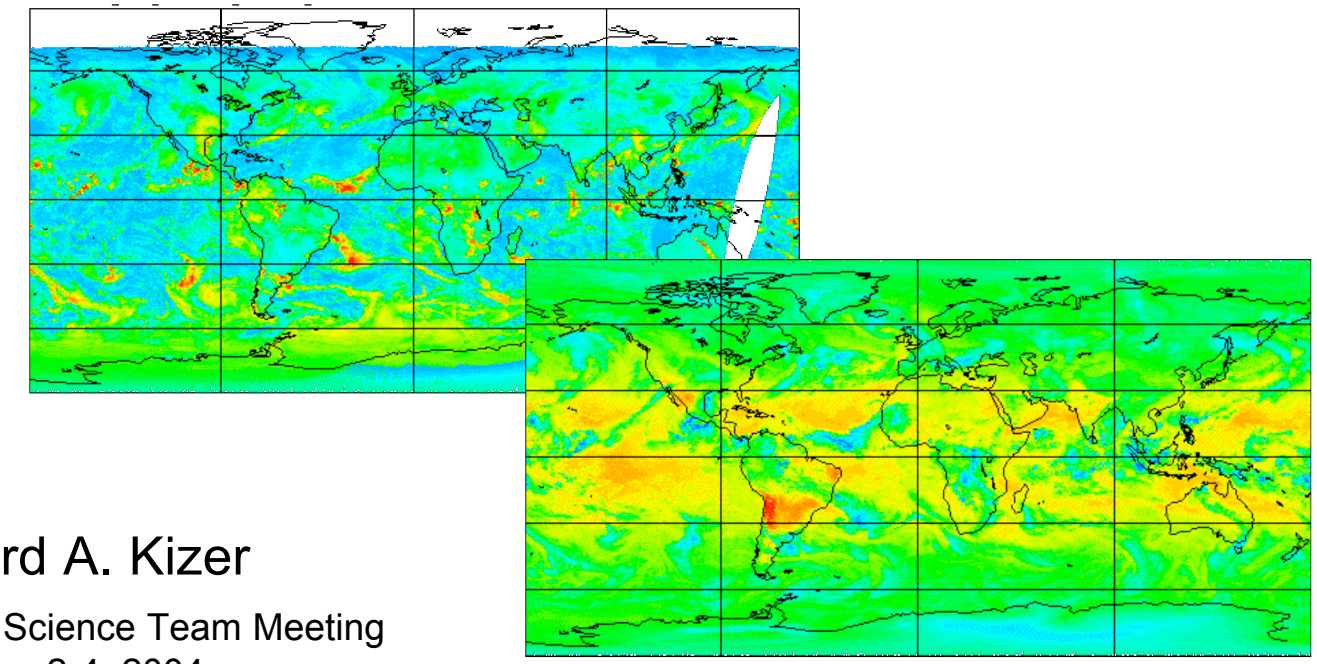
# Atmospheric Sciences Data Center

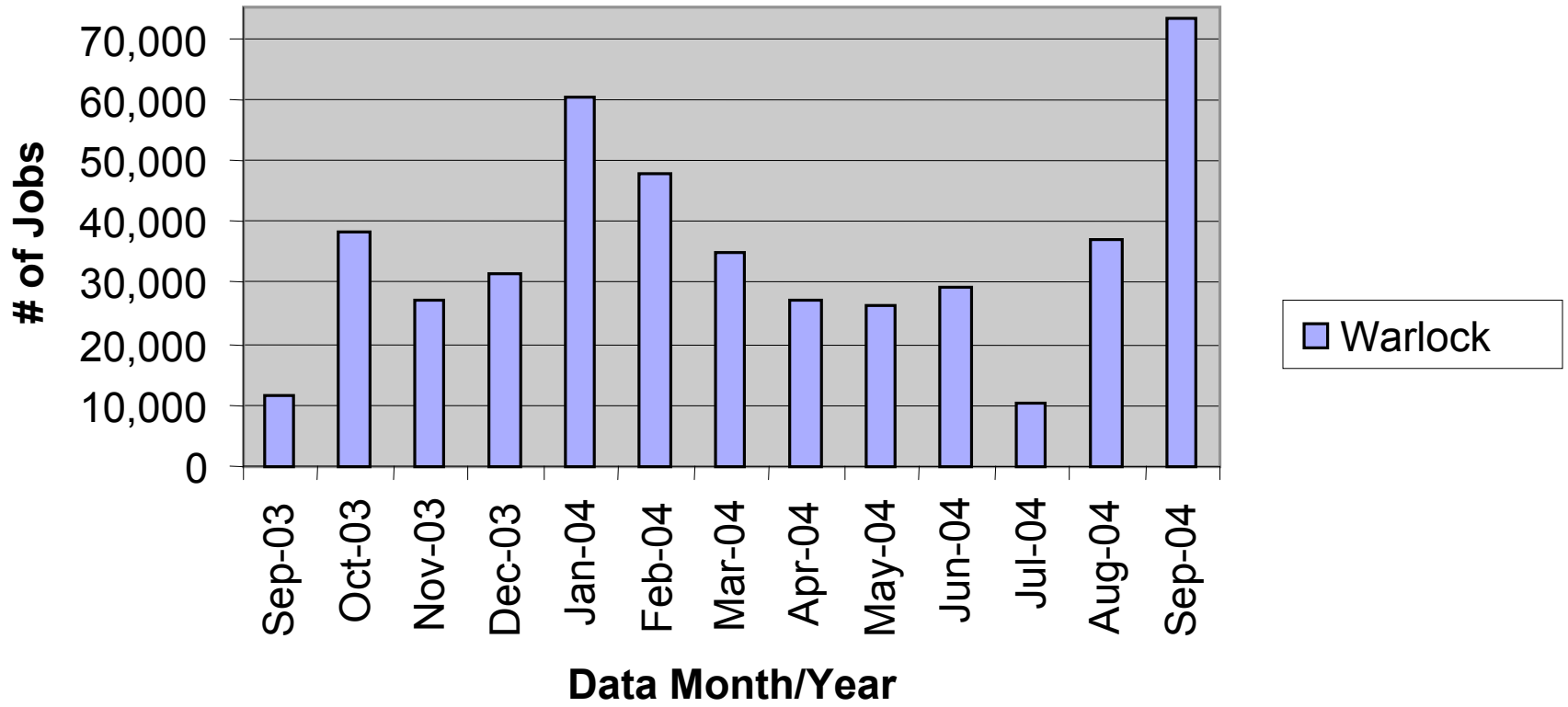
**Processing, archiving, and distributing Earth Science data**



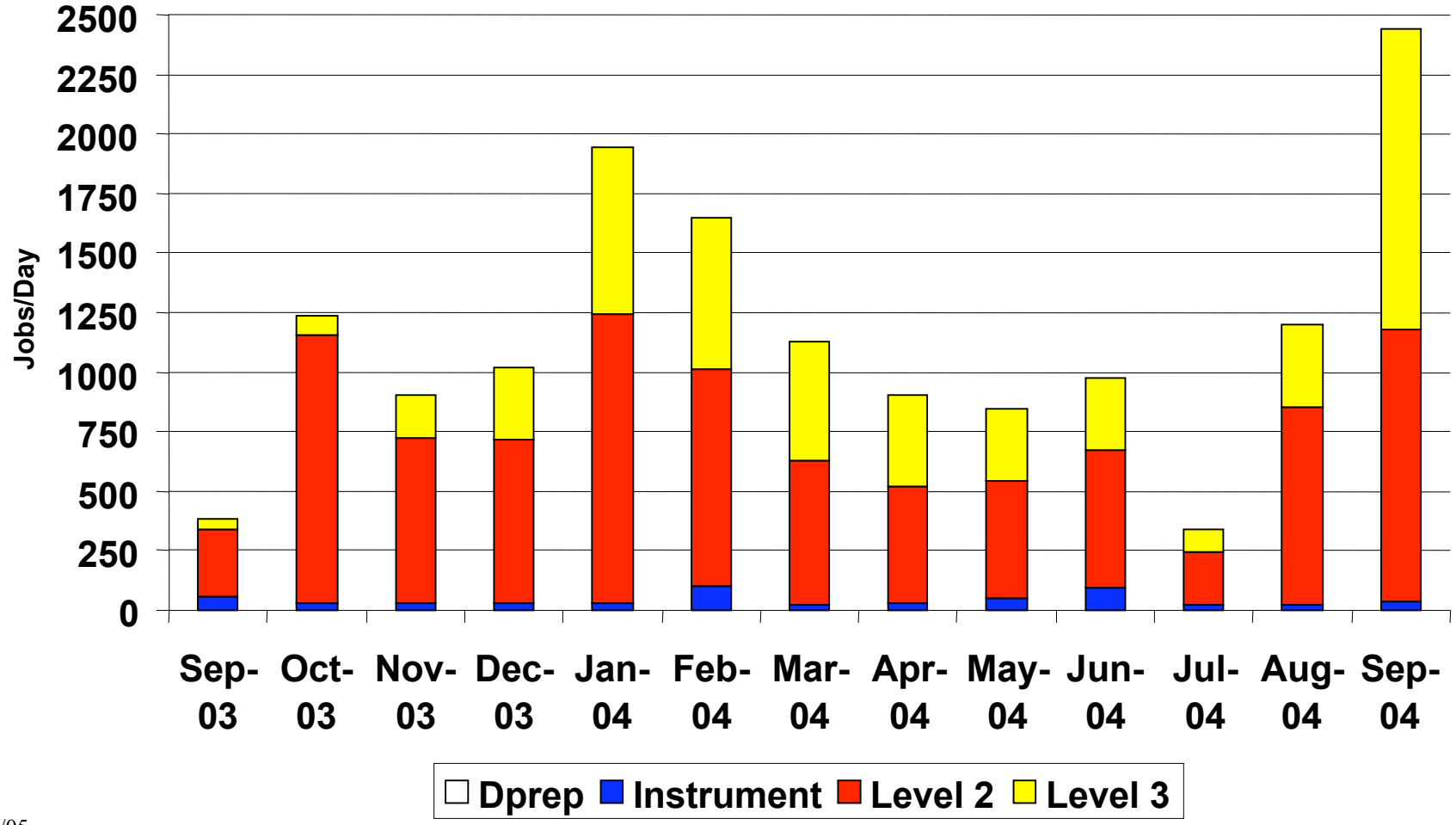
Edward A. Kizer

CERES Science Team Meeting
November 2-4, 2004

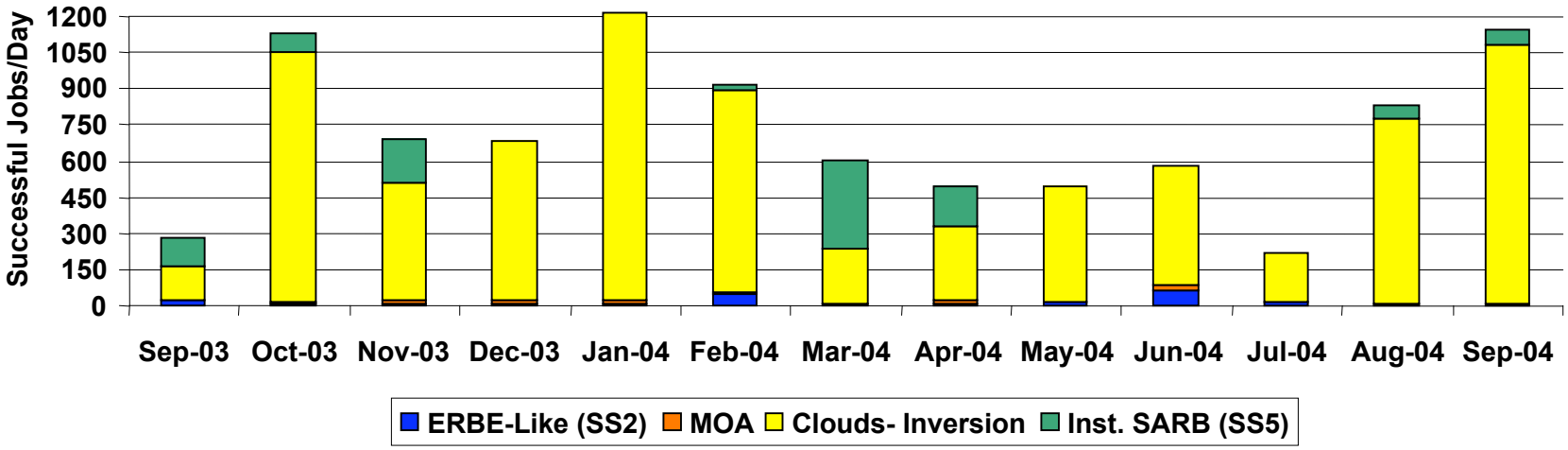
# CERES Jobs Processed on LATIS 2003-2004



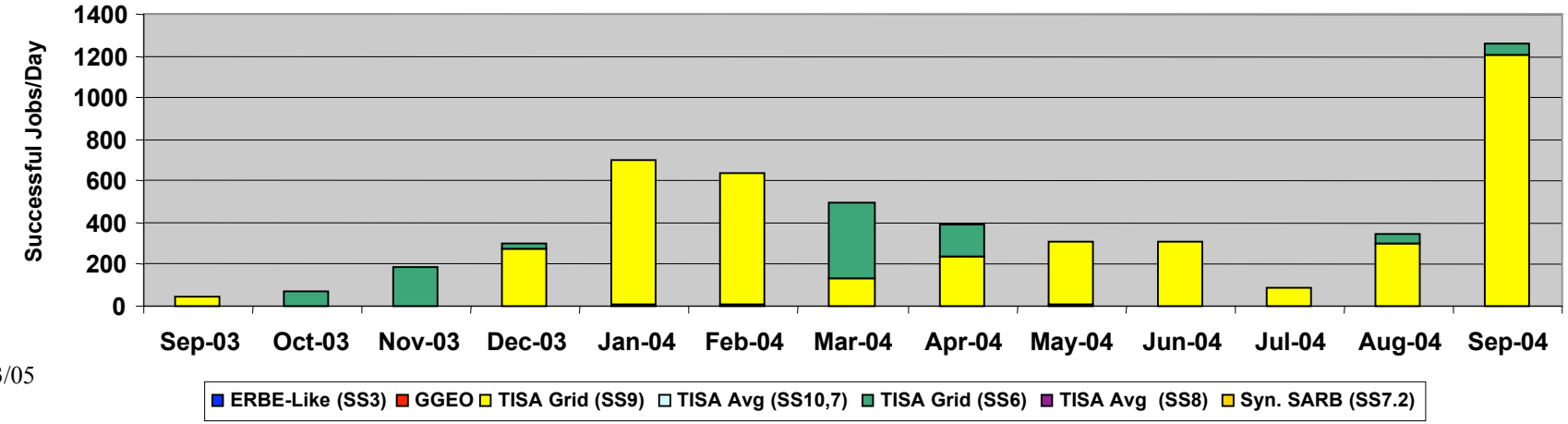
# CERES Production - Daily Average



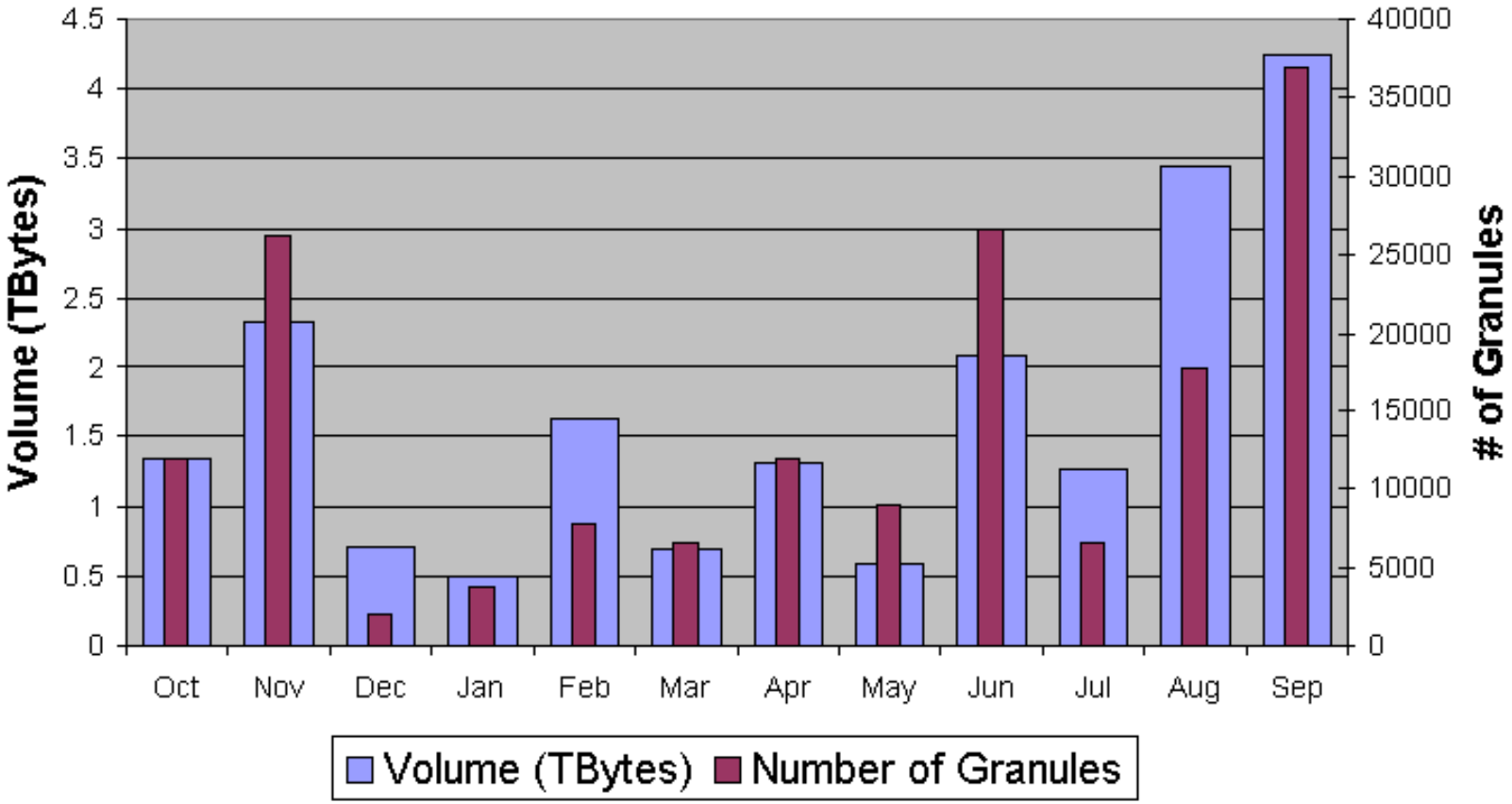
## CERES Level 2 Production - Daily Average



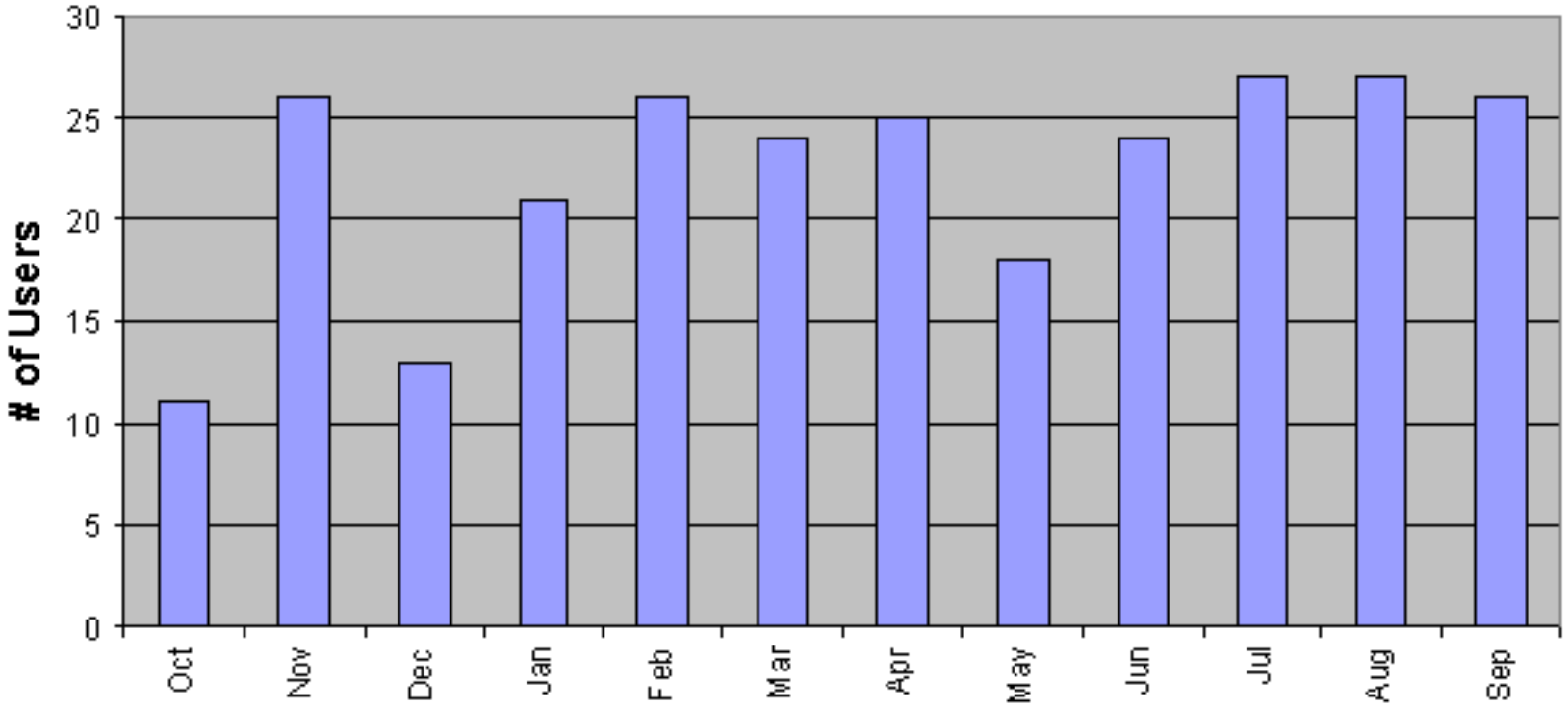

## CERES Level 3 Production - Daily Average

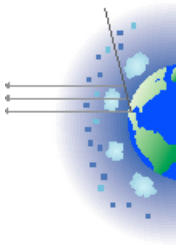


# CERES Data Distributed (Oct03-Sep04)



# Number of CERES Data Users (Oct03-Sep04)





Address http://eosweb.larc.nasa.gov/PRODOCS/ceres/table_ceres.html Go Link

ATMOSPHERIC SCIENCES DATA CENTER

# CERES Data Products

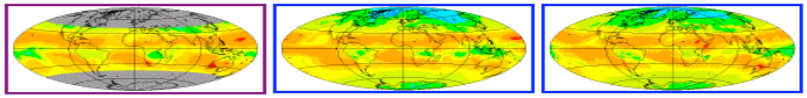
The Clouds and the Earth's Radiant Energy System (CERES) is a key component of the Earth Observing System (EOS) program. The CERES instrument provides radiometric measurements of the Earth's atmosphere from three broadband channels. The CERES missions are a follow-on to the successful Earth Radiation Budget Experiment (ERBE) mission. The CERES data products are written in HDF format.

The first CERES instrument (PFM) was launched on November 27, 1997, as part of the Tropical Rainfall Measuring Mission (TRMM). Two CERES instruments (FM1 and FM2) were launched into polar orbit on board the EOS flagship *Terra* on December 18, 1999, and two additional CERES instruments (FM3 and FM4) were launched on board EOS *Aqua* on May 4, 2002.

The following images show the areal coverage for each satellite the CERES instrument(s) flies on. In particular, the images show top of atmosphere all sky longwave measurements. CERES Level 2 ES-8 and Level 3 ES-4 browse images are available from the CERES Browse Products page.

**Examples of Satellite-Instrument Coverage**

**TRMM-PFM** | **Terra-FM1** | **Aqua-FM3**



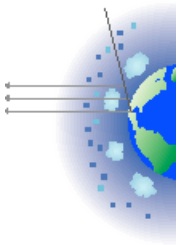
**Available Data Products**

| Documentation | Ordering Data | Tools and Images | Relevant Links |
|---|---|---|---|
| • Data Products Catalog<br>• Collection Guides<br>• Workshop Presentations (January 2003) | • Subsetting Tips<br>• Langley Web Ordering Tool<br>• EOS Data Gateway (EDG) Locations<br>• CERES Sampler CD-ROM (5 Volumes) | • Instrument Operations<br>• view_hdf Tool<br>• Information on HDF<br>• Outgoing Longwave Radiation Animation: 9 Mbytes \| 15 Mbytes<br>• Validation Graphics: ES-8 and ES-4 Validation Graphics<br>• Browse Images<br>• Visible Earth Images | • Join CERES News List<br>• CERES Home Page<br>• CERES Brochure (PDF)<br>• CERES Aqua Home Page<br>• CERES Terra Home Page<br>• CERES TRMM Home Page<br>• CERES ARM Validation Experiment<br>• CERES/ARM/GEWEX Experiment<br>• CERES/ARM Radiation Experiment<br>• CERES Surface Properties<br>• CLAMS Home Page<br>• Earth Observatory Feature |

## Available Data Products

| Level | CERES Data Product |
|---|---|
| Level 3 Data Sets (Monthly Averages) | ERBE-like Geographical Averages (ES-4) |
| | TOA/Surface Averages (SRBAVG) |
| | ERBE-like Regional Averages (ES-9) |
| | Gridded Single Satellite Fluxes and Clouds (FSW) |
| | Gridded TOA/Surface Fluxes and Clouds (SFC) |
| Level 2 Data Sets (Instantaneous unfiltered data) Subsetting Available | ERBE-like TOA Estimates (ES-8) |
| | TOA/Surface Fluxes and Clouds (SSF) |
| | Clouds and Radiative Swath (CRS) |
| Level 1B Data Sets (Instantaneous scanner data) | Instrument data (BDS) |

A Portable Document Format (PDF) reader (such as Adobe Acrobat Reader) is required to open and view the PDF documents after they are downloaded to your system.



Address http://eosweb.larc.nasa.gov/PRODOCS/ceres/level1b_table.html Go Links

ATMOSPHERIC SCIENCES DATA CENTER

# CERES Level 1B Data Sets

Level 2 Data Sets | Level 3 Data Sets | CERES Data Sets

The CERES data products are written in HDF format. (Information on HDF)

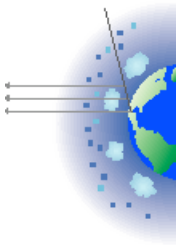
**Available Level 1B Data Sets**
(Instantaneous scanner data)

| CERES Data Product | Frequency | Approximate File Size | Parameter List |
|---|---|---|---|
| Instrument data (BDS) | 1/Day | 500 MB | BDS |

For convenience in ordering a specific CERES data product through the Langley Web Ordering Tool, select the Data Set Name in the tables below.

## Level 1B Data Sets

| BiDirectional Scan (BDS)<br>24 hours of instantaneous Level-1b CERES data for a single scanner instrument. | | | | |
|---|---|---|---|---|
| **Select Parameters**: Filtered Radiances, Detector Values, Instr. Engineering Parameters.<br>**Complete Parameter List** | | | | |
| **Documents**: Description/Abstract \| Collection Guide (PDF). | | | | |
| **Spacecraft** | **Data Set Name (Select name to order)** | **Data Products Catalog** | **Sample Software** | **Temporal Coverage (Daily)** |
| **TRMM** | CER_BDS_TRMM- | | Readme \| | 12/27/1997 - 08/31/1998, |



Address http://eosweb.larc.nasa.gov/PRODOCS/ceres/level3_table.html Go Links

ATMOSPHERIC SCIENCES DATA CENTER

# CERES Level 3 Data Sets

Level 1B Data Sets | Level 2 Data Sets | CERES Data Sets

The CERES data products are written in HDF format. (Information on HDF)

**Available Level 3 Data Sets**
(Monthly Averages)

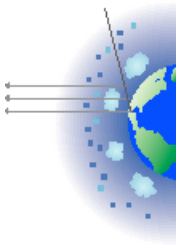
| CERES Data Product | Frequency | Approximate File Size | Parameter List |
|---|---|---|---|
| ERBE-like Geographical Averages(ES-4) | 1/Month | 8.8 MB | ES-4 |
| TOA/Surface Averages (SRBAVG) | | 963/1171 MB | SRBAVG |
| ERBE-like Regional Averages (ES-9) | | 72.4 MB | ES-9 |
| Gridded Single Satellite Fluxes and Clouds (FSW) | | 644 MB | FSW |
| Gridded TOA/Surface Fluxes and Clouds (SFC) | | 325 MB | SFC |

For convenience in ordering a specific CERES data product through the Langley Web Ordering Tool, select the Data Set Name in the tables below.

## Level 3 Data Sets

| ERBE-like Monthly Geographic Averages (ES-4): Monthly (Day), Monthly (Hour), Daily, and Hourly averages. |
|---|
| **Select Parameters:** Clear-sky and Total-sky Fluxes, Clear-sky and Total-sky Solar Incidence, and Clear-sky and Total-sky Albedo. **Complete Parameter List** |

Internet



Address http://eosweb.larc.nasa.gov/PRODOCS/ceres/level2_table.html#top

ATMOSPHERIC SCIENCES DATA CENTER

# CERES Level 2 Data Sets

Level 1B Data Sets | Level 3 Data Sets | CERES Data Sets

The CERES data products are written in HDF format. (Information on HDF)
Subsetting is available for ES-8, SSF, and CRS data products. (CERES Subsetting Information)

**Available Level 2 Data Sets**

| CERES Data Product | Frequency | Approximate File Size | Parameter List |
|---|---|---|---|
| ERBE-like TOA Estimates (ES-8) | 1/Day | 293 MB | ES-8 |
| TOA/Surface Fluxes and Clouds (SSF) | 1/Hour | 60 MB | SSF |
| Clouds and Radiative Swath (CRS) | | 225 MB | CRS |

For convenience in ordering a specific CERES data product through the Langley Web Ordering Tool, select the Data Set Name in the tables below.

## Level 2 Data Sets

**ERBE-like Instantaneous TOA Estimates (ES-8):**
**24 hours of instantaneous CERES data for a single scanner instrument.**

**Select Parameters:** TOA Fluxes, Unfiltered Radiances, Filtered Radiances, OLR, ERBE Scene Identification.
**Complete Parameter List**

**Documents**: Description/Abstract | Collection Guide (PDF).

| Spacecraft | Data Set Name (Select name to order) | Data Products Catalog | Sample Software | Temporal Coverage (Daily) |
|---|---|---|---|---|
| **TRMM** (covers opened 12/27/1997) | CER_ES8_TRMM-PFM_Edition2. Quality Summary. Validation Graphics. | DPC_ES8_R4V1 | Readme \| Read Package (C). | 12/27/1997 - 08/31/1998, 03/01/2000 - 03/31/2000 |
| | CER_ES8_TRMM-PFM_Edition1. Quality Summary. | DPC_ES8_R3V2 | Readme \| Read Package (C). | 12/27/1997 - 08/31/1998, 03/01/2000 - 03/31/2000 |
| | CER_ES8_TRMM-PFM_Transient-Ops2. Quality Summary. | | | 01/19/1999 - 07/17/1999 (Non-continuous days within this period) |
| **Terra** (covers opened 02/25/2000) | CER_ES8_Terra-FM1_Edition2. CER_ES8_Terra-FM2_Edition2. Quality Summary. | DPC_ES8_R4V1 | Readme \| Read Package (C). | 02/25/2000 - Current Production |
| | CER_ES8_Terra-FM1_Edition1. CER_ES8_Terra-FM2_Edition1. Quality Summary. | | | 02/25/2000 - Current Production |
| **Aqua** (covers opened 06/18/2002) | CER_ES8_Aqua-FM3_Edition2. CER_ES8_Aqua-FM4_Edition2. Quality Summary. | | | 06/18/2002 - Current Production. |
| | CER_ES8_Aqua-FM3_Edition1. CER_ES8_Aqua-FM4_Edition1. Quality Summary. | | | 06/18/2002 - Current Production. |

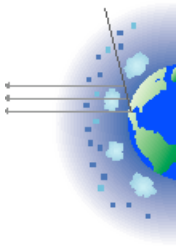
^ Top of Page **Level 2:** (ES-8 | SSF | CRS)

**Single Scanner Footprint TOA/Surface Fluxes and Clouds (SSF):**
**One hour of instantaneous CERES data for a single scanner instrument.**

**Select Parameters:** Cloud Properties, TOA Fluxes, Surface (Radiative) Fluxes, Unfiltered Radiances, Filtered Radiances, OLR, Surface Types
**Complete Parameter List**

**Documents**: Description/Abstract | Collection Guide (PDF).

| Spacecraft | Data Set Name (Select name to order) | Data Products Catalog | Sample Software | Temporal Coverage (Hourly) |
|---|---|---|---|---|



Address http://eosweb.larc.nasa.gov/PRODOCS/ceres/parameters/ssf_dpc.html Go Link

ATMOSPHERIC SCIENCES DATA CENTER

# CERES SSF Data Parameters

**The information contained on this page was retrieved from the MOST RECENT Data Products Catalog (DPC) pages. Users who have ordered data should ALWAYS refer to the DPC pages that are provided with their data set. The DPC section for other specific data sets can be found on the CERES Data Products Catalog Page.**
**To access SSF data, go to the CERES SSF Access Data Table.**

---

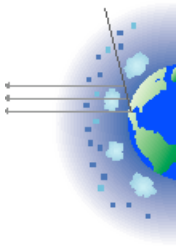
**View parameters for:**

- Time and Position
- Viewing Angles
- Surface Map
- Surface Type
- Filtered Radiances
- Unfiltered Radiances
- TOA and Surface Fluxes
- Full Footprint Area
- Clear Footprint Area
- Cloudy Footprint Area
- Footprint Imager Radiance Statistics
- MODIS Land Aerosols
- MODIS Ocean Aerosols

---

**DPC Table 2.5-3. Time and Position**

| SDS Name (Parameter Name) | Units | Range | Dimensions | Data Type | Maximum Hourly Size (MB) |
|---|---|---|---|---|---|
| Time of observation | day | 2440000 .. 2480000 | n | 64-bit real | 1.87 |
| Radius of satellite from center of Earth at observation | km | 6000 .. 8000 | n | 64-bit real | 1.87 |
| X component of satellite inertial velocity | km sec-1 | -10 .. 10 | n | 64-bit real | 1.87 |
| Y component of satellite inertial velocity | km sec-1 | -10 .. 10 | n | 64-bit real | 1.87 |
| Z component of satellite inertial velocity | km sec-1 | -10 .. 10 | n | 64-bit real | 1.87 |
| Colatitude of subsatellite point at surface at observation | deg | 0 .. 180 | n | 32-bit real | 0.94 |
| Longitude of subsatellite point at surface at observation | deg | 0 .. 360 | n | 32-bit real | 0.94 |



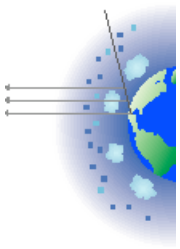
Address http://eosweb.larc.nasa.gov/PRODOCS/ceres/level2_table.html#ssf Go Link

**Single Scanner Footprint TOA/Surface Fluxes and Clouds (SSF):**
**One hour of instantaneous CERES data for a single scanner instrument.**

**Select Parameters:** Cloud Properties, TOA Fluxes, Surface (Radiative) Fluxes, Unfiltered Radiances, Filtered Radiances, OLR, Surface Types
Complete Parameter List

**Documents**: Description/Abstract | Collection Guide (PDF).

| Spacecraft | Data Set Name (Select name to order) | Data Products Catalog | Sample Software | Temporal Coverage (Hourly) |
|---|---|---|---|---|
| **TRMM** (covers opened 12/27/1997) | CER_SSF_TRMM-PFM-VIRS_Edition2B. Quality Summary. | DPC_SSF_013010 | Readme \| Read Package (C). | 01/01/1998 - 08/31/1998, 03/01/2000 - 03/31/2000 |
| | CER_SSF_TRMM-PFM-VIRS_Edition2B-TransOps. Quality Summary. | | | 01/19/1999 - 07/17/1999 (Non-continuous hours within this period) |
| | CER_SSF_TRMM-PFM-VIRS_Edition2A. Quality Summary. | | | 01/01/1998 - 08/31/1998, 03/01/2000 - 03/31/2000 |
| | CER_SSF_TRMM-PFM-VIRS_Edition2A-TransOps. Quality Summary. | | | 01/01/1999 - 07/17/1999 (Non-continuous hours within this period) |
| | CER_SSF_TRMM-SIM-VIRS_Edition2-VIRSonly. Quality Summary. | | | 09/01/1998 - 02/29/2000, 04/01/2000 - 07/31/2001 |
| | CER_SSF_TRMM-PFM-VIRS_Edition1. CER_SSF_TRMM-PFM-VIRS_Subset-Edition1. Quality Summary. | DPC_SSF_010008 | Readme \| Read Package (C). | 01/01/1998 - 08/31/1998, 03/01/2000 - 03/31/2000 |
| **Terra** (covers opened 02/25/2000) | CER_SSF_Terra-FM1-MODIS_Edition2B. CER_SSF_Terra-FM2-MODIS_Edition2B. Quality Summary. | DPC_SSF_R4V1 | Readme \| Read Package (C). | 02/25/2000 hour 22 - Current Production |
| | CER_SSF_Terra-FM1-MODIS_Edition2A. CER_SSF_Terra-FM2-MODIS_Edition2A. Quality Summary. | DPC_SSF_R3V4 | Readme \| Read Package (C). | 02/25/2000 hour 22 - Current Production |
| | CER_SSF_Terra-FM1-MODIS_Edition1A. CER_SSF_Terra-FM2-MODIS_Edition1A. Quality Summary. | DPC_SSF_R3V3 | Readme \| Read Package (C). | 03/01/2000 - 08/31/2000, 11/01/2000 - 10/31/2002 |
| **Aqua** (covers opened 06/18/2002) | CER_SSF_Aqua-FM3-MODIS_Beta2. CER_SSF_Aqua-FM4-MODIS_Beta2. Quality Summary. | DPC_SSF_R3V4 | Readme \| Read Package (C). | 12/01/2002 - 12/31/2002 |
| | CER_SSF_Aqua-FM4-MODIS_Beta1. Quality Summary. | | | 09/01/2002 - 10/31/2002, 01/01/2003 - 01/31/2003 |



Address http://eosweb.larc.nasa.gov/cgi-bin/searchTool.cgi?Dataset=CER_SSF_Terra-FM1-MODIS_Edition2B Go Link

**The NASA Langle y DAAC Web Ordering Tool -- Java Version**

Help | Questions/Comments/Feedback

Welcome guest

Keywords Search | Geographic Area | Data Set Info | Reset All | Login

Searching is done.

**Projects (34)**

ACRIMII
AIRMISR
ARB
ARESE
ATOST

Apply

**Parameters (285)**

ABSOLUTE HUMIDITY
ABSORPTION
ACTINIC FLUX
ADIABATIC TENDENCY

Apply

**Data Sets (407)**

CER_SSF_Terra-FM1-MODIS_Edition2B (20682 files)

**[ Advanced Search (Optional) ]**

**Geographic Area**

North: 90.0
West: -180.0
East: 180.0
South: -90.0

**Time Range**

Start: 2001-10-29
End: 2001-10-30
YYYY-MM-DD

**Name Matches (optional)** *e.g. MET20*

Day/Night Flag: (•) Both ( ) Day ( ) Night

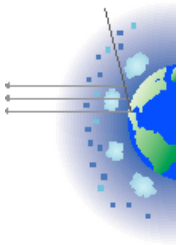
Search Files

**Search Result (41 files)**

| File Name | Start Date | End Date | Size (bytes) |
|---|---|---|---|
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102900 | 2001-10-29 | 00:00:03 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102901 | 2001-10-29 | 01:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102902 | 2001-10-29 | 02:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102903 | 2001-10-29 | 03:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102904 | 2001-10-29 | 04:00:01 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102905 | 2001-10-29 | 05:00:01 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102906 | 2001-10-29 | 06:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102907 | 2001-10-29 | 07:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102908 | 2001-10-29 | 08:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102909 | 2001-10-29 | 09:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102914 | 2001-10-29 | 14:00:01 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102915 | 2001-10-29 | 15:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102916 | 2001-10-29 | 16:00:01 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102917 | 2001-10-29 | 17:00:00 | 2001-10-2 |
| CER_SSF_Terra-FM1-MODIS_Edition2B_026030.2001102918 | 2001-10-29 | 18:00:00 | 2001-10-2 |

☐ All Files ☐ Compressed ☑ Read Software ☐ MetaData File

File Info | CERES Subset | FTP | Submit Order



Address http://eosweb.larc.nasa.gov/PRODOCS/ceres/subsetting_tips.html Go Link

ATMOSPHERIC SCIENCES DATA CENTER

# CERES Subsetting Information

Subsetting is a service provided by the Langley Atmospheric Sciences Data Center(ASDC). This interface allows users to subset CERES data through the ASDC Ordering Tool - Java version. Subsets are created by latitude and longitude coordinates, by parameters, or by parameter criterion. The subset tool extracts the data specified and generates another, smaller file in the same format as the original file.

## Instructions

Subsets of CERES data are requested during the data ordering process at the data set level. All files related to the specified data set for subsetting will be a subset order. For reference, steps three through ten are numbered in the example "Subset Criteria Selection Interface" image that follows.

1. Select the data granule(s) to be ordered in the ASDC Ordering Tool.
2. Select "CERES Subset" at the bottom of the web page to initiate the subset interface.
   Note: If the dataset can not be subset, then no new window will be created.
3. In the new window,"Subset Criteria Selection Interface", select the data set to be subset in the "Subsettable Data Set(s)" section.

NOTE: You may subset by "Output Parameters" and at most only one of the following; "Area", "Time", or "Criterion"

### Subset by Parameters

4. In the "Subset type" section, select "Output Parameters". The "Output Parameters" section, will list all parameters in the selected data set that may be extracted from the original data file. Select any number of these parameters. Default is all parameters.

### Subset by Latitude/Longitude

5. In the "Subset type" section, select "Area". In the "Subset area" section, enter the South, North (-90,90) and West, East (-180,180) coordinates. Default is the entire globe.

### Subset by Time

6. In the "Subset type" section, select "Time". In the "Subset Start Time" and/or "Subset End Time" section, provide the times needed using the time format listed: YYYY-MM-DD-hh:mm:ss.

### Subset by Parameter Criterion

Criteria can be used to subset data based on the data range available for the selected parameter. For example, if requesting daytime data for SW radiances, select Solar Zenith Angle and change the limits to 0 and 90 degrees.

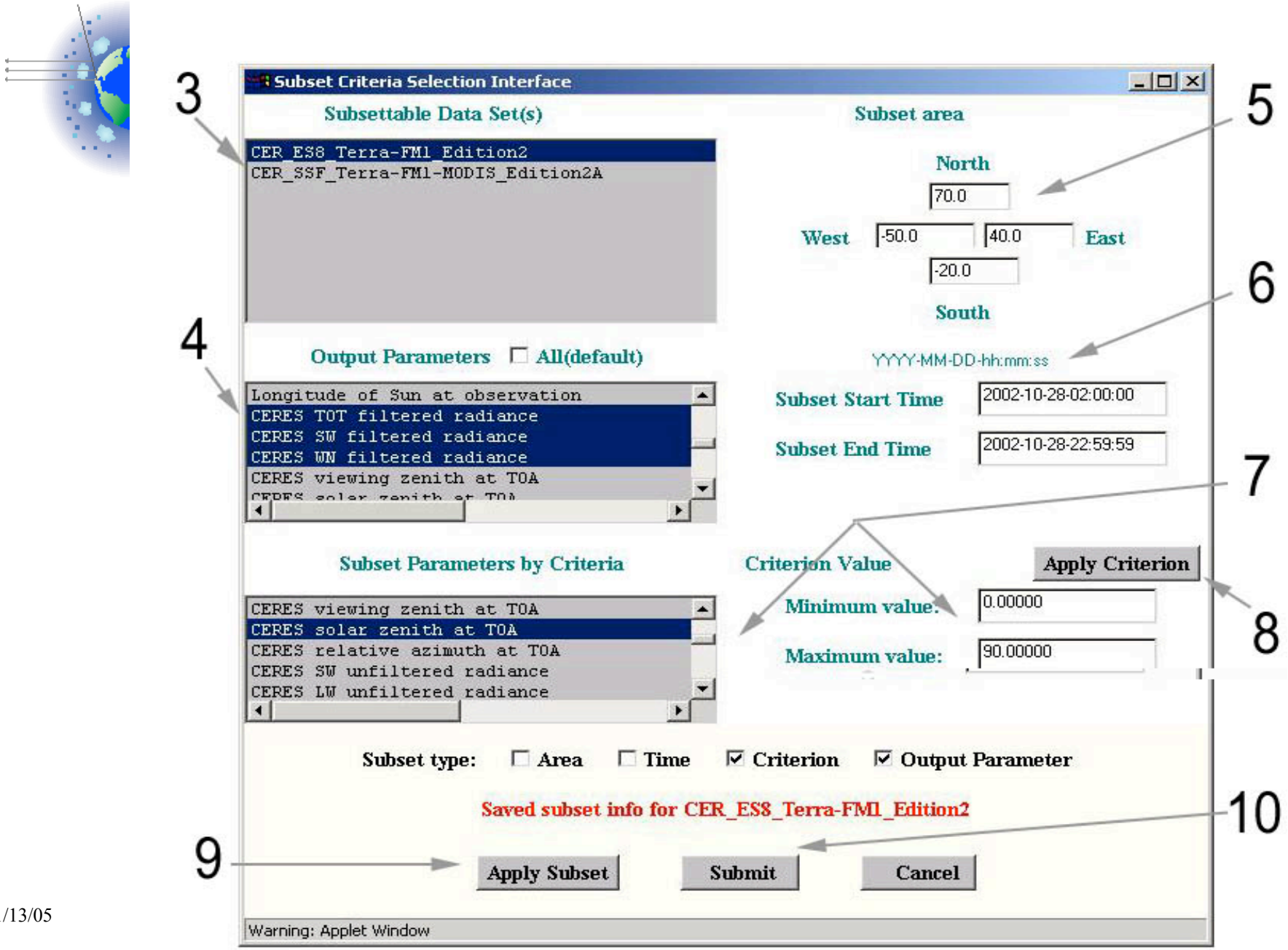
7. In the "Subset type" section, select "Criterion". Select a parameter in the "Subset Parameters by Criterion" section. The min/max values of the selected parameter will be propagated in the "Criterion Value" area. Adjust the values as needed.
8. Select "Apply Criterion". A message in red will be printed below to state the criterion was applied (eg. "Applied min/max value for CERES Solar Zenith Angle").

### Apply Subsetting to the Data Set

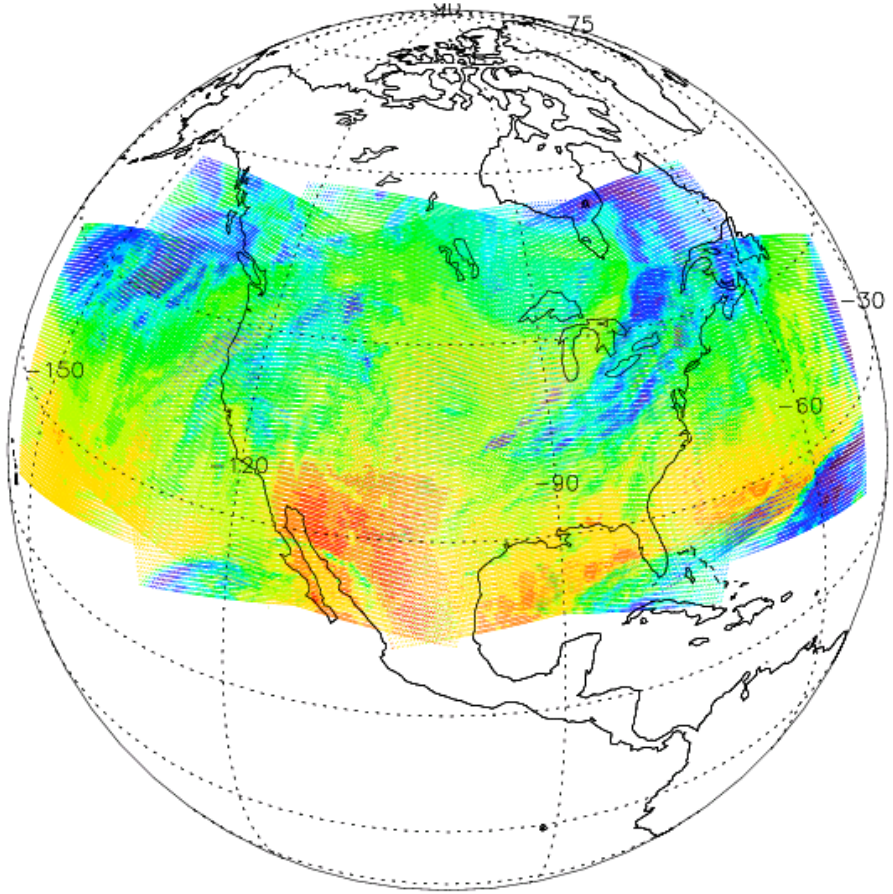
9. Select "Apply Subset". A message in red will be printed below to state the subsetting of the dataset was applied (eg. "Saved subset info for CER_CRS_TRMM-PFM-VIRS_Edition2C").

   NOTE: For each additional dataset, repeat steps 3 thru 9.

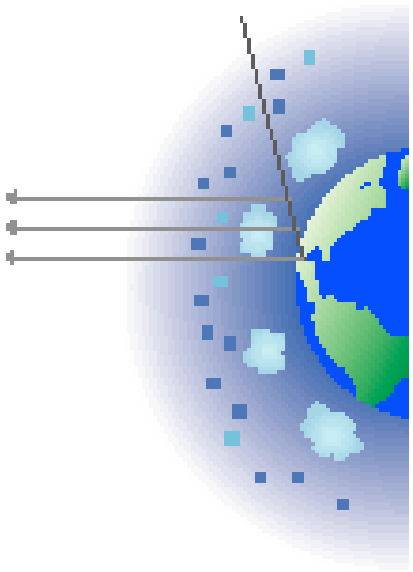
10. To submit the order, select "Submit". After the orders are completed, be sure to select the media type. Default is FTP.


Subset Criteria Selection Interface
3
Subsettable Data Set(s)
CER_ES8_Terra-FM1_Edition2
CER_SSF_Terra-FM1-MODIS_Edition2A
Subset area
5
North
70.0
West
-50.0
40.0
East
-20.0
South
6
YYYY-MM-DD-hh:mm:ss
Subset Start Time
2002-10-28-02:00:00
Subset End Time
2002-10-28-22:59:59
4
Output Parameters
All(default)
Longitude of Sun at observation
CERES TOT filtered radiance
CERES SW filtered radiance
CERES WN filtered radiance
CERES viewing zenith at TOA
7
Subset Parameters by Criteria
Criterion Value
Apply Criterion
CERES viewing zenith at TOA
CERES solar zenith at TOA
CERES relative azimuth at TOA
CERES SW unfiltered radiance
CERES LW unfiltered radiance
Minimum value:
0.00000
Maximum value:
90.00000
8
Subset type:
Area
Time
Criterion
Output Parameter
Saved subset info for CER_ES8_Terra-FM1_Edition2
10
9
Apply Subset
Submit
Cancel
Warning: Applet Window

# CER_ES8_Terra-FM1_Edition2_023019.20011102
# LW TOA Fluxes




Original file size 260.1 Mbytes
Subsetted file size 22.5 Mbytes



# ATMOSPHERIC SCIENCES DATA CENTER

http://eosweb.larc.nasa.gov

larc@eos.nasa.gov