Clouds and the Earth's Radiant Energy System

(CERES)

Data Management System

Operator's Manual

TISA Averaging
(Subsystems 7.1, 8.0, & 10.0)

Release 5
Version 19

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Document Revision Record

The Document Revision Record contains information pertaining to approved document changes. The table lists the date the Software Configuration Change Request (SCCR) was approved, the Release and Version Number, the SCCR number, a short description of the revision, and the revised sections. The document authors are listed on the cover. The Head of the CERES Data Management Team approves or disapproves the requested changes based on recommendations of the Configuration Control Board.

Document Revision Record

SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
06/28/01	R3V3	276	• Added the command to execute the clean up script.	Sec. 1.5.4
			• Corrected file name errors. Added plot file names for the cloud layer effective pressures and optical depths.	Table 1-5
			• Corrected the data file names. Added data file name for the cloud layer effective pressures and optical depths.	Table 1-6
			• Updated format to comply with standards.	All
04/01/02	R3V4	334	• Changed the alternate name, email and phone number.	Sec. 1.1.1
			• Added the PCF and log files and SRBAVG file.	Table 1-5
			• Took CAFR.{YYYY}{MM}_$INST and CSFR.{YYYY}{MM}_$INST out.	Table 1-6
			• Updated format to comply with standards.	All
01/22/03	R3V5	418	• Added PGE name for Subsystem 7.1 in Document Overview.	Document Overview
			• Added Subsystem 7.1 in Subsystem Overview.	Subsystem Overview
			• Deleted "EOS" to correct since SRBAVG is an HDF product.	All
			• Added PGE name CER7.1.1P1.	Sec. 1.0
			• Corrected Table number.	Sec. 2.1.2
			• Corrected Section number.	Sec. 2.2.5
			• Corrected Table number.	Sec. 2.4.1
			• Corrected Table number.	Sec. 2.4.5
			• Corrected Table number.	Sec. 2.5.1
			• Corrected Section number.	Sec. 2.5.4
			• Added Instrument code for AQUA.	Table 2-5
			• Updated format to comply with standards.	All

Document Revision Record

SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
08/25/03	R3V6	462	• Added Subsystem 8 in the Document Overview. • Added Subsystem 8 in the Subsystem Overview. • Added PGEName: CER8.1P1. • Updated format to comply with standards.	Document Overview Subsystem Overview Sec. 2.0 All
03/25/04	R3V7	516	• Removed /QA from output files. • All files written to CERESHOME/tisa_avg/web/* were changed to "permanent." • Updated format to comply with standards.	All All All
04/20/05	R4V1	583	• Delete the two PGEs CER10.2P1 and CER10.3P1. • Added phase one to create the snow map, the monthly and monthly hourly means CERESclear-sky albedo and SW flux and clear-sky map. • Added PGE CER10.1P2. • Changed ENV10.1P1-env.csh to ENV10.1P2 and took out CC9_1. • Changed ENV10.1P1-env.csh to ENV10.1P2. • Updated format to comply with standards.	Document Overview Sec. 3.0 Sec. 4.0 Sec. 4.2.2 Sec. 4.4 All
04/24/06	R4V2	624	• Added new PGE CER10.1P3. • Added the CER11.6P1 PGE for Parent PGE. • Added GGEOW input dataset. • Added PGE CER11.6P1. • Corrected the Production Strategy and the Configuration code. • Corrected the Production Strategy for input SFC. • Added GGEOW input dataset. • Corrected the Production Strategy and Configuration code for input dataset mhr-csalb. • Corrected the Production Strategy and Configuration code for input dataset csalb0-intrp2s. • Corrected the Production Strategy and Configuration code for input dataset SNOW-PCT.	Document Overview Sec. 1.1.3 Sec. 1.3.3 Sec. 3.1.3 Sec. 3.2.2 Sec. 3.3.2 Sec. 3.3.3 Sec. 3.3.4 Sec. 3.3.5 Sec. 3.3.6

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SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
04/24/06 (Cont'd)	R4V2	624	• Changed CC10_1 to CC10. • Changed the PS and CC code for CER10.1P2. • Added information for PGE CER10.1P3. • Added CER11.6P1 PGE. • Added GGEOW input dataset. • Updated format to comply with standards.	Sec. 3.4 Sec. 4.2 Sec. 5 Sec. 5.1.3 Sec. 5.3.3 All
07/10/06	R4V3	631	• Changed file names and added inputs. • Corrected the directories for the input files. • Modified filename. • Updated format to comply with standards.	Sec. 1.0 Sec. 5.3 Sec. 1.3.3 All
10/04/06	R4V4	637	• Added a new PGE CER10.1P4 for Aqua processing. • Removed the input data for CER7.1.1P1. • Added a new PGE CER10.1P5 for Aqua phase one processing.	Sec. 6.0 Sec. 1.3.7 Sec. 7.0
11/15/06	R4V5	639	• Updated PGE CER8.1P1 for new processing. • Added a new PGE CER8.2P1 for creating SYN product Web plots. • Added a new cleanup script for all subsystems. • Added SSAI to Acronyms and Abbreviations. • Changed SAIC to SSAI in Contact Tables throughout the document. • Added 8.2P1 as a target pge in Table 2-3. • Added 8.2P1 as a target pge and removed "rm" from Table 2-5.	Sec. 2.0 Sec. 3.0 All App. A All Sec. 2.1.4 Sec. 2.6
02/08/08	R4V6	667	• Updated PGE CER8.1P1 to add the .gif files in the output data part. • Deleted PGE CER8.2P1 and merged this PGE with PGE CER8.1P1.	Sec. 2.0 Sec. 3.0
08/06/08	R5V1	677	• Updated PGE CER7.1.1P1 to include the new directory structure. • Added /pcf to PCF, and PCFIN, and changed 7.1P1 to 7.1.1P1 to PCF, PCFin, LogReport, LogStatus, and LogUser expected output filenames. (10/06/08)	Sec. 1.0 Table 1-6

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11/12/08	R5V2	689	• Updated PGE CER8.1P1 to include the new directory structure.	Secs. 2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 2.5.2, 2.5.3, 2.5.4, & Table 2-5
			• Updated information in contact tables.	Tables 1-1, 2-1, 3-1, 4-1, 5-1, 6-1, & 7-1
			• Updated to change the scripts from bin to rcf directory. (11/17/2008)	Secs. 2.4, 2.5, 2.6
04/05/07	R5V3	650	• Disabled PGEs CER10.1P1, CER10.1P2, CER10.1P3, CER10.1P4, CER10.1P5.	Secs. 3.0, 4.0, 5.0, 6.0, & 7.0
			• Add PGEs CER10.0P1 and CER10.0P2.	Secs. 8.0 & 9.0
			• Input filenames were modified. (04/19/2010)	Secs. 9.3.4 & 9.3.5
			• Removed /QA from expected output file listings in the destination column. (06/04/2010)	Table 2-5
07/19/10	R5V4	796	• Added PGE CER7.3.1P1.	Sec. 2.0
			• Added PGE CER10.0P3.	Sec. 11.0
			• Added SS, PS and CC for GGEO input data. (09/21/2010)	Sec. 11.2.2
			• Added GGEO input descriptions. (09/21/2010)	Sec. 11.3.3
08/11/10	R5V5	801	• SNOW-PCT input file was added as it was deleted earlier and shouldn't have been.	Sec. 1.3.7
			• Updated PGE CER7.3.1P1 to be run on *AMI-P6* platform.	Sec. 2.0
			• Updated PGE CER10.0P3 to be run on *AMI-P6* platform.	Sec. 11.0
			• Added "Available Through Ordering Tool" column and removed red "meta" from expected output tables.	All Expected Output Tables
07/19/10	R5V6	795	• Updated the HDF output files to be Monthly, Monthly-3Hour, and kept Synoptic 3 hour the same.	Overview
			• Updated to run PGE CER8.1P1 on *P6* in support of Terra-Aqua and SGE.	Sec. 3.0
			• Added information referencing FM1 and FM2. (01/07/2011)	Sec. 3.0

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SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
07/19/10 (Cont'd)	R5V6	795	• Corrected the file path for the LRGRP files. (02/14/2011)	Sec. 3.6
			• Added the PCF log file to Table 3.5 and made a note in Section 3.4.1. (07/01/11)	Sec. 3.4.1 & Table 3-5
08/11/10	R5V7	801	• Added satellite options for PGE CER7.3.1P1.	Sec. 2.0
			• Added satellite options for PGE CER10.0P3.	Sec. 11.0
			• Corrected the directory for TSI-xglb. (01/10/2012)	Table 11-6
			• Added the INST_ID for Terra instruments. (01/23/2012)	Sec. 3.2.2
			• Added INSTR_NAME and PLAT for the Environment Script Requirements. (02/01/2012)	Sec. 3.2.2
			• Updated the valid INSTR_NAME. (03/26/2012)	Sec. 3.2.2
			• Modified a link and document title name. (04/10/2012)	References
			• Updated table footnotes for PGE CER8.1P1. (04/11/2012)	Table 3-5
			• Added INSTR_NAME and PLAT for the Environment Script Requirements. (08/23/2012)	Secs. 2.2.2 & 11.2.2
10/05/12	R5V8	934	• Added PGE CER10.0P4 to produce SSF1deg data in GMT time.	Sec. 12.0
			• The parameter PLAT was changed to read "PLAT equals INSTR_Name". (05/02/2013)	Sec. 3.2.2
			• Added PCF, PCF log files, .met files, and deleted LogUser file. (05/09/2013)	Table 12-6
			• LogUser file was added back in. (05/09/2013)	Table 12-6
			• Updated the output data path. (05/14/2013)	Table 12-6
			• Removed PGEs CER7.1.1P1, CER10.1P1, CER10.1P2, CER10.1P3, CER10.1P4, CER10.1P5, CER10.0P1, and CER10.0P2. (09/05/2013)	Secs. 1.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, & 10.0
			• Updated Expected Output Tables. (09/05/2013)	Tables 1.6 & 3.6
			• Modified Target PGE for TSIB output file. (09/19/2013)	Table 1-6
			• Modified script requirements. (09/19/2013)	Sec. 2.2.2
			• Changed all the "Do not remove" in the "File Disposition after successful execution:" to "N/A and made a few other minor modifications. (09/19/2013)	Secs. 1.3.1-1.3.7, 2.3.1, 2.3.2, 3.3.1-3.3.3, & 4.3.1
			• Changed "M" to "m" in the "m/o" output table column to conform to standards. (10/04/2013)	Table 1-6

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10/05/12 (Cont'd)	R5V8	934	• Minor table modifications (changed double lines to single lines). (10/04/2013)	Tables 2-4, 2-5, 3-2, 3-6, 4-2, & 4-6
			• Modified SSF1deg-Day(met) output filename. (10/08/2013)	Table 4-6
			• Fixed some cross reference link issues. (10/11/2013)	
			• Added the PCF.log file destination. (02/05/2014)	Tables 1.6 & 3.6
			• Removed "Archive" from PCF.log output file. (02/05/2014)	Table 4-6
			• Added DPO to destination column for output files that need to be placed not only into the Archive, but into the DPO, and also removed the "rm" destination for the same files. (06/04/2014)	Tables 1-6, 2-5, 3-6, & 4-6
			• Modified filename of PCF and PCF.log file. (06/04/2014)	Table 4-6
06/14/14	R5V9	1016	• Removed x86 references for PGE CER10.0P4.	Secs. 4.0, 4.4.2
			• Corrected spelling for product name in text.	Sec. 4.4.4
			• Added "Archive" to PGEs CER7.3.1P1, CER10.0P3, and CER10.0P4 PCF.log output file destination. (09/10/2014)	Tables 1-6, 3-6, & 4-6
06/23/14	R5V10	1023	• Added new PGE CER10.0P5.	Sec. 5.0
			• Added InputArchiveSS. (02/12/2015)	Sec. 5.2.2
			• Corrected the instrument names. (04/01/2015)	Sec. 9.2.2
			• Removed reference to x86 platform. (05/05/2015)	Sec. 9.0
			• Added environment parameter. (05/19/2015)	Sec 9.2.2
06/23/14	R5V11	1024	• Added 3 new PGEs – CER7.3.1P2, CER7.3.1P3, and CER7.3.1P4.	Secs. 2.0, 3.0, & 4.0
			• Deleted an extra space in an input filename. (02/26/2015)	Secs. 3.3.3 & 4.3.4
			• Corrected errors in directories and filenames. (03/03/2015)	Table 2-6
			• Added .met file for Aqua SSF. (03/03/2015)	Sec. 2.3.1
			• Updated PGE CER7.3.1P2 to correct processing strategy. (03/05/2015)	Secs. 2.2.2 & 2.3.1
			• Updated PGE CER7.3.1P3 to add SS7_2, PS7_2, and CC7_2. (03/05/2015)	Sec. 3.2.2
			• Added input data from PGE CER7.3.1P2. (03/05/2015)	Sec. 3.3.5

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SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
06/23/14 (Cont'd)	R5V11	1024	• Corrected input data indexes. (03/05/2015)	Secs. 4.3.2, 4.3.3, & 4.3.4
			• Added climatology data. (03/05/2015)	Sec. 4.3.8
			• Added PGE CER7.3.1P2 to Target name column. (03/05/2015)	Table 3-2
			• Added PGE CER7.3.1P2 to Target name column. (03/05/2015)	Table 4-2
			• Modified input filename. (03/05/2015)	Sec. 4.3.5
			• Removed target PGE from TSI-SNOW-PCT output file. (03/05/2015)	Table 3-6
			• Updated to change the file names. (03/09/2015)	Table 2-6, Secs. 3.3.5 & 4.3.8
			• Changed input files from Optional to Mandatory and changed GGEO_1HR filenames. (03/25/2015)	Secs. 3.3.3 & 4.3.4
			• Correction to 7.3.1P4 info for platforms on which to run. (03/25/2015)	Sec. 4.0
			• Correct GGEO directory paths. (03/26/2015)	Secs. 3.3.3 & 4.3.4
			• Correct the environments for PGEs 7.3.1P2, 7.3.1P3, 7.3.1P4, and 8.1P2. (04/08/15)	Secs. 2.0, 3.0,4.0,6.0 & Tables 2-6, 3-6, & 4-6
			• Corrected the INSTR_NAME and PLAT environment parameters. (05/19/2015)	Secs. 3.2.2 & 4.2.2
			• Corrected typo error PS7_3_3. (05/19/2015)	Sec. 4.3.5
			• Modified sentence to remove "or Only Aqua." (05/19/2015)	Sec. 4.0
			• Corrected typo error. (05/19/2015)	Sec. 2.4.2
			• Corrected environment parameters. (05/19/2015)	Sec. 2.2.2, 3.2.2, & 4.2.2
			• Corrected Crosstrack months for FM4. (07/29/2015)	Sec. 2.2.2
06/23/14	R5V12	1025	• Added 1 new PGE - CER8.1P2.	Sec. 6.0
			• Added 8.1P2 and 10.0P5 to list.	Document Overview
			• Added 8.1P2 to text.	App. B

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SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
06/23/14 (Cont'd)	R5V12	1025	• Environment variables: Correct some, add curly brackets to others in order to allow an underscore character to appear directly after. PGEs CER7.3.1P2, CER7.3.1P3, CER7.3.1P4, and CER8.1P2. (04/13/2015)	Secs. 2.4.1, 2.4.2, 2.5.3, 3.3.1, 3.3.2, 3.3.5, 3.4.1, 3.4.2, 3.5.3, 4.3.2, 4.3.3, 4.3.5, 4.3.6, 4.3.7, 4.3.8, 4.4.1, 4.4.2, 4.5.3, 6.4.1, 6.4.2, 6.5.3, Tables 2-6, 3-6, 3-7, 4-6, & 6-5
			• Add and expand input filenames for PGE CER7.3.1P4. (04/13/2015)	Sec. 4.3.5
			• Minor fixes. (04/13/2015)	Sec. 2.3.1
			• Removed references to P6 platform for PGEs CER7.3.1P2, CER7.3.1P3, CER7.3.1P4, and CER8.1P2. (04/10/2015)	Secs. 2.0, 3.0, 4.0, 6.0, & 6.2.4
			• Clarified descriptions of environment variables for PGEs CER8.1P1 and CER8.1P2. (04/15/2015)	Secs. 5.2.2 & 6.2.2
04/16/15	R5V13	1069	• Added run on x86 option.	Sec. 8.0
			• Corrected environment errors. (05/19/2015)	Sec. 8.2.2
			• Added platform to the list of SGE_Driver arguments for CER10.0P4. (06/04/2015)	Sec. 8.4.2
06/03/15	R5V14	1075	• Added run on x86 option for CER10.0P5.	Secs. 9.0 & 9.4.2
			• Correct the input directory for SSF1degB. (04/15/2016)	Sec. 9.3.1
			• Correct SS9 and PS9 for SFCB and SSF1degB. (04/15/2016)	Secs. 7.3.1, 7.3.2, & 8.3.1
11/18/15	R5V15	1097	• CER8.1P2: Added instructions to clean previous output.	Secs. 6.4.4 & 6.5.4
			• Adjusted memory/disk space/time requirements.	Sec. 6.2.4
			• Updated exit code to match expected standard.	Sec. 6.5.1
			• Added SYN1deg-MHour files and removed SYNB intermediate files from the expected output file table.	Table 6-5
			• Added Temporary Files table with SYNB files.	Table 6-6

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SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
11/18/15 (Cont'd)	R5V15	1097	• Updated file disposition for TSIB inputs and SYN1deg outputs. (01/29/2016)	Sec. 6.3.1 & Table 6-5
			• Updated file disposition for SSF1deg Ed3 and Ed4 outputs. (01/29/2016)	Table 8-6 & Table 9-6
			• Updated file dispositions for TSIB outputs and SYN1deg input TSIB files. (3/11/2016)	Tables 1-6 & 4-6, & Sec. 6.3.1
			• Added PGE name for CER7.3.1P2. (3/24/2016)	Sec. 2.0
05/25/16	R5V16	1134	• Added environment variables for NPP.	Secs. 3.2.2 & 4.2.2
			• Added NPP input datasets.	Secs. 3.3.3 & 4.3.4
			• Added input SORCE dataset.	Secs. 3.3.7 & 4.3.10
			• Added command line for NPP.	Secs. 3.4.1, 3.4.2, & 4.4.1
09/19/16	R5V17	1177	• Added sibiMap input dataset.	Sec. 9.3.2
			• Corrected SSF1degB input directory.	Sec. 9.3.1
			• Added the SS, PS, and CC for the sibiMap. (10/04/2016)	Sec. 9.2.2
10/26/16	R5V18	1122	• Updated parent PGE instrument lists.	Table 6-2
			• Updated environment variable values.	Sec. 6.2.2
			• Updated output file sizes, added sge_log to output table, and updated legend. (03/01/2017)	Table 2-6
			• Added sge_log to output table, corrected 'xglb' file directories, and updated legend. (03/01/2017)	Table 3-6
			• Added sge_log to output table and updated legend. (03/01/2017)	Table 4-6
			• Corrected sge_log file in output table. (03/01/2017)	Table 6-5
			• Added sge_log to output table, consolidated main output files with their met files, and updated legend. (03/01/2017)	Table 9-6
			• Updated valid value for YYYY. (03/01/2017)	Tables 3-4, 4-4, 6-3, & 9-4
			• Corrected environment script name. (03/01/2017)	Sec. 3.2.2
			• Corrected input file name. (03/01/2017)	Secs. 3.3.1 & 4.3.2

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SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
10/26/16 (Cont'd)	R5V18	1122	• Corrected incomplete input file path and updated typical file size. (03/01/2017)	Secs. 3.3.1, 3.3.2, 3.3.3, 4.3.2, 4.3.3, & 4.3.4
			• Corrected alternate dataset to 'N/A' and updated typical file size. (03/01/2017)	Secs. 3.3.4 & 4.3.5
			• Corrected 'xglb' input file directories. (03/01/2017)	Sec. 4.3.6
			• Adjusted input file size to correct units. (03/01/2017)	Sec. 4.3.8
03/21/16	R5V19	1121	• Added SS4_11, PS4_11, CC4_11 for CER7.3.1P3 and P4. Updated PLAT, IMAGE.	Secs. 3.2.2 & 4.2.2
			• Added Input data Sibi Map.	Secs. 3.3.8 & 4.3.11
			• Added 'rm' to TSI-SNOW-PCT file destination.	Table 3-6
			• Corrected Edition4 'xglb' file directories.	Table 3-6 & Sec. 4.3.6
			• Changed input file disposition from 'N/A' to 'rm'.	Secs. 4.3.6, 4.3.7, 4.3.8, & 4.3.9
			• Removed PGEs and any references to the following PGEs CER7.3.1P1, CER8.1P1, CER10.0P3, and CER10.0P4. (03/07/2019)	All

Preface

The Clouds and the Earth's Radiant Energy System (CERES) Data Management System 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 Science Data Center (ASDC), produces an extensive set of science data products.

The Data Management System consists of 12 subsystems; each subsystem represents one or more stand-alone executable programs. Each subsystem executes when all of its required input data sets are available and produces one or more archival science products.

This Operator's Manual is written for the data processing operations staff at the Langley ASDC by the Data Management Team responsible for this Subsystem. Each volume describes all Product Generation Executables for a particular subsystem and contains the Runtime Parameters, Production Request Parameters, the required inputs, the steps used to execute, and the expected outputs for each executable included within this Subsystem. In addition, all subsystem error messages and subsequent actions required by the ASDC operations staff are included.

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

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Introduction

CERES is a key component of EOS and NPP. The first CERES instrument (PFM) flew on TRMM, four instruments are currently operating on the EOS Terra (FM1 and FM2) and Aqua (FM3 and FM4) platforms, and NPP (FM5) platform. CERES measures radiances in 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 last data processed from the PFM instrument aboard TRMM was March 2000; no additional data are expected. Until June 2005, one instrument on each EOS platform operated in a fixed azimuth scanning mode and the other operated in a rotating azimuth scanning mode; now all are typically operating in the fixed azimuth scanning mode. The NPP platform carries the FM5 instrument, which operates in the fixed azimuth scanning mode though it has the capability to operate in a rotating azimuth scanning mode.

CERES climate data records involve an unprecedented level of data fusion: CERES measurements are combined with imager data (e.g., MODIS on Terra and Aqua, VIIRS on NPP), 4-D weather assimilation data, microwave sea-ice observations, and measurements from five geostationary satellites to produce climate-quality radiative fluxes at the top-of-atmosphere, within the atmosphere and at the surface, together with the associated cloud and aerosol properties.

The CERES project management and implementation responsibility is at NASA Langley. The CERES Science Team is responsible for the instrument design and the derivation and validation of the scientific algorithms used to produce the data products distributed to the atmospheric sciences community. The CERES DMT is responsible for the development and maintenance of the software that implements the science team's algorithms in the production environment to produce CERES data products. The Langley ASDC is responsible for the production environment, data ingest, and the processing, archival, and distribution of the CERES data products.

Document Overview

This document, the CERES Release 3 Operator's Manual for the Time Interpolation and Averaging Subsystem (TISA) 10.0, provides an overview of the operating environment, the operating procedure, and evaluation of the expected output files of the three Subsystems. This document is organized as follows:

Subsystem Overview

Subsystem 7.1 - Time Interpolation for Single and Multiple Satellites

The time interpolation process (7.1), one of the two key parts of Subsystem 7.0, temporally interpolates CERES data and produces hourly of top-of-the-atmosphere (TOA) fluxes and cloud properties on a 1.0-degree equal-area grid. Another key part of Subsystem 7.0, the Synoptic Surface and Atmospheric Radiation Budget (SARB), Subsystem 7.2, produces the Intermediate Synoptic Radiative Fluxes and Clouds (SYNI), which contains the vertical structure of atmospheric and surface flux using the interpolated data as input and boundary conditions.

The main input to the time interpolation process is the Hourly Gridded Single Satellite Fluxes and Clouds (SFC) product, produced by Atmospheric Gridding and Spatial Averaging, Subsystem 9.0. The gridded shortwave (SW) and longwave (LW) TOA fluxes and cloud information are the key items to be interpolated. The radiative profile will be recalculated in the SARB part of Subsystem 7.0 using the interpolated fluxes as constraints. This process produces the internal product, Time Space Interpolate (TSI). These files contain nested grid region data which is the input to Subsystem 7.2.

The time interpolation process produces global maps of TOA total-sky LW and SW flux, TOA clear-sky LW and SW flux, TOA window radiances, and cloud properties at every hour Greenwich Mean Time (GMT) for every day of the month. The process of producing involves several steps:

1. Cloud properties from the CERES times of observation are interpolated.
2. The CERES TOA LW and SW fluxes are interpolated for every hour using geostationary data to assist in modeling meteorological variations between times of observations.

Subsystem 8.0 - Compute Regional, Zonal, and Global Averages

The Monthly Regional, Zonal, and Global Radiation Fluxes and Cloud Properties Subsystem produces regional, zonal and global monthly and monthly-3-hourly means. These means are calculated from one month of synoptic maps on a regional basis and then combined to produce zonal and global averages.

The main input to this Subsystem is the Surface and Atmospheric Radiation Budget (SARB) product, produced by Subsystem 7.2, SYNI. This product contains one month of 3-hourly synoptic maps of top-of-atmosphere (TOA) LW and SW fluxes, TOA window fluxes, upwelling and downwelling SW and LW fluxes at each standard CERES pressure level, and numerous cloud parameters for each region of the CERES global 1.0-degree equal-area grid. The flux parameters include both total-sky and clear-sky.

The four archival products output from CER8.1P2, the Edition4 Processor in this Subsystem are the Monthly Regional, Zonal and Global Radiative Fluxes and Clouds (Monthly) product (HDF

format) which contains the regional, zonal and global monthly means of fluxes and cloud parameters, the Daily Regional Radiative Fluxes and Clouds (Day) product (HDF format) which contains the regional daily averages of the above parameters, the 3-Hourly Regional Radiative Fluxes and Clouds (3Hour) product (HDF format) which contains regional synoptic 3-hourly averages of the above parameters, and the 1-Hourly Regional Radiative Fluxes and Clouds (1Hour) product (HDF format) which contains regional 1-hour averages of the above parameters.

The main steps involved in the averaging process are:

1. Read the synoptically ordered data.
2. Average the flux data to produce regional synoptic hourly, monthly and monthly-hourly means.
3. Average the cloud properties using the specified weighting schemes to produce regional synoptic hourly, monthly and monthly-hourly means.
4. Average the regional means to produce zonal means.
5. Average the zonal means to produce global means.

Subsystem 10.0 - Compute Monthly and Regional TOA and SRB Averages

The Monthly Regional TOA and SRB Averages Subsystem (10.0) computes averages of TOA longwave (LW) and shortwave (SW) fluxes, and cloud properties on regional, zonal, and global spatial scales. The main input to Subsystem 10.0 is the Hourly Gridded Single Satellite TOA and Clouds (SFC) product produced by Surface Gridding and Spatial Averaging Subsystem (9). SFC contains hourly single satellite flux and cloud properties averaged over 1.0-degree regions. Subsystem 10.0 produces the Monthly and Daily Regional TOA and SRB Averages (SSF1deg) product (HDF format).

The process of producing the means stored in SSF1deg-Month and SSF1deg-Daily involve:

1. The TOA clear-sky flux data and the cloud property data are linearly interpolated.
2. Monthly and daily means are calculated from the interpolated fluxes and cloud properties on regional, zonal, and global scales.

Subsystem 10.0 - Compute Monthly and Monthly Hourly CERES Albedo and SW Flux

The monthly and monthly hourly albedo and SW flux and the clear-sky albedo map are required for inputs into Subsystem 10.0. The main input to compute the average albedo and SW flux for each region are the Hourly Gridded TOA and Clouds (SFC) product from Subsystem 9.0

The process of producing the monthly and monthly hourly albedo and SW flux involved:

1. Timely interpolate the TOA albedo and SW flux for each region.
2. Spacial average the albedo and SW flux.
3. A clear-sky map of albedo is then produced for inputs to compute the GGEO fluxes.

1.0 PGEName: CER7.3.1P2

TO BE RUN ON *AMI-x86* PLATFORM

CERES Aqua Climatology Data for All-sky LW

Note: Climatology Data for CERES Aqua Only

1.1 PGE Details

1.1.1 Responsible Persons

Table 1-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Cathy Nguyen	Dennis Keyes
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1666	951-1650
Fax	951-1900	951-1900
LaRC email	Le.T.Nguyen@nasa.gov	Dennis.F.Keyes@nasa.gov

1.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 1-1.

1.1.3 Parent PGE(s)

Table 1-2. Parent PGEs for CER7.3.1P2

PGEName	Description
CER4.5-6.1P6	CERES Subsystems 4.5 and 4.6 SSF Subset Postprocessor for Terra and Aqua Processing for Edition4 and NPP Edition1

1.1.4 Target PGE(s)

Table 1-3. Target PGEs after CER7.3.1P2

PGEName	Description
CER7.3.1P3	Flux Narrowband to Broadband coefficients of Merged Terra and Aqua Satellites
CER7.3.1P4	Time Interpolation of Merged Terra and Aqua Satellites

1.2 Operating Environment

1.2.1 Runtime Parameters

Table 1-4. Runtime Parameters for CER7.3.1P2

Parameter	Description	Data Type	Valid Values
MM	CERDataDateMonth	I(2)	01 .. 12
YYYY	CERDataDateYear	I(4)	>2001

1.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**CER7_3_1P2_env.pm'** and contains the following parameters:

SS7_3_2 Output Sampling Strategy for Subsystem 7.3, see Production Request
SS4_5 Input Sampling Strategy for Subsystem 4, see Production Request
PS7_3_2 Output Production Strategy for Subsystem 7.3, see Production Request
PS4_5 Input Production Strategy for Subsystem 4, see Production Request
CC7_3_2 Output Configuration Code for Subsystem 7.3, see CM Database
CC4_5 Input Configuration Code for Subsystem 4, see CM Database
SW7_3_2 Output Software SCCR# for Subsystem 7.3, see CM Database
DATA7_3_2 Output Data SCCR# for Subsystem 7.3, see CM Database
INST FM4 for the following months:
Year 2002, months: 07, 08, 09, 10
Year 2003, months: 02, 03, 04, 08, 09, 10, 11, 12
Year 2004, all months
Year 2005, months: 01, 02, 03
FM3 for all other months
SAT Aqua

IMAG MODIS
InputArchive Directory from which to read the input data products, for all production processing this directory should be set to **/ASDC_archive/CERES**
InputArchiveSS Input data directory is **$CERESHOME/inversion/data**

1.2.3 Execution Frequency (daily, hourly, or monthly)

monthly (1/month) - This PGE is processed once per month, when input is available.

1.2.4 Memory/Disk Space/Time Requirements

Memory:	128MB
Disk Space:	21.6 GB
Total Run Time:	30 minutes

1.2.5 Restrictions Imposed in Processing Order

None. Process when input data are available (see Section 1.3).

1.3 Processor Dependencies (Previous PGEs, Ingest Data)

Note: Include required .met files, header files, .. all required inputs

1.3.1 Input Dataset Name (#1): SSF Aqua

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/SSF/${SS4_5}_${PS4_5}/yyyy/mm
CER_SSF_${SS4_5}_${PS4_5}_${CC4_5}.yyyymmddhh, where dd=01..31,hh=00..23

$InputArchive/SSF/${SS4_5}_${PS4_5}/yyyy/mm
CER_SSF_${SS4_5}_${PS4_5}_${CC4_5}.yyyymmddhh.met, where dd=01..31,hh=00..23

1. Mandatory/Optional: **Mandatory but with whichever files available. If some SSF Aqua files are not available, it will skip those.**
2. Time Related Dependency:

   The data must match the Runtime Parameters yyyy, mm, dd, hh.
3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER4.5-6.1P6

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **130 MB per hour**

1.4 Operating Procedures (Procedure for each part of the processor's elements)

The main processor production script, **run_CER7.3.1P2.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first executing the generator, **CER7.3.1P2_pcf_gen.pl** after all of the necessary environment variables in Section 1.2.2 have been set**.** To run via SGE execute the production script by typing **CER7.3.1P2-SGE_Driver.pl** followed by the data date.

1.4.1 How to Generate the PCF File for manual operations

The PCF file generator requires two (2) command line arguments:

(-d)	2-character static code to indicate that a date follows
(YYYY)	4-digit year
(MM)	2-digit month

At the command line (>) type:

> cd $CERESHOME/tisa_avg/CER7.3.1P2/rcf

For Aqua only:

> ./CER7.3.1P2_pcf_gen.pl -date {YYYY}{MM}

The following file will be generated in **$CERESHOME/tisa_avg/CER7.3.1P2/rcf/pcf**:
CER7.3.1P2_PCF_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}
CER7.3.1P2_PCF_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}.log

1.4.2 How to Execute the Main Processor

The production script is executed by typing the script name, **run_CER7.3.1P2.pl**, followed by the PCF file name.

To run at the command line:

> cd $CERESHOME/tisa_avg/CER7.3.1P2/rcf
>./run_CER7.3.1P2.pl
CER7.3.1P2_PCF_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}

To run using SGE:

Note: It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission scripts.

> CER7.3.1P2-SGE_Driver.pl -date YYYYMM

The **CER7.3.1P2-SGE_Driver.pl** script will search for the required input data files and any existing data product files for the requested date and time given. If all input data files are available and previously created output for this data date does not exist it will submit the job to the cluster. However, if any mandatory data files are missing the script will not submit the job to the cluster.

If existing output data products are discovered they will be listed as output to the screen and the user must delete these files before rerunning the **CER7.3.1P2-SGE_Driver.pl** script.

1.4.3 Special Case Considerations

N/A at this time.

1.4.4 Special Reprocessing Instructions

If reprocessing is done to correct an error during production, then all TSI files created during the previous run must be deleted. A script to remove all files from the failed run is available. The script **CleanOutput.pl** takes as in input parameter the PCF filename for the failed run. The environment variable $CERESHOME must be set in order for this script to work.

```
> cd $CERESHOME/tisa_avg/CER7.3.1P2/rcf/
> ./CleanOutput.pl $YYYY $MM
```

1.5 Execution Evaluation

1.5.1 Exit Codes

The processor CER7.3.1P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS), as seen in Table 1-5. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person(s) (see Table 1-1) for assistance.

Table 1-5. Exit Codes for CER7.3.1P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see Appendix B).

1.5.2 Screen Messages (Use Table format for large number of messages)

When running the production script, **CER7.3.1P2**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output file that does not exist. This does not signify a problem.

1.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/tisa_avg/runlogs/CER7.3.1P2**.

1. **Report Log File:**
   CER7.3.1P2_LogReport_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}

The Report Log File contains TISA Averaging related messages. A comprehensive list of these messages that can be generated during execution of the PGE is contained in Appendix B.

2. **Status Log File:**
   CER7.3.1P2_LogStatus_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '_F_', fatal message type. The responsible person should be advised.

3. **User Log File:**
   CER7.3.1P2_LogUser_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}

The User Log File is not used at this time, but exists to satisfy the Toolkit requirements. Typically the _U_ and _N_ (User information and Notice) will be written to User Log File and Status Log File.

1.5.4 Solutions to Possible Problems

As mentioned in Appendix B all output files are opened with Status = NEW. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing. A script, which removes PGE created files, **CleanOutput.pl**, is located in directory **$CERESHOME/tisa_avg/CER7.3.1P2/rcf**. To use the clean-up files for **CER7.3.1P2**:

> **$CERESHOME/tisa_avg/CER7.3.1P2/rcf/CleanOutput.pl $YYYY $MM**

1.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

   There are no foreseeable subsystem terminating conditions at this time.

b. Target PGE Termination

   N/A

1.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process once per month**.**

Table 1-6. Expected Output File Listing for CER7.3.1P2

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER7.3.1P2_PCF_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}@($CERESHOME/tisa_avg/CER7.3.1P2/rcf/pcf)	m	1	1/mo	N/A	Archive, rm	No
CER7.3.1P2_PCF_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}.log@($CERESHOME/tisa_avg/CER7.3.1P2/rcf/pcf)	m	1	1/mo	N/A	Archive, rm	No
CER_LW-lnd-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.375	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_LW-lnd-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.375	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_LW-ocn-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.075	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_LW-ocn-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.075	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_LW-sno-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.075	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_LW-sno-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.075	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_WN-lnd-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.375	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_WN-lnd-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.375	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_WN-ocn-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.075	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_WN-ocn-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.075	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_WN-sno-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.075	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER_WN-sno-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM)	m	0.075	1/mo	CER7.3.1P3 and CER7.3.1P4	DPO, Archive	No
CER7.3.1P2_LogStatus_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/CER7.3.1P2)	m	0.005	1/mo	N/A	Archive, rm	No

Table 1-6. Expected Output File Listing for CER7.3.1P2

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER7.3.1P2_LogReport_${SS7_3_2}_${PS7_3_2}_ $CC7_3_2.{YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/ CER7.3.1P2)	m	0.001	1/mo	N/A	Archive, rm	No
CER7.3.1P2_LogUser_${SS7_3_2}_${PS7_3_2}_ $CC7_3_2.{YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/ CER7.3.1P2)	m	0.001	1/mo	N/A	Archive, rm	No
CER7.3.1P2_${SS7_3_2}_${PS7_3_2}_${CC7_3_2}. {YYYY}{MM}.oNNNNNN @($CERESHOME/tisa_avg/sge_logs/CER7.3.1P2/)	m	0.01	1/mo	N/A	Archive, rm	No

a. See Section 1.2 for information on variable data values
If "(**.met**)" is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension
YYYY - 4 digit year
MM - 2 digit month {valid values: 01 .. 12}

b. rm - remove
DPO - File content is to be entered into /ASDC_archive/CERES
m - mandatory output
o - optional output

2.0 PGEName: CER7.3.1P3
TO BE RUN ON *AMI-x86* PLATFORM

CERES Only Terra or Merged Terra and Aqua Monthly and Monthly Hourly Albedo and SW Flux (Subsystem 7)

2.1 PGE Details

2.1.1 Responsible Persons

Table 2-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Cathy Nguyen	Dennis Keyes
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1666	951-1650
Fax	951-1900	951-1900
LaRC email	Le.T.Nguyen@nasa.gov	Dennis.F.Keyes@nasa.gov

2.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 2-1.

2.1.3 Parent PGE(s)

Table 2-2. Parent PGEs for CER7.3.1P3

PGEName	Description
CER9.3P3	Terra Sort and Merge Gridded TOA and Surface Fluxes
CER9.3P3	Aqua Sort and Merge Gridded TOA and Surface Fluxes
CER9.1P2	Post-Processor for MOA Data, creates PMOA
CER11.2P3	Sort and Merge Gridded Geostationary Narrowband Radiance, GGEO.
CER7.3.1P2	Narrowband to Broadband Climatology Data

2.1.4 Target PGE(s)

Table 2-3. Target PGEs after CER7.3.1P3

PGEName	Description
CER7.3.1P4	Time Interpolation of Merged Terra and Aqua Satellites

2.2 Operating Environment

2.2.1 Runtime Parameters

Table 2-4. Runtime Parameters for CER7.3.1P3

Parameter	Description	Data Type	Valid Values
MM	CERDataDateMonth	I(2)	01 .. 12
YYYY	CERDataDateYear	I(4)	>1999

2.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**CER7_3_1P3_Env.pm'** and contains the following parameters:

SS7_3_3 Output Sampling Strategy for Subsystem 7.3, see Production Request
SS7_3_2 Input Sampling Strategy for Subsystem 7.3, see Production Request
SS9_T Input Sampling Strategy for Subsystem 9, see Production Request
SS9_A Input Sampling Strategy for Subsystem 9, see Production Request
SS9_N Input Sampling Strategy for Subsystem 9, see Production Request
SS11 Input Sampling Strategy for Subsystem 11, see Production Request
SS12 Input Sampling Strategy for Subsystem 12, see Production Request
SS4_11 Input Sampling Strategy for Subsystem 4, see Production Request
PS7_3_3 Output Production Strategy for Subsystem 7.3, see Production Request
PS7_3_2 Input Production Strategy for Subsystem 7.3, see Production Request
PS9_T Input Production Strategy for Subsystem 9, see Production Request
PS9_A Input Production Strategy for Subsystem 9, see Production Request
PS9_N Input Production Strategy for Subsystem 9, see Production Request
PS11 Input Production Strategy for Subsystem 11, see Production Request
PS12 Input Production Strategy for Subsystem 12, see Production Request
PS4_11 Input Production Strategy for Subsystem 4, see Production Request
CC7_3_3 Output Configuration Code for Subsystem 7.3, see CM Database

CC7_3_2	Input Configuration Code for Subsystem 7.3, see CM Database
CC9_T	Input Configuration Code for Subsystem 9, see CM Database
CC9_A	Input Configuration Code for Subsystem 9, see CM Database
CC9_N	Input Configuration Code for Subsystem 9, see CM Database
CC11	Input Configuration Code for Subsystem 11, see CM Database
CC9_1	Input Configuration Code for Subsystem 9, see CM Database
CC4_11	Input Configuration Code for Subsystem 4, see CM Database
SW7_3_3	Output Software SCCR# for Subsystem 7.3, see CM Database
DATA7_3_3	Output Data SCCR# for Subsystem 7.3, see CM Database
INSTR_NAME	For 200003 - 200206 (Terra), INSTR_NAME is FM1+FM2 For 200207 forward (Merged Terra/Aqua), INSTR_NAME is FM1+FM2+FM3+FM4 For 201204 forward, addition to Merged Terra/Aqua is Merged Terra/NPP. INSTR_NAME is FM1+FM2+FM5
PLAT	For 200003 - 200206, PLAT = Terra For 200207 forward, PLAT = Terra-Aqua Note: PLAT is never equal to Aqua for this PGE. For additional Merge Terra/NPP, PLAT = Terra-NPP
IMAGE	MODIS for Terra or Merged Terra/Aqua. **MODIS**-VIIRS for Merged Terra/NPP
InputArchive	Directory from which to read the input data products, for all production processing this directory should be set to **/ASDC_archive/CERES**
InputArchiveSS	Input data directory is **$CERESHOME/tisa_grid/data**

2.2.3 Execution Frequency (daily, hourly, or monthly)

monthly (1/month) - This PGE is processed once per month, when input is available.

2.2.4 Memory/Disk Space/Time Requirements

Memory:	54624 K
Disk Space:	21.6 GB
Total Run Time:	48 minutes

2.2.5 Restrictions Imposed in Processing Order

None. Process when input data are available (see Section 2.3).

2.3 Processor Dependencies (Previous PGEs, Ingest Data)

Note: Include required .met files, header files, .. all required inputs

2.3.1 Input Dataset Name (#1): SSF1degB Terra

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/SSF1degB/${SS9_T}_${PS9_T}/{YYYY}/{MM}/
CER_SSF1degB_${SS9_T}_${PS9_T}_${CC9_T}.{YYYY}{MM}Z*, where* = 001 .. 180

$InputArchive/SSF1degB/${SS9_T}_${PS9_T}/{YYYY}/{MM}/CER_SSF1degB_${SS9_T}_${PS9_T}_${CC9_T}.{YYYY}{MM}Z*.met, where* = 001 .. 180

1. Mandatory/Optional: **180 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER9.3P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **63 MB**

2.3.2 Input Dataset Name (#2): SSF1degB Aqua

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/SSF1degB/${SS9_A}_${PS9_A}/{YYYY}/{MM}/ CER_SSF1degB_${SS9_A}_${PS9_A}_${CC9_A}.{YYYY}{MM}Z*, where* = 001 .. 180

$InputArchive/SSF1degB/${SS9_A}_${PS9_A}/{YYYY}/{MM}/ CER_SSF1degB_${SS9_A}_${PS9_A}_${CC9_A}.{YYYY}{MM}Z*.met, where* = 001 .. 180

1. Mandatory/Optional: **180 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER9.3P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **63 MB**

2.3.3 Input Dataset Name (#3): SSF1degB NPP

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/SSF1degB/${SS9_N}_${PS9_N}/{YYYY}/{MM}/ CER_SSF1degB_${SS9_N}_${PS9_N}_${CC9_N}.{YYYY}{MM}Z*, where* = 001 .. 180

$InputArchive/SSF1degB/${SS9_N}_${PS9_N}/{YYYY}/{MM}/ CER_SSF1degB_${SS9_N}_${PS9_N}_${CC9_N}.{YYYY}{MM}Z*.met, where* = 001 .. 180

1. Mandatory/Optional: **180 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER9.3P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **80 MB**

2.3.4 Input Dataset Name (#4): GGEO

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/GGEO/$SS11_$PS11/YYYY/MM/ CER_GGEO_$SS11_$PS11_$CC11.{YYYY}{MM}F*, where * = 1 .. 4

1. Mandatory/Optional: **4 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER11.2P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **2970 MB**

2.3.5 Input Dataset Name (#5): PMOA

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/PMOA/$SS12_$PS12/YYYY/MM/
CER_PMOA_$SS12_$PS12_$CC9_1.{YYYY}{MM}F*, where * = 1 .. 4

1. Mandatory/Optional: **These files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source is PGE name or Ingest Source):

Source PGE: CER9.1P2

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **Total file size = 1441 MB (total 4 files = 5764 MB).**

2.3.6 Input Dataset Name (#6): LW-lnd-day, WN-lnd-day, LW-ocn-day, WN-ocn-day, LW-sno-day, WN-sno-day, LW-lnd-nit, WN-lnd-nit, LW-ocn-nit, WN-ocn-nit, LW-sno-nit, WN-sno-nit

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-lnd-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-lnd-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-ocn-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)
$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-ocn-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-sno-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-sno-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)
$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-lnd-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-lnd-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-ocn-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-ocn-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-sno-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-sno-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

1. Mandatory/Optional: **These files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.
3. Waiting Period: **None, process when all input data are available**

b. Source of Information (Source is PGE name or Ingest Source):

Source PGE: CER7.3.1P2

c. Alternate Data Set, if one exists (maximum waiting period): **None**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **Total file size = 0.4 MB**

2.3.7 Input Dataset Name (#7): SORCE file (Solar constant file)

a. Directory Location/Inputs Expected:

$InputArchive/CERES/SORCE/sorce_tsi_v15.txt.$yyyymmdd
where $yyyymmdd = the date of the newest file available

1. Mandatory/optional: **These files are mandatory for all data sets.**

   The files reside in the input directory and do not need to be staged.
2. Time Related Dependency: **The subsystem will automatically use the newest file available.**
3. Waiting Period: **As soon as available.**

b. Source of Information (Source PGE name or Ingest Source):

Ingest Source: TSI

c. Alternate Data Set, if one exists (maximum waiting period): **NONE**

d. File Disposition after successful execution: **N/A**

2.3.8 Input Dataset Name (#8): sibiMap

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/sibiMap/${SS4_11}_${PS4_11}/{YYYY}/{MM}/
CER_sibiMap_${SS4_11}_${PS4_11}_${CC4_11}.{YYYY}{MM}

1. Mandatory/Optional: **Mandatory**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER4.5-6.0P6

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **0.2 MB**

2.4 Operating Procedures (Procedure for each part of the processor's elements)

The main processor production script, **run_CER7.3.1P3.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first executing the generator, **CER7.3.1P3_pcf_gen.pl** after all of the necessary environment variables in Section 2.2.2 have been set**.** To run via SGE execute the production script by typing **CER7.3.1P3-SGE_Driver.pl** followed by the data date

2.4.1 How to Generate the PCF File for manual operations

The PCF file generator requires two (2) command line arguments:

(-d)	2-character static code to indicate that a date follows
(YYYY)	4-digit year
(MM)	2-digit month

At the command line (>) type:

> cd $CERESHOME/tisa_avg/CER7.3.1P3/rcf

For Terra only:

> ./CER7.3.1P3_pcf_gen.pl -date {YYYY}{MM} -satellites terra ggeo

For Merged Terra Aqua:

>./CER7.3.1P3_pcf_gen.pl -date {YYYY}{MM} -satellites terra aqua ggeo

For Merged Terra NPP:

>./CER7.3.1P3_pcf_gen.pl -date {YYYY}{MM} -satellites terra NPP ggeo

The following file will be generated in **$CERESHOME/tisa_avg/CER7.3.1P3/rcf/pcf**:
CER7.3.1P3_PCF_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}
CER7.3.1P3_PCF_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}.log

2.4.2 How to Execute the Main Processor

The production script is executed by typing the script name, **run_CER7.3.1P3.pl**, followed by the PCF file name.

To run at the command line:

> cd $CERESHOME/tisa_avg/CER7.3.1P3/rcf
> ./run_CER7.3.1P3.pl {YYYY} {MM}
CER7.3.1P3_PCF_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

To run using SGE:

Note: It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission scripts.

For Terra only:

> CER7.3.1P3-SGE_Driver.pl -date YYYYMM -satellites terra ggeo

For Merged Aqua Terra:

>CER7.3.1P3-SGE_Driver.pl -date YYYYMM -satellites terra aqua ggeo

For Merged Terra NPP:

> CER7.3.1P3-SGE_Driver.pl -date YYYYMM -satellites terra NPP ggeo

The **CER7.3.1P3-SGE_Driver.pl** script will search for the required input data files and any existing data product files for the requested date and time given. If all input data files are available and previously created output for this data date does not exist it will submit the job to the cluster. However, if any mandatory data files are missing the script will not submit the job to the cluster.

If existing output data products are discovered they will be listed as output to the screen and the user must delete these files before rerunning the **CER7.3.1P3-SGE_Driver.pl** script.

2.4.3 Special Case Considerations

N/A at this time.

2.4.4 Special Reprocessing Instructions

If reprocessing is done to correct an error during production, then all TSI files created during the previous run must be deleted. A script to remove all files from the failed run is available. The script **CleanOutput.pl** takes as in input parameter the PCF filename for the failed run. The environment variable $CERESHOME must be set in order for this script to work.

```
> cd $CERESHOME/tisa_avg/CER7.3.1P3/rcf/
> ./CleanOutput.pl $YYYY $MM
```

2.5 Execution Evaluation

2.5.1 Exit Codes

The processor CER7.3.1P3 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS), as seen in Table 2-5. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person(s) (see Table 2-1) for assistance.

Table 2-5. Exit Codes for CER7.3.1P3

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see Appendix B).

2.5.2 Screen Messages (Use Table format for large number of messages)

When running the production script, **CER7.3.1P3**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output file that does not exist. This does not signify a problem.

2.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/tisa_avg/runlogs/CER7.3.1P3**.

1. **Report Log File:**
   CER7.3.1P3_LogReport_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

The Report Log File contains TISA Averaging related messages. A comprehensive list of these messages that can be generated during execution of the PGE is contained in Appendix B.

2. **Status Log File:**
   CER7.3.1P3_LogStatus_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '_F_', fatal message type. The responsible person should be advised.

3. **User Log File:**
   CER7.3.1P3_LogUser_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

The User Log File is not used at this time, but exists to satisfy the Toolkit requirements. Typically the _U_ and _N_ (User information and Notice) will be written to User Log File and Status Log File.

2.5.4 Solutions to Possible Problems

As mentioned in Appendix B all output files are opened with Status = NEW. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing. A script, which removes PGE created files, **CleanOutput.pl**, is located in directory **$CERESHOME/tisa_avg/CER7.3.1P3/rcf**. To use the clean-up files for **CER7.3.1P3**:

> **$CERESHOME/tisa_avg/CER7.3.1P3/rcf/CleanOutput.pl $YYYY $MM**

2.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

   There are no foreseeable subsystem terminating conditions at this time.

b. Target PGE Termination

   N/A

2.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process once per month**.**

Table 2-6. Expected Output File Listing for CER7.3.1P3

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER7.3.1P3_PCF_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}@($CERESHOME/tisa_avg/CER7.3.1P3/rcf/pcf)	m	1	1/mo	N/A	Archive, rm	No
CER7.3.1P3_PCF_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}.log@($CERESHOME/tisa_avg/CER7.3.1P3/rcf/pcf)	m	1	1/mo	N/A	Archive, rm	No
CER_TSI-mhr-csalb_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-mhr-csalb/${SS7_3_3}_$PS7_3_3/YYYY/MM)	m	12	1/mo	CER7.3.1P4	DPO, Archive	No
CER_TSI-csalb0-intrp2s_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-csalb0-intrp2s/${SS7_3_3}_$PS7_3_3/YYYY/MM)	m	1	1/mo	CER7.3.1P4	DPO, Archive	No
CER_TSI-SNOW-PCT_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-SNOW-PCT/${SS7_3_3}_$PS7_3_3/YYYY/MM)	m	4	1/mo	N/A	DPO, Archive, rm	No
CER_TSI-LWxglb_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}(.met) @($CERESHOME/tisa_avg/data/TSI-xglb/${SS7_3_3}_$PS7_3_3/YYYY/MM)	m	3	1/mo	CER7.3.1P4	DPO, Archive	No
CER_TSI-SWxglb_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}(.met) @($CERESHOME/tisa_avg/data/TSI-xglb/${SS7_3_3}_$PS7_3_3/YYYY/MM)	m	3	1/mo	CER7.3.1P4	DPO, Archive	No
CER_TSI-WNxglb_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}(.met)@($CERESHOME/tisa_avg/data/TSI-xglb/${SS7_3_3}_$PS7_3_3/YYYY/MM)	m	3	1/mo	CER7.3.1P4	DPO, Archive	No
CER7.3.1P3_LogStatus_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/CER7.3.1P3)	m	0.005	1/mo	N/A	Archive, rm	No
CER7.3.1P3_LogReport_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/CER7.3.1P3)	m	0.001	1/mo	N/A	Archive, rm	No
CER7.3.1P3_LogUser_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/CER7.3.1P3)	m	0.001	1/mo	N/A	Archive, rm	No
CER7.3.1P3_${SS7_3_3}_${PS7_3_3}_${CC7_3_3}.{YYYY}{MM}.oNNNNNN @($CERESHOME/tisa_avg/sge_logs/CER7.3.1P3/)	m	0.01	1/mo	N/A	Archive, rm	No

a. See Section 2.2 for information on variable data values
If "(**.met**)" is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension
YYYY - 4 digit year
MM - 2 digit month {valid values: 01 .. 12}

b. rm - remove
DPO - File content is to be entered into /ASDC_archive/CERES
m - mandatory output
o - optional output

2.7 Expected Temporary Files/Directories

Table 2-7. Temporary Files Listing

Directory	File Name
$CERESHOME/tisa_avg/data/int_prod	CER_TSI-clrsky-albsw_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}
$CERESHOME/tisa_avg/data/int_prod	CER_allLW-match_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}
$CERESHOME/tisa_avg/data/int_prod	CER_allSW-match_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

3.0 PGEName: CER7.3.1P4
TO BE RUN ON *AMI-x86* PLATFORM

Time Interpolation for Only Terra or Merged Terra and Aqua Satellites (Subsystem 7.1)

3.1 PGE Details

3.1.1 Responsible Persons

Table 3-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Cathy Nguyen	Dennis Keyes
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1666	951-1650
Fax	951-1900	951-1900
LaRC email	Le.T.Nguyen@nasa.gov	Dennis.F.Keyes@nasa.gov

3.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 3-1.

3.1.3 Parent PGE(s)

Table 3-2. Parent PGEs for CER7.3.1P4

PGEName	Description
CER9.1P2	Post-Processor for MOA Data, creates PMOA
CER9.3P3	Sort and Merge Gridded Single Satellite Fluxes and Clouds
CER11.2P3	Sort and Merge Gridded Geostationary Narrowband Radiance, GGEO.
CER7.3.1P3	Preprocessor for creating the clear-sky map, the monthly hourly CERES clear-sky albedo, Snow/Ice Data and SW normalization coefficients
CER7.3.1P2	Narrowband to Broadband Climatology Data

3.1.4 Target PGE(s)

Table 3-3. Target PGEs after CER7.3.1P4

PGEName	Description
CER7.2.1P2	Synoptic SARB Subsystem Main-Processor
CER8.1P2	Synoptic Regional, Zonal and Global Averages

3.2 Operating Environment

3.2.1 Runtime Parameters

Table 3-4. Runtime Parameters for CER7.3.1P4

Parameter	Description	Data Type	Valid Values
MM	CERDataDateMonth	I(2)	01 .. 12
YYYY	CERDataDateYear	I(4)	>1999

3.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**CER7_3_1P4_env.pm**' and contains the following parameters:

SS7_3_4 Output Sampling Strategy for Subsystem 7.3, see Production Request
SS9_T Input Sampling Strategy for Subsystem 9, see Production Request
SS9_A Input Sampling Strategy for Subsystem 9, see Production Request
SS9_N Input Sampling Strategy for Subsystem 9, see Production Request
SS7_3_3 Input Sampling Strategy for Subsystem 7.3, see Production Request
SS7_3_2 Input Sampling Strategy for Subsystem 7.3, see Production Request
SS11 Input Sampling Strategy for Subsystem 11, see Production Request
SS12 Input Sampling Strategy for Subsystem 12, see Production Request
SS4_11 Input Sampling Strategy for Subsystem 4, see Production Request
PS7_3_4 Output Production Strategy for Subsystem 7.3, see Production Request
PS9_T Input Production Strategy for Subsystem 9, see Production Request
PS9_A Input Production Strategy for Subsystem 9, see Production Request
PS9_N Input Production Strategy for Subsystem 9, see Production Request
PS7_3_3 Input Production Strategy for Subsystem 7.3, see Production Request
PS7_3_2 Input Production Strategy for Subsystem 7.3, see Production Request
PS11 Input Production Strategy for Subsystem 11, see Production Request

PS12	Input Production Strategy for Subsystem 12, see Production Request
PS4_11	Input Production Strategy for Subsystem 4, see Production Request
CC7_3_4	Output Configuration Code for Subsystems 7.3, see CM Database
CC9_T	Input Configuration Code for Subsystems 9, see CM Database
CC9_A	Input Configuration Code for Subsystems 9, see CM Database
CC9_N	Input Configuration Code for Subsystems 9, see CM Database
CC9_1	Input Configuration Code for PMOA. see CM Database
CC7_3_3	Input Configuration Code for Subsystem 7.3, see CM Database
CC7_3_2	Input Configuration Code for Subsystem 7.3, see CM Database
CC11	Input Configuration Code for Subsystem 11, see CM Database
CC4_11	Input Configuration Code for Subsystem 4, see CM Database
SW7_3_4	Output Software SCCR# for Subsystems 7.3, see CM Database
DATA7_3_4	Output Data SCCR# for Subsystems 7.3, see CM Database
INSTR_NAME	For 200003 - 200206 (Terra), INSTR_NAME is FM1+FM2 For 200207 forward (Merged Terra/Aqua), INSTR_NAME is FM1+FM2+FM3+FM4 For 201204 forward, addition to Merged Terra/Aqua is Merged Terra/NPP. INSTR_NAME is FM1+FM2+FM5
PLAT	For 200003 - 200206, PLAT = Terra For 200207 forward, PLAT = Terra-Aqua Note: PLAT is never equal to Aqua for this PGE. For additional Merge Terra/NPP, PLAT = Terra-NPP
IMAGE	MODIS for Terra or Merged Terra/Aqua. **MODIS**-VIIRS for Merged Terra/NPP
InputArchive	Directory from which to read the input data products, for all production processing this directory should be set to **/ASDC_archive/CERES**
InputArchiveSS	Input data directory is **$CERESHOME/tisa_grid/data**

3.2.3 Execution Frequency (daily, hourly, or monthly)

monthly (1/month) - This PGE is processed once per month, when input is available.

3.2.4 Memory/Disk Space/Time Requirements

Memory:	69792 K
Disk Space:	21.6 GB
Total Run Time:	1 hours 14 minutes

3.2.5 Restrictions Imposed in Processing Order

None. Process when input data are available (see Section 3.3).

3.3 Processor Dependencies (Previous PGEs, Ingest Data)

Note: Include required .met files, header files, .. all required inputs

3.3.1 Input Dataset Name (#1): PMOA

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/PMOA/$SS12_$PS12/YYYY/MM/
CER_PMOA_$SS12_$PS12_$CC9_1.{YYYY}{MM}F*, where * = 1 .. 4

1. Mandatory/Optional: **These files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source is PGE name or Ingest Source):

Source PGE: CER9.1P2

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **Total file size = 1441 MB (total 4 files = 5764 MB).**

3.3.2 Input Dataset Name (#2): SSF1degB Terra

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/SSF1degB/${SS9_T}_${PS9_T}/{YYYY}/{MM}/
CER_SSF1degB_${SS9_T}_${PS9_T}_${CC9_T}.{YYYY}{MM}Z*, where* = 001 .. 180

$InputArchive/SSF1degB/${SS9_T}_${PS9_T}/{YYYY}/{MM}/
CER_SSF1degB_${SS9_T}_${PS9_T}_${CC9_T}.{YYYY}{MM}Z*.met, where* = 001 .. 180

1. Mandatory/Optional: **180 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER9.3P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **63 MB**

3.3.3 Input Dataset Name (#3): SSF1degB Aqua

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/SSF1degB/${SS9_A}_${PS9_A}/{YYYY}/{MM}/ CER_SSF1degB_${SS9_A}_${PS9_A}_${CC9_A}.{YYYY}{MM}Z*, where* = 001 .. 180

$InputArchive/SSF1degB/${SS9_A}_${PS9_A}/{YYYY}/{MM}/ CER_SSF1degB_${SS9_A}_${PS9_A}_${CC9_A}.{YYYY}{MM}Z*.met, where* = 001 .. 180

1. Mandatory/Optional: **180 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER9.3P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **63 MB**

3.3.4 Input Dataset Name (#4): SSF1degB NPP

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/SSF1degB/${SS9_N}_${PS9_N}/{YYYY}/{MM}/ CER_SSF1degB_${SS9_N}_${PS9_N}_${CC9_N}.{YYYY}{MM}Z*, where* = 001 .. 180

$InputArchive/SSF1degB/${SS9_N}_${PS9_N}/{YYYY}/{MM}/ CER_SSF1degB_${SS9_N}_${PS9_N}_${CC9_N}.{YYYY}{MM}Z*.met, where* = 001 .. 180

1. Mandatory/Optional: **180 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER9.3P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **80 MB**

3.3.5 Input Dataset Name (#5): GGEO

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/GGEO/$SS11_$PS11/YYYY/MM/
CER_GGEO_$SS11_$PS11_$CC11.{YYYY}{MM}F*, where * = 1 .. 4

1. Mandatory/Optional: **4 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER11.2P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **2970 MB**

3.3.6 Input Dataset Name (#6): TSI-LWxglb, TSI-SWxglb, TSI-WNxglb

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/TSI-xglb/${SS7_3_3}_$PS7_3_3/YYYY/MM/
CER_TSI-LWxglb_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

$InputArchive/TSI-xglb/${SS7_3_3}_$PS7_3_3/YYYY/MM/
CER_TSI-SWxglb_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

$InputArchive/TSI-xglb/${SS7_3_3}_$PS7_3_3/YYYY/MM/
CER_TSI-WNxglb_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

1. Mandatory/Optional: **These files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER7.3.1P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **rm**

e. Typical file size (MB): **2.33 MB**

3.3.7 Input Dataset Name (#7): TSI-mhr-csalb

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/TSI-mhr-csalb/${SS7_3_3}_$PS7_3_3/YYYY/MM/ CER_TSI-mhr-csalb_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER7.3.1P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **rm**

e. Typical file size (MB): **15.62 MB**

3.3.8 Input Dataset Name (#8): TSI-csalb0-intrp2s

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/TSI-csalb0-intrp2s/${SS7_3_3}_$PS7_3_3/YYYY/MM/CER_TSI-csalb0-intrp2s_${SS7_3_3}_${PS7_3_3}_$CC7_3_3.{YYYY}{MM}

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER7.3.1P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **rm**

e. Typical file size (MB): **0.6**

3.3.9 Input Dataset Name (#9): LW-lnd-day, WN-lnd-day, LW-ocn-day, WN-ocn-day, LW-sno-day, WN-sno-day, LW-lnd-nit, WN-lnd-nit, LW-ocn-nit, WN-ocn-nit, LW-sno-nit, WN-sno-nit

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-lnd-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-lnd-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-ocn-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-ocn-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-sno-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-sno-day_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-lnd-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-lnd-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-ocn-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)
$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-ocn-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_LW-sno-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

$InputArchive/TSI-nb2bb-coeff/${SS7_3_2}_$PS7_3_2/YYYY/MM/
CER_WN-sno-nit_${SS7_3_2}_${PS7_3_2}_$CC7_3_2.{YYYY}{MM}(.met)

1. Mandatory/Optional: **These files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source is PGE name or Ingest Source):

Source PGE: CER7.3.1P2

c. Alternate Data Set, if one exists (maximum waiting period): **None**

d. File Disposition after successful execution: **rm**

e. Typical file size (MB): **Total file size = 0.4 MB**

3.3.10 Input Dataset Name (#10): SORCE file (Solar constant file)

a. Directory Location/Inputs Expected

$InputArchive/CERES/SORCE/sorce_tsi_v15.txt.$yyyymmdd
where $yyyymmdd = the date of the newest file available

1. Mandatory/optional: **These files are mandatory for all data sets. The files reside in the input directory and do not need to be staged.**
2. Time Related Dependency: **The subsystem will automatically use the newest file available.**
3. Waiting Period: **As soon as available.**

b. Source of Information (Source PGE name or Ingest Source):

Ingest Source: TSI

c. Alternate Data Set, if one exists (maximum waiting period): **NONE**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **169 KB**

3.3.11 Input Dataset Name (#11): sibiMap

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/sibiMap/${SS4_11}_${PS4_11}/{YYYY}/{MM}/
CER_sibiMap_${SS4_11}_${PS4_11}_${CC4_11}.{YYYY}{MM}

1. Mandatory/Optional: **Mandatory**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER4.5-6.0P6

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **0.2 MB**

3.4 Operating Procedures (Procedure for each part of the processor's elements)

The Main Processor production script, **run_CER7.3.1P4.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. The PCF is created by executing the PCF generator, **CER7.3.1P4_pcf_gen.pl** after all of the necessary environment variables in Section 3.2.2 have been set. To run via SGE execute the production script by typing **CER7.3.1P4-SGE_Driver.pl** followed by the data date.

3.4.1 How to Generate the PCF for manual operations

The PCF file generator requires two (2) command line arguments:

(-d)	2-character static code to indicate that a date follows
(YYYY)	4-digit year
(MM)	2-digit month

At the command line (>) type:

> cd $CERESHOME/tisa_avg/CER7.3.1P4/rcf

For Terra Only:

> ./CER7.3.1P4_pcf_gen.pl -date {YYYY}{MM} -satellites terra ggeo

For Merged Terra Aqua:

> ./CER7.3.1P4_pcf_gen.pl -date {YYYY}{MM} -satellites terra aqua ggeo

For Merged Terra NPP:

> ./CER7.3.1P4_pcf_gen.pl -date {YYYY}{MM} -satellites terra NPP ggeo

The following file will be generated in **$CERESHOME/tisa_avg/CER7.3.1P4/rcf/pcf**:

CER7.3.1P4_PCF_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}
CER7.3.1P4_PCF_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}.log

3.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **run_CER7.3.1P4.pl**, followed by the PCF filename.

To run at the command line:

At the command line (>) type:

> cd $CERESHOME/tisa_avg/CER7.3.1P4/rcf
> ./run_CER7.3.1P4.pl
CER7.3.1P4_PCF_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.YYYYMM

To run using SGE:

Note: It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission scripts.

For Terra only:

> ./CER7.3.1P4-SGE_Driver.pl -date YYYYMM -satellites terra ggeo

For Merged Terra Aqua:

> ./CER7.3.1P4-SGE_Driver.pl -date YYYYMM -satellites terra aqua ggeo

For Merged Terra NPP:

> ./CER7.3.1P4-SGE_Driver.pl -date YYYYMM -satellites terra NPP ggeo

The **CER7.3.1P4-SGE_Driver.pl** script will search for the required input data files and any existing data product files for the requested date and time given. If all input data files are available and previously created output for this data date does not exist it will submit the job to the cluster. However, if any mandatory data files are missing the script will not submit the job to the cluster.

If existing output data products are discovered they will be listed as output to the screen and the user must delete these files before rerunning the **CER7.3.1P4-SGE_Driver.pl** script.

3.4.3 Special Case Considerations

N/A at this time.

3.4.4 Special Reprocessing Instructions

If reprocessing is done to correct an error during production, then all TSI files created during the previous run must be deleted. A script to remove all files from the failed run is available. The script **CleanOutput.pl** takes as in input parameter the PCF filename for the failed run. The environment variable **$CERESHOME** must be set in order for this script to work.

> cd $CERESHOME/tisa_avg/CER7.3.1P4/rcf
> ./CleanOutput.pl $YYYY $MM

3.5 Execution Evaluation

3.5.1 Exit Codes

The processor CER7.3.1P4 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS), as seen in Table 3-5. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person(s) (see Table 3-1) for assistance.

Table 3-5. Exit Codes for CER7.3.1P4

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see Appendix B).

3.5.2 Screen Messages (Use Table format for large number of messages)

When running the production script, **CER7.3.1P4**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output file that does not exist. This does not signify a problem.

3.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/tisa_avg/runlogs/CER7.3.1P4**.

1. **Report Log File:**
   CER7.3.1P4_LogReport_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}

The Report Log File contains TISA Averaging related messages. A comprehensive list of these messages that can be generated during execution of the PGE is contained in Appendix B.

2. **Status Log File:**
   CER7.3.1P4_LogStatus_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '_F_', fatal message type. The responsible person should be advised.

3. **User Log File:**
   CER7.3.1P4_LogUser_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}

The User Log File is not used at this time, but exists to satisfy the Toolkit requirements. Typically the _U_ and _N_ (User information and Notice) will be written to User Log File and Status Log File.

3.5.4 Solutions to Possible Problems

As mentioned in Appendix B all output files are opened with Status = NEW. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be

removed before reprocessing. A script, which removes PGE created files, **CleanOutput.pl**, is located in directory **$CERESHOME/tisa_avg/CER7.3.1P4/rcf**. To use the clean-up files for **CER7.3.1P4**:

- **$CERESHOME/tisa_avg/CER7.3.1P4/rcf/CleanOutput.pl $YYYY $MM**

3.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

There are no foreseeable subsystem terminating conditions at this time.

b. Target PGE Termination

N/A

3.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process once per month**.**

Table 3-6. Expected Output File Listing for CER7.3.1P4

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER7.3.1P4_PCF_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}@($CERESHOME/tisa_avg/CER7.3.1P4/rcf/pcf)	m	1	1/mo	N/A	Archive, rm	No
CER7.3.1P4_PCF_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}.log@($CERESHOME/tisa_avg/CER7.3.1P4/rcf/pcf)	m	1	1/mo	N/A	Archive, rm	No
CER7.3.1P4_LogReport_${SS7_3_4}_${PS7_3_4}_$CC7_3_4. {YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/CER7.3.1P4)	m	1	1/mo	N/A	Archive, rm	No
CER7.3.1P4_LogStatus_${SS7_3_4}_${PS7_3_4}_$CC7_3_4. {YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/CER7.3.1P4)	m	1	1/mo	N/A	Archive, rm	No
CER7.3.1P4_LogUser_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}@($CERESHOME/tisa_avg/runlogs/CER7.3.1P4)	m	1	1/mo	N/A	Archive, rm	No
CER_TSIB_${SS7_3_4}_${PS7_3_4}_$CC7_3_4.{YYYY}{MM}Z*,where * = 001...180 (.met) @($CERESHOME/tisa_avg/data/TSIB/${SS7_3_4}_$PS7_3_4/YYYY/MM)	m	298	180/mo	7.2.1P2 & 8.1P2	DPO, Archive, rm	No
CER7.3.1P4_${SS7_3_4}_${PS7_3_4}_${CC7_3_4}.{YYYY}{MM}.oNNNNNN @($CERESHOME/tisa_avg/sge_logs/CER7.3.1P4/)	m	0.01	1/mo	N/A	Archive, rm	No

a. See Section 3.2 for information on variable data values
If "(.met)" is written next to an expected Output Filename, then the metadata file must exist with the identical filename and .met extension
YYYY - 4 digit year
MM - 2 digit month {valid values: 01 .. 12}

b. rm - remove
DPO - File content is to be entered into /ASDC_archive/CERES
m - mandatory output
o - optional output

3.7 Expected Temporary Files/Directories

N/A

4.0 PGEName: CER8.1P2

To Be Run on *AMI-x86* PLATFORM
SYN1deg Edition4 Processor (Subsystem 8.0)

4.1 PGE Details

4.1.1 Responsible Persons

Table 4-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Dennis Keyes	Cathy Nguyen
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1650	951-1666
Fax	951-1900	951-1900
LaRC email	Dennis.F.Keyes@nasa.gov	Le.T.Nguyen@nasa.gov

4.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 4-1.

4.1.3 Parent PGE(s)

Table 4-2. Parent PGEs for CER8.1P2

PGEName	Description	Instruments
CER7.2.1P2	CERES Synoptic Surface and Atmospheric Radiation Budget (SARB) MainProcessor (Edition4)	Terra (FM1, FM2), Terra-Aqua (Merged) Terra-NPP (Merged)
CER7.3.1P4	Time Interpolation for Only Terra or Only Aqua or Merged Terra and Aqua Satellites (Subsystem 7.1)	Terra (FM1, FM2), Terra-Aqua (Merged) Terra-NPP (Merged)

4.1.4 Target PGE(s)

CER8.1P2 has no target PGE(s).

4.2 Operating Environment

4.2.1 Runtime Parameters

Table 4-3. Runtime Parameters for CER8.1P2

Parameter	Description	Data Type	Valid Values
MM	CERDataDateMonth	I(2)	01 .. 12
YYYY	CERDataDateYear	I(4)	>1999

4.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters. The URL for this document is http://ceres.larc.nasa.gov/Internal/intern_docs.php

One Environment Script is required. It is named '**CER8_1P2_Env.pm**' and contains the following parameters:

SS8	Output Sampling Strategy for Subsystem 8, see Production Request
SS7_2	Input Sampling Strategy for Subsystem 7.2, see Production Request
SS7_3_4	Input Sampling Strategy for Subsystem 7.3, see Production Request
PS8	Output Production Strategy for Subsystem 8, see Production Request
PS7_2	Input Production Strategy for Subsystem 7.2, see Production Request
PS7_3_4	Input Production Strategy for Subsystem 7.3, see Production Request
CC8	Output Configuration Code for Subsystem 8, see CM Database
CC7_2	Input Configuration Code for Subsystem 7.2, see CM Database
CC7_3_4	Input Configuration Code for Subsystem 7.3, see CM Database
SW8	Output Software SCCR# for Subsystem 8, see CM Database
DATA8	Output Data SCCR# for Subsystem 8, see CM Database
PLAT	For Terra only, PLAT is Terra For Merged Terra-Aqua, PLAT is Terra-Aqua For Merged Terra-NPP, PLAT is Terra-NPP
INSTR_NAME	If PLAT = Terra then INSTR_NAME is FM1+FM2 If PLAT = Terra-Aqua then INSTR_NAME is FM1+FM2+FM3+FM4 If PLAT = Terra-NPP then INSTR_NAME is FM1+FM2+FM5
IMAGE	IMAGE is set to MODIS for Terra or Terra-Aqua IMAGE is set to MODIS-VIIRS for Terra-NPP
PROD	"yes" if being run in Production. "no" if being run in testing.
InputArchive	Directory from which to read the input data products, for all production processing this directory should be set to **/ASDC_archive/CERES**
InputArchiveSS	If PROD = no: Input data directory is $CERESHOME/tisa_avg/data If PROD = yes: This is set to $InputArchive

InputArchiveSARB	If PROD = no: Input data directory is $CERESHOME/sarb/data/CERES If PROD = yes: This is set to $InputArchive

4.2.3 Execution Frequency (daily, hourly, or monthly)

monthly (1/month) - This PGE is processed once per month, when input is available.

4.2.4 Memory/Disk Space/Time Requirements

Memory:	7.3 GB
Disk Space:	31 GB
Total Run Time:	6 hours 20 minutes

4.2.5 Restrictions Imposed in Processing Order

Process when input data are available (see Section 4.3).

4.3 Processor Dependencies (Previous PGEs, Ingest Data)

Note: Include required .met files, header files, .. all required inputs

4.3.1 Input Dataset Name (#1): TSIB

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchiveSS/TSIB/${SS7_3_4}_${PS7_3_4}/YYYY/MM/ CER_TSIB_${SS7_3_4}_${PS7_3_4}_${CC7_3_4}.{YYYY}{MM}Z{zone number}, where zone number = 01 .. 180

1. Mandatory/Optional: **All of the 180 files are Mandatory.**
2. Time Related Dependency: **The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.**
3. Waiting Period:

   Wait until CER7.3.1P4 has completed for the DataMonth.

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER7.3.1P4

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **151 MB**

4.3.2 Input Dataset Name (#2): SYNI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchiveSARB/SYNI/${SS7_2}_${PS7_2}/YYYY/MM/ CER_SYNI_${SS7_2}_${PS7_2}_${CC7_2}.{YYYY}{MM}Z{zone number}, where zone number = 01 .. 180

1. Mandatory/Optional: **All 180 files are Mandatory.**

2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period:

   Wait until CER7.2.1P2 has completed for the DataMonth.

b. Source of Information (Source PGE name or Ingest Source):

   Source PGE: CER7.2.1P2

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **147 MB**

4.4 Operating Procedures

The main processor production script, **run_CER8.1P2.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first executing the PCF generator, **CER8.1P2_pcfgen.pl** after all of the necessary environment variables in Section 4.2.2 have been set. To run via SGE execute the production script by typing **CER8.1P2-SGE_Driver.pl** followed by the data date (YYYYMM).

4.4.1 How to Generate the PCF File

The PCF generator, **CER8.1P2_pcfgen.pl**, requires one command line argument:

(-date)	5-character static code to indicate that a date follows
(YYYYMM)	4-digit year and 2-digit month as 1 word

At the command line (>) type:

> **cd $CERESHOME/tisa_avg/CER8.1P2/rcf/**
> **./CER8.1P2_pcfgen.pl -date YYYYMM**

The following PCF will be generated in **$CERESHOME/tisa_avg/CER8.1P2/rcf/pcf/**:

CER8.1P2_PCF_${SS8}_${PS8}_$CC8.{YYYY}{MM}
CER8.1P2_PCF_${SS8}_${PS8}_$CC8.{YYYY}{MM}.log

The log file will identify any required files that are missing along with those that will be used based on the pcf file.

4.4.2 How to Execute the Main Processor

The production script is executed by typing the script name, **run_CER8.1P2.pl**, followed by the PCF file name, see Table 4-3.

At the command line (>) type:

> **cd $CERESHOME/tisa_avg/CER8.1P2/rcf**
> **./run_CER8.1P2.pl CER8.1P2_PCF_${SS8}_${PS8}_$CC8.{YYYY}{MM}**

To run using SGE:

Note: It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission scripts.

> ./CER8.1P2-SGE_Driver.pl -date YYYYMM

The **CER8.1P2-SGE_Driver.pl** script will search for the required input data files and any existing data product files for the requested date and time given. If all input data files are available and previously created output for this data date does not exist, it will submit the job to the cluster. However, if any mandatory data files are missing the script will not submit the job to the cluster.

If existing output data products are discovered they will be listed as output to the screen and the user **must** delete these files before rerunning the **CER8.1P2-SGE_Driver.pl** script.

See Section 4.4.4 if reprocessing is required.

4.4.3 Special Case Considerations

N/A at this time.

4.4.4 Special Reprocessing Instructions

All output files are opened with STATUS=NEW in Subsystem 8.0. The PGE script has been designed to check for these files and delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before processing.

The script, **CleanOutput.pl**, with the year and month will cleanup ALL previous output matching the sampling strategy and production strategy currently set in the environment variables under **tisa_avg/CER8.1P2/rcf/pcf** and t**isa_avg/data** with the following command:

> **cd $CERESHOME/tisa_avg/CER8.1P2/rcf**
> **./CleanOutput.pl YYYY MM**

4.5 Execution Evaluation

4.5.1 Exit Codes

The processor **run_CER8.1P2.pl** (called by **CER8.1P2-SGE_Driver.pl**) terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 4-4. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Table 4-1) for assistance.

Table 4-4. Exit Codes for CER8.1P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action. (see Appendix B).

4.5.2 Screen Messages (Use Table format for large number of messages)

When running the production script, **run_CER8.1P2.csh** (called by **CER8.1P2-SGE_Driver.pl**), the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output file that does not exist. This does not signify a problem.

4.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE.

If running using the batch script SGE **CER8.1P2-SGE_Driver.pl** program, information (statements, errors and warnings) is output to the **$CERESHOME/tisa_avg/sge_logs/CER8.1P2/CER8.1P2_$INSTANCE.oNNNNNN**.

* NNNNNN is the job number.

The PGE log files are located in directory: **$CERESHOME/tisa_avg/runlogs/CER8.1P2**.

1. **Report Log File: CER8.1P2_LogReport_${SS8}_${PS8}_$CC8.{YYYY}{MM}**

The Report Log File contains TISA Averaging related messages. A comprehensive list of these messages that can be generated during execution of the PGE is contained in Appendix B.

2. **Status Log File: CER8.1P2_LogStatus_${SS8}_${PS8}_$CC8.{YYYY}{MM}**

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '_F_', fatal message type. The responsible person should be advised.

3. **User Log File: CER8.1P2_LogUser_${SS8}_${PS8}_$CC8.{YYYY}{MM}**

The User Log File is not used at this time, but exists to satisfy the Toolkit requirements. Typically the _U_ and _N_ (User information and Notice) will be written to User Log File and Status Log File.

4.5.4 Solutions to Possible Problems

As mentioned in Section 4.4.4, all output files are opened with Status = NEW. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

The script, **CleanOutput.pl**, with the year and month will cleanup ALL previous output matching the sampling strategy and production strategy currently set in the environment variables under **tisa_avg/CER8.1P2/rcf/pcf** and **tisa_avg/data** with the following command:

> **cd $CERESHOME/tisa_avg/CER8.1P2/rcf**
> **./CleanOutput.pl YYYY MM**

4.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

There are no foreseeable subsystem terminating conditions at this time.

b. Target PGE Termination

N/A

4.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process once per month.

Table 4-5. Expected Output File Listing for CER8.1P2

File Name[a]/Directory[c]	m/o[d]	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER8.1P2_PCF_${SS8}_${PS8}_$CC8.{YYYY}{MM} @($CERESHOME/tisa_avg/CER8.1P2/rcf/pcf)	m	.1	1/mo	N/A	Archive, rm	No
CER8.1P2_PCF_${SS8}_${PS8}_$CC8.{YYYY}{MM}.log @($CERESHOME/tisa_avg/CER8.1P2/rcf/pcf)	m	.06	1/mo	N/A	Archive, rm	No
CER8.1P2_PCF_${SS8}_${PS8}_$CC8.{YYYY}{MM} .summary@($CERESHOME/tisa_avg/CER8.1P2/rcf/ pcf/summary)	o	.01	1/mo	N/A	Archive, rm	No
CER8.1P2_LogReport_${SS8}_${PS8}_$CC8.{YYYY} {MM}@($CERESHOME/tisa_avg/runlogs/CER8.1P2)	m	.12	1/mo	N/A	Archive, rm	No
CER8.1P2_LogStatus_${SS8}_${PS8}_$CC8.{YYYY} {MM}@($CERESHOME/tisa_avg/runlogs/CER8.1P2)	m	0.1	1/mo	N/A	Archive, rm	No
CER8.1P2_LogUser_${SS8}_${PS8}_$CC8.{YYYY}{MM} @($CERESHOME/tisa_avg/runlogs/CER8.1P2)	m	.01	1/mo	N/A	Archive, rm	No
CER8.1P2_${SS8}_${PS8}_$CC8.{YYYY}{MM}. oNNNNNN @($CERESHOME/tisa_avg/sge_logs/CER8.1P2)	o	.01	1/mo	N/A	Archive, rm	No
CER_SYN1deg-Month_${SS8}_${PS8}_$CC8.{YYYY} {MM}(.met)@($CERESHOME/tisa_avg/data/SYN1deg-Month/${SS8}_$PS8/YYYY/MM)	m	49	1/mo	N/A	DPO, Archive, rm	Yes
CER_SYN1deg-MHour_${SS8}_${PS8}_$CC8.{YYYY} {MM}(.met)@($CERESHOME/tisa_avg/data/SYN1deg-MHour/${SS8}_$PS8/YYYY/MM)	m	982	1/mo	N/A	DPO, Archive, rm	Yes
CER_SYN1deg-Day_${SS8}_${PS8}_$CC8.{YYYY} {MM}{DD}(.met)@($CERESHOME/tisa_avg/data/ SYN1deg-Day/${SS8}_$PS8/YYYY/MM)	m	45	28..31/ mo	N/A	DPO, Archive, rm	Yes
CER_SYN1deg-3Hour_${SS8}_${PS8}_$CC8.{YYYY} {MM}{DD}(.met)@($CERESHOME/tisa_avg/data/ SYN1deg-3Hour/${SS8}_$PS8/YYYY/MM)	m	250	28..31/ mo	N/A	DPO, Archive, rm	Yes
CER_SYN1deg-1Hour_${SS8}_${PS8}_$CC8.{YYYY} {MM}{DD}(.met) @($CERESHOME/tisa_avg/data/ SYN1deg-1Hour/${SS8}_$PS8/YYYY/MM)	m	695	28..31/ mo	N/A	DPO, Archive, rm	Yes

a. See Section 4.2 for information on variable data values
If "**(.met)**" is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension

b. Permanent - Files will not be removed from the production disk
DPO - File content is to be entered into /ASDC_archive/CERES
rm - remove

c. YYYY - 4 digit year
MM - 2 digit month {valid values: 01 .. 12}
DD - 2 digit day {valid values: 01 .. 31}

d. m - mandatory output
o - optional output

4.7 Expected Temporary Files/Directories

Table 4-6. Temporary Files Listing

Directory	File Name
$CERESHOME/tisa_avg/data/scr	CER_SYNB_${SS8}_${PS8}_$CC8.{YYYY}{MM}{DD}

5.0 PGEName: CER10.0P5

CERES Only Terra or Only Aqua or Only NPP Monthly and Daily Averaged TOA Fluxes and Cloud Properties (Subsystem 10.0)

TO BE RUN ON *AMI-P6* or *AMI-x86* PLATFORM

5.1 PGE Details

5.1.1 Responsible Persons

Table 5-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Cathy Nguyen	Dennis Keyes
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1666	951-1650
Fax	951-1900	951-1900
LaRC email	Le.T.Nguyen@nasa.gov	Dennis.F.Keyes@nasa.gov

5.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 5-1.

5.1.3 Parent PGE(s)

Table 5-2. Parent PGEs for CER10.0P5

PGEName	Description
CER9.3P3	Terra Sort and Merge Gridded TOA and Surface Fluxes
CER9.3P3	Aqua Sort and Merge Gridded TOA and Surface Fluxes
CER9.3P3	NPP Sort and Merge Gridded TOA and Surface Fluxes

5.1.4 Target PGE(s)

Table 5-3. Target PGEs after CER10.0P5

PGEName	Description
None	Final Product – SSF1deg-Month and SSF1deg-Day

5.2 Operating Environment

5.2.1 Runtime Parameters

Table 9-4. Runtime Parameters for CER10.0P5

Parameter	Description	Data Type	Valid Values
MM	CERDataDateMonth	I(2)	01 .. 12
YYYY	CERDataDateYear	I(4)	>1999

5.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**CER10_0P5_env.pm'** and contains the following parameters:

SS10_5	Output Sampling Strategy for Subsystem 10, see Production Request
SS9	Input Sampling Strategy for Subsystem 9, see Production Request
SS4_11	Input Sampling Strategy for Subsystem 4, see Production Request
PS10_5	Output Production Strategy for Subsystem 10, see Production Request
PS9	Input Production Strategy for Subsystem 9, see Production Request
PS4_11	Input Production Strategy for Subsystem 4, see Production Request
CC10_5	Output Configuration Code for Subsystem 10, see CM Database
CC9	Input Configuration Code for Subsystem 9, see CM Database
CC4_11	Input Configuration Code for Subsystem 4, see CM Database
SW10	Output Software SCCR# for Subsystem 10, see CM Database
DATA10	Output Data SCCR# for Subsystem 10, see CM Database
PLAT	Terra or Aqua
IMAGE	MODIS
INSTR_NAME	If PLAT = Terra then INSTR_NAME is FM1+FM2 If PLAT = Aqua then INSTR_NAME is FM3+FM4

InputArchive	Directory from which to read the input data products, for all production processing this directory should be set to **/ASDC_archive/CERES**
InputArchiveSS	Input data directory is **$CERESHOME/tisa_grid/data**

5.2.3 Execution Frequency (daily, hourly, or monthly)

monthly (1/month) - This PGE is processed once per month, when input is available.

5.2.4 Memory/Disk Space/Time Requirements

Memory:	54624 K
Disk Space:	21.6 GB
Total Run Time:	25 minutes

5.2.5 Restrictions Imposed in Processing Order

None. Process when input data are available (see Section 5.3)

5.3 Processor Dependencies (Previous PGEs, Ingest Data)

Note: Include required .met files, header files, .. all required inputs

5.3.1 Input Dataset Name (#1): SSF1degB Terra

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/SSF1degB/${SS9}_${PS9}/{YYYY}/{MM}/
CER_SSF1degB_${SS9}_${PS9}_${CC9}.{YYYY}{MM}Z*, where* = 001 .. 180

$InputArchive/SSF1degB/${SS9}_${PS9}/{YYYY}/{MM}/
CER_SSF1degB_${SS9}_${PS9}_${CC9}.{YYYY}{MM}Z*.met, where* = 001 .. 180

1. Mandatory/Optional: **180 files are Mandatory.**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER9.3P3

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **33 MB**

5.3.2 Input Dataset Name (#2): sibiMap

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

$InputArchive/sibiMap/${SS4_11}_${PS4_11}/{YYYY}/{MM}/
CER_sibiMap_${SS4_11}_${PS4_11}_${CC4_11}.{YYYY}{MM}

1. Mandatory/Optional: **Mandatory**
2. Time Related Dependency:

   The DataDate {YYYY}{MM} must match the Runtime Parameters YYYY and MM.

3. Waiting Period: **None, process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

Source PGE: CER4.5-6.0P6

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **N/A**

e. Typical file size (MB): **0.2 MB**

5.4 Operating Procedures (Procedure for each part of the processor's elements)

The main processor production script, **run_CER10.0P5.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first executing the generator, **CER10.0P5_pcf_gen.pl** after all of the necessary environment variables in Section 5.2.2 have been set**.** To run via SGE execute the production script by typing **CER10.0P5-SGE_Driver.pl** followed by the data date.

5.4.1 How to Generate the PCF File for manual operations

The PCF file generator requires two (2) command line arguments:

(-d)	2-character static code to indicate that a date follows
(YYYY)	4-digit year
(MM)	2-digit month

At the command line (>) type:

> cd $CERESHOME/tisa_avg/CER10.0P5/rcf

For Terra:

> ./CER10.0P5_pcf_gen.pl -date {YYYY}{MM} -satellites terra

For Aqua:

> ./CER10.0P5_pcf_gen.pl -date {YYYY}{MM} -satellites aqua

For NPP:

> ./CER10.0P5_pcf_gen.pl -date {YYYY}{MM} -satellites NPP

The following file will be generated in **$CERESHOME/tisa_avg/CER10.0P5/rcf/pcf**:
CER10.0P5_PCF_$SS10_5_$PS10_5_$CC10_5.{YYYY}{MM}
CER10.0P5_PCF_$SS10_5_$PS10_5_$CC10_5.{YYYY}{MM}.log

5.4.2 How to Execute the Main Processor

The production script is executed by typing the script name, **run_CER10.0P5.pl**, followed by the PCF file name.

To run at the command line:

> cd $CERESHOME/tisa_avg/CER10.0P5/rcf
> ./run_CER10.0P5.pl {YYYY} {MM}
CER10.0P5_PCF_$SS10_5_$PS10_5_$CC10_5.{YYYY}{MM}

To run using SGE for a single date:

Note: It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission scripts.

For Terra:

> CER10.0P5-SGE_Driver.pl -date YYYYMM -satellites terra -platform CPU

For Aqua:

> CER10.0P5-SGE_Driver.pl -date YYYYMM -satellites aqua -platform CPU

For NPP:

> **CER10.0P5-SGE_Driver.pl -date YYYYMM –satellites NPP -platform CPU**

To run using SGE for a for a range of months:

For Terra:

> CER10.0P5-SGE_Driver.pl -start YYYYMM -end YYYYMM -satellites terra -platform CPU

For Aqua:

> CER10.0P5-SGE_Driver.pl -start YYYYMM -end YYYYMM -satellites aqua -platform CPU

For NPP:

> CER10.0P5-SGE_Driver.pl -start YYYYMM -end YYYYMM -satellites NPP -platform CPU

There are several options for running jobs for multiple months.

Here are optional arguments for **CER10.0P5-SGE_Driver.pl**:

[-clean]	Delete any existing outputs that are encountered
[-satellites SAT]	Run the PGE for the designated satellite SAT (i.e., terra or aqua)
[-date YYYYMM]	Run the PGE on the data month specified by YYYYMM
[-start YYYYMM]	Run the PGE starting on the data month specified by YYYYMM
[-end YYYYMM]	Run the PGE stopping on the data month specified by YYYYMM
[-platform CPU]	Run the PGE on the platform designated by CPU (P6 or x86)

Below are some examples of executing the driver script with these arguments.

To run a single month on the p6 platform:

> CER10.0P5-SGE_Driver.pl -date 200801 -satellites terra -platform p6

To run a range of months on the x86 platform:

> CER10.0P5-SGE_Driver.pl -start 200801 -end 200812 -satellites aqua -platform x86

The **CER10.0P5-SGE_Driver.pl** script will search for the required input data files and any existing data product files for the requested date and time given. If all input data files are available and previously created output for this data date does not exist it will submit the job to the cluster. However, if any mandatory data files are missing the script will not submit the job to the cluster.

If existing output data products are discovered they will be listed as output to the screen and the user must delete these files before rerunning the **CER10.0P5-SGE_Driver.pl** script.

5.4.3 Special Case Considerations

N/A at this time.

5.4.4 Special Reprocessing Instructions

If reprocessing is done to correct an error during production, then SSF1deg and SSF1deg-Day files created during the previous run must be deleted. A script to remove all files from the failed run is available. The script **CleanOutput.pl** takes as in input parameter the PCF filename for the failed run. The environment variable **$CERESHOME** must be set in order for this script to work.

> cd $CERESHOME/tisa_avg/CER10.0P5/rcf/
> ./CleanOutput.pl $YYYY $MM

5.5 Execution Evaluation

5.5.1 Exit Codes

The processor CER10.0P5 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS), as seen in Table 5-5. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person(s) (see Table 5-1) for assistance.

Table 5-5. Exit Codes for CER10.0P5

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see Appendix B).

5.5.2 Screen Messages (Use Table format for large number of messages)

When running the production script, **CER10.0P5**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output file that does not exist. This does not signify a problem.

5.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/tisa_avg/runlogs/CER10.0P5**.

1. **Report Log File: CER10.0P5_LogReport_$SS10_5_$PS10_4_$CC10_5.{YYYY}{MM}**

The Report Log File contains TISA Averaging related messages. A comprehensive list of these messages that can be generated during execution of the PGE is contained in Appendix B.

2. **Status Log File: CER10.0P5_LogStatus_$SS10_5_$PS10_5_$CC10_5.{YYYY}{MM}**

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '_F_', fatal message type. The responsible person should be advised.

3. **User Log File: CER10.0P5_LogUser_$SS10_5_$PS10_5_$CC10_5.{YYYY}{MM}**

The User Log File is not used at this time, but exists to satisfy the Toolkit requirements. Typically, the _U_ and _N_ (User information and Notice) will be written to User Log File and Status Log File.

5.5.4 Solutions to Possible Problems

As mentioned in Appendix B all output files are opened with Status = NEW. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing. A script, which removes PGE created files, **CleanOutput.pl**, is located in directory **$CERESHOME/tisa_avg/CER10.0P5/rcf**. To use the clean-up files for **CER10.0P5**:

> **$CERESHOME/tisa_avg/CER10.0P5/rcf/CleanOutput.pl $YYYY $MM**

5.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

There are no foreseeable subsystem terminating conditions at this time.

b. Target PGE Termination

N/A

5.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process once per month**.**

Table 5-6. Expected Output File Listing for CER10.0P5

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSF1deg-Month_$SS10_5_ $PS10_5_$CC10_5.{YYYYMM}(.met)@ ($CERESHOME/tisa_avg/data/SSF1deg-Month/$SS10_5_$PS10_5/$year/$month)	m	1	1/mo	N/A	DPO, Archive, rm	Yes
CER_SSF1deg-Day_$SS10_5_ $PS10_5_$CC10_5.{YYYYMM}(.met)@ ($CERESHOME/tisa_avg/data/SSF1deg-Day/$SS10_5_$PS10_5/$year/$month)	m	1	1/mo	N/A	DPO, Archive, rm	Yes
CER10.0P5_LogStatus_$SS10_5_$PS10_5 _$CC10_5.{YYYY}{MM} @($CERESHOME/tisa_avg/runlogs/ CER10.0P5)	m	0.005	1/mo	N/A	Archive, rm	No
CER10.0P5_LogReport_$SS10_5_$PS10_ 5_$CC10_5.{YYYY}{MM} @($CERESHOME/tisa_avg/runlogs/ CER10.0P5)	m	0.001	1/mo	N/A	Archive, rm	No
CER10.0P5_LogUser_$SS10_5_$PS10_5_ $CC10_5.{YYYY}{MM} @($CERESHOME/tisa_avg/runlogs/ CER10.0P5)	m	0.001	1/mo	N/A	Archive, rm	No
CER10.0P5_PCF_$SS10_5_$PS10_5_$CC 10_5.{YYYY}{MM}.log @($CERESHOME/tisa_avg/CER10.0P5/ rcf/pcf)	m	0.07	1/mo	N/A	Archive, rm	No
CER10.0P5_PCF_$SS10_5_$PS10_5_$CC 10_5.{YYYY}{MM} @($CERESHOME/tisa_avg/CER10.0P5/ rcf/pcf)	m	0.06	1/mo	N/A	Archive, rm	No
CER10.0P5_${SS10_5}_${PS10_5}_ ${CC10_5}.{YYYY}{MM}.oNNNNNN @($CERESHOME/tisa_avg/sge_logs/CER1 0.0P5/)	m	0.01	1/mo	N/A	Archive, rm	No

a. See Section 5.2 for information on variable data values
If "(**.met**)" is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension
YYYY - 4 digit year
MM - 2 digit month {valid values: 01 .. 12}

b. rm - remove
DPO - File content is to be entered into /ASDC_archive/CERES
m - mandatory output
o - optional output

5.7 Expected Temporary Files/Directories

N/A

References

1. Reference "Sampling Strategy, Production Strategy, and Configuration Code Implementation at the Langley TRMM and Terra Information System (LATIS)" internal paper for detail description of the CERES environment parameters. URL: http://ceres.larc.nasa.gov/Internal/intern_docs.php

Appendix A
Acronyms and Abbreviations

ADM	Angular Distribution Models
ASCII	American Standard Code Information Interchange
ASDC	Atmospheric Science Data Center
AVG	Monthly Regional, Average Radiative Fluxes and Clouds
CERES	Clouds and the Earth's Radiant Energy System
CERESLib	CERES Library
DAAC	Distributed Active Archive Center
DMT	Data Management Team
EOS	Earth Observing System
EOSDIS	EOS Data Information System
EOS-AM	EOS Morning Crossing Mission
EOS-PM	EOS Afternoon Crossing Mission
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
F90	Fortran 90
FOV	Field-of-View
FSW	Hourly Gridded Single Satellite Fluxes and Clouds
GB	Gigabytes
GGEO	Geostationary data
HDF	Hierarchical Data Format
HDF-EOS	Hierarchical Data Format - Earth Observing System
KB	Kilobytes
LaRC	Langley Research Center
LaTIS	Langley TRMM Information System
LW	Longwave
MB	Megabytes
MCF	Metadata Control File
μm	micrometer, micron
met	metadata file
μm	microns
MM	Two-digit Month
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PCF	Process Control File

PMOA	Post Meteorological, Ozone, and Aerosol
QC	Quality Control
SARB	Surface and Atmospheric Radiation Budget
SFC	Hourly Gridded Single Satellite TOA and Surface Fluxes and Clouds
SGE	Sun Grid Engine
SMF	Status Message File
SRBAVG	Monthly TOA and SRB Averages
SSAI	Science Systems and Applications, Inc.
SW	Shortwave
SYN	Synoptic Radiative Fluxes and Clouds
TISA	Time Interpolation and Spatial Averaging
TOA	Top-Of-the-Atmosphere
TRMM	Tropical Rainfall Measuring Mission
TSI	Time Space Interpolation of clouds and TOA fluxes
UT	Universal Time
YYYY	Four-digit Year
ZAVG	Monthly Zonal and Global Average Radiative Fluxes and Clouds

Appendix B
Error Messages for PGEs CER7.3.1P2, CER7.3.1P3, CER7.3.1P4, CER8.1P2, and CER10.0P5

Appendix B contains a comprehensive list of messages that can be generated during the execution of a PGE. These messages are used to inform the operator or analyst of specific circumstances encountered during data processing. These messages may be strictly informative (Error Type = Status or Warning), or may indicate a fatal condition that results in premature PGE termination (Error Type = Fatal). All messages are written to the LogReport File and/or the LogStatus File of the processing instance.

Table B-1 contains a list of the PGEs 7.3.1P2, CER7.3.1P3, CER7.3.1P4, CER8.1P2, and CER10.0P5 diagnostic messages. Each table entry includes a message pneumonic, the message content, the source module and the recommended action that should be taken when the message is encountered.

Operator Instructions:

If a PGE prematurely terminates, then take the following steps:

1. Look at the last few records on the LogStatus File.
2. Find the error message in the following Error Message listing(s), and follow the appropriate ACTION.
3. If an error message is not in the LogStatus File, then repeat steps 1 and 2 using the LogReport File.
4. If the appropriate ACTION failed, then call the responsible persons in Section 1.1.1.
5. In all cases, log all steps that were taken after the PGE failure, and send a copy to the responsible persons.

Action Key Definitions:

Key	Action
1	Go to the appropriate directory to check for the file availability and file permission.
2	Check file existence in directory. $CERESHOME/tisa_avg/data/ancillary/static.
3	Check for permission on $CERESHOME/tisa_avg/data/data_8/out_comp.
4	Check directory $CERESHOME/tisa_avg/data/ for input files.
5	Error in closing file. Check for permission then call the responsible persons.
6	Check for input file permission.
7	Check for write permission and then call the responsible persons.
8	Warning message. Call the responsible persons.
9	Warning message. Code check for analyst.
10	Code errors. Call the responsible persons.
11	Check the hrs.h@($CERESHOME/tisa_avg/src/include7_10) file in the source code/include directory.

B.1 Error Messages for PGEs CER7.3.1P2, CER7.3.1P3, CER7.3.1P4, CER8.1P2, and CER10.0P5.

Table B-1. TK Message Table for PGEs CER7.3.1P2, CER7.3.1P3, CER7.3.1P4, CER8.1P2, and CER10.0P5

Message/Error Type		Module Name	Action Key
TISAVG_E_OPEN_ERROR	ERROR...Opening GEORC file	georc	1
TISAVG_E_OPEN_ERROR	ERROR...Opening SRBAVG files	hdf_file	1
TISAVG_E_OPEN_ERROR	ERROR...Opening grid for a opened HDF file	hdf_file	1
TISAVG_M_CLOSE_ERROR	MESSAGE...Error detaching grid	hdf_file	8
TISAVG_M_CLOSE_ERROR	MESSAGE...Error closing hdf file	hdf_file	2
TISAVG_E_SRBAVG_WRT_ERR	ERROR...Error writing data onto HDF file	hdf_file	7
TISAVG_E_SUBSYS_HR	ERROR...Error hours in day for the processing subsystem	init_subsys	11
TISAVG_E_BAD_PARAM_INT	ERROR...Error if there is a measurement for the hour and the data is default value	interp_algrthms	8
TISAVG_E_OPEN_ERROR	ERROR...Opening HDF file for write	io_data_mod	1
TISAVG_E_OPEN_ERROR	ERROR...Open_interp_file	output_interp_data	1
TISAVG_E_OPEN_ERROR	ERROR...Opening qc report file	qc_avg	1
TISAVG_F_SOLDEC_ERR	FATAL...Calculating solar declination angles, distance corrected solar constants	sol_stats	10
TISAVG_E_ACCESS_RTN	ERROR...Routine call need at least one input parameter	sol_stats	6
TISAVG_F_CDM_OPEN_ERR	FATAL...Unable to fill sw directional model table	sw_dirmod_rtns	10
TISAVG_W_GET_PCF_PARAM_UNKNOWN	WARNING...Run time param read is not successful	sys_param	8
TISAVG_E_OPEN_ERROR	ERROR...Reading valid region data	valid_regions	6
TISAVG_E_POLAR_FLAG_ERROR	ERROR...Getting the polar flag for a given zone	weights_flags	6