

**DMSO MEL-TRG-PAPER-0300**

**INTEGRATED NATURAL ENVIRONMENT  
AUTHORITATIVE REPRESENTATION PROCESS  
(INE ARP)**

**MASTER ENVIRONMENTAL LIBRARY  
(MEL)**

# **TECHNICAL REFERENCE GUIDE**

*Characteristics and Performance*



**November 2001**

Defense Modeling and Simulation Office

Washington, DC

**INTEGRATED NATURAL ENVIRONMENT  
AUTHORITATIVE REPRESENTATION PROCESS  
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**November 2001**

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APPROVED BY:

  
MEL PROJECT LEAD

# **MEL Technical Reference Guide**

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## **FOREWORD**

The Department of Defense (DoD) Modeling and Simulation Master Plan (MSMP), DoD 5000.59-P, October 1995, identifies sub-objectives for providing authoritative representations of the natural environment, and discusses creation of Modeling and Simulation Executive Agents (MSEAs). Under separate letters the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) designated the Defense Mapping Agency (now part of the National Imagery and Mapping Agency), the Department of the Navy and the Department of the Air Force as the MSEAs for the natural terrain, ocean, air, and space environments respectively.

The Master Environmental Library (MEL) is sponsored by the Defense Modeling and Simulation Office (DMSO), and managed under their Integrated Natural Environment (INE) Program. This Technical Reference Guide (TRG) describes the general characteristics and performance features of the MEL, and will be reviewed and updated as required to maintain its currency.

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## RECORD OF CHANGES

CHANGE NUMBER	DATE OF CHANGE	CHANGE DESCRIPTION	DATE ENTERED	ENTERED BY

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## **NOTE: Conventions**

This document uses the following typographical conventions:

**CAPITAL LETTERS** for the names of Internet protocols, acronyms, and abbreviations.

**Boldface** type for references to other sections in this document and user actions.

*Italic* font for words, which have special meaning or emphasis.

`Monospaced font` for keywords in computer system commands, directory path names, and file names. In proper context, the text in `[square brackets]` represents command options and text in `<angle brackets>` represents items the user should replace with applicable text.

*Monospaced italic font* for Internet addresses.

Acronyms and abbreviations used in this document are defined in [Appendix A](#).

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## SECTION 1. INTRODUCTION

### 1.1 PURPOSE

This *Technical Reference Guide* (TRG) provides information about the general characteristics and performance features of the Master Environmental Library (MEL). It is intended for use as a technical reference by the MEL Site Administrators and other project personnel. [Appendix A](#) contains a list of Acronyms and Abbreviations used in this document.

### 1.2 BACKGROUND

#### THE MEL MISSION

To support the warfighter and national decision makers, with outreach to the non-Department of Defense (DoD) and commercial communities, through direct and timely access to natural environmental information, products and data that support a common interoperable view of the battlespace and help ensure battlespace dominance; and through the supply of natural environmental information, products, and data to models and simulations for training, analysis, and acquisition.

Objective Two of the *Modeling and Simulation Master Plan* (MSMP) is to provide timely and authoritative representations of the natural environment, which includes terrain, oceanographic, atmospheric, and near-space information. The MEL project supports this objective by providing users with direct and timely access to natural environmental information, products and data for battlespace modeling, simulation, management, planning, training, and development. The MEL project is sponsored by the Defense Modeling and Simulation Office (DMSO), and managed under their Integrated Natural Environment (INE) Program. A more detailed chronological history of the MEL project is provided in [Appendix B](#).

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## SECTION 2. THE MEL OVERVIEW

The MEL supports discovery and retrieval of authoritative information about the natural oceanographic, meteorological, terrain, and near-space environment from geographically distributed databases via the Internet, NIPRNET<sup>1</sup>, or SIPRNET<sup>2</sup>. As shown in **Figure 1**, the MEL is based upon a library paradigm in which users query a “*card catalog*” located at a MEL Access Site. The “*cards*” in the card catalog serve as the common denominator among different types of data in the distributed library, and those consist of *metadata records* that comply with the United States Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata (CSDGM). A MEL Access Site consists of an Internet Hypertext Transfer Protocol (HTTP) Server (also known as the *Web server*) that supports Hypertext Markup Language (HTML), Java™ interfaces, and supporting Common Gateway Interface (CGI) programs.

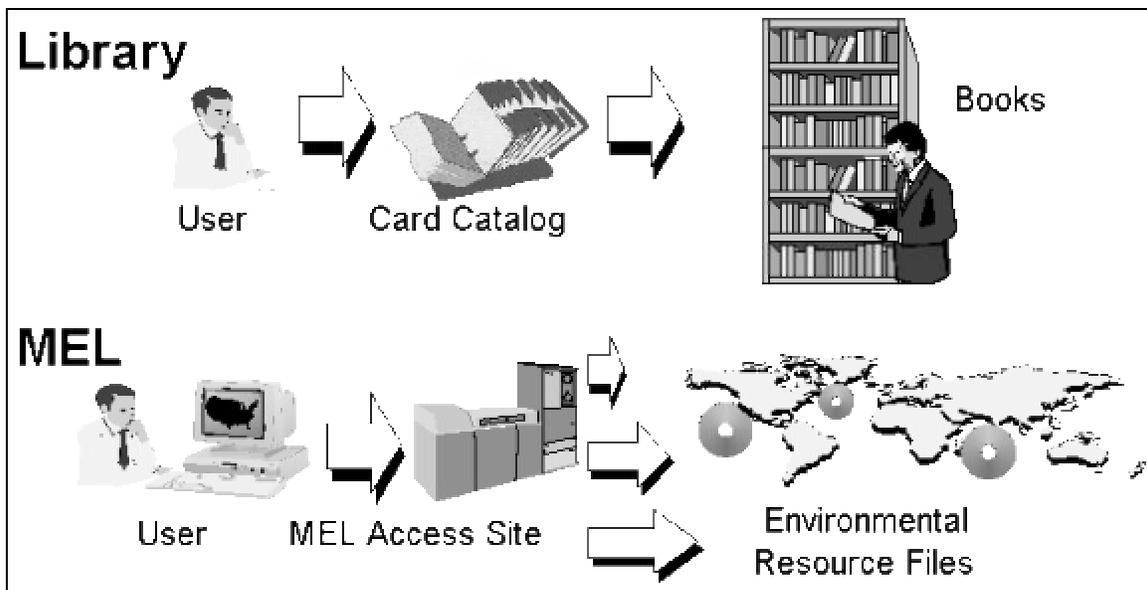


Figure 1. MEL Library Model

The MEL users search for and order available data through a World Wide Web (WWW) browser. They may choose either an HTML or Java interface to interactively create a Query, browse the Query results, and place an Order for data. Such Queries and Orders include a region of interest, time range, category keywords, and data center elements. The Query checks all metadata records at the specified data sites. Query results are displayed for users to:

<sup>1</sup> Non-Secure Internet Protocol Router Network

<sup>2</sup> Secure Internet Protocol Router Network

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examine the full text of the metadata record, view any browse graphics associated with the metadata record, and link directly to the data or data site or generate an Order Form customized for the desired data set. The Java Query feature provides an interactive interface that promotes visual comparison of Query results, thus guiding users through a potentially large set of criteria-fitting data to the specific data sets of interest. Users can order existing information, or possibly subscribe to regularly produced information for automatic distribution. The formats in which information can be provided are specified in corresponding metadata records. The MEL Access Sites can generate customized Order Forms from these records and accommodate other optional specifications, such as the ability to subset the data. In the Unclassified MEL, Resource Sites may designate some metadata as being access controlled. Only certain users who have been given the privilege by the appropriate Resource Site Administrator would be able to discover and view these restricted metadata.

Orders for data are sent to the applicable MEL Resource Sites via Internet InterORB Protocol (IIOP) and processed by the MEL Resource Site Software (MRSS). This customizable software parses the Orders, handles scheduling of requests, extracts data from the local databases; formats, compresses, delivers the data; and notifies users of delivery via Electronic mail (E-mail). The requested data are delivered in standard formats, like Gridded Binary (GRIB), Binary Universal Form for Representation (BUFR) of meteorological data, and Synthetic Environment Data Representation and Interchange Specification (SEDRIS); via anonymous File Transfer Protocol (FTP). Information can optionally be stored on magnetic media and mailed to users, or users can have it temporarily stored on the MEL Resource Site's anonymous FTP server for later downloading.

The MEL Resource Sites maintain control over, and access to their information. The MRSS supports user authentication, data extraction, and data delivery. A data center does not need to change its information management policies or architecture when it becomes a MEL Resource Site. DMSO has mandated that each MEL Resource Site use the FGDC metadata content standard to describe data sets and must deliver each data set in at least one of the standard formats.

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## SECTION 3. THE MEL ARCHITECTURE

The *Metadata Records* function as a common denominator among the different types of information available via the MEL. These records comply with the FGDC CSDGM and provide information about data sets in the MEL.

The MEL architecture is based upon federal and internationally recognized standards. The Use of the MRSS ordering and delivery system is optional for Resource Sites, which may choose to link to existing ordering systems. One benefit of the MRSS ordering system is that users need only learn one interface, instead of different interfaces for various sites.

Figure 2 shows a high-level schematic of the MEL Architecture.

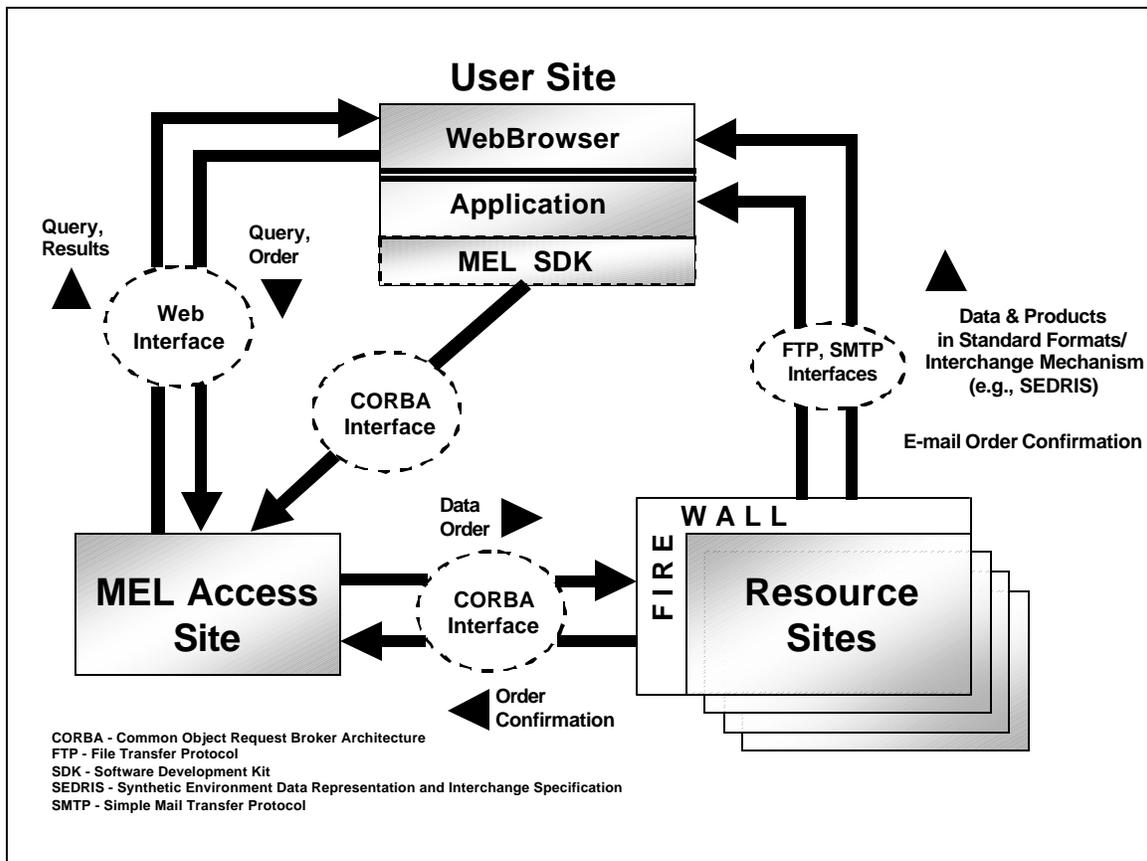


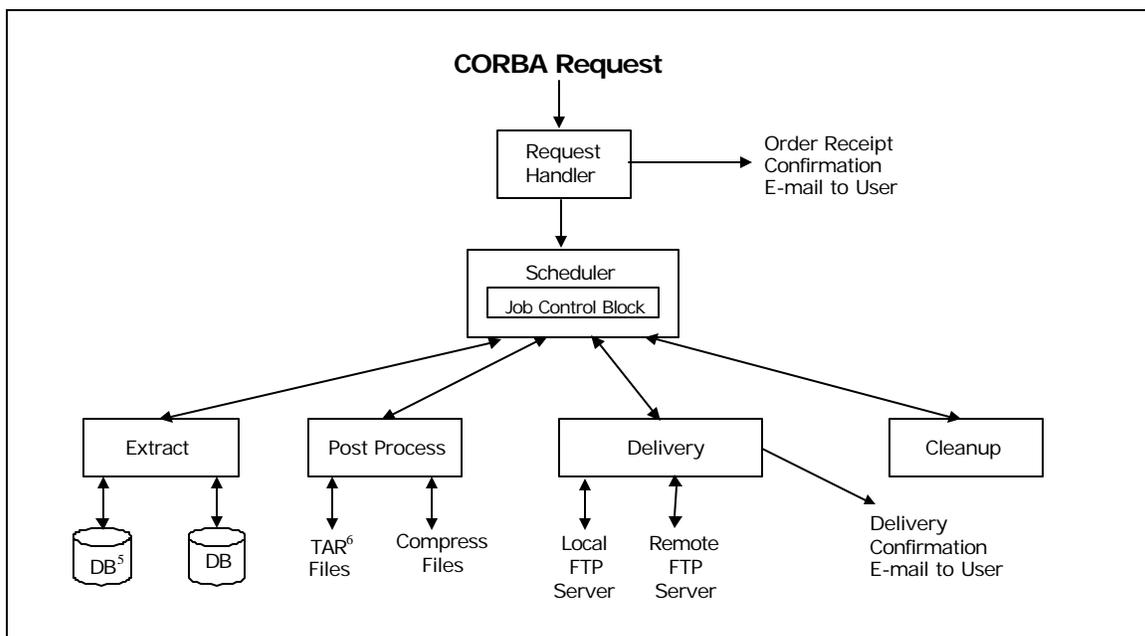
Figure 2. MEL Architecture

A MEL Access Site provides a search and Order interface to distributed Resource Sites. Information at these Resource Sites is described by metadata records in FGDC CSDGM formats. These metadata records are indexed and searched within the MEL using modified Isite software. The metadata records are also searchable by the FGDC clearinghouse and other search clients using the American National Standards Institute/ National Information Standards

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Organization (ANSI/ NISO) Z39.50<sup>3</sup> standard protocol. Metadata records and search indexes are managed by the MEL Resource Sites through a Metadata Manager tool at the MEL Access Site. Activities can become MEL Resource Sites without changing their information management methods or architecture, except to maintain metadata records for data they provide via the MEL and optionally install the MRSS to facilitate data ordering and delivery.

The MEL ordering process provides a method for creating Order Forms for information described in the metadata, as well as a system to process the Orders. The MEL Access Site will permit users to link to a MEL Order Form, and/or to other ordering processes outside the MEL. Order Forms can contain clickable maps, date range specifications, text entry boxes, single and multiple-choice list, and hyperlinks to ancillary information. The Orders are transferred to the MEL Resource Sites and are processed by the MRSS. Upon submission of an Order Form, the Access Site generates a CORBA request for the data<sup>4</sup>, which can be delivered by the following two methods as shown in **Figure 3**: (1) Transfer to a user-designated FTP server (Remote FTP Server), or (2) transfer to the Resource Site FTP Server for later downloading by the user (Local FTP Server).



**Figure 3. MRSS Functions**

<sup>3</sup> Information Retrieval Application Service Definition and Protocol Specification for Open Systems Interconnections.

<sup>4</sup> Some Resource Sites have their own online ordering processes and do not use the custom MEL ordering system. These Sites may fill a data order by a direct download of the data to the user, bypassing the Access Site.

<sup>5</sup> Database.

<sup>6</sup> Tape ARchive (UNIX command).

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The MEL design is based on a three-tiered architecture that provides for scalability, load management, and replacement of functional parts as technologies advance or mature. The First Tier consists of a Commercial-Off-The-Shelf (COTS) Web browser application, and a delivery site (optional). The Second Tier includes the MEL Access Site's Query Form, results, and Order Form interface; along with the MEL Resource Site's Order parser and job scheduler. The Third Tier consists of the MEL Resource Sites' databases, extraction, and delivery processes. Unlike two-tiered client/server architectures that can bog down as the number of clients increases, such a three-tiered architecture can balance the workload by sending jobs to different servers and scheduling order processing.

Use of a COTS Web browser and HTML provides a nearly platform-independent user interface. There is no need to maintain multiple versions of user interface software for different platforms. Use of the FGDC CSDGM in creating metadata records allows searching for common attributes in databases of various designs and implementations. The MEL ordering syntax and the MRSS provide a generic data ordering and delivery system that can be tailored for each Resource Site's needs. The MEL Resource Sites maintain complete control over user access to their information.

## SECTION 4. TYPICAL MEL PROCESS

### 4.1 OVERVIEW OF QUERY, REVIEW, ORDER, RECEIVE

1. **Connect** to the *MEL Access Site* using Web browser  
<http://mel.dmsso.mil/>
2. **Select** the *HTML* or *Java Query*
3. **Specify** the *Region* or **Accept** default (*global*)
4. **Specify** the *Date Range* or **Accept** default (*all dates*)
5. **Specify** the *keywords* for search, or **Select** from list, or **Accept** default (*unspecified*)
6. **Specify** the desired *Data Sources* or **Accept** default of (*All*)
7. **Click** the *Begin the Query* button
8. **Review** the *MEL Query Results* (headlines)
9. If desired, **Select** the individual metadata headlines of interest to view associated metadata and associated browse graphics
10. If desired, **View** the *Data Description* to see the metadata file
11. To order, **Click** either the *MEL Order* or *Alternative Access*. If *MEL Order* is selected, proceed with the following steps. If *Alternative Access* is selected, use the Resource Site's own ordering methods
12. **Fill in** the order form (**change** region of interest, dates, Parameter, Level, or Forecast time if necessary, and if supported by that MEL Resource Site)
13. **Insert** the *e-mail address* in the form (*required*)
14. (For new users) **Create** *New User Profile*
15. If necessary, **Edit** the existing *user profile*
16. **Submit** the *Order*
17. **Select** the desired *FTP delivery method*
18. **Click** "OK"
19. **Receive** the *MEL Data Request Acknowledgment*
20. **Receive** the *order confirmation* via e-mail
21. **Download** the dataset from an *FTP Server* using the *FTP link* in the e-mail
22. If necessary, **Untar and/or expand dataset**

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## 4.2 WORK FLOW

The MEL workflow is shown in **Figure 4** with the HTML workflow depicted on the left and the Java workflow on the right.

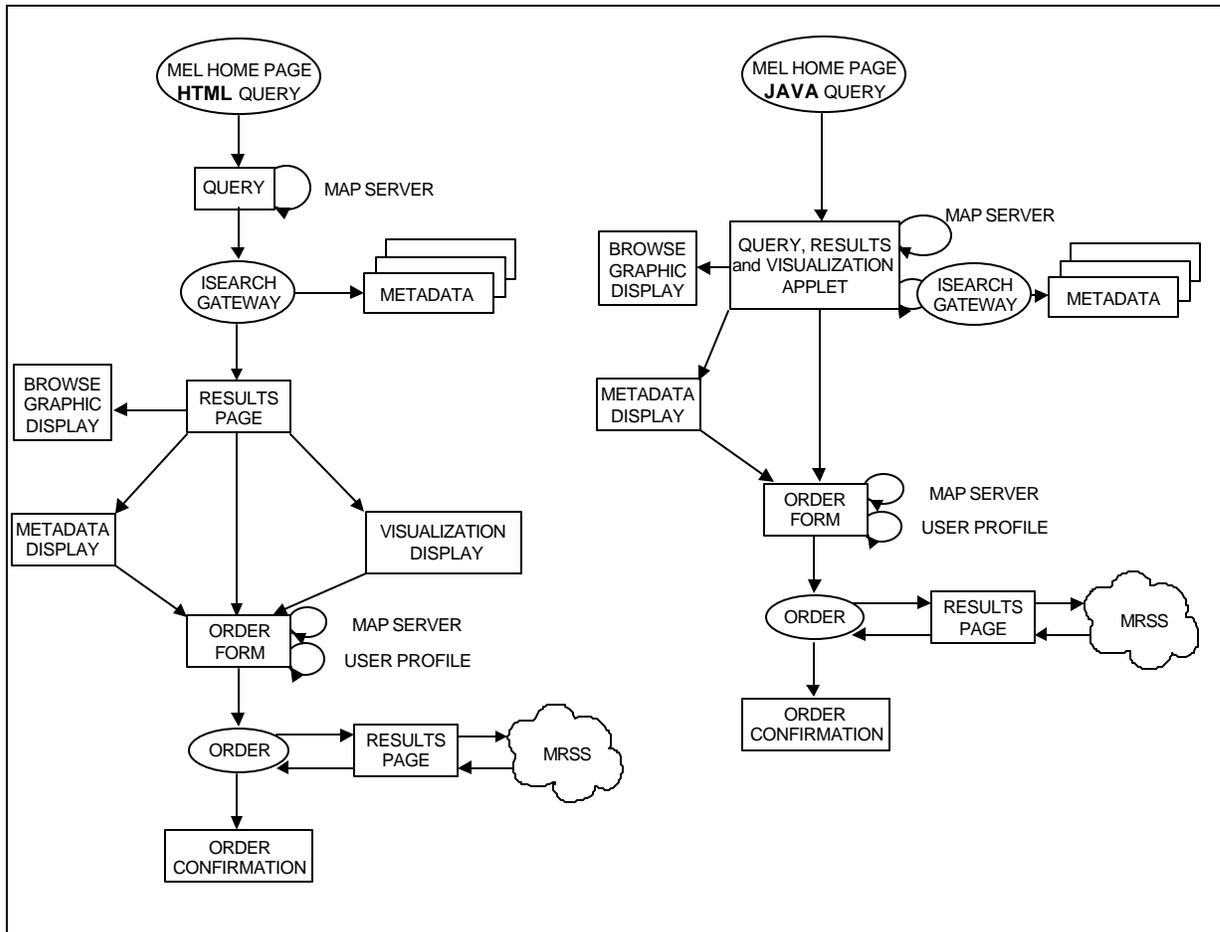


Figure 4. MEL Workflow

This process is a combination of Common Gateway Interface (CGI)-Perl scripts and HTML pages generated dynamically for the user's display.

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## SECTION 5. THE MEL SITES

The most up-to-date list of the MEL Resource sites may be found online at:

[http://mel.dmsi.mil/about\\_mel/resource.jsp](http://mel.dmsi.mil/about_mel/resource.jsp)

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## SECTION 6. THE MEL POINTS OF CONTACT

The most up-to-date list of the MEL Points of Contact may be found online at:

[http://mel.dmsso.mil/about\\_mel/personnel.jsp](http://mel.dmsso.mil/about_mel/personnel.jsp)

Questions regarding installation procedures should be e-mailed to:

[mel\\_help@msiac.dmsso.mil](mailto:mel_help@msiac.dmsso.mil)

## SECTION 7. HARDWARE REQUIREMENTS

The following guidelines describe system hardware requirements for the MEL.

### 7.1 MANDATORY FOR END USERS

1. 16-bit processor
2. Random Access Memory (RAM) — at least 8 MegaBytes (MB)
3. Mouse or other pointing device
4. Internet connectivity with sufficient bandwidth to allow acceptable interactive use of Web browser

### 7.2 RECOMMENDED FOR END USERS

1. 32-bit processor
2. RAM — 32 MB
3. Graphics accelerator video card
4. 8 bit color capability (256 colors), 16-bit color capability (65,536 colors) or better highly recommended
5. Integrated Services Digital Network (ISDN) or faster Internet connection

### 7.3 MANDATORY FOR RESOURCE SITE HOSTS

1. RAM — at least 32 MB
2. Hard Disk Capacity — at least 9 GigaBytes (GB)
3. UNIX Server (or 32-bit processor Personal Computer (PC) running Linux)
4. Reliable Internet connection providing sufficient bandwidth

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## 7.4 RECOMMENDED FOR RESOURCE SITE HOSTS

1. RAM —128 MB
2. Available Hard Disk Capacity — 3 hard disks, each with at least 9 GB of available storage capacity. All three disks should be the same make and model to facilitate exchange. One of these disks should be kept off-line as a spare
3. Processor — Computer class equivalent to or better than Sun SPARC 20
4. Sufficient bandwidth on Local Area Network (LAN) and Internet connections to handle forecast peak loads with acceptable response times for FTP deliveries
5. Highly reliable and available LAN network

## 7.5 MANDATORY FOR ACCESS SITE HOSTS

1. RAM — at least 128 MB
2. Hard Disk Capacity — minimum 4 GB of available storage
3. UNIX Server - Silicon Graphics, Inc. (SGI) computer class equivalent to or better than SGI WebFORCE™ Origin200 Server with 2x180 MegaHertz (MHz) R10000 processors and 1 MB of Cache
4. Reliable, full-time fractional T-1 Internet connection on LAN and Internet connections

## 7.6 RECOMMENDED FOR ACCESS SITE HOSTS

1. RAM —256 MB
2. UNIX Server — Computer class equivalent to or better than SGI WebFORCE™ Origin200 Server with 2x180 MHz R10000 processors and 1 MB of Cache
3. Reliable, full-time T-1 Internet connection

## SECTION 8. SOFTWARE REQUIREMENTS

Many of the software applications in this section are available through hyperlinks at the following Uniform Resource Locator (URL):

[http://mel.dms.o.mil/mel\\_tools/user\\_software.jsp](http://mel.dms.o.mil/mel_tools/user_software.jsp)

### 8.1 MANDATORY FOR END USERS

- a. HTML 3.2-compliant Web browser (primary interface)
- b. Compression software/applications (to expand compressed and tarred data sets)

### 8.2 RECOMMENDED FOR END USERS/REQUIRED FOR SOME RESOURCE SITE HOSTS

- a. Java enabled HTML 3.2-compliant Web browser
- b. Encoder/Decoder applications/files (to decode GRIB, BUFR, SEDRIS, etc. data sets)
- c. FTP Client software (if Web browser does not have FTP function)

### 8.3 MANDATORY FOR RESOURCE SITE HOSTS

- a. HTTP server (Web server)
- b. UNIX operating system
- c. Good News, not UNIX ( ) Zip file compression utility (optional)
- d. Java Development Kit (JDK) -1.1.5 to 1.1.8
- e. Perl 5.005 or higher

### 8.4 MANDATORY FOR ACCESS SITES HOSTS

- a. HTTP Server (i.e., Web server) application that supports required servlet engine
- b. Servlet container that supports Java Servlet 2.2 specification or higher and JavaServer Pages 1.1 specification or higher
- c. ANSI C compiler

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- d. C++ compiler
- e. Standard UNIX development libraries
- f. Current patch level on operating system
- g. Java Development Kit (JDK) 1.1.5 to 1.1.8
- h. A second JDK, 1.2.2 or higher
- i. GNU Zip file compression utility
- J. Wusage – A Web server statistics program

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## SECTION 9. MAILING LIST PROCEDURES

Mailing lists have been established to provide an efficient method of communicating to specific groups of people. In general, all end users, Resource Site Administrators, and metadata creators should address their initial questions, comments, or recommendations to:  
[mel\\_help@msiac.dmsoc.navy.mil](mailto:mel_help@msiac.dmsoc.navy.mil)

### 9.1 POSTING A MESSAGE TO A LIST

To send an e-mail message to a list, send e-mail to:

*<listname>@nrlmry.navy.mil*

where,

*<listname>* is a name from **Paragraph 9.3** below

For example,

*mel\_grib@nrlmry.navy.mil*

### 9.2 SUBSCRIBING TO A MAILING LIST

To subscribe to a Mailing List, send an e-mail message using the following format:

To: *majordomo@nrlmry.navy.mil*

Subj: **[leave blank]**

subscribe *<listname>*

( *where <listname> is the MEL Mailing List chosen from **Paragraph 9.3** below* )

### 9.3 THE MEL MAILING LIST

mel\_grib.....General forum for GRIB code form  
mel\_bufr.....General forum for BUFR code form  
mel\_bugs.....General forum for reporting MEL bugs  
mel\_comments.....General forum for sending comments to MEL team  
mel\_access\_admin.....Used by MRSS Administrators to contact MEL  
Access Site Software (MASS) Administrators  
mel\_help.....Mail is routed from the *saica mel\_help* address

## SECTION 10. EXAMPLE - ORDERING THE MEL DATA

### 10.1 DATA DISCOVERY PROCEDURE

Follow these steps to discover available data in the MEL:

1. **Type** in the MEL URL <http://mel.dmsso.mil/> into the browser address box.
2. **Click** HTML Data Query. The MEL users may pick either the HTML Data Query or the Java Data Query to search for and order data. This example will use the HTML Data Query.
3. The *HTML Query Form* will be displayed.
  - a. **Scroll** down to *Set Region*. This area is used to narrow the search to a specific area, but accept the default settings for this example.
  - b. **Scroll** down to *Set Date Range*. This area is used to narrow the search to a specific time range, but accept the default settings again.
  - c. **Scroll** down to *Set Keywords*. This area is used to narrow the search to metadata records containing the user-specified keywords. In the box provided for keyword entries type (with the quotation marks included) “relative
  - d. **Scroll** down to *Set Data Sources*, the default selection is *All Data Sources*. To speed up the search for this example, deselect the *All Data Sources* by selecting only the Naval Research Laboratory, Monterey, CA (NRLMRY) database from the scrollable list.
  - e. **Scroll** down and click *Begin Data Query*.
4. The *Query Results* page will be displayed, showing all the “hits” from the Naval Research Laboratory (NRL) Monterey database that met the search criteria.
  - a. For this example, the product of interest is the Coupled Ocean/Atmosphere Mesoscale Prediction System (COAMPS) model data for Southwest Asia (or any other COAMPS data set if Southwest Asia is not available).
  - b. **Scroll** down until *COAMPS Southwest Asia* is visible.

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## 10.2 DATA ORDERING PROCEDURE

Follow these steps to order data from the MEL:

1. As for all of the choices, the metadata ‘headline’ for the *COAMPS Southwest Asia* data is displayed. The following hyperlinks are available under each headline.
  - a. *Data Description* will display the metadata record for the user to learn more about the data set.
  - b. *The MEL Order* will display the MEL Dataset Order Form screen for the user to order the data set.

If applicable, an *Alternative Access* hyperlink will also be available.

2. **Click** the *MEL Order* corresponding to the *COAMPS Southwest Asia* data to be requested. The *MEL Dataset Order Form for:* is now displayed.
  - a. **Scroll** down through the *COVERAGE OF DATASET* section.
  - b. **Scroll** to the *DATE/TIME RANGE* section. This area is used to narrow the search to a specific time range, but leave the default settings.
  - c. **Scroll** to the *FORMAT* section and review the formats available for the data set.
  - d. **Scroll** to the *PARAMETER* section and in the Parameter list, the pre-selected parameter "geo-potential height dimension @ isobaric surface" will be used for this example.
  - e. **Scroll** to the *LEVEL* section and in the Level list, the pre-selected parameter "100 hectoPascal (hPa) (isobaric surface)" will be used for this example.

**NOTE:** For this data set, a common error is to select invalid Parameter/Level combinations. For example, the Parameter “2 Meter (m). (height above Surface)” cannot be selected and then coupled to an isoheight level from the Levels list. The Parameter and Level must be consistent. To see a list of all the available Parameter/Level combinations, **select** the *Valid Parameter/Level/Forecast Combinations* link.

- f. **Scroll** to *FORECAST\_TIME* and use the pre-selected 000 in the list.
- g. **Scroll** down to the E-mail address section.

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It is mandatory to **type** in your e-mail address before you proceed. The three options at this point are:

- i. *Submit Order* - Select this option if you have previously ordered from the MEL and have a User Profile on record.
  - ii. *Edit User Profile* - Select this option to make changes to an existing User Profile, e.g., delivery method. A password is required before editing of the profile may proceed. The *Edit User Profile* screen will now be displayed.
    - 1) **Fill** in the displayed text entry boxes (red titles indicate the information that is required).
    - 2) After completing the necessary information, **select** *Save User Profile*. The display will return to the *MEL Dataset Order Form* screen. With a completed profile, an Order may be entered by **clicking** *Submit Order*.
  - iii. *Create New User Profile* - This option is for users who have never ordered data from the MEL.
    - 1) The *Create New User Profile* screen is displayed.
    - 2) **Type** in a unique password that will be used to order the MEL data. **Enter** the same password a second time to confirm the first entry. Then **click** the *Create User Profile* link and proceed to answer the questions. When all of the questions have been answered **click** *Save User Profile*.
    - 3) When a completed profile has been made, an order may be requested by **clicking** *Submit Order*.
3. When the display reads *Please Confirm Delivery Choices*, the process is completed and now the Order is ready for final submission. Make any desired adjustments about the data delivery, and **click** *OK*. If an *Error!* message is displayed, note the message and repeat the steps required.
  4. If the display reads *MEL Data Request Acknowledgment*, the process is completed and the Query has been submitted.
  5. Data will typically be delivered in one of the standard MEL formats. Encoders/Decoders software for these formats is available at:

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[http://mel.dmsi.mil/mel\\_tools/user\\_software.jsp#encoders\\_decoders](http://mel.dmsi.mil/mel_tools/user_software.jsp#encoders_decoders)

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## SECTION 11. THE MEL RESOURCE SITE PLATFORMS

The host system Platforms, Operating Systems, and currently installed MRSS Version at each of the MEL Resource Sites are described in **Table 1**.

**Table 1. MEL Resource Site Platforms**

Site	Platform	Operating System	MRSS Version Installed
AFCCC <sup>7</sup>	n /a	n /a	n /a
AFWA <sup>8</sup>	SGI Origin 200	Irix 6.5	2.2
ESG <sup>9</sup>	Intel	RH Linux 6.2	2.2
FNMOD-A <sup>10</sup>	n /a	n /a	n /a
MSU-ERC <sup>11</sup>	Sun SPARC Server-1000	Solaris 5.6	2.2
NAVOCEANO <sup>12</sup>	SUN 450	Solaris 5.7	2.2
NGDC <sup>13</sup>	Intel	Linux	2.2
NIMA <sup>14</sup> (Unclassified)	Sun SPARC Server-2000	Solaris 2.4	2.2
NRLMRY	SGI IP25	Irix 6.2	2.2
SDBF <sup>15</sup>	n /a	n /a	n /a
* n/a indicates that the Resource Site uses their own ordering system instead of the MRSS			

<sup>7</sup> Air Force Combat Climatology Center

<sup>8</sup> Air Force Weather Agency

<sup>9</sup> Environmental Scenario Generator

<sup>10</sup> Fleet Numerical Meteorology and Oceanography Detachment-Asheville

<sup>11</sup> Mississippi State University Engineering Research Center

<sup>12</sup> Naval Oceanographic Office

<sup>13</sup> National Geophysical Data Center

<sup>14</sup> National Imagery and Mapping Agency

<sup>15</sup> Simulator DataBase Facility

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## APPENDIX A. ACRONYMS/ABBREVIATIONS

### A-B

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AFCCC .....	Air Force Combat Climatology Center
AFWA .....	Air Force Weather Agency
ANSI .....	American National Standards Institute
ARL.....	Army Research
BUFR.....	Binary Universal Form for the Representation of meteorological data

### C

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CGI.....	Common Gateway Interface
COAMPS .....	Coupled Ocean/Atmosphere Mesoscale Prediction System
CORBA.....	Common Object Request Broker Architecture
COTS .....	Commercial Off-The-Shelf
CSDGM.....	Content Standard for Digital Geospatial Metadata

### D-E

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DB .....	Database
DMSO .....	Defense Modeling and Simulation Office
DoD.....	Department of Defense
E-mail.....	Electronic mail
ESG .....	Environmental Scenario Generator

### F-G

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FGDC .....	Federal Geographic Data Committee
FNMOD-A.....	Fleet Numerical Meteorology and Oceanography Detachment-Ashville

# MEL Technical Reference Guide

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FTP .....File Transfer Protocol  
GB .....GigaBytes  
GNU .....Good News, not UNIX  
GRIB.....Gridded Binary

## H- I

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hPa.....hectoPascal  
HTML.....Hypertext Markup Language  
HTTP .....Hypertext Transfer Protocol  
IIOP .....Internet InterORB Protocol  
INE .....Integrated Natural Environment  
INE ARP .....Integrated Natural Environment Authoritative Representation  
Process  
ISDN .....Integrated Services Digital Network

## J-L

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JDK .....Java Development Kit  
LAN.....Local Area Network

## M

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m.....Meter  
MASS.....MEL Access Site Software  
MB.....MegaBytes  
MEL.....Master Environmental Library  
MHz.....MegaHertz  
MRSS .....MEL Resource Site Software  
MSEA.....Modeling and Simulation Executive Agent  
MSMP .....Modeling and Simulation Master Plan  
MSRR.....Modeling and Simulation Resource Repository  
MSU-ERC .....Mississippi State University Engineering Research Center

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## N

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NAVOCEANO .....	Naval Oceanographic Office
NCSA.....	National Center for Supercomputer Applications
NGDC .....	National Geophysical Data Center
NIMA .....	National Imagery and Mapping Agency
NIPRNET .....	Non-Secure Internet Protocol Router Network
NISO .....	National Information Standards Organization
NRL.....	Naval Research Laboratory
NRLMRY .....	Naval Research Laboratory, Monterey, CA

## O-R

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PC.....	Personal Computer
RAM.....	Random Access Memory
RH Linux.....	Red Hat Linux

## S

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SDBF.....	Simulator DataBase Facility
SDK.....	Software Development Kit
SEDRIS .....	Synthetic Environment Data Representation and Interchange Specification
SGI .....	Silicon Graphics, Incorporated
SIPRNET.....	Secure Internet Protocol Router Network
SMTP .....	Simple Mail Transfer Protocol

## T- U

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TAR.....	Tape ARchive (UNIX command)
TRG.....	Technical Reference Guide
USD(AT&L).....	Under Secretary of Defense for Acquisition, Technology, and Logistics

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## V-Z

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WWW .....World Wide Web

Z39.50 .....ANSI/NISO Z39.50-1995, Information Retrieval (Z39.50):  
Application Service Definition and Protocol Specification

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## APPENDIX B. MEL PROJECT CHRONOLOGY

- 8 Aug 1994 .....MEL Memorandum of Agreement released
- 8 Aug 1994 .....MEL Program Development Plan released
- Feb 1995 .....Kickoff Meeting
- Oct 1995.....M&S Master Plan promulgated
- 13 Nov 1995.....MEL Access Site established
- 13 Nov 1995.....First MEL Resource Site established (MSU-ERC)
- 13 Nov 1995.....First MEL Prototype demonstration
- 2 Feb 1996 .....Server Upgrade (NCSA httpd 1.5a-export)
- 3 Mar 1996.....Working prototype of MEL Access Site at NRL Monterey
- Apr 1996 .....MASS 1.0 released
- 2 Jul 1996 .....MRSS 1.0 released
- 30 Jul 1996 .....MEL is registered node of MSRR
- 30 Jul 1996 .....NIMA Resource Site online
- Sep 1996 .....AFWA Resource Site online
- 2 Oct 1996.....NGDC Resource Site online
- 7 Nov 1996.....Updated MEL Java interface
- 31 Dec 1996 .....Upgraded Server to Netscape Enterprise Ver. 2.13
- Jan 1997 .....AFCCC Resource Site online
- 23 Apr 1997 .....MRSS 1.1 released
- 1 Jun 1997 .....NAVOCEANO Prototype Resource Site online
- 8 Jul 1997 .....MEL BUFR Library Ver. 2.0 released
- 30 Jul 1997 .....MASS Ver. 1.1 beta released
- 19 Mar 1998.....MEL 2.0 Critical Design Review
- 9 Jul 1998 .....NAVOCEANO Resource Site online
- 8 Aug 1998 .....ARL Resource Site online
- 31 Aug 1998 .....7ATC Resource Site online
- 31 Aug 1998 .....SDBF Resource Site online
- Oct 1998.....Modified Isite software, replaced freeWAIS-sf software as the  
MEL indexing and search engine

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27 Jan 1999 .....MEL 2.0 Product Baseline Established  
27 Jan 1999 .....MEL 2.0 Approved for Release  
11 Mar 1999.....MEL 2.2 Critical Design Review  
16 Mar 1999.....Access Site Software 2.0.1 implemented  
17 Mar 1999.....Cut-over to MEL 2.0  
9 Jun 1999 .....MEL 2.1 Approved for Release  
11 Jun 1999 .....Cut-over to MEL 2.1  
13 Aug 1999 .....Implemented MEL 2.1.1  
4 Nov 1999.....Implemented MEL 2.1.2  
5 Apr 2000 .....MEL 3.0 Critical Design Review  
10 Apr 2000 .....MEL 2.2 Approved for Release  
28 Apr 2000 .....Cut-over to MEL 2.2  
19 Oct 2000.....MEL 3.0 Approved for Release  
25 Oct 2000.....Cut-over to MEL 3.0  
14 Jun 2001 .....MEL 3.1 Approved for Release  
20 June 2001.....Cut-over to MEL 3.1

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## APPENDIX C. GLOSSARY

### A

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- AFCCC** .....The Air Force Combat Climatology Center develops and produces special weather-impact information used in: (a) planning and executing worldwide operations of the military services, unified commands, and allied nations, (b) engineering, design, and deployment of weapon systems, (c) weather sensitive, national programs controlled by the Secretary of the Air Force, and also serves as the DoD lead for air and space weather modeling and simulation.
- AFWA**.....The Air Force Weather Agency has the mission to build a comprehensive environmental database and apply this information in real-time to satisfy the operational requirements of the national command authorities, DoD, combat forces of the Air Force and Army, and weather sensitive AF Precedence 1-1 programs.
- ARL** .....The Army Research Laboratory executes fundamental and applied research to provide the Army the key technologies and analytical support necessary to assure supremacy in future land warfare.

### B-G

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- BUFR**.....FM 94-XI BUFR is the World Meteorological Organization's standard format for the Binary Universal Form for Representation of meteorological data. BUFR is designed to represent meteorological data employing a continuous binary stream.
- CGI**.....Common Gateway Interface is the specified standard for communication between HTTP servers and server-side gateway programs. Using CGI specifications, the programmer can write simple programs or scripts to process user queries or interrogate databases.

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- DMSO** .....The Defense Modeling and Simulation Office, acting for the Director of Defense Research and Engineering, provides a full time focal point for information concerning DoD Modeling and Simulation (M&S) activities. Currently, the DMSO promulgates M&S policy, initiatives, and guidance to promote cooperation among DoD components to maximize interoperability, reuse, efficiency, and effectiveness.
- FGDC**.....The Federal Geographic Data Committee has assumed leadership in the evolution of the National Spatial Data Infrastructure in cooperation with state and local governments, academia and the private sector to establish policies, standards, and procedures for organizations to cooperatively produce and share geospatial data.
- GRIB** .....FM 92-X Ext. GRIB (Gridded Binary) is a standard World Meteorological Organization's format for processed binary data expressed in the form of grid-point values.

## H-I

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- HTML**.....Hypertext Markup Language is a scripted computer language specifically designed to specify the logical organization of a text document, with important extensions for hyperlinks and user interaction. It is the primary format for documents made available on the World Wide Web.
- HTTP** .....Hypertext Transfer Protocol is a communications protocol used on the World Wide Web for the rapid distribution of HTML documents.

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## J-M

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- MEL**.....The Master Environmental Library  
(<http://mel.dmsomil>) is sponsored by the Defense Modeling and Simulation Office and managed under their Integrated Natural Environment Program. The MEL is a wide area network-based information discovery and retrieval system providing access to oceanographic, meteorological, terrain, and near-space data sets.
- MSEA**.....Modeling and Simulation Executive Agents are DoD components to whom the Under Secretary of Defense for Acquisition, Technology and Logistics has assigned responsibility and delegated authority for the development and maintenance of a specific area of Modeling & Simulation (M&S) applications, including relevant standards and databases used by or common to many models and simulations.
- MSRR** .....The Modeling and Simulation Resource Repository is a collection of computer resources and information that will assist the Modeling and Simulation community in communication and information sharing. The MSRR Project is sponsored by the Defense Modeling and Simulation Office. The MEL is the environmental node of MSRR.
- MSU-ERC**.....The Mississippi State University's Engineering Research Center places emphasis on application of numerical ocean models and modeling techniques toward realistic simulation of ocean conditions, particularly the physical and dynamic state of coastal waters and semi-enclosed seas. Although the primary focus is on oceanography, MSU-ERC has expanded its efforts to coupled air-ocean modeling and supports the acquisition, storage, and application of meteorological data of all kinds.

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## N

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- NAVOCEANO**.....The Naval Oceanographic Office, a Naval Meteorology and Oceanography Command activity, has the mission of providing specialized and unique oceanographic products and services to joint warfighters in a manner and time frame that allows them to meet their objectives.
- NCSA**.....The National Center for Supercomputer Applications is a university-based, high-performance computing facility and research center designed to serve the national computational science and engineering community. Located at the University of Illinois at Urbana-Champaign, NCSA is funded by the National Science Foundation, other federal agencies, the State of Illinois, the University of Illinois, and industrial corporations collaborating through partnership agreements.
- NGDC**.....The National Geophysical Data Center manages environmental data in the fields of marine geology and geophysics, paleo-climatology, solar-terrestrial physics, solid earth geophysics, and glaciology (snow and ice).
- NIMA** .....The National Imagery and Mapping Agency (*formerly the Defense Mapping Agency*) has central responsibility for imagery and mapping with the mission of providing timely, relevant, and accurate imagery intelligence and geo-spatial information in support of national security objectives.
- NRLMRY**.....The Naval Research Laboratory Marine Meteorology Division in Monterey, CA is the only scientific center in the Navy wholly dedicated to atmospheric research. NRLMRY is responsible for conducting research and development to provide objective local, regional and global atmospheric analysis and prediction as well as the development of automated weather interpretation systems to support Naval operations.

## O-R

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- Perl**.....An interpreted computer language optimized for scanning arbitrary text files, extracting information from those text files,

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and printing reports based on that information. Perl is also a good language for many system management tasks.

**Resource Site** .....The third tier of the MEL architecture made up of Resource Site databases and associated extraction and delivery processes. Participating sites may install and run the MEL Resource Site Software on a server connected to the Internet, NIPRNET, or SIPRNET.

## S

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**SDBF** .....The Simulator DataBase Facility is a data repository of simulator databases with the primary function of the transfer of database investments between U.S. Government organizations and programs.

**SEDRIS** .....Synthetic Environment Data Representation and Interchange Specification is a simulated environment database with an integrated set of data elements that describes a defined geographic region, for use in M&S applications. It contains a consistent and correlated description of the environment (terrain, ocean, atmosphere, and space) that is appropriate for the simulation objective.

## T

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**T-1**.....Telecommunications connection category 1 supporting data rates of 1.544Mbits per second.

**TAR** .....Tape ARchive is a UNIX archive file format used to consolidate files.

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## U

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**URL** .....Uniform Resource Locator is an Internet-specific address specifying the location of information on the World Wide Web (WWW). Usually in the form of www.dms0.mil, indicating a domain name (dms0.mil) and the server identifier (www).

## V-W

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**WWW** .....The World Wide Web is the interconnection of many independent computers (servers and clients) worldwide that provides access to information and databases through the Internet. The WWW is usually accessed with a Web Browser to retrieve HTML documents and multimedia files.

## X-Z

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**Z39.50** .....This standard specifies a client/server-based protocol for information retrieval. It specifies procedures and structures for a client to search a database provided by a server, retrieve database records identified by a search, scan a term list, and sort a result set. The protocol addresses communication between corresponding information retrieval applications, the client and server; it does not address interaction between the client and the end-user. It is used by Internet services to search for files through the use of keywords and is widely used for remote access to library catalogs.