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Essential Fish Habitat project status report

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Reporting date: November 19, 2014

Project number: 2011-07

Title: Low-cost multibeam mapping to support habitat based groundfish assessment and deepwater coral research in the Gulf of Alaska

PIs: Chris Wilson, Chris Rooper, Tom Weber, Jon Heifetz, Jodi Pirtle (Postdoc)

Funding year: FY11

Funding amount: $67,400

Status: Complete

Reporting: The final results of this project are reported in a manuscript that has been prepared for publication in a peer-reviewed journal. The manuscript is attached to this final report and the title and abstract are included below.

Title: Assessment of trawlable and untrawlable seafloor using multibeam-derived metrics.

Abstract: Groundfish that associate with rugged seafloor types are difficult to assess with bottom-trawl sampling gear. Simrad ME70 multibeam echosounder (MBES) data and video imagery were collected to characterize trawlable and untrawlable areas, and to ultimately improve efforts to determine habitat-specific groundfish biomass. The data were collected during two acoustic-trawl surveys of the Gulf of Alaska (GOA) during 2011 and 2012 by NOAA Alaska Fisheries Science Center (AFSC) researchers. MBES data were collected continuously along the trackline, which included parallel transects (1-20 nmi spacing) and fine-scale survey locations in 2011. Video data were collected at camera stations using a drop camera system. Multibeamderived seafloor metrics were overlaid with the locations of previously conducted AFSC bottomtrawl (BT) survey hauls and 2011 camera stations. Generalized linear models were used to identify the best combination of multibeam metrics to discriminate between trawlable and untrawlable seafloor for the region of overlap between the camera stations or haul paths and the MBES data. The most discriminatory models were chosen based on the Akaike information criterion (AIC). The two best models were developed using data collected at camera stations with either oblique incidence backscatter strength (Sb) or mosaic Sb in combination with bathymetric position index and seafloor ruggedness and described over 54% of the variation between trawlable and untrawlable seafloor types. A map of predicted seafloor trawlability produced from the model using mosaic Sb and benthic-terrain metrics demonstrated that 58% of the area mapped (5,987 km2) had > 50% probability of being trawlable and 42% of being untrawlable. The model predicted 69% of trawlable and untrawlable haul locations correctly. Successful hauls occurred in areas with 62% probability of being trawlable and haul locations with gear damage occurred in areas with a 38% probability of being trawlable. This model and map produced from multibeamderived seafloor metrics may be used to refine seafloor interpretation for the AFSC BT surveys and to advance efforts to develop habitat-specific biomass estimates for GOA groundfish populations.