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A Retrospective Analysis of Sustainable Oyster Harvest from the Louisiana State Primary Seed Grounds, 1999-2010: A Shell-Neutral Modeling Approach

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(M), from Japan. The results of these trials showed that larvae (24 hrs post-hatch) from all strains averaged the same size immediately after spawning, reaching between 50 to 85 microns (m) on the first day. At four months of age, all four strains have shown successful growth reaching minimum lengths (DVM) of 1.5 cm; widths of 1.0 cm; and heights of 0.5 cm. Growout trials will continue for one year and data on the condition index will also be collected.

A RETROSPECTIVE ANALYSIS OF SUSTAINABLE OYSTER HARVEST FROM THE LOUISIANA STATE PRIMARY SEED GROUNDS, 1999-2010: A SHELL-NEUTRAL MODELING APPROACH.

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The Louisiana Department of Wildlife and Fisheries manages nearly 1.7 million acres of public water bottoms for the cultivation of the eastern oyster, *Crassostrea virginica*. The Department sets seasons, monitors harvest, and plants cultch. Currently, annual stock assessments, combined with best professional judgment, are used to both inform management and to predict the success of the upcoming oyster season. While these data provide crucial information for tracking oyster stock on an annual basis, present management has no established biological reference point and consequently no criterion by which sustainable harvest can be estimated. A numerical model is presented which defines a sustainability criterion as no net loss of shell, and calculates a sustainable harvest of seed and sack oysters. Stock assessments of the Primary State Seed Grounds conducted east of the Mississippi from 1999–2010 show a trend toward decreasing abundance of sack and seed oysters. Retrospective simulations provide estimates of annual sustainable harvests. Comparisons of simulated sustainable harvests to actual harvests show a trend toward unsustainable harvests toward the end of the time series. Stock assessments combined with shell-neutral models can be used to estimate sustainable harvest and manage cultch through shell planting when actual harvest exceeds sustainable harvest.

CHEMICAL AND PHYSIOLOGICAL MEASURES ON EASTERN OYSTERS FROM OIL-EXPOSED SITES IN LOUISIANA.

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On April 20th, 2010, an explosion on the Deepwater Horizon oil well, located 80 km off the coast of Louisiana, triggered a human, economic, and environmental disaster. When the well was capped on July 15, 2010, nearly 5 million barrels of oil had been released into the offshore waters. Oil laden waters advected into the estuaries and demonstrated the risk of offshore oil activities to inshore oyster populations. Potential lethal and sub-lethal effects of oil from the Deepwater Horizon spill to oysters (*Crassostrea virginica*) in Louisiana east of the Mississippi River were examined along a biophysical gradient of oil pollution, salinity, and disease. Approximately 6 months after the capping of the Deepwater Horizon wellhead, no polycyclic aromatic hydrocarbons were detected in oysters from oil-exposed sites. Variations in oyster condition and reproductive state, and infection with the oyster parasite *Perkinsus marinus* are consistent with natural differences along the salinity gradient and not with impacts of polycyclic aromatic hydrocarbon contamination. Although no impact was observed in this study, we caution the over application of the results of this spatially and temporally limited study to other areas and other times where impacts from the Deepwater Horizon spill may have occurred.

ROTATIONAL HARVEST IN THE RAPPAHANNOCK RIVER, VIRGINIA: A REVIEW OF PROGRESS TO DATE.

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Ransom Myers once described rotational harvest as a ''fisheries management strategy robust to ignorance.'' (Can. J. Fish. Aquat. Sci. Vol. 57:2357-2362, 2000). We present a history of rotational harvest management of oysters in the lower Rappahannock River, in the Virginia portion of the Chesapeake Bay and pose the question: does it work? In 2007 a collaboration between industry, academia, non governmental organizations, and regulators agreed to adopt a three year rotational harvest protocol using six geographic areas in the lower river, with two of the six areas open each year, and an area lying ''fallow'' for two years after a harvest period. We review the success of this program in terms of the relationship of annual assessments to eventual production, and options to enhance production in specific time frames and areas through shell substrate and/or spat on shell addition.