



**UNITED STATES DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

National Marine Fisheries Service  
Southwest Fisheries Science Center  
8604 La Jolla Shores Drive  
La Jolla, CA 92037

September 10, 2009

F/SWC1:DAG

CRUISE REPORT

VESSEL: F/V *Frosti*, 0904-FR.

CRUISE DATES: April 15 - May 9, 2009

PROJECT: Sardine Biomass Survey, Fisheries Resources Division.

ITINERARY: The *Frosti* departed Port Angeles, Washington at approximately 1300 on April 10, 2009 with crew and a single SWFSC scientist. During the transit south, several tows were conducted to verify the integrity of the newly installed marine mammal excluder device. The excluder device was placed in mid-section of a Nordic 264 surface trawl just forward of the codend. The vessel arrived in San Francisco, California on April 14, 2009 to load the remaining gear and personnel. After loading gear and completing the installation, the *Frosti* departed San Francisco and began occupying the requested survey trackline (see appendix A). The vessel arrived in San Diego, California on May 8, 2009 after the successful completion of the survey.

- OBJECTIVES:
1. Collect fishery independent adult sardines for spawning biomass estimates.
  2. Map sardine egg distribution with CUFES (Continuous Underway Fish Egg Sampler) within the CalCOFI survey region.
  3. Collect oceanographic data over a fixed cruise track which covers the region 30°N to 37°N out to 125° W and inshore to 117° W.
  4. Collect acoustic data continuously throughout the survey using an EK-60 Simrad sounder.
  5. Conduct quantitative plankton tows using a Pairovet net for calibration of the CUFES and attempt to quantify the sardine spawning biomass using an EPM (Egg Production Method).
  6. Collect continuous underway temperature and conductivity measurements of surface waters. These measurements were collected using NOAA's SCS software which is also interfaced with the CUFES software.

- PROCEDURES:
1. Eighty four primary stations were plotted on the survey track with an approximate spacing of 20 - 40 nautical miles. At each station the following activities were performed:
    - a. Deployment of a Seabird CTD down to 200 meters, bottom depth permitting. The self-contained CTD collected depth, temperature, conductivity and oxygen data.
    - b. Standard Pairovet cast down to 70 meters depth deployed concurrently with the CUFES system.

c. A CalBOBL (CalCOFI Bongo) standard oblique plankton tow with 300 meters of wire out, depth permitting, using paired 505 µm mesh nets with 71 cm diameter openings. The technical requirements for this tow were: Descent wire rate of 50 meters per minute, held at terminal depth for 30 seconds and retrieved at a wire rate of 20 meters per minute. All tows with ascending wire angles lower than 38° or higher than 51° in the final 100 meters of wire were repeated. Additionally, a 45° wire angle was closely maintained during the ascent and descent of the net frame.

d. Standard meteorological data including SST, wind speed and direction, wave height and direction, cloud cover, relative humidity, air temperature and barometric pressure.

e. During all transits between stations continuous measurements were made of pelagic fish eggs (CUFES) and acoustic targets using the EK-60.

f. A 264 Nordic Rope Trawl with 3.0 meter<sup>2</sup> foam core doors was towed on the surface at night for a duration of thirty minutes. The 264 NRT was modified for surface trawling with Polyform floats attached to the head rope and trawl wings. The trawls have been modified with marine mammal excluder devices (MMED) to eliminate any possibility of catching marine mammals.

Although the probability was very low that the gear being lowered into the water on station will interact with any marine mammals, a marine mammal watch was initiated 30 minutes before arriving on station. If any marine mammals were detected in the area, operations were suspended and the station location moved.

RESULTS:

<u>Activity</u>	<u>Requested</u>	<u>Completed</u>	<u>Aborted</u>
Bongo tows	84	81	3
Paironet tows	136	136	0
CTD casts	84	84	0
Weather	136	136	0
Surface Temp.	136	136	0
Surface Trawls	59	59	0
EK-60 (hours)	520	520	0
CUFES samples	663	663	0

Trawl results:

<u>Species</u>	<u>Total weight (kg)</u>
Pacific sardine ( <i>Sardinops sagax</i> )	377.51
Northern anchovy ( <i>Engraulis mordax</i> )	6.01
Jack mackerel ( <i>Trachurus symmetricus</i> )	1115.7
Pacific mackerel ( <i>Scomber japonicus</i> )	38.35
Myctophidae	32.05
Squid	35.77

DISPOSITION OF DATA:

CalBOBL, Manta tow data sheets and formalin preserved samples - David Griffith, FRD (SWFSC).

EK-60 data files - David Demer, FRD (SWFSC).

Station activity logs, weather data and surface temperature data - David Griffith, FRD (SWFSC).

CTD data - David Griffith, FRD (SWFSC).

Underway data - David Griffith, FRD (SWFSC).

Alcohol preserved bongo samples - William Watson, FRD (SWFSC).

INCIDENTS &  
MALFUNCTIONS:

Mechanical problems were minimal over the course of this survey and only accounted for approximately 5 hours of lost time.

At the beginning of the survey, there were difficulties charging the CTD batteries. With repeated charging cycles, the batteries regained their charging capacity.

COMMENDATIONS:

The personnel of the *Frosti* should be recognized and commended for their dedication and professional manner, ensuring the completion of the cruise:

The deck crew for their ability to meet the needs of all types of gear with speed and expertise. Adapting to specific trawling requests and last minute schedule changes was greatly appreciated.

The bridge crew for their assistance with all sampling operations as well as assuring the safety and well-being of all personnel aboard. Efforts to complete stations in a timely manner and meet specific time schedules for projects contributed to the completion of all scheduled work.

The ship's cook for providing excellent meals and accommodations in all weather conditions.

PERSONNEL:

Dave Griffith, Cruise Leader	SWFSC
Bev Macewicz	SWFSC
Amy Hays	SWFSC
Noelle Bowlin	SWFSC
Ron Dotson	SWFSC
Dimitry Abramenkoff	SWFSC

SWFSC personnel authorized per diem at the rate of \$3.00 per day to be paid via the Imprest Fund at the termination of the cruise.

WATCH HOURS:

1200 - 0000	Charge to account #28LEF01-P15
0000 - 1200	
1800 - 0600	

Date: September 10, 2009

Prepared by: \_\_\_\_\_



David Griffith

Approved by: \_\_\_\_\_

Norman W. Bartoo, Ph.D.  
Acting Science & Research Director  
Southwest Region

