2010 Ocean Sciences Meeting
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Cite abstracts as **Author(s) (2010), Title, *Eos Trans. AGU, 91*(26), Ocean Sci. Meet. Suppl., Abstract xxxxx-xx**

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harrison pham

HR: 1700h
AN: **IT24E-07**
TI: Pelagic Habitat Analysis Module for GIS-Based Fisheries Decision Support
AU: **Harrison, D P**
EM: *daniel@earthoceanspace.com*
AF: *Marine Envrionmental Biology, University of Southern California, Los Angeles, CA, United States*
AU: **Kiefer, D A**
EM: *kiefer@usc.edu*
AF: *Marine Envrionmental Biology, University of Southern California, Los Angeles, CA, United States*
AU: **Hinton, M G**
EM: *mhinton@iattc.org*
AF: *Inter-American Tropical Tuna Commision, LA Jolla, CA, United States*
AU: **Kohin, S**
EM: *Suzanne.Kohin@noaa.gov*
AF: *Southwest Fisheries Science Centre, LA Jolla, CA, United States*
AU: **Armstrong, E M**
EM: *edward.m.armstrong@jpl.nasa.gov*
AF: *Jet Propulsion Laboratory, Pasadena, CA, United States*
AU: **Snyder, S**
EM: *stephanie.snyder@noaa.gov*
AF: *Southwest Fisheries Science Centre, LA Jolla, CA, United States*
AU: **O'Brien, F J**
EM: *fjobrien@cox.net*
AF: *System Science Applications, Irvine, CA, United States*
AB: We developed a Pelagic Habitat Analysis Module (PHAM) within a GIS framework to integrate satellite imagery and ocean circulation models into the decision support systems for management of commercial and threatened pelagic species. The project integrates data from fishery surveys, tagging projects, and commercial fishing operations, with satellite imagery and outputs of circulation models to identify the distribution of a species habitat in terms of oceanographic parameters. We predict distributions of species and overlaps in habitat, which may then be used in population-dynamics models for fisheries management. The PHAM resides within the EASy GIS, which supports a multidimensional (latitude, longitude, depth, & time) home for the data. Tools within EASy currently include EOF analysis of satellite imagery, data matching between environmental data and fisheries presence / count data, and statistical techniques for examining relationships between environmental conditions and habitat. Results are applied to produce historic and real-time dynamic maps of predicted species density. PHAM is able to assimilate large quantities of oceanographic and satellite products, such as ocean

color, sea surface temperature, sea surface height, surface wind data, and our derived frontal probability indices. The NASA ECCO-2 circulation model can be queried dynamically for any depth, allowing assessment of modeled current velocity & direction, salinity, SSH, temperature, and mixed layer depth. Tools are provided that use model output to track water masses for studies of larval drift and dispersion for stock recruitment analysis. We are using the PHAM in two separate case studies: (1) In a collaboration with the Inter American Tropical Tuna Commission, providing insights into the temporal and spatial variability of the habitat of three commercially important tuna species; bigeye (Thunnus obesus), skipjack (Katsuwonus pelamus), and yellowfin (T. albacares); in the Eastern Pacific Ocean. The remote-sensing data and NASA circulation models are being used to improve understanding of environmental drivers affecting recruitment variability and stock size. Results will be available to inform the management decisions of the Commission. (2) In a collaboration with the Coastal Pelagics Division of the Southwest Fishery Science Center, the PHAM is informing management decisions for shark along the Californian coast, including those for blue (Prionace glauca), mako (Isurus oxyrinchus), and thresher sharks (Alopias vulpinus & A. pelagicus). The PHAM is used to define habitat for each species and identify strata within which there is potential interaction or presence of multiple species. The results allow identification of areas where species targeted by a fishery and a threatened species co-occur, providing decision support for NOAA/NMFS management. We present data and preliminary results from both projects, demonstrating the utility of satellite-based data products and circulation models to inform decisions in fishery management.

DE: [0480] BIOGEOSCIENCES / Remote sensing
DE: [1928] INFORMATICS / GIS science
DE: [1980] INFORMATICS / Spatial analysis and representation
DE: [4830] OCEANOGRAPHY: BIOLOGICAL AND CHEMICAL / Higher trophic levels
SC: Interdisciplinary (IT)
MN: 2010 Ocean Sciences Meeting

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