BOUNDARY LAYER HEIGHTS: SODAR (FIFE)
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# Boundary Layer Heights: SODAR (FIFE)

## Summary:

The acoustic sounder (SODAR) maps the amplitude of backscattered acoustic energy associated with temperature fluctuations and thus thermal inversions in the atmosphere. The aim of the SODAR measurements was to provide estimates of the height of the mixed layer and the vertical dimensions of inversions within the lower kilometer of the atmosphere. A single, vertically pointing, conventional SODAR was operated at an acoustic frequency near 1500 Hz to detect the amplitude of backscattered acoustic energy.

The thickness of an elevated inversion as seen by the SODAR is often smaller than the difference between the heights of the inversion top and bottom, because of oscillations in the heights that occur. The heights were estimated only for the inversions that were clearly associated with the active mixed layer. These data were collected at one location in the northwest quadrant of the FIFE study area during the first three Intensive Field Campaigns held in 1987.

## Table of Contents:



## 1. Data Set Overview:

### Data Set Identification:

Boundary Layer Heights: SODAR (FIFE).
(Boundary Layer Heights Using SODAR).

### Data Set Introduction:

The Boundary Layer Heights Using SODAR Data Set was collected at one location in the northwest quadrant of the FIFE study area during 1987. The data set contains inversion information (e.g., height, top, and bottom).

### Objective/Purpose:

The aim of acoustic sounder (SODAR) measurements was to provide estimates of the height of the mixed layer and the vertical dimensions of inversions within the lower kilometer of the atmosphere.

### Summary of Parameters:

Ground-based inversion height, elevated inversion top, and elevated inversion bottom.

### Discussion:

The thickness of an elevated inversion as seen by the SODAR is often smaller than the difference between the heights of the inversion top and bottom, because of oscillations in the heights that occur. The heights were estimated only for the inversions that were clearly associated with the active mixed layer. These data were collected at one location in the northwest quadrant of the FIFE study area during the first three Intensive Field Campaigns held in 1987.

### Related Data Sets:

- FIFE Radiosonde Data.
- Quick Look Boundary Layer Height.
- FIFE Temperature and Humidity Profiles.
- FIFE Radiosonde Wind Profiles.
- Detrended Atmospheric Turbulence Data from the NCAR King Air.
- Filtered Atmospheric Turbulence Data from the NCAR King Air.
- Raw Atmospheric Turbulence Data from the NCAR King Air.

### FIS Data Base Table Name:

SODAR_DATA.

## 2. Investigator(s):

### Investigator(s) Name and Title:

Dr. Marvin L. Wesely
Argonne National Laboratory

### Title of Investigation:

Measurements of Boundary-Layer Inversion Heights with a SODAR.

## Contact Information:

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## Requested Form of Acknowledgment.

The Boundary Layer Heights Using SODAR data were obtained by M. L. Wesely, R. L. Coulter, and associates at Argonne National Laboratory.

# 3. Theory of Measurements:

The signal detected with the SODAR is the amplitude of the backscatter of acoustic pulses transmitted vertically. This backscatter is caused mostly by the rapid temperature fluctuations associated with thermal inversions coupled with mechanical mixing in the atmosphere. With appropriate range gating, vertical profiles of the acoustic refractive index structure function can be plotted versus height, thus mapping inversion heights.

# 4. Equipment:

## Sensor/Instrument Description:

A single, vertically pointing, conventional SODAR was operated at an acoustic frequency near 1500 Hz to detect the amplitude (uncalibrated) of backscattered acoustic energy. The primary components in the field were a 1.5-m diameter parabolic dish and transducer that serves as both the transmitter and receiver, a switchbox and field amplifier, sound baffling around the antenna to suppress sidelobes, and electronic cabling to go to the electronics. The electronics were located in a trailer and consisted of an analog signal processor, a digital microprocessor, and a pseudo-facsimile display.

### Collection Environment:

Ground.

### Source/Platform:

The transmit-receive antenna was located on the ground, and the electronics were located in a nearby trailer. The antenna was placed approximately 100 m from the trailer and other equipment so that the antenna would be in a location where the background acoustic noise was small.

### Source/Platform Mission Objectives:

Not available.

### Key Variables:

Key parameters are heights of the mixed layer (ground-based inversion) and the top and bottom of thermal inversions in the lower one kilometer of the atmosphere.

### Principles of Operation:

The SODAR maps the amplitude of backscattered acoustic energy associated with temperature fluctuations and thus thermal inversions in the atmosphere.

### Sensor/Instrument Measurement Geometry:

The SODAR system measures vertical profiles from the surface to heights of approximately one kilometer. The beam width was typically 10 degrees between half-power points. Energy is both transmitted from and received at the same point, i.e., within the parabolic antenna.

### Manufacturer of Sensor/Instrument:

The SODAR was designed and assembled by R.L. Coulter and T.J. Martin of Argonne National Laboratory.

## Calibration:

No calibrations were necessary.

# 5. Data Acquisition Methods:

The SODAR system pointed vertically and sampled acoustic backscatter intensity from the measured signal amplitude at 0.8 m height intervals. The amplitude information received was digitized and stored using a computer system that was also used for performing the data analysis. Sampled at the rate of 68 pulses per second, the data within each pulse were averaged by twos or fours and were subsequently averaged in a pulse-to-pulse manner for 100 pulses (30 min.) before being stored in memory (Coulter and Wesely 1980).

The data indicating the magnitude of high-frequency temperature fluctuations were displayed on a pseudo-facsimile chart, and plotted as a function of height with time. Some of the regions of greatest signal can be readily identified as being portions of temperature inversions. The data were extracted by visual inspection of the facsimile charts and entered manually into a data file.

# 6. Observations:

## Data Notes:

Not available.

## Field Notes:

Usually inversions heights up to one kilometer above the ground can be detected. The maximum setting for the range of the facsimile chart varied from 0.6 to 1.5 km. Because of noise associated with wind and insects at the SODAR antenna, the maximum practical range was typically limited to about 1.0 km even though the maximum range displayed on the facsimile was usually 1.5 km. During the first few days of both IFC-1 and IFC-5, the maximum range of the SODAR was less than one kilometer because the sound baffling had not been completed and the insect problem was significant.

# 7. Data Description:

## Spatial Characteristics:

The FIFE study area, with areal extent of 15 km by 15 km, is located south of the Tuttle Reservoir and Kansas River, and about 10 km from Manhattan, Kansas, USA. The northwest corner of the area has UTM coordinates of 4,334,000 Northing and 705,000 Easting in UTM Zone 14.

### Spatial Coverage:

Horizontal location of data collection occurred at specific fixed locations.

In 1987, the acoustic antenna was located at station 114 (sitegrid_ID = 2731-SOD), which was approximately 100 meters west of station 4 (sitegrid_ID = 2731-ECA), where the 10-m walkup tower for eddy correlation had been placed.

| SITEGRID_ID | STN_ID | NORTHING | EASTING | LATITUDE | LONGITUDE | ELEV |
|---|---|---|---|---|---|---|
| 2731-SOD | 114 | 4328678 | 711110 | 39 05 01 | -96 33 34 | 446 |

### Spatial Coverage Map:

Not available.

### Spatial Resolution:

These are point data; however, vertical resolution of the heights was approximately 25 m.

Horizontal resolution is within 1.5 m which is the diameter of the dish containing both the receiver and the transmitter.

### Projection:

Not available.

### Grid Description:

Not available.

## Temporal Characteristics:

### Temporal Coverage:

Measurements were taken during IFC's 1, 2, and 3. Data were collected between May 28 and June 6, 1987 (IFC-1), June 25 and July 11, 1987 (IFC-2), and August 5 and 21, 1987 (IFC-3).

### Temporal Coverage Map:

Not available.

### Temporal Resolution:

Not available.

## Data Characteristics:

The SQL definition for this table is found in the SODAR.TDF file located on FIFE CD-ROM Volume 1.

| Parameter/Variable Name | Parameter/Variable Description | Range | Units | Source |
|---|---|---|---|---|
| SITEGRID_ID | This is a FIS grid location code. FIS Site grid codes (SSEE-III) give the south (SS) and east (EE) cell number in a 100 x 100 array of 200 m square cells. The last 3 characters (III) are an instrument identifier | | | |
| STATION_ID | The ID number of the station, where the observations were made. | min = 114, max = 114 | FIS | |
| OBS_DATE | The date that the observation was made on. | min = 26-MAY-87, max = 22-AUG-89 | ANL | |
| OBS_TIME | The time of the observation. | min = 15, max = 2345 | [GMT] | ANL |
| GRND_INVERSION_HEIGHT * | The height of the initiation of the SODAR mixed layer as measured from the ground. If 9999, then no inversion found at this SCALE setting. | min = 50, max = 600, missing = 9999 | [meters] | SODAR |
| ELEVTD_INVERSION_TOP * | The top of thermal inversion zone. If 9999, then no inversion found at this SCALE setting. | min = 100, max = 1500, missing = 9999 | [meters] | SODAR |
| ELEVTD_INVERSION_BOTTOM * | The bottom of thermal inversion zone. If 9999, then no inversion found at this SCALE setting. | min = 50, max = 1450, missing = 9999 | [meters] | SODAR |
| SODAR_MAX_HEIGHT_SCALE * | The maximum height on setting on the SODAR chart. If this is 9999, then no readings were taken. | min = 600, max = 1500, missing = 9999 | [meters] | SODAR |
| COMMENT1 ** | A comment describing any inversion found. | | | ANL |

COMMENT2 ** A comment describing any inversion found. ANL

COMMENT3 ** A comment describing any inversion found. ANL

FIFE_DATA_CRTFCN_CODE *** The FIFE Certification Code for the data, FIS in the following format: CPI (Certified by PI), CPI-??? (CPI - questionable data).

LAST_REVISION_DATE data, in the format (DD-MMM-YY). max = 22-APR-89

Footnotes:

- For these parameters, 9999 means no data were collected, when the SODAR_MAX_HEIGHT_SCALE = 9999.

** Valid Comments are:

- Additional layer(s) existed above the active mixed layer.
- Disturbance was obvious, usually with multiple layers.
- Elevated inversions merged during half hour.
- Ground-based inversion became elevated during the half hour.
- Inversion weakened, no longer distinguishable from noise.
- Precipitation occurred during the half hour.
- The SODAR chart maximum height scale was changed during half hour.
- The elevated inversion bottom appears to be near cloud base.
- The elevated inversion top and/or elevated inversion bottom height was greater than the SODAR chart maximum height scale.
- The ground-based inversion height top was lower than detectable (below 50 m).

*** Decode the FIFE_DATA_CRTFCN_CODE field as follows:

The primary certification codes are: EXM Example or Test data (not for release) PRE Preliminary (unchecked, use at your own risk) CPI Checked by Principal Investigator (reviewed for quality) CGR Checked by a group and reconciled (data comparisons and cross checks)

The certification code modifiers are: PRE-NFP Preliminary - Not for publication, at the request of investigator. CPI-MRG PAMS data which is "merged" from two separate receiving stations to eliminate transmission errors. CPI-??? Investigator thinks data item may be questionable.

## Sample Data Record:

| SITEGRID_ID | STATION_ID | OBS_DATE | OBS_TIME | GRND_INVERSION_HEIGHT |
|---|---|---|---|---|
| 2731-SOD | 114 | 26-MAY-87 | 515 | 9999 |
| 2731-SOD | 114 | 26-MAY-87 | 545 | 9999 |
| 2731-SOD | 114 | 26-MAY-87 | 615 | 9999 |
| 2731-SOD | 114 | 26-MAY-87 | 645 | 9999 |

| ELEVTD_INVERSION_TOP | ELEVTD_INVERSION_BOTTOM | SODAR_MAX_HEIGHT_SCALE |
|---|---|---|
| 9999 | 9999 | 9999 |
| 9999 | 9999 | 9999 |
| 9999 | 9999 | 9999 |

```
9999                    9999                    9999
     COMMENT1
------------------
     COMMENT2
------------------
     COMMENT3
------------------
    FIFE_DATA_CRTFCN_CODE    LAST_REVISION_DATE
---------------------    ------------------
CPI                    07-DEC-88
CPI                    07-DEC-88
CPI                    07-DEC-88
CPI                    07-DEC-88
```

# 8. Data Organization:

## Data Granularity:

These data are point data, however, vertical resolution of the heights was approximately 25 m. Horizontal resolution is within 1.5 m which is the diameter of the dish containing both the receiver and the transmitter.

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

## Data Format:

The CD-ROM file format consists of numerical and character fields of varying length separated by commas. The character fields are enclosed with a single apostrophe. There are no spaces between the fields. Each file begins with five header records. Header records contain the following information: Record 1 Name of this file, its table name, number of records in this file, path and name of the document that describes the data in this file, and name of principal investigator for these data. Record 2 Path and filename of the previous data set, and path and filename of the next data set. (Path and filenames for files that contain another set of data taken at the same site on the same day.) Record 3 Path and filename of the previous site, and path and filename of the next site. (Path and filenames for files of the same data set taken on the same day for the previous and next sites (sequentially numbered by SITEGRID_ID)). Record 4 Path and filename of the previous date, and path and filename of the next date. (Path and filenames for files of the same data set taken at the same site for the previous and next date.) Record 5 Column names for the data within the file, delimited by commas. Record 6 Data records begin.

Each field represents one of the attributes listed in the chart in the *Data Characteristics Section* and described in detail in the TDF file. These fields are in the same order as in the chart.

# 9. Data Manipulations:

## Formulae:

### Derivation Techniques and Algorithms:

The heights were calculated by range gating according to transmission times and estimates of the speed of sound. For this purpose, no calibrations were necessary. Occasional spot checks on the height of the mixed layer were made by comparison to the results of radiosonde launches a few kilometers away.

Ambient mean surface temperature was recorded and incorporated into the calculations of heights. Data were analyzed by visual inspection of the pseudo-facsimile charts and manual recording of the heights.

Heights were derived from the SODAR pseudo-facsimile charts by direct visual inspection and consideration of the time and height scales on the charts.

## Data Processing Sequence:

### Processing Steps:

After each IFC, the processing of the pseudo-facsimile charts were done at Argonne National Laboratory. The values were recorded in a notebook and then typed into a computer data file.

### Processing Changes:

None.

## Calculations:

### Special Corrections/Adjustments:

Heights were read directly from the SODAR pseudo-facsimile charts. Because the acoustic pulse lengths were finite, the height derived was altered by one-half the pulse length from the edge of the inversion seen on the chart.

### Calculated Variables:

Heights of inversions.

## Graphs and Plots:

None.

# 10. Errors:

## Sources of Error:

Errors in the heights can occur as a result of misreading the charts. Experimental factors that could cause underestimation of the parameters include volume averaging of the signals backscattered from the acoustic beam, short averaging time (finite acoustic pulse lengths) used in the SODAR computations, and excessive filtering of the acoustic backscatter signals by the SODAR system.

## Quality Assessment:

### Data Validation by Source:

The 1987 SODAR data was checked by Drs. Coulter and Wesely of ANL. Sorbjan et al. (1991) analyzed the FIFE SODAR data obtained during the second IFC in 1987 using local similarity theory, and concluded that the data seem to produce temperature profiles that agree qualitatively with predictions and with results of

Fairall (1987).

### Confidence Level/Accuracy Judgment:

There is some uncertainty in the height measurements. Because of the smearing associated with a finite height, the transmission beam pulse length, and typical variations that occur within each half-hour measurement period, the heights have an uncertainty of +/-25 m.

### Measurement Error for Parameters:

The uncertainty of the height measurements for the elevated inversion top, elevated inversion bottom, and ground-based inversion height were typically plus-or-minus 25 m.

Other errors mentioned in the *Sources of Error Section* above were not quantified.

### Additional Quality Assessments:

FIS staff applied a general QA procedure to the data to identify inconsistencies and problems for potential users. As a general procedure, the FIS QA consisted of examining the maximum, minimum, average, and standard deviations that appeared inconsistent with the mean. In some cases, histograms were examined to determine whether outliers were consistent with the shape of the data distribution.

The discrepancies, that were identified, are reported as problems in the *Known Problems with the Data Section*.

### Data Verification by Data Center:

The data verification performed by the ORNL DAAC deals with the quality of the data format, media, and readability. The ORNL DAAC does not make an assessment of the quality of the data itself except during the course of performing other QA procedures as described below.

The FIFE data were transferred to the ORNL DAAC via CD-ROM. These CD-ROMs are distributed by the ORNL DAAC unmodified as a set or in individual volumes, as requested. In addition, the DAAC has incorporated each of the 98 FIFE tabular datasets from the CD-ROMs into its online data holdings. Incorporation of these data involved the following steps:

- copying the entire FIFE Volume 1, maintaining the directory structure on the CD-ROM.
- using data files, documentation, and SQL code provided on the CD-ROM to create a database in Statistical Analysis System (SAS).
- creating transfer files to transfer the SAS metadata database to Sybase tables.

Each distinct type of data (i.e. "data set" on the CD-ROM), is accompanied by a documentation file (i.e., .doc file) and a data format/structure definition file (i.e., .tdf file). The data format files on the CD-ROM are Oracle SQL commands (e.g., "create table") that can be used to set up a relational database table structure. This file provides column/variable names, character/numeric type, length, and format, and labels/comments. These SQL commands were converted to SAS code and were used to create SAS data sets and subsequently to input data files directly from the CD-ROM into a SAS dataset. During this process, file names and directory paths were captured and metadata was extracted to the extent possible electronically. No files were found to be corrupted or unreadable during the conversion process.

Additional Quality Assurance procedures were performed as follows:

- Statistical operations were performed to calculate minimum and maximum values for all numeric fields and to create a listing of all values of the character fields. During this process, it was determined that various conventions were used to represent missing values. (Note: no modifications were made to any data by the DAAC). In most cases, missing value identification conventions were discussed in the accompanying .doc file. Based on a visual check of the minimum and maximum values, no glaring errors or holes were identified that might indicate errors introduced during CD-ROM mastering by the FIFE project or data ingest by the DAAC.
- Some minor inconsistencies and typographical errors were identified in some of the character fields and column labels, however, no modifications were made to the data by the DAAC.
- Some conversions of ASCII data were necessary to move the data from a DOS platform to a UNIX platform. Standard operating system conversion utilities were used (e.g., dos2unix).
- Much of the metadata required for archival is imbedded in the narrative documentation accompanying the data sets and extracted manually by DAAC staff who have read the .doc files provided on the CD-ROM and have hand entered this information into the metadata database maintained by the DAAC. QA procedures have been performed on these metadata to identify and eliminate typographical errors and inconsistencies in naming conventions, to ensure that all required metadata is present, and to ensure the accuracy of file names and paths for retrieval.
- Data requested for distribution to users are checked to verify that files copied from disk to other media remain uncorrupted.

As errors are discovered in the online tabular data by investigators, users, or DAAC staff, corrections are made in cooperation with the principal investigators. These corrections are then distributed to users. CD-ROM data are corrected when re-mastering occurs for replenishment of CD-ROM stock.

# 11. Notes:

## Limitations of the Data:

Not available.

## Known Problems with the Data:

discrepancies or errors in the data have been reported:

Results of the FIS staff quality assessment:

- Investigators data document suggests that there is data from 22-AUG-87 to 22-AUG-89, but no 1989 data exists in the FIFE data base.
- 90% of the data is -999.

## Usage Guidance:

Data on the heights of inversions were obtained by other investigators during the FIFE campaigns. For example, radiosonde data collected by Brutsaert (FIFE Radiosonde Data) can be used to infer inversion heights; LIDAR Quick Look Boundary Layer Height data collected by Eloranta, and NOAA Wind Profiles Using LIDAR data collected by Gal-Chen provide other measures of the mixing layer depth; and Atmospheric Turbulence Data from the NCAR King Air obtained by Grossman and Sinclair often can be used to infer information on inversions. These data set and documents describing them are included on FIFE CD-ROM Volume 1.

### Any Other Relevant Information about the Study:

None.

## 12. Application of the Data Set:

The acoustic sounder (SODAR) measurements are used to provide estimates of the height of the mixed layer and the vertical dimensions of inversions within the lower kilometer of the atmosphere.

## 13. Future Modifications and Plans:

The FIFE field campaigns were held in 1987 and 1989 and there are no plans for new data collection. Field work continues near the FIFE site at the Long-Term Ecological Research (LTER) Network Konza research site (i.e., LTER continues to monitor the site). The FIFE investigators are continuing to analyze and model the data from the field campaigns to produce new data products.

## 14. Software:

Software to access the data set is available on the all volumes of the FIFE CD-ROM set. For a detailed description of the available software see the *Software Description Document.*

## 15. Data Access:

### Contact Information:

ORNL DAAC User Services
Oak Ridge National Laboratory

Telephone: (865) 241-3952
FAX: (865) 574-4665
Email: ornldaac@ornl.gov

### Data Center Identification:

ORNL Distributed Active Archive Center
Oak Ridge National Laboratory
USA

Telephone: (865) 241-3952
FAX: (865) 574-4665
Email: ornldaac@ornl.gov

### Procedures for Obtaining Data:

Users may place requests by telephone, electronic mail, or FAX. Data is also available via the World Wide Web at http://daac.ornl.gov.

### Data Center Status/Plans:

FIFE data will be available from the ORNL DAAC. Please contact the ORNL DAAC User Services Office for the most current information about these data.

## 16. Output Products and Availability:

The Boundary Layer Heights Using SODAR data are available on FIFE CD-ROM Volume 1. The CD-ROM filename is as follows:

\DATA\ATMOS\SODAR\YyyMmm\ydddgrid.SOD.

Where *yy* is the last two digits of the year (e.g., Y87 = 1987) and *mm* is the month of the year (e.g., M12 = December). Note: capital letters indicate fixed values that appear on the CD-ROM exactly as shown here, lower case indicates characters (values) that change for each path and file.

The format used for the filenames is: *ydddgrid.sfx*, where *grid* is the four number code for the location within the FIFE site grid, *y* is the last digit of the year (e.g. 7 = 1987, and 9 = 1989), and *ddd* is the day of the year (e.g., 061 = sixty-first day in the year). The filename extension (*.sfx*), identifies the data set content for the file (see the *Data Characteristics Section*) and is equal to .SOD for this data set.

## 17. References:

### Satellite/Instrument/Data Processing Documentation.

Culter, R.L., and M.L. Wesely. 1980. Estimates of surface heat flux from SODAR and Laser Scintillation measurements in the unstable boundary layer. J. Appl. Meteorol. 19:1209-1222.

Greenfield, R.J., M. Teufel, D.W. Thomson, and R.L. Coulter. 1974. A method for measurement of temperature profiles in inversions from refractive transmission of sound. J. Geophys. Res. 79:5551-5554.

### Journal Articles and Study Reports.

Brutsaert, W., M. Sugita, and L.J. Fritschen. 1990. Inner region humidity characteristics of the neutral boundary layer over prairie terrain. Water Resour. Res. 26:2931-2936.

Coulter, R.L. 1979. A comparison of three methods for measuring mixing- layer height. J. Appl. Meteorol. 18:1495-1499.

Eberhard, W.L., R.E. Cupp, and K.R. Healy. 1989. Doppler LIDAR measurement of profiles of turbulence and momentum flux. J. Atmos. Oceanic Technol. 6:809-819.

Fairall, C.W. 1987. A top-down and bottom-up diffusion model of C[(T)E-2] and C[(Q)E-2] in the entraining convective boundary layer. J. Atmos. Sci. 44:1009-1017.

Gal-Chen, T., and R.A. Kropfli. 1984. Buoyancy and pressure perturbations derived from dual-Doppler radar observations of the planetary boundary layer: applications for matching models with observations. J. Atmos. Sci. 41:3007-3020.

Kunkel, K.E., E.W. Eloranta, and J.A. Weinman. 1980. Remote determination of winds, turbulence spectra and energy dissipation rates in the boundary layer from LIDAR measurements. J. Atmos. Sci. 37:978-985.

Sellers, P.J., F.G. Hall, G. Asrar, D.E. Strebel, and R.E. Murphy. 1988. The first ISLSCP field experiment (FIFE). Bull. Am. Meteorol. Soc. 69:22-27.

Sorbjan, Z., R.L. Coulter, and M.L. Wesely. 1991. Similarity scaling applied to SODAR observations of the convective boundary layer above an irregular hill. Boundary-layer Meteorol. 56:33-50.

Sugita, M., and W. Brutsaert. 1990. Wind velocity measurements in the neutral boundary layer above hilly prairie. J. Geophys. Res. 95:7617-7624.

### Archive/DBMS Usage Documentation.

The Collected Data of the First ISLSCP Field Experiment is archived at the EOS Distributed Active Archive Center (DAAC) at Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee (see the *Data Center Identification Section*). Documentation about using the archive and/or online access to the data at the ORNL DAAC is not available at this revision.

## 18. Glossary of Terms:

A general glossary for the DAAC is located at Glossary.

## 19. List of Acronyms:

CD-ROM Compact Disk (optical), Read-Only Memory DAAC Distributed Active Archive Center EOSDIS Earth Observing System Data and Information System FIFE First ISLSCP Field Experiment FIS FIFE Information System ISLSCP International Satellite Land Surface Climatology Project ORNL Oak Ridge National Laboratory URL Uniform Resource Locator UTM Universal Transverse Mercator

A general list of acronyms for the DAAC is available at

## 20. Document Information:

May 6, 1994 (citation revised on October 7, 2002).

Warning: This document has not been checked for technical or editorial accuracy by the FIFE Information Scientist. There may be inconsistencies with other documents, technical or editorial errors that were inadvertently introduced when the document was compiled or references to preliminary data that were not included on the final CD-ROM.

Previous versions of this document have been reviewed by the Principal Investigator, the person who transmitted the data to FIS, a FIS staff member, or a FIFE scientist generally familiar with the data.

### Document Review Date:

February 18, 1996.

## Document ID:

ORNL-FIFE_SODAR.

## Citation:

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## Document Curator:

DAAC Staff

## Document URL:

http://daac.ornl.gov