SITE AVERAGED FLUX DATA: 1987-1989 (BETTS)
Get Data

Site Averaged Flux Data: 1987-1989 (Betts)

Summary:

The Site Averaged Flux Data: 1987-1989 (Betts) data set contains the site-averaged product data collected by many PIs during the 1987-1989 FIFE experiment. Data are in 30-minute time intervals in 1987 and include the entire period 1987-1989.

Table of Contents:

1. Data Set Overview:

Data Set Identification:

SITE AVERAGED FLUX DATA: 1987-1989 (BETTS).

Data Set Introduction:

This data set is a site-averaged product of the FLUX data collected by many PI's acquired during the 1987-1989 FIFE experiment. The raw data have been further edited before the site average was generated.

Objective/Purpose:

Information not available.

Summary of Parameters:

Heat flux, soil heat budget, and soil heat flux.

Discussion:

This data set is a site-averaged product of the FLUX data collected by many PI's acquired during the 1987-1989 FIFE experiment. The raw data have been further edited before the site average was generated.

The center of the FIFE 15x15 km site is close to 39.05þN, 96.53þW. Most of the data comes from the FIFE CD ROM Volume 1; or was retrieved directly from the Oak Ridge DAAC. All the originating data should correspond to that in the group 8, "Surface Meteorological Measurements (i.e., SUR_MET)" or FIFE CD-ROM Volume 1, dated May 22, 1994, in directories sur_flux\30-min and sur_flux\basel_92 .

The one big exception is the 1988 Fritschen Flux data, which had been mostly lost before archive and was retrieved directly from Leo Fritschen, and reprocessed by Betts and Ball. Our special thanks to Leo Fritschen for coming out of retirement to retrieve this data. It is a key component in the 1988 data.

Related Data Sets:

- Site Averaged Flux Data: 1987 (Betts)
- Site Averaged Flux Data: 1988 (Betts)
- Site Averaged Flux Data: 1989 (Betts)

2. Investigator(s):

Investigator(s) Name and Title:

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Atmospheric Research
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Title of Investigation:

FIFE Follow-On.

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Requested Form of Acknowledgment.

You may use these files freely. Please send Alan Betts (akbetts@aol.com) an e-mail if you do, so he can notify you of any updates. Please notify both Alan Betts and the ORNL DAAC of any errors you find.

This data processing was supported by NASA under Contract NAS5-32356 to Alan Betts, and an acknowledgment of the years of work that went into the production of these files would be appreciated in publications based substantially on them.

The FIFE CD-ROM can be cited as D. E. Strebel, D. R. Landis, K. F. Huemmrich, and B. W. Meeson (1994), Collected Data of The First ISLSCP Field Experiment, Vol. 1: Surface Observations and Non-Image Data Sets.

3. Theory of Measurements:

Information not available.

4. Equipment:

Sensor/Instrument Description:

ANALYSIS*:* The process of an individual examining the information collected during a scientific investigation. Often this takes the form of reviewing and working with output from modeling activities to give meaning to the information.

Collection Environment:

Ground-based.

Source/Platform:

Field Investigation.

Source/Platform Mission Objectives:

Information not available.

Key Variables:

Information not available.

Principles of Operation:

Information not available.

Sensor/Instrument Measurement Geometry:

Information not available.

Manufacturer of Sensor/Instrument:

Information not available.

Calibration:

Information not available.

5. Data Acquisition Methods:

Information not available.

6. Observations:

Information not available.

7. Data Description:

Spatial Characteristics:

Spatial Coverage:

The center of the FIFE 15x15 km site is close to 39.05þN, 96.53þW.

Spatial Coverage Map:

Not available.

Spatial Resolution:

These are point data.

Projection:

Information not available.

Grid Description:

Information not available.

Temporal Characteristics:

The time interval of the year is broken down into 30-min intervals. There is one variable sample at each 30 minute time interval so in a LEAP YEAR (NOTE 1988) there are 366 x 48 = 17658 time intervals. This field in the data base in named "YSq#" (Yearly Sequence #) and makes a convenient linear time scale; in addition to day and UTC.

Temporal Coverage:

This data set is a time series of 30-minute average variables for the periods May 27, 1987 - August 16, 1989.

Temporal Coverage Map:

Not available.

Temporal Resolution:

Information not available.

Data Characteristics:

Parameter/Variable:

- Heat Flux,
- Soil Heat Budget, and
- Soil Heat Flux.

Variable Description/Definition:

- Heat Flux:
- Soil Heat Budget:
- Soil Heat Flux: The rate of energy (heat) transfer from the soil into the atmosphere.

Table 1. contains a summary of the variables in this data set.

Table 1. Variable Description

Variable Name	Long Name	SAS Type	Description
1 Ysq_no		8	"Time interval of the year broken down into 30-minute intervals"
2 Rnet	NET_RADTN	8	"Average net radiation (W/m2)"
3 Rnet_k		8	"Number of sites included in average net radiation (Rnet)"
4 Rnet_s		8	"Standard deviation of average net radiation (Rnet)"
5 LH	LATENT_HEAT_FLUX	8	"Average latent heat flux (W/m2)"
6 LH_s		8	"Standard deviation of average latent heat flux (LH)"
7 LH_k		8	"Number of sites included in average latent heat flux (LH)"
8 SH	SENSIBLE_HEAT_FLUX	8	"Average sensible heat flux (W/m2)"
9 SH_s		8	"Standard deviation of average sensible heat flux (SH)"
10 SH_k		8	"Number of sites included in average sensible heat flux (SH)"
11 Soil	SOIL_HEAT_FLUX	8	"Average soil heat flux (W/m2)"
12 Soil_s		8	"Standard deviation of average soil heat flux (Soil)"
13 Soil_k		8	"Number of sites included in average soil heat flux (Soil)"

```
14 SolDn        TOTAL_INCIDENT_RADTN    8         "Average total incident radiation
(W/m2)"
15 SolDn_s                              8         "Standard deviation of average
total incident radiation
(SolDn)"
16 SolDn_s                              8         "Number of sites included in
average total incident radiation
(SolDn)"
17 SolRef       SHORTWAVE_SOLAR_REFL    8         "Average shortwave solar
reflectance (W/m2)"
18 SolRef_s                             8         "Standard deviation of average
shortwave solar reflectance
(SolRef)"
19 SolRef_k                             8         "Number of sites included in
average shortwave solar
reflectance (SolRef)"
20 LWDn         LONG_WAVE_DOWN          8         "Average longwave down (W/m2)"
21 LWDn_s                               8         "Standard deviation of average
longwave down (LWDn)"
22 LWDn_k                               8         "Number of sites included in
average longwave down (LWDn)"
23 LWup         LONG_WAVE_UP            8         "Average longwave up (W/m2)"
24 LWup_s                               8         "Standard deviation of average
longwave up (LWup)"
25 LWup_k                               8         "Number of sites included in
average longwave up (LWup)"
26 Jul_Date                             8         "Julian date (day of year 1-366)"
27 UTC                                  8         "Decimal time"
28 obs_date                             8         "Observation date (mm/dd/yyyy)"
29 obs_time                             8         "Observation time (hhmm)"
30 year                                 8         "Year"
```

Unit of Measurement:

Refer to *Table 1*.

Data Source:

Meteorological Station.

Data Range:

Information not available.

Sample Data Record:

```
Ysq_no, Rnet,  Rnet_k, Rnet_s,  LH,    LH_s,  LH_k,  SH,    SH_s,  SH_k,
Soil,   Soil_s, Soil_k, SolDn, SolDn_s, SolDn_s, SolRef, SolRef_s, SolRef_k,
LWDn, LWDn_s, LWDn_k, LWup, LWup_s, LWup_k, Jul_Date, UTC,
obs_date,   obs_time,  year
```

```
7009,   33.4,  12.16,    8,   -72.12,  19.19,   5,  12.88,  13.27,    5,
18.58,  12.82,    7,      .,      .,      .,       .,       .,       .,
.,     .,       .,     .,     .,      .,      147,    0.25,
05/27/1987,  0015,    1987
7010,   -4.32, 12.03,    7,   -17.64,  14.82,   6,   7.68,  13.23,    6,
18.15,   5.72,   6,       .,      .,      .,       .,       .,       .,
```

```
.,      .,        .,      .,      .,      .,      147,    0.75,
05/27/1987,  0045,    1987
7011,  -30.53,  6.85,    7,    -1.98,  13.04,   6,   9.27,   8.32,    6,
25.72,   8.57,   6,       .,      .,      .,       .,       .,       .,
.,      .,        .,      .,      .,      .,      147,    1.25,
05/27/1987,  0115,    1987
.
.
.
5627,      .,      .,       0,       .,       .,      0,     .,       .,       0,
.,       .,      0,        .,       0,       0,       .,       .,        0,
.,      .,        .,      .,      .,      .,      118,    5.25,
04/27/1988,  0515,    1988
5628,      .,      .,       0,       .,       .,      0,     .,       .,       0,
.,       .,      0,        .,       0,       0,       .,       .,        0,
.,      .,        .,      .,      .,      .,      118,    5.75,
04/27/1988,  0545,    1988
5629,      .,      .,       0,       .,       .,      0,     .,       .,       0,
.,       .,      0,        .,       0,       0,       .,       .,        0,
.,      .,        .,      .,      .,      .,      118,    6.25,
04/27/1988,  0615,    1988
.
.
.
9650,      .,      .,       0,       .,       .,      0,     .,       .,       0,
.,       .,      0,        .,       0,       0,       .,       .,        0,
.,      .,        .,      .,      .,      .,      202,    0.75,
07/21/1989,  0045,    1989
9651,      .,      .,       0,       .,       .,      0,     .,       .,       0,
.,       .,      0,        .,       0,       0,       .,       .,        0,
.,      .,        .,      .,      .,      .,      202,    1.25,
07/21/1989,  0115,    1989
9652,      .,      .,       0,       .,       .,      0,     .,       .,       0,
.,       .,      0,        .,       0,       0,       .,       .,        0,
.,      .,        .,      .,      .,      .,      202,    1.75,
07/21/1989,  0145,    1989
```

8. Data Organization:

Data Granularity:

File names	size (bytes)
ffoflx.dat	1987330

Data Format:

This data set is a time series of 30 minute average variables for the periods May 27, 1987 - Aug 16, 1989 (Year seq #;Rnet, LH, SH, Soilheat flux, SolDn,Solref,LWdn,LWup (each with a count and standard deviation); date (1), UTC.)

9. Data Manipulations:

Information not available.

10. Errors:

Sources of Error:

Information not available.

Quality Assessment:

Data Validation by Source:

Information not available.

Confidence Level/Accuracy Judgment:

The quality of the flux data is quite good. Each variable (for all sites), together with the site-average and standard deviation were then examined graphically and manually (and iteratively) edited to eliminate bad data; and generate a cleaned-up site average for each variable. Some bad data has escaped this process; often this is indicated by a solitary extreme standard deviation. However the heterogeneity between sites is considerable; from valleys to ridgetop. When there are only a few sites such as July 24-Aug 3,1987, the "quality" of the site-average are poorer.

Measurement Error for Parameters:

Information not available.

Additional Quality Assessments:

Information not available.

Data Verification by Data Center:

Information not available.

11. Notes:

Limitations of the Data:

Not available.

Known Problems with the Data:

Following discussions with the PI (Leo Fritschen), some late July, early August, 1987 data has been rejected , as well as all the data from Fritschen station #34 (3479-BRL) in 1987 which was on a slope and had shadowing problems. In 1988 and 1989 all stations have been included.

Usage Guidance:

The quality of the flux data is quite good. When there are only a few sites such as July 24-Aug 3,1987, the "quality" of the site-average data is poorer.

Any Other Relevant Information about the Study:

Information not available.

12. Application of the Data Set:

Information not available.

13. Future Modifications and Plans:

There are no plans to revisit this data; but let us know of errors.

14. Software:

Information not available.

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
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:

This data set is available online via the World Wide Web at *http://daac.ornl.gov/*, or telnet ornlims.ornl.gov 6493 (128.219.24.108 6493), or eosims.ornl.gov 12345 (128.219.24.108 12345)

17. References:

Betts and Ball, 1996: FIFE surface climate and site-average data set 1987-1989, Submitted to J. Atmos. Sci. (3rd FIFE special issue)

Betts, A.K., J.H. Ball, and A.C.M. Beljaars, 1993: Comparison between the land surface response of the European Centre model and the FIFE-1987 data. Q.J.R.M.S., 119, 975-1001.

Betts, A.K. and J.H. Ball, 1994: Budget analysis of FIFE-1987 sonde data. J.G.R., 99, 3655-3666.

Betts, A.K. and J.H. Ball, 1995: The FIFE surface diurnal cycle climate. J.G.R. 100, 25679-25693.

Betts A. K. And J. H. Ball, 1997: FIFE surface climate and site-average dataset: 1987-1989. (FIFE special issue 3 J.Atmos. Sci. in press)

Strebel, D. E., D. R. Landis, K. F. Huemmrich, and B. W. Meeson, 1994: Collected data of the First ISLSCP Field Experiment, in Surface Observations and Non-Image Data Sets., Vol 1, CD-ROM, NASA GSFC, Greenbelt, MD 20771

The First FIFE special issue in JGR, 97, (November 1992) contains many important refs by the PI's who collected this data

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 *http://cdiac.esd.ornl.gov/cdiac/glossary.html*.

19. List of Acronyms:

ESD Environmental Sciences Division (Oak Ridge National Laboratory) FTP File Transfer Protocol NASA National Aeronautics and Space Administration ORNL Oak Ridge National Laboratories, Oak Ridge, Tennessee, U.S.A. URL Uniform Resource Locator

A general list of acronyms for the DAAC is available at *http://daac.ornl.gov/acronyms.html.*

20. Document Information:

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