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

June 1, 2005 F/SWC1:DAG

CRUISE REPORT

VESSEL: NOAA Vessel *David Starr Jordan*, 0504-JD, DS 05-03.

CRUISE DATES: March 28 - April 26, 2005

PROJECT: Pelagic Biomass/CalCOFI, Fisheries Resources Division.

ITINERARY: Leg I: Departed San Diego, California at 1230 on March 28, 2005. Proceeded to first station 95.0/28.0 (position 32° 37.1'N/117° 12.2'W) and began the occupation of the southern section of the pattern to be later joined by the Scripps Institution of Oceanography research vessel *New Horizon* (see attached cruise track). At approximately 20:30 on March 28 it was discovered that the gyro was inoperable. The Jordan returned to port for repairs on March 29 around 18:30. Once repairs were completed, the ship got underway on March 31 at 18:00. Due to the loss of time, it was necessary to abandon the two most southern lines of the pattern. A personnel exchange was completed on April 6, 2005 in Avila Beach, California. The ship pulled into San Francisco on April 13 at the completion of leg I.

Leg II: Departed San Francisco at 10:30 on April 14 and headed to station 70.0/51.0 to complete the remaining stations prior to personnel drop offs in Monterey and Drakes Bay. Returned to San Diego at 14:00 on April 26.

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 2005 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 capture adult sardines for determination of spawning biomass as well as to collect data on adult reproductive parameters, age and genetic structure for the southern and central California coast.

PROCEDURES: 1. The *Jordan* conducted operations in conjunction with the Scripps Institution of Oceanography research vessel *New Horizon*. During the southern occupation of the pattern (roughly, San Diego to Point Conception), the *Jordan* conducted targeted mid-water trawls and directed adaptive sampling of pelagic fish eggs from March 31 to April 5 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. 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 *New Horizon* conducted standard CalCOFI operations and CUFES sampling from April 19 to May 1.

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. The *New Horizon* occupied the standard CalCOFI pattern from April 19 to May 1. Once the *Jordan* 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 100.0.

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 for 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.

4. A 264 Nordic Rope Trawl with 3.0 m^2 foam core doors was towed at opportunistic times 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.

RESULTS:

Activity	Requested	Completed	Aborted
Bongo tows	35	25	10
Manta tows	34	25	9
Pairovet tows	35	31	4
CTD casts	38	31	7
Salinity	38	31	7
Nutrients	38	31	7
Chlorophyll	38	31	7
Weather	55	49	6
Surface Temp.	62	56	6
ADCP (hours)	576	576	0
CUFES samples	562	562	0
Surface trawls	19	19	0

In addition, 288 hours of bird observations were logged by Cornelia Oedekoven.

DISPOSITION OF DATA:

CalBOBL, Manta 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 - Richard Charter, FRD (SWFSC).

CTD data - Richard Charter, FRD (SWFSC)and Tim Pennington (MBARI).

Water analysis data (temperatures, salinities, nutrients and chlorophylls) - Tim Pennington (MBARI).

Underway data - Richard Charter, FRD (SWFSC).

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

Trawl data and specimens - Beverly Macewicz, FRD (SWFSC).

INCIDENTS & MALFUNCTIONS:

On the second day out, the Yokogowa gyro became erratic and eventually non-functional. The ship returned to MARFAC for repairs. Estimated time lost 2½ days.

Continuous poor weather throughout the cruise slowed progress and made it necessary to seek shelter on two occasions which cost the survey approximately 3½ 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. Adapting to specific trawling requests and last minute schedule changes was greatly

appreciated.

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. Unfortunately, in this case, the majority of the weather conditions were bad.

PERSONNEL:

Leg I:

Dave Griffith, Cruise Leader	SWFSC
Ron Dotson	SWFSC
Sherri Charter†	SWFSC
Dimitry Abramenkoff	SWFSC
Beverly Macewicz	SWFSC
Marguerite Blum‡	MBARI
Asila Ghoul‡	MBARI
Rafael Gonzalez-Quiros	SIO
Motomitsu Takahashi	SIO
Cornelia Oedekoven, bird observer	PRBO

Leg II:

Dave Griffith, Cruise Leader	SWFSC
Ron Dotson	SWFSC
Dimitry Abramenkoff	SWFSC
Beverly Macewicz	SWFSC
Marguerite Blum	MBARI
Ann Vassilieva	MBARI
Motomitsu Takahashi	SIO
Cornelia Oedekoven, bird observer*	PRBO

†Disembarked in Avila Beach, California
‡Embarked in Avila Beach, California
*Disembarked in Drakes Bay, California

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.

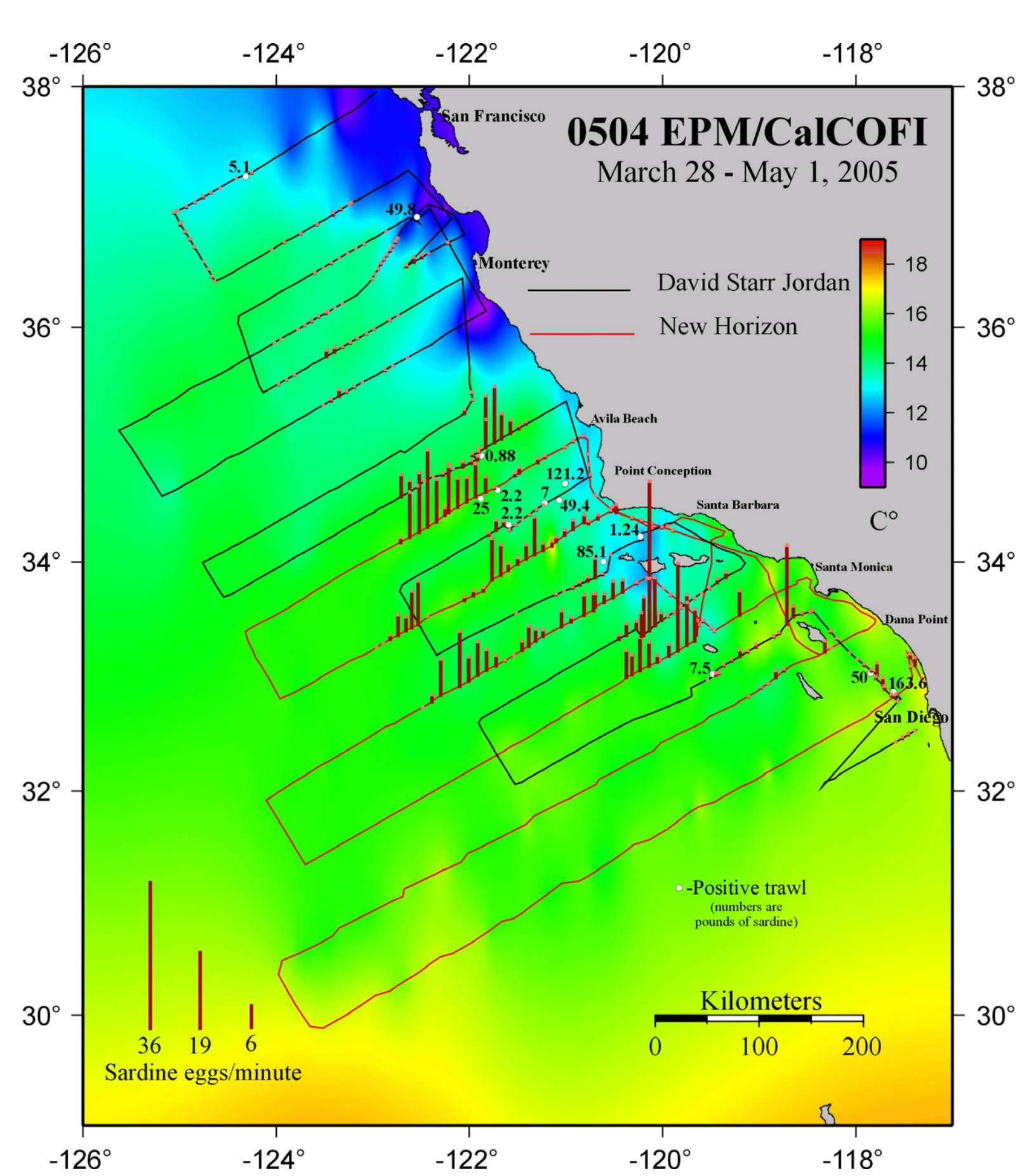
WATCH HOURS: 1200 - 2359
0000 - 1159

Charge to account #28LAF01 P-15

Date: _____

Prepared by: _____
David Griffith

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


0504 EPM/CalCOFI
March 28 - May 1, 2005
David Starr Jordan
New Horizon
C°
18
16
14
12
10
San Francisco
Monterey
Avila Beach
Point Conception
Santa Barbara
Santa Monica
Dana Point
San Diego
5.1
49.8
0.88
121.2
2.2
7
25
2.2
49.4
1.24
85.1
7.5
50
163.6
-126°
-124°
-122°
-120°
-118°
38°
36°
34°
32°
30°
-Positive trawl
(numbers are
pounds of sardine)
Kilometers
0
100
200
36
19
6
Sardine eggs/minute