



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

March 27, 2003

F/SWC1:DAG

CRUISE ANNOUNCEMENT

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: Depart San Diego, California at 0800 on April 7, 2003. Proceed to first station 95.0/28.0 (position 32° 37.1'N/117° 12.2'W) and begin the proposed pattern (see attached cruise track). To complete the proposed cruise track, it will be necessary to maintain maximum speed between stations whenever possible. On or around April 13, the ship will exchange scientific personnel and take on fuel in Port Hueneme.

Leg II: The ship will depart Port Hueneme after fueling operations are complete and return to sampling operations. Once station 73.3/100 is reached, standard CalCOFI operations will begin on lines 73.3, 70.0, 66.7, 63.3 and 60.0. After completing line 66.7, the ship will pull into Monterey to exchange personnel on or around April 26.

Leg III: The *Jordan* will continue operations until the proposed pattern is completed. The vessel will return 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 will be 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* will conduct 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* will occupy intermediate lines of the CalCOFI pattern while the *Revelle* conducts standard CalCOFI operations on the cardinal lines (see attached diagram). During this survey, the *Jordan* will conduct directed adaptive sampling of pelagic fish eggs using the following protocol: Water will be 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 filters all material larger than 505  $\mu\text{m}$ . The sieved material is then collected and identified. All fish eggs are identified to lowest taxa, counted and entered into the data acquisition software.

Sampling intervals will vary in length, depending on the number of fish eggs seen, from five to 30 minutes. If two consecutive samples have a concentration of Pacific sardine eggs equal to or greater than 1 egg per minute, the ship will stop to conduct a Pairovet tow. Pairovet tows will continue at four mile intervals until a concentration of less than one egg per minute is observed in two consecutive samples. Thus, the offshore extent of each line will be determined by the absence of sardine eggs. All Pairovet samples will be taken concurrently with CUFES samples in addition to sampling continuously between Pairovet samples. The four mile interval may be adjusted if SST's from satellite images suggests a potentially large spawning habitat.

2. The Pairovet net will be fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150  $\mu\text{m}$  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 will be repeated.
3. Once the *Jordan* has completed the southern survey, up to line 75.0, full CalCOFI stations will be occupied starting on line 73.3 and will continue on lines 70.0, 66.7, 63.3 and 60.0 out to station 100. The intermediate lines in the northern region will be surveyed using an adaptive approach similar to the southern region.
4. Each standard CalCOFI station will include the following:
  - a. A CTD/Rosette consisting of 3 2-liter hydrographic bottles will be lowered to 500 meters (depth permitting) to measure physical parameters and collect water at depth, mixed layer and surface for calibration analysis of oxygen, salinity, and chlorophyll concentrations.
  - b. A CalBOBL (CalCOFI Bongo) standard oblique plankton tow with 300 meters of wire out, depth permitting, using paired 505  $\mu\text{m}$  mesh nets with 71 cm diameter openings. The technical requirements for this tow are: Descent rate of 50 meters per minute. All tows with ascending wire angles lower than 38° or higher than 51° in the final 100 meters of wire will be repeated. Additionally, a 45° wire angle should be closely maintained during the ascent and descent of the net

frame.

- c. A Manta net (neuston) tow, using a 505  $\mu\text{m}$  mesh net on a frame with a mouth area of 0.1333  $\text{m}^2$ .
- d. Weather observations.
- e. A Pairovet (vertical) plankton tow will be taken using protocols as described previously.
- f. During transit between stations, a bird observer will be recording location and species of various sea birds and marine mammals
- g. After the completion of station 60.0/50.0, the ship will head offshore along line 60 and then traverse the terminal stations of the northern lines and return shoreward along line 76.7 continuously running the ADCP. In addition, a CTD cast down to 1000 meters will be performed at each terminal station of the cardinal CalCOFI lines. This transit will measure the net transport of the northern region.

EQUIPMENT: 1.

Supplied by scientific party:

- -80°C Freezer (SWFSC)
- 37% Formalin (SWFSC)
- Ethanol (SWFSC)
- Tris buffer (SWFSC)
- Sodium borate (SWFSC)
- 30 cc and 50 cc syringes (SWFSC)
- Canulas (SWFSC)
- Pint, quart and gallon jars (SWFSC)
- Scintillation vials (SWFSC)
- Inside and outside labels (SWFSC)
- CalCOFI net tow data sheets (SWFSC)
- 71 cm CalCOFI Bongo frames (SWFSC)
- 71 cm CalCOFI 505  $\mu\text{m}$  mesh nets (SWFSC)
- CalCOFI 150  $\mu\text{m}$  Calvet nets and codends (SWFSC)
- CalCOFI Pairovet frames (SWFSC)
- 333  $\mu\text{m}$  mesh codends (SWFSC)
- Inclinator for bongo tows (SWFSC)
- Digital flowmeters (SWFSC)
- 75 lb Bongo weight (SWFSC)
- 100 lb hydro weights (SWFSC)
- CalCOFI Manta net frames (SWFSC)
- 60 cm CalCOFI 505  $\mu\text{m}$  mesh Manta nets (SWFSC)
- Standard CalCOFI tool boxes (SWFSC)
- Bucket thermometers and holders (SWFSC)
- Hand held inclinometer (SWFSC)
- Oxygen titration rig with reagents (ODF)
- Oxygen flasks (ODF)
- Guideline Portasal (ODF)
- Salinity bottles (ODF)
- Standard sea water (SWFSC)
- Data sheets for scheduled hydrographic work (SIO)
- Weather observation sheets (SIO)
- CTD and rosette (SWFSC)
- 2 liter hydrographic bottles (SWFSC)
- CUFES (SWFSC)
- CUFES data acquisition software (SWFSC)
- CUFES data acquisition notebook computer (SWFSC)

2. Supplied by *David Starr Jordan*:

- Starboard hydro winch with  $\frac{1}{4}$ " cable for standard Bongo,

- Pairovet and Manta tows
- Port winch with .322" conductive cable
- Guideline Autosal
- Constant temperature room set at 22°C ±1°C (71.5°F ±2°F)
- Winch monitoring system
- Seabird thermosalinometer
- Knudsen bottom sounder
- EK-500 Scientific sounder
- Raytheon 12 kHz depth recorder
- Acoustic Doppler Current Profiler w/writeable CD drive
- Serial cable from SCS for egg pump data acquisition computer located in port specimen lab

MISCELLANEOUS:

1. The disposal of fish caught will be in accordance with NOAA Administrative order 202-735B dated January 25, 1989.
2. At the completion of the cruise an inspection will be made of scientific working and berthing spaces by the Commanding Officer or his designated representative. The Scientific party is responsible for the condition and cleanliness of spaces assigned to the scientific party.
3. The Cruise Leader will hold a pre-cruise meeting aboard the vessel before departure.
4. The Cruise Leader will hold a post-cruise meeting upon termination of the cruise.
5. NOAA Fleet Medical Policy requires that all scientific personnel embarking on NOAA vessels complete an SF-93 form, Report of Medical History.
6. All dates and times recorded will be in Pacific Standard Time.

PERSONNEL:

Leg I:

Dave Griffith, Cruise Leader	SWFSC
Elaine Acuña	SWFSC
Sherri 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 Kibebe	MBARI
Joseph Oyama, volunteer	

Leg III:

Dave Griffith, Cruise Leader	SWFSC
Elaine Acuña	SWFSC
Dimitry Abramenkoff	SWFSC
Adam Jenkins	SWFSC
Noelle Bowlin	SWFSC
Val Growney	SWFSC
Cornelia Oedekoven, bird observer	PRBO
Anne Hess	MBARI
Jared Kibebe	MBARI



