Oceanography-2013
OMICS Group Conferences
Accelerating Scientific Discovery
International Conference on
Oceanography
August 21-23, 2013 Orlando-Florida, USA

Linking Oceanographic Modeling and Benthic Mapping With Habitat Suitability Models For Pink Shrimp On The West Florida Shelf

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Abstract

A study was conducted to model and map spatial distributions and abundances of pink shrimp (*Farfantepenaeus duorarum*) on the West Florida Shelf (WFS) using habitat suitability modeling (HSM). Data loggers and electronic logbook systems on three shrimp boats were used to gather catch and effort along with bottom temperature, salinity, and depth data at known fishing locations. Vessel monitoring system (VMS) data supplied by the fishing company helped delineate areas with high fishing effort. Significantly higher mean catch rates (CPUEs) of pink shrimp occurred on the WFS during June to September, and October to December 2004 in comparison to January to March, and April to June 2005. Oceanographic modeling predicted monthly averaged bottom currents (speed and direction) and temperatures from March 2004 to June 2005. Current speed and direction indicated marked upwelling onto the WFS during 2004, and downwelling during 2005. Sediment data were interpolated to produce a sediment distribution map. Suitability functions were created to predict CPUEs in relation to depth, aspect, bottom type, bottom temperature, current speed, current direction, and VMS zones. The HSM linked to geographic information systems (GIS) were used to predict spatial distributions and abundances of pink shrimp monthly from March 2004 to June 2005. The areas with the most pronounced upwelling were also the areas that the HSM predicted should have the highest mean CPUEs. This was verified by overlaying observed CPUEs from the fishing vessels onto the suitability zones predicted by the HSM. Nutrients carried onto the shelf promoted higher shrimp abundances.

Biography

Peter Rubec obtained his Ph.D. from Texas A&M University and conducted postdoctoral research and teaching at Boston University. Surveys, stock assessments, and stock separation studies on Ocean Perch (*Sebastes spp*.) were conducted for the Canadian Department of Fisheries and Oceans and coastal research for the Texas Parks and Wildlife Department. Since, 1995 he has been a Research Scientist with the Florida Fish and Wildlife Conservation Commission in the Center for Spatial Analysis. He has led interdisciplinary research pertaining to freshwater inflow, upwelling, and developed habitat suitability models using GIS. He has over 80 primary and secondary papers.