



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

May 29, 2003

F/SWC1:DAG

CRUISE REPORT

VESSEL: NOAA Vessel *David Starr Jordan*, 0304-JD, DS 03-03, (337).

CRUISE DATES: April 7 - 30, 2003.

PROJECT: Pelagic Biomass/CalCOFI, Fisheries Resources Division.

ITINERARY: Leg I: Departed San Diego, California at 1000 on April 7, 2003. Proceeded to first station 95.0/28.0 (position 32° 37.1'N/117° 12.2'W) and began the proposed pattern (see attached cruise track). On April 13, the ship exchanged scientific personnel in Port Hueneme. The *Jordan* had originally scheduled to take on fuel in Port Hueneme but due to a contract transition between fuel vendors, fuel was unavailable.

Leg II: The ship departed Port Hueneme after personnel were exchanged and returned to sampling operations. Once station 73.3/100 was reached, standard CalCOFI operations began on lines 73.3, 70.0, 66.7, 63.3 and 60.0. Upon completion of line 66.7, the ship pulled into Monterey Bay to exchange personnel at Moss Landing on April 21.

Leg III: The *Jordan* continued station operations after departing Monterey Bay up to line 60.0. It was necessary to pull into San Francisco on April 26 to take on fuel and fresh water. The vessel returned to San Diego, California on April 30, 2003.

- OBJECTIVES: 1. The National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG) have the responsibility of determining the status of the Pacific sardine (*Sardinops sagax*) population along the west coast of North America. During the 2003 sardine survey, data was collected to determine the biomass of the sardine population located between San Francisco as the northern boundary and San Diego as the southern boundary. These data will be analyzed using a daily egg production method (DEPM) to determine the spawning biomass. This method measures the abundance of newly spawned eggs and the rate at which mature females are producing eggs.
2. To conduct continuous underway sampling of surface waters. Temperature and salinity will be automatically logged by computer with the output from the GPS navigational unit.
 3. To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler in an attempt to estimate net transport in the northern region.
 4. To continue an ongoing assessment of pelagic fish stocks between La Jolla and San Francisco, California.
 5. To monitor environmental conditions within the CalCOFI survey area.
 6. To make continuous observations of sea birds and marine mammals.
 7. To record continuous acoustic targets obtained with the EK-500 scientific sounder.

PROCEDURES: 1. The *Jordan* conducted operations in conjunction with the Scripps Institution of Oceanography research vessel *Roger Revelle*. During the southern occupation of the pattern (roughly, San Diego to Point Conception), the *Jordan* occupied intermediate lines of the CalCOFI pattern while the *Revelle* conducted standard CalCOFI operations on the cardinal lines. During this survey, the *Jordan* conducted directed adaptive sampling of pelagic fish eggs using the following protocol: Water was continuously sampled using the CUFES (Continuous Underway Fish Egg Sampler) from a depth of three meters. Approximately 640 liters/minute is sent through a concentrator which filtered all material larger than 505 μm . The sieved material was collected and identified. All fish eggs were identified to lowest taxa, counted and entered into the data acquisition software.

Sampling intervals varied in length, depending on the number of fish eggs seen, from two to 30 minutes. If two consecutive samples had a concentration of Pacific sardine eggs equal to or greater than 1 egg per minute, the ship stopped to conduct a Pairovet tow. Pairovet tows continued at four mile intervals until a concentration of less than one egg per minute was observed in two consecutive samples. Thus, the offshore extent of each line was determined by the absence of sardine eggs. All Pairovet samples were taken concurrently with CUFES samples in addition to sampling continuously between Pairovet samples.

The Pairovet net was fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150 μm mesh nets. The technical requirements for Pairovet tows are: Descent rate of 70 meters per minute, a terminal depth time of 10 seconds and an ascent rate of 70 meters per minute. All tows with wire angles exceeding 15° during the ascent were repeated.

2. Once the *Jordan* completed the southern survey, up to line 75.0, full CalCOFI stations were occupied starting on line 73.3 out to station 100.0 and continued on lines 70.0, 66.7, 63.3 and 60.0 out to station 90.0. The intermediate lines in the northern region were surveyed using an adaptive approach similar to the southern region.
3. Each standard CalCOFI station included the following:
 - a. A CTD/Rosette consisting of 12 2-liter hydrographic bottles was lowered to 500 meters (depth permitting) to measure physical parameters and collect water at terminal depth, mixed layer and surface for calibration analysis of salinity, and all bottle depths for calibration of nutrient and chlorophyll concentrations.
 - b. 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 are: Descent wire rate of 50 meters per minute, a terminal depth time of 30 seconds and an ascent 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.
 - c. A Manta net (neuston) tow, using a 505 μm mesh net on a frame with a mouth area of 0.1333 m^2 .

- d. Weather observations.
- e. A Pairovet (vertical) plankton tow was taken using protocols as described previously.
- f. During transit between stations, a bird observer recorded location, number and species of various sea birds and marine mammals.
- g. After the completion of station 60.0/50.0, the ship headed offshore along line 60 and then traverse the terminal stations of the northern lines running the ADCP. In addition, a CTD cast down to 1000 meters was performed at each station on line 60.0. This transit measured the net transport of the northern region.

RESULTS:

<u>Activity</u>	<u>Requested</u>	<u>Completed</u>	<u>Aborted</u>
Bongo tows	34	28	6
Manta tows	34	28	6
Pairovet tows	166	164	2
CTD casts	50	36	14
Salinity	50	36	14
Nutrients	50	36	14
Chlorophyll	50	36	14
Weather	50	36	14
Surface Temp.	50	36	14
Secchi	11	11	0
ADCP (hours)	576	576	0
EK-500 (hours)	576	576	0
CUFES samples	872	872	0

In addition, 240 hours of bird observations were logged by Cornelia Oedekoven.

DISPOSITION
OF DATA:

CalBOBL, Manta and pairovet tow data sheets and formalin preserved samples - Richard Charter, FRD (SWFSC).

Station activity logs, weather data and surface temperature data - Richard Charter, FRD (SWFSC).

ADCP data - Paul Smith, FRD (SWFSC) and Teri Chereskin (SIO).

Water analysis data (temperatures, salinities, nutrients and chlorophylls) - Richard Charter, FRD (SWFSC) and Francisco Chavez (MBARI).

CTD data - Richard Charter, FRD (SWFSC).

Alcohol preserved bongo samples - Russ Vetter, FRD (SWFSC).

EK-500 data - David Demer, FRD (SWFSC).

INCIDENTS &
MALFUNCTIONS:

The ship's departure from MARFAC was delayed two hours due to mechanical problems.

Two of the three water making evaporators were non functional from early in the cruise. This caused water rationing and slight instability to the ship due to loss of ballast. It was necessary to pull into San Francisco to top off the water and fuel tanks.

At station 60/70, the conductive cable shorted out while the CTD

was at depth. The cable was repaired and the CTD was redeployed. Approximately 7 hours lost.

Midway through the pattern, the Navy rerouted the ship away from launch operations. Time lost approximately 10 hours

COMMENDATIONS:

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

The deck department for their ability to meet the needs of all types of gear with speed and expertise.

The bridge officers 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 engineering department for their performance and ability correcting major and minor malfunctions to allow the completion of the cruise with little or no loss of time.

The electronics specialist for his assistance with communications and correcting any electronic malfunctions for both the ship and scientific gear.

The stewards department for providing excellent meals and accommodations in all weather conditions.

PERSONNEL:

Leg I:

Dave Griffith, Cruise Leader	SWFSC
Elaine Acuña	SWFSC
Sherrri Charter	SWFSC
David Ambrose	SWFSC
Cornelia Oedekoven, bird observer	PRBO

Leg II:

Dave Griffith, Cruise Leader	SWFSC
Elaine Acuña	SWFSC
Dimitry Abramenkoff	SWFSC
Bill Watson	SWFSC
Noelle Bowlin	SWFSC
Cornelia Oedekoven, bird observer	PRBO
Anne Hess	MBARI
Jared Kibele	MBARI
Joseph Oyama, volunteer	

Leg III:

Dave Griffith, Cruise Leader	SWFSC
Elaine Acuña	SWFSC
Dimitry Abramenkoff	SWFSC
Bill Watson	SWFSC
Noelle Bowlin	SWFSC
Cornelia Oedekoven, bird observer	PRBO
Anne Hess	MBARI
Jared Kibele	MBARI

SWFSC personnel authorized per diem at the rate of \$2.00 per day to be paid via the Imprest Fund at the termination of the cruise.

WATCH HOURS:

1200 - 2359
0000 - 1159

Charge to account #8L4S0D05

Date: _____

Prepared by: _____
David Griffith

Approved by: _____
Michael F. Tillman Ph.D.
Science & Research Director
Southwest Region

