Historic Monthly Meteorology Data (FIFE)

Summary:

The FIFE Historic Monthly Meteorology Data Data Set is one of the historical data sets used for the FIFE project. This data set provides monthly precipitation values from January 1858 to December 1989 for Manhattan, Kansas adjacent to the FIFE study area. Daily weather observations of precipitation were made according to the procedures outlined by the National Weather Service by Kansas State University. The daily precipitation data were then summed to produce monthly precipitation.

Table of Contents:

1. Data Set Overview:

Data Set Identification:

Historic Monthly Meteorology Data (FIFE).
(Historical Monthly Rainfall Data for Manhattan, Kansas.)

Data Set Introduction:

The FIFE Historic Monthly Meteorology Data Data Set is one of the historical data sets used for the FIFE project. This data set provides monthly precipitation values.

Objective/Purpose:

The aim is to provide long-term meteorological data, which can be used in numerical simulation models.

Summary of Parameters:

Monthly rainfall.

Discussion:

This is one of the historical data sets used for the FIFE project. It provides monthly precipitation values from January 1858 to December 1989 for the town adjacent to the FIFE study area.

Related Data Sets:

- Historical Daily Rainfall and Temperature Data for Manhattan, Kansas.
- Kings Creek Watershed 30 Minute Precipitation.
- Daily Rainfall Amounts in the Konza Research Area.
- Automatic Micrometeorological Observations.
- NOAA Regional Surface Data.
- NOAA Regional Surface Data - 1989 (NCDC).

FIS Data Base Table Name:

HISTORIC_MONTHLY_MET_DATA.

2. Investigator(s):

Investigator(s) Name and Title:

Kansas State University.

Title of Investigation:

Historical Meteorological Data for Manhattan, Kansas.

Contact Information:

Contact 1:
Mary Knapp
Cooperative Extension Service

Computer Systems Office
Manhattan, KS
Tel. (913) 532-6270

Requested Form of Acknowledgment.

The Historical Monthly Rainfall Data for Manhattan, Kansas were collected by the staff of the Kansas State University at Manhattan, Kansas.

3. Theory of Measurements:

Daily weather observations of precipitation were made by Kansas State University. The daily precipitation data were then summed to produce monthly precipitation. The observations are made according to the procedures outlined by the National Weather Service (Anonymous 1989).

4. Equipment:

Sensor/Instrument Description:

Rain gauge.

Collection Environment:

Ground-based.

Source/Platform:

Ground-based.

Source/Platform Mission Objectives:

Collection of precipitation data.

Key Variables:

Monthly precipitation.

Principles of Operation:

Collected precipitation is measured by a volumetric cylinder, an 8-inch non-recording rain gauge. Liquid equivalent of snowfall is determined by adding a measured amount of warm water to melt the snow, rather than waiting for the snow to melt at room temperature. Snow boards are not used, see procedures described in paragraph 2.5.3 of the National Weather Service Observing Handbook No. 2 for a full description of methodology.

Sensor/Instrument Measurement Geometry:

Not available.

Manufacturer of Sensor/Instrument:

They are standard National Weather Service issued items.

Calibration:

Specifications:

Not available.

Tolerance:

Precipitation is measured daily to the nearest hundredth of an inch and summed to get monthly values. The monthly precipitation data were converted to millimeters by FIS staff.

Frequency of Calibration:

Not available at this revision.

Other Calibration Information:

Not available at this revision.

5. Data Acquisition Methods:

Rainfall measurements are checked daily at 7:00 AM CST.

6. Observations:

Data Notes:

Not available.

Field Notes:

Not available at this revision.

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:

These data were collected in Manhattan, Kansas, near the FIFE study area.

The weather station site is on the Kansas State University campus. From 1-Oct-1856 to 31-July-1955 the station was located at 39 degrees 11 minutes N latitude, 96 degrees 34 minutes W longitude, at an elevation of 1070.0 m above sea level. From 1-Aug-1955 to 30-Apr-1970 the station was located at 39 12' N, 96 35' W, and 1040 m elevation. From 1-May-1970 to 1-June-1988 the station was located at 39 12' N, 96 35' W, and 1070 m elevation. From 2-June-1988 to present the station was located at 39 12'N, 96 35' W, and 1065 m elevation.

Spatial Coverage Map:

Not available.

Spatial Resolution:

These are point data.

Projection:

Not available.

Grid Description:

Not available.

Temporal Characteristics:

Temporal Coverage:

Data acquisition was from January 1858 through December 1989.

Temporal Coverage Map:

Not available.

Temporal Resolution:

Monthly.

Data Characteristics:

The SQL definition found in this table for the HMON_MET.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 the 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 station ID designating the location of the observations.			
START_DATE	The starting date of the observations (the first day of the month), in the format (DD-mmm-YY).			
END_DATE	The ending date of the observations (the last day of the month), in the format (DD-mmm-YY).			
TOTAL_PRECIP	The monthly precipitation in milli-meters, converted from inches by FIS. Snowfall is recorded as water equivalents.		[mm]	
FIFE_DATA_CRTFCN_CODE	The FIFE Certification Code for the data, in the following format: CAL (Calculated by FIS from daily data), CPI (Certified by PI).	*		

```
LAST_REVISION_DATE
in the format (DD-mmm-YY).
```

Footnote:

* 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 that are "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    START_DATE     END_DATE     TOTAL_PRECIP
-----------    ----------   ------------  -----------  ------------
XCCP-MET          998       01-JAN-1858   31-JAN-1858        64
XCCP-MET          998       01-FEB-1858   28-FEB-1858        12
XCCP-MET          998       01-MAR-1858   31-MAR-1858        49
XCCP-MET          998       01-APR-1858   30-APR-1858       113
FIFE_DATA_CRTFCN_CODE    LAST_REVISION_DATE
---------------------    ------------------
CPI                         26-JUL-93
CPI                         26-JUL-93
CPI                         26-JUL-93
CPI                         26-JUL-93
```

8. Data Organization:

Data Granularity:

This data set contains point data representing monthly precipitation amounts.

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:

Inches (I) of precipitation were converted to millimeters (mm) using:

mm = I / 25.4

Derivation Techniques and Algorithms:

Not available at this revision.

Data Processing Sequence:

Monthly precipitation values were provided by the Kansas State University staff up to February 1987. From March 1987 monthly precipitation values were calculated by the FIS staff.

Processing Steps:

Not available at this revision.

Processing Changes:

Not available at this revision.

Calculations:

Special Corrections/Adjustments:

Not available at this revision.

Calculated Variables:

Monthly Precipitation Values.

Graphs and Plots:

Not available at this revision.

10. Errors:

Sources of Error:

Not available at this revision.

Quality Assessment:

Data Validation by Source:

Not available at this revision.

Confidence Level/Accuracy Judgment:

Not available at this revision.

Measurement Error for Parameters:

Not available at this revision.

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 deviation for each numerical field in the data table. Inconsistencies and problems found in the QA check are described 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); and
- 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:

No known problems at this revision.

Usage Guidance:

Not available at this revision.

Any Other Relevant Information about the Study:

Not available at this revision.

12. Application of the Data Set:

This data set can be used as input data in numerical simulation models.

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:

The Historical Monthly Rainfall Data for Manhattan, Kansas are available on FIFE CD-ROM Volume 1. The CD-ROM filename is as follows:

\DATA\SUR_MET\HMON_MET\CEN_yyyy\yyyygrid.HMN

Where *yyyy* is the century (e.g., CEN_1800 = Eighteenth century). 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 *grid* is the four-number code for the location within the FIFE site *grid* and *yyyy* are the four digits of the century and year (e.g., 1987, 1989). The filename extension (*.sfx*), identifies the data set content for the file (see the *Data Characteristics Section*) and is equal to .HMN for this data set.

17. References:

Satellite/Instrument/Data Processing Documentation.

Anonymous. 1989. Nation Weather Service Observing Handbook No. 2 - Cooperative Station Observations. July, 1989.

Journal Articles and Study Reports.

Not available at this revision.

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 (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 Acronyms.

20. Document Information:

May 6, 1994 (citation revised on October 16, 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.

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January 16, 1997

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Document Curator:

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