

445-TP-006-002

# EOSView Version 3.1 Users Guide for the ECS Project

Technical Paper

January 2000

**Technical Paper--Not intended for formal review or  
government approval.**

Prepared Under Contract NAS5-60000

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# Abstract

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EOSView is a file viewing tool developed for the ECS project for the examination and verification of HDF and HDF-EOS data files. This tool enables the user of EOS data products to view the contents of HDF files and individual objects by being able to read and display all metadata fields and data objects appropriately. Supported record types for viewing and display capability include images, Raster images, multidimensional arrays, text, tables, (Vdatas) and Vgroups. Attributes and annotations can also be viewed. EOSView users will see the underlying HDF structures and will be prompted for which parts of the structure they wish to view.

The EOSView application is able to convert HDF and HDF-EOS data files to a particular type, ASCII and binary, for storage on a user's disk space so that the user can then make further use of analysis and visualization tools already available in commercial public domain systems. EOSView is then able to open and provide the means for ingesting HDF and HDF-EOS files into other software systems.

**Keywords:** EOSVIEW, HDFEOS, VDATAS, HDF, images, point, swath, grid

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# 1. Introduction

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## 1.1 Identification

The EOSView User's Guide for the ECS Project was prepared under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-60000).

## 1.2 Scope

This document is intended for use by anyone who wished to verify or inspect EOS data products written as HDF-EOS or as HDF files. Users of this document will include EOS instrument team science software developers and data product designers, DAAC personnel, and end users of EOS data products, i.e. scientists and researchers.

## 1.3 Purpose and Objectives

This document will serve as a user's guide for the EOSView data verification tool, developed for ECS. The reader should have an understanding of the user interface and the functionality provided with the tool. A cursory understanding of HDF and HDF-EOS data structures is recommended, but not required.

Information on HDF-EOS can be found in The HDF-EOS Users Guide for the ECS Project. Information on HDF can be found in The NCSA HDF User's Guide.

## 1.4 Status and Schedule

January, 1995, EOSView Design Document Available

Evaluation Plan 6, Version 1.5.1, November, 1995

June, 1996, EOSView, Beta Version 1.9 Available, including:

- Help text enabled on major displays.
- View contents of multiple files simultaneously.
- Display multi-dimensional SDSs in table format.
- Display multi-file SDS group as single entity.
- Text display of annotations.
- Display Attributes on SDSs, Classes on Vgroups/Vdatas.
- Display Vdatas in table format.
- Some scripting commands.

- Select alternate color palette.
- Display Data Dictionary, Text in scrolling window.
- Display Metadata in scrolling window

November, 1996 – EOSView, Beta Version 2.1 Available, including:

- Text display of annotations.
- Display Vdatas in table format.
- 24-bit raster display.
- Pan image with outline on thumbnail image.
- Zoom in image with outline on thumbnail, using pixel replication or interpolation.
- Zoom out image with outline on thumbnail using subsampling
- Display color scatter plot (point only).
- Basic Overlay
- Swath, Point, Grid interface.
- Already met: Improved animation interface.
- Already met: Select alternate color palettes.

May, 1997 – Release B.0 Version of EOSView Available, including:

- Select cursor position Lat/Long, Pixel, Scanline (Grid only).
- Display cursor position by Lat/Long (Grid only), Pixel (all images), Scanline (Swath only).
- Save HDF and HDF-EOS objects to ASCII or binary file.

July 1997 – EOSView, Beta Version 2.5 Available

August 1998 – EOSView 3.0 Available including:

- Plot range options.

December 1999 – EOSView 3.1 Available including:

- Lat/Long lines for polar Grid images.
- Ability to save data from list box to ASCII file

## 1.5 Document Organization

This document is organized as follows:

Section 1 Introduction - Presents Scope and Purpose of this document

Section 2 Related Documentation

- Section 3 Overview of EOSView - Background and design features of the tool
- Section 4 Installation and Maintenance - Information on obtaining the tool, supported platforms, user help
- Section 5 EOSView User Interface

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## 2. Related Documentation

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### 2.1 Parent Documents

The following document is the parent from which this document's scope and content derive:

423-41-03	Goddard Space Flight Center, EOSDIS Core System Contract Data Requirements Document, Data Item Description No. 311
423-41-03	Goddard Space Flight Center, EOSDIS Core System Contract Data Requirements Document, Data Item Description No. 609

### 2.2 Related Documents

The following documents are directly applicable to this requirement's specification:

333-CD-003	SDP Toolkit Users Guide for the ECS Project
170-TP-500	Release 5A HDF-EOS Library Users Guide for the ECS Project – Volume 1: Overview and Examples
170-TP-501	Release 5A HDF-EOS Library Users Guide for the ECS Project – Volume 2: Function Reference Guide
none	University of Illinois, Getting Started with HDF
none	University of Illinois, NCSA HDF User's Guide
none	University of Illinois, NCSA HDF Reference Manual
none	University of Illinois, NCSA HDF Specification and Developer's Guide

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## 3. Overview of HDF and HDF-EOS

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### 3.1 Introduction

Prior to discussing EOSView, it is helpful to provide an overview of the data formats which the tool is designed: namely HDF.

The Hierarchical Data Format (HDF) has been selected by the Earth Observing System (EOS) Data and Information System, Core System (ECS) Project as the format for EOS standard product distribution. HDF is a general scientific data format, which supports raster, text, array and table type structures. The files are self-describing and portable to most Unix systems. HDF data structures are implemented with a software interface supplied by the National Center for Supercomputing Applications (NCSA). See NCSA HDF User's Guide and references. HDF has been extended by the ECS Project to focus conventions for writing EOS data products. These extensions, called HDF-EOS, are described below.

EOSView has been designed to supply the user with the capability of opening and inspecting the contents of an HDF-EOS or HDF data file. The tool will provide producers and users of EOS data the ability to navigate through HDF-EOS and HDF files, display metadata, file directory information, and data in table and/or image form.

### 3.2 HDF and HDF-EOS File Formats

#### 3.2.1 Overview

Most of the NCSA defined datatypes map well to EOS datatypes. Examples include raster images, multi-dimensional arrays, and text blocks. There are other EOS datatypes, however, that do not map directly to NCSA datatypes, particularly in the case of geolocated datatypes. Examples include projected grids, satellite swaths, and field campaign or point data.

An HDF file consists of a directory, and records pointed to by that directory. Each directory entry consists of fields for the record type (TAG), a unique ID number (REF), and a location and size of the record pointed to. All locations in the HDF file are in byte locations from the beginning of the file. All record sizes are also specified in bytes.

Supported record types include images, multidimensional arrays, text, tables (known in HDF as Vdatas), and so on. One record type, known as Vgroup, lets the user group a series of records into a larger structure, similar to disk directories.

To bridge the gap between the needs of EOS data products and the capabilities of HDF, the ECS Project has developed extensions of HDF, which standardize the conventions for writing HDF files, and are called HDF-EOS. These extensions facilitate the creation of Grid, Point, and Swath data structures. The software interface for the HDF-EOS implementation is very similar

to the HDF interface. See HDF-EOS Users Guide for the ECS Project [170-TP-001-001] and references.

The Point interface is designed to support data that has associated geolocations information, but is not organized in any well defined spatial or temporal way. The Swath interface is tailored to support time-ordered data such as satellite swaths (which consist of a time-ordered series of scanlines), or profilers (which consist of a time-ordered series of profiles). The Grid interface is designed to support data that has been stored in a rectilinear array based on a well defined and explicitly supported projection.

### **3.2.2 Structure of an HDF-EOS File**

An HDF-EOS file is any valid HDF file (i.e. any file created by the NCSA HDF library), that contains a family of global attributes called “coremetada.X”, where “.X” is a sequence number beginning at 0 and running as high as 9. Optional data objects which may appear in an HDF-EOS file include, another family of global attributes called “archivemetadada.X” and any number of Point, Swath, and/or Grid data structures. The existence of Point, Swath, or Grid structures in an HDF-EOS file implies the existene of another family of global attributes called “StructMetadata.X”. These terms are defined below.

#### **Core Metadata**

Core Metadata represent information which will be used to populate searchable tables within the structure. These metadata, which are defined in DID 311, are contained in the “coremetadada.X” (X=0,...,n) family of global attributes within an HDF-EOS file. The syntax of these metadata is compliant with the Object Description Language (ODL). Tools for formatting, accessing and writing core metadata are provided in the ECS Science Data Processing (SDP) Toolkit.

#### **Archive Metadata**

Archive metadata represent information that, by definition, will not be searchable. It contains whatever information the file creator considers useful to be in the file, but which will not be directly accessible for the system. These metadata are also accessed via SDP Toolkit calls and are written in ODL syntax into the “archivemetadada.X”, (X=0,...,n) family of global attributes.

#### **Structural Metadata**

Structural metadata describe the contents and structure of an HDF-EOS file. These metadata are present in the file only if the HDF-EOS library has been invoked to create a Grid, Point, or Swath structure. These metadata are stored in the “StructMetadata.X” family of global attributes and are created and maintained by the HDF-EOS library. These metadata are not intended to be directly accessed by data producers or users. Therefore, all access to these metadata should be via appropriate function calls in the HDF-EOS library.

#### **Point Structure**

Point structures are implemented in HDF-EOS files as a hierarchy of Vgroups containing several Vdatas, i.e. tables. All Vgroups and Vdatas that are part of any Point structure carry the class

“POINT”. Each level of data within a Point structure is implemented as a single Vdata, with each data field being named field in the Vdata.

The following limitations apply to Point structures and should be kept in mind by EOSView users:

- The reserved field names for special purpose geolocation fields are “Longitude”, “Latitude”, “Colatitude”, and “Time” (case sensitive). These fields are subject to the following requirements:

Field Name	Data Type	Format
Longitude	float32 or float64	Decimal degrees on the range [-180.0, 180.0]
Latitude	float32 or float64	Decimal degrees on the range [-90.0, 90.0]
Colatitude	float32 or float64	Decimal degrees on the range [0.0, 180.0]
Time	float64	TAI93 (seconds until(-)/since(+)) midnight 1/1/93)

- Fields may only be one-dimensional.
- Up to 8 levels may exist in a Point structure.

### Swath Structure

Swath structures are implemented as a hierarchy of Vgroups containing a number of Vdatas and/or SDSs, i.e. tables and multi-dimensional arrays. All Vgroups and Vdatas that are part of any Swath structure carry the class “SWATH”. Each one-dimensional field is implemented as a named field within its own Vdata. One-dimensional fields that are the same length, are merged into “communal” Vdatas, with each data field occupying one field in the Vdata.

Each multi-dimensional field is implemented as an SDS. Three dimensional fields which share the same dimensionality, dimension sizes, and data type and which are specifically allowed by the calling program are merged into communal SDSs with three dimensions. Two-dimensional arrays are merged as if they were three-dimensional arrays with a first dimension of size 1. No merging is performed on fields with more than three dimensions, on fields with an unlimited dimension, or on compressed fields.

The following limitations apply to Swath structures:

- The reserved field names for special purpose geolocation fields are “Longitude”, “Latitude”, “Colatitude”, and “Time” (case sensitive). These fields are subject to the following requirements:

Field Name	Data Type	Format
Longitude	float32 or float64	Decimal degrees on the range [-180.0, 180.0]
Latitude	float32 or float64	Decimal degrees on the range [-90.0, 90.0]
Colatitude	float32 or float64	Decimal degrees on the range [0.0, 180.0]
Time	float64	TAI93 (seconds until(-)/since(+) midnight 1/1/93)

These fields may be one- or two-dimensional

- Non-reserved fields may have up to 8 dimensions.
- An “unlimited” dimension must be the first dimension (in C-order).
- For all multi-dimensional fields in scan- or profile-oriented Swaths, the dimension representing the “along track” dimension must precede the dimension representing scan or profile dimension(s).
- Compression is selectable at the field level within a Swath. All HDF-supported compression methods are available through the HDF-EOS library. Specifying compression on a field prevents merging.

Note: EOSView users need not be concerned whether a file has been compressed internally or not. The tool will uncompress the file automatically.

### **Grid Structure**

Grid structures are implemented as a hierarchy of Vgroups containing several SDSs. All Vgroups that are part of any Grid structure carry the class “GRID”. Each data field within a Grid structure is implemented as a single SDS. Merging is done the same way for Grid data fields as for multi-dimensional Swath data fields.

The following limitations apply to Grid structures:

- Fields may have from 2 to 8 dimensions.
- Compression is selectable at the field level within a Grid. All HDF-supported compression methods are available through the HDF-EOS library. Specifying compression on a field prevents merging.

Note: EOSView users need not be concerned whether a file has been compressed internally or not. The tool will uncompress the file automatically.

## 4. Environment, Installation and Maintenance

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### 4.1 Introduction

EOSView is designed to be a stand-alone tool for accessing HDF and HDF-EOS files. The installation instructions are described below.

### 4.2 Download Instructions

Downloading EOSView can be accomplished by using an ftp session. The address is:

```
ftp edhs1.gsfc.nasa.gov
```

```
Name: anonymous
```

```
Password: <your e-mail address>
```

```
ftp>quote site group sdptk
```

```
ftp> quote site gpass ecs-tkit
```

```
ftp>cd eosview
```

A README file will also be provided in this directory.

```
ftp>get README
```

This file will answer many questions you have about running EOSView.

Change to the eosview directory that matches your hardware.

```
dec/
```

```
hp/
```

```
ibm/
```

```
sgi/
```

```
sun/
```

```
source/
```

Once in the directory set type to I, download the files, and exit.

```
ftp>bin
```

```
ftp>mget *
```

```
ftp>bye
```

The following files will be downloaded:

EOSView (executable)  
 eosview.csc (hypertext on-line help file)  
 eosview.uid (user interface description file)  
 eosview.dat (IDL commands file)

If the user prefers to view the EOSView source code, change to the source/ directory and download the file EOSVIEW\_source.tar.Z. This is a compressed tar file. To unload the contents of this file type:

```
uncompress EOSVIEW_source.tar.Z
tar xvf EOSVIEW_source.tar
```

Start EOSView by typing 'EOSView' at the command prompt. If the environment variables described in Section 4.3.4 are not set, the current working directory must contain the four EOSView files.

## 4.3 Notes

### 4.3.1 Approved Platforms

EOSView was built and tested in a multi-platform environment. The list of approved platforms, which includes information about operating system is given in Table 4-1. The platforms should run Motif 1.2 window manager.

**Table 4-1. Operating Systems**

Platform	OS	Version
Sun Sparc	Solaris	2.5.1
HP 9000/735	HP-UX	10.20
SGI	IRIX	6.2
DEC Alpha	OSF1	4.0
IBM	AIX	4.3

### 4.3.2 Interfaces and Data Types

EOSView exchanges data of various types through internal interfaces within ECS:

- IDL for graphics
- XVT for GUI builder
- links with the HDF compile time library

### 4.3.3 Tunable Parameters

The following attributes can be modified through the standard .Xdefaults file:

- focus policy (mouse pointer)
- icon geometry (size and location)
- fonts
- colors

### 4.3.4 Environment Variables

Table 4-2 lists the environment variables for EOSView. These variables are optional.

**Table 4-2. Environment Variables**

Required By	Environment Variable	Description or Valid Ranges
EOSView	UIDPATH	location of the eosview.uid file that contains a description of GUI objects
EOSView	EOSVIEWHELPPDIR	location of eosview.csc (hypertext on-line help file) and eosview.dat file (idl commands)
EOSView	ECS_HOME	directory for File Selection dialog to begin

### 4.3.5 Special Constraints

EOSView will read only HDF and HDF-EOS formatted files.

### 4.3.6 Command Line Interface

Command line interface is available through a script file as a separately created text file passed as a command-line argument for EOSView to read and perform actions. The following script commands are valid:

- OPEN [filename] - opens file 'filename'
- DISPLAY IMAGE [n] - displays the n-th image in the file (must be preceded by OPEN command)
- ANIMATE IMAGES 999 - animates all images in file (must be preceded by OPEN command)

## 4.4 User Feedback Mechanism

The mechanism for handling user feedback, documentation and software discrepancies, and bug reports follows:

- 1) The following account at the ECS Landover facility has been set up for user response:  
pgstlkit@eos.hitc.com

- 2) Users will e-mail problem reports and comments to the above account. A receipt will be returned to the sender. Responses will be prioritized based on the severity of the problem and the available resources. Simple bug fixes will be turned around sooner, while requested functional enhancements will be placed in a recommended requirements data base (RRDB) and handled more formally.
- 3) In order to help expedite responses, we request the following information be supplied with problem reports:

Name:

Date:

EOS Affiliation (DAAC, Instrument, Earth Science Data and Information System (ESDIS), etc.):

Phone No:

Computing Platform:

Operating System (including version):

Problem Description:

## 5. EOSView User Interface

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### 5.1 Introduction

EOSView is a custom HDF file verification tool. It displays the contents of HDF files and the contents of files containing HDF-EOS data. Individual objects can be selected for display. Displays include Raster images, datasets in tables, pseudo-color images of datasets, attributes, and annotations. Simple animation can be performed for a file with multiple raster images.

EOSView has a unique interface for handling HDF-EOS data structures. The Swath/Grid/Point interface uses only HDF-EOS library calls. The EOSView operator will not see the underlying HDF structures but will be prompted for which parts of the structure they wish to view.

EOSView is used to perform the operator functions listed in Table 5-1.

**Table 5-1. Common ECS Operator Functions Performed with EOSView  
(1 of 2)**

Operating Function	Command/Script or GUI	Description	When and Why to Use
Display HDF file contents	EOSView File Contents window	Looks at data file images, metadata, and auxiliary information	To verify structures put in a file
Display Raster Image	Image Display window	<ul style="list-style-type: none"> <li>• displays Browse images, geolocated maps, etc</li> <li>• multiple zoom features in image display available</li> <li>• pan feature available</li> <li>• multiple palettes available</li> </ul>	To view a snapshot of an image (not data)
Animate Raster Images	Animation Window	presents in order images as they appear in each file	To show a succession of movement (e.g., temperature adjustment from one image to the next)
Display of SDS data in table	<ul style="list-style-type: none"> <li>• SDS data table</li> <li>• Vdata table</li> </ul>	Displays a one or two dimensional list of data in a scrollable list	To view/compare associated numbers
Expand a Vgroup	Select "Vgroup" from File Contents window	Vgroups are logical groupings of information such as Vdata, SDS data, and images	To view information by a certain subject (e.g., the information associated with Geolocation)

**Table 5-1. Common ECS Operator Functions Performed with EOSView  
(2 of 2)**

<b>Operating Function</b>	<b>Command/Script or GUI</b>	<b>Description</b>	<b>When and Why to Use</b>
Pseudo-color display of SDS data	Image Display Window	Converts data into a visual image	To view the pseudo-color image of an SDS table
Display text objects	Text (Attributes) Window	Describes the types of data strings for an individual object or for an entire file	To look at factors when doing computations (e.g., longitude/latitude)
Hypertext help	On-line Help	On-line help is available from all menu bars	to help in the navigation and use of EOSView
Swath/Point/Grid interface (HDF-EOS)	File Contents Display window for swath, point and grid files	View HDF-EOS objects at a high level (i.e., data types cannot be broken down)	To view segments of data in terms of swath, a point on the earth, and grid (e.g., lat/long) data
Plot VData	EOSView Plot Window	Static line plot display of x and y data (from a Vdata Table)	To view line plot of data capabilities
Plot SDS Data	EOSview surface/contour plot window	Surface or contour plot of SDS	To view plots of SDS tables

## **5.2 Quick Start Using EOSView and GUI Overview**

This section presents an orientation of EOSView.

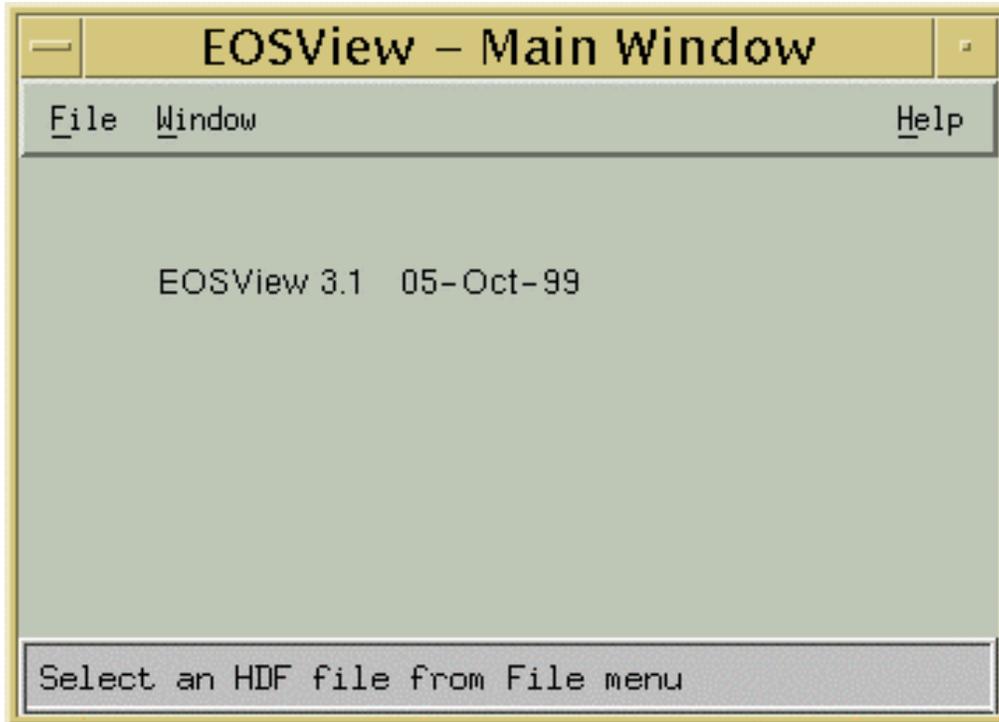
### **5.2.1 Invoke EOSView**

EOSview can be started from the UNIX command line by typing the command:

**EOSView**

### **5.2.2 EOSView Main Screen**

The EOSView Main Window (shown in Figure 5-1) displays the current version of EOSView and date.



**Figure 5-1. EOSView Main Screen**

From the **F**ile pulldown menu, the operator can select Open or Exit.

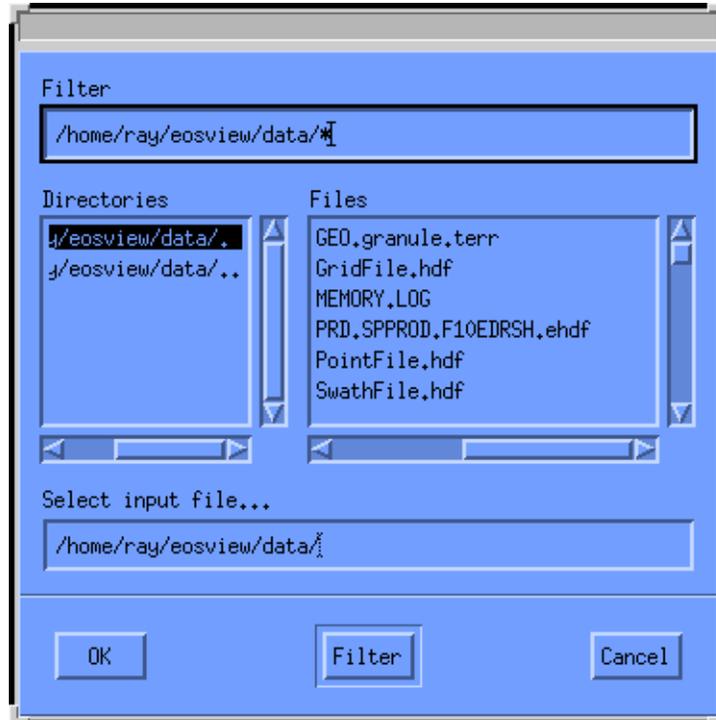
- **Open** -- This will cause a file selection dialog to appear (shown in Figure 5-2)
- **Exit** – Exits EOSView

From the **W**indow pulldown menu, the operator can select an EOSView screen and have the focus change to that window as long as it is currently open. This feature is described in Section 5.2.23 “Window Pulldown Menu.”

From the **H**elp pulldown menu, the operator can select help on context, on help, on window, keys, contents, index and version. This feature is described in Section 5.2.25 “Help Pulldown Menu.”

### 5.2.3 EOSView File Selection Dialog

Selecting **Open** from the EOSView File pulldown menu will bring up the File Selection Dialog shown in Figure 5-2. This is a standard file selection dialog box that lets the operator search through directories and select an HDF file.



**Figure 5-2. File Selection Dialog**

Table 5-2 describes the File Selection fields.

**Table 5-2. EOSView File Selection Field Description**

Field Name	Data Type	Size	Entry	Description
Filter	system generated (editable)	unlimited	required	displays file selection parameters to filter the directories
Directories	selection	unlimited	required	displays a list of directories
Files	selection	unlimited	required	displays a list of files to select from
Select Input File	system generated (editable)	unlimited	required	displays the filename selection

In addition, the following pushbuttons are provided:

- **OK** – opens the specified file
- **Filter** – filters through the directories in layers until the desired directory/file is displayed
- **Cancel** – closes the file selection dialog

#### 5.2.4 File Contents Display Pop-up

Once the HDF file has been selected, the File Contents Pop-up (see Figure 5-3) for that file will appear. This is a scrollable window with the following menu items:

- The **F**ile pulldown menu (described in Section 5.2.21) provides additional information about a file and provides a way to close the file.
- The **O**ptions pulldown menu (described in Section 5.2.22) and its Animate images selection becomes sensitized when the selected file contains multiple Raster Image Groups. This will cause all the images to be lined up and displayed in order in an EOSView - Animation Window.
- From the **W**indow pulldown menu, the operator can select an EOSView window and have the focus change to that window as long as it is currently open. This feature is described in Section 5.2.23 “Window Pulldown Menu.”
- From the **A**tttributes pulldown menu (described in Section 5.2.24), the operator can view the global attributes for the selected HDF file.
- From the **H**elp pulldown menu (described in Section 5.2.25), the operator can select help on context, on help, on window, keys, contents, index and version.

To select an HDF object simply double-click on the object that is displayed in the scrollable window. Objects can be Numeric Data, Vdata, Vgroup, Raster Images, or Grid/Swath/Point data. Each of these objects are described in the following sections.

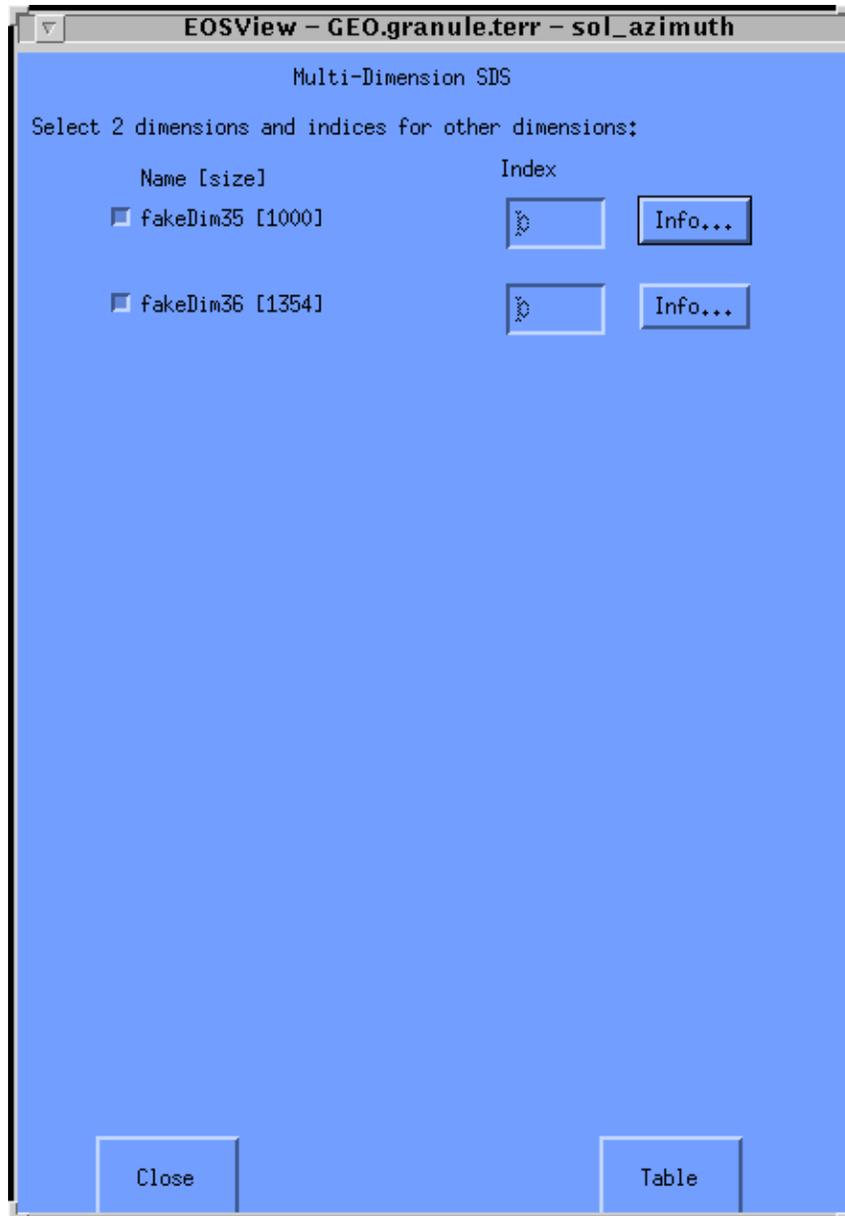
#### 5.2.5 Numeric Data Group

In this example, the GEO.granule.terr HDF file was selected from the File Selection Dialog, bringing up the File Contents Display Pop-up shown in Figure 5-3.



**Figure 5-3. EOSView File Contents Pop-up**

Double-clicking on an item from the EOSView File Contents Pop-up (in this example, Numeric Data Group: "sol\_azimuth" Size : [1000X1354] was selected) brings up the Multi-Dimension SDS window as shown in Figure 5-4. This window allows the operator to select dimensions and indices for other dimensions.



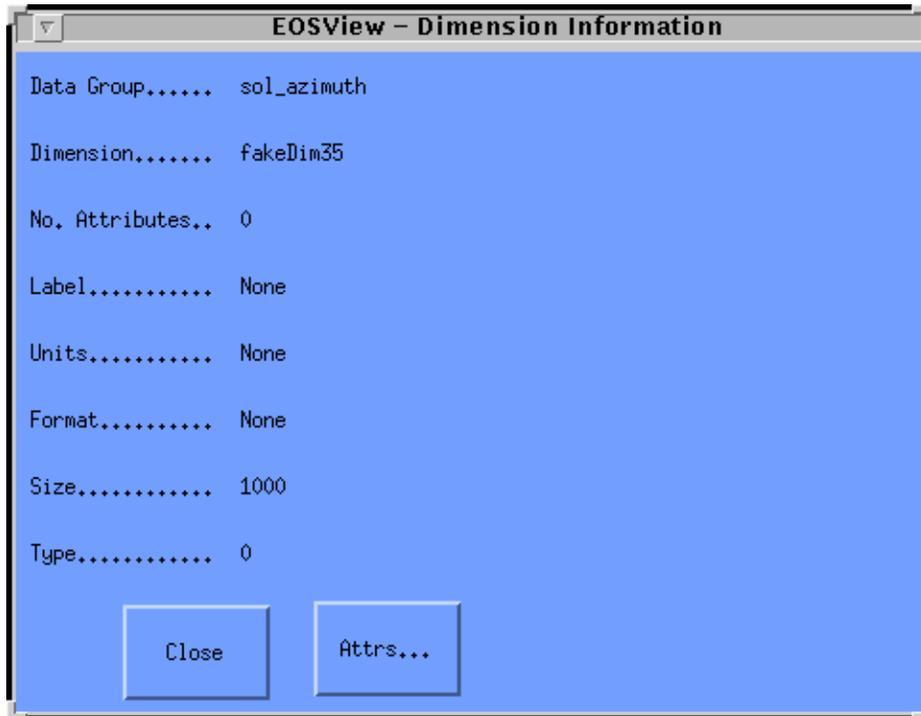
**Figure 5-4. Multi-Dimension SDS Pop-up**

Table 5-3 describes the fields of the Multi-Dimension SDS Pop-up.

**Table 5-3. Multi Dimension SDS Field Description€**

Field Name	Data Type	Size	Entry	Description
Index	integer	N/A	Required	Index of involved dimensions. For the selected dimension the default value is 0. For the unselected dimension the number can be as large as what is in bracket after dimension name.

EOSView can only display 2 dimensional datasets. If a dataset contains more than 2 dimensions, a 2-D slice of the dataset needs to be selected. This is accomplished by selecting ONLY 2 dimension boxes to the left of the dimension name. The other dimensions can have an index entered in the text box. Additional information for each dimension can be displayed in a separate window by pressing the button next to the dimension the information is desired. Clicking on the **Info** button will bring up a Dimension Information pop-up shown below in Figure 5-5.



**Figure 5-5. Dimension Information Pop-up**

This window contains information such as number of attributes, units, format, size, etc. From this window, the operator can display textual output of the attributes for this dimension by clicking on the **Attrs...** button. Selecting **Close** closes the EOSView - Dimension Information Window.

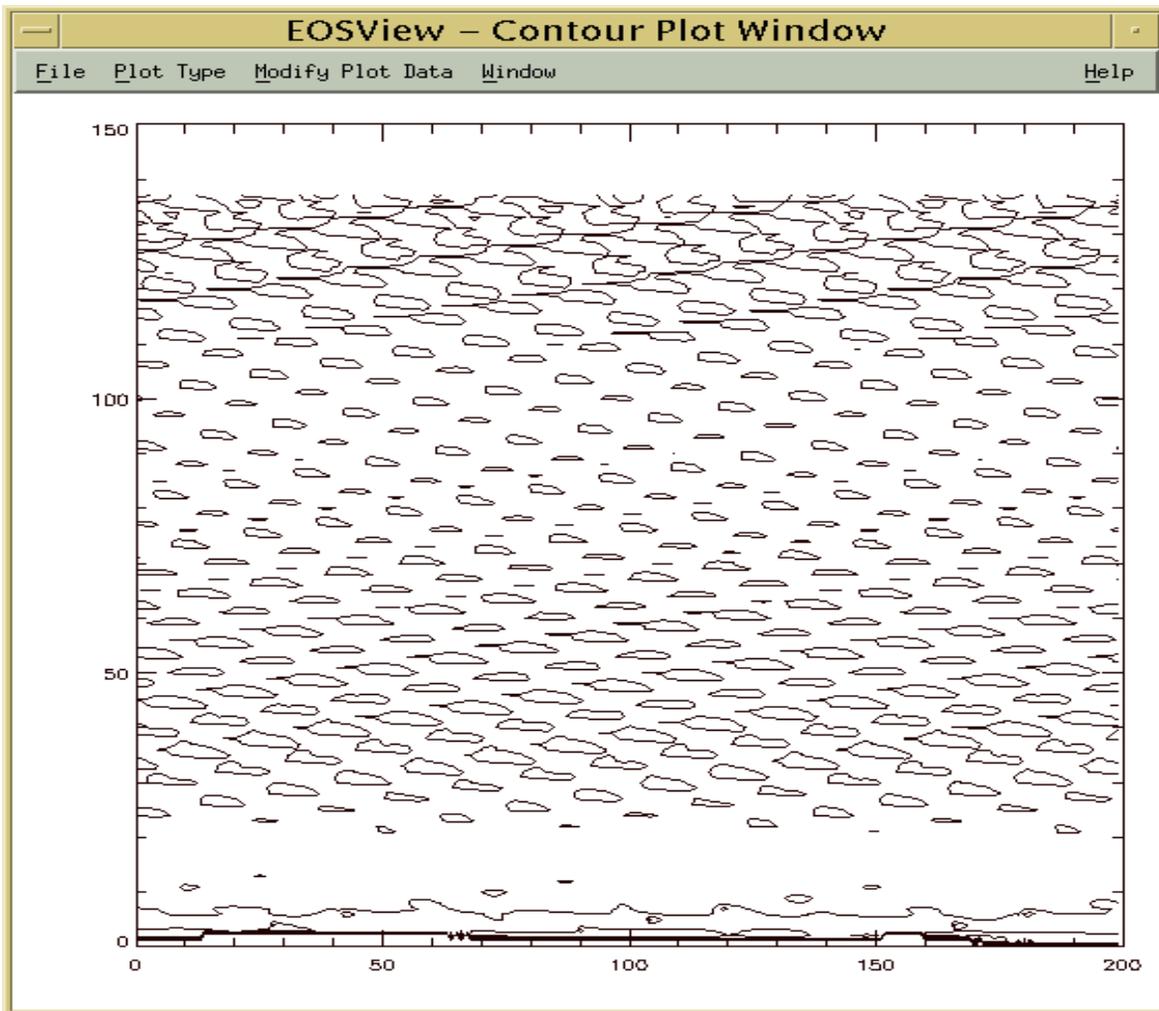
Selecting the **Table** button from the Multi-Dimension SDS window brings up a table window as shown in Figure 5-6. The table window will display a 1 or 2 dimensional list of the data as either a Scientific Data Group or Vdata. The window is sizable and contains horizontal and vertical scrollbars.

The **File** pulldown menu contains the following items, as shown in figure 5-6:

- **Make Image** - This will create a pseudo-color image of the selected table. Selecting this option causes the Min/Max Values Pop-up to appear (figure 5-14).
- **Plot** - if the table has been created from an SDS the operator has the option of converting the table to a surface or contour plot as shown in figure 5-7.
- **Attributes** - This displays text attributes assigned to this table. Selecting this option will cause the Attributes Text Display Pop-up to appear as shown in figure 5-34.
- **Statistics** - EOSView has basic statistical capabilities for table data. An SDS table will have the minimum, maximum and average for the entire table displayed in the EOSView - Stats window (see figure 5-11). For a table created from Vdata data the same stats will be calculated for each column of data (field of Vdata). The EOSView stats window displays the name, min, max, and average values of a table. The name corresponds to the name of the SDS or Vdata field name. The data is not editable and non-selectable. Hitting the “Ok” button will close the EOSView Stats Window.
- **Jump To** – This option allows the operator to jump to a specific row in a table. Selecting this option causes the Jump To Dialog to appear (figure 5-12). The user may enter the desired row number. Once the OK button is pressed the desired row number will appear in the first row of the table. See section 5.2.7 for a description of the Jump To... option.
- **Save** - This option allows the operator to save the table in either ASCII or binary format. Once the operator has selected ASCII or binary from the cascading menu the EOSView File Save Dialog is displayed (see figure 5-13). This window is similar to the EOSView File Open Dialog. EOSView will only save tables to a new file, therefore, a unique file name must be entered in the “Save as:” text field.
- **Close Window** - Closes the table window.

	0	1
	23437	23455
	23434	23451
	23431	23448
	23427	23445
	23424	23441
	23421	23438
	23417	23435
	23414	23431
8	23411	23428
9	23407	23425
10	23421	23439
11	23418	23435
12	23415	23432
13	23411	23429
14	23408	23425
15	23405	23422
16	23401	23419
17	23398	23415
18	23394	23412
19	23391	23408
20	23405	23423
21	23402	23419
22	23400	23417

**Figure 5-6. EOSView “sol\_azimuth” Table Pop-up**



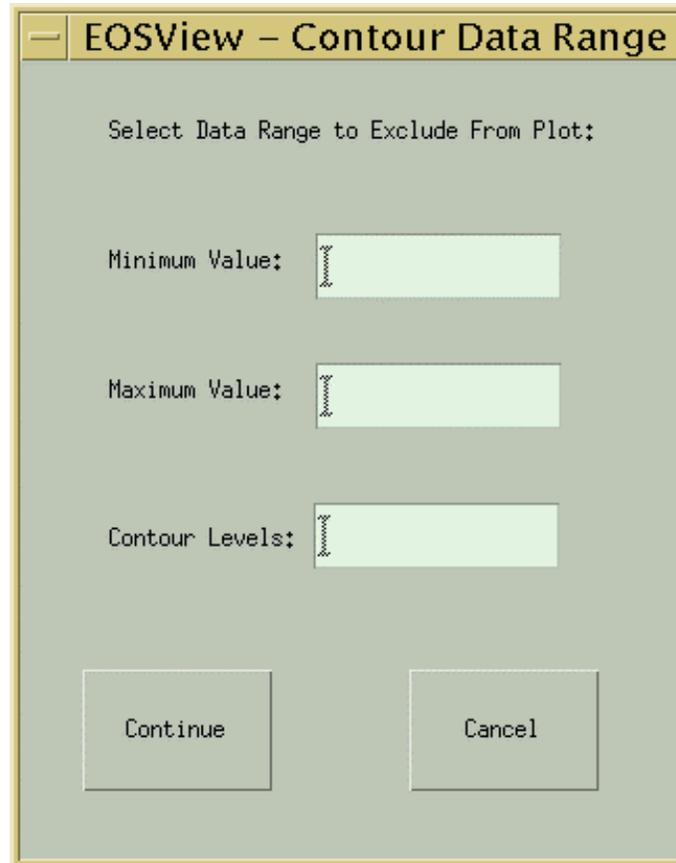
**Figure 5-7. EOSView Contour Plot Pop-up**

### 5.2.6 Surface/Contour Plot

The EOSView Contour/Surface Display will display a surface or contour plot of the selected Numeric Data Group. The window contains a menubar and can be resized.

- The **F**ile menubar option contains only one option. Selecting **C**lose will close the surface/contour plot window.
- The **P**lot **T**ype menubar options acts as a toggle between the surface and contour plots. If the current plot being displayed is a contour plot then the option listed will be **S**urface **P**lot. If the current plot being displayed is a surface plot then the option listed will be **C**ontour **P**lot. Selecting this option will cause a new window to appear with the selected plot.

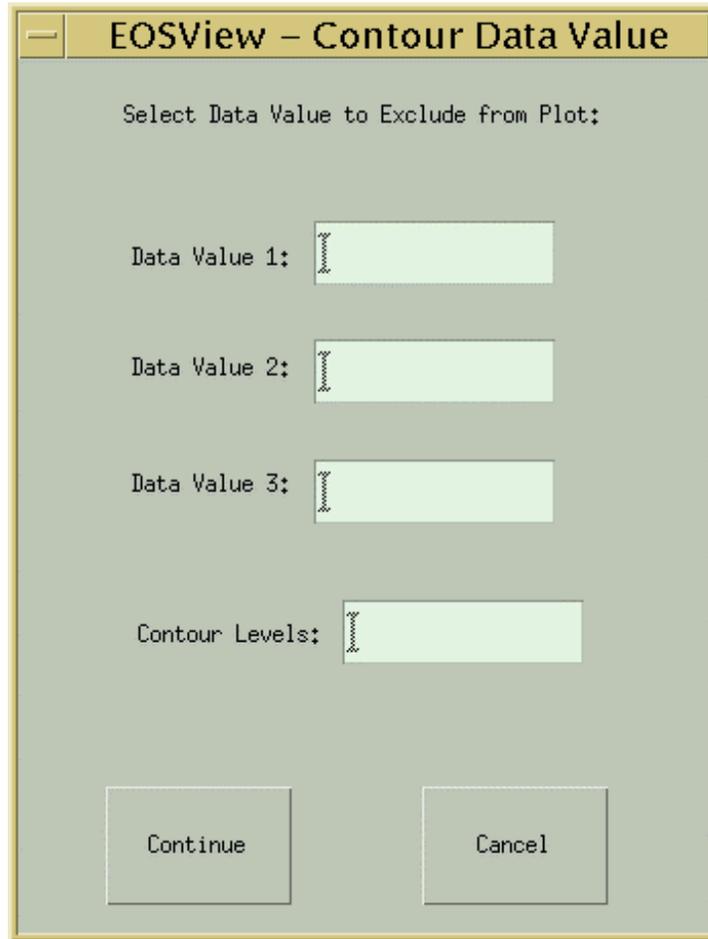
- The **Modify Plot Data** menubar option allows the user to modify the plots based on three criteria. The user may modify a plot by excluding a range of data, excluding up to three individual values, or plotting between a minimum and maximum value.
- The **Window** option lists in a pull-down menu all windows which are currently open. See Section 5.2.23 “Window Pulldown Menu.”



**Figure 5-8. Contour/Surface Data Range Pop-up**

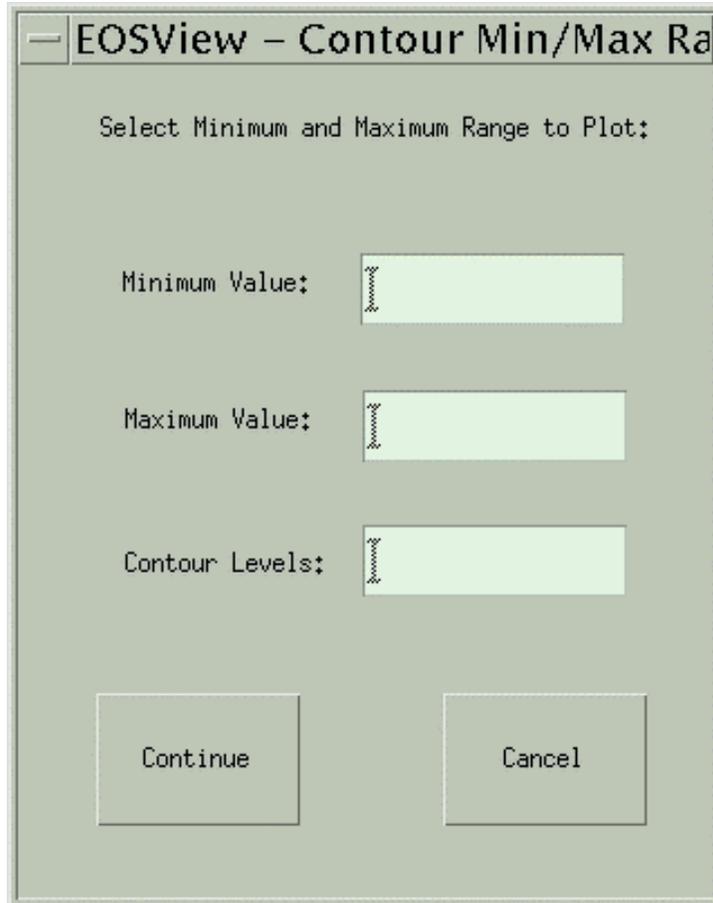
The option **Data Range to Exclude** listed under the **Modify Plot Data** menubar option will cause the Contour/Surface Data Range window to appear (figure 5-8). The user can select a range of data to exclude from the plot by entering the minimum value to exclude in the Minimum Value text field and the maximum value to exclude in the Maximum Value text field. The user can select the number of contour levels desired by entering the number in the Contour Levels text field. Entering data in the Contour Levels text field is optional. The Contour Levels text fields will only appear in the Data Range Pop-up if the plot was a contour plot. Pressing the **Continue**

button will cause a new plot to be drawn without the data range entered. Pressing the **Cancel** button closes the window with no further action.



**Figure 5-9. Contour/Surface Data Value Pop-up**

The option **Data Value** listed under the **Modify Plot Data** menubar option will cause the Contour/Surface Data Value window to appear (figure 5-9). The user can enter up to three values that will not be plotted. The first value should be entered in the Data Value 1 text field, the second value should be entered in the Data Value 2 text field, and the third value should be entered in the Data Value 3 text field. The user can select the number of contour levels desired by entering the number in the Contour Levels text field. Entering data in the Contour Levels text field is optional. The Contour Levels text fields will only appear in the Data Range Pop-up if the plot was a contour plot. Pressing the **Continue** button will cause a new plot to be drawn without the selected data values. Pressing the **Cancel** button closes the window with no further action.



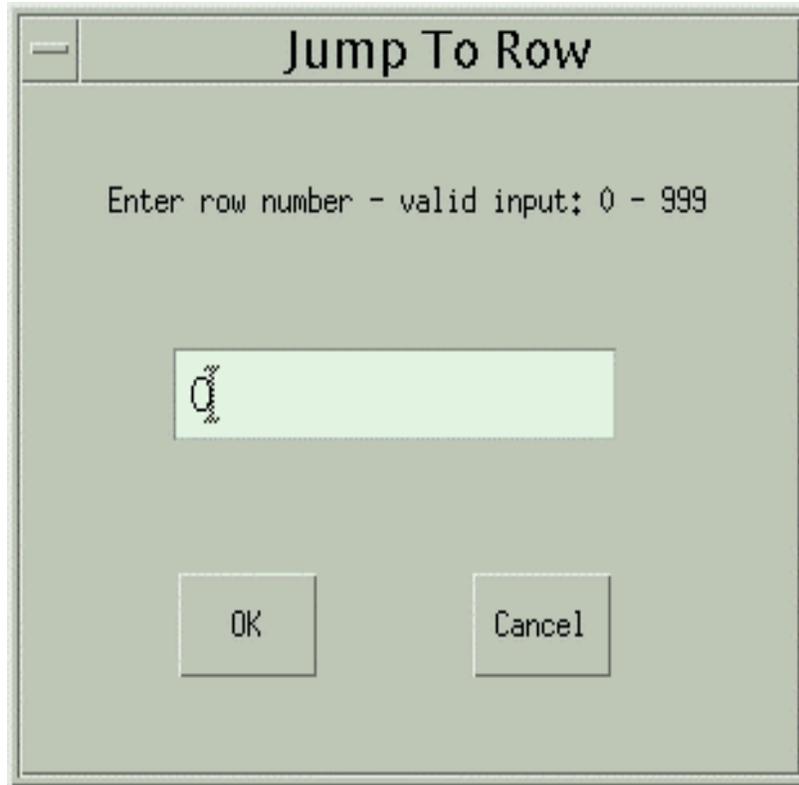
**Figure 5-10. Contour/Surface Min/Max Range Pop-up**

The option **Min - Max Range** listed under the **Modify Plot Data** menubar option will cause the Contour/Surface Min/Max Range window to appear (figure 5-10). The user can enter a range of values that is desired to be plotted. All values less than the minimum value and greater than the maximum value will not be plotted. The minimum value to be plotted may be entered in the Minimum Value text field. The maximum value to be plotted may be entered in the Maximum Value text field. The user can select the number of contour levels desired by entering the number in the Contour Levels text field. Entering data in the Contour Levels text field is optional. The Contour Levels text fields will only appear in the Data Range Pop-up if the plot was a contour plot. Pressing the **Continue** button will cause a new plot to be drawn using the data range entered. Pressing the **Cancel** button closes the window with no further action.



**Figure 5-11. EOSView Stats Pop-up**

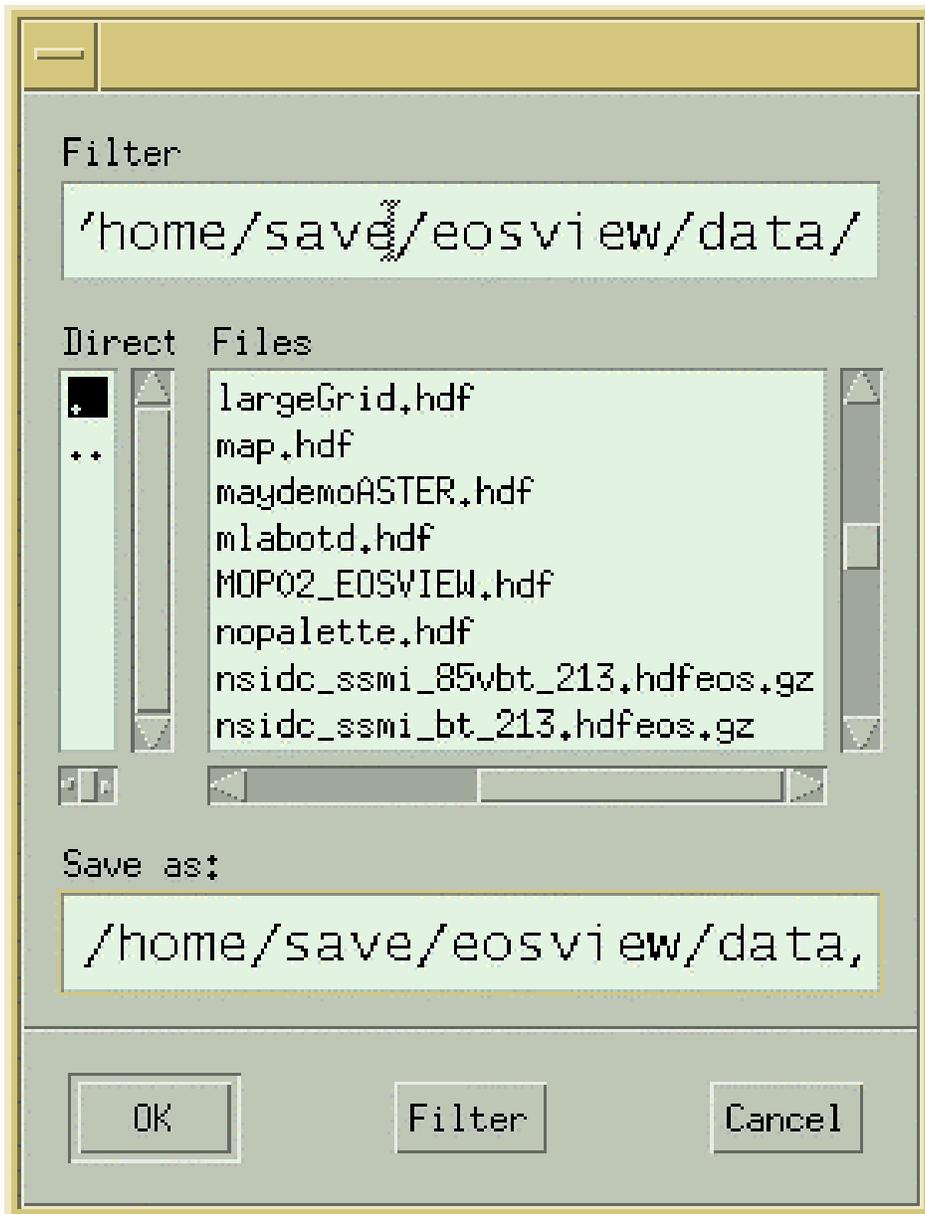
The EOSView Statistics Pop-up window will list the minimum value, maximum value and average value in a table. For a table created from an SDS the values will be taken from the entire table. For a table from a Vdata the values will be from each column. No statistics will be calculated for character data. To close this window press the **OK** button.



**Figure 5-12. Jump To Dialog**

### **5.2.7 Jump To Dialog**

The user may jump to a specific row number in a table by selecting the **Jump To...** option. Selecting this option will cause the Jump To Dialog (Figure 5-12) to appear. This dialog will accept integer input in the range listed in the text field preceded with “Enter row number...” Pressing the “OK” button will cause the table to jump to the selected row number. Pressing the “Cancel” button will close the Jump To Dialog with no action being taken on the table.



**Figure 5-13. File Save Dialog**

### 5.2.8 File Save Dialog

The user may save a table in EOSView in one of two ways. The table may be saved in either an ASCII format or it may be saved as a binary file. Selecting the save option will cause the File Save Dialog to appear. The user may then enter the name of the file that is desired to save the table into. EOSView will only save the table to a new file. The EOSView table save mechanism saves to the HDF ASCII Interchange Format (HAIF).

Table 5-4 describes the File Save fields.

**Table 5-4. EOSView File Save Field Description**

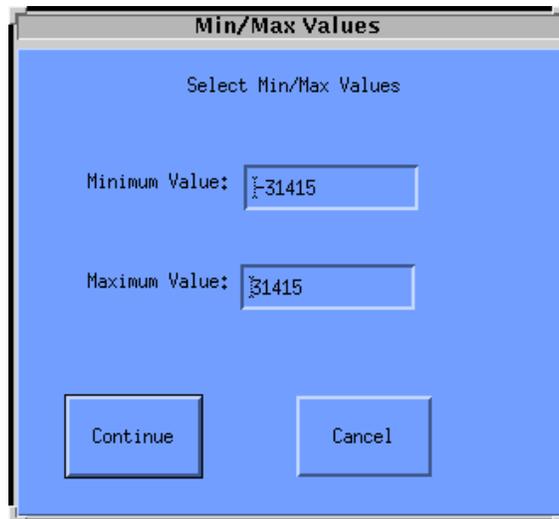
Field Name	Data Type	Size	Entry	Description
Filter	system generated (editable)	unlimited	required	displays file selection parameters to filter the directories
Directories	selection	unlimited	required	displays a list of directories
Files	selection	unlimited	required	displays a list of files
Save As	system generated (editable)	unlimited	required	displays the filename selection - user may enter to new filename in this field

In addition, the following pushbuttons are provided:

- **OK** – saves to the specified file
- **Filter** – filters through the directories in layers until the desired directory is displayed
- **Cancel** – closes the file save dialog

### 5.2.9 Make Image From Table Data

A pseudo-color image can be built from the data displayed in the Table. The image can be created by selecting **File - Make Image** from the menu bar of the EOSView - Table Pop-up. Selecting this option causes the Min/Max Values window to appear as shown in Figure 5-14. Table 5-5 describes the fields of the Min/Max Values Pop-up.

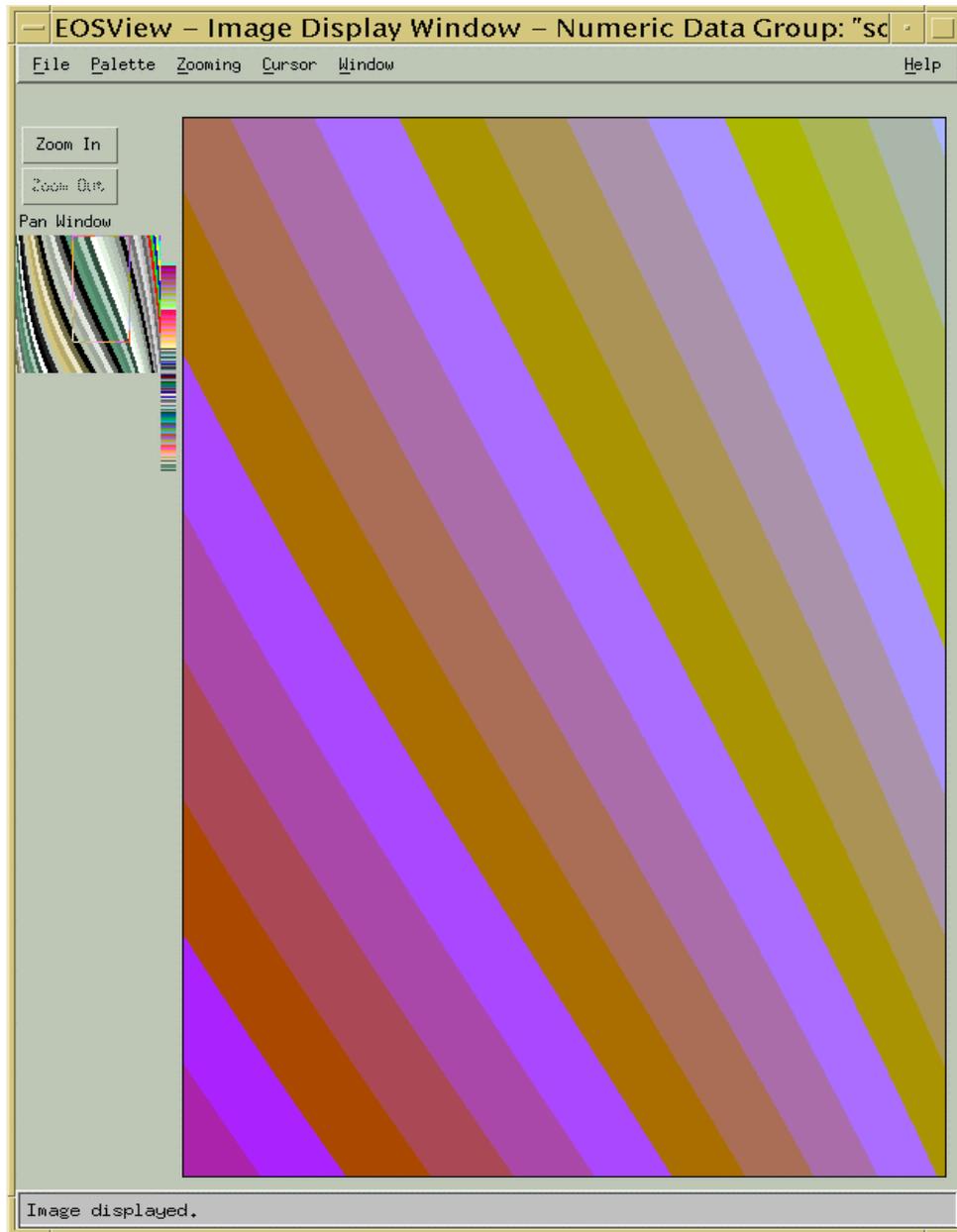


**Figure 5-14. Min/Max Values Pop-up**

**Table 5-5. Min/Max Values Window Field Description**

<b>Field Name</b>	<b>Data Type</b>	<b>Size</b>	<b>Entry</b>	<b>Description</b>
Minimum Value	integer or float (depending upon original data values)	N/A	required	Min value used for the image (field size is limited by the values that first appear when the window opens)
Maximum Value	Integer or float (depending upon original data values)	N/A	required	Max value used for the image (field size is limited by the values that first appear when the window opens)

From the Min/Max Values Window, the operator has the opportunity to enter the minimum and maximum values used for the image. Pressing the **Continue** button will cause the EOSView - Image Display Pop-up to appear (shown in Figure 5-15). The operator may cancel all actions by pressing the **Cancel** button.



**Figure 5-15. “sol\_azimuth” Image Display Pop-up**

### **5.2.10 Image Display**

The Image Display pop-up has the following pulldown menu options: File, Palette, Zooming, Cursor, Window, and Help.

- Inside the **File**, the Overlay option is active only if the image has been created from a grid table. The Overlay option allows the operator to have lat/lon lines drawn over the image or the operator may have an icon displayed at a point on the grid image. See section 5.2.11 which describes the EOSView lat/lon window for symbols and cursor positioning. Selecting the Close option exits the Image Display Window.
- The **Palette** pulldown menu allows the operator to select colors from the following types of palettes for comparison: Default, Greyscale, Antarctica, Rainbow, and World Colors. The first palette option is "Default" which is the palette provided within the HDF file of the image being displayed; if no palette was provided, the default color map is used. The second palette option is "Greyscale" which will be a black and white version of the image being displayed. The next three options are "Antarctica", "Rainbow" and "World Colors." These three palettes are provided as part of EOSView. Selecting one of these three palettes will cause the current image to use that palette. The "Use Entire Palette" option is not functional.
- The **Zooming** pulldown menu allows the operator to select from two zoom methods: Bilinear Interpolation and Nearest Neighbor. Bilinear Interpolation uses interpolation to calculate the probable color during an expansion/compression event; it gives a much smoother image during zooming. The second is Nearest Neighbor which uses sub-sampling or super sampling to determine probable color, e.g., two red pixels are now four red pixels during expansion.
- The **Cursor** pulldown menu allows the operator to set the cursor at a specified position. The first is "X-Y Position". The Operator will be prompted for an X-Y location and the cursor will be positioned at that location. In EOSView, position 0,0 is the lower left corner (see section 5.2.12, which describes the EOSView - x-y cursor window). If the image has been created from a grid table, the operator may enter a lat/lon position and the cursor will be positioned to that location. See section 5.2.11 which describes the "EOSView - lat/lon window (used for symbols and cursor positioning). If the image has been created from a swath table the operator may position the cursor at the selected scan line. The cursor will be placed at the beginning of the scanline. See section 5.2.13 which describes the EOSView Scanline Cursor Window.
- The **Window** option lists in a pull-down menu all windows which are currently open. See Section 5.2.23 "Window Pulldown Menu."
- **Help** – see Section 5.2.25 "Help Pulldown Menu."

The Image Display also has the following pushbuttons: Zoom In and Zoom Out. It also has a panning feature as described below.

- **Zoom In** and **Zoom Out** pushbuttons -- pressing the Zoom In button will cause the image to be zoomed in and re-drawn in the image window. Pressing the Zoom Out button will cause the image to be zoomed out until it returns to original size. The zoom factor

will be displayed in the bottom left corner of the EOSView - Image Display Window on the status bar.

- **Pan Window** -- If the operator has zoomed in on an image, the operator may pan around the image by holding down the left mouse button while the cursor is in the postage stamp size image and moving it around. The cursor will be outlined by a box which indicates the portion of the image being displayed in the full size image window.

The Image Display Pop-up also has cursor tracking capabilities. Placing the cursor on the image and holding the left mouse button will cause the cursor position (in x-y coordinates) to be displayed on the right side of the status bar. If the image has been created from a grid table the cursor position will be displayed in lat/lon coordinates on the right side of the status bar.

### 5.2.11 Lat/Lon Symbol Pop-up

The EOSView Lat/Lon Symbol/Cursor pop-up (figure 5-16) allows the operator to enter the desired coordinate pair in one of two ways. Degrees-minutes-seconds (DMS radio button) allows the operator to type in the degrees (Deg), minutes (Min), and seconds (Sec) for the latitude and the longitude. The second method is by entering degrees (DEG radio button) in the degrees text fields. In either case the operator may switch between North (N), South (S), and East(E), West (W) by using the list buttons to the right of the text entry fields. For both entry methods, hitting the “Ok” button will cause the cursor to be positioned or a symbol drawn at the desired location. Hitting the “Cancel” button will cancel the operation.

**Lat/Lon Symbol Window**

Enter Latitude/Longitude for symbol position:

Method

DMS

DEG

	Deg	Min	Sec		
Lat:	<input type="text"/>	<input type="text"/>	<input type="text"/>	N	<input type="button" value="▼"/>
Lon:	<input type="text"/>	<input type="text"/>	<input type="text"/>	E	<input type="button" value="▼"/>

Degrees

Lat:	<input type="text"/>	N	<input type="button" value="▼"/>
Lon:	<input type="text"/>	E	<input type="button" value="▼"/>

**Figure 5-16. Lat/Lon Symbol Pop-up**

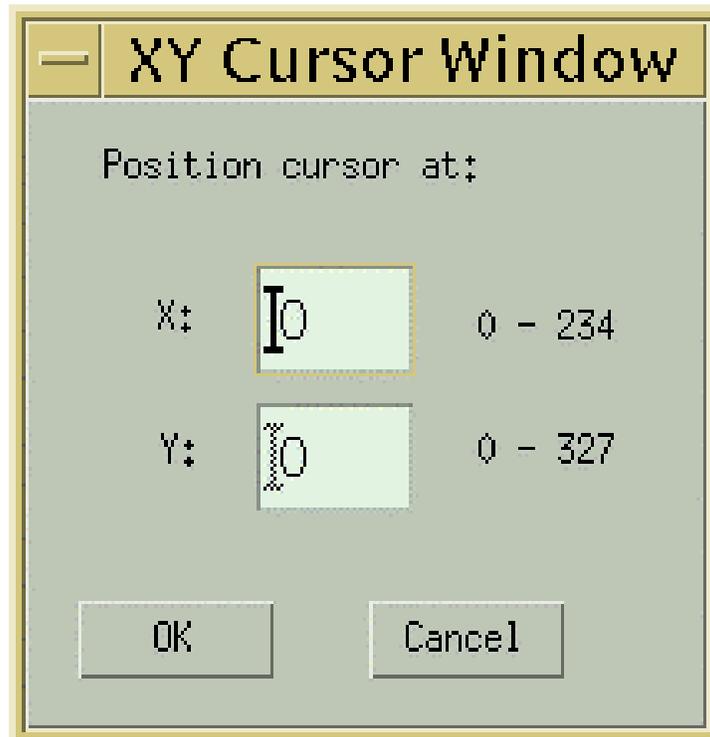
Table 5-6 describes the parameters in the Lat/Lon Symbol Window.

**Table 5-6. Lat/Lon Symbol Window Field Description**

Field Name	Data Type	Size	Entry	Description
Lat (DMS)	float	N/A	required	Latitude (if DEG is selected)
Lon (DMS)	float	N/A	required	Longitude (if DEG is selected)
Lat/Lon (Deg)	float	N/A	required	Degrees of Latitude/Longitude (if DMS is selected)
Lat/Lon(Min)	float	N/A	required	Minutes of Latitude/Longitude (if DMS is selected)
Lat/Lon(Sec)	float	N/A	required	Seconds of Latitude/Longitude (if DMS is selected)

### 5.2.12 X-Y Cursor Window

The operator may enter the X-Y coordinates to have the cursor positioned by using the EOSView X-Y Cursor Pop-up (figure 5-17). The operator may enter the desired X-Y location in the corresponding X-Y text field. The X-Y limits are placed to the right of the text fields. Hitting the “Ok” button will cause the cursor to be placed at the desired location in the image. Hitting the “Cancel” button will cancel the operation.



**Figure 5-17. X-Y Cursor Pop-up**

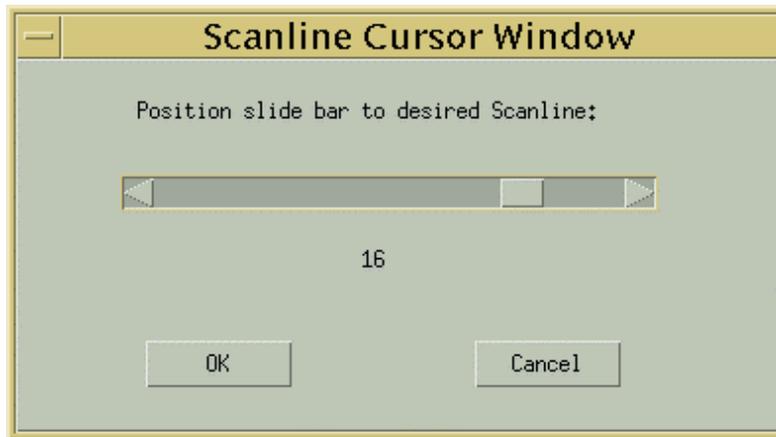
Table 5-7 describes the parameters in the X-Y Cursor Pop-up.

**Table 5-7. X-Y Cursor Window Field Description**

Field Name	Data Type	Size	Entry	Description
X:	integer	N/A	required	X horizontal coordinate (max accepted value is listed to the right of the text field)
Y:	integer	N/A	required	Y vertical coordinate (max accepted value is listed to the right of the text field)

### 5.2.13 ScanLine Cursor Window

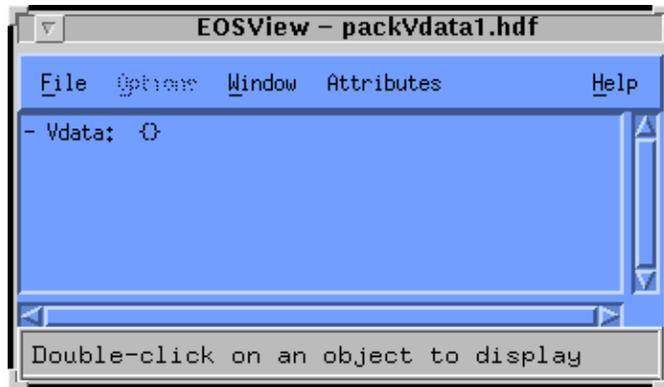
If the image was created from a Swath table the operator may position the cursor to the beginning of the scanline by using the EOSView - ScanLine Cursor Pop-up (figure 5-18). Moving the slider left and right will cause the scanline value below the slider to decrease and increase, respectively. Once the desired scanline is achieved, hitting the “Ok” button will cause the cursor to be placed at the beginning of the scanline. Hitting the “Cancel” button will cancel the operation.



**Figure 5-18. Scanline Cursor Pop-up**

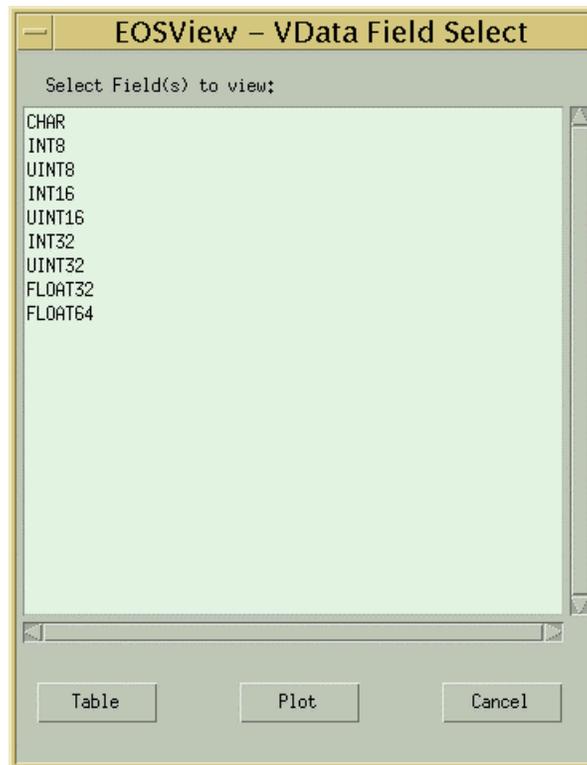
### 5.2.14 Vdata

In this example, the packVdata1.hdf file was selected from the File Selection dialog, bringing up the Vdata File Contents Pop-up (see Figure 5-19).



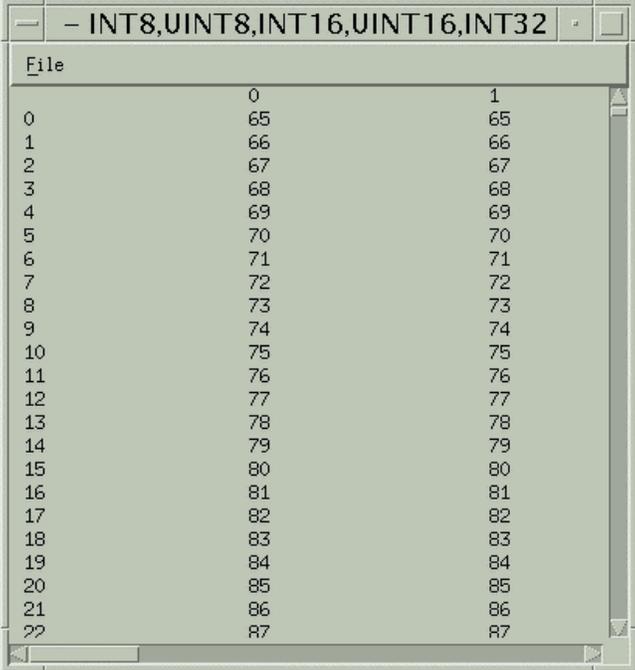
**Figure 5-19. File Contents Pop-up Containing Vdata**

Double-clicking on the Vdata entry brings up the “EOSView - VData Field Select” pop-up (shown in figure 5-20). This window lists all the field names in the selected Vdata. The operator may select one or more fields for display. If the fields contain multiple values for a field then that field will appear in its own table.



**Figure 5-20. EOSView - Vdata Field Select Pop-up**

**Table** button - Once the operator has selected the fields desired, pressing the table button will cause the Vdata to appear in a table.



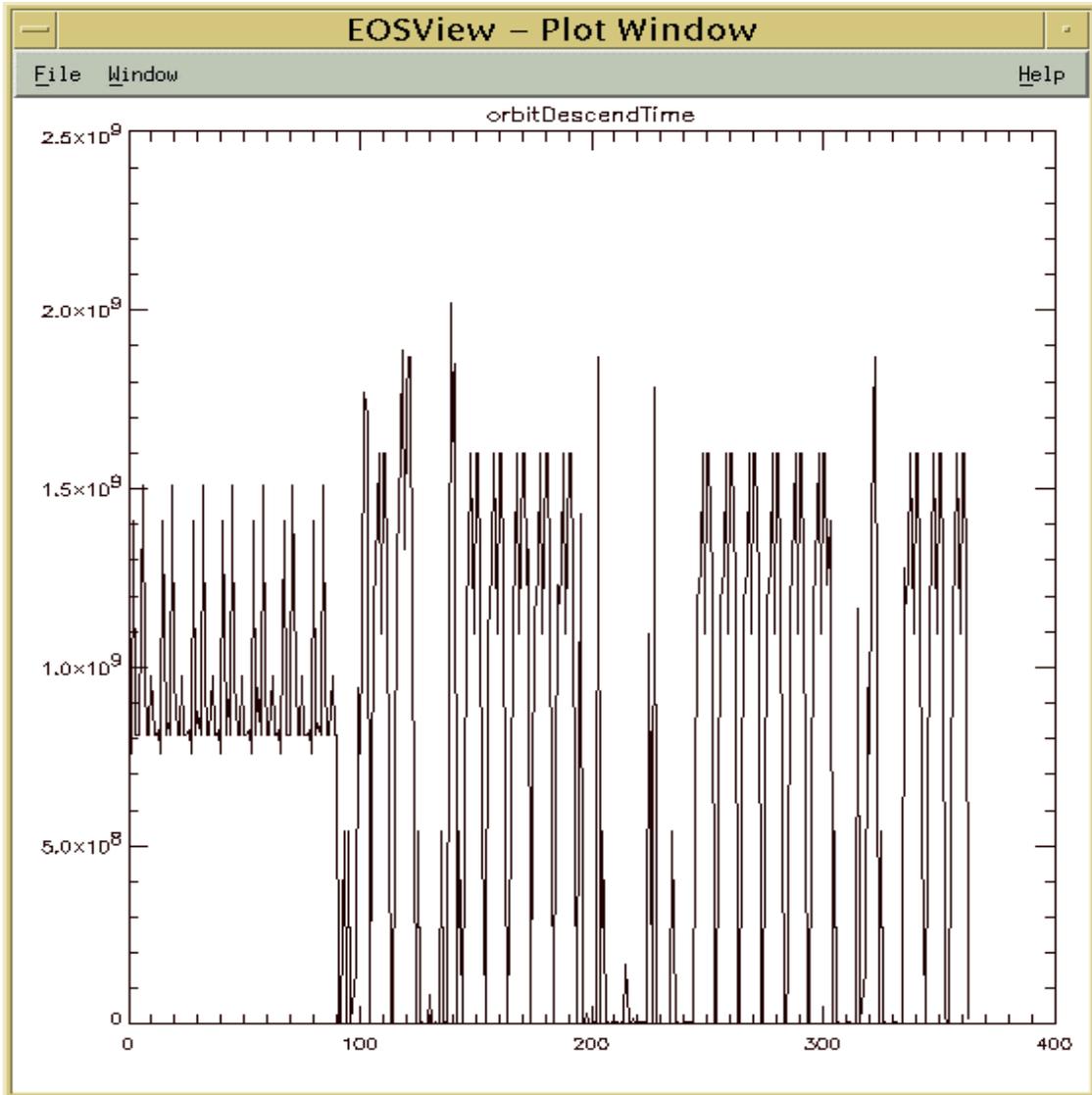
The screenshot shows a software window with a title bar containing the text "- INT8,UINT8,INT16,UINT16,INT32". Below the title bar is a menu bar with the word "File". The main area of the window displays a table with three columns and 23 rows. The first column contains integers from 0 to 22. The second and third columns contain corresponding integers from 65 to 87. The table is displayed in a monospaced font.

	0	1
0	65	65
1	66	66
2	67	67
3	68	68
4	69	69
5	70	70
6	71	71
7	72	72
8	73	73
9	74	74
10	75	75
11	76	76
12	77	77
13	78	78
14	79	79
15	80	80
16	81	81
17	82	82
18	83	83
19	84	84
20	85	85
21	86	86
22	87	87

**Figure 5-21. Table containing Vdata field Pop-up**

**Plot** button - The operator may select one or two non-character data fields and have the data plotted by pressing the plot button (see figure 5-22).

**Cancel** button - Cancels all actions



**Figure 5-22. Plot Pop-up**

The Plot Pop-up created from the Vdata Field Select window contains the following menu options:

- The **File** options allows the user to close the window by selecting **Close**.
- The **Window** option lists in a pull-down menu all windows which are currently open. See Section 5.2.23 “Window Pulldown Menu.”

### 5.2.15 VGroup

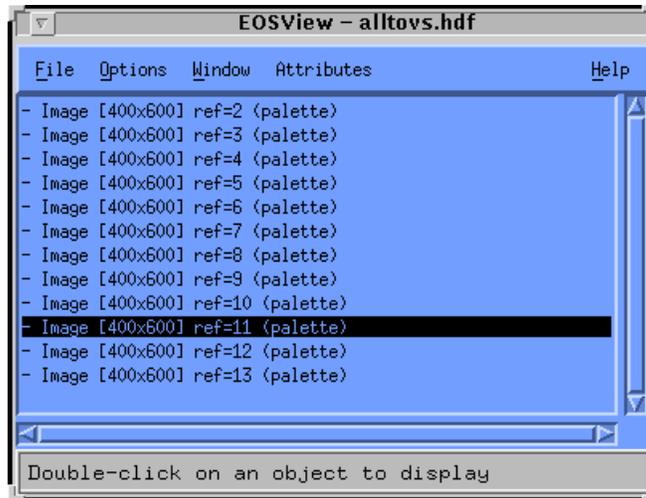
If the object in the File Contents Display Window is a **Vgroup**, the contents of the VGroup will be added to the list and the list will be re-drawn in the list box. Clicking on a VGroup that has already had the contents expanded will cause the contents of the VGroup to disappear and the list will be re-drawn in the list box. Figure 5-23 shows several expanded and unexpanded Vgroup categories.



**Figure 5-23. File Contents Pop-up containing Vgroups**

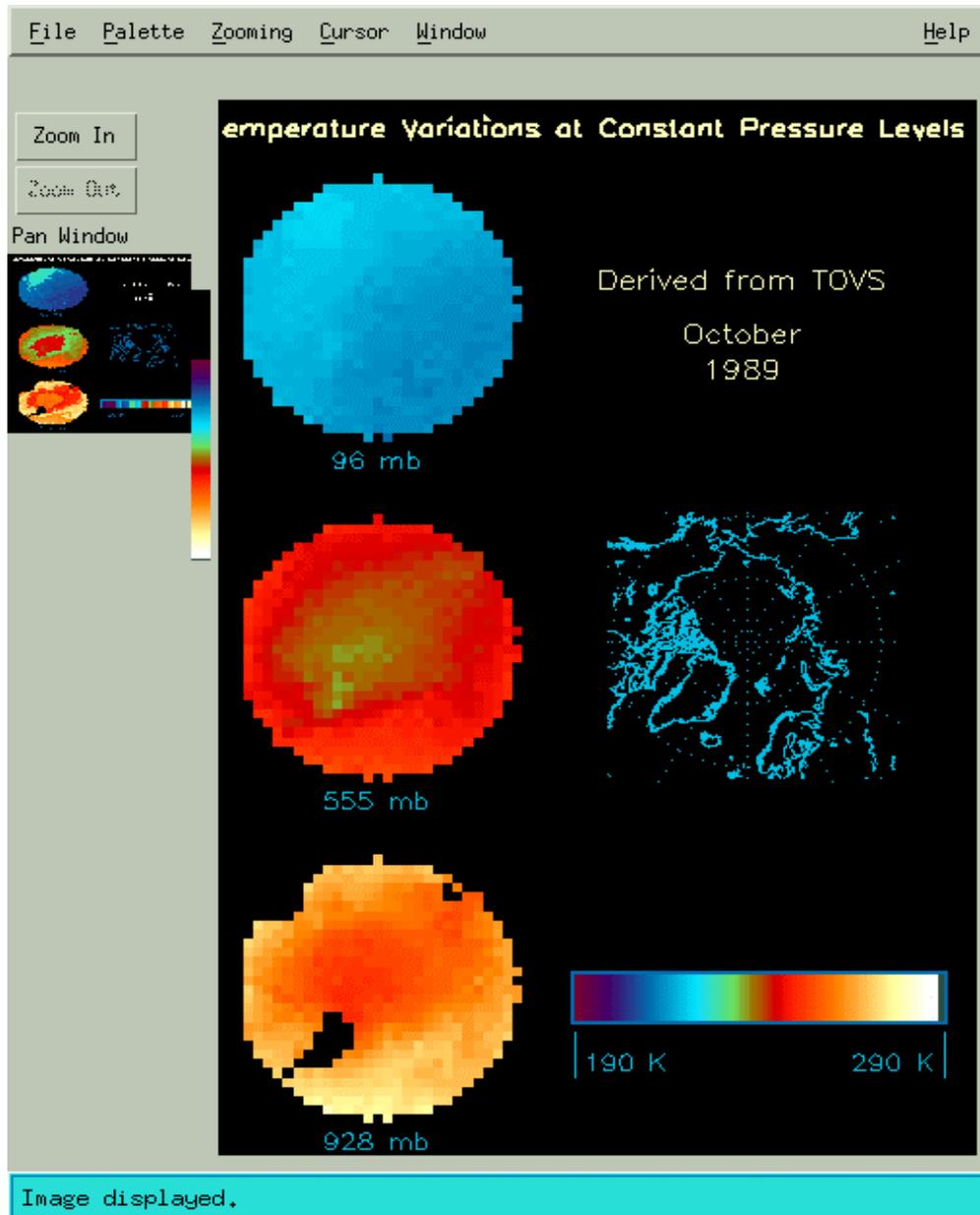
### 5.2.16 Raster Image

In this example, the alltovs.hdf file was selected from the File Selection dialog, bringing up the File Contents Display Window shown in Figure 5-24.



**Figure 5-24. File Contents Pop-up containing Raster Images**

Clicking on a Raster Image Group will cause the image to be drawn in an EOSView - Image Display Pop-up (see Figure 5-25).

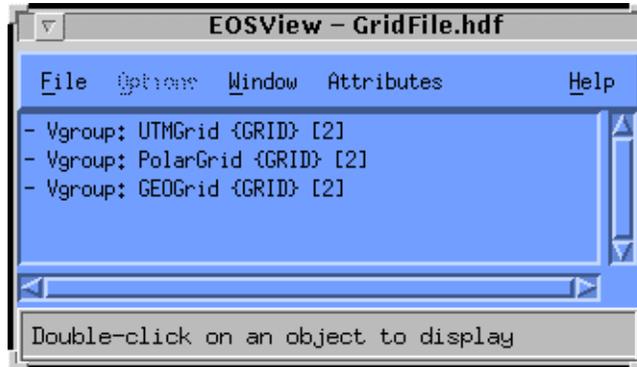


**Figure 5-25. Raster Image Pop-up**

A Raster image is different than the pseudo-color image shown in Section 5.2.9 since this image is not drawn from data. It is simply a visual depiction of an object. The menus and pushbuttons for this window are the same as those described for the pseudo-color display. See section 5.2.10 for a description of the Image Display Window.

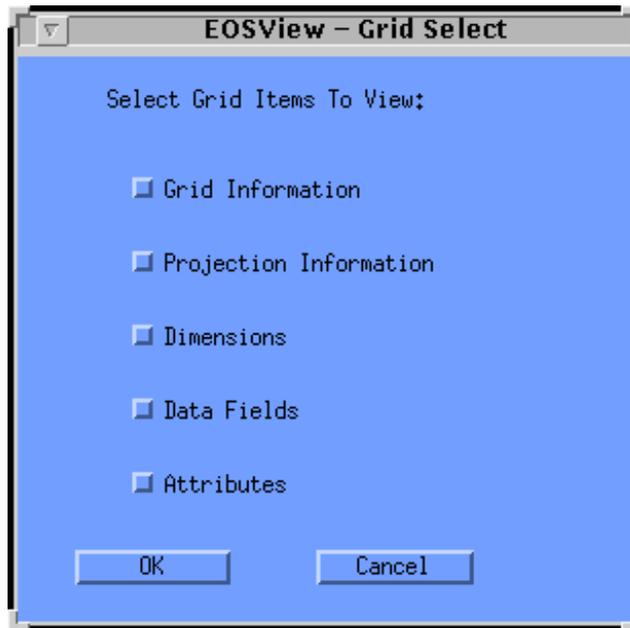
### 5.2.17 EOSView Grid Select GUI

In this example, the GridFile.hdf was selected from the File Selection dialog, bringing up the GridFile.hdf File Contents Display shown in Figure 5-26.



**Figure 5-26. Grid File Contents Display Pop-up**

Double-clicking on a selection (in this case, the object *Vgroup: UTMGrid {GRID} [2]* was selected) brings up the Grid Select Pop-up shown in Figure 5-27.

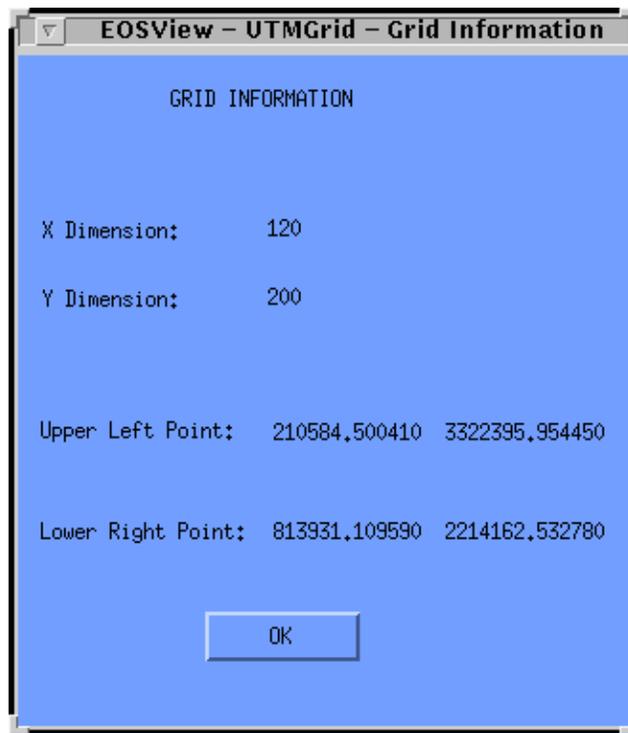


**Figure 5-27. Grid Select Pop-up**

All of the following options are available for selection: Grid Information, Projection Information, Dimensions, Data Fields, and Attributes. Selecting **OK** will bring up windows for all the items selected. Clicking on **Cancel** will return the operator to File Contents Window. Assuming that all the items have been selected, the following windows will appear:

### Grid Information Dialog

To view a summary of a selected Grid object, click on the Grid Information checkbox. The Grid Information dialog pop-up (shown in Figure 5-28) displays information about the selected grid such as X-Dimension value, Y-Dimension value, Upper Left Point values, and Lower Right Point values.



**Figure 5-28. Grid Information Dialog Pop-up**

This window can be closed by pressing the **OK** button.

## Projection Information

To view the Projection Information of the selected Grid object, click on the Projection Information checkbox in the EOSView - Grid Select window and press the **OK** button. This will cause the EOSView - Grid Projection Information pop-up shown in Figure 5-29 to appear.

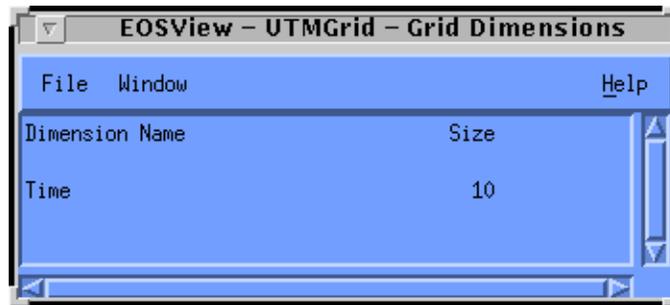


**Figure 5-29. Projection Information Pop-up**

The Projection Information pop-up displays information about the projection of the selected grid in a dialog box. The first item displayed is the Projection itself. If the projection is Universal Transverse Mercator, the next item is displayed in the Zone Code. For any other projection the next items displayed are the thirteen (13) Projection Parameters. This window can be closed by pressing the **OK** button.

### Dimensions

To view the dimensions of the selected Grid object, click on the Dimensions checkbox in the EOSView - Grid Select pop-up and press the **OK** button. This will cause the EOSView - Grid Dimensions window (shown in Figure 5-30) to appear.

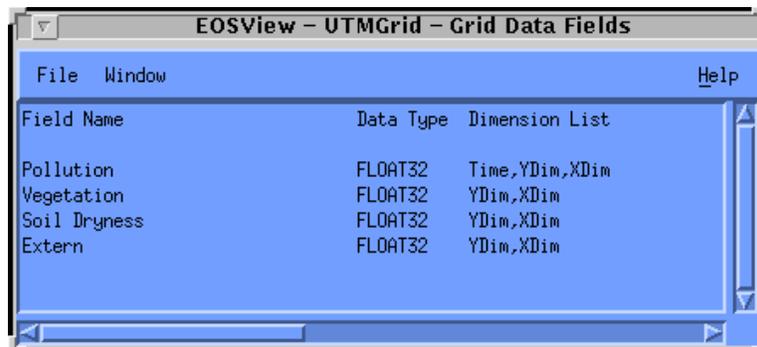


**Figure 5-30. Grid Dimensions Pop-up**

This window lists Dimension Names and Sizes for the selected Grid in table form in a scrollable window. The items listed are non-selectable and are for display/verification purposes only. See section 5.2.26 for a description of saving the contents of the window to an ASCII file.

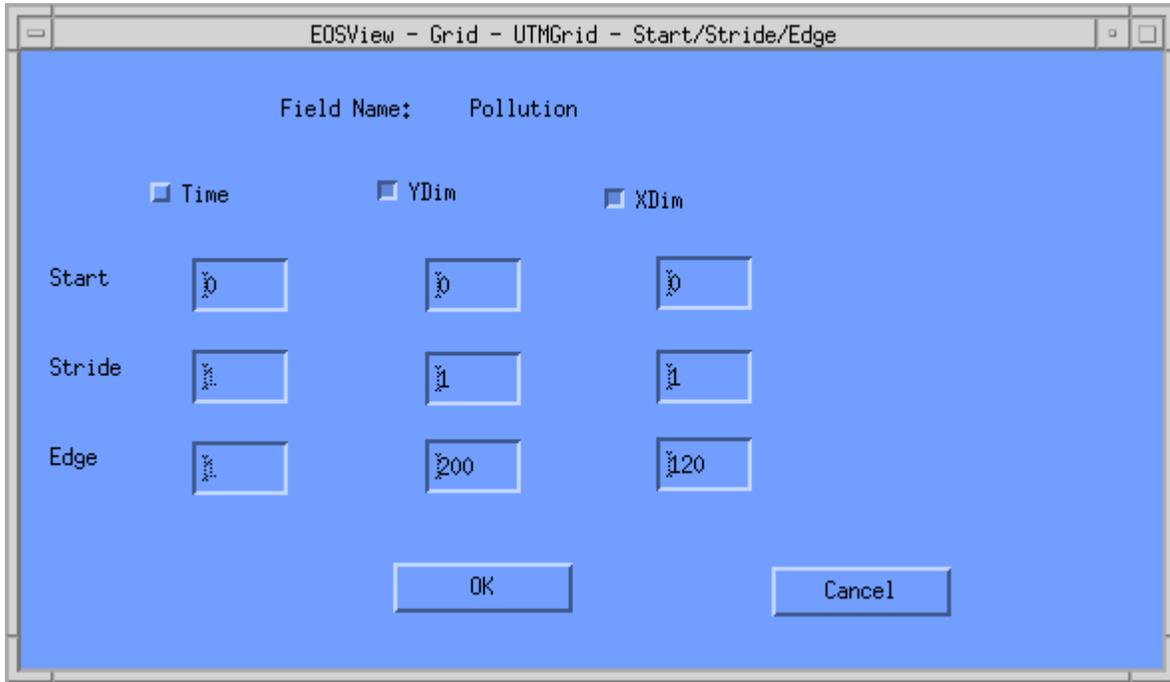
### Data Fields

To view the Data Fields of the selected Grid object simply click on the Data Fields checkbox in the EOSView - Grid Select pop-up and press the **OK** button. This will cause the EOSView - Grid Data Fields window (shown in Figure 5-31) to appear. See section 5.2.26 for a description of saving the contents of the window to an ASCII file.



**Figure 5-31. Grid Data Fields Pop-up**

To view a slice of the Grid Geolocation/Data Field data, move the pointer over the object and double click the left mouse button. This will cause the EOSView - Start/Stride/Edge pop-up (shown in Figure 5-32) to appear.



**Figure 5-32. Start/Stride/Edge Pop-up**

Table 5-8 describes the Start/Stride/Edge pop-up fields.

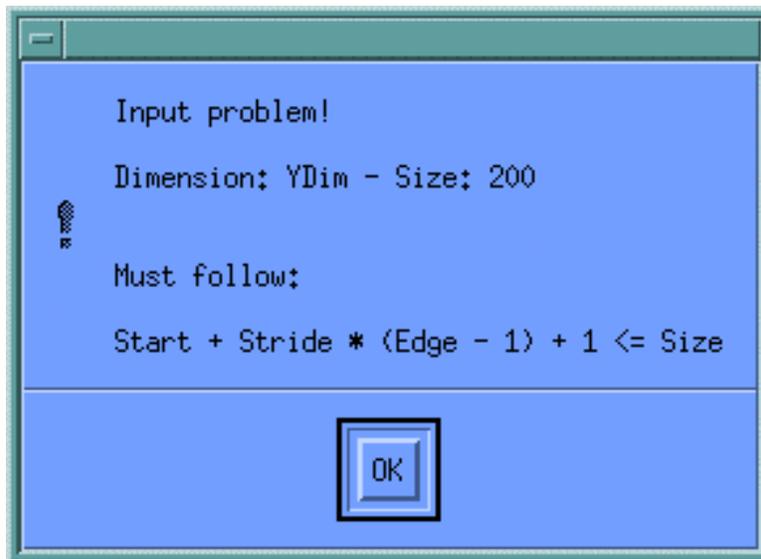
**Table 5-8. Start/Stride/Edge Pop-up Field Description**

Field Name	Data Type	Size	Entry	Description
Start	Integer	N/A	required	Start for grid geolocation/data field data
Stride	Integer	N/A	required	Stride for grid geolocation/data field data
Edge	Integer	N/A	required	Edge for grid geolocation/data field data

This pop-up displays the Start, Stride, and Edge values for each dimension (there may be up to eight). The start value for each dimension may be edited but the stride and edge values may only be edited for the selected dimensions. This is a way of subsampling the data desired. A dimension may be selected by clicking on the check box next to the dimension name. A maximum of two dimensions may be selected. Once the operator has entered the desired data the

**OK** button may be pressed and the selected dimension data will be displayed in the EOSView - Grid Table. For more information on a Table, building a pseudo-color image, and the Min/Max Values Pop-up, see Section 5.2.9. The operator may cancel all actions by pressing the **Cancel** button.

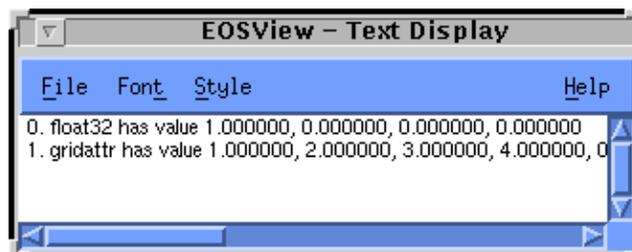
Note that if an input error occurs, a warning dialog (Figure 5-33) will appear, displaying the dimension name that is in error and a size total. The operator must meet the criteria in the formula displayed in the warning dialog. Click OK to return to the Start/Stride/Edge Window to re-enter the correct values.



**Figure 5-33. Warning Dialog**

### Attributes

Clicking on the Attributes checkbox in the EOSView Grid Select Pop-up brings up the Attributes Text Display shown in Figure 5-34.



**Figure 5-34. Attributes Text Display Pop-up**

This display shows the attributes associated with a particular dataset. The text display can be closed from the **F**ile pulldown menu, the text can be modified using the **F**ont and **S**tyle pulldown menus, and additional help can be obtained from the **H**elp pulldown menu (see Section 5.2.25 “Help Pulldown Menu.”)

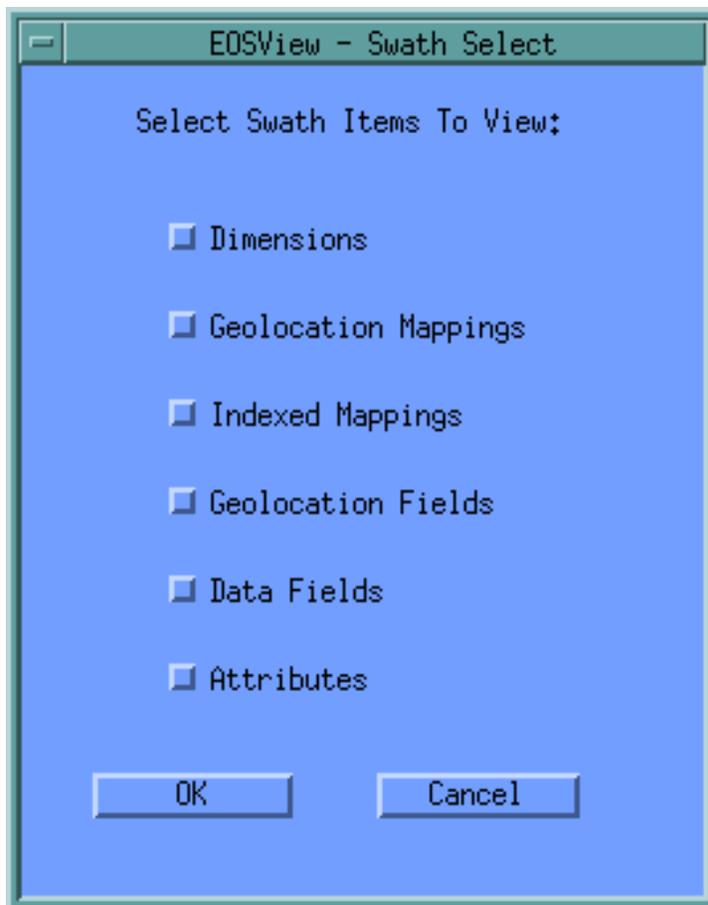
### 5.2.18 EOSView Swath Select

In this example, the SwathFile.hdf file was selected from the File Selection dialog, bringing up the File Contents Pop-up shown in Figure 5-35.



**Figure 5-35. SwathFile File Select Pop-up**

Double clicking on an item in the File Select window brings up the Swath Select Pop-up shown in Figure 5-36.



**Figure 5-36. Swath Selection Pop-up**

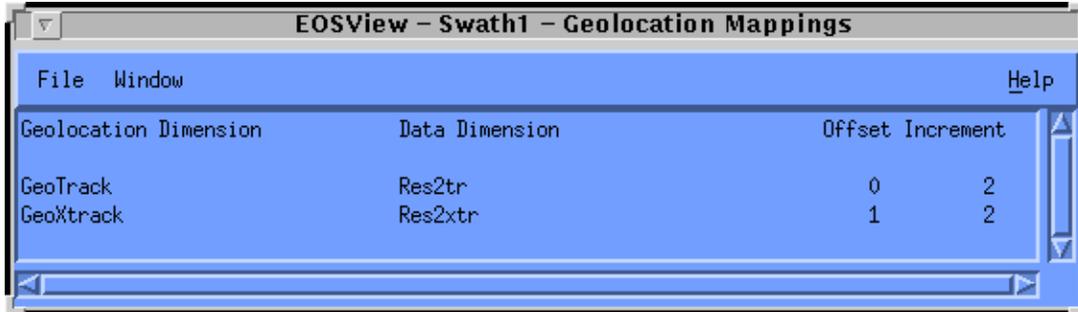
As many options as desired can be selected from the following list: Dimensions, Geolocation Mappings, Indexed Mappings, Geolocation Fields, Data Fields, and Attributes. Selecting OK will bring up windows for all the items selected. Clicking on Cancel will close the Swath Selection Pop-up with no action being taken. Assuming that all the items have been selected, the following windows will appear.

### **Dimensions**

To view the dimensions of the selected Swath object, click on the Dimensions checkbox in the EOSView - Swath Select pop-up and press the OK button. This will cause the EOSView - Swath Dimensions pop-up to appear. This window lists the Dimension Names and Sizes for the selected Swath in a table form in a scrollable window. The items listed are non-selectable and are for display/verification purposes only. This window is similar to the Grid file dimensions window described in Section 5.2.17 “EOSView Grid Select GUI” (see Dimensions).

## Geolocation Mappings

To view the Geolocation Mappings of the selected Swath object, click on the Geolocation Mappings checkbox in the EOSView - Swath Select pop-up and press the OK button. This will cause the EOSView - Swath Geolocation Mappings window (shown in Figure 5-37) to appear.



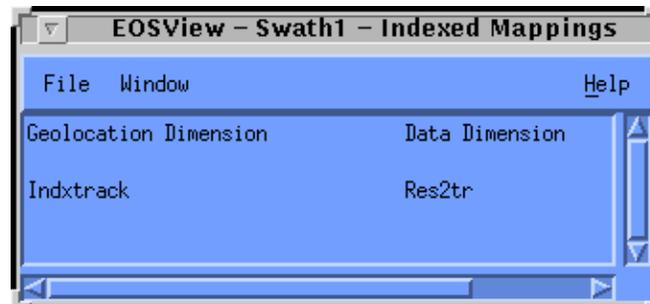
Geolocation Dimension	Data Dimension	Offset	Increment
GeoTrack	Res2tr	0	2
GeoXtrack	Res2xtr	1	2

**Figure 5-37. Swath Geolocation Mappings Pop-up**

This window lists the Geolocation Dimensions, Data Dimensions, Offsets, and Increments for the selected Swath in a table form in a scrollable window. The items listed are non-selectable and are for display/verification purposes only. See section 5.2.26 for a description of saving the contents of the window to an ASCII file.

## Indexed Mappings

To view the Indexed Mappings of the selected Swath object, click on the Indexed Mappings checkbox in the EOSView - Swath Select pop-up and press the OK button. This will cause the EOSView - Swath Indexed Mappings pop-up (shown in Figure 5-38) to appear.



Geolocation Dimension	Data Dimension
Indxtrack	Res2tr

**Figure 5-38. Swath Indexed Mappings Pop-up**

Viewing the size of the mapping may be performed by moving the pointer over the object and double clicking the left mouse button. This will cause the EOSView - Indexed Mapping Sizes pop-up (shown in Figure 5-39) to appear. See section 5.2.26 for a description of saving the contents of the window to an ASCII file.

Geo Index	Data Index
0	0
1	1
2	3
3	6
4	7
5	8
6	11
7	12
8	14
9	24
10	32
11	30

**Figure 5-39. Index Mapping Sizes Pop-up**

This window lists the Geolocation Indices and Data Indices for the selected Swath in a table form in a scrollable window. The items listed are non-selectable and are for display/verification purposes only. The window can be closed by selecting “Close” from the File menu. See section 5.2.26 for a description of saving the contents of the window to an ASCII file.

### Geolocation Fields

To view the Geolocation Fields of the selected Swath object, click on the Geolocation Fields checkbox in the EOSView - Swath Select pop-up and press the OK button. This will cause the EOSView - Swath Geolocation Fields window (shown in Figure 5-40) to appear.

Field Name	Data Type	Dimension List
Time1	FLOAT32	GeoTrack
Time2	FLOAT32	GeoTrack
Time3	FLOAT32	GeoTrack
OneD	FLOAT32	Unlim
LonLat	FLOAT32	TW0,GeoTrack,GeoXtrack
Longitude	FLOAT32	GeoTrack,GeoXtrack
Latitude	FLOAT32	GeoTrack,GeoXtrack
Temp1	FLOAT32	GeoTrack,GeoXtrack
Temp2	FLOAT32	GeoTrack,GeoXtrack

**Figure 5-40. Swath Geolocation Fields Pop-up**

Selecting a Swath Geolocation to view a slice of the data may be performed by moving the pointer over the object and double clicking the left mouse button. This will cause the EOSView - Start/Stride/Edge pop-up to appear. This window lists the Start, Stride, and Edge values for each dimension listed. This window is similar to the Grid file Start/Stride/Edge window described in Section 5.2.17 “EOSView Grid Select GUI“ (see Data Fields). See section 5.2.26 for a description of saving the contents of the window to an ASCII file.

### Data Fields

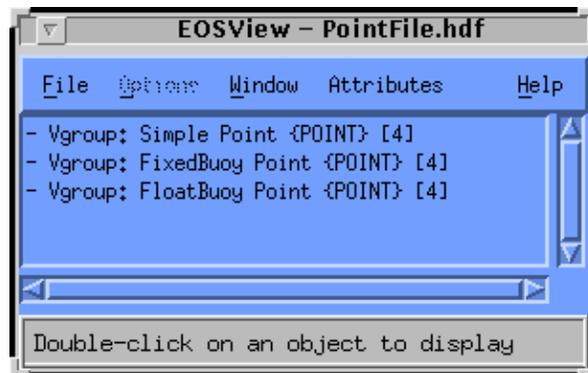
To view the Data Fields of the selected Swath object, click on the Data Fields checkbox in the EOSView - Swath Select pop-up and press the OK button. This will cause the EOSView - Swath Data Fields pop-up to appear. This window is similar to the Grid file data fields window described in Section 5.2.17 “EOSView Grid Select GUI“ (see Data Fields). See section 5.2.26 for a description of saving the contents of the window to an ASCII file.

### Attributes

To view the attributes of the selected Swath object, click on the Attributes checkbox in the EOSView - Swath Select window and press the OK button. This window is similar to the Grid file attributes pop-up described in Section 5.2.17 “EOSView Grid Select GUI “ (see Attributes).

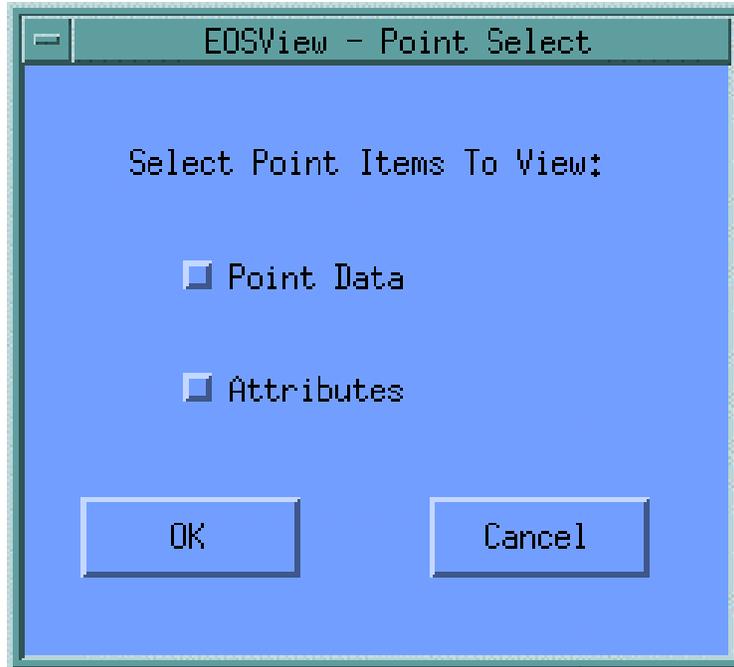
### 5.2.19 Point Files

In this example, selecting PointFile.hdf from the File Select dialog brings up the File Contents pop-up shown in Figure 5-41.



**Figure 5-41. PointFile File Contents Pop-up**

Double-clicking on an item in the PointFile pop-up (in this example, the *Vgroup: FloatBuoy Point {POINT} [4]* object is selected) opens the Point Select Pop-up shown in Figure 5-42.

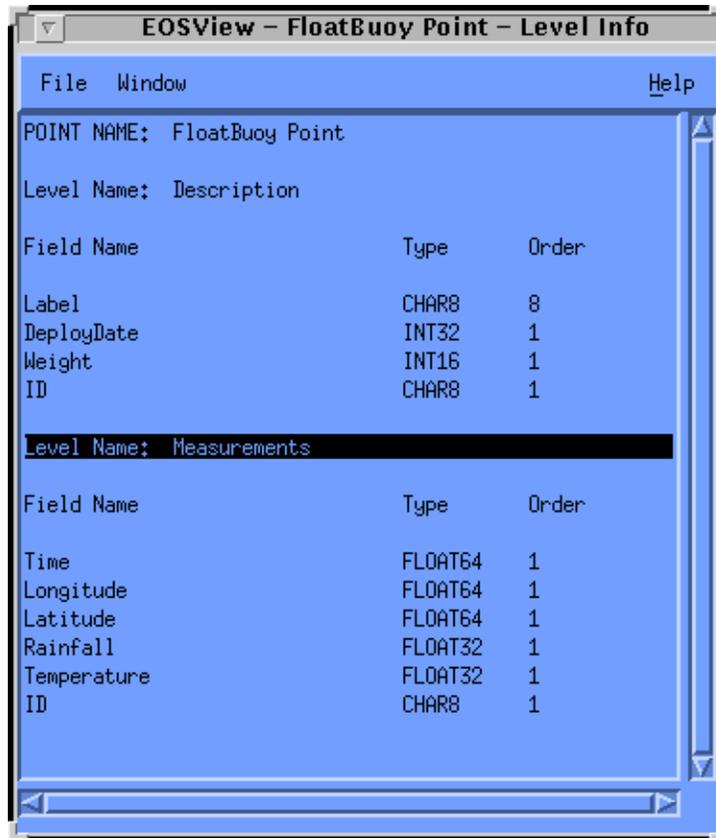


**Figure 5-42. Point Select Pop-up**

Either Point Data, Attributes or both options can be selected. Clicking on OK will open the corresponding windows for the options selected. Clicking on Cancel will close the Point Select Pop-up with no action being taken. Assuming both items have been selected, the windows as described below will appear.

### **Point Data**

To view the Point Data of the selected Point object, simply click on the Point Data checkbox in the EOSView - Point Select window and press the OK button. This will cause the EOSView-Point Level Info pop-up to appear as shown in Figure 5-43.



**Figure 5-43. Point File Level Information Pop-up**

Double-clicking on any **Level Name** will bring up the Vdata field select pop-up, shown in figure 5-20. The operation of the Vdata field select pop-up is described in Section 5.2.14. See section 5.2.26 for a description of saving the contents of the window to an ASCII file.

Selecting a field or multiple fields will bring up the table window shown in figure 5-44.

	0	1
0	34532000.000000	-56.795451
1	34655930.800000	-51.144523
2	34761777.400000	73.005232
3	34924857.400000	-51.289537
4	35010197.100000	-137.896588
5	35113965.300000	70.943919
6	35146430.000000	-141.334164
7	35180802.900000	-51.291848
8	35286334.700000	-141.921518
9	35359789.300000	-139.960931
10	35510873.500000	-56.995840
11	35583198.000000	73.083084
12	35741969.400000	-138.607937
13	35811504.600000	-52.535794
14	35890062.600000	71.995167
15	36015258.200000	-51.100562
16	36176650.200000	-141.603094
17	36292709.900000	-53.052534
18	36307577.300000	-53.937608
19	36384294.900000	-55.381183
20	36576747.400000	-141.588561
21	36725342.200000	-51.199441
22	36758333.400000	-138.998487

**Figure 5-44. Vdata Table Pop-up**

The data in this table can be saved by selecting Save from the File pulldown menu (see Section 5.2.14 for a sample of a Plot Window). The statistics of this table may be viewed by selecting Statistics from the File pulldown menu. To close this window select Close from the file pulldown menu.

**Attributes**

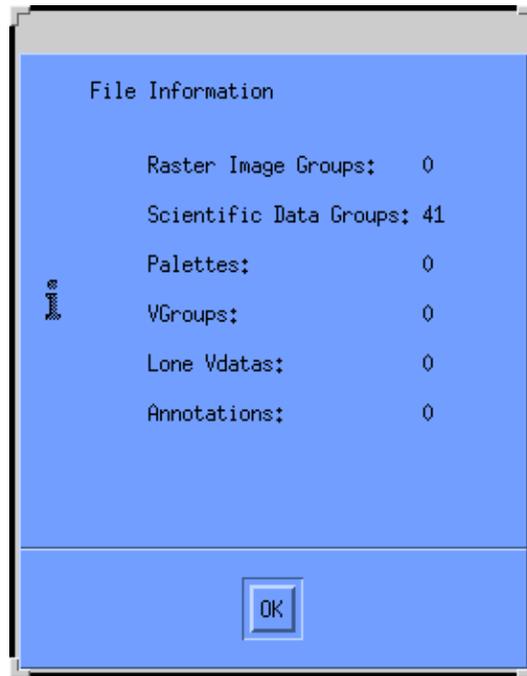
To view the attributes of the selected Point Select object, click on the Attributes checkbox in the EOSView - Point Select window and press the OK button. This window is similar to the Grid file attributes pop-up described in Section 5.2.17 “EOSView Grid Select GUI “ (see Attributes).

**5.2.20 Pulldown Menus**

The File Contents Displays all have a common pulldown menu structure with the following options: File, Options, Window, Atttributes, and Help. These are described in the sections below.

### 5.2.21 File Pulldown Menu

The File pulldown menu consists of the following options: File Info, Save, and Close. The Close pulldown menu will close the File Contents Display Pop-up and all windows derived from the window. The Save feature is described in section 5.2.26 “Save Pulldown Menu.” The File Info pulldown menu selection allows the operator to bring up information on the number of Raster Image groups, scientific data groups, palettes, Vgroups, LoneVdata, and annotations in the form of a File Information dialog as shown in Figure 5-45.

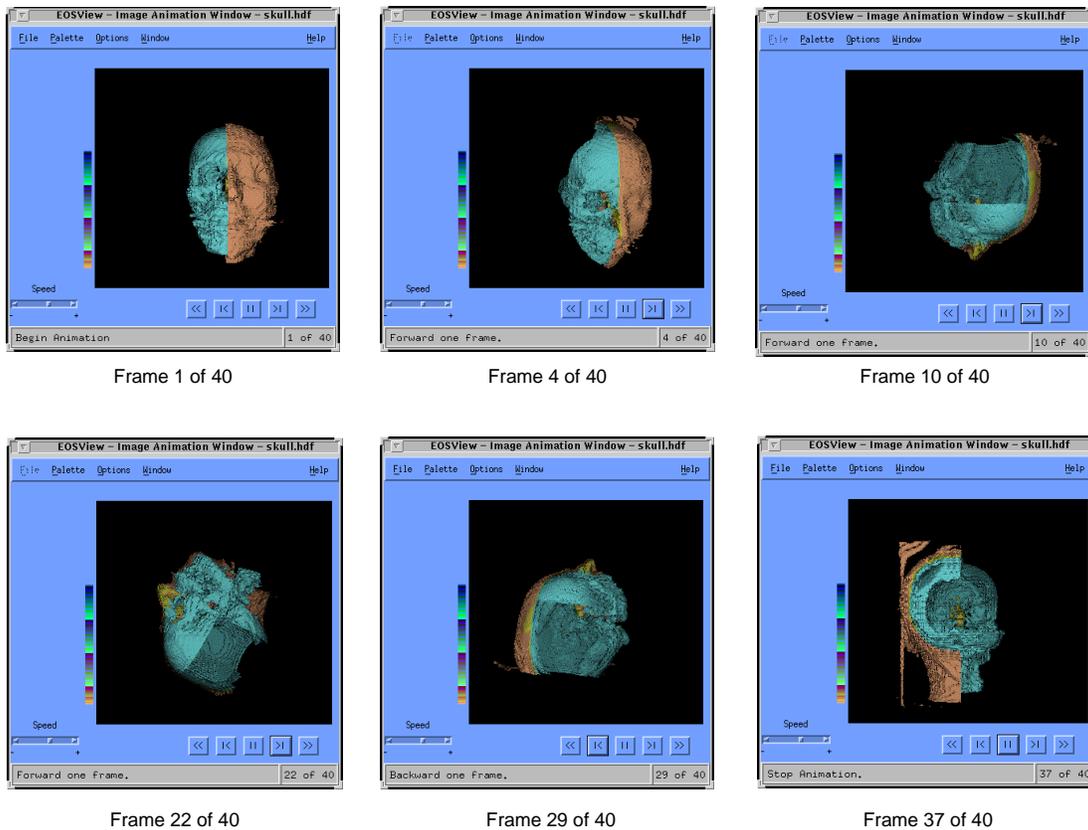


**Figure 5-45. File Information Dialog**

Clicking the **OK** button closes the File Information Dialog.

### 5.2.22 Options Pulldown Menu

The Options pulldown menu and its **Animate images** selection becomes sensitized when the selected file contains multiple Raster Image Groups. This will cause all the images to be lined up and displayed in order in an EOSView - Animation Window. The Animation Window is depicted in Figure 5-46, with different frames of an actual animation shown (skull.hdf file).



**Figure 5-46. Animation Window Pop-up**

The Animation Window has the following features:

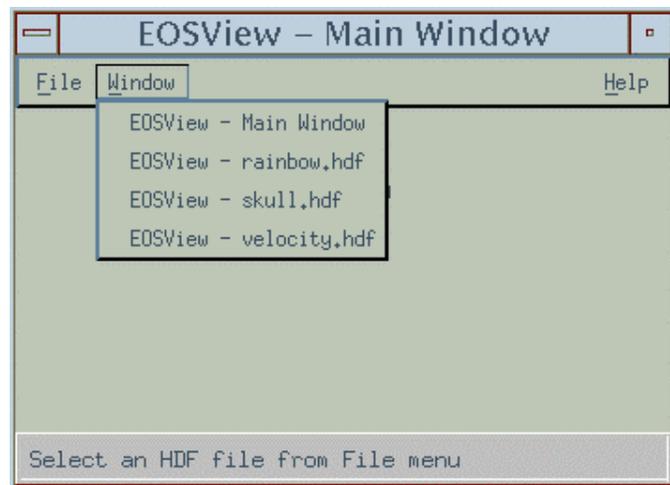
- **Closing Animation Window** – The Close option on the menu bar of the animation window will cause the animation window to close.
- **Palette** – see Section 5.2.10 for a description of the Image Display palette.
- **Modes** -- There are three modes of animation. These modes may be selected by selecting the Options - Modes options of the animation window menu bar.
  - The first option "Stop at end" will display the images until the last image or first image is displayed. This is based upon what direction was selected for animation.
  - The second option "Continuous run" will cause the animation to go into an endless loop in the direction selected until the stop button is pressed.
  - The third option "Bounce" will cause the animation to run back and forth in forward and reverse order until the stop button is pressed.

- **Speed Control** -- The speed control slider will adjust the speed of the animation to the desired speed. Moving the slider in the "+" direction will increase the animation speed while moving the slider in the "-" direction will cause the animation to decrease in speed.
- **Window** – see Section 5.2.23 “Window Pulldown Menu.”
- **Help** – see Section 5.2.25 “Help Pulldown Menu.”
- **Start/Stop Buttons** -- There are five buttons centered underneath the animation image. The five buttons are labeled "<<" "<" "||" ">" and ">>". These buttons are known as the Start/Stop Buttons.
  - The button labeled "<<" will cause the animation to begin in reverse direction.
  - The button labeled "<" will cause the animation image to decrease by one frame.
  - The button labeled "||" is the Stop button and will cause the animation to stop.
  - The button labeled ">" will cause the animation image to increase by one frame.
  - The button labeled ">>" will cause the animation to begin in forward direction.

The mode of operation of these buttons will be controlled by selecting the Modes option on the menu bar.

### 5.2.23 Window Pulldown Menu

The Window pulldown menu lists all windows which are currently open. Any window selected from this list will be shuffled to the top. Figure 5-47 shows the Window pulldown menu provided when the EOSView Main Window, orbital.hdf, rainbow.hdf and skull.hdf files are open.

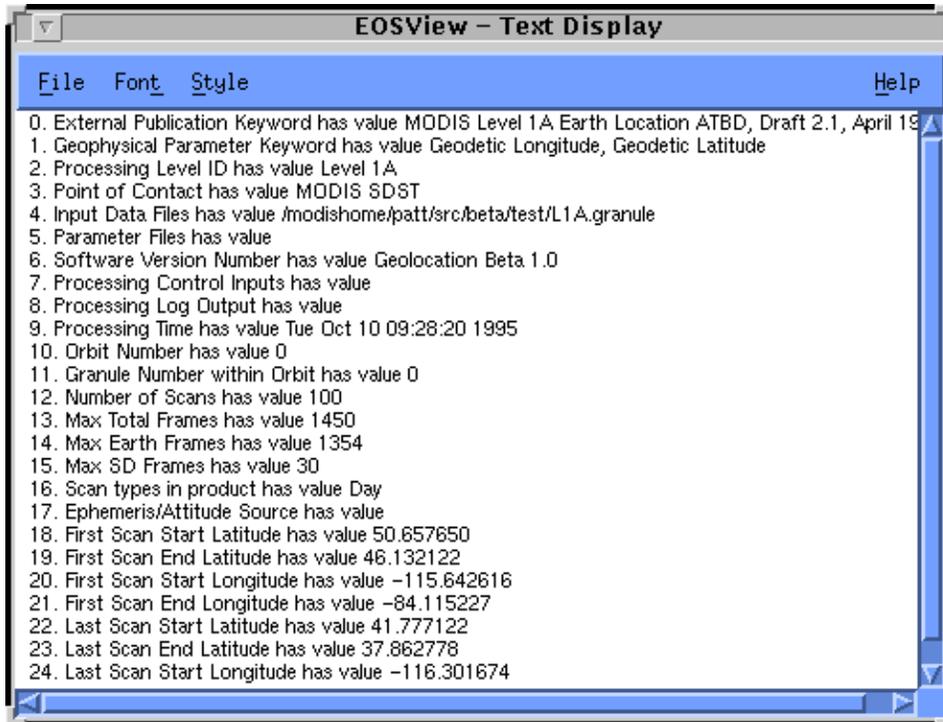


**Figure 5-47. EOSView Main Screen Showing Window Pulldown Menu**

The Window pulldown menu provides the same function on all other screens on which it appears.

### 5.2.24 Attributes Pulldown Menu

The Attributes option contains one pull-down menu item “Global...” which brings up a text file window (shown in Figure 5-48) with a list of attributes (e.g., parameters, values, version numbers) for the entire file or brings up a dialog which states that there are no attributes available.



**Figure 5-48. Text Display Pop-up**

From the text window, the operator can do the following using the pull-down menus:

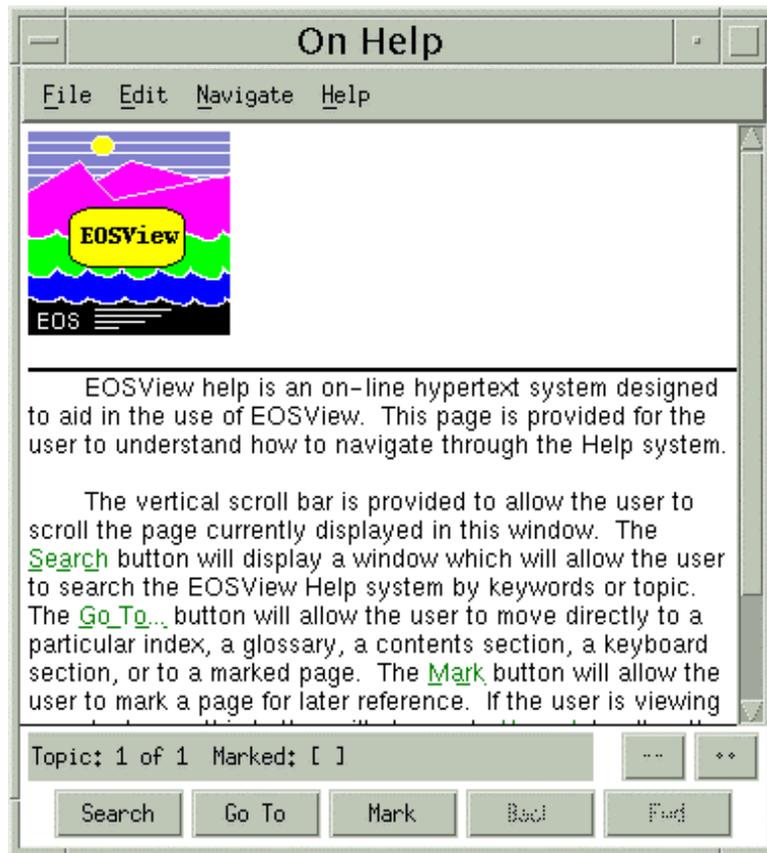
- **File** – exit the window
- **Font** – select from a list of fonts (e.g., courier, Helvetica). A box showing what the text looks like based on the selection is provided.
- **Styl**e – select from a list of styles (e.g., normal, bold, italic) and point sizes (e.g., 8 pt, 10 pt.)
- **Help** – see Section 5.2.25 “Help Pulldown Menu.”

### 5.2.25 Help Pulldown Menu

The Help option contains a pulldown menu with the following selections: help on context, on help, on window, keys, contents, index and version.

**Help On Context** – turns the mouse pointer into a “?” which can be clicked on an area of interest, bringing up help text for that item.

**Help On Help** – tells the operator how to use the EOSView on-line help feature (see Figure 5-49) to help understand how to navigate through the Help system using the on-line hypertext system.



**Figure 5-49. EOSView On Help Pop-up**

- **File** – allows the operator to exit the On Help window. Print and Print Setup are not available.
- **Edit** – allows the operator to Copy, Copy Part of a Topic, or Copy as Wrapped

- **Navigate** – allows the operator to search for a topic, go to a specified topic, bookmark items of interest, go forward and back to a topic (these items are available in the form of pushbuttons at the bottom of the screen), and view a previous or next topic.
- **Help** – provides help on how to use help and “about help” (not functional).

The On Help window provides the following pushbuttons:

- The "**Search...**" button provides a way to search the EOSView Help system in one of two ways. The operator may select to search by Topic in which case a list of topics will be displayed for the operator to choose from or the operator may select search by Keyword in which case the operator will be presented with a list of keywords from which to choose.
- The "**Go To...**" button allows the operator to move to one of five topics:
  1. Index - the help described in the Help - Index selection from the menu bar.
  2. Glossary - a defined glossary of selectable terms common to EOSView.
  3. the help described in the Help - Contents selection from the menu bar.
  4. the help described in the Help - On Keys selection from the menu bar.
  5. any marked page (see below).
- The "**Mark**" button allows the operator to mark a page. Once the page is marked the page appears in a list box in the "Topic Go to Dialog" box. The marked page may then be selected and immediately recalled. The "Mark" button will appear as "Unmark" when viewing a marked page.
- The "**Unmark**" button allows the operator to unmark a marked page. If the operator is currently viewing a marked page an "X" appears in the check box labeled "Marked:." Pressing the "Unmark" button will cause the "X" to disappear and the page will not appear in the list box of the "Topic Goto Dialog."
- The "**Back**" button will return the operator to the previously viewed page. The operator should think of the help system as a book. The back button will only appear sensitized if the previously viewed page would be logically backward from the point of current view.
- The "**Forward**" button will move the operator to the last forward page viewed. The operator should think of the help system as a book. The forward button will only appear sensitized if the previously viewed page would have a page number greater than the page being currently viewed.

### **Help On Window**

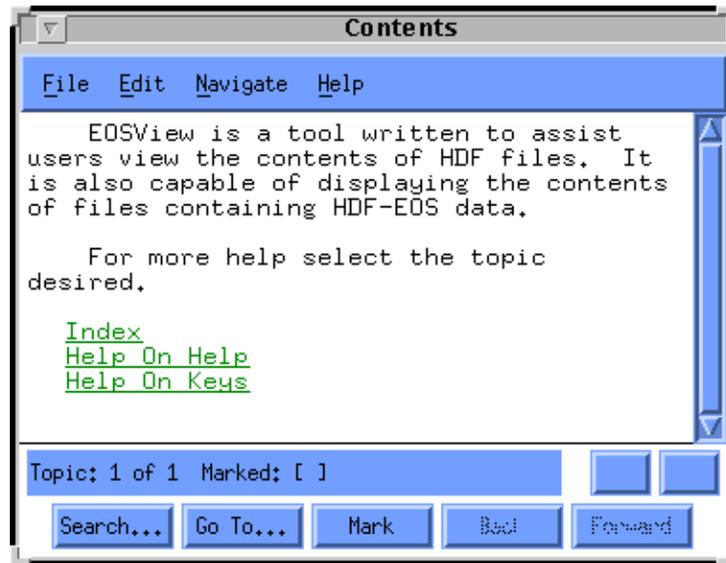
The Help On Window is the same as the Help On Index Window shown below.

## Help On Key

When Help On Key is selected from the Help pulldown menu, the following message will appear in a Keys Window: “EOSView uses no special keys to traverse through the program. To navigate through EOSView simply use the mouse and click on the options that are desired.”

## Help On Contents

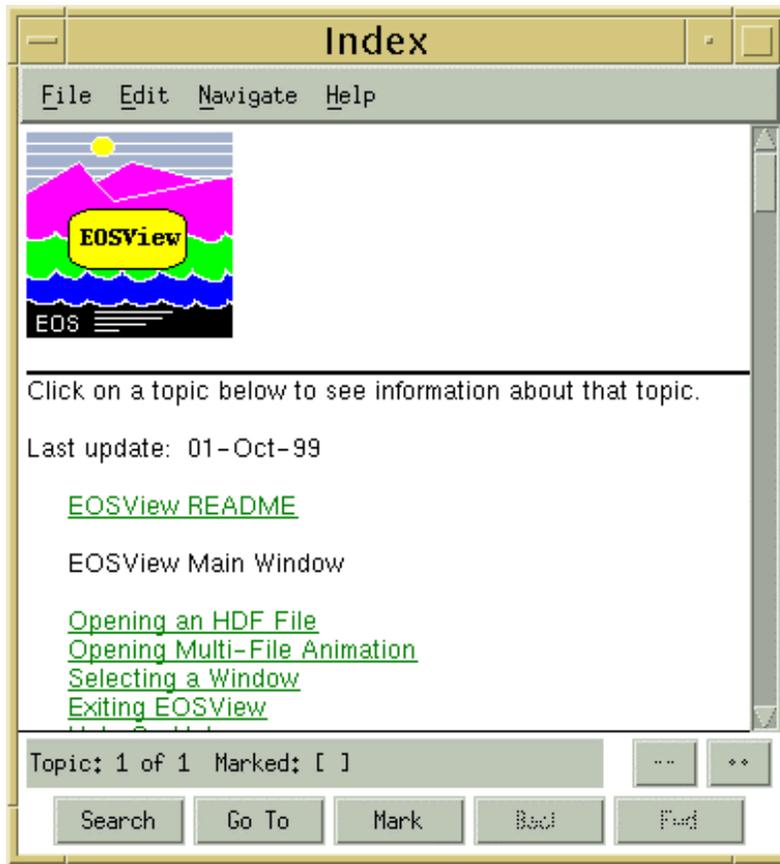
The Help On Contents window tells the operator that EOSView is a tool written to assist operators view the contents of HDF files and that it is capable of displaying the contents of files containing HDF-EOS data. More help can be obtained by selecting the topic desired (see figure 5-50).



**Figure 5-50. Help On Contents Pop-up**

## Help On Index

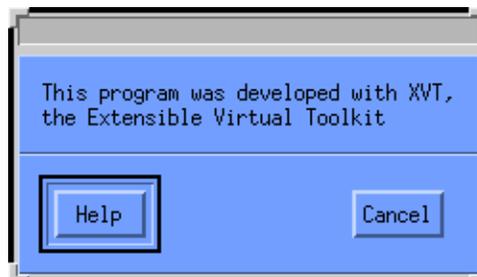
Selecting Help On Index brings up the Index window shown in Figure 5-51. This pop-up presents a list of each EOSView window and a list of hypertext help items.



**Figure 5-51. Help On Index Pop-up**

### **Help On Version**

Selecting Help On Version from the Help pulldown menu brings up the dialog shown in Figure 5-52.



**Figure 5-52. Help On Version Dialog**

Clicking on the Help button takes the operator to the Help on Contents screen (figure 5-49). Click on Cancel to close the dialog.

### **5.2.26 Save Pulldown Menu**

The Save option allows the user to save the contents listed in the window to an ASCII file. Selecting the Save option will display the File Save Dialog (Figure 5-12). Upon entering a unique file name the contents of the window will be saved to an ASCII file exactly as they are listed in the window. This Save option is different from the EOSView table save option (described in section 5.2.8) in that there is no option to save in binary format. This option exists in EOSView windows which incorporates a scrollable text list as the main window function.