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METADATA GUIDE

August 2001

DEFENSE MODELING AND SIMULATION OFFICE
ALEXANDRIA, VA

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August 2001

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APPROVED BY:

Richard Sigrig

MEL PROJECT LEAD

FOREWORD

The Department of Defense (DoD) Modeling and Simulation Master Plan (MSMP), DoD 5000.59-P, Oct 95, identifies sub-objectives for providing authoritative representations of the natural environment, and discusses the 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) project is sponsored by the Defense Modeling and Simulation Office (DMSO), and is part of the Modeling and Simulation community's initiative to provide authoritative representations of the natural environment. It is managed under DMSO's Integrated Natural Environment (INE) Program. This MEL Metadata Guide is a supplementary document. Much of its content is derived from information in the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM).

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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 type for words that 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**.

SECTION 1. SCOPE

1.1 IDENTIFICATION

This Master Environmental Library (MEL) *Metadata Guide* provides information that will allow Metadata Administrators to create, manage, and delete metadata records for the MEL.

1.2 SYSTEM OVERVIEW

1.2.1 Purpose

Objective Two of the Department of Defense (DoD) *Modeling and Simulation Master Plan* (MSMP) pertains to providing access to authoritative representations of natural environmental features. The MEL supports discovery and retrieval of authoritative information regarding the natural ocean, terrain, air, and space environments from distributed sources for use in battlespace modeling, simulations, management, planning, training, and development activities.

1.2.2 Project Sponsor

The MEL project is sponsored by Defense Modeling and Simulation Office (DMSO). It is managed under their Integrated Natural Environment (INE) Program.

1.2.3 Project Developer

The MEL Software Development Group (SDG) is responsible for the MEL software development. The Lead Laboratory for the MEL is the Naval Research Laboratory (NRL) Marine Meteorology Division in Monterey, CA; assisted by personnel from other Government activities and support contractors.

1.2.4 Life-Cycle Support Agencies

The Modeling and Simulation Information Analysis Center (MSIAC) in Alexandria, VA has been identified as a Life-Cycle Support Activity for the MEL.

1.3 DOCUMENT OVERVIEW

This document provides guidance and instructions for creating, editing, deleting, and using metadata in the MEL for the purpose of environmental data discovery and retrieval. It is intended to augment, not replace, more detailed sources of information referenced in **Section 2**. The contents of this document are organized as follows:

- **Section 1** provides Introductory Information
- **Section 2** lists Pertinent References
- **Section 3** includes an Overview of metadata and standards, along with guidance for creating metadata for the MEL
- **Sections 4 and 5** provides Details and Examples of standards
- **Section 6** lists some MEL Keyword Thesauri as a reference for metadata creation
- **Section 7** provides details regarding the MEL Choice Syntax
- **Appendix A** includes a list of Acronyms used in this Guide and their definitions
- **Appendix B** lists the MEL Information Resource Originators
- **Appendix C** contains Examples of two Attribute/Entity methods
- **Appendix D** lists the FGDC CSDGM[1] Metadata Templates in long and short form
- **Appendix E** contains Sample Metadata Records

[1] Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata

SECTION 2. REFERENCED DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

2.1.1 Standards

a. United States. Federal Geographic Data Committee. FGDC-STD-001-1998, Content Standard for Digital Geospatial Metadata. FGDC, Jun 98. Online. Internet. Accessed 28 Sep 00. Available: http://www.fgdc.gov/standards/documents/standards/metadata/v2_0698.wpd and http://www.fgdc.gov/standards/documents/standards/metadata/v2_0698.pdf

b. United States. Information Technology Laboratory. Federal Information Processing Standards Publication 192-1 (FIPS PUB 192-1), Application Profile for the Government Information Locator Service (GILS). National Institute of Standards, Aug 97.

2.1.2 Other Documents

a. Under Secretary of Defense for Acquisition and Technology. DoD 5000.59-P: Department of Defense Modeling and Simulation (M&S) Master Plan. Department of Defense, Oct 95.

b. United States. Federal Geographic Data Committee, Nebert, Douglas. Z39.50 Application Profile for Geospatial Metadata, Version 2.1c Final. FGDC, Nov 97. Online. Internet. Accessed 28 Sep 00. Available: http://130.11.52.178/GEO21c.html

c. United States. Department of Defense. Defense Information System Agency (DISA) Data Administration Tools. Online. Internet. Accessed 28 Sep 00. Available: http://www-datadmn.itsi.disa.mil/guidance.html

d. U. S. Geological Survey. Schweitzer, Peter. A File Encoding Scheme for Formal Metadata. Feb 97. Online. Internet. Accessed 28 Sep 00. Available: http://geology.usgs.gov/tools/metadata/tools/doc/encoding.html

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h. U. S. Geological Survey. Content Standard for Digital Geospatial Metadata Workbook, Version 1.0. USGS, Mar 95

i. United States. Department of Defense. Defense Modeling and Simulation Office. DMSO MEL-SUM-PAPER-0310, MEL Software User Manual, DMSO, Jun 01.

j. United States. Department of Defense. Defense Modeling and Simulation Office. DMSO MEL-SCOM-PAPER-0310, MEL Software Center Operator Manual, DMSO, Jun 01.

k. United States. Department of Defense. Defense Modeling and Simulation Office. DMSO MEL-SVD-PAPER-0310, MEL Software Version Description, DMSO, Jun 01.

2.2 NON-GOVERNMENT DOCUMENTS

None

SECTION 3. METADATA OVERVIEW

3.1 INTRODUCTION TO METADATA

3.1.1 Metadata Defined

Metadata may be used to summarize the content of information resources. As such, it describes important characteristics such as title, time frame, location, data parameters, contact persons, data quality, etc.

3.1.2 Metadata in the MEL

Metadata helps the MEL users evaluate the following four features of the information it describes:

- Availability – Data sets that exist for a geographic location
- Applicability – Data sets meeting specific needs
- Access – Information needed to acquire an identified data set
- Transfer – Information needed to process and use a data set

The MEL uses metadata for documenting its information resource holdings, and uses the information in the metadata to search and categorize holdings of the MEL Resource Sites. Until a Resource Site's metadata records are registered within the MEL, users cannot access that Resource Site's information via the MEL. For this reason, high quality, accurate, and current metadata records are critical for effective information discovery using the MEL. A simplified way of explaining the value of the metadata is to view the MEL as a library, and view the metadata records as the cards in the card catalog for the library holdings.

3.1.3 MEL Metadata Standards

The MEL uses the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM) as the metadata standard for geospatial information. The FGDC CSDGM may be considered an extended version of the Government Information Locator Service (GILS), with additional fields specifically designed to describe geospatially-oriented data. The FGDC and GILS standards are available online at the following Uniform Resource Locators (URLs), respectively:

http://www.fgdc.gov/metadata/contstan.html

http://www.usgs.gov/gils/prof_v2.html

3.1.4 MEL Metadata Organization

Key MEL Metadata personnel are listed below. These individuals can provide valuable assistance to Metadata Creators, and should be notified regarding metadata problems.

- MEL Access Site Administrator – serves as the overall manager of the MEL Access Site, including the metadata records uploaded from the MEL Resource Sites.
- MEL Metadata Coordinator – serves as the authority for metadata in the MEL. Maintains the MEL Keyword Thesauri, answers questions about the MEL metadata, and represents the MEL in metadata related standards meetings.
- Metadata Approval Authorities – are personnel designated by the MEL management to approve submitted metadata records as complete and correct.
- Resource Site Metadata Creators – have primary responsibility for creating, maintaining, and submitting metadata records to describe a MEL Resource Site's holdings.

3.1.5 MEL Metadata Creation and Registration Process

Metadata records must be created and registered for each data set that is to be discoverable via the MEL. Novice users should first obtain a copy of the FGDC CSDGM, and become familiar with it. They should then become familiar with the format (see **Appendix E**) and review some metadata examples.

The recommended steps for creating and registering metadata records are:

1. Compile the required information.
2. If the collection in an Unclassified MEL is to contain access-controlled metadata, inform the MEL Access Site Administrator and have the collection designated as such.
3. Create the metadata record(s) using the guidelines provided in **Paragraphs 4.1 – 4.4** of this document. If the data being described are to be made available via the MEL Resource Site Software (MRSS), fill in the *Distribution_Information Custom_Order_Process* Section with the MEL Custom Order Syntax used to generate online Order Forms (see **Paragraph 4.1.8**).
4. Check the metadata record(s) for compliance with FGDC CSDGM and the MEL requirements.
5. Upload the metadata to the Resource Site's *test* metadata collection database at the MEL Access Site using the MEL Metadata Manager (see **Paragraph 4.6**).

6. Add keywords correctly from the MEL Keyword Thesauri using the Keyword help facility for guidance.
7. Check the syntax; edit as necessary until all syntax errors are corrected using the MEL Metadata Manager. The metadata syntax checking software can be downloaded and run on a local computer, but use of the MEL Metadata Manager is recommended.
8. Index metadata using the MEL Metadata Manager.
9. Test the search function and Order Forms (if applicable) using the "test" query page (http://mel.dmso.mil/mel-bin/test_query.html). If there are restricted metadata in the Unclassified MEL and they need to be tested, the URL is (http://mel.dmso.mil/mel-bin/res_test_query.html) In the latter case, obtain access privileges to the metadata (see **Paragraph 3.1.5**).
10. When the metadata has been tested and ready to go online, contact the Metadata Coordinator who will review the metadata.
11. To modify, delete, or rename an existing metadata record, use the MEL Metadata Manager(refer to **Paragraph 4.6)**.

3.2 CREATING GOOD METADATA

Metadata is used for discovery of useful information among many possible data sets, either by computerized search or by a user reading the metadata record. From a search perspective, the information resource is only as good as the metadata. If users cannot discover resources through a search, they might never be used. If users can locate metadata, but cannot discern key details about the information, it may be ignored. Following are some tips for creating and maintaining good metadata records:

- Write metadata that can be interpreted by novice users, and include all pertinent information.
- Avoid jargon and buzz words that may lose their meaning in time.
- Define all acronyms the first time they are used in the metadata record.
- Use descriptive titles, synonyms, and general topic terms.
- Identify common user search terms like content, theme (topic), spatial coverage, geographic region, and time period. Identify Elements numerically and textually. Use as many Keywords from the MEL Keyword Thesauri as possible to describe the data (see **Section 6),** or use the online Metadata Manager Keyword help facility.
- Follow this standard as adopted by the MEL for consistency.

- Use as many of the metadata Elements as possible to provide users with a complete description of the information content. Metadata records usually contain more than just the Required Fields. The MEL and the FGDC CSDGM do not require all Elements to appear in a metadata record, only the MEL Required Fields[2]. However, metadata records that include additional Elements often provide a more complete description of the information. When creating a metadata record, ask the question: "If I was looking for this data, is the information that is included in the metadata sufficient for me to find the data and evaluate its usefulness, availability, and suitability for my needs?"
- Keep metadata record current. Make updating the metadata record part of the regular information resource update/maintenance cycle.

3.3 ASSISTANCE AND PROBLEM REPORTING

The MEL provides metadata Creators/Managers with the following e-mail address for technical questions, suggestions, or problems.

mel_metadata@nrlmry.navy.mil

The MEL users may also contact the MSIAC MEL Help Desk at the following:

1-888-566-7672 (toll-free), 0700-1600 ET, Monday through Friday

mel_help@msiac.dmso.mil

[2] A superset of the FGDC CSDGM Required Fields.

SECTION 4. FGDC CSDGM METADATA

4.1 CONSTRUCTING MEL METADATA RECORDS

A FGDC CSDGM-compliant metadata record can contain up to ten Sections. Seven are *Major* Sections of the metadata record, while the remaining three *Subordinate* Sections support others and are not used alone. The Elements of the *Subordinate* Sections are often used repeatedly throughout the seven *Major* Sections. The ten Sections of a FGDC CSDGM-compliant metadata record are:

Major Sections:

Identification Information (*Required*)

Data Quality Information (*Recommended*)

Spatial Data Organization Information (*Recommended*)

Spatial Reference Information (*Recommended*)

Entity and Attribute Information (*Required*)

Distribution Information (*Required for MEL Custom Order*)

Metadata Reference Information (*Required*)

Subordinate Sections:

Citation Information

Time Period Information

Contact Information

To ensure the MEL metadata consistency and to aid in searching of records, the MEL requires more metadata Elements than does the FGDC CSDGM. Within all of the Major Sections, some Elements are *Required* while others are *Optional*. A metadata record *MUST* contain the *Required* Sections to be accepted by the MEL.

Including the *Optional* Sections and Elements in a metadata record can provide a more complete description of the data set. **Paragraph 4.3** describes a metadata record template of suggested Elements that should be followed. Additional requirements apply when the metadata record is to be used in a Classified MEL environment (see **Paragraph 4.2)**.

4.1.1 General Comments

An Element or Data Element is described in the FGDC CSDGM as a, "logically primitive item of data." Each Element is followed by a Field containing a Value describing the Element. An Element is separated from its Field Value by a colon and at least one space.

An Element can be one of the following six Types: Integer, Real, Text, Date, Time, or Compound. A Compound Element is a group of Data Elements and other Compound Elements. All Compound Elements are described by Data Elements, either directly or through intermediate Compound Elements. Compound Elements represent higher-level concepts that cannot be represented by individual Data Elements

The domain of an Element includes all of the valid Values that can be placed in the Element's Field. Valid Values can be found in the appropriate sections of the FGDC CSDGM and in this document. Unrestricted entries are indicated by the use of the word "free" in front of the Element type (e.g., free text, free real, free integer, free date, free time). If used as part of a domain enumeration, it is best if one of the enumerated items is used in place of entering free text. For example, if the domain was:

"ground condition", "publication date", free text

Then "ground condition" and "publication date" should be used if possible before entering free text.

Any Field of the metadata can be assigned a Classification and Control Marking if the Field allows free text (see **Paragraph 4.2.3**). These markings will be visible when the metadata record is viewed. Classification Markings should appear in parentheses (e.g., (U), (S)) before the actual value of the Field. An example of a title Field is:

Title: (U) WAM Mediterranean Sea

Some examples of Elements and their Values, followed by the type, are:

Place_Keyword_Thesaurus: MEL_Location_Thesaurus (Type = Text)

Metadata_Date: 19960627 (Type = Date)

Identification_Information: (Type = Compound)

Citation: (Type = Section Ref.)

Citation_Information (Type = Compound)

Originator: NIMA – National Imagery & Mapping Agency (Type = Text)

In the following discussions, only the immediate sub-Elements, component Elements of a Compound Element or Section are shown when they are defined. If the sub-Element is a Compound Element, its definition must be consulted for its sub-Elements. For example, the Identification Information Section contains the Compound sub-Element Citation. In the discussion of the Identification Information Section, the Elements of the Compound Element Citation are not given. Component Elements are discussed in the Citation Section.

The MEL software requires that metadata Element names consisting of more than one word have those words connected by underscores. For example, the Element named "Identification Information" would be written as "Identification_Information." All words have initial capitals, except the words "and" and "or." Field Values can contain spaces, for example:

Currentness_Reference: Time of model run.

When creating a metadata record, the Elements must be indented according to their location in the Element hierarchy. An indentation must be at least one space, and tabs must not be used. The indentation scheme must be used consistently throughout the metadata record. An example indentation scheme follows:

```
 One indentation for Section,
  Two indentations for subSection,
   Three indentations for sub-subSection,
    Four indentations for sub-sub-subSection,
     and so on.
```

An indentation scheme is illustrated in the sample metadata templates and in the metadata examples (see **Appendix E)**.

Metadata Creators should not leave non-compound metadata Fields blank; but should use the Values "Unknown" or "None" (see the FGDC CSDGM to determine which Value to use). Missing values in non-Compound metadata Fields will cause warnings in the syntax checker described in **Paragraph 4.6**.

Each FGDC CSDGM-compliant metadata record Section contains Required and Optional Elements. The Data Quality Section as recommended by the MEL for example, has Required Elements as well as Recommended Elements. Absence of Required Elements will cause the generation of error messages during the syntax checking process described in **Paragraph 4.6**.

When metadata is displayed through a Web browser, non-leading multiple consecutive white spaces are all collapsed and displayed as one space character. Metadata Creators should avoid use of multiple spaces and tabs in their metadata.

Values for file names, network addresses for computer systems, and related services should follow the URL convention of the Internet when possible. See http://www.ncsa.uiuc.edu/demoweb/url-primer.html for additional details.

The MEL requires all URLs to be enclosed in angle brackets, e.g., *<URL: . . . >*. The following is an example of the syntax:

Online_Linkage: NASA JPL data: <URL:http://podac-www.jpl.nasa.gov/data.tar>

Additional guidelines on how to construct the various Sections of a FGDC CSDGM-compliant metadata record are presented in the following paragraphs.

4.1.2 Production Rules and Notation

This section describes the notation used in the following sections and the associated production rules. A production rule specifies the relationship between a Compound Element, Data Elements, and other (lower-level) Compound Elements. Each production rule has a left side (identifier) and a right side (expression) connected by the symbol "=", meaning that the term on the left side is replaced by or produces the term on the right side. Terms on the right side are either other Compound Elements or individual Data Elements. By making substitutions using matching terms in the production rules, one can explain higher-level concepts using Data Elements. The symbols used in the production rules have the following meanings:

= is replaced by, produces, consists of
+ and
[|] selection - select one term from the list of enclosed terms (exclusive or).
Terms are separated by "|"
m{}n iteration - the term(s) enclosed is(are) repeated from "m" to "n" times
() optional - the term(s) enclosed is(are) optional

Examples:

a = b + c "a consists of b and c"
a = [b | c]"a consists of one of b or c"
a = 4{b}6 "a consists of four to six occurrences of b"
a = b + (c) "a consists of b and optionally c"

The notation 0{ term }1 is not the same as optional. This notation is used to indicate the concept of "mandatory if applicable." This concept means that if the data set exhibits a defined characteristic, then the producer shall provide the information needed to describe that characteristic.

FGDC CSDGM Elements that are mandatory are indicated in **this font in bold** in the Element listing**.** There are some Elements that are not mandatory under the FGDC CSDGM but are required or recommended by the MEL. Mandatory MEL Elements are indicated by **this font** and recommended Elements by ***this font in bold and italic.***

For example, suppose that a Compound Element has the following components (sub-Elements):

Element_1 +
(**Element_2**) +
(Element_3) +
(***Element_4***)

Using the FGDC CSDGM, only **Element_1** is Required and the others are all Optional. **Element_2** is the typeface that indicates that it is a MEL Required Element. ***Element_4*** is in the typeface that indicates that it is a MEL recommended Element. These fonts and typefaces are only used in the listing of the component Elements and not in the discussion that follows.

4.1.3 Identification Information *(Required)*

This section describes the Elements that provide basic information about the information resource. The Elements and their associated production rules are:

Citation +
Description +
Time_Period_of_Content +
Status +
Spatial_Domain +
Keywords +
Access_Constraints +
Use_Constraints +
(**Point_of_Contact**) +
(1{***Browse_Graphic***}n) +
(Data_Set_Credit) +
(**Security_Information**) +
(Native_Data_Set_Environment) +
(1{Cross_Reference}n)

An overview of the Elements follows:

- Citation (Required):

  This Compound Element supplies basic referencing information for the data set and is described in **Paragraph 4.1.10** on *Citation Information.* It includes the

originator, title, publication date, and online linkages. The Publication_Date sub-Element is the date of publication and not the date of the data. The Online_Linkages sub-Element should point to the Order Forms.

- Description (Required):

  This is a very important Compound Element whose content often determines whether a user will select the data set or not. The description should provide a characterization of the data set, including its intended use and limitations. The Compound Element description has the following component Elements:

  Abstract +
  Purpose +
  (Supplemental_Information)

  - Abstract (Required): Free text, brief narrative summary of the data set
  - Purpose (Required): Free text, summary of the intended use of the data set

  Include a description of the information in the data set, what geographic region is covered, the limitations of the data, etc. in these Elements. Descriptions should be written in a tone and terms easily understood by novice users.

- Time Period of Content (Required):

  This Compound Element refers to the time period covered by the data set and has the following component Elements:

  Time_Period_of_Information +
  Currentness_Reference

  Both Elements are required:

  - Time_Period_Information (Required): This Compound Element specifies the actual time or period of time covered by the data. Use the Elements and fields as described in **Paragraph 4.1.11**. Choose between specifying a single date/time, multiple dates/times, or a range of dates/times. Single or range of date/times works best for the MEL searches. Date is required, while Time is not.
  - Currentness_Reference (Required): This Element specifies the basis on which the Time_Period_Information is determined and can include the terms “time of model run”, “ground condition”, “publication date”, or some other explanation in free text format.

- Status (Required):

This Compound Element refers to the progress and maintenance of the data set, not of the metadata. The Elements are:

Progress +
Maintenance_and_Update_Frequency

- Progress (Required): State of the data set. Insert text values from domain "Complete", "In work", or "Planned".
- Maintenance_and_Update_Frequency (Required): Frequency of changes and additions to the data set after the initial data set has been completed. Insert text values from the domain: "Continually", "Daily", "Weekly", "Monthly", "Annually", "Unknown", "As needed", "Irregular", "None planned", or free text.

- Spatial Domain (Required):

The Spatial Domain is the geographic coverage of the data set expressed in degrees of latitude and longitude. This Compound Element is very important for data discovery and generation of map displays. The Spatial Domain is composed of the following Elements:

Bounding_Coordinates +
(1{Data_Set_G-Polygon}n)

- Bounding Coordinates (Required): A bounding rectangle that depicts the geographic coverage of the data set.

The following example shows the usual Elements with their Fields indicating global coverage:

```
Spatial_Domain:
  Bounding_Coordinates:
    West_Bounding_Coordinate: -180
    East_Bounding_Coordinate:  180
    North_Bounding_Coordinate:  90
    South_Bounding_Coordinate: -90
```

The conventions for writing latitude and longitude are the following:

Latitude and longitude may be expressed as decimal degrees to the precision desired. When decimal fractions are used they will be separated from the whole degrees by a decimal point, e.g., 85.3.

Latitudes north of the equator shall be specified by a plus sign (+), or by the absence of a minus sign (-), preceding the number. Latitudes south of the equator shall be designated by a minus sign (-) preceding the number. A point on the equator shall be assigned to the northern hemisphere. The domain of Values for latitude is from -90 to +90.

Longitudes east of the prime meridian shall be specified by a plus sign (+), or by the absence of a minus sign (-), preceding the number. Longitudes west of the prime meridian shall be designated by minus sign (-) preceding the number. Any point on the prime meridian shall be assigned to the eastern hemisphere (+). Any point on the 180th meridian shall be assigned to the western hemisphere (-). One exception to this last convention is permitted; for the special condition of describing a band of latitude around the earth, the East_Bounding_Coordinate data Element shall be assigned the Value +180 (180) degrees (see the above example).

- Data_Set_G-Polygon (Optional): may be inserted at the level of Element Bounding Coordinates and defines a sequence of coordinates defining the outline of an area covered by a data set. The MEL currently only searches on the Bounding Coordinates Element. See the FGDC CSDGM for more information.

- Keywords (Required):

A Keyword is a word or phrase that summarizes the content of a data set. Users employ Keywords to search for data sets of interest to them. It is extremely important to include an extensive suite of Keywords that fully characterize each data set. The Elements are:

1{**Theme**}n +
0{***Place***}n +
0{***Stratum***}n +
0{***Temporal***}n

- Theme (Required): The subjects that relate to the data set

- Place (MEL Required): Geographic location of the data in the data set, such as SE USA, Korea, or Montgomery County

- Stratum (MEL Required): Vertical location of the data set, such as seafloor, seabed, troposphere, or stratosphere

- Temporal (MEL Recommended): Time reference for a data set, such as Pre-Cambrian or World War II. If time is not relevant for the data set in terms of searching for data covering a particular time period, a special entry is made so the MEL will disable date searching on this metadata record. This is useful for terrain data sets when a user searches for data covering a particular spatial area and time period, the terrain data covering the search area is discovered even though it was produced (Time_Period_of_Content) before the time period being searched. The following entries should be included if date is not applicable for searching:

Temporal:
Temporal_Keyword_Thesaurus: MEL_Temporal_Coverage_Thesaurus
Temporal_Keyword: Ignore_Dates

Each of the Keyword Elements is a Compound Element in the following form:

XXXX_Keyword_Thesaurus +
1{XXXX_Keywords}n

where XXXX corresponds to one of the Elements

A Thesaurus in the context of the MEL is an authoritative list of discipline-specific Keywords for which a formal citation may be given. If the Keywords used do not come from an authoritative list, they are inserted under a thesaurus name of "None." Otherwise, a free text citation identifying the thesaurus is entered.

When developing Keywords for a data set, Metadata Creators should first select Keywords from the MEL Keyword Thesauri. These contain lists of: Theme, Place, Stratum, and Temporal Keywords that must be used if they are applicable. The MEL uses these Keywords in several of its standardized searches, and if left out, the user will probably not discover the data set. The online MEL Metadata Manager (see **Paragraph 4.6**) has a Keyword entry facility to help in entering Keywords from the official MEL Thesauri using drop-down lists. Any new Keywords entered will be submitted for consideration for inclusion in the corresponding official thesaurus. Metadata Creators should use the following controlled lists of the MEL Keyword Thesauri when building Keyword lists:

Theme:

MEL_Scientific-Engineering_Field_Thesaurus (Required) (**Paragraph 6.1**)

MEL_Product_Thesaurus (Required) (**Paragraph 6.2**)

MEL_Exercise-Simulation_Thesaurus (**Paragraph 6.3**)

MEL_Resource_Types_Thesaurus (**Paragraph 6.4**)

Place:

MEL_Location_Thesaurus (Required) (**Paragraph 6.5**)

Stratum:

MEL_Environmental_Domain_Thesaurus (Required) (**Paragraph 6.6**)

MEL_Areal_Coverage_Thesaurus (**Paragraph 6.7**)

Temporal:

MEL_Temporal_Coverage_Thesaurus (**Paragraph 6.8**)

The following example shows how Keywords might be chosen for an oceanographic data set. Only the MEL Keyword Thesaurus entries are required; the author for completeness inserted others. Note that no Exercise-Simulation Keyword was used because the data set was not part of any named exercise or simulation. The MEL Thesaurus names are entered with underscores ("_") instead of spaces so the name is searchable as one word.

Theme:
  Theme_Keyword_Thesaurus: MEL_Scientific-Engineering_Field_Thesaurus
    Theme_Keyword: Oceanography
Theme:
  Theme_Keyword_Thesaurus: MEL_Product_Thesaurus
    Theme_Keyword: TOPS – Thermodynamic Ocean Prediction System
Theme:
  Theme_Keyword_Thesaurus: None
    Theme_Keyword: Temperature
    Theme_Keyword: Salinity
Place:
  Place_Keyword_Thesaurus: MEL_Location_Thesaurus
    Place_Keyword: North Atlantic Ocean
Place:
  Place_Keyword_Thesaurus: None
    Place_Keyword: MLML site
Stratum:
  Stratum_Keyword_Thesaurus: MEL_Environmental_Domain_Thesaurus
    Stratum_Keyword: Ocean
Stratum:
  Stratum_Keyword_Thesaurus: MEL_Areal_Coverage_Thesaurus
    Stratum_Keyword: Mesoscale
Temporal:
  Temporal_Keyword_Thesaurus: MEL_Temporal_Coverage_Thesaurus
    Temporal_Keyword: Hindcast Data

Guidelines for Keywords:

Use as many Keywords from the MEL Keyword Thesauri as applicable.

Identify in general terms the parameters of the data, but avoid acronyms (e.g., use "air temperature" instead of ATMP). More specific documentation of the exact parameters of the data set is given in the Entities and Attributes Section, only common and general words describing the data parameters are placed as Keywords.

If any are likely to be used as search keys, include sensor, platform, and/or project name as Theme Keywords.

Keep Keywords short to facilitate their use as search keys.

- Access Constraints (Required):

  These include access constraints applied to ensure protection of privacy or intellectual property. Security restrictions are listed in the Security_Information Element described later. However, qualifications to the security classification can be placed in this Section if applicable. Valid values are:

  RS – Risk Sensitive
  FOUO – For Official Use Only
  OC – Originator Controlled
  NF – No Foreign
  PR – Proprietary Information

- Use Constraints (Required):

  These include constraints on use of the information resource after access is granted. Security constraints are placed in the Security_Information Element, described later. However, qualifications to the security classification can be placed in this Section if applicable. Valid values are:

  RS – Risk Sensitive
  FOUO – For Official Use Only
  OC – Originator Controlled
  NF – No Foreign
  PR – Proprietary Information

- Point of Contact (MEL Required):

  This Compound Element refers to a person or organization that can answer questions about the data set. It is recommended to use organizations rather than persons, since responsibility usually stays with the position or organization rather than with an individual who can change positions. The appropriate Elements from **Paragraph 4.1.12** on *Contact Information*, are inserted here.

- Browse Graphic (MEL Recommended):

  A browse graphic is a Compound Element reference to some type of graphical representation of the data set that a user may select and display to visualize all or part of the data set. The browse graphic can reference any displayable graphic (e.g., image, movie, or three-dimensional representation) or Common Gateway Interface (CGI) program that generates a display graphic. Typical file types are: Graphic Interchange Format (GIF), Joint Photographic Experts Group (JPEG), Motion Pictures Expert Group (MPEG), Audio Video Interleaved (AVI), Vis5D, Tagged Image File Format (TIFF), etc. The use of browse graphics with data sets

is encouraged. Multiple Browse Graphics entries can be made. Field Values should follow the URL convention of the Internet (see **Paragraph 4.1.1.g**), as in the example:

Browse_Graphic_File_Name: <URL:http://www.fnoc.navy.mil/otis/lattest.gif>

If the Browse Graphic Element is used, all three of the following component Elements *must* be included (Fields are free text format):

- Browse_Graphic_File_Name: Free text URL of graphic file or CGI. The URL must be entered all on one line with no returns.
- Browse_Graphic_File_Description: Free text
- Browse_Graphic_File_Type: Free text (JPEG, GIF, MPEG, etc.)

- Data Set Credit:

  This Element recognizes those who contributed to the data set. The format for the Field Value is free text.

- Security Information (MEL Required):

  This Compound Element describes restrictions placed on the information resource (data) because of national security, privacy, or other concerns. All three of the following Elements that make up the Compound Element must be included:

  - Security_Classification_System: Free text
  - Security_Classification: Insert text from domain the Values, "Secret," "Confidential," or "Unclassified". Qualifications such as "Restricted," "Government Only," etc. should be placed in the Access_Constraints and/or Use_Constraints Elements as applicable.
  - Security_Handling_Description: Free text

  The classification of the metadata (this record) is described by Elements in the Metadata Reference Information in **Paragraph 4.1.9**. Note that the metadata may be Unclassified, but the data itself may have a classification other than Unclassified. It is up to the classifying agency to determine if Unclassified metadata that points to Classified data can be made available over an Unclassified system. In any case, Classified data itself cannot be obtained via the Unclassified MEL. Such data would have to be obtained through normal channels, or via the Classified MEL if the data are made available there.

- Native Data Set Environment:

This free text Element is used to describe the information resource in the producer's processing environment, including items such as name of software, computer operating system, file names and/or URLs, and data set size.

- Cross Reference:

  This Compound Element is used for other, related data sets that might be of interest. If used, the appropriate Elements from **Paragraph 4.1.10** on *Citation Information* are inserted.

4.1.4 Data Quality Information *(Recommended)*

Metadata Creators have a responsibility to give potential users some estimate of data quality. The MEL particularly recommends this commentary on attribute and positional accuracy or, in the case of images, cloud cover percentage. If specific quantitative estimates of data quality cannot be provided, qualitative textual descriptions may be given. The Data Quality Element is composed of the following Elements:

0{**Attribute_Accuracy**}1 +
Logical_Consistency_Report +
Completeness_Report +
0{Positional_Accuracy}1 +
Lineage +

If the Data Quality Section is included, FGDC CSDGM requires the Elements Logical Consistency Report, Completeness Report, and Lineage. These must be included along with any of the MEL-recommended Elements, but their Fields may be filled with placeholder words such as "Not required by MEL." See the FGDC CSDGM for more information on all the following Elements:

- Attribute Accuracy (MEL Required):

  A Compound Element that provides an assessment of the accuracy of the identification of entities and assignment of attribute Values in the data set. The Elements are:

  - Attribute_Accuracy_Report (Required)**:** This is an explanation of the accuracy of the identification of the Entities and assignments of Values in the data set and a description of the tests used.

  - Quantitative_Attribute_Accuracy_Assessment: This is a Value assigned to summarize the accuracy of the identification of the Entities and assignments of Values in the data set and the identification of the test that yielded the Value.

- Logical Consistency Report (Required):

  An explanation of the fidelity of relationships in the data set and tests used.

- Completeness Report (Required):

  Information about omissions, selection criteria, generalization, definitions and other rules used to derive the data set.

- Positional Accuracy:

  This Compound Element is broken down into horizontal and vertical accuracy of the positions of spatial objects. These may be expressed in a qualitative or quantitative fashion. An "Accuracy_Report" would be more qualitative, while a "Quantitative_Accuracy_Assessment" would be more quantitative. Field Values are free text and the Value "Unknown" is acceptable. Suggested Elements are:

  - Horizontal_Positional_Accuracy:
    Horizontal_Positional_Accuracy_Report:

  - Vertical_Positional_Accuracy:
    Vertical_Positional_Accuracy_Report:

  See the FGDC CSDGM for more information on the Optional Compound Elements:

  - Quantitative_Horizontal_Positional_Accuracy_Assessment:

  - Quantitative_Vertical_Positional_Accuracy_Assessment:

- Lineage (Required):

  This subSection gives information about the events, parameters, and source data that led to the construction of the data set being documented The Compound. Elements in this subSection are:

  0{Source_Information}n +
  1{**Process_Step**}n

  - Source_Information: This Compound Element lists sources and includes a short discussion of the information contributed by some. When several sources have contributed to a data set, each source is identified in a Source_Information Element along with the source's contribution to the data set. The Elements are:

    Source_Citation +
    0{Source_Scale_Denominator}1 +
    Type_of_Source_Media +
    Source_Time_Period_of_Content +

Source_Citation_Abbreviation +
Source_Contribution

- Source_Citation (Required): A reference to the source of the data set. See **Paragraph 4.1.10** on *Citation Information* for additional information.

- Type_Of_Source_Media (Required): The medium of the source data set. From the domain of:Paper, stable-base material, microfiche, microfilm, audiocassette, chart, filmstrip, transparency, videocassette, videodisc, videotape, physical model, computer program, disc, cartridge tape, magnetic tape, online, CD-ROM, electronic bulletin board, electronic mail system, free text

- Process_Step (Required): This Compound Element contains information about a single event in the creation of the data set. This Element is repeated as many times as it takes to describe the process. The Elements are:

  Process_Description +
  0{Source_Used_Citation_Abbreviation}n +
  Process_Date +
  (Process_Time) +
  0{Source_Produced_Citation_Abbreviation}n +
  (Process_Contact)

See the FGDC CSDGM and the FGDC CSDGM Workbook for more information.

4.1.5 Spatial Data Organization Information *(Recommended)*

This Compound Element describes how spatial information is represented in the data set. The Elements for spatial data organization are:

0{Indirect_Spatial_Reference}1 +
0{***Direct_Spatial_Reference_Method*** +
([Point_and_Vector_Object_Information |
Raster_Object_Information])}1

- Indirect Spatial Reference: Free text description of types of geographic features, addressing schemes, or other means by which locations are referenced in the data set.

- Direct Spatial Reference Method (Recommended): The system of objects used to represent space in the data set.

  From the domain of: “Point”, “Vector”, “Raster”

- Point and Vector Object Information: Is a Compound Element that describes the types and numbers of vector or nongridded point spatial objects in the data set

  [1{SDTS_Terms_Description}n |
  VPF_Terms_Description]

  See the FGDC CSDGM for more information.

- Raster Object Information: This Compound Element describes the types and numbers of raster spatial objects in the data set

  Raster_Object_Type +
  (Row_Count + Column_Count + 0{Vertical_Count}1)

  where Raster_Object_Type is "from the domain"

  Point, Pixel, Grid Cell, Voxel

  See the FGDC CSDGM for more information.

4.1.6 Spatial Reference Information *(Recommended)*

This Compound Element describes the reference frame for the coordinates in the data set and how to encode the coordinates. The Elements are:

0{Horizontal_Coordinate_System_Definition}1 +
0{Vertical_Coordinate_System_Definition}1

Please refer to the FGDC CSDGM for additional information. The commonly used Meteorology and Oceanography (METOC) vertical coordinates of: pressure level, height above terrain, and sigma levels are not vertical coordinates under the standard because they are not spatial coordinates in a strict sense (i.e., they are not referenced to a fixed datum such as the WSG 86 geoid).

4.1.7 Entity and Attribute Information *(Required)*

The Entity and Attribute Section describes the data parameters included in the information resource. The component Elements are:

[1{Detailed_Description}n |
1{Overview_Description}n |
1{Detailed_Description}n + 1{Overview_Description}n]

- Detailed_Description (Recommended): A description of the Entities, Attributes, Attribute Values, and related characteristics encoded in the data set. It may be

repeated unlimited times, once for each Entity type. This Compound Element includes the following Elements:

Entity_Type +
0{***Attribute***}n

The MEL requires Entities and Attributes be described using DDDS terminology, where appropriate. When all of the MEL metadata uses the same terminology for parameters, searching becomes much more powerful and useful. The online MEL interface can provide parameter search help using DDDS terminology.

It is very important to spend the necessary time finding the correct DDDS Entity & Attribute names for locally named parameters. If either the correct DDDS Entity or Attribute cannot be found to describe the local parameter, enter the local names used. The MEL will periodically search all metadata for non-DDDS terms used and send them to the MEL Metadata Coordinator for consideration as additions to the DDDS.

NOTE: The DoD Data Administration information is available online at the following:

DoD Data Administration Guidance/Procedures:
http://www-datadmn.itsi.disa.mil/guidance.html

DoD Data Administration Tools:
http://www-datadmn.itsi.disa.mil/tools.html

Online DDDS data Element search is available from either of these pages.

Software for DDDS Release 4.0:
http://www-datadmn.itsi.disa.mil/ddds/ddds40.html

Entity and Attribute information may be described with the Compound Element Detailed_Description and/or with the Compound Element Overview_Description. The MEL recommends the use of the Detailed_Description Element for each Entity/Attribute, but recognizes that some users have valid reasons for using the Overview_Description. The MEL search mechanism allows searches on DDDS Entity/Attribute names. A description of the Elements in this Description Section follows. See the FGDC CSDGM for official definitions of the Element names.

- Entity_Type (Required): A Compound Element containing the definition and description of a set into which similar Entity instances are classified. The component Elements are:

  Entity_Type_Label +
  Entity_Type_Definition +
  Entity_Type_Definition_Source

- Entity_Type_Label (Required): Use free text Entity name from DDDS, otherwise use a stratum keyword from the MEL Environmental Domain Thesaurus. The DDDS shows Entity names as all capital letters.
- Entity_Type_Definition (Required): Insert free text definition from DDDS.
- Entity_Type_Definition_Source (Required): Use "DDDS" for a DDDS Entity or free text term for a local data dictionary name.

o Attribute (MEL Required): A defined characteristic of an Entity. A Compound Element that may be repeated multiple times, once for each Attribute under the Entity type. The component Elements are:

Attribute_Label +
Attribute_Definition +
Attribute_Definition_Source +
1{**Attribute_Domain_Values**}n +

0{Beginning_Date_of_Attribute_Values +
0{Ending_Date_of_Attribute_Values}1}n +
(Attribute_Value_Accuracy_Information) +
(Attribute_Measurement_Frequency)

The first four Elements are required.

- Attribute_Label (Required): Insert the free text Attribute name. Use the DDDS Attribute name. The DDDS Attribute names contain both the Entity (capitalized) and Attribute (lowercase) in the official Attribute Name. It should be entered this way in the metadata. A non-DDDS Attribute can be used with a DDDS Entity if, for example, the Attribute had non-DDDS units or if a particular data parameter did not yet have a DDDS Attribute name assigned. As mentioned before, non-DDDS Attributes found in the MEL metadata will periodically be sent to the MEL Metadata Coordinator for consideration for addition to the DDDS.
- Attribute_Definition (Required): Insert free text definition from DDDS.
- Attribute_Definition_Source (Required): Use "DDDS" for a DDDS Attribute or free text term for a local data dictionary name.
- Attribute_Domain_Values (Required): A Compound Element that may be inserted multiple times, each time employing one of the sub-Elements below.

[Enumerated_Domain |
Range_Domain |
Codeset_Domain |
Unrepresentable_Domain]

Enumerated_Domain - A Compound Element that lists an established set of valid Values. For rain intensity could have the domain Values of light, moderate, and heavy. The sub-Elements are:

1{Enumerated_Domain_Value +
Enumerated_Domain_Value_Definition +
Enumerated_Domain_Value_Definition_Source +
0{Attribute}n }n

Range_Domain – A Compound Element that describes a domain that is comprised of a sequence, series, or scale of Values (usually numeric) between limits. For example Atmospheric temperature has a range from 163K to 336K. The sub-Elements are

Range_Domain_Minimum +
Range_Domain_Maximum +
0{Attribute_Units_of_Measure}1 +
(Attribute_Measurement_Resolution) +
0{Attribute}n

When looking at the range of Values for a particular attribute, consider the DDDS defined range as default. A more limited range may be used.

Codeset_Domain – A Compound Element that describes a domain in which the data Values are defined by a set of codes. The FGDC example is the Federal Information Processing Standards that contain numeric codes for nations, states, and counties. The sub-Elements are:

Codeset_name +
Codeset_Source

Unrepresentable_Domain – A domain for which the set of data Values cannot be represented.

For special situations, the use of some or all of the following additional Elements may be desirable. See the FGDC CSDGM for more information:

- Attribute_Measurement_Resolution:
- Beginning_Date_of_Attribute_Values:
- Ending_Date_of_Attribute_Values:
- Attribute_Value_Accuracy_Information:

See **Appendix C** for an example of the Detailed Description method.

- Overview_Description: A summary of, and citation to detailed description of, the information content of the data set. This Compound Element may be repeated multiple times, and has the following Elements:

Entity_and_Attribute_Overview +
1{Entity_and_Attribute_Detail_Citation}n

- Entity_and_Attribute_Overview: Free text detail summary of the information contained in a data set. This is often used for geographic data sets that may contain thousands of Entities and Attributes and a Detailed_Description would be too long for practical use.

- Entity_and_Attribute_Detail_Citation: Free text reference to a description of the Entities and Attributes in an information resource, if it exists.

See **Appendix C** for an example of the Overview Description method.

4.1.8 Distribution Information (*Recommended*)

This optional Section supplies information on how to obtain the information resource. The component Elements are:

```
Distributor +
0{Resource_Description}1 +
Distribution_Liability +
0{Standard_Order_Process}n +
0{Custom_Order_Process}1 +
(Technical_Prerequisites) +
(Available_Time_Period)
```

An overview of the Section Elements follows:

- Distributor (Required):

  This Compound Element refers to one or more distributors from whom the data set may be obtained. It is of the form of the supplemental *Contact Information* described in **Paragraph 4.1.12**.

- Resource Description:

  This free text Element gives the identifier or name by which the distributor may identify the data set.

- Distribution Liability (Required):

  This is a free text narrative describing the liability assumed by the distributor of the data.

- Standard Order Process (repeat as many times as needed):

  This Compound Element describes common methods for obtaining a data set from a distributor. Access via the World Wide Web is one option. If the data may be ordered using the MEL's Custom Order facility, the Custom Order Process field is used instead. The sub-Elements are:

  [Non-digital_Form |
  1{Digital_Form}n] +
  Fees +
  (Ordering_Instructions) +
  (Turnaround)

  - Non-digital_Form - The description of options for obtaining the data set on non-computer-compatible media.

  - Digital_Form - The description of options for obtaining the data set on computer-compatible media.

  - The remaining Elements are fairly self-explanatory. See the FGDC CSDGM for additional details.

- Custom Order Process:

  This free text Element describes available custom distribution services available for the information resource. For data to be made available through the MRSS, a special MEL Order Syntax is placed in this field. See **Section 7** for a description and discussion of the MEL Order Syntax. The MEL Order Syntax is used by the MEL Access Site to automatically generate a Hypertext Markup Language (HTML) Order Form when requested. A description of the MEL Order Syntax is found in the MRSS Appendix of the MEL Software Center Operator Manual (SCOM). The information in the Order Syntax is tightly coupled to the extractor used by the MRSS to extract the data.

- Technical Prerequisites:

  This free text Element is used to describe any technical capabilities that are required to use the information resource in the form(s) provided by the distributor.

- Available Time Period:

  This Compound Element refers to when the data set will be available from the distributor. If used, insert applicable Elements from **Paragraph 4.1.11** on *Time Period Information* and complete the Field Values according to that context.

4.1.9 Metadata Reference Information *(Required)*

This Section describes the currentness of the metadata information and the responsible party. The component Elements are:

Metadata_Date +
(**Metadata_Review_Date**) +
(Metadata_Future_Review_Date) +
Metadata_Contact +
Metadata_Standard_Name +
Metadata_Standard_Version +
0{Metadata_Time_Convention}1 +
(Metadata_Access_Constraints) +
(Metadata_Use_Constraints) +
(Metadata_Security_Information) +
0{Metadata_Extensions}n

Some of these contain sub-Elements. See the FGDC CSDGM for additional information. A brief overview of the Section Elements follows:

- Metadata Date (Required):

  Insert the date the metadata was created or was last updated (which ever is newer) using the format YYYYMMDD, where the month is expressed as a two-digit integer.

- Metadata Review Date (MEL Required):

  This is the date of last review of the metadata by a MEL Metadata Approval Authority, in the format YYYYMMDD.

- Metadata Future Review Date:

  This is the date when the metadata is scheduled for review. If used, format is YYYYMMDD.

- Metadata Contact (Required):

  The Metadata Contact should be the organization and person that created the metadata and who can answer questions or correct errors in the metadata. Insert applicable Elements from **Paragraph 4.1.12** on *Contact Information*.

- Metadata Standard Name (Required):

  This should be "FGDC Content Standard for Digital Geospatial Metadata".

- Metadata Standard Version (Required):

  This text Element states the current version of the FGDC CSDGM was released in June 1998 and should be entered as "FGDC-STD-001-1998".

- Metadata Time Convention:

  A text Element describing the form used to convey the time of day information in the metadata entry. It is used if time of day information is included in the metadata for a data set. The domain is "local time", "local time with time differential factor", and "universal time." All MEL metadata should use "universal time." This makes time comparisons between metadata at different geographic locations possible. See **Paragraph 4.1.11** for an explanation of the different forms.

- Metadata Access Constraints (Required if metadata is other than Unclassified, public access):

  This text Element includes restrictions and legal prerequisites for accessing the metadata. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special limitations or restrictions on obtaining the metadata. Qualifications to the Metadata Security information are placed in this Section as applicable. Valid values are:

  RS – Risk Sensitive
  FOUO – For Official Use Only
  OC – Originator Controlled
  NF – No Foreign
  PR – Proprietary Information

- Metadata Use Constraints:

  This text Element describes any restrictions or legal conditions for using the metadata, including protection of privacy and intellectual property. Qualifications to the Metadata Security information are placed in this Section as applicable. Valid values are:

  RS – Risk Sensitive
  FOUO – For Official Use Only
  OC – Originator Controlled
  NF – No Foreign
  PR – Proprietary Information

- Metadata Security Information (Required if metadata is other than Unclassified, public access):

This Compound Element describes the restrictions based on national security, privacy, or other concerns. The three Required Elements are:

- Metadata_Security_Classification_System: Free text format
- Metadata_Security_Classification: Insert Value from the domain of: "Secret," "Confidential," or "Unclassified". Under DoD guidelines, the only valid security classifications are those listed above. "Sensitive" and "Restricted" are not valid entries and should be entered under Metadata_Access_Constraints and/or Metadata_Use_Constraints as appropriate.
- Metadata_Security_Handling_Description: Free text format

4.1.10 Citation Information

NOTE: This Section provides a means of stating the citation of a data set, and is used by other Sections of the metadata standard. This Section is never used alone.

The list of Citation Information Elements is:

1{**Originator**}n +
Publication_Date +
(Publication_Time) +
Title +
0{***Edition***}1 +
0{Geospatial_Data_Presentation_Form}1 +
0{Series_Information}1 +
0{Publication_Information}1 +
0{Other_Citation_Details}1 +
(1{**Online_Linkage**}n) +
0{Larger_Work_Citation}1

The Elements used and the corresponding Field Values should be chosen to reflect the context for this particular Citation. If Citation Information is used, certain Elements are required; as indicated. Other Elements are optional. General notes on some of the Elements are given below. For additional information, see the FGDC CSDGM.

- Originator (Required):

  The name of organization or individual that developed the data set. It may be repeated. When citing a data set or other information resource, if the Originator is one of the organizations listed in the MEL Originators List (see **Appendix B**), use the abbreviation and name exactly as it is shown on the list. If the Originator is not listed, use free text to identify them.

- Publication Date (Required):

  The date when the data set is published or otherwise made available for release. For MEL data, it refers to the approval date of the model or publication date of the product. It does not refer to the production date of the data set. Use the convention YYYYMM or YYYYMMDD, where the month is written as a two-digit integer (i.e., 09). Use of the terms "Unknown" and "Unpublished material" is acceptable, but discouraged.

- Title (Required):

  Data set Titles must be unique within the metadata collection. If the data set has an acronym it should come first, followed by the full name. To make the Title unique, it is useful to include a location and an indication of time period covered, if appropriate. It can also be useful to include one of the terms "current" or "archived" to represent regularly updated data and older data, respectively. Make data set Titles brief, but complete. A good Title should have 100 characters (and spaces) or less, although more characters are acceptable. When the metadata will be used on a Classified MEL system, the Title must be marked with a Classification code. The following codes apply:

  S – Secret
  C – Confidential
  U - Unclassified

  Examples:

```
Title: (ADCIRC) Advanced Three-Dimensional Circulation
Model for Camp Lejeune, North Carolina, March 1997

Title:  TOPS - Thermodynamic Ocean Prediction System,
global coverage, 1 degree grid, data archive

Title:  DTED0 - Digital Terrain Elevation Data Level 0 -
N90,W150

Title:  Bathymetry Scotland Northeast Coast (30 sec. res.)

Title:  (S) WAM – Current 25 days, global coverage (1 degree
grid), WAVE MODEL
```

- Edition (Recommended):

  The version of the title (data set). A free text Element describing the version of the data set. For the output of numerical models, this is the version of the model, not an output level. Example:

```
Edition: COAMPS 1998
```

- Geospatial_Data_Presentation_Form:

The mode in which the geospatial data are represented. In the MEL this is coordinated with the Theme Keywords and one of the Values from the MEL Resource Types Thesaurus (see **Paragraph 6.4**) should be used. Insert that name exactly as given in the list. Otherwise, insert an appropriate free text description and use the same description in the Theme Keywords and it will automatically be submitted for consideration to be included in the standard list.

- Online_Linkage (Mel Required in the Identification Information section):

  An online resource for obtaining the described data. An online linkage can be a URL to a data file, the MEL custom ordering system, or any other existing data ordering or access system. As many entries as needed may be used. An informative Title helps users decide which online linkage to use when more than one exists. See **Paragraph 4.1.1.g** for additional information.

NOTE: Avoid links to homepages that require additional steps by the user to reach the actual data page. The link should take the user as close to the data as possible. Users are confused when they search to find the metadata then have to search again (after following the Online_Linkage) in a different system.

If a MEL Resource Site is running the MRSS, a URL similar to the first example below is required to order the data. The MEL Custom Order URL requires the URL shown below along with the Resource Site ID (site=<site_id>) and metadata filename (ofile=<filename>).

CAUTION: If the MEL Custom Order URL is not in the Online Linkage section of the metadata, the data will not be orderable.

After a search using the MEL Web interface, users will see the words "MEL Order" associated with a MEL Custom Order link and "Alternative Access" associated with other Online Linkages.

Examples:

```
Online_Linkage:

MEL Custom Order Form: <URL:http://mel.dmso.mil/mel-
bin/order?site=nima&ofile=dted0_150w60n.meta&action=order>

Online_Linkage:

Terrain Modeling Project Office:
<URL:http://www.tmpo.nima.mil/tmpo-bin/goto.cgi?dted0-data.html

Online_Linkage: Data File:
<URL:ftp://ftp.nima.mil/pub/data.tar.Z>
```

In the above examples, the whole entry (i.e., the FGDC CSDGM Element name and its Value) can be placed on one line or the Element name "Online_Linkage" can be placed on one line with its Value on the following line, indented one space (in some of the examples above, the second line has line wrapped).

Example of a source citation:

```
Citation_Information:
   Originator: U.S. Department of Commerce
   Originator: National Oceanic and Atmospheric
Administration (NOAA) <line wrapped around>
   Publication_Date: 19941100
   Title: World Ocean Atlas 1994: CD-ROM Data Set
Documentation <line wrapped around>
   Publication_Information:
   Publication_Place: Washington, D.C.
   Publisher: U.S. Department of Commerce
   Other_Citation_Details: NODC Informal Report No. 13
```

4.1.11 Time Period Information

NOTE: This Section provides a means of stating temporal information, and is used by other Sections of the metadata record. This Section is never used alone.

The component Elements are:

[Single_Date/Time | Multiple_Dates/Times | Range_of_Dates/Times]

As can be seen, there are three methods for describing Time Period Information. The same method should be used throughout the metadata record.

- Single_Date/Time:

  The means of encoding a single date and time. The sub-Elements are:

  Calendar_Date +
  (Time_of_Day)

- Multiple_Dates/Times:

  The means of encoding multiple individual dates and times. The sub-Elements are:

  2{**Single_Date/Time**}n

- Range_of_Dates/Times:

  The means of encoding a range of dates and times: The sub-Elementes are:

  Beginning_Date +

(Beginning_Time) +
Ending_Date +
(Ending_Time)

Conventions for Date and Time format:

a. The convention[3] for writing a date is YYYY or YYYYMM or YYYYMMDD, (ANSI X3.30-1985), where the month and day are expressed as a two-digit integer (e.g., March is written as 03).

b. Although the FGDC CSDGM supports the time formats: Local Time, Local Time with Time Differential Factor, and Coordinated Universal Time (UTC); UTC is required for the MEL metadata. This allows for all searching and time calculations in the MEL to be based on the same system.

   Coordinated Universal Time *(Required)*: Time expressed as Universal Time values shall follow the 24-hour timekeeping system for Universal Time of day in hours, minutes, seconds, and decimal fractions of a second (expressed to the precision desired) without a separator such as a period between the whole part and the decimal fraction, with the upper case letter "Z" directly following the low-order (or extreme right hand) time Element of the 24-hour clock time expression. The general form is HHMMSSSSZ. (ANSI X3.51-1975). The Z distinguishes the time from local time.

c. If Range_of_Dates/Times is used, the Ending_Date can contain the word "Present". In the MEL this is interpreted as the data has current data, or data for today's date. The use of "Unknown" is discouraged as it often is not searched correctly by search engines because the meaning is not clear. Use of "Unknown" in date fields can prevent finding the data.

4.1.12 Contact Information

> *NOTE:* This Section provides a means of identifying individuals and organizations, and is used by other Sections of the metadata standard. This Section is never used alone.

The component Elements are:

[Contact_Person_Primary | Contact_Organization_Primary| +
(Contact_Position) +
1{**Contact_Address**}n +
1{**Contact_Voice_Telephone**}n +
(1{Contact_TDD/TTY_Telephone}n) +
(1{Contact_Facsimile_Telephone}n) +

[3] This convention refers to a date from the A.D. era. For dates from the B.C. era, see the *FGDC CSDGM*.

(1{***Contact_Electronic_Mail_Address***}n) +
(Hours_of_Service) +
(Contact_Instructions)

The Elements used and the corresponding Field Values should be chosen to reflect the context for this particular Contact. If Contact Information is used, certain Elements are Required; as indicated. Other Elements are Optional. Some general notes on some of the Elements are given below. For additional information, see the FGDC CSDGM.

One of the following two Compound Elements must be used: Contact Primary Person, or Contact Organization Primary. Contact Organization Primary is recommended. This allows personnel changes without having to change the metadata.

- Contact Organization Primary (Recommended):

  The organization, and the member of the organization, associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set. The sub-Elements are:

  Contact_Organization +
  (Contact_Person)

  - Contact Organization (Required): This text Element is the title of the organization.
  - Contact Person (Optional): The name of the person.

- Contact Position (Optional):

  This text Element is the title of the individual**.**

- Contact Address (Required):

  The address for the organization or individual. The sub-Elements are:

  Address_Type +
  0{Address}n +
  City +
  State_or_Province +
  Postal_Code +
  (Country)

  - Address Type: Text Element describing the information provided by the address. The domain is “mailing”, “physical”, “mailing and physical”, or free text.

- Address: (Can be repeated for multiple street address lines) Free text Element containing the address.
- City: Free text Element containing the city of the address.
- State or Province: Free text Element.
- Postal Code: Free text Element with the ZIP or other postal code of the address.
- Country: Free text Element containing the country.

4.2 CLASSIFICATION MARKINGS IN MEL METADATA RECORDS

Metadata records used on the Classified MEL require special markings. The special markings are used to indicate the classification of both the metadata and the data. The data may be Classified while the corresponding metadata may be Unclassified.

The following sections apply to metadata records on the Classified MEL; however, it is strongly recommended that these Sections also be filled out for metadata records that are on the Unclassified MEL. These markings appear in several areas of the metadata and control classification banners shown on the MEL display. Improper labeling will prevent some MEL functions from working as expected.

Valid Classification Markings are given in **Table 1.** Valid Control Markings (qualifications to the security information) are given in **Table 2**.

Table 1. Valid Classification Markings

Classification	Code
Secret	S
Confidential	C
Unclassified	U

Table 2.Valid Control Markings

Qualification	Code
Risk Sensitive	RS
For Official Use Only	FOUO
Originator Controlled	OC
No Foreign	NF
Proprietary Information	PR

Classification information is supplied for both the metadata record and for the data.

4.2.1 Metadata Classification

The following metadata Sections are mandatory in a Classified system. If absent, the metadata will not be viewable from the *Results* page.

The overall classification of the metadata record should be entered in the following metadata Element:

Metadata_Reference_Information

Metadata_Security_Information

Metadata_Security_Classification : <classification>

The valid Classification Markings for the metadata are given in **Table 1**. The overall metadata Control Markings will go in the metadata Element:

Metadata_Reference_Information

Metadata_Access_Constraints : <control markings>

Valid Control Markings are given in **Table 2**.

4.2.2 Data Classification

The classification of the data is specified using the metadata Element:

Identification_Information

Security_Information

Security_Classification: <classification>

The valid Classification Markings are listed in **Table 1**. Control Markings for the data are specified in the metadata Element:

Identification_Information

Access_Constrains: <control markings>

4.2.3 Other Required Markings

Any field of the metadata can be assigned a Classification and Control Marking if the Field allows free text. The Markings will be visible when the metadata is viewed. The Classification and Control Markings should appear in parentheses (e.g., (U), (S)) before the actual Value of the Field. For instance, for a Title Field, we might have:

Title: (S) WAM - Current 25 days, global coverage (1 degree grid). Note that there must be a space between the Classification Marking and the actual Field Value.

The Spatial Domain Bounding Coordinates and the Time Period of Content in the Identification Information section of the metadata cannot have Classification and Control Markings because they are not free text. If these sections are classified and this needs to be communicated to the system, then it should be indicated in the following Section:

Identification_Information
Security_Information
Security_Handling_Description :

The Classification and Control Markings of the spatial and temporal information is specified using the following format in the Security_Handling_Description field:

[SPATIAL = ... | TEMPORAL = ...]

One could have SPATIAL, TEMPORAL, or both. If both, the two have to be separated by the | sign. This information will be used to Portion Mark the sections in the order and the visualization pages. They will not be used to Portion Mark the appropriate sections when viewing the metadata. An example is:

SPATIAL = U//RS | TEMPORAL = U//FOUO, OC

Notice the absence of the brackets in the Classification and Control Markings in these cases.

4.2.4 General Comments

It is important that Metadata Creators and Reviewers make sure that the overall Classification and Control Markings of the metadata as discussed be consistent with the Portion Markings of the metadata. The classification should be of the highest classification of the metadata, and the Control Markings should be a comma-separated concatenation (e.g., RS, FOUO, and OC).

When the *Query Results* page is rendered in the MEL, the only thing that will affect the overall classification of the page will be the Portion Markings of the titles of the result set. If none of the titles have Portion Markings, then the page will not have any Portion Markings and the overall classification is assumed to be Unclassified. Otherwise the page will have a classification of the highest classification indicated in the Titles and all the Titles will be Portion Marked, with the default (U) being the case for Titles without markings.

When the user wishes to visualize the bounding areas of the result set, the overall classification will be determined from the title and the spatial domain classification if it exists as discussed in **Paragraph 4.2.3**. The bounding areas displayed in the page will be Portion Marked appropriately.

When the user wishes to visualize the date ranges of the result set, the overall classification will be determined from the Titles as well as the time period of content classification if it exists as discussed in **Paragraph 4.2.3**. The date ranges displayed in the page will be Portion Marked appropriately.

When the metadata page is viewed, the overall Classification and Control Markings of the page will be obtained from the fields as discussed in **Paragraphs 4.2.1 to 4.2.3**. The Portion Markings in the metadata will just appear as they have been entered in the metadata.

When the *Order* page is rendered, the overall classification will be obtained from the Title field of the metadata as well as any of the TEXT dimensions in the MEL Custom Order section. These TEXT dimensions appear as a paragraph of text in the different Sections of the metadata and can be Portion Marked, and these will be taken into consideration for the overall Classification and Control Markings of the *Order* page. Note that if the spatial and time period of content is marked, they should be entered in the TEXT dimension, and be consistent with those entered above.

4.3 TEMPLATES TO CREATE FGDC CSDGM-COMPLIANT MEL METADATA RECORDS

Appendix D contains both the long and short forms of the FGDC CSDGM-compliant Metadata templates. The long form contains all possible FGDC CSDGM Elements. The short form contains only those Elements that are either required or recommended for the MEL metadata records.

4.4 SAMPLE MEL METADATA RECORDS

Appendix E contains four general MEL metadata record examples.

4.5 CREATING FGDC CSDGM COMPLIANT MEL METADATA RECORDS

The FGDC CSDGM specifies only the contents of metadata files and not their format or encoding. The MEL has adopted a text format encoding scheme described online at the following location:

http://geology.usgs.gov/tools/metadata/tools/doc/encoding.html

Creation of a FGDC CSDGM-compliant MEL metadata record involves creating an ASCII text file containing the metadata Elements and their values. Text files can then be checked for proper formatting and syntax (see **Paragraph 4.6**) using the metadata compiler, mp. When error free, the metadata record is usable within the MEL.

The text-encoding scheme calls for indentation at each level of the metadata hierarchy using a consistent number of either spaces or tabs. It is very easy, using a text editor, to end up with a mixture of tabs and spaces within one indentation level and still have the document look correct. This will, however, produce errors when using the syntax checker (mp). For consistency, the MEL recommends the use of a one-space indent for each subordinate level.

One approach to creating a metadata file is to use a text editor or word processor to edit a copy of either the short form or long form of the FGDC CSDGM metadata template described in **Paragraph 4.3** of this document. Type Field Value information into the template after the colon (:) at each appropriate non-Compound metadata Element. All possible options and choices for each Element are included in the long form, while only the MEL required Elements plus recommended Elements are included in the short form. When using these templates, many Elements will need to be deleted, and some may need to be duplicated. Using examples of other MEL metadata records and referring to **Paragraph 4.1** of this document as well as the FGDC CSDGM, create the desired metadata record and save it as an ASCII text file. The metadata should be created in compliance with Schweitzer's prescribed encoding scheme as described above.

Other alternatives for creating and editing metadata are reviewed or listed at the following online links:

http://www.fgdc.gov/metadata/toollist/metatool.html

http://www.state.oh.us/das/dcs/ogrip/pdf/evaluation.pdf

http://badger.state.wi.us/agencies/wlib/sco/metatool/mtools.htm

The United States Geological Survey (USGS) metadata editor, `xtme`, is reviewed in the above links and may also be used to create metadata files. This editor is designed for UNIX systems with X-Windows and creates a metadata file in the appropriate format. It is available online at:

http://geology.usgs.gov/tools/metadata/tools/doc/xtme.html

Install the editor application and use it to edit an ASCII copy of a similar metadata file, or use either the short or long form of the FGDC CSDGM metadata template described in **Paragraph 4.3**. The editor application allows adding other Fields not in the original or template files. This will be easier if an example metadata file can be found that is somewhat similar to what will be created. Display that example in a separate window next to the editor, or just print a copy. The editor `xtme` is a basic tool and does not provide many advanced features.

If a tool is used that does not produce output in a format that passes the metadata compiler syntax checking, the tool "`cns`", developed by the USGS, can many times reformat the file so that it does pass. The USGS "`cns`" program is available at the following URL:

http://geology.usgs.gov/tools/metadata/tools/doc/cns.html

4.6 MEL METADATA MANAGEMENT

Official copies of the MEL metadata records are stored at the MEL Access Site. Some of the benefits of centralizing the metadata at the Access Site are that searching is faster and access to metadata collections is consistent. The MEL provides an online Metadata Management tool to help metadata creators manage their metadata collections. The tool allows for uploading metadata from a URL or file, editing, deleting, renaming, and syntax checking of metadata, as well as MEL Keyword entry help and collection indexing. The tool can also be used to manage access privileges to collections that contain access-controlled metadata in the Unclassified MEL.

The MEL allows metadata from each Resource Site to be organized into online and test collections. Currently, the collections are named with the Resource Site ID code (e.g., `nima`, and `nima-test`). Online collections may be discovered by users through the online MEL interface, while the test collections are not. The purpose of a test collection is to have a place to develop, test, and gain approval of metadata before it is posted to the Web server. Unless a metadata file has been completed, tested, and approved, it should not be indexed into the Resource Site's online collection.

All test collections, as well as collections that have not been approved as "active", are searchable through a separate HTML query interface that is the same as the online MEL HTML query interface. The URL for the test collections is:

http://mel.dmso.mil/mel-bin/test_query

If the collection contains restricted metadata in the Unclassified MEL, then the URL for accessing the collection is:

http://mel.dmso.mil/mel-bin/res_test_query

NOTE: These URLs are a staging area for metadata records under development and should not be accessed by anyone except Metadata Managers and Metadata Creators.

To make the MEL an authoritative source of information, its metadata must be approved before it is added to an online collection. The current Metadata Management tool does not enforce this, but the next version will provide automatic support for the approval process. The Modeling and Simulation Executive Agents (MSEAs) will assign one or more approval authorities for each of their environmental domains. In the current system, the MEL metadata records should be approved by the appropriate Metadata Authority before being moved from a site's test collection to the online collection. The Metadata Authority might request changes or additions to make it acceptable.

4.6.1 The Online Metadata Manager

The Online Metadata Manager may be accessed at the following URL:

http://mel.dmso.mil/mel-bin/meta-mgr

NOTE: The MEL recommends that metadata creator's bookmark this link.

There is also a link to the Metadata Manager from the MRSS Administrators Tool.

4.6.1.1 SELECT A METADATA COLLECTION

Select the desired Collection-ID from the pull down menu (see **Figure 1**), **enter** the associated Password in the text box provided, then click the **Submit** button. The password is maintained in the Resource Site's record at the Access Site[4]. To set up a new collection a Resource Site Administrator must talk with the Access Site Administrator. The Access Site Administrator will ask for the necessary information including password. If the password is forgotten, the Access Site Administrator can create a new one. Note that the list of Collection-IDs displayed includes both active/online and test collections. Click **Submit** to manage the selected collection.

[4] Currently, the Collection and Resource Site record is one and the same. In a future version of MEL these will be separate records allowing each Resource Site to maintain distinct collections. This can be accomplished now by having multiple Resource Site records for the same site, one for each Collection.

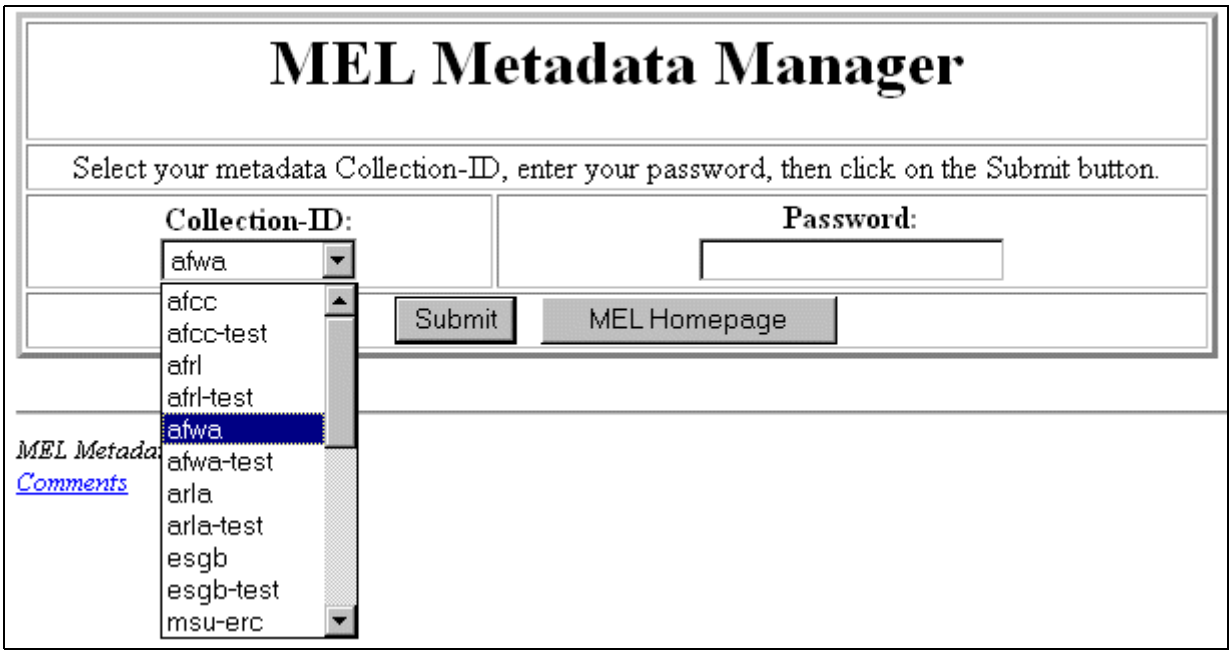

Figure 1. Metadata Manager Opening Screen

4.6.1.2 MANAGING A METADATA COLLECTION

The Metadata Manager allows for the following operations to be performed on a collection (see **Figure 2**):

Upload record from file

Upload record from URL

Rename record

Edit record

Delete record

Check Syntax of record

Record keyword Entry Help

Index Collection

Manage Access

Download record to local site

Choose Another Collection

MEL Homepage

It is organized with a list of metadata records for the chosen collection in the left frame and a set of record and collection operations in the right frame. The MEL currently requires the convention that all metadata file names end in "`.meta`" or "`.meta_res`" if the metadata in question is restricted and available in the Unclassified MEL. Hence, to designate a metadata record as being restricted or access-controlled, name the file "`.meta_res`".

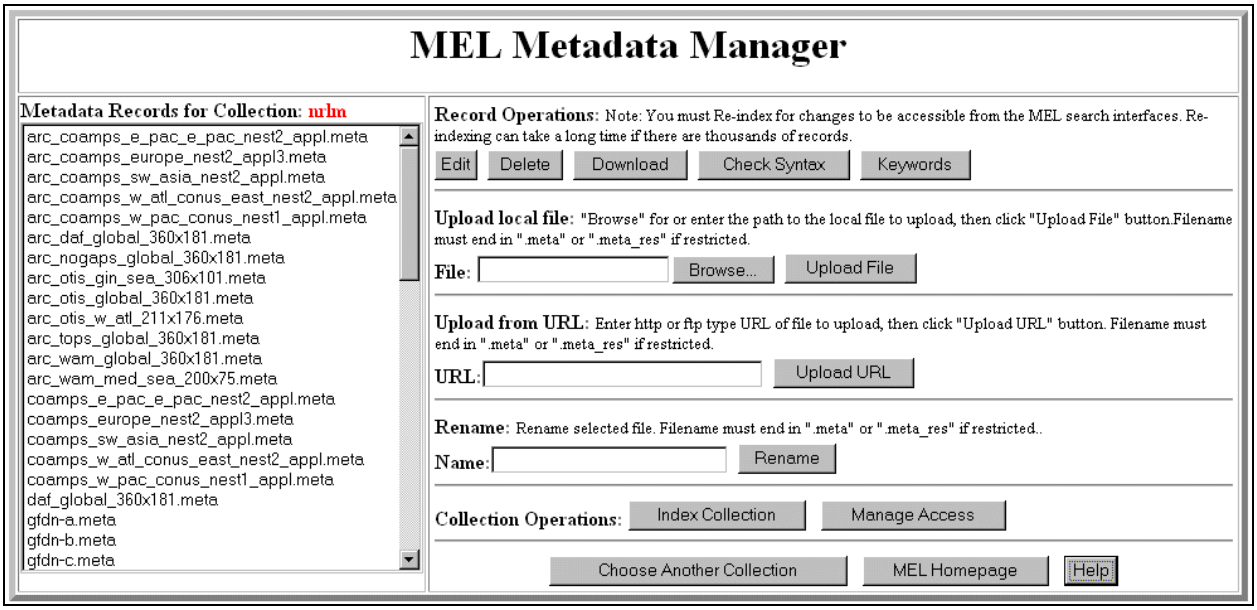

Figure 2. Metadata Collection Management Screen

To Upload a Metadata Record from a Local File

To transfer a metadata file from a local computer into the current collection at the Access Site, use the *Upload File* function. To use this feature, the metadata file must reside on the same computer as the Web browser. Either **type** in the full path and filename of the metadata file, or click **Browse …** to activate a File Upload dialog window. Use this dialog window to find and **highlight** the metadata file to upload. When completed, the path and filename will appear in the text box labeled "File". Finally, click **Upload File** to initiate the file transfer. Once the file is transferred, the filename will be displayed and highlighted in the left frame. The filename must end in "`.meta`" or "`.meta_res`" to be acceptable. If an uploaded file has the same name as one that already exists in the collection, the uploaded file will overwrite the existing file, without warning.

To Upload a Metadata Record from a URL

This function provides an easy method of copying a metadata record from one collection to another, e.g., from `cast-test` to `cast`. In the URL text box, **type** the URL of the metadata record to upload into the current collection. Either HTTP[5] or FTP[6] type URLs are acceptable. The metadata file must be in either an

[5] HTTP - Hypertext Transfer Protocol

HTTP accessible location or an anonymous FTP site. Finally, click **Upload File** to initiate the file transfer. Once the file is transferred, the filename will be displayed and selected in the left frame. The filename must end in "`.meta`" or "`.meta_res`" to be acceptable. If an uploaded file has the same name as one that already exists in the collection, the uploaded file will overwrite the existing file, without warning.

To Select a Metadata Record

All record operations except upload and index require selection of a metadata record in the left frame of the screen. Click on the **desired filename** in the left frame of the screen to select it.

To Rename a Metadata Record

To rename a metadata record in the current collection, **select** the record to rename in the left frame and **type** in the new filename in the "Name:" text box. Finally, click **Rename** to execute the change. The new filename will appear in the left frame. To designate an existing metadata as being restricted, rename it so its file extension ends in "`.meta_res`". If the dataset is MEL Orderable, be sure that the Online_Linkage field references the changed file name.

To Edit a Metadata Record

A simple text edit capability is available for making changes to metadata records that are at the Access Site. To edit a metadata record in the current collection, **select** the record to edit in the left frame and click **Edit**. A scrollable text edit window will display the selected metadata file (see **Figure 3**). Maintain correct indentation and check the syntax after editing, either from this window or the previous collection window. Make any desired changes, and then **choose** one of the options displayed near the top of the MEL Metadata Manager window:

- Check Syntax: Check for compliance with format encoding and syntax rules.
- Save: Save file with changes and return to the previous screen.
- Reset: Revert the file back to the state it was before editing.
- Cancel: Return to the previous screen without saving changes.

[6] FTP - File Transfer Protocol

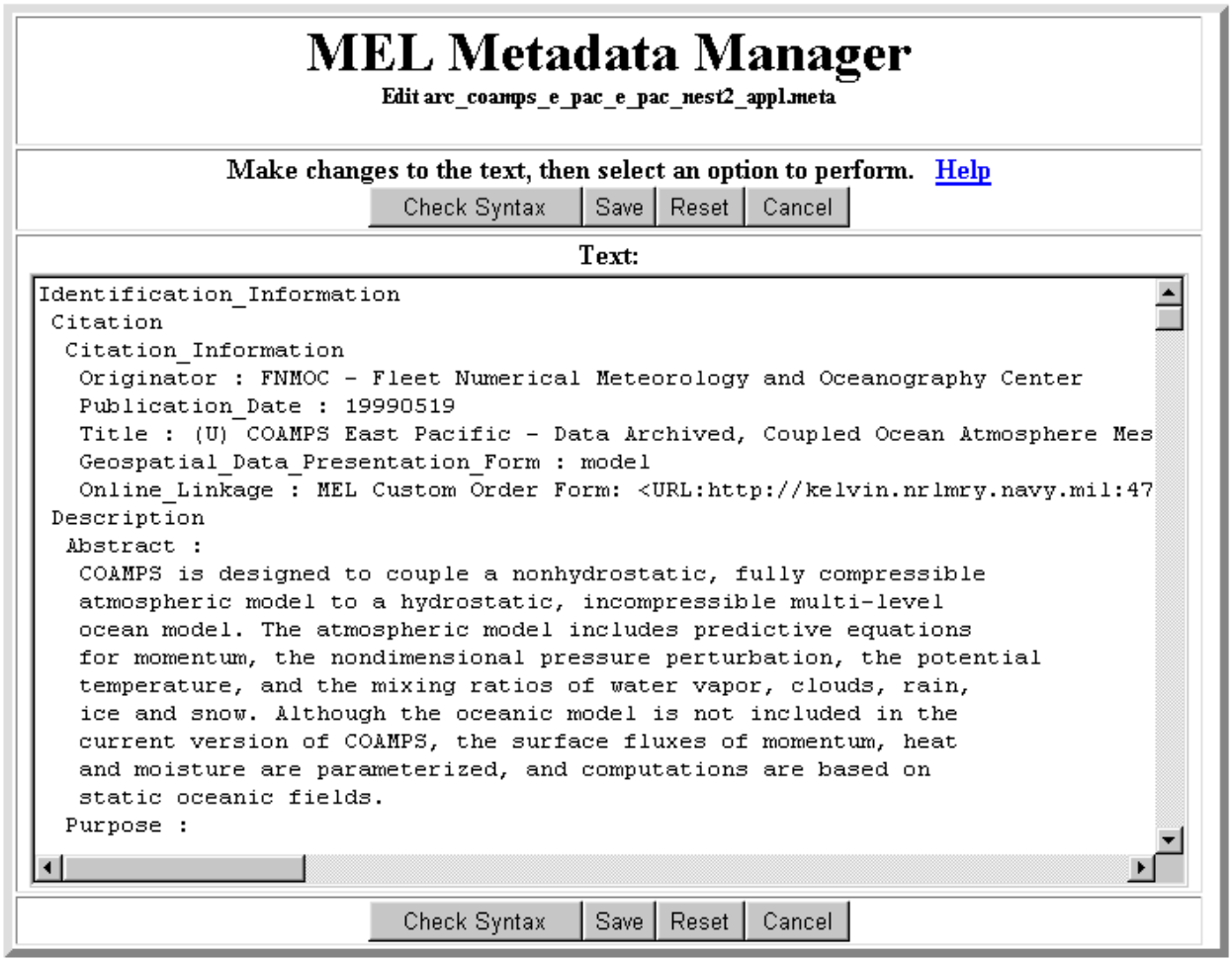

Figure 3. Metadata File Edit Screen

To Delete a Metadata Record

To delete a metadata record from the current collection, **highlight** the desired filename in the left frame and click **Delete**. The file will be deleted from the Access Site and the filename will be deleted from the left frame.

To Download a Metadata Record

Use this function to download an existing metadata record. When you click the **Download** button, the selected metadata content will be displayed in a separate browser window. To save it to your computer in a specific location, use your browser's *Save As* function. On Netscape Navigator and Microsoft Internet Explorer, this is an option in the *File* menu item.

To Check the Syntax of a Metadata Record

The *Check Syntax* function is used to ensure both the format encoding rules and the FGDC CSDGM syntax rules have been followed in the selected metadata file.

It is very important for the inner workings of the MEL that each metadata file abides by these rules. If the syntax check produces errors, the metadata record might not index correctly and might not be discoverable by users. The MEL uses Peter Schweitzer's metadata compiler, mp, to check syntax and to convert the metadata file to Standard Generalized Markup Language (SGML) format for indexing later.

To check the syntax of the metadata, **highlight** the desired filename in the left frame and click **Check Syntax**. The Metadata Validation Service screen will display with four Sections (see **Figure 4**). The first Section near the top contains the following three buttons:

- Go Back To Metadata Manger: Return to the metadata collection screen.
- Edit Metadata Record: Go to edit record screen.
- Save Record: Save temporary changes made in Edit screen.

The second Section displays the metadata record with line numbers in a scrollable window. The third Section displays a list of syntax errors and warnings, if any, in a scrollable window. Use the information given in this window to fix the metadata record. Changes are made in the Edit window. Always re-check the syntax after making changes. The fourth Section displays the metadata in HTML like a user of the MEL will see it.

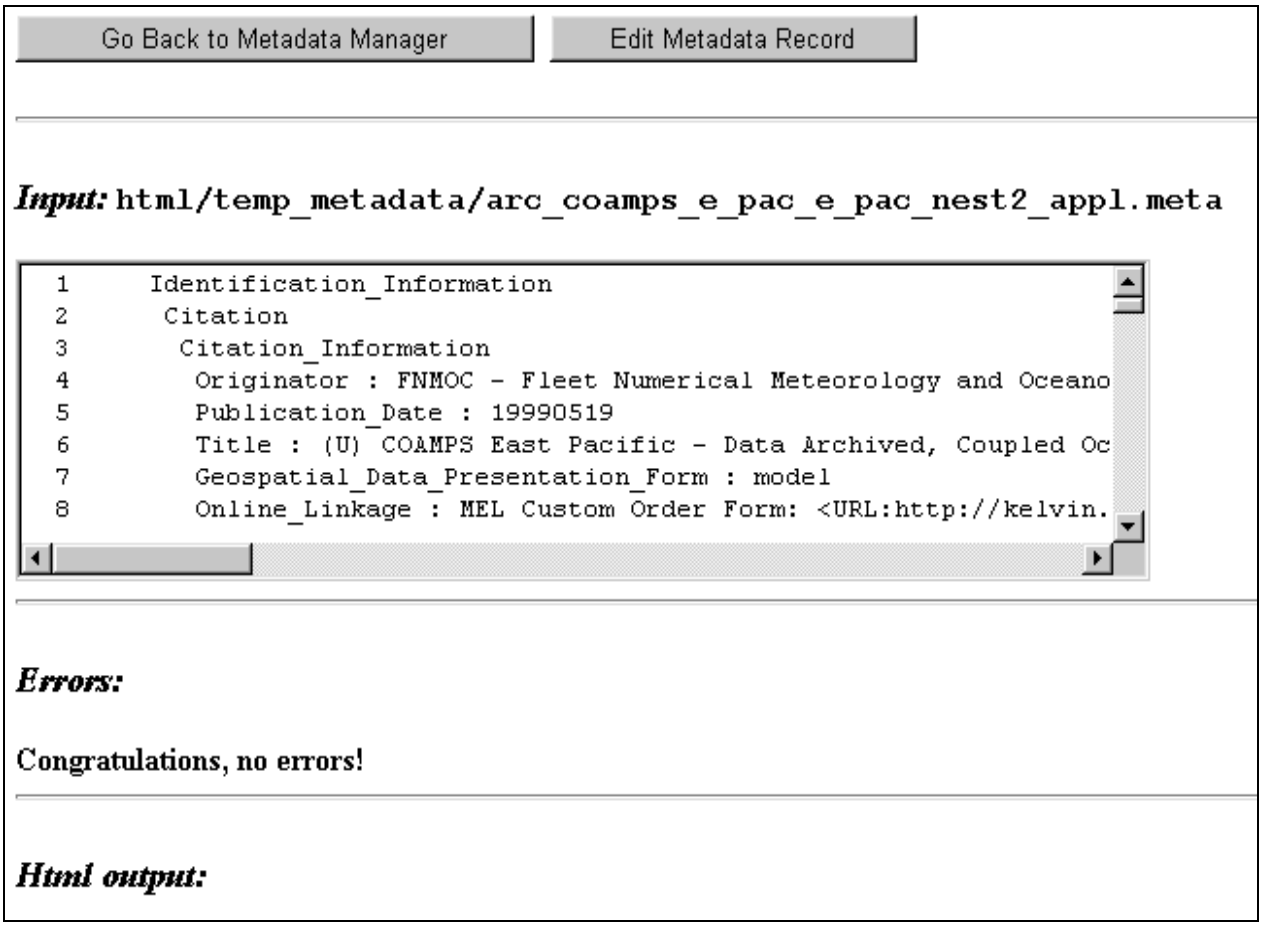

Figure 4. Metadata Syntax Check Screen

To Add MEL Keywords to a Metadata Record

The Metadata Manager provides a tool that adds Keywords from the official MEL Keyword Thesauri to metadata records (see **Figure 5**). As described in **Paragraph 4.1.2**, there are currently nine MEL Keyword Thesauri whose Keywords belong in particular fields of the metadata record (see **Table 3).** Metadata Creators will occasionally require words or phrases that do not exist in the particular thesaurus being used. The Keyword tool allows Metadata Creators to "nominate" a word (or phrase) for inclusion in the Thesaurus. The "nominated" Keyword(s) can be used in the metadata file and associated with the desired Thesaurus. The MEL Metadata Coordinator will be automatically notified of the use of the new Keyword(s) and will consider it for inclusion in the official MEL Thesauri.

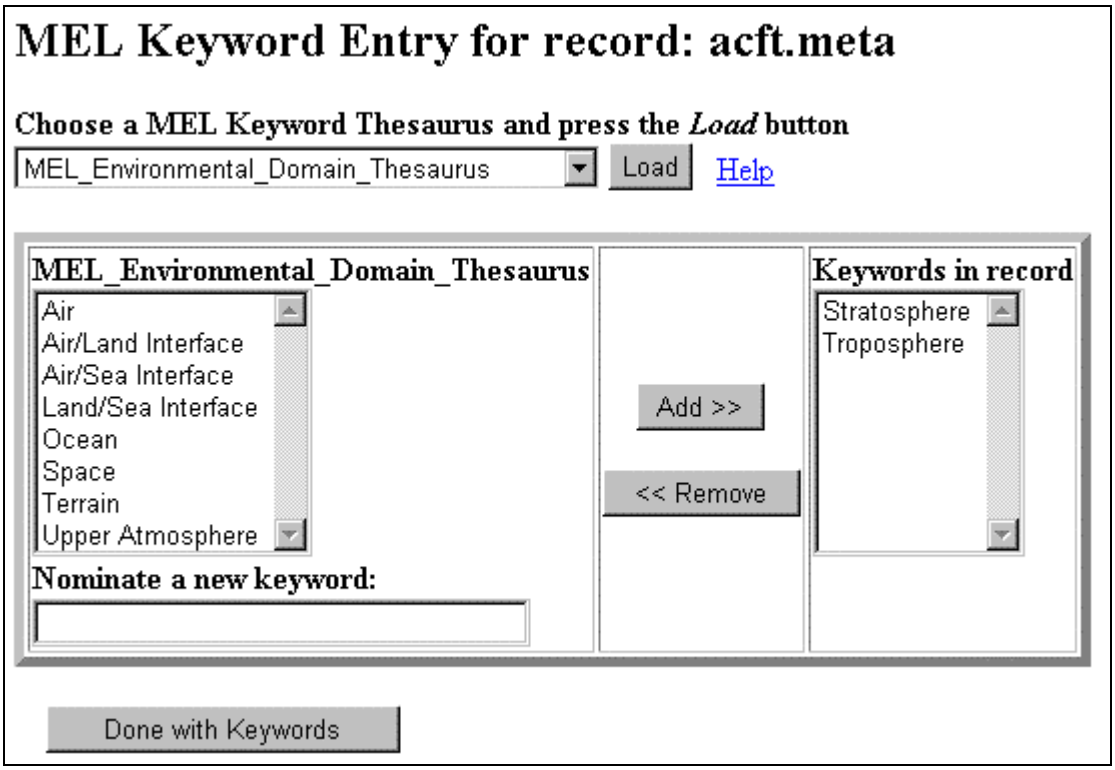

Figure 5. Metadata Keyword Help Screen

The interface provides the user with a drop-down list of available MEL Thesauri along with a *Load* button for loading the Keywords for the selected Thesaurus. Also displayed, on the left of the screen, is a scrollable list of Keywords from the currently loaded thesaurus. On the right side of the screen is a list of the Keywords from the loaded Thesaurus that are currently in the metadata record.

Each Thesaurus should be examined for Keywords that pertain to the metadata record. Include all Keywords that are appropriate. First, **select** the Thesaurus using the drop-down list. Next, click **Load**. The *Load* button must be clicked or else the displayed thesaurus might not match the selected Thesaurus. If they do not match and you try to add a Keyword, an error will be displayed. **Highlight** one or more appropriate Keywords[7] from the current Thesaurus on the left side of the display. Click ***Add >>*** to add these Keywords to the metadata record. They will be displayed on the right side of the screen indicating which Keywords from the current Thesaurus exist in the metadata record.

[7] Only one Keyword entry is allowed in the MEL_Resource_Types_Thesaurus.

Table 3. MEL Keyword Thesauri

Thesaurus Name	FGDC CSDGM Element Name	Status
MEL_Originators_List	Identification_Info.Citation.Citation_info.Originator	Required
MEL_Resource_Types_Thesaurus	Identification_Info.Citation.Citation_info.Geospatial_Data_Presentation_Form	Required
MEL_Scientific-Engineering_Field_Thesaurus	Identification_Info.Keywords.Theme	Required
MEL_Product_Thesaurus	Identification_Info.Keywords.Theme	Required
MEL_Exercise-Simulation_Thesaurus	Identification_Info.Keywords.Theme	Optional
MEL_Location_Thesaurus	Identification_Info.Keywords.Place	Required
MEL_Environmental_Domain_Thesaurus	Identification_Info.Keywords.Stratum	Required
MEL_Areal_Coverage_Thesaurus	Identification_Info.Keywords.Stratum	Optional
MEL_Temporal_Coverage_Thesaurus	Identification_Info.Keywords.Temporal	Optional

To delete keywords from the metadata record, **highlight** the words to delete in the "Keywords in record" scrollable window and click ***<<Remove***.

To nominate a new Keyword for the current Thesaurus and to add it to the metadata record, **type** the word or phrase into the "Nominate a new keyword" text box and click **Add >>**. The MEL Metadata Coordinator will be notified (the first time only per word) of its use and will consider it for official inclusion in the Thesaurus.

If desired, other non-MEL thesauri may be used to include Keywords. This can be accomplished by manually entering the desired information using the *Edit* metadata function.

When finished, click **Done with Keywords** to return to the main *Metadata Manager* display.

To Index a Metadata Collection

For new metadata records to be discoverable by users and for updates to metadata records to take full effect, the metadata collection to which they belong must be indexed. To index the current metadata collection, click **Index Collection** as shown in **Figure 2**. Indexes are created for all searchable Fields (as defined by the MEL) in the metadata. The MEL search engine uses these indexes. A MEL Keyword search (from the HTML or Java MEL search interface) searches the following metadata Fields:

- Identification_Info.Citation.Citation_info.Originator
- Identification_Info.Citation.Citation_info.Geospatial_Data_Presentation_Form
- Identification_Info.Keywords.Theme.Theme_Keyword
- Identification_Info.Keywords.Place.Place_Keyword
- Identification_Info.Keywords.Stratum.Stratum_Keyword
- Identification_Info.Keywords.Temporal.Temporal_Keyword
- Entity_and_Attribute_Info.Detailed_Description.Entity_Type.Entity_Type_Label
- Entity_and_Attribute_Info.Detailed_Description.Attribute.Attribute_Label

To Manage Access

If the collection contains restricted metadata, you can manage who has access privileges to the collection through this function. Click the **Manage Access** button shown in **Figure 2** to manage access. This will bring up a new page as shown in **Figure 6**. On the left side is a list of the current users of the MEL who have set up User Profiles through the MEL *Order* pages. On the right hand side is a list of users who currently have access privileges to the collection. To grant access to a user, **select** their E-mail address from the list on the left and click **Grant Access >>.** The user will be added to the list of users who have access privileges to the collection. To retract access from a user who currently has access privileges, **select** their E-mail address from the list on the right and click **<< Retract Access**. The user's name will be removed from the list on the right. Note that for a user to be granted access privileges, they need to have created a User Profile in the MEL system. If they do not have one, inform them to create a User Profile by going to an *Order* page in the MEL.

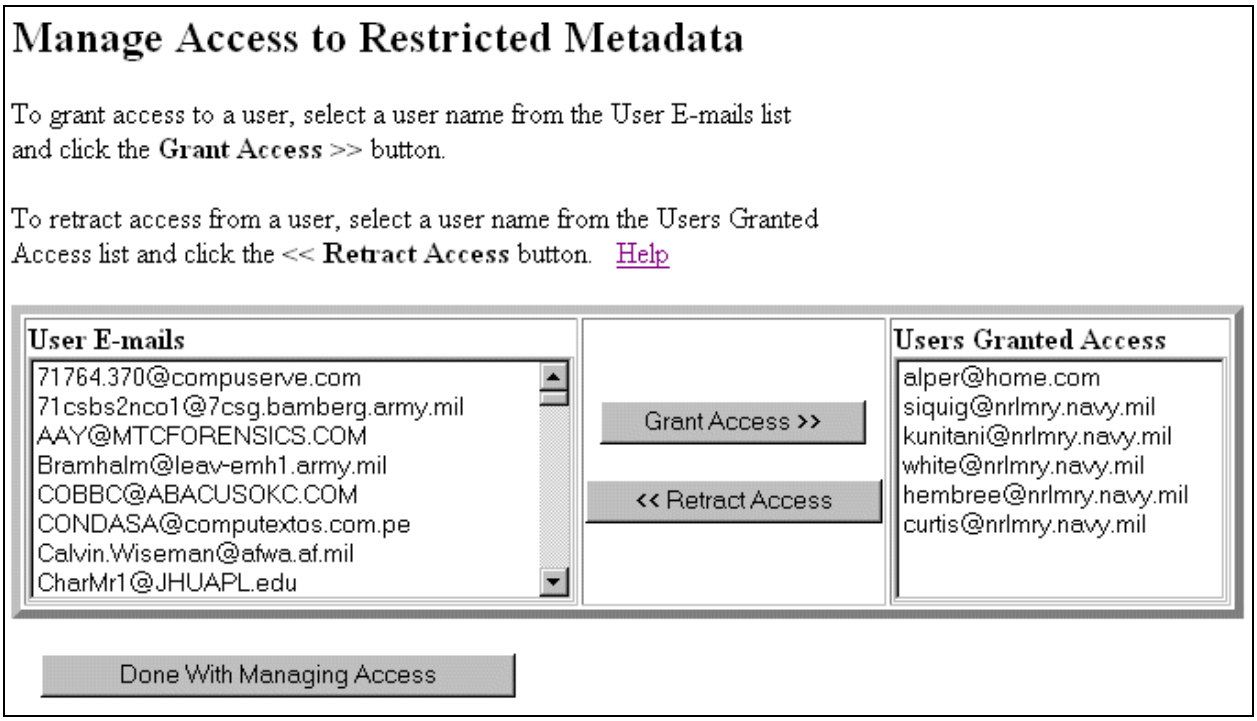

Figure 6. Manage Access to Restricted Data

If someone applies to you to gain access privileges evaluate their suitability depending on your institution's criteria, grant the access privileges and mail the URL for accessing restricted metadata to the user. The restricted metadata are only searchable through an alternative HTML Query interface at the following URL:

http://mel.dmso.mil/mel-bin/res_query

4.6.2 Remote Metadata Management

The MEL provides a command-line driven, Java-client application with the MRSS. The application "metadata" is used to add, update, or delete metadata records. The "metadata" application is useful for uploading multiple metadata records or to upload metadata records that are updated on a regular basis.

Usage:

UNIX: metadata <collectionID> [delete | put] <CredentialsFile.xml> <MSAServerReferenceURL> <list_of_files>

WinNT: bash metadata <collectionID> [delete | put] <CredentialsFile.xml> <MSAServerReferenceURL> <list_of_files>

Examples:

metadata cast delete credentials.xml http://mel.dmso.mil/MelRef.html *.meta

bash metadata cast put credentials.xml http://mel.dmso.mil/MelRef.html *.meta

To list multiple records instead of using wild cards (*), each filename is separated by a blank space, e.g., *noraps.meta nogaps.meta gfdn.meta*

SECTION 5. GILS METADATA

The GILS standard described in *FIPS PUB 192-1* has been identified as the MEL standard for non-geospatial digital metadata. Since the GILS metadata standard will not be implemented in the MEL 3.1 however, it is not discussed in this update. When implemented in a future release, this Section will be completed.

SECTION 6. MEL KEYWORD THESAURI

A "Thesaurus" in the context of the MEL is an authoritative list of discipline-specific Keywords for which a formal citation may be given. Appropriate Keywords must be selected from these Thesauri and included in the metadata record. Additional Keywords may also be included.

6.1 MEL SCIENTIFIC-ENGINEERING FIELD THESAURUS

Select one or more Keywords from **Table 4** to be used as controlled Theme Keyword(s).

Table 4. MEL Scientific-Engineering Thesaurus

Astrodynamics	Astrometry	Atmosphere
Atmospheric chemistry	Bathymetry	Cartography
Celestial geodesy	Clouds	Electromagnetic propagation
Fluid mechanics	Geodesy	Geodetic astronomy
Geography	Geology	Geophysics
Gravimetry	Gravity	Hydrography
Hydrology	Hypsography	Imagery interpretation
Lithometeorology	Magnetic fields/magnetism	Mapping
Meteorology	Military geography	Navigation
Ocean acoustics	Ocean chemistry	Ocean engineering
Ocean optics	Oceanography	Optics
Photogrammetry	Physics	Physiography
Selenodesy	Simulation	Spectroscopy
Stereophotogrammetry	Stereoscopy	Topography
Underice acoustics	Underwater acoustics	

6.2 MEL PRODUCT THESAURUS

If the information being described contains one or more of the following products, choose one or more Keywords from **Table 5** to be used as Theme Keyword(s). If an abbreviation is indicated, you may use the abbreviation rather than the complete product name.

Table 5. MEL Product Thesaurus

ADCIRC - Advanced Circulation Model
ADRG - Arc Digitized Raster Graphic
BBS - Brigade/Battalion Battle Simulation
CADRG - Compressed Arc Digitized Raster Graphic
CBS - Corps Battle Simulation
CIB - Controlled Image Base
CLFBL - Consolidated Low Frequency Bottom Loss
COAMPS - Coupled Ocean/Atmosphere Mesoscale Prediction System
CSSM - Cloud Scene Simulation Model
DAF - Derived Atmospheric Fields
DBDB 0.1 - Digital Bathymetric Data Base - 0.1 Minute
DBDB 0.5 - Digital Bathymetric Data Base - 0.5 Minute

DBDB - V - Digital Bathymetry Data Base - Variable Resolution
DBDB5 - Digital Bathymetry Data Base - 5 Minute
DCDB - Digital Cities Database
DCW - Digital Chart of the World
DEM - Digital Elevation Model
DFAD1 - Digital Feature Analysis Database 1
DFAD1C - Digital Feature Analysis Database 1C
DFAD2 - Digital Feature Analysis Database 2
DFAD3C - Digital Feature Analysis Database 3C
DG - Digital Gazetteer
DMSP - Defense Meteorological Satellite Program
DNC - Digital Nautical Chart
DPPDB - Digital Point Positioning Database
DTED - Digital Terrain Elevation Data
DTED0 - Digital Terrain Elevation Data Level 0
DTED1 - Digital Terrain Elevation Data Level 1
DTED2 - Digital Terrain Elevation Data Level 2
DTED3 - Digital Terrain Elevation Data Level 3
DTED4 - Digital Terrain Elevation Data Level 4
DTED5 - Digital Terrain Elevation Data Level 5
DTOP - Digital Topographic Data
GDB - Geophysical Database
GDEM - Generalized Digital Environmental Model
GDEMPS - GDEM Province Subset
GFDN - Geophysical Fluid Dynamics Lab Tropical Cyclone Model
GMS - Geostationary Meteorological Satellite
GOES_10 - Geostationary Operational Environmental Satellite - 10
GOES_8 - Geostationary Operational Environmental Satellite - 8
HFBL – High Frequency Bottom Loss
HITS - Historical Temporal Shipping
HM - Harpoon Missile Program
ICECAP - Ice Statistics
ITD - Interim Terrain Data
JTS – Joint Tactical Simulation
LFBL – Low Frequency Bottom Loss
LWD - Littoral Warfare Data
MM5 - Mesoscale Model version 5
MOBA - Mobile Operations in Built up Areas
MODAS – Modular Ocean Data Assimilation System
MOUT - Mobile Operations in Urban Terrain
NOGAPS - Navy Operational Global Atmospheric Prediction System
NORAPS - Navy Operational Regional Atmospheric Prediction System
NSSM – Navy Standard Surf Model
OTIS - Optimal Thermal Interpolation System
POM - Princeton Ocean Model
PWC - Princeton West Coast Model
RWM - Relocatable Window Model
SEDRIS - Synthetic Environment Data Representation and Interchange Specification
SIF - Standard Simulator Database (SSDB) Interchange Format
SILS - Sea Ice Land System
SIMNET - Simulation Networking
SMGC - Surface Marine Gridded Climatology
SN - Shipping Noise
STWAVE - Stationary Wave Model

SWAFS - Shallow Water Analysis and Forecast System
TERCOM - Terrain Contour Mapping
TOPS - Thermodynamic Ocean Prediction System
UVMAP - Urban Vector Map
VITD - Vector Product Interim Terrain Data
VMAP0 - Vector Smart Map Level 0
VMAP1 - Vector Smart Map Level 1
VMAP2 - Vector Smart Map Level 2
VSS - Volume Scattering Strength
WAM - Wave Model
WRN - Wind and Residual Noise
WVS – World Vector Shoreline
WVS+ - World Vector Shoreline Plus

6.3 MEL EXERCISE-SIMULATION THESAURUS

Choose one or more of the Keywords in **Table 6** to be used as the controlled Theme Keyword(s).

Table 6. MEL Exercise-Simulation Thesaurus

AR - Atlantic Resolve
FD - Fuertas Defensas
PW - Prairie Warrior
STOW - E - Synthetic Theater of War
STOW - Synthetic Theater of War Europe
UE - United Endeavor

6.4 MEL RESOURCE TYPES THESAURUS

Select one or more of the resource types Keywords in **Table 7** to be used as an Element for Geospatial_Data_Presentation_Form. If the resource type is “Document” and one of the subcategories applies, select a subcategory name as an additional Theme/Subject Keyword.

Table 7. MEL Resource Types Thesaurus

Algorithm
Analog video
Atlas
Audio information/recording
Catalog
Database other than digital
Diagram
Digital database
Document
Field Manual
Globe
Image
Instruction
Map/chart
Model
Multimedia Presentation

Periodical
Policy Paper
Profile
Raster Digital Image
Remote-sensing image
Section
Specification
Spreadsheet
Standard
Tabular digital data
Technical Manual
Technical Paper
Texture
Vector digital data
Video
View
White Paper

6.5 MEL LOCATION THESAURUS

If applicable, select one or more of the controlled terms from **Table 8, Table 9,** and **Table 10**, to be used as Place Keyword(s). The MEL Locations Thesaurus Keywords are grouped into Regions, DoD Locations, Countries, and United States (these headings are not themselves separate Thesauri).

Table 8. Regions

Africa	Antarctic
Arabian Sea	Aral Sea
Arctic Ocean	Asia
Atlantic Ocean	Australia
Baltic Sea	Bay of Bengal
Bering Sea	Black Sea
Caribbean Sea	Caspian Sea
Central America	Central California
Central Europe	Central North Pacific Ocean
Continental United States - CONUS	Dead Sea
East China Sea	Eastern Asia
Eastern Atlantic Ocean	Eastern Mediterranean Sea
Eastern Pacific Ocean	Eastern United States
Europe	Global
Greenland Sea	Gulf of Alaska
Gulf of Mexico	Hudson Bay
Indian Ocean	Mediterranean Sea
Middle East	North America
North Atlantic Ocean	North Pacific Ocean
North Sea	Northeast United States
Northern Africa	Northern California
Northern Europe	Northern Hemisphere
Northwest Pacific United States	Onslow Bay
Pacific Ocean	Persian Gulf
Red Sea	San Diego
San Francisco Bay	Sargasso Sea

Sea of Japan	Sea of Okhotsk
South America	South Atlantic Ocean
South China Sea	South Indian Ocean
South Pacific Ocean	Southeast Asia
Southeast United States	Southern California
Southern Europe	Southern Hemisphere
Southern Indian Ocean	Southern Ocean
Southern Pacific Ocean	Southwest Asia
Southwest United States	West Coast United States
Western Atlantic Ocean	Western Mediterranean Sea
Western Pacific Ocean	Western United States
Yellow Sea	

Table 9. DoD Locations

29 Palms
29 Palms Marine Corps Base
C17 East Coast
C5 NE Geo
Camp LeJeune
Camp Pendleton
China Lake Naval Weapons Center
Cibola Test Range
Fort Benning
Fort Drum
Fort Hood
Fort Huachucha
Fort Hunter-Liggett
Fort Irwin
Fort Leonard Wood
Ft. Benning
Ft. Drum
Ft. Hood
Ft. Huachucha
Ft. Hunter-Liggett
Ft. Irwin
Ft. Leonard Wood
Marine Corps Air Ground Combat Center
National Training Center
Range 400
USMC Air Ground Combat Center
Yakima Firing Center
Yuma Proving Ground

Table 10. Countries

Afghanistan	Albania	Algeria
American Samoa	Andorra	Angola
Anguilla	Antarctica	Antigua and Barbuda
Argentina	Armenia	Aruba
Ashmore and Cartier Islands	Australia	Austria
Azerbaijan	Bahrain	Baker Island
Bangladesh	Barbados	Belarus

Belgium	Belize	Benin
Bermuda	Bhutan	Bolivia
Bosnia and Herzegovina	Botswana	Bouvet Island
Brazil	British Indian Ocean Territory	British Virgin Islands
Brunei	Bulgaria	Burma
Burundi	Cambodia	Cameroon
Canada	Cape Verde	Cayman Islands
Central African Republic	Chad	Chile
China	Christmas Island	Clipperton Island
Cocos (Keeling) Islands	Colombia	Comoros
Cook Islands	Coral Sea Islands	Costa Rica
Cote d'Ivoire (Ivory Coast)	Croatia	Cuba
Cyprus	Czech Republic	Denmark
Djibouti	Dominica	Dominican Republic
Ecuador	Egypt	El Salvador
Equatorial Guinea	Eritrea	Estonia
Ethiopia	Falkland Islands (Islas Malvinas)	Faroe Islands
Federated States of Micronesia	Fiji	Finland
France	French Guiana	French Polynesia
French Southern and Antarctic Lands	Gabon	Georgia
Germany	Ghana	Gibraltar
Greece	Greenland	Grenada
Guadeloupe	Guam	Guatemala
Guernsey	Guinea	Guinea-Bissau
Guyana	Haiti	Heard Island and McDonald Islands
Holy See	Honduras	Hong Kong
Howland Island	Hungary	Iceland
India	Indonesia	Iran
Iraq	Ireland	Isle of Man
Israel	Italy	Jamaica
Jan Mayen	Japan	Jarvis Island
Jersey	Johnston Atoll	Jordan
Kazakhstan	Kenya	Kingman Reef
Kiribati	Kuwait	Kyrgyzstan
Laos	Latvia	Lebanon
Lesotho	Liberia	Libya
Liechtenstein	Lithuania	Luxembourg
Macau	Madagascar	Malawi
Malaysia	Maldives	Mali
Malta	Marshall Islands	Martinique
Mauritania	Mauritius	Mayotte
Mexico	Midway Islands	Moldova
Monaco	Mongolia	Montserrat
Morocco	Mozambique	Namibia
Nauru	Navassa Island	Nepal
Netherlands	Netherlands Antilles	New Caledonia
New Zealand	Nicaragua	Niger
Nigeria	Niue	Norfolk Island

North Korea	Northern Mariana Islands	Norway
Oman	Pakistan	Palau
Palmyra Atoll	Panama	Papua New Guinea
Paracel Islands	Paraguay	Peru
Philippines	Pitcairn Islands	Poland
Portugal	Puerto Rico	Qatar
Reunion	Romania	Russia
Rwanda	Saint Helena	Saint Kitts and Nevis
Saint Lucia	Saint Pierre and Miquelon	Saint Vincent and the Grenadines
Samoa	San Marino	Sao Tome and Principe
Saudi Arabia	Senegal	Serbia and Montenegro
Seychelles	Sierra Leone	Singapore
Slovakia	Slovenia	Solomon Islands
Somalia	South Africa	South Georgia and the South Sandwich Islands
South Korea	Spain	Spratly Islands
Sri Lanka	Sudan	Suriname
Svalbard	Swaziland	Sweden
Switzerland	Syria	Taiwan
Tajikistan	Tanzania	Thailand
The Bahamas	The Gambia	Togo
Tokelau	Tonga	Trinidad and Tobago
Tunisia	Turkey	Turkmenistan
Turks and Caicos Islands	Tuvalu	Uganda
Ukraine	United Arab Emirates	United Kingdom
United States	Uruguay	Uzbekistan
Vanuatu	Venezuela	Vietnam
Virgin Islands	Wake Island	Wallis and Futuna
Western Sahara	Yemen	Zambia
Zimbabwe		

Table 11. States

Alabama	Alaska	Arizona
Arkansas	California	Colorado
Connecticut	Delaware	District of Columbia
Florida	Georgia	Hawaii
Idaho	Illinois	Indiana
Iowa	Kansas	Kentucky
Louisiana	Maine	Maryland
Massachusetts	Michigan	Minnesota
Mississippi	Missouri	Montana
Nebraska	Nevada	New Hampshire
New Jersey	New Mexico	New York
North Carolina	North Dakota	Ohio
Oklahoma	Oregon	Pennsylvania
Rhode Island	South Carolina	South Dakota
Tennessee	Texas	Utah
Vermont	Virginia	Washington
West Virginia	Wisconsin	Wyoming

6.6 MEL ENVIRONMENTAL DOMAIN THESAURUS

Choose one or more of the controlled terms listed in **Table 12** to be used as Stratum Keyword(s).

Table 12. MEL Environmental Domain Thesaurus

Air	Air/Land Interface	Air/Sea Interface
Land/Sea Interface	Ocean	Space
Terrain	Upper Atmosphere	

6.7 MEL AREAL COVERAGE THESAURUS

If appropriate, choose one of the controlled Stratum Keywords from **Table 13**. Definitions are not part of the Keyword.

Table 13. MEL Areal Coverage Thesaurus

Stratum Keyword	***Definition***
Planetary	The largest spatial scale, covering essentially the entire planet, and incorporating the primary or planetary circulation regimes; larger than synoptic scale.
Synoptic	Phenomena operating at the continental or oceanic spatial scale. This scale lies between mesoscale and planetary scale. A strategic-scale model would incorporate a synoptic-scale analysis.
Mesoscale	Dimensions of an environmental layer that ranges from a few kilometers to some tens of kilometers horizontally, with a vertical scale equivalent to that in the synoptic scale. This scale lies between the microscale and synoptic scale. A tactical-scale model would incorporate a mesoscale analysis.
Regional	Relating to a specific geographic region such as a state, group of states, or part of a country, as contrasted with local. An operational-scale model would incorporate a regional scale forecast.
Local	Relating to a specific limited geographic area, such as a city or a county/parish-sized zone, as contrasted with regional. A tactical-scale model would incorporate a local scale forecast.
Microscale	Dimensions of an environmental layer that ranges from a few centimeters to a few

Stratum Keyword	*Definition*
	ranges from a few centimeters to a few kilometers in the horizontal, and up to approximately 100 meters in the vertical.

6.8 MEL TEMPORAL COVERAGE THESAURUS

If appropriate, choose one of the controlled terms listed in **Table 14** as a Temporal Coverage Keyword.

Table 14. MEL Temporal Coverage Thesaurus

Climatology-annual
Climatology-daily
Climatology-hourly
Climatology-monthly
Climatology-other
Climatology-seasonal
Forecast data
Hindcast data
Historical data
Ignore_Dates
Nowcast data
Real-time data

SECTION 7. MEL CHOICE SYNTAX

7.1 MEL CHOICE SYNTAX

The purpose of the MEL Choice Syntax is to describe choices that users have when ordering data available through the MRSS for which the MEL Access Site Software (MASS) can automatically generate an HTML order form. When users request an Order Form from the MASS, the Choice Syntax associated with the data's metadata record is parsed and an HTML Order Form is created on the fly. When the Form is filled out and submitted, the MASS creates an XML order string that is passed to the MRSS. The MRSS makes the user's choices available to the data set's extractor via the Perl `%value` associative array that has global scope in the extractor. The MEL Choice Syntax is placed in the data set's metadata record in the Distribution_Information.Custom_Order_Process Section.

The MEL Choice Syntax is tightly coupled to the extractor for the data set being described. Values provided in the choice syntax cause a particular extractor to be called when the Order is processed. The `NAME` given each `DIMENSION` in the Choice Syntax will be the name used to access the user's choices in the `%value` name/value pairs in the extractor. The Choice Syntax is SGML and XML like but does not have an official Data Type Definition (DTD). The MEL Choice Syntax contains the following required sections arranged in the hierarchy as shown below:

- **MEL** – Delimiter for MEL Choice Syntax.
  - **PROLOGUE** – General information about the Order.
  - **DATA SET** – Information specific to the data set.
    - **LOCAL** – Non-choice related information used to identify the extractor and other information the extractor needs to extract the data.
    - **ACTION** – What type of action to take.
      - **DIMENSION** – Can be used multiple times. Each `DIMENSION` represents a choice a user must make. Dimensions are not necessarily orthogonal.

Because the MEL Choice Syntax is entered in the metadata, it all must be indented the same amount, i.e., one indentation level more than the Distribution_Information's Custom_Order_process Element tag. Each Section tag, above, must be inside angle brackets and have a matching closing tag:

…

Custom_Order_Process:

Via MEL system: Use MEL Query form to identify data set.

Use Order Form to request data.

A MEL subset description, used to generate Order Form, follows:

```
<MEL>
<PROLOGUE>
…
</PROLOGUE>
…
</MEL>
…
```

The syntax allows for comments and line continuation. All text following a '#' is treated as a comment. A line can be continued by using a backslash, '\', at the end of the line.

Each `DIMENSION` Section describes a choice the user must make. Its associated `NAME` should be a short and descriptive indicator (no white spaces allowed) of what the choice refers to (ex: `PARAMETER, LEVEL, FORECST_TIME, FORMAT`). Using the Choice Syntax specification, the MASS creates an HTML Order Form with a choice Section for each `DIMENSION` described. Depending on how the Dimension is specified, the user display will show a single or multiple select list, radio buttons, checkboxes, a text entry box, or a static or interactive region-of-interest map. The basic attributes of the `DIMENSION` Section are described here; other more specialized attributes are described further below in the example.

7.1.1 <DIMENSION NAME = free_text_name >

NAME is the title displayed by this choice. NAME can be any free text, no spaces allowed. This is also the name used to access the user's choices in the %value array in your extractor.

7.1.2 TEXT = free_text

Free text intended to help the user make intelligent choices among the values displayed. TEXT is an optional Attribute.

7.1.3 UNITS = free_text

Free text describing the units of the choice Values. This is intended to add context in helping the user make a choice. UNITS are an optional Attribute.

7.1.4 CHOICE_TYPE = SINGLE | MULTIPLE | RANGE | TEXT

CHOICE_TYPE can be SINGLE indicating that a choice of one of the displayed VALUEs is allowed. This will generate either a single-select list or a group of radio buttons, depending on the number of VALUES entered below. For allowing multiple choices, use MULTIPLE, this will generate either a multi-select list or a group of checkboxes, depending on the number of VALUES entered. RANGE is only valid for DIMENSIONs with the special NAMEs TIME or ROI. TEXT will generate a text entry box intended for textual input.

7.1.5 VALUES = value1, value2, value3

```
VALUES = value1 => displayed value1, \
         value2 => displayed value2, \
         value3 => displayed value3
```

VALUES contains the choices presented to the user. The two acceptable formats are displayed above. The first is a comma-delimited list of Values displayed to the user. The user's choice(s) will be returned to the associated extractor as displayed. The second is a comma-delimited list of return-Value/display-value pairs separated by the special characters '=>'. The string on the right is displayed to the user while the string on the left is returned to the extractor for any Values selected by the user. Values can have white space if desired. If Values take more than one line, use the '\' line continuation character. Be sure not to use a line continuation character on the last line or a multi-line entry. If CHOICE_TYPE is TEXT, VALUES is ignored, thus it is not required.

7.1.6 DEFAULTS = default_value1, default_value2

DEFAULTS contains a comma-delimited list of VALUES to set as the default in the Order Form. Every DIMENSION must have default. The default_value should be spelled exactly as it appears in the VALUES attribute. If the 'value1 => displayed value1' form is used, the default Value should match the left-hand side or return-Value portion. If CHOICE_TYPE is TEXT, DEFAULTS is what is initially displayed in the text edit box.

7.1.7 </DIMENSION>

Closing Section tag for DIMENSION.

There are four special cases for DIMENSION NAME — TIME, LATITUDE, LONGITUDE, and ROI. In the following example, the syntax for these special cases is discussed. The extractor associated with the data will receive the following information in regards to these DIMENSION names.

TIME: $value{'TIME'} = "time_start, time_end, time_increment"

Where time_start and time_end are the requested time range of the data and time_increment is the increment between requested data sets.

LONGITUDE & LATITUDE: Since these are used to display a static map of the area of coverage and no choice is associated with them, nothing is placed in the %value array.

ROI: $value{'ROI'} = "lat_max, lon_min, lat_min, lon_max".

Where lat_max, lon_min, lat_min, lon_max represent the user's choice of bounding coordinates.

7.2 CHOICE SPECIFICATION EXAMPLE

The following is an example of the Choice Specification, interspersed with many comments and graphic displays produced by the MASS. Order Forms can contain from zero to many choices for the user, depending on what the metadata describes. The following example is designed to show many of the possibilities.

```
<MEL>          # Begin MEL choice specification
<PROLOGUE>     # PROLOGUE section

# SITE_ID          - Required
# Resource Site ID code assigned by Access Site.
SITE_ID = nrlm


# REQUEST          - Required
# Type of orders allowed GET and/or SUBSCRIBE
# GET means one time order,
# SUBSCRIBE means data is subscribable and can be delivered
whenever
# it becomes available.  When SUBSCRIBE is used, the "notify"
option
# also becomes available to the user.  Notify provides the ability
# to email notification every time the data is available but it is
# not extracted or delivered.
```

```
REQUEST = GET, SUBSCRIBE

# COMPRESS     - Required
# Type of compression imposed by MRSS can be:
# NONE | UNIXCOMPRESS | GZIP | PKZIP
COMPRESS = NONE

# TAR              - Required
# Will data be tarred?  YES | NO
TAR = YES

</PROLOGUE>    # End PROLOGUE section

# Begin DATA SET section with unique data set NAME
<DATASET NAME = NOGAPS_global_360x181> The data set name is
used for tracking and in various status reports.  The name
must be chosen so that it is unclassified, regardless of
whether the metadata itself represents Classified data.

# Begin LOCAL section
# Any information that your extractor needs, user won't see this.
# Everything in the LOCAL section will be returned to your
extractor.
# Older versions used "NAME: VALUE" instead of "NAME = VALUE" in
the
# LOCAL Section.  Either way works but the latter is shown here
for
# consistency.
<LOCAL>

# DATABASE         - Required
# This is effectively the extractor name as specified in the
# %database_index associative array in the
# $MRSS/lib/local/extractor.info file.
# FILE_PRODUCT is how you call the General Product Extractor
# (GPE) extractor.  The DATABASE name is used for tracking
purposes.  The name must be chosen so that it is unclassified,
regardless of whether or not metadata itself represents Classified
data.
DATABASE = FILE_PRODUCT

# FILE     - Required if DATABASE = FILE_PRODUCT
# For the GPE extractor, this is where to find the
# files relative to the MRSS variable $FILE_BASE.
# The GFE first makes all possible substitutions
# of variable names surrounded by "$" from the
# DIMENSIONs below.
```

```
FILE =grib/NOGAPS/global_360x181/058.240.$PARAMETER$.$LEVEL$.
0.$FCST_TIME$

</LOCAL>      # End LOCAL section

# Begin ACTION section with name.
# SUBSET is the only legal action currently.
<ACTION NAME = SUBSET>

# LONGITUDE and LATITUDE have special meaning as a DIMENSION NAME.
# These tags cause the bounding rectangular coordinates to
# be gathered from the metadata Elements in the
# Bounding_Coordinates section.  A map is generated and
# displayed in the order form but is NOT selectable.  It is used
for
# informative purposes only.
# The LONGITUDE and LATITUDE tags are commented out in this
example
# so we can display the ROI dimension below.
#<DIMENSION NAME = LONGITUDE>

# For LONGITUDE and LATITUDE, CHOICE_TYPE is RANGE
#CHOICE_TYPE = RANGE
#</DIMENSION>

#<DIMENSION NAME = LATITUDE>
#CHOICE_TYPE = RANGE
#</DIMENSION>

# ROI should be used instead of LONGITUDE and LATITUDE
# when the spatial area is sub-settable.  ROI will display an
# editable region of interest map.
# The map will be the first choice on the form.
<DIMENSION NAME = ROI>
CHOICE_TYPE = RANGE
</DIMENSION>

# Begin DIMENSION Section with unique NAME.
# TIME, LATITUDE, LONGITUDE, & ROI all have special meaning.
# Thus their use as DIMENSION NAMEs are reserved for those
meanings.
# For DIMENSION NAME = TIME, the beginning and Ending times
# displayed on the Order Form are taken from the Beginning_Date
# & Beginning_Time & Ending_Date & Ending_Time in the
#
Identification_Information.Time_Period_of_Content.Range_of_Dates/
# Times metadata Section. The Ending_Date can use the special word
# "Present" representing the current time.  The Ending_Date
# needs to be a fixed date for the search engine to work
correctly.
# No VALUES Section is required for TIME since the necessary
```

```
values
# are taken from the metadata.
<DIMENSION NAME = TIME>

# UNITS: optional units to be displayed
UNITS = YYYYMMDDhh.hh

# TEXT: optional text to be displayed
TEXT = Choose a Time range.

# DELAY: subtract this from ending time if Ending_Date
# is "Present" (optional).  Thus, if the data set represents
# a 0Z run but is not available until twelve hours later,
# a DELAY = 12 would adjust the end time displayed to the user.
DELAY = 12

# CHOICE_TYPE, currently, only RANGE supported. Required
CHOICE_TYPE = RANGE

</DIMENSION>  # End DIMENSION = TIME section

# Start DIMENSION = PARAMETER
# "PARAMETER" has meaning only to the extractor, it is just a
string.
<DIMENSION NAME = PARAMETER>

# CHOICE_TYPE: Required, type of choice presented to user, can be:
# SINGLE | MULTIPLE | TEXT

CHOICE_TYPE = MULTIPLE

# TEXT: Optional - Use this tag to add textual information
intended
# to help the user make an intelligent choice.
TEXT = This data set has more than one parameter.  The parameters
\
available are shown below with their associated level types.  \
Select one or more parameter values.

# VALUES: Required - What values to display in the choice.
# Can be comma-separated list or as below where
# the string to the right of "=>" is displayed to the
# user and the left string is returned to the MRSS extractor.
# Notice the use of "\" as a line continuation character.
VALUES = \
abs_vort.isbr_lvl => absolute vorticity rate @ isobaric surface, \
dwpt_dprs.isbr_lvl => dew point depression @ isobaric surface, \
evap_duct_ht.surface => evaporation duct height dimension @
surface of earth/sea, \
geop_ht.isbr_lvl => geopotential height dimension @ isobaric
```

```
surface, \
ltnt_heat_flux.surface => latent heat flux rate @ surface of
earth/sea, \
pres_msl.msl => pressure reduced to MSL @ mean sea level, \
rltv_hum.isbr_lvl => relative humidity rate @ isobaric surface, \
temp.ht_sfc => air temperature @ height level above ground, \
temp.isbr_lvl => air temperature @isobaric surface, \
terr_ht.surface => terrain height dimension @ surface of
earth/sea, \
ttl_prcp.surface => precipitation rate @ surface of earth/sea

# DEFAULTS: Required - The default values to show selected
# when Form is first displayed.  Must match left side string
# in values exactly.  Multiple defaults separated by commas
allowed.

DEFAULTS = abs_vort.isbr_lvl

</DIMENSION>

# Start DIMENSION = LEVEL
# "LEVEL" has no special meaning, it is just a name.
<DIMENSION NAME = LEVEL>

# TEXT: Optional - Notice the use of a URL in this text.  It is
# displayed as a live hyperlink in the form.  Use TEXT to explain
# what you expect from the user.
TEXT = This data set has more than one level type per parameter. \
Each parameter, however, is only available at certain levels. \
Check the chart of \
<A HREF=http://www-mel.nrlmry.navy.mil/mel-
bin/gridPlot?file=grids/NOGAPS_global> \
Valid Parameter/Level/Forecast Combinations </A>, \
and then select level values that are available.

CHOICE_TYPE = MULTIPLE
VALUES = \
0    => 0 _. (mean sea level or surface of earth/sea), \
2    => 2 m. (surface level above ground), \
10   => 10 m. (surface level above ground), \
19   => 19 m. (surface level above ground), \
100  => 100 hPa. (isobaric surface), \
300  => 300 hPa. (isobaric surface), \
500  => 500 hPa. (isobaric surface), \
800  => 800 hPa. (isobaric surface), \
1000 => 1000 hPa. (isobaric surface)

DEFAULTS = 100
</DIMENSION>

# Example of CHOICE_TYPE = TEXT
```

```
<DIMENSION NAME = MAX_WAVE_HT>   # high bound wave height
TEXT = Maximum wave height in meters must be greater than
MIN_WAVE_HT
UNITS = meters
CHOICE_TYPE = TEXT
SIZE = 5
DEFAULTS = 1.0
</DIMENSION>
<DIMENSION NAME = MIN_WAVE_HT>   # low bound wave height
TEXT = Minimum wave height in meters must be less than MAX_WAVE_HT
UNITS = meters
CHOICE_TYPE = TEXT

SIZE = 5

DEFAULTS = 0.0
</DIMENSION>

# Another example of CHOICE_TYPE = TEXT
<DIMENSION NAME = Input_Data_URL>   # URL of data set to retrieve
in extractor
TEXT = Enter the URL of the input data set (ftp or http).
CHOICE_TYPE = TEXT
SIZE = 40
DEFAULTS = ftp://your_domain/path_to_data set
</DIMENSION>

# Example of choice for data format
<DIMENSION NAME = FORMAT>
CHOICE_TYPE = SINGLE
VALUES = GRIB, HDF, SEDRIS
DEFAULTS = GRIB
</DIMENSION>

# Example of single choice with embedded images
# in buttons
<DIMENSION NAME = COLOR>
TEXT = Select your favorite color:
CHOICE_TYPE = SINGLE
VALUES = \
red => <IMG SRC="http://www-
mel.nrlmry.navy.mil/images/squares/red-square.gif"> Red, \
blue => <IMG SRC="http://www-
mel.nrlmry.navy.mil/images/squares/blue-square.gif"> Blue, \
yellow => <IMG SRC="http://www-
mel.nrlmry.navy.mil/images/squares/yellow-square.gif"> Yellow
DEFAULTS = blue
</DIMENSION>

# Example of single choice with embedded images
# in buttons and in TEXT field.
```

```
<DIMENSION NAME = GEO_CELL>
TEXT = <IMG SRC="http://www-
mel.nrlmry.navy.mil/images/world2.gif"> \
<BR>Select desired geographic area:
CHOICE_TYPE = SINGLE
VALUES = \
global => <IMG SRC="http://www-
mel.nrlmry.navy.mil/images/squares/red-square.gif"> A, \
conus => <IMG SRC="http://www-
mel.nrlmry.navy.mil/images/squares/yellow-square.gif"> B, \
indonesia  => <IMG SRC="http://www-
mel.nrlmry.navy.mil/images/squares/green-square.gif"> C
DEFAULTS = global
</DIMENSION>

</ACTION>  #  end of subsetting
</DATA SET>
</MEL>  #  end of MEL Choice syntax
```

APPENDIX A. ACRONYMS/ABBREVIATIONS

7ATC .....Seventh Army Training Command

29 Palms.....Twentynine Palms

A

A.D.....Anno Domini

ADCIRC .....Advanced Hydrodynamic Circulation Model

ADRG .....Arc Digitized Raster Graphic

AFCCC .....Air Force Combat Climatology Center

AFRL .....Air Force Research Laboratory

AFWA.....Air Force Weather Agency

ANSI .....American National Standards Institute

AR.....Atlantic Resolve

ARC .....Ames Research Center

ARLA ..... A free implementation of the UNIX Andrew FileSystem (AFS) from KTH (Royal Institute of Technology, Sweden)

ARL/BED .....Army Research Laboratory/Battlefield Environment Division

ARP.....Authoritative Representation Process

ASCII .....American Standard Code for Information Interchange

ATMP .....Air Temperature

AVI .....Audio Video Interleaved

B

BBS.....Brigade/Battalion Battle Simulation

B.C. .....Before Christ

C

C.....Confidential

C5.....Lockheed C-5 Galaxy cargo transport aircraft

C17.....McDonnell Douglas C-17 Globemaster III cargo transport aircraft

CADRG .....Compressed Arc Digitized Raster Graphic
CAST .....Center for Air Sea Technology
CBS.....Corps Battle Simulation
CD-ROM .....Compact Disk-Read Only Memory
CSDGM .....Content Standard for Digital Geospatial Metadata
CERC.....Coastal Engineering Research Center
CGI .....Common Gateway Interface
CIB.....Controlled Image Base
CLFBL.....Consolidated Low-Frequency Bottom Loss
COAMPS.....Coupled Ocean/Atmosphere Mesoscale Prediction System
CONUS.....Continental United States
CSDGM .....Content Standard for Digital Geospatial Metadata
CSSM.....Cloud Scene Simulation Model

D

DAF .....Dynamic Atmospheric Functions
DBDB .....Digital Bathymetric Data Base
DBDB-0.1 .....Digital Bathymetric Data Base - 0.1 Minute
DBDB-0.5 .....Digital Bathymetric Data Base - 0.5 Minute
DBDB -V .....Digital Bathymetry Data Base - Variable Resolution
DBDB5 .....Digital Bathymetry Data Base - 5 Minute
DCDB .....Digital Cities Database
DCW .....Digital Chart of the World
DDDS .....Defense Data Dictionary System
DEM .....Digital Elevation Model
DFAD .....Digital Feature Analysis Database
DFAD1 .....Digital Feature Analysis Database 1
DFAD1C.....Digital Feature Analysis Database 1C
DFAD2 .....Digital Feature Analysis Database 2
DFAD3C.....Digital Feature Analysis Database 3C
DG.....Digital Gazetteer
DIGEST .....Digital Geographic Information Exchange Standard
DISA .....Defense Information System Agency

DMSO.....Defense Modeling and Simulation Office

DMSP .....Defense Meteorological Satellite Program

DNC.....Digital Nautical Chart

DoD.....Department of Defense

DPPDB .....Digital Point Positioning Database

DTD .....Data Type Definition

DTED.....Digital Terrain Elevation Data

DTED0.....Digital Terrain Elevation Data Level 0

DTED1.....Digital Terrain Elevation Data Level 1

DTED2.....Digital Terrain Elevation Data Level 2

DTED3.....Digital Terrain Elevation Data Level 3

DTED4.....Digital Terrain Elevation Data Level 4

DTED5.....Digital Terrain Elevation Data Level 5

DTOP.....Digital Topographic Data

E

e-mail .....electronic mail

F

FACC.....Feature and Attribute Coding Catalog

FD .....Fuertas Defensas

FGDC.....Federal Geographic Data Committee

FGDC CSDGM .Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata

FIPS .....Federal Information Processing Standard

FNMOC .....Fleet Numerical Meteorology and Oceanography Center

FOUO .....For Official Use Only

Ft. .....Fort

FTP .....File Transfer Protocol

G

GDB.....Geophysical Database

GDEM.....Generalized Digital Environmental Model

GDEMPS .....GDEM Province Subset
GFDN .....Navy Global Fluid Dynamics model
GFE.....Generic File Extractor
GIF .....Graphic Interchange Format
GILS .....Government Information Locator Service
GMS.....Geostationary Meterorological Satellite
GPE.....General Product Extractor
GOES.....Geostationary Operational Environmental Satellite
GRIB.....Gridded Binary

H

HFBL .....High-Frequency Bottom Loss
HITS .....Historical Temporal Shipping
HM.....Harpoon Missile Program
hPa .....hectopascal
HTML.....Hypertext Markup Language
HTTP .....Hypertext Transfer Protocol

I

ICECAP .....Ice Statistics
ID .....identification
INE.....Integrated Natural Environment
INE ARP.....Integrated Natural Environment Authoritative Representation Process
IR .....infrared
ITD.....Interim Terrain Data

J-K

JPEG .....Joint Photographic Experts Group
JPL .....Jet Propulsion Laboratory
JTS .....Joint Tactical Simulation

L

LFBL.....Low-Frequency Bottom Loss

LWD .....Littoral Warfare Data

M

M&S .....Modeling and Simulation

MASS .....MEL Access Site Software

m .....meter

mb .....millibar

MB .....Megabyte (1,048,576 bytes)

MEL.....Master Environmental Library

METOC .....Meteorology and Oceanography

MIL .....Military

MM5 .....Mesoscale Model version 5

mp .....Peter Schweitzer's metadata compiler

MOBA .....Mobile Operations in Built-up Areas

MODAS.....Modular Ocean Data Assimilation

MOUT.....Mobile Operations in Urban Terrain

MPEG .....Moving Pictures Experts Group image format

MRSS.....MEL Resource Site Software

MSEA .....Modeling and Simulation Executive Agent

MSMP.....Modeling and Simulation Master Plan

MSIAC.....Modeling and Simulation Information Analysis Center

MSRC .....Major Shared Resource Center

MSU-ERC.....Mississippi State University Engineering Research Center

N

NASA .....National Aeronautics and Space Administration

NAVOCEANO ..Naval Oceanographic Office

NCAR .....National Center for Atmospheric Research

NCDC .....National Climatic Data Center

NCEP .....National Centers for Environmental Prediction
NF .....No Foreign
NGDC .....National Geophysical Data Center
NIMA.....National Imagery and Mapping Agency
NOAA.....National Oceanic and Atmospheric Administration
NODC .....National Oceanographic Data Center
NOGAPS .....Navy Operational Global Atmospheric Prediction System
NORAPS.....Navy Operational Regional Atmospheric Prediction System
NRL .....Naval Research Laboratory
NRLMRY .....Naval Research Laboratory, Marine Meteorology Division, Monterey, CA
NSI.....Neptune Sciences Incorporated
NSSM .....Navy-Standard Surf Model

O

OC.....Originator Controlled
OTIS .....Optimum Thermal Interpolation System

P-Q

PC .....Personal Computer (IBM-compatible)
POM.....Princeton Ocean Model
PR .....Proprietary Information
PST .....Pacific Standard Time
PUB.....Publication
PW .....Prairie Warrior
PWC.....Princeton West Coast Model

R

ROI .....Region of Interest
RS .....Risk Sensitive
RWM .....Relocatable Window Model

S

S .....Secret
SCOM .....Software Center Operator Manual
SDBF .....Simulator Data Base Facility
SDG .....Software Development Group
SE.....southeast
SEDRIS.....Synthetic Environment Data Representation and Interchange Specification
SGML .....Standard Generalized Markup Language
SIF.....Standard Simulator Data Base Interchange Format
SILS .....Sea Ice Land System
SIMNET .....Simulation Networking
SMGC .....Surface Marine Gridded Climatology
SN .....Shipping Noise
SPOT.....Systeme Probe Observation l'Terre
STD.....Standard
STOW .....Synthetic Theater of War
STOW-E .....Synthetic Theater of War Europe
STWAVE.....Stationary Wave Model
SUM.....Software User Manual
SVD .....Software Version Description
SWAFS .....Shallow Water Forecasting System

T

tar .....UNIX tape archive file format
TERCOM.....Terrain Contour Mapping
TIFF .....Tagged Image File Format
TOPS.....Thermodynamic Ocean Prediction System

U

U .....Unclassified
UE .....United Endeavor
URL .....Uniform Resource Locator
U.S. .....United States

USATEC.....United States Army Topographic Engineering Center

USD(A,T&L).....Under Secretary of Defense for Acquisition, Technology, and Logistics

USGS .....United States Geological Survey

USMC .....United States Marine Corps

UTC .....Coordinated Universal Time

UVMAP.....Urban Vector Map

V

Vis5D.....Visualization system for gridded data sets in 5 dimensions

VITD.....Vector Product Interim Terrain Data

Vmap.....Vector Map Product

VMAP0.....Vector Smart Map Level 0

VMAP1.....Vector Smart Map Level 1

VMAP2.....Vector Smart Map Level 2

VSS .....Volume Scattering Strength

X

XML .....Extensible Markup Language

W-Z

WAM .....Wave Model

WDCS.....World Data Center System

WRN .....Wind and Residual Noise

WVS .....World Vector Shoreline

WVS+ .....World Vector Shoreline Plus

WWW .....World Wide Web

APPENDIX B. MEL ORIGINATORS LIST

These terms in **Table 15** are used as Field Values for the "Originator" Element. The Originator of an information resource is the actual creator of the information. The Originator may be different from the MEL Resource Site.

Table 15. MEL Originators List

Originator (Acronym – Full Name)
7ATC - Seventh Army Training Command
AFCCC - Air Force Combat Climatology Center
AFRL - Air Force Research Laboratory
AFWA - Air Force Weather Agency
ARL/BED - Army Research Laboratory/Battlefield Environment Division
CERC - Coastal Engineering Research Center
FNMOC - Fleet Numerical Meteorology and Oceanography Center
MSU-ERC - Mississippi State University - Engineering Research Center
NAVOCEANO - Naval Oceanographic Office
NCAR - National Center for Atmospheric Research
NCDC - National Climatic Data Center
NCEP - National Centers for Environmental Prediction
NGDC - National Geophysical Data Center
NIMA - National Imagery and Mapping Agency
NODC - National Oceanographic Data Center
NRL - Naval Research Laboratory
NSI - Neptune Sciences Incorporated
SDBF - Simulator Data Base Facility
SPOT - Systeme Probe Observation l'Terre
USATEC - U.S. Army Topographic Engineering Center
WDCS - World Data Center System

APPENDIX C. ENTITY AND ATTRIBUTE INFORMATION EXAMPLES

C.1 DETAILED DESCRIPTION EXAMPLE

```
Entity_and_Attribute_Information
 Detailed_Description
  Entity_Type
   Entity_Type_Label : AIR-TEMPERATURE-ANALYSIS-FORECAST
   Entity_Type_Definition : An estimate of the measure of heat and
                            psychrometric parameters in the air.
   Entity_Type_Definition_Source : DDDS
  Attribute
   Attribute_Label : AIR-TEMPERATURE-ANALYSIS-FORECAST dew point
                     temperature
   Attribute_Definition : The estimated temperature to which a given
                          parcel of air must be cooled at constant
                          pressure and water vapor content in order
                          for saturation to occur.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : 213
     Range_Domain_Maximum : 336
     Attribute_Units_of_Measure : DEGREES-KELVIN
  Attribute
   Attribute_Label : AIR-TEMPERATURE-ANALYSIS-FORECAST air temperature
   Attribute_Definition : The temperature of the air estimated by an
                          AIR-TEMPERATURE-ANALYSIS-FORECAST.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : 163
     Range_Domain_Maximum : 336
     Attribute_Units_of_Measure : DEGREES-KELVIN
 Detailed_Description
  Entity_Type
   Entity_Type_Label : ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST
   Entity_Type_Definition : An estimate of characteristics of air
                            pressure.
   Entity_Type_Definition_Source : DDDS
  Attribute
   Attribute_Label : ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST
                     geopotential height dimension
   Attribute_Definition : The height of a point in the atmosphere
                          expressed in units proportional to the
                          geopotential at that height.
```

```
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : -400
     Range_Domain_Maximum : 99999
     Attribute_Units_of_Measure : GEOPOTENTIAL-METERS
  Attribute
   Attribute_Label : ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST pressure
                     rate
   Attribute_Definition : The estimated air pressure of an
                          ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : 0.001
     Range_Domain_Maximum : 1100.000
     Attribute_Units_of_Measure : HECTOPASCALS
 Detailed_Description
  Entity_Type
   Entity_Type_Label : CLOUD-ANALYSIS-FORECAST
   Entity_Type_Definition : An estimate of cloud coverage conditions.
   Entity_Type_Definition_Source : DDDS
  Attribute
   Attribute_Label : CLOUD-ANALYSIS-FORECAST total cloud coverage rate
   Attribute_Definition : The estimated rate of the sky dome that is
                           covered by clouds.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : 0
     Range_Domain_Maximum : 100
     Attribute_Units_of_Measure : PERCENT
 Detailed_Description
  Entity_Type
   Entity_Type_Label : PRECIPITATION-ANALYSIS-FORECAST
   Entity_Type_Definition : An estimate of characteristics of
                            precipitation.
   Entity_Type_Definition_Source : DDDS
  Attribute
   Attribute_Label : PRECIPITATION-ANALYSIS-FORECAST precipitation
                     rate
   Attribute_Definition : The estimated rate of the liquid water
                          equivalent of precipitation that falls over
                          a period of time.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : 00.00
     Range_Domain_Maximum : 99.99
     Attribute_Units_of_Measure : CENTIMETERS/HOUR
 Detailed_Description
```

```
  Entity_Type
   Entity_Type_Label : WIND-ANALYSIS-FORECAST
   Entity_Type_Definition : An estimate of characteristics of the
                            movement of air.
  Attribute
   Attribute_Label : WIND-ANALYSIS-FORECAST absolute vorticity rate
   Attribute_Definition : The estimated rate of the circular motion,
                          around a vertical axis, of the air.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : -0.0099999
     Range_Domain_Maximum : 0.0099999
     Attribute_Units_of_Measure : ONE/SECOND
  Attribute
   Attribute_Label : WIND-ANALYSIS-FORECAST u component rate
   Attribute_Definition : The estimated rate of wind movement on the
                          west-east direction.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : -200
     Range_Domain_Maximum : 200
     Attribute_Units_of_Measure : METERS/SECOND
  Attribute
   Attribute_Label : WIND-ANALYSIS-FORECAST v component rate
   Attribute_Definition : The estimated rate of wind movement on the
                          south-north direction.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : -200
     Range_Domain_Maximum : 200
     Attribute_Units_of_Measure : METERS/SECOND
```

C.2 OVERVIEW DESCRIPTION EXAMPLE

```
Entity_and_Attribute_Information
 Overview_Description:
  Entity_and_Attribute_Overview:
     VMAP Level 1 data is attribute coded in accordance with Feature
     and Attribute Coding Catalog (FACC) specifications.  A full
     description of FACC may be found in Digital Geographic Information
     Exchange Std (DIGEST) Edition 1.2, January, 1994.
  Entity_and_Attribute_Detail_Citation:
     Entities (features) and attributes are fully described in
     Department of Defense Military Specification Vector Smart Map
     (Vmap) Level 1 (Mil-V-89033)
```

APPENDIX D. FGDC CSDGM METADATA TEMPLATES

See **Paragraph 4.5** of this MEL *Metadata Guide* regarding the use of the following templates.

D.1 FGDC CSDGM LONG FORM

All Elements of the FGDC CSDGM.

```
Identification_Information:
  Citation:
    Citation_Information:
      Originator:
      Publication_Date:
      Publication_Time:
      Title:
      Edition:
      Geospatial_Data_Presentation_Form:
      Series_Information:
        Series_Name:
        Issue_Identification:
      Publication_Information:
        Publication_Place:
        Publisher:
      Other_Citation_Details:
      Online_Linkage:
      Larger_Work_Citation:
        Citation_Information:
  Description:
    Abstract:
    Purpose:
    Supplemental_Information:
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date:
        Time_of_Day:
      Multiple_Dates/Times:
        Calendar_Date:
        Time_of_Day:
      Range_of_Dates/Times:
        Beginning_Date:
        Beginning_Time:
        Ending_Date:
        Ending_Time:
    Currentness_Reference:
  Status:
    Progress:
    Maintenance_and_Update_Frequency:
  Spatial_Domain:
    Bounding_Coordinates:
```

```
      West_Bounding_Coordinate:
      East_Bounding_Coordinate:
      North_Bounding_Coordinate:
      South_Bounding_Coordinate:
    Data_Set_G-Polygon:
      Data_Set_G-Polygon_Outer_G-Ring:
        G-Ring_Latitude:
        G-Ring_Longitude:
      Data_Set_G-Polygon_Exclusion_G-Ring:
        G-Ring_Latitude:
        G-Ring_Longitude:
  Keywords:
    Theme:
      Theme_Keyword_Thesaurus:
      Theme_Keyword:
    Place:
      Place_Keyword_Thesaurus:
      Place_Keyword:
    Stratum:
      Stratum_Keyword_Thesaurus:
      Stratum_Keyword:
    Temporal:
      Temporal_Keyword_Thesaurus:
      Temporal_Keyword:
  Access_Constraints:
  Use_Constraints:
  Point_of_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person:
        Contact_Organization:
      Contact_Organization_Primary:
        Contact_Organization:
        Contact_Person:
      Contact_Position:
      Contact_Address:
        Address_Type:
        Address:
        City:
        State_or_Province:
        Postal_Code:
        Country:
      Contact_Voice_Telephone:
      Contact_TDD/TTY_Telephone:
      Contact_Facsimile_Telephone:
      Contact_Electronic_Mail_Address:
      Hours_of_Service:
      Contact_Instructions:
  Browse_Graphic:
    Browse_Graphic_File_Name:
    Browse_Graphic_File_Description:
    Browse_Graphic_File_Type:
  Data_Set_Credit:
  Security_Information:
    Security_Classification_System:
    Security_Classification:
    Security_Handling_Description:
```

```
  Native_Data_Set_Environment:
  Cross_Reference:
    Citation_Information:
      Originator:
      Publication_Date:
      Publication_Time:
      Title:
      Edition:
      Geospatial_Data_Presentation_Form:
      Series_Information:
        Series_Name:
        Issue_Identification:
      Publication_Information:
        Publication_Place:
        Publisher:
      Other_Citation_Details:
      Online_Linkage:
      Larger_Work_Citation:
        Citation_Information:
Data_Quality_Information:
  Attribute_Accuracy:
    Attribute_Accuracy_Report:
    Quantitative_Attribute_Accuracy_Assessment:
      Attribute_Accuracy_Value:
      Attribute_Accuracy_Explanation:
  Logical_Consistency_Report:
  Completeness_Report:
  Positional_Accuracy:
    Horizontal_Positional_Accuracy:
      Horizontal_Positional_Accuracy_Report:
      Quantitative_Horizontal_Positional_Accuracy_Assessment:
        Horizontal_Positional_Accuracy_Value:
        Horizontal_Positional_Accuracy_Explanation:
    Vertical_Positional_Accuracy:
      Vertical_Positional_Accuracy_Report:
      Quantitative_Vertical_Positional_Accuracy_Assessment:
        Vertical_Positional_Accuracy_Value:
        Vertical_Positional_Accuracy_Explanation:
  Lineage:
    Source_Information:
      Source_Citation:
        Citation_Information:
          Originator:
          Publication_Date:
          Publication_Time:
          Title:
          Edition:
          Geospatial_Data_Presentation_Form:
          Series_Information:
            Series_Name:
            Issue_Identification:
          Publication_Information:
            Publication_Place:
            Publisher:
          Other_Citation_Details:
          Online_Linkage:
          Larger_Work_Citation:
```

```
            Citation_Information:
      Source_Scale_Denominator:
      Type_of_Source_Media:
      Source_Time_Period_of_Content:
        Time_Period_Information:
          Single_Date/Time:
            Calendar_Date:
            Time_of_Day:
          Multiple_Dates/Times:
            Calendar_Date:
            Time_of_Day:
          Range_of_Dates/Times:
            Beginning_Date:
            Beginning_Time:
            Ending_Date:
            Ending_Time:
        Source_Currentness_Reference:
      Source_Citation_Abbreviation:
      Source_Contribution:
    Process_Step:
      Process_Description:
      Source_Used_Citation_Abbreviation:
      Process_Date:
      Process_Time:
      Source_Produced_Citation_Abbreviation:
      Process_Contact:
        Contact_Information:
          Contact_Person_Primary:
            Contact_Person:
            Contact_Organization:
          Contact_Organization_Primary:
            Contact_Organization:
            Contact_Person:
          Contact_Position:
          Contact_Address:
            Address_Type:
            Address:
            City:
            State_or_Province:
            Postal_Code:
            Country:
          Contact_Voice_Telephone:
          Contact_TDD/TTY_Telephone:
          Contact_Facsimile_Telephone:
          Contact_Electronic_Mail_Address:
          Hours_of_Service:
          Contact_Instructions:
  Cloud_Cover:
Spatial_Data_Organization_Information:
  Indirect_Spatial_Reference:
  Direct_Spatial_Reference_Method:
  Point_and_Vector_Object_Information:
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type:
      Point_and_Vector_Object_Count:
    VPF_Terms_Description:
      VPF_Topology_Level:
```

```
      VPF_Point_and_Vector_Object_Type:
      Point_and_Vector_Object_Count:
  Raster_Object_Information:
    Raster_Object_Type:
    Row_Count:
    Column_Count:
    Vertical_Count:
Spatial_Reference_Information:
  Horizontal_Coordinate_System_Definition:
    Geographic:
      Latitude_Resolution:
      Longitude_Resolution:
      Geographic_Coordinate_Units:
    Planar:
      Map_Projection:
        Map_Projection_Name:
        Albers_Conical_Equal_Area:
          Standard_Parallel:
          Longitude_of_Central_Meridian:
          Latitude_of_Projection_Origin:
          False_Easting:
          False_Northing:
        Azimuthal_Equidistant:
          Longitude_of_Central_Meridian:
          Latitude_of_Projection_Origin:
          False_Easting:
          False_Northing:
        Equidistant_Conic:
          Standard_Parallel:
          Longitude_of_Central_Meridian:
          Latitude_of_Projection_Origin:
          False_Easting:
          False_Northing:
        Equirectangular:
          Standard_Parallel:
          Longitude_of_Central_Meridian:
          False_Easting:
          False_Northing:
        General_Vertical_Near-sided_Perspective:
          Height_of_Perspective_Point_Above_Surface:
          Longitude_of_Projection_Center:
          Latitude_of_Projection_Center:
          False_Easting:
          False_Northing:
        Gnomonic:
          Longitude_of_Projection_Center:
          Latitude_of_Projection_Center:
          False_Easting:
          False_Northing:
        Lambert_Azimuthal_Equal_Area:
          Longitude_of_Projection_Center:
          Latitude_of_Projection_Center:
          False_Easting:
          False_Northing:
        Lambert_Conformal_Conic:
          Standard_Parallel:
          Longitude_of_Central_Meridian:
```

```
      Latitude_of_Projection_Origin:
      False_Easting:
      False_Northing:
    Mercator:
      Standard_Parallel:
      Scale_Factor_at_Equator:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Modified_Stereographic_for_Alaska:
      False_Easting:
      False_Northing:
    Miller_Cylindrical:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Oblique_Mercator:
      Scale_Factor_at_Center_Line:
      Oblique_Line_Azimuth:
        Azimuthal_Angle:
        Azimuth_Measure_Point_Longitude:
      Oblique_Line_Point:
        Oblique_Line_Latitude:
        Oblique_Line_Longitude:
      Latitude_of_Projection_Origin:
      False_Easting:
      False_Northing:
    Orthographic:
      Longitude_of_Projection_Center:
      Latitude_of_Projection_Center:
      False_Easting:
      False_Northing:
    Polar_Stereographic:
      Straight-Vertical_Longitude_from_Pole:
      Standard_Parallel:
      Scale_Factor_at_Projection_Origin:
      False_Easting:
      False_Northing:
    Polyconic:
      Longitude_of_Central_Meridian:
      Latitude_of_Projection_Origin:
      False_Easting:
      False_Northing:
    Robinson:
      Longitude_of_Projection_Center:
      False_Easting:
      False_Northing:
    Sinusoidal:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Space_Oblique_Mercator_(Landsat):
      Landsat_Number:
      Path_Number:
      False_Easting:
      False_Northing:
    Stereographic:
```

```
        Longitude_of_Projection_Center:
        Latitude_of_Projection_Center:
        False_Easting:
        False_Northing:
      Transverse_Mercator:
        Scale_Factor_at_Central_Meridian:
        Longitude_of_Central_Meridian:
        Latitude_of_Projection_Origin:
        False_Easting:
        False_Northing:
      van_der_Grinten:
        Longitude_of_Central_Meridian:
        False_Easting:
        False_Northing:
      Other_Projection's_Definition:
    Grid_Coordinate_System:
      Grid_Coordinate_System_Name:
      Universal_Transverse_Mercator:
        UTM_Zone_Number:
        Transverse_Mercator:
      Universal_Polar_Stereographic:
        UPS_Zone_Identifier:
        Polar_Stereographic:
      State_Plane_Coordinate_System:
        SPCS_Zone_Identifier:
        Lambert_Conformal_Conic:
        Transverse_Mercator:
        Oblique_Mercator:
        Polyconic:
      ARC_Coordinate_System:
        ARC_System_Zone_Identifier:
        Equirectangular:
        Azimuthal_Equidistant:
      Other_Grid_System's_Definition:
    Local_Planar:
      Local_Planar_Description:
      Local_Planar_Georeference_Information:
    Planar_Coordinate_Information:
      Planar_Coordinate_Encoding_Method:
      Coordinate_Representation:
        Abscissa_Resolution:
        Ordinate_Resolution:
      Distance_and_Bearing_Representation:
        Distance_Resolution:
        Bearing_Resolution:
        Bearing_Units:
        Bearing_Reference_Direction:
        Bearing_Reference_Meridian:
      Planar_Distance_Units:
  Local:
    Local_Description:
    Local_Georeference_Information:
  Geodetic_Model:
    Horizontal_Datum_Name:
    Ellipsoid_Name:
    Semi-major_Axis:
    Denominator_of_Flattening_Ratio:
```

```
  Vertical_Coordinate_System_Definition:
    Altitude_System_Definition:
      Altitude_Datum_Name:
      Altitude_Resolution:
      Altitude_Distance_Units:
      Altitude_Encoding_Method:
    Depth_System_Definition:
      Depth_Datum_Name:
      Depth_Resolution:
      Depth_Distance_Units:
      Depth_Encoding_Method:
Entity_and_Attribute_Information:
  Detailed_Description:
    Entity_Type:
      Entity_Type_Label:
      Entity_Type_Definition:
      Entity_Type_Definition_Source:
    Attribute:
      Attribute_Label:
      Attribute_Definition:
      Attribute_Definition_Source:
      Attribute_Domain_Values:
        Enumerated_Domain:
          Enumerated_Domain_Value:
          Enumerated_Domain_Value_Definition:
          Enumerated_Domain_Value_Definition_Source:
      Attribute_Domain_Values:
        Range_Domain:
          Range_Domain_Minimum:
          Range_Domain_Maximum:
          Attribute_Units_of_Measure:
          Attribute_Measurement_Resolution:
    Attribute:
      Attribute_Domain_Values:
        Codeset_Domain:
          Codeset_Name:
          Codeset_Source:
        Unrepresentable_Domain:
      Beginning_Date_of_Attribute_Values:
      Ending_Date_of_Attribute_Values:
      Attribute_Value_Accuracy_Information:
        Attribute_Value_Accuracy:
        Attribute_Value_Accuracy_Explanation:
      Attribute_Measurement_Frequency:
  Overview_Description:
    Entity_and_Attribute_Overview:
    Entity_and_Attribute_Detail_Citation:
Distribution_Information:
  Distributor:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person:
        Contact_Organization:
      Contact_Organization_Primary:
        Contact_Organization:
        Contact_Person:
      Contact_Position:
```

```
      Contact_Address:
        Address_Type:
        Address:
        City:
        State_or_Province:
        Postal_Code:
        Country:
      Contact_Voice_Telephone:
      Contact_TDD/TTY_Telephone:
      Contact_Facsimile_Telephone:
      Contact_Electronic_Mail_Address:
      Hours_of_Service:
      Contact_Instructions:
  Resource_Description:
  Distribution_Liability:
  Standard_Order_Process:
    Non-digital_Form:
    Digital_Form:
      Digital_Transfer_Information:
        Format_Name:
        Format_Version_Number:
        Format_Version_Date:
        Format_Specification:
        Format_Information_Content:
        File_Decompression_Technique:
        Transfer_Size:
      Digital_Transfer_Option:
        Online_Option:
          Computer_Contact_Information:
            Network_Address:
              Network_Resource_Name:
            Dialup_Instructions:
              Lowest_BPS:
              Highest_BPS:
              Number_DataBits:
              Number_StopBits:
              Parity:
              Compression_Support:
              Dialup_Telephone:
              Dialup_File_Name:
          Access_Instructions:
          Online_Computer_and_Operating_System:
        Offline_Option:
          Offline_Media:
          Recording_Capacity:
            Recording_Density:
            Recording_Density_Units:
          Recording_Format:
          Compatibility_Information:
    Fees:
    Ordering_Instructions:
    Turnaround:
  Custom_Order_Process:
  Technical_Prerequisites:
  Available_Time_Period:
    Time_Period_Information:
      Single_Date/Time:
```

```
        Calendar_Date:
        Time_of_Day:
      Multiple_Dates/Times:
        Calendar_Date:
        Time_of_Day:
      Range_of_Dates/Times:
        Beginning_Date:
        Beginning_Time:
        Ending_Date:
        Ending_Time:
Metadata_Reference_Information:
  Metadata_Date:
  Metadata_Review_Date:
  Metadata_Future_Review_Date:
  Metadata_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person:
        Contact_Organization:
      Contact_Organization_Primary:
        Contact_Organization:
        Contact_Person:
      Contact_Position:
      Contact_Address:
        Address_Type:
        Address:
        City:
        State_or_Province:
        Postal_Code:
        Country:
      Contact_Voice_Telephone:
      Contact_TDD/TTY_Telephone:
      Contact_Facsimile_Telephone:
      Contact_Electronic_Mail_Address:
      Hours_of_Service:
      Contact_Instructions:
  Metadata_Standard_Name:
  Metadata_Standard_Version:
  Metadata_Time_Convention:
  Metadata_Access_Constraints:
  Metadata_Use_Constraints:
  Metadata_Security_Information:
    Metadata_Security_Classification_System:
    Metadata_Security_Classification:
    Metadata_Security_Handling_Description:
```

D.2 FGDC CSDGM SHORT FORM

MEL Required and Recommended FGDC CSDGM Elements:

```
Metadata:
  Identification_Information:
    Citation:
      Citation_Information:
      Originator:
      Publication_Date:
      Title:
      Edition:
      Online_Linkage:
    Description:
      Abstract:
      Purpose:
    Time_Period_of_Content:
      Time_Period_Information:
        Single_Date/Time:
          Calendar_Date:
          Time_of_Day:
        Multiple_Dates/Times:
          Calendar_Date:
          Time_of_Day:
        Range_of_Dates/Times:
          Beginning_Date:
          Beginning_Time:
          Ending_Date:
          Ending_Time:
      Currentness_Reference:
    Status:
      Progress:
      Maintenance_and_Update_Frequency:
    Spatial_Domain:
      Bounding_Coordinates:
        West_Bounding_Coordinate:
        East_Bounding_Coordinate:
        North_Bounding_Coordinate:
        South_Bounding_Coordinate:
    Keywords:
      Theme:
        Theme_Keyword_Thesaurus: MEL_Scientific-Engineering_Field_
                                 Thesaurus
        Theme_Keyword:
      Theme:
        Theme_Keyword_Thesaurus: MEL_Product_Thesaurus
        Theme_Keyword:
      Theme:
        Theme_Keyword_Thesaurus: MEL_Exercise-Simulation_Thesaurus
        Theme_Keyword:
```

```
      Theme:
        Theme_Keyword_Thesaurus: MEL_Resource_Types_Thesaurus
        Theme_Keyword:
      Place:
        Place_Keyword_Thesaurus: MEL_Location_Thesaurus
        Place_Keyword:
      Stratum:
        Stratum_Keyword_Thesaurus: MEL_Environmental_Domain_Thesaurus
        Stratum_Keyword:
      Stratum:
        Stratum_Keyword_Thesaurus: MEL_Areal_Coverage_Thesaurus
        Stratum_Keyword:
      Temporal:
        Temporal_Keyword_Thesaurus: MEL_Temporal_Coverage_Thesaurus
        Temporal_Keyword:
    Access_Constraints:
    Use_Constraints:
    Point_of_Contact:
      Contact_Information:
        Contact_Organization_Primary:
        Contact_Organization:
      Contact_Position:
      Contact_Address:
        Address_Type:
        Address:
        City:
        State_or_Province:
        Postal_Code:
        Country:
      Contact_Voice_Telephone:
      Contact_TDD/TTY_Telephone:
      Contact_Facsimile_Telephone:
      Contact_Electronic_Mail_Address:
      Hours_of_Service:
      Contact_Instructions:
    Browse_Graphic:
      Browse_Graphic_File_Name:
      Browse_Graphic_File_Description:
      Browse_Graphic_File_Type
    Security_Information:
      Security_Classification_System:
      Security_Classification:
      Security_Handling_Description:
  Data_Quality_Information:
    Attribute_Accuracy:
      Attribute_Accuracy_Report:
      Quantitative_Attribute_Accuracy_Assessment:
        Attribute_Accuracy_Value:
        Attribute_Accuracy_Explanation:
    Logical_Consistency_Report:
    Completeness_Report:
```

```
    Lineage:
      Source_Information:
        Source_Citation:
          Citation_Information:
            Originator:
            Publication_Date:
            Publication_Time:
            Title:
            Edition:
            Geospatial_Data_Presentation_Form:
            Series_Information:
              Series_Name:
              Issue_Identification:
            Publication_Information:
              Publication_Place:
              Publisher:
            Other_Citation_Details:
            Online_Linkage:
            Larger_Work_Citation:
              Citation_Information:
        Source_Scale_Denominator:
        Type_of_Source_Media:
        Source_Time_Period_of_Content:
          Time_Period_Information:
            Single_Date/Time:
              Calendar_Date:
              Time_of_Day:
            Multiple_Dates/Times:
              Calendar_Date:
              Time_of_Day:
            Range_of_Dates/Times:
              Beginning_Date:
              Beginning_Time:
              Ending_Date:
              Ending_Time:
          Source_Currentness_Reference:
        Source_Citation_Abbreviation:
        Source_Contribution:
      Process_Step:
        Process_Description:
        Process_Date:
    Cloud_Cover:
  Spatial_Data_Organization_Information:
    Indirect_Spatial_Reference:
    Direct_Spatial_Reference_Method:
    Point_and_Vector_Object_Information:
      SDTS_Terms_Description:
        SDTS_Point_and_Vector_Object_Type:
        Point_and_Vector_Object_Count:
      VPF_Terms_Description:
        VPF_Topology_Level:
```

```
        VPF_Point_and_Vector_Object_Type:
        Point_and_Vector_Object_Count:
    Raster_Object_Information:
      Raster_Object_Type:
      Row_Count:
      Column_Count:
      Vertical_Count:
  Spatial_Reference_Information:
    Horizontal_Coordinate_System_Definition:
      Geographic:
        Latitude_Resolution:
        Longitude_Resolution:
        Geographic_Coordinate_Units:
      Planar:
        Map_Projection:
          Map_Projection_Name:
          Albers_Conical_Equal_Area:
            Standard_Parallel:
            Longitude_of_Central_Meridian:
            Latitude_of_Projection_Origin:
            False_Easting:
            False_Northing:
          Azimuthal_Equidistant:
            Longitude_of_Central_Meridian:
            Latitude_of_Projection_Origin:
            False_Easting:
            False_Northing:
          Equidistant_Conic:
            Standard_Parallel:
            Longitude_of_Central_Meridian:
            Latitude_of_Projection_Origin:
            False_Easting:
            False_Northing:
          Equirectangular:
            Standard_Parallel:
            Longitude_of_Central_Meridian:
            False_Easting:
            False_Northing:
          General_Vertical_Near-sided_Perspective:
            Height_of_Perspective_Point_Above_Surface:
            Longitude_of_Projection_Center:
            Latitude_of_Projection_Center:
            False_Easting:
            False_Northing:
          Gnomonic:
            Longitude_of_Projection_Center:
            Latitude_of_Projection_Center:
            False_Easting:
            False_Northing:
          Lambert_Azimuthal_Equal_Area:
            Longitude_of_Projection_Center:
```

```
    Latitude_of_Projection_Center:
    False_Easting:
    False_Northing:
  Lambert_Conformal_Conic:
    Standard_Parallel:
    Longitude_of_Central_Meridian:
    Latitude_of_Projection_Origin:
    False_Easting:
    False_Northing:
  Mercator:
    Standard_Parallel:
    Scale_Factor_at_Equator:
    Longitude_of_Central_Meridian:
    False_Easting:
    False_Northing:
  Modified_Stereographic_for_Alaska:
    False_Easting:
    False_Northing:
  Miller_Cylindrical:
    Longitude_of_Central_Meridian:
    False_Easting:
    False_Northing:
  Oblique_Mercator:
    Scale_Factor_at_Center_Line:
    Oblique_Line_Azimuth:
      Azimuthal_Angle:
      Azimuth_Measure_Point_Longitude:
    Oblique_Line_Point:
      Oblique_Line_Latitude:
      Oblique_Line_Longitude:
    Latitude_of_Projection_Origin:
    False_Easting:
    False_Northing:
  Orthographic:
    Longitude_of_Projection_Center:
    Latitude_of_Projection_Center:
    False_Easting:
    False_Northing:
  Polar_Stereographic:
    Straight-Vertical_Longitude_from_Pole:
    Standard_Parallel:
    Scale_Factor_at_Projection_Origin:
    False_Easting:
    False_Northing:
  Polyconic:
    Longitude_of_Central_Meridian:
    Latitude_of_Projection_Origin:
    False_Easting:
    False_Northing:
  Robinson:
    Longitude_of_Projection_Center:
```

```
      False_Easting:
      False_Northing:
    Sinusoidal:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Space_Oblique_Mercator_(Landsat):
      Landsat_Number:
      Path_Number:
      False_Easting:
      False_Northing:
    Stereographic:
      Longitude_of_Projection_Center:
      Latitude_of_Projection_Center:
      False_Easting:
      False_Northing:
    Transverse_Mercator:
      Scale_Factor_at_Central_Meridian:
      Longitude_of_Central_Meridian:
      Latitude_of_Projection_Origin:
      False_Easting:
      False_Northing:
    van_der_Grinten:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Other_Projection's_Definition:
  Grid_Coordinate_System:
    Grid_Coordinate_System_Name:
    Universal_Transverse_Mercator:
      UTM_Zone_Number:
      Transverse_Mercator:
    Universal_Polar_Stereographic:
      UPS_Zone_Identifier:
      Polar_Stereographic:
    State_Plane_Coordinate_System:
      SPCS_Zone_Identifier:
      Lambert_Conformal_Conic:
      Transverse_Mercator:
      Oblique_Mercator:
      Polyconic:
    ARC_Coordinate_System:
      ARC_System_Zone_Identifier:
      Equirectangular:
      Azimuthal_Equidistant:
    Other_Grid_System's_Definition:
  Local_Planar:
    Local_Planar_Description:
    Local_Planar_Georeference_Information:
  Planar_Coordinate_Information:
    Planar_Coordinate_Encoding_Method:
```

```
          Coordinate_Representation:
            Abscissa_Resolution:
            Ordinate_Resolution:
          Distance_and_Bearing_Representation:
            Distance_Resolution:
            Bearing_Resolution:
            Bearing_Units:
            Bearing_Reference_Direction:
            Bearing_Reference_Meridian:
          Planar_Distance_Units:
      Local:
        Local_Description:
        Local_Georeference_Information:
      Geodetic_Model:
        Horizontal_Datum_Name:
        Ellipsoid_Name:
        Semi-major_Axis:
        Denominator_of_Flattening_Ratio:
    Vertical_Coordinate_System_Definition:
      Altitude_System_Definition:
        Altitude_Datum_Name:
        Altitude_Resolution:
        Altitude_Distance_Units:
        Altitude_Encoding_Method:
      Depth_System_Definition:
        Depth_Datum_Name:
        Depth_Resolution:
        Depth_Distance_Units:
        Depth_Encoding_Method:
Entity_and_Attribute_Information:
    Detailed_Description:
      Entity_Type:
        Entity_Type_Label:
        Entity_Type_Definition:
        Entity_Type_Definition_Source:
      Attribute:
        Attribute_Label:
        Attribute_Definition:
        Attribute_Definition_Source:
        Attribute_Domain_Values:
          Enumerated_Domain:
            Enumerated_Domain_Value:
            Enumerated_Domain_Value_Definition:
            Enumerated_Domain_Value_Definition_Source:
          Range_Domain:
            Range_Domain_Minimum:
            Range_Domain_Maximum:
            Attribute_Units_of_Measure:
            Attribute_Measurement_Resolution:
          Codeset_Domain:
            Codeset_Name:
            Codeset_Source:
```

```
    Overview_Description:
      Entity_and_Attribute_Overview:
      Entity_and_Attribute_Detail_Citation:
  Distribution_Information:
    Distributor:
      Contact_Information:
        Contact_Organization_Primary:
        Contact_Organization:
        Contact_Position:
        Contact_Address:
          Address_Type:
          Address:
          City:
          State_or_Province:
          Postal_Code:
          Country:
        Contact_Voice_Telephone:
        Contact_TDD/TTY_Telephone:
        Contact_Facsimile_Telephone:
        Contact_Electronic_Mail_Address:
        Hours_of_Service:
        Contact_Instructions:
    Distribution_Liability:
    Standard_Order_Process:
      Digital_Form:
        Digital_Transfer_Information:
          Format_Name:
          File_Decompression_Technique:
          Transfer_Size:
        Digital_Transfer_Option:
          Online_Option:
            Computer_Contact_Information:
              Network_Address:
                Network_Resource_Name:
          Offline_Option:
            Offline_Media:
            Recording_Format:
      Fees:
      Ordering_Instructions:
    Custom_Order_Process:
  Metadata_Reference_Information:
    Metadata_Date:
    Metadata_Review_Date:
    Metadata_Future_Review_Date:
    Metadata_Contact:
      Contact_Information:
        Contact_Organization_Primary:
          Contact_Organization:
          Contact_Person:
        Contact_Position:
        Contact_Address:
```

```
        Address_Type:
        Address:
        City:
        State_or_Province:
        Postal_Code:
        Country:
      Contact_Voice_Telephone:
      Contact_TDD/TTY_Telephone:
      Contact_Facsimile_Telephone:
      Contact_Electronic_Mail_Address:
      Hours_of_Service:
      Contact_Instructions:
  Metadata_Standard_Name:
  Metadata_Standard_Version:
  Metadata_Time_Convention:
  Metadata_Access_Constraints:
  Metadata_Use_Constraints:
  Metadata_Security_Information:
    Metadata_Security_Classification_System:
    Metadata_Security_Classification:
    Metadata_Security_Handling_Description:
```

APPENDIX E. EXAMPLE METADATA RECORDS

E.1 EXAMPLE 1 – GOES-8 METADATA RECORD

```
Identification_Information
 Citation
  Citation_Information
   Originator: NRL - Naval Research Laboratory
   Publication_Date: 19980702
   Title: GOES_8 - Tropical Atlantic
   Geospatial_Data_Presentation_Form : remote-sensing image
   Online_Linkage: MEL Custom Order Form: <URL:http://mel.dmso.mil/mel-
bin/order?site=nrlm&ofile=goes_8_prod_trop_atl.meta&action=order>
   Online_Linkage: Satellite Photos and Movies (NRL-
Monterey):<URL:http://www.nrlmry.navy.mil/sat_products.html>
 Description
  Abstract:
   The latest Visible, IR, and Water Vapor channel GOES-8 Satellite Images
   generated in near real-time by the NRL-Monterey SeaSpace TeraScan receiving
   station.
   Routine images are produced on a nominal 1/2 hour update schedule.
   Visible images are only generated during local daylight hours.
  Purpose:
   These images are generated for research purposes by NRL-Monterey.
   Additional products may be added at a future date.
 Time_Period_of_Content
  Time_Period_Information
   Range_of_Dates/Times
    Beginning_Date: 19981211
    Beginning_Time: 00000000Z
    Ending_Date: Present
    Ending_Time: 00000000Z
  Currentness_Reference: Start of satellite scan
 Status
  Progress: Complete
  Maintenance_and_Update_Frequency: Continuously updated every 30 minutes
 Spatial_Domain
  Bounding_Coordinates
   West_Bounding_Coordinate: -100.0
   East_Bounding_Coordinate:  -10.0
   North_Bounding_Coordinate: 50.0
   South_Bounding_Coordinate:  0.0
 Keywords
  Theme
   Theme_Keyword_Thesaurus: MEL_Scientific-Engineering_Field_Thesaurus
   Theme_Keyword: Meteorology
   Theme_Keyword: Oceanography
  Theme
   Theme_Keyword_Thesaurus: MEL_Product_Thesaurus
   Theme_Keyword: GOES_8
  Place
   Place_Keyword_Thesaurus: MEL_Location_Thesaurus
```

```
   Place_Keyword: Atlantic Ocean
   Place_Keyword: Caribbean Sea
   Place_Keyword: Gulf of Mexico
   Place_Keyword: Florida
   Place_Keyword: Cuba
  Stratum
   Stratum_Keyword_Thesaurus: MEL_Environmental_Domain_Thesaurus
   Stratum_Keyword: Air
   Stratum_Keyword: Air/Land Interface
   Stratum_Keyword: Air/Sea Interface
   Stratum_Keyword: Land/Sea Interface
   Stratum_Keyword: Ocean
  Stratum
   Stratum_Keyword_Thesaurus: MEL_Areal_Coverage_Thesaurus
   Stratum_Keyword: mesoscale analysis scale
  Temporal
   Temporal_Keyword_Thesaurus: MEL_Temporal_Coverage_Thesaurus
   Temporal_Keyword: Real-time data

 Access_Constraints: None
 Use_Constraints: None
 Point_of_Contact
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
    Contact_Person: Jeff Hawkins
   Contact_Position: Code 7541
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
    Postal_Code: 93943-5006
    Country: US
   Contact_Voice_Telephone: (831) 656-4833
   Contact_Facsimile_Telephone: (831) 656-4833
   Contact_Electronic_Mail_Address: hawkins@nrlmry.navy.mil

 Browse_Graphic
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/trop_atlantic_ir/LATEST.j
peg>
  Browse_Graphic_File_Description: 1124x625 JPEG of GOES-8 latest infrared
(channel 4) generated every 1/2 hour.  Mercator projection of tropical
Atlantic, Caribbean, Gulf of Mexico, and Eastern USA.
  Browse_Graphic_File_Type: jpeg

 Browse_Graphic
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/loops/tropicir>
  Browse_Graphic_File_Description: ~660K Full Size MPEG of GOES-8 latest
infrared generated every 30 minutes. Mercator projection of tropical
Atlantic, Caribbean, Gulf of Mexico, and Eastern USA.
  Browse_Graphic_File_Type: mpg

 Browse_Graphic
```

```
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/loops/tropicpcir>
  Browse_Graphic_File_Description: ~83K PC Size MPEG of GOES-8 latest
infrared generated every 1/2 hour. Mercator projection of tropical Atlantic,
Caribbean, Gulf of Mexico and Eastern USA.
  Browse_Graphic_File_Type: mpg

 Browse_Graphic
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/trop_atlantic_vis/LATEST.
jpeg>
  Browse_Graphic_File_Description: 1124x625 JPEG of GOES-8 latest visible
(channel 1) generated every 1/2 hour.  Mercator projection of tropical
Atlantic, Caribbean, Gulf of Mexico and Eastern USA.
  Browse_Graphic_File_Type: jpeg

 Browse_Graphic
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/loops/tropicvis>
  Browse_Graphic_File_Description: ~360K Full Size MPEG of GOES-8 latest
visible (channel 1) generated every 1/2 hour.  Mercator projection of
tropical Atlantic, Caribbean, Gulf of Mexico and Eastern USA.
  Browse_Graphic_File_Type: mpg

 Browse_Graphic
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/loops/tropicpcvis>
  Browse_Graphic_File_Description: ~126K PC Size MPEG of GOES-8 latest
visible (channel 1) generated every 1/2 hour.   Mercator projection of
tropical Atlantic, Caribbean, Gulf of Mexico and Eastern USA.
  Browse_Graphic_File_Type: mpg

 Browse_Graphic
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/trop_atlantic_vapor/LATES
T.jpeg>
  Browse_Graphic_File_Description: 1124x625 JPEG of GOES-8 latest water vapor
(channel 3) generated every 1/2 hour.  Mercator projection of tropical
Atlantic, Caribbean, Gulf of Mexico and Eastern USA.
  Browse_Graphic_File_Type: jpeg

 Browse_Graphic
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/loops/tropicwv>
  Browse_Graphic_File_Description: ~313K Full Size MPEG of GOES-8 latest
water vapor (channel 3) generated 1/2 hour.  Mercator projection of tropical
Atlantic, Caribbean, Gulf of Mexico and Eastern USA.
  Browse_Graphic_File_Type: mpg

 Browse_Graphic
  Browse_Graphic_File_Name:
<URL:http://www.nrlmry.navy.mil/satdat/goes8_images/loops/tropicpcwv>
  Browse_Graphic_File_Description: ~100K PC Size MPEG of GOES-8 latest water
vapor (channel 3) generated 1/2 hour. Mercator projection of tropical
Atlantic, Caribbean, Gulf of Mexico and Eastern USA.
  Browse_Graphic_File_Type: mpg
```

```
 Data_Set_Credit: NRLMRY
 Security_Information
  Security_Classification_System:
   Department of Defense Trusted Computer Systems Evaluation Criteria CSC-
STD-001-83
  Security_Classification: Unclassified
  Security_Handling_Description: no restrictions

Spatial_Data_Organization_Information
 Indirect_Spatial_Reference: Tropical Atlantic
 Direct_Spatial_Reference_Method: Raster
 Raster_Object_Information
  Raster_Object_Type: Pixel
  Row_Count: 512
  Column_Count: 768

Entity_and_Attribute_Information
 Detailed_Description
  Entity_Type
   Entity_Type_Label: SATELLITE-ELECTROMAGNETIC-SENSOR-CHANNEL
   Entity_Type_Definition: A component of a satellite sensor that monitors an
interval of the electrom agnetic spectrum to measure upwelling/backscattered
or in situ radiation.
   Entity_Type_Definition_Source: DDDS
  Attribute
   Attribute_Label: SATELLITE-ELECTROMAGNETIC-SENSOR-CHANNEL identifier
   Attribute_Definition: The identifier that represents a SATELLITE-
ELECTROMAGNETIC-SENSOR-CHANNEL.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: -80
     Range_Domain_Maximum: 100
     Attribute_Units_of_Measure: varies with channel

Distribution_Information
 Distributor
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
    Contact_Person: Cindy Curtis
   Contact_Position: NRLMRY MEL Administrator
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
    Postal_Code: 93943-5006
    Country: US
   Contact_Voice_Telephone: (831) 656-4792
   Contact_Facsimile_Telephone: (831) 656-4769
   Contact_Electronic_Mail_Address: curtis@nrlmry.navy.mil
   Hours_of_Service: 0800 - 1700 PST Monday - Friday
 Resource_Description: See Custom_Order_process
 Distribution_Liability: None
 Custom_Order_Process:
  Via MEL system: Use MEL Query form to identify dataset.
```

```
  Use order form to request data.
  A MEL subset description follows:
  <MEL>
  <PROLOGUE>
  SITE_ID: nrlm
  REQUEST = GET, SUBSCRIBE
  COMPRESS = NONE
  TAR = YES
  </PROLOGUE>
  <DATASET NAME = LATEST_GOES_8_TROP_ATL>
  DELIV_FMT = JPEG
  <LOCAL>
  Satellite_Name: GOES_8
  Sensor_Name: GOES_IMAGER
  Database: FILE_PRODUCT
  File: LATEST_GOES_8_TROP_ATL/$CHANNEL$/$FORMAT$/g8_*
  Geog_Location: Tropical Atlantic
  SUBSCRIPTION_DIR: LATEST_GOES_8_TROP_ATL/$CHANNEL$/$FORMAT$
  </LOCAL>
  <ACTION NAME = SUBSET>

  <DIMENSION NAME = LONGITUDE>
  UNITS = deg.dd  # decimal degrees + is E - is W
  CHOICE_TYPE = RANGE
  </DIMENSION>

  <DIMENSION NAME = LATITUDE>
  UNITS = deg.dd  # decimal degrees + is N - is S
  CHOICE_TYPE = RANGE
  </DIMENSION>

  <DIMENSION NAME = CHANNEL>
  CHOICE_TYPE = SINGLE
  VALUES = vis=>visible, vapor=>water vapor, ir=>infrared
  DEFAULTS = vis
  </DIMENSION>

  <DIMENSION NAME = FORMAT>
  CHOICE_TYPE = SINGLE
  VALUES = jpg=>Latest image (jpeg), \
  mpg=>Latest full size mpeg movie (~0.4 - 1.0 MB), \
  pcmpg=>Latest PC size mpeg movie (~130K or less)
  DEFAULTS = jpg
  </DIMENSION>

  </ACTION>  # end of subsetting
  </DATASET>
  </MEL>  # end of the message

 Technical_Prerequisites: The MEL requires an HTML Browser (e.g., Netscape),
 an Internet connection, email, and a use delivery site (email or anonymous
 ftp).

Metadata_Reference_Information
 Metadata_Date: 19981211
 Metadata_Contact
  Contact_Information
```

```
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
   Contact_Position: NRLMRY MEL Administrator
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
    Postal_Code: 93943-5006
    Country: US
   Contact_Voice_Telephone: (831) 656-4792
   Contact_Facsimile_Telephone: (831) 656-4769
   Contact_Electronic_Mail_Address: curtis@nrlmry.navy.mil
 Metadata_Standard_Name: FGDC - Content Standards for Digital Geospatial
Metadata
 Metadata_Standard_Version: FGDC-STD-001-1998
 Metadata_Time_Convention: universal time
```

E.2 EXAMPLE 2 – GFDN METADATA RECORD

```
 Identification_Information
 Citation
  Citation_Information
   Originator: FNMOC - Fleet Numerical Meteorology and Oceanography Center
   Publication_Date: 19971009
   Title: GFDN South Pacific Ocean - Data Archived, Geophysical Fluid
Dynamics Laboratory Tropical Cyclone Model, Navy Version System
   Geospatial_Data_Presentation_Form: model
   Online_Linkage: MEL Custom Order Form: <URL:http://mel.dmso.mil/mel-
bin/order?site=nrlm&ofile=gfdn-p.meta&action=order>
 Description
  Abstract:
   GFDN is a triple nested movable mesh model, including initialization,
   forecast, and sections.  Some key features include three computational
   nests with resolution 1ø, 1/3ø, and 1/6ø, convective adjustment, surface
   fluxes, second order turbulence, infrared and solar radiation, a bulk
   subsurface layer, and parameterization of surface features by vegetation
   type.
  Purpose:
   GFDN provides numerical guidance for tropical cyclone track and intensity
   forecasts.  It also provides forecasts of tropical cyclone structure and of
   the synoptic environment.

 Time_Period_of_Content
  Time_Period_Information
   Range_of_Dates/Times
    Beginning_Date: 19971009
    Beginning_Time: 06000000Z
    Ending_Date: 19980426
    Ending_Time: 06000000Z
  Currentness_Reference: Time of model run.
 Status
  Progress: Complete
  Maintenance_and_Update_Frequency : Time_Increment=0000000012.0,
Forecast_Period_Resolution=0000000012.0.
```

```
 Spatial_Domain
  Bounding_Coordinates
   West_Bounding_Coordinate: 130.0000
   East_Bounding_Coordinate: -130.0000
   North_Bounding_Coordinate: 0.0000
   South_Bounding_Coordinate: -50.0000

 Keywords
  Theme
   Theme_Keyword_Thesaurus: MEL_Scientific-Engineering_Field_Thesaurus
   Theme_Keyword: Meteorology
   Theme_Keyword: Oceanography
  Theme
   Theme_Keyword_Thesaurus: MEL_Product_Thesaurus
   Theme_Keyword: GFDN
  Place
   Place_Keyword_Thesaurus: MEL_Location_Thesaurus
   Place_Keyword: South Pacific Ocean
  Stratum
   Stratum_Keyword_Thesaurus: MEL_Environmental_Domain_Thesaurus
   Stratum_Keyword: Air
   Stratum_Keyword: Air/Land Interface
   Stratum_Keyword: Air/Sea Interface
   Stratum_Keyword: Land/Sea Interface
   Stratum_Keyword: Ocean
  Stratum
   Stratum_Keyword_Thesaurus: MEL_Areal_Coverage_Thesaurus
   Stratum_Keyword: mesoscale analysis scale
  Temporal
   Temporal_Keyword_Thesaurus: MEL_Temporal_Coverage_Thesaurus
   Temporal_Keyword: Forecast data
   Temporal_Keyword: Nowcast data

 Access_Constraints: None
 Use_Constraints: None
 Point_of_Contact
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
   Contact_Position: NRLMRY MEL Administrator
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
    Postal_Code: 93943-5006
    Country: US
   Contact_Voice_Telephone: (831) 656-4792
   Contact_Facsimile_Telephone: (831) 656-4769
   Contact_Electronic_Mail_Address: curtis@nrlmry.navy.mil
 Data_Set_Credit: FNMOC
 Security_Information
  Security_Classification_System: Department of Defense Trusted Computer
Systems Evaluation Criteria CSC-STD-001-83
  Security_Classification: Unclassified
  Security_Handling_Description: None
```

```
Spatial_Data_Organization_Information
 Indirect_Spatial_Reference: South Pacific Ocean
 Direct_Spatial_Reference_Method: Raster
 Raster_Object_Information
  Raster_Object_Type: Grid Cell

Entity_and_Attribute_Information
 Detailed_Description
  Entity_Type
   Entity_Type_Label: AIR-TEMPERATURE-ANALYSIS-FORECAST
   Entity_Type_Definition: An estimate of the measure of heat and
psychrometric parameters in the air.
   Entity_Type_Definition_Source: DDDS
  Attribute
   Attribute_Label: AIR-TEMPERATURE-ANALYSIS-FORECAST air temperature
   Attribute_Definition: The temperature of the air estimated by an AIR-
TEMPERATURE-ANALYSIS-FORECAST.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: 163
     Range_Domain_Maximum: 336
     Attribute_Units_of_Measure: DEGREES-KELVIN
  Attribute
   Attribute_Label: AIR-TEMPERATURE-ANALYSIS-FORECAST relative humidity rate
   Attribute_Definition: The estimated rate of vapor pressure to SATURATION
VAPOR PRESSURE.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: 0
     Range_Domain_Maximum: 100
     Attribute_Units_of_Measure: PERCENT
 Detailed_Description
  Entity_Type
   Entity_Type_Label: ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST
   Entity_Type_Definition: An estimate of characteristics of air pressure.
   Entity_Type_Definition_Source: DDDS
  Attribute
   Attribute_Label: ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST geopotential
height dimension
   Attribute_Definition: The height of a point in the atmosphere expressed in
units proportional to the geopotential at that height.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: -400
     Range_Domain_Maximum: 99999
   Attribute_Units_of_Measure: GEOPOTENTIAL-METERS
  Attribute
   Attribute_Label: ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST pressure reduced
to mean sea level.
   Attribute_Definition: The estimated air pressure of an ATMOSPHERIC-
PRESSURE-ANALYSIS-FORECAST reduced to mean sea level.
   Attribute_Definition_Source: NRL
   Attribute_Domain_Values
    Range_Domain
```

```
     Range_Domain_Minimum: 0.1
     Range_Domain_Maximum: 110000.000
     Attribute_Units_of_Measure: PASCALS
 Detailed_Description
  Entity_Type
   Entity_Type_Label: PRECIPITATION-ANALYSIS-FORECAST
   Entity_Type_Definition: An estimate of characteristics of precipitation.
   Entity_Type_Definition_Source: DDDS
  Attribute
   Attribute_Label: PRECIPITATION-ANALYSIS-FORECAST precipitation rate
   Attribute_Definition: The estimated rate of the liquid water equivalent of
precipitation that falls over a period of time.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: 0.1
     Range_Domain_Maximum: 110000.000
     Attribute_Units_of_Measure: CENTIMETERS/HOUR
 Detailed_Description
  Entity_Type
   Entity_Type_Label: WIND-ANALYSIS-FORECAST
   Entity_Type_Definition: An estimate of characteristics of the movement of
air.
   Entity_Type_Definition_Source: DDDS
  Attribute
   Attribute_Label: WIND-ANALYSIS-FORECAST u component rate
   Attribute_Definition: The estimated rate of wind movement on the west-east
direction.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: -200
     Range_Domain_Maximum: 200
     Attribute_Units_of_Measure: METERS/SECOND
  Attribute
   Attribute_Label: WIND-ANALYSIS-FORECAST v component rate
   Attribute_Definition: The estimated rate of wind movement on the south-
north direction.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: -200
     Range_Domain_Maximum: 200
     Attribute_Units_of_Measure: METERS/SECOND

Distribution_Information
 Distributor
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
    Contact_Person: Cindy Curtis
   Contact_Position: NRLMRY MEL Administrator
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
```

```
    Postal_Code: 93943-5006
    Country: US
   Contact_Voice_Telephone: (831) 656-4792
   Contact_Facsimile_Telephone: (831) 656-4769
   Contact_Electronic_Mail_Address: curtis@nrlmry.navy.mil
   Hours_of_Service: 0800 - 1700 PST Monday - Friday
 Resource_Description: See Custom_Order_Process
 Distribution_Liability: None
 Custom_Order_Process:
  Via MEL system: Use MEL Query form to identify dataset.
  Use order form to request data.
  A MEL subset description, used to generate order form, follows:
  <MEL>
  <PROLOGUE>
  SITE_ID: nrlm
  REQUEST = GET, SUBSCRIBE
  COMPRESS = NONE
  TAR = YES
  </PROLOGUE>

  <DATASET NAME = GFDN_South_Pacific_Ocean>
  DELIV_FMT = GRIB

  <LOCAL>
  Database: GFDN_ARC_GRIB_EXT
  File: grib/$DATE HOUR$.fnmoc/$STORM$/GFDN-
P/generic/092.255.$PARAMETER$.$LEVEL$.0.$DATE HOUR$.$FORECAST_TIME$
  SUBSCRIPTION_DIR : GFDN_South_Pacific_Ocean
  </LOCAL>

  <ACTION NAME = SUBSET>

  <DIMENSION NAME = STORM>
  TEXT = Select the storm number of interest.  Data for all dates will be
returned.
  CHOICE_TYPE = SINGLE
  VALUES = \
        02P1998 => 02 P 1998 @ 19971009 - 19971011, \
        03P1998 => 03 P 1998 @ 19971027 - 19971027, \
        05P1998 => 05 P 1998 @ 19971118 - 19971120, \
        11P1998 => 11 P 1998 @ 19980103 - 19980108, \
        12P1998 => 12 P 1998 @ 19980103 - 19980120, \
        14P1998 => 14 P 1998 @ 19980128 - 19980201, \
        18P1998 => 18 P 1998 @ 19980203 - 19980203, \
        19P1998 => 19 P 1998 @ 19980203 - 19980203, \
        25P1998 => 25 P 1998 @ 19980227 - 19980227, \
        29P1998 => 29 P 1998 @ 19980319 - 19980326, \
        30P1998 => 30 P 1998 @ 19980322 - 19980330, \
        31P1998 => 31 P 1998 @ 19980330 - 19980405, \
        32P1998 => 32 P 1998 @ 19980423 - 19980426
  DEFAULTS = 02P1998
  </DIMENSION>

  <DIMENSION NAME = GRID_TYPE>
  TEXT = This data is available for a standard and nested grid.  Select the
desired grid type.
  CHOICE_TYPE = SINGLE
```

```
  VALUES = \
        standard, \
        nested
  DEFAULTS = standard
  </DIMENSION>

  <DIMENSION NAME = PARAMETER>
  TEXT = This data set has more than one parameter.  The parameters available
are shown below with their associative level types.  Select one or more
parameter values.
  UNITS = null  # ignored at present
  CHOICE_TYPE = MULTIPLE
  VALUES = \
  temp.isbr_lvl        => air temperature @ isobaric surface, \
  geop_ht.isbr_lvl     => geopotential height dimension @ isobaric surface, \
  ttl_prcp.msl         => precipitation rate @ mean sea level, \
  pres_msl.msl         => pressure reduced to mean sea level @ mean sea
level, \
  rltv_hum.isbr_lvl    => relative humidity rate @ isobaric surface, \
  wnd_ucmp.ht_sfc      => wind u component rate @ height level above ground,
\
  wnd_ucmp.isbr_lvl    => wind u component rate @ isobaric surface, \
  wnd_vcmp.ht_sfc      => wind v component rate @ height level above ground,
\
  wnd_vcmp.isbr_lvl    => wind v component rate @ isobaric surface
  DEFAULTS = geop_ht.isbr_lvl
  </DIMENSION>

  <DIMENSION NAME = LEVEL>
  TEXT = This data set has more than one level type per parameter.  Each
parameter, however, is only available at certain levels.  Check the chart of
<A HREF=http://www-mel.nrlmry.navy.mil:1234/mel-bin/gridPlot?file=grids/GFDN-
generic> Valid Parameter/Level/Forecast Combinations </A>, and then select
level values that are available.
   CHOICE_TYPE = MULTIPLE
   VALUES = \
   0    => 0 m. (mean sea level), \
   35   => 35 m. (height level above ground), \
   50   => 50 mb. (isobaric surface), \
   100  => 100 mb. (isobaric surface), \
   150  => 150 mb. (isobaric surface), \
   200  => 200 mb. (isobaric surface), \
   250  => 250 mb. (isobaric surface), \
   300  => 300 mb. (isobaric surface), \
   350  => 350 mb. (isobaric surface), \
   400  => 400 mb. (isobaric surface), \
   450  => 450 mb. (isobaric surface), \
   500  => 500 mb. (isobaric surface), \
   550  => 550 mb. (isobaric surface), \
   600  => 600 mb. (isobaric surface), \
   650  => 650 mb. (isobaric surface), \
   700  => 700 mb. (isobaric surface), \
   750  => 750 mb. (isobaric surface), \
   800  => 800 mb. (isobaric surface), \
   850  => 850 mb. (isobaric surface), \
   900  => 900 mb. (isobaric surface), \
   950  => 950 mb. (isobaric surface), \
```

```
   1000 => 1000 mb. (isobaric surface)
   DEFAULTS = 100
  </DIMENSION>

  <DIMENSION NAME = FORECAST_TIME>
  TEXT = This data is available at various forecast times.  Select all
forecast times desired.
  UNITS = Tau (Hours since model analysis)
  CHOICE_TYPE = MULTIPLE
  VALUES = 000, 006, 012, 018, 024, 030, 036, 042, 048, \
  054, 060, 066, 072
  DEFAULTS = 000
  </DIMENSION>

  <DIMENSION NAME = LONGITUDE>
  UNITS = deg.dd  # decimal degrees + is E - is W
  CHOICE_TYPE = RANGE
  </DIMENSION>

  <DIMENSION NAME = LATITUDE>
  UNITS = deg.dd  # decimal degrees + is N - is S
  CHOICE_TYPE = RANGE
  </DIMENSION>

  </ACTION>  # end of subsetting
  </DATASET>
  </MEL>  # end of the message

 Technical_Prerequisites: MEL requires an HTML Browser (e.g., Netscape), an
Internet connection, email, and a use delivery site (email or anonymous ftp).

Metadata_Reference_Information
 Metadata_Date: 19981211
 Metadata_Contact
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
   Contact_Position: MEL regional site admin
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
    Postal_Code: 93943-5006
    Country: US
   Contact_Voice_Telephone: (831) 656-4792
   Contact_Facsimile_Telephone: (831) 656-4769
   Contact_Electronic_Mail_Address: curtis@nrlmry.navy.mil
 Metadata_Standard_Name: FGDC - Content Standards for Digital Geospatial
Metadata
 Metadata_Standard_Version: FGDC-STD-001-1998
 Metadata_Time_Convention: universal time
```

E.3 EXAMPLE 3 – NOGAPS METADATA RECORD

```
Identification_Information
 Citation
  Citation_Information
   Originator: FNMOC - Fleet Numerical Meteorology and Oceanography Center
   Publication_Date: 19970610
   Title: NOGAPS - Current 25 days, global coverage (1 degree grid), Navy
Operational Global Atmospheric Prediction System
   Geospatial_Data_Presentation_Form: model
   Online_Linkage: MEL Custom Order Form: <URL:http://mel.dmso.mil/mel-
bin/order?site=nrlm&ofile=nogaps_global_360x181.meta&action=order>
 Description
  Abstract:
   The Navy Operational Global Atmospheric Prediction System (NOGAPS) is a
   global spectral model of 80 spectral waves and 18 vertical levels to 10 mb.
   The vertical coordinate is a hybrid system that follows the terrain at low
   levels, and constant pressure surfaces at upper levels.  Model physics
   include long-wave and short-wave radiation, boundary-layer processes, and
   stable and convective cloud and precipitation parameterization.
  Purpose:
   The U.S. Navy's NOGAPS has proven itself to be competitive with any of the
   large forecast models run by the large forecast centers around the world.
   Navy applications include ballistic winds in the stratosphere to air-sea
   fluxes to drive ocean general circulation models.
 Time_Period_of_Content
  Time_Period_Information
   Range_of_Dates/Times
    Beginning_Date: 19981112
    Beginning_Time: 00000000Z
    Ending_Date: 19981207
    Ending_Time: 00000000Z
  Currentness_Reference: Time of model run.
 Status
  Progress: Complete
  Maintenance_and_Update_Frequency: Present -025 days,
Time_Increment=0000000012.0, Forecast_Period_Resolution=0000000012.0.
 Spatial_Domain
  Bounding_Coordinates
   West_Bounding_Coordinate: -180.0000
   East_Bounding_Coordinate: 180.0000
   North_Bounding_Coordinate: 90.0000
   South_Bounding_Coordinate: -90.0000

 Keywords
  Theme
   Theme_Keyword_Thesaurus: MEL_Scientific-Engineering_Field_Thesaurus
   Theme_Keyword: Meteorology
   Theme_Keyword: Oceanography
  Theme
   Theme_Keyword_Thesaurus: MEL_Product_Thesaurus
   Theme_Keyword: NOGAPS
  Place
   Place_Keyword_Thesaurus: MEL_Location_Thesaurus
```

```
   Place_Keyword: global
  Stratum
   Stratum_Keyword_Thesaurus: MEL_Environmental_Domain_Thesaurus
   Stratum_Keyword: Air
   Stratum_Keyword: Air/Land Interface
   Stratum_Keyword: Air/Sea Interface
   Stratum_Keyword: Land/Sea Interface
   Stratum_Keyword: Ocean
  Stratum
   Stratum_Keyword_Thesaurus: MEL_Areal_Coverage_Thesaurus
   Stratum_Keyword: mesoscale analysis scale
  Temporal
   Temporal_Keyword_Thesaurus: MEL_Temporal_Coverage_Thesaurus
   Temporal_Keyword: Forecast data
   Temporal_Keyword: Nowcast data
 Access_Constraints: None
 Use_Constraints: None
 Point_of_Contact
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
   Contact_Position: NRLMRY MEL Administrator
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
    Postal_Code: 93943-5006
    Country: US
   Contact_Voice_Telephone: (831) 656-4792
   Contact_Facsimile_Telephone: (831) 656-4769
   Contact_Electronic_Mail_Address: curtis@nrlmry.navy.mil
 Data_Set_Credit: FNMOC
 Security_Information
  Security_Classification_System: Department of Defense Trusted Computer
Systems Evaluation Criteria CSC-STD-001-83
  Security_Classification: Unclassified
  Security_Handling_Description: None
Spatial_Data_Organization_Information
 Indirect_Spatial_Reference: global_360x181
 Direct_Spatial_Reference_Method: Raster
 Raster_Object_Information
  Raster_Object_Type: Grid Cell
  Row_Count: 181
  Column_Count: 360
  Vertical_Count: 10
Spatial_Reference_Information
 Horizontal_Coordinate_System_Definition
  Geographic
   Latitude_Resolution: 1.0
   Longitude_Resolution: 1.0
   Geographic_Coordinate_Units: Decimal degrees

Entity_and_Attribute_Information
 Detailed_Description
  Entity_Type
   Entity_Type_Label: AIR-TEMPERATURE-ANALYSIS-FORECAST
```

```
   Entity_Type_Definition: An estimate of the measure of heat and
   psychrometric parameters in the air.
   Entity_Type_Definition_Source: DDDS
  Attribute
   Attribute_Label: AIR-TEMPERATURE-ANALYSIS-FORECAST air temperature
   Attribute_Definition: The temperature of the air estimated by an AIR-
TEMPERATURE-ANALYSIS-FORECAST.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: 163
     Range_Domain_Maximum: 336
     Attribute_Units_of_Measure: DEGREES-KELVIN
  Attribute
   Attribute_Label: AIR-TEMPERATURE-ANALYSIS-FORECAST dew point temperature
   Attribute_Definition: The estimated temperature to which a given parcel of
   air must be cooled at constant pressure and water vapor content in order
   for saturation to occur.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: 213
     Range_Domain_Maximum: 336
     Attribute_Units_of_Measure: DEGREES-KELVIN

 Detailed_Description
  Entity_Type
   Entity_Type_Label: ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST
   Entity_Type_Definition: An estimate of characteristics of air pressure.
   Entity_Type_Definition_Source: DDDS
  Attribute
   Attribute_Label: ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST geopotential
   height dimension
   Attribute_Definition: The height of a point in the atmosphere expressed in
   units proportional to the geopotential at that height.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
    Range_Domain_Minimum: -400
    Range_Domain_Maximum: 99999
    Attribute_Units_of_Measure: GEOPOTENTIAL-METERS
  Attribute
   Attribute_Label: ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST pressure reduced
   to MSL
   Attribute_Definition: The estimated air pressure of an ATMOSPHERIC-
   PRESSURE-ANALYSIS-FORECAST reduced to MSL.
   Attribute_Definition_Source: NRL
   Attribute_Domain_Values
    Range_Domain
    Range_Domain_Minimum: 0.001
    Range_Domain_Maximum: 1100.000
    Attribute_Units_of_Measure: HECTOPASCALS
  Attribute
   Attribute_Label: ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST water vapor
   pressure rate
   Attribute_Definition: The estimated water vapor pressure of an
   ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST.
```

```
  Attribute_Definition_Source: NRL
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum:0
    Range_Domain_Maximum:300
    Attribute_Units_of_Measure: HECTOPASCALS

Detailed_Description
 Entity_Type
  Entity_Type_Label: CLOUD-ANALYSIS-FORECAST
  Entity_Type_Definition: An estimate of cloud coverage conditions.
  Entity_Type_Definition_Source: DDDS
 Attribute
  Attribute_Label: CLOUD-ANALYSIS-FORECAST total cloud coverage rate
  Attribute_Definition: The estimated rate of the sky dome that is covered
  by clouds.
  Attribute_Definition_Source: DDDS
  Attribute_Domain_Values
   Codeset_Domain
    Range_Domain_Minimum: 0
    Range_Domain_Maximum: 100
    Attribute_Units_of_Measure: PERCENT

Detailed_Description
 Entity_Type
  Entity_Type_Label: GEOPHYSICAL-POINT-CLIMATOLOGY
  Entity_Type_Definition: A statistical analysis of historical geophysical
  data for a point.
  Entity_Type_Definition_Source: DDDS
 Attribute
  Attribute_Label: GEOPHYSICAL-POINT-CLIMATOLOGY freezing height dimension
  Attribute_Definition: freezing height
  Attribute_Definition_Source: NRL
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum:-400
    Range_Domain_Maximum: 5000
    Attribute_Units_of_Measure: METERS
 Attribute
  Attribute_Label: GEOPHYSICAL-POINT-CLIMATOLOGY terrain height dimension
  Attribute_Definition: The height of the surface of the earth relative to a
  VERTICAL-REFERENCE-DATUM.
  Attribute_Definition_Source: DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum: -400
    Range_Domain_Maximum: 9999
    Attribute_Units_of_Measure: METERS

Detailed_Description
 Entity_Type
  Entity_Type_Label: ICE-ANALYSIS-FORECAST
  Entity_Type_Definition: The condition of ice derived from interpretation
  of ice observation(s)
  Entity_Type_Definition_Source: DDDS
 Attribute
  Attribute_Label: ICE-ANALYSIS-FORECAST percent concentration rate
```

```
  Attribute_Definition: The percent of the water's surface that is covered
  by allforms of ice.
  Attribute_Definition_Source: DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum: 0
    Range_Domain_Maximum: 100
    Attribute_Units_of_Measure: METERS

Detailed_Description
 Entity_Type
  Entity_Type_Label: PRECIPITATION-ANALYSIS-FORECAST
  Entity_Type_Definition: An estimate of characteristics of precipitation.
  Entity_Type_Definition_Source: DDDS
 Attribute
  Attribute_Label: PRECIPITATION-ANALYSIS-FORECAST ground wetness
  Attribute_Definition: Wetness of the ground.
  Attribute_Definition_Source: NRL
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum: Unknown
    Range_Domain_Maximum: Unknown
    Attribute_Units_of_Measure: Unknown
 Attribute
  Attribute_Label: PRECIPITATION-ANALYSIS-FORECAST precipitation rate
  Attribute_Definition: The estimated rate of the liquid water equivalent of
  precipitation that falls over a period of time.
  Attribute_Definition_Source: DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum: 00.00
    Range_Domain_Maximum: 99.99
    Attribute_Units_of_Measure: CENTIMETERS/HOUR

Detailed_Description
 Entity_Type
  Entity_Type_Label: SURFACE-TEMPERATURE-FORECAST
  Entity_Type_Definition: An forecast of the temperature at the surface.
  Entity_Type_Definition_Source: NRL
 Attribute
  Attribute_Label: EARTH-SURFACE-TEMPERATURE-ANALYSIS-FORECAST skin
  temperature
  Attribute_Definition: The estimated skin temperature of the earth's
  surface. Skin is defined as the surface of the soil or the surface ofa body
  of water.
  Attribute_Definition_Source: DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum: 163
    Range_Domain_Maximum: 423
    Attribute_Units_of_Measure: DEGREES-KELVIN

 Entity_Type
  Entity_Type_Label: WIND-ANALYSIS-FORECAST
  Entity_Type_Definition: An estimate of characteristics of the movement of
  air.
  Entity_Type_Definition_Source: DDDS
```

```
  Attribute
   Attribute_Label: WIND-ANALYSIS-FORECAST absolute vorticity rate
   Attribute_Definition: The estimated rate of the circular motion, around a
   vertical axis, of the air.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: -0.0099999
     Range_Domain_Maximum: 0.0099999
     Attribute_Units_of_Measure: ONE/SECOND
  Attribute
   Attribute_Label: WIND-ANALYSIS-FORECAST wind u component rate
   Attribute_Definition: The estimated rate of wind movement on the west-east
   direction.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: -200
     Range_Domain_Maximum: 200
     Attribute_Units_of_Measure: METERS/SECOND
  Attribute
   Attribute_Label: WIND-ANALYSIS-FORECAST wind v component rate
   Attribute_Definition: The estimated rate of wind movement on the south-
   north direction.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: -200
     Range_Domain_Maximum: 200
     Attribute_Units_of_Measure: METERS/SECOND
  Attribute
   Attribute_Label: WIND-ANALYSIS-FORECAST vertical velocity rate
   Attribute_Definition: The estimated vertical rate of movement of air
   relative to pressure coordinates for a WIND-ANALYSIS-FORECAST.
   Attribute_Definition_Source: DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum: -0.009999
     Range_Domain_Maximum: 0.009999
     Attribute_Units_of_Measure: HECTOPASCAL/SECOND

Distribution_Information
 Distributor
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
    Contact_Person: Cindy Curtis
   Contact_Position: NRLMRY MEL Administrator
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
    Postal_Code: 93943-5006
    Country: US
   Contact_Voice_Telephone: (831) 656-4792
   Contact_Facsimile_Telephone: (831) 656-4769
```

```
   Contact_Electronic_Mail_Address: curtis@nrlmry.navy.mil
   Hours_of_Service: 0800 - 1700 PST Monday - Friday
 Resource_Description: See Custom_Order_Process
 Distribution_Liability: None
 Custom_Order_Process:
  Via MEL system: Use MEL Query form to identify data set.
  Use order form to request data.
  A MEL subset description, used to generate order form, follows:
  <MEL>
  <PROLOGUE>
  SITE_ID: nrlm
  REQUEST = GET, SUBSCRIBE
  COMPRESS = NONE
  TAR = YES
  </PROLOGUE>
  <DATASET NAME = NOGAPS-global_360x181>
  <LOCAL>
  Database: STD_GRIB_EXT
  File:
grib/$TIME$.fnmoc/ops/NOGAPS/global_360x181/058.240.$PARAMETER$.$LEVEL$.0.$TI
ME$.$FORECAST_TIME$
  SUBSCRIPTION_DIR: NOGAPS-global_360x181
  </LOCAL>
  <ACTION NAME = SUBSET>

  <DIMENSION NAME = FORMAT>
  TEXT = This data set is available in GRIB format only.
  CHOICE_TYPE = SINGLE
  VALUES = GRIB
  DEFAULTS = GRIB
  </DIMENSION>

  <DIMENSION NAME = TIME>
  UNITS = YYYYMMDDhh.hh
  DELAY = 12
  CHOICE_TYPE = RANGE
  VALUES = -3000, Present, 6
  </DIMENSION>

  <DIMENSION NAME = PARAMETER>
  TEXT = This data set has more than one parameter.  The parameters available
  are shown below with their associative level types.  Select one or more
  parameter values.
  UNITS = null  #  ignored at present
  CHOICE_TYPE = MULTIPLE
  VALUES = \
  abs_vort.isbr_lvl      => absolute vorticity rate @ isobaric surface, \
  temp.ht_sfc            => air temperature @ height level above surface, \
  temp.isbr_lvl          => air temperature @ isobaric surface, \
  dwpt_dprs.isbr_lvl     => dew point temperature @ isobaric surface, \
  dwpt_dprs.surface      => dew point temperature @ surface of the earth/sea,
\
  frz_ht.isth_lvl        => freezing height dimension @ level of 0 degree C
  isotherm, \
  geop_ht.isbr_lvl       => geopotential height dimension @ isobaric surface,
\
```

```
grnd_sea_temp.surface  => ground sea temperature @ surface of the
earth/sea, \
grnd_wet.surface       => ground wetness @ surface of the earth/sea, \
ice_cvrg.surface       => ice concentration rate @ surface of the
earth/sea, \
ttl_prcp.surface       => precipitation rate @ surface of the earth/sea, \
pres_msl.msl           => pressure reduced to MSL @ mean sea level, \
terr_ht.surface        => terrain height dimension @ surface of the
earth/sea, \
ttl_cld.surface        => total cloud coverage rate @ surface of the
earth/sea, \
vpr_pres.isbr_lvl      => vapor pressure rate @ isobaric surface, \
vpr_pres.surface       => vapor pressure rate @ surface of the earth/sea, \
wnd_vert_vel.isbr_lvl  => vertical velocity rate @ isobaric surface, \
wnd_ucmp.ht_sfc        => wind u component rate @ height level above
surface, \
wnd_ucmp.isbr_lvl      => wind u component rate @ isobaric surface, \
wnd_vcmp.ht_sfc        => wind v component rate @ height level above
surface, \
wnd_vcmp.isbr_lvl      => wind v component rate @ isobaric surface
DEFAULTS = temp.ht_sfc
</DIMENSION>

<DIMENSION NAME = LEVEL>
TEXT = This data set has more than one level type per parameter.  Each
parameter, however, is only available at certain levels.  Check the chart
of <A HREF=http://www-mel.nrlmry.navy.mil:1234/mel-
bin/gridPlot?file=grids/NOGAPS-global_360x181> Valid
Parameter/Level/Forecast Combinations </A>, and then select level values
that are available.
 CHOICE_TYPE = MULTIPLE
 VALUES = \
 0    => 0 _. (level of 0 degree C isotherm or mean sea level or surface of
 the earth/sea), \
 2    => 2 m. (height level above surface), \
 10   => 10 (height level above surface(m.) or isobaric surface(hPa.)), \
 19   => 19 m. (height level above surface), \
 20   => 20 hPa. (isobaric surface), \
 30   => 30 hPa. (isobaric surface), \
 50   => 50 hPa. (isobaric surface), \
 70   => 70 hPa. (isobaric surface), \
 100  => 100 hPa. (isobaric surface), \
 150  => 150 hPa. (isobaric surface), \
 200  => 200 hPa. (isobaric surface), \
 250  => 250 hPa. (isobaric surface), \
 300  => 300 hPa. (isobaric surface), \
 400  => 400 hPa. (isobaric surface), \
 500  => 500 hPa. (isobaric surface), \
 700  => 700 hPa. (isobaric surface), \
 850  => 850 hPa. (isobaric surface), \
 900  => 900 hPa. (isobaric surface), \
 925  => 925 hPa. (isobaric surface), \
 950  => 950 hPa. (isobaric surface), \
 975  => 975 hPa. (isobaric surface), \
 1000 => 1000 hPa. (isobaric surface)
 DEFAULTS = 2
</DIMENSION>
```

```
  <DIMENSION NAME = FORECAST_TIME>
  TEXT = This data set is available at various forecast times.  Select all
  forecast times desired.
  UNITS = Tau (Hours since model analysis)
  CHOICE_TYPE = MULTIPLE
  VALUES = 000, 006, 012, 018, 024, 030, 036, 042, 048, \
  060, 072, 084, 096, 120
  DEFAULTS = 000
  </DIMENSION>

  <DIMENSION NAME = LONGITUDE>
  UNITS = deg.dd  #  decimal degrees + is E - is W
  CHOICE_TYPE = RANGE
  </DIMENSION>

  <DIMENSION NAME = LATITUDE>
  UNITS = deg.dd  #  decimal degrees + is N - is S
  CHOICE_TYPE = RANGE
  </DIMENSION>

  </ACTION>  # end of subsetting
  </DATASET>
  </MEL>  # end of the message
 Technical_Prerequisites: The MEL requires an HTML Browser, an Internet
 connection, email, and a use delivery site (email or anonymous ftp).
Metadata_Reference_Information
 Metadata_Date: 19981211
 Metadata_Contact
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization: Naval Research Laboratory
   Contact_Position: NRLMRY MEL Administrator
   Contact_Address
    Address_Type: mailing and physical address
    Address: 7 Grace Hopper Rd.
    City: Monterey
    State_or_Province: CA
    Postal_Code: 93943-5006
    Country : US
   Contact_Voice_Telephone: (831) 656-4792
   Contact_Facsimile_Telephone: (831) 656-4769
   Contact_Electronic_Mail_Address: curtis@nrlmry.navy.mil
 Metadata_Standard_Name : FGDC - Content Standards for Digital Geospatial
Metadata
 Metadata_Standard_Version: FGDC-STD-001-1998
 Metadata_Time_Convention: universal time
```

E.4 EXAMPLE 4 – METADATA RECORD WITH CLASSIFICATION LABELING

```
Identification_Information
 Citation
  Citation_Information
   Originator : FNMOC - Fleet Numerical Meteorology and Oceanography Center
   Publication_Date : 19980624
   Title : (U) COAMPS Europe - Data Archived, Coupled Ocean Atmosphere
Mesoscale Prediction System
   Geospatial_Data_Presentation_Form : model
   Online_Linkage : MEL Custom Order Form: <URL:http://www-
   mel.nrlmry.navy.mil:4837/mel-
   bin/order?site=nrlmt&ofile=arc_coamps_europe_nest2_appl3.meta&action=order>
 Description
  Abstract :
   COAMPS is designed to couple a nonhydrostatic, fully compressible
   atmospheric model to a hydrostatic, incompressible multi-level
   ocean model. The atmospheric model includes predictive equations
   for momentum, the nondimensional pressure perturbation, the potential
   temperature, and the mixing ratios of water vapor, clouds, rain,
   ice and snow. Although the oceanic model is not included in the
   current version of COAMPS, the surface fluxes of momentum, heat
   and moisture are parameterized, and computations are based on
   static oceanic fields.
  Purpose :
   The COAMPS provides mesoscale numerical weather forecasts for direct
   use by simulations and for providing high-resolution input to other
   meteorological and oceanographic models.
 Time_Period_of_Content
  Time_Period_Information
   Range_of_Dates/Times
    Beginning_Date : 19980625
    Beginning_Time : 00000000Z
    Ending_Date : 20000901
    Ending_Time : 12000000Z
  Currentness_Reference : Time of model run.
 Status
  Progress : Complete
  Maintenance_and_Update_Frequency : Time_Increment=0000000012.0,
Forecast_Period_Resolution=0000000006.0
 Spatial_Domain
  Bounding_Coordinates
   West_Bounding_Coordinate : -12.0000
   East_Bounding_Coordinate : 40.0000
   North_Bounding_Coordinate : 47.0000
   South_Bounding_Coordinate : 29.0000

 Keywords
  Theme
   Theme_Keyword_Thesaurus : MEL_Scientific-Engineering_Field_Thesaurus
   Theme_Keyword : Meteorology
   Theme_Keyword : Oceanography
  Theme
   Theme_Keyword_Thesaurus : MEL_Product_Thesaurus
```

```
   Theme_Keyword : COAMPS - Coupled Ocean/Atmosphere Mesoscale Prediction
   System
  Place
   Place_Keyword_Thesaurus : MEL_Location_Thesaurus
   Place_Keyword : Europe
  Stratum
   Stratum_Keyword_Thesaurus : MEL_Environmental_Domain_Thesaurus
   Stratum_Keyword : Air
   Stratum_Keyword : Air/Land Interface
   Stratum_Keyword : Air/Sea Interface
   Stratum_Keyword : Land/Sea Interface
   Stratum_Keyword : Ocean
  Stratum
   Stratum_Keyword_Thesaurus : MEL_Areal_Coverage_Thesaurus
   Stratum_Keyword : Mesoscale
  Temporal
   Temporal_Keyword_Thesaurus : MEL_Temporal_Coverage_Thesaurus
   Temporal_Keyword : Forecast data
   Temporal_Keyword : Archived data

 Access_Constraints : None
 Use_Constraints : None
 Point_of_Contact
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization : Naval Research Laboratory
   Contact_Position : NRLMRY MEL Administrator
   Contact_Address
    Address_Type : mailing and physical address
    Address : 7 Grace Hopper Rd.
    City : Monterey
    State_or_Province : CA
    Postal_Code : 93943-5006
    Country : US
   Contact_Voice_Telephone : (831) 656-4792
   Contact_Facsimile_Telephone : (831) 656-4769
   Contact_Electronic_Mail_Address : curtis@nrlmry.navy.mil
 Data_Set_Credit : FNMOC
 Security_Information
  Security_Classification_System : Department of Defense Trusted Computer
Systems Evaluation Criteria CSC-STD-001-83
  Security_Classification : Unclassified
  Security_Handling_Description : None

Spatial_Data_Organization_Information
 Indirect_Spatial_Reference : europe_nest2_appl3
 Direct_Spatial_Reference_Method : Raster
 Raster_Object_Information
  Raster_Object_Type : Grid Cell
  Row_Count : 91
  Column_Count : 261
  Vertical_Count : 14

Spatial_Reference_Information
 Horizontal_Coordinate_System_Definition
  Geographic
   Latitude_Resolution : 0.2
```

```
   Longitude_Resolution : 0.2
   Geographic_Coordinate_Units : Decimal degrees

Entity_and_Attribute_Information
 Detailed_Description
  Entity_Type
   Entity_Type_Label : AIR-TEMPERATURE-ANALYSIS-FORECAST
   Entity_Type_Definition : An estimate of the measure of heat and
   psychrometric parameters in the air.
   Entity_Type_Definition_Source : DDDS
  Attribute
   Attribute_Label : AIR-TEMPERATURE-ANALYSIS-FORECAST air temperature
   Attribute_Definition : The temperature of the air estimated by an AIR-
   TEMPERATURE-ANALYSIS-FORECAST.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : 163
     Range_Domain_Maximum : 336
     Attribute_Units_of_Measure : DEGREES-KELVIN
  Attribute
   Attribute_Label : AIR-TEMPERATURE-ANALYSIS-FORECAST dew point temperature
   Attribute_Definition : The estimated temperature to which a given parcel
   of air must be cooled at constant pressure and water vapor content in order
   for saturation to occur.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : 213
     Range_Domain_Maximum : 336
     Attribute_Units_of_Measure : DEGREES-KELVIN
  Attribute
   Attribute_Label : AIR-TEMPERATURE-ANALYSIS-FORECAST relative humidity rate
   Attribute_Definition : The estimated rate of vapor pressure to SATURATION
   VAPOR PRESSURE.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : 0
     Range_Domain_Maximum : 100
     Attribute_Units_of_Measure : PERCENT

 Detailed_Description
  Entity_Type
   Entity_Type_Label : ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST
   Entity_Type_Definition : An estimate of characteristics of air pressure.
   Entity_Type_Definition_Source : DDDS
  Attribute
   Attribute_Label : ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST geopotential
   height dimension
   Attribute_Definition : The height of a point in the atmosphere expressed
   in units proportional to the geopotential at that height.
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : -400
     Range_Domain_Maximum : 99999
```

```
    Attribute_Units_of_Measure : GEOPOTENTIAL-METERS
 Attribute
  Attribute_Label : ATMOSPHERIC-PRESSURE-ANALYSIS-FORECAST pressure reduced
  to MSL
  Attribute_Definition : The estimated air pressure of an ATMOSPHERIC-
  PRESSURE-ANALYSIS-FORECAST reduced to MSL.
  Attribute_Definition_Source : NRL
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum : 0.001
    Range_Domain_Maximum : 1100.000
    Attribute_Units_of_Measure : HECTOPASCALS

Detailed_Description
 Entity_Type
  Entity_Type_Label : EARTH-SOLAR-RADIATION-ANALYSIS-FORECAST
  Entity_Type_Definition : An estimate of natural sunlight radiation
  characteristics.
  Entity_Type_Definition_Source : DDDS
 Attribute
  Attribute_Label : EARTH-SOLAR-RADIATION-ANALYSIS-FORECAST latent heat flux
  rate
  Attribute_Definition : The estimated rate of heat flow per unit mass for a
  system in a reversible, isobaric-isothermic change of phase.
  Attribute_Definition_Source : DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum : 0.0
    Range_Domain_Maximum : 9.99
    Attribute_Units_of_Measure : WATTS/METER-SQUARED

Detailed_Description
 Entity_Type
  Entity_Type_Label : ELECTROMAGNETIC-TROPOSPHERIC-ANALYSIS-FORECAST
  Entity_Type_Definition : An estimate of electromagnetic properties within
  the troposphere.
  Entity_Type_Definition_Source : DDDS
 Attribute
  Attribute_Label : ELECTROMAGNETIC-TROPOSPHERIC-ANALYSIS-FORECAST
  evaporation duct height dimension
  Attribute_Definition : The estimated height of a duct formed from
  evaporation of seawater which begins at sea level and rises to an elevation
  (duct height) corresponding to a change in the slope in the index of
  refraction.
  Attribute_Definition_Source : DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum : 0
    Range_Domain_Maximum : 99
    Attribute_Units_of_Measure : METERS

Detailed_Description
 Entity_Type
  Entity_Type_Label : GEOPHYSICAL-POINT-CLIMATOLOGY
  Entity_Type_Definition : A statistical analysis of historical geophysical
  data for a point.
  Entity_Type_Definition_Source : DDDS
```

```
 Attribute
  Attribute_Label : GEOPHYSICAL-POINT-CLIMATOLOGY terrain height dimension
  Attribute_Definition : The height of the surface of the earth relative to
  a VERTICAL-REFERENCE-DATUM.
  Attribute_Definition_Source : DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum : -400
    Range_Domain_Maximum : 9999
    Attribute_Units_of_Measure : METERS

Detailed_Description
 Entity_Type
  Entity_Type_Label : PRECIPITATION-ANALYSIS-FORECAST
  Entity_Type_Definition : An estimate of characteristics of precipitation.
  Entity_Type_Definition_Source : DDDS
 Attribute
  Attribute_Label : PRECIPITATION-ANALYSIS-FORECAST precipitation rate
  Attribute_Definition : The estimated rate of the liquid water equivalent
  of precipitation that falls over a period of time.
  Attribute_Definition_Source : DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum : 00.00
    Range_Domain_Maximum : 99.99
    Attribute_Units_of_Measure : CENTIMETERS/HOUR

Detailed_Description
 Entity_Type
  Entity_Type_Label : WIND-ANALYSIS-FORECAST
  Entity_Type_Definition : An estimate of characteristics of the movement of
  air.
  Entity_Type_Definition_Source : DDDS
 Attribute
  Attribute_Label : WIND-ANALYSIS-FORECAST absolute vorticity rate
  Attribute_Definition : The estimated rate of the circular motion, around a
  vertical axis, of the air.
  Attribute_Definition_Source : DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum : -0.0099999
    Range_Domain_Maximum : 0.0099999
    Attribute_Units_of_Measure : ONE/SECOND
 Attribute
  Attribute_Label : WIND-ANALYSIS-FORECAST u component rate
  Attribute_Definition : The estimated rate of wind movement on the west-
  east direction.
  Attribute_Definition_Source : DDDS
  Attribute_Domain_Values
   Range_Domain
    Range_Domain_Minimum : -200
    Range_Domain_Maximum : 200
    Attribute_Units_of_Measure : METERS/SECOND
 Attribute
  Attribute_Label : WIND-ANALYSIS-FORECAST v component rate
  Attribute_Definition : The estimated rate of wind movement on the south-
  north direction.
```

```
   Attribute_Definition_Source : DDDS
   Attribute_Domain_Values
    Range_Domain
     Range_Domain_Minimum : -200
     Range_Domain_Maximum : 200
     Attribute_Units_of_Measure : METERS/SECOND

Distribution_Information
 Distributor
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization : Naval Research Laboratory
    Contact_Person : Cindy Curtis
   Contact_Position : NRLMRY MEL Administrator
   Contact_Address
    Address_Type : mailing and physical address
    Address : 7 Grace Hopper Rd.
    City : Monterey
    State_or_Province : CA
    Postal_Code : 93943-5006
    Country : US
   Contact_Voice_Telephone : (831) 656-4792
   Contact_Facsimile_Telephone : (831) 656-4769
   Contact_Electronic_Mail_Address : curtis@nrlmry.navy.mil
   Hours_of_Service : 0800 - 1700 PST Monday - Friday
 Resource_Description : See Custom_Order_Process
 Distribution_Liability : None
 Custom_Order_Process :
  Via MEL system: Use MEL Query form to identify data set.
  Use order form to request data.
  A MEL subset description follows:
  <MEL>
  <PROLOGUE>
  SITE_ID: nrlmt
  REQUEST = GET
  COMPRESS = NONE
  TAR = YES
  </PROLOGUE>
  <DATASET NAME = COAMPS_EUROPE-europe_nest2_appl3>

  <LOCAL>
  Database: STD_ARC_GRIB_EXT
  File:
   grib/$TIME$.fnmoc/ops/COAMPS_EUROPE/europe_nest2_appl3/022.183.$PARAMETER$.
   $LEVEL$.0.$TIME$.$FORECAST_TIME$
  SUBSCRIPTION_DIR : COAMPS_EUROPE-europe_nest2_appl3
  </LOCAL>
  <ACTION NAME = SUBSET>

  <DIMENSION NAME = FORMAT>
  TEXT = (TS) This data set is available in GRIB format only.
  CHOICE_TYPE = SINGLE
  VALUES = GRIB
  DEFAULTS = GRIB
  </DIMENSION>

  <DIMENSION NAME = TIME>
```

```
TEXT = (S) WARNING: The archive represents a very large collection of data.
Please limit this order to three weeks of data or less.
UNITS = YYYYMMDDhh.hh
CHOICE_TYPE = RANGE
DELAY = 12
VALUES = -3000.00, Present, 6
</DIMENSION>

<DIMENSION NAME = PARAMETER>
TEXT = (C//FOUO,OC) This data set has more than one parameter.  The
parameters available are shown below with there associative level types.
Select one or more parameter values.
UNITS = null  #  ignored at present
CHOICE_TYPE = MULTIPLE
VALUES = \
abs_vort.isbr_lvl      => absolute vorticity rate @ isobaric surface, \
temp.ht_sfc            => air temperature @ height level above surface, \
temp.isbr_lvl          => air temperature @ isobaric surface, \
dwpt_dprs.isbr_lvl     => dew point depression @ isobaric surface, \
evap_duct_ht.surface   => evaporation duct height dimension @ surface of
earth/sea, \
geop_ht.isbr_lvl       => geopotential height dimension @ isobaric surface,
\
ltnt_heat_flux.surface => latent heat flux rate @ surface of earth/sea, \
ttl_prcp.surface       => precipitation rate @ surface of earth/sea, \
pres_msl.msl           => pressure reduced to MSL @ mean sea level, \
rltv_hum.isbr_lvl      => relative humidity rate @ isobaric surface, \
terr_ht.surface        => terrain height dimension @ surface of earth/sea,
\
wnd_ucmp.ht_sfc        => u component rate @ height level above surface, \
wnd_ucmp.isbr_lvl      => u component rate @ isobaric surface, \
wnd_vcmp.ht_sfc        => v component rate @ height level above surface, \
wnd_vcmp.isbr_lvl      => v component rate @ isobaric surface
DEFAULTS = temp.ht_sfc
</DIMENSION>

<DIMENSION NAME = LEVEL>
TEXT = This data set has more than one level type per parameter.  Each
parameter, however, is only available at certain levels.  Check the chart
of <A HREF=http://www-mel.nrlmry.navy.mil:7777/mel-
bin/local/gridPlot?file=grids/COAMPS_EUROPE-europe_nest2_appl3> Valid
Parameter/Level/Forecast Combinations </A>, and then select level values
that are available.
CHOICE_TYPE = MULTIPLE
VALUES = \
0    => 0 _. (mean sea level or surface of earth/sea), \
2    => 2 m. (height level above surface), \
10   => 10 m. (height level above surface), \
19   => 19 m. (height level above surface), \
100  => 100 hPa. (isobaric surface), \
150  => 150 hPa. (isobaric surface), \
200  => 200 hPa. (isobaric surface), \
250  => 250 hPa. (isobaric surface), \
300  => 300 hPa. (isobaric surface), \
400  => 400 hPa. (isobaric surface), \
500  => 500 hPa. (isobaric surface), \
700  => 700 hPa. (isobaric surface), \
```

```
  850  => 850 hPa. (isobaric surface), \
  925  => 925 hPa. (isobaric surface), \
  1000 => 1000 hPa. (isobaric surface)
  DEFAULTS = 2
  </DIMENSION>

  <DIMENSION NAME = FORECAST_TIME>
  TEXT = This data set is available at various forecast times.  Select all
  forecast times desired.
  UNITS = Tau (Hours since model analysis)
  CHOICE_TYPE = MULTIPLE
  VALUES = 000, 006, 012, 018, 024, 030, 036, 042, 048
  DEFAULTS = 000
  </DIMENSION>

  <DIMENSION NAME = LONGITUDE>
  UNITS = deg.dd  #  decimal degrees + is E - is W
  CHOICE_TYPE = RANGE
  </DIMENSION>

  <DIMENSION NAME = LATITUDE>
  UNITS = deg.dd  #  decimal degrees + is N - is S
  CHOICE_TYPE = RANGE
  </DIMENSION>

  </ACTION>  #  end of subsetting
  </DATASET>
  </MEL>  #  end of the message

 Technical_Prerequisites : MEL requires an HTML Browser (e.g., Netscape), an
 Internet connection, email, and a use delivery site (email or anonymous
 ftp).

Metadata_Reference_Information
 Metadata_Date : 20000919
 Metadata_Review_Date : 19990218
 Metadata_Contact
  Contact_Information
   Contact_Organization_Primary
    Contact_Organization : Naval Research Laboratory
   Contact_Position : NRLMRY MEL Administrator
   Contact_Address
    Address_Type : mailing and physical address
    Address : 7 Grace Hopper Rd.
    City : Monterey
    State_or_Province : CA
    Postal_Code : 93943-5006
    Country : US
   Contact_Voice_Telephone : (831) 656-4792
   Contact_Facsimile_Telephone : (831) 656-4769
   Contact_Electronic_Mail_Address : curtis@nrlmry.navy.mil
 Metadata_Standard_Name : FGDC - Content Standards for Digital Geospatial
Metadata
 Metadata_Standard_Version : FGDC-STD-001-1998
 Metadata_Time_Convention : universal time
 Metadata_Access_Constraints : RS
 Metadata_Security_Information
```

```
Metadata_Security_Classification_System : Department of Defense Trusted
Computer System Evaluation Criteria CSC-STD-001-83
Metadata_Security_Classification : Unclassified
Metadata_Security_Handling_Description : None
```

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