

# The Baseline Surface Radiation Network and the World Radiation Monitoring Center

## Status March 2018



Amelie Driemel, Gert König-Langlo\*, Rainer Siegert†, and Charles N Long



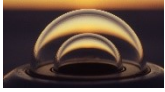
## Baseline Surface Radiation Network (BSRN)

Global observatory network providing observations of the best possible quality for short- & long-wave surface radiation fluxes in 1 min resolution

## World Radiation Monitoring Center (WRMC)

The WRMC is the central archive for all data from the BSRN, since 2008 operated at the Alfred-Wegener Institut in Bremerhaven

In 2017 the director changed from G. König-Langlo to A. Driemel



# Definitions



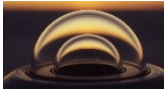
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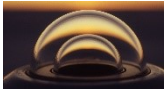


# Data overview, status 03-2018



1	LR 0100: <b>Global, Diffuse, Direct, Long-wave down</b>	60 stations
2	LR 0300: <b>Reflex, Long-wave up</b>	15 stations
3	LR 0500: <b>UV</b>	12 stations
4	LR 1000: <b>Synops</b>	13 stations
5	LR 1100: <b>Upper air soundings</b>	30 stations
6	LR 1200: <b>Total ozone</b>	9 stations
7	LR 1300: <b>Ceilometer data</b>	3 stations
8	LR 30x0: <b>Radiation measurements from tower</b>	13 stations

Status March 2018 **>10500 monthly datasets** (>870 years)



# Data extraction



## 1. ftp server:

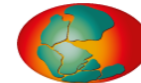
<ftp.bsrn.awi.de>

station-to-archive files

Datein...	Zuletzt geändert	Berechtigungen	Besitzer/Gruppe
..			
ale	2015-12-12	drwxr-x---	bsrnadm bsrn
asp	2016-03-30	drwxr-x---	bsrnadm bsrn
bar	2012-10-08	drwxr-x---	bsrnadm bsrn
ber	2015-06-03	drwxr-x---	bsrnadm bsrn
bil	2017-02-01 15:07:00	drwxr-x---	bsrnadm bsrn
bon	2017-01-23 19:45:00	drwxr-x---	bsrnadm bsrn
bos	2017-03-06 09:18:00	drwxr-x---	bsrnadm bsrn
hou	2016-07-21	drwxr-x---	bsrnadm bsrn

## 2. PANGAEA:

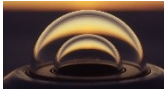
<https://dataportals.pangaea.de/bsrn/>



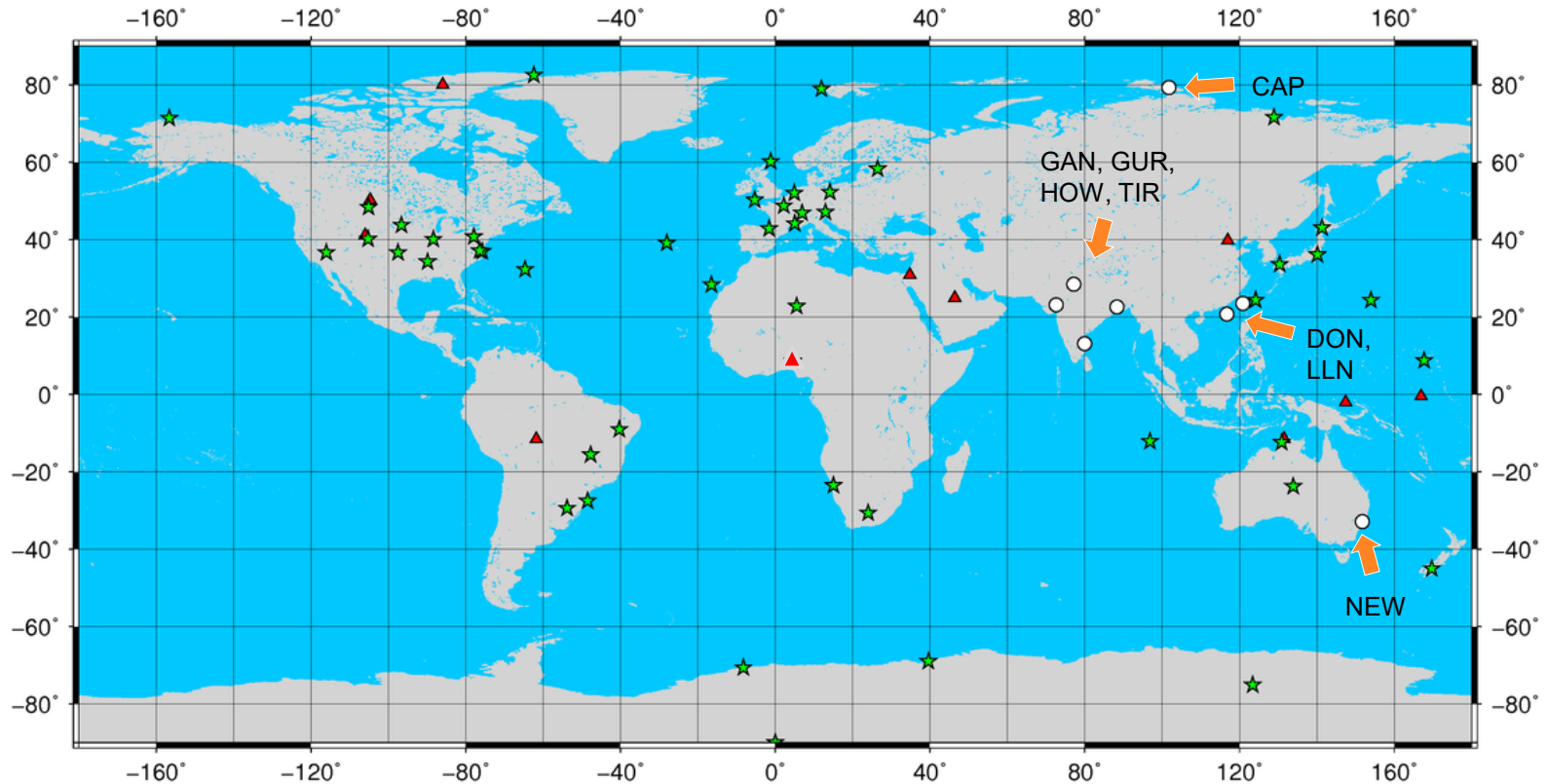
**PANGAEA.**

Data Publisher for Earth & Environmental Science

Station	Short name	Station scientist currently in charge	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Alert	ALE	Christopher Cox ( <a href="mailto:christopher.j.cox@noaa.gov">christopher.j.cox@noaa.gov</a> )													X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Alice Springs	ASP	Matt Tully ( <a href="mailto:m.tully@bom.gov.au">m.tully@bom.gov.au</a> )				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Barrow	BAR	Sara Morris ( <a href="mailto:Sara.Morris@noaa.gov">Sara.Morris@noaa.gov</a> )	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bermuda	BER	Sara Morris ( <a href="mailto:Sara.Morris@noaa.gov">Sara.Morris@noaa.gov</a> )	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Billings	BIL	Charles Long ( <a href="mailto:chuck.long@noaa.gov">chuck.long@noaa.gov</a> )		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bondville	BON	John Augustine ( <a href="mailto:John.A.Augustine@noaa.gov">John.A.Augustine@noaa.gov</a> )				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Boulder, SURFRAD	BOS	John Augustine ( <a href="mailto:John.A.Augustine@noaa.gov">John.A.Augustine@noaa.gov</a> )				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Boulder	BOU	** Station closed in July 2016 **	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Brasilia	BRB	Enio Bueno Pereira ( <a href="mailto:enio.pereira@inpe.br">enio.pereira@inpe.br</a> )															X	X	X	X	X	X	X	X	X	X	X		
Cabauw	CAB	Wouter Knap ( <a href="mailto:Knap@knmi.nl">Knap@knmi.nl</a> )														X	X	X	X	X	X	X	X	X	X	X	X	X	
Camborne	CAM	Jonathan Tamlyn ( <a href="mailto:jonathan.tamlyn@metoffice.gov.uk">jonathan.tamlyn@metoffice.gov.uk</a> )										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	



# Changes in stations

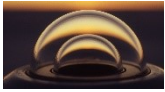


- Stations**
- ★ Running
  - Inactive
  - ▲ Closed
  - Candidate

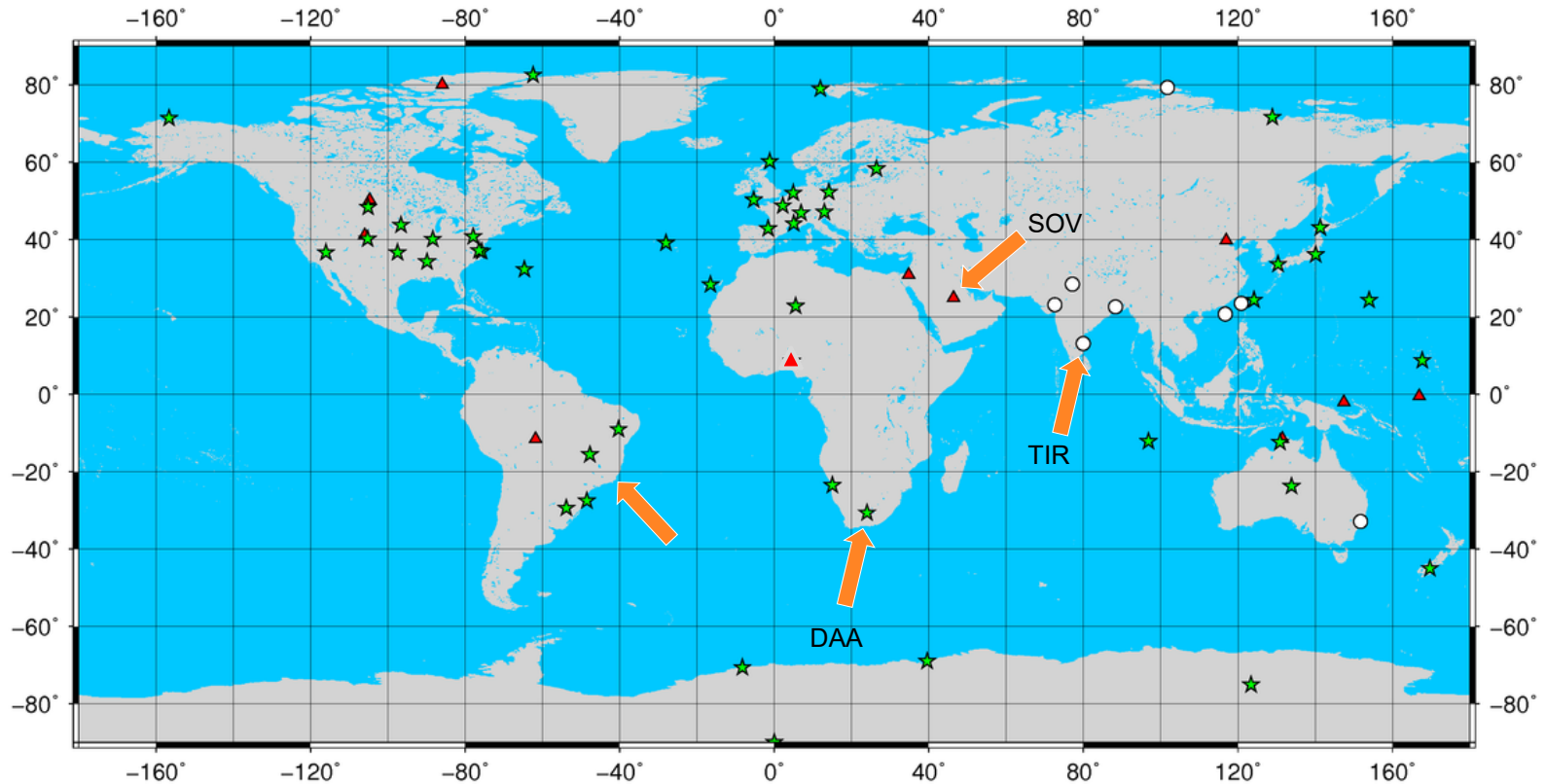
14th BSRN Scientific Review Workshop  
26-29 April 2016 in Canberra, Australia  
Hosted by Australian BoM



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# Changes in stations



**Stations**

- ★ Running
- Inactive
- ▲ Closed
- Candidate

Closed in 2016: BOU (CO, USA)  
XIA (China)

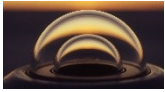
Inactive: CLH (USA)

Submitting again: Brazilian stations SMS, PTR, RLM  
De Aar, South Africa (DAA)

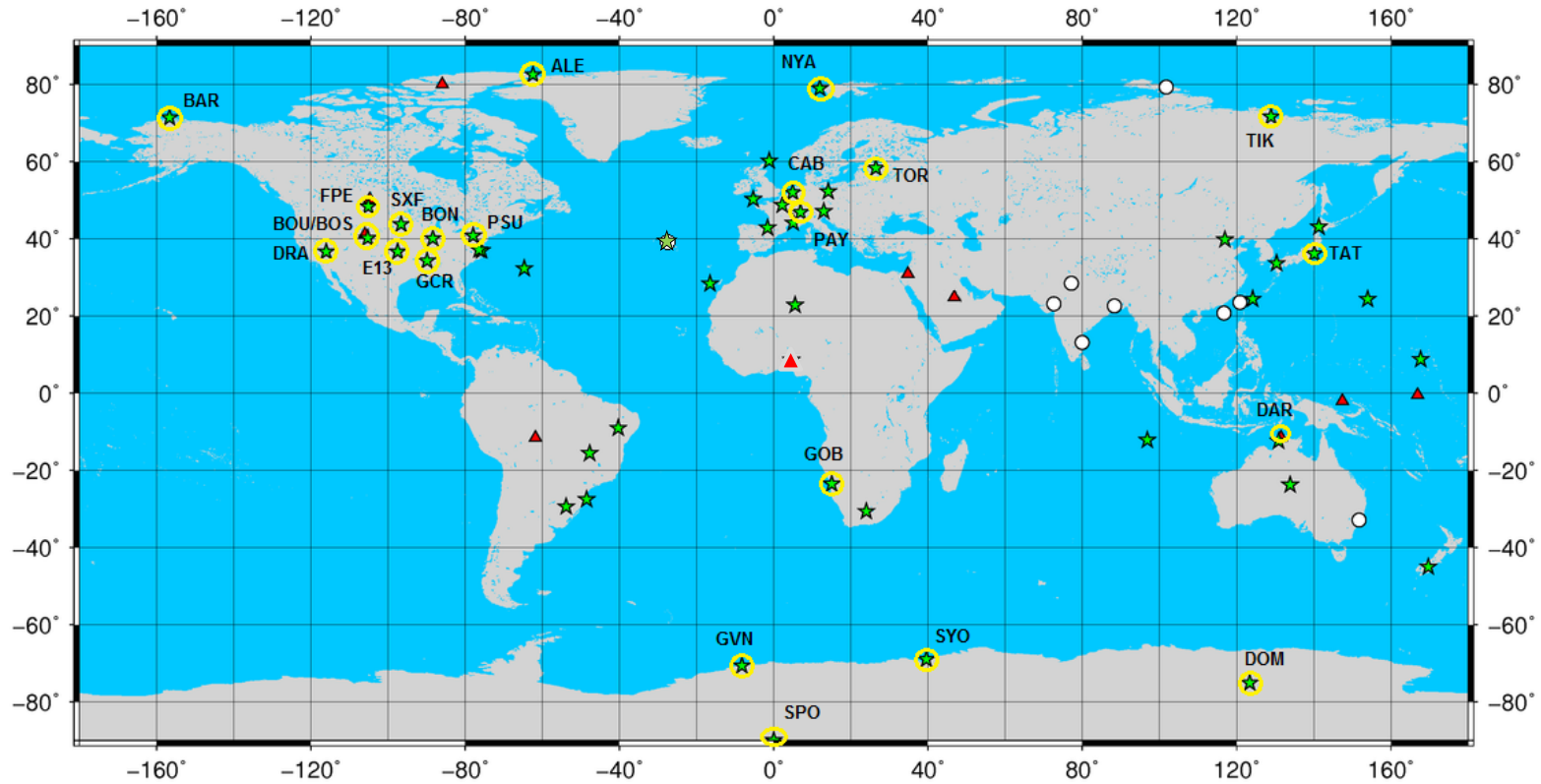
Some new stations interested in becoming BSRN  
stations: Huancayo (Peru), Ashalim (Israel) etc.



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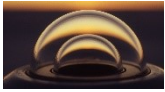
# Stations with complete budget



- Stations**
- ★ Running
  - ◻ Inactive
  - ▲ Closed
  - Candidate







# New publications





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16 Feb 2018

Review status

This discussion paper is a preprint. It is a manuscript under review for the journal Earth System Science Data (ESSD).

### Review article

#### Baseline Surface Radiation Network (BSRN): structure and data description (1992–2017)

Amelie Driemel<sup>1</sup>, John Augustine<sup>2</sup>, Klaus Behrens<sup>3,\*</sup>, Sergio Colle<sup>4</sup>, Christopher Cox<sup>5</sup>, Emilio Cuevas-Agulló<sup>6</sup>, Fred M. Denn<sup>7</sup>, Thierry Duprat<sup>8</sup>, Masato Fukuda<sup>9</sup>, Hannes Grobe<sup>1</sup>, Martial Haeffelin<sup>10</sup>, Nicole Hyett<sup>11</sup>, Osamu Ijima<sup>9</sup>, Ain Kallis<sup>12</sup>, Wouter Knap<sup>13</sup>, Vasili Kustov<sup>14</sup>, Charles N. Long<sup>2</sup>, David Longenecker<sup>2,\*</sup>, Angelo Lupi<sup>15</sup>, Marlon Maturilli<sup>16</sup>, Mohamed Mimouni<sup>17,\*</sup>, Lucky Ntsangwane<sup>18</sup>, Hiroyuki Ogihara<sup>9</sup>, Xabier Olano<sup>19</sup>, Marc Oiefs<sup>20</sup>, Masao Omori<sup>9</sup>, Lance Passamani<sup>11</sup>, Enio Bueno Pereira<sup>21</sup>, Holger Schmithüsen<sup>1</sup>, Stefanie Schumacher<sup>1</sup>, Rainer Sieger<sup>1,\*</sup>, Jonathan Tamlyn<sup>22,\*</sup>, Roland Vogt<sup>23</sup>, Laurent Vuilleumier<sup>24</sup>, Xiangao Xia<sup>25</sup>, Atsumu Ohmura<sup>26,\*</sup>, and Gert König-Langlo<sup>1,\*</sup>

<sup>1</sup>Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Bremerhaven, Germany  
<sup>2</sup>NOAA ESRL Global Monitoring Division, Boulder, CO, USA  
<sup>3</sup>Deutscher Wetterdienst, Meteorologisches Observatorium Lindenberg - Richard-Abmann-Observatorium, Germany  
<sup>4</sup>Universidade Federal de Santa Catarina, Florianopolis, Brasil  
<sup>5</sup>CIRES/NOAA-ESRL Physical Sciences Division, Boulder, CO, USA  
<sup>6</sup>Izaña Atmospheric Research Center (AEMET), Tenerife, Spain  
<sup>7</sup>Science Systems and Applications, Inc., Lanham, USA  
<sup>8</sup>Meteo France, Carpentras, France  
<sup>9</sup>Japan Meteorological Agency, Tokio, Japan  
<sup>10</sup>Laboratoire de Météorologie Dynamique, Paris, France  
<sup>11</sup>Bureau of Meteorology, Melbourne, Australia  
<sup>12</sup>Estonian Environment Agency, Toravere, Estonia  
<sup>13</sup>Royal Netherlands Meteorological Institute, De Bilt, Netherlands  
<sup>14</sup>Arctic and Antarctic Research Institute, Saint Petersburg, Russia  
<sup>15</sup>Institute of Atmospheric Sciences and Climate, National Research Council of Italy, Bologna, Italy  
<sup>16</sup>Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Potsdam, Germany  
<sup>17</sup>Office National de la Météorologie, Algier, Algeria  
<sup>18</sup>South African Weather Service, Pretoria, South Africa

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Short summary

The Baseline Surface Radiation Network (BSRN), collects and centrally archives high quality... Read more

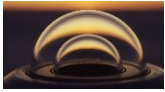
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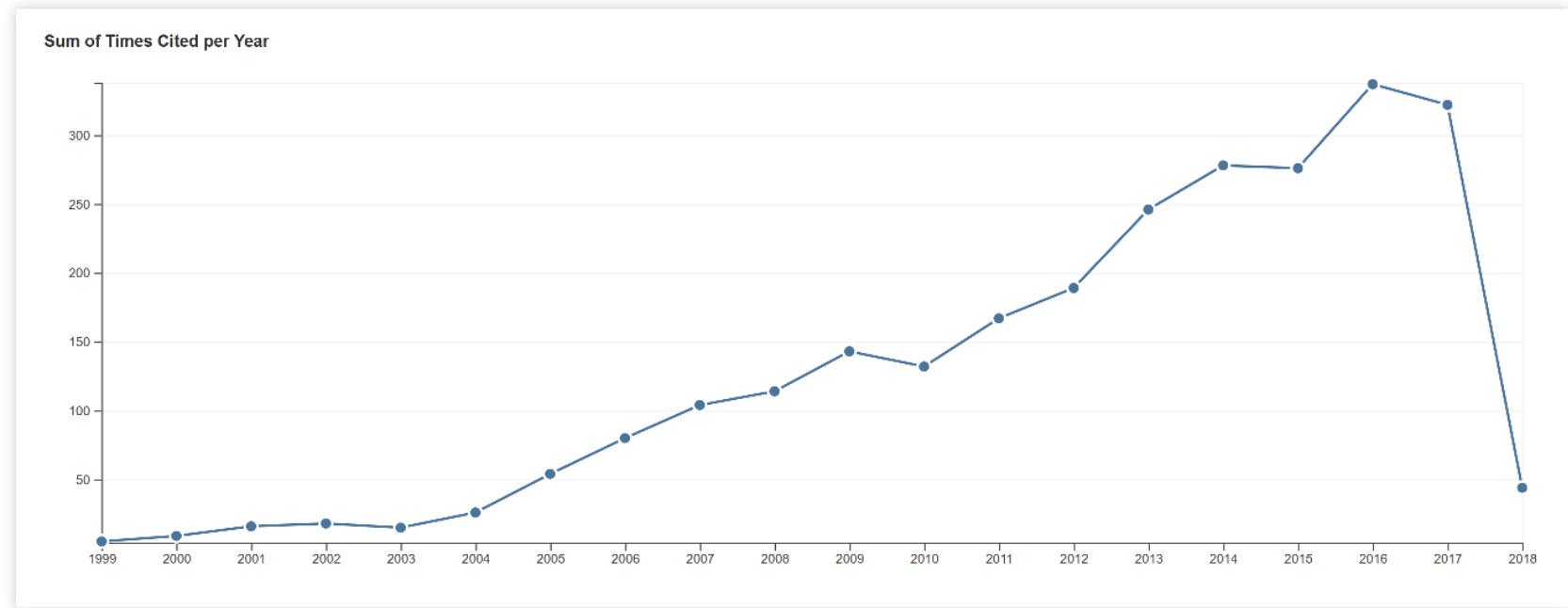
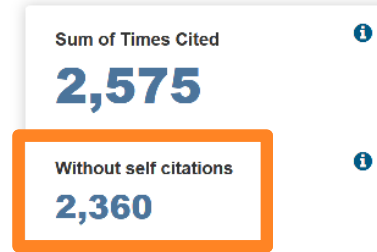
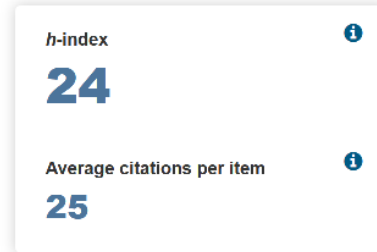
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Also: Chapter on BSRN in the upcoming Volume 100 of the meteorological education journal **PROMET**



# BSRN articles in Web of Science

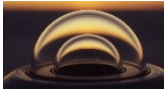




# BSRN Working Groups



- **Infrared** Working Group (Julian Gröbner)
- **Spectral** Working Group (Kathy Lantz)
- **Broadband** Working Group (Allison McComiskey)
- **Cold Climate Issues** Working Group (Chris Cox)
- **Uncertainties** Working Group (Nicole Hyett ~ Interim Ian Dollery)
- **Archive** (Amelie Driemel)



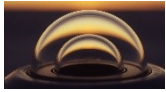
## Current issues



- Some **stations closed**/no longer maintained/financial problems
- Data submission in arrears => **inactive** status will be introduced
- Some **quality issues** e.g. in remote areas difficult to manage
- Lots of **retirements** in 2017 (concerns stations: CAM / LER, GVN, LIN, TAM, SURFRAD stations, Australian stations)
- Chuck Long will retire this year, **new Project Manager** needs to be assigned at the

15th **BSRN Workshop** held at CIRES, Boulder CO, 16-20<sup>th</sup> July 2018





# Thanks!



....To **Gert König-Langlo** who was WRMC director for 10 years (and GVN station scientist for much longer) and who retired in 2017



