

First ISCCP Regional Experiment (FIRE) Cirrus 1 NASA ER-2 Cloud Lidar 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 data set contains cloud top height and ground height calculations from the ER2 Cloud Lidar System (CLS) during the Wisconsin FIRE experiment in October, 1986. Latitude, Longitude, Plane Height, etc. are also included.

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1. Data Set Overview:

Data Set Identification:

FIRE_CI1_ER2_LIDAR:

First ISCCP Regional Experiment (FIRE) Cirrus 1 NASA ER-2 Cloud Lidar Data Set Document (FIRE_CI1_ER2_LIDAR)



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:

Cloud Top Height
Ground Height

Discussion:

...

Related Data Sets:

...

2. Investigator(s):

Investigator(s) Name and Title:

Dr. James D. Spinhirne
NASA Goddard Space Flight Center

Title of Investigation:

First ISCCP Regional Experiment (FIRE)

Contact Information:

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3. Theory of Measurements:

...

4. Equipment:

Sensor/Instrument Description:

NASA/GSFC ER2 Lidar System operating at 532 NM dual channel polarized vertical resolution 7.5 meters.



Collection Environment:

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Source/Platform:

NASA ER2

Source/Platform Mission Objectives:

...

Key Variables:

Cloud Top Height
Ground Height

Principles of Operation:

...

Sensor/Instrument Measurement Geometry:

...

Manufacturer of Sensor/Instrument:

...

Sensor/Instrument:

LIDAR

Calibration:

None to date.

Specifications:

...

Tolerance:

...

Frequency of Calibration:

...

Other Calibration Information:

...

5. Data Acquisition Methods:

...

6. Observations:

Data Notes:

...

Field Notes:

...

7. Data Description:



Spatial Characteristics:

Spatial Coverage:

Data Set Name	Min Lat	Max Lat	Min Lon	Max Lon
FIRE_CI1_ER2_LIDAR	39.82	47.50	-97.50	-86.18

Spatial Coverage Map:

There are no maps available for this data set.

Spatial Resolution:

One flight covered 1450-3000 KM. One flight line covered 37-221 Kilometers.

Projection:

...

Grid Description:

...

Temporal Characteristics:

Temporal Coverage:

Data Set Name	Begin Date	End Date
FIRE_CI1_ER2_LIDAR	10-13-1986	11-02-1986

Temporal Coverage Map:

There are no maps available for this data set.

Temporal Resolution:

Flights were 2 to 4 hours long. Flight lines were 3 to 18 minutes long. The Lidar fired approximately 5 shots per second.

Data Characteristics:

Parameter/Variable:

This data set contains 114 binary data files.

All records and parameters within this data set have been defined, including their minimum and maximum values, in the header file.

The header file states that there are 80 bytes in each data record. The last four bytes in each record are padded with zeroes.

The undetected data value has been flagged with a -9.9.

An integer value appears at the end of the file. The data producer is not sure why there are a few records of this same integer appearing in every data file. The data producer has asked that we ignore this value. All data looks good once this value was ignored. This integer value is 538976288. This sample read program has been written to ignore these values.

The fill value number for this data set is the maximum 4-byte integer word size of 2147483647.

The ASCII header record contains 160 bytes; however, the space is not the same as what has been defined in the SDF document.



The GMT date within the ASCII header record of each data file contains blanks instead of zeroes.

There were no problems with values being out of the minimum/maximum range.

Variable Description/Definition:

...

Unit of Measurement:

...

Data Source:

...

Data Range:

...

Sample Data Record:

...

8. Data Organization:

Data Granularity:

A general description of data granularity as it applies to the IMS appears in the [EODIS Glossary](#).

Data Format:

The data are in native binary data format (Standard Data Format, SDF).

9. Data Manipulations:

Formulae:

Derivation Techniques and Algorithms:

...

Data Processing Sequence:

Processing Steps:

...

Processing Changes:

...

Calculations:

Special Corrections/Adjustments:

...

Calculated Variables:

...

Graphs and Plots:

Images are not available for this data set.



10. Errors:

Sources of Error:

...

Quality Assessment:

Data Validation by Source:

...

Confidence Level/Accuracy Judgement:

...

Measurement Error for Parameters:

...

Additional Quality Assessments:

...

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:

...

Known Problems with the Data:

...

Usage Guidance:

...

Any Other Relevant Information about the Study:

...

12. Application of the Data Set:

...

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:

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NASA Langley Research Center
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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:

Sorlie, Susan E. (Editor). Langley DAAC Handbook. NASA/Langley Research Center, Hampton, Virginia, June 27, 1994.

Spinhirne, J.D., Hansen, M.Z., Simpson, J. 1983 "The Structures and Phase of Cloud Tops as Observed by Polarization Lidar," J. Appl. Meteor. 22, 1319.

18. Glossary of Terms:

[EOSDIS Glossary](#).

19. List of Acronyms:

CLS - Cloud Lidar System
DAAC - Distributed Active Archive Center
FIRE - First ISCCP Regional Experiment
GCM - General Circulation Model
GMT - Greenwich Mean Time
GSFC - Goddard Space Flight Center
IFO - Intensive Field Observations
ISCCP - International Satellite Cloud Climatology Project
KM - kilometers
LaRC - Langley Research Center
NASA - National Aeronautics Space Administration



NM - Nautical Miles
SDF - Standard Data Format
URL - Uniform Resource Locator

[EOSDIS Acronyms.](#)

20. Document Information:

Document Revision Date:

August 15, 1997; November 24, 1997; July 1999

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Document Curator:

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