PROJECT SUMMARY

ORGANIZATION: National Centers for Coastal Ocean Science, Center for Coastal Fisheries and Habitat Research, 101 Pivers Island Rd., Beaufort, NC 28516

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PROJECT TITLE: Comparison of bacteria uptake and depuration rates between the Suminoe oyster *Crassostrea ariakensis* and the American oyster *Crassostrea virginica*.

PROJECT DURATION: 8 months: 1 January 2005 – September 31, 2005

PROJECT OBJECTIVES: With the proposed introduction of the non-native Suminoe oyster, *Crassostrea ariakensis,* into the estuaries of the East Coast of the United States, a vast suite of ecological, economic, and human health concerns are being raised. The proposed introduction, if successful, would likely result in an increase in oyster consumption. This increase brings to light concerns regarding the safety of eating raw and poorly handled shellfish. The health risk of consumption of raw and poorly handled shellfish has been clearly demonstrated. According to the Interstate Shellfish Sanitation Conference (2004 Final Report), 30 people die each year from health complications resulting from the consumption of shellfish containing a bacterium known as *Vibrio vulnificus*. A wide variety of other pathogens, including Hepatitis A, enteroviruses, adenoviruses, and eoroviruses, also present distinct public health risks in relation to oyster consumption. The potential non-native oyster introduction and the likely increase in shellfish related illnesses that could result from an increase in oyster consumption along the East Coast, demands a comparative analysis between *C. virginica* and *C. ariakensis* regarding bacteria (*Vibrio* sp., fecal coliform, *E. coli)* uptake and handling related issues. The objectives of this work is to conduct laboratory comparisons of bacteria uptake, depuration, and post harvest handling between *C. ariakensis* and *C. virginica*.

WORK TO BE PERFORMED: Experiments will be carried out in the laboratory using seawater from the Newport River estuary, North Carolina known to contain high levels of *Vibrio* sp. Indicator bacteria (*E. coli*) will also be seeded into the recirculating biosecure rearing tanks allowing direct comparisons of bacteria uptake between the two species. Once elevated levels of bacteria in the oysters have been accomplished and comparisons made, depuration rates for each species will also be determined. Bacteria growth in both *C. ariakensis* and *C. virginica* post harvest will also be compared by placing both oysters into mechanical refrigeration simulating natural harvesting conditions. All shellfish meat and water bacteria assays will be conducted in compliance with FDA approved protocols currently being used by NC DENR Shellfish Sanitation staff.

Significance and Customer Base: These studies will verify if bacteria uptake, depuration, and post harvest handling differences exists between *C. ariakensis* and *C. virginica*. This work will significantly contribute to the ongoing NOAA Environmental Impact Statement (EIS) for the proposed introduction and will also address a key research priority concerning human health risks identified by the Shellfish Technical Advisory Committee (STAC, 2004). This work will benefit federal and state authorities considering this non-native oyster introduction. This work will be a collaborative effort involving North Carolina Department of Environment and Natural Resources staff and will be directly relevant to shellfish safety issues for North Carolina, Chesapeake Bay, and other East Coast estuaries.

Project collaborators:
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Rachel Noble, University of North Carolina at Chapel Hill, Institute of Marine Science
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