The Global Observing System for Climate

BSRN in the wider community

BSRN Workshop

17th – 20th July, 2018

Boulder, Colorado, USA

GCOS Secretariat, WMO

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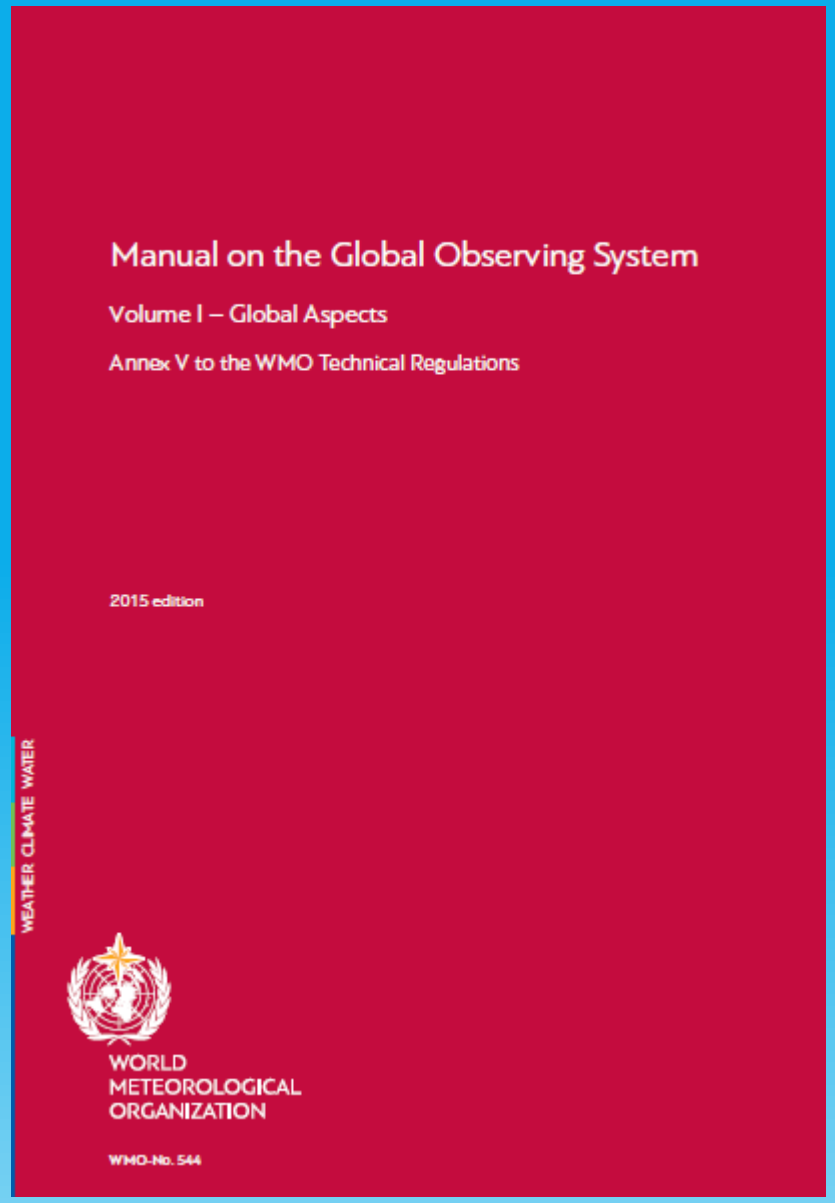
WMO UNESCO IOC ICSU International Council for Science UNEP

Action A11:	Operation of the BSRN
Action	Ensure continued long-term operation of the BSRN and expand the network to obtain globally more representative coverage and improve communications between station operators and the archive centre.
Benefit	Continuing baseline surface radiation climate record at BSRN sites.
Who	Parties' national services and research programmes operating BSRN sites in cooperation with AOPC and the WCRP GEWEX Radiation Panel.
Time-frame	Ongoing.
Performance Indicator	The number of BSRN stations regularly submitting valid data to International Data Centres.
Annual Cost	100k - 1M US$

The World Radiation Data Centre holds archive data for 1590 stations for a period since January 1964, as of March 2014. This represents a significant increase on the figure of 1118 reported in GCOS (2009). Some data are held for most countries, with the largest exception occurring for several in South America. The locations of stations reporting for the period from January 2013 to August 2014 (as of September 2014) are similar to the number of about 400 stations quoted in GCOS (2009).

Action A12:	Surface Radiation Data into WRDC
Action	Submit surface radiation data with quality indicators from national networks to the World Radiation Data Centre (WRDC). Expand deployment of surface radiation measurements over ocean.
Benefit	Expand central archive. Data crucial to constrain global radiation budgets and for satellite product validation. More data over ocean would fill an existing gap.
Who	National Meteorological Services and others, in collaboration with the WRDC.
Time-frame	Ongoing.
Performance Indicator	Data availability in WRDC.
Annual Cost	1-10M US$

WMO – Global Observing System



2.12.1.2 Members should cooperate in the establishment of special stations for particular purposes.

2.12.1.3 Special stations shall include:

2.12.3.2 Members should maintain a network of radiation stations of sufficient density for the study of radiation climatology.

2.12.3.3 Each Member should maintain an up-to-date directory of the radiation stations in its territory, including ordinary and principal stations, giving the following information for each station:

(a) Name and geographical coordinates in degrees and minutes of arc;

(b) Elevation, in whole metres;

(c) Brief description of local topography;

(d) Category of station and details of the observing programme;

(e) Details of radiometers in use (type and serial number of each instrument, calibration factors, dates of any significant changes);

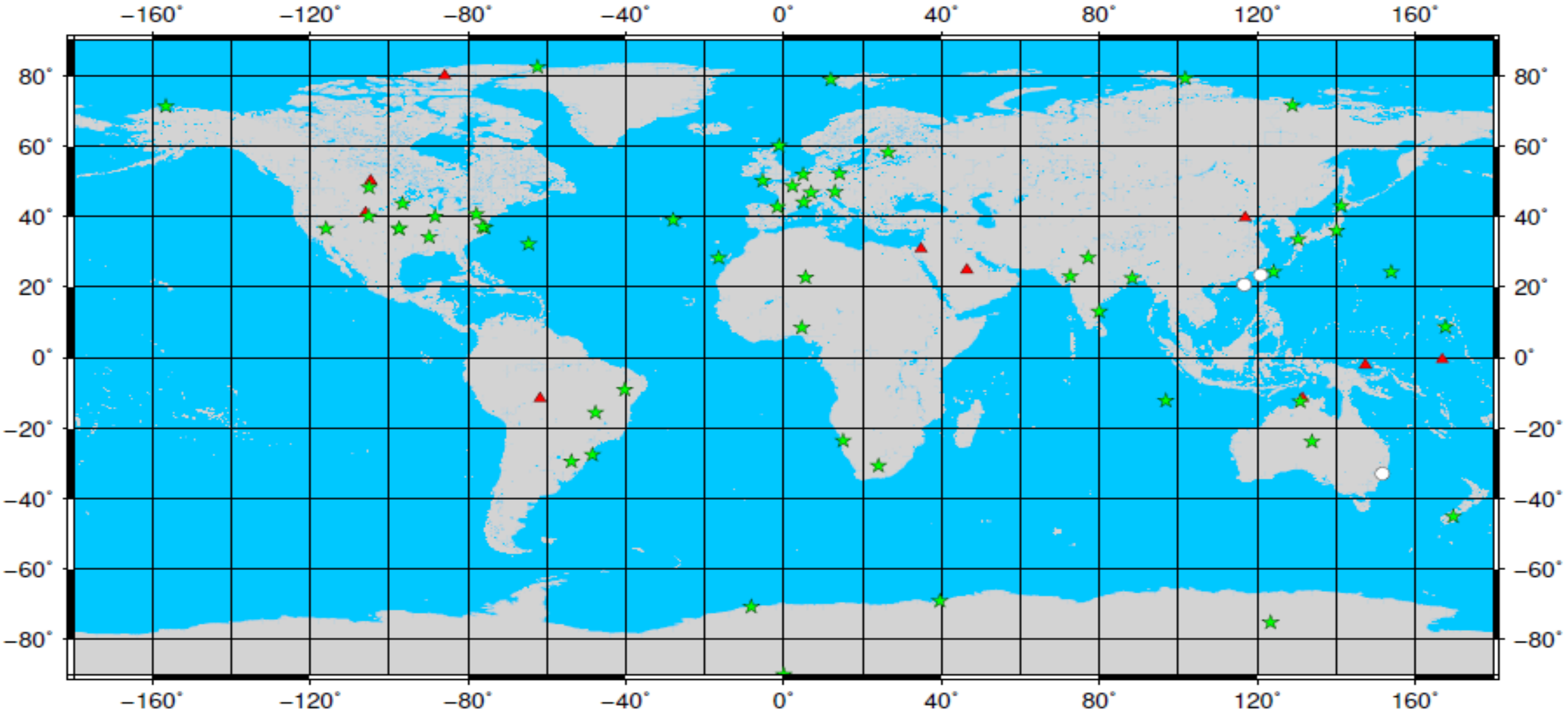
(f) Exposure of radiometers, including height above ground, details of the horizon of each instrument and nature of the surface of the ground;

(g) Station history (date of beginning of records, changes of site, closure or interruption of records, changes in the name of the station and important changes in the observing programme);

(h) Name of the supervising organization or institution.

1.69 in

Running, planned, and closed BSRN Stations, July 2018



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Strengths

BSRN is a well known brand
It is regarded as high-quality Radiation observations
Common practices and an underpinning standard
Good collaboration between experts and stations

Weaknesses

The aims, requirements and user needs of BSRN are not greatly known outside of the direct community
Is the global coverage sufficient.
Collaborative governance is hard to manage when stations don't meet requirements. Plus difficult to address gaps.
Ownership within the WMO community and poor guidance to Members through technical regulations

Opportunities

Best practices and outreach can support the comprehensive network (tiered network)
Reference/Baseline component in support of other networks

Threats

Budget cuts and resource
Lack of 'resourced' management can undermine the benefits
Availability of technical expertise

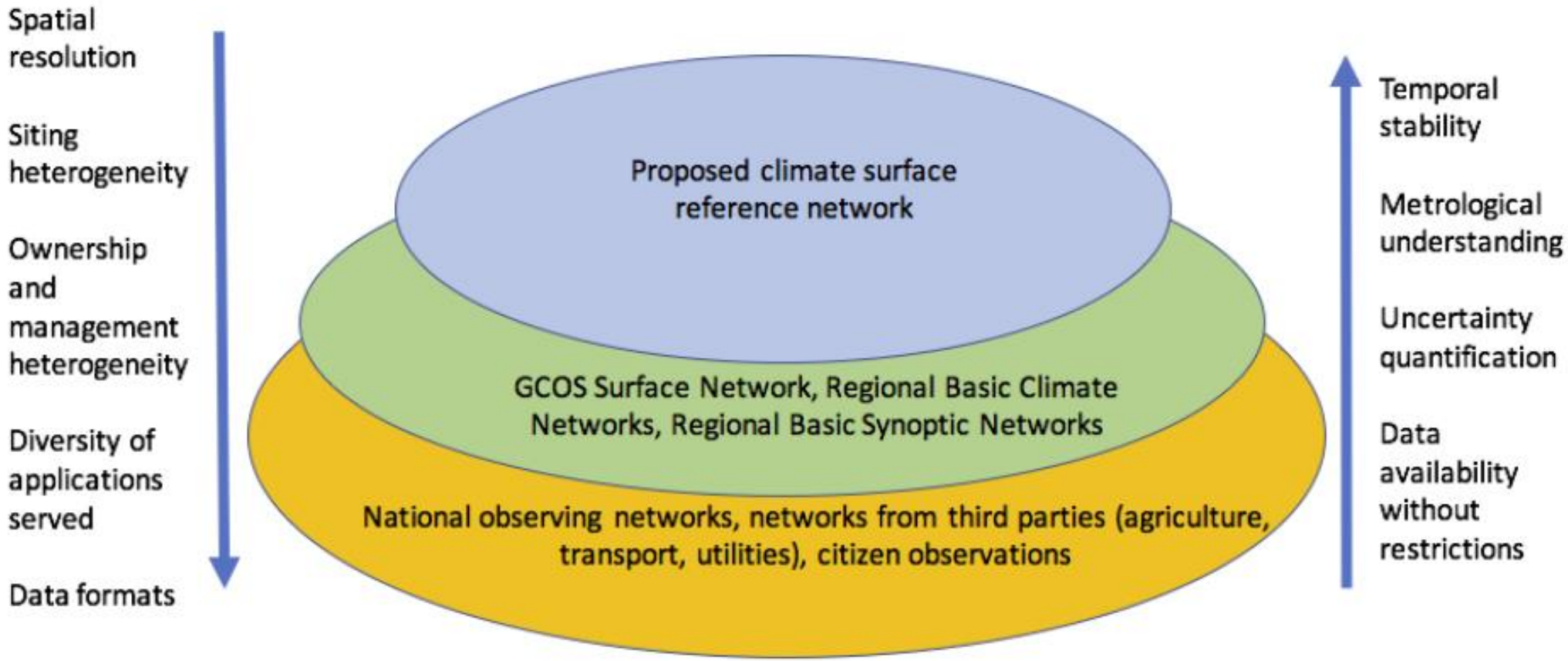

Figure 1 Conceptual outline of how climate observational capabilities map onto the tiered system of systems approach of Thorne et al. (submitted). The tiers from top to bottom are: Reference, Baseline and Comprehensive. Arrows and associated text denote important facets of the measurements that increase as you move down tiers (left hand side) or up tiers (right hand side).

A GCOS Surface Reference Network

Improved long-term accuracy, stability and comparability of observations.

- **Aims**
  - **To achieve simultaneous high-quality observations of many ECVs**
  - **Provide reference data to constrain and calibrate more spatially comprehensive observing systems.**
- **A Reference Network**
  - **Is traceable to an internationally accepted standard and has a comprehensive uncertainty analysis and is validated;**
  - **Is documented in accessible literature and Includes complete metadata description**
  - **Will measure temperature and precipitation and a range of other surface ECVs**
  - **May be based on existing networks such as the US Climate Reference Network and the Cryonet sites from WMO GCW**

How are GCOS attempting to support this?

- Actions in the latest Implementation Plan
- Engagement at the annual AOPC meeting (invite BSRN expert)
- Support to the biennial workshop
- Open to new ideas

QUESTIONS

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SOURCE: ESA

The Global Observing System for Climate

Thank you

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