



**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 11, 2006 F/SWC1:AEH

CRUISE REPORT

VESSEL: NOAA Vessel *David Starr Jordan*, 0602-JD, DS 06-01.

CRUISE DATES: Feb. 3- Feb. 27, 2006.

PROJECT: CalCOFI Survey, Fisheries Resources Division.

ITINERARY: Leg I: The *David Starr Jordan* departed for the first station 93.3/26.7 (position 32° 57.4'N/117° 18.3'W) on Feb. 3, 2006, at 0900 PST. Sailing was delayed by two days due to generator problems and an engine oil leak. Once getting underway, the ship fueled at the Navy Fuel Pier. We arrived on the first CalCOFI station at 1624 PST. A personnel exchange was made at Dana Point on Feb. 10, 2006.

Leg II: After exchanging personnel at Dana Point, the ship continued to occupy the proposed pattern. A personnel exchange was made at Ventura on Feb. 15, 2006 after finishing line 83.3. Line 80.0 and most of line 76.7 were completed prior to refueling and exchanging personnel at Port Hueneme on Feb. 19, 2006.

Leg III: The ship left Port Hueneme at 1600 PST. Stations 76.7 55.0, 51.0 and 49.0 were occupied prior to heading up to line 73.3. A personnel transfer was made at Monterey on Feb. 22, 2006.

Leg IV: The ship continued to occupy the remaining cruise pattern up through line 60.0 and returned to San Diego on Feb. 27, 2006.

- OBJECTIVES:
1. To continue an ongoing assessment of pelagic fish stocks between San Francisco and La Jolla, California.
  2. To monitor environmental conditions within the CalCOFI survey area.
  3. To conduct a continuous underway sampling of surface waters using the ship's SCS (scientific computing system). Temperature, salinity and chlorophyll will be automatically logged with the output from the GPS navigational unit.
  4. To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler (ADCP)
  5. To make continuous observations of sea birds and marine mammals.

PROCEDURES: 1. Each standard CalCOFI station included the following:

- a. A CTD/Rosette consisting of 20 10-liter hydrographic bottles was lowered to 500 meters (depth permitting) to measure physical parameters and collect



water at discrete depths. Sea water from each hydrographic bottle was analyzed for chlorophyll from 200 meters and above, oxygen, salinity and nutrients from all depths. Continuous profiling during the cast was obtained for oxygen, temperature, nitrate, conductivity, light transmittance and fluorometry.

b. An LOPC/CalBOBL (CalCOFI Bongo with a laser optical particle counter installed) standard oblique plankton tow with 300 meters of wire out, depth permitting, used paired 505  $\mu\text{m}$  mesh nets with 71 cm diameter openings. The technical requirements for this tow were: Descent rate of 50 meters per minute, ascent rate of 20 meters per minute. All tows with ascending wire angles lower than  $38^\circ$  or higher than  $51^\circ$  in the final 100 meters of wire were repeated. Additionally, a  $45^\circ$  wire angle was closely maintained during the ascent and descent of the net frame. Contents of the starboard side net were preserved in buffered formalin for later identification. The port side net contents were preserved in buffered ethanol for later identification of ichthyoplankton and DNA studies.

c. A Manta net (surface) tow, using a 505  $\mu\text{m}$  mesh net on a frame with a mouth area of  $0.1333 \text{ m}^2$ . The duration of each tow was 15 minutes at approximately  $1\frac{1}{2}$  knots.

d. Weather observations.

e. A Pairovet (vertical) plankton tow was taken at all stations inshore of and including station 70. The Pairovet net was fished from 70 meters (depth permitting) to the surface using a 25 cm diameter 150  $\mu\text{m}$  mesh net. The technical requirements for Pairovet tows are: Descent rate of 70 meters per minute, ascent rate of 70 meters per minute. All tows with wire angles exceeding  $15^\circ$  during the ascent were repeated.

f. At about 1100 hours on each day of the cruise a primary productivity CTD cast consisting of six 10-liter hydrographic bottles was carried out in conjunction with the normal 500 meter CTD cast. The cast arrangement of sample bottles used for productivity measurements was determined by a Secchi disc observation and the chlorophyll maximum layer and mixed layer depth measured during the CTD cast. The purpose of the cast was to collect water from 6 discrete depths for daily *in situ* productivity experiments. Measurements of extracted chlorophyll and phaeophytin were obtained with a fluorometer. Primary production was measured as  $\text{C}^{14}$  uptake in a 6 hour *in situ* incubation. Nutrients were measured with an auto-analyzer. All radioisotope work areas were given a wipe test before the departure of the SIO technical staff.

g. At approximately one mile prior to daylight stations, a sonabuoy was deployed to record frequency soundings from marine mammals in the area.

h. An acoustical array with four hydrophones was towed during transit to all daylight stations. This instrument was used to monitor marine mammal soundings in the area.

i. LTER (Long Term Ecological Reserves) research was carried out by SIO/LTER technicians and graduate student. This work originally started on the 0501NH CalCOFI Cruise. It is funded through 2010. The work includes a PRPOOS (Planktonic Rate Processes in Oligotrophic Ocean Systems) vertical net tow with a 202  $\mu\text{m}$  mesh. It was deployed entirely on lines 90.0 and 80.0, and lines 86.7 and 83.3, station 70.0 and inshore thereof. This is a

vertical tow down to 210 meters, depth permitting.

j. Water was continuously sampled using the CUFES (Continuous Underway Fish Egg Sampler) from a depth of three meters. Approximately 640 liters/minute was sent through a concentrator which filtered all material larger than 505  $\mu\text{m}$ . 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 ten to thirty minutes.

RESULTS:

<u>Activity</u>	<u>Requested</u>	<u>Completed</u>	<u>Aborted</u>
LOPC/Bongo Tows	99	93	6
Manta	90	86	4
Paironet	61	58	3
PRPOOS	35	30	5
CTD	101	96	5
Salinity	101	96	5
Oxygen	75	73	2
Nutrients	101	96	5
Chlorophyll	101	96	5
Weather	101	96	5
Surface Temp.	101	96	5
Secchi	25	25	0
Phytoplankton	66	65	1
Primary Prod.	20	18	2
HPLC	101	96	5
CUFES Samples	655	655	0
Sonabuoy	47	47	0
SCS (hours)	585	585	0
ADCP (hours)	575	440	135
TSG (hours)	585	585	0

In addition, approximately 200 hours of bird and mammal observations were logged by Jim Teitz (PRBO), Greg Campbell (SIO), Stephen Claussen (Cascadia Research) and Dominique Camacho (Cascadia Research). Additional mammal observations using big eye binoculars and traditional mammal line transect procedures were funded by John Hildebrand (SIO). The CalCOFI program anticipates these observations on future cruises.

DISPOSITION  
OF DATA:

CalBOBL, Manta and Paironet 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 - Teri Chereskin (SIO).

Water analysis data (temperatures, salinities, oxygens, nutrients and chlorophylls) - Arnold Mantyla, IOD (SIO).

Phytoplankton samples - Elizabeth Venrick, IOD (SIO).

CTD, primary productivity data, HPLC data - Ralf Goericke, IOD (SIO).

Alcohol preserved CalBOBL samples - Russ Vetter, William Watson FRD (SWFSC).

LOPC data - David Checkley, IOD (SIO).

PRPOOS tow data sheets and formalin preserved samples - Mark Ohman, IOD (SIO).

Bird and mammal observations - Bill Sydeman (PRBO).

Line transect mammal observations, sonabuoy and acoustic towed array data - John Hildebrand (SIO).

CUFES data - Richard Charter, FRD (SWFSC).

INCIDENTS &  
MALFUNCTIONS:

The first station, which is typically occupied 3 hours from the start of the cruise, was delayed approximately 6 hours due to fueling.

The cruise was scheduled to leave on Feb. 1, 2006, but was delayed until Feb. 3, 2006 because of generator problems and an oil leak in one engine. The lost time was added at the end of the cruise, extending it by a day.

The level wind on the starboard winch broke on the second station. A few hours were lost due to repair. LOPC Bongos were suspended for five stations while awaiting repairs to the level wind. The standard Bongo was deployed in its' place. The level wind was again operational on station 93.3 35.0. Slight adjustments to the level wind on station 93.3 100.0 caused a repeat of the Bongo tow and a one hour delay.

The ADCP was down off and on for approximately six days.

The towed hydrophone array was damaged on Feb. 24, 2006 during an impromptu man-overboard drill. The ship tried to maneuver a "Williamson" turn with the hydrophone still in the water. The hydrophone incurred sufficient enough damage to render it useless for the duration of the cruise.

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. Special thanks to Joao Alves for lending his knot tying expertise to Greg Campbell and the acoustical array team.

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 scheduled work. Thank you for allowing extra station work in very shallow waters!

The engineering department for their performance and ability correcting major and minor malfunctions to allow the completion of the cruise.

The electronics specialist, Jim Anthony, for his assistance with communications and correcting any electronic malfunctions for both the ship and scientific gear. Jim also helped in the troubleshooting and repair of an electronics problem with the

acoustical array.

The stewards department for providing excellent meals and accommodations in all weather conditions, excellent job Lito and Mike!

In addition, the scientific staff personnel of SWFSC, SIO, PRBO and Cascadia Research should be commended on their ability to continuously collect high quality data throughout the duration of the cruise.

Personnel:	Amy Hays, Cruise Leader	SWFSC
	Dimitry Abramenkoff †,●	SWFSC
	Ronald Dotson †††	SWFSC
	Sue Manion ††,●●	SWFSC
	Noelle Bowlin	SWFSC
	Jim Wilkinson, IOD technical coordinator ¶	SIO
	Fernando Ramirez	SIO
	Dave Wolgast ¶	SIO
	Jennifer Sheldon ¶	SIO
	Zac Chsieh, graduate student ¶	SIO
	Teresa Kacena, ODF chemist ¶	SIO
	Shonna Dovel ¶	SIO
	Craig Murdoch ¶	SIO
	Greg Campbell	SIO
	Stephen Claussen, mammal observer ●●	CR
	Dominique Camacho, mammal observer ¥	CR
	Jim Teitz, bird observer ●●	PRBO
	Marguerite Blum ¥	MBARI
	Asila Ghoul ¶¶	MBARI

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.

- † Disembarked in Dana Point, CA
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- ††† Disembarked in Ventura, CA
- Embarked in Ventura, CA
- Disembarked in Port Hueneme, CA
- ¥ Embarked in Port Hueneme, CA
- ¶ Disembarked in Monterey, CA
- ¶¶ Embarked in Monterey

WATCH HOURS: 1200 - 2359 Charge to account #28LEF01-P15  
 0000 - 1159

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

Amy Hays

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

William W. Fox, Jr., Ph.D.  
 Science & Research Director  
 Southwest Region

