



GLOBE DataTool

Version 1.3

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1 DataTool

1.1 Introduction

The DataTool has been developed to facilitate the upload of environmental measurements or extensive datasets into the GLOBE database. Instead of form-based data entry using the GLOBE homepage (www.globe.gov/globe-data/data-entry), existing data can easily be imported as a CSV file from any spreadsheet (e.g. Excel, Numbers, etc.) and then edited, visualized and uploaded. The prerequisite is that the respective measurement sites have already been created at GLOBE and a valid user ID exists.

1.2 System Requirements and Installation Instructions

The Application is available as 64-bit version only and has been compiled for macOS (Version 10.10.5 or later) and Windows (Version 7 SP1 or later). In addition, a pre-installed e-mail client (e.g. Apple Mail, Outlook, Thunderbird, etc.) is also required for uploading data into the GLOBE database.

macOS. After unzipping, DataTool should be placed into the **Applications** folder.

Windows After unpacking, the program and all necessary files are in the **DataTool** folder. **DataTool.exe** can only be launched from this folder. However, the folder itself can be moved to any directory (e.g. **Applications**).

1.3 User Interface

After launching the application, the main window shows up. It is divided into a \triangleright *toolbar*, the \triangleright *workspace* and a contextual \triangleright *status bar*. Most features of the program can also be accessed using the \triangleright *menu bar* (see Fig. 1.1) or via corresponding shortcuts.

The toolbar provides convenient access to commonly used commands. There are buttons for \triangleright *import/export*, \triangleright *selecting protocols* and switching to a specific \triangleright *view*. By default, the software uses the editor view as primary working environment.

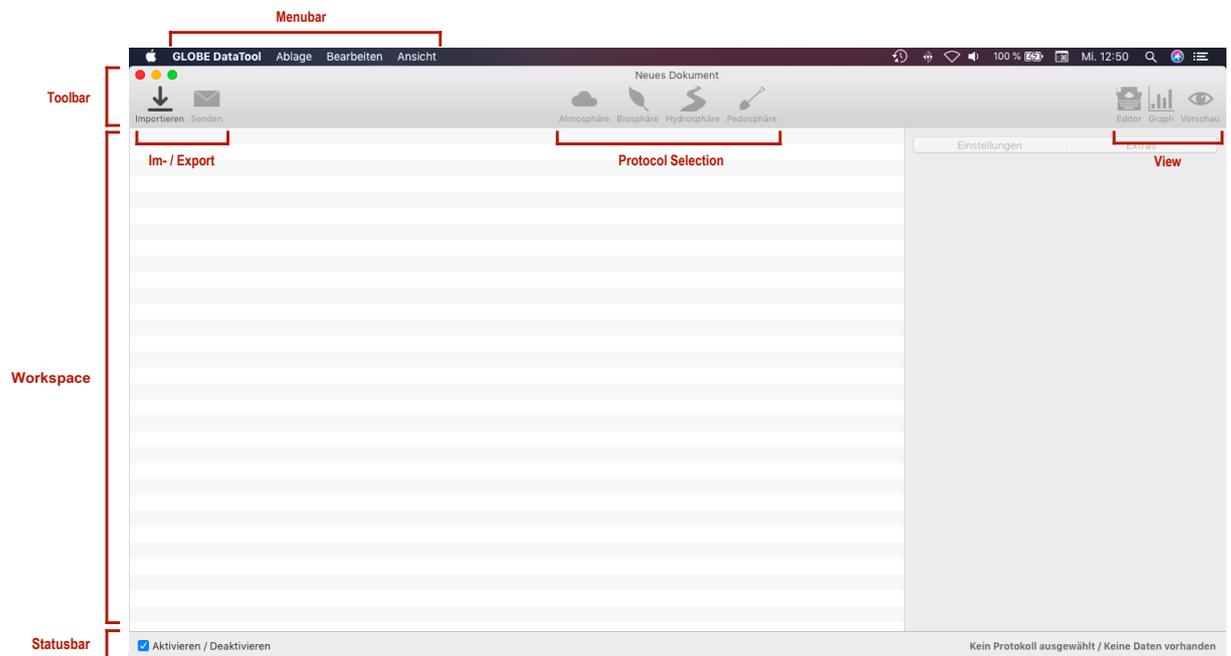


Figure 1.1: The User Interface.

2 Views

2.1 Editor

The editor view is used to import, edit and prepare data for uploading into the GLOBE database. The editor can easily be accessed using the **Editor** button, which is located on the right side of the toolbar, or by choosing **View >> Editor** in the menu bar. Alternatively, the shortcut **⌘ + 1** on macOS or **ctrl + 1** on Windows can be used.

2.1.1 Importing a CSV file

Importing data in comma-separated value (CSV) format is only possible when working in the editor view. For this purpose, use **Import** in the toolbar, or choose **File >> Import** in the menu bar. Select the file using the operating system's open dialog. In the following window, the delimiter used to separate the entries must be set using the radio buttons and has to be confirmed by clicking **OK** (see Fig. 2.1).

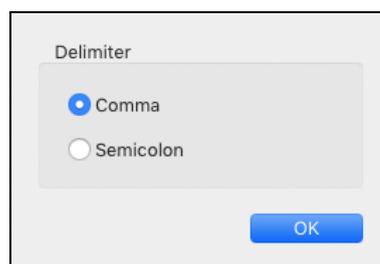


Figure 2.1: Selecting a delimiter.

2.1.2 Assign Variables

Uploading measurements to the GLOBE database requires a valid User- and Site-ID, date and time, and specific readings. After importing a CSV file, it must first be determined in

which column of the data table the corresponding variables were entered. The assignment can be made in the **Setup** pane (see Fig. 2.2).

Variable	Column	Property
Air temperature	-	°C
Maximum Temperature	-	°C
Minimum Temperatur	-	°C

Figure 2.2: The Setup pane.

ID. Enter the User- or Organization ID into the field **User**. The assignment of the measurement to a specific location is done by entering its ID into the field **Site**. Frequently used ID's can be selected from the list of choices. Those ID's must be created beforehand using **Measurement** » **Manage IDs**.

Date/Time. Assign date and time by entering the number of the corresponding column into the field **column** or by selecting from the list of choices. Only columns that are not yet linked to other variables can be specified. In the **UTC** field, the offset from the coordinated world time must be given in hours, based on the measurements' time zone. In addition, the format of time and date have to be set using the **Format** field.

Protocol. The selection of a protocol is done via a separate pop-up field. The default is the ATM protocol. In the listbox below, the associated variables are displayed for each protocol. Clicking in a column field opens a pop-up menu in which the corresponding column in the data table is defined. An attribute field is displayed for some variables, so that the unit of a measurement or the measuring device can be specified.

The assignment of variables to a single protocol can be overridden using **Measurement** »

Variables >> Reset. Select Measurement >> Variables >> Reset all to remove all of the assignments. In addition, the entries for ▷ *ID*, ▷ *Date/Time* and ▷ *Protocol* can be saved using Measurement >> Presets >> Save as... as a preset.

2.1.3 Find and Replace

In order to find or replace a specific entry within the data table, use the tab Tools, which is located in the sidebar (see Fig. 2.3).

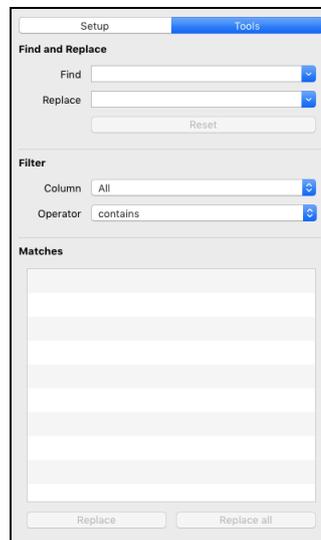


Figure 2.3: Find and Replace.

Find and replace. Any character string can be entered in the Search field. By pressing ,  or  the entry is completed and the search is started. At the same time, the search term is added to the list of choices and can be selected directly for future search calls. Optionally, a replacement for a search word can be entered in the Replace field.

Filter. The filter function further refines the search result. In the pop-up menu labeled as Column the search can be limited to just a single column of the data table or extended to all available columns. In addition, a single criterion for the search routine can be stated in the Cell field.

Matches. Every match is displayed in the result list. Select an arbitrary element of this list to display and highlight the corresponding cell in the data table. **Replace** changes search term for the selected list item only. The **Replace All** button causes the replacement to be performed on all matches.

2.1.4 Edit Data

Click into a cell of the datatable to edit its content. Editing is finished by pressing **↵**, **↩** or **→**. Press **⌫** or **Escape** to leave the input field without any changes.

2.1.5 Selecting Data

The check boxes on the left edge of the data table indicate which data will be evaluated. By default, all flags are on. Click on a check box to activate or deactivate a single row. In order to do this for several rows, you must first select them with the mouse button pressed or by **⬆**-clicking. Confirm the selection using the **Mark/Unmark** button. The number of available and marked entries is shown in the status bar below (see Fig. 2.4).

2.2 Graph

In the graph view, the selected data can be visualized. Switch to this view by clicking **Graph** in the toolbar, or by choosing **View > Graph** in the menu bar. Alternatively, the shortcut **⌘ + 2** on macOS or **ctrl + 2** on Windows can be used.

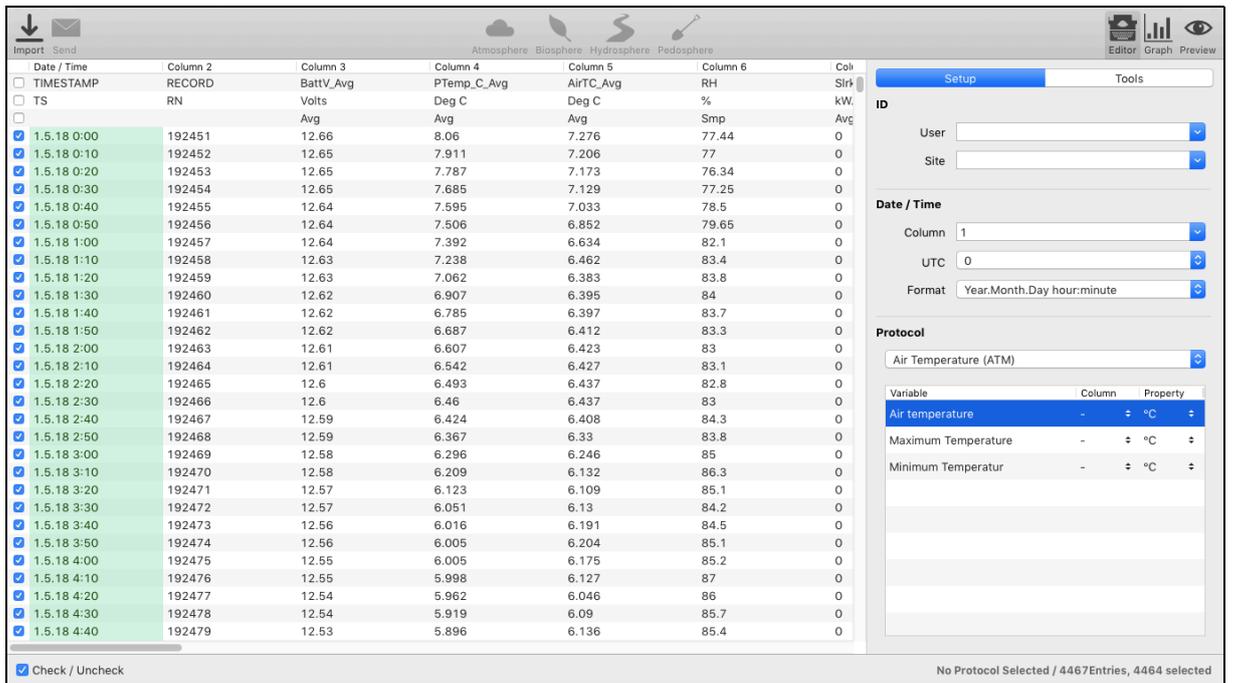


Figure 2.4: Selecting Data.

2.2.1 Visualizing Data

Based on the variables assigned in the editor, a protocol can be selected by clicking `Atmosphere`, `Biosphäre`, `Hydrosphere` or `Pedosphäre`. The protocols' name will be displayed in the status bar. Select the variable to plot using the pop-up menu. A corresponding graph and basic statistics are displayed automatically (see Fig. 2.5).

2.2.2 Selection Tool

The selection tool  can be used to query information about the data points. The segmented control is enabled in the status bar as soon as a graph has been plotted.

Single Selection. The single selection is the default tool. By clicking on the graph, a guide, date and time as well as the measured value are displayed for this single point.

Range Selection. Information for a given time interval is displayed using the range selection tool. A frame is raised while dragging the mouse (see Fig. 2.6).

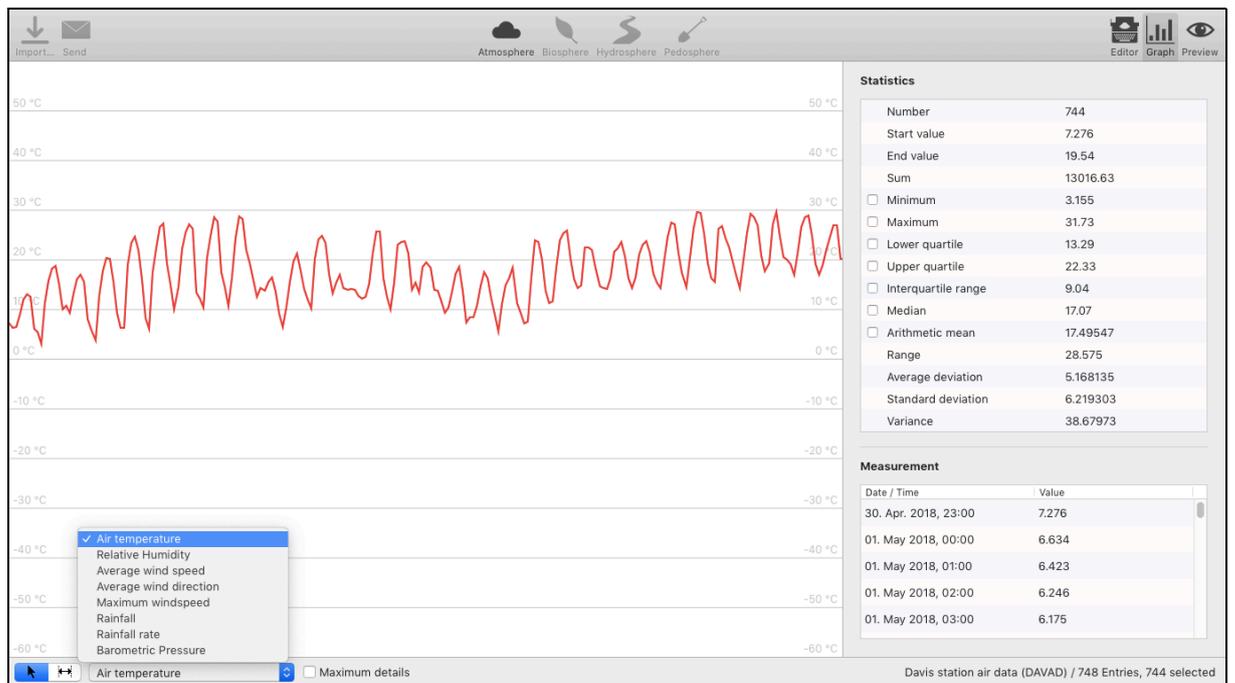


Figure 2.5: Plotting a Graph.

2.2.3 Statistics

At the right edge of the screen, basic *statistics* are displayed for the evaluated data or the current range selection. By setting a check mark, the statistical information on minimum, maximum, lower quartile, upper quartile, interquartile range, median and arithmetic mean can also be shown directly within the graph. In the *Measurement* area, the respective measured values including their date of entry (UTC) are also listed.

2.3 Preview

Data is shown according to the settings in the editor, and can be uploaded to the GLOBE database. Switch to this view by clicking `Preview` or by choosing `View >> Preview` in the menu bar. Alternatively, use `⌘ + 3` on macOS or `ctrl + 3` on Windows.

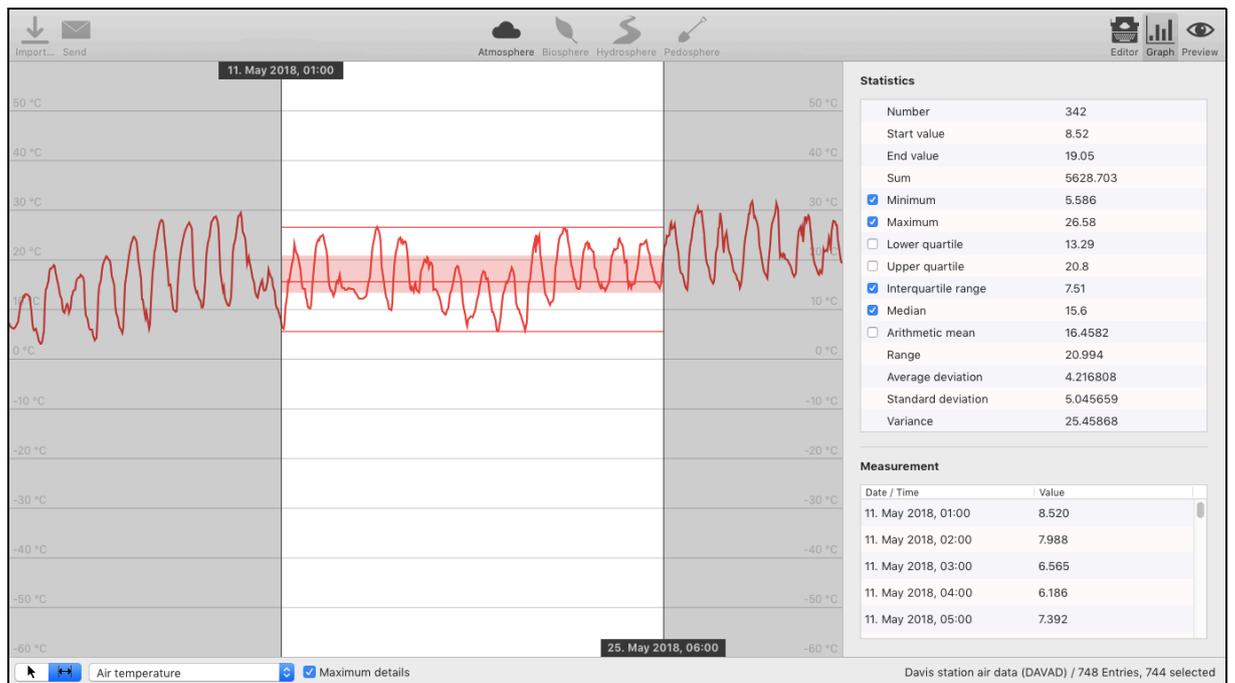


Figure 2.6: Selecting a Range.

2.3.1 Selecting a Protocol

Click on the toolbar items **Atmosphere**, **Biosphere**, **Hydrosphere** or **Pedosphere** to select a GLOBE protocol. The name of the protocol, the User- and Site-ID, as well as date and time are colored to distinguish them from the measured values (see Fig. 2.7).

2.3.2 Send Data

The data displayed in the preview can be uploaded into the GLOBE database via e-mail, if all necessary information is given. Transferring measurements to the pre-installed e-mail client may take some time, depending on the size of the data set (see Fig. 2.8).

Data. Measurements are sent to the address `data@globe.gov`. To do this, click on **Send** **Data** in the toolbar. In the menu bar, this is done via **File** **Send** **Data**.

Practice Data. Exercise data will be sent to `practicedata@globe.gov`. To do this, click on **Send** **Practice Data** in the toolbar, or select **File** **Send** **Practice Data** in the menu bar.

Protocol	User	Site	Date / Time	Air temperatur...	Relative Humi...	Average Wind ...	Average Wind ...	Maximum Win...	Maximum Win...	Wind Run	Rainfall [mm]	Rainfall Rate [...]	Barometric Pr...
DAVAD		SITE_ID:	201804302...	7.276	77.440	2.649	SW	X	X	X	X	X	998.000
DAVAD		SITE_ID:	201804302...	7.206	77.000	1.464	SSW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201804302...	7.173	76.340	1.667	SSW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201804302...	7.129	77.250	2.002	SW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201804302...	7.033	78.500	2.450	SW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201804302...	6.852	79.650	3.431	SW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201805010...	6.634	82.100	3.228	SW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201805010...	6.462	83.400	2.628	SW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201805010...	6.383	83.800	2.923	SW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201805010...	6.395	84.000	2.507	SW	X	X	X	X	X	999.000
DAVAD		SITE_ID:	201805010...	6.397	83.700	2.483	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.412	83.300	2.546	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.423	83.000	2.204	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.427	83.100	2.201	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.437	82.800	2.566	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.437	83.000	2.479	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.408	84.300	3.294	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.330	83.800	3.075	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.246	85.000	2.766	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.132	86.300	2.493	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.109	85.100	2.472	SW	X	X	X	X	X	1000.000
DAVAD		SITE_ID:	201805010...	6.130	84.200	3.012	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.191	84.500	2.448	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.204	85.100	2.419	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.175	85.200	2.365	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.127	87.000	2.270	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.046	86.000	2.670	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.090	85.700	2.796	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.136	85.400	2.880	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.198	84.600	2.500	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.246	82.900	2.988	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.260	83.200	3.009	SW	X	X	X	X	X	1001.000
DAVAD		SITE_ID:	201805010...	6.254	83.600	2.583	SW	X	X	X	X	X	1002.000
DAVAD		SITE_ID:	201805010...	6.244	82.600	2.123	SW	X	X	X	X	X	1002.000
DAVAD		SITE_ID:	201805010...	6.324	82.600	2.134	SW	X	X	X	X	X	1002.000
DAVAD		SITE_ID:	201805010...	6.408	82.100	2.291	SW	X	X	X	X	X	1002.000
DAVAD		SITE_ID:	201805010...	6.460	82.100	2.393	SW	X	X	X	X	X	1002.000
DAVAD		SITE_ID:	201805010...	6.501	81.800	1.916	SW	X	X	X	X	X	1003.000
DAVAD		SITE_ID:	201805010...	6.514	82.000	2.030	SW	X	X	X	X	X	1003.000
DAVAD		SITE_ID:	201805010...	6.523	80.900	2.014	SW	X	X	X	X	X	1003.000
DAVAD		SITE_ID:	201805010...	6.604	80.500	1.766	SW	X	X	X	X	X	1003.000

Davis Station Air Data (DAVAD) / 4467Entries, 4464 selected

Figure 2.7: Data Preview.

An: DATA@GLOBE.GOV

Kopie:

Blindkopie:

Betreff: DATA

Signatur: Ohne

/!AA

DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112230	14.170	76.550	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112240	14.110	73.150	0.193	NE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112250	14.390	71.070	0.470	ENE	X	X	X	0.000	X	1011.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112300	14.080	76.010	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112310	13.720	77.410	0.097	S	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112320	13.510	76.310	0.015	SE	X	X	X	0.000	X	1011.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112330	13.460	78.140	0.054	E	X	X	X	0.000	X	1011.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112340	12.990	79.190	0.003	SSE	X	X	X	0.000	X	1011.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805112350	12.670	80.300	0.005	E	X	X	X	0.000	X	1011.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120000	12.360	82.200	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120010	11.960	83.500	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120020	11.880	84.300	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120030	11.670	86.200	0.029	W	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120040	12.000	84.200	0.227	NE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120050	12.260	84.800	0.013	WSW	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120100	11.990	85.800	0.059	W	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120110	12.090	84.300	0.032	NE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120120	11.740	87.100	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120130	11.600	87.300	0.007	ESE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120140	11.260	88.700	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120150	10.900	89.800	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120200	10.630	90.200	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120210	10.410	91.500	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120220	10.410	92.200	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120230	10.670	90.900	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120240	10.570	91.000	0.032	W	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120250	10.250	91.300	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120300	10.200	93.200	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120310	10.200	92.700	0.156	SSE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120320	10.410	90.900	0.140	ENE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120330	10.330	91.500	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120340	10.200	91.600	0.000	N	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120350	10.220	91.400	0.059	ESE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120400	10.240	91.400	0.045	ESE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120410	10.300	91.200	0.013	ESE	X	X	X	0.000	X	1010.000
DAVAD	GLOBE123	SITE_ID:GLOBE456	201805120420	10.500	90.500	0.008	ENE	X	X	X	0.000	X	1010.000

Figure 2.8: Transferring Data into an Email-Client.

3 Tutorial

In this tutorial, a file is imported and formatted for output into the DAVAD protocol.

1. Import file Pulheimer_Bach-May-2018 and choose `semicolon` as delimiter.
2. Enter User- and Site-ID into the corresponding fields.
3. Date and time are assigned in the sidebar via `column >> 1`. The UTC-offset is set by `UTC >> +1`. Select `Format >> Day.Month.Year Hour:Minute` to parse the date correctly.
4. Choose `Davis Weather Station (DAVAD)` as GLOBE protocol and assign the variables as shown in table 3.1.

Table 3.1: List of Variables

<i>Variable</i>	<i>Column</i>
Air Temperature	5
Relative Humidity	6
Average Windspeed	27
Average Wind Directiong	28
Barometric Pressure	30

5. The first three rows of the data table are not required and can therefore be deactivated using the check boxes.
6. In the graph environment, the associated variables can be visualized with the command `Atmosphere >> Davis Weather Station (DAVAD)`. By default, the entry `Air Temperature` is selected in the pop-up menu in the context bar.
7. After switching to the preview, all data is output in tabular form and in the correct formatting.