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 4, 2004 F/SWC1:DAG

CRUISE REPORT

VESSEL: NOAA Vessel *David Starr Jordan*, 0404-JD, DS 04-02, (342).

CRUISE DATES: April 12 - 25, 2004.

PROJECT: Pelagic Biomass/CalCOFI, Fisheries Resources Division.

ITINERARY: Departed San Diego, California at 1600 on April 12, 2004. Proceeded to first station 73.3/100.0 (position 31° 5.1'N/122° 39.7'W) and continued the occupation of the pattern started by the Scripps Institution of Oceanography research vessel *New Horizon*(see attached cruise track). The ship returned to San Diego on April 24, 2004.

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 2004 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 *New Horizon* and the charter vessel *F/V Frosti*. During the southern occupation of the pattern (roughly, San Diego to Point Conception), the *New Horizon* conducted standard CalCOFI operations from March 28 to April 10. During this survey, the *New Horizon* and *David Starr 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. The F/V Frosti staged out of San Francisco and begun collecting adult sardine data using a midwater trawl beginning on April 20 and ending April 29.

CUFES 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 *New Horizon* completed the southern survey up to line 76.7, the *Jordan* began occupying CalCOFI stations starting on line 73.3 station 100.0 and continued on lines 70.0, 66.7, 63.3 and 60.0 out to station 80.0.

3. Each standard CalCOFI station included the following:

   a. A CTD/Rosette consisting of 14 10-liter hydrographic bottles was lowered to 500 meters (depth permitting) to measure physical parameters and collect water for calibration analysis of salinity, nutrient and chlorophyll concentrations. On line 66.7, additional intermediate stations were occupied and all CTD casts on line 66.7 were to 1000 meters.

   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.

RESULTS:

Activity	Requested	Completed	Aborted

Bongo tows	34	25	9
Manta tows	34	25	9
Pairovet tows	84	83	1
CTD casts	38	28	10
Salinity	38	28	10
Nutrients	38	28	10
Chlorophyll	38	28	10
Weather	102	92	10
Surface Temp.	102	92	10
ADCP (hours)	312	312	0
EK-500 (hours)	312	312	0
CUFES samples	351	351	0

In addition, 130 hours of bird observations were logged by Cornelia Oedekoven.

DISPOSITION OF DATA:

CalBOBL, Manta, CUFES and pairovet 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:

Initially, the readout on the starboard winch was inoperable but was quickly repaired by the ship’s LET.

On or around station 70.60, the port side shaft seal fail causing the need to secure the port main engine. Ship’s speed dropped from 10 knots to 7.5 knots. Estimated time lost: 1.8 days.

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:

Dave Griffith, Cruise Leader	SWFSC
Amy Hays	SWFSC
Sue Manion	SWFSC
Noelle Bowlin	SWFSC
Marguerite Blum	MBARI
Moira Decima	MBARI
Cornelia Oedekoven, bird observer	PRBO

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.

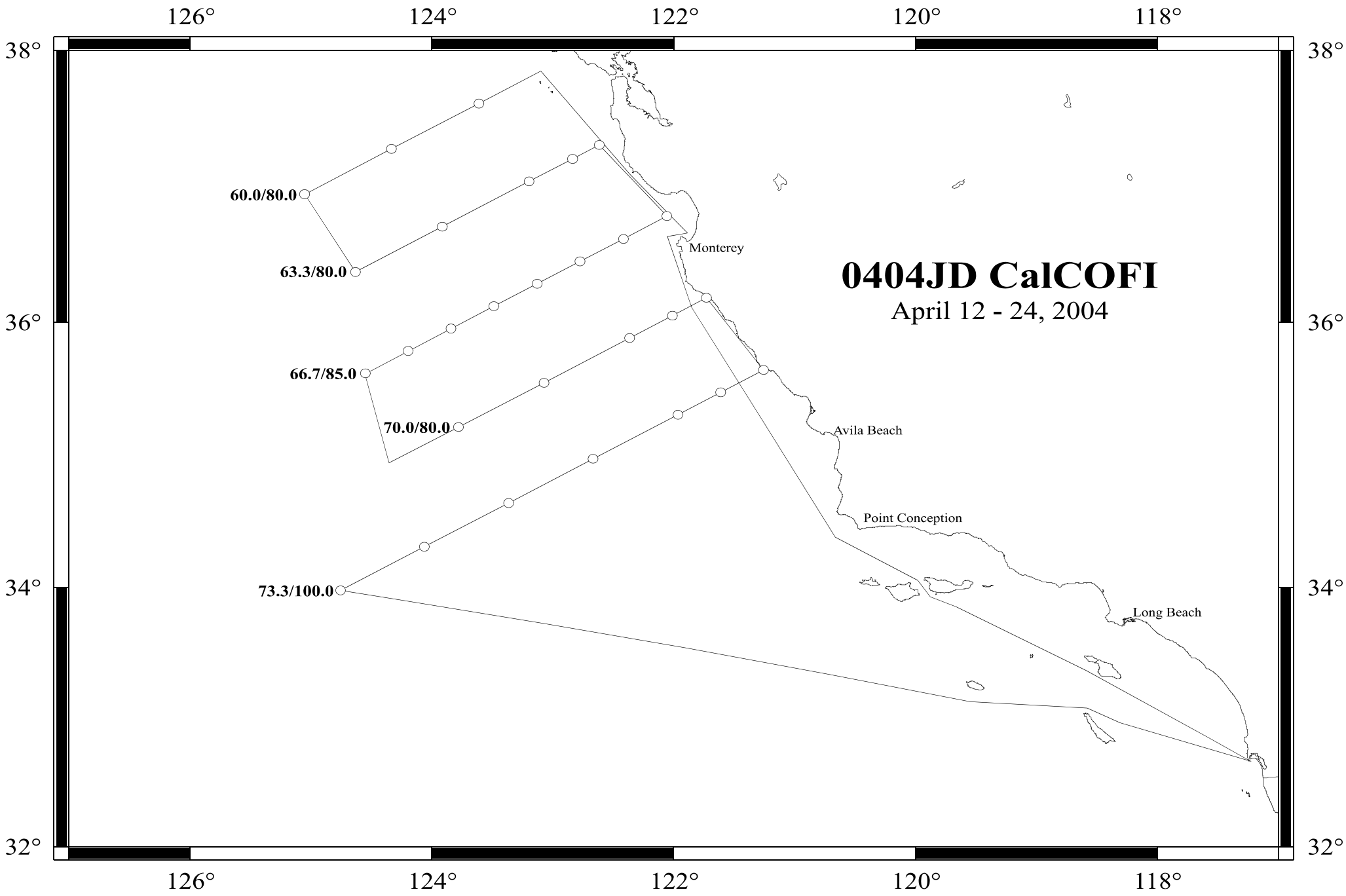
WATCH HOURS: 1200 - 2359
0000 - 1159

Charge to account #8L4S0D05

Date: _____

Prepared by: _____
David Griffith

Approved by: _____
William W. Fox, Jr. Ph.D.
Science & Research Director
Southwest Region


126°
124°
122°
120°
118°
38°
36°
34°
32°
60.0/80.0
63.3/80.0
66.7/85.0
70.0/80.0
73.3/100.0
Monterey
Avila Beach
Point Conception
Long Beach
0404JD CalCOFI
April 12 - 24, 2004