First ISCCP Regional Experiment (FIRE) Cirrus 1 Surface Radiation Budget (SRB) Langley DAAC Data Set Document

Summary:

The First ISCCP Regional Experiments (FIRE) have been designed to improve data products and cloud/radiation parameterizations used in general circulation models (GCMs). Specifically, the goals of FIRE are (1) to improve basic understanding of the interaction of physical processes in determining life cycles of cirrus and marine stratocumulus systems and the radiative properties of these clouds during their life cycles and (2) to investigate the interrelationships between the ISCCP data, GCM parameterizations, and higher space and time resolution cloud data.

To-date, four intensive field-observation periods were planned and executed: a cirrus IFO (October 13-November 2, 1986); a marine stratocumulus IFO off the southwestern coast of California (June 29-July 20, 1987) a second cirrus IFO in southeastern Kansas (November 13-December 7, 1991); and a second marine stratocumulus IFO in the eastern North Atlantic Ocean (June 1-June 28, 1992). Each mission combined coordinated satellite, airborne, and surface observations with modeling studies to investigate the cloud properties and physical processes of the cloud system.

This document provides information for the following data sets.

- FIRE_CI1_SRB_ALASKA
- FIRE_CI1_SRB_CANADA
- FIRE_CI1_SRB_SO_POLE
- FIRE_CI1_SRB_SWITZ

Table of Contents:

1.Data Set Overview:

Data Set Identification:

FIRE_CI1_SRB_ALASKA:	First ISCCP Regional Experiment (FIRE) Cirrus 1 Surface Radiation Budget (SRB) Alaska Data (FIRE_CI1_SRB_ALASKA)
FIRE_CI1_SRB_CANADA:	First ISCCP Regional Experiment (FIRE) Cirrus 1 Surface Radiation Budget (SRB) Canada Data (FIRE_CI1_SRB_CANADA)
FIRE_CI1_SRB_SO_POLE:	First ISCCP Regional Experiment (FIRE) Cirrus 1 Surface Radiation Budget (SRB) South Pole Data (FIRE_CI1_SRB_SO_POL)
FIRE_CI1_SRB_SWITZ:	First ISCCP Regional Experiment (FIRE) Cirrus 1 Surface Radiation Budget (SRB) Switzerland Data (FIRE_CI1_SRB_SWITZ)

Data Set Introduction:

Project FIRE (First ISCCP Regional Experiment) is a U.S. cloud climatology research program to validate and improve ISCCP (International Satellite Cloud Climatology Project) data products and cloud/radiation parameterizations used in general circulation models (GCMs).

The primary emphasis of FIRE is the study of marine stratocumulus and cirrus cloud systems. These two cloud types were selected because of their recognized importance for global climate and their scientific appeal for many members of the scientific community.

Objective/Purpose:

The objective of FIRE is to investigate the cloud properties and physical processes of the cloud systems using combined and coordinated satellite, airborne, and surface observations with modeling studies.

The goals of FIRE are (1) to improve the basic understanding of the interaction of physical processes in determining life cycles of cirrus and marine stratocumulus systems and the radiative properties of these clouds during their life cycles and (2) to investigate the interrelationships between the ISCCP data, GCM parameterizations, and higher space and time resolution cloud data.

Summary of Parameters:

FIRE_CI1_SRB_ALASKA : Radiance
FIRE_CI1_SRB_CANADA : Radiance
FIRE_CI1_SRB_SO_POLE : Radiance
FIRE_CI1_SRB_SWITZ : Radiance

Discussion:

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Related Data Sets:

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2. Investigator(s):

Investigator(s) Name and Title:

Dr. William B. Rossow
NASA Goddard Space Flight Center

Title of Investigation:

First ISCCP Regional Experiments (FIRE)

Contact Information:

Dr. William B. Rossow
NASA Goddard Space Flight Center
Mailstop 940.0
Greenbelt, MD 20771
USA

Telephone: (212) 678-5567
FAX: (212) 678-5622
E-mail: wrossow@giss.nasa.gov

3. Theory of Measurements:

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4. Equipment:

Sensor/Instrument Description:

Collection Environment:

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Source/Platform:

FIRE_CI1_SRB_ALASKA : NOAA-9
FIRE_CI1_SRB_CANADA : NOAA-9
FIRE_CI1_SRB_SO_POLE : NOAA-9
FIRE_CI1_SRB_SWITZ : NOAA-9

Source/Platform Mission Objectives:

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Key Variables:

FIRE_CI1_SRB_ALASKA : Radiance
FIRE_CI1_SRB_CANADA : Radiance
FIRE_CI1_SRB_SO_POLE : Radiance
FIRE_CI1_SRB_SWITZ : Radiance

Principles of Operation:

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Sensor/Instrument Measurement Geometry:

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Manufacturer of Sensor/Instrument:

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Sensor/Instrument:

FIRE_CI1_SRB_ALASKA : AVHRR
FIRE_CI1_SRB_CANADA : AVHRR
FIRE_CI1_SRB_SO_POLE : AVHRR
FIRE_CI1_SRB_SWITZ : AVHRR

Calibration:

Radiances normalized to NOAA-9 AVHRR, which in turn is normalized to NOAA-7 AVHRR as part of ISCCP calibration monitoring. Absolute visible calibration is then obtained from a combination of ISCCP normalization and an absolute calibration from NASA ER-2 flights under NOAA-9.

Specifications:

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Tolerance:

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Frequency of Calibration:

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Other Calibration Information:

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5. Data Acquisition Methods:

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6. Observations:

Data Notes:

Questions about instrumentation and specific data parameters (including their derivation utilization and units) should be directed to Goddard Institute of Space Studies (GISS). There are small discrepancies pertaining to the SRB data set. Some of the values from data files and ancillary files were out of range when compared against the ranges provided by the VTOC, and the maximum and minimum values from the Header files. The data producers response to these discrepancies was "What is in VTOC is the definition of the region, what is in the Ancillary files is a subset of scan lines falling in that region. A given scan line may have some pixels with lat/lon outside the region."

Field Notes:

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7. Data Description:

Spatial Characteristics:

Spatial Coverage:

Data Set Name	Min Lat	Max Lat	Min Lon	Max Lon
FIRE_CI1_SRB_ALASKA	55.00	90.00	-175.00	-135.00
FIRE_CI1_SRB_CANADA	40.00	90.00	-110.00	-70.00
FIRE_CI1_SRB_SO_POLE	-90.00	-55.00	-180.00	180.00
FIRE_CI1_SRB_SWITZ	30.00	55.00	-40.00	40.00

Spatial Coverage Map:

There are no maps available for this data set.

Spatial Resolution:

FIRE_CI1_SRB_ALASKA : Equal-area grid
FIRE_CI1_SRB_CANADA : Equal-area grid
FIRE_CI1_SRB_SO_POLE : 30 KM
FIRE_CI1_SRB_SWITZ : Equal-area grid

Projection:

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Grid Description:

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Temporal Characteristics:

Temporal Coverage:

Data Set Name	Begin Date	End Date
FIRE_CI1_SRB_ALASKA	09-30-1986	10-31-1986
FIRE_CI1_SRB_CANADA	09-30-1986	10-31-1986
FIRE_CI1_SRB_SO_POLE	09-30-1986	10-31-1986
FIRE_CI1_SRB_SWITZ	09-30-1986	10-31-1986

Temporal Coverage Map:

There are no maps available for this data set.

Temporal Resolution:

FIRE_CI1_SRB_ALASKA : 3 Hour
FIRE_CI1_SRB_CANADA : 3 Hour
FIRE_CI1_SRB_SO_POLE : 6 Hour
FIRE_CI1_SRB_SWITZ : 6 Hour

Data Characteristics:

Parameter/Variable:

Each of the observation data files in FIRE Cirrus I SRB contains 24 variables. Each variable has been defined as a one byte unsigned integer. Two variables (Lat/Lon) are stored in each ancillary data files each in INTEGER*2 format. In order to scale the data so they are 1-byte, 2-byte, or 4-bytes positive integers the following equation is used:

Q = (R - A) * (2**(b - N))

where R is the actual (real) data value, b-7 for 1 byte integers, b=15 for 2 byte integers, and b=31 for 4 byte integers and Q is rounded to a positive integer. All records and parameters within each record have been defined including their minimum and maximum values in the header file filename.001.

Variable Description/Definition:

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Unit of Measurement:

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Data Source:

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Data Range:

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Sample Data Record:

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8. Data Organization:

Data Granularity:

A general description of data granularity as it applies to the IMS appears in the EOSDIS Glossary.

Data Format:

The data are written in Modified Standard Data Format.

9. Data Manipulations:

Formulae:

Derivation Techniques and Algorithms:

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Data Processing Sequence:

Processing Steps:

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Processing Changes:

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Calculations:

Special Corrections/Adjustments:

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Calculated Variables:

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Graphs and Plots:

Images are not available for this data set.

10. Errors:

Sources of Error:

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Quality Assessment:

Data Validation by Source:

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Confidence Level/Accuracy Judgement:

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Measurement Error for Parameters:

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Additional Quality Assessments:

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Data Verification by Data Center:

The Langley DAAC performs an inspection process on this data received by the data producer via ftp. The DAAC checks to see if the transfer of the data completed and were delivered in their entirety. An inspection software was developed by the DAAC to see if the code was able to read every granule. The code also checks to see if every parameter of data falls within the ranges which are included in the granule. This same code extracts the metadata required for ingesting the data into the IMS. If any discrepancies are found, the data producer is contacted. The discrepancies are corrected before the data are archived at the DAAC.

11. Notes:

Limitations of the Data:

Questions about instruments and specific data parameters (including their derivation utilization and units) should be directed to Goddard Institute of Space Studies (GISS). There are small discrepancies pertaining to the SRB data set. Some of the data values from data files and ancillary files were out of range when compared against the ranges provided by the VTOC, and the maximum and minimum values from the Header files. The data producers response to these discrepancies was "What is in VTOC is the definition of the region, what is in the Ancillary files is a subset of scan lines falling in that region. A given scan line may have some pixels with lat/lon outside the region."

Known Problems with the Data:

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Usage Guidance:

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Any Other Relevant Information about the Study:

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12. Application of the Data Set:

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13. Future Modifications and Plans:

There are no plans for future modifications of these data sets.

14. Software:

Software Description:

Sample read software are available.

Software Access:

The software can be obtained through the Langley DAAC. Please refer to the contact information below. The software can also be obtained at the same time the user is ordering these data sets.

15. Data Access:

Contact Information:

Langley DAAC User and Data Services Office
NASA Langley Research Center
Mail Stop 157D
Hampton, Virginia 23681-2199
USA
Telephone: (757) 864-8656
FAX: (757) 864-8807
E-mail: support-asdc@earthdata.nasa.gov

Data Center Identification:

Langley DAAC User and Data Services Office
NASA Langley Research Center
Mail Stop 157D
Hampton, Virginia 23681-2199
USA
Telephone: (757) 864-8656
FAX: (757) 864-8807
E-mail: support-asdc@earthdata.nasa.gov

Procedures for Obtaining Data:

The data are available from the Langley Data Center web site.

Data Center Status/Plans:

The Langley DAAC will continue to archive this data. There are no plans to reprocess.

16. Output Products and Availability:

There are no output products available at this time for this data set.

17. References:

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18. Glossary of Terms:

EOSDIS Glossary.

19. List of Acronyms:

NASA - National Aeronautics Space Administration
URL - Uniform Resource Locator

EOSDIS Acronyms.

20. Document Information:

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Document Curator:
Langley DAAC User and Data Services Office
Telephone: (757) 864-8656
FAX: (757) 864-8807
E-mail: support-asdc@earthdata.nasa.gov