

# ***Vibrio Vulnificus* Education Program**

## **Final Report – Summary**

June 2009

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# **I. *Vibrio Vulnificus* Education Program**

## **Final Report**

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**Gulf & South Atlantic Fisheries Foundation, Inc.**

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## II. Abstract

The Gulf & South Atlantic Fisheries Foundation (Foundation) received funding from NOAA (Grant NA03NMF4270393) for a total of \$1,473,751 with an award period of September 1, 2003 to December 31, 2008, as amended. The awards are under three separate Congressional appropriations with separate budgets for each award period. Although the scope of each appropriation is directly related to *Vibrio vulnificus* education, individual proposals were drafted and approved by NOAA for each funding cycle. Each proposal had related but distinct objectives:

- “At-risk *Vibrio vulnificus* Educational Program Targeting the Medical Professional Community” (GASAFFI#89);
- “Evaluation of Past and Development of New *Vibrio vulnificus* Consumer Education Programs designed to Improve Effectiveness in Reaching and Changing the Attitudes of At-Risk Consumers”, revised to “*Vibrio vulnificus* Education and Social Marketing: Implementing Strategies Needed to reduce Illnesses Related to the Consumption of Raw Oysters” (GASAFFI#93); and
- “Implementation of Strategies Needed to Reduce *Vibrio vulnificus* Related Illnesses: A Focus on Core States” (GSAFFI#96).

This Final Report summarizes all three projects and evaluates the results. Attached to this report is the *Table of Contents* for the three interim reports. This enables you to find exactly which section or appendix to access. If there are additional reports or sections you wish to read please contact the Foundation offices (813) 286-8390 and we will provide them.

## III. Executive Summary

Early in the project, the Foundation convened an Advisory Group of experts in fields related to *Vibrio vulnificus* education to develop strategies to reduce *Vibrio vulnificus* related illnesses and include them in a Strategic Plan. Throughout the entire project, formal and informal teleconferences were convened to allow for peer review. The Project Team included contractors: Beuerman Miller Fitzgerald (BMF), Ms. Maria Marcello of Marcello Designs, LLC, Dr. Fred Lopez of Louisiana State University Health Sciences Center, Dr. Sally Soileau of Louisiana State University AgCenter and Interstate Shellfish Sanitation Conference (ISSC); with collaborators from Louisiana Seafood Promotion and Marketing Board, Florida Department of Agriculture Bureau of Seafood and Aquaculture Marketing, Florida Department of Health and Mississippi Department of Marine Resources.

The Foundation completed numerous projects using contractors and collaborators. Full descriptions of the efforts and resulting products are discussed in the Interim Reports and their accompanying appendices.

To strengthen and unify the message of the *Vibrio vulnificus* educational campaigns, the Florida Department of Agriculture Bureau of Seafood and Aquaculture Marketing designed an identifier logo (BeOysterAware). The logo was used in publications, web pages, research projects, presentations, formal documents, letters, advertisements and mailings related to *Vibrio vulnificus* education and Gulf of Mexico oysters. Using the logo, Foundation staff and BMF created a new educational brochure targeting the “at-risk” oyster consumer, completed in December 2006 with over 21,000 brochures distributed to date. The logo was also used in advertisements placed in trade journals and trade magazines defining the inherent risks associated with raw oyster consumption and the medical conditions placing individuals in the “at-risk” category.

The Foundation provided support to the ISSC to reproduce *Vibrio vulnificus* educational materials and brochures to be included in pharmacy bags through a partnership between Florida Department of Agriculture Bureau of Seafood and Aquaculture Marketing and Walgreens Pharmacy. Advertisements consisting of the BeOysterAware logo with a special web address were printed on pharmacy bags which were then distributed through Kroger Pharmacies in Texas. The Florida Bureau of Aquaculture Environmental Services conducted a direct mailing to all registered physicians in Alabama, Florida, Georgia, Louisiana and Texas. The letter encouraged recipients to access online the ISSC's continuing medical education course entitled, "Diagnosis, Treatment and Prevention of *Vibrio vulnificus* Infection".

Ms. Maria Marcello, Marcello Design, LLC, created the BeOysterAware website (<http://www.beoysteraware.com>) “published” in April 2006. Website promotion was accomplished through a variety of media including web banner campaigns in 2006 and 2007. The Foundation, working with BMF, developed a Webinar and conducted it for the Louisiana Restaurant Association. BMF created radio and television advertisements with four radio spots and one thirty second television spot. The four radio spots were placed in eight different markets in Texas, Louisiana and Florida.

The Foundation made funds available to state health organizations and institutions, including universities and extension personnel, to attend national and regional medical conferences and participate in exhibition booths.

The Foundation worked with Louisiana Seafood Promotion and Marketing Board, Florida Bureau of Seafood and Aquaculture Marketing, and Mississippi Department of Marine Resources to develop and manage an oyster marketing campaign to create awareness of commercially available post-harvest processed (PHP) and value-added products (VAP).

## IV. Purpose

### A. Problems Facing the Gulf of Mexico Shellfish Industry

The Gulf of Mexico shellfish industry is facing major restraints to their economic well being because of illnesses and deaths related to *Vibrio vulnificus* contracted through the consumption of raw or undercooked oysters. *Vibrio vulnificus*, a gram-negative bacterium occurs naturally in warm, unpolluted seawater. Its abundance is positively correlated with seawater temperature, and warmer water temperatures have been linked to an increase in *Vibrio vulnificus* related illnesses. Disease transmission occurs through the direct consumption of raw seafood and exposure of wounds to seawater containing the bacteria. For a small number of individuals considered “at-risk”, ingestion of *Vibrio vulnificus* causes severe illnesses (e.g., primary septicemia and septic shock) and can result in more than a 50 percent mortality rate.

Those considered most “at-risk” for *Vibrio vulnificus* infection are individuals with impaired immune systems. Medical conditions which can result in a potential “at-risk” consumer include liver disease, liver cirrhosis, hemochromatosis, alcoholism, chronic renal disease, cancer, immunodeficiency syndromes (HIV and AIDS), hemolytic anemia, and individuals taking immunosuppressive drugs. Although *Vibrio vulnificus* related infections are treatable with a regimen of antibiotics and supportive care, without prompt medical attention the health of infected patients can deteriorate rapidly. Literature stresses the need for increased and continued educational programs targeting medical/health professionals and the “at-risk” patient/consumer.

The link between *Vibrio vulnificus* illnesses/deaths and oysters is reported by the media due to the severity of the related illnesses. This publicity can have a very negative effect on the industry. Given the \$68,046,325 value of Gulf oysters (22,072,203 pounds) harvested during 2007 (NMFS 2008), the losses in oyster revenue can cause substantial economic impacts to oyster dependent fishing communities. In addition, the FDA estimates that the cost to society of one individual case of *Vibrio vulnificus* is \$2,008,917 (Federal Register 12/18/1995).

In order to reduce the number of *Vibrio vulnificus* related illnesses and deaths, the Interstate Shellfish Sanitation Conference (ISSC) adopted a *Vibrio vulnificus* Management Plan which mandates a reduction in the rate of *Vibrio vulnificus* illnesses reported from the consumption of commercially harvested raw or undercooked oysters. The ISSC is a cooperative organization of state and federal control agencies, the shellfish industry and the academic community. The ISSC adopts uniform procedures and guidelines contained in the National Shellfish Sanitation Program (NSSP) that regulate the harvesting, processing, and shipping of molluscan shellfish. The ISSC required reduction in *Vibrio vulnificus* related illnesses of 40 percent, for years 2005 and 2006 (average), and 60 percent for years 2007 and 2008 (average) (ISSC 2003). Illness

reduction rates for the respective time periods will be compared against the average illness rate for the years 1995-1999 reported from the core reporting states of California, Florida, Louisiana, and Texas (e.g. 0.306 illnesses/million is considered the baseline illness rate) (ISSC 2003). If these illness reduction goals are not accomplished by the periods specified, a series of control measures may be implemented, drastically affecting the harvest and sale of Gulf of Mexico oysters. These measures could include:

“(a) Labeling all oysters, “For shucking by a certified dealer,” when the Average Monthly Maximum Water Temperature exceeds 75°F;

(b) Subjecting all oysters intended for the raw, half-shell market to an Authority-approved post harvest processing that reduces the *Vibrio vulnificus* levels to 3MPN/g or less, when the Average Monthly Maximum Water Temperature exceeds 75°F;

(c) Closing shellfish growing areas for the purpose of harvest of oysters intended for the raw, half-shell market when the Average Monthly Maximum Water Temperature exceeds 75°F;

(d) Labeling all oysters, “For shucking by a certified dealer,” during the months of May through September, inclusive;

(e) Subjecting all oysters intended for the raw, half-shell market to a post harvest processing that is both approved by the Authority and reduces the *Vibrio vulnificus* levels to 3MPN/g or less during the months of May through September, inclusive; and

(f) Closing shellfish growing areas for the purpose of harvesting oysters intended for the raw, half-shell market during the months of May through September, inclusive.” (ISSC 2003)

Data from the core reporting states of California, Florida, Louisiana, and Texas suggest that illness rate reductions were being achieved, but not to the level needed to reach the 40 percent by December 31, 2006 and 60 percent by December 31, 2008. If the industry is faced with closures during the warmer months they will lose their traditional markets and face great difficulty in reopening those markets in the cooler months. To reduce temperatures in the oysters more quickly they face additional costs for refrigeration equipment or reduced operating hours, possibly reducing harvests.

## B. Objectives of the Project

In early 2005, the Foundation received funding through a Congressional appropriation with the goal of developing programs to educate medical professionals and “at-risk” consumers of raw oysters. To provide guidance, the Foundation convened an Advisory

Group who developed a strategy to implement an education and communication plan for the “at-risk” oyster consumer. The ultimate goal was to reduce the number of *Vibrio vulnificus* related illnesses in the states of Florida, Louisiana, and Texas. The major objectives of the plan are:

- Compile, analyze, integrate, evaluate and publish current information on *Vibrio vulnificus* through consumer educational materials and advice for the “at-risk” consumers;
- Identify and partner with key individuals and organizations (especially medical and health professionals) that are essential to the successful implementation of the *Vibrio vulnificus* Illness Reduction Program;
- Develop *Vibrio vulnificus* education materials targeted at medical and health professionals and “at-risk” consumers; and
- Contract with an Education Consultant to coordinate the implementation of all strategies included in the Strategic Plan.

## V. Approach

### A. Advisory Board

**Formation of an Advisory Group:** In order to provide guidance, the Foundation convened an Advisory Group of knowledgeable experts from the Gulf oyster industry, state health organizations, universities and non-profits. Individuals were selected based on their expertise and experiences in several areas including Gulf oyster industry, public health, social marketing, shellfish regulation, dietetics and microbiology. Throughout the project, formal and informal teleconferences were convened on a semi-annual and as needed basis to allow for peer review. Project Principal Investigators (PIs), contractors, the Advisory Group and interested parties participated in conference calls. Additionally, several face-to-face meetings of the Advisory Group were convened to provide updates on project performance and goals accomplished.

**Strategic Plan:** The Advisory Group met several times to discuss strategies that would assist in reducing the number of *Vibrio vulnificus* related illnesses and then included them in the finalized Strategic Plan. The Strategic Plan can be found in the Appendices of the Interim Reports.

### B. Contractors

The Foundation continually monitored and coordinated the performance of contractors to ensure compliance with deadlines and contract requirements. The firm of Beuerman Miller Fitzgerald (BMF) was contracted to serve as Education Coordinator and, as such,

was involved in many of the projects. They provided guidance to other participants and assisted the Foundation in review of draft products. Ms. Maria Marcello, of Marcello Designs, LLC, created the BeOysterAware website (<http://www.beoysteraware.com>), which was “published” in April 2006. Dr. Fred Lopez of Louisiana State University Health Sciences Center was contracted to serve as medical spokesperson for the project and provided messages on several occasions: local television in New Orleans, Times Picayune newspaper articles, radio interviews and a Webinar conducted for the Louisiana Restaurant Association. Dr. Sally Soileau of Louisiana State University conducted numerous meetings in which she presented the facts about *Vibrio vulnificus*. Dr. Soileau, Tori Stivers of University of Georgia Marine Extension and Dr. Roberta Hammond of Florida Department of Health manned information booths at numerous meetings of the medical community (state and national). The Foundation supported the facilitation efforts of the ISSC. With support from ISSC, each Gulf state developed a *Vibrio vulnificus* education plan tailored to their specific needs. These plans were reviewed and guided by the ISSC *Vibrio vulnificus* Education Subcommittee whose members included a Foundation representative.

### C. Collaborations

The Foundation worked in close collaboration with the following state agencies: (1) Louisiana Seafood Promotion and Marketing Board, (2) Florida Department of Agriculture Bureau of Seafood and Aquaculture Marketing, and (3) Mississippi Department of Marine Resources. The Foundation also provided funding to the Florida Department of Agriculture and Consumer Services to attend the Boston Seafood Show in 2006 and 2007 and distribute a variety of outreach materials, including the BeOysterAware Brochures. During the second quarter of 2006, the Foundation provided support to the state of Mississippi to assist in the refinement and reproduction of a variety of oyster post-harvest processing educational materials (specifically a brochure, poster, flyers and fact sheet).

## VI. Findings

The Foundation completed numerous projects using contractors and collaborators throughout the Gulf States. Full descriptions of the efforts and resulting projects are contained in the Interim Reports and their accompanying appendices.

***Educational Brochure:*** Foundation staff and BMF created a new educational brochure targeting the “at-risk” oyster consumer. A total of ten thousand brochures were printed originally with another 30,000 reprints in 2007. To date, there have been over 21,000 brochures distributed to various state and industry organizations for redistribution.

***Advertisement in Trade Journals and Trade Magazines:*** General education *Vibrio vulnificus* advertisements, defining the inherent risks associated with raw oyster consumption and the medical conditions placing individuals in the “at-risk” category,



were developed by BMF. These ads were placed in peer-reviewed journal publications widely read and distributed to medical/health professionals, i.e. *Annals of Internal Medicine*, *Texas Medicine*, *Louisiana Journal of Medicine*, and *Florida Medical Magazine*.

***Sponsorship and Assistance for Video- and Internet-conferences:*** The Foundation, working with the Education Coordinator, developed a Webinar. BMF contacted the Louisiana Restaurant Association and conducted a Webinar for its members in July of 2008.

***Vibrio vulnificus Identifier Logo:*** To strengthen and unify the intended message of *Vibrio vulnificus* educational campaigns, the Florida Department of Agriculture Bureau of Seafood and Aquaculture Marketing designed the identifier logo. The logo was used in publications, webpages, research projects, presentations, formal documents, letters, advertisements and mailings related to *Vibrio vulnificus* education and Gulf of Mexico oysters.



***Promotion and Marketing of Gulf of Mexico Oysters, and Dissemination of Educational Materials:*** In the first phase of the project the Foundation provided printing for ISSC brochures to be included in pharmacy bags through a partnership between Florida Department of Agriculture Bureau of Seafood and Aquaculture Marketing and Walgreens Pharmacy.

The Florida Department of Agriculture Division of Aquaculture conducted a direct mailing (coversheet and *Vibrio vulnificus* fact sheet) to all registered physicians in Alabama, Florida, Georgia, Louisiana and Texas. The letter encouraged the recipients to access the ISSC's online continuing medical education course entitled, "Diagnosis, Treatment and Prevention of *Vibrio vulnificus* Infection".

An oyster education/promotion campaign was conducted to create awareness of commercially available post-harvest processed (PHP) and value-added products (VAP) using radio advertisements, internet advertisements and print media. The Foundation worked with Louisiana Seafood Promotion and Marketing Board, Florida Department of Agriculture Bureau of Seafood and Aquaculture Marketing, and Mississippi Department of Marine Resources to create and manage an oyster marketing campaign. During the second quarter of 2006, the Foundation provided support to the state of Mississippi for the refinement and reproduction of a variety of PHP educational materials.

The Foundation provided support to the ISSC in 2008 to reproduce *Vibrio vulnificus* educational materials including 50,000 copies of "The Risk of Eating Raw Oysters," 10,000 copies of half cards describing the Online *Vibrio vulnificus* Education Course for Nurses

CME, and 5,000 copies each of information sheets: "*Vibrio vulnificus* and Liver Disease", "*Vibrio vulnificus* and Diabetes" and "*Vibrio vulnificus* for the Immunocompromised".

***Direct Mailings:*** During the course of this project BMF made extensive efforts to develop health organization partnerships in Louisiana, Texas and Florida. Several mail outs enclosing the BeOysterAware brochures were made to those groups such as AIDS Resources of Rural Texas, El Paso County Medical Society, South Texas Chapter of the American Liver Association, Texas Liver Coalition, Baton Rouge AIDS Society, Council on Alcohol and Drug Abuse for Greater New Orleans, Louisiana AIDS Drug Assistance Program, Louisiana Cancer Foundation, New Orleans AIDS task Force, Big Bend Cares, Florida Department of Health Hepatitis Program and the NE Florida AIDS Network.

***Participation at Professional Conferences by Knowledgeable Spokespersons:*** The Foundation made funds (registration fees, booth participation, necessary supplies, travel and/or salaries) available to directly assist state health organizations and institutions, including universities and extension personnel, in attending national and regional medical conferences and participating in exhibition booths. The purpose was to educate medical/health professionals about *Vibrio vulnificus* and the threat of raw oyster consumption. This participation has included the use of collapsible display booths, distribution of *Vibrio vulnificus* literature, and face-to-face contact with medical/health professionals.

***Creation of Radio and Television Advertisements:*** BMF created radio and television advertisements with four radio spots (two thirty second and two fifteen second radio spots in both English and Spanish) and one thirty second television spot. Television spots aired in the Texas market. Radio spots were placed in eight different markets in the core states of Texas, Louisiana and Florida; cities included: Dallas, Houston, New Orleans, Panama City, Pensacola, Tampa, Ft. Myers and Miami.

***Dedicated Website:*** Ms. Maria Marcello of Marcello Designs, LLC created the BeOysterAware website (<http://www.beoysteraware.com>) "published" in April 2006. The website focuses on educating the public-at-large, the general oyster consumer, and the "at-risk" oyster consumer. Website promotion was accomplished through a variety of media including the insertion of the domain name in all radio and television advertisements, a limited number of internet advertisements, promotion at medical conferences and regional events and web banner campaigns in 2006 and 2007. To advertise the website a web banner campaign was initiated on major regional websites.

***Partnerships with Pharmacies:*** The one successful outreach campaign occurred in 2008 through Kroger Pharmacies. Advertisements consisting of the BeOysterAware logo with a special web address linked to BeOysterAware were placed on pharmacy bags which were then distributed through Kroger Pharmacies in the Houston, Texas area to eight different Kroger Pharmacies with 24,000 bags to each pharmacy.

***Partnerships with Non-Profit Health/Support Organizations:*** BMF developed a database of approximately 100 organizations in the health and restaurant fields in Texas, Florida and Louisiana. An invitational letter was sent to each organization directing them to <http://www.beoysteraware.com>. As a result of the invitation approximately 15,000 brochures were distributed.

***Email Blast:*** The Education Coordinator executed a campaign preparing and distributing two “email blasts” to members of doctor and nurse organizations in Texas and Florida to help raise awareness of the need to better educate their “at-risk” patients. In June 2008, emails were sent to 41,608 nurses, 10,645 doctors, and 451 pharmacies in the states of Texas and Florida. In August 2008, a second email blast reached over 40,000 medical professionals.

***DVD:*** The Education Coordinator produced a comprehensive DVD of all educational materials and advertisements designed or used during the "BeOysterAware" campaign. DVDs were distributed to approximately 70 current or prospective partner organizations in Texas and Louisiana to be used by local TV and radio stations. The DVDs are available through our Foundation office.

## **B. Problems**

The major challenge in this grant was maintaining close coordination of the numerous collaborators and contractors involved. The Foundation was supported by BMF in this effort and the broad involvement resulted in a very successful campaign. The Foundation also found that it was difficult to get commitments from pharmacies to distribute educational materials. The only successful distribution of pharmacy bags was Kroger in Texas. An additional effort using Kroger and Walgreens who worked with ISSC as an example might result in broader cooperation.

## **C. Description of need for additional work**

The Advisory Group and the ISSC believe that there must be continued education of medical professionals and “at-risk” consumers of raw oysters. The tools have been developed by the Foundation and its collaborators and contractors. The continued updating and disseminating of these materials is critical to further reduce the incidence of *Vibrio vulnificus* and protect the economic health of the Gulf oyster industry.

## **VII. Evaluation**

The Gulf & South Atlantic Fisheries Foundation, Inc. proposed to deliver a strategic education and communications plan to reduce the health hazards for certain “at-risk” consumers resulting from the consumption of raw oysters. With the help of the Advisory Group they developed and implemented a plan to reduce the number of *Vibrio vulnificus* illnesses and contributed to the reduction of related illnesses. The objectives of this

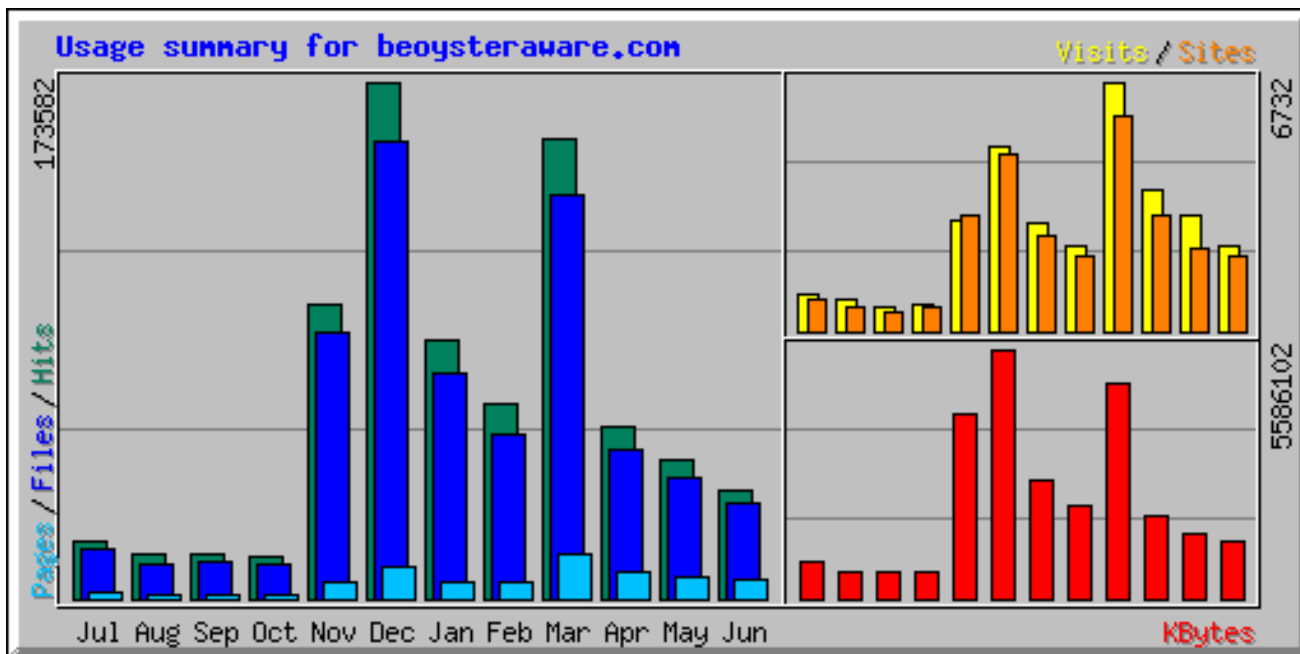


Figure 1: BeOysterAware Webstats for 2006-2007 Reflecting Increased Traffic from Banner Ad Campaigns.

outreach campaign were successful as measured through the metric of increased traffic to the Foundation’s BeOysterAware Website (Figure 1).

We believe that other forms of outreach, such as spokesperson activity, trade show and festival participation, TV and radio ads, and other partnerships are likely to have had similar impacts in terms of reaching the public and affecting changes in behavior of the “at-risk” consumer. In addition to other education activities, a coordinated message promoting PHP products as an alternative to the traditional raw oyster product has given the consumer an informed choice to continue the consumption of oysters and still reduce the risks of *Vibrio vulnificus* illness.

The information generated by this research and development project has enabled the Gulf’s oyster industry and responsible government agencies to more effectively communicate the positive and beneficial side of the oyster industry to general consumer markets. It has also helped reduce the adverse effects of raw oyster consumption on the “at-risk” consumer segment of the population, providing them with safer and equally attractive oyster product options. Effective dissemination of information may have resulted in the stabilization of oyster consumption despite heavy media exposure of informed consumers to negative headline news featuring *Vibrio vulnificus* related oyster illnesses or fatalities.

The plan was modified in Year II to avoid duplication with work already underway by ISSC. “Evaluation of Past and Development of New *Vibrio vulnificus* Consumer Education Programs designed to Improve Effectiveness in Reaching and Changing the Attitudes of At-Risk Consumers” was revised to “*Vibrio vulnificus* Education and Social Marketing:

Implementing Strategies Needed to reduce Illnesses Related to the Consumption of Raw Oysters."

#### Dissemination of Project Results

The project results will be disseminated to the Foundation Board of Directors, the Advisory Group, the collaborators and contractors and others who may be recommended to the Foundation. This Final Report will be provided to a broad audience, and Interim Reports and Appendices to those who request them from the Foundation Office. Summary reports of the project's findings were published as part of the "Foundation Project Update" section of the "Gulf & South Atlantic News", the quarterly publication of the Gulf & South Atlantic Fisheries Foundation, Inc. After NMFS/NOAA review and approval of the Final Report, it will be posted on the Foundation's website ([www.gulfsouthfoundation.org](http://www.gulfsouthfoundation.org)).

### **VIII. Assessing the Impacts of the Project**

The ultimate goal of this project was to reduce the number of oyster related *Vibrio vulnificus* illnesses within the Core States of Florida, Louisiana, and Texas. Failure by the industry to achieve illness rate reduction goals of 40 percent by 2006 and 60 percent by 2008 (versus a long term illness rate benchmark) trigger the implementation of control measures on the Gulf of Mexico oyster industry which will be severe and result in millions of dollars of lost revenue from closed markets or the purchase and conversion to costly post-harvest processing equipment. The effects of these control measures could have a negative effect on the economic health of coastal communities dependent upon the strong harvest and sale of commercial oysters. Although the number of illnesses and deaths has been reduced over the duration of this project, (see Figure 2), the benchmark of a 60% reduction from the baseline may not be met by 2008. An ongoing *Vibrio vulnificus* education program can continue to contribute to the reduction in illness.

The strategies developed under this project have affected millions of individuals throughout the Gulf of Mexico region and the United States. We believe these strategies have resulted in a positive change in the behavior of "at-risk" oyster consumers and have contributed to the decline in the number of oyster-related *Vibrio vulnificus* illnesses. The ISSC *Vibrio* Education Subcommittee and the *Vibrio* Management Committee (ISSC 2009) have determined that there appears to be a 13 percent lower consumption rate of raw oysters in "at-risk" versus "non at-risk" raw oyster consumers. In addition, the ISSC *Vibrio* Education Committee and state *Vibrio vulnificus* coordinators have agreed that at this time there has been an average 35 percent reduction in the rate of oyster consumption related *Vibrio vulnificus* illnesses compared to the baseline rate of illness. This illness rate reduction could translate to a reduction of 10.5 cases annually and an annual savings to society of \$21 million dollars based on the FDA cost estimate for an individual *Vibrio vulnificus* illness case.

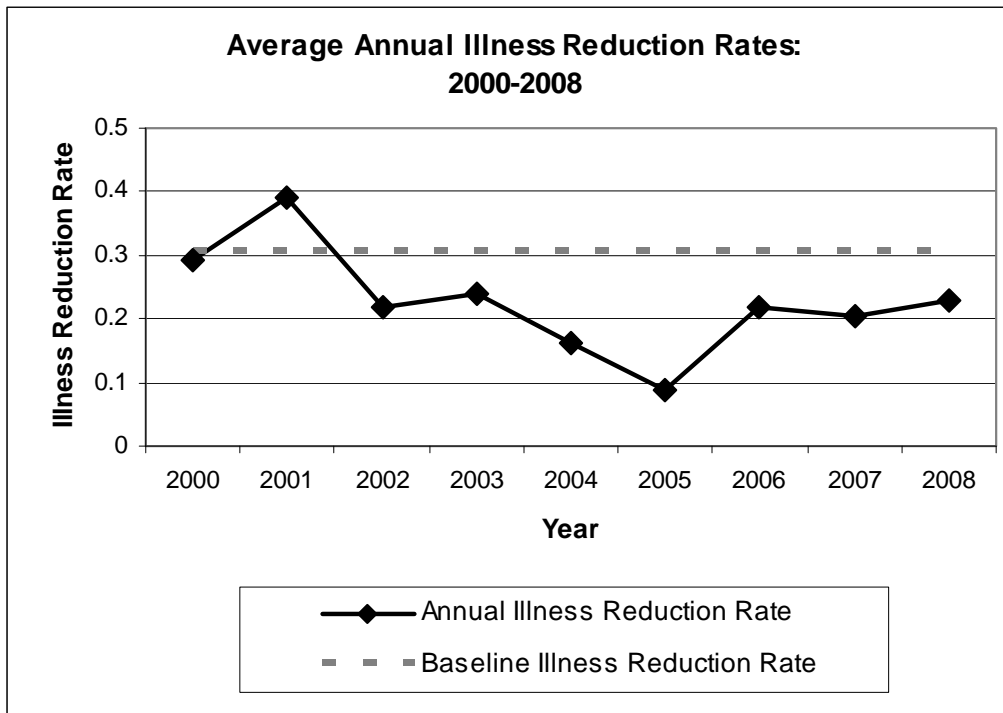


Figure 2. Average *Vibrio Vulnificus* Illness Reduction Rates for 2000-2008

## IX. References

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# Appendices

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B. Table of Contents: Interim Report II. "*Vibrio vulnificus* Education and Social Marketing: Implementing Strategies Needed to Reduce Illnesses Related to the Consumption of Raw Oysters" (GASAFFI#93)

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