

FINAL REPORT  
DEMERSAL SHELF ROCKFISH STOCK ASSESSMENT  
IN THE EASTERN GULF OF ALASKA  
JULY 1, 2000 – JUNE 30, 2001  
NOAA Award: NA07FN0076



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## **I. Executive Summary**

This is a final report of activities under NOAA grant NA07FN0076 for research on Demersal Shelf Rockfish in the eastern Gulf of Alaska for the period July 1, 2000 to June 30, 2001. NOAA initially funded this program in 1994. Each year since then this project has evolved to provide increasingly precise and complete estimates of rockfish abundance and distribution. The objective of this project this year was to continue a habitat-based method of estimating rockfish abundance as a means to improve rockfish management and to reduce the risk of overharvest (O'Connell and Carlile 1993, O'Connell et al. 1999). The focus this year was to survey a portion of seafloor using a multibeam echosounder in the important commercial fishing grounds in Southern Southeast Alaska. This information will allow improvements in estimates of rockfish biomass.

Two survey sites were covered in this survey (Figure 1). The survey began at the Hazy Island site where an area approximately 390 km<sup>2</sup> was covered in about 5.6 days. Initial interpretations of the sun-illuminated imagery and backscatter data for that area shows an increase in the amount of known rock bottom over what we had previously thought. At the site off Cape Ommaney approximately 275 km<sup>2</sup> was covered in about 2.7 days. Initial interpretation of the data shows an increase in rock bottom. Good imaging of a known coral site was also obtained.

In addition to the field work conducted, the 2001 stock assessment for DSR was revised, GIS applications of mapping data, survey data, and fishery data were continued, and research results were presented at the American Fisheries Society, Alaska Chapter meeting and the Annual Science Conference of ICES.

## **II. Purpose of Project**

The North Pacific Fishery Management Council, the Alaska Department of Fish and Game (ADF&G), and the National Marine Fisheries Service (NMFS) have all identified improvement of rockfish stock assessment, identification of habitat areas of particular concern (HAPC), and fishing gear impacts on habitat as research priorities in the Gulf of Alaska. There is an increasing recognition of the importance of habitat in distribution of rockfish species. Multibeam mapping, combined with in-situ habitat verification using a submersible provides a permanent record of the seafloor and allows for habitat classification and quantification, critical to rockfish stock assessment and definition of HAPC.

The objective of this project was to continue bottom-mapping in the East Yakutat Section of the Eastern Gulf of Alaska to provide detail on habitat characterization in this important fishing ground. The data collected can be mapped in a variety of ways, including using the Habitat Classification system proposed by Greene et al. (1999) and GIS layers can be constructed for illustrative purposes (e.g. distribution of *Primnoa* coral and yelloweye rockfish).

Specific objectives were as follows:

- Conduct a multibeam echosounder survey of 800 km<sup>2</sup> of the seafloor between 80 and 220 m depth in the East Yakutat section of southeast Alaska.
- Produce a GIS compatible sun-illuminated multibeam (backscatter) mosaic of this area complete with bathymetric contour mosaic and a geological habitat interpretation of this mosaic.
- Quantify rockfish habitat based on multibeam data and geological interpretation, subcontracted to Moss Landing Marine Laboratories.
- Produce GIS layers of information relevant to HAPC considerations (i.e., *Primnoa* etc).

### III. Approach

The survey was conducted under subcontract to the Thanes Racal Company using the Reson 8111 Multibeam Echo Sounder sensor operated at 100 kHz and hull mounted on the *R/V Davidson*. The *R/V Davidson* is approximately 150 feet long and fully equipped for work on the outer coast. Data was collected 24 hours per day for approximately 9 days as the vessel traveled back and forth over the survey areas in lines roughly parallel to the contour of the bottom. The average speed of the vessel was approximately 7 knots; lines were run at spacing not more than 3x the water depth. Backscatter was collected simultaneously.

Data were collected using Winfrog Multibeam V1.3A. The resulting data files were initially processed onboard the vessel around the clock using Universal Systems CARIS Hydrographic Information Processing System (HIPS), and Hydrographic Data Cleaning System (HDCS). Backscatter data files were initially processed on board as well. Crude mosaics of both the multibeam and backscatter data were rendered on board so that any holes in the mosaic could be resurveyed before leaving the survey area.

Submersible video is being reviewed to locate the presence of *Primnoa* corals and large sponges. Location and date are being recorded and this information is being entered into a spreadsheet for use in GIS mapping.

This is a cooperative project between NMFS Auke Bay Laboratory, ADF&G, and Moss Landing Marine Laboratory (MLML). ADF&G has the lead role and is responsible for project oversight, field participation, and final reporting. MLML is responsible for habitat classification, digitizing of habitats, and field participation, and the Auke Bay Laboratory helped identify habitat areas of common interest.

### IV. Results, Evaluation and Conclusions

Two sites were covered in this survey (Figure 1). The survey began at the Hazy Island site where an area approximately 390 km<sup>2</sup> was covered in about 5.6 days. Initial interpretations of the sun-illuminated imagery and backscatter data for that area shows an increase in the amount of known rock bottom over what we had previously thought. At the site off Cape Ommaney approximately 275 km<sup>2</sup> was covered in about 2.7 days. Initial interpretation of the data shows an increase in rock bottom as well. Good imaging of a known coral site was also obtained.

Given the scheduling of the field work late in the fiscal year, final products are not yet available. Further cleaning of the data and subsequent interpretation will yield definite quantification of rocky habitat in both of these areas. We anticipate receiving final products from the contractor in

September, 2001 and finalizing habitat characterization by late fall.

The quality of the multibeam data is excellent and provides a permanent record of two portions of important fishing grounds in Southeast, Alaska. The information gained from the multibeam, sidescan, and habitat classification will contribute greatly to our stock assessment for demersal shelf rockfish.

It would be beneficial to stock assessment of all rockfish species and to identification of Habitat Areas of Particular Concern, if multibeam and sidescan mapping were to continue in other areas of the continental shelf of the Gulf of Alaska.

## **V. Products**

O'Connell, V. M., D. Carlile, and C. Brylinsky. 2001. Demersal Shelf Rockfish Stock Assessment and Fishery Evaluation Report for 2001. Alaska Department of Fish and Game, Division of Commercial Fisheries. RIR 1J00-36. 42 pp.

O'Connell, V. and M. Cartwright. 2000. Demersal Shelf Rockfish: Can a slow growing, long-lived marine species complex be managed for sustainability. Abstract American Fisheries Society, Alaska Chapter Annual Meeting. Fairbanks, AK.

Greene, H. G., M. M. Yoklavich, V. M. O'Connell, R. M. Starr, W. W. Wakefield, C. K. Brylinsky, J. J. Bizzarro, and G. M. Cailliet. Mapping and classification of deep seafloor habitats. 2000. ICES Annual Science Conference. 11 pp.

O'Connell V., M. Ruccio, D. Urban, C. Trowbridge, T. Brookover, M. Cartwright, C. Brylinsky, S. Meyer, K. Munk, M. Jaenicke, B. Piorkowski, L. Seeb, T. Haverland, B. Bechtol, and R. Gish. 2001. State of Alaska Groundfish Fisheries and associated Investigations in 2000. Prepared for the Forty Second Annual Meeting of the Technical Sub-committee of the Canada-United States Groundfish Committee. Pacific States Marine Fisheries Commission, Portland, OR. 36 pp.

## **VI. References**

Greene, H. G., M. M. Yoklavich, R. M. Starr, V. M. O'Connell, W. W. Wakefield, D. E. Sullivan, J. E. McRea Jr., and G. M. Cailliet. 1999. A classification scheme for deep seafloor habitats. *Oceanologica Acta* 22(6):663-678.

O'Connell, V. M. and D. W. Carlile. 1993. Habitat-specific density of adult yelloweye rockfish *Sebastes ruberrimus* in the eastern Gulf of Alaska. *Fish Bull.* 91:304-309.

O'Connell, V. M, D. W. Carlile, and C. Brylinsky. 1999. Demersal Shelf Rockfish. *In* 2000 Stock Assessment and Fishery Evaluation Report for the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK.

## **VII. Key Words**

Demersal Shelf Rockfish, yelloweye rockfish, multibeam mapping, stock assessment, habitat, Gulf of Alaska.

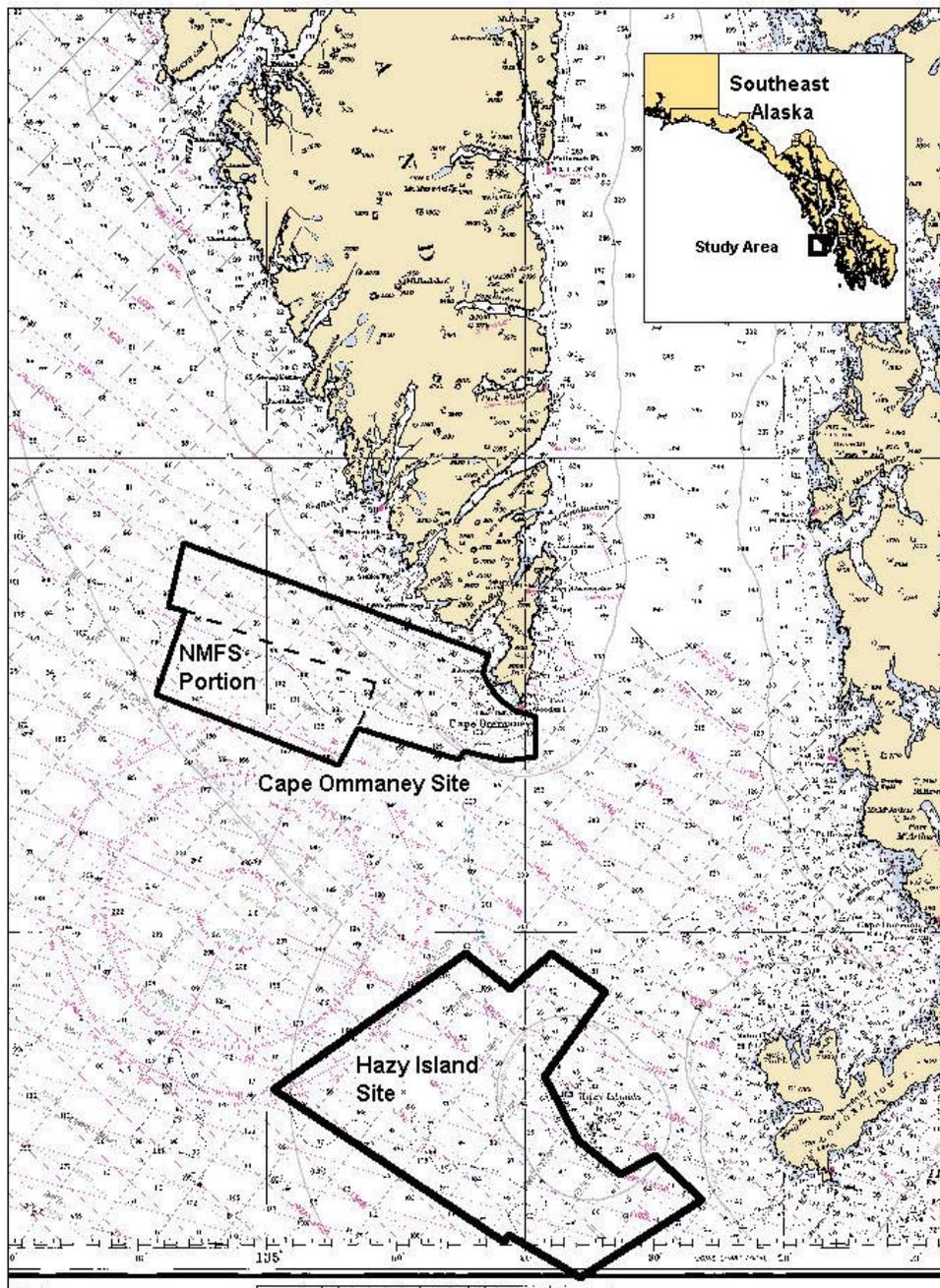


Figure 1. Multibeam survey sites, Southeast Alaska, May 2001.

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