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FOCUS USERS GUIDE

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## ABSTRACT

Because of increased pressure on living marine resources, scientific interest is being focused on relationships between environmental fluctuations and the interannual variability of fish stocks. Understanding these relationships demands the availability of comprehensive environmental data sets, in a user friendly form and on time and space scales that are applicable to fisheries. In response to this need, NOAA's Northwest and Alaska Fisheries Center (NWAFC) and Pacific Marine Environmental Laboratory (PMEL) have jointly developed a data base management system known as FOCUS (Fisheries Oceanography Cooperative Users System) for use in investigations on ocean-fishery variability and interactions in the Bering Sea and Gulf of Alaska. The system offers the ability to associate, join and directly analyze two or more data types from various environmental and fisheries data sets and computer systems in order to develop statistical summaries, time series plots, contour plots and other integrated data analyses. FOCUS establishes software compatibility among existing data sets and analysis packages within a distributed data base environment. This report describes the operation of FOCUS from a user's point of view.

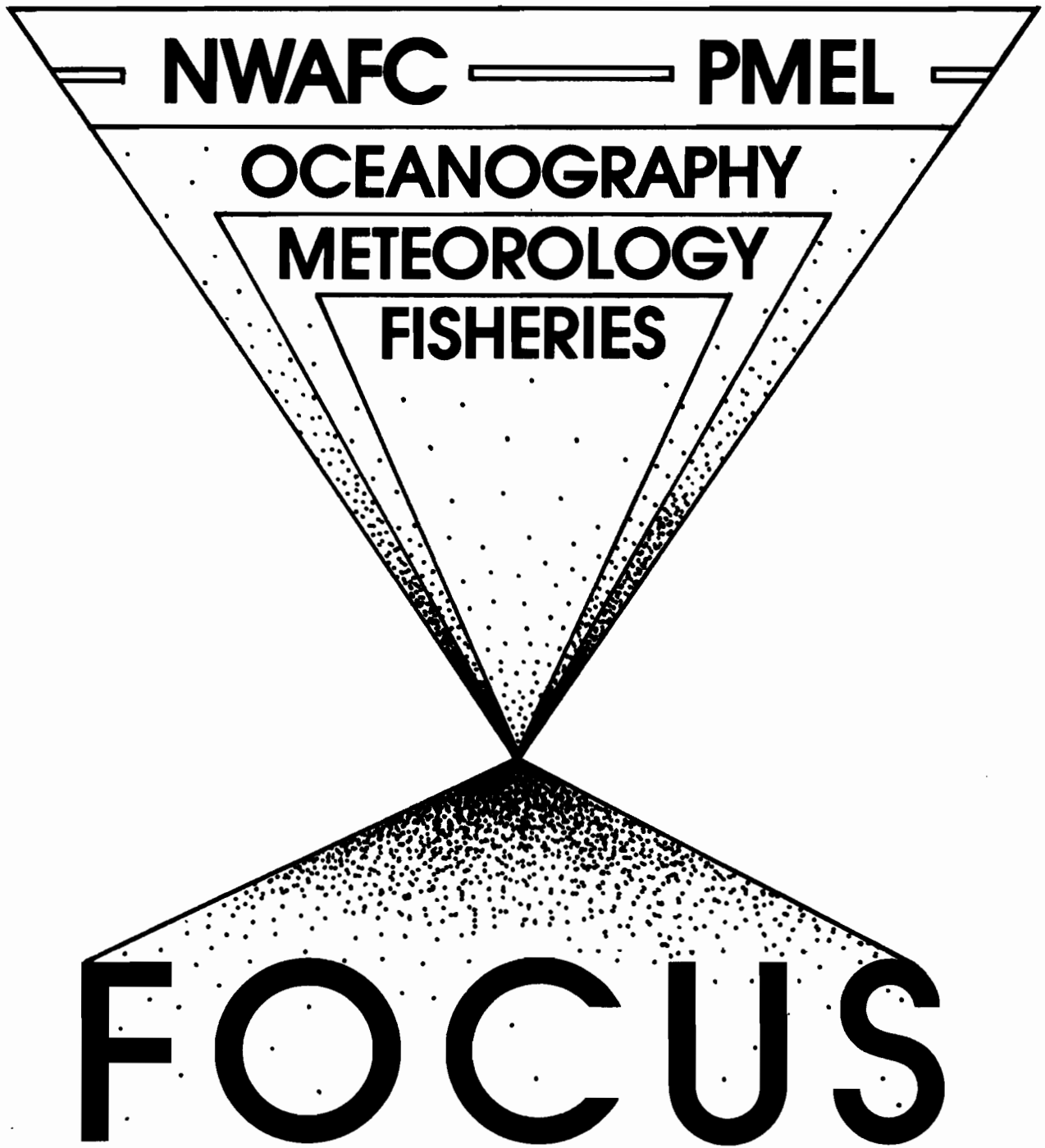


Figure 1. FOCUS facilitates cross-disciplinary research in fisheries oceanography.

## 1.0 INTRODUCTION

The Fisheries Oceanography Cooperative Users System (FOCUS) is a data base management system that facilitates the analysis of data within a distributed environment. It provides a mechanism to establish compatibility between existing data sets so that subsets of data can be selected and associated. The system is a result of a cooperative project by NOAA's Northwest and Alaska Fisheries Center (NWAFC) and the Pacific Marine Environmental Laboratory (PMEL). The project was funded by the administrator of NOAA with the goal of developing a regional information resource for Fisheries Oceanography Research (Parker and McConaghy, 1983).

This user's guide describes how to gain access to FOCUS and utilize it efficiently. For a comprehensive description of the internal structure of FOCUS, please refer to NOAA Technical Memorandum ERL PMEL-50, FOCUS - Fisheries Oceanography Cooperative Users System (McConaghy *et al.*, 1983). Appendix A contains a listing of other useful guides.

## 2.0 FOCUS OVERVIEW

FOCUS serves as a mechanism for providing compatibility between existing data sets and thus, entire data bases (RACEBASE, R2D2, etc.) have been incorporated into the overall system. A tiered directory is used to index data within the system. FOCUS provides a global data index that lists data sets, their access system, time and geographic limits, data types, and other related information. This index is maintained using Relational Information Management (RIM), a data base management package which follows the concepts of a relational data base model using free-field English-like commands to facilitate data definition, update, and retrieval (University of Washington, 1982). For more detailed information about a

given data file, the user would access the local index related to a specific data base.

Once a data set has been identified, the entire file or a subset can be extracted using the procedures associated with its respective data base. FOCUS then uses a series of menu-driven interactive programs (identified as the "black box" in Figure 2) to transform the attributes of the data subset into standard "FOCUS data relations." All codes and units are standardized and the data is stored under the user's account in card-image format according to a predefined relational schema.

FOCUS then loads the relations into a "mini relational data base" (MRDB) using RIM. Through iterative uses of this procedure, several data subsets from different sources can be accumulated on one mini data base. In most cases the MRDB would only contain a few data subsets at a given time. However, it could conceivably contain all the information from several data bases depending upon the needs of the user. The MRDB concept and the selection of software tools available within RIM allow the researcher to associate, join and directly analyze two or more data types from various data sets and computers.

The user has the option of saving his files after creating either the "FOCUS data relations" or the "mini relational data base." Additionally, the user can backtrack through the system and output a "user data file." This file contains data in the format required for a given application. Each of the major data systems (R2D2, RACEBASE, METLIB) has a series of unique application programs for processing and analysis purposes. The "user data file" can also be in a card-image format to facilitate using other applications or statistical packages such as SPSS (Nie, 1975) and BMD (Dixon, 1977).



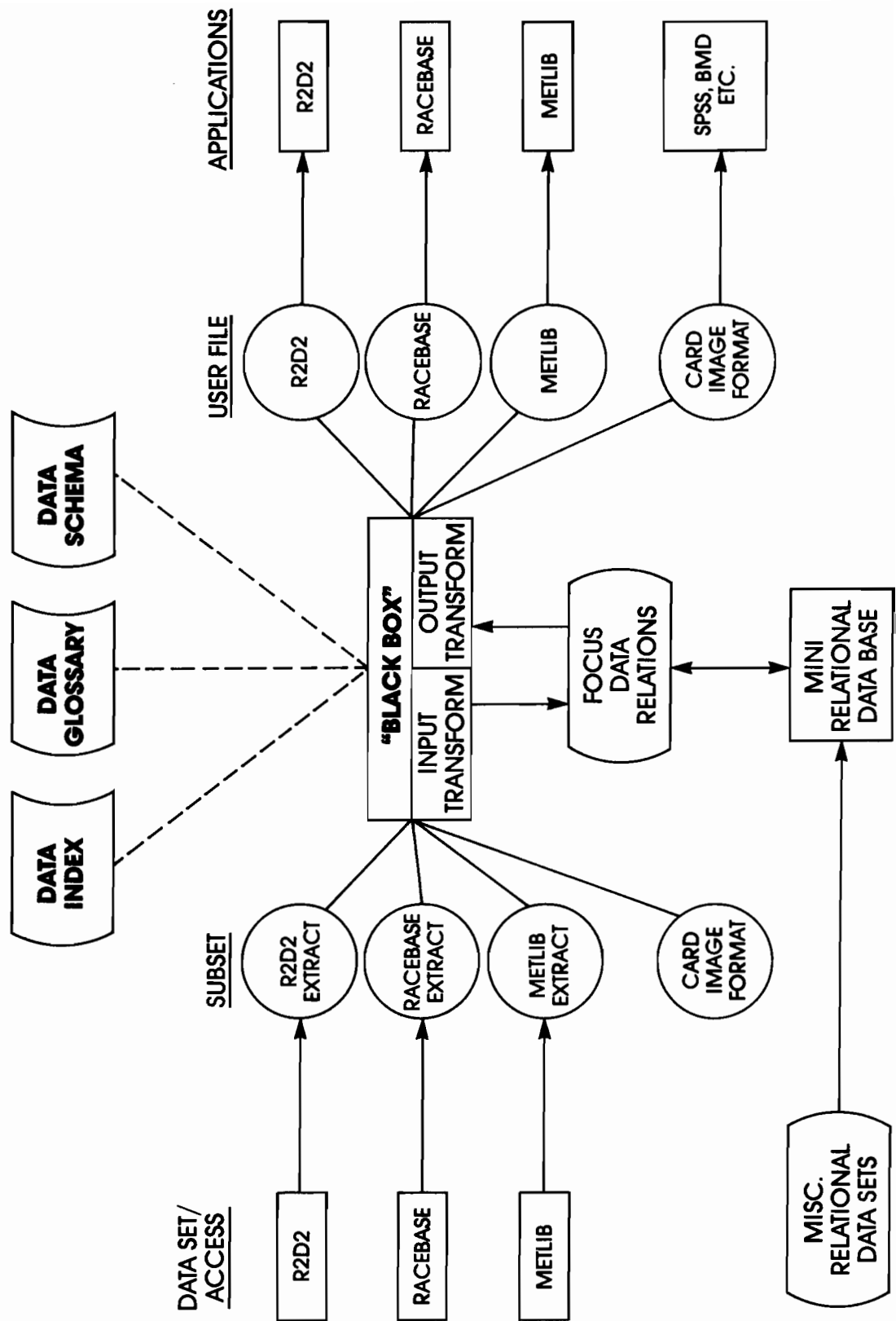


Figure 2. FOCUS system design.

The relational aspects of FOCUS enable readily sortable data formats to be created in a standardized fashion so that processing techniques and data applications may be run with greater efficacy. Thus research efforts may be consolidated just as data bases and analysis programs have been, accessing in a single integrated system a wide variety of complex interaction computations. The relational approach facilitates the sorting process, along with data editing, plotting and problem isolation within the system. Finally, the "black box" design provides the essential liaison between these capabilities across an ensemble of data bases (most of which were collected and designed for different purposes) in order to output statistical summaries, profiles, time series plots, and various other data summaries. The system represents an extremely useful product for ocean data analysis as well as fisheries research and management. Ultimately, the linking of existing data bases into a user-friendly relational data base management system will facilitate communication and cooperation between oceanographers, meteorologists and fishery scientists for this resource-rich region.

To explain how FOCUS might be utilized, let us consider a simple demonstration that compares a sea surface or bottom temperature time series to the estimated abundance of pre-juvenile red king crab. The user would take the following steps to "focus" his data.

- 1) Start R2D2 (Pearson, Krancus, and Charnell, 1979; Pearson, 1981) on the CDC computer and sort by latitude/longitude, month/year and compute mean temperatures at desired depth. Generate a data subset or extract using R2D2's user data file format.

- 2) Run RACEBASE (Mintel and Smith, 1981) routines on the Burroughs computer to generate an output file listing the abundance of pre-juvenile red king crab. This file would then be transferred in card image format to the CDC computer using a stranger tape.
- 3) Start FOCUS, which would read the two data subsets and transform their attributes into standard "FOCUS data relations" with codes and units standardized.
- 4) FOCUS would load these data relations into a "mini relational data base" using RIM. The user can then use RIM commands to build a new relation that would associate temperature and estimated abundance.
- 5) Specify an output analysis option such as SPSS or BMD. FOCUS then retrieves the appropriate attributes from the "mini relational data base" and builds a user file with the required format (card-image, in this case). The user can then run the analysis on the CDC or transfer the file to the Burroughs.

### 3.0 GETTING STARTED

FOCUS physically resides on the NOAA Control Data Corporation (CDC) CYBER 170/750 computer located in Boulder, Colorado. The CYBER currently runs a NOS operating system (see Appendix B). PMEL has a remote job entry (RJE) terminal with both print and plot output capabilities. Users may pick up their output in the terminal room at PMEL or call the RJE operator (526-6753) and have it mailed to their office.

The CYBER is normally scheduled to run 24 hours a day, Monday through Friday, as well as most weekends and holidays. However, as the Boulder computer operators are on duty only during the daytime and evening hours, users should run any tape jobs between the hours of 5 A.M. and 11 P.M. (Seattle time).

### 3.1 Establishing a Computer Account

Computer accounts may be established for any individual employed by an organization authorized to access the Cyber 750 computer system.

To establish a computer account, contact User Services, 303-497-5850, FTS 320-5850, and provide the following information:

1. Name, address, and telephone of primary user of the account.
2. Name, address, and telephone of authority contact for the account (generally the supervisor or group leader).
3. Family name (NOAA).
4. User name (2 to 7 letters and/or numbers).
5. Alternate user name (in the event first choice is already taken).
6. Initial user account password (4 to 7 letters/numbers). You should change this password immediately after the account is established.
7. Budget charge numbers.

Your new computer account will be established and ready to use within one working day of your request.

User Services can also be contacted regarding inquiries about rates and computer charges. For interactive users, the primary unit of measure for computer charges is called the System Resource Unit (SRU). SRU usage is displayed at the termination of timeshare terminal sessions.

To calculate the cost of your SRU usage use the new rates listed below:

JOB CLASS	RATE
P2	\$0.08/SRU
P4	\$0.008/SRU

There is a charge for each permanent file stored on the NOAA family disks. Permanent file accounting is taken once each day, Saturdays and Sundays excepted. The daily storage rate is \$0.000576 per PRU (physical recored unit = 640 characters). There is a minimum daily storage charge of \$0.02 per file. The FILCOST utility program provides a usage summary for your permanent file catalog. To access and run the program, enter the following commands from an account in the NOAA family:

```
GET,FILCOST/UN=DOCLIB
FILCOST.
```

The report from the FILCOST program is written to a local file named ZFILCST with printer carriage control.

A summary of your computer charges for a particular charge/project number can be obtained by entering the following command:

```
COSTS,lfn,CC.
```

where "lfn" is the name of the file on which the report will be written (default is "OUTPUT"). The "CC" parameter is necessary only if line printer carriage control is desired (default for interactive jobs is no carriage control).

### 3.2 Logging On

First, your terminal (and modem) should be set for full duplex. Next, dial up the CYBER either via the data switch at PMEL or directly

using commercial lines or FTS. Phone numbers for the PMEL data switch are as follows:

206-526-6772 for 300 Baud  
206-526-6774 for 1200 Baud

(Note: PMEL offices have wall outlets for direct connection to the data switch.)

Once connected to the switch, the message WHERE TO BUDDY will be displayed.

Respond to the message by typing CYBER to access the Boulder CYBER. The

CYBER can also be called directly using the following numbers.

FTS	COMMERCIAL	BAUD
320-3020	303-497-3020	300
320-3070	303-497-3070	1200

After your terminal is connected, press the [BREAK] and [RETURN] keys (you may need to press [RETURN] more than once). When the line

ENTER CLASS

appears on the screen, the user can log in to the system by entering a class code (type in 010) and pressing [RETURN]. If the code is valid, the system responds with the line

CLASS 010 START

The user should wait a few seconds and then press [RETURN] to begin the CYBER log in sequence. If three lines ending with FAMILY: appear on the screen (see lines 1-3 below), the user can log in to the CYBER. The following is an example of what appears on the terminal screen during a typical CYBER log in sequence (PMEL Computer Services, 1982):

---

82/01/06. 11.39.13	line 1
N O A A / E R L 170/750 82/01/01. NOS 1.4 531/528.10	line 2
FAMILY:	line 3
USER NUMBER:	line 4
PASSWORD	line 5
APPLICATION IAF	line 6
TERMINAL: 52, TTY	line 7
RECOVER/ CHARGE: CHARGE, Z877654320,Z	line 8
\$CHARGE,Z87654320,Z	line 9
/	line 10

---

Lines 1-3: The computer issues data and time information, then asks for FAMILY:

Respond by simply hitting the [RETURN] key. This is equivalent to typing NOAA [RETURN].

Line 4: The computer then asks for a USER NUMBER:

Respond with the user name you were assigned when you opened your computer account. For example, your user name might be ABC, so you would type ABC and hit the [RETURN] key. For security reasons, the user name you type in does not appear on the screen.

Lines 5-6: The computer requests a PASSWORD and APPLICATION:

Type in your password and hit [RETURN]. For security reasons the letters you type do not appear on the screen when you enter the password. Enter IAF for APPLICATION.

Line 7: The computer issues this line, which contains important information that you will need if you become accidentally disconnected from the computer later on in the session. The number 52 in this line is the port number you would need to know in case you wanted to attempt a recovery after being disconnected.

Lines 8-9: The computer requests that you enter a CHARGE or RECOVER command (RECOVER/CHARGE):

Respond by typing in the complete CHARGE command line:

CHARGE,Z8nnnnnnn,Z.  
or  
CHARGE,W82nnn,sub.

where n is a digit and sub is a character field of up to 10 characters. Use the charge account number and project number

you were assigned when you opened a computer account at PMEL. The computer responds with a copy of the CHARGE command if the CHARGE command was valid, or with an ILLEGAL CHARGE if it was not.

Line 10: The computer system prompts users with a slash mark. You can now enter any of the NOS commands listed in the NOAA Time-Sharing User's Reference Manual as well as many of the commands listed in the NOS Reference Manual, Volume 1, including another CHARGE command if the response to your first CHARGE command was ILLEGAL CHARGE.

To log out, the user must type in

BYE

and turn off the terminal and modem. Simply turning off the terminal or hanging up the phone does not automatically log out the user for at least ten minutes.

### 3.3 Useful Files

There are three useful files that should be created on your account prior to using FOCUS. These files are PROCFIL, USERID and BANNER. The files are needed by the FOCUS system to know where to send your output, what your user number is and how to label your output.

#### 3.3.1 PROCFIL

Several useful procedures have already been saved on a file called PROCFIL under the user name PMELIB. They have been written to make the RJE operations run more smoothly.



Before you can use these procedures, you must create a PROCFIL and save it as a permanent file under your own user name. To do this, type in

```
GET,GPROCF/UN=PMELIB
GPROCF
```

and simply respond appropriately to the prompts that GPROCF issues to you. When GPROCF suggests that you save your new PROCFIL, enter

```
SAVE,PROCFIL
```

### 3.3.2 USERID

In order to access all of the options in FOCUS, you need to create a file named USERID containing your user name and charge number. This file should look as follows:

```
USER,user name,PASSWORD.
CHARGE,charge number,project number.
```

To create this file, enter XEDIT,USERID. The terminal will respond with a ?? prompt. Press [RETURN] again and you will get a single ? prompt. Then key in the required information. Don't forget to include the ".". When you have finished, press [RETURN] again to get the ?? prompt and then enter E,,RL. The USERID file is now a permanent file on your account. If you change your password, don't forget to also change your USERID file.

### 3.3.3 BANNER

Users intending to access R2D2 should create a procedure file called BANNER. This file is used internally by R2D2. If BANNER is not found, execution will continue but a warning message will be printed. An example of a BANNER file is:

```
PROC,BANNER,LFN.
HEADING,LFN.  MCCONAGHY
```

This file can be created by following the same steps used to create the USERID file (see section 3.3.2).

#### 4.0 FOCUS

To start FOCUS you need to enter two commands as follows:

```
GET,FOCUS/UN=FOCUS
FOCUS
```

The terminal will then respond with a FOCUS greeting and the main menu (Figure 3). From the main menu, you enter the number of the desired option and FOCUS will initiate that particular task. At the completion of the task, you will return to the main menu where another option may be selected. If you get stuck somewhere and there is no apparent path back to the main menu, you can always enter STOP. This aborts both the current task and FOCUS. FOCUS can be restarted by entering FOCUS. The following sections describe each of the options on the main menu.

#### 4.1 HELP

The HELP option will display a series of eight screens that briefly describe the items on the main menu (Figure 3). The screens are titled:

```
FOCUS INTERACTIVE MENU
USERID FILE
FOCUS NEWS
FOCUS DATA DICTIONARY
FOCUS DATA BASE INITIALIZATION
FOCUS DATA TRANSFORMATION
DATA BASES
APPLICATION PACKAGES
EXIT FOCUS
```

The screens are displayed sequentially. At the end of each screen the title of the next screen is displayed and the user is prompted to [RETURN] to continue or enter QUIT to stop.

FOCUS

VERSION 2/10/84

FISHERIES  
OCEANOGRAPHY  
COOPERATIVE  
USERS  
SYSTEM

3/20/84: SHIPOBS DATA NOW AVAILABLE FOR DETAILS--SELECT NEWS ON MAIN MENU.

FOCUS MAIN MENU

1. HELP
2. NEWS
3. FOCUS DATA DICTIONARY
4. FOCUS DATA BASE INITIALIZATION
5. FOCUS DATA TRANSFORMATION
6. DATA BASE
7. APPLICATION PACKAGES
8. EXIT FOCUS

ENTER THE NUMBER OF YOUR CHOICE

?

Figure 3. FOCUS Main Menu

FOCUS INTERACTIVE MENU:

```
* * * * *
* NOTE:  FOCUS REQUIRES THAT YOU HAVE A FILE *
* CALLED "USERID" CONTAINING YOUR USER AND *
* CHARGE NUMBER. *
* * * * *
```

FOCUS IS A USER FRIENDLY SYSTEM DESIGNED TO FACILITATE THE ASSOCIATION AND ANALYSIS OF VARIOUS FISHERIES, OCEANOGRAPHIC AND METEOROLOGICAL DATA SETS. THE INTERACTIVE MENU PROVIDES EVEN THE OCCASIONAL USER WITH A MEANS OF MOVING FROM ONE TASK TO ANOTHER WITHOUT HAVING TO WORRY ABOUT CYBER CONTROL LANGUAGE COMMANDS.

FROM THE MAIN MENU, YOU MERELY ENTER THE NUMBER OF THE DESIRED OPTION AND FOCUS WILL INITIATE THAT PARTICULAR TASK. AT THE COMPLETION OF THE TASK, YOU WILL RETURN TO THE MAIN MENU WHERE ANOTHER OPTION MAY BE SELECTED. IF YOU GET STUCK SOMEWHERE, A "STOP" COMMAND WILL ABORT BOTH YOUR TASK AND FOCUS.

THIS HELP FILE CONTAINS A SHORT SECTION ON EACH OF THE MENU ITEMS. FOR DETAILED INFORMATION ON FOCUS PLEASE REFER TO NOAA TECHNICAL MEMORANDUM ERL PMEL-50.

USERID FILE:

ENTER CR TO CONTINUE, OR "QUIT" TO STOP

?

Figure 4. HELP FILE - first screen

## 4.2 News

This option presents screens describing updates and other information related to FOCUS (Figure 4). The screens are presented in the same fashion as the HELP file. The headline from news is also displayed when FOCUS first begins.

```
3/20/84: SHIPOBS DATA NOW AVAILABLE
        SHIPOBS IS AN ABSTRACT OF DATA FROM SHIPBOARD RADIO WEATHER
        MESSAGES. GLOBAL COVERAGE FROM 1946 - 1984 IS PROVIDED. THE
        FOLLOWING STATISTICS: MEAN, STANDARD DEVIATION, NUMBER OF
        OBSERVATIONS, MINIMUM AND MAXIMUM ARE SUMMED OVER 5x5 DEGREE
        CELLS FOR THE FOLLOWING MEASUREMENTS: SST, SCALAR WIND, U, V,
        AND SURFACE PRESSURE. TO GENERATE AN ABSTRACT OF THE DATA, ENTER:
        GET,SOP8/UN=WDO
        -,SOP8
FOR FURTHER INFORMATION CALL BILL OTTO:  FTS-320-6232.

2/27/84: FOCUS DATA DICTIONARY UPDATED

ENTER CR TO CONTINUE, OR "QUIT" TO STOP
?
```

Figure 5. News File

## 4.3 FOCUS Data Dictionary

The FOCUS data dictionary is stored as a RIM database. This option automatically opens the database and displays the three relations that are available; GLOSSARY, SCHEMA, and INDEX (Figure 6). Desired information can be retrieved by using RIM commands (see Appendix C). The command EXIT will return you to the main menu.

The GLOSSARY is an abstract of all the variables associated with each data set related to FOCUS. The abstract includes variable names, meanings,

BEGIN RIM --- CDC VERSION 5.1 UW31 84/05/11 11.29.21  
UNIVERSITY OF WASHINGTON - RELATIONAL INFORMATION MANAGEMENT SYSTEM

FOCUS DATA DICTIONARY  
DATABASE FILE: FOCUS  
EXISTING RELATIONS AS OF 84/05/11 11.29.22

GLOSSARY  
SCHEMA  
INDEX

R>

Figure 6. FOCUS Data Dictionary

units and codes. The SCHEMA is a description of how data is logically organized within FOCUS. It is an abstract of relations and attribute names including formats and meanings for commonly used data sets.

The INDEX lists data sets pertinent to FOCUS, their access system, time and geographic limits, data types, and other related information. The entire INDEX can be listed with the RIM command SELECT ALL FROM INDEX or specific data sets can be identified by searching for desired attributes. Appendix D contains a list of attributes for the relation INDEX. Attribute names are limited to eight characters and have been abbreviated where necessary. The attributes providing general information on the data set such as data set name, time and space limits, remarks, etc. are of type "TEXT", "INT" or "REAL" as appropriate. The attributes identifying specific data types such as CTD, XBT, etc. are all numeric and have a value of 1 when the data set contains that data type or a value of 0 if it does not. If more detail is required, an index associated with the appropriate data base should be searched (see Figure 7).

## FOCUS DATA INDEX: FLOW DIAGRAM

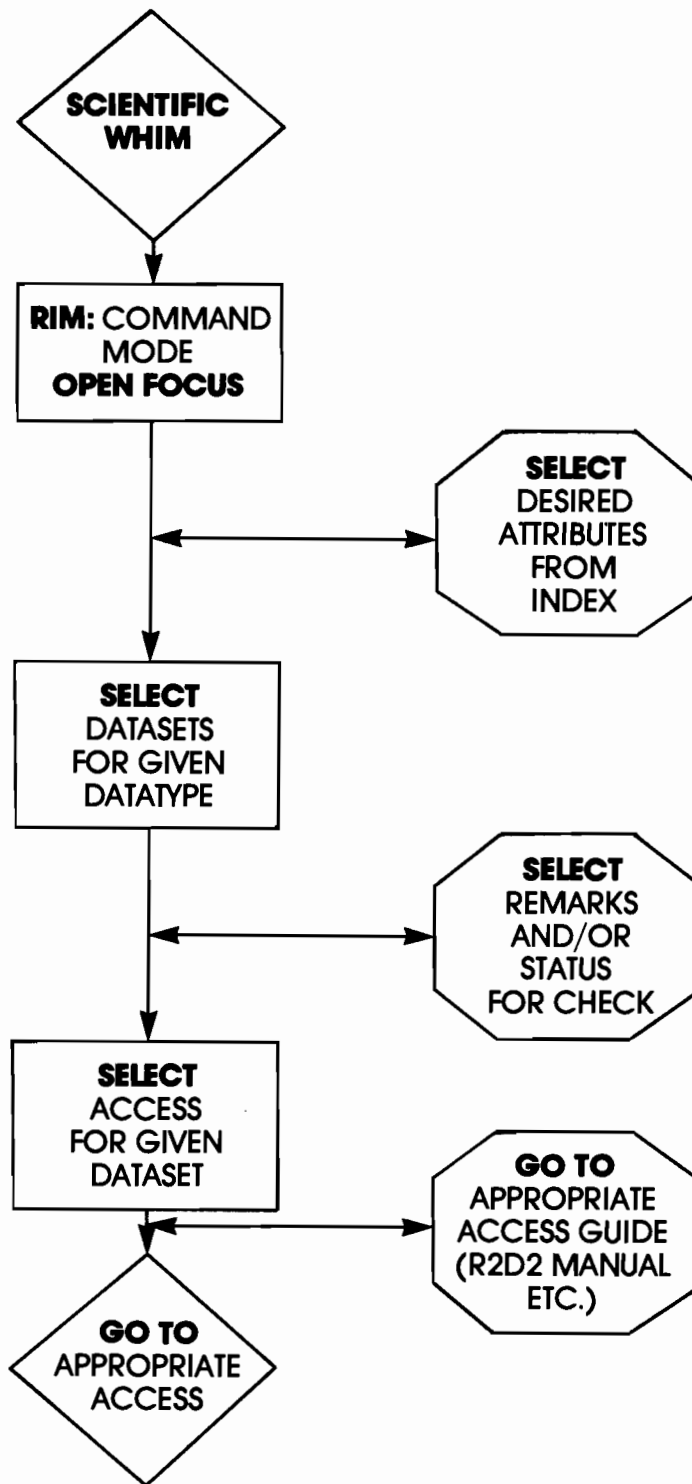


Figure 7. FOCUS data index: flow diagram.

#### 4.4 Data Base Initialization

RIM is the data base management system used by FOCUS. In order to set up a new data base, you must first specify or define all your attributes, and then group them into relations or tables. The "FOCUS data base initialization" option is a menu driven procedure that will do this automatically for standard relations according to the SCHEMA in the FOCUS DATA DICTIONARY (Figure 8). These standard relations are available for any of the data files recognized by "FOCUS data transformation" (see section 4.5). If desired, RIM commands can also be used to create new relations or modify the standard relations.

MRDB V1.0 8/12/83

FOCUS RIM SCHEMA CREATION PROGRAM

HELLO DAVID

ARE YOU A NOVICE USER  
DO YOU WANT INSTRUCTIONS?  
? Y

THIS PROGRAM WRITES INSTRUCTIONS WHICH  
ARE USED BY RIM TO CREATE A CUSTOMIZED  
USER DATABASE FROM A STANDARD DATABASE  
CONTAINING USEFUL FOCUS DATA RELATIONS.

A RIM DATABASE NAME MAY HAVE FROM 1 TO 6  
CHARACTERS, AND MUST START WITH A LETTER.  
WHAT DO YOU WANT TO CALL YOUR RIM DATABASE?  
?

Figure 8. Data Base Initialization



#### 4.5 FOCUS Data Transformation

Once your data base has been initialized or defined, you can load data into it. This is actually a two-step process. The first step requires that all codes and units be standardized and that the data be stored as a "FOCUS Data Relation" in character format. This file is called a card file (has nothing to do with cards). The second step involves the actual loading of this data from the card file onto a RIM data base identified as the "Mini Relational Data Base" (MRDB) in Figure 2. The FOCUS data transformation menu contains a list of options that will automatically perform either or both of these tasks (Figure 9).

FOCUS has predefined linkages and schemas that accomodate common data sets (*i.e.*, R2D2, RACEBASE). For other types of data subsets where no linkage exists, FOCUS may still be used if the data follows a relational schema (one record format per file) and is in card image (character) format. To do this you select processing type 3 - "card file to RIM". Another menu will appear and ask for the description of your file. Remember the data in your file must be compatible with the schema of your data base as defined under "data base initialization."

Additional data relations can be accumulated in your MRDB through successive runs of "data transformation" options. After several data sets have been loaded, RIM commands such as intersect, join, or select can be used to associate the data in any desired fashion. New data relations can be formed and simple statistics such as minimum, maximum, average, and sum can be computed.

This entire process can be reversed and RIM relations converted to "user data files" by selecting the appropriate "data transformation" option. If the desired output file doesn't have a predefined linkage you can use processing type 6 - "RIM to card file".

FOTRANS

VERSION 2/10/84

FOCUS DATA TRANSFORMATION PROGRAM

ARE YOU A NOVICE USER  
DO YOU WANT INSTRUCTIONS?  
? Y

THIS PROGRAM WRITES INSTRUCTIONS WHICH  
TELL THE COMPUTER HOW YOUR DATA IS TO BE  
TRANSFORMED. YOU MUST HAVE ONE OR MORE  
DATA FILES IN CARD FORMAT OR IN ONE OF  
A SET OF STANDARD R2D2 OR RACEBASE FILE  
TYPES.

USER DISPLAYS WILL BE SHOWN AUTOMATICALLY,  
AND MAY BE RECALLED BY HITTING RETURN.  
YOU MAY ACCESS THE HELP FILE BY ENTERING "?".  
YOU MAY EXIT AT ANY TIME BY ENTERING "STOP".

WHAT TYPE OF PROCESSING DO YOU WANT?

- |                           |                           |
|---------------------------|---------------------------|
| 1. DATA FILE TO RIM       | 4. RIM TO DATA FILE       |
| 2. DATA FILE TO CARD FILE | 5. CARD FILE TO DATA FILE |
| 3. CARD FILE TO RIM       | 6. RIM TO CARD FILE       |

? 1

ENTER TYPE OF DATA FILE TO BE INPUT

- |                             |                           |
|-----------------------------|---------------------------|
| 1. R2D2 STD USER DATA FILE  | 5. RACEBASE HAUL FILE     |
| 2. R2D2 CURRENT METER FILE  | 6. RACEBASE LENGTH FILE   |
| 3. R2D2 PRESSURE GAUGE FILE | 7. RACEBASE SPECIMEN FILE |
| 4. RACEBASE CATCH FILE      |                           |

Figure 9. Data Transformation

#### 4.6 Data Bases

The data bases and functions of the FOCUS data base menu (Figure 10) are as follows:

RIM: This option initiates execution of the UWRIM package. Once opened, you can create a new data base or access existing RIM formatted data bases.

R2D2: A Rapid Retrieval Data Display analysis package developed at PMEL for CTD and current meter data processing (Pearson *et al.*, 1979; Pearson, 1981). This data set has been organized for the Outer Continental Shelf Environmental Assessment Program (OCSEAP), a systematic mesoscale physical oceanographic and meteorological study in Alaska waters. Nearly two million observations for 49 coastal stations and 600,000 marine observations since 1972 are included, along with the National Climatic Center's (NCC) Tape Data Family 11 and summaries for selected stations.

A variety of other meteorological data sources were integrated by the OCSEAP efforts such as the National Weather Service, U.S. Navy and Air Force and Alaska's Arctic Environmental Information and Data Center. Data from 12,000 CTD/STD hydrographic casts, over 600 current meter and pressure gauge records and over 6,000 casts from 80 research cruises are included.

The R2D2 option will initiate execution of the R2D2 package.

RACEBASE: The resource assessment survey data base and analysis system at the NWAFC. This system was designed to process data from groundfish surveys. The data base contains information from approximately 30 years of such surveys in the Pacific Northwest and Alaska regions.

RACEBASE currently represents the central fisheries data and analysis capacity within FOCUS. It includes a variety of functions for reporting and analysis such as data listings, statistics, plots, and data editing

and checking. Organized in a relational concept, the various data files within the system may be associated through common data elements. This relational concept also provides a wide range of opportunities for interfacing with other major data bases (Intel and Smith, 1981).

The RACEBASE option will display information that will show you how to access the data base.

METLIB: A FORTRAN program library for deriving geographic time series of geostrophic, gradient, or surface winds from sea level pressure (SLP) and ancillary fields gridded on a polar stereographic projection. Such fields are generated at the National Meteorological Center (NMC) and at Fleet Numerical Oceanographic Central (FNOC). The library also contains programs for contouring scalars, such as SLP or wind speed, and for plotting vector arrows with a map background. PMEL has tape files of associated data for the Bering Sea and Gulf of Alaska (Overland *et al.*, 1980).

The METLIB option will display information that will show you how to access the data base.

MOODS: U.S. Navy Fleet Numerical Oceanography Center's (FNOC) "Master Oceanographic Observations Data Set." The MOODS compilation contains over 3.6 million observations on comprehensive 9-track monthly tapes (6250 BPI), including National Oceanographic Data Center (NODC) files, unclassified U.S. Navy data and Japanese bathythermograph data (Fleet Weather Facility, Yokosuka). It represents one of the most complete sets of subsurface profile data for global oceanography. The operational analysis provides subsurface data to 700 m (below which profiles blend with deep climatology).

An extract was produced by FNOC and FOCUS that includes most hydrographic information compiled since 1923 in the subarctic Pacific region from

48°-67°N and 122°W-150°E. Most of the data collected under OCSEAP (see R2D2 below) were also merged into the MOODS format as part of the compilation.

The MOODS option initiates a menu driven routine that can be used to select a subset of data.

SLVLUS: The NOAA National Ocean Survey (NOS) has calculated monthly mean sea level from hourly data at tide gauge stations in the Gulf and the Bering Sea since the 1940's, providing continuous time series data for circulatory calculations in the region. These data were compiled and edited by Dr. K. Wyrski of the University of Hawaii.

The SLVLUS option initiates a menu driven routine that loads the dataset onto a RIM formatted database.

#### 4.7 Application Packages

The application menu provides three options (Figure 11). "TAPE COPYING" is a menu driven routine that will assist you in either reading or writing stranger tapes. "OMNITAB" is a statistical analysis package. The language is relatively simple and easy to use, but you should read the reference manual for detailed instructions.

Note: your input/output files should be named OMFIL1 ... OMFIL6. "NOS command access allows you to use almost all of the CCL commands (CYBER job control language) without exiting FOCUS.

Note: use COPY, FN instead of -ROUTE or LIST. A RETURN will return you to the applications menu.

FOCUS DATABASE MENU

1. RIM
2. R2D2
3. RACEBASE
4. METLIB
5. MOODS
6. SLVLUS
7. RETURN TO MAIN MENU

ENTER THE NUMBER OF YOUR CHOICE  
?

Figure 10. Data Bases.

FOCUS APPLICATION MENU

1. TAPE COPYING
2. OMNITAB
3. NOS COMMAND ACCESS
4. RETURN TO MAIN MENU

ENTER THE NUMBER OF YOUR CHOICE  
?

Figure 11. Application Packages.

## 5.0 ACKNOWLEDGMENTS

FOCUS has been a cooperative project and its design reflects an accumulation of thoughts and ideas from many individuals. Guidance was provided by an advisory committee which consisted of fifteen members from both NWAFC and PMEL and one from the International Pacific Halibut Commission. Sections of this memorandum were taken in part from NOAA Technical Memorandum ERL PMEL-50, FOCUS - Fisheries Oceanography Cooperative Users System, McConaghy *et al.* This project was supported by the NOAA Administrator's Discretionary Fund.

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Pearson, C. A., 1981: Guide to R2D2 - Rapid Retrieval Data Display, NOAA Technical Memorandum ERL PMEL-29, U.S. Dept. of Commerce, Wash. D.C., 148 pp.

PMEL Computer Services, 1982: How to work with NOAA's CYBER computer, NOAA/PMEL, Seattle, WA, 123 pp.

University of Washington, 1982: UWRIM Primer, N509, University of Washington Academic Computer Center, Seattle, WA, 35 pp.

## 7.0 Appendices

### Appendix A.

#### Reference Guides

The following is a list of useful reference guides that might be handy to have for serious FOCUS users.

CDC: "How to Work With NOAA's Cyber Computer"  
Call Laura McCarty 526-6767

Burroughs: "NWAFC Primer For Interactive Usage"; On line documentation.  
LIST (ADPX0030)DOC/SYS/14 on OFIS  
and LIST (ADPX0030)DOC/DOC on OFIS

RACEBASE: NOAA Technical Memorandum NMFS F/NWC-18, Mintel and Smith, 1981.  
Call Gary Smith 442-0822

R2D2: NOAA Technical Memorandum ERL PMEL-29, Pearson, 1981.  
Call David Kachel 526-6783

FOCUS: NOAA Technical Memorandum ERL PMEL-50, McConaghy *et al.*, 1983.  
Call David McConaghy 526-6806

RIM: "UWRIM Primer N509", "UWRIM Reference Manual N510"  
Call U of W Academic Computer Center 543-5970

## Appendix B

### Useful CCL Commands

ATTACH, fname/UN = usern	: allows you to access direct access files.
BEGIN, fname	: initiates execution of a procedure file.
BYE	: the log out command.
CATLIST	: lists your permanent file directory.
CHANGE, newfname = fname	: changes the name of a file.
DEFINE, fname	: creates a direct access permanent file.
ENQUIRE,F	: lists your local file directory.
GET, fname/UN = usern	: allows you to access indirect access files.
LIST,F = fname	: lists a local file on the screen.
PASSWOR	: starts a procedure to change your password.
PURGE, fname	: erases a permanent file.
REPLACE, fname	: saves a local file as a permanent file but erases any other permanent file with the same name.
RETURN, fname	: clears a file from your local file space.
REWIND, fname	: rewinds a file.
SAVE, fname	: saves an indirect access file as a permanent file unless there is another permanent file by the same name.
SUBMIT, fname	: submits a file to run as a batch job.
XEDIT, fname	: calls the Xedit editor to edit a local file. Selected commands as follows:

**XEDIT Commands:**

- B            moves pointer to last line of current record in file.
- T            moves pointer to the top of the file.
- Nn           advances pointer n lines from its current position.
- N-n          moves pointer backwards n lines.
- Pn           prints n lines, starting at the current pointer position.
- C/string1/string2/n    replaces every occurrence in n lines of string1 with string2.
- Dn           deletes n lines.
- In           inserts n lines after the current pointer position.
- [c/r]        same as INPUT command except no editing allowed and input terminated with another carriage return as the first entry in a line.
- E,,RL       terminates editing by both replacing the edited copy and making it local.
- STOP         terminates editing and restores file to original condition.

## Appendix C

### Useful RIM Commands

DELETE DUPLICATES [attname1, attname2, ...] FROM relname

DELETE ROWS FROM relname WHERE...

EXIT : leaves RIM system.

INTERSECT relname1 WITH relname2 FORMING relname3 [USING attname1...attnamen]

JOIN relname1 USING attname1 WITH relname2 USING attname2 FORMING relname3  
[WHERE (EQ) (NE) (GT) (LT)]

LISTREL : lists relations.

LISTREL relname : lists the schema of relname.

MENU : places RIM in menu mode.

NEWPAGE : causes a new page to be issued (for nonterminal output only).

OPEN dbname : opens RIM data base.

OUTPUT filename : directs RIM output to a specific file.

OUTPUT TERMINAL : directs RIM output to terminal screen.

PROJECT relname1 FROM relname2 USING (ALL) (attname1...attnamen) [WHERE ...]

RELOAD : rebuilds data files to recover unused space created by deletions.

REMOVE relname : erases a relation.

RENAME attname1 TO attname2 [IN relname]

RENAME RELATION relname TO newname

SELECT (ALL) (attname1...attnamen) FROM relname [SORTED BY attname1 + (=A)(=D)]...attnamen [(=A)(=D)] [WHERE...]

SUBTRACT relname1 FROM relname2 FORMING relname3 USING attname1...attnamen

UNION relname1 WITH relname2 FORMING relname3 [USING attname1...attnamen]

## Appendix D

### INDEX ATTRIBUTES

The FOCUS data index is composed of a number of standard attributes that are used to describe the data sets available to FOCUS. A user can select any number of attributes to provide information on data sets of interest. The following is a list of the attributes currently in use along with their descriptions. This list may expand as more data is acquired and more attributes are needed to describe all of the data sets. Descriptive attributes may be TEXT, an integer (INT), or REAL. This is specified in parentheses after the attribute name as is the number of characters which can be entered for the text attributes. All data type attributes are type INT with a value of 1 or 0, depending on whether that data type is included in the data set.

#### A. Descriptive attributes

1. DATASET (TEXT, 8): The name given to a data set. Usually an acronym or abbreviation that should be easily recognized by potential users.
2. SOURCE (TEXT, 20): A recognized acronym or combination of acronyms that defines the agency or source from which the data set was obtained.
3. ACCESS (TEXT, 10): Refers to the appropriate data base, computer, or other medium on which the data currently resides. Examples are R2D2 (data base), CDC (computer) and TAPE (if not yet loaded on computer).
4. STATIONS (INT, 1): An integer indicating the number of stations included in a data set.
5. STATUS (TEXT, 20): A three word code to describe the current status of a data set. Status codes are listed at the end of Appendix D.
6. REMARKS (TEXT, 40): A short written description of the data set.

7. SDATE (INT, 1): A four digit integer that indicates the start year and month (YR MO) of the data set.
8. EDATE (INT, 1): A four digit integer that indicates the end year and month (YR MO) of the data set.
9. LOLAT (REAL, 1): A four digit real number that indicates, in decimal degrees, the low latitude limit of the area covered by the data set. North latitude is assumed.
10. HILAT (REAL, 1): A four digit real number that indicates in decimal degrees, the high latitude limit of the area covered by the data set. North latitude is assumed.
11. ELONG (REAL, 1): A real number that indicates the eastern longitude limit in decimal degrees of the area covered by the data set. A positive value implies west longitude and a negative number denotes east longitude.
12. WLONG (REAL, 1): A real number that indicates the western longitude limit in decimal degrees, of the area covered by the data set. A positive value applies to west longitude and a negative value refers to east longitude.

B. Data type attributes

1. CTD: Profile data including temperature, salinity, and depth.
2. XBT: Digitized expendable bathythermograph data including temperature and depth.
3. HYDRO: Temperature, salinity and depth profile data as collected with Nansen or Niskin bottles at intermittent levels.
4. SPM: Suspended particulate matter, as derived from the light attenuation measurements of a transmissometer.
5. SURFTEMP: Water surface temperature.
6. CURRENT: Current meter time series data including U and V vector components, speed and usually temperature. May also include salinity, pressure and light attenuation.
7. BOTPRES: Bottom pressure time series as collected by a moored pressure gauge. May also include temperature time series.
8. SEALEVEL: Sea level time series measurements typically measured by coastal tide gauges. Usually expressed as monthly means.
9. RIVERFLO: Volumetric flow measurements for major rivers. Usually expressed as monthly means.
10. SLP: The air pressure at sea level.
11. TEMP: Surface air temperature.
12. THICKNESS: A meteorological parameter referring to the vertical air column thickness between the 500 mb and 1000 mb pressure surfaces.
13. WINDVEL: Wind velocity time series measurements, usually expressed as U and V components.
14. AIRTEMP: Air temperature measurements.
15. AIRPRES: Air pressure measurements.



16. GROUND: Refers to ground (bottom) fish measurements of species composition, length frequencies and age structure.
17. PELAGIC: Refers to open ocean, mid water fish measurements of species composition, length frequencies and age structure.
18. CRAB: Refers to measurements of crab size, year class and abundance.
19. PHYTO: Measurements of phytoplankton.
20. ZOO: Measurements of zooplankton.
21. LARVAL: Measurements of fish and crab larvae.
22. NUTRIENT: Nutrient measurements including NO<sub>3</sub>, PO<sub>4</sub>, S<sub>1</sub>O<sub>4</sub>, NH<sub>3</sub> and others.
23. O<sub>2</sub>: Dissolved O<sub>2</sub> measurements.
24. CARBON: Carbon measurements.
25. CHLOR: Chlorophyll measurements.
26. Other

#### Status codes

The following is a list of the code words used to describe the current status of data sets included in FOCUS.

1. a. "FOCUS" - All data from a data set is accessible and included in FOCUS.
- b. "FOCUS/Partial %" - Some but not all data from a data set is included in FOCUS. Partial % would describe the approximate percentage of data accessible.
2. "POSSESS/location/who" - Physically have possession of, or access to, a data set but not yet included in FOCUS. Location would describe where data is stored such as PMEL, CDC, B7811, etc. Who would indicate who currently has knowledge of the data set.
3. "SOURCE/date/who" - Data has not yet been acquired from the source. Date would describe when the data was requested from the source. Who would indicate who requested this data and/or has information on status of the data set.