

The Global Observing System for Climate

GCOS

BSRN Workshop

17th – 20th July, 2018

Boulder, Colorado, USA

GCOS Secretariat, WMO

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ICSU

International Council for Science





GCOS established April 1992

The vision of GCOS is that all users have access to the climate observations, data records and information which they require to address pressing climate-related concerns. GCOS users include individuals, national and international organizations, institutions and agencies.

The role of GCOS is to work with partners to ensure the sustained provision of reliable physical, chemical and biological observations and data records for the total climate system – across the atmospheric, oceanic and terrestrial domains, including hydrological and carbon cycles and the cryosphere.



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GCOS is concerned with the observations

- what is measured, how it is measured, where it is measured, how measurement is sustained, how change is managed

data transmission

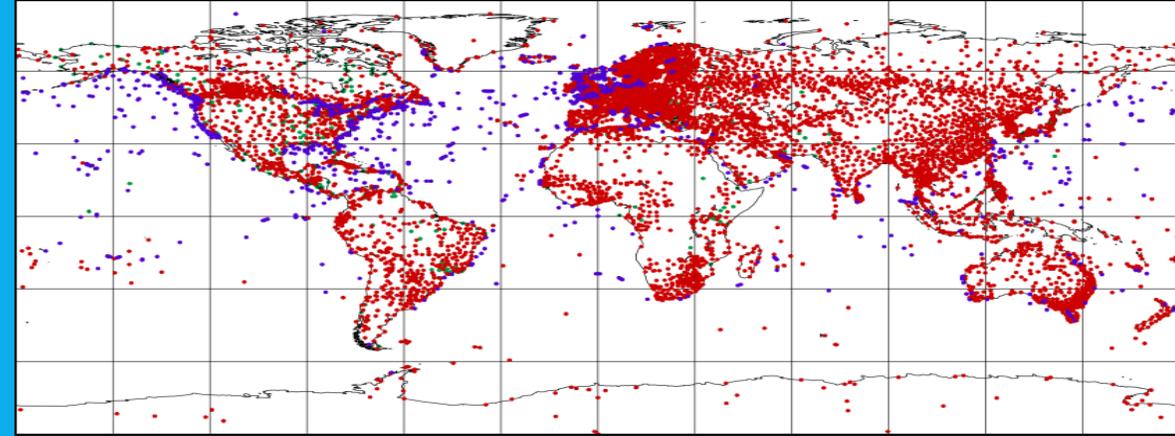
- what is transmitted, with what time delay, in what code

data management, including data rescue

- archiving and access to raw data, metadata, processed data records and products
- recovery and rehabilitation of past data

data records and products

- fundamental records, including recalibration and homogenisation
- satellite retrievals, gridded fields from *in situ* and remotely-sensed measurements, comprehensive reanalyses of multiple observational datasets based on weather-prediction systems



Locations of 36064 surface weather observations
received by ECMWF
09-15UTC 12 June 2012

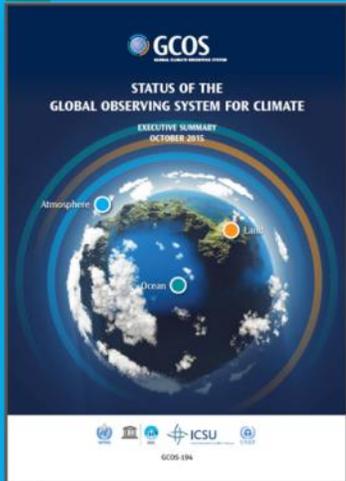


GCOS Progress: Improving global climate observations



United nations conference
on climate change
COP21/CMP11

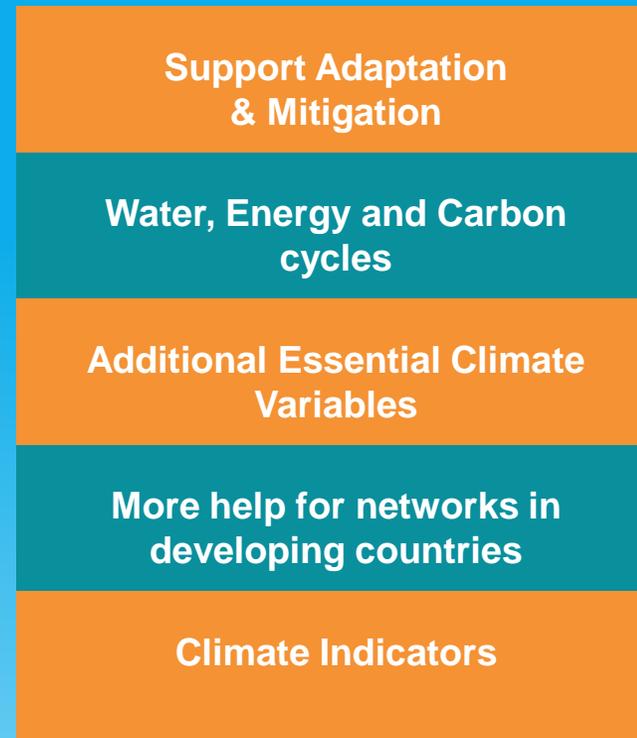
COP-22, Marrakech,
Decision 19/CP.22
SBSTA Conclusions



2015



2016



2017

- First Regional workshop held in Fiji for Pacific Island States
- Working group in Lightning starts work
- Working group on GCOS Reference Surface Network meets for first time
- Weather radar data for climate
- Review of ocean observing systems

WGClimate



***ECV Inventory:
The Architecture
for Climate
Monitoring
from Space in
Action***

Actions of the IP

GCOS IP

Actions in the IP

20 General, Cross-cutting Actions

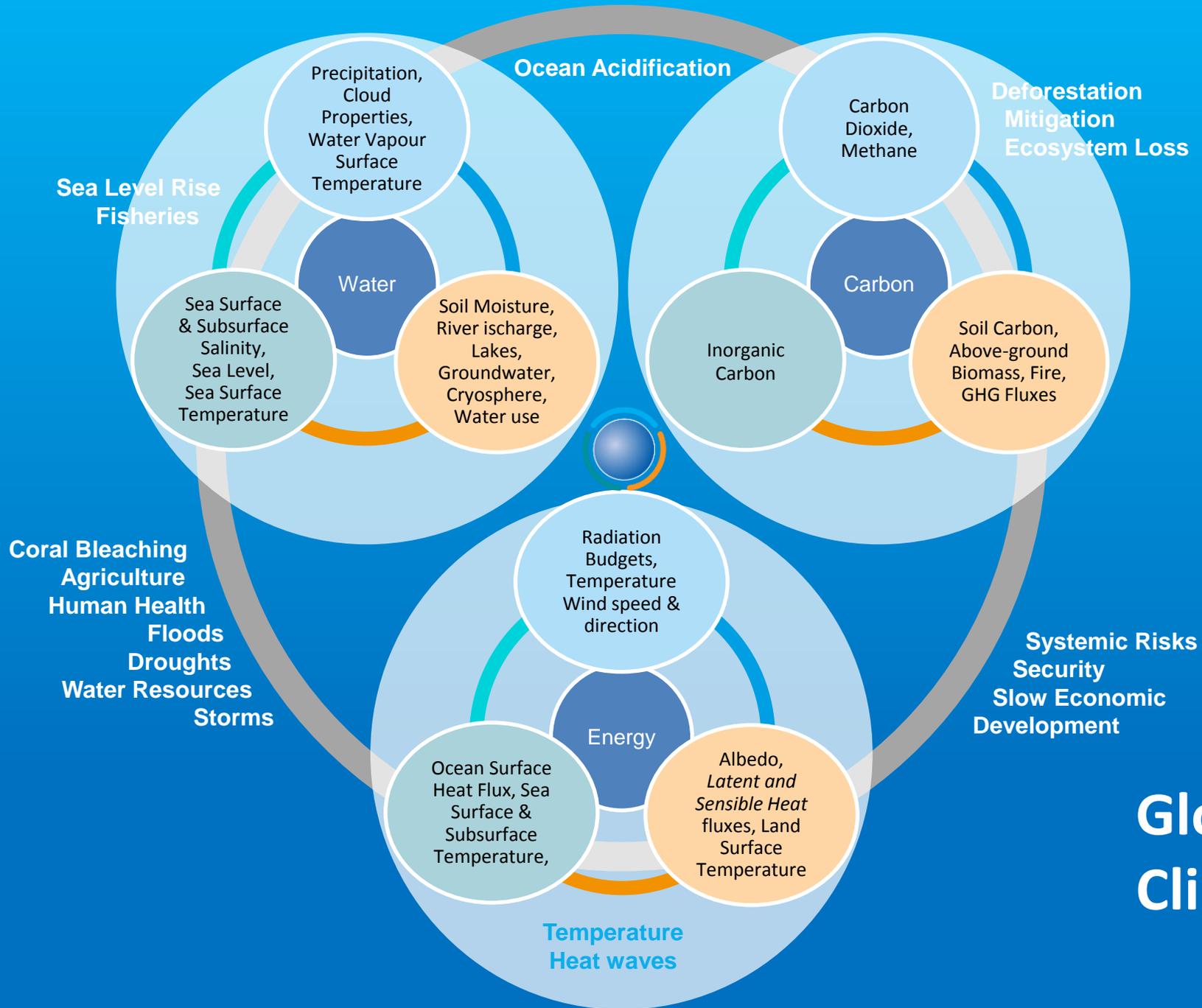
40 Atmospheric Actions

57 Ocean Actions

72 Land Actions



<http://www.wmo.int/pages/prog/gcos/>



Global Climate Cycles

Surface Radiation Budget	
Contributing networks	Status
GCOS BSRN.	Coverage limited but 10 more stations added since 2009, though 2 Arctic stations closed. Continuity needs to be secured.
WWW/GOS surface synoptic network.	Quality and coverage of routine radiation data (mainly incoming solar in monthly CLIMAT reports) is variable.
Additional national networks.	Limited availability of high-quality data in national networks.
Moored buoys	Solar fluxes and longwave radiation available over the ocean from some moored buoys and research vessels.
Contributing Satellite data	Status
Geostationary and polar orbiter visible and infrared data.	<p>Incident solar radiation inferred from satellite visible radiances.</p> <p>For infrared, satellite data are used to estimate cloud and near-surface parameters and thermodynamics fields are typically taken from reanalyses.</p>

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\$

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Thank you

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