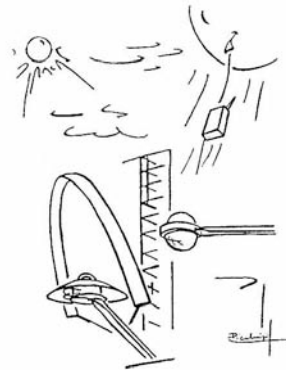


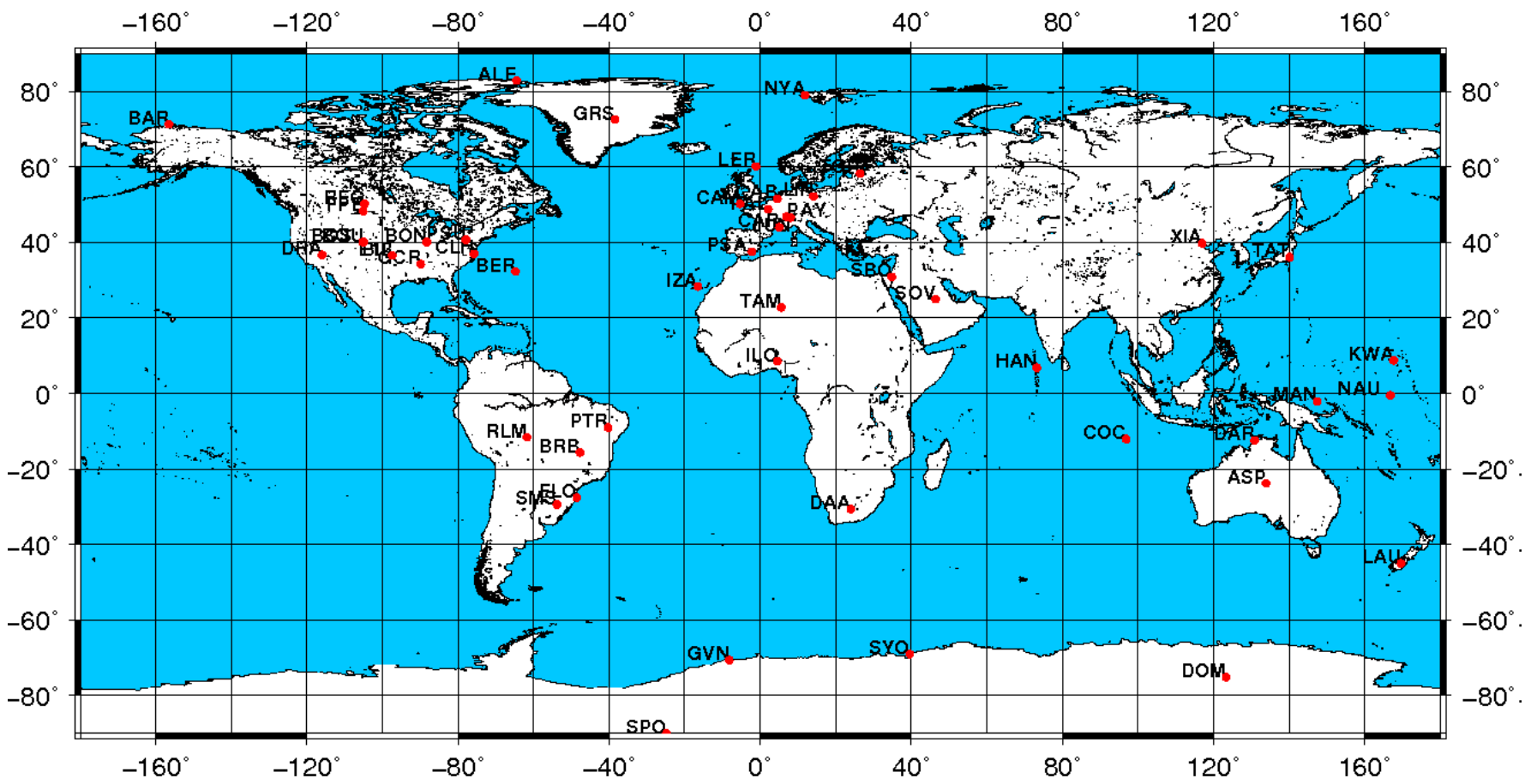
Status of the World Radiation Monitoring Center



Brief BSRN History:

1. 1988: The WMO proposed the establishment of the BSRN.
2. 1992: The BSRN started with 5 sites and the WRMC at ETH Zurich under the direction of Prof. Atsumu Ohmura.
3. 2004: BSRN officially became a contributor to the Global Climate Observing System (GCOS).
4. 2008 July: After 15 years of nearly continuous operation at ETH Zurich, the archive moved to Alfred Wegener Institute (AWI) in Bremerhaven, Germany under the direction of Dr. Gert König-Langlo.

Present State of the WRMC: 47 stations providing data



Present State of the WRMC: Datasets

The typical average interval for radiation data is 1 minute:

- | | |
|---|---------------|
| 1. LR 0100: (Global, Diffuse, Direct, Long-wave down) | 47 stations |
| 2. LR 0200: (Long-wave spectral down) | 0 stations |
| 3. LR 0300: (Reflex, Long-wave up) | 9 stations |
| 4. LR 0500: (UV) | 12 stations |
| 5. LR 1000: (Synops) | 8 stations |
| 6. LR 1100: (Upper air soundings) | 25 stations |
| 7. LR 1200: (Total ozone) | 8 stations |
| 8. LR 1300: (Aerosol optical depths) (under construction) | (14) stations |
| 9. LR 1300: (Ceilometer data) | 3 stations |
| 10. LR 30x0: (Radiation measurements from tower) | 11 stations |

Homepage

1. The web-address is: <http://www.bsrn.awi.de>. The old homepage <http://bsrn.ethz.ch> does not exist any more.
2. The web pages at AWI base on the content management system **Typo3**. It offers a web-based editing throughout the word.
3. Access to <ftp://ftp.bsrn.awi.de/>
4. Link-tables offer easy access to any dataset.
5. Additional, station information, parameters, software, literature etc. are offered.

Index von ftp://ftp.bsrn.awi.de/ - Mozilla Firefox

Baseline Surface Radiation Network - Status - Mozilla Firefox

BSRN Stations - Mozilla Firefox

http://www.pangaea.de/ddi?request=bsrn/BSRNEvent&format=html&title=BSRN+Stati

BSRN Stations

Event, optional label	Event label	Area name	Latitude	Longitude	Elevation	Date/Time	Comment	URI of event
Alert	ALE	Lincoln Sea	82.8667	-64.5833			Candidate	
Alice Springs	ASP	Macdonnell Ranges, Northern Territory, Australia	-23.7980	133.8880	547	1995-01-01	BSRN station no: 1; Surface type: grass; Topography type: flat, rural; Horizon: doi:10.1594/PANGAEA.669509; Station manager: Bruce Forgan (B.Forgan@bom.gov.au)	
Barrow	BAR	Alaska, United States of America	71.3230	-156.6070	8	1992-01-01	BSRN station no: 22; Surface type: tundra; Topography type: flat, rural; Station manager: Ellsworth Dutton (Ellsworth.G.Dutton@noaa.gov)	http://www.esrl.noaa.gov/gmd/tobop/brw/
Bermuda	BER	Bermuda	32.2670	-64.6670	8	1992-01-01	BSRN station no: 24; Surface type: water, ocean; Topography type: flat, rural; Horizon: doi:10.1594/PANGAEA.669510; Station manager: Ellsworth Dutton (Ellsworth.G.Dutton@noaa.gov)	http://www.esrl.noaa.gov/gmd/grad/sites/ber.html
Billings	BIL	Oklahoma, United States of America	36.6050	-97.5160	317	1993-06-01	BSRN station no: 28; Surface type: grass; Topography type: flat, rural; Station manager: Charles Long (chuck.long@pnl.gov)	
Bondville	BON	Illinois, United States of America	40.0667	-88.3667	213	1995-01-01	BSRN station no: 32; Surface type: grass; Topography type: flat, rural; Station manager: John A. Augustine (john.a.augustine@noaa.gov)	http://www.srnb.noaa.gov/surfrad/bondvill.html
Boulder	BOS	Colorado, United States of America	40.1250	-105.2370	1689	1995-07-01	BSRN station no: 34; Surface type: grass; Topography type: hilly, rural; Station manager: John A. Augustine (john.a.augustine@noaa.gov)	http://www.srnb.noaa.gov/surfrad/tablemt.html
Boulder	BOU	Colorado, United States of America	40.0500	-105.0070	1577	1992-01-01	BSRN station no: 23; Surface type: grass; Topography type: flat, rural; Station manager: Ellsworth Dutton (Ellsworth.G.Dutton@noaa.gov)	
Brasilia	BRB	Brasilia City, Distrito Federal, Brazil	-15.6010	-47.7130	1023	2006-02-01	BSRN station no: 71; Surface type: concrete; Topography type: flat, rural; Horizon: doi:10.1594/PANGAEA.695899; Station manager: Enio Bueno Pereira (eniobp@cptec.inpe.br)	
Cabauw	CAB	The Netherlands	51.9711	4.9267	0	2005-12-01	BSRN station no: 53; Surface type: grass; Topography type: flat, rural; Horizon: doi:10.1594/PANGAEA.669511; Station manager: Wouter Knap (knap@knmi.nl)	http://www.knmi.nl/bsrn/
Camborne	CAM	United Kingdom	50.3167	5.2167	80	2001-01-01	BSRN station no: 50; Surface type: grass; Topography type: flat, rural; Station manager: Wouter Knap (knap@knmi.nl)	

Workflow at AWI:

Incoming Data

1. Each station scientist produces one station-to-archive file per month and station.
2. Files get copied from the station scientists to [ftp.bsrn.awi.de/incoming/station](ftp://ftp.bsrn.awi.de/incoming/station).
3. Accepted files (formal check, visual inspection) get copied from the WRMC to [ftp.bsrn.awi.de/station](ftp://ftp.bsrn.awi.de/station) where they are public available.
4. Accepted files get additionally imported into the publishing network for geoscientific & environmental data “PANGAEA”.

Outgoing Data

1. AWI provides ftp-access ([ftp.bsrn.awi.de/station](ftp://ftp.bsrn.awi.de/station)) to any station-to-archive file.
2. Additionally, AWI provides the full “PANGAEA” service with respect to any single dataset (logical record, station, month) (<http://www.bsrn.awi.de>).
3. For longer time series and averages the “Data Warehouse” service is available.

Present State of the WRMC: 5622station-months available

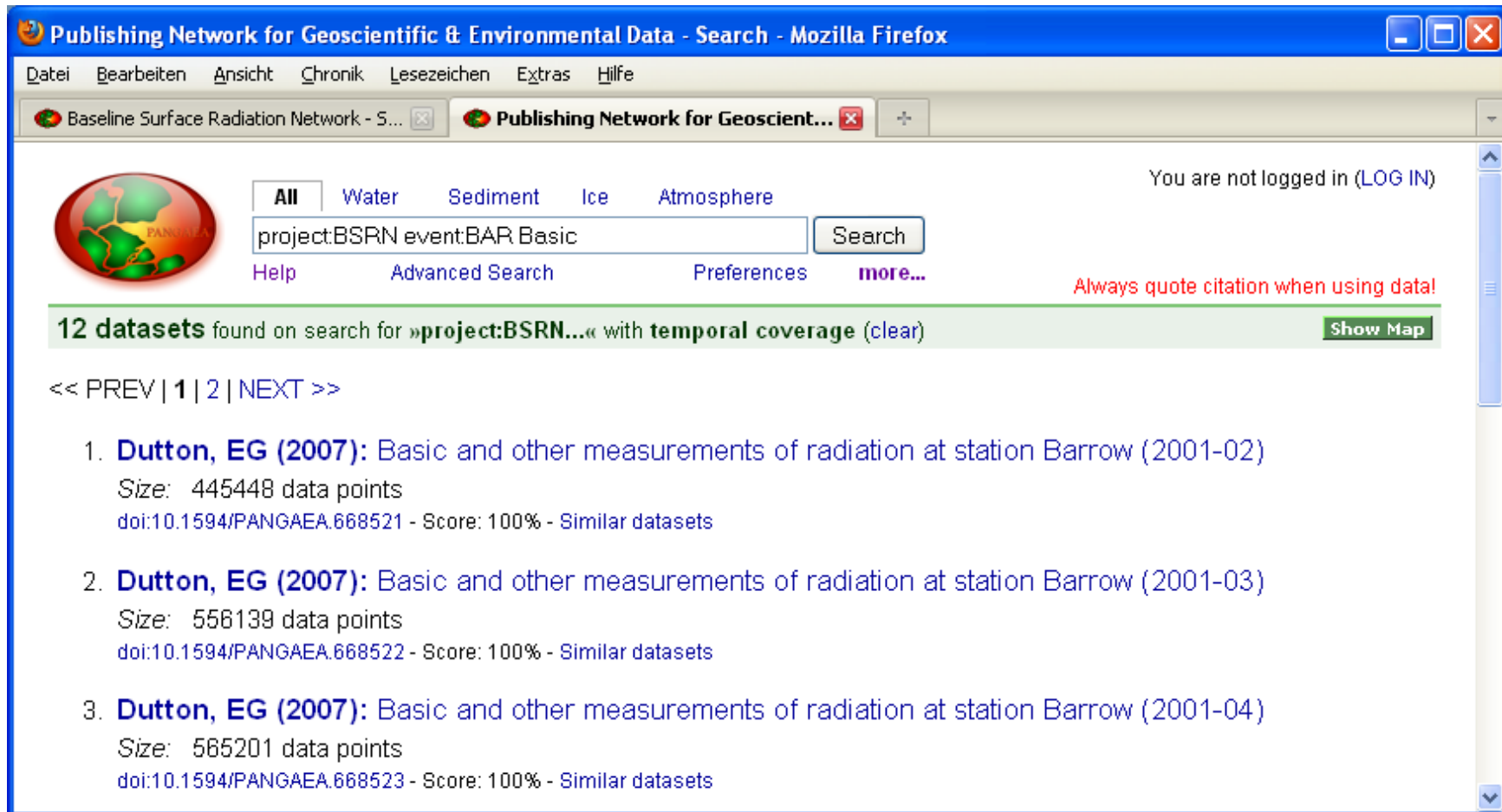
Station	Short name	Station manager currently in charge	pre BSRN	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	All
Alice Springs	ASP	Bruce Forgan (B.Forgan@bom.gov.au)					12	12	12	12	12	12	11	12	12	12	12	12	12				X
Barrow	BAR	Ellsworth Dutton (Ellsworth.G.Dutton@noaa.gov)		12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6		X
Bermuda	BER	Ellsworth Dutton (Ellsworth.G.Dutton@noaa.gov)		12	12	12	12	12	12	12	12	12	12	12	10	12	12	12	12	12	6		X
Billings	BIL	Charles Long (chuck.long@pnl.gov)			4	12	12	12	12	12	12	12	11	12	12	12	12	12	12	12	6		X
Bondville	BON	John Augustine (John.A.Augustine@noaa.gov)					12	12	12	12	12	12	12	12	12	12	12	12	12	12	6		X
Boulder, SURFRAD	BOS	John Augustine (John.A.Augustine@noaa.gov)					5	12	12	12	12	12	12	12	12	12	12	12	12	12	6		X
Boulder	BOU	Ellsworth Dutton (Ellsworth.G.Dutton@noaa.gov)		12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6		X
Brasilia	BRB	Enio Bueno Pereira																8	10				X

.....

Tamanrasset	TAM	Mohamed Mimouni (m_mimouni_dz@yahoo.fr)										10	12	12	12	12	12	12	12	12	12		X
Tateno	TAT	Nozomu Ohkawara (ohkawara@met.kishou.go.jp)						11	12	12	12	12	12	11	11	12	12	12	12	12	12		X
Toravere	TOR	Ain Kallis (kallis@aai.ee)									12	12	12	12	12	12	12	12	12	12	12	1	X
Xianghe	XIA	Xiangao Xia (xiangaoxia2000@yahoo.com)															12	12	12	8			X
Historical station	Eismitte		1																				X
	All			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			pre BSRN	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	All



What offers PANGAEA?



The screenshot shows a Mozilla Firefox browser window displaying the PANGAEA search results for the query "project:BSRN event:BAR Basic". The browser's address bar shows the URL "http://www.pangaea.de/search". The search results page features a navigation menu with tabs for "All", "Water", "Sediment", "Ice", and "Atmosphere". The search results are displayed in a list format, showing the first three results. Each result includes the author "Dutton, EG (2007)", the title "Basic and other measurements of radiation at station Barrow", the time period, the number of data points, the DOI, and the score. The results are: 1. Dutton, EG (2007): Basic and other measurements of radiation at station Barrow (2001-02), Size: 445448 data points, doi:10.1594/PANGAEA.668521 - Score: 100% - Similar datasets; 2. Dutton, EG (2007): Basic and other measurements of radiation at station Barrow (2001-03), Size: 556139 data points, doi:10.1594/PANGAEA.668522 - Score: 100% - Similar datasets; 3. Dutton, EG (2007): Basic and other measurements of radiation at station Barrow (2001-04), Size: 565201 data points, doi:10.1594/PANGAEA.668523 - Score: 100% - Similar datasets. The page also includes a "Show Map" button and a note "Always quote citation when using data!".

12 datasets found on search for »project:BSRN...« with **temporal coverage** (clear) [Show Map](#)

<< PREV | 1 | 2 | NEXT >>

1. **Dutton, EG (2007):** Basic and other measurements of radiation at station Barrow (2001-02)
Size: 445448 data points
doi:10.1594/PANGAEA.668521 - Score: 100% - Similar datasets
2. **Dutton, EG (2007):** Basic and other measurements of radiation at station Barrow (2001-03)
Size: 556139 data points
doi:10.1594/PANGAEA.668522 - Score: 100% - Similar datasets
3. **Dutton, EG (2007):** Basic and other measurements of radiation at station Barrow (2001-04)
Size: 565201 data points
doi:10.1594/PANGAEA.668523 - Score: 100% - Similar datasets

What offers PANGAEA?

PANGAEA presents well defined metadata for any dataset (no login)

Dutton, Ellsworth (2007): Basic and other measurements of radiation at station Barrow (2001-12) - Mozilla Firefox

http://doi.pangaea.de/10.1594/PANGAEA.668531

Citation: Dutton, Ellsworth (2007): Basic and other measurements of radiation at station Barrow (2001-12), *Climate Monitoring & Diagnostics Laboratory, Boulder*, doi:10.1594/PANGAEA.668531

Project(s): Baseline Surface Radiation Network (BSRN)

Coverage: West: -156.6070 * East: -156.6070 * South: 71.3230 * North: 71.3230
Minimum HEIGHT above ground: 2.0 m * Maximum HEIGHT above ground: 2.0 m
Date/Time Start: 2001-12-01T00:00:00 * Date/Time End: 2001-12-31T23:59:00

Event(s): BAR (Barrow) * Latitude: 71.3230 * Longitude: -156.6070 * Elevation: 8.0 m * Date/Time: 1992-01-01T00:00:00 * Location: Alaska, United States of America * Campaign: WCRP/GEWEX * Device: Monitoring station * Comment: BSRN station no: 22; Surface type: tundra; Topography type: flat, rural

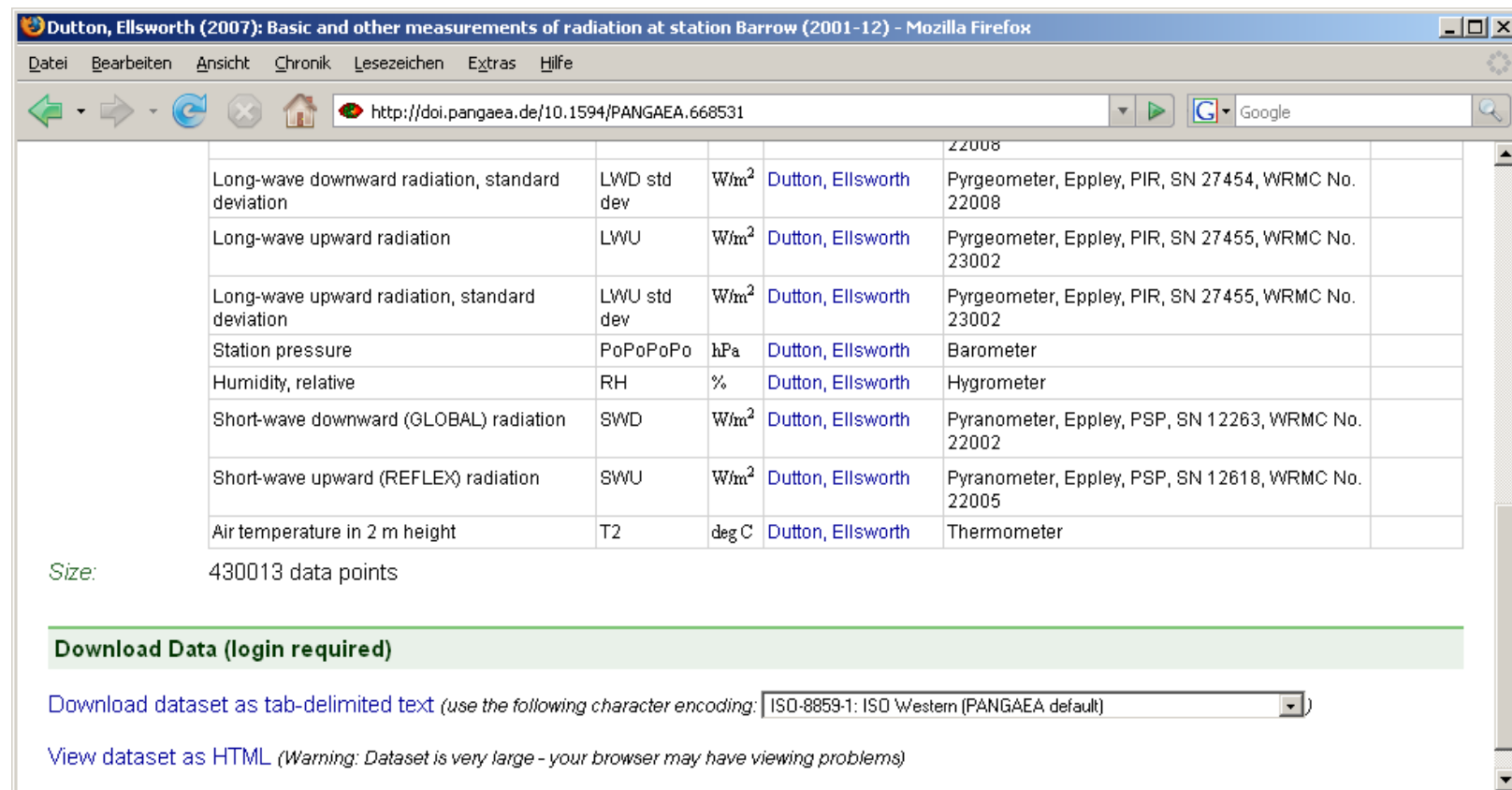
Other version: <ftp://ftp.bsrn.awi.de/bar/bar1201.dat.gz>

Parameter(s):

Parameter	Short Name	Unit	Principal Investigator	Method	Comment
DATE/TIME	Date/Time				Geocode
HEIGHT above ground	Height	m			Geocode
LATITUDE	Latitude				Geocode
LONGITUDE	Longitude				Geocode
Diffuse radiation	DIF	W/m ²	Dutton, Ellsworth	Pyranometer, Eppley, 8-48, SN 32870, WRMC No. 22009	
Long-wave downward radiation	LWD	W/m ²	Dutton, Ellsworth	Pyrgeometer, Eppley, PIR, SN 27454, WRMC No. 22008	

What offers PANGAEA?

PANGAEA presents well defined metadata for any dataset (no login)



Dutton, Ellsworth (2007): Basic and other measurements of radiation at station Barrow (2001-12) - Mozilla Firefox

http://doi.pangaea.de/10.1594/PANGAEA.668531

Long-wave downward radiation, standard deviation	LWD std dev	W/m ²	Dutton, Ellsworth	22008	Pyrgeometer, Eppley, PIR, SN 27454, WRMC No. 22008
Long-wave upward radiation	LWU	W/m ²	Dutton, Ellsworth	23002	Pyrgeometer, Eppley, PIR, SN 27455, WRMC No. 23002
Long-wave upward radiation, standard deviation	LWU std dev	W/m ²	Dutton, Ellsworth	23002	Pyrgeometer, Eppley, PIR, SN 27455, WRMC No. 23002
Station pressure	PoPoPoPo	hPa	Dutton, Ellsworth		Barometer
Humidity, relative	RH	%	Dutton, Ellsworth		Hygrometer
Short-wave downward (GLOBAL) radiation	SWD	W/m ²	Dutton, Ellsworth	22002	Pyranometer, Eppley, PSP, SN 12263, WRMC No. 22002
Short-wave upward (REFLEX) radiation	SWU	W/m ²	Dutton, Ellsworth	22005	Pyranometer, Eppley, PSP, SN 12618, WRMC No. 22005
Air temperature in 2 m height	T2	deg C	Dutton, Ellsworth		Thermometer

Size: 430013 data points

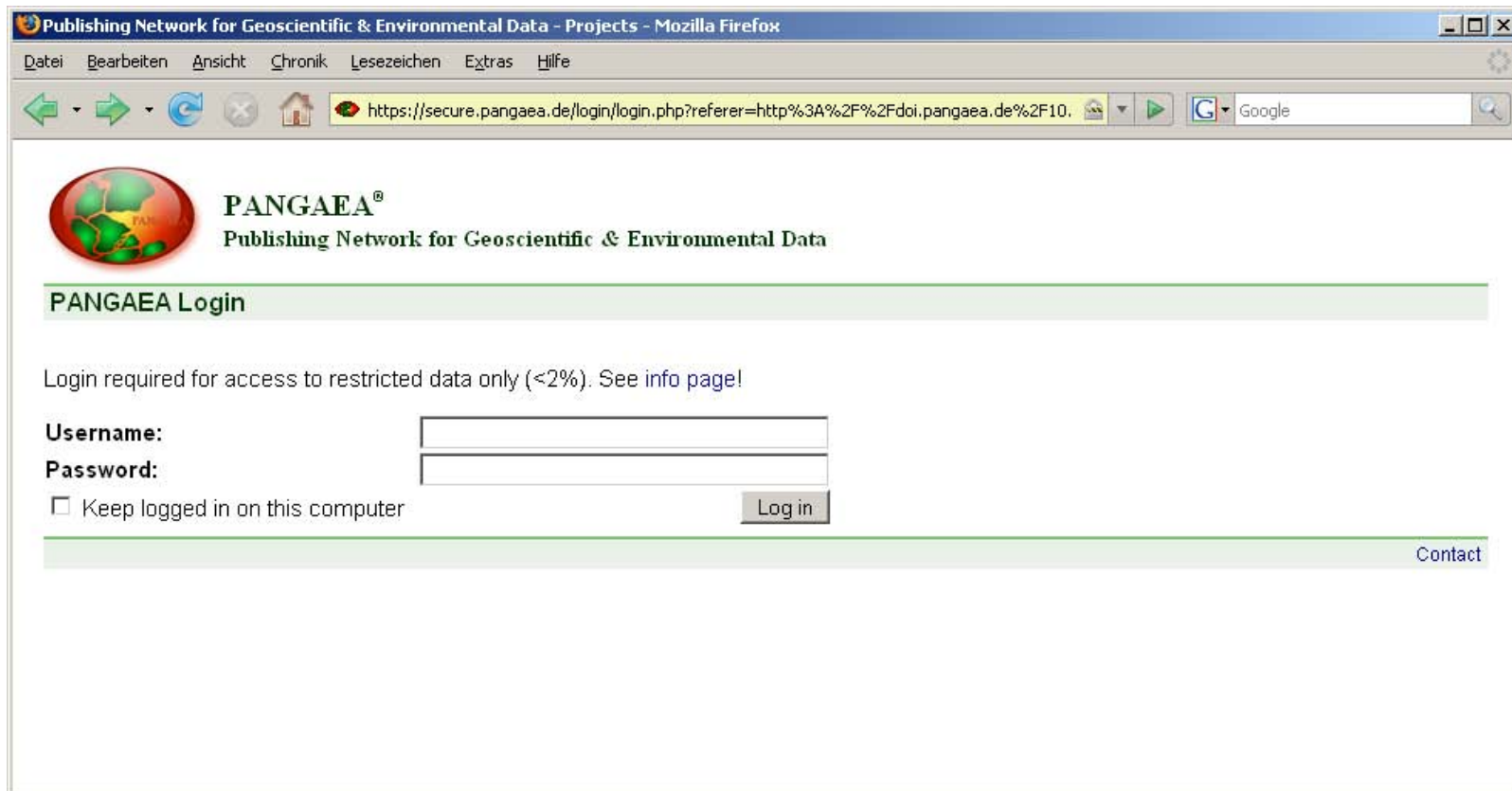
Download Data (login required)

Download dataset as tab-delimited text (use the following character encoding:)

View dataset as HTML (Warning: Dataset is very large - your browser may have viewing problems)

What offers PANGAEA?

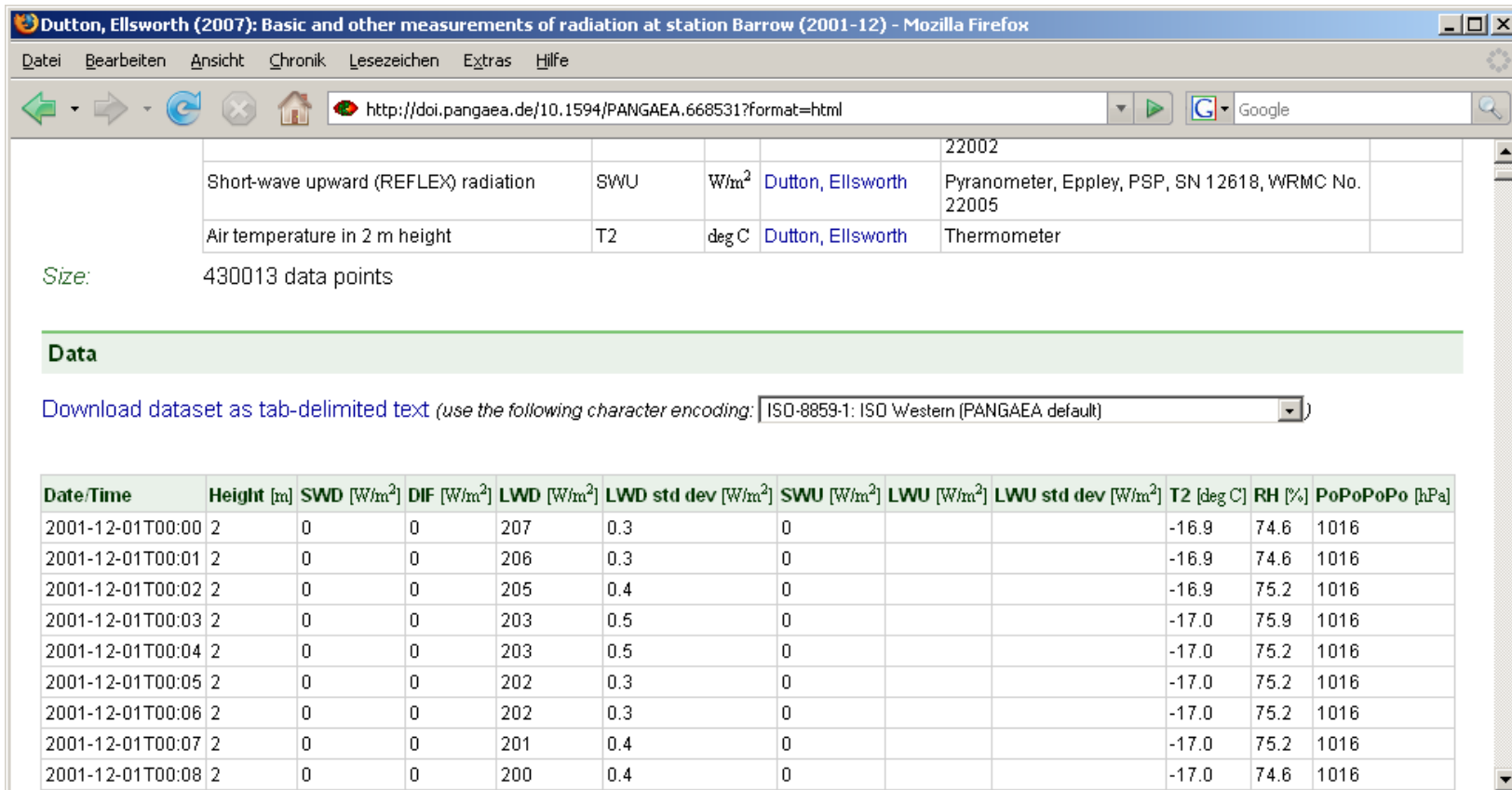
PANGAEA offers access restrictions



The screenshot shows a Mozilla Firefox browser window with the title "Publishing Network for Geoscientific & Environmental Data - Projects". The address bar shows the URL "https://secure.pangaea.de/login/login.php?referer=http%3A%2F%2Fdoi.pangaea.de%2F10.". The page content includes the PANGAEA logo and the text "PANGAEA® Publishing Network for Geoscientific & Environmental Data". Below this is a section titled "PANGAEA Login" with a message: "Login required for access to restricted data only (<2%). See info page!". There are two input fields for "Username:" and "Password:". A checkbox labeled "Keep logged in on this computer" is present, along with a "Log in" button. A "Contact" link is located at the bottom right of the page.

What offers PANGAEA?

PANGAEA presents the data itself in different formats (ftp, text, html)



Dutton, Ellsworth (2007): Basic and other measurements of radiation at station Barrow (2001-12) - Mozilla Firefox

http://doi.pangaea.de/10.1594/PANGAEA.668531?format=html

Short-wave upward (REFLEX) radiation	SWU	W/m ²	Dutton, Ellsworth	22002	Pyranometer, Eppley, PSP, SN 12618, WRMC No. 22005
Air temperature in 2 m height	T2	deg C	Dutton, Ellsworth		Thermometer

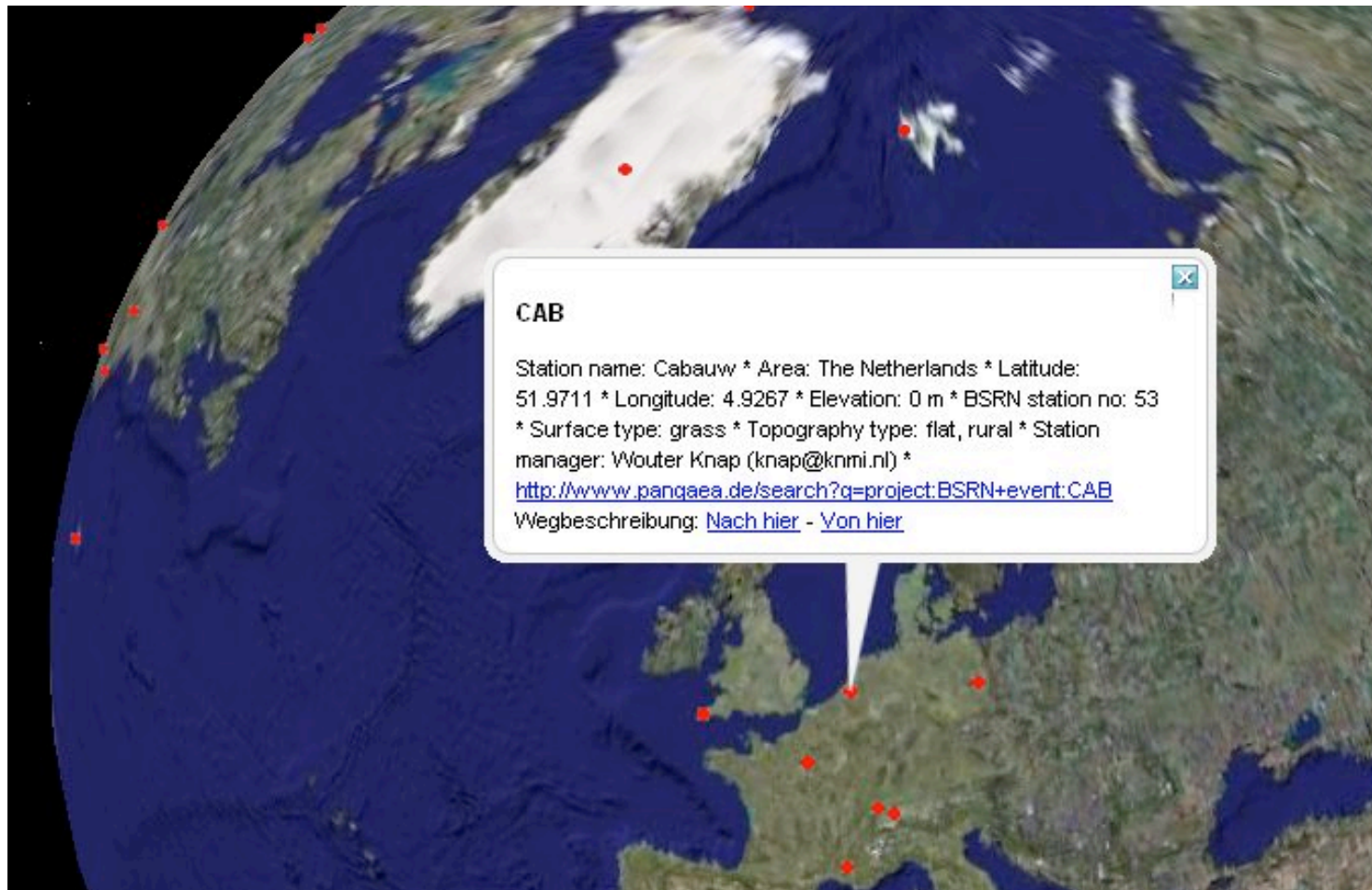
Size: 430013 data points

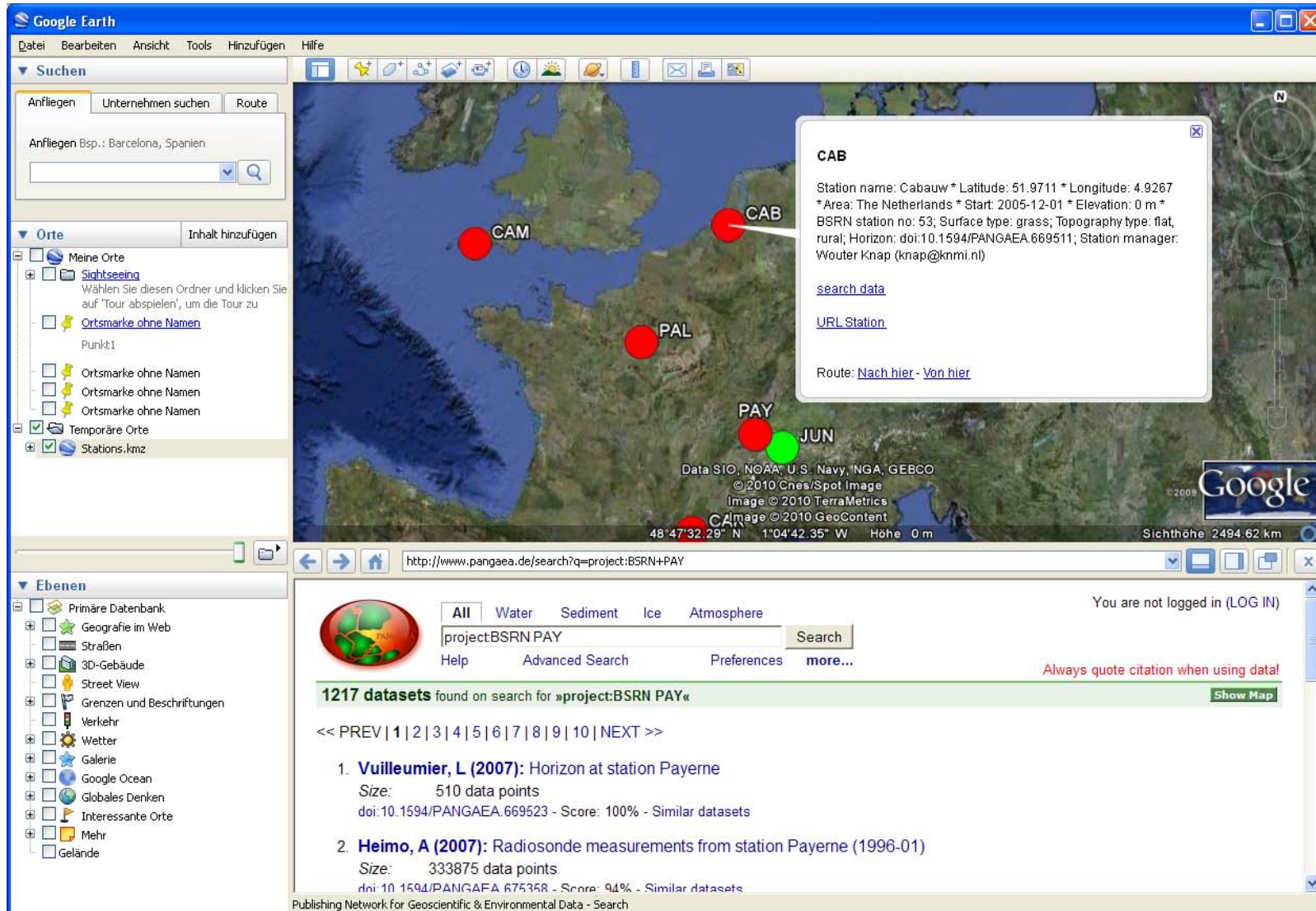
Data

Download dataset as tab-delimited text (use the following character encoding: ISO-8859-1: ISO Western (PANGAEA default))

Date/Time	Height [m]	SWD [W/m ²]	DIF [W/m ²]	LWD [W/m ²]	LWD std dev [W/m ²]	SWU [W/m ²]	LWU [W/m ²]	LWU std dev [W/m ²]	T2 [deg C]	RH [%]	PoPoPoPo [hPa]
2001-12-01T00:00	2	0	0	207	0.3	0			-16.9	74.6	1016
2001-12-01T00:01	2	0	0	206	0.3	0			-16.9	74.6	1016
2001-12-01T00:02	2	0	0	205	0.4	0			-16.9	75.2	1016
2001-12-01T00:03	2	0	0	203	0.5	0			-17.0	75.9	1016
2001-12-01T00:04	2	0	0	203	0.5	0			-17.0	75.2	1016
2001-12-01T00:05	2	0	0	202	0.3	0			-17.0	75.2	1016
2001-12-01T00:06	2	0	0	202	0.3	0			-17.0	75.2	1016
2001-12-01T00:07	2	0	0	201	0.4	0			-17.0	75.2	1016
2001-12-01T00:08	2	0	0	200	0.4	0			-17.0	74.6	1016

Google Earth Overlay





The screenshot shows a Google Earth window with a map of Europe. Several red and green markers are placed on the map, labeled CAM, CAB, PAL, PAY, and JUN. A pop-up window for station CAB is visible, providing details such as station name, coordinates, area, and manager. Below the map, a search results page is open, displaying a search for 'project:BSRN PAY' and listing two datasets: 'Vuilleumier, L (2007): Horizon at station Payerne' and 'Heimo, A (2007): Radiosonde measurements from station Payerne (1996-01)'.

Google Earth Interface:

- Search bar: Anfliegen, Unternehmen suchen, Route
- Orte: Meine Orte, Sichtseeing, Ortsmarke ohne Namen, Temporäre Orte, Stations.kmz
- Ebenen: Primäre Datenbank, Geografie im Web, Straßen, 3D-Gebäude, Street View, Grenzen und Beschriftungen, Verkehr, Wetter, Galerie, Google Ocean, Globales Denken, Interessante Orte, Mehr, Gelände

Station CAB Pop-up:

CAB
 Station name: Cabauw * Latitude: 51.9711 * Longitude: 4.9267
 * Area: The Netherlands * Start: 2005-12-01 * Elevation: 0 m *
 BSRN station no: 53; Surface type: grass; Topography type: flat,
 rural; Horizon: doi:10.1594/PANGAEA.669511; Station manager:
 Wouter Knap (knap@knmi.nl)

[search data](#)
[URL Station](#)
 Route: [Nach hier](#) - [Von hier](#)

Search Results:

http://www.pangaea.de/search?q=project:BSRN+PAY

All Water Sediment Ice Atmosphere

project:BSRN PAY Search

Help Advanced Search Preferences more...

Always quote citation when using data!

1217 datasets found on search for »project:BSRN PAY« [Show Map](#)

<< PREV | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | NEXT >>

- Vuilleumier, L (2007):** Horizon at station Payerne
 Size: 510 data points
 doi:10.1594/PANGAEA.669523 - Score: 100% - Similar datasets
- Heimo, A (2007):** Radiosonde measurements from station Payerne (1996-01)
 Size: 333875 data points
 doi:10.1594/PANGAEA.675358 - Score: 94% - Similar datasets

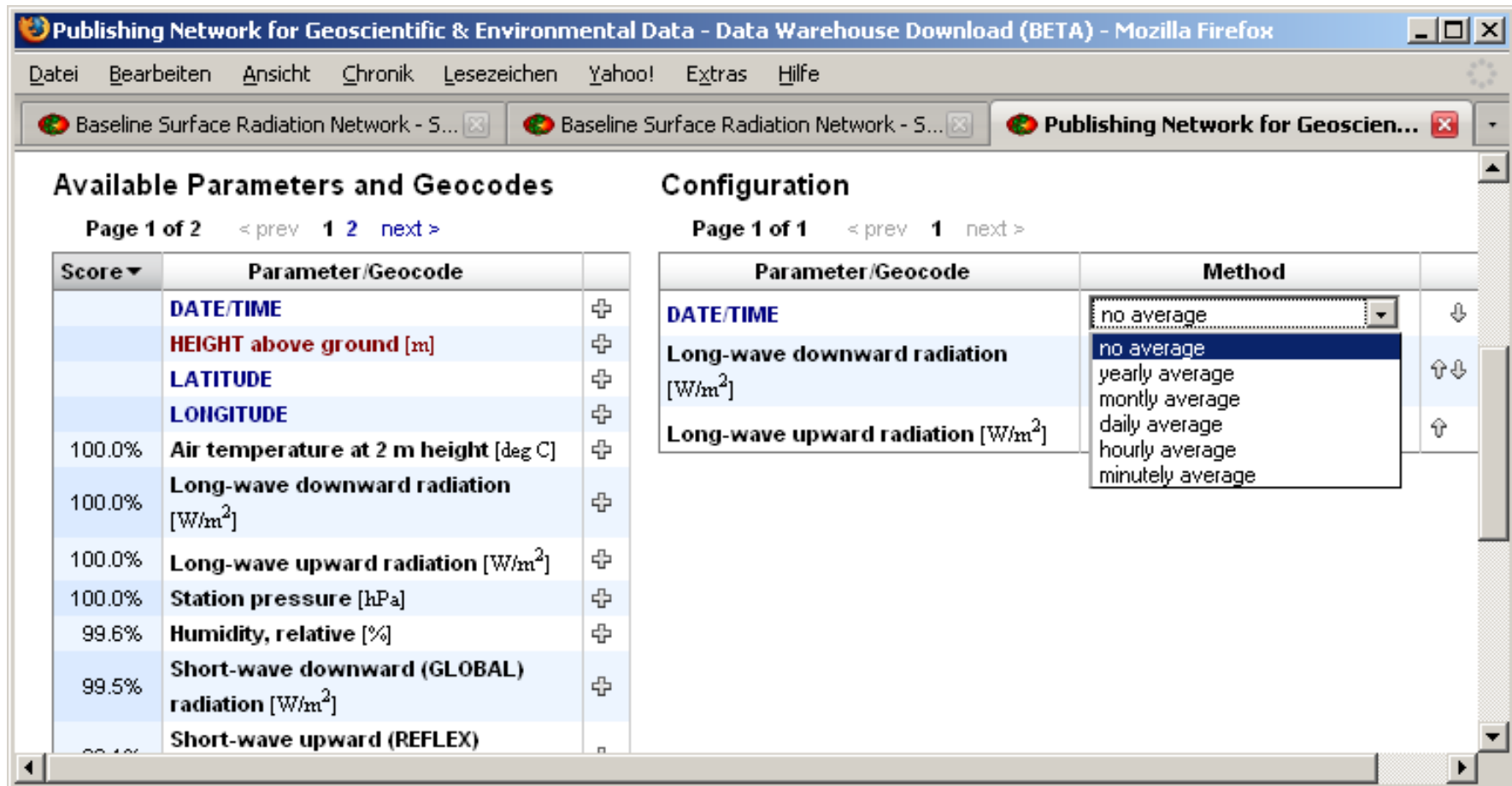
Publishing Network for Geoscientific & Environmental Data - Search



Gert König-Langlo, Rainer Sieger, BSRN Meeting 2010

What offers PANGAEA?

PANGAEA Data Warehouse offers averaging of long time series



The screenshot shows a web browser window titled "Publishing Network for Geoscientific & Environmental Data - Data Warehouse Download (BETA) - Mozilla Firefox". The interface is divided into two main sections: "Available Parameters and Geocodes" and "Configuration".

Available Parameters and Geocodes (Page 1 of 2):

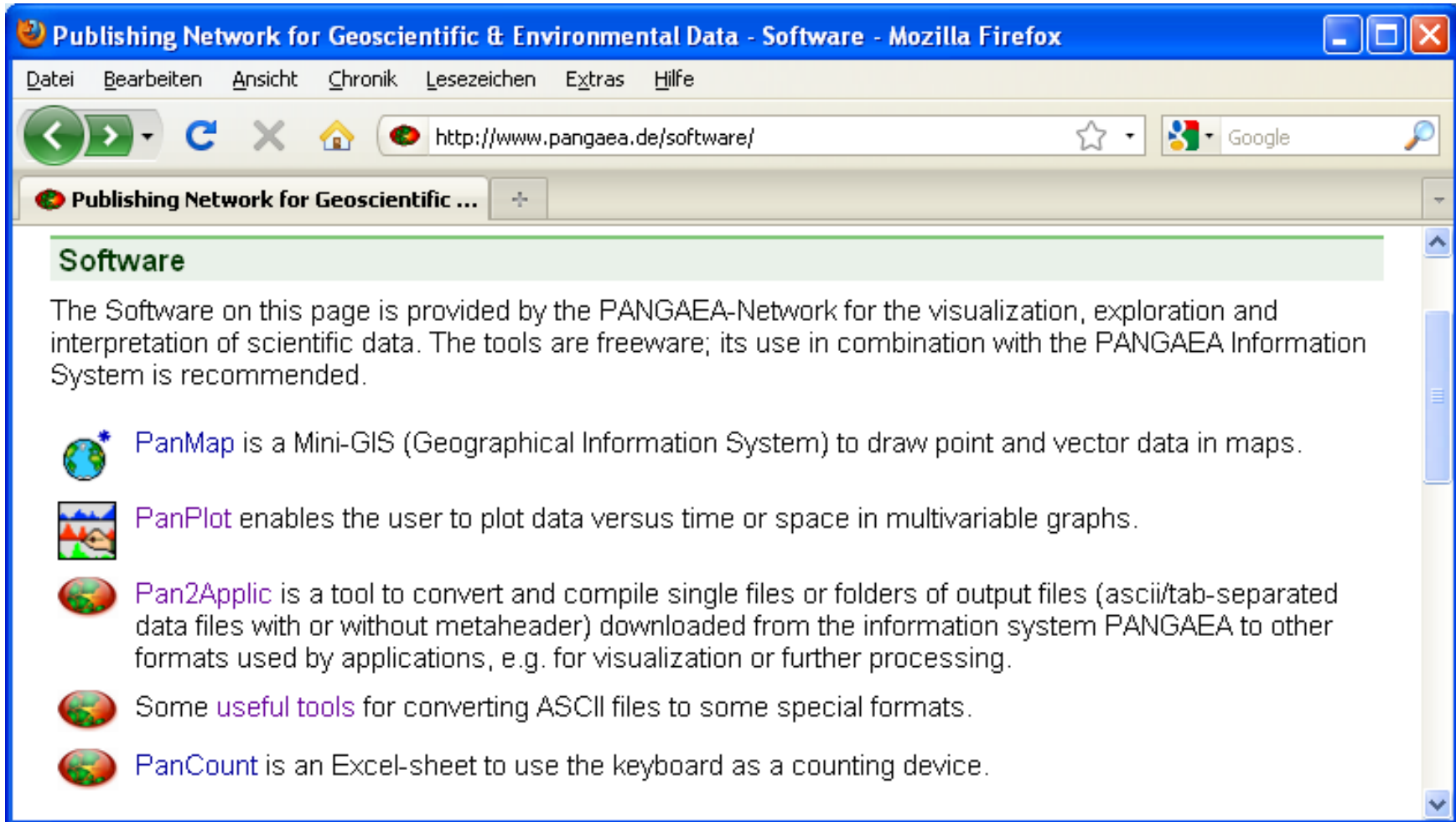
Score	Parameter/Geocode	
	DATE/TIME	+
	HEIGHT above ground [m]	+
	LATITUDE	+
	LONGITUDE	+
100.0%	Air temperature at 2 m height [deg C]	+
100.0%	Long-wave downward radiation [W/m²]	+
100.0%	Long-wave upward radiation [W/m²]	+
100.0%	Station pressure [hPa]	+
99.6%	Humidity, relative [%]	+
99.5%	Short-wave downward (GLOBAL) radiation [W/m²]	+
99.4%	Short-wave upward (REFLEX)	+

Configuration (Page 1 of 1):

Parameter/Geocode	Method	
DATE/TIME	no average	↓
Long-wave downward radiation [W/m²]	no average	↑↓
Long-wave upward radiation [W/m²]	yearly average	↑↓
	monthly average	↑↓
	daily average	↑↓
	hourly average	↑↓
	minutely average	↑

What offers PANGAEA?

Software








Publishing Network for Geoscientific & Environmental Data - Software - Mozilla Firefox

File Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

http://www.pangaea.de/software/

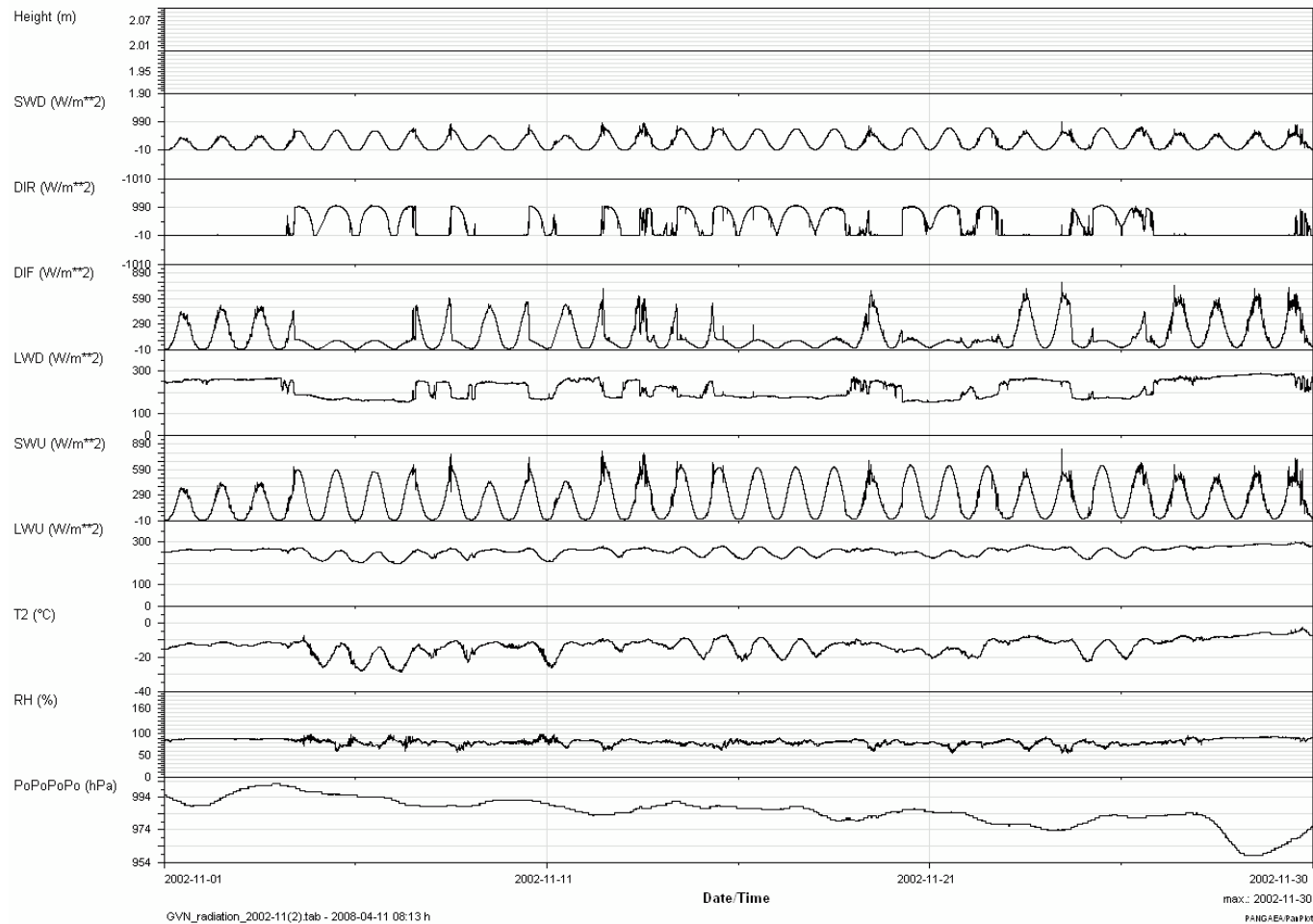
Software

The Software on this page is provided by the PANGAEA-Network for the visualization, exploration and interpretation of scientific data. The tools are freeware; its use in combination with the PANGAEA Information System is recommended.

-  **PanMap** is a Mini-GIS (Geographical Information System) to draw point and vector data in maps.
-  **PanPlot** enables the user to plot data versus time or space in multivariable graphs.
-  **Pan2Applic** is a tool to convert and compile single files or folders of output files (ascii/tab-separated data files with or without metaheader) downloaded from the information system PANGAEA to other formats used by applications, e.g. for visualization or further processing.
-  Some **useful tools** for converting ASCII files to some special formats.
-  **PanCount** is an Excel-sheet to use the keyboard as a counting device.

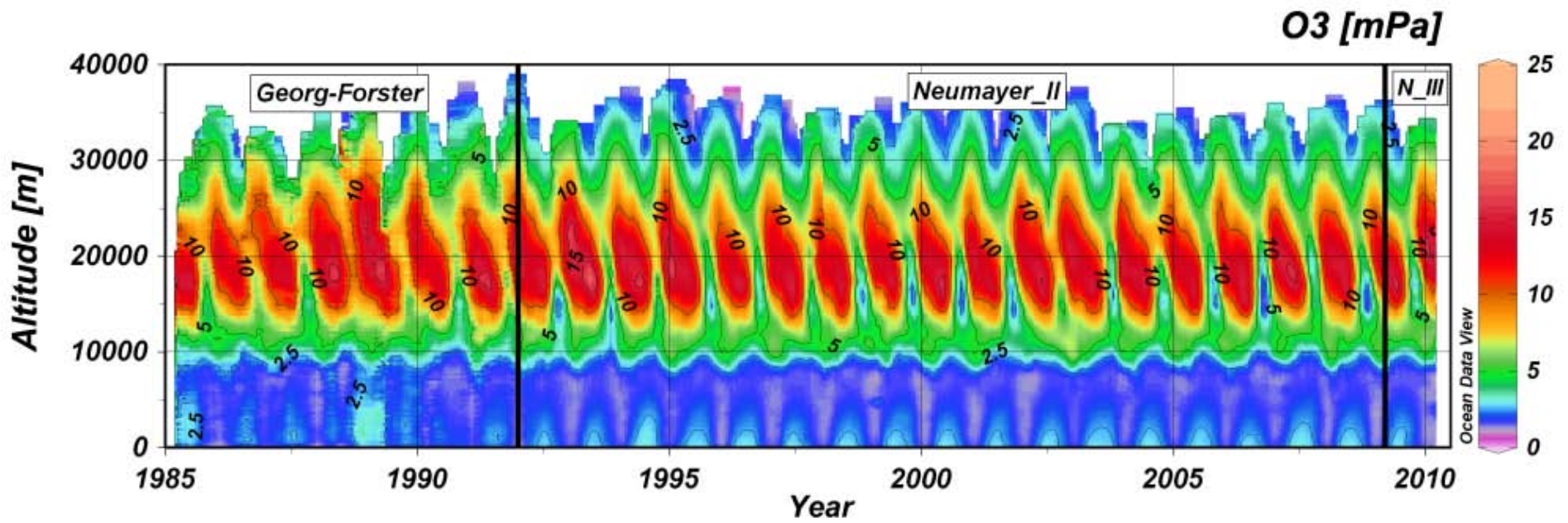
What offers PANGAEA?

Quicklook with PanPlot



What offers PANGAEA?

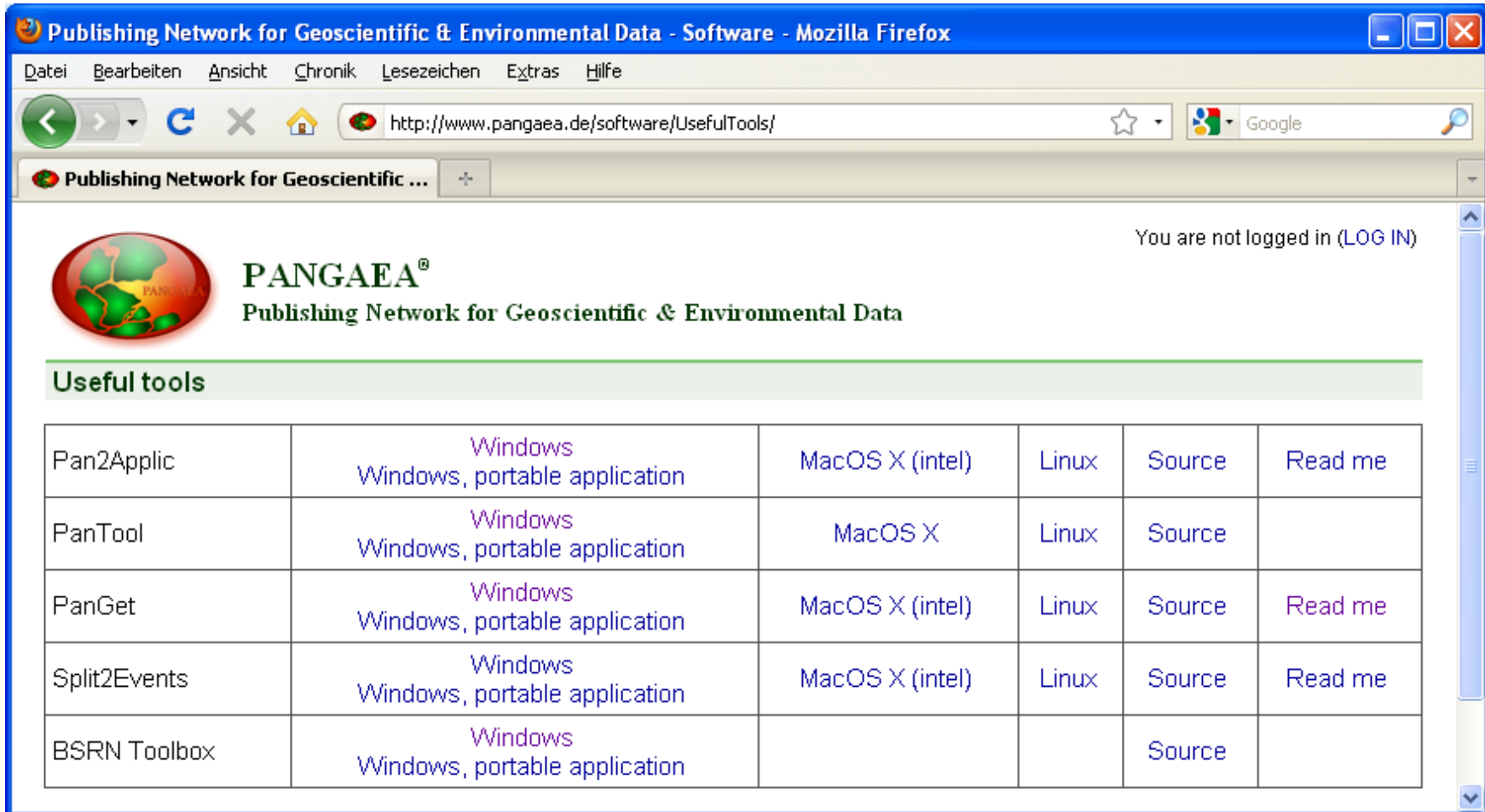
Ocean Data View example:





What offers PANGAEA?

Software



PANGAEA®
Publishing Network for Geoscientific & Environmental Data

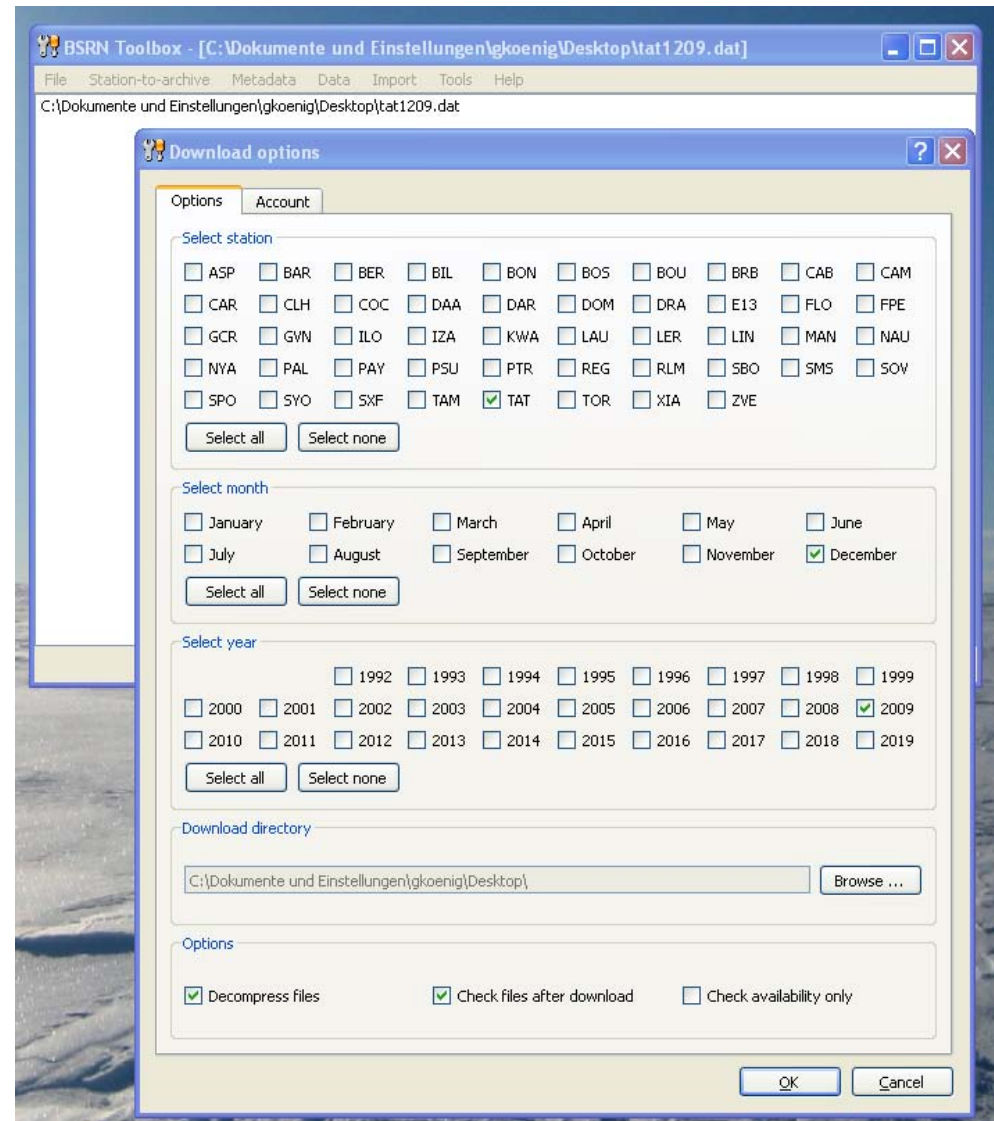
You are not logged in ([LOG IN](#))

Useful tools

Pan2Applic	Windows Windows, portable application	MacOS X (intel)	Linux	Source	Read me
PanTool	Windows Windows, portable application	MacOS X	Linux	Source	
PanGet	Windows Windows, portable application	MacOS X (intel)	Linux	Source	Read me
Split2Events	Windows Windows, portable application	MacOS X (intel)	Linux	Source	Read me
BSRN Toolbox	Windows Windows, portable application			Source	

BSRN Toolbox:

1. Downloading files from the public ftp account.
2. Decompressing files.
3. Formal check of the files.
4. Extract metadata.
5. Create files for PanPlot etc.



Future plans:

1. Publication of an updated „Technical Plan for BSRN Data Management“. A draft is already available.
2. Data handling of the “spectral aerosol optical depths” (AODs) must be redefined since AODs cannot be included in the station-to-archive files as originally planned. This work is in process (Bruce Forgan). As soon as AOD data are available they will be offered in PANGAEA.
3. A central quality management will be established from Dr. Xiuping Yan, who started to work at AWI in February 2010. The main tool of the new quality management system will be a program which adds quality flags to PANGAEA derived datasets.
4. The program for data quality flagging will get offered public domain as e.g. the BSRN-Toolbox. It can be used from any customer from the WRMC. It is planned to keep the error limits flexible to allow more specific error analysis depending of the applied instrument, the station environment and the demands of the users.