UNIVERSITY OF CALIFORNIA
Santa Barbara

Abundance and Distribution of Cetaceans in the California Current System as Observed from Ship and Satellite Data

A thesis submitted in partial satisfaction
of the requirements for the degree of

Master of Arts

in

Geography

by

Elizabeth Ann Dunlap

Committee in charge:

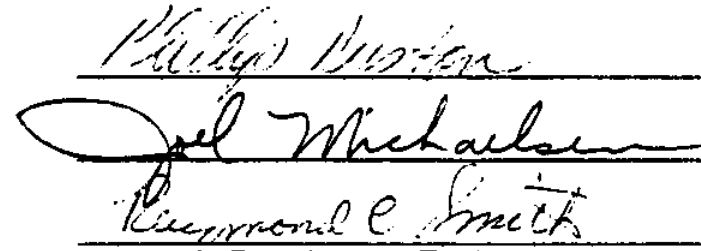
Professor Raymond C. Smith, Chairman

Professor Joel Michaelsen

Professor Phillip Dustan

August 1985

The thesis of Elizabeth Ann Dunlap is approved:



Committee Chairman

August 1985

Acknowledgements

This work was accomplished with the help of many individuals. The author would especially like to thank Ray Smith for his inspiration and encouragement throughout this project. Many thanks also to Karen Baker, Phillip Dustan, and Joel Michaelsen for their constructive criticism and positive suggestions. The shipboard data used for this research were obtained by Phillip Dustan under the NASA Grant NSG-1641. Karen Baker was responsible for the reduction of the raw ship data used in the preparation of Appendices 1 and 2. The marine mammal sighting data were made available from David Au. The author would like to express appreciation to Roger Lenard for his help with computer programming. R. Evans, O. Brown, and J. Brown (RSMAS) provided software for image processing. Marine mammal spotters include R. Pitman, S. Sinclair, G. Friedrichsen, and R. Clarke. The cruise leader was T. Duffy. This work was supported by NASA grants NSG-1641 and NAGW-290-2 to Raymond C. Smith and Karen S. Baker. Elizabeth A. Dunlap was supported by a Seagrant Traineeship (R/CZ-64A) during this work.

This work is a result of research sponsored in part by NOAA, National Sea Grant College Program, Dept. of Commerce, under grant number NA80AA-D-00120, project number R/CZ-64, through the California Sea Grant College Program. The U.S. Government is authorized to reproduce and distribute for governmental purposes.

ABSTRACT

Abundance and Distribution of Cetaceans in the California Current System as Observed from Ship and Satellite Data

by

Elizabeth Ann Dunlap

Two marine mammal surveys were conducted off the coast of California in 1979 and 1980. Along-track measures of chlorophyll fluorescence and temperature were obtained with a flow-through fluorometer and a thermosalinograph, respectively. Sea surface chlorophyll measures were also determined from satellite images taken from the Coastal Zone Color Scanner aboard the Nimbus-7 satellite. Statistical techniques comparing marine mammal abundance with chlorophyll and temperature measures indicate that cetaceans are not randomly distributed with respect to these variables. Cetaceans were more abundant in regions of relatively high chlorophyll and low temperature. It is suggested that sea surface chlorophyll and temperature may be used as habitat descriptors for selected marine mammals and that the remote sensing of these variables will provide complementary data useful in the interpretation of observed distribution patterns of marine mammals and in the estimation of their abundance.