

CalCOFI 15110C CRUISE ANNOUNCEMENT

VESSEL: R/V *Oceanus* (OSU) Cruise OC1511a.

CRUISE DATES: Oct 25 - Nov 13, 2015.

PROJECT: CalCOFI 15110C Survey, Fisheries Resources Division.

ITINERARY: Depart Newport Oregon at 0800 on Oct 25, 2015. Proceed to first CalCOFI station 93.3/26.7 (position 32° 57.4'N/117° 18.3'W) and begin a standard CalCOFI pattern (see attached cruise track and station position table). The vessel will return to San Diego, California on Nov 13, 2015.

I. OBJECTIVES:

- To monitor environmental conditions within the CalCOFI survey area.
- To conduct continuous underway sampling of surface waters. Temperature, salinity and chlorophyll will be automatically logged by computer with the output from the GPS navigational unit.
- To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler.
- To measure optical profiles within the California bight. The optical profile measurements will include pigment concentration and particle absorption.

II. PROCEDURES: Each standard CalCOFI station will include the following:

- a. A CTD/Rosette consisting of 24 10-liter hydrographic bottles will be lowered to 515 meters (depth permitting) to measure physical parameters and collect water at discrete depths for analysis of: oxygen concentration, salinity, nutrients, chlorophylls and phytoplankton.
- b. 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 rate of 50 meters per minute, ascent 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. A self-contained LOPC (Laser Optical Particle Counter) will be mounted in the port side opening during each tow. The port side sample will be preserved in buffered ethanol at all stations inshore of, and including station 100.0.
- c. A Manta net (surface) tow, using a 505 μ m mesh net on a frame with a mouth area of 0.1333 m².
- d. Weather observations.
- e. A Pairovet (vertical) plankton tow will be taken at all stations inshore of, and including station 70. The Pairovet net will be fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150 μ m mesh nets. 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° during the ascent will be repeated.

f. A PRPOOS (Planktonic Rate Processes in Oligotrophic Ocean Systems) net tow will be taken at all stations on line 90.0 and 80.0 as well as stations out to and including station 70.0 on lines 86.7 and 83.3. These stations are occupied as part of the LTER (Long Term Ecological Reserve) project. The mesh of the PRPOOS net is 202 μ m and the tow is a vertical cast up from 210 meters.

g. At about 1100 hours on each day of the cruise a primary productivity CTD cast consisting of six 10-liter hydrographic bottles will be carried out. The cast arrangement will be determined by a Secchi disc observation. The purpose of the cast is to collect water from 6 discrete depths for daily *in situ* productivity experiments. Measurements of extracted chlorophyll and phaeophytin will be obtained with a fluorometer. Primary production will be measured as C¹⁴ uptake in a ~8 hour *in situ* incubation. Nutrients will be measured with an auto-analyzer. All radioisotope work areas will be given a wipe test before the departure of the SIO technical staff.

h. A secchi disc cast, used to measure the light intensity in the euphotic zone, will be performed at every daylight station including the primary productivity cast.

i. During transit between stations, a bird observer and two mammal observers will be recording location and species of various sea birds and marine mammals.

j. During transit between most daylight stations, an acoustic hydrophone array will be towed off the stern with a cable/winch to record sounds from marine mammals. Upon approaching a station, two sonobuoys will be deployed one nautical mile prior to stopping for station work.

III. EQUIPMENT:

A. Supplied by scientific party:

- 37% Formalin (SWFSC)
- 95% Ethyl alcohol (SWFSC)
- Sodium borate (SWFSC)
- 30 cc and 50 cc syringes (SWFSC)
- Tris buffer (SWFSC)
- Canulas (SWFSC)
- Pint, quart and gallon jars (SWFSC)
- Inside and outside labels (SWFSC)
- CalCOFI net tow data sheets (SWFSC)
- 71 cm CalCOFI Bongo frames (SWFSC)
- 71 cm CalCOFI 505 μ m mesh Bongo nets (SWFSC)
- CalCOFI 150 μ m calvet nets and codends (SWFSC)
- CalCOFI paironet frames (SWFSC)
- 333 μ m mesh codends (SWFSC)

- LTER PRPOOS frames(LTER)
- LTER 202 μm mesh nets and codends(LTER)
- Inclinator for bongo tows (SWFSC)
- Digital flowmeters (SWFSC)
- 75 lb Bongo weights (SWFSC)
- 170 lb hydro weight (LTER)
- CalCOFI Manta net frames (SWFSC)
- 60 cm CalCOFI 505 μm mesh Manta nets (SWFSC)
- Standard CalCOFI tool boxes (SWFSC)
- Bucket thermometers and holders (SIO)
- Hand held inclinometer (SWFSC)
- Oxygen titration rig with reagents (SIO)
- Oxygen flasks (SIO)
- Guildline Portasal (SIO)
- Salinity bottles (SIO)
- Standard sea water (SIO)
- Data sheets for scheduled hydrographic work (SIO)
- Weather observation sheets (SIO)
- CTD and rosette; remote depth readout box for CTD depths (SIO)
- 10 liter hydrographic bottles (SIO)
- Isotope van (SIO)

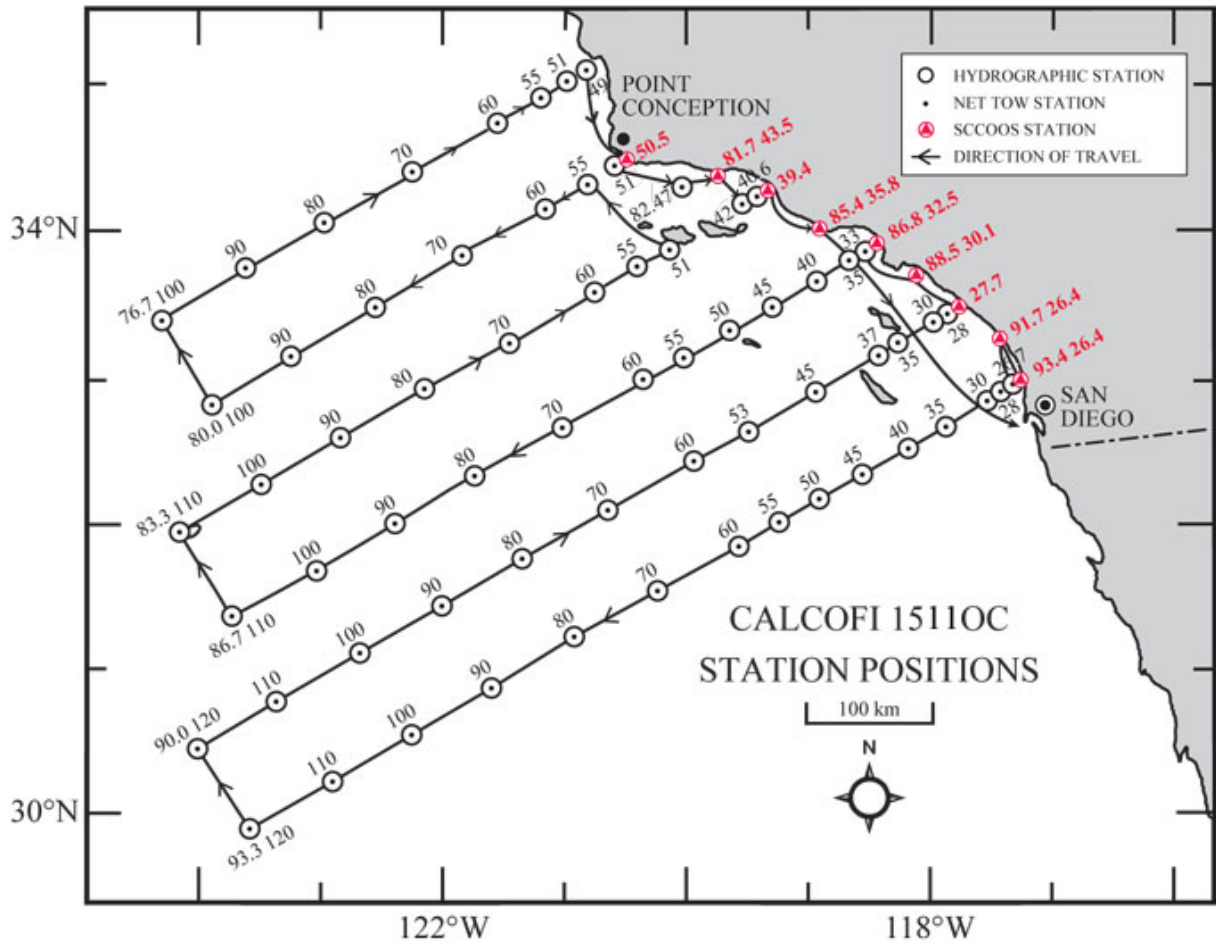
B. Supplied by R/V Oceanus:

- Hydro winch with .322 cable for standard Bongo, Pairovet and Manta tows
- Oceanographic winch w/.322" conductive cable
- Squirt boom w/blocks to accommodate both CTD & net tow .322" cables
- Constant temperature in main lab set at $22^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ($71.5^{\circ}\text{F} \pm 2^{\circ}\text{F}$)
- Winch monitoring system (wire out)
- 12 kHz Knudsen precision depth recorder

- Acoustic Doppler Current Profiler
- 20ft general purpose van (OSU-UNOLS)
- Marine mammal acoustics hydrophone deck winch (Either SIO or OSU)

IV. MISCELLANEOUS:

- The Cruise Leader may hold a pre-cruise meeting aboard the vessel before departure. A scientific and ship orientation meeting is always conducted after the ship clears the San Diego sea buoy.
- All CalCOFI data/samples dates and times will be recorded in Pacific Standard Time (PST). It is requested the ship roll-back all ship clocks to PST upon departure. If the ship chooses to stay on daylight savings time (DST), the scientific watch schedules will be on DST. Regardless, all scientific computer systems will be on PST or UTC; all data recorded will be in PST or UTC.
- Upon station arrival, CTD operations are usually first unless arrival to station is too early to start the primary productivity incubations. Under this circumstance, net tows will be first. The ship may want to position down-swell/wind (no more than 1.5nm) and tow toward station so it does not have to return to station for the CTD cast. The watch leader should notify the bridge if net tows will be the first operations on station.
- Primary productivity CTD casts are not done on SCCOOS 20m isobaths stations - too shallow - so station sequence nearshore may change to adjust arrival times. The Chief Scientist will notify the bridge of any change in station schedule.
- The latitude-longitude of SCCOOS stations may change to find a 20m bottom depth which may vary due to tides or changes in bottom.
- At the completion of the cruise an inspection will be made of scientific working and berthing spaces by the Master or his designated representative. The scientific party is responsible for the condition and cleanliness of spaces assigned to the scientific party.



Proposed Station Order

Schedule Order	Line	Station	Lat Deg	Lat Dec Min	Lon Deg	Lon Dec Min
1	93.3	26.7	32	57.378	117	18.318
2	93.4	26.4	32	56.94	117	16.41
3	91.7	26.4	33	14.61	117	27.924
4	93.3	28	32	54.78	117	23.658
5	93.3	30	32	50.778	117	31.872
6	93.3	35	32	40.782	117	52.368
7	93.3	40	32	30.78	118	12.828
8	93.3	45	32	20.778	118	33.252
9	93.3	50	32	10.782	118	53.634
10	93.3	55	32	0.78	119	13.98
11	93.3	60	31	50.778	119	34.29
12	93.3	70	31	30.78	120	14.796
13	93.3	80	31	10.782	120	55.158
14	93.3	90	30	50.778	121	35.376
15	93.3	100	30	30.78	122	15.45
16	93.3	110	30	10.782	122	55.392

17	93.3	120	29	50.778	123	35.196
18	90	120	30	25.074	123	59.934
19	90	110	30	45.072	123	19.896
20	90	100	31	5.076	122	39.72
21	90	90	31	25.074	121	59.4
22	90	80	31	45.072	121	18.93
23	90	70	32	5.076	120	38.322
24	90	60	32	25.074	119	57.558
25	90	53	32	39.072	119	28.932
26	90	45	32	55.074	118	56.13
27	90	37	33	11.076	118	23.22
28	90	35	33	15.072	118	14.982
29	90	30	33	25.074	117	54.348
30	90	28	33	29.076	117	46.08
31	90	27.7	33	29.676	117	44.844
32	88.5	30.1	33	40.464	118	5.016
33	86.8	32.5	33	53.328	118	26.652
34	86.7	33	33	53.37	118	29.418
35	86.7	35	33	49.368	118	37.722
36	86.7	40	33	39.366	118	58.452
37	86.7	45	33	29.37	119	19.14
38	86.7	50	33	19.368	119	39.792
39	86.7	55	33	9.366	120	0.402
40	86.7	60	32	59.37	120	20.976
41	86.7	70	32	39.366	121	1.998
42	86.7	80	32	19.368	121	42.87
43	86.7	90	31	59.37	122	23.592
44	86.7	100	31	39.366	123	4.164
45	86.7	110	31	19.368	123	44.586
46	83.3	110	31	54.702	124	10.218
47	83.3	100	32	14.7	123	29.538
48	83.3	90	32	34.704	122	48.702
49	83.3	80	32	54.702	122	7.71
50	83.3	70	33	14.7	121	26.568
51	83.3	60	33	34.704	120	45.264
52	83.3	55	33	44.7	120	24.552
53	83.3	51	33	52.704	120	7.95
54	80.0	55	34	19.0	120	48.1
55	80	60	34	9	121	9
56	80	70	33	48.996	121	50.58
57	80	80	33	28.998	122	31.998
58	80	90	33	9	123	13.254
59	80	100	32	48.996	123	54.354

60	76.7	100	33	23.292	124	19.368
61	76.7	90	33	43.29	123	37.998
62	76.7	80	34	3.294	122	56.46
63	76.7	70	34	23.292	122	14.76
64	76.7	60	34	43.29	121	32.892
65	76.7	55	34	53.292	121	11.898
66	76.7	51	35	1.29	120	55.068
67	76.7	49	35	5.292	120	46.644
68	80	50.5	34	27.996	120	29.34
69	80	51	34	27	120	31.434
70	81.8	46.9	34	16.488	120	1.512
71	81.7	43.5	34	24.33	119	48.018
72	83.3	42	34	10.704	119	30.51
73	83.3	40.6	34	13.5	119	24.672
74	83.3	39.4	34	15.9	119	19.668
75	85.4	35.8	34	1.278	118	50.046