

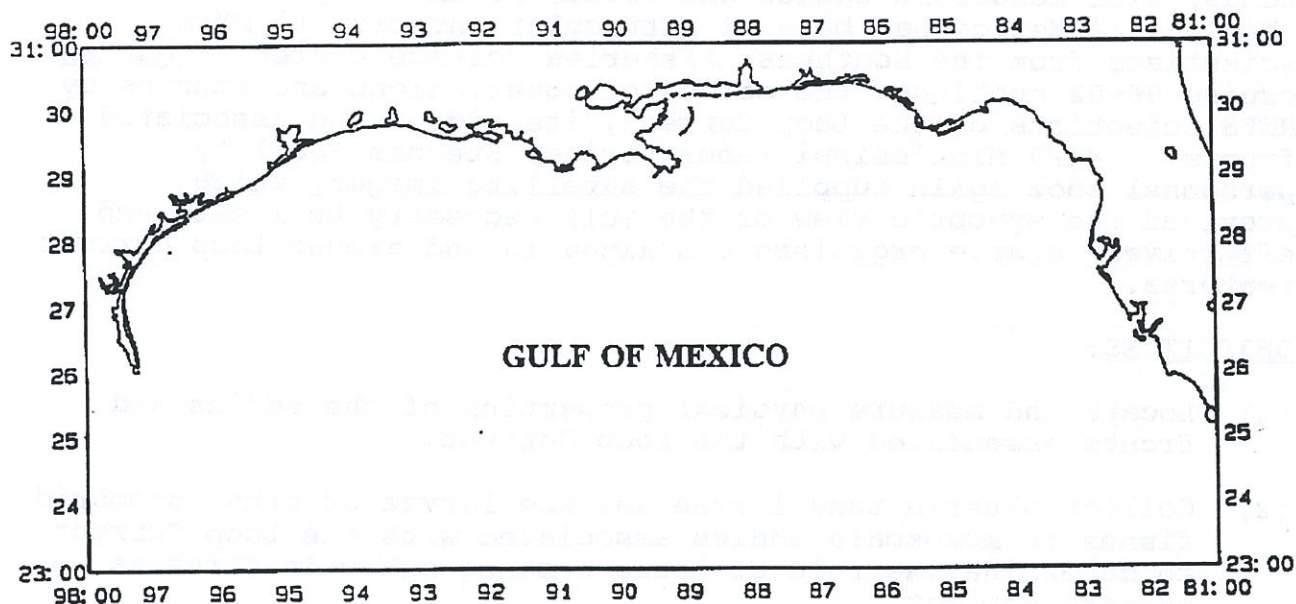
CRUISE RESULTS

JUL 20 1996

Plankton Survey

NOAA Ship CHAPMAN Cruise CH-96-02 (72)

04/26-05/05/96



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National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
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Chapman Cruise CH-96-02(72)
April 26 to May 5, 1996

INTRODUCTION

Marine scientists have long recognized that interfaces or fronts between differing water masses are usually characterized by increased concentrations of planktonic and pelagic organisms. The association of the larvae of scombrid fishes, especially the tunas, with mesoscale eddies and fronts of the Loop Current in the Gulf of Mexico has been of particular interest to NMFS scientists from the Southeast Fisheries Science Center. Chapman cruise 96-02 continued the series of observations and studies by NMFS scientists of the Loop Current, its eddies and associated fronts. NMFS Mississippi Laboratories, Stennis Facility personnel once again supplied the satellite imagery which provided the synoptic view of the Gulf necessary to locate and effectively sample organisms contained in and around Loop Current features.

OBJECTIVES:

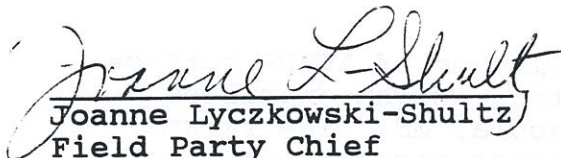
- (1) Locate and measure physical properties of the eddies and fronts associated with the Loop Current.
- (2) Collect bluefin tuna larvae and the larvae of other scombrid fishes in mesoscale eddies associated with the Loop Current to determine the role of these oceanographic features as nursery habitat.

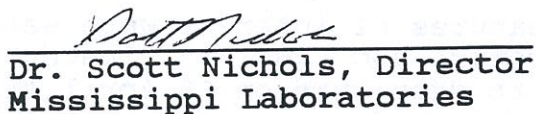
MATERIALS AND METHODS:

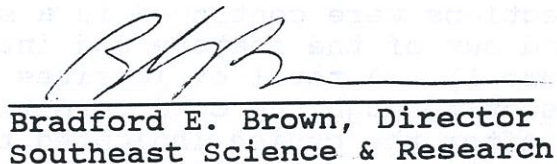
Plankton collections, nine per set, were taken using a one-square meter (mouth opening) MOCNESS (multiple opening/closing net and environmental sensing system) fitted with 335 micron mesh nets. Plankton samples were taken from the following discrete depth intervals: 0 to 200, 200 to 175, 175 to 150, 150 to 125, 125 to 100, 100 to 75, 75 to 50, 50 to 25, 25 to 0 meters. After the primary collections were completed two, additional deep (over 900m) MOCNESS tows were made fishing nets at six depth intervals: 0 to 530, 530 to 920, 920 to 770, 800 to 650, 650 to 500, and 500 to 200 meters at a site. Vertical profiles of sea temperature, conductivity (converted to salinity), dissolved oxygen, transmissivity, and fluorescence (measure of chlorophyll a) were made with a Seabird SBE-25 Sealogger CTD unit at all but the deep MOCNESS site. All but a few plankton samples were preserved in

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95% ethanol. Those samples containing excessive gelatinous zooplankters were fixed initially in 5% formalin than later transferred to 95% ethanol.

RESULTS:

Two features of interest were selected from maps of AVHRR surface temperature and ERS-1 (altimeter) sea surface height anomalies prior to departure on 26 April from Pascagoula, MS. The first one was a cold core (cyclonic) feature located directly north of the Loop Current in the central Gulf. Plankton sampling and environmental measurements were begun well north of that feature at latitude 28°59.00' N and longitude 88°00.00' W on 27 April. Collections were continued in a southeasterly direction until we passed out of the feature and into the Loop Current itself (Figure 1). A total of 10 sites were sampled along the single transect through the cold core ring. Examination of hydrographic data after the cruise indicated that this cyclone was one of the strongest ever measured in the Gulf (Doug Biggs, Texas A&M Univ. personal communication). The second feature was an 'old' warm core eddy (Eddy Biloxi) located to the west of the cold core feature. It was examined with collections and measurements at 11 sites arranged in a rosette pattern (Figure 1).

The final sampling site was located at latitude 29° N and longitude 87° W near the shelf edge break. This location was chosen to investigate the presence of larvae of shelf dwelling fishes in deep slope waters.

The ship returned to Pascagoula on 5 May, one day earlier than scheduled, after all planned operations had been successfully completed.

CRUISE PARTICIPANTS:

NAME	TITLE	ORGANIZATION
Joanne Lyczkowski-Shultz	Field Party Chief	NMFS, Pascagoula, MS
LCDR John Lamkin	Chief Scientist	NOAA Corps, Miami, FL
Ken Wilkinson	Electronics Tech.	NMFS, Pascagoula, MS
Jeff Govoni	Fishery Biologist	NMFS, Beaufort, NC
Jon Hare	Fishery Biologist	NMFS, Beaufort, NC

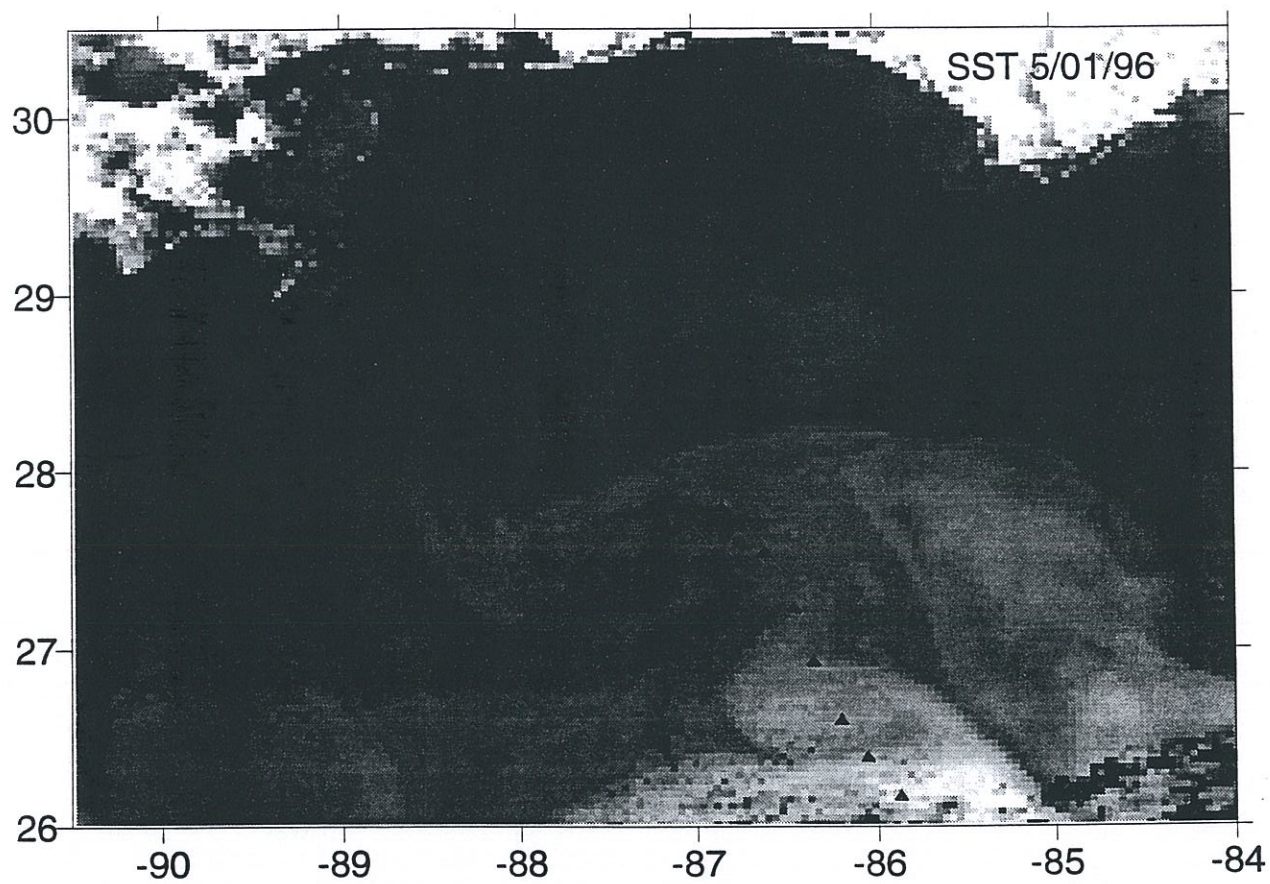


Figure 1. Station locations for CHAPMAN Cruise 96-02 (72), April 26 to May 5, 1996 overlaid on an AVHRR satellite image of sea surface temperatures (SST) from May 1, 1996.