Award Number:1325452
Project Title: Coastal SEES (Track 1): Novel Approaches to Understanding Human Use Patterns and Mobility for Coastal Natural Resources Management
Report Type: Annual Project Report
PI: Steven Murawski
Awardee: University of South Florida

Data Management Plan

During the first year of the project we received the confidential vessel monitoring system (VMS) data for all fishing trips targeting reef fish in the Gulf of Mexico. The NOAA data were provided to us via a web portal over the course of two days. Because the UC Davis and USF teams are pursuing different behavioral models of fishermen behavior, the VMS data is being stored at both sites. Due to NOAA rules, the data are stored on non-networked computers in both sites. The confidentiality requirements of the data will prohibit us from releasing the raw data that is associated with a fishing trip and a particular vessel. During the next couple of months, we expect to receive the vessel logbook data that will be stored at both sites on non-networked computers.

The PIs will coordinate the use of the VMS and logbook data to ensure that we are utilizing the same sample of data in our analysis. Specifically, we will coordinate the merging of the two data sets that entails, for example, some complexities regarding the merging of VMS trip data to logbook trip data.

We plan to make available summary statistics (e.g., monthly landings in a statistical area) at the termination of our project subject to the NOAA rules on confidentiality and data sharing.

Data Management Plan

This project will generate a considerable quantity of data and metadata summarized from primary sources generated by the National Marine Fisheries Service. There four primary databases that will be used to calculate spatial statistics of human use, species productivity and economics:

- Vessel Monitoring System (VMS) data are required of all vessels fishing in reef fish, large pelagic and shark fisheries of the Gulf of Mexico. Typically the system produces about 3.5 million position records per year for the reef fish fleet (one ping per hour, for all vessels either at sea or at the dock), which includes commercial reef fish fishers and "for hire" recreational vessels. The VMS system was implement in August, 2006, resulting in 7 years of data available to this project, or approximately 25 million position records. This is exclusive of large pelagic and shark VMS records from the same system
- Vessel Logbook data that summarize the fish catch and discards for each fishing trap made by commercial fishers. Typically, there are in excess of 30,000 reef fish fishing trips per year in the Gulf of Mexico. These trips summarize landings into a number of rather large statictical reporting areas (Figure 1). The logbook record includes catch in pounds by species, catch zone, gear and effort data, and prices paid by fish dealers for the catch. Analyses by NMFS and the Gulf of Mexico Fishery management Council have pro-rated these landings into finer spatial regions (Figure 2), based on filtered VMS position data. There should be a VMS and logbook record for each fishing trip thereby indicating fishing success at the trip level.
- Headboat logbook data are required of all recreational "for hire" fishers operating in the Gulf of Mexico. These data include both VMS records and logbook data usually required of commercial fishers. Typically these vessels operate closer to shore than commercial vessels, and data include numbers and weight of fish caught, landed and discarded and numbers of fishers onboard. Several thousand "for hire" logbooks are available each year.
- Reef Fish Observer Data. There is a small but important effort to put scientifically trained observers on commercial reef fish, longline and shark fishing vessels. These data provide highly accurate position and catch data on a haul-by-haul basis, and therefore very precise accountings of the sequence of catches and movement patterns of fishers. These are the most precise data with which to assess fisherman's choice decisions. Typically hundreds of trips are observed each year.

These data sets primarily reside with the National Marine Fisheries Service, Southeast regional Office. Because they represent data from individual fishing firms, the data are subject to confidentiality restrictions that do not violate the "rule of three" which means that if less than three firms participate in some activity, the data must be summarized at a level of aggregation sufficient to include more than three firms. Initial analyses from these data will use vessel coding that will not allow the identity of specific vessels to be retained. This coding will, however, allow matching of vessel and logbook and observer data for our analyses. Because of the high volume and sensitivity of the VMS data we will summarize them initially for plotting and other purposes in 1 minute squares, which will considerably reduce the dimensions of the data sets. These data will be stored in intermediate files for use by the project team. If appropriate, project team members will sign confidentiality agreements regarding the data.

Once we analyze the spatial utilization data, we plan to achieve these data in a NOAA archive so that they can be used by researchers seeking to extend the analyses or conduct complimentary research. We will archive the aggregated spatial data with the NOAA National Oceanographic Data Center's National Coastal Data development Center (NCDDC) located at the Stennis Center, Mississippi. (https://www.ncddc.noaa.gov/about-ncddc/). The NCDDC is considered the repository of choice for much of the oceanographic and habitat data for the Gulf of Mexico, and is an appropriate archive for NOAA-related data. We attach a letter of support from the NCDDC staff (Dr. Russell Beard).

The data to be archived will include computed spatial statistics per trip, summary information on catch, grid locations, and a unique trip identifier to allow reference to the specific (although unidentified) vessel under consideration. Each trip will be summarized into one record, which will include a prorated VMS record as well (how much catch was allocated to each ping when the vessel was fishing. The raw VMS data will be stored on the NMFS Southeast Fisheries Science Center website, which is being set up to handle data requests.

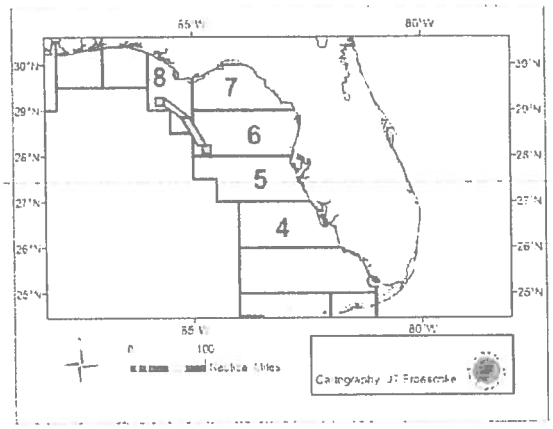

Figure 1. Statistical zones 4-8 with current and proposed area closures.

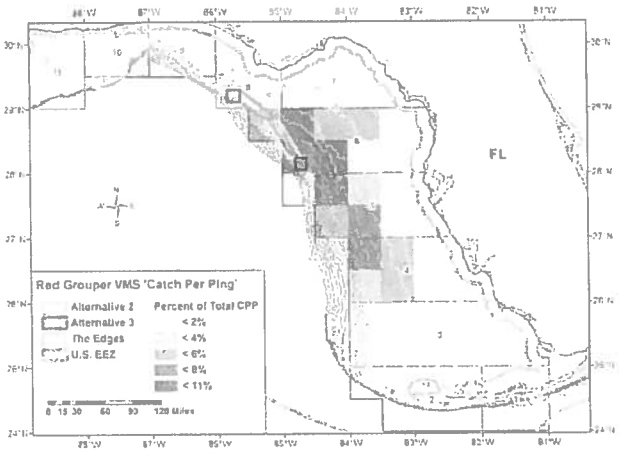

Figure 2. Prorated red grouper catch data on the west Florida shelf, August 2008-2009. Data use the commercial and for hire logbook and the VMS positions to allocate landings "per ping" from VMS.