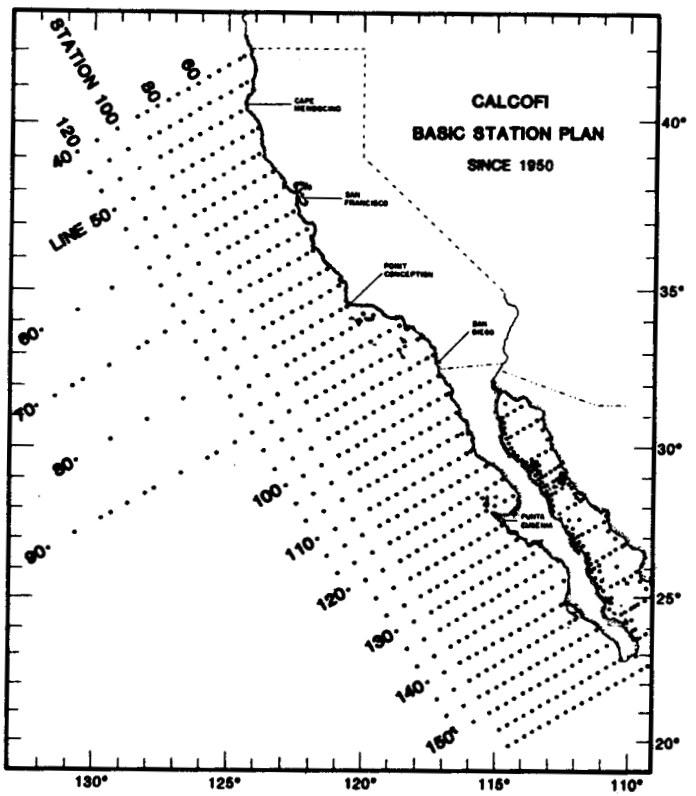
8805

CalCOFI ON-LINE DATA SYSTEM USER'S MANUAL

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Center

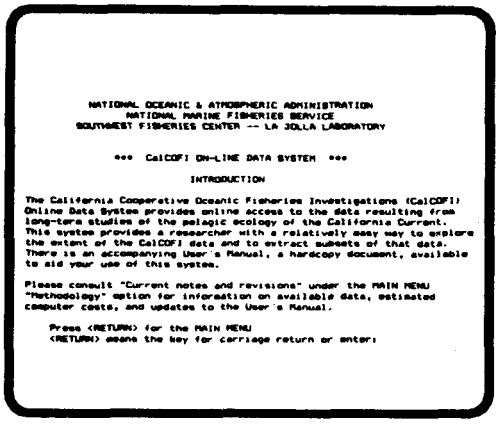


The California Cooperative Oceanic Fisheries Investigations (CalCOFI) is a consortium of marine research institutions engaged in long-term studies of the pelagic ecology of the California Current. In support of these studies, systematic surveys have been conducted since 1951; approximately 50,000 plankton samples and 20,000 hydrocasts have been obtained during the course of over 300 cruises.

The CalCOFI On-Line Data System provides on-line access to the data resulting from analyses of the plankton and water samples. This system provides a researcher with a relatively easy way to explore the extent of the CalCOFI data and to extract subsets of that data. The ichthyoplankton portion of this system is an electronic edition of the data report series published by the Southwest Fisheries Center in 1987 and 1988. This report series is the authoritative and citable source of the CalCOFI ichthyoplankton data. Any researcher using this system is strongly encouraged to consult the data reports (cited in the on-line reference list) for the most complete description of these data.

REQUIRED HARDWARE AND SIGN-ON/SIGN-OFF PROCEDURES

The CalCOFI On-line Data System is maintained in a VAX/VMS computing environment. The system currently resides on a VAX/780 computer operated by the UCSD Academic Computing Center (designated SDCC1) and accessed through the UCSD Local Area Network. For accounting purposes, any researcher desiring access to the system must have an account on SDCC1 or use a special account set up by Information Technology Services at the Southwest Fisheries Center. Once logged on SDCC1, type @CALCOFI at the $ prompt to bring up the INTRODUCTION.



Output is directed to both the terminal screen and to a computer file for subsequent processing or printing. Terminal display can be prematurely aborted without affecting the integrity of the computer file. Output file formats are described in the on-line methodology section. Screen display of 132-column tables requires VT100 terminal emulation. Screen display of plots requires Tektronix 4010/14 graphics capability. Plot files are not saved.

The system is capable of servicing one researcher at a time. If the system is in use access will be denied and the researcher will be advised to try again at a later time. The researcher signs off through the main menu. The system responds by displaying the computer charges and the names and formats of output files created during the on-line session.

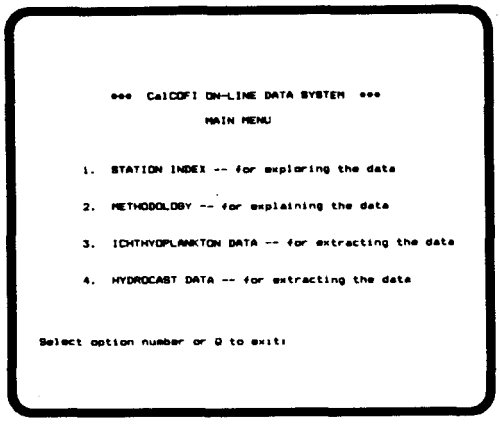
For additional information contact:

CalCOFI Data Manager
Southwest Fisheries Center
P.O. Box 271
La Jolla, California 92038
(619) 546-7157

CalCOFI Online Data System
Version 1.0
April 1988

MAIN MENU

The main menu provides the researcher with options that describe the extent of the observations, the methods used to collect and process the samples, horizontal distributions of ichthyoplankton data, and vertical profiles of temperature, salinity and oxygen content.



1. STATION INDEX is chosen to explore the extent of the data and to note the cruise numbers and geographic areas of interest. These will be required as input for data extraction.

2. METHODOLOGY option provides access to an on-line document that describes the ichthyoplankton sampling protocol and sorting procedures. Descriptions of the output files and an annotated list of references are also available.

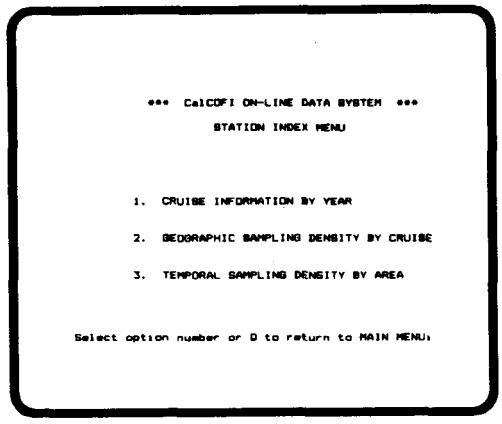
3. ICHTHYOPLANKTON DATA option is chosen to extract counts of fish eggs and larvae. The researcher is asked to specify the desired cruises.

4. HYDROCAST DATA option is chosen to extract estimates of temperature, salinity and oxygen at standard depths. The researcher is asked to specify the desired cruises.

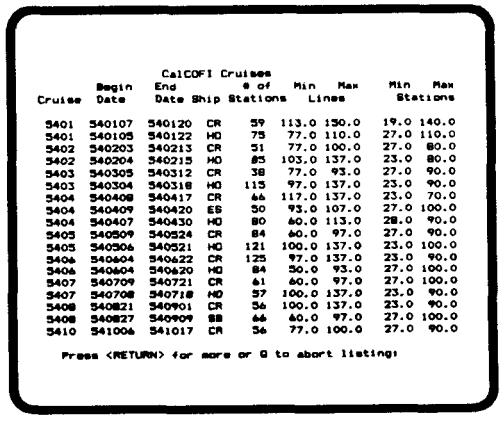
Each option from the main menu has an associated submenu. These are described on the following pages.

1. STATION INDEX

Station Index provides an overview of the geographic and temporal sampling density. It is intended to be used as an aid in specifying criteria for data selection.



1.1 CRUISE INFORMATION BY YEAR option provides the beginning and ending dates of every cruise, the name of the ship(s) used, and the number of stations occupied for the year(s) specified. Typical screen output:



CalCOFI Cruises

Cruise	Begin Date	End Date	Ship	# of Stations	Min Lines	Max Lines	Min Stations	Max Stations
5401	540107	540120	CR	59	113.0	150.0	19.0	140.0
5401	540105	540122	HO	75	77.0	110.0	27.0	110.0
5402	540203	540213	CR	51	77.0	100.0	27.0	80.0
5402	540204	540215	HO	85	103.0	137.0	23.0	80.0
5403	540305	540312	CR	38	77.0	93.0	27.0	90.0
5403	540304	540318	HO	115	97.0	137.0	23.0	90.0
5404	540408	540417	CR	66	117.0	137.0	23.0	70.0
5404	540409	540420	EB	50	93.0	107.0	27.0	100.0
5404	540407	540430	HO	80	60.0	113.0	28.0	90.0
5405	540509	540524	CR	84	60.0	97.0	27.0	90.0
5405	540506	540521	HO	121	100.0	137.0	23.0	100.0
5406	540604	540622	CR	125	97.0	137.0	23.0	90.0
5406	540604	540620	HO	84	50.0	93.0	27.0	100.0
5407	540709	540721	CR	61	60.0	97.0	27.0	100.0
5407	540708	540718	HO	57	100.0	137.0	23.0	90.0
5408	540821	540901	CR	56	100.0	137.0	23.0	90.0
5408	540827	540909	SB	66	60.0	97.0	27.0	100.0
5410	541006	541017	CR	56	77.0	100.0	27.0	90.0

Press <RETURN> for more or 0 to abort listing:

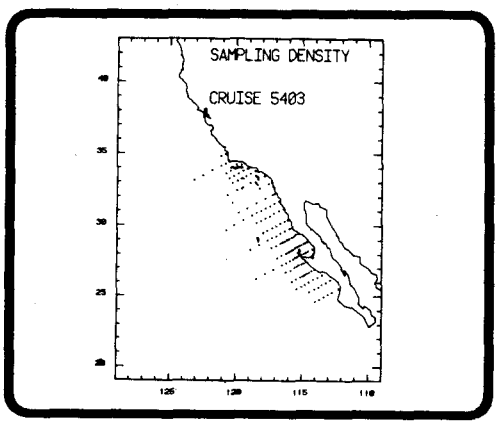
1.2. GEOGRAPHIC SAMPLING DENSITY BY CRUISE option provides a list of all stations occupied, the type of plankton tow(s) conducted at each station and whether a hydrocast was obtained. The researcher is asked to specify the cruise. Cruise numbers are four-digit codes; the first two designate the year and the last two designate the month. Typical screen output:

```
Geographic Sampling Density for Cruise 5403
                    Plankton
Line Station Tow Type Hydrocast

 87.0  35.0  CALIMOBL
 87.0  40.0  CALIMOBL  Y
 87.0  45.0  CALIMOBL
 87.0  50.0  CALIMOBL  Y
 87.0  55.0  CALIMOBL
 87.0  60.0  CALIMOBL  Y
 85.0  60.0  CALIMOBL
 85.0  55.0  CALIMOBL  Y
 85.0  50.0  CALIMOBL
 85.0  45.0  CALIMOBL  Y
 85.0  40.0  CALIMOBL
 85.0  39.0  CALIMOBL  Y
 83.0  40.0  CALIMOBL
 83.0  43.0  CALIMOBL  Y
 82.0  47.0  CALIMOBL  Y
 83.0  48.0  CALIMOBL
 83.0  51.0  CALIMOBL  Y
 83.0  55.0  CALIMOBL

Press <RETURN> for more or Q to abort listing:
```

Those who are connected by graphic terminals can select the plot option. Typical screen output:



Press <RETURN> to clear plot from screen and return to **STATION INDEX MENU.**

1.3. TEMPORAL SAMPLING DENSITY BY AREA option provides a list of all stations ever occupied, the dates, the type of plankton tow(s) conducted and whether a hydrocast was obtained for the geographic area and the years specified by the researcher. Areas are specified by the northernmost and southernmost line number and by the inshore and offshore station number; consult the station grid on the first page of this manual when specifying areas. Typical screen output:

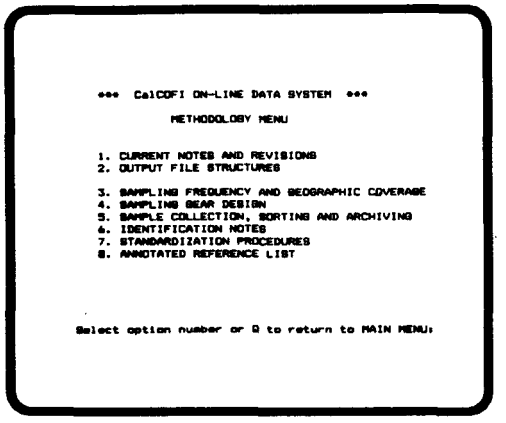
```
Temporal Sampling Density for the Area Between
CalCOFI Lines 60 to 60 and Stations 40 to 100
                        Plankton
Line Station  Date    Tow Type Hydrocast

 60.0  90.0  540411  CALIMOBL
 60.0  80.0  540411  CALIMOBL
 60.0  70.0  540411  CALIMOBL
 60.0  60.0  540411  CALIMOBL  Y
 60.0  55.0  540411  CALIMOBL
 60.0  55.0  540510  CALIMOBL
 60.0  60.0  540510  CALIMOBL  Y
 60.0  70.0  540510  CALIMOBL
 60.0  80.0  540511  CALIMOBL  Y
 60.0  90.0  540511  CALIMOBL
 60.0 100.0  540606  CALIMOBL  Y
 60.0  90.0  540607  CALIMOBL
 60.0  80.0  540607  CALIMOBL  Y
 60.0  70.0  540607  CALIMOBL
 60.0  60.0  540607  CALIMOBL  Y
 60.0  55.0  540607  CALIMOBL
 60.0  55.0  540710  CALIMOBL

Press <RETURN> for more or Q to abort listing:
```

2. METHODOLOGY

Each of the Methodology options has an associated submenu to further refine a request for information. Text is displayed on the terminal screen. Any portion of the text can be written to a computer file for subsequent printing.



2.1. CURRENT NOTES AND REVISIONS option provides access to the latest programmer's notes, a description of the data currently available, and computer charges for typical sessions.

2.2. OUTPUT FILE STRUCTURES option describes the output data file formats for the eleven file types available.

2.3. SAMPLING FREQUENCY AND GEOGRAPHIC COVERAGE option describes the cruise frequency and geographic coverage for four eras: 1951-60, 1961-65, 1966-84, 1985-87.

2.4. SAMPLING GEAR DESIGN option describes the CAL1MOBL, CALBOBL, and CALVET plankton samplers and their deployment.

2.5. SAMPLE COLLECTION, SORTING AND ARCHIVING option describes field collection methods, sorting procedures, larval length categories, and anchovy egg stages.

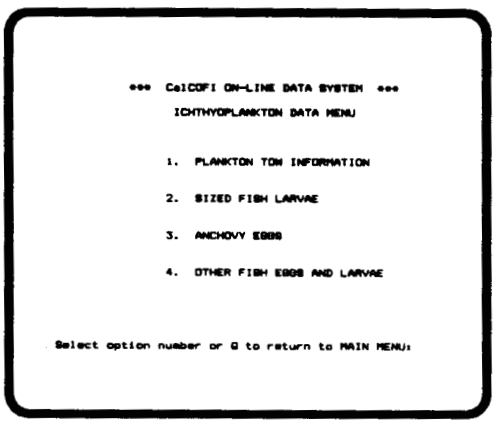
2.6. IDENTIFICATION NOTES option describes the number of taxonomic categories used during four eras: 1950's, 1960's, 1970's and 1980's.

2.7. STANDARDIZATION PROCEDURES option describes the adjustment for fractional sorting and the standard haul factor.

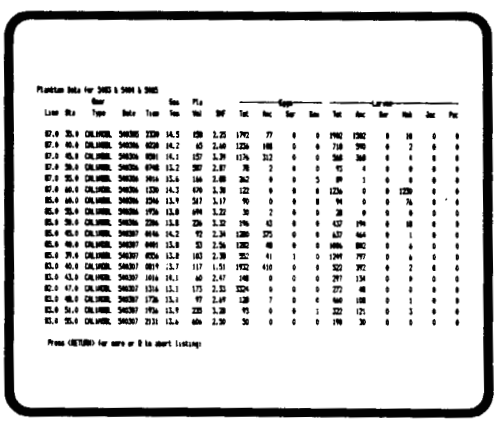
2.8. ANNOTATED REFERENCE LIST option lists sampling manuals, data reports and atlases, and references on estimates of egg and larval mortality and spawning biomass.

3. ICHTHYOPLANKTON DATA

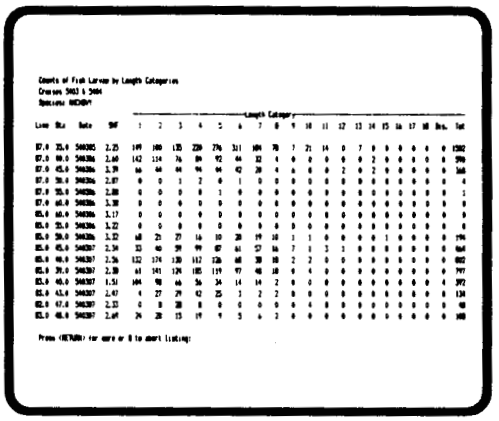
Ichthyoplankton Data extracts data from the files created from analyses of the CalCOFI plankton samples. The researcher is asked to specify the cruise(s) and, for some options, the fish species of interest.



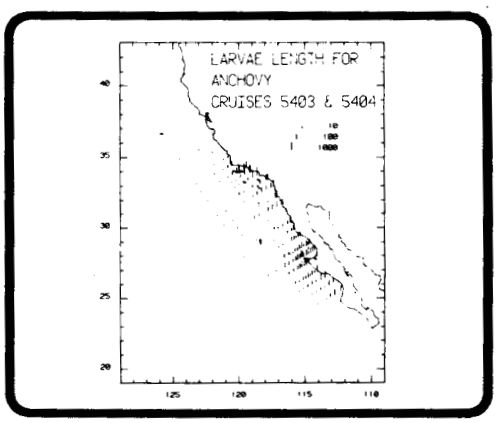
3.1. PLANKTON TOW INFORMATION option lists gear type, date and time of tow, plankton volume, sea surface temperature, standard haul factor, total number of fish eggs, numbers of anchovy, sardine and saury eggs, total number of fish larvae, and numbers of anchovy, sardine, saury, hake, jack mackerel and Pacific mackerel larvae for each station occupied during the cruise(s) specified. Typical screen output (132-column format):



3.2. SIZED FISH LARVAE option provides counts of fish larvae by length categories. Category definitions can be found under the "Methodology" option of the main menu. The researcher is asked to specify the cruise(s) and species (anchovy, sardine, hake, jack mackerel, or Pacific mackerel) of interest. Typical screen output (132-column format):



Those who are connected by graphics terminals can display plots of selected length categories of larvae for selected species. Typical screen output:



Press <RETURN> to clear plot from screen and return to **ICHTHYOPLANKTON DATA MENU.**

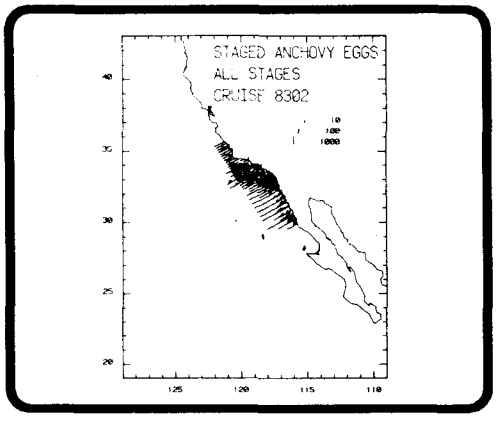
3.3. ANCHOVY EGGS option provides counts of anchovy eggs by developmental stage; the time of the tow and the water temperature are also listed. Stage definitions can be found under the MAIN MENU "Methodology" option. The researcher is asked to specify the cruise(s) of interest. These data are available only from the CalVET samples obtained for the anchovy biomass surveys (1980-85). Typical screen output (132-column format):

Counts of Anchovy Eggs by Developmental Stage
Cruise: 8302

					Developmental Stage											
Line	Sta	Date	Time	Temp	I	II	III	IV	V	VI	VII	VIII	II	I	II	Dis
80.3	36.0	830225	2000	16.1	0	0	0	0	0	0	0	0	1	0	0	0
80.3	38.0	830225	2105	16.1	0	0	0	0	0	0	0	0	1	0	1	0
80.3	39.0	830225	2145	16.0	1	0	4	7	1	0	0	0	6	0	0	0
80.3	40.0	830225	2223	16.0	0	0	0	2	0	0	0	0	0	0	0	0
80.3	41.0	830225	2307	15.9	0	0	0	1	0	0	0	0	1	0	0	0
80.3	42.0	830225	2336	15.9	0	0	0	0	0	0	0	0	0	0	0	0
80.3	43.0	830226	0015	15.9	0	2	0	3	3	1	1	2	0	0	0	0
80.3	44.0	830226	0050	15.5	0	0	0	11	2	0	0	0	5	0	0	0
80.3	45.0	830226	0124	15.8	0	0	0	17	12	3	1	2	11	1	0	0
80.3	46.0	830226	0206	15.8	0	0	0	0	6	0	0	13	13	0	0	0
80.3	47.0	830226	0239	15.8	0	1	0	0	0	0	0	0	0	0	0	0
80.3	48.0	830226	0315	15.7	4	0	0	0	0	0	0	0	1	0	0	0
80.3	49.0	830226	0416	15.7	52	57	0	0	83	0	2	0	7	0	0	0
80.3	50.0	830226	0455	15.5	0	2	0	0	5	1	0	0	9	0	0	0
80.3	51.0	830226	0538	15.5	0	36	0	0	35	15	0	0	1	0	0	0
80.3	52.0	830226	0639	15.6	0	27	0	0	0	0	0	0	0	0	0	0
80.3	53.0	830226	0719	15.5	0	52	0	0	0	0	0	0	0	0	0	17

Press (RETURN) for more or B to abort listing:

Those who are connected by graphics terminals can display plots of selected stages of eggs. Typical screen output:



Press <RETURN> to clear plot from screen and return to **ICHTHYOPLANKTON DATA MENU.**

3.4. OTHER FISH EGGS AND LARVAE option will display a submenu:

*** CalCOFI ON-LINE DATA SYSTEM ***

OTHER FISH EGGS AND LARVAE

1. SPECIES OCCURRENCES

2. SPECIES ABUNDANCES

Select option number or B to return to ICHTHYOPLANKTON DATA MENU:

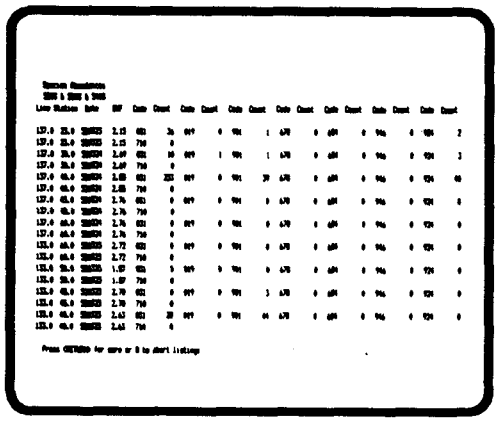
3.4.1. SPECIES OCCURRENCES option provides a list of taxonomic categories, the number of occurrences of each, and standardized counts of each for the cruise(s) specified by the researcher. Typical screen output:

Species Occurrences
Cruises 9404 & 9407

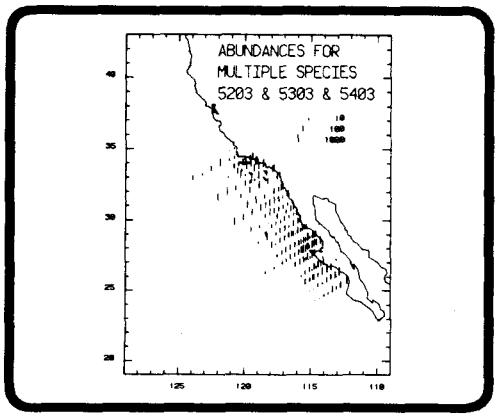
Code	Species Name	Number of Occurrences	Number of Specimens
683	Bebaster spp.	183	4921.44
301	Triphoturus mexicanus	163	7406.61
031	Engraulis mordax	141	15124.81
071	Bathylagus wesethi	125	2719.64
574	Scomber japonicus	125	16.54
260	Lampanyctus ritteri	98	820.54
093	Vinciguerria lucetia	96	4622.06
072	Leuroglossus stilbius	88	843.23
242	Diogenichthys laternatus	81	1195.73
019	Sardinops sagax	77	6015.32
220	Diaphus spp.	77	4735.47
292	Stenobrachius leucopsarus	74	1258.31
297	Tarletonbeania crenularis	63	1199.42
288	Protomyctophum crockeri	55	343.56
925	Citharichthys stigmaeus	53	428.67
398	Melamphaes spp.	50	228.56
076	Cyclothone spp.	48	393.75

Press (RETURN) for more or B to abort listing:

3.4.2. SPECIES ABUNDANCES option provides specimen counts for each station occupied. The researcher is asked for the cruise(s) and taxon of interest. Consult the code list at the end of this manual when specifying desired taxonomic categories. The researcher may elect to display only positive stations, however, the computer file contains both positive and negative stations. Typical screen output (132 column format):



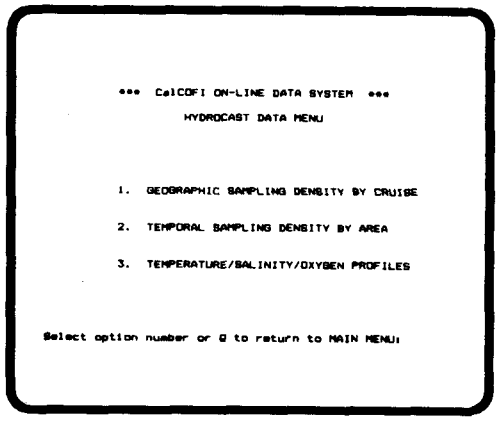
Those who are connected by graphics terminals can display a plot of the total number of specimens in the selected taxonomic categories. Typical screen output:



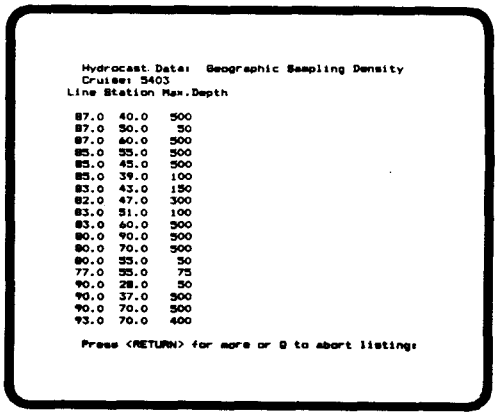
Press <RETURN> to clear plot from screen and return to **OTHER FISH EGGS AND LARVAE MENU.**

4. HYDROCAST DATA

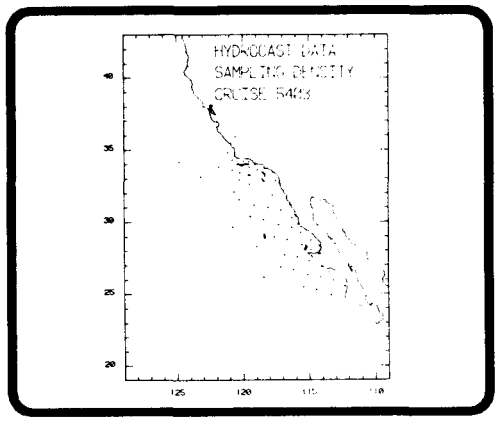
Hydrocast Data provides access to data files created from analyses of water samples. These data files, originally processed by Scripps Institution of Oceanography, contain measurements of temperature, salinity and oxygen content at standard depths. The first two options allow the researcher to explore the extent of the hydrocast data; the last option is used to extract desired data.



4.1. GEOGRAPHIC SAMPLING DENSITY BY CRUISE option provides a list of hydrocasts, the equipment used and the maximum depth sampled. The researcher is asked to specify the cruise of interest. Typical screen output:



Those who are connected by graphic terminals can select the plot option. Typical screen output:



Press <RETURN> to clear plot from screen and return to **HYDROCAST DATA** MENU.

4.3. TEMPERATURE/SALINITY/OXYGEN PROFILES option lists the temperature, salinity, oxygen content, oxygen saturation, density, and dynamic height anomaly at standard depths for each hydrocast. Researcher is asked to specify the cruise(s) of interest. Typical screen output:

Temperature/Salinity/Oxygen Profiles
Cruises 5203

Line	Sta	Date	Depth	Temp	Sal	Oxy	Oxy Satur	Density	Dynam. Height
137.0	23.0	520324	0	19.030	34.490	4.970	94.22	24.640	0.0000
137.0	23.0	520324	10	18.940	34.490	4.990	94.44	24.670	0.0330
137.0	23.0	520324	20	18.910	34.490	5.070	95.90	24.670	0.0660
137.0	23.0	520324	30	18.920	34.490	5.090	96.30	24.670	0.0990
137.0	23.0	520324	50	18.120	34.470	4.440	82.73	24.860	0.1630
137.0	30.0	520307	0	18.770	34.450	5.120	96.57	24.680	0.0000
137.0	30.0	520307	10	18.630	34.470	5.250	98.77	24.730	0.0330
137.0	30.0	520307	20	18.620	34.470	5.250	98.75	24.730	0.0650
137.0	30.0	520307	30	18.620	34.470	5.230	98.38	24.730	0.0970
137.0	30.0	520307	50	18.330	34.470	4.940	92.41	24.800	0.1610
137.0	30.0	520307	75	14.110	34.200	2.000	34.37	25.570	0.2310
137.0	30.0	520307	100	12.900	34.280	1.170	19.62	25.870	0.2890
137.0	30.0	520307	125	12.480	34.480	0.620	10.32	26.110	0.3400
137.0	30.0	520307	150	12.100	34.600	0.240	3.97	26.280	0.3870
137.0	30.0	520307	200	11.430	34.650	0.100	1.63	26.440	0.4730
137.0	40.0	540324	0	16.200	34.050	0.000	0.00	24.990	0.0000
137.0	40.0	520324	10	16.200	33.980	0.000	0.00	24.940	0.0300

Press <RETURN> for more or Q to abort listing:

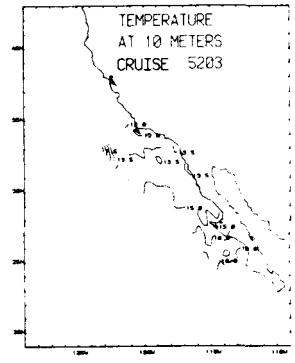
4.2. TEMPORAL SAMPLING DENSITY BY AREA option provides a list of station locations, dates, equipment used, and maximum depth sampled. The researcher is asked to specify the geographic area and year(s) of interest.

Hydrocast Data: Temporal Sampling Density for the Area Between
CalCOFI Lines 60 to 60 and Stations 40 to 100

Line	Station	Date	Max.Depth
60.0	60.0	540411	500
60.0	60.0	540511	500
60.0	80.0	540511	500
60.0	100.0	540607	500
60.0	80.0	540607	500
60.0	60.0	540607	500
60.0	60.0	540711	150
60.0	80.0	540711	500
60.0	100.0	540712	500
60.0	60.0	540831	500
60.0	80.0	540901	500
60.0	100.0	540901	500
60.0	60.0	550426	500
60.0	70.0	550426	500
60.0	80.0	550426	500
60.0	90.0	550426	500
60.0	52.0	550426	50
60.0	52.0	550826	50

Press <RETURN> for more or Q to abort listing:

Those who are connected by a graphics terminal can display isopleth plots of the variables at a standard depth. Researcher is asked to specify the variable and depth of interest. Typical screen output:



TAXONOMIC CODES

Specimens which could not be identified to species were assigned to the larger taxonomic categories of genera, families, or orders

ELOPIFORMES

005 Albulidae
006 Albula spp.
007 Albula vulpes
003 Elopidae
004 Elops affinis

ANGUILLIFORMES

355 Anguilliformes
358 Congridae
359 Ariosoma spp.
360 Hildebrandia spp.
368 Cyematidae
370 Muraenidae
375 Ophichthidae
378 Serrivomeridae

CLUPEIFORMES

015 Clupeidae
011 Etrumeus spp.
012 Etrumeus acuminatus
016 Opisthonema spp.
019 Sardinops sagax
025 Engraulidae
026 Anchoa spp.
031 Engraulis mordax

SALMONIFORMES

108 Salmoniformes
035 Alepocephalidae
036 Alepocephalus spp.
055 Argentinidae
056 Argentina sialis
058 Microstoma microstoma
061 Nansenia spp.
062 Nansenia candida
063 Nansenia crassa
065 Bathylagidae
070 Bathylagus spp.
073 Bathylagus longirostris
066 Bathylagus milleri
067 Bathylagus nigrigenys
068 Bathylagus ochotensis
069 Bathylagus pacificus
071 Bathylagus wesethi
074 Leuroglossus schmidti
072 Leuroglossus stilbius
050 Opisthoproctidae
054 Bathylychnops exilis
051 Dolichopteryx spp.
052 Dolichopteryx longipes
053 Macropinna microstoma
045 Osmeridae

STOMIIFORMES

109 Stomiiformes
075 Gonostomatidae
076 Cyclothone spp.
077 Cyclothone acclinidens
078 Cyclothone signata
084 Danaphos oculatus
086 Diplophos spp.
087 Diplophos taenia
080 Gonostoma spp.
088 Ichthyococcus spp.
089 Ichthyococcus irregularis
091 Valenciennellus stellatus
092 Vinciguerria spp.
093 Vinciguerria lucetia
094 Vinciguerria poweriae
095 Woodsia nonsuchae
100 Sternoptychidae
101 Argyropelecus spp.
103 Argyropelecus affinis
102 Argyropelecus lychnus
105 Argyropelecus sladeni
107 Sternoptyx spp.
110 Astronesthidae
155 Chauliodontidae
156 Chauliodus macouni
160 Idiacanthidae
161 Idiacanthus antrostomus
150 Malacosteidae
151 Aristostomias scintillans
130 Melanostomiidae
131 Bathophilus spp.
132 Bathophilus filifer
133 Bathophilus flemingi
136 Eustomias spp.
137 Leptostomias spp.
139 Photonectes spp.
142 Tactostoma macropus
120 Stomiidae
121 Stomias atriventer

MYCTOPHIFORMES

190 Myctophiformes
210 Alepisauridae
211 Alepisaurus ferox
328 Anotopterus pharao
345 Evermannellidae
346 Evermannella indica
330 Omosudidae
331 Omosudis lowei
310 Paralepididae
312 Lestidiops spp.
311 Lestidiops ringens
317 Notolepis risso
318 Paralepis atlantica
314 Stemonosudis spp.
315 Stemonosudis macrura
321 Sudis atrox
200 Aulopidae
201 Aulopus spp.
195 Notosudidae
196 Scopelosaurus spp.
335 Scopelarchidae
334 Benthalbella spp.
336 Benthalbella dentata
337 Benthalbella linguidens
343 Rosenblattichthys volucris
342 Scopelarchoides nicholsi
338 Scopelarchus spp.
339 Scopelarchus analis
340 Scopelarchus guentheri
341 Scopelarchus stephensi
215 Myctophidae
216 Disintegrated myctophid
255 Bolinichthys spp.
225 Ceratoscopelus spp.
226 Ceratoscopelus townsendi
228 Diaphus spp.
229 Diaphus pacificus
227 Diaphus theta
257 Lampadena spp.
256 Lampadena urophaos
261 Lampanyctus spp.
262 Lampanyctus idostigma
263 Lampanyctus omostigma
264 Lampanyctus parvicauda
259 Lampanyctus regalis
260 Lampanyctus ritteri
266 Lobianchia spp.
281 Notolychnus valdiviae
283 Notoscopelus resplendens
286 Parvilux ingens
292 Stenobrachius leucopsarus
258 Taaningichthys minimus
303 Triphoturus spp.
301 Triphoturus mexicanus
302 Triphoturus nigrescens
217 Benthosema pterota
219 Benthosema suborbitale
221 Centrobranchus spp.
241 Diogenichthys spp.
239 Diogenichthys atlanticus
242 Diogenichthys laternatus
243 Electrona rissoi
249 Gonichthys tenuiculus
250 Hygophum spp.
251 Hygophum atratum
253 Hygophum proximum
252 Hygophum reinhardtii
270 Loweina rara
274 Myctophum spp.
272 Myctophum aurolaternatum
275 Myctophum lychnobium
273 Myctophum nitidulum
289 Protomyctophum spp.
288 Protomyctophum crockeri
287 Protomyctophum thompsoni
298 Symbolophorus californiensis
297 Symbolophorus evermanni
299 Tarletonbeania crenularis
204 Synodontidae
206 Synodus spp.
207 Synodus lucioceps

GADIFORMES

885 Bregmacerotidae
886 Bregmaceros spp.
887 Bregmaceros bathymaster
905 Gadidae
904 Gadus macrocephalus
908 Microgadus proximus
907 Theragra chalcogramma
900 Merlucciidae
901 Merluccius productus
909 Moridae
908 Physiculus spp.
895 Macrouridae
891 Coryphaenoides spp.

OPHIDIIFORMES

869 Ophidiiformes
885 Bythitidae
866 Brosmophycis marginata
875 Carapidae
870 Ophidiidae
872 Chilara taylori
871 Ophidion scrippsae

BATRACOIDIFORMES

820 Batrachoididae
821 Porichthys spp.

LOPHIIFORMES

971 Lophiiformes
980 Antennariidae
981 Antennarius spp.
985 Chaunacidae
986 Chaunax spp.
998 Ogcocephalidae
990 Ceratioidei
992 Ceratiidae
995 Gigantactinidae
993 Linophrynidae
994 Melanocetidae
991 Oneirodidae
975 Lophiidae

GOBIESOCIFORMES

830 Callionymidae
825 Gobiesocidae

BELONIFORMES

175 Belonidae
176 Ablennes hians
180 Exocoetidae
170 Hemiramphidae
181 Oxyporhamphus micropterus
165 Scomberesocidae
166 Cololabis saira

ATHERINIFORMES

470 Atherinidae
471 Atherinops spp.

LAMPRIDIFORMES

387 Lophotidae
380 Trachipteridae
385 Desmodema spp.
381 Trachipterus spp.
382 Trachipterus altivelis
383 Trachipterus fukuzakii
384 Zu cristatus
350 Eutaeniophoridae
351 Eutaeniophorus spp.

BERYCIFORMES

388 Beryciformes
390 Diretmidae
391 Diretmus pauciradiatus
413 Holocentridae
395 Melamphaidae
398 Melamphaes spp.
396 Melamphaes lugubris
397 Melamphaes parvus
404 Poromitra spp.
409 Scopeloberyx robustus
412 Scopelogadus bispinosus

SYNGNATHIFORMES

785 Fistulariidae
780 Macroramphosidae
781 Macroramphosus gracilis
790 Syngnathidae
791 Syngnathus spp.

SCORPAENIFORMES

760 Agonidae
710 Anoplopomatidae
711 Anoplopoma fimbria
735 Cottidae
736 Scorpaenichthys marmoratus
770 Cyclopteridae
715 Hexagrammidae
717 Hexagrammos spp.
721 Ophiodon spp.
720 Ophiodon elongatus
730 Oxylebius pictus
726 Zaniolepis spp.
670 Scorpaenidae
671 Pontinus spp.
676 Scorpaena spp.
678 Scorpaena guttata
675 Scorpaenodes xyris
683 Sebastes spp.
688 Sebastes aurora
684 Sebastes jordani
685 Sebastes levis
687 Sebastes macdonaldi
686 Sebastes paucispinis
707 Sebastolobus spp.
708 Sebastolobus alascanus
709 Sebastolobus altivelis
755 Triglidae
756 Prionotus spp.

PERCIFORMES

423 Perciformes
585 Acanthuridae
880 Ammodytidae
881 Ammodytes hexapturus
845 Blennioidei
855 Bathymasteridae
850 Blenniidae
851 Hypsoblennius spp.
840 Clinidae
841 Gibbonsia spp.
848 Pholididae
846 Stichaeidae
795 Gobiidae
796 Coryphopterus nicholsii
844 Microdesmidae
540 Icosteidae
541 Icosteus aenigmaticus
635 Labridae
636 Halichoeres spp.
639 Oxyjulis californica
641 Semicossyphus pulcher
625 Pomacentridae
626 Chromis punctipinnis
627 Hypsypops rubicundus
650 Scaridae
480 Mugilidae
481 Mugil spp.
445 Apogonidae
446 Howella brodiei
550 Bramidae
551 Brama spp.
552 Brama japonica
500 Carangidae
501 Caranx spp.
508 Chloroscombrus orqueta
509 Decapterus scombrinus
512 Naucrates ductor
513 Oligoplites spp.
516 Seriola spp.
517 Seriola lalandi
514 Trachurus symmetricus
558 Caristiidae
559 Caristius macropus
555 Coryphaenidae
554 Coryphaena spp.
557 Coryphaena equisetis
556 Coryphaena hippurus
615 Ephippidae
616 Chaetodipterus zonatus
495 Gerreidae
496 Eucinostomus spp.
600 Haemulidae
601 Anisotremus davidsoni
451 Xenichthys xanti
452 Xenistius californiensis
660 Kyphosidae
656 Girella nigricans
664 Hermosilla azurea
661 Kyphosus spp.
666 Medialuna californiensis
450 Lutjanidae
610 Malacanthidae
611 Caulolatilus princeps
480 Mullidae
440 Priacanthidae
610 Sciaenidae
609 Atractoscion nobilis
614 Cheilotrema saturnum
611 Cynoscion spp.
612 Genyonemus lineatus
617 Menticirrhus spp.
618 Roncador stearnsii
613 Seriphus politus
619 Umbrina roncador
425 Serranidae
435 Anthiinae
427 Epinephelinae
426 Epinephelus spp.
438 Grammistinae
430 Serraninae
431 Paralabrax spp.
605 Sparidae
607 Calamus brachysomus
490 Polynemidae
590 Gempylidae
597 Diplospinus multistriatus
591 Gempylus serpens
592 Nealotus tripes
560 Scombridae
561 Auxis spp.
564 Euthynnus spp.
567 Katsuwonus pelamis
571 Sarda chiliensis
574 Scomber japonicus
577 Scomberomorus spp.
581 Thunnus albacares
595 Trichiuridae
596 Lepidopus xantusi
598 Trichiurus nitens
485 Sphyraenidae
486 Sphyraena argentea
535 Centrolophidae
536 Icichthys lockingtoni
520 Nomeidae
522 Cubiceps spp.
526 Cubiceps caeruleus
527 Cubiceps pauciradiatus
521 Nomeus gronovii
523 Psenes spp.
525 Psenes pellucidus
524 Psenes sio
530 Stromateidae
532 Peprilus spp.
531 Peprilus simillimus
545 Tetragonuridae
547 Tetragonurus atlanticus
546 Tetragonurus cuvieri
815 Chiasmodontidae
816 Chiasmodon niger
835 Uranoscopidae
836 Astroscopus spp.
860 Zoarcidae

PLEURONECTIFORMES

915 Pleuronectiformes
916 Bothidae
917 Bothus spp.
918 Bothus leopardinus
931 Engyophrys sancti-laurentii
937 Monolene spp.
924 Citharichthys spp.
921 Citharichthys fragilis
922 Citharichthys gilberti
920 Citharichthys platophrys
923 Citharichthys sordidus
925 Citharichthys stigmaeus
926 Citharichthys xanthostigma
930 Cyclopsetta spp.
928 Etropus spp.
933 Hippoglossina spp.
929 Hippoglossina stomata
934 Paralichthys spp.
932 Paralichthys californicus
927 Syacium ovale
936 Xystreurys liolepis
940 Pleuronectidae
959 Atheresthes stomias
961 Embassichthys bathybius
960 Eopsetta jordani
941 Glyptocephalus zachirus
947 Hippoglossoides elassodon
945 Hippoglossus stenolepis
942 Hypsopsetta guttulata
963 Inopsetta ischyra
962 Isopsetta isolepis
944 Lepidopsetta bilineata
943 Lyopsetta exilis
946 Microstomus pacificus
948 Parophrys vetulus
949 Platichthys stellatus
954 Pleuronichthys spp.
951 Pleuronichthys coenosus
952 Pleuronichthys decurrens
953 Pleuronichthys ritteri
955 Pleuronichthys verticalis
958 Psettichthys melanostictus
950 Reinhardtius hippoglossoides
985 Cynoglossidae
986 Symphurus spp.
988 Soleidae
989 Achirus mazatlanus

TETRAODONTIFORMES

415 Balistidae
414 Ostraciidae
420 Tetraodontidae

002 Disintegrated fish larva
001 Unidentified fish larva