NOAA Regional Surface Data (FIFE)

Summary:

The FIFE Staff Science effort included the acquisition, processing and archiving of meteorological parameters of the atmosphere above the FIFE study area, which would furnish surface meteorological parameters from hourly reporting network for the FIFE area, and provide input data and/or verification data for numerical simulation models. Though the measurements presented in this data set were not taken precisely at the FIFE site, it is hypothesized that they present a representative horizontal cross-section of meteorological variables and sky conditions in and around the site. It is also realized that many of the variables presented in this data set are somewhat subjective and dependent on the skill (and biases) of the observer, such as estimates of cloud amount and height.

The NOAA regional surface reports were extracted from the NOAA operational analysis system and transmitted to the FIS. This contained hourly surface meteorological data from selected stations as received from NESDIS for FIFE.

Table of Contents:

1. Data Set Overview:

Data Set Identification:

NOAA Regional Surface Data (FIFE)
(NOAA Regional Surface Data).

Data Set Introduction:

The NOAA Regional Surface Data Data Set contains hourly surface meteorological parameters including weather, visibility, temperature, wind, pressure, precipitation, humidity, and cloud information.

Objective/Purpose:

The FIFE Staff Science effort covered those activities which were FIFE community level activities, or required uniform data collection procedures across sites and time. These activities included the acquisition, processing and archiving of meteorological parameters of the atmosphere above the FIFE study area, which would furnish surface meteorological parameters from hourly reporting network for the FIFE area, and provide input data and/or verification data for numerical simulation models.

Summary of Parameters:

Air and dew point temperatures, visibility, weather conditions, sky obscurity, wind direction and velocity, gust velocity, sea level pressure difference, cloud levels, cloud amounts, atmospheric pressure tendency, precipitation, cloud group, maximum and minimum temperatures, and altimeter pressure.

Discussion:

The NOAA regional surface reports were extracted from the NOAA operational analysis system and transmitted to the FIS. This contained hourly surface meteorological data from selected stations as received from NESDIS for FIFE.

Related Data Sets:

- NOAA Radiosonde Observations.
- NOAA Radiosonde Observations - 1989 (NCDC).
- NOAA Regional Surface Data - 1989 (NCDC).
- Upper Air Derivative Data from NMC.
- Automatic Micrometeorological Observations.
- FIFE Radiosonde Observations.

FIS Data Base Table Name:

NOAA_SURFACE_DATA.

2. Investigator(s):

Investigator(s) Name and Title:

Dan Tarpley
National Oceanic and Atmospheric Administration

Title of Investigation:

Staff Science Meteorological Data Acquisition Program.

Contact Information:

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Requested Form of Acknowledgment.

The NOAA Regional Surface Data were obtained from Dr. Dan Tarpley of the National Oceanic and Atmospheric Administration (NOAA)/National Environmental Satellite Data and Information Service (NESDIS).

3. Theory of Measurements:

Though the measurements presented in this data set were not taken precisely at the FIFE site, it is hypothesized that they present a representative horizontal cross-section of meteorological variables and sky conditions in and around the site. It is also realized that many of the variables presented in this data set are somewhat subjective and dependent on the skill (and biases) of the observer, such as estimates of cloud amount and height.

4. Equipment:

Sensor/Instrument Description:

A variety of instruments are used in gathering the NOAA surface weather data. Standard instruments include propeller anemometers, a tipping bucket rain gauge, a psychrometer, and an

aneroid pressure sensor. Descriptions of specific instruments at each regional site are not available to FIS Staff at this time.

Collection Environment:

Ground-based.

Source/Platform:

Instruments were mounted within and in the proximity of standard NOAA surface meteorological stations.

Source/Platform Mission Objectives:

To provide surface meteorology data from first mission order meteorological stations for the area surrounding the Konza Prairie.

Key Variables:

Weather, visibility, temperature, wind, pressure, precipitation, humidity, and clouds.

Principles of Operation:

Not available at this revision.

Sensor/Instrument Measurement Geometry:

Not available at this revision.

Manufacturer of Sensor/Instrument:

Not available at this revision.

Calibration:

NOAA has established specific operational procedures for the instruments used in surface meteorological stations. It is beyond the scope of this documentation to describe this, but details may be found in Federal Meteorological Handbook No. 1 (see the *Satellite/Instrument/Data Processing Documentation Section*). In addition, NOAA uses the calibration factors supplied by the manufacturer for each instrument.

Specifications:

Not available at this revision.

Tolerance:

Not available at this revision.

Frequency of Calibration:

Not available at this revision.

Other Calibration Information:

Not available at this revision.

5. Data Acquisition Methods:

Dan Tarpley, of NOAA's National Environmental Satellite Data and Information Service (NESDIS), acquired the NOAA Regional Surface Data through a direct downlink from the reporting NOAA surface stations. These data were then sent to the FIFE Information System.

6. Observations:

Data Notes:

Not available.

Field Notes:

None.

7. Data Description:

Spatial Characteristics:

Spatial Coverage:

Data collection included all NOAA stations within a 256 km by 256 km area centered on the FIFE site.

NOAA STATION LOCATION	NORTHING	EASTING
BEATRICE/MUNICIPAL AIRPORT	4465124	691182
CONCORDIA/BLOSSER MUNICIPAL AIRPORT	4378475	615994
CHANUTE/MARTIN JOHNSON AIRPORT	4171529	280964
EMPORIA/MUNICIPAL AIRPORT	4246304	744744
HUTCHINSON/MUNICIPAL AIRPORT	4213612	599418
SALINA/MUNICIPAL AIRPORT	4295241	617233
FORT RILEY/MARSHALL AIR FORCE BASE	4324491	693267
TOPEKA/BILLARD MUNICIPAL AIRPORT	4327268	272167
LINCOLN/MUNICIPAL AIRPORT	4524331	689669
FALLS CITY/BRENNER AIRPORT	4438145	279683

TOPEKA/FORBES AIR FORCE BASE	4314402	268903
WICHITA/MCCONNELL AIR FORCE BASE	4164493	652981
WICHITA/MID-CONTINENT MUNICIPAL AIRPORT	4167957	639679
MANHATTAN/MUNICIPAL AIRPORT	4335807	701637
WICHITA/JABARRA AIRPORT	4179370	657112

LATITUDE	LONGITUDE
40 19 00	96 45 00
39 33 00	97 39 00
37 40 00	95 29 00
38 20 00	96 12 00
38 04 00	97 52 00
38 48 00	97 39 00
39 03 00	96 46 00
39 04 00	95 38 00
40 51 00	96 45 00
40 04 00	95 35 00
38 57 00	95 40 00
37 37 00	97 16 00
37 39 00	97 25 00
39 09 00	96 40 00
37 45 00	97 13 00

Spatial Coverage Map:

Not available.

Spatial Resolution:

These are point data.

Projection:

Not available.

Grid Description:

Not available.

Temporal Characteristics:

Temporal Coverage:

The overall time period of data acquisition for FIFE was from July 2, 1985 through October 23, 1988.

Temporal Coverage Map:

Not available.

Temporal Resolution:

Observations are made at hourly intervals.

Data Characteristics:

The SQL definition for this table is found in the NOAA_SUR.TDF file located on 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.			NOAA
STATION_CALL_SIGN The station call sign of the reporting station.	min = 3KM, max = TOP		NOAA
OBS_DATE The date of the observations.	min = 02-JUL-85, max = 23-OCT-88		NOAA
OBS_TIME The time that the observation was taken.	min = 0, max = 2359	[GMT]	NOAA
TEMP The reported temperature.	min = -26.67, max = 65.56, missing = -999	[degrees Celsius]	NOAA
DEWPNT_TEMP The reported dewpoint temperature.	min = -38.89, max = 34.44, missing = -999	[degrees Celsius]	NOAA

VISIBILITY The current visibility.	min = 0, max = 1208.58	[km]	NOAA
PRESENT_WEATHER The present weather conditions as reported by the station. (Simply picked up from record as character data and put into data base.).	** D-dust, F-fog, G-ground fog, H-haze, IP-ice pellets, K-smoke, L-drizzle, R-rain, RW-rain shower, S-snow, T-thunder, TRW-thunder shower, + heavy condition, - light condition		NOAA
PARTIAL_OBSCURATION The partial obscuration, if observed, when there are cloud layers, e.g., -X. (Simply picked up from record as character data and put into data base.).	min = **, max = P-		NOAA
WIND_DIR The direction from which the wind is blowing.	min = 0, max = 360	[degrees]	NOAA
WIND_SPEED The wind speed. Converted from knots using 3600 seconds/hour, 6080.2 ft/nautical mile, 3.2808 ft/meter or 1 nautical mile/hr = 0.5147965 m/sec.	min = 0, max = 50.45	[meters] [sec^-1]	NOAA
GUST_SPEED The gust speed. Converted from knots using 3600 seconds/hour, 6080.2 ft/nautical mile, 3.2808 ft/meter or 1 nautical mile/hr = 0.5147965 m/sec.	min = 0, max = 169.88	[meters] [sec^-1]	NOAA
SEA_LVL_PRESS_DIF The difference in pressure between sea level and station level. If > 50 add 990	min = 0, max = 99.9	[millibars]	NOAA

to value to get actual pressure; if < 50, add 1000 to value to get actual pressure (per NOAA reference).			
LOWEST_CLOUDS The lowest cloud layer information, expressed in standard NOAA notation.	+ min = X, max = 9/1453		NOAA
SECOND_LOWEST_CLOUDS The second lowest cloud layer information, expressed in standard NOAA notation.	+ min = 3//000, max = 9//010W		NOAA
THIRD_LOWEST_CLOUDS The third lowest cloud layer information, expressed in standard NOAA notation.	+ min = 3//010, max = 8//890		NOAA
PRESS_TENDENCY_CHAR The characteristic of the pressure tendency reported every 3 hours, expressed in standard NOAA notation.	$ min = *, max = 9		NOAA
AMT_PRESS_TENDENCY The amount of the pressure tendency over the last 3 hours.	min = 0, max = 9.9	[millibars]	NOAA
AMT_PRECIP The amount of precipitation which has occurred in the last six hours.	min = 0, max = 146.81	[mm]	NOAA
CLOUD_TYPE_GROUP The cloud type group, expressed in standard NOAA notation.	# min = 1///, max = 1999		NOAA
MAX_OR_MIN_TEMP The maximum or minimum temperature transmitted by the station. The maximum temperature for the last 12 hours is given at 0000 and 0600. The minimum temperature for the last 12 hours is given at 1200 and 1800.	min = -17.78, max = 37.22, missing = 99999	[degrees Celsius]	NOAA
ALTIMETER_SETTING			

The reported altimeter setting. Converted from inches of mercury (Hg) using millibars = (inches Hg) * 33.8639 millibars/inch Hg at 0 deg C.	min = 937.01, max = 1066.04, missing = 99999	[millibars]	NOAA

COMMENTS Any comments transmitted by the station.			NOAA

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

LAST_REVISION_DATE data, in the format (DD-MMM-YY).

Footnotes:

** Decode the PRESENT_WEATHER field as follows:

Code	Interpretation
A	hail
BD	blowing dust
BS	blowing snow
D	dust
F	fog
GF	ground fog
H	haze
IC	ice crystals
IF	ice fog
IP	ice pellets
IPW	ice pellet showers
K	smoke
L	drizzle
R	rain
RW	rain shower
S	snow
SG	snow grains
SP	snow pellets
SW	snow showers
T	thunder
TRW	thunder shower
ZL	freezing drizzle
ZR	freezing rain

Precipitation intensities associated with each of the codes above are as follows:

```
- = Light
no sign = Moderate
+ = Heavy
```

The three LOWEST_CLOUDS fields (lowest, second and third) are 7 digit encoded fields where each digit represents a different parameter. The following list defines the parameter associated with each digit and the interpretation of the codes for that parameter.

Digit	Parameter	Code Interpretation
1	cloud cover in oktas	1 - 8 for eighths of sky with clouds (e.g., 7= seven eighths of sky obscured with clouds 9 = sky obscured
2, 3	cloud type	// = cloud layer present -X = partly obscured X = obscured CL = clear
4,5,6	height of cloud layer	height in 100's of feet EAR = clear.
7	miscellaneous features of cloud layer	E = height estimated M = height measured - = thin layer X = obscured disturbed W = height of obscuring layer

Note: seventh digit may be missing.

$ Decode the PRESS_TENDENCY_CHAR field as follows:

* = Unknown.
0 = Increasing, then decreasing; atmospheric pressure the same or higher than 3 hours ago.
1 = Increasing, then steady; or increasing, then increasing more slowly.
2 = Increasing (steadily or unsteadily).
3 = Decreasing or steady, then increasing; or increasing. then increasing more rapidly.
4 = Steady; atmospheric pressure the same as 3 hours ago.
5 = Decreasing, then increasing; atmospheric pressure the same or lower than 3 hours ago.
6 = Decreasing, then steady; or decreasing, then decreasing more slowly.
7 = decreasing (steadily or unsteadily).
8 = Steady or increasing, then decreasing; or decreasing, then decreasing more rapidly.
Numbers between 0 and 3 stand for atmospheric pressure now that is higher than 3 hours ago.
Number 4 stands for steady pressure during this period.
Numbers between 5 and 9 stand for atmospheric pressure now that is lower than 3 hours ago.
The tendency is reported every three hours (e.g., 0000Z, 0300Z, 0600Z, 0600Z, 2100Z).

The CLOUD_TYPE_GROUP is a four digit encoded field where each digit represents a different feature of the clouds. The definition for each digit and the interpretation of the codes for each is given below:

Digit	Parameter	Code Interpretation
Code	Cloud amount in oktas(eighths)	

1	Indicates the amount of low clouds	0 = 0 1 = 1 okta or less, but not zero 2 = 2 3 = 3 4 = 4 5 = 5 6 = 6 7 = 7 oktas or more, but not 8 oktas 8 = 8 9 = sky obscured by fog and/or other meteorological phenomena / = Cloud cover is indiscernible for reasons other than fog or other meteorological phenomena, or observations not made.
2	Predominate type of low cloud	0 = No clouds--cumulus, cumulonimbus, stratocumulus, or stratus 1 = Predominately cumulus with little vertical extent and seemingly flattened or ragged cumulus other than bad weather or both 2 = No cumulonimbus present and cumulus clouds are of moderate to strong vertical extent 3 = Cumulonimbus are present and the upper part of none of the cumulonimbus clouds are clearly fibrous or striated 4 = No cumulonimbus present and stratocumulus are formed by the spreading out of the cumulus 5 = Predominately stratocumulus that are not formed by the spreading out of the cumulus 6 = Predominately stratus in a more or less continuous sheet or layer, or in ragged shreds (other than those associated with bad weather or both) 7 = Predominately pannus (ragged shreds of stratus of bad weather or ragged cumulus of bad weather or both) 8 = No cumulonimbus present and cumulus and stratocumulus clouds with bases at different levels are present 9 = Cumulonimbus present and upper part of at least one of the cumulonimbus clouds is clearly fibrous and striated. / = Clouds not visible due to darkness, fog, blowing dust or sand, or similar phenomena
3	Predominate type of middle cloud layer	See the codes for digit 2 above.
4	Predominate type of highest cloud	See the codes for digit 2 above.

layer

Decode the FIFE_DATA_CRTFCN_CODE field as follows:

The primary certification codes are: EXM Ex ample 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 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_CALL_SIGN   OBS_DATE     OBS_TIME      TEMP      DEWPNT_TEMP
-----------   -----------------   ----------   --------   -----------  -----------
BIE           01-JAN-87       55         3.330       -2.220
CNK           01-JAN-87       50         4.440       -2.220
CNU           01-JAN-87       51         4.440       -1.110
EMP           01-JAN-87       48         5.560       -1.670
      VISIBILITY  PRESENT_WEATHER  PARTIAL_OBSCURATION  WIND_DIR  WIND_SPEED
-----------  ---------------  -------------------  --------  ----------
16.090                                                 .000
32.190                                          350       4.630
11.270                                          320       2.570
16.090                                          310       3.090
     GUST_SPEED   SEA_LVL_PRESS_DIF   LOWEST_CLOUDS   SECOND_LOWEST_CLOUDS
----------   -----------------   -------------   --------------------
.000            .00              8//120E
.000          20.20              8//043M
.000          18.40              6//080E           6//250
.000          18.90              6//100E           8//250
     THIRD_LOWEST_CLOUDS   PRESS_TENDENCY_CHAR   AMT_PRESS_TENDENCY   AMT_PRECIP
-------------------  -------------------   ------------------   -----------
.00            .000
.00            .000
.00            .000
.00            .000
     CLOUD_TYPE_GROUP   MAX_OR_MIN_TEMP   ALTIMETER_SETTING
---------------   ---------------   -----------------
99999.000          1019.300
99999.000          1018.960
99999.000          1017.610
99999.000          1017.950
     COMMENTS                                    FIFE_DATA_CRTFCN_CODE
---------------------------------------- ----------------------
010 LAST
009
005
006
     LAST_REVISION_DATE
------------------
```

8. Data Organization:

Data Granularity:

This data set contains point data collected at hourly intervals.

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:

Conversion of wind velocities from knots to meters/sec:

3600 nautical mile/hr, 6080.2 ft/nautical mile, 3.2808 ft/meter

OR

1 nautical mile/hr = 0.5147965 meters/sec

Conversion of altimeter setting from inches of mercury (Hg) to millibars:

millibars (mb) = (inches of Hg) * (33.8639 mb/inch Hg at 0 deg C)

Data Processing Sequence:

Processing Steps:

1. Unpack 9-track tape data sent by D. Tarpley.

A program was run that unpacked each file and created three files (e.g., FILES1_RADIO, FILE1_UPPERAIR, and FILE1_SURFACE). The 9-track tape sent by D. Tarpley contained three sets of data: the NOAA Radiosonde Observations, Upper Air Derivative Data from NMC, and NOAA Regional Surface Data. The files were ASCII text files. In addition to the above files, the program created a log file to flag problems (e.g., missing data or year). A message indicated any problem, correct and continue.

2. Load data into FIS data base.

   A program was run, which uses ORACLE, that adds data to the data base in appropriately labeled tables (e.g., NOAA Radiosonde Observations, Upper Air Derivative Data from NMC, or NOAA Regional Surface Data). ORACLE was then used to systematically check data tables for inconsistencies in entries.

3. Extract data files for CD-ROM.

   A program was run that extracted NOAA surface data for the CD-ROM.

Processing Changes:

Not available at this revision.

Calculations:

Temperature calculation:

Tn = (R - Rl) / (Rh - Rl)

Where:
Tn = normalized reading
R = raw transducer reading
R1 and **Rh** = low and high reference readings

T = A0 + A1Tn + A2 Tn2**

Where:
Coefficients **A0, A1, A2** are determined from temperature profile calibration.

Pressure calculation:

Pn = (R - Rl) / Rh - Rl)

Where:
Pn = normalized reading
R = raw transducer reading
Rl and **Rh** = low and high reference readings

P = A0 + A1Pn + A2Pn2 + A3Pn**3 + A4Tn**

Where:
Coefficients **A0 - A4** are each different over seven segments of temperature.

Special Corrections/Adjustments:

None.

Calculated Variables:

- Temperature and
- Pressure.

Graphs and Plots:

None.

10. Errors:

Sources of Error:

Most remote station problems are detected at the base by direct observation of data being received and displayed. Determining the nature of most problems is generally straightforward. Typical problems experienced in the field, which introduce errors in the data, include a variety of modes. Psychrometer water bottles dry out or fail to wick properly, or their fans may freeze-up. Rain gauges can become clogged. Batteries can lose one or more cells. Water may invade components or cabling, causing failure or sporadic operation. Wind sensors may become choked with dust. Electronic boxes may experience component failures. Communication quality or timing may degrade.

Quality Assessment:

The quality of some of the data is suspect and no general quality assurance has been attempted. A number of the stations are third-level facilities dependent on volunteers or lacking in equipment. Manhattan, Kansas, for example, had no rain gauge. The visibility's for Manhattan and Fort Riley are constant under all conditions; however, the two stations report different values even though they are practically next door neighbors. The cloud cover estimates show a statistical bias according to an analysis by Dr. Henderson-Sellers. There may be many other problems which have not yet been discovered.

Data Validation by Source:

The data were not validated.

Confidence Level/Accuracy Judgment:

See the *Data Characteristics Section*, the *Sample Data Base Data Record Section*, and the *Quality Assessment Section*.

Measurement Error for Parameters:

Not available at this revision.

Additional Quality Assessments:

Dr. Ann Henderson-Sellers did a comparison between her cloud camera data measurements (made at the FIFE study area) and observations made at the nearest synoptic stations (Manhattan airport and Fort Riley) for the entire year of 1987.

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:

As of the revision data of this document, the following discrepancies or errors in the data have been reported:

Results of the FIS staff quality assessments:

- There are 3 temperature records with values greater than 50 deg. C.

- There are 71 wind velocity records with values greater than 20 m/s.
- A maximum wind velocity of 50 m/s was recorded.
- There are 13 gust velocity records with values greater than 30 m/s.
- A maximum gust velocity of 169.88 m/s was recorded.
- There are 20 precipitation records with values greater that 50 mm.
- A maximum precipitation of 158 mm was recorded.

According to Dr. Ann Henderson-Sellers, the cloud amount observations made at Manhattan, Kansas Airport and Fort Riley, the two nearest synoptic stations, are very odd. No cloud amounts other than clear, 3, 6, and 8 oktas are ever reported. Henderson-Sellers looked through the whole year (1987) but the data show no other numbers. Bearing in mind that second and third cloud layers are only reported if the amounts are above specified thresholds (usually 3 and 5 oktas respectively) it is very odd. There is no reason that values of 1, 2, 4, 5, or 7 oktas should be missing.

Usage Guidance:

These standard meteorological data for sites within the FIFE area could be used to compare with imagery-derived meteorological data of the area, and perhaps ground meteorological data from other prairie regions. However, extreme caution is advised in using these regional surface reports, because the general quality of the data cannot be vouched for.

Any Other Relevant Information about the Study:

The NOAA Surface data described in this document (Surface data from July 2, 1985 through October 23, 1988) was acquired, by Dr. Tarpley, directly from the NOAA surface stations. This data did not go through NCDC as did the Surface Met. 1989 data. Therefore, NCDC did no Q/A of this data.

12. Application of the Data Set:

These standard meteorological data for sites within the FIFE area could be used to compare with imagery-derived meteorological data of the area, and perhaps ground meteorological data from other prairie regions. See the *Usage Guidance Section* for precautions.

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 NOAA Regional Surface data are available on FIFE CD-ROM Volume 1. The CD-ROM filename is as follows:

\DATA\SUR_MET\NOAA_SUR\GRIDxxxx\Yyyyy\YyyMmm\ydddgrid.NOS.

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

17. References:

Satellite/Instrument/Data Processing Documentation.

Anonymous. 1982. Federal Meteorological Handbook No. 1 Surface Observations. Third Edition - 1982. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. Washington, D. C.

Anonymous. 1988. Federal Meteorological Handbook No. 2. Surface Synoptic Codes FCM-H2-1988. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. Washington, D. C.

Journal Articles and Study Reports.

Hall, F.G., P.J. Sellers, I. MacPherson, R.D. Kelly, S. Verma, B. Markham, B. Blad, J. Wang, and D.E. Strebel. 1989. FIFE: Analysis and Results - A Review. Adv. Space Res. 9(7):275-293.

Pike, J.M. 1985. Field calibration of humidity instruments in the natural atmosphere. Proceedings of International Symposium on moisture and humidity. Washington, DC, 15-18 April. Instrument Society of America. Research Triangle Park, NC. p111-119.

Wade, C.G. 1987. A quality control program for surface mesometeorological data. J. Atmos. Oceanic Tech. 4:435-453.

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 ISLSCP International Satellite Land Surface Climatology Project NESDIS National Environmental Satellite Data and Information Service NMC National Meteorological Center NOAA National Oceanic and Atmospheric Administration 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:

April 24, 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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