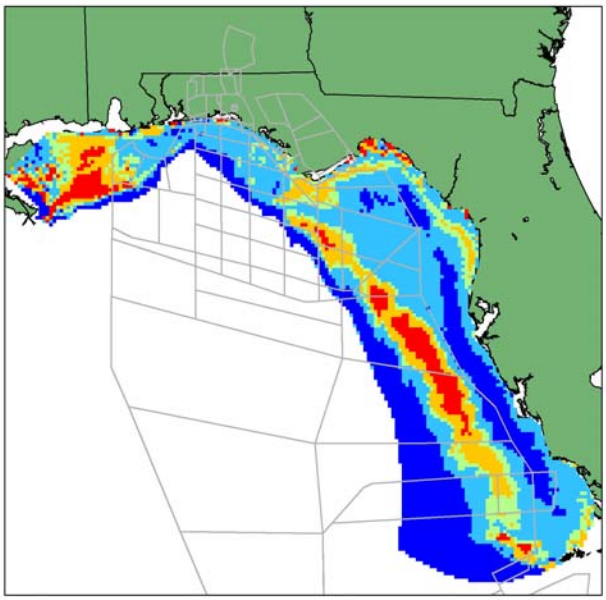
Protected Species Habitat Modeling in the Eglin Gulf Test and Training Range

07-270

Background:

The Eglin Gulf Test and Training Range (EGTTR) is a Department of Defense water range that is critical for weapons system testing and training. The marine habitats within the EGTTR are home to protected species including marine mammals and sea turtles. Environmental permitting requirements under both the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) require evaluation of the impacts of training activities on these protected species. However, the available assessment data do not provide animal density estimates at sufficient spatial or temporal resolution to adequately quantify impacts.



Habitat models are used to predict the density of protected species within EGTTR operations areas.

Objective:

To improve environmental planning, this project developed habitat models to predict the spatial distribution and abundance of marine protected species within the EGTTR. The project outcomes improve environmental assessment and compliance by providing a quantitative basis for assessing the impacts of training activities on protected species. This will streamline the process of obtaining required permits to avoid delays in the execution of critical training and testing exercises. The project's final products include GIS shapefiles providing monthly density and abundance estimates for each species within the operational areas of the EGTTR.

Summary of Approach:

We used recent aerial survey data along with remotely sensed water temperature and surface chlorophyll concentration data to develop habitat models for bottlenose dolphins, loggerhead turtles, Kemp's Ridley turtles, leatherback turtles, and green/hawksbill turtles. These "species-environment" models were projected both spatially and temporally to provide monthly maps of animal density. Sources of bias in density estimates were accounted for to obtain accurate estimates of the total abundance of each species. The approach also evaluated the uncertainty in the predicted densities to identify months and areas where data is insufficient to support valid predictions.

Benefit:

The project benefits the military mission by providing an improved basis for environmental impact assessment and for obtaining required permits under the ESA and MMPA. The project will improve conservation by allowing environmental planners to site missions at times and places where the overall density of protected species, and hence mission impacts, are expected to be lowest.

Accomplishments:

There was strong seasonal and spatial variability in the density of marine mammals and turtles in the EGTTR. The models for bottlenose dolphins, loggerhead turtles, and Kemp's Ridley turtles were effective and provided valid predictions, particularly during summer and winter months. However, the models for green/hawksbill and leatherback turtles were less reliable due to small numbers of sightings during the surveys. The ability to predict spatial distribution during the spring and fall was limited because the environmental conditions are very different from those observed during the surveys. However, within the spatial and temporal range of the study, the derived habitat models provided precise and accurate predictions of animal density to support environmental planning.

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