Clouds and the Earth's Radiant Energy System (CERES)

Data Management System

CERES RegridMOA Subsystem Subsystem 12.0 Test Plan

Release 5
Version 1

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Document Revision Record

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10/01/02	R3V4	396	• Removed GEOS2 test cases. • Added GEOS4 test cases. • Updated format to comply with standards.	3.0 3.0 All
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10/21/08	R5V1	686	• Removed references to previous ozone backup source OMI including test case and other information.	1.2, 3.0, 1.1.1.1, App. C
			• Removed reference to outdated scripts. Reversed order of steps 3 and 4 of installation.	2.1
			• Changed pathnames throughout document to reflect new directory structure.	2.2, 3.1, 3.2, 3.3, App. B, App. C
			• Removed reference to processing of previous MOA versions.	3.0
			• Removed GEOS4 test cases and associated information and replaced with G5-CERES test cases and information.	3.1.2.1.1, App. C
			• Updated data space requirements.	3.1.2, Table 3-1
			• Changed test cases dates.	3.1, 3.2
			• Added PROD environment variable and “unlimit” command. (11/17/2008)	3.1.2.1.1

Preface

The Clouds and the Earth's Radiant Energy System (CERES) Data Management System (DMS) supports the data processing needs of the CERES Science Team research to increase understanding of the Earth's climate and radiant environment. The CERES Data Management Team works with the CERES Science Team to develop the software necessary to support the science algorithms. This software, being developed to operate at the Langley Atmospheric Sciences Data Center (ASDC), produces an extensive set of science data products.

The DMS consists of 12 subsystems; each subsystem contains one or more Product Generation Executables. Each subsystem executes when all of its required input data sets are available and produces one or more archival science products.

This Test Plan is written by the responsible CERES subsystem team for the CERES Configuration Management Team and the Langley ASDC to support subsystem testing. This document describes the software and supporting data files for this Subsystem and explains the procedures for installing, executing, and testing the software in the Science Software Integration and Testing environment. A section is also included on validating the software results.

Acknowledgment is given to CERES Documentation Team for their support in preparing this document.

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1.0 Introduction

The Clouds and the Earth's Radiant Energy System (CERES) is a key component of the Earth Observing System (EOS). The CERES instrument provides radiometric measurements of the Earth's atmosphere from three broadband channels: a shortwave channel (0.3 - 5 μm), a total channel (0.3 - 200 μm), and an infrared window channel (8 - 12 μm). The CERES instruments are improved models of the Earth Radiation Budget Experiment (ERBE) scanner instruments, which operated from 1984 through 1990 on the National Aeronautics and Space Administration's (NASA) Earth Radiation Budget Satellite (ERBS) and on the National Oceanic and Atmospheric Administration's (NOAA) operational weather satellites NOAA-9 and NOAA-10. The strategy of flying instruments on Sun-synchronous, polar orbiting satellites, such as NOAA-9 and NOAA-10, simultaneously with instruments on satellites that have precessing orbits in lower inclinations, such as ERBS, was successfully developed in ERBE to reduce time sampling errors. CERES continues that strategy by flying instruments on the polar orbiting EOS platforms simultaneously with an instrument on the Tropical Rainfall Measuring Mission (TRMM) spacecraft, which has an orbital inclination of 35 degrees. In addition, to reduce the uncertainty in data interpretation and to improve the consistency between the cloud parameters and the radiation fields, CERES includes cloud imager data and other atmospheric parameters. The CERES instruments fly on the TRMM spacecraft, on the EOS-AM platforms and on the EOS-PM platforms. The TRMM satellite carries one CERES instrument while the EOS satellites carry two CERES instruments, one operating in a fixed azimuth scanning mode and the other operating in a rotating azimuth scanning mode.

1.1 Document Overview

This document, CERES Regrid Meteorological, Ozone, and Aerosol (MOA) Subsystem (Subsystem 12) Release 3 Test Plan, is part of the CERES Subsystem 12.0 Release 3 delivery package provided to the Atmospheric Sciences Data Center (ASDC). It provides a description of the CERES RegridMOA Subsystem Release 3 software and explains the procedures for installing, executing, and testing the software in the Science Software Integration and Testing (SSI&T) environment. A section is also included on validating the software results. A description of acronyms and abbreviations is provided in Appendix A, a directory structure diagram is contained in Appendix B, and a description of the software and data files is contained in Appendix C.

This document is organized as follows:

Section 1.0 - Introduction
Section 2.0 - Software and Data File Installation Procedures
Section 3.0 - Test and Evaluation Procedures
Appendix A - Acronyms and Abbreviations
Appendix B - Directory Structure Diagram
Appendix C - File Description Tables

1.2 Subsystem Overview

The CERES RegridMOA Subsystem ingests meteorological, ozone, and aerosol data from several different external sources and combines these data into one product, the MOA product. The RegridMOA Subsystem executes once per day, and produces one MOA file every six hours. Since the input data from the different external sources do not conform to a common horizontal grid system, this Subsystem horizontally interpolates the input aerosol and ozone data to conform to the same horizontal grid as the meteorological data. Microwave humidity data, however, are retained on their original input grid. Vertical and temporal interpolations of the meteorological and ozone data are also necessary to meet CERES requirements. Software developed by the CERES Clouds, Surface and Atmospheric Radiation Budget (SARB), and Time Interpolation and Spatial Averaging (TISA) Working Groups all require access to the data contained in MOA.

External products the RegridMOA Subsystem accesses in Release 3 include meteorological, ozone, and microwave precipitable water data. The primary meteorological data, such as temperature, humidity, and wind speed profile data, are obtained from the Data Assimilation System (DAS) at Goddard Space Flight Center. The primary ozone data is obtained from the National Centers for Environmental Prediction (NCEP) Stratospheric Monitoring Group Ozone Blended Analysis (SMOBA). The SSM/I (Special Sensor Microwave Imager) precipitable water data are obtained from the Global Hydrology Resource Center (GHRC) at NASA Marshall. CERES provides the input climatological data sets for aerosol optical depth at the time of software delivery.

This Subsystem first interpolates the ozone and aerosol input data horizontally, which is the domain where the data have the smallest variability. The aerosol optical depth data requires neither temporal nor vertical interpolation. The ozone data also require no temporal interpolation. Next, the nonmicrowave meteorological data are temporally interpolated. The meteorological profile data--temperature, specific humidity, and wind speed vectors--are interpolated in the vertical domain where the data have the largest variability. Data interpolated in the vertical domain provide vertical profiles at pressure levels selected by the CERES Science Team. While the microwave humidity data are neither horizontally nor vertically interpolated, they are temporally interpolated to provide hourly data. This temporal interpolation requires data from both the previous and succeeding days.

For purposes of testing the RegridMOA Subsystem software in the ASDC SSI&T environment, the CERES SARB Working Group provides the input data sets. For production processing, however, the Langley TRMM Information System (LaTIS) obtains the external ancillary input data required by this Subsystem and performs the initial ingestion of these data. The spatial and temporal resolutions of these data are not altered by LaTIS. LaTIS provides a scheduler that tracks the availability of these input data sets and subsequently controls processing of the RegridMOA Subsystem Product Generation Executive (PGE). The CERES Science Team decides on an allowable lag time between the measurement of CERES data and the execution of this Subsystem. This lag time is built into the processing scheduler, thus, allowing for the accumulation of the necessary input data from the external sources. If microwave humidity data are not available from the external source after this lag time, the RegridMOA Subsystem may still process. If the ozone data for a given day is not available within the allowable lag time, the most recent ozone data file may be used.

2.0 Software and Data File Installation Procedures

This section describes how to install the Subsystem 12.0 RegridMOA software in preparation for making the necessary test runs at the Langley ASDC. The installation procedures include instructions for uncompressing and untarring the delivered tar files, properly defining environmental variables, and compiling the RegridMOA software.

2.1 Installation

Software/Data File Install Procedure:

1. The scripts, makefiles, and Process Control Files in the Subsystem 12.0 delivery package expect the CERES environment variable, **$CERESENV**, to point to a file which sets the following environment variables:

PGSDIR	**-**	**Directory for Toolkit libraries**
F90	**-**	**Pointer to the SGI F90 64 bit compiler**
CERESHOME	**-**	**Top Directory for CERES Software**
CERESLIB	**-**	**Directory for CERESlib**
PGSMSG	**-**	**Directory which contains Toolkit and CERES Status Message Files**
PGSLIB	**-**	**Directory which contains SGI 64-bit Toolkit library file**
F90COMP	**-**	**SGI F90 compiler options (use the following options: -O1 -64 -c)**
PGSINC	**-**	**Pointer to the PGS include file directory**
HDFDIR	**-**	**Pointer to the HDF home directory**

2. Source the CERES environment variable and change directory to the directory where you plan to install the RegridMOA Subsystem. (The following instructions assume that the directory will be **$CERESHOME**).

   source $CERESENV
   cd $CERESHOME

3. If the delivery is a full subsystem delivery then the files from previous deliveries should be removed

4. Uncompress and untar the tar files.

2.2 Compilation

1. **MOA_Gen.exe**, the executable for Subsystem 12.0 RegridMOA Main-Processor, is not included in the delivered tarfiles. To create the executable in directory **$CERESHOME/sarb/bin/regridmoa**, use the **makemoa** script:

   cd $CERESHOME/sarb/CER12.1P1/rcf
   ./makemoa.pl all

This script executes the Makefiles in the following directories:

$CERESHOME/sarb/smf/regridmoa
$CERESHOME/sarb/CER12.1P1/src

The following files will be created:

$CERESHOME/sarb/CER12.1P1/bin/MOA_Gen.exe

2. The executable for the comparison software is not provided in the tar file. To create the executable on directory **$CERESHOME/sarb/CER12.1P1/test_suites**, type the following commands:

cd $CERESHOME/sarb/CER12.1P1/test_suites
./run_make clean

3.0 Test and Evaluation Procedures

This section provides general information on how to execute Subsystem 12.0 and provides an overview of the test and evaluation procedures. It includes a description of what is being tested and the order in which the tests should be performed.

This test of the RegridMOA Subsystem uses DAS-G5-CERES, the primary meteorological data source, and SMOBA, the ozone data source.

3.1 Stand-alone Test Procedures

3.1.1 PCF Generator

The RegridMOA Main-Processor production script, **runmoa.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the production run. This PCF is created by first executing an ASCII file generator, **ascii_gen_12.1P1.pl**, and then executing the PCF generator, **pcfgen_12.1P1.pl**.

The ASCII file generator, **ascii_gen_12.1P1.pl**, must be executed to create the ASCII input file for a particular production run. The ASCII file generator requires one command-line argument in the form YYYYMMDD, where YYYY is the 4-digit year, MM is the 2-digit month, and DD is the 2-digit day. The PCF generator, **pcfgen_12.1P1.pl**, is then executed using the newly created ASCII input file name as a command-line argument.

Execution of both the ASCII file generator and the PCF file generator can be accomplished by running the script, **setupmoa.pl**. This script requires one command-line argument in the form YYYYMMDD, where YYYY is the 4-digit year, MM is the 2-digit month, and DD is the 2-digit day.

3.1.2 Execution

The RegridMOA Main-Processor production script, **runmoa.pl**, is executed using the PCF path and filename as a command-line argument. A total of 764 MB of disk space is required for running both test cases. Disk space requirements for test cases are included in the test case summaries.

3.1.2.1 Execution using Primary Input Data Source

3.1.2.1.1 DAS/G5-CERES Data and SMOBA

Go to MOA run directory and use primary input data source:

cd $CERESHOME/sarb/CER12.1P1/rcf
cp ssit-moa-env-G5.pl ssit-moa-env.pl

Specify non-production testing:

setenv PROD no

Set the Date and Instance variables:

setenv DATE 19971215
setenv INSTANCE CERES_SSIT-DAO-G5-CERES_999999.19971215

Execute the MOA Setup script for this test case:

./setupmoa.pl $DATE

Execution of the MOA Setup script creates the ASCII input file and PCF, respectively:

$CERESHOME/sarb/CER12.1P1/rcf/pcf/CER12.1P1_PCFin_$INSTANCE
$CERESHOME/sarb/CER12.1P1/rcf/pcf/CER12.1P1_PCF_$INSTANCE

Remove default limits on available memory:

unlimit

Execute RegridMOA Main-Processor for this test case:

./runmoa.pl CER12.1P1_PCF_$INSTANCE

Execution of the RegridMOA Main-Processor creates:

$CERESHOME/sarb/data/out_comp/data/regridmoa/CER_MOA_$INSTANCE*hh*
$CERESHOME/sarb/data/out_comp/data/regridmoa/CER_MOA_$INSTANCE*hh*.met

where “hh” equals “00”, “06”, “12”, and “18”

$CERESHOME/sarb/data/out_comp/qa_reports/regridmoa/CER_PQCR_$INSTANCE
$CERESHOME/sarb/data/out_comp/qa_reports/regridmoa/CER_PQCR_$INSTANCE.met

Table 3-1. Test Summary for PGE 12.1P1 (G5 test case)

	Warlock	Linux Cluster
Run Time	9:15 minutes	3:51 minutes
Memory	68064 k	68064 k
Required Disk Space	764 MB	764 MB

3.2 Evaluation Procedures

3.2.1 Exit Codes

Subsystem 12.0 software terminates using the CERES-defined EXIT CODES for LaTIS. Successful completion is indicated by an exit code of 0.

3.2.2 Log and Status File Results

The Error and Status Log file, LogReport, the LogStatus file, and the LogUser file will be located in directory $CERESHOME/sarb/runlogs after CERES Subsystem 12.0 has been executed.

3.2.3 Execution of Comparison Software

The evaluation software for the RegridMOA Main-Processor compares all of the parameter values that were written to the binary MOA files by PGE CER12.1P1 during SSI&T with all of the parameter values in the binary MOA files included with this software delivery. The comparison software should be executed for all five test cases.

To execute the comparison software for the MOA, type the following commands:

Execute the comparison processor for the Primary Input Data Source test:

cd $CERESHOME/sarb/CER12.1P1/test_suites/
./run_moa_compare CER_MOA_CERES_SSIT-DAO-G5-
CERES_999999.19971215

Execution of the comparison processor creates:

$CERESHOME/sarb/CER12.1P1/test_suites/
CER_MOA_CERES_SSIT-DAO-G5-
CERES_999999.19971215_test_suites_results

3.2.4 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from Subsystem 12.0 comparison software.

1. Examine the comparison report files by typing:

   more
   $CERESHOME/sarb/CER12.1P1/test_suites/
   CER_MOA_CERES_SSIT-DAO-G5-
   CERES_999999.19971215_test_suites_results

   If all goes well, each file will show only the processing date of both files for each hour being produced by the Langley ASDC with those produced by the CERES team.

2. E-mail the comparison report files listed above to Tom Caldwell, Thomas.E.Caldwell@nasa.gov.

3.3 Solutions to Possible Problems

All output files are opened with Status = NEW in Subsystem 12.0 software. These files must be removed before rerunning the software. A script to accomplish this task is included in this delivery. The script, **rm_script_12.1P1**, is executed using the PCF file name as a command-line argument. The script should be executed once for each set of files that is to be removed.

```
cd $CERESHOME/sarb/CER12.1P1/rcf/
./rm_script_12.1P1.pl CER12.1P1_PCF_CERES_SSIT-DAO-G5-
    CERES_999999.19971215
```

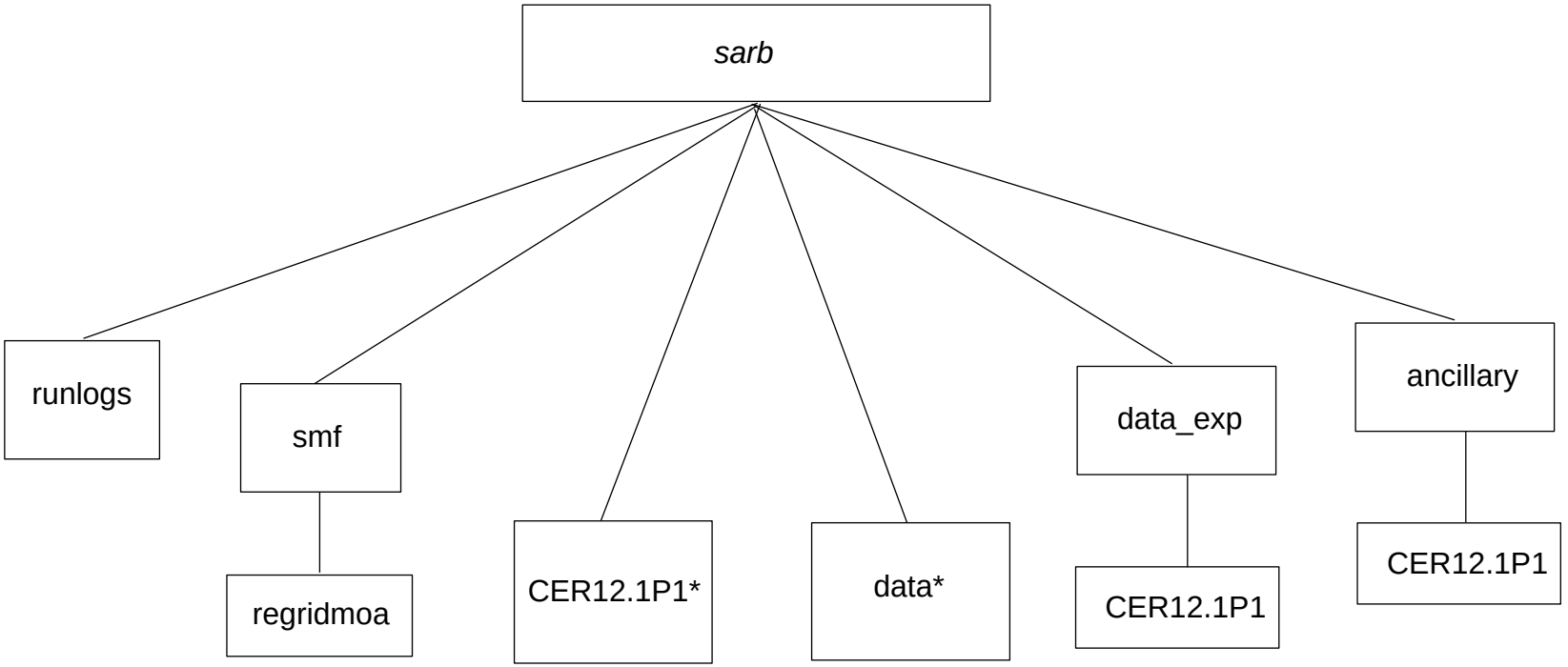
Appendix A
Acronyms and Abbreviations

ASCII	American Standard Code Information Interchange
ASDC	Atmospheric Sciences Data Center
CERES	Clouds and the Earth's Radiant Energy System
CERESlib	CERES library
DAAC	Distributed Active Archive Center
DAO	Data Assimilation Office
DAS	Data Assimilation System
ECMWF	European Centre for Medium-Range Weather Forecasting
ECS	EOSDIS Core System
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing Mission
EOSDIS	EOS Data Information System
EOS-PM	EOS Afternoon Crossing Mission
EP-TOMS	Earth Probe - Total Ozone Mapping Spectrometer
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
F90	Fortran 90
GEOS	Goddard Earth Observing System
GHRC	Global Hydrology Resource Center
HDF	Hierarchical Data Format
LaTIS	Langley TRMM Information System
MCF	Metadata Control Files
MOA	Meteorological, Ozone, and Aerosol
NASA	National Aeronautics and Space Administration
NCEP	National Centers for Environmental Prediction
NOAA	National Oceanic and Atmospheric Administration
PCF	Process Control File
PGE	Product Generation Executive
QC	Quality Control
SARB	Surface and Atmospheric Radiation Budget
SMF	Status Message Files
SMOBA	Stratospheric Monitoring Group Ozone Blended Analysis
SSF	Single Satellite CERES Footprint TOA and Surface Fluxes, Clouds
SSI&T	Subsystem Integration and Testing
SSM/I	Special Sensor Microwave / Imager

TISA	Time Interpolation and Spatial Averaging
TOA	Top-of-Atmosphere
TRMM	Tropical Rainfall Measuring Mission

Appendix B
Directory Structure Diagrams

BREAKDOWN OF THE SARB REGRIDMOA DIRECTORY



*Indicates additional charts for subpaths

Figure B-1. SARB Regrid MOA Delivery Directory Structure

BREAKDOWN OF THE DATA DIRECTORY

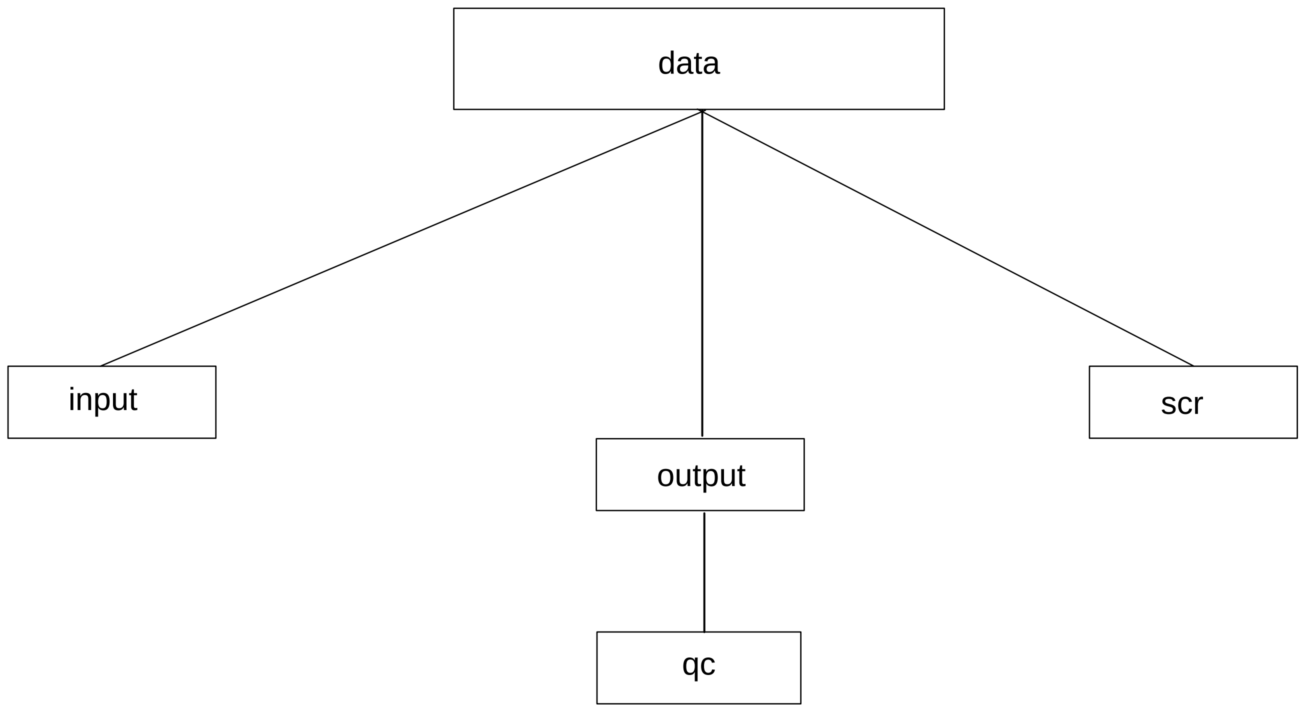


Figure B-1. SARB Regrid MOA Delivery Directory Structure

BREAKDOWN OF THE CER12.1P1 DIRECTORY

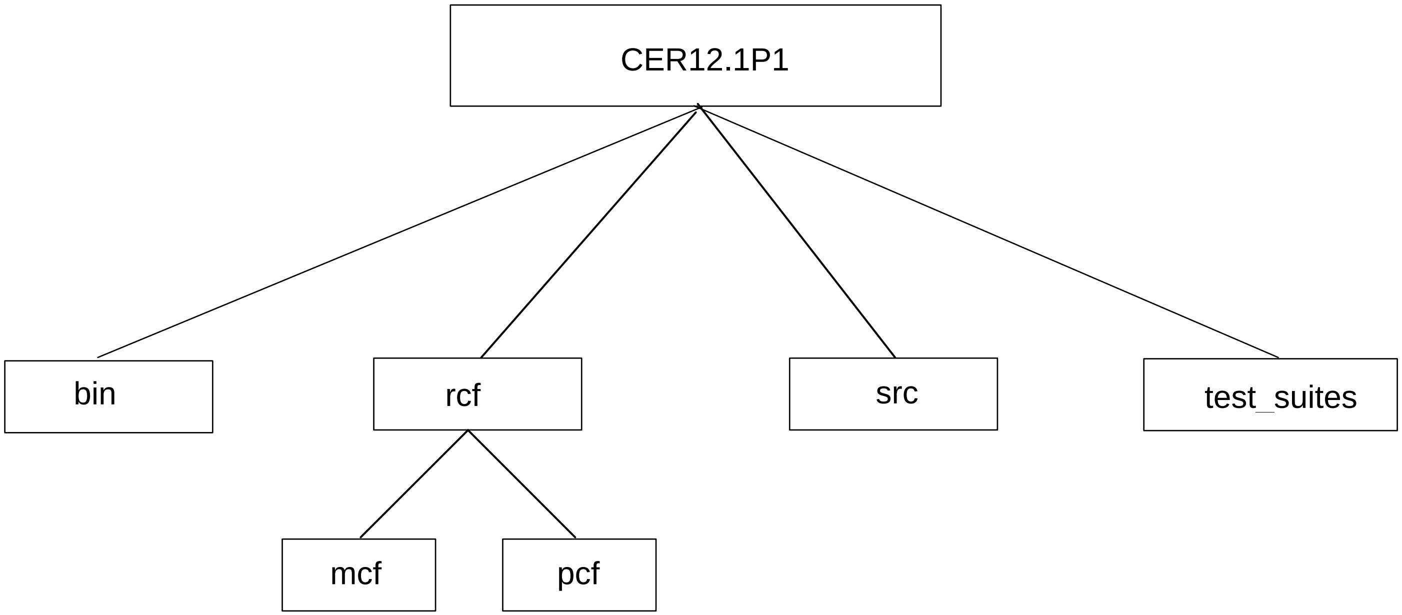


Figure B-1. SARB Regrid MOA Delivery Directory Structure

Appendix C
File Description Tables

C.1 Production Scripts

Table C.1-1. Production Scripts @ $(CERESHOME)/sarb/CER12.1P1/rcf/

File Name	Format	Description
ascii_gen_12.1P1.pl	ASCII	Perl script which creates the PCF generator's ASCII file needed by the Main Processor
pcfgen_12.1P1.pl	ASCII	Perl script which creates the PCF for the Main Processor
setupmoa.pl	ASCII	Perl script which executes the ASCII file and PCF generators
makemoa.pl	ASCII	Perl script which compiles the status message files and generates the MOA executable
runmoa.pl	ASCII	Perl script which executes the Main Processor
rm_script_12.1P1.pl	ASCII	Perl script which removes SS 12.0 output files
ssit-moa-env-G5.pl	ASCII	Perl script which sets the environment variables for test described in section 3.1.2.1

C.2 Executables

Table C.2-1. Executables @ $(CERESHOME)/sarb/CER12.1P1/bin/

File Name	Format	Description
MOA_Gen.exe[a]	Binary	Main Processor executable

a. This file will be generated on execution of Subsystem software and is not included in the tar file.

C.3 Status Message Files (SMF)

Table C.3-1. Status Message Files @ $(PGSMSG)

File Name	Format	Description
PGS_26500[a]	ASCII	Toolkit Status Message File
PGS_26501[a]	ASCII	Toolkit Status Message File
PGS_26502[a]	ASCII	Toolkit Status Message File
PGS_26503[a]	ASCII	Toolkit Status Message File
PGS_26504[a]	ASCII	Toolkit Status Message File
PGS_26505[a]	ASCII	Toolkit Status Message File
PGS_26506[a]	ASCII	Toolkit Status Message File
PGS_26507[a]	ASCII	Toolkit Status Message File
PGS_26508[a]	ASCII	Toolkit Status Message File
PGS_26509[a]	ASCII	Toolkit Status Message File
PGS_26510[a]	ASCII	Toolkit Status Message File
PGS_26511[a]	ASCII	Toolkit Status Message File
PGS_26512[a]	ASCII	Toolkit Status Message File
PGS_26513[a]	ASCII	Toolkit Status Message File
PGS_26514[a]	ASCII	Toolkit Status Message File
PGS_26515[a]	ASCII	Toolkit Status Message File

a. These files will be generated on execution of production software and are not included in the tar file.

C.4 Processing Control Files (PCF) and Metadata Control Files (MCF)

The Process Control Files are not included in the Software Delivery Package. They will be created by the PCF generator scripts.

Table C.4-1. Metadata Control Files @ $(CERESHOME)/sarb/CER12.1P1/rcf/mcf/

File Name	Format	Description
CPMOA_AA.mcf	ODL	MCF for Main Processor MOA files.
CPQCR_AA.mcf	ODL	MCF for Main Processor QC Report file

Table C.4-2. Process Control File @ $(CERESHOME)/sarb/CER12.1P1/rcf/pcf/

File Name	Format	Description
CER12.1P1_PCF_$SS12_$PS12_$CC12.yyyymmdd[a]	ASCII	Process Control File template for Main Processor

a. This file will be generated on execution of Subsystem software and is not included in the tar file. See operators manual for environment variable descriptions.

C.5 Production Source Code and Makefile

Table C.5-1. Fortran 90 Main Processor Code @ $(CERESHOME)/sarb/CER12.1P1/src/

File Name	Format	Description
Aerosols_Mod.f90	ASCII	Processes aerosol data
AirCalc_Mod.f90	ASCII	Determines air mass index
ColOzone_Mod.f90	ASCII	Processes ozone data
GEOS_Params.f90	ASCII	Contains parameters required to process DAS meteorological input data
GEOS2_MOD.f90	ASCII	Drives ingestion and processing of DAS-GEOS2 meteorological input data
GEOS3_MOD.f90	ASCII	Drives ingestion and processing of DAS-GEOS3 meteorological input data
GEOS4_MOD.f90	ASCII	Drives ingestion and processing of DAS-GEOS4 meteorological input data

Table C.5-1. Fortran 90 Main Processor Code @ $(CERESHOME)/sarb/CER12.1P1/src/

File Name	Format	Description
ECMWF_Access.f90	ASCII	Contains routines required to access ECMWF meteorological input data
ECMWF_Main.f90	ASCII	Drives processing of ECMWF meteorological data
ECMWF_Mod.f90	ASCII	Contains routines used in processing of ECMWF data
G5_Mod.f90	ASCII	Drives processing of G5-CERES meterological input data
Grid_Params.f90	ASCII	Contains parameters required by the gridding process
Grid_Setup.f90	ASCII	Contains routines necessary for gridding to the MOA output grid
Horiz_Inter.f90	ASCII	Converts data on one horizontal grid to another horizontal grid
MOA_Init.f90	ASCII	Contains initialization routines
MOA_Main.f90	ASCII	Regrid MOA Subsystem main program
MOA_LOGID.f90	ASCII	Parameter module of logic IDs for input and output files
MOA_Var.f90	ASCII	Contains type declarations for variables used throughout the Regrid MOA Subsystem
MW_H2O.f90	ASCII	Drives processing of microwave humidity data
NCEP_Ingest.f90	ASCII	Ingests NCEP (backup source) meteorological data
NCEP_Main2.f90	ASCII	Drives processing of NCEP data
PostProc.f90	ASCII	Drives processing of QC reports and MetaData
SAGE_Replace.f90	ASCII	Vertically and horizontally interpolates SAGE data to the output grid
Temp_Humid.f90	ASCII	Temporally and vertically interpolates temperature and humidity data
Temp_Humid_G5.f90	ASCII	Variation of Temp_Humid.f90 which accommodates G5 processing requirements
gbytes.c	ASCII	Extracts requested number of bytes from a word
sphertlib3.f90	ASCII	Converts NCEP wave data to data on a Gaussian grid
Makefile	ASCII	Makefile to produce executable
run_make	ASCII	Script to manage make settings on different platforms

C.6 Ancillary Input Data

Table C.6-1. Ancillary Input Data @ $(CERESHOME)/sarb/ancillary/CER12.1P1/

File Name	Format	Description
CERES000.prod.assim.const_2d_asm_Nx.00000000.hdf	HDF	DAS G5 orography data for G5 processing
GRIBZ19980701.bin	Binary	C program for reading orography data of ECMWF regions
GridParams_SS12.20081024	Formatted Namelist	Sizes and region counts for all of the grids used in the Regrid MOA Subsystem
RegCenters_SS12.20081024	Binary	Latitudinal and longitudinal coordinates of the CERES and Gaussian grids
Ozwts_mmm mmm = jan ... dec	ASCII	Monthly Zonal and pressure level dependent weighting factors for generating a vertical ozone profile
Pink_Stow_mm mm = 01 .. 12	Binary	Monthly Aerosol climatological data set
SAGE_WV_sss sss = spr, sum, aut, win	Binary	Seasonal SAGE water vapor climatology data set
ozone_clim.dat	ASCII	Ozone climatology derived from EPToms data

C.7 Primary Input Data

Table C.7-1. Primary Input Data Files @ $(CERESHOME)/sarb/data/inpuregridmoa/

File Name	Format	Description
CERES100.prod.assim.tavg1_2d_slv_Nx.yyyymmdd.hdf[a]	HDF	DAS-G5 0.5x0.67 hourly surface data Use when Production Strategy is DAO-G5-CERES
CERES100.prod.assim.inst6_3d_ana_Np.yyyymmdd.hdf[a]	HDF	DAS-G5 0.5x0.67 6-hourly profile data Use when Production Strategy is DAO-G5-CERES
f13_iwva_yyJJJ_dayAD.hdf[b]	HDF	SSM/I microwave humidity data
f14_iwva_yyJJJ_dayAD.hdf[b]	HDF	SSM/I microwave humidity data
ozYYMMDD.dat[c]	ASCII	SMOBA ozone data
ozYYMMDD.dat[c]	ASCII	SMOBA ozone data

a. yyyymmdd = 19971215
b. yyJJJ = 97347 thru 97351
c. YYMMDD = 971214, 971215