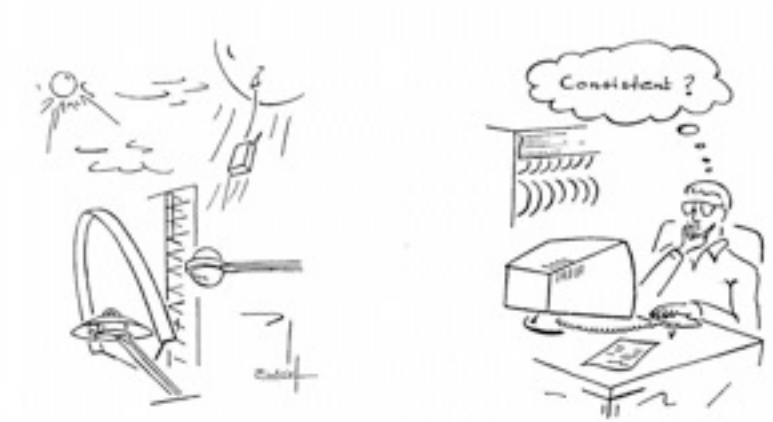
The World Radiation Monitoring Center at the Alfred Wegener Institute



Gert König-Langlo, Rainer Sieger, Kuratorentreffen 2010

Main WRMC Objectives:

Collecting uniform and consistent measurements throughout the Baseline Surface Radiation Network (BSRN) to:

1. monitor the surface short-wave and long-wave radiative components and their changes with the best methods currently available,
2. provide data for the validation of satellite-based estimates of the surface radiative fluxes and
3. produce high quality observational data for comparison to climate models.

Brief BSRN History:

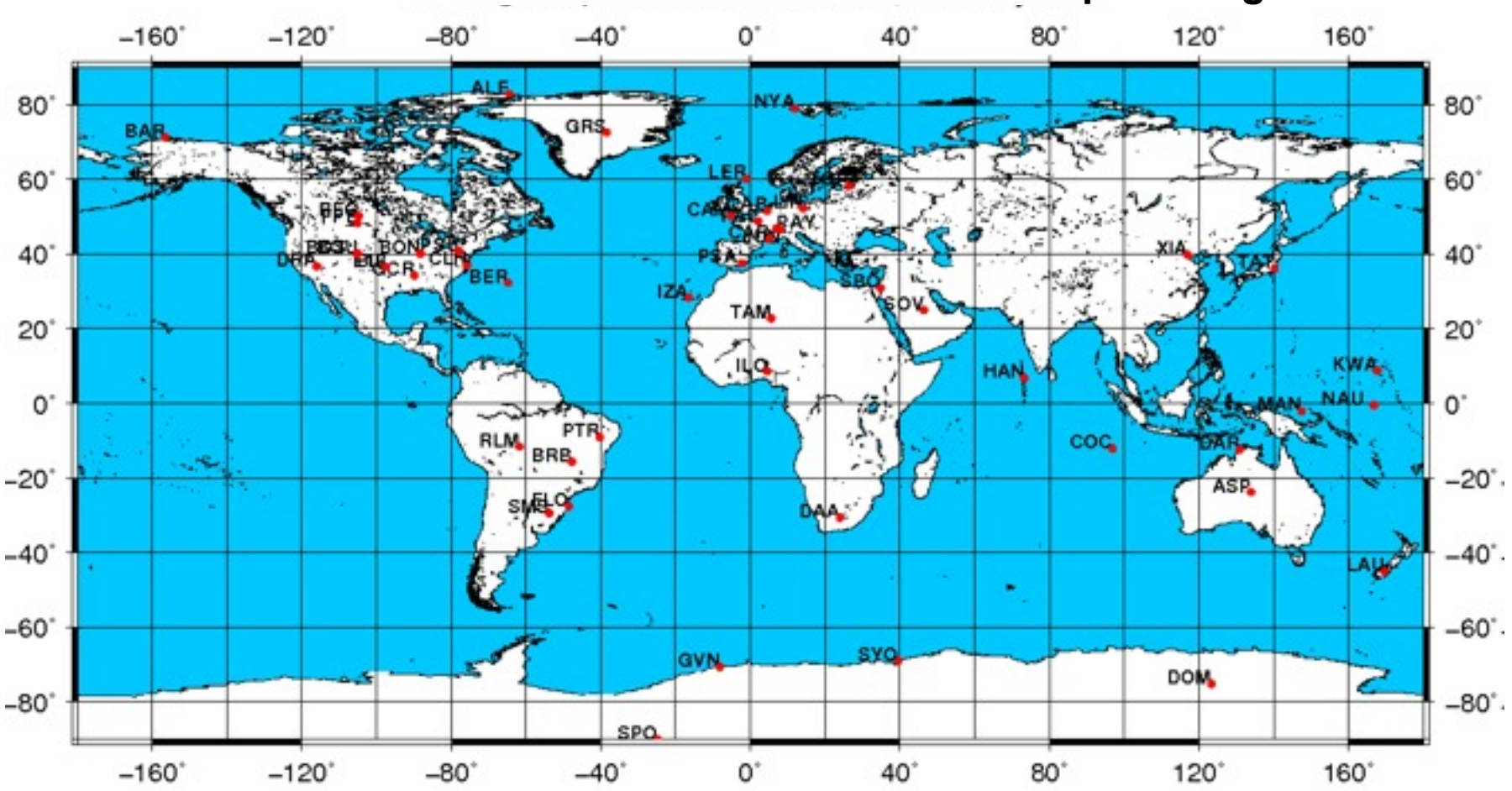
1. 1988: The WMO proposed the establishment of the BSRN.
2. 1992: The BSRN started with 5 sites and the WRMC at ETH Zurich under the direction of Prof. Atsumu Ohmura.
3. 2004: BSRN officially became a contributor to the Global Climate Observing System (GCOS).
4. 2008 July: After 15 years of nearly continuous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

WRMC-BSRN

World Radiation Monitoring Center- Baseline Surface Radiation Network

hosted by AWI

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)	7 stations
6. LR 1100: (Upper air soundings)	25 stations
7. LR 1200: (Total ozone)	8 stations
8. LR 1300: (Aerosol optical depths)	0 stations
9. LR 1300: (Ceilometer data)	2 stations
10. LR 30x0: (Radiation measurements from tower)	11 stations

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.
3. Accepted files get copied from the WRMC to ftp.bsrn.awi.de/station where they are public available.
4. Accepted files get additionally imported into PANGAEA.

Outgoing Data

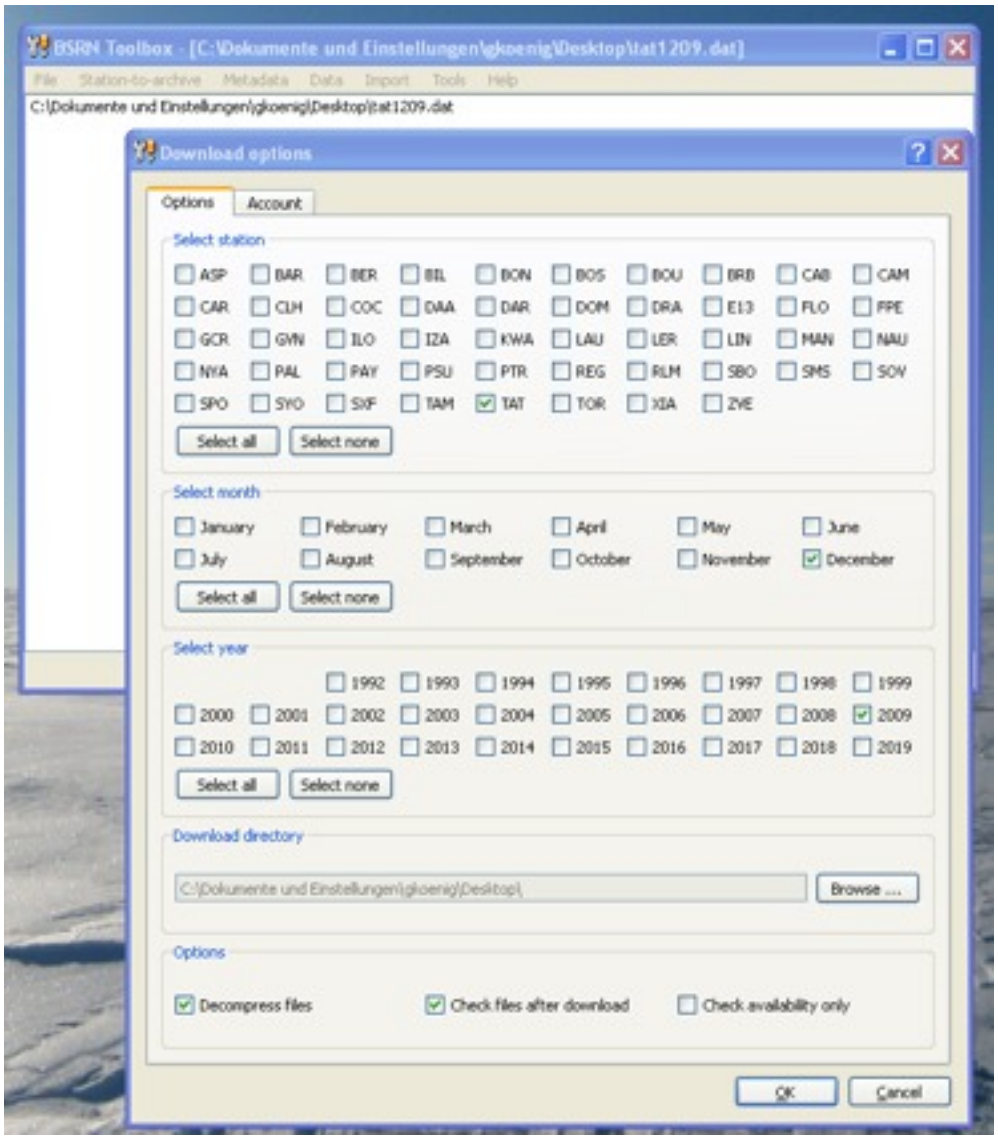
1. AWI provides ftp-access (ftp.bsrn.awi.de/station) to any station-to-archive file.
2. Additionally, AWI provides the full PANGAEA service with respect to any single dataset (logical record, station, month) (http://www.bsrn.awi.de).
3. For longer time series and averages the Data Warehouse service is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

Station-to-Archive File:

```
XXX      XXX      -1      -1.0000      -1.0000
Comparison to reference SL501A SN 1904
Ratio between instruments at 300 DU and SZA 40 deg
 -1 -1 -1 Y
Solar Light Co                  SL501A          3549                12/01/97 21053
XXX
 -1 -1  -1.000  -1.000  -1.000  -1.000  -1.000  -1.000 71 23
MeteoSwiss, Payerne, CH         Dr. L. Vuilleumier
06/23/06 07/13/06  1       1.0700      -1.0000
XXX      XXX      -1      -1.0000      -1.0000
XXX      XXX      -1      -1.0000      -1.0000
Comparison to reference SL501A 1904
Ratio between instruments at 300 DU and SZA 40 deg
*U0009
 -1 -1 -1         2 21005 -1
 -1 -1 -1       131 21006 -1
 -1 -1 -1       124 21052 -1
 -1 -1 -1       125 21053 -1
*U0100
  1    0     -2   0.1   -2   -1   -999 -99.9 -999 -999
             -1   0.0   -1   -1    255   0.5  254  256      0.2  99.7  955
  1    1     -2   0.1   -2   -1   -999 -99.9 -999 -999
             -1   0.0   -1   -1    255   0.5  255  256      0.2  99.7  955
  1    2     -2   0.1   -2   -1   -999 -99.9 -999 -999
```

BSRN Toolbox:

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



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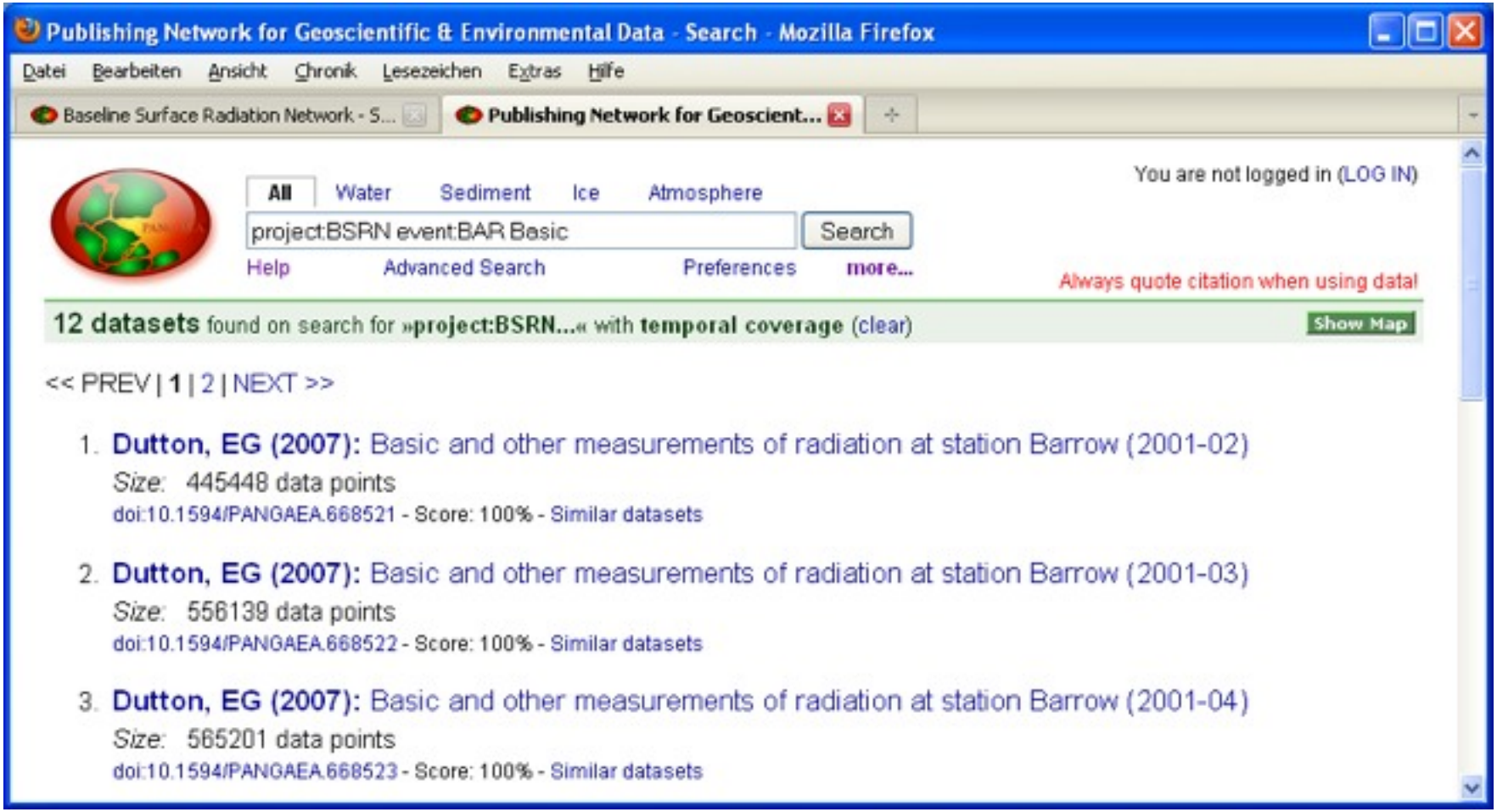
Present State of the WRMC: 5622station-months available

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	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

.....

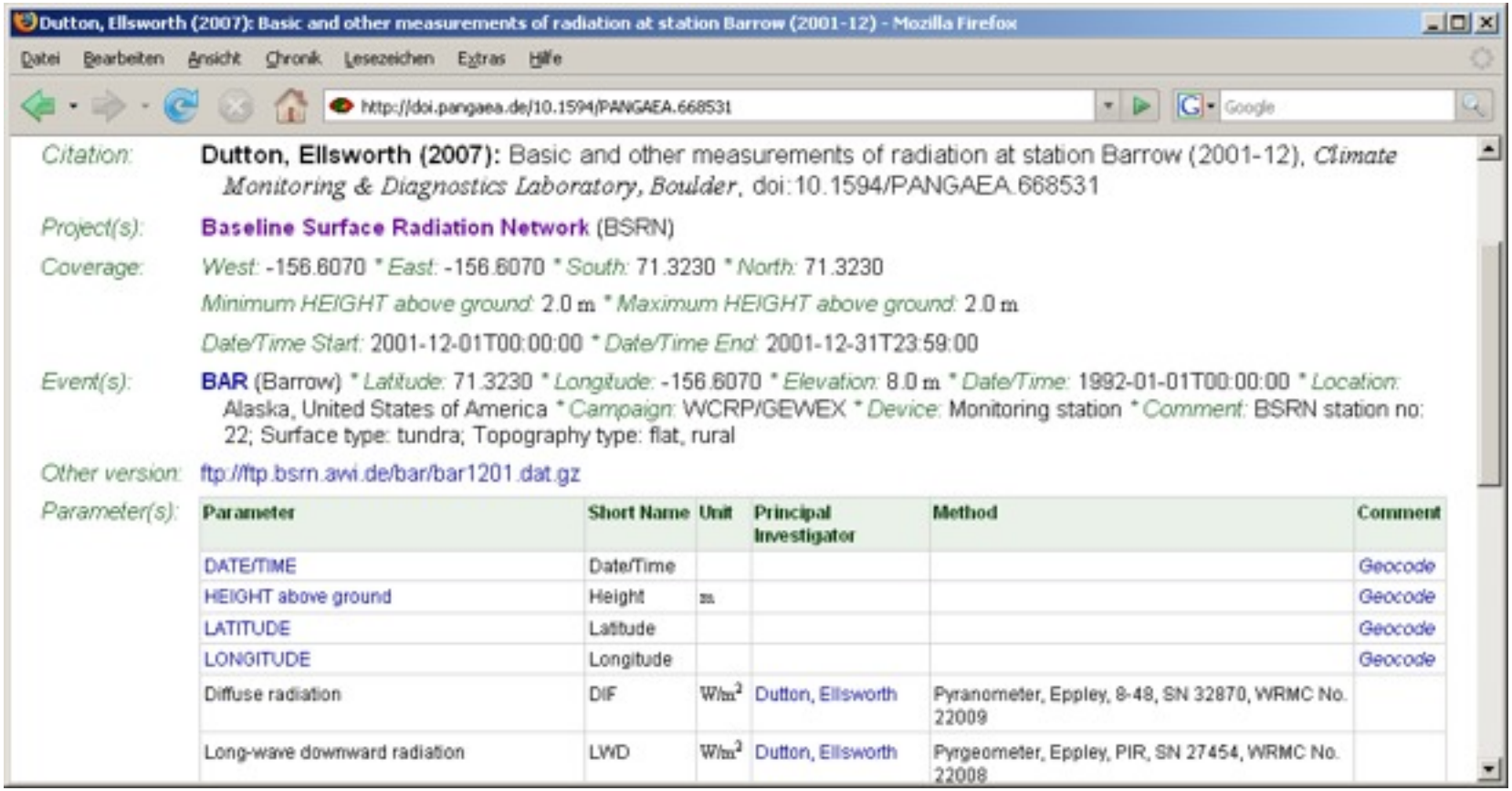
Tamanrasset	TAM	Mohamed Mimouni (m_mimouni_dz@yahoo.fr)										10	12	12	12	12	12	12	12	12	12		X
Tateno	TAT	Nozomu Ohkawara (ohkawara@met.kishou.go.jp)						11	12	12	12	12	12	11	11	12	12	12	12	12	12		X
Toravere	TOR	Ain Kallis (kallis@aai.ee)									12	12	12	12	12	12	12	12	12	12	12	1	X
Xianghe	XIA	Xiangao 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?



What offers PANGAEA?

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



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

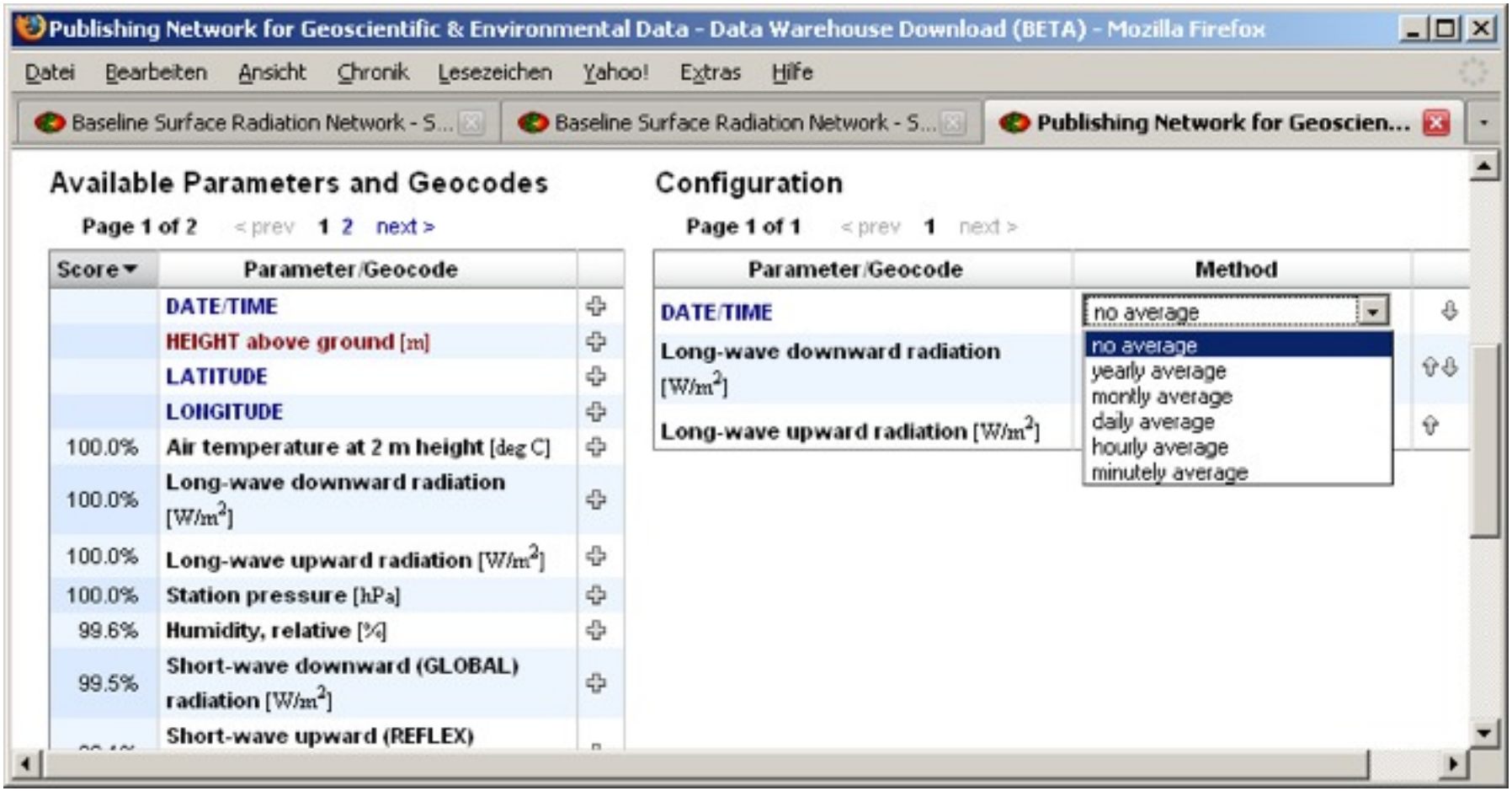
Other version: ftp://ftp.bsrn.awi.de/bar/bar1201.dat.gz

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	

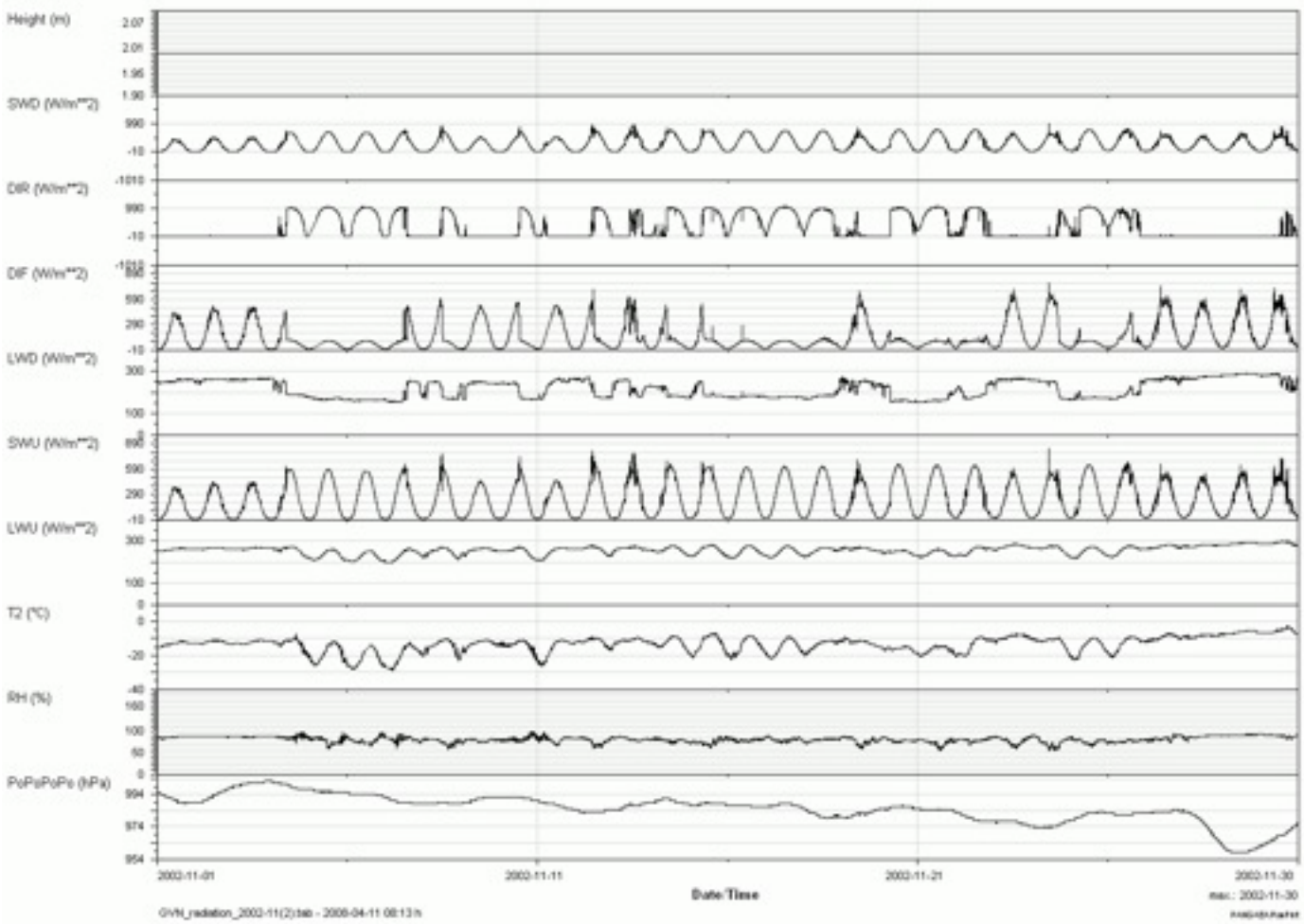
What offers PANGAEA?

PANGAEA Data Warehouse offers averaging of long time series



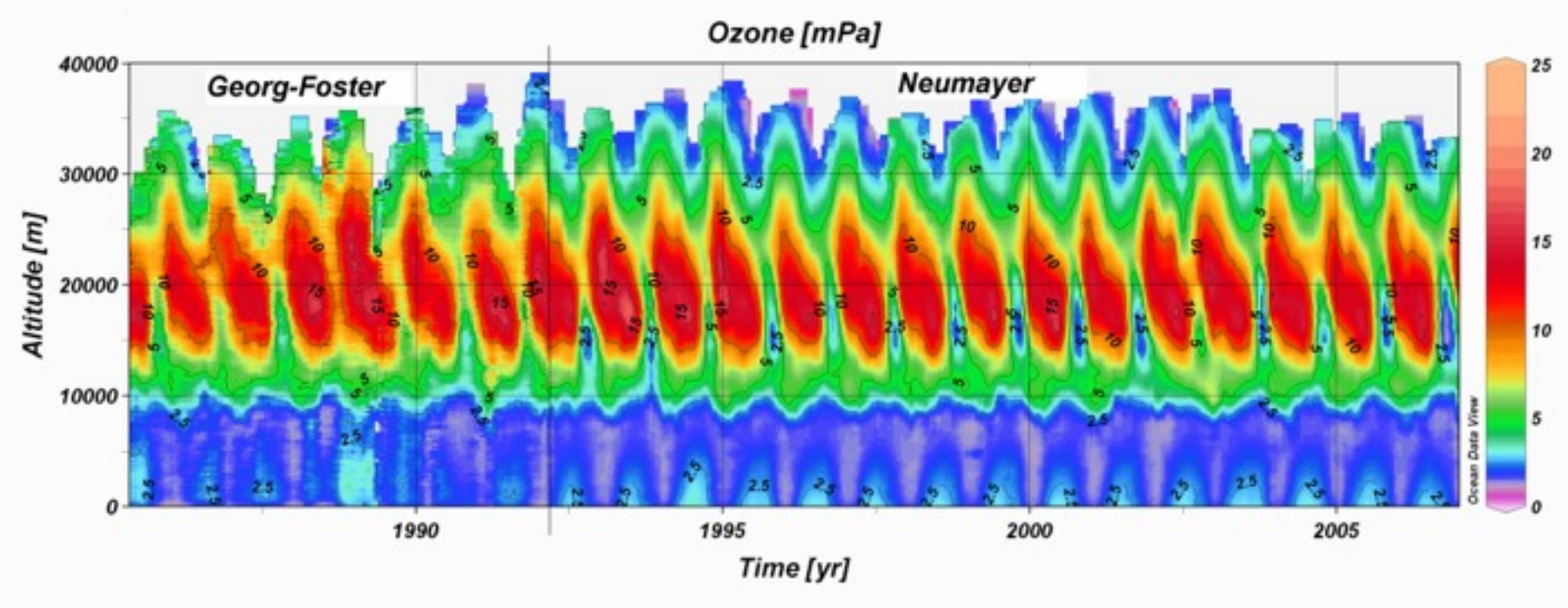
What offers PANGAEA?

PanPlot example



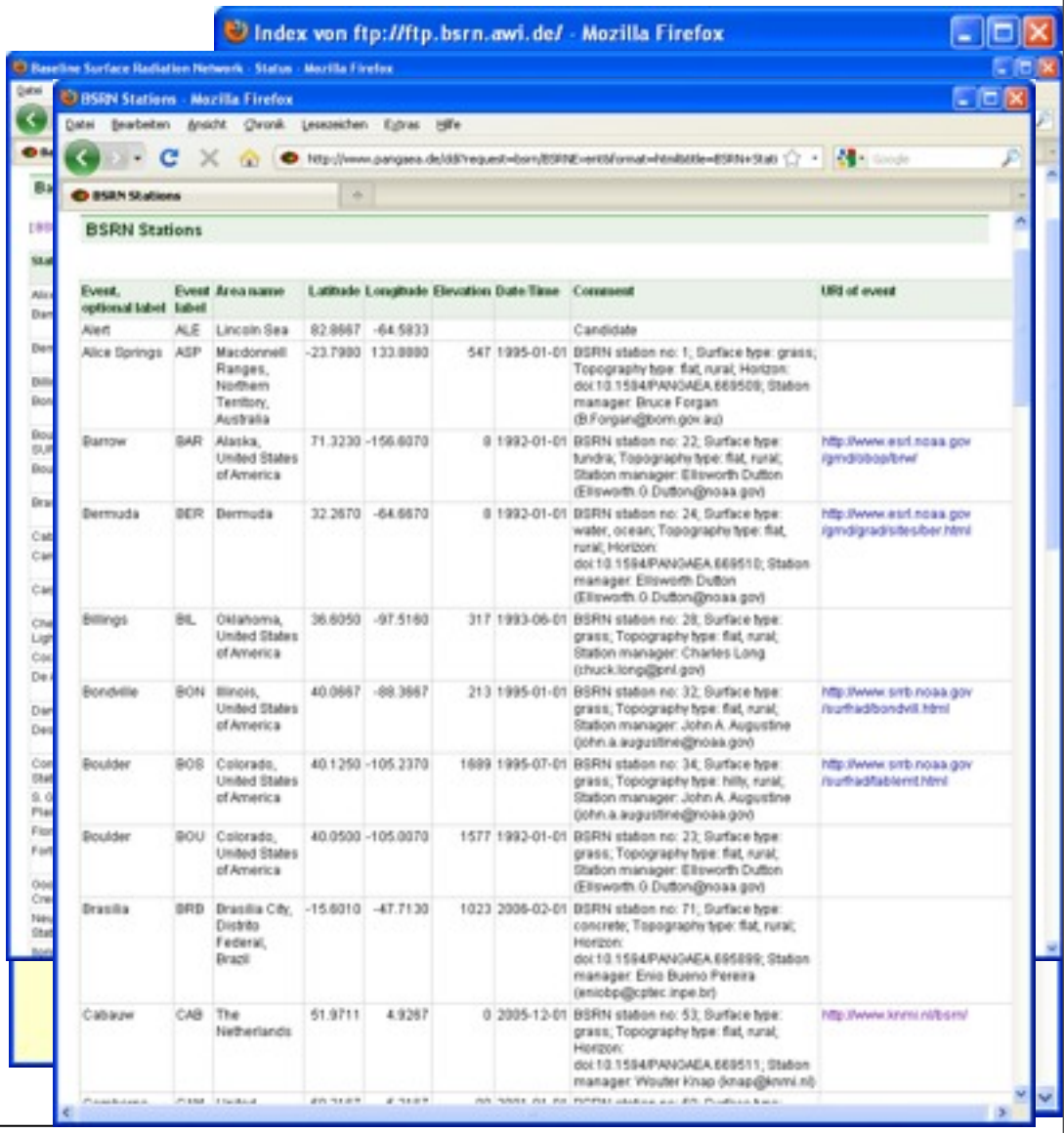
What offers PANGAEA?

Ocean Data View example:



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.



Google Earth overlay

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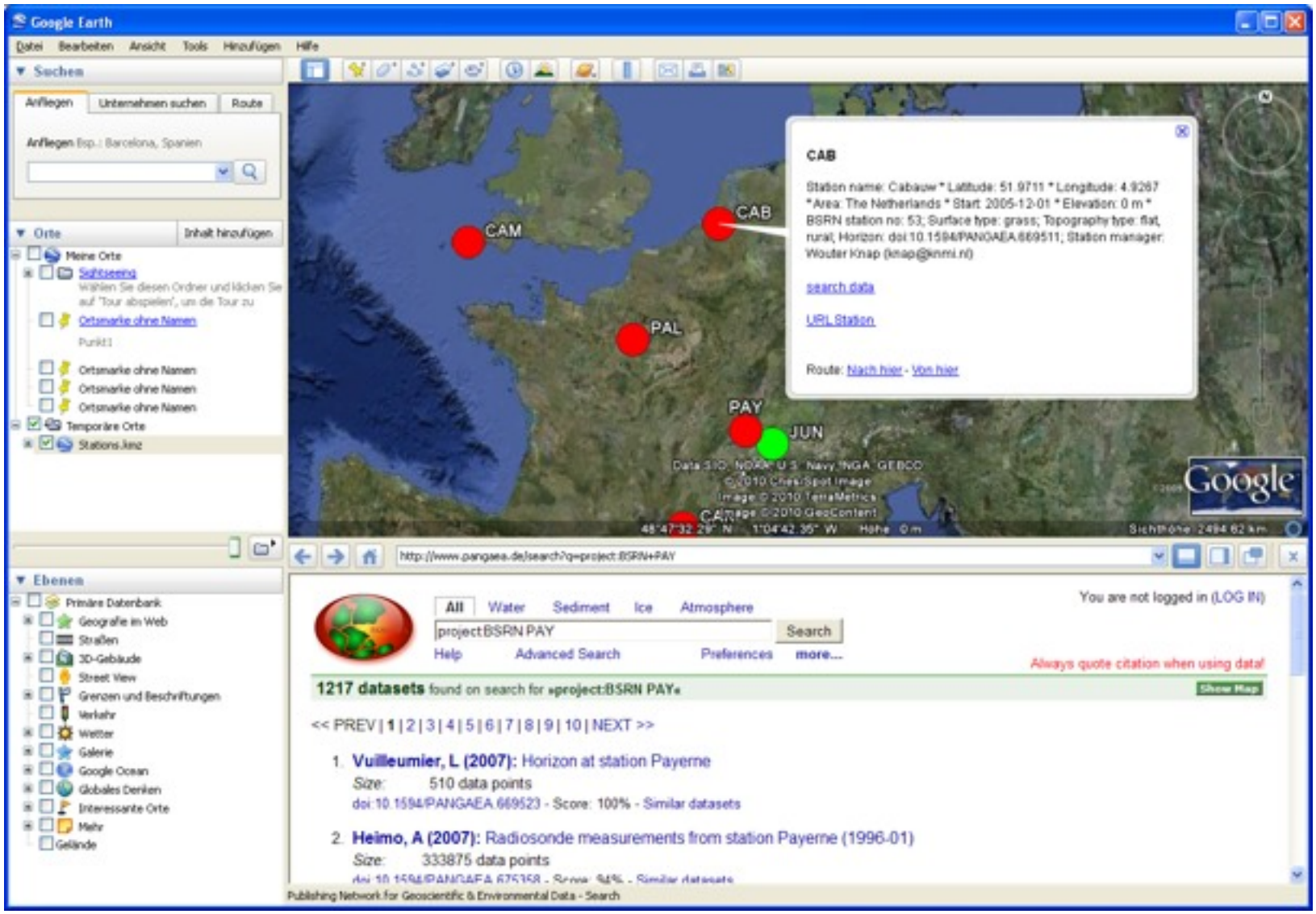

Gert König-Langlo, Rainer Sieger, BSRN Meeting 2010

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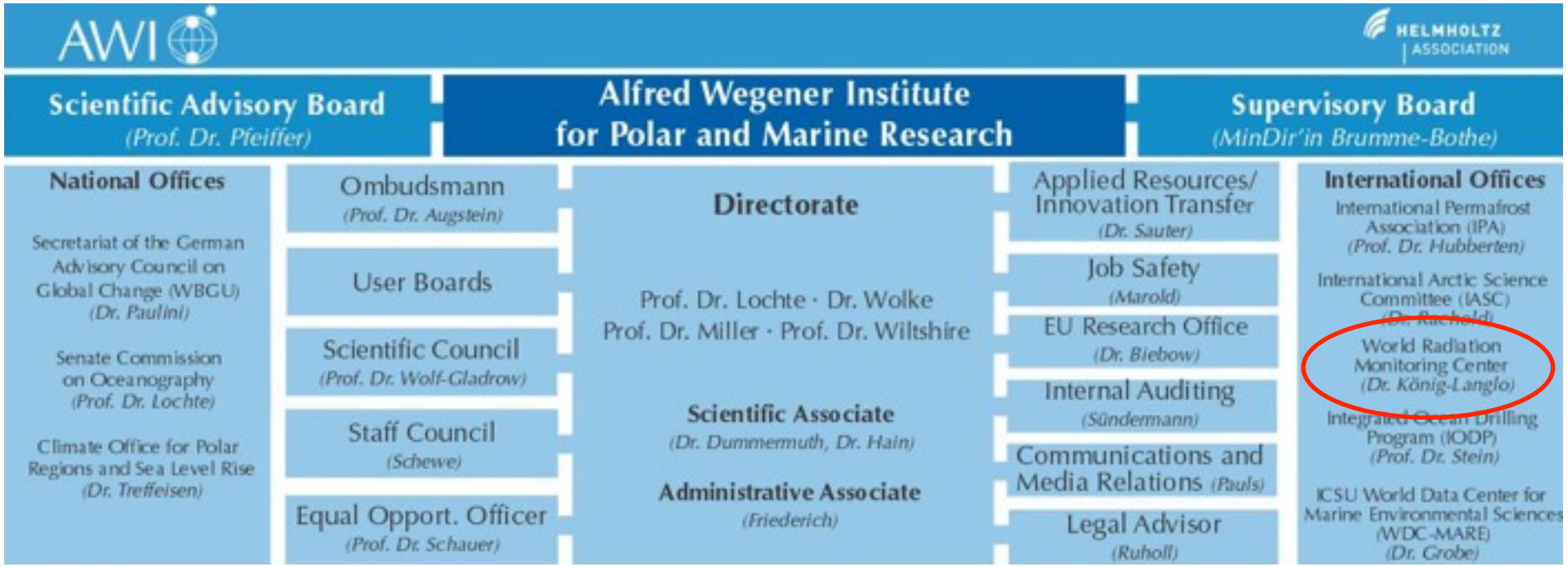

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