SITE AVERAGED NEUTRON SOIL MOISTURE: 1987 (BETTS)
Get Data

Site Averaged Neutron Soil Moisture: 1987 (Betts)

Summary:

The Site Averaged Neutron Soil Moisture: 1987 (Betts) data set contains the site-averaged product data of the neutron probe soil moisture collected during the 1987-1989 FIFE experiment. Samples were averaged for each site, then averaged for each day. This data set includes only 1987 data.

Table of Contents:

1. Data Set Overview:

Data Set Identification:

SITE AVERAGED NEUTRON SOIL MOISTURE: 1987 (BETTS).

Data Set Introduction:

This data set is a site-averaged product of the neutron probe soil moisture data collected during the 1987-1989 FIFE experiment. Samples were averaged for each site, and then each site was interpolated to give a value for each day. Then the sites were averaged for each day.

Objective/Purpose:

Information not available.

Summary of Parameters:

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

Discussion:

The Soil Moisture Site averages contain neutron probe data, converted by FIS to a volumetric value, using individual sample density. These values are a profile down to 200 cm if the tube went that deep (i.e., no rock).

Samples were averaged for each site (which often had 5 tubes), and then each site was interpolated to give a value for each day (and to fill in missing days). Then the sites were averaged for each day. Data levels are 200, 180, 160, 140, 120, 100, 80, 60, 50, 40, 30, and 20 cm and the 2 volumetric values for 2.5 and 7.5 cm converted from gravimetric measurements. For 20 and 100 cm the count (k) of sites has been included along with a sum of the actual number of measurements to indicate data density on that day. A blank value means no actual observations; Value is all interpolation.

The 20 cm level data is suspect. The range of neutron probe exceeds 20 cm in dry soil. The 20 cm data has different characteristics in 1987 to 1988; it is inconsistent with the profile in 1987 but not in 1988. A change of measurement protocol is suspected, but the documents show nothing so it is only hearsay.

The 1989 neutron data is so infrequesntly sampled that the average should be used with caution.

This data was retrieved directly from the Oak Ridge DAAC. All the originating data, however, should correspond to that on CD-ROM Volume 1, dated May 22, 1994, in directory soilmstr\sm_neut.

Related Data Sets:

- Site Averaged Neutron Soil Moisture Data: 1988 (Betts)
- Site Averaged Neutron Soil Moisture Data: 1989 (Betts)
- Site Averaged Neutron Soil Moisture Data: 1987 - 1989 (Betts)

2. Investigator(s):

Investigator(s) Name and Title:

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Title of Investigation:

FIFE Follow-On.

Contact Information:

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Fax: 1-(865)-574-4665
Email: ornldaac@ornl.gov

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:

Temporal Coverage:

This data set is a time series of daily values for the period between May 28, 1987- November 6, 1987.

Temporal Coverage Map:

Not available.

Temporal Resolution:

Time index is Julian day.

Data Characteristics:

Parameter/Variable:

- Soil Moisture,

Variable Description/Definition:

- Soil Moisture:

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

Table 1. Variable Description

Variable Name	Long Name	SAS Type	Description
1	Jul_Date	8	"Julian date (day of year 1-366)"
2	SM200	8	"Average % soil moisture at depth of 200 cm"
3	SM180	8	"Average % soil moisture at depth of 180 cm"
4	SM160	8	"Average % soil moisture at depth of 160 cm"
5	SM140	8	"Average % soil moisture at depth of 140 cm"
6	SM120	8	"Average % soil moisture at depth of 120 cm"
7	SM100	8	"Average % soil moisture at depth of 100 cm"
8	SM100_k	8	"Number of sites included in average soil moisture at depth of 100 cm (SM100)"
9	SM100sum	8	"Sum of soil moisture measurements at depth of 100 cm"
10	SM80	8	"Average % soil moisture at depth of 80 cm"
11	SM60	8	"Average % soil moisture at depth of 60 cm"
12	SM50	8	"Average % soil moisture at depth of 50 cm"
13	SM40	8	"Average % soil moisture at depth

```
of 40 cm"
14 SM30                                 8         "Average % soil moisture at depth
of 30 cm"
15 SM20                                 8         "Average % soil moisture at depth
of 20 cm"
16 SM20_k                               8         "Number of sites included in
average soil moisture at depth
of 20 cm  (SM20)"
17 SM20sum                              8         "Sum of soil moisture
measurements at depth of 20 cm"
18 SM7_5v                               8         "Volumetric soil moisture for
depth of 7.5 cm converted from
gravimetric measurements"
19 SM2_5v                               8         "Volumetric soil moisture for
depth of 2.5 cm converted from
gravimetric measurements"
20 SM2_5vk                              8         "Number of gravimetric
measurements at 2.5 cm included
in volumetric conversion"
21 obs_date                             8         "Observation date (mm/dd/yyyy)"
```

Unit of Measurement:

Refer to *Table 1*.

Data Source:

Meteorological Station.

Data Range:

Information not available.

Sample Data Record:

```
Jul_Date, SM200,  SM180,  SM160,  SM140,   SM120,   SM100, SM100_k, SM100sum,
SM80,   SM60,   SM50,   SM40,   SM30,   SM20,   SM20_k, SM20sum, SM7_5v, SM2_5v, SM2_5vk, obs_dat
```

```
148,       .,       .,       .,    23.25,   25.95,   27.38,    1,       6,
27.97,  29.67,  30.65,  31.33,  31.47,  30.65,    1,       5,     45,      44.6,
1,      05/28/1987
149,     35.1,    35.42,  34.55,  32.42,   33.7,    34.17,    5,      16,
34.5,   36.73,  37.6,   38.13,  37.93,  31.6,     6,      20,     41.22,   41.4,
10,     05/29/1987
150,     34.11,   34.46,  34.29,  33.62,   34.38,   34.52,   15,      29,
35.27,  36.92,  37.61,  37.87,  37.11,  29.62,   16,      37,     37.01,   38.92,
29,     05/30/1987
151,     34.03,   34.33,  34.2,   33.62,   34.3,    34.43,   15,       .,
35.17,  36.77,  37.45,  37.63,  36.64,  28.55,   16,       .,     35.93,   36.62,
29,     05/31/1987
```

8. Data Organization:

Data Granularity:

File names	size (bytes)
ffoneut87.dat	18000

Data Format:

Data levels are 200, 180, 160, 140, 120, 100, 80, 60, 50, 40, 30, and 20 cm. The 2 volumetric values for 2.5 and 7.5 cm are converted from gravimetric measurements. A count (k) of sites along with a sum of the actual number of measurements to indicate data density on that day is included for the 20 and 100 cm levels.

A blank value indicates no actual observations; value is all interpolation.

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:

Irregularity of sampling is the biggest problem with the soil moisture data. During dry spells and between IFC's sampling was less frequent, and this smoothes the time series considerably.

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:

The 20 cm level data is suspect. Range of neutron probe exceeds 20 cm in dry soil. The 20 cm data has different characteristics in 1987 to 1988; it is inconsistent with the profile in 1987 but not in 1988. A change of measurement protocol is suspected, but the documents show nothing so it is only hearsay.

The 1989 neutron data is so fragmentary that it is still being considered.

Usage Guidance:

Information not available.

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, 1997: FIFE surface climate and site-average data set 1987-1989, J. Atmos. Sci. In press (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 (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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