Identification and monitoring of dynamic habitat in the changing ocean

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There is an increasing emphasis on the employment of ecosystem-based management towards the stewardship of living marine resources. This inherently includes a requirement for the accessibility of timely descriptions of the aspects of marine environment that are relevant to a given ecosystem. In the past decade there has been a proliferation of publicly available oceanographic data sets derived from a variety of platforms and sensors. National, provincial, and municipal researchers and managers who are not necessarily expert in the production and distribution of oceanographic satellite data often face a bewildering, and seemingly contradictory, array of options when choosing data for use in their applications. We offer examples of applications, including several client-side tools designed to extract environmental data within the spatial-temporal locus of a given animal track, and to then import this data directly into the working environment with which a given research or managerial team is comfortable. Additionally, we present sample applications employed along the North American Pacific coast in the support of management of both fisheries and protected species. These examples utilize highly-derived products that fully integrate data provided by electronic tags placed on Chinook salmon (Oncorhynchus tshawytscha) and more traditional cetacean surveys with environmental data derived from remotely sensed and in situ data, and model output using the various dissemination systems discussed. Such integrated data suites will allow for improvement of the identification and monitoring of essential habitat over a broad range of spatial and temporal scales.

Mapping hard bottom reef fisheries habitat off northwest Florida—needs, methods, and status

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The west Florida shelf (WFS) supports some of the most valuable reef fish fisheries in the U.S. Gulf of Mexico. However, very little of its area has been mapped with enough resolution to accurately locate and quantify the hard/live bottom habitat these fisheries are so strongly tied to. Such maps are essential for designing an efficient fishery-independent survey of reef fishes, enabling prestratification by habitat, and thereby minimizing variance and optimizing survey resources. Accurate habitat maps will also be critical for ecosystem-based fisheries management and marine spatial planning. In support of a recently expanded fishery-independent reef fish survey, the SEFSC began mapping cross-shelf transects on the northern WFS using multibeam and side scan sonar. Two transects ~1.5–2.5 x 30 nautical miles (n.mi.) were mapped with a 300kHz multibeam sonar and seven single swath cross-shelf transects ~20–30 n.mi. x 150 m were mapped using a 600 kHz side scan sonar. An inexpensive live video drop camera and occasionally an remotely-operated vehicle were used for visual ground truthing. Although the multibeam provided bathymetry and backscatter data at very high resolution, the side scan hardware and software was much more user friendly and provided data on which hard/live bottom habitat could, after a very short learning curve, be easily identified. Given the scale of most interest for fisheries-related needs, the 600 kHz side scan sonar may be the most cost-effective tool for our purposes.
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