beds, or bring layers of silt, which smothers them. Oyster beds may take years to recover from destructive hurricane-force winds and storm surges, during which time oystermen and their economic partners—brokering seafood dealers, fish houses, and restaurateurs—suffer. For example, according to the Florida Fish and Wildlife Research Institute, in 2003 statewide oyster harvests were 1,791,283 pounds, 20% lower than the average harvest from 1998-2002, and 25% lower than the historical average landings from 1982-2003. Averaging 5.0 million pounds from 1982 to 1985, Florida's Gulf landings declined by 50% after 1985's Hurricane Elena destroyed oyster beds. The same beds were later exposed to a prolonged period of drought, from 1987 to 1989, and the Gulf oyster harvest reached a low of 1.4 million pounds in 1996, recovering to 2.6 million pounds in 2001, then decreasing to 1.8 million pounds in 2003 (See Figure 5).<sup>43</sup> More recently, in 2005, Hurricane Katrina wreaked havoc with oyster beds throughout the Gulf. The effects were felt throughout the industry, from harvest to table. According to the *St. Petersburg Times*, "Dave Mastry at Mastry's seafood in St. Petersburg ... is no longer offering oysters. 'Oyster prices were already high before Katrina,' he said. 'Besides people are reluctant to eat them and there's a lot of uncertainty about what's coming out of Louisiana [concern about the safe consumption of oysters harvested from storm-plagued waters].'"<sup>44</sup>

Surprisingly, according to Dave Ankeney of Bar Harbor Seafood in Orlando, price influences purchasing more so than media stories of oyster-caused illness, despite

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<sup>43</sup> Florida Fish and Wildlife Institute website, "Eastern Oyster," [http://www.floridamarine.org/features/view\\_article.asp?id=4825](http://www.floridamarine.org/features/view_article.asp?id=4825).

<sup>44</sup> Waveney Ann Moore, "Storm Scatters Oyster Supply: Hurricane Katrina Aftermath," *St. Petersburg Times*, 17 September 2005, B1.

the fact that eating contaminated oysters is a major cause food-borne disease in the U.S.<sup>45</sup> According to Ankeney, “prime” oysters—single as opposed to those clustered by attached shells—cost more, but some exacting chefs demand them; and, the least expensive oysters travel shorter distances from harvest to table. For example, for consumers in the Tampa Bay area, Apalachicola oysters are usually a good bargain, according to Ankeney, although he confirmed that most of the area’s high-end restaurants and bars will offer at least one northern oyster, occasionally even the “supreme” Malpecques from Prince Edward Island in Canada. Former restaurateur Robert Richards confirms that the Apalachicola oyster was the most popular at his restaurant.

Over time, environmental changes affect the viability of healthy oyster beds. Salinity and water quality especially affect oyster bed growth. For example, there is evidence that the Tampa Bay area once had thriving commercial oyster beds. In an article that A. Smeltz wrote for the 1898 Bulletin of the United States Fish Commission, he wrote of his investigation of the greater Tampa Bay area:

...thence I continued southward to the Alafia River, Big and Little Manatee, Sarasota, Boca Grande oyster bars and 100 miles farther south, and on every hand I found the same conditions – oysters, oysters everywhere. How little did I then think that in less than twenty-five years every one of these bars would be partially or totally depleted.<sup>46</sup>

Indeed, Tampa Bay has had its oystering successes. In 1928, P. D. Howe operated an oyster farm at the north end of Old Tampa Bay and offered oyster roasts at his place. The *St. Petersburg Times* reported that Howe personally delivered a quart of

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<sup>45</sup>Personal interview with the late Dave Ankeney, former Wholesale Seafood Representative, Bar Harbor Seafood, Orlando, Florida, January 2006; CNN News Online, “CSPI: Seafood, Eggs Biggest Causes of Food Poisoning in the US,” 7 August 2000, accessed at <http://archives.cnn.com/2000/FOOD/news/08/07/food.poisoning.reut/>.

<sup>46</sup>A. Smeltz, “The Oyster-Bars of the West Coast of Florida: Their Depletion and Restoration,” in the 1898 *Bulletin of the United States Fish Commission*, Washington, D.C.: Government Printing Office, 305;

his oysters to the newspaper for sampling. The oysters were so plump that as few as twenty filled a quart. The newspaper described them as the “best and fattest ever seen in this section.”<sup>47</sup> Howe attributed his success in harvesting large, fat oysters to spring-fed water mixing with the estuarine Bay waters producing an ideal growing situation in an easy to harvest environment—one he thought others should consider, too, as he planned to lease another five or six acres to extend his venture. Yet, increased pollution and development and, over a longer period of time, other changes such as rising sea levels, eroded the oyster population in west central Florida.<sup>48</sup> Robert Richards recalled how the



**Figure 7.** Road fill shell pit. *Courtesy Florida Memory Collection.*

quality of Tampa Bay oysters lessened over time as they exhibited leaner meat and higher water content, making them uncompetitive with the readily-obtainable and more flavorful

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<sup>47</sup> “Oyster farmer extols profit potential,” *St. Petersburg Times*, 3 February 1928.

<sup>48</sup> Telephone conversation with Bill Arnold, PhD, Research Scientist, Fish and Wildlife Research Institute, St. Petersburg, November 2007.



Apalachicola oysters.<sup>49</sup> The declining quality of oysters is consistent with Tampa Bay's water quality problems during the later half of the twentieth century. Throughout Florida physical evidence abounds of the oyster's cultural impact. Over several millennia prior to the arrival of the Spanish explorers in 1513, coastal dwelling Indians discarded shells in huge piles called middens. Even in 1880, one midden at Safety Harbor in Pinellas County measured 146 feet by 162 feet and 20 feet high.<sup>50</sup> Today, several shell middens still punctuate Florida's coastal areas, although most have been disturbed by ruthless treasure hunters and pragmatic construction workers. For more than the last century, many of these shell mounds provided easily extractable road fill, much to the dismay of modern archaeologists studying Native American material culture. Unfortunately, random and careless scavenging of the layers of shell and other debris that has accumulated over time disturbs the distribution and condition of the artifacts. To the local populace, however, use of this ancient shell "debris" signaled development; oxen-hauled carts loaded with oyster shell were a welcome sight. The caption of one nineteenth century photograph of Bradenton reads: "One of the biggest events in the life of the young community was the paving of Main Street with oyster shell. It had been a dirt road for years, but now, in 1893-94, it became a hard road, and progress could not be stopped anymore."<sup>51</sup> Crowds gathered to watch the laying of the shell with great excitement and anticipation.

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<sup>49</sup> Richards interview.

<sup>50</sup> Mac Perry, Sacred Lands Preservation and Education, accessed at <http://www.sacredlands.info>.

<sup>51</sup> Arthur C. Schofield, *Yesterday's Bradenton* (Miami: E.A. Seeman Publishing, Inc., 1975), 21.



**Figure 8.** Steam roller, packing shells for Apalachicola roadbed in 1910. *Courtesy of the Florida Memory Collection.*

Above-ground mounds of oyster shell were not the exclusive source of construction-bound shells. Entire businesses grew to specialize in the collection of ancient oyster shell by dredging it from underwater. One such company was R.C. Huffman Construction in St. Petersburg during the mid 1950s and 1960s. Huffman's company dredged for shells and deposited them in huge piles adjacent to Bayboro Harbor. Huffman would then sell and distribute the shells, mainly to road builders and contractors.<sup>52</sup> Layers of silt and mud camouflage old underwater oyster beds making them difficult to locate, but the payoff for oyster-shell dredging was lucrative because prehistoric shells actually provide the best shell product for road construction. The shells of live oysters are rock-hard and unforgiving, but old shell crushes and packs easily, and provides a robust foundation for roads and driveways that may consequently be overlaid with non-permeable road surfaces such as asphalt. Many people in the South have long

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<sup>52</sup> William Smith, "About that Shell Hill," *St. Petersburg Times*, 23 January 1966, magazine, 12.

preferred the aesthetic look of a crushed shell driveway—one that is attractive, quiet, easily maintained, and environmentally friendly. To that end, the City of St. Petersburg used 29,670 tons of shell in road works as recently as 1966.<sup>53</sup>

Nor is the use of crushed oyster shell limited to road fill. Historically, oyster shell mixed in equal parts with lime, sand, and water produced *tabby*, a cheap, but labor intensive building material popular in South Carolina, Georgia, and Florida, particularly before the American Revolution (see Figure 9).<sup>54</sup> The introduction of Portland Cement mixed with shells launched a Tabby Revival period that lasted from the 1880s until 1925.<sup>55</sup> The observant wayfarer will find examples of tabby in some of the Tampa Bay area's older neighborhoods. Older Florida neighborhoods, particularly Italian immigrant communities, reveal another use of prehistoric oyster shell—courts of the popular Italian ball game, bocce. Bocce courts are best laid on a foundation of compacted, crushed shell followed by a surface dusted with oyster shell flour that, once compacted, produces a hard-wearing finished surface.<sup>56</sup> Unfortunately for modern archaeologists, the popularity of oyster shell for its many uses added to the destruction of shell middens.

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<sup>53</sup> Ibid.

<sup>54</sup> Dennis Adams, "Tabby, The Concrete of the Lowcountry." The Beaufort, South Carolina, Public Library website, <http://www.beaufortcountylibrary.org/rooms/documents/html/tabby.htm>.

<sup>55</sup> Laura Sickels-Taves, "The Care and Preservation of Tabby." The Henry Ford Museum website, <http://www.hfm-gv.org/research/caring/tabby.aspx>, and "Tabby," in *The New Georgia Encyclopedia*, Georgia Humanities Council website, accessed at <http://www.georgiaencyclopedia.org/nge/Article.jsp?id=h-3277&hl=y>.

<sup>56</sup> An example of a common bocce court construction procedure is available at <http://www.boccebrew.com/Boccepro5.htm>.



**Figure 9.** A period example of tabby construction, Gamble Plantation in Manatee County, c. 1902. *Courtesy of Florida Memory Collection.*

In the twentieth century, plastic buttons eliminated the production and use of popular mother-of-pearl buttons, extracted from inside oyster and mussel shells. Pearls remain a favorite fashion jewelry accessory, but the most celebrated of those actually come from mussels, not oysters. Today, we find oyster shell on the retail shelf in various forms. Natural or health food stores stock calcium supplements containing crushed oyster shell. Farm feed and supply stores offer crushed oyster shell by the pound as a soil amendment (lime) and as an additional source of nutritional grit for poultry. Pet supply stores stock boxes of crushed oyster shell for customers seeking nutrients for caged birds and pH balance for koi ponds. Even the local garden center offers crushed and broken oyster shell as a soil additive for improved drainage or pH balance.

The multiple and flexible uses of an oyster harvest, from consumption to construction, as an environmentally friendly flood barrier in the form of an oyster reef,

and as water-quality indicator provide justification for sustaining oyster research and traditional oystering practices—planting and harvesting—in all coastal areas of Florida.

## Chapter Two

### Public Health and Marketing Challenges

*Culture begins when the raw gets cooked.*

*Felipe Fernandez-Armesto*

How is it that in this age of advanced medicine, modern public health regulation, and heightened hygiene awareness, people get sick, sometimes fatally, from eating raw oysters? There's more to consider before enthusiastically downing a tray of freshly shucked oysters on the half-shell than whether you are eating them in a month that contains an *r*. Raw and inadequately cooked oysters harbor potential for illness that might be as mild as a stomach upset or as severe as deadly blood poisoning. As filter feeders, oysters concentrate what they ingest and in addition to water-borne nutrients, they can take on *Escherichia coli* (*E-coli*) bacteria from sewage-infested water, *Vibrio* bacteria from the same bacteria family as cholera, or heavy metals and other industrial pollutants.

In 1993, one Florida newspaper headline read, "Eight people have died in Florida this year from eating contaminated raw oysters."<sup>57</sup> Indeed, Florida experienced the largest outbreak of oyster-associated gastroenteritis ever reported in January 1995, when 228 people fell ill after consuming oysters, raw *and* cooked, traced back to an Apalachicola Bay harvest.<sup>58</sup> Late in 2004, headlines warned, "Raw oysters are risky, State says."<sup>59</sup> More recently, a headline in the *Florida Times-Union* declared "Area

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<sup>57</sup> S. Purks, "Shucks! Even death can't deter raw oyster lovers" *Tampa Tribune*, 1 January 1993.

<sup>58</sup> S. McDonnell, et al. "Failure of cooking to prevent shellfish-associated viral gastroenteritis," *Archives of Internal Medicine* 157(1), (1997 Jan. 13): 111-116.

<sup>59</sup> S. Colavechio-Van Sicker, "Raw oysters are risky, State says," *St. Petersburg Times*, 19 November 2004 South Pinellas Edition, B1.

oysters contain fire retardant.”<sup>60</sup> The last few years have given rise to concerns about shellfish-borne *Vibrio* bacteria, and related illness and deaths that make headlines.<sup>61</sup> Shellfish brokers and retailers cringe at such reports because the consuming public thinks twice before choosing to swallow the tasty bivalve. Not surprisingly, strengthening a declining market for oyster products remains a significant challenge.<sup>62</sup>

In this chapter, I consider the culture of suspicion and popular myth surrounding oyster consumption and present data on the numbers of people who actually became ill from consuming raw or undercooked oysters. I examine shellfish regulation as it pertains to oysters, specifically public health controls surrounding oysters and shellfish from harvest to wholesale distribution to retail sale, as well as the consequences of eating contaminated oysters. Finally, I will look at the strategies the shellfish industry uses to market a product with such a risky reputation.

People generally love or loathe raw oysters. The “slimy” texture revolts some while the tang of its salty liquor and fleshy texture elates others. Highly nutritious, oysters are rich in copper, iodine, calcium, and especially iron. Moreover, one cup of oyster meat contains as few as 160 calories.<sup>63</sup> Oysters provide an abundance of nutrients to the human diet. Low in fat and cholesterol, oysters have a high protein content that makes them a healthy substitute for meat. Oysters are a rich source of iron, zinc, omega-

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<sup>60</sup> Steve Patterson, “Area oysters contain fire retardant,” *Florida Times Union*, 19 May 2009.

<sup>61</sup> *Vibrio* is a potentially deadly bacteria in the same family as cholera. Jane E. Brody, “The Culprits, When Good Food Goes Bad,” *New York Times*, 6 February 2001, F.8; Greg Winter, “Gulf Coast Oyster Farmers Try Self-Regulation,” *New York Times*, 27 May 2001, Section 3, 5; Letitia Stein, “Do you know what you’re diving into?” *St. Petersburg Times*, 11 May 2009, B1.

<sup>62</sup> W. Arnold and M. Berrigan. *A Summary of the Oyster (Crassostrea virginica) Fishery in Florida: A Report to the Division of Marine Fisheries, Florida Fish and Wildlife Conservation Commission*. January 2002. Accessed at [http://research.myfwc.com/publications/publication\\_info.asp?id=43908](http://research.myfwc.com/publications/publication_info.asp?id=43908)

<sup>63</sup> *Ibid.*

3, vitamin B, copper, manganese, calcium, and phosphorus, as well as 200 times more iodine than an equivalent amount of beef.<sup>64</sup>

Yet despite its nutritive value, uncertainty about eating oysters, especially raw oysters, is common. People with low immune efficiency are most susceptible to bacteria called *Vibrio vulnificus* and *Vibrio parahaemolyticus*, sometimes found in oysters. Both are halophilic organisms—they can live in saltwater—and they thrive in warm, brackish seawater, and both occur naturally in coastal waters of the United States and Canada. If present, these bacteria occasionally trigger infections through open wounds exposed to seawater.<sup>65</sup>

	FL	AL	MS	LA	TX	Totals
2007	54	9	8	28	60	159
2006	70	0	9	31	54	164
2005	98	2	23	44	52	219
2004	11	5	0	37	76	129
2003	91	9	2	28	48	178
2002	78	12	5	34	46	175
2001	55	14	4	35	24	132
2000	57	7	9	18	34	125
1999	80	14	3	25	42	164
1997-1998*	171	19	8	99	92	389
<b>Totals</b>	<b>765</b>	<b>91</b>	<b>71</b>	<b>379</b>	<b>528</b>	<b>1,834</b>

\*Note: 1997 and 1998 data were not separated in the source report.

**Figure 10.** Numbers of Reported Gulf Coast *Vibrio* infections  
 Source: Annual Summaries, Cholera and other *Vibrio* Illness Surveillance System. National Surveillance Team-Enteric Diseases Epidemiology Branch, Centers for Disease Control and Prevention, available at [http://www.cdc.gov/nationalsurveillance/cholera\\_vibri](http://www.cdc.gov/nationalsurveillance/cholera_vibri)

<sup>64</sup> Florida Seafood, Florida Department of Agriculture and Consumer Services, accessed at [http://www.fl-seafood.com/consumers/nutrient\\_values.htm](http://www.fl-seafood.com/consumers/nutrient_values.htm); W. Nowak, *The Marketing of Shellfish* (London: Fishing News [Books] Ltd., 1970), 156.

<sup>65</sup> “*Vibrio parahaemolyticus*” and “*Vibrio vulnificus*, ” Centers for Disease Control and Prevention, Division of Foodborne, Bacterial and Mycotic Diseases. Accessed at [http://www.cdc.gov/nczved/dfbmd/disease\\_listing/vibriop\\_gi.html](http://www.cdc.gov/nczved/dfbmd/disease_listing/vibriop_gi.html) and [http://www.cdc.gov/nczved/dfbmd/disease\\_listing/vibriov\\_gi.html](http://www.cdc.gov/nczved/dfbmd/disease_listing/vibriov_gi.html) respectively.



*Vibrio parahaemolyticus* causes gastrointestinal illness in humans, most commonly through consumption of raw or undercooked shellfish, especially oysters. Medically, the infection is self-limiting, i.e., symptoms of diarrhea and cramping, nausea, vomiting, fever and chills last no longer than three days and do not require aggressive medical treatment.<sup>66</sup> Many cases go unreported because infected people often do not seek medical care. More people become ill from *V.*

*parahaemolyticus*, than from *Vibrio vulnificus*, but deaths are rare. However, while fewer people contract *V. vulnificus*, more of them will die from that infection or live with serious consequences of blood poisoning such as limb amputation.<sup>67</sup> Figure 10 shows the number of reported *Vibrio* occurrences in Gulf Coast states during the 11-year period between 1997 and 2007. The data in Figure 10 reveals that Florida has experienced a significantly higher number of reported cases of *Vibrio* disease. One might surmise the



**Figure 11.** *Vibrio vulnificus* infection must be treated with massive doses of antibiotics. In some cases amputation is the only means to prevent the spread of the infection.

<sup>66</sup> “*Vibrio parahaemolyticus*.” Center for Disease Control and Prevention, Division of Foodborne, Bacterial and Mycotic Diseases, accessed at [http://www.cdc.gov/nczved/dfbmd/disease\\_listing/vibriop\\_gi.html#1](http://www.cdc.gov/nczved/dfbmd/disease_listing/vibriop_gi.html#1).

<sup>67</sup> As summarized in each of the CDC’s *Vibrio* surveillance reports from 1997-98 through 2007. Accessed at [http://www.cdc.gov/nczved/dfbmd/disease\\_listing/vibriov\\_gi.html](http://www.cdc.gov/nczved/dfbmd/disease_listing/vibriov_gi.html).

reasons for this are: 1) consumption of raw oysters by Florida's large population of senior citizens who because of their advanced age and potentially weaker immune systems become ill; 2) better diagnosis and reporting of the disease to the state's department of public health; 3) the many visitors to the state who may not have been exposed to, or believed, the numerous health warnings and safe oyster consumption education posted in places of purchase or consumption.

Healthy people who ingest *Vibrio vulnificus*, most often after eating raw or undercooked oysters, experience much the same gastrointestinal symptoms as those exposed to *V. parahaemolyticus*.<sup>68</sup> Unfortunately, people with compromised immune systems, in particular those with chronic liver disease, will likely face an infection in the bloodstream, or what the Center for Disease Control and Prevention (CDC) describes as “a severe and life-threatening illness characterized by fever and chills, decreased blood pressure (septic shock), and blistering skin lesions...fatal about 50% of the time”<sup>69</sup> Invasion of *V. vulnificus* through open wounds exposed to direct contact with seawater is most dangerous to immuno-compromised persons, and if not fatal, may lead to limb amputation.<sup>70</sup> Figure 11 provides an example of the severity of *V. vulnificus* infection.

Others at high risk are persons suffering from hemochromatosis,<sup>71</sup> alcoholism, HIV/AIDS, and cancer. Even people who have had gastric surgery, or take antacid medicine to reduce stomach acid levels should avoid raw or undercooked shellfish. The International Sanitation Shellfish Conference (ISSC) reports that “the typical U.S.

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<sup>68</sup> Ibid. After oysters, shrimp is the next most likely food to cause *Vibrio* illness in humans.

<sup>69</sup> “*Vibrio vulnificus*.” Center for Disease Control and Prevention, Division of Foodborne, Bacterial and Mycotic Diseases, accessed at [http://www.cdc.gov/nczved/dfbmd/disease\\_listing/vibriov\\_gi.html](http://www.cdc.gov/nczved/dfbmd/disease_listing/vibriov_gi.html).

<sup>70</sup> Ibid.

<sup>71</sup> Defined by the *Encarta Dictionary* as a genetic disorder wherein the human body stores an excess of iron that leads to organ damage, particularly the liver and the pancreas.

shellfish-consumption *V. vulnificus* case profile is a middle-aged, white man who is a heavy drinker and either is unaware of or ignores dietary risks. He consumes three to twelve raw oysters and develops septicemia.”<sup>72</sup>

When it comes to consumption of raw or undercooked oysters or clams, no physical appearance or taste indicator alerts the unlucky consumer to the presence of *V. vulnificus*. According to the *Journal of the Florida Medical Association*, of the cases reported from 1981 to 1992, 72 cases of *Vibrio vulnificus* infection from raw oysters were reported; 36 patients (50%) died, making this infection the leading cause of reported deaths from food-borne illness in Florida.<sup>73</sup> Between January 1996 and May 2009, 346 cases of *Vibrio vulnificus* were reported to the Florida Department of Health.<sup>74</sup>

Until 2007, infections caused by *Vibrio* species were not required to be reported to the CDC by the states’ departments of public health; however, since 1988 the Gulf of Mexico states have voluntarily collaborated with the CDC to provide data. It is in those states where most *Vibrio* cases occur, especially during the months of May through September, with infections peaking during June, July, and August, the months with the warmest water temperature. Health officials advise people at high risk, particularly those with cancer, HIV, hepatitis, diabetes, and even heavy drinkers, not to eat raw oysters.

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<sup>72</sup>M. Tamplin, R. Hammond, P. Gulig, and R. Baker, *Vibrio vulnificus*, a Hidden Risk in Raw Oysters (2001, video). A clinician’s guide to *V. vulnificus* infection and treatment. Quote accessed at <http://safeoysters.org/medical/PubHealthImpact.htm>.

<sup>73</sup>Hlady, W.G., R.C. Mullen, and R.S. Hopkins, “*Vibrio vulnificus* from raw oysters: Leading cause of reported deaths from food borne illness in Florida,” *Journal of the Florida Medical Association*. (Aug. 1993) 80(8): 536-8.

<sup>74</sup>Florida Department of Health Communicable Disease Frequency Report by Year. Accessed online at [www.myflorida.com/DOH](http://www.myflorida.com/DOH).

Many, though not all, public health experts claim thorough cooking will kill the bacteria resulting in safe consumption.<sup>75</sup>

Bear in mind that most raw oysters, excluding those that are post-harvest treated, are sold as live animals. The tag affixed to each bag of harvested oysters indicates who harvested them, the date of harvest, and the place of harvest. That tag remains with those oysters throughout the entire distribution process, *and* ninety days beyond retail sale in order to backtrack in the event of post-consumption illness. That seems a reasonable time period because illness symptoms usually appear from 12 hours to several days after infection. This period allows time for any sporadic reporting to be investigated by public health departments. The optimum temperature range for safe storage of live oysters is between 34 and 45°F.<sup>76</sup> Stored at that temperature, Gulf oysters are safe for consumption for up to fourteen days, northern oysters for twenty-one days.<sup>77</sup> Buyers have the option to request oysters that have been pasteurized or pre-treated for the *Vibrio* bacteria, but they are not available at all outlets. These post-harvest processed (PHP) oysters are treated in the shell to ensure safety and retain flavor.

Human ingestion of contaminated oysters can trigger other unpleasant ailments. Today, oyster-borne viral pathogens such as Hepatitis A, which damages the liver, and Norwalk virus (*calicivirus*), which causes gastroenteritis associated with *Vibrio parahaemolyticus* infection from Gulf coast oysters, are reported by the medical community on a regular basis giving credence to the need for public safety parameters.<sup>78</sup>

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<sup>75</sup> Shannon Colavecchio-VanSickler, "Raw Oysters are Risky, State Says." *St. Petersburg Times*, November 19, 2004, B1.

<sup>76</sup> Interstate Shellfish Sanitation Conference (ISSC), "How Should Oysters Be Stored and Handled?" Accessed at <http://www.iscc.org/ConsumerInfo/Oysters.aspx>.

<sup>77</sup> Ankeney interview.

<sup>78</sup> See, for example, the article, "Epidemiologic Notes and Reports Foodborne Hepatitis A—Alaska, Florida, North Carolina, Washington," in the CDC's Morbidity and Mortality report, *MMWR Weekly*, (13

In the Gulf of Mexico, Hepatitis A-contaminated oysters usually originate from oyster beds polluted by untreated sewage from offshore oil-drilling platforms or fishing boats. However, in 1988, Hepatitis A infected 61 people who ate oysters harvested from unapproved oyster beds near sewage treatment plants.<sup>79</sup>

Norwalk virus, first identified in 1972, passes from one human to the next via stool contamination producing mild to severe gastrointestinal symptoms.<sup>80</sup> Like Hepatitis A, typhoid and cholera, Norwalk virus contamination of oysters most often occurs from raw sewage dumped overboard by recreational or commercial boaters. In January 1995, 322 cases of Norwalk virus infection–associated acute gastroenteritis resulted from the consumption of raw oysters in Florida. In 2003, six people in Texas contracted typhoid fever as a result of eating oysters from the same oyster bed.<sup>81</sup>

On top of all this, red tide triggers even more health complications associated with oyster consumption. Ingestion of red tide algae by oysters renders them potentially toxic to humans because filter feeding concentrates the red tide toxin in oyster meat.<sup>82</sup> The Florida Department of Health warns that oysters should not be eaten if harvested from red

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April 1990), 39(14): 228-232. The report refers to an August 1988 outbreak of hepatitis A in 61 persons: Alabama (23), Florida (18), Georgia (18), Hawaii (1), Tennessee (1) all perpetuated by consumption of oysters harvested from Bay County, Florida, waters. It's interesting to note that 80% of those infected were male, and 97% (59) of the total number of infected persons ate raw oysters, although one did consume baked oysters and the "median incubation period between consumption of raw oysters and onset of illness was 29 days" with a range of 16-48 days.

<sup>79</sup> A.E. Fiore, "Hepatitis A Transmitted by Food" *Food Safety: Clinical Infectious Diseases* (March 2004) (38): 705.

<sup>80</sup> M. Kohn, T. Farley, T. Ando, et al. "An outbreak of Norwalk virus gastroenteritis associated with eating raw oysters: implications for maintaining safe oyster beds." *Journal of the American Medical Association* (1995), (273): 466-71.

<sup>81</sup> S. McDonnell, K.B. Kirkland, W.G. Hlady, et al., "Failure of cooking to prevent shellfish-associated viral gastroenteritis, *Archives of Internal Medicine*, (1997), (157)1: 111-6.

<sup>82</sup> According to the Mote Marine Laboratory in Sarasota, Florida, "Florida red tide is the generic term for a bloom of a microscopic alga (a plant-like organism) called *Karenia brevis*." First identified in Florida in the 1840s, its exact cause is still being scientifically investigated but nitrogen-rich pollution seems to aggravate it. Red tide blooms may cause closure of some oyster harvest areas because red tide toxin retained in the oyster may cause illness in consumers. Accessed at

<http://www.more.org/idex/php?src=faq&refno=438category=Florida%20red%20tide>

tide-affected waters.<sup>83</sup> Symptoms from consuming red-tide contaminated shellfish may begin within a few hours of consumption and "...include tingling and numbness of tongue, lips, throat; muscular aches; gastrointestinal distress; and dizziness, depending on the amount of toxin ingested and the overall health of the victim." Such symptoms typically do not last more than a couple of days but the toxin may be fatal to people with severe respiratory conditions.<sup>84</sup> On the Florida coast, high concentrations of red-tide algae in waters containing shellfish prompt the state government to prohibit harvesting in that area. Florida's Department of Agriculture and Consumer Services closed the Apalachicola Bay oyster beds from September to late November 2005 due to extremely high levels of red tide.<sup>85</sup> "The oysters harvested from a closed area present a significant threat to public health,"<sup>86</sup> observed Capt. Martin Redmond, [Florida] Fish and Wildlife Commission investigations supervisor for the North Central Region, when interviewed about the November 2005 arrest of three people in Dixie County for selling oysters collected from a closed area. Capt. Redmond emphasized the need to prevent unlicensed harvest and sale of shellfish products, an illegal practice that can result in charges ranging from a misdemeanor to a felony. In this case, the perpetrators were charged with: harvest of oysters from a closed area; commercial harvest/sale of oysters with no Saltwater Products License; commercial harvest from a vessel not constructed to protect products from bilge/contaminants; shellfish harvest vessel not equipped with sewage disposal

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<sup>83</sup> Florida Department of Health, Bureau of Community Health/Aquatic Toxins, <http://www.doh.state.fl.us/environment/community/aquatic/redtide.htm>.

<sup>84</sup>Ibid. "Red Tide," Florida Fish and Wildlife Research Institute, accessed at [http://research.myfwc.com/support/view\\_faqs.asp?id=13](http://research.myfwc.com/support/view_faqs.asp?id=13).

<sup>85</sup> David Heil, "Bronson Announces Re-opening of Shellfish Areas," Florida Department of Agriculture and Consumer Services Press Release, 23 November 2005.

<sup>86</sup> K. Parker, "FWC takes on illegal oyster harvesters," Florida Fish and Wildlife Commission Press Release, 6 December 2005.

receptacle. Collectively, these charges indicate the seriousness of jeopardizing not only public health, but also the economic viability of one of Florida's iconic food industries.

In 1995, the Epidemic Intelligence Service of the Centers for Disease Control and Prevention (CDC) conducted an investigation of “the largest outbreak of oyster-associated gastroenteritis ever reported,” which occurred in the Florida panhandle in January of that year. They tested stool specimens and serum samples for antibodies to Norwalk virus from 223 oyster eaters, 129 of whom became ill. Investigators found that 67 percent of those people who ate grilled, stewed, or fried oysters became as ill as those who ate raw oysters, *even though water quality tests for fecal coliform were within acceptable limits.*<sup>87</sup> Ultimately, investigators attributed the outbreak to feces dumped overboard from boats during an outbreak of diarrheal illness among Apalachicola Bay communities. The CDC's “findings of acceptable water quality measures for fecal contamination and the lack of appreciable protective effect from cooking leave the consumer with *no assurance of safety* [emphasis mine],”<sup>88</sup> so it could be suggested that Irish writer Jonathan Swift's maxim that “He was a bold man that first ate an oyster” holds true today.

In addition to grandmother's admonition to avoid consumer oysters in a month not containing an *r*, consumption of raw oysters draws other axioms. One invokes the belief that drinking alcohol as one eats raw oysters renders them safe to eat. Another is that dousing raw oysters in hot sauce prevents illness. Neither of these alleged preventive measures works. The preferred principle is that illness prevention lies in educating people about the risks of consuming raw or undercooked shellfish. Numerous public education

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<sup>87</sup> S. McDonnell, K. Kirkland, W. Hlady, et al., Ibid.

<sup>88</sup> Ibid.

and information efforts are made from websites hosted by the Center for Disease Control, the Florida Department of Health, Florida Department of Agriculture and Consumer Services, [www.safeoysters.org](http://www.safeoysters.org), and [www.beoysteraware.com](http://www.beoysteraware.com). Time and again, food safety officials say *fully* cooked oysters may be safely consumed, even by high-risk persons. Florida state law requires any establishment selling fresh or cooked seafood to post a notice warning that the consumption of raw or cooked seafood may pose a health threat to consumers. Restaurant menus contain this warning, and retail seafood counters are required to post the warning in direct sight of purchasers.

The regulation of shellfish harvesting in the United States began in the late seventeenth century when the Dutch colony of New Amsterdam enacted conservation legislation.<sup>89</sup> However, public health concerns did not become a national priority until the late nineteenth century after the advent of Louis Pasteur’s germ theory. At that time, large outbreaks of severe illness attributed to the consumption of raw oysters, clams, and mussels occurred throughout the western world, in particular bacteria, originating from sewage—fecal coliforms—that contaminate shellfish. In his book, *The Big Oyster*, Mark Kurlansky discusses how, in the late nineteenth century, Pasteur’s germ theory supported the long-suspected connection between oysters and diseases such as cholera (*Vibrio cholerae*) and typhoid fever (*Salmonella bacillus*): “In one decade [the 1890s], the medical view of the world changed. The culprits of urban epidemics switched from poverty, immigration, and immorality to bacteria, sewage, and shellfish.”<sup>90</sup>

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<sup>89</sup> U.S. Department of Health and Human Services, Public Health Administration, Food and Drug Administration. “Introduction,” *National Shellfish Sanitation Program Manual of Operations (NSSP Manual), ISSC, Part I and II*. (Washington, D.C.: Food and Drug Administration, Shellfish Sanitation Branch, 2007), accessed at <http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/Seafood/FederalStatePrograms/NationalShellfishSanitationProgram/ucm061549.htm>; Mark Kurlansky. *The Big Oyster: History on the Half Shell* (New York: Ballantine Books, 2006), 82-85.

<sup>90</sup> Kurlansky, *The Big Oyster*, 252-253.



Consequently, public health officials placed new emphasis on government inspection and regulation of water quality.

Ingestion of sewage-contaminated oysters led to an intensely virulent epidemic of typhoid fever in 1924 that spanned New York, Washington, D.C., and Chicago. New York alone recorded more than 400 cases.<sup>91</sup> In response to public and government pressure to do something to ensure safe seafood consumption, the Surgeon General of the United States and the federal Public Health Service convened a conference in Washington, D.C. in 1925 comprising 150 representatives of state and municipal health authorities, state conservation commissions, the predecessor of the Food and Drug Administration—the Bureau of Chemistry, the predecessor of the National Marine Fisheries Service—the Bureau of Commercial Fisheries, and members of the shellfish industry. At the conclusion of the conference, resolutions called for:

- Identification, inspection and control of shellfish beds by some official state agency and the U.S. Public Health Service.
- Inspection and control of shellfish shucking, preparation, or packaging by some official state agency and the U.S. Public Health Service.
- State control, in cooperation with trade organizations, of ensuring the source and authenticity of the shellfish is honestly communicated to the consumer.
- Supervision, inspection, control, and approval of shipping methods by appropriate federal and state agencies
- Product conformation to established bacterial standards and federal, state, and local laws relative to salinity, water content, food proportion, and Pure Food Laws.<sup>92</sup>

The Surgeon General relayed these guidelines to state health authorities later in the year, and he made clear that ultimate responsibility for shellfish industry sanitation control lay

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<sup>91</sup> “New typhoid cases in city decrease,” *New York Times*, 23 December 1924.

<sup>92</sup> *Ibid.*; “Move to protect oysters from germs,” *New York Times*, 20 February 1925; “House votes \$57,600 for oyster inquiry,” *New York Times*, 27 February 1925; “Introduction,” *National Shellfish Sanitation Program Manual of Operations (NSSP Manual), ISSC, Part I and II*. (Washington, D.C.: Food and Drug Administration, Shellfish Sanitation Branch, 2007), accessed at <http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/Seafood/FederalStatePrograms/NationalShellfishSanitationProgram/ucm061549.htm>.

at the state level, although the Public Health Service would offer both assistance and cooperation. It was agreed that shellfish-producing states would ensure agreed-upon sanitation standards by issuing “certificates” or permits to operate.

The U.S. Public Health Service continued to conduct “scientific investigations of fundamental importance” and served “as a clearinghouse for the interchange of information and the discussion of policies between state authorities.”<sup>93</sup> Basically, this cooperative program of sanitary control of the shellfish supply resulted in dedicated procedural responsibility on the part of three partners: federal government, state government, and industry. Laws and regulations were instituted at the state level for sanitary control of the shellfish industry, sanitary surveys of growing areas, defining and patrolling restricted areas, inspection of shellfish plants, laboratory investigations, and other control measures necessary for assuring safe handling from harvest to final sale. Federal level responsibility included annual review of each shellfish-producing state’s control program, including the inspection of a representative number of shellfish processing plants, Food and Drug Administration (FDA) determination of state conformity with the National Shellfish Sanitation Program (NSSP), and for general information purposes, monthly publication of valid interstate shellfish shipper certificates by the Food and Drug Administration. The shellfish industry agreed to harvest shellfish from safe sources, ensuring maintenance of agreed-upon standards, appropriate labeling of shellfish packaging, and documentation confirming origin and disposition of all shellfish.

The NSSP, another outcome of the Surgeon General’s 1925 conference, has maintained its original doctrine over the years, with periodic revisions under the auspices

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<sup>93</sup>*NSSP Manual, ibid.*

of the FDA. In 1954, cooperating members convened the first National Shellfish Sanitation Workshop, which further modified the *NSSP Manual*. In 1959, the manual split to accommodate two sections: Part I, Sanitation of Shellfish Growing Areas; and Part II, Sanitation of Harvesting and Processing of Shellfish. In 1965, cooperation on the revision of the manual grew to include “shellfish control authorities in all coastal states, food control authorities in the inland states, interested federal agencies, Canadian federal departments....” and various shellfish growers’ organizations and associations throughout North America.<sup>94</sup> Update of the manual continues to be a cooperative effort between the FDA and the Interstate Shellfish Sanitation Conference (ISSC), an organization born in 1982 “to foster and promote shellfish sanitation through the cooperation of state and federal control agencies, the shellfish industry, and the academic community.”<sup>95</sup> In 1998, the FDA, again in cooperation with the ISSC, issued a new guide, “*National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish*,” to replace Parts I and II of the existing *NSSP Manual of Operation*. The new *Guide* contains language designed for easy adoption into state laws or regulations.<sup>96</sup> The recent *NSSP Manual* ensures not only equal interstate sanitary control of shellfish, but also recreational and intrastate commercial standards. Interestingly, the FDA uses the *NSSP Manual* for “‘certifying’ foreign shellfish sanitation programs,” as well.<sup>97</sup>

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<sup>94</sup> Introduction. *NSSP Manual – Part I*, Shellfish Sanitation Branch, Division of Seafood Programs, Office of Seafood, Center for Food Safety and Applied Nutrition, Food and Drug Administration Introduction, Washington, D.C., 1992, xviii.

<sup>95</sup>The Interstate Shellfish Sanitation Conference consists of six representatives from “producing state shellfish control agencies, three representatives from non-producing state shellfish control agencies, six industry representatives, one member each from the U.S. Food and Drug Administration, the National Marine Fisheries Service, and the U.S. Environmental Protection Agency, and a non-voting representative from each of three fast forces with ISSC.” “About Us [the ISSC]” accessed at <http://www.issc.org>.

<sup>96</sup> *NSSP Guide for Control of Molluscan Shellfish*, accessed at <http://www.cfsan.fda.gov/~ear/nss2-toc.html>.

<sup>97</sup> *NSSP Manual*, 1992, xix.

Within the Florida Department of Agriculture, the Florida Shellfish Commission came into being in 1913, and by 1915 a Shell Fish Commissioner, T.R. Hodges, was assigned to the newly created Florida Department of Game and Fish.<sup>98</sup> Over the course of the twentieth century, different state agencies have shared responsibilities for different aspects of shellfish regulation and management, especially since public oyster reefs yield the bulk of the state's commercial oyster harvest.<sup>99</sup> The ever-increasing multiple layers of government regulation fuel frustration among participants from harvest to distribution.

Florida's Division of Aquaculture, which is part of the state's Department of Agriculture and Consumer Services (DACS), oversees the commercial shellfish industry in the Sunshine State. The DACS is responsible for classifying coastal waters using sanitary, hydrographic, meteorological, and bacteriological surveys. According to the DACS,

Sanitary surveys identify waters where contaminants may be present in amounts that present a health hazard; hence, should not be open to harvest. The bacteriological survey identifies waters meeting NSSP fecal coliform standards. A comprehensive shellfish harvesting area survey is written for each shellfish harvesting area to document the methods and findings of these surveys, as well as proposed changes in classification and management. NSSP guidelines require that these reports be maintained annually, reevaluated every three years, and resurveyed every 12 years. Areas that do not comply with sanitary requirements are to be immediately reclassified or closed.<sup>100</sup>

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<sup>98</sup> William Warren Rogers, *Outposts on the Gulf* (Gainesville: University Press of Florida, 1986), 118.

<sup>99</sup> Arnold, *A Summary of the Oyster*, 6-7.

<sup>100</sup> Florida Department of Agriculture and Consumer Services, Bureau of Aquaculture, Shellfish Harvesting. Accessed at [http://www.floridaaquaculture.com/SEAS/SEAS\\_intro.htm](http://www.floridaaquaculture.com/SEAS/SEAS_intro.htm)



**Figure 12.** A buoy identifying a shellfish harvesting area. It offers a reward up to \$2,500 for information leading to the arrest and conviction of individuals unlawfully possessing or harvesting cultured shellfish. *Photo courtesy of Florida State Archives.*

Within the Division of Aquaculture, the Shellfish Environmental Assessment Section (SEAS) located in Tallahassee, with its shellfish laboratory in Apalachicola, has responsibility for classifying and managing oyster harvest areas around the state “to provide maximum utilization of shellfish resources and to reduce the risk of shellfish-borne illness.”<sup>101</sup> The SEAS monitors 1,430,854 acres of shellfish harvesting areas around the state that include 1,200 bacteriological sampling stations.<sup>102</sup> Monitoring of fecal coliform levels in Florida waters occurs weekly. It takes 24 hours to produce test results once samples reach the SEAS laboratory in Apalachicola. Florida abides by the bacteriological standards for fecal coliform established by the NSSP for classifying harvesting areas, as listed in Figure 13. If in doubt, one should consider the waters Unclassified, in which case, taking any product for human consumption is unlawful

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<sup>101</sup> Ibid.

<sup>102</sup> Ibid.

because the waters will not have been analyzed for potential contamination. All the coastal waters in the following Florida counties remain Unclassified: Jefferson, Taylor, Hernando, Pasco, Monroe, Dade, Broward, Palm Beach, Martin, Flagler, and Nassau. Shellfish harvesting areas may be in the open or closed status.

In Florida, where shellfish industry sales contribute millions of dollars to the state's economy, the public's sensitivity to safe consumption of raw oysters remains particularly high.<sup>103</sup> The oyster consuming public appears to depend on government regulation to ensure food safety, but these regulations are not perfect. Scientists consider oysters an "indicator species" because thriving oyster beds signal clean waters, whereas ailing beds may be a sign of pollution and other water quality problems. Contaminating forces constantly threaten oyster beds in the form of naturally-occurring water-borne viruses, excessive algae growth, fecal matter, and severe storms. Of course, water quality monitoring takes place at the local, state, and federal levels and determines whether the water is clean enough to harvest oysters fit for human consumption. But quality control for oyster sales does not end there. After harvest, government technicians examine oysters for such bacterial and viral contaminants as *Vibrio vulnificus*, *E-coli*, and hepatitis A.<sup>104</sup>

Section 5L-1 of Florida's Administrative Code contains the Comprehensive Shellfish Control Code. Florida oysters may be legally harvested from open areas when

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<sup>103</sup> Florida Agricultural Facts, 2003. Available at <http://www.nass.usda.gov/fl/rtoc0a.htm>

<sup>104</sup> During a visit to the shellfish laboratory of the Shellfish Environmental Assessment Section (SEAS) of the Florida Bureau of Aquaculture in Apalachicola on 14 August 2009, the author witnessed the dozens of glass vials the laboratory receives and tests, including several the laboratory director pointed out to me as being "positive" or contaminated. The water in those vials turned cloudy or murky as a result of the tests, which take about 24 hours before results are available. In another section of the lab, the meat of oysters chosen from random harvests are ground in blenders and cultured for *Vibrio* bacteria. Because the SEAS holds responsibility for classifying and managing Florida's shellfish harvest areas, test results that indicate contamination may trigger implementation of safety controls such as temporarily closing certain areas to harvest.

shells reach three inches in size. The location of open areas is readily available from the maps at the Florida Shellfish Harvesting Area website (See Appendix A).<sup>105</sup> Mapped areas are assigned an identification number and description. The greater Apalachicola Bay oyster harvest area consists of approximately 6000 acres, 5400 of which may be harvested by licensed oystermen and 600 of which are privately leased by the state for exclusive use by the lessee. Apalachicola Bay has seasonal harvest areas. Certain identified areas may be conditionally approved during the summer, but may be restricted in the winter, or vice versa. Appendix A provides an example of an area classification map on Florida's west coast. To ensure public health and safety, not only must a potential oyster harvester (such as the man working in Figure 14), make application to the Division of Aquaculture within the Florida DACS for commercial harvesting of oysters, but licensure is also required for shellfish processing by molluscan shippers, shucker-packers, and re-packers.<sup>106</sup> Licensure provides additional controls on safe processing of Florida oysters. There are approximately 100 licensed shellfish processors in the state. Licensed processors can handle both oysters and clams; approximately 60 percent of the processors currently handle only clams; approximately 25 percent of the processors currently handle only oysters, and these are mostly located in the panhandle of the State.

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<sup>105</sup> The website address is [http://www.floridaaquaculture.com/seas/seas\\_shamap.htm](http://www.floridaaquaculture.com/seas/seas_shamap.htm).

<sup>106</sup> According to the Division of Aquaculture, a shell-stock shipper is a person who operates a shell-stock shipping plant as a certified shellfish dealer, who grows, harvests, buys or repacks and sells shell-stock. A shell-stock shipper is not allowed to act as a shucker-packer or repacker. A shell-stock shipper may also ship sealed containers of shucked shellfish. A shucker-packer is a person who operates a shucker-packer plant as a certified shellfish dealer who shucks and packs shellfish and who may act as a shell-stock shipper and/or repacker. A repacker is a person operating a repacking plant as a certified shellfish dealer, other than the original certified shucker-packer, who repacks shucked shellfish into other containers for distribution or sale. A repacker may also repack and ship shell-stock. A repacker shall not shuck shellfish. Definitions retrieved from <http://www.floridaaquaculture.com/faq.htm>.

Approved Areas	NSSP 14/43 Standard = The fecal coliform median must not exceed 14 MPN <sup>(a)</sup> /100 ml, AND not more than 10% may exceed 43 MPN/100 ml	Normally open to shellfish harvesting; may be temporarily closed under extraordinary circumstances such as red tides, hurricanes and sewage spills. The 14/43 standard must be met for all combinations of defined adverse pollution conditions (tide, rainfall, river, tide/rainfall, tide/river and tide/rainfall/river).
Conditionally Approved Areas		Periodically closed to shellfish harvesting based on pollution events, such as rainfall or increased river flow. The 14/43 standard must be met when the management plan parameter (rainfall, river stage, and/or river discharge) is less than the adverse pollution condition during all other adverse pollution conditions.
Restricted Areas	NSSP 88/260 Standard = The fecal coliform median must not exceed 88 MPN/100 ml, and Not more than 10% may exceed 260 MPN/100 ml.	Normally open to relaying or controlled purification, allowed only by special permit and supervision; may be temporarily closed under extraordinary circumstances such as red tides, hurricanes and sewage spills. The 88/260 standard must be met for all combinations of defined adverse pollution conditions (tide, rainfall, river, tide/rainfall, tide/river and tide/rainfall/river).
Conditionally Restricted Areas		Periodically, relay and controlled purification activity is temporarily suspended based on pollution events, such as rainfall or increased river flow. The 88/260 standard must be met when the management plan parameter (rainfall, river stage, and/or river discharge) is less than the adverse pollution condition during all other adverse pollution conditions
Prohibited Areas	Shellfish harvesting is not permitted due to actual or potential pollution. This classification is least desirable, and is used only when standards are exceeded for Approved, Conditionally Approved, Restricted and Conditionally Restricted classification management schemes.	
Unclassified = Unapproved Areas	Shellfish harvesting is not permitted pending bacteriological and sanitary surveys. To reopen an area following temporary closure associated with a pollution event, sample results of waters must meet the appropriate NSSP standard (14/43 or 88/260), and adequate time must elapse for shellfish to purify. Public health is protected by allowing shellfish to be harvested only from waters of high quality.	
<p>Note: The data for this chart was retrieved from the Shellfish Harvesting page of the Bureau of Aquaculture, Florida Department of Agriculture and Consumer Services, accessed at <a href="http://www.floridaaquaculture.com/SEAS/SEAS_intro.htm">http://www.floridaaquaculture.com/SEAS/SEAS_intro.htm</a></p> <p>(a) MPN=Most Probable Number. Definition: The MPN is a statistical estimate of the number of bacteria per unit volume and is determined from the number of positive results in a series of fermentation tubes. NSSP Definitions, NSSP Manual, Part 1, p. DEF2.</p>		

**Figure 13.** Florida Shellfish Harvesting Areas Classification



Approximately 15 percent of the processors currently handle both oysters and clams.<sup>107</sup>

State law requires harvesters to cull their catch and return to the water oysters below the minimum harvest size limit of three inches (See Figure 14). Each 60-pound bag gets tagged with the date and place of harvest. If a consumer should become ill from eating those oysters, their point of origin and history of processing is readily available. To



**Figure 14.** Oysterman Cletis Anderson culls his harvest in the waters of Apalachicola, 1986. *Courtesy of the Florida Memory Collection.*

safeguard consumers, very specific regulations in Florida apply to retail sale of oysters and clams. The Florida Cooperative Extension Service guide, *Buying Seafood for Retail*, advises consumers that every container of fresh, shucked oysters or clams must carry a label informing that the contents can be sold within 14 days after the shucking date; after that time, the oysters must be discarded. In fact, most retail firms sell their oysters within

<sup>107</sup> Personal correspondence with David Heil, Assistant Director, Division of Aquaculture, Florida Department of Agriculture and Consumer Services.

5 to 6 days after purchase.<sup>108</sup> Such guidelines are meant to instill consumer confidence in the quality of the seafood product. Nonetheless, overcoming media excitement when someone becomes severely ill or even dies as a result of eating raw oysters is an uphill battle for the shellfish industry. While market demand for raw oysters declined nationwide during the 1990s, the Florida market, especially that of Apalachicola, has remained relatively stable.<sup>109</sup>

Overcoming resistance to the oyster's reputation for conveying illness is an ongoing challenge for the shellfish industry. Part of the mission of the Gulf Oyster Industry Council, a trade association based in New Orleans that represents Gulf of Mexico oyster growers, distributors, and retailers is "to balance public health protection with legitimate economic consideration."<sup>110</sup> Among industry strategies to address consumption safety concerns are means to ensure that oysters remain free of toxins when they reach the retail market. However, the public education literature distributed by the U.S. Food and Drug Administration (FDA) provides a serious warning: "You can't tell if an oyster is contaminated by *Vibrio vulnificus* by looking at it or by smelling it.... Nor does the freshness of the oyster mean it is safe from bacteria because it is present in the water where live oysters feed."<sup>111</sup>

Beyond government regulatory control of oyster harvesting areas, scientists and oyster distributors have collaborated on post-harvest processes (PHP) efforts to ensure "pure" oysters for the consumer. PHP methods vary. Depuration, is one method—a

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<sup>108</sup> W. Otwell, F. Lawlor III, et al, *Buying Seafood for Retail*. Sea Grant Extension Bulletin SGEB-9 (November 1985) (Gainesville: Florida Sea Grant Extension Program, University of Florida), 6-7.

<sup>109</sup> Arnold, *A Summary of the Oyster*, 11.

<sup>110</sup> Gulf Oyster Industry Council. Mission statement. Accessed at <http://www.gulfoysters.org/>.

<sup>111</sup> U.S. Food and Drug Administration, *Vibrio vulnificus* Health Education Kit, *The Danger of Eating Contaminated Raw Oysters*, March 2004. Accessed at <http://www.fda.gov/Food/ResourcesForYou/HealthEducators/ucm085368.htm>.

process in which harvested, but contaminated, oysters are relayed through vats of fresh water flows, often ionized, over a period of hours or days, during which time oysters flush toxins out of their tissue. Oysters have the ability to concentrate water-borne toxins up to 100 times greater than the surrounding water levels, so this depuration process may take as long as three days.<sup>112</sup> Therefore, relaying, like almost every part of shellfish processing, is strictly regulated in accordance with NSSP standards. While it is mostly effective for eliminating traces of fecal coliform, the process does not work as well with chemical or heavy metal pollutants, nor does it work to flush the *Vibrio vulnificus* bacterium. Those pollutants tend to concentrate in oysters because their physiology renders them unable to purge such toxins.<sup>113</sup>

Other purification methods include irradiation using Cobalt-60; flash cold treatments such as IQF (individually quick frozen) in which fresh unopened oysters are flash-frozen in liquid nitrogen or in powerful blast freezers; and high hydrostatic pressure (HHP). HHP involves putting banded oysters into a high-pressure vessel, then submitting the oysters to two to five minutes of intense air pressure at 35,000 pounds per square inch, impressively more than standard outdoor atmospheric air pressure at sea level which is just 14.7 pounds per square inch. Bands keep the oysters from opening during treatment—an event that jeopardizes their fresh-like texture. The Florida Department of Agriculture and Consumer Services and the USDA agree that effective treatment means reducing *Vibrio vulnificus* levels to less than 30 organisms per gram of meat.<sup>114</sup>

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<sup>112</sup> Florida Department of Agriculture and Consumer Services, Bureau of Aquaculture. Accessed at [http://www.floridaaquaculture.com/SEAS/SEAS\\_intro.htm](http://www.floridaaquaculture.com/SEAS/SEAS_intro.htm).

<sup>113</sup> NSSP Manual, Part 1, Section D.

<sup>114</sup> One of the best non-industrial descriptions of high hydrostatic pressure process I found is in this article: Lee Hockstader “The Holy Grail of Oysterdom,” *The Houston Chronicle*, 23 September 2003; “UF experts help oyster processors use new technology to keep consumers, industry healthy,” University of Florida press release, 15 August 2006, at <http://news.ufl.edu/2006/08/15/oysters>.

Experimental research with HHP revealed an added benefit for oyster processors/dealers; the pressure causes the only part of the oyster meat attached to the shell (its muscle) to detach—a step that is otherwise only accomplished via the knife of a hand shucker. This benefit adds to the processor’s bottom line; one does not have to pay to have the oysters shucked after treatment, because once the shell is popped open, the oyster slides out.

In addition to monitoring post-harvest treatment regimes, the federal Food and Drug Administration administers a Hazard Analysis Critical Control Points (HACCP) program, “a process that has been established for juice, meat, poultry and seafood processing in order to prevent foodborne illness.” A critical control point is the “point, step, or procedure in a food process at which control can be applied, and a food safety hazard can as a result be prevented, eliminated, or reduced to acceptable levels.”<sup>115</sup> For example, consideration must be given to food safety hazards that might occur as a result of natural toxins, microbiological contamination, chemical contamination, pesticides, drug residues, parasites, and direct or indirect food additives.<sup>116</sup> While this bureaucratic oversight benefits public safety, the administrative oversight at the processing level of distribution can be a challenge. From mice to cleaning solutions, every consideration must be given to unintended contamination of an oyster safe for human consumption.

In an effort to eliminate contaminants like the *Vibrio* bacteria, some oyster distributors expose harvested live oysters, prior to shucking, to warm water carefully calibrated to kill harmful bacteria. Next, distributors plunge the oysters into ice-cold water to shock the bacteria. This is known as the HCP method, Heat/Cool/Process. One

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<sup>115</sup> According to the USDA HACCP site located at [http://foodsafety.nal.usda.gov/nal\\_display/index.php?info\\_center=16&tax\\_level=1&tax\\_subject=177](http://foodsafety.nal.usda.gov/nal_display/index.php?info_center=16&tax_level=1&tax_subject=177) and <http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/Seafood/FishandFisheriesProductsHazardsandControlsGuide/ucm120134.htm>

<sup>116</sup> Ibid.

company, Ameripure Oysters in Louisiana, buys, treats, and markets oysters from all around the Gulf using this process. Its website boasts that

Oysters that undergo the AmeriPure Process at our modern, government-inspected plant are completely free of *Vibrio vulnificus*, and *Vibrio parahaemolyticus* (severe temperature abuse studies have conclusively shown that these bacteria do not reoccur). After processing, aerobic bacteria were also substantially reduced, thereby slowing the natural rate of spoilage.<sup>117</sup>

The oyster does not survive treatment, but Ameripure assures consumers that because the oyster's shell never opens, and therefore retains all its natural juices and texture, its culinary quality is as good as a live raw oyster. Ameripure also claims a 21-day shelf life for its packaged shucked oysters due to the HCP treatment, with no detrimental effects on the flavor and texture of the product.

Another complex, but less expensive, method used to ensure safe consumption of raw oysters is IQF, individual quick freezing, a process used by a couple of seafood processors in Apalachicola. Culled to individual shell-stock, oysters are quickly deep frozen in layers that are easy to package and ship in their deep frozen state. Once thawed, IQF distributors claim the opened and shucked *dead* oysters can be served like, and taste as good as, a freshly shucked, just-harvested oysters. In 2005 the FDA approved irradiation, exposure to a radioactive source, such as Cobalt-60, to a degree that does not kill the oyster. In June 2009, Florida's Division of Aquaculture licensed Food Technology Services Inc. (FTSI), in Mulberry, Florida, to use irradiation on oysters. According to the Division's press release, FTSI is the first company in the nation certified to use this process to produce safer oysters by eliminating the *Vibrio vulnificus*

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<sup>117</sup> Ameripure Oysters. Accessed at <http://www.ameripure.com/process.html>

bacteria to undetectable levels.<sup>118</sup> In focused studies of this process, consumers could detect no difference between the taste and texture of irradiated oysters and untreated oysters.<sup>119</sup>

In a recent survey conducted by researchers at Mississippi State University, scientists explored reasons for consumption and non-consumption of raw oysters. Individuals who typically do not purchase raw shellfish (non-consumers) responded that taste, texture, and smell were their top reasons for avoiding oysters. On the other hand, consumers who *do buy* oysters responded that price, safety concerns, and unavailability of a fresh product were their top three reasons for *not* eating raw oysters. In the same study consumers of oysters were queried as to preferred methods of decontamination (the descriptions were provided in lay terms): 61 percent chose depuration, or clean-water filtering, compared with only 9 percent choosing irradiation. The study also revealed a marked ignorance, even amongst regular raw oyster consumers, of government controls and relative product safety. For example, 57 percent of those consumers who indicated concern with product safety said they might be inclined to consume oysters if there were increased government regulation.<sup>120</sup>

According to the Florida Fish and Wildlife Conservation Commission, the two greatest threats to the market for raw oysters are environmental degradation and concern

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<sup>118</sup> David Heil. "Department Licenses Mulberry Food Irradiation Facility for Oyster Processing." Press release, 12 June 2009. Division of Aquaculture, Florida Department of Agriculture and Consumer Services.

<sup>119</sup> I repeatedly found the conclusion that post-harvest treatments for sanitary consumption of oysters did not produce enough of a change in taste or texture to negatively influence the consumer's desire to eat them, even raw. See, for example, Commercial Oyster Postharvest Processing Systems. Accessed at <http://www.msstate.edu/dept/crec/owmr.html>; L. Andrews, B. Posadas, and M. Jahncke, *Oyster irradiation: Pathogenic vibrio response and consumer difference testing*. October 2002. Accessed at <http://sst.ifas.ufl.edu/26thAnn/file35.pdf>; Wright, et al. *Evaluation of Postharvest-Processed Oysters*, *ibid*; O. Ashton Morgan, Gregory S. Martin, and William L. Huth. *Oyster demand adjustments to counter-information and source treatments in response to Vibrio vulnificus*. Abstract. (October 2008). Accessed at <http://econ.appstate.edu/RePEc/pdf/wp0908.pdf>.

<sup>120</sup> Andrews, et al., *Oyster Irradiation*, 26.

about safe consumption.<sup>121</sup> Florida’s rapid growth and development continues to degrade water quality in estuaries and coastal communities where oysters thrive. “Man dies from oysters!” the headlines shout.<sup>122</sup> At the same time the media reports a catastrophe, it educates the public about the importance of thoroughly cooking oysters. “We’re not saying, ‘Don’t eat oysters,’” said Department of Health and Rehabilitative Services spokesman David Adams. “Eat them. Enjoy them.... Just cook them first,” was his advice after a spate of seven oyster-related deaths in Florida in the early 1990s.<sup>123</sup> If one has any doubt, that advice is probably the best. Public agencies at the federal, state, and local level provide educational outreach to oyster consumers, from brochures available online with a simple search of appropriate keywords (See Appendix B) to educational workshops such as the “Oyster School” developed by the University of Florida Sea Grant Program, which offers seafood retailers three days of “comprehensive and practical training for marketing raw oysters from harvest to table.”<sup>124</sup>

In partnership with the International Shellfish Safety Conference (ISSC), the Gulf States committed to reduce the rate of *Vibrio vulnificus* infection by 60 percent by December 31, 2008. For its part, Florida formulated strategies in a *Vibrio vulnificus* Risk Reduction Plan in April 2005.<sup>125</sup> The Gulf States did not achieve the 60 percent illness rate reduction goal by the end of 2008. Because of its immediate focus on the H1N1

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<sup>121</sup> William S. Arnold and Mark E. Berrigan, *A Summary of the Oyster (Crassostrea virginica) Fisher in Florida*. A Report to the Division of Marine Fisheries, Florida Fish and Wildlife Conservation Commission, January 2002.

<sup>122</sup> “Man dies from oysters,” *Tampa Tribune*, 4 September 1993.

<sup>123</sup> M. Soko, “Cook ‘em before you eat ‘em, oyster lovers told,” *St. Petersburg Times*, 10 December 1992, E1.

<sup>124</sup> The first Oyster School was held in Apalachicola in October 2007, and another was held there in October 2008. The next will take place in January/February 2010 according to UFIFAS research scientist Victor Garrido. Personal communication, 19 August 2009.

<sup>125</sup> Accessed at the Florida Bureau of Aquaculture, <http://www.floridaaquaculture.com/publications/VVriskreduction.pdf>.

(Swine) flu health event, the Center for Disease Control and Prevention (CDC) has delayed final calculations of 2008 Gulf state rates of *V. vulnificus* illness; however, a 35 percent illness reduction rate is anticipated, 25 percent short of the goal. In accordance with requests by the ISSC, which has taken the lead on this issue, each Gulf state must submit proposals, due in October 2009, for achieving the additional 25 percent reduction in illness. Implementation will begin in May 2010. This effort will create even more rules for the Nation's most heavily regulated food industry.<sup>126</sup>

Interestingly, the Florida Department of Health reports that in 2006, 24 cases of *Vibrio vulnificus* were reported in the state, and only seven of those were related to consumption of raw oysters. In fact, 13 cases were wound-related, and one was attributed to crab consumption. However, of those contracting the bacterium, there were four more deaths as a result of raw-oyster consumption, two from wound infections, and two in which the source of the infection could not be identified. The Florida Department of Health considers a single *case* equal to an *outbreak* due to the virulence of *Vibrio vulnificus*.<sup>127</sup> Although the CDC confirms the number of cases reported from 22 coastal states, it estimates that twice the number of reported cases actually occur; in other words, half remain unreported. Most of those cases are reported by the Gulf States of Florida, Alabama, Mississippi, Louisiana, and Texas, with which the CDC has collaborated on *Vibrio* reporting for a longer period of time (See Figure 10.)

Rather than attempt to balance its response along the high wire between government regulation in the name of public health and the economic interests of oyster

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<sup>126</sup> Heil, personal communication.

<sup>127</sup> Florida Department of Health, Division of Environmental Health, *An overview of foodborne Vibrio vulnificus, Florida, 2006*. Accessed at: [http://www.doh.state.fl.us/environment/foodsurveillance/pdfs/AnOverviewof\\_FoodborneVibrio\\_vulnificus.pdf](http://www.doh.state.fl.us/environment/foodsurveillance/pdfs/AnOverviewof_FoodborneVibrio_vulnificus.pdf).



industry, the Center for Science in the Public Interest (CSPI) actively campaigns for mandatory post-harvest processing for all oysters harvested in the Gulf of Mexico.<sup>128</sup> Despite implementation of an ISSC 2001 risk management plan, the number of “deaths and illnesses caused by raw oysters contaminated with the dangerous *Vibrio vulnificus* bacteria remained relatively constant” through August 2005. The CSPI claimed the reason deaths did not increase was because in 2003 the state of California actually *banned* the sale of summer-harvested Gulf coast oysters that were not certified as have been post-harvest treated. Despite studies that indicate post-harvest cold treatments and hydrostatic pressure do not affect consumer attitudes on oyster taste, the industry has been slow to introduce those post-harvest treatments.<sup>129</sup>

In the meantime, Florida DACS continues its efforts to educate consumers about the benefits of purchasing treated oysters; but it walks a fine line so as not to offend traditional oyster processors and jeopardize sales of their non-treated product. Considering the widely-known and positive reputation of Apalachicola oysters, the DACS does not need to go out of its way to develop marketing strategies for this region’s oysters, according to Paul Balthorp in the Florida Bureau of Seafood and Aquaculture Marketing.<sup>130</sup> Perhaps so, but this view is in stark contrast to funds and energy the department expended during a recent three-year “Wild and Wonderful Florida Shrimp”

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<sup>128</sup> Founded by three scientists in 1971, The Center for Science in the Public Interest, based in Washington, DC, publishes the *Nutrition Action Healthletter*, with 900,000 subscribers, whose subscriptions are the main source of the organization’s funding. According to its website, the CSPI accepts no funding from government or corporate sources, in keeping with their mission “to educate the public, advocate government policies...consistent with scientific evidence on health and environmental issues, and counter industry’s powerful influence on public opinion and public policies.” [www.cspinet.org/about/index.html](http://www.cspinet.org/about/index.html).

<sup>129</sup> Center for Science in the Public Interest, “Deaths, illnesses from contaminated oysters continue.” Press release, 18 August 2005. Accessed at <http://www.dcpinet.org/new/200508181.html>.

<sup>130</sup> Telephone interview by author, 3 September 2009.

campaign launched by the DACS in 2006 to counter the flood of cheap, farmed shrimp imported from foreign countries like Vietnam, China, India, and Brazil.<sup>131</sup>

In the end, the onus is on the consuming public to consider the risk of illness as a consequence of consuming oysters, especially for those people considered at high-risk for bacterial and viral infection. The Gulf Oyster Industry Council warns, “The consumer is the ultimate arbitrator of risk.”<sup>132</sup> With increased vigilance on the part of consumers, and continuing public health education, consumers should be armed with enough information to make an informed decision about the potential consequences of eating raw oysters.

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<sup>131</sup> John Grimes and Don Yow, “Globalizing Shrimp: Florida’s ‘Wild & Wonderful Shrimp’ Program,” *Southeastern Geographer*, 49(2), 2009: 200-220; Barbera Turnbull, “Marketing Campaign Helps Florida Shrimp Industry Beset by Flood of Foreign Imports.” Press Release, Florida Department of Agriculture and Consumer Services, 8 September 2006.

<sup>132</sup> The Gulf Oyster Industry Council’s critical analysis of the U.S. General Accounting Office Report *Federal Oversight of Shellfish Safety Needs U.S.*, GAO-01-702, July 2001.

## Chapter Three

### Apalachicola: Shipping and Seafood Processing Emerges

In the 1820s, planters in the northern Florida territory, eastern Alabama, and as far north as Columbus, Georgia, sent flatboats laden with cotton down the continuous south-flowing currents of the Chattahoochee, Flint and Apalachicola Rivers to “cotton town” – a bustling maritime trading post on the west bank of the mouth of Apalachicola River. Cotton reigned and continued to do so for decades. Cotton Town became the town of Apalachicola in 1831. Steamboats plied up and down the Apalachicola River with goods and people. The *Apalachicola Advertiser* boasted, “Our wharfs present the appearance of a great Commercial City – indeed, our Bay is full of all kinds of craft...four new steamboats have arrived within the last two weeks intended for trade between this place and Columbus.”<sup>133</sup>

In Apalachicola’s halcyon trading days during the 1840s and 1850s, as many as 43 sturdy brick warehouses brimmed with mechanically compressed cotton bales bound for textile mills throughout the American Northeast and the English Midlands.<sup>134</sup> Lighter craft vied for loading positions at Apalachicola’s busy quays. These shallow-water craft ferried cotton loads across the bay to larger, deeper-hulled, multi-masted schooners, brigs, barks, and square-riggers anchored outside of West Pass between St.

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<sup>133</sup> “Steamboats,” *Apalachicola Advertiser*, 3 January 1835.

<sup>134</sup> Lynn Willoughby, *Apalachicola Aweigh: Shipping and Seamen at Florida’s Premier Cotton Port*, *The Florida Historical Quarterly*, 69(2), (Oct. 1990): 178-194; George Chapel, *A Brief History of the Apalachicola Area*, accessed at <http://www.baynavigator.com/briefhistory.cfm?c=7>.

Vincent and St. George Islands. Sailing a triangular route, these ships mostly traveled east around the peninsula of Florida, to Boston or New York City and Liverpool, England.<sup>135</sup> They returned to Apalachicola with relatively little in the way of imported goods, so self-sufficient were inhabitants of the region. Staples items such as sugar, salt, and potatoes often arrived as ballast in the ships' holds.<sup>136</sup> According to the 1840 census, Apalachicola's population numbered about one thousand residents. However, between December and May, the peak of cotton shipping season, the town swelled to twice that number.<sup>137</sup> Sailors, teamsters, and traders frequented the town's hotels and oyster bars.<sup>138</sup>

First recorded for sale in Apalachicola in 1836, local oysters have been a continuous commodity given the abundance of the natural resource.<sup>139</sup> In 1881, naturalist Ernest Ingersoll quoted a friend who had recently visited the area:

This neighborhood has been highly favored with a large number of beds furnishing oysters of large size and fine flavor, which are easily procured and distributed by means of river steamers from (the town of) Apalachicola, through a wide inland area. Besides a number of large reefs in St. George and St. Vincent sounds and Apalachicola Bay, there are scattered all through the deeper waters a great many small beds. The depth of water here averages 7 feet, and it is brackish and full of sediment. The oysters from these beds are of superior flavor; I found none better in any part of the Gulf during my visit in 1881.<sup>140</sup>

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<sup>135</sup> Willoughby, *Apalachicola Aweigh*, 193.

<sup>136</sup> *Ibid.*, 190.

<sup>137</sup> In *Apalachicola Aweigh* Willoughby describes that trade was quieter between June and December because the depth of the Apalachicola River and beyond to the north was often too shallow for boat traffic. Summer rains brought the water levels back to navigable heights in late fall when commercial trading would increase, 179.

<sup>138</sup> Willoughby, *Apalachicola Aweigh*, 179.

<sup>139</sup> Clyde L. MacKenzie, Jr., "History of Oystering in the United States and Canada, Featuring the Eight Greatest Oyster Estuaries," *Marine Fisheries Review*, 58(4), (1996): 1-87, n/p.

<sup>140</sup> E. Ingersoll, *The Oyster Industry*. In G. Brown Goode, (Ed.). *The History and Present Condition of the Fishery Industries*. Washington, D.C.: U.S. Gov. Print. Off., 1881, 194.

To ensure viability and flavor, only shell-stock oysters were shipped, and only regionally, layered in barrels between wet burlap bags or damp Spanish moss as late as 1895. Then, faster railroad distribution allowed vendors to supply shucked meats packed in ice.<sup>141</sup> The completion of the Atlantic and Gulf Railroad between Bainbridge and Savannah Georgia signaled the demise of Apalachicola as a lively international trading and shipping port.<sup>142</sup> Buyers and sellers of cotton found it more economical, and faster, to ship cotton via train to Atlantic ports such as Savannah and Charleston, and avoid sailing from Apalachicola around the Florida peninsula.<sup>143</sup> In 1856, Fernandina Beach, on the Atlantic coast just north of Jacksonville, witnessed Florida's first venture into canning oysters. Set on the Nassau River, it was an unsuccessful venture, but a Russian immigrant, Saul Goffin, bought the property in 1893, renovated the plant in order to can shrimp, crabs, and citrus, and crushed the oyster shell-stock piles to construct roads in his self-named community, Goffinsville.<sup>144</sup> At about the same time, the Apalachicola oyster industry was coming into its own.

Indeed, Apalachicola became host to of several decades of successful seafood canning, beginning with oysters in 1888, and eventually including shrimp, clams, turtle soup, crabmeat, and coquina broth. By 1941, however, only nine licensed seafood canners remained in the state and shrimp had overtaken oysters as the canned seafood of choice. Cheaper canned seafood imports from Japan handicapped the Florida seafood

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<sup>141</sup> MacKenzie, Jr., *History of Oystering*, n/p.

<sup>142</sup> Rogers, *Outposts on the Gulf*, 95.

<sup>143</sup> Willoughby, *Apalachicola Aweigh*, 194.

<sup>144</sup> MacKenzie, *History of Oystering*, n/p; "Park site once home of Goffinsville community," *Florida Times-Union*, 9 August 2009.



**Figure 15.** A young oyster fisher Randy Summerford says he starts out at 4 a. m. one day, is out all night in the little oyster boat and back next day some time. Gets a share of the proceeds. Location, Apalachicola, Florida, January 1909. *Source: Library of Congress National Child Labor Committee Collection Photographs by Lewis Hine*

canning market—a situation provoking passage of a hefty import duty on the product in August 1941, followed by a complete embargo when the United States enter World War II later that year.<sup>145</sup>

Unfortunately, the blight of the canning industry in the late nineteenth and early twentieth century was always its abuse of the labor of women and children. Early twentieth century photographer Lewis Hine documented the controversies surrounding child labor issues; Figure 15 depicts a sixteen-year-old youngster who told Hine that he had been migrating from Georgia for four years to work the Apalachicola oyster season from October to mid-April. Figure 16 illustrates a common migrant family who might

<sup>145</sup>Florida Department of Agriculture, *Canning in Florida 1942*, New Series Bulletin, no. 117, Tallahassee, FL, 71-72.



**Figure 16.** Six members of Slebzak family in field, five of whom are working on Bottomley's farm near Baltimore, Maryland. Lewis Hine, photographer. Photographic print. 1909 July.

work the vegetable fields during Maryland's spring, then move into Baltimore's vegetable canning operations in summer and early fall, and then migrate to the Gulf of Mexico in October to work in the region's shrimp and oyster canning industry through the winter. With the 1912 founding of the federal Children's Bureau, the first national agency for child welfare, public awareness of the interstate migration of child labor drew attention to the oyster canning industry. Owen Lovejoy, then Secretary of the National Child Labor Committee, a private, non-profit organization that led the child labor reform movement at the turn of the twentieth century, told the *New York Times*:

...other problems of [laboring children include] education, health and citizenship. Here is a case in point: In certain oyster canning plant in Florida, little children are employed all winter, under conditions, by the way of absolute filth, as 'helpers.' Some of them are Negro children; most of them are Poles and Hungarians. And these Poles and Hungarians are not Florida children, they are imported from Baltimore. Every fall these children are sent down from Maryland to Florida, and every spring they are shipped back again. All winter they work in the oyster canneries on the Florida coast, and our agents are told that it is all right

for them to work in the winter because in the spring the oyster season is over and the children go to school. But as soon as their work in Florida is ended and they are sent back to Maryland, they are put to work immediately on the fruit canning—and our agents are told that of course they work in the summer, but then they go to school all the rest of the year. . . . The Children’s Bureau, being a Federal body, will be empowered to investigate just such cases as that.<sup>146</sup>

Nine years after Lewis Hine photographed children working in Maryland farm fields (See Figure 16), a Bureau of Children’s Labor investigator, Viola Paradise, investigated the use of the labor of children who migrated between the Baltimore canning plants and the Gulf of Mexico seafood canning plants.<sup>147</sup> Figure 17 lends credibility to the range of ages of children Paradise encountered in the canning operations, as well as in less than desirable living conditions with which they coped supplied through the cannery.



**Figure 17.** Children work and play among oyster shells in a Gulf cannery, c. 1918. *Source: Viola Paradise, 65-.2.*

<sup>146</sup> “Work of Children’s Bureau,” *New York Times*, 29 September 1912.

<sup>147</sup> Viola Paradise was an investigator with the Children’s Bureau, U.S. Department of Labor in the early 1900s. In November 1922, *The American Child - A Monthly Bulletin of General Child Welfare*, published by the Children’s Bureau, reported on page five that Paradise “declared that there is no gain in child labor even for the employer; that it is caused not by greed but by stupidity; that to use child labor today is like using a horse-drawn vehicle instead of changing to motor power.” Paradise continued to be active in shaping public policy regarding children’s welfare well into the mid-century.



Figure 17 is copied from a 1918-19 study by the Children’s Bureau on “Child Labor and the Work of Mothers in Oyster and Shrimp Canning Communities on the Gulf Coast.”<sup>148</sup>

In her investigations along the Gulf Coast, Viola Paradise concentrated on 22 canning operations spread among two Louisiana towns on the Mississippi River, six coastal towns in Mississippi, and one in Florida—Apalachicola. According to Paradise, the 1919 season was “abnormal” because of World War I and some canneries closed temporarily. New Orleans was not included “because at the time of the study the amount of oyster and shrimp canning in that city was negligible.”<sup>149</sup>

The report offers a rich description of industrial life in the Gulf of Mexico seafood processing communities. Paradise noted in the report’s introduction that because it was customary “for employers to import families from Baltimore for the oyster and shrimp season,” her study investigated labor recruitment methods in Baltimore.<sup>150</sup> The practice began in 1905 when Baltimore ceded its acclaim as the capital of canning to the Gulf region. The Gulf Coast canning industry grew so rapidly a local labor shortage forced employers to import of experienced workers from mostly Baltimore and New York. Paradise reported that the labor demand could have been met with local African American help, but “the reasons given [for not doing so] were those usually given for the non-employment of blacks in factory work in the South. Racist southerners would rather hire white immigrant labor than local black labor. At the time of Paradise’s investigation, only 12 employers used Negro labor in actual canner work.”<sup>151</sup> Canning employers

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<sup>148</sup> Viola Paradise, *Child Labor and the Work of Mothers in Oyster and Shrimp Canning Communities on the Gulf Coast*, Children’s Bureau, U.S. Department of Labor (Washington, DC: Government Printing Office, 1922).

<sup>149</sup> *Ibid.*, 8-9.

<sup>150</sup> *Ibid.*

<sup>151</sup> Paradise, 69.

preferred workers they referred to as “Bohemians”—Polish immigrants, in particular, but also Slavs, Czechs, Hungarians, and Austrians, all of whom the employers described as being “better than the local workers because they stick to their work.”<sup>152</sup> It is no wonder they did stick to their work: they were entrapped. At the end of summer vegetable canning season in Baltimore, “row bosses” arrived from the Gulf Coast to recruit workers for that region’s autumn, winter, and spring seafood canning seasons. Gulf region employers told the row bosses to seek out family men. Families were less likely to move on if the employment situation did not suit them. So, enticed by warm climate, free rent, free fuel, sometimes free furniture, and family rail fare, many came south. Some employers offered return fares if a family stayed for the entire canning season; otherwise, workers bore the return fare expense themselves, though most could not. Rarely were the employment terms contractual, and the work could be very irregular, depending on harvest conditions. Oysters were shucked and canned as harvested oysters left the steamer cages. Shrimp were picked, peeled, and canned as soon as the boats unloaded. Workers were as likely to be called in to the factory by the watchman as early as 3 a.m. or as late as 7 p.m. and worked until the loads were processed. Some of the local workers resented the imported labor on the grounds that it kept wages artificially low: “They...tell the people lies to get ‘em here. We’d get a living wage...if it weren’t for imported labor. Some of the factories use almost all children; they do it to keep down the men’s wages. They would rather pay 15 cents an hour to two children than give a man 30 cents for the same job.”<sup>153</sup> Children as young as five years old worked alongside their parents, especially their mothers, in the oyster shucking room or picking shrimp. They

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<sup>152</sup> Ibid., 72.

<sup>153</sup> Ibid., 74.

would run and hide if labor inspectors called on the operation. Of the families Paradise visited, “544 children under 16 years of age were employed in the canneries. Of these, 334 were under 15 years of age, 1 being 4 years and another 5 years of age and 64 percent of them worked regularly—whenever the factory was operating.”<sup>154</sup>

Child labor was taken for granted by all: parents, employers, and the community. Children’s education was secondary to family survival. Federal and state labor laws regarding child labor at this time were weak by today’s standards and tough to enforce. Living quarters for the migrant workers’ camps, while most often supplied by the employer, were primitive and overcrowded. Disease and especially injury from shucking oysters and peeling shrimp were rampant. Workers purchased gloves at their own expense, but the gloves rarely lasted more than a day. A mother might share a pairs of gloves with her child, one glove each, but sizes did not suit little children’s hands so they most often went without. Sanitary conditions in the plants were terrible, in part due to ignorance of bacteria. Blood poisoning was not uncommon, and knowing what we do today about the *Vibrio* bacteria, it is not surprising to read of the documented problems with festering sores, unsuccessful lancing efforts, and high fevers. Paradise reports that some physicians who treated the workers “did not take oyster cuts lightly,” believing the dirt on the shell compromised the injured patient. The workers believed that shrimp peeling was worse than oyster shucking because it made their hands so raw, they bled. Some would pick shrimp for no more than two days, then take two days off—consequently enduring the financial hardship of that decision. Ammonia-like shrimp acids affected even the men who unloaded shrimp from boats into the carts; it ate through

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<sup>154</sup> Ibid., 11, 14.

the leather of their boots leaving their feet raw. It was not unusual for workers to continue loading or peeling even as their hands and feet bled.<sup>155</sup>

Some employers provided buckets of alum water which offered some relief to cuts and scrapes of oyster shucking, burns from steam, and raw skin and infections from the acid juices and pricking barbs of shrimp peels. Seeking physical relief in order to keep working, people spent part of their meager wages on their own supply of alum powder and sticks. Falls on slippery floors and crushing by the heavy steam carts occurred regularly. Incidental to the picking work were the conditions of bad odors, dampness, and cold, because the shrimp had to be kept iced and the cold melting water soaked the workers' clothes and footwear.<sup>156</sup>

Paradise does not identify any of the oyster and shrimp canning operations by name. However, at the time in Apalachicola, the Ruge Brothers had been operating a canning company since 1885. Bay City Packing Company marketed the "Pearl" brand of Apalachicola-processed seafood. The Rice Brothers also had a successful oyster and shrimp-packing operation.<sup>157</sup> William Lee Popham, a local land speculator, was carried away by his fascination with the reproductive capabilities of local oysters. In the early 1920s, he and his wife, Maude, founded the Oyster Growers' Co-Operative Association, planted live oysters and shell and sold shares in the enterprise. He even went so far as to build a state-of-the-industry 61,000 square foot oyster factory and warehouse with cooling fans and steam heat.<sup>158</sup> Popham was well-liked within the community and was so convincing about the fecundity of the native oyster population, that he was able to sell

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<sup>155</sup> Ibid., 31-33.

<sup>156</sup> Ibid., 34.

<sup>157</sup> Chapel, *A Brief History of the Apalachicola Area*, Chapter 11.

<sup>158</sup> Rogers, *Outposts on the Gulf*, 213-216.

fraudulent oyster leases which led to criminal charges and prison time. Consequently, his company never fulfilled the hopes for economic success in the Apalachicola business community.<sup>159</sup>

In the late 1920s, Apalachicola boasted more than a dozen seafood processing plants. However, by the late 1930s, in part because of severe drought conditions throughout the Apalachicola River watershed, only six seafood plants remained in operation. But, in 1934 with the finished construction of the six-mile long John Gorrie Bridge between Apalachicola and its oystering sister town across the bay, Eastpoint, the *New York Times* declared, “This old fishing town, bottled up for 110 years, is about to emerge from its isolation.”<sup>160</sup>



**Figure 18.** Women shucking oysters at the Apalachicola Fish and Oyster Company, 1947. *Courtesy Florida Memory Collection.*

Then, in 1947, the face of oyster shuckers changed, too. Figure 18 illustrates the use of local labor. As more blacks moved north to take advantage of better paying jobs, more and more local white women took on oyster shucking. Many found the plant jobs

<sup>159</sup> Ibid., Chapel, *A Brief History of Apalachicola*, Chapter 11.

<sup>160</sup> “Apalachicola’s 110 Years of Isolation to End Soon,” *New York Times*, 3 August 1934.

flexible enough to fit in with minding their children and being available to shuck oysters for their husbands' harvest, too. They also benefitted from laws implemented to ensure better workplace safety conditions and sanitary standards for the benefit of public health.

## Chapter Four

### Environmental and Cultural Sustainability

*This coast is the Kingdom of oysters...  
Pierre de la Charlevoix*

*This industry is sustainable and non-polluting.  
Apalachicola Bay Chamber of Commerce*

For centuries, the oyster bounty of the greater Apalachicola Bay waters has moved people to wonder and curiosity. In the early eighteenth century, Pierre de la Charlevoix, a Jesuit historian who explored and documented the far-flung empire of New France, described his party's encounter with the area:

All these low lands, which we coasted as near as possible, are bordered with trees, to which are fastened a prodigious quantity of little oysters, of an exquisite taste: other, much larger and less dainty, are found in the sea in such numbers that they form banks in it, which we take at first for rocks on a level with the surface of the water.<sup>161</sup>

In more recent times, the local flavor of Florida seafood sells tourists the idea that their get-away is not complete without dining on local oysters. In 1965, the *New York Times* reported the cooperative effort of the adjoining Apalachicola Bay counties—Franklin, Gulf, and Wakulla, “to make their attractions for tourists better known” and targeting the more affluent post-World War II middle class lifestyle by promoting the

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<sup>161</sup> Having left France to teach in Quebec for several years, Father Pierre Xavier de la Charlevoix was charged by the French Court to return to the New World to explore and document New France. His party came upon Florida's Gulf Coast enroute from the Bahamas to the mouth of the Mississippi River in the early 1720s. The description of the Apalachicola Bay area is included in one of his many historic manuscripts, *Histoire et description generale de la Nouvelle-France*, published in Paris in 1744. Edward Spillane. "François-Xavier Charlevoix." *The Catholic Encyclopedia*. Vol. 3. New York: Robert Appleton Company, 1908; Quoted in E. Ingersoll, "The Oyster Industry," in G. Brown Goode, ed., *The History and Present Condition of the Fishery Industries* (Washington, D.C.: U.S. Government Printing Office, 1881), 193.

unspoiled natural resources of the region.<sup>162</sup> The *New York Times* declared “Apalachicola is probably best known, at least to Floridians, as the home of Florida oysters.... So important a factor is seafood in the life of this area that Apalachicola holds a seafood festival every November;” several thousand people attended the 1965 festival.<sup>163</sup> By 2002, the *Times* declared that “food critics and restaurant owners from Miami and New Orleans say Apalachicola Bay oysters are among the finest in the world.”<sup>164</sup> Fanning that reputation today, the Florida Seafood Festival is a foundation of the tourist business in Apalachicola. A two-day event occurring annually on the first weekend in November, the festival boasts attendance of greater than 50,000; in a town with a 2007 population of just 2,237, the festival’s economic impact and challenging logistics are significant. This festival highlights the local seafood industry with emphasis on the oyster, a fact affirmed by the festival reign of King Retsyo (oyster spelled backwards) and oyster-eating and -shucking contests.

In 2007, the U.S. Travel Industry Association arrived at a list of the top ten favorite destinations for “culinary tourists—people who make travel decisions based on food-related experience....” and Florida ranked second behind California.<sup>165</sup> No surprise, then, that culinary tourism thrives in Apalachicola. The Fall/Winter 2006 front cover of the upscale *SweetTea Journal: From the Porches of Northwest Florida* flaunts, “Only in Florida: The Oysters of Apalachicola” emblazoned across an iconic view of the lone oysterman working his tongs against a setting sun. Luring tourists by their taste buds is

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<sup>162</sup> According to the organization’s website, the “U.S. Travel Association, based in Washington, D.C., is a non-profit trade organization that represents and speaks for the common interests of the \$740 billion U.S. travel industry.” Accessed at [http://www.tia.org/about/what\\_we\\_do.html](http://www.tia.org/about/what_we_do.html); C.E. Wright, “Florida’s Apalachicola Area is Astir,” *New York Times*, 3 January 1965.

<sup>163</sup> C.W. Wright, see footnote immediately above.

<sup>164</sup> “From Apalachicola Bay, Oysters Rated the Best,” *New York Times*, 15 June 2002.

<sup>165</sup> Dave Kovalski, “Top destinations for Foodies,” *Association Meetings (19)2* (1 April 2007), para. 1. Accessed at [http://meetingsnet.com/associationmeetings/mag/meetings\\_top\\_destinations\\_foodies/](http://meetingsnet.com/associationmeetings/mag/meetings_top_destinations_foodies/).



not restricted to the print media.<sup>166</sup> While the cover of the print version of the official visitors' guide of the Apalachicola Bay Area Chamber of Commerce boasts an attractive half-dozen raw oysters served on the half-shell in the company of photos depicting breathtaking local sunsets, folksy fishing boats, and pretty Victorian homes, its complementary web page at [www.apalachicolabay.org](http://www.apalachicolabay.org) asserts that one's visit to this pristine and charming coast will not be complete unless combined "with some of the finest oysters in the world."<sup>167</sup>

The illustrative photo on the cover of the *SweetTea Journal* conveys a message beyond "wouldn't you like to be right here?" It portends the loss of Florida's oystering heritage. The message might as well be "Get it now, while you can; this won't be around forever." The allure of local seafood and Florida's fishing heritage extends to participants in "The Gatherings" of the Florida Humanities Council, the state affiliate of the National Endowment for the Humanities. The Gatherings offer in-depth cultural tours guided by scholars, and local leaders of unique Florida communities. But according to program director, Monica Kile, "fresh, local seafood is the biggest attraction."<sup>168</sup> Kile states that participants' curiosity about the "unique, remote, and non-homogenous" traditions of Apalachicola are satisfied in part by the "very place-based" itinerary that includes visiting oyster-shucking and seafood processing facilities and enjoying meals that feature and celebrate the local culinary resources. Kile comments that while not every participant chooses to visit the raw bar, those who do seem little concerned about, nor have they ever questioned, the quality of the oysters; on the contrary, they appear to

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<sup>166</sup> Mark Zaloudek, "Luring tourists by their taste buds," *Sarasota Herald-Tribune*, 7 June 2006.

<sup>167</sup> "Dining and Seafood," Apalachicola Bay Chamber of Commerce website. Available at [www.apalachicolabay.org](http://www.apalachicolabay.org).

<sup>168</sup> Interview by author on 3 June 2009 in St. Petersburg, Florida.

eat them with gusto, seemingly assured of their purity by reason of their freshness. She continues, "They are looking to experience a strong sense of place when they visit Apalachicola, and food is a huge part of that experience."<sup>169</sup>

In May 2006, the food traditions of Florida's primary oyster region became the focus of a three-day field trip designed by the Southern Foodways Alliance under the direction of renowned food author, John T. Edge. Not only did the participants pay homage to the oystermen and women by trying out the tonging effort out on bay waters for themselves, but they savored the friendly ambience of the Apalachicola community while devouring the fruits of the region, which beyond oysters include shrimp, crab, Tupelo honey, and smoked mullet.<sup>170</sup>

Fame of its archaically unchanging oyster traditions lends Apalachicola romantic draw. In 2008, a travel agency in Birmingham, Alabama, offered a "Foraging for the Forgotten Coast" package to journalists and travel writers around the country that included tonging for one's own oyster dinner, prepared by no less than a James Beard Foundation Award<sup>171</sup> nominee.<sup>172</sup> That chef, Chris Hastings, prepared locally-gathered Tupelo honey and flounder gigged by the participants. Hastings affirmed this locavore keystone: "There's become such a disconnect between people and food," he says. "Do this trip and you start to understand seasonality again. You can taste the difference."<sup>173</sup> Marketing the locavore philosophy just might pay off for Apalachicola. In a survey of

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<sup>169</sup> Ibid.

<sup>170</sup> Sixth Southern Foodways Alliance Field Trip "Florida's Forgotten Coast: Apalachicola and Environs, 18-20 May 2006. Accessed at [http://www.southernfoodways.com/events/past\\_events/2006.html](http://www.southernfoodways.com/events/past_events/2006.html).

<sup>171</sup> *Time* magazine compared the James Beard Foundation Awards to the Oscars of the culinary world in Andrea Dorfman's article, "Sweet Taste of Success: A Desserter from the Dance." 13 November 2000. Accessed online at <http://www.time.com/time/magazine/article/0,9171,998472,00.html>.

<sup>172</sup> Christopher Percy Collier, *National Geographic Adventure*, June/July 2008. Accessed at <http://adventure.nationalgeographic.com/print/2008/06/weekend-getaways/east-summer-text>.

<sup>173</sup> A locavore is an eco-conscious person who eats locally grown food, i.e. food grown or produced within a set radius of, say, 100 miles; Collier, Ibid.

more than 1600 members of the American Culinary Federation, the National Restaurant Association found that sustainable seafood and local produce appear in the top ten “hot” trends for restaurant menus in 2009.<sup>174</sup>

One can make the argument that the attraction to this remote oystering and shrimping community is more than food and how that defines its character; indeed, the fear is that if one waits too long to visit this “real” place, it may no longer exist; that in fact, what visitors to the area seek is a chance to experience a distinctive Florida culture that may disappear in the not too distant future. Development pressures, pollution, drought, hurricane destruction, and a thirty-year old battle over water allocation along the Apalachicola, Chattahoochee, Flint River (ACF) system threaten the life of the bay and the centuries-old fisherfolk traditions of the Florida panhandle.

Already subject to the freshwater flows that affect naturally varying levels of salinity, decreased upriver water releases through the dams negatively impacted the lower reaches of the ACF and the bay, too. According to the local community, much of the blame rests in Atlanta’s need for extracting water from Lake Lanier, a result of completion of the Buford Dam on the Chattahoochee River in 1956. The 38,000 acre lake has an average normal summer depth of about 1,000 ft. Operated by the U.S. Army Corps of Engineers (USACE), the reservoir of Lake Sidney Lanier northeast of greater Atlanta, became the city’s main water source. However, the states of Alabama and Florida, which share the Apalachicola, Chattahoochee, and Flint Rivers’ system with Georgia, contend that the original three purposes for building the reservoir were to

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<sup>174</sup> Annika Stensson and Mike Donohue, “Healthy Kids’ Meals, Local Produce, Mini Desserts Among Hottest Menu Trends for 1009, According to National Restaurant Association Research,” Press Release, National Restaurant Association, 9 December 2008. Accessed at <http://www.restaurant.org/pressroom/pressrelease.cfm?ID=1708>.

control floods, float barges downstream, and generate power. Therefore, Atlanta's drinking water supply is a secondary issue.<sup>175</sup> According to Federal law, if two or more states have access to a river's flow, riparian rights prevail and each state shares equal access to the water. Yet, Georgia's laissez-faire growth management policies have aggravated the ongoing drought.

Heightening the tri-state sensitivities to ACF water allocation, "non-irrigation water use in the ACF alone increased about 260 percent between 1970 and 1990...and irrigation use increased 1,300 percent...."<sup>176</sup> Additionally, droughts, one from May 1998 to September 2002 and the more recent drought from 2006 to 2009, have put increased stress on Atlanta's fast-growing population, their water resources, as well as the organisms dependent on those same water resources. Needless to say, recent drought further enflamed the tri-state water conflict.<sup>177</sup> Despite the adoption of ACF Compacts by each of the three states in 1997, negotiated agreements that were Congressionally authorized negotiations expected to provide a "formal and legal framework for addressing water-allocation issues, basin-wide management, and dispute resolution...." Negotiations failed repeatedly.<sup>178</sup> In June 2006, drought-stricken Lake Lanier had dropped by as much as six feet and was descending. The slow flow of water to Apalachicola Bay was further aggravated by agricultural irrigation draws from the Flint River basin. Consequently, Florida's down-river mussels started to die, and nutrient

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<sup>175</sup> Stacy Shelton, "Lake Lanier Decision Pending on Water Use Issue," *Atlanta Journal-Constitution*, 12 August 2008.

<sup>176</sup> Jeffrey L. Jordan, "Conflict Comes to the Humid East: The Tri-State Water Wars," in *Interstate Water Allocation in Alabama, Florida, and Georgia*, Jeffrey L. Jordan and Aaron T. Wolf, eds., (Gainesville: University Press of Florida, 2006), 21.

<sup>177</sup> *Ibid.*

<sup>178</sup> *Ibid.*, 27-28.

supplies and salinity levels required for Florida's Apalachicola Bay oysters to thrive were in serious jeopardy.<sup>179</sup>

Haphazard efforts on Atlanta's part to conserve water infuriated downriver stakeholders along and at the mouth of the Apalachicola River. "We know they've got to have drinking water in Atlanta and we don't want to talk harsh on them [sic],' said Keith Millender, whose family has farmed oysters and netted shrimp for generations in Apalachicola Bay. 'But tell them to stop filling up their swimming pools and washing their cars. We've got to earn a living, and they can sacrifice, too. If they can't get to their boats on Lake Lanier because their dock is standing dry, tell them to do what we do: get a dingy and paddle out.'"<sup>180</sup>

The ongoing drought and lack of freshwater releases north of the ACF system create extraordinary conditions to which oysters are not adapted. Marine research scientist Bill Arnold explains, "Oysters may not be physiologically adapted on an individual basis, [nor] ecologically adapted on a population basis, to such anthropogenic alterations because those alterations have occurred during a very short period of time relative to the evolutionary history of the animal."<sup>181</sup>

The late Buddy Ward, an Apalachicola seafood harvester and processor, reiterated in 2002 the importance of adequate drainage of the ACF into Apalachicola Bay—because oysters depend on microscopic organic materials for sustenance.<sup>182</sup> The battle over water releases is two-edged. If drought conditions prevail, the river flow that brings nutrient-

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<sup>179</sup> "Florida Oysters suffering for Georgia Drought," *St. Petersburg Times*, 23 July 2006.

<sup>180</sup> Mike Williams, "For proud Florida oystermen, a way of life is endangered," *Atlanta Journal-Constitution*, 3 December 2007.

<sup>181</sup> Arnold, *A Summary of the Oyster*, Ibid, 14.

<sup>182</sup> Buddy Ward, in Faith Eide, (Ed.), *Voices of the Apalachicola*. Gainesville: University Press of Florida, 2006.

rich mud into the bay is minimal. On the other hand, heavy rain fall or water releases from the dams along the system bring concentrations of pollutants along with necessary nutrients. Commercial fisherman and retail seafood business owner Steve Davis declares, “This bay depends on that river for the mud.... Pollution don’t outweigh the nutrients coming down with the mud.”<sup>183</sup>

Lake Lanier is now just two feet below its “full pool” level of 1071 feet, and the U.S. District Court recently ruled that the U.S. Army Corps of Engineers illegally allowed drinking water withdrawals from the Lake and that Georgia has only three years to address Lake Lanier water use and negotiate a deal with Alabama and Florida. If no deal is reached within three years, permitted withdrawals will be reset to 1970s levels, those prior to metropolitan Atlanta’s recent population boom.<sup>184</sup> If that happens, its other water sources will not sustain the current regional population.

According to Chuck Adams, a professor and marine economist with the Food and Resource Economics Department and Florida Sea Grant College Program at the University of Florida, the concept of *sustainability* of marine resources ranks highest among marine resource utilization concerns, despite his claim that shellfish are “becoming increasingly popular”.<sup>185</sup> In other words, the increasing popularity of seafood consumption increases the possibility that certain marine species might be over-fished, jeopardizing their reproductive capability thereby resulting in a diminished population, well below the level needed to sustain demand of current and even future

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<sup>183</sup> Steve Davis, as quoted in Eidse, *Voices*, 132.

<sup>184</sup> Lake Sidney Lanier Water Level, Lakes Online on 28 September 2009, <http://lanier.uslakes.info/Level.asp>; Jeremy Redmon, “Lake Lanier Blame Game Brews,” *Atlanta Journal-Constitution*, 26 July 2009.

<sup>185</sup> Chuck Adams, “Selected factors affecting seafood markets in the United States,” *Journal of Food Distribution Research* (1998), (29)1: 8-17.

generations of consumers. Simon Dresner, in his book *The Principles of Sustainability* addresses the slippery arguments surrounding the concept of sustainability. He reminds us that the 1987 report of the United Nations' World Commission on Environment and Development, *Our Common Future*, successfully drew the notion of sustainability under the umbrella of sustainable development, i.e. "equity between generations" and "equity within generations."<sup>186</sup> Yet, environmentalists and conservative economists argue about sustainable development constantly, the former making the case for controlling the depletion of Earth's resources, its "natural capital," and the latter's line of reasoning that timely advances in science and technology will make up for those risks.

In general, Adams indicates that seafood continues to lose market share to meat, in part because people are less familiar with varieties of seafood and how to prepare it.<sup>187</sup> I argue that the culture of suspicion surrounding different seafoods also influences demand. The culture of suspicion is at least partly driven by the media. One localized bout of gastroenteritis tracked to oysters from a particular place of harvest makes headline news and as a result *all* oysters come under suspicion, as discussed earlier in this narrative. The recent scare of *e-coli* contaminated peanut butter from one processing plant in Georgia caused a major drop in consumer purchase of *all* peanut butters.<sup>188</sup> Regarding seafood specifically, the recent flap in Florida whereby unscrupulous restaurants, and even wholesale dealers, substituted cheaper kinds of white fish meat for Florida's iconic grouper, a variety for which tourists as well as locals are willing to pay a

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<sup>186</sup> Simon Dresner, *The Principles of Sustainability* (London: Earthscan Publications Ltd., 2002), 2-5; World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987).

<sup>187</sup> *Ibid.*, 14.

<sup>188</sup> Andrew Martin and Liz Robbins, "Fallout Widens as Buyers Shun Peanut Butter," *New York Times*, 7 February 2009.

premium, attracted much attention—so much so that the Division of Marketing and Development of the Florida Department of Agriculture and Consumer Services established a website entitled “Be An Informed Consumer” to specifically educate people about the possibility of cheaper fish of inferior quality being substituted for Florida grouper.<sup>189</sup>

It is interesting to note that the *Crassostrea virginica*, American or Eastern oyster, does *not* appear on the RAFT (Renewing America’s Food Traditions) Redlist of Fisheries at Risk in North America, although in the category for shellfish at risk, a number of bivalves do appear including bay scallops, Olympia oysters, quahogs, and soft shell mussels.<sup>190</sup> That fact might indicate that the mollusk continues to be prolific enough that challenges of population growth, pollution, climate change, and weather events are not detrimental enough to negatively influence its ability to thrive even in marginal conditions.

“Seafood is sustainable,” contends the seafood marketing division of the Florida Department of Agriculture, “when the population of that species of fish is managed in a way that provides for today’s needs without damaging the ability of the species to reproduce and be available for future generations.”<sup>191</sup> While Atlantic states, in particular Connecticut and Rhode Island, find it necessary to restore and enhance commercially harvested oyster reefs by artificial means, those efforts are not necessary in the Gulf of Mexico to sustain a viable population of *Crassostrea virginica*, according to a 2007

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<sup>189</sup> More information can be found online at FL-Seafood.com, [http://www.fl-seafood.com/consumers/grouper\\_substitution.htm](http://www.fl-seafood.com/consumers/grouper_substitution.htm).

<sup>190</sup> Renewing America’s Food Traditions (RAFT) is a consortium founded by Gary Nabhan, PhD, author of *Renewing America’s Food Traditions*, and funded by a variety of food, seed, and culture conservationists. The Redlist: Seafood traditions at risk in North America was published in the *Journal of Agricultural & Food Information*. (9)3 (2008): 186-195.

<sup>191</sup> “Florida Fishermen Help Keep Seafood Sustainable,” Division of Marketing and Development, Florida Department of Agriculture and Consumer Services at [www.fl-seafood.com](http://www.fl-seafood.com).



report commissioned by National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries. Resilient to broad fluctuations in the characteristics of its ideal growth environment—salinity, oxygen levels, and temperature—the Eastern oyster is a hardy creature, especially in Florida. Surveys of resource managers and independent experts conducted by the Biological Review Team support that overharvesting oysters in Florida is not a major threat.<sup>192</sup> The report concludes:

there are some threats that may be significant at a regional or local level. However, while the species encounters many threats throughout its range, none are considered to be overwhelmingly dominant or advancing at a rate that would threaten the viability of the species throughout its full range. Based on the available information...the long term persistence of eastern oysters throughout their range is not at risk now or in the foreseeable future.<sup>193</sup>

While the Eastern oyster may not be threatened biologically “throughout its range,” ongoing drought and more reduced freshwater releases from the northern regions of the ACF frustrate the seafood industry in the Apalachicola region, and the continuous pressures of coastal development and population growth in the panhandle of Florida are the greatest threats to the Florida commercial oystering industry, according to David Heil, Assistant Director of Florida’s Division of Aquaculture.<sup>194</sup> Population growth produces negative and positive consequences. Local governments want higher tax revenue that growth brings. Also, markets for goods and services increase, providing more choices and competition that benefit the community. However, without careful planning, growth’s impacts to the environment can be severe. Traffic congestion, air and water pollution, and loss of green spaces are commonplace. Stanley Smith asserts that a new populace influences the “prevailing local lifestyle and changes the nature of the

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<sup>192</sup> Ibid, 1.

<sup>193</sup> Ibid, 2

<sup>194</sup> Arnold, *A Summary of the Oyster*, 13; Heil interview.

community.... It increases the number (and perhaps the intensity) of public and private disputes.”<sup>195</sup> Some Floridians rejoice over a recent report by the Bureau of Economic and Business Research at the University of Florida that contends Florida’s population declined for the first time in over 60 years, by almost 58,000.<sup>196</sup> While the state’s population increased 32 times between 1900 and 2000, Franklin County’s population barely doubled—an anomaly clearly illustrated in Figure 19. That may change if the new regional airport under construction near Panama City stimulates growth along the north Florida Panhandle coast.

Year	County	Florida
1900	4,890	528,542
1910	5,201	752,619
1920	5,318	968,470
1930	6,283	1,468,211
1940	5,991	1,897,414
1950	5,814	2,771,305
1960	6,576	4,951,560
1970	7,065	6,789,443
1980	7,651	9,746,961
1990	8,967	12,937,926
2000	9,821	15,982,378

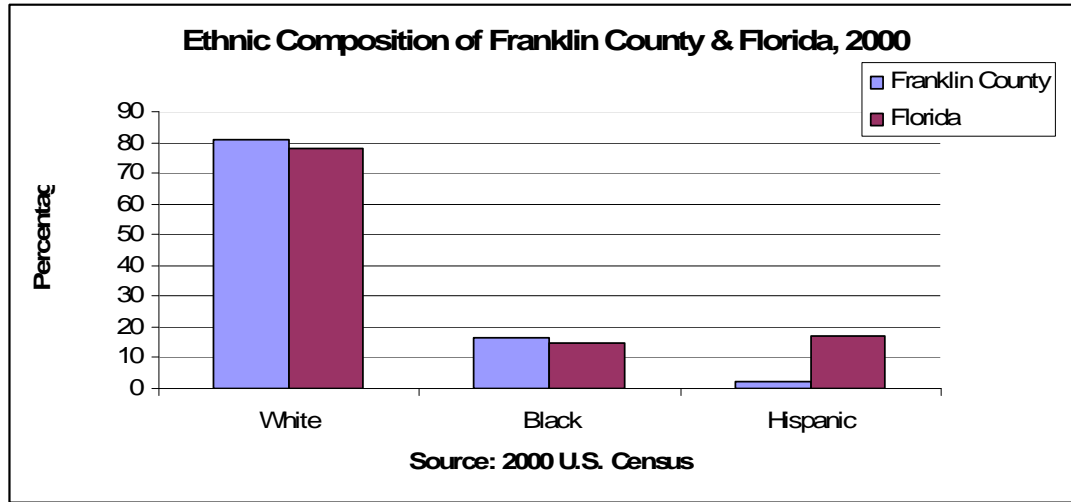
**Figure 19.** Population Trends in Franklin County, Florida. Source: 2000 U.S. Census

Today’s population in Apalachicola and Franklin County is not a mirror of the rest of Florida (see Figure 20). While the number of Hispanic people appears relatively low in Franklin County, anecdotally, and not surprisingly, the Hispanic population in the

<sup>195</sup> Stanley K. Smith, *Florida Population Growth: Past, Present, and Future* (Gainesville: Bureau of Economic and Business Research, University of Florida, 2005), 20. Available at <http://www.bebr.ufl.edu/content/florida-population-growth-past-present-and-future>.

<sup>196</sup> Jeff Kunerth, “Sunshine State may be a bit emptier,” *Orlando Sentinel*, 18 August 2009, A1.

area is increasing. Employers seem to be happy with their Hispanic workers saying they work hard and are dependable.



**Figure 20.** Ethnic Composition of Franklin County & Florida. Source: 2000 U.S. Census.

Over the centuries, many people along the Panhandle coast of Florida believed the region’s rich natural food resources prevented hunger within the communities. In 1948, one Northwest Florida resident, E. E. Callaway, noted “Until 1941, when good roads and bridges came, there was no great incentive to own automobiles. [The people] did not pull their hair to know where the next meal was coming from.”<sup>197</sup> In other words, because of the good graces of Nature and with some determined physical effort, people working Apalachicola Bay could harvest a ready supply of oysters, shrimp, crab, and many varieties of fish according to the season, just as they have done for many generations. Recently, one local resident claimed he “don’t think anybody’s ever starved to death in Apalachicola” because of the abundance of readily available seafood.<sup>198</sup>

<sup>197</sup> E. E. Callaway, “The Land of the Apalach,” *Literary Florida* (April 1948), 3. The author found the unbound pages of this article in a folder of miscellaneous articles in the Apalachicola Public Library.

<sup>198</sup> Steve Davis, as quoted in Eidse, *Voices*, 131.

Seventy-two year old coastal native Martha Pearl Ward recounts how barren New Mexico seemed to her and her husband Buddy, a native of Apalachicola, during his Army stint in Albuquerque in the early 1950s.<sup>199</sup> Facing uncertain employment on their return to their Apalachicola hometown, she reminded him, “When we get home...no matter, we can go catch fish, we can get oysters. We can survive. Out here [in New Mexico], you can’t.” They did go home, buying out her uncle’s Thirteen Mile Oyster Company. They harvested and marketed Apalachicola Bay oysters during the fall, winter, and spring, and shrimp in the summertime.<sup>200</sup> Some years are better than others. “It’s a hard life, but a good life,” stated Ms. Ward.<sup>201</sup> “You really have to work at it; and you really have to put back for a rainy day, which is hard, it’s really hard.”<sup>202</sup>

In fact, Apalachicola Bay can be a lifesaver for many people in the region, because when local businesses experience shut-downs or lay offs many in the community turn to oystering, relieved that they paid that annual license fee, “just in case.” Over one thousand Floridians currently hold \$100 oyster licenses and one in ten persons in Franklin County is an oysterman or oysterwoman, though many of those licenses just ensure second jobs.<sup>203</sup> Many harvest oysters just to make ends meet.<sup>204</sup> While the rigors

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<sup>199</sup> Martha Pearl Ward. Personal interview by the author in Apalachicola on Thursday, 25 September 2008. Ms. Ward’s late husband, Buddy Ward, was the patriarch of Buddy Ward and Sons Seafood, still a family operation under the direction of son Tommy Ward.

<sup>200</sup> Gulf oysters may be harvested year round; however, some areas are closed during the warmer summer months lessening economic potential, and demand for oysters tends to drop during this, their spawning period. By rotating to shrimp harvesting during summer season, local fisher folk attempt to maintain economic stability.

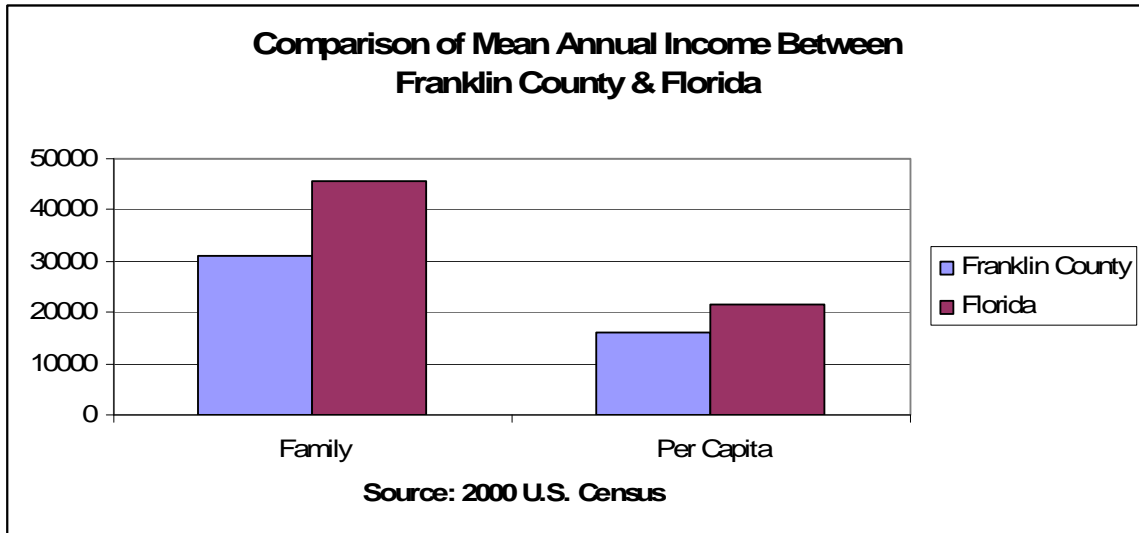
<sup>201</sup> Ward interview.

<sup>202</sup> Buddy Ward, as quoted in Eidse, *Voices*, 114.

<sup>203</sup> Thomas Becnel, “Apalachicola Bay oystermen still harvest by hand,” *Sarasota Herald-Tribune*, 27 December 2008.

<sup>204</sup> James Golden, as quoted in Eidse, *Voices*, 125.

of tonging oysters will not necessarily make an oysterman rich, he will probably sleep good, according to John Richards, the former head of the Franklin County



**Figure 21.** Comparison of Mean Annual Income Between Franklin County & Florida. Source: 2000 U.S. Census.

Seafood Workers Association If the wholesalers pay \$16 per 60-pound sack and a good day’s work yields ten sacks, Richards calls that “a pretty good day’s work.” “It’s hard,” Richard likes to say, “but it’s fair.”<sup>205</sup> Accordingly, the 2000 census reveals that people in Apalachicola and Franklin County much lower incomes than other Floridians (see 21).

<sup>205</sup> Williams, “For Proud Oystermen,” *AJC*.



**Figure 22.** Skiffs stored in the backyard. The future of Florida’s oyster industry? 2009. *Photo by author.*

There is nothing glamorous about oystering, an industry that can be likened more to farming than fishing. For example, unlike fishing, the oysterfolk do not have to leave their homes for extended periods of time. In my conversations with today’s oystering families, the oystering parents repeated the sentiment that they don’t expect, nor do they encourage, their children to continue in the tradition of oystering for a living. While they admitted the “kids” will take a skiff out onto the bay to harvest for a few hours after school or on the weekends “because they know with bit of hard work...in a relatively short time, they can earn enough money to make a car payment, or put gas in their cars.”<sup>206</sup> My informal survey revealed that oystering parents are heartily encouraging their children to get an education, even if it means their children end up moving away from the area.

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<sup>206</sup> Cristal Bailey. Personal interview by the author in Eastpoint, Florida, on 24 September 2008.

On the other hand, oyster harvesting is a family tradition, an art passed from one generation to the next. “In oysterin’, you gotta have a knowledge of the bay, where you



**Figure 23.** A thriving 13-Mile Oyster Company in Apalachicola, Florida.  
*Photo by author.*

want to go and what tide you wanna go on,” said Steve Davis, oysterman, shrimper, and owner of Lloyds Fish Market, in Apalachicola.<sup>207</sup> The locals who grow up in the industry have the advantage over newcomers by virtue of their intimate knowledge of the bay and

often hold a license to harvest in case they another source of income. While some young people do work with family members on boats, either tonging or culling, many oystermen lament the lack of young people interested in pursuing commercial seafood harvesting, even as they refrain from encouraging their own family members to seek a career in the sea. One such person is Cristal Bailey, an Eastpoint oysterwoman who partners with her husband; she culls while he tongs in Apalachicola Bay. Their 16-year old son funds his

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<sup>207</sup> Quoted in Eidse, *Voices*, 135.

driving and entertainment expenses by happily applying his after-school hours to harvesting oysters on occasion. His mother says, “It’s hard work, but he’s young and strong and knows he can make money. However, we encourage him to continue his college-bound career plan; we don’t want him to work in this uncertain and erratic industry.”<sup>208</sup> On the other hand, Tommy Ward’s son, TJ, might prove the exception; he seems proud to continue in the family tradition of Apalachicola Bay seafood supply.<sup>209</sup> The rationale for discouraging children from extending the family traditions of oystering is both economic and environmental. “Oysters are on the decline. Now what they are catching I threw away when I first moved here” mourned one oysterman referring to the current legal harvest size of three inches.<sup>210</sup>



**Figure 24.** A typical example of many of the Apalachicola oysters houses closed as a result of hurricane or economic stresses. 2008. *Photo by author.*

In recent decades, development, both commercial and residential, as well as weather catastrophes have put a lot of pressure on the Bay communities and their

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<sup>208</sup> Bailey interview.

<sup>209</sup> Tommy Ward. Personal interview by the author at Thirteen Mile Oyster Company on 23 September 2008. During the course of the interview, the author met TJ, Tommy Ward’s son. .

<sup>210</sup> Jerry Allen, as quoted in Eidse, 188.



maritime heritage. The seafood houses of Apalachicola's working waterfront are gradually giving way to economic pressure to adapt the area for tourism. There's never been much of a profit margin in the industry, especially for the tongers. As James Golden observed, "A lot of these old oyster houses you know they paid probably over \$100,000, \$150,000 for 'em; it's just sittin' idle. You ride through. Every one of these old houses just waitin' for condos."<sup>211</sup>

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<sup>211</sup> James Golden, as quoted in Eidse, 124.

## Conclusion

Standing on the shore at Thirteen Mile, gazing out at the myriad oyster skiffs bobbing gently on the waters of Apalachicola Bay, I want to believe that the scene will look pretty much the same fifty or one hundred years from now. However, all it takes to quash that thought is for me to turn around, get into my car, and work my way a few miles east into the town of Apalachicola and its neighbor across the river, Eastpoint. All along U.S. Highway 98 sit half-demolished wooden buildings, their docks tilted and broken; faded, weather-beaten signs read “Oysters,” and weeds disguise the shell-covered parking lots. Figure 23 provides one example not far off the main highway in Apalachicola. Hardship and economics have always challenged the industry, as has the lack of available workers. While seafood processors imported workers from Baltimore in the early 1900s, today’s plant bosses still like the work ethics of migrant workers. Kevin Begos, Executive Director of the Franklin County Oyster and Seafood Task Force, recently told me the declining workforce is a major concern among oystermen and dealers, despite a growing Hispanic contingency (young men and women in their 20s) in the seafood processing labor pool. While traditional oyster shuckers in more recent times have been local women, black and white, that workforce continues to grow more elderly. Many of them are over 50 years of age, and some are over 70, having shucked oysters since their youth. Today, most local youngsters do not want to do that work, “unless they

absolutely have to.”<sup>212</sup> Figure 25 illustrates how little has changed over the last hundred years when it comes to shucking oysters. Workers stand at individual work stations, stainless steel today rather than the wood or concrete of yesteryear. They wear long aprons, leather gloves, boots, and stand on raised boards out of the way of pieces of shell and slippery, wet concrete.



**Figure 25.** Modern-day oyster shuckers. *Courtesy Florida Memory Collection.*

Nature’s forces provide an element of uncertainty in the industry. Affected by droughts as far north as the lower Appalachian ranges and by hurricane-devastated reefs and flooded estuaries, the oysters, and those who make a living harvesting them, are subject to the whims of nature. As a result of Hurricane Dennis in 2005, Lynn Martina, owner of Lynn’s Quality Oysters in Eastpoint, said, “after the storms, I didn’t want to build back.... But, I had people—I had families you know, counting on me because they

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<sup>212</sup> Personal correspondence, 20 August 2009; Lynn Martina in an interview with Amy Evans about “Florida’s Forgotten Coast,” *Southern Foodways Alliance Oral History Program*, 11 January 2006 in Apalachicola, FL.

can't do anything else.... Most of them don't have an education. The bay is their education."<sup>213</sup> That may not change, but commitment on the part of the state, manifested by quick action and funds to assist replenishing and restoring the beds, lessens the negative affects. Unlike in the early twentieth century when sanitary and food safety regulations were either non-existent or just coming into being and irregularly enforced, today's regulatory environment is increasingly complex. Multiple layers of government rules and safeguards—local, state, and federal—overlap on issues of food handling, food safety, and worker training. And yet, regulation is so complicated now, that resulting frustration may drive some long-timers out of business. They spend more time trying keeping up with bureaucratic paperwork and in compliance with foodhandling safety guidelines than working their trade hands-on. Indeed, a shift to mandatory post-harvest processing may be the straw that breaks the camel's back. A vigorous campaign in underway by advocates of more stringent controls by the FDA to prevent foodborne illness. The CSPI is one example; the organization is calling on mandatory post-harvest treatment of *all* oysters harvested in the Gulf of Mexico.

Probably the greatest threat to the industry is population growth along the watersheds of the Apalachicola Bay estuarine basin. There is no denying that with population growth comes increased pollution in the form of storm-water runoff, leaking sewage, and increased nitrogen run-off from both residential fertilizing and agricultural operations. Increases in pollution will close harvesting waters, either temporarily, or permanently. If oyster beds die, they signal the eventual demise of the commercial and recreational fishing in those same waters because, as an indicator species, oysters are among the most vulnerable to pollution. It might take decades, but first go the oysters,

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<sup>213</sup> Martina interview.

then the fish, and in due course, recreational swimming. It is only with a cooperative commitment on the part of government planners and permiters to adhere to smart growth policies that take into consideration the health of local waterways and the Gulf of Mexico, to be sensitive to the generational traditions of the local seafood industry, and to work with experts within the Florida departments of Natural Resources and Conservation and Agriculture and Consumer Services and Fish and Wildlife that the Florida seafood industry may be sustained.

Given more time, I would have liked to explore the labor history of the industry, especially the work of women and children in the industry. Another topic that deserves more attention is the complexity of multiple layers of regulation with which seafood businesses have to comply. They cover everything from sanitation to workers' compensation and the legal convolutions are sometimes mind-boggling for the lay business-owner. Finally, the subject of culinary tourism in Florida is rich in potential. To investigate our association of food and its connection to a sense of a place, in all its perceived dimensions could be a fascinating research journey. Perhaps others will follow these lines of research with enthusiasm, and appetite! Until then, I will continue to enjoy my post-harvest treated oysters, but always demanding that they be of Apalachicola origin.



## References

### *Newspapers*

*Apalachicola Advertiser*  
*Atlanta Journal Constitution*  
*Florida Times Union*  
*New York Times*  
*St. Petersburg Times*  
*Sarasota Herald Tribune*  
*Tampa Tribune*

### *Articles and Books*

Adams, Dennis. "Tabby, The Concrete of the Low Country." the Beaufort, South Carolina, Public Library. Accessed at <http://www.beaufortcountylibrary.org/rooms/documents/html/tabby.htm>.

*American Heritage, the Magazine of History. The American Heritage Cookbook and Illustrated History of American Eating and Drinking.* American Heritage Publishing Co., Inc., 1964.

Ameripure Oysters. Accessed at <http://www.ameripure.com/process.html>.

Andrews, L., B/ Posadas, and M. Jahncke. Oyster irradiation: Pathogenic vibrio response and consumer difference testing. Accessed at <http://sst.ifas.ufl.edu/26thAnn/file35.pdf>

Apalachicola Bay Chamber of Commerce website. Accessed at <http://www.apalachicolabay.org/eastpointhome.htm>.

Bocce Brew. "Bocce Court Design and Installation." Accessed at <http://www.boccebrew.com/Boccepro5.htm>.

Callaway, E.E. "The Land of the Apalach." *Literary Florida*, April 1948.  
Chapel, George. *A Brief History of the Apalachicola Area*, accessed at <http://www.baynavigator.com/briefhistory.cfm?c=7>.

CNN News Online. "CSPI: Seafood, Eggs Biggest Causes of Food Poisoning in the US," 7 August 2000.

Commercial Oyster Postharvest Processing Systems. Accessed at <http://www.msstate.edu/dept/crec/owmr.html>

- Cook, Joseph J. *The Changeable World of the Oyster*. New York: Dodd, Mead & Co., 1974.
- Dresner, Simon. *The Principles of Sustainability*. London: Earthscan Publications Ltd., 2002.
- Edge, John T. "Local Flavor: The Oysters of Apalachicola." *SweetTea Journal*. Fall/Winter, 2006, p. 58-60.
- Egerton, John. *Southern Food: At Home, on the Road, in History*. New York: Alfred A. Knopf, Inc.: Borzoi Book, 1987.
- Eidse, Faith. (Ed.). *Voices of the Apalachicola*. Gainesville: University Press of Florida, 2006.
- Evans, Amy. "Florida's Forgotten Coast: Life on the Apalachicola Bay," Oral Histories, Southern Foodways Alliance accessed at [http://www.southernfoodways.com/documentary/oh/florida\\_forgotton\\_coast/index.shtml](http://www.southernfoodways.com/documentary/oh/florida_forgotton_coast/index.shtml).
- Fernandez-Armesto, Felipe. *Near a Thousand Tables: A History of Food*. New York: Simon & Schuster's The Free Press, 2002.
- Gastroenteritis, Emedicine from WebMD accessed at <http://www.emedicine.com/emerg/topic213.htm>.
- Gulf Oyster Industry Council Critical Analysis of the report *Federal Oversight of Shellfish Safety Needs U.S. General Accounting Office Report GAO-01-702 July 2001*. Accessed at <http://www.gulfoysters.org/gaocritical.cfm>.
- Harlow, Jay. "Oysters: Grand Crus on the Half Shell," Sally's Place website, <http://www.sallys-place.com/food/columns/harlow/oysters.htm>.
- Hedeen, Robert A. *The Oyster: The life and lore of the celebrated bivalve*. Centreville, MD: Tidewater Publishers, 1986
- Ingersoll, E. The Oyster Industry. In G. Brown Goode, (Ed.). *The History and Present Condition of the Fishery Industries*. Washington, D.C.: U.S. Gov. Print. Off., 1881.
- Jacobsen, Rowan. *A Geography of Oysters: The Connoisseur's guide to Oyster Eating in North America*, New York: Bloomsbury, 2008

- MacKenzie, Jr., Clyde E. History of Oystering in the United States and Canada, Featuring Eight Greatest Oyster Estuaries. *Marine Fisheries Review* 58(4), 1996, p. 1-87.
- Marsh, Jesse. Eastern Oyster-Final Report, Southeast Region, Seafood Watch, Seafood Report, April 21, 2004, Monterey Bay Aquarium, [http://www.mbayaq.org/cr/cr\\_seafoodwatch/content/media/MBA\\_SeafoodWatch\\_EasternOysterReport.pdf](http://www.mbayaq.org/cr/cr_seafoodwatch/content/media/MBA_SeafoodWatch_EasternOysterReport.pdf)
- McClaine, A.J. *The Encyclopedia of Fish Cookery*. New York: Holt, Rinehart and Winston, 1977.
- McCarthy, Kevin. *Apalachicola Bay*. Sarasota, FL: Pineapple Press, 2004.
- McDonnell, S., et al. "Failure of cooking to prevent shellfish-associated viral gastroenteritis." *Archives of Internal Medicine*.1997, Jan. 13: 157(1):111-6.
- Nowak, W. *The marketing of shellfish*. London: Fishing News (Books) Ltd., 1970.
- Perry, Mac. Sacred Lands Education and Preservation website, <http://www.sacredlands.info>
- Reardon, Joan. *Oysters, A Culinary Celebration*. Guildford, CT: The Lyons Press, 2004.
- Rogers, William Warren. *Outposts on the Gulf: Saint George Island & Apalachicola from Early Exploration to World War II*. Pensacola: University of West Florida Press, 1986.
- Safe Oysters website. Accessed at <http://safeoysters.org/medical/symptoms.htm>
- Schofield, Arthur C. *Yesterday's Bradenton*, Miami: E.A. Seeman Publishing, Inc., 1975.
- Sickels-Taves, Laura. "The Care and Preservation of Tabby," The Henry Ford Museum website, <http://www.hfmvgv.org/research/caring/tabby.aspx>.
- Spillane, Edward. "François-Xavier Charlevoix." *The Catholic Encyclopedia*. Vol. 3. New York: Robert Appleton Company, 1908. Accessed at <http://www.newadvent.org/cathen/03631a.htm>.
- Stensson, Annika and Mike Donohue. "Healthy Kids' Meals, Local Produce, Mini Desserts Among Hottest Menu Trends for 1009, According to National Restaurant Association Research." Press Release, National Restaurant Association, 9 December 2008. Accessed at <http://www.restaurant.org/pressroom/pressrelease.cfm?ID=1708>.
- Stott, Rebecca. *Oyster*. London: Reaktion Books Ltd, 2004.



- Sunshine, Sylvia (1880). *Petals Plucked from Sunny Climes*. Gainesville: UP of Florida, 1976.
- Tamplin, M., R. Hammond, P. Gulig, R. Baker. 2001. *Vibrio vulnificus*, a hidden risk in raw oysters (video). A clinician's guide to *V. vulnificus* infection and treatment. Quote accessed at <http://safeoysters.org/medical/PubHealthImpact.htm>
- Toussaint-Samat, Maguelonne. 1987. *A History of Food*. Translated by Anthea Bell. Cambridge, MA: Blackwell Publishers, 1992.
- Townsend, Frederick J. *Wildlife in Florida*. London: Hurst & Blackett, 1875.
- Walsh, Robb. *Sex Death & Oysters: A Half-Shell Lover's World Tour*. Berkeley, CA: Counterpoint, 2009.
- Widmer, Randolph M. *The Evolution of the Calusa: A Nonagricultural Chiefdom on the Southwest Florida Coast*. Tuscaloosa: University of Alabama Press, 1988.
- Willoughby, Lynn. Apalachicola Aweigh: Shipping and Seamen at Florida's Premier Cotton Port, *The Florida Historical Quarterly*, 69(2), Oct. 1990, 178-194.
- World Commission on Environment and Development. *Our Common Future*. Oxford: Oxford University Press, 1987
- Government Documents and Webpages*
- Arnold, W. and Berrigan, M. *A Summary of the Oyster (Crassostrea virginica) Fishery in Florida: A Report to the Division of Marine Fisheries, Florida Fish and Wildlife Conservation Commission*. January, 2002. Accessed at [http://research.myfwc.com/publications/publication\\_info.asp?id=43908](http://research.myfwc.com/publications/publication_info.asp?id=43908).
- Centers for Disease Control and Prevention. Accessed at [http://www.cdc.gov/nationalsurveillance/cholera\\_vibrio\\_surveillance.html](http://www.cdc.gov/nationalsurveillance/cholera_vibrio_surveillance.html).
- Division of Aquaculture, Florida Department of Agriculture and Consumer Services. Accessed at [http://www.floridaaquaculture.com/SEAS/SEAS\\_intro.htm](http://www.floridaaquaculture.com/SEAS/SEAS_intro.htm).
- \_\_\_\_\_. Accessed at <http://www.floridaaquaculture.com/publications/VVriskreduction.pdf>.
- Eastern Oyster Biological Review Team. 2007. Status review of the eastern oyster (*Crassostrea virginica*). Report to the National Marine Fisheries Service, Northeast Regional Office. 16 February 2007. 105 pp.
- Florida Department of Agriculture. *Canning in Florida*. Tallahassee: State of Florida, 1942.

- Florida Department of Agriculture and Consumer Services. Accessed at [http://www.flseafood.com/consumers/eating\\_oysters.htm](http://www.flseafood.com/consumers/eating_oysters.htm)<http://www.dhpe.org/infect/norwalk.html> and [http://www.flseafood.com/pubs/pubform/pdf/English\\_Brochure\\_Oysters.pdf](http://www.flseafood.com/pubs/pubform/pdf/English_Brochure_Oysters.pdf).
- Florida Department of Health. Communicable Disease Frequency Reports. Accessed at <http://www.floridacharts.com/merlin/freqrpt.asp>.
- Florida Department of Health, Bureau of Community Health/Aquatic Toxins, Accessed at <http://www.doh.state.fl.us/environment/community/aquatic/redtide.htm>.
- Florida Fish and Wildlife Conservation Commission. Accessed at <http://myfwc.com>.
- Florida Fish and Wildlife Institute website, “Eastern Oyster.” Accessed at [http://www.floridamarine.org/features/view\\_article.asp?id=4825](http://www.floridamarine.org/features/view_article.asp?id=4825).
- Florida Seafood, FDACS. Accessed at [http://www.fl-seafood.com/consumers/nutrient\\_values.htm](http://www.fl-seafood.com/consumers/nutrient_values.htm)
- Heil, David. “Bronson Announces Re-opening of Shellfish Areas,” Florida Department of Agriculture and Consumer Services Press Release, 23 November 2005.
- National Ocean and Aeronautic Administration (NOAA) Fisheries: Office of Science and Technology, *Fisheries of the United States-2008*. Accessed at [www.st.nmfs.noaa.gov/st1/fus/fus08/index.html](http://www.st.nmfs.noaa.gov/st1/fus/fus08/index.html)
- Otwell, W., F. Lawlor III, et al. “Buying Seafood for Retail.” Sea Grant Extension Bulletin SGEB-9, November 1985. Gainesville: Florida Sea Grant Extension Program, University of Florida.
- Paradise, Viola. *Child Labor and the Work of Mothers in Oyster and Shrimp Canning Communities on the Gulf Coast*. Children’s Bureau, U.S. Department of Labor. Washington: Government printing Office, 1922.
- Parker, K. “FWC takes on illegal oyster harvesters.” Florida Fish and Wildlife Commission Press Release, 6 December 2005.
- Smeltz, A. “The Oyster-Bars of the West Coast of Florida: Their Depletion and Restoration.” In *Bulletin of the United States Fish Commission*, 1898. Washington D.C.: Government Printing Office.
- U.S. Department of Agriculture Facts Book 2001-2002, Chapter 2,. Accessed at <http://www.usda.gov/factbook/tables/ch2table21.jpg>.
- U.S. Department of Health and Human Services, Public Health Administration, Food and Drug Administration. *National Shellfish Sanitation Program Manual of*

*Operations, ISSC, Part 1 and II.* Washington, D.C.: Food and Drug Administration, Shellfish Sanitation Branch, 1990.

U.S. Department of Health and Human Services, Public Health Administration, Food and Drug Administration. *National Shellfish Sanitation Program Manual of Operations, ISSC, Part 1 and II.* Washington, D.C.: Food and Drug Administration, Shellfish Sanitation Branch, 2003.

### *Interviews*

Ankeney, David. Representative, Bar Harbor Seafood. Telephone interview by author in

Bailey, Cristal. Personal interview by author on 24 September 2008 in Eastpoint, Florida. Notes and recording.

Begos, Kevin. Executive Director, Franklin County Seafood and Oyster Workers Association. Telephone interview on

Garrido, Victor. Email correspondence. 19 August 2009.

Grove, Anita, Executive Director, Apalachicola Chamber of Commerce. Telephone interview by author on 25 August 2009. Notes.

Heil, David. Assistant Director, Division of Aquaculture, Florida Department of Agriculture and Consumer Services. Personal interview by author in Tallahassee, Florida, on 13 September 2009. Notes.

Kile, Monica Rowland. Personal interview by author in St. Petersburg, Florida on 3 June 2009. Notes.

Richards, Robert. Owner of the former Seabreeze Restaurant in Tampa. Telephone interview by author in August 2007. Notes.

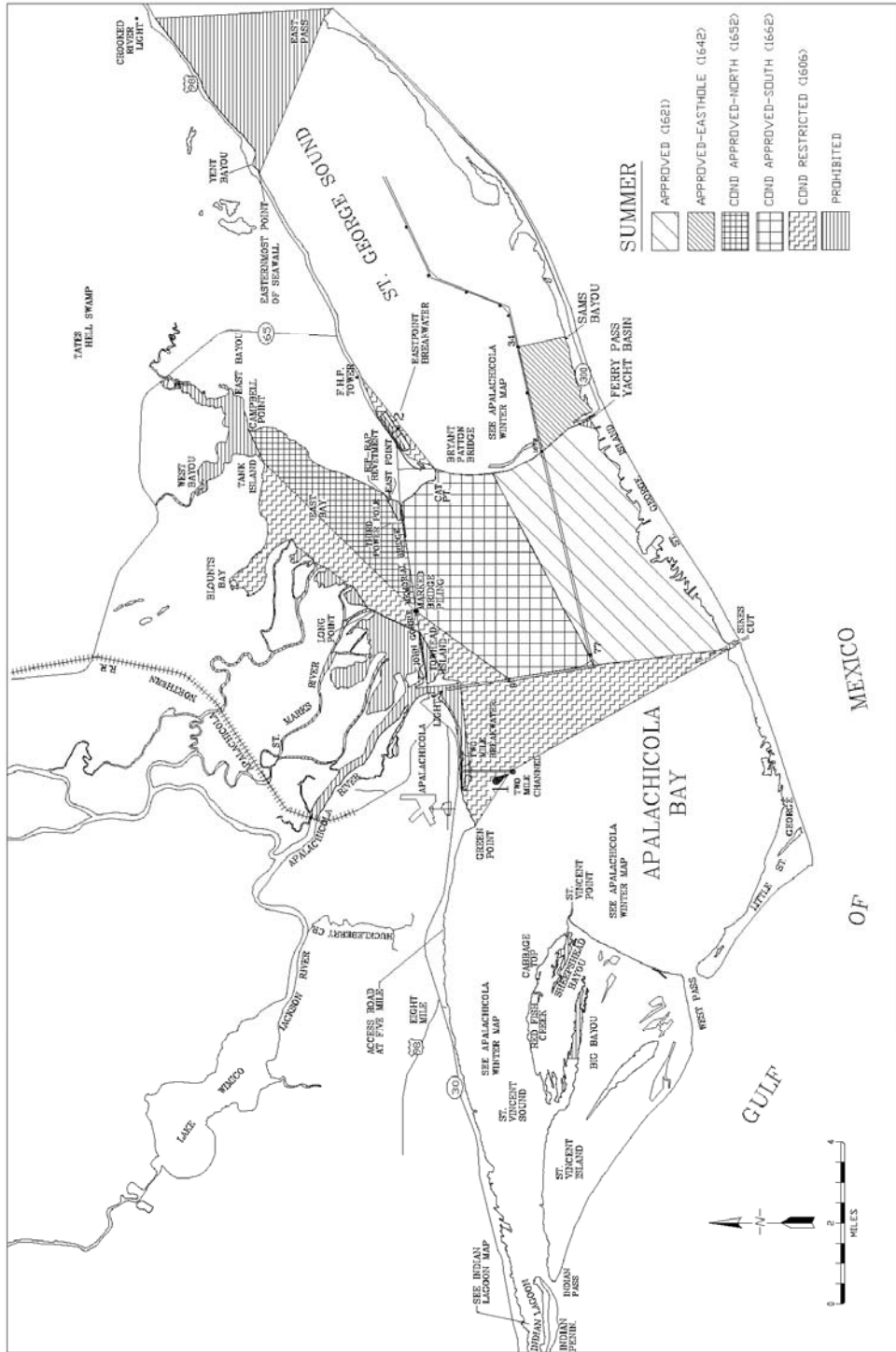
Ward, Martha Pearl. Personal interview by author in Apalachicola, Florida, on 25 September 2008. Notes and recording.

Ward, Tommy. Personal interview by author on 23 September 2008 at Thirteen Mile Oyster Company in Apalachicola, Florida. Notes.

## Appendices

Appendix A

Current status of this area  
 SHELLFISH HARVESTING AREA CLASSIFICATION MAP # 168 (Effective: September 5, 2005)  
 Apalachicola Bay System [# 16] Shellfish Harvesting Area in Franklin County  
 Summer June - August



Source: Florida Division of Aquaculture Shellfish Management Information for Apalachicola Bay, #16.  
 Accessed at [http://www.floridaaquaculture.com/SEAS\\_maplinks/16.htm](http://www.floridaaquaculture.com/SEAS_maplinks/16.htm)

## Florida Oysters

**Florida Oysters**

**Seafood Safe Handling Tips**

- Purchase seafood last and keep it cold during the trip home.
- Keep raw and cooked seafood separate to prevent bacterial cross-contamination.
- After handling raw seafood, thoroughly wash knives, cutting surfaces, sponges and hands with hot soapy water.

**Buying and Storing Tips**

- Live oysters should close tightly when shell is tapped. Discard oysters that do not close.
- Oysters should have a mild sea breeze odor and shells free of cracks.
- Oysters should never be exposed to sudden temperature change. Do not store live oysters directly on ice or immersed in water.
- Store at a constant 41° F in the refrigerator in a container with the lid slightly open. They will remain alive for up to 7 days. Drain excess liquid daily.
- Freshly shucked oysters have a fresh sea breeze aroma and a clear or slightly milky gray liquid in the container.

**Cooking Tips**

- Wash live oysters thoroughly under cold running water prior to cooking.
- Oysters become plump and opaque and the edges begin to curl when thoroughly cooked.
- Serve roasted and grilled oysters in shells with melted butter or a sauce.
- **Easy grilling:** Place oysters about 4 inches from hot coals or gas flame. Grill for approximately 10 minutes or until shells open.
- **Easy oven roasting:** Place oysters on a baking sheet on the middle rack. Roast at 350° F for 10 minutes or until shells open.
- **Easy fried oysters:** bread shucked oysters and fry in oil for 3 to 4 minutes at 375° F.
- **Easy baked oysters:** bake shucked oysters for 10 minutes at 450° F.

**Florida Oysters**

Oysters have a long history as a favored food dating back to the ancient Greeks and Romans. Oysters feed mainly on single cell plants and flourish in Florida's estuaries where nutrient rich fresh water rivers meet coastal saltwater. With this plentiful food supply, Florida's Eastern oysters (*Crassostrea virginica*) grow rapidly and can reach market size in less than two years. Along Florida's Gulf Coast, oysters are harvested commercially from small boats by fishermen using large, long-handled tongs to scoop oysters from the sandy bottom beds.

**Characteristics:** The extra lean meat is tender to firm textured with slightly salty flavor.

**Substitute Species:** Hard clams

**How Much to Buy:** In-shell oysters: 6 whole oysters per serving. Shucked oysters: 1/3 to 1/2 pint per serving.

**Nutritional Value Per Serving:**  
For approximately 4 ounces (114 grams) of raw edible portions: Calories 80, Calories From Fat 24, Total Fat 3g, Saturated Fat 1g, Trans Fatty Acid 0, Cholesterol 56mg, Total Carbohydrates 5g, Protein 8g, Omega 3 Fatty Acid 1.54g

**Oyster Po-Boy**



**Florida Oysters**

People with compromised immune systems are at high-risk and should avoid consumption of raw oysters. They can, however, consume thoroughly cooked oysters. If you have chronic illness of the liver, stomach, blood, diabetes or other immune disorders, you are at greater risk of serious illness from raw oysters and should eat oysters fully cooked. People in high-risk groups insist on consuming raw oysters should consider only oysters that are labeled "processed to reduce *Vibrio vulnificus* to non-detectable levels." If unsure of your risk, consult a physician. For more information, go to [www.beyesteraware.com](http://www.beyesteraware.com)



Always ask for Florida seafood and look for the Fresh from Florida or From Florida logos on signs, brochures and packaging in your supermarket or sea food market. Florida's seafood industry is dedicated to supplying wholesome, nourishing and affordable seafood products. Fresh from Florida seafood recipes, species information and brochures can be found at [www.FL-Seafood.com](http://www.FL-Seafood.com).

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*Recipes*

**Oysters**





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Charla H. Bennett, Commissioner

### Golden Oyster Chowder

- 1 pint shucked Florida oysters, undrained
- 1/2 cup Florida onion, chopped
- 1/2 cup Florida celery, sliced
- 2 cups fresh Florida mushrooms, sliced
- 1/4 cup butter
- 1 cup all-purpose flour
- 1 teaspoon salt
- 1/4 cups Florida milk
- 2 cups Florida milk
- 1 10 1/2 ounce can cream of potato soup
- 1 1/2 cups sharp Cheddar cheese, shredded
- 1 2-ounce jar sliced pimiento
- 1/4 teaspoon hot pepper sauce

Remove any shell particles from oysters; set aside. Cook onions, celery and mushrooms in butter over low heat until tender. Stir in flour; salt and pepper; add milk gradually stirring until thickened. Add potato soup and grated cheese. When cheese is melted, add oysters, pimiento and hot pepper sauce. Simmer for 5-10 minutes or until oyster edges curl.  
Yield: 6 servings

Nutritional Value Per serving: Calories 330, Calories From Fat 200, Total Fat 23g, Saturated Fat 15g, Trans Fatty Acid 0, Cholesterol 50mg, Total Carbohydrate 17g, Protein 16g, Omega 3 Fatty Acid 0.46g



### Fried Florida Oysters

- 1 pint Florida oysters, shucked
- 3 tablespoons milk
- 1/2 cup all-purpose flour
- 1/2 cup cornmeal
- 1/2 teaspoon salt
- 1/4 teaspoon pepper
- canola oil for pan frying

Drain liquid from oysters and remove any shell pieces. In a bowl, combine oysters and milk. Mix flour, cornmeal, salt and pepper in a pie plate and coat oysters with flour mixture. In a heavy skillet, fry oysters in oil over medium-high heat for 2 to 3 minutes on each side until browned. Drain on absorbent paper. Serve with a favorite sauce or on salad.  
Yield: 6 servings

Nutritional Value Per Serving: Calories 131, Calories From Fat 25, Total Fat 5g, Saturated Fat 0.78g, Trans Fatty Acid 0, Cholesterol 45mg, Total Carbohydrate 17g, Protein 8g, Omega 3 Fatty Acid 0.51g



### Oysters Rockefeller

- 36 Florida oysters, shucked, on the half shell
- rock salt
- 2 cups Florida spinach, cooked and drained
- 1/4 cup Florida onion, chopped
- 2 fresh bay leaves
- 2 tablespoons Florida celery, chopped
- 1 teaspoon Florida parsley, chopped
- 1/2 teaspoon salt
- 1/4 teaspoon hot pepper sauce
- 1/3 cup butter
- 1 cup dry bread crumbs
- 1 tablespoon Florida lemon juice

Preheat oven to 400° F. Arrange oysters in shells on rock salt in a baking dish. Process spinach, onion, bay leaves, celery, parsley and seasonings in a food processor until smooth. In a wokpan, cook spinach mixture in butter for 3 minutes. Add bread crumbs and lemon juice, mixing well. Spoon the spinach mixture on top of oysters and bake at 400° F until oyster edges curl.  
Yield: 6 servings

### Spicy Jalapeno Cheese and Bacon Oysters

- 36 Florida oysters, shucked, on the half shell
- rock salt
- 12 ounces mozzarella cheese, grated
- 1/2 cup cooked bacon, crumbled
- 4 Florida jalapeno peppers, chopped

Arrange oysters on rock salt in a baking dish. Top each oyster with 1/2 teaspoon of cheese, crumbled bacon and chopped jalapeno to taste. Bake in a preheated oven at 350° F for 10 minutes or until edges of oysters begin to curl.  
Yield: 6 servings

Nutritional Value Per Serving: Calories 248, Calories From Fat 110, Total Fat 12g, Saturated Fat 12g, Trans Fatty Acid 0, Cholesterol 50mg, Total Carbohydrates 7g, Protein 27g, Omega 3 Fatty Acid 0.46g

