Stream Flow Daily Data: USGS (FIFE)

Summary:

The Daily Stream Flow Amounts Data Set contains daily measurements of stream flow for the four LTER stations and for the USGS stream-flow station located on tributaries to Kings Creek. This data set contains measurements from April 1979 to September 1988 for the USGS station, and from June 1985 to December 1987 for the 4 LTER stations. Five stream-flow gauges were placed across creeks in the Long-Term Ecological Research (LTER) section of the FIFE study area. Four of these five stations were maintained and monitored by the LTER staff while the fifth was part of the USGS network of stream flow gauges.

The V-throated flume and standpipes used at the LTER weirs operated on the principle that the height of the water level in a standpipe at a specific location within a weir of known dimensions can be converted to volume of water in the stream. The change of this instantaneous volume with time could then be used to compute volumetric stream flow. The stilling pipe installation at the USGS stations operates on the principle that the height of the water level in a standpipe at a specific location within a streambed can be converted to volume of water in the stream. The tracking of the change in stream height with time then enables the calculation of stream flow.

Table of Contents:

1. Data Set Overview:

Data Set Identification:

Stream Flow Daily Data: USGS (FIFE)
(Daily Stream Flow Amounts).

Data Set Introduction:

The Daily Stream Flow Amounts Data Set contains daily measurements of stream flow for the four LTER stations and for the USGS stream-flow station located on tributaries to Kings Creek. Daily minimum, maximum and mean stream flow, and total volume of water flow in the stream are included in the data set.

Objective/Purpose:

The purpose of this data set was to provide accurate measurements of the stream-flow from tributaries within the FIFE study area, thereby enabling the study of the hydrology of streams that drain from a tallgrass prairie.

Summary of Parameters:

Daily minimum, maximum and mean stream flow, and total volume of water flow in the stream.

Discussion:

Five stream-flow gauges were placed across creeks in the Long-Term Ecological Research (LTER) section of the FIFE study area. Four of these five stations were maintained and monitored by the LTER staff while the fifth was part of the USGS network of stream flow gauges.

Daily measurements of stream flow are available for the 4 LTER stations and for the USGS stream-flow station located on tributaries to Kings Creek. This data sets contains measurements from April 1979 to September 1988 for the USGS station, and from June 1985 to December 1987 for the 4 LTER stations.

Related Data Sets:

- Storm Event Stream Flow.
- Fifteen Minute Stream Flow Rates from USGS.

FIS Data Base Table Name:

STREAM_FLOW_DAILY_DATA.

2. Investigator(s):

Investigator(s) Name and Title:

Staff Science.

Title of Investigation:

Staff Science Soil Moisture and Hydrology Data Acquisition Program.

Contact Information:

Contact 1:
Dr. John Briggs
Kansas State University
Manhattan, KS 66506
Tel.: (913) 532-6629
Email: jmb@andro.konza.ksu.edu

Requested Form of Acknowledgment.

The daily stream flow amounts were provided by the staff of the Long-Term Ecological Research (LTER) site at Kansas State University (KSU) and the U.S. Geological Survey, Kansas. The data collected by the LTER staff were collected under the Konza Prairie LTER grant BSR 8514327 awarded to KSU by the National Science Foundation.

3. Theory of Measurements:

The V-throated flume and standpipes used at the LTER weirs operated on the principle that the height of the water level in a standpipe at a specific location within a weir of known dimensions can be converted to volume of water in the stream. The change of this instantaneous volume with time could then be used to compute volumetric stream flow. See Replogle 1978 for a more in-depth discussion of the theory associated with this type of weir.

The stilling pipe installation at the USGS stations operates on the principle that the height of the water level in a standpipe at a specific location within a streambed can be converted to volume of water in the stream. The tracking of the change in stream height with time then enables the calculation of stream flow.

4. Equipment:

Sensor/Instrument Description:

At the LTER sites the weir used created a V-throated flume. There was a standpipe associated with the weir through which the gauge height was measured.

Collection Environment:

Ground-based.

Source/Platform:

The LTER weir and stilling pipe intake is built into the streambed. The stilling pipe intake at the USGS station is built into the bottom of the streambed.

Source/Platform Mission Objectives:

To measure the volume of stream flow.

Key Variables:

Average, minimum and maximum daily stream-flow and daily total volume of stream-flow.

Principles of Operation:

The LTER weirs were constructed in the streambed with a specific configuration so that the height of the water as it flows through the weir could be measured using a pressure transducer. The gauge height is measured as the pressure of the water in a standpipe associated with the V-throated weir. This height is then converted to a volumetric flow knowing the geometry of the weir.

For a description of the operating principles for the USGS station see the Principles of Operation Section in Fifteen Minute Stream Flow Rates from USGS on FIFE CD-ROM Volume 1.

Sensor/Instrument Measurement Geometry:

The LTER weirs were V-throated flumes.

A weir was not installed into Kings Creek at the USGS station.

Manufacturer of Sensor/Instrument:

The LTER weirs were built by the staff of the Konza LTER site using a design described in Replogle et al., 1978.

Pressure transducers: Model No. PDCR 10/D

Druck
P.O. Box 551

Logan, UT 84321
(801) 753-2342

Data logger: Model No. CR-21X

Campbell Scientific Co.
P. O. Box 551
Logan, UT 84321

Data recorder: Model PC201

Campbell Scientific Co.
P. O. Box 551
Logan, UT 84321

For a description of the instruments used at the USGS station see the Manufacturer of Sensor/Instrument Section in the Fifteen Minute Stream Flow Rates from USGS document on FIFE CD-ROM Volume 1.

Calibration:

During normal events the LTER weirs are calibrated by making direct measurements of actual gauge height which are measured at predetermined reference points within each weir. These actual heights are used to correct the pressure measured gauge heights to the actual values on the data logger. This change is noted in the logbook which is kept by the LTER site at KSU.

See the Calibration Section in the Fifteen Minute Stream Flow Rates from USGS on FIFE CD-ROM Volume 1 for a description of the calibration methodology for the USGS station.

Specifications:

The LTER weirs were calibrated at different discharge volumes. These calibrations indicate that the conversion from gauge height to volumetric flow employs different geometric relationships at gauge heights less than 18.25 cm and at heights above 18.25 cm.

This information is not available at this revision for the USGS station.

Tolerance:

The tolerance of the LTER sites is not available at this revision.

Accuracy of the stilling well is about (+/-) 0.3048 E-3 meters.

Frequency of Calibration:

Gauge height for the LTER weirs is calibrated at least weekly by making actual measurements of the gauge height.

Discharge measurements for the USGS station are checked monthly.

Stage height for the USGS station is checked when the station is visited by an engineer or at a minimum every 2 - 3 years.

Other Calibration Information:

None available at this revision.

5. Data Acquisition Methods:

The stream gauge height on the LTER weirs is automatically measured every 1 minute with the Druck pressure transducers. These one minute values are recorded and averaged every five minutes into 5 minute averages. The data is then dumped from the data logger to a cassette tape. These data are then dumped from tape to an IBM PC where they are then converted to volumetric stream flow.

The USGS data were obtained from the USGS by the staff of LTER site at Kansas State University.

6. Observations:

Data Notes:

Not available.

Field Notes:

None available at this revision.

7. Data Description:

Spatial Characteristics:

The FIFE site 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:

Data were collected from four LTER stations on watersheds N4D, NUB, N1B, and N2B in the Konza Prairie Natural Research Area in the northwest quadrant of the FIFE study area, and from one USGS station 2.9 miles upstream from the mouth of Kings Creek.

Sitegrid ID	Station ID	Watershed	Northing	Easting	Latitude	Longitude
1715-STG	650	KINGS CREEK	4330650	707973	39 06 07	-96 35 42
2422-STV	651	N1B	4329110	709380	39 05 16	-96 34 45
2421-STV	652	N2B	4329140	709260	39 05 17	-96 34 50
2323-STV	653	N4D	4329380	709560	39 05 25	-96 34 37
2423-STV	654	NUB	4329230	709620	39 05 20	-96 34 35

Spatial Coverage Map:

Not available.

Spatial Resolution:

These data were collected at point locations, however, they represent the integrated value of the runoff into the creek and stream above the location of the wier or stilling gauge.

Projection:

Not available.

Grid Description:

Not available.

Temporal Characteristics:

Temporal Coverage:

Generally data are available from April, 1979 through December, 1987.

Watershed	Sitegrid ID	Station ID	Start	Stop
KINGS CREEK	1715-STG	650	01-APR-79	02-SEP-88
N1B	2422-STV	651	14-JUN-85	31-DEC-87
N2B	2421-STV	652	14-JUN-85	31-DEC-87
N4D	2323-STV	653	14-JUN-85	31-DEC-87
NUB	2423-STV	654	10-JUN-86	31-DEC-87

Temporal Coverage Map:

Not available.

Temporal Resolution:

Data are available every day.

Data Characteristics:

The SQL definition for this table is found in the STRM_DAY.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. 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. FIS

STATION_ID
The station ID designating the location of the observations. min = 650, max = 654 KANSAS STATE UNIVERSITY

OBS_DATE
The date of the observations. min = 01-APR-79, max = 02-SEP-88 KANSAS STATE UNIVERSITY

AVG_FLOW
The average water flow for the day. min = 0, max = 6.11644, [meters^3] [sec^-1] WEIR
missing = -9.999

MAX_FLOW
The maximum water flow for the min = 0, [meters^3] WEIR

day. missing = -9.999	max = 2.6,	[sec^-1]	
MAX_FLOW_TIME The time of the maximum water flow, modified from CDT. missing = 9999	min = 0, max = 2855,	[GMT]	WEIR
MIN_FLOW The minimum water flow for the day. missing = -9.999	min = 0, max = .1,	[meters^3] [sec^-1]	WEIR
MIN_FLOW_TIME The time of the minimum water flow, modified from CDT. missing = 9999	min = 0, max = 2855,	[GMT]	KANSAS STATE UNIVERSITY
TOTAL_VOL The total volume of water which flowed through the observation point during this day.	min = -10, max = 23020	[meters^3]	WEIR
FIFE_DATA_CRTFCN_CODE The FIFE Certification Code for the data, in the following format: CPI (Certified by PI), CPI-??? (CPI - questionable data). data	* CPI=checked by principal investigator, CPI-MRG=merged		FIS
LAST_REVISION_DATE data, in the format (DD-MMM-YY).	max = 17-OCT-89		

Footnote:

* Valid levels

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	AVG_FLOW	MAX_FLOW	MAX_FLOW_TIME
1715-STG	650	01-APR-79	.339800		
1715-STG	650	02-APR-79	.368120		
1715-STG	650	03-APR-79	.339800		
1715-STG	650	02-MAY-79	.127430		

MIN_FLOW	MIN_FLOW_TIME	TOT_VOL	FIFE_DATA_CRTFCN_CODE
CPI			
CPI			
CPI			
CPI			

LAST_REVISION_DATE
22-JUN-88
22-JUN-88
22-JUN-88
22-JUN-88

8. Data Organization:

Data Granularity:

These data were collected at point locations, however, they represent the integrated value of the runoff into the creek and stream above the location of the wier or stilling gauge. The stream gauge height on the LTER weirs was automatically measured every 1 minute interval. These one minute values were recorded and into 5 minute averages. Generally data are available from April, 1979 through December, 1987.

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:

Gauge height measurements made by the LTER staff at SITEGRID IDs 2422-STV, 2421-STV, 2323-STV, 2423-STV are converted to stream discharge using the following rating curves (Replogle et. al., 1978);

Use the following equation when gauge height is > 18.25 cm:

Q = 4.64 (E^-5) (s^2.587)

Use the following equation when gauge height is between 0-18.25 cm:

Q = 4.49 (E^-5) (s^2.4714)

where:

Q = discharge in cubic meters per second
s = gauge height in cm

Derivation Techniques and Algorithms:

Not available at this revision for the LTER stations.

For a description of the formulas and derivation techniques used at the USGS station see the Derivation Techniques and Algorithms Section in the Fifteen Minute Stream Flow Rates from USGS document on FIFE CD-ROM Volume 1.

Data Processing Sequence:

The data collected at the 4 LTER stations are processed using the following steps:

1. The raw data from each watershed is read from the cassette tape for that watershed and placed on-line.
2. These raw data are reformatted into a condensed more easily read form.
3. These data are then compared to the log sheets for the data loggers. The data processor is looking for indications that the data loggers have drifted and the amount of that drift. The data loggers are routinely monitored for drift. An observer periodically measures the ACTUAL stage height of the stream and compares this value with that recorded by the data logger. When a drift is detected the observer changes the recorded value on the data logger to the measured value and notes the time and change in the logbook.
4. Recorded stage height values are then corrected for the detected drift in one of 4 ways:

   a) When all values are off by the same amount a value is added or subtracted from all entries.

   b) When values are wrong on both ends of a time period or at one end and not the other, a linear regression derived from the actual stage height recorded on the log sheets is performed.

   c) When there is no flow observed yet there is a indication of flow on the data logger all values are changed to 0.

   d) When there is no drift, the data is not altered.

5. These data are then converted to discharge using the formulas in the *Formulae Section* above.

See the Data Processing Sequence Section in the Fifteen Minute Stream Flow Rates from USGS document on FIFE CD-ROM Volume 1 for a description of the data processing sequence for data from the USGS station.

Processing Steps:

See the *Data Processing Sequence Section* above.

Processing Changes:

None known at this revision.

Calculations:

See the *Formulae Section* above.

Special Corrections/Adjustments:

None known at this revision.

Calculated Variables:

Steam discharge.

Graphs and Plots:

None.

10. Errors:

Sources of Error:

Errors in the data collected by the LTER site staff may arise from several sources:

1. The transducers which detect the stage height have a tendency to drift. Errors can result with this drift is not detected.
2. Power outages occur occasionally thereby preventing the recording of data to the data loggers.
3. Occasionally the data loggers themselves malfunction.
4. Data can be lost or corrupted when it is transferred from the data loggers to the cassette tapes.

Errors in the data from the USGS station originate from the instability of the relationship between stage height and discharge. This relationship varies temporally. It is affected by changes in the streambed that result from the flow of water over the bed, such as scour and fill, aquatic growth, ice, debris, or bed roughness.

The intakes to the stilling well at the USGS station can become plugged with debris or overgrown with plant or animal material, and the float can malfunction.

Quality Assessment:

Data Validation by Source:

The LTER site staff make spot checks of the stage height during storm events. These spot checks "calibrations" are used to create a calibration for the stage height during the storm event.

The discharge curves for the USGS station are routinely checked for accuracy. The stage height within the stilling well is checked against that measured using a manual gauge.

Confidence Level/Accuracy Judgment:

The quality of the data collected by the staff of the LTER site is thought to range from poor to excellent, generally it is considered to be excellent data. No formal quality assurance is done, however, missing values are inserted when the data is known to be very poor. A coarse check is routinely made of these data.

See the Confidence Level/Accuracy Judgment Section in the Fifteen Minute Stream Flow Rates from USGS document for accuracy information for the USGS station.

Measurement Error for Parameters:

The measurement error for the data collected by the staff of the LTER site is unknown.

See the Measurement Error for Parameters Section in the Fifteen Minute Stream Flow Rates from USGS document for accuracy information for the USGS station.

Additional Quality Assessments:

FIS staff applied a general Quality Assessment (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 deviation for each numerical field in the data table. An attempt was made to find an explanation for unexpected high or low values, values outside of the normal physical range for a variable, or 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, which 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:

During the general QA performed by the FIS staff the following 26 days were found to have mean flow less than the minimum flow rates:

OBS_DATE	OBS_DATE
27-JUN-85	30-SEP-85
28-JUN-85	02-OCT-85
28-JUN-85	04-OCT-85
03-JUL-85	25-OCT-85
03-JUL-85	30-DEC-85
03-JUL-85	28-JAN-86
07-JUL-85	03-FEB-86
07-JUL-85	10-APR-86
08-JUL-85	22-MAY-86
26-AUG-85	03-JUN-86
23-SEP-85	28-AUG-86
23-SEP-85	11-SEP-86
23-SEP-85	24-SEP-86

The data on these days should be used with caution.

Usage Guidance:

The data collected by the LTER site staff should be used with caution. It should be checked against the spot measurements which are available from the LTER site at Kansas State University (KSU). See the *Contact Information Section* for contact information.

None available for the data collected at the USGS station.

Any Other Relevant Information about the Study:

More detailed information on the USGS gauging stations, such as discharge measurements, gauge-height records, and rating tables, is on file in the USGS Kansas District office in Lawrence, Kansas. The USGS keeps most of this information in computer-usable form along with the statistical analysis which have been performed on the data.

12. Application of the Data Set:

This data set can be used to study the hydrology of streams that drain from a tallgrass prairie.

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 are 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:

Daily Stream Flow Amounts are available on FIFE CD-ROM Volume 1. The CD-ROM filename is as follows: \DATA\HYDROLGY\STRM_DAY\GRIDxxxx\yyyygrid.SDY

Where *xxxx* is the four digit code for the location within the FIFE site grid. 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: *yyyygrid.sfx*, where *yyyy* are the four digits of the century and year (e.g., 1987 or 1989). The filename extension (.*sfx*), identifies the data set content for the file (see the *Data Characteristics Section*) and is equal to .SDY for this data set.

17. References:

Satellite/Instrument/Data Processing Documentation.

Anonymous. 1993. Methods Manual for Konza Prairie Research Natural Area. Konza LTER publication.

Replogle, J.A., H. Reikert, B. F. Swindel. 1978. Water Monitoring in Coastal Forest Watershed Studies. IMPAC Report 2, Vol. 3, No. 2. Southwestern Forest Expt. Station. USDA. Gainesville, Florida.

U.S. Geological Survey Water-Data Report KS-79-1 Through KS-89-1, Water Resources Data Kansas, Water Year 1979-, Prepared in cooperation with the State of Kansas and with other agencies.

Journal Articles and Study Reports.

Engman, E.T., W. Kustas, T.J. Schmugge, and J.R. Wang. 1987. Relationship among the remotely sensed soil moisture, streamflow, and evapotranspiration. AGU Fall Meeting. San Francisco.

Engman, E.T., G. Angus, and W. Kustas. 1989. Relationships between the hydrologic balance of a small watershed and remotely sensed soil moisture. Remote Sensing and Large Scale Processes. IAHS Publ. No. 186, Proc. IAHS, 3rd Int. Assoc. Baltimore, MD.

Sellers, P.J., F.G. Hall, G. Asrar, D.E. Strebel, and R.E. Murphy. 1988. The First ISLSCP Field Experiment (FIFE). Am. Meteor. Soc. 69:22-27.

Wood, E.F. 1990. Water balance model for Kings Creek. Symposium on FIFE. Am. Meteorol. Soc. Boston, Massachusetts, p 163-166.

Archive/DBMS Usage Documentation.

Contact 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-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 GMT Greenwich Mean Time GSFC Goddard Space Flight Center IFC Intensive Field Campaign ISLSCP International Satellite Land Surface Climatology Project KSU Kansas State University LTER Long Term Ecological Research Site, Konza Prairie ORNL Oak Ridge National Laboratory PI Principal Investigator URL Uniform Resource Locator USGS United States Geological Survey UTM Universal Transverse Mercator

A general list of acronyms for the DAAC is available at Acronyms.

20. Document Information:

April 26, 1994 (citation revised on October 14, 2002).

This document has been reviewed by the FIFE Information Scientist to eliminate technical and editorial inaccuracies. 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. It is believed that the document accurately describes the data as collected and as archived on the FIFE CD-ROM series.

Document Review Date:

September 19, 1996.

Document ID:

ORNL- FIFE_STRM_DAY

Citation:

Cite this data set as follows:

Briggs, J. 1994. Stream Flow Daily Data: USGS (FIFE). Data set. Available on-line [http://www.daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/119. Also published in D. E. Strebel, D. R. Landis, K. F. Huemmrich, and B. W. Meeson (eds.), Collected Data of the First ISLSCP Field Experiment, Vol. 1: Surface Observations and Non-Image Data Sets. CD-ROM.

National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Maryland, U.S.A. (available from http://www.daac.ornl.gov).

Document Curator:

DAAC Staff

Document URL:

http://daac.ornl.gov