



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

April 10, 2009

F/SWC1:DAG

CRUISE ANNOUNCEMENT

VESSEL: F/V *Frosti*, 0904-FR.

CRUISE DATES: April 15 - May 9, 2009.

PROJECT: Sardine Biomass Survey, Fisheries Resources Division.

ITINERARY: Depart Port Angeles, Washington at approximately 1300 on April 10, 2009. Proceed to San Francisco Bay after loading trawl gear and a SWFSC fishery biologist. During the transit south, several tows will be conducted to verify the integrity of the newly installed marine mammal excluder devices. The vessel will arrive in San Francisco, California on April 15, 2009 to load remaining gear and personnel. After loading and gear installation, the *Frosti* will depart San Francisco and begin occupying the requested stations (see appendix A). The vessel will arrive in San Diego, California on May 9, 2009.

OBJECTIVES: 1. Collect fishery independent adult sardines for spawning biomass estimates.

2. Map sardine egg distribution with CUFES (Continuous Underway Fish Egg Sampler) off of Oregon and Washington.

3. Collect oceanographic data over a fixed cruise track which covers the region 30°N to 37°N out to 125° W and inshore to 117° W.

4. Collect acoustic data continuously throughout the survey using an EK-60 Simrad sounder.

5. Conduct quantitative plankton tows using a Pairovet net for calibration of the CUFES and attempt to quantify the sardine spawning biomass using an EPM (Egg Production Method).

6. Collect continuous underway temperature and conductivity measurements of surface waters. These measurements will be collected using NOAA's SCS software which is also interfaced with the CUFES software.

PROCEDURES: 1. Eighty four primary stations have been plotted on the survey track with an approximate spacing of 20 - 40 nautical miles (please refer to attached diagram). At each station the following activities will be performed:

a. Deployment of a Seabird CTD down to 200 meters, bottom depth permitting. The self-contained CTD will collect depth, temperature, conductivity and oxygen data.

b. Standard Pairovet cast down to 70 meters depth deployed concurrently with the CUFES system.

c. A CalBOBL (CalCOFI Bongo) standard oblique plankton tow with 300 meters of wire out, depth permitting, using paired 505 μ m mesh nets with 71 cm diameter openings. The technical requirements for this tow are: Descent

wire rate of 50 meters per minute, held at terminal depth for 30 seconds and retrieved at a 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 will be repeated. Additionally, a 45° wire angle should be closely maintained during the ascent and descent of the net frame.

d. Standard meteorological data including SST, wind speed and direction, wave height and direction, cloud cover, relative humidity, air temperature and barometric pressure.

e. During all transit between stations continuous measurements will be made of pelagic fish eggs (CUFES) and acoustic targets using the EK-60.

f. A 264 Nordic Rope Trawl with 3.0 meter² foam core doors will be towed on the surface at night for a duration of thirty minutes. The 264 NRT will be modified for surface trawling with Polyform floats attached to the head rope and trawl wings. The trawls have been modified with marine mammal excluder devices (MMED) to eliminate any possibility of catching marine mammals.

EQUIPMENT: 1.

Supplied by scientific party:

- 37% Formalin (SWFSC)
- Sodium borate (SWFSC)
- 30 cc and 50 cc syringes (SWFSC)
- Canulas (SWFSC)
- Pint, 8 oz and 4 oz jars (SWFSC)
- Inside and outside labels (SWFSC)
- CalCOFI net tow data sheets (SWFSC)
- CalCOFI 150 µm Calvet nets and codends (SWFSC)
- CalCOFI Pairovet frames (SWFSC)
- 71 cm diameter CalCOFI bongo frames (SWFSC)
- 71 cm diameter CalCOFI bongo 505 µm nets (SWFSC)
- 333 µm mesh codends (SWFSC)
- Digital flowmeters (SWFSC)
- Standard CalCOFI tool boxes (SWFSC)
- Bucket thermometers and holders (SWFSC)
- Hand held inclinometer (SWFSC)
- Weather observation sheets (SWFSC)
- Motion compensated balance (SWFSC)
- Seabird CTD (SWFSC)
- CUFES system (SWFSC)
- Midwater trawls (SWFSC)
- Trawl doors (SWFSC)
- Underway monitoring system (SWFSC)
- Simrad 38 kHz GPT (SWFSC)

2. Supplied by *F/V Frosti*:

- Winch monitoring system
- 38 kHz split-beam transducer
- Port and starboard side trawl winches
- Winch for Pairovet and CalBOBL tows

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 captain 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. All dates and times recorded will be in Pacific Standard Time.

PERSONNEL:	Dave Griffith, Cruise Leader	SWFSC
	Bev Macewicz	SWFSC
	Amy Hays	SWFSC
	Noelle Bowlin	SWFSC
	Ron Dotson	SWFSC
	Dimitry Abramenkoff	SWFSC

NOAA 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.

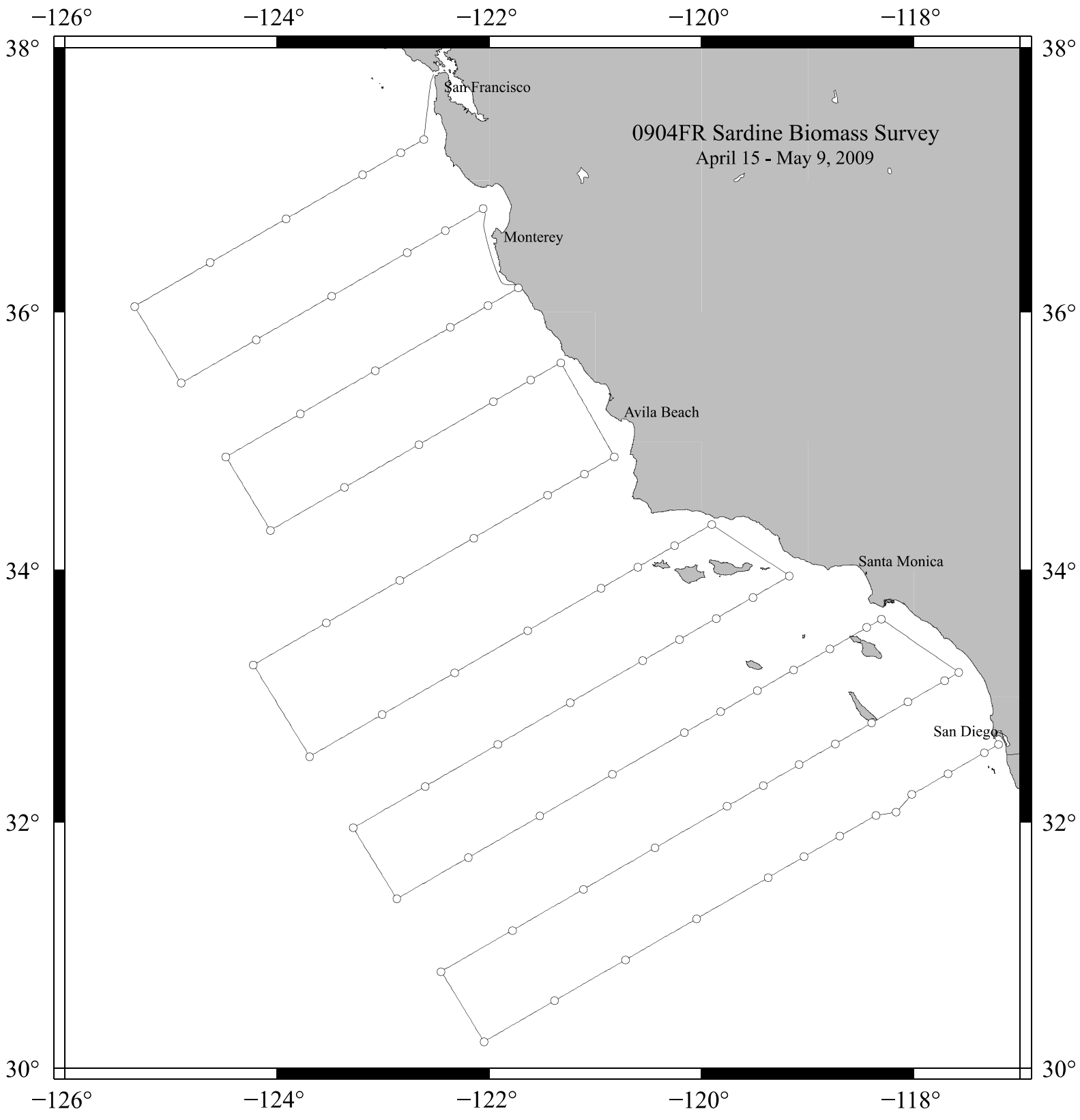
WATCH HOURS: 1200-0000 Charge to account #28LEF01-P1A
 1800-0600
 0000-1200

OVERTIME: 156 hours (Authorized total per NMFS personnel)
NIGHT DIFF: 156 hours (Authorized total per NMFS personnel)

Date: _____

Prepared by: David Griffith
 David Griffith

Approved by: _____
 Norm W. Bartoo, Ph.D
 Acting Science & Research
 Director, Southwest Region



Appendix A: Station positions

Schedule Line Order	Station	Dlatitude	Dlongitude	
1	61.5	48	37.75429	122.5498
				Way point in SF bay - not a station
2	63.3	52	37.30919	122.6178
3	63.3	55	37.20919	122.8345
4	63.3	60	37.04252	123.195
5	63.3	70	36.70919	123.9136
6	63.3	80	36.37586	124.6291
7	63.3	90	36.04252	125.3415
8	66.7	90	35.45363	124.9028
9	66.7	85	35.62029	124.5496
10	66.7	80	35.78696	124.1957
11	66.7	75	35.95363	123.8411
12	66.7	70	36.12029	123.4856
13	66.7	65	36.28696	123.1295
14	66.7	60	36.45363	122.7725
15	66.7	55	36.62029	122.4148
16	66.7	50	36.78696	122.0563
17	70	51	36.18205	121.7259
18	70	55	36.04872	122.0105
19	70	60	35.88205	122.3656
20	70	70	35.54872	123.0735
21	70	80	35.21538	123.7784
22	70	90	34.88205	124.4805
23	73.3	90	34.31047	124.0615
24	73.3	80	34.64381	123.3644
25	73.3	70	34.97714	122.6644
26	73.3	60	35.31047	121.9615
27	73.3	55	35.47714	121.609
28	73.3	51	35.61047	121.3265
29	77.5	51	34.88301	120.8221
30	77.5	55	34.74968	121.1021
31	77.5	60	34.58301	121.4515
32	77.5	70	34.24968	122.1481
33	77.5	80	33.91635	122.842
34	77.5	90	33.58301	123.5331
35	77.5	100	33.24968	124.2215
36	81.7	100	32.52222	123.6925
37	81.7	90	32.85555	123.0098
38	81.7	80	33.18888	122.3245
39	81.7	70	33.52222	121.6365
40	81.7	60	33.85555	120.9459
41	81.7	55	34.02222	120.5996
42	81.7	50	34.18888	120.2525
43	81.7	45	34.35555	119.9048
44	85	40	33.95064	119.1716
45	85	45	33.78397	119.5176
46	85	50	33.61731	119.863
47	85	55	33.45064	120.2077
48	85	60	33.28397	120.5517
49	85	70	32.95064	121.2377
50	85	80	32.61731	121.9212
51	85	90	32.28397	122.6021

52	85	100	31.95064	123.2805	
53	88.3	100	31.37906	122.8715	
54	88.3	90	31.7124	122.1974	
55	88.3	80	32.04573	121.5208	
56	88.3	70	32.37906	120.8417	
57	88.3	60	32.7124	120.1601	
58	88.3	55	32.87906	119.8183	
59	88.3	50	33.04573	119.4759	
60	88.3	45	33.2124	119.1328	
61	88.3	40	33.37906	118.7891	
62	88.3	35	33.54573	118.4447	
63	88.3	33	33.6124	118.3067	
64	91.7	28	33.19017	117.5753	
65	91.7	30	33.1235	117.7126	
66	91.7	35	32.95683	118.0553	
67	91.7	40	32.79017	118.3974	
68	91.7	45	32.6235	118.7388	
69	91.7	50	32.45683	119.0796	
70	91.7	55	32.29017	119.4197	
71	91.7	60	32.1235	119.7593	
72	91.7	70	31.79017	120.4364	
73	91.7	80	31.45683	121.1111	
74	91.7	90	31.1235	121.7834	
75	91.7	100	30.79017	122.4533	
76	95	100	30.21859	122.0504	
77	95	90	30.55192	121.3845	
78	95	80	30.88526	120.7163	
79	95	70	31.21859	120.0457	
80	95	60	31.55192	119.3727	
81	95	55	31.71859	119.0353	
82	95	50	31.88526	118.6973	
83	95	45	32.05192	118.3587	
84	95.3	42.7	32.07663	118.1684	9 Mile Bank
85	95	40	32.21859	118.0194	
86	95	35	32.38526	117.6796	
87	95	30	32.55192	117.339	
88	95	28	32.61859	117.2027	
89	94.72297	27.9872	32.667	117.233	Way point in SD bay - not a station