

The Global Observing System for Climate

IMPLEMENTATION

NEEDS

*Essential climate variables, indicators and actions in the
2016 GCOS implementation plan to support the Paris Agreement
goals*

GCOS Secretariat, WMO

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ICSU

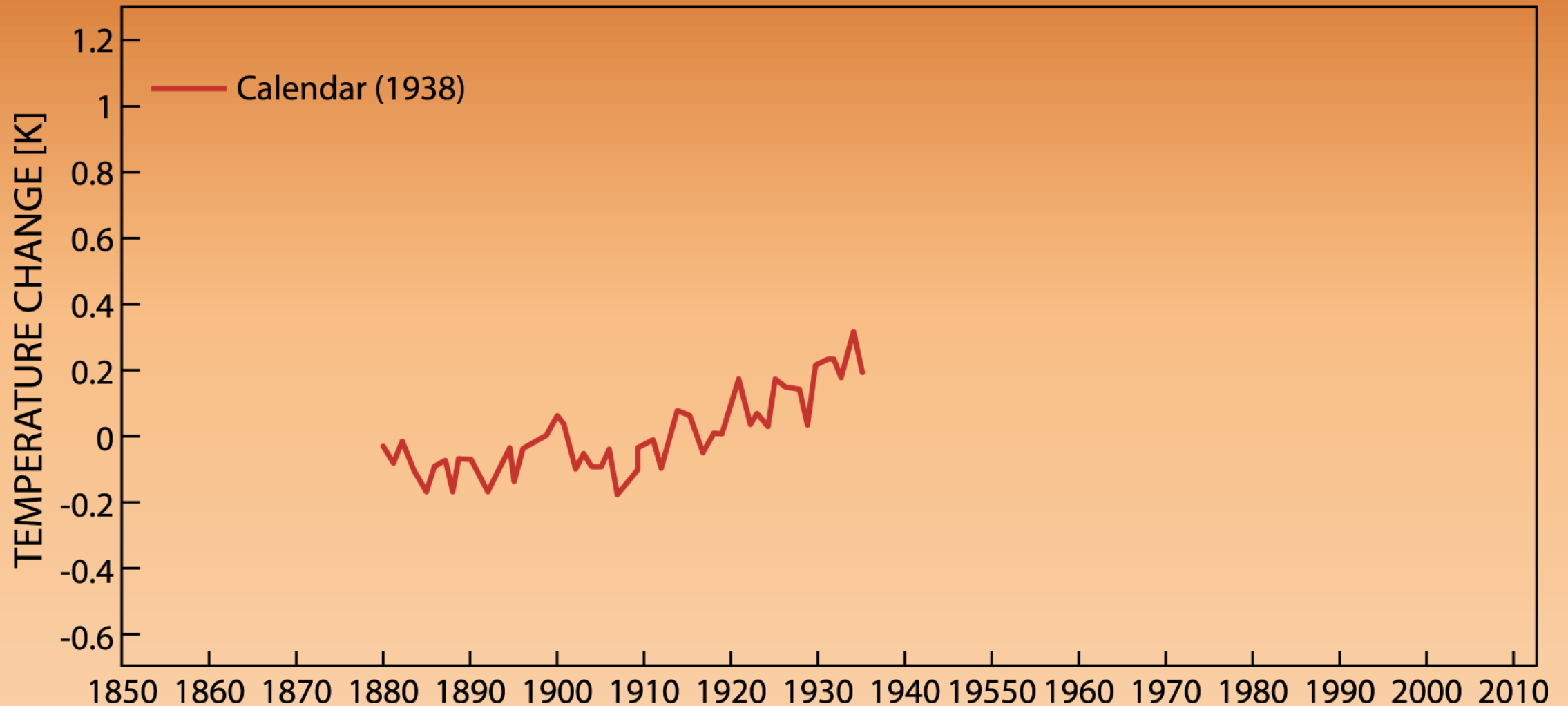
International Council for Science





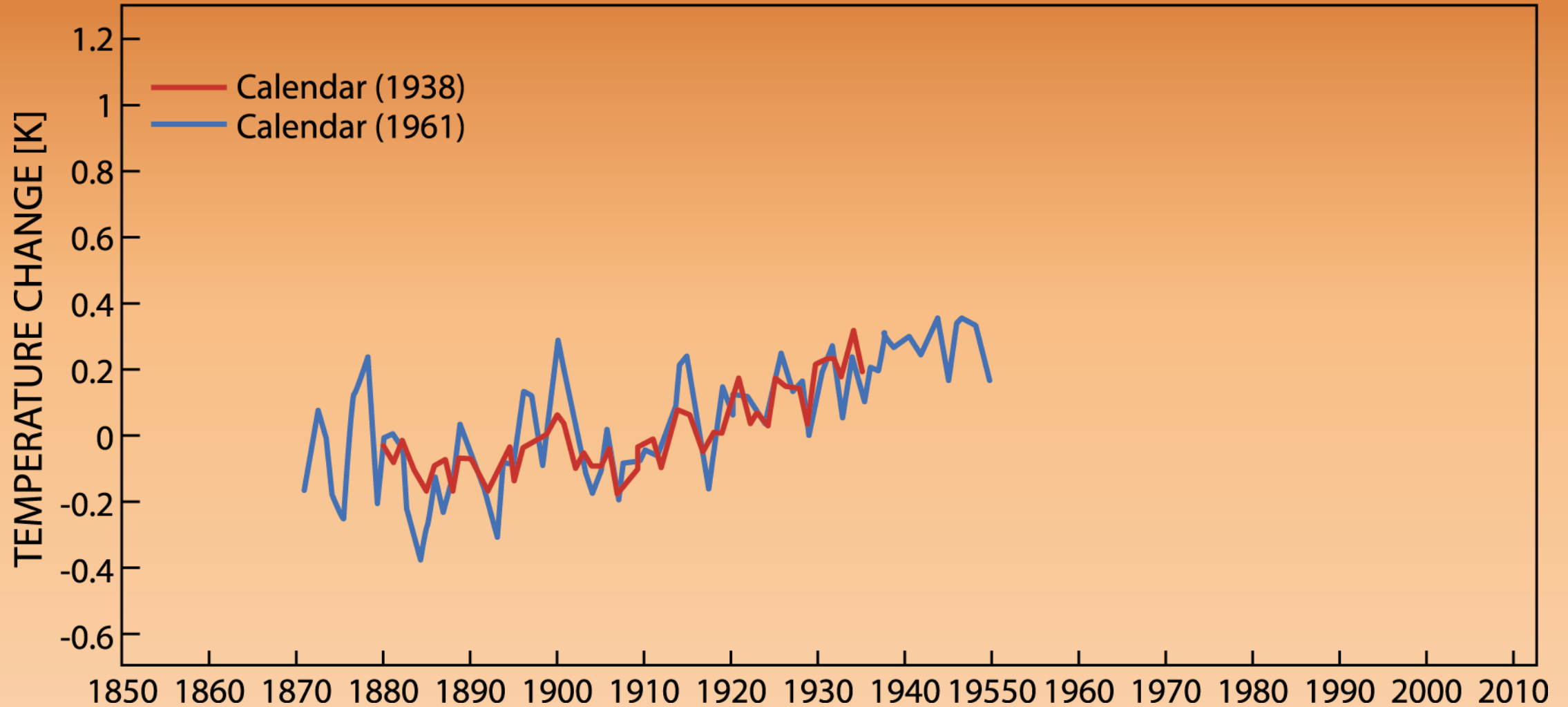
Global temperature records

NEAR-GLOBAL LAND TEMPERATURES (RELATIVE TO 1880–1935)



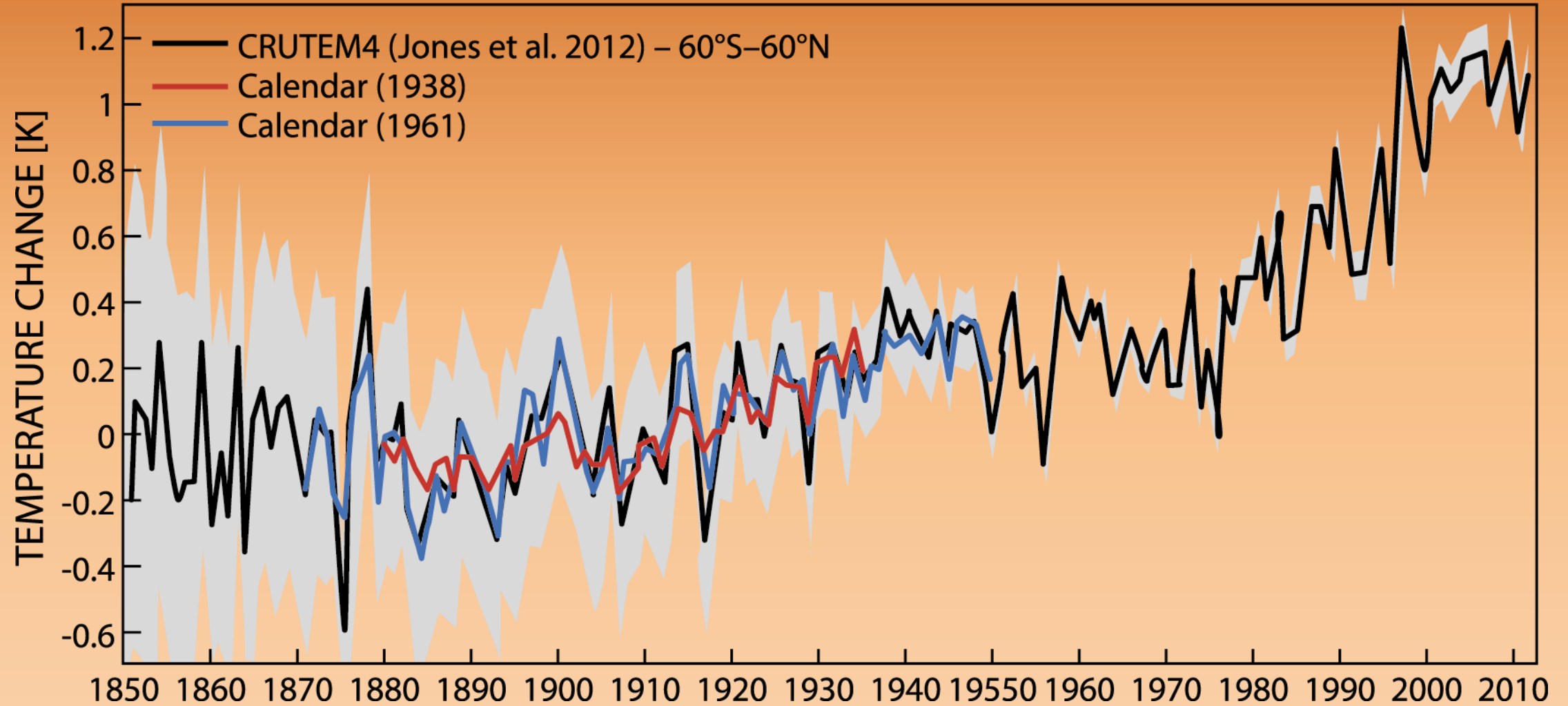
Global temperature records

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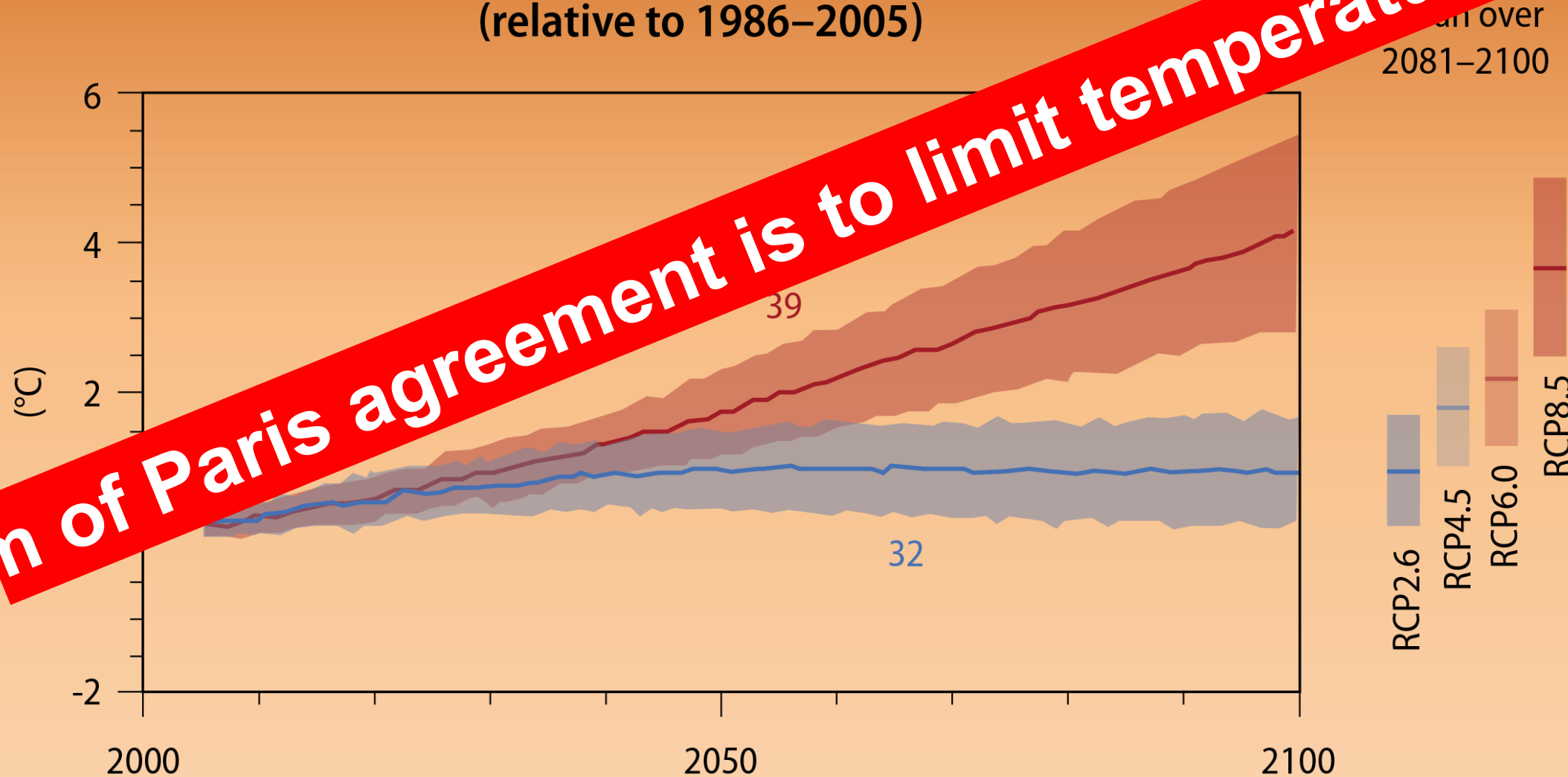
Global temperature records

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Global temperature records

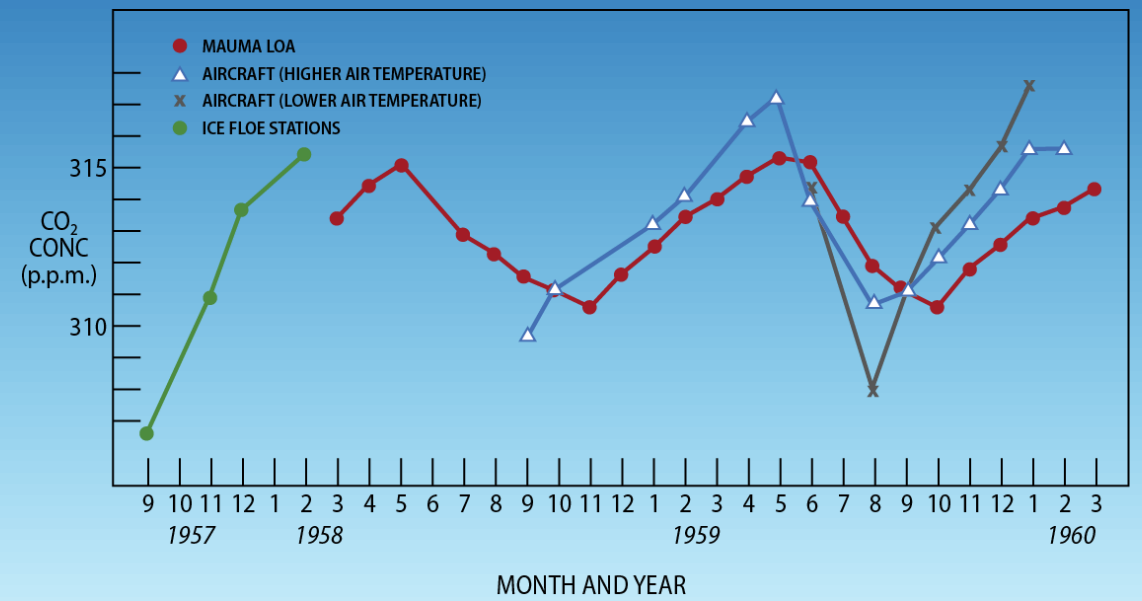
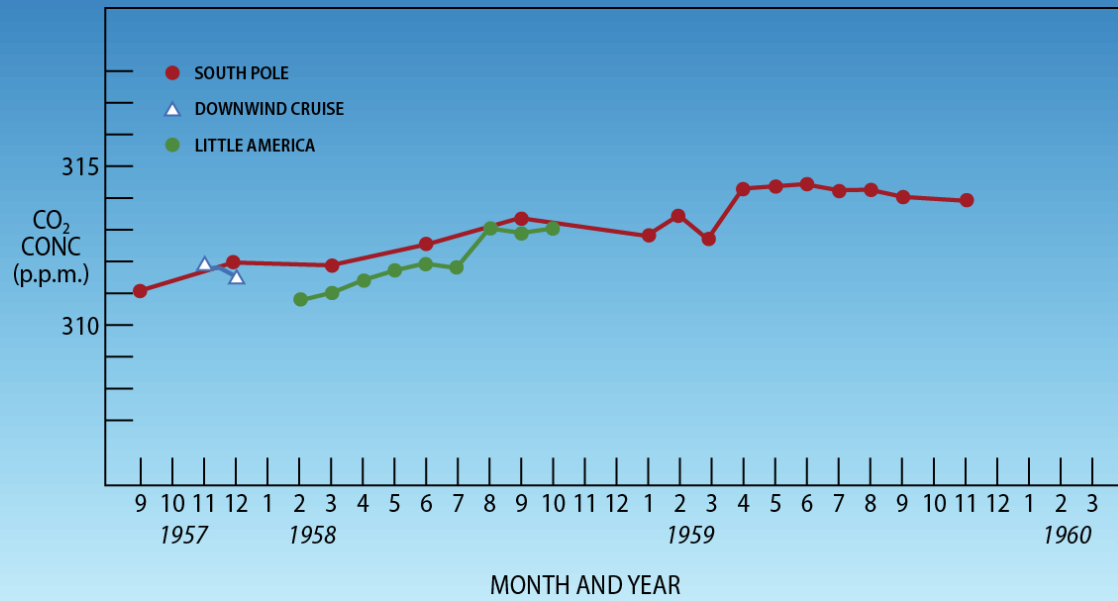
Global average surface temperature change
(relative to 1986–2005)

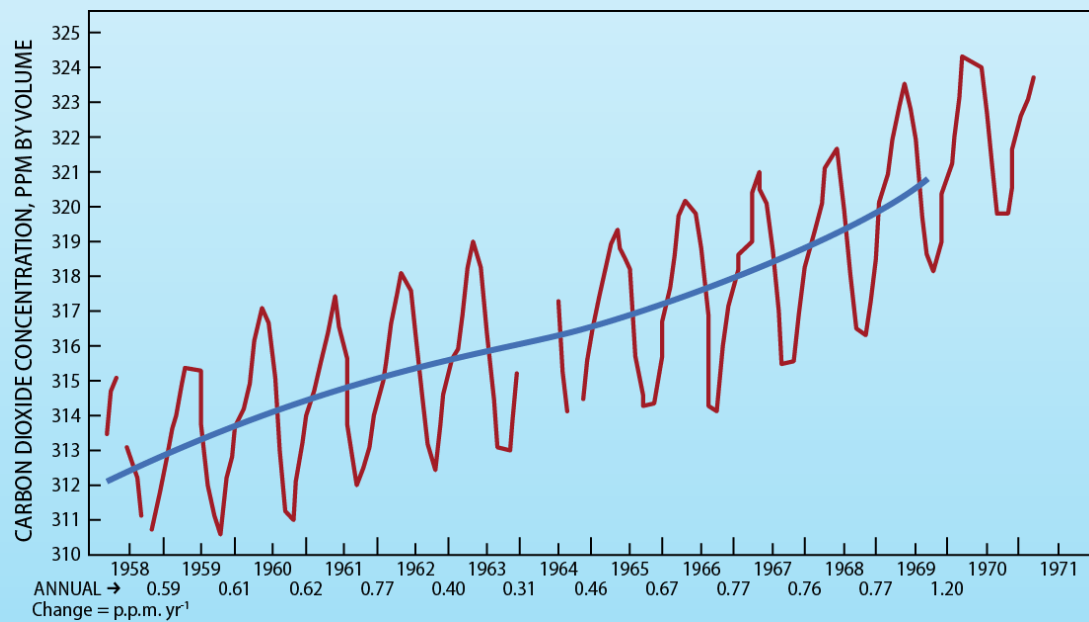
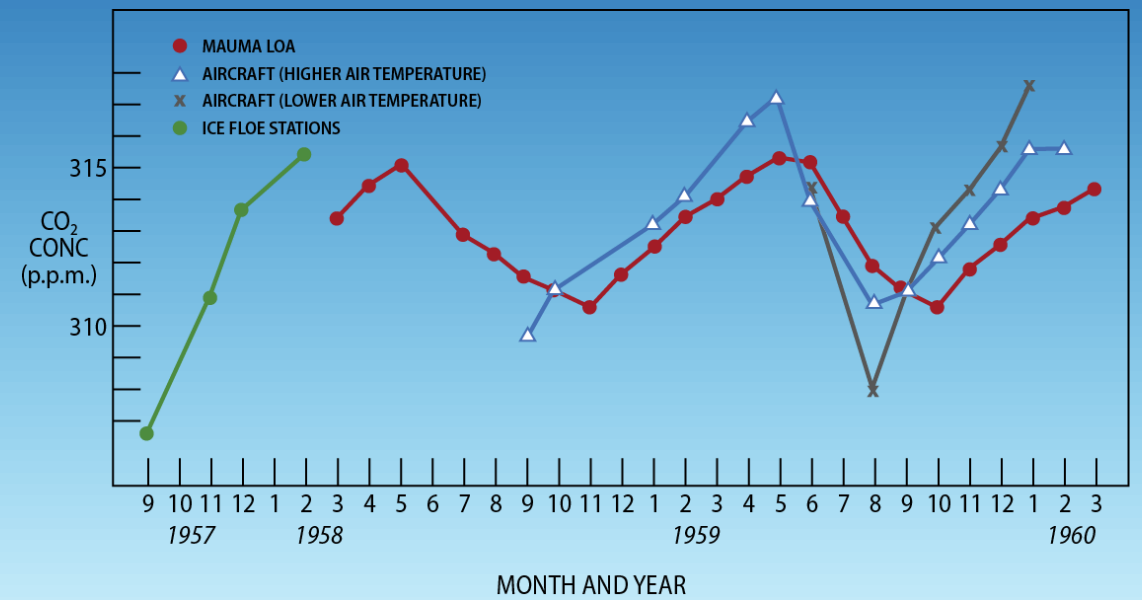
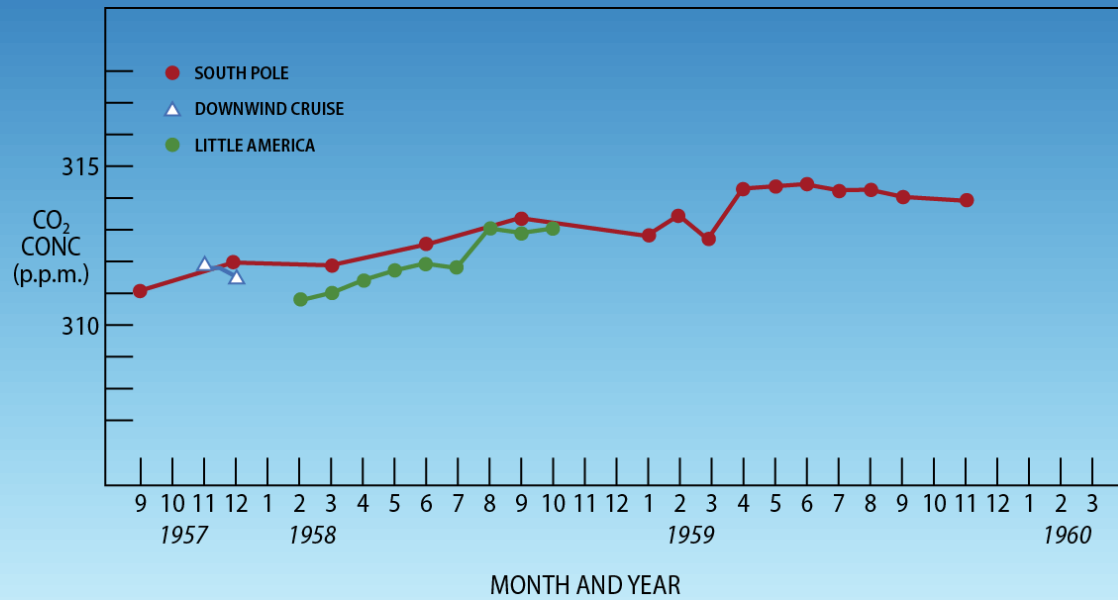


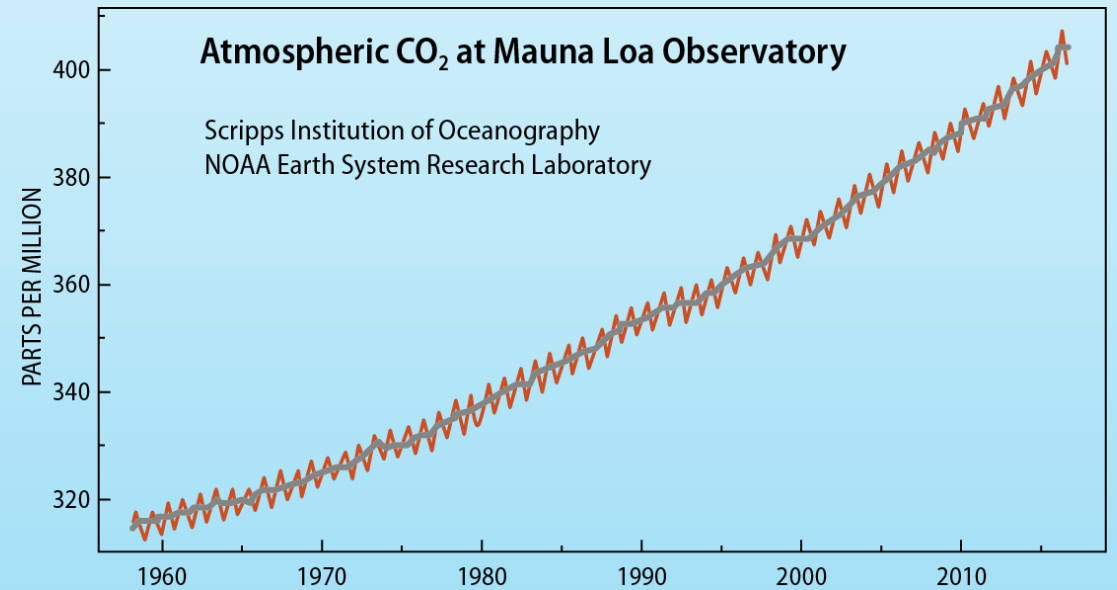
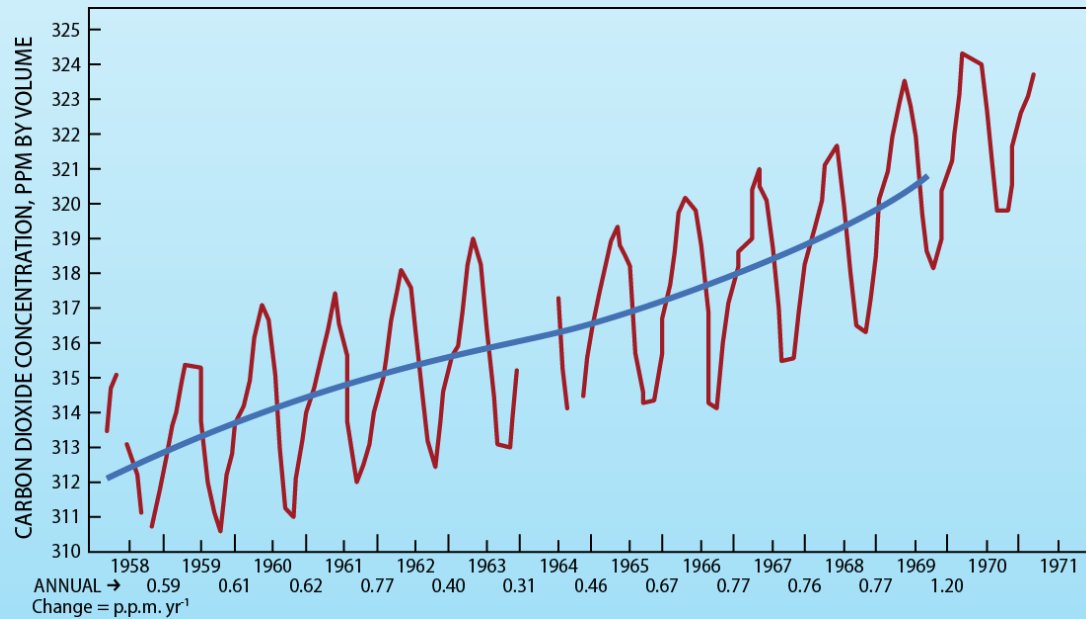
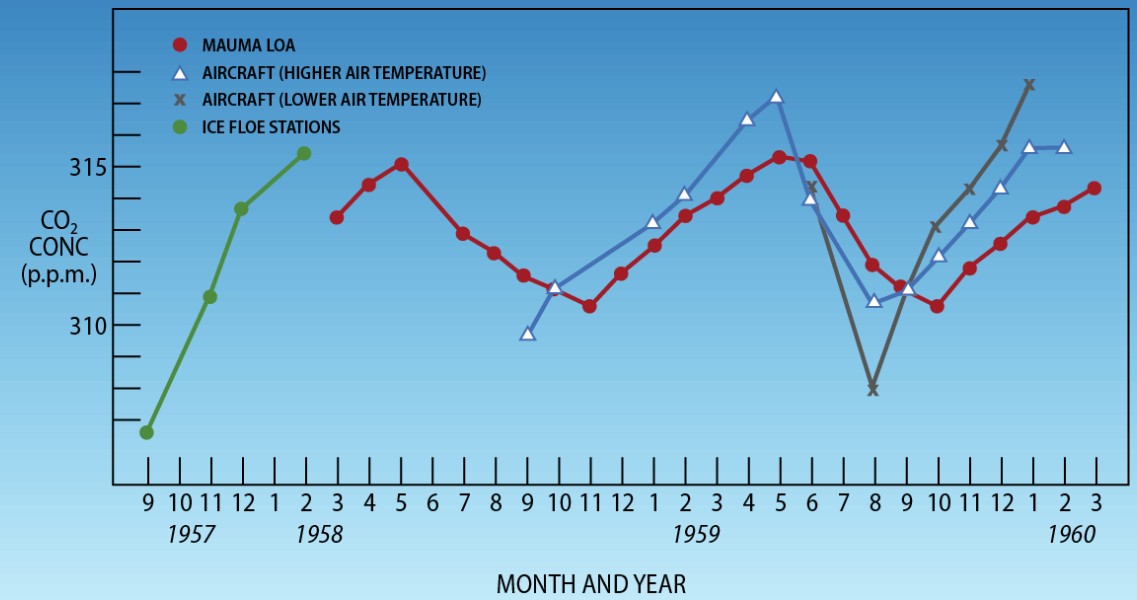
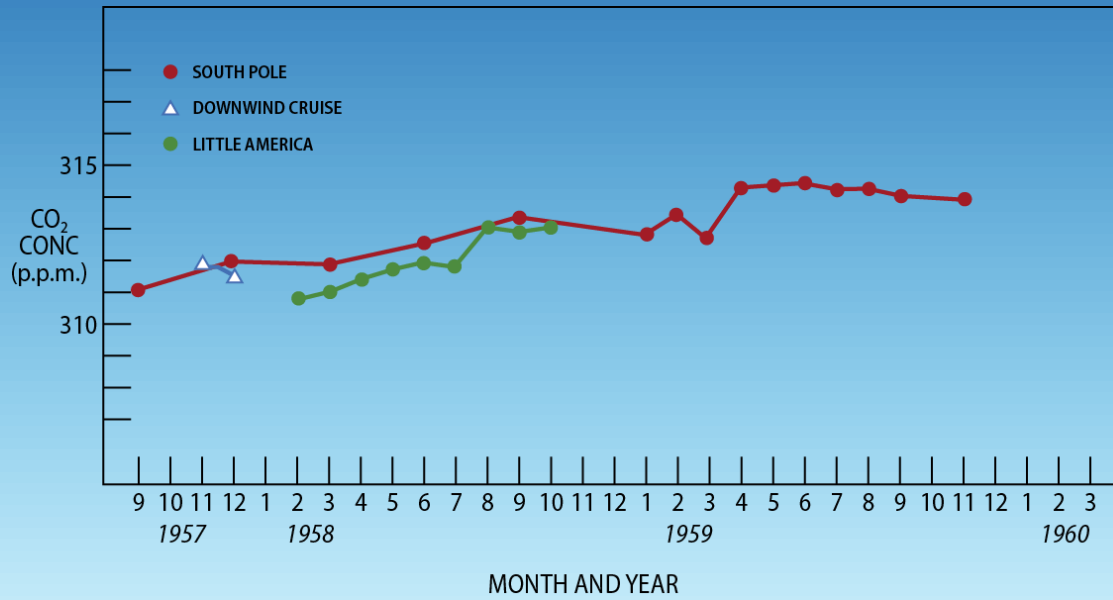
Aim of Paris agreement is to limit temperature rise

39

32

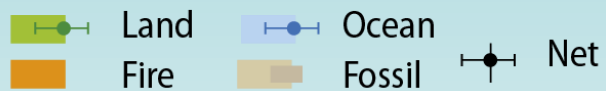
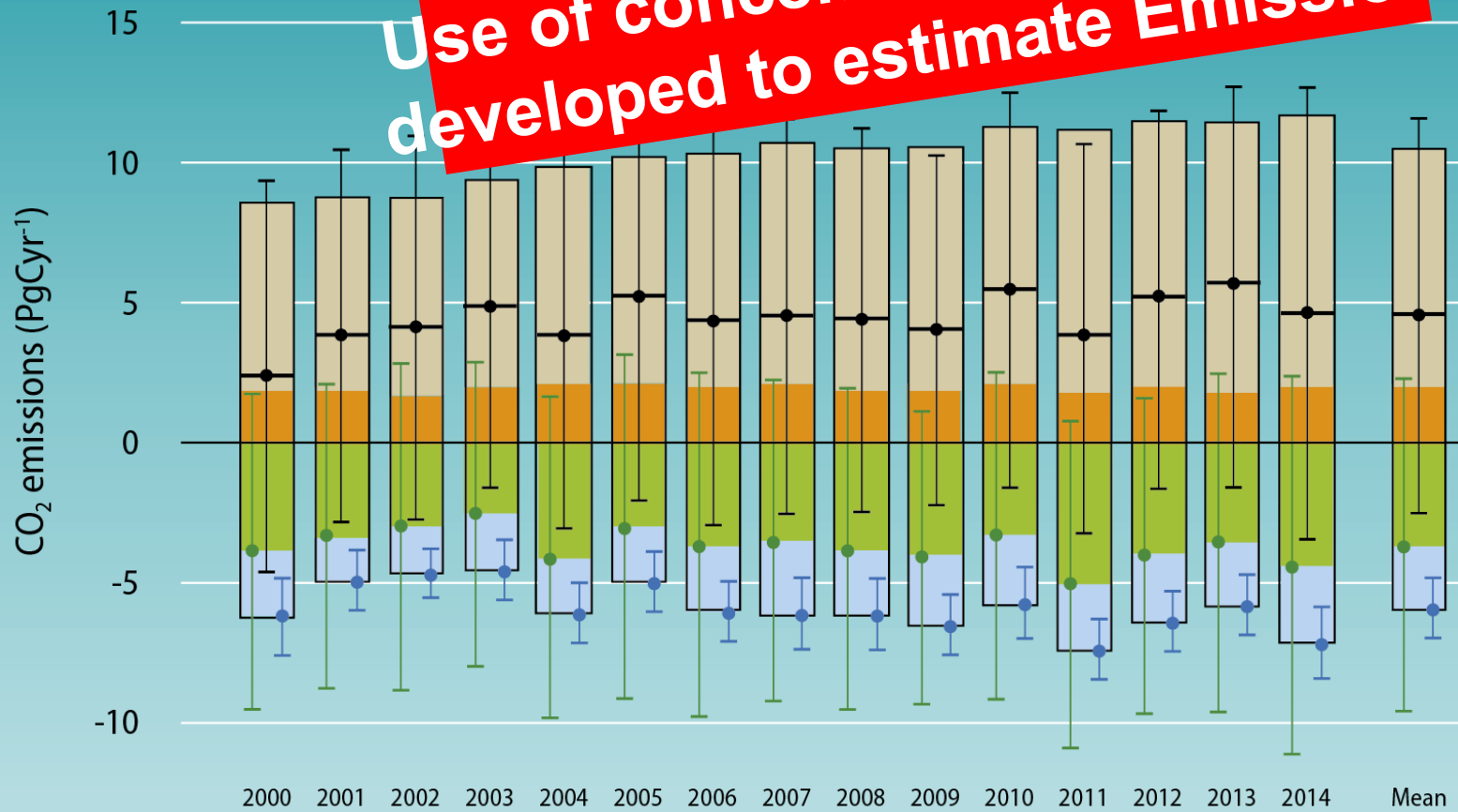






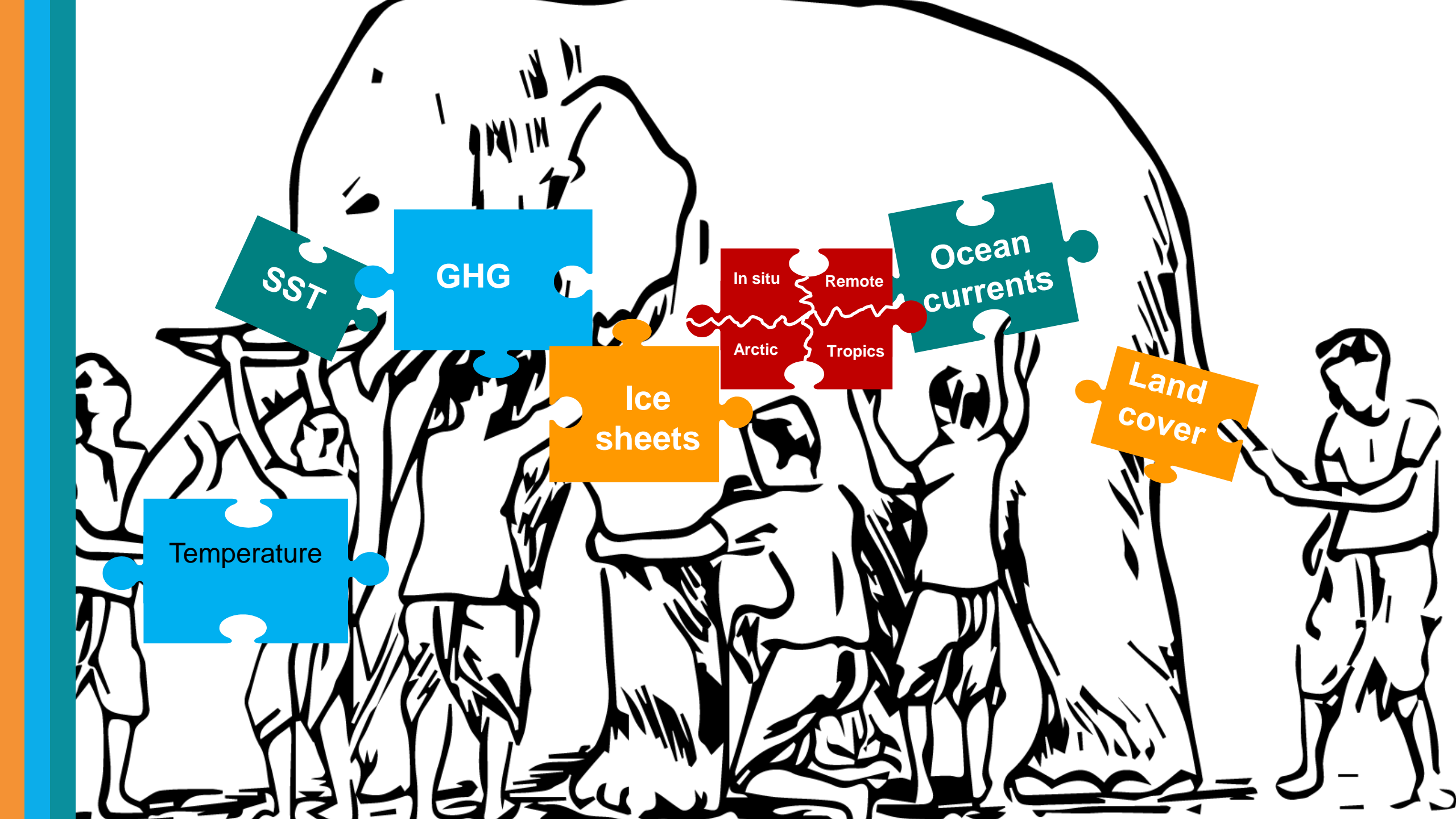
Global annual total emissions

Use of concentration data being developed to estimate Emissions



It was six men of Indostan
To learning much inclined,
Who went to see the Elephant
(Though all of them were
blind),
That each by observation
Might satisfy his mind. [...]
And prate about an Elephant
Not one of them has seen!
(John Godfrey Saxe's)





SST

GHG

In situ
Remote
Arctic
Tropics

Ocean currents

Ice sheets

Land cover

Temperature

Improved observations lead to significant benefits

ECV
Requirements,
Adequacy
Reports, Plans

Observations,
Products,
Open Data

Science,
Assessments,
Policy

Climate
Services, Risk
Assessments,
Early Warning
& Disaster
Risk
Reduction
Policies

Successful
adaptation
and
mitigation,
reduced
climate risks,
enhanced
livelihoods,
and food &
water
security.

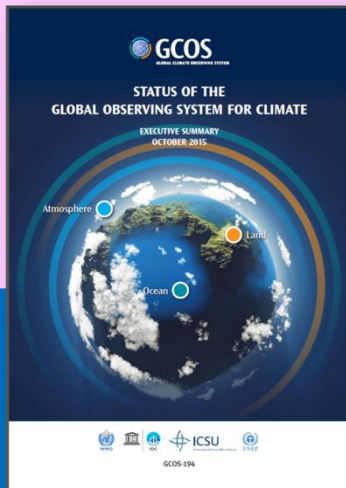
GCOS Reports and Plans

Status

2015



United nations conference
on climate change
COP21/CMP11



New Plan

2016



Adaptation
& Mitigation

I

Additional
Essential
Climate
Variables

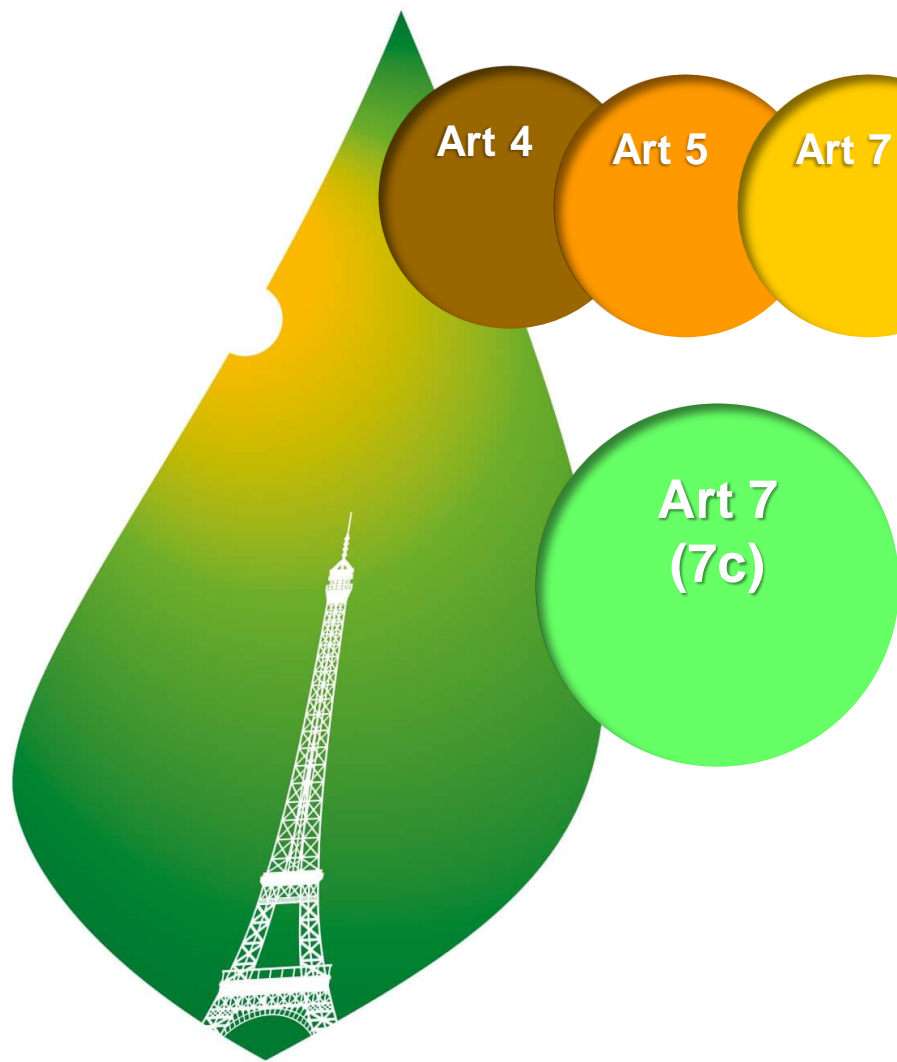
III

Water, Energy
and Carbon
cycles

II

Emphasis on
more help for
networks in
developing
countries

IV



Art 4

Art 5

Art 7

Art 8

Art 9

Art 10

Art 11

Art 12

Art 13

Art 14

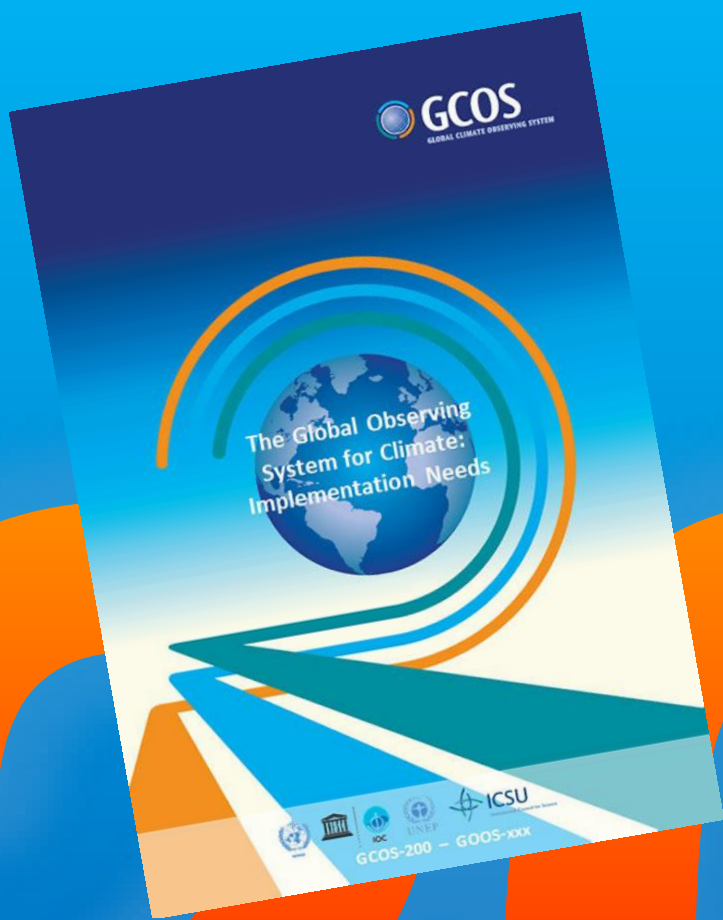
Art 7
(7c)

**Paris Agreement Article 7 (7c):
Strengthening scientific knowledge
on climate, including research,
systemic observation of the
climate system and early warning
systems.**

COP21 • CMP11

PARIS 2015

UN CLIMATE CHANGE CONFERENCE



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GCOS Implementation Plan

Implementation Aims



Annex A – Terrestrial ECV product requirements

ECV	Products	Frequency	Resolution	Required measurement uncertainty
Above-ground biomass	Maps of AGB	Annual	500m-1km based on 100-200m observations	< 20% error for biomass values > 50 t/ha, and 10 t/ha for biomass values ≤ 50 t/ha
Land cover	Maps of land cover	Annual	250m	15% (maximum error of omission and commission in mapping individual classes), location accuracy better than 1/3 IFOV with target IFOV 250 m
	Maps of high resolution land cover	5 year	10 - 30m	5% (maximum error of omission and commission in mapping individual classes), location accuracy better than 1/3 IFOV with target IFOV 10-30 m
	Maps of key IPCC land use, related changes and land management types	1-10 years (incl. historical data)	10-1000 m (depending on time period)	20% (maximum error of omission and commission in mapping individual classes), location accuracy better than 1/3 IFOV with target IFOV



NEED FOR
HIGHER
SPATIAL AND
TEMPORAL
RESOLUTION

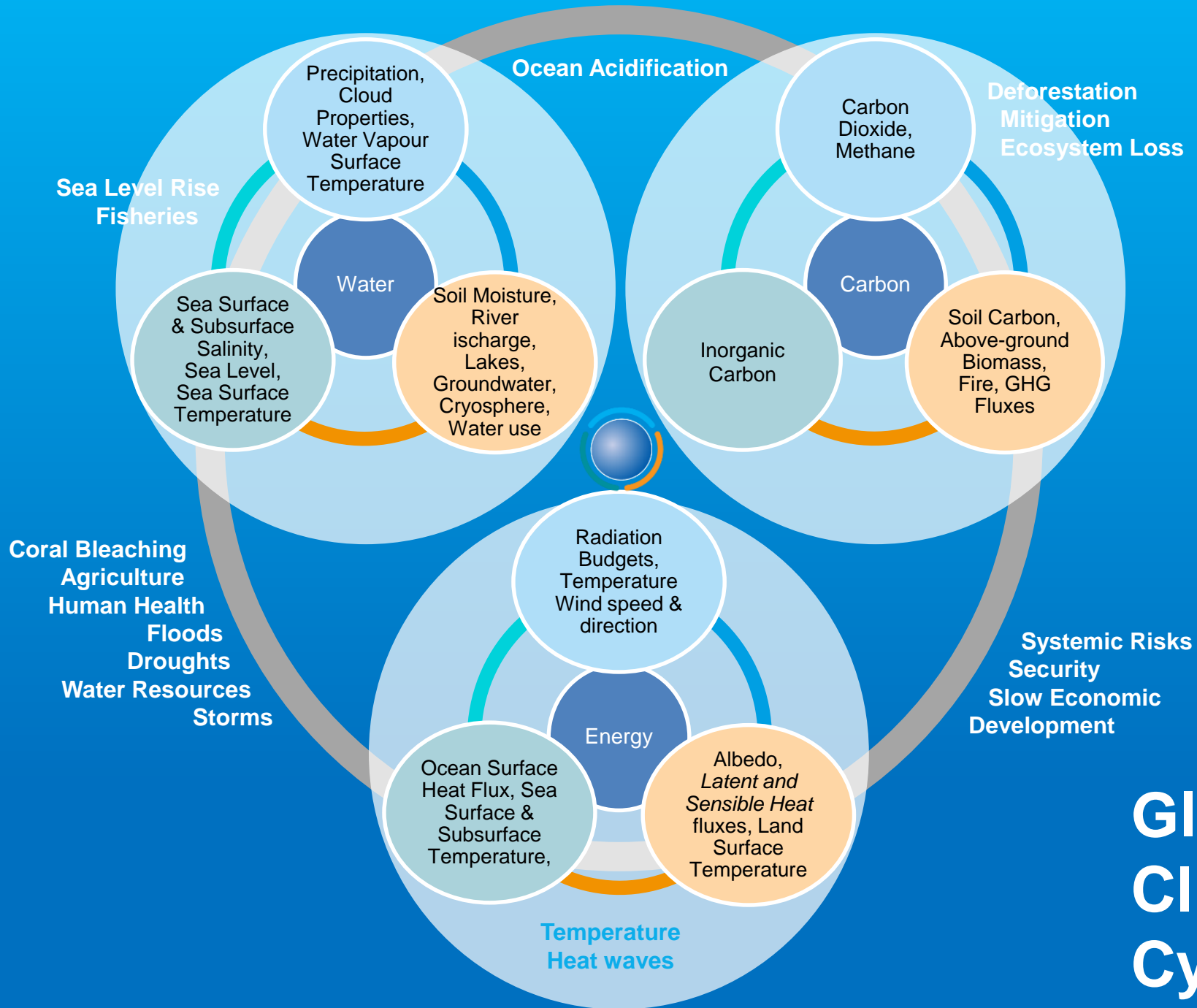
**EVEN THE
SMALLEST
PIXEL IS
TOO LARGE**

Climate observations also support



- Energy & Temperature
- Other Physical Properties
- Carbon Cycle and other GHGs
- Hydrosphere
- Snow & Ice
- Biosphere
- Human Resource Use





Global Climate Cycles

Wide scale monitoring of lightning is now possible and a proxy for severe weather events



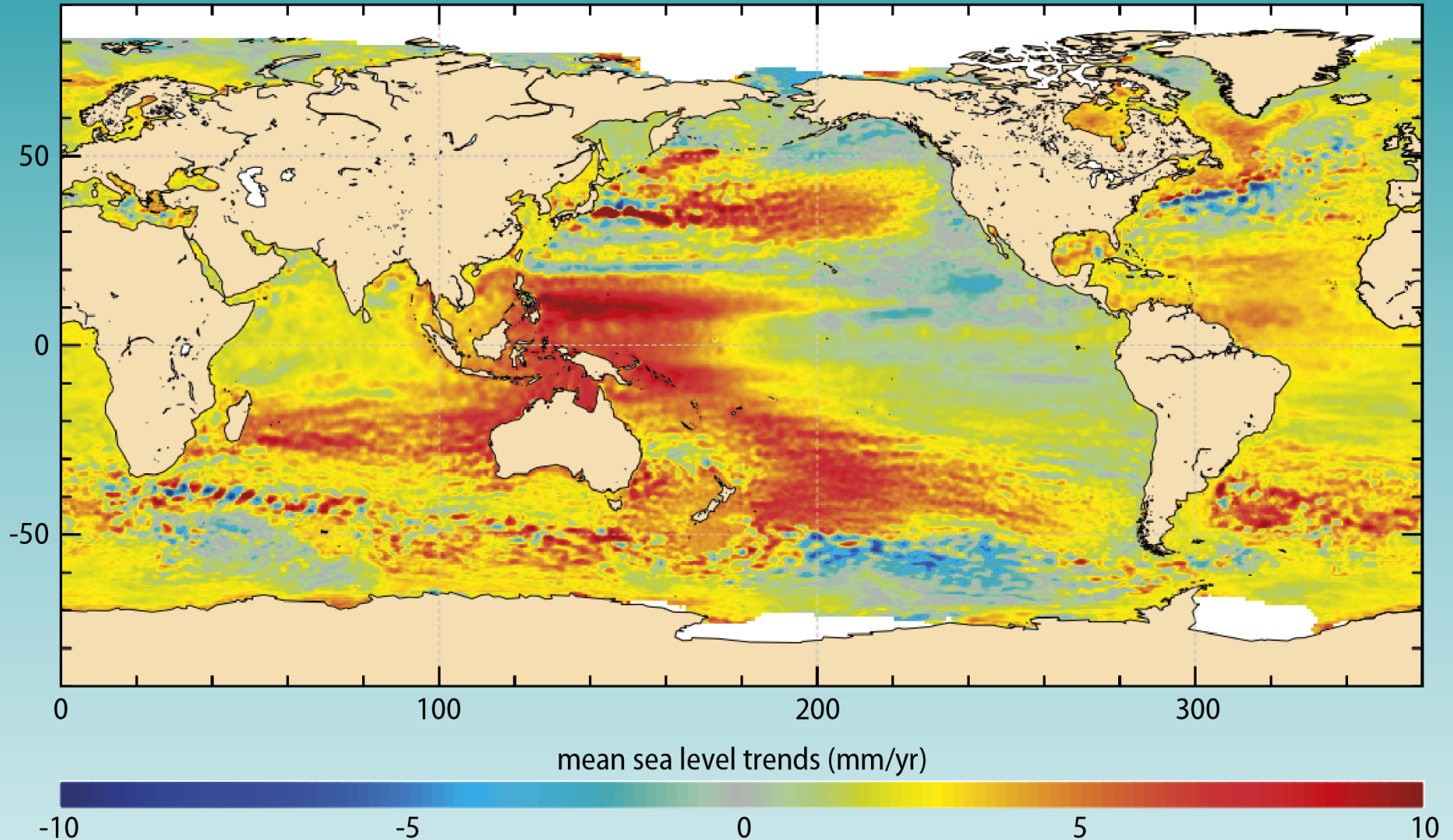
Monitoring of ecosystems is important for adaption (coastal protection, fisheries and biodiversity) as well as understanding changes in the carbon cycle

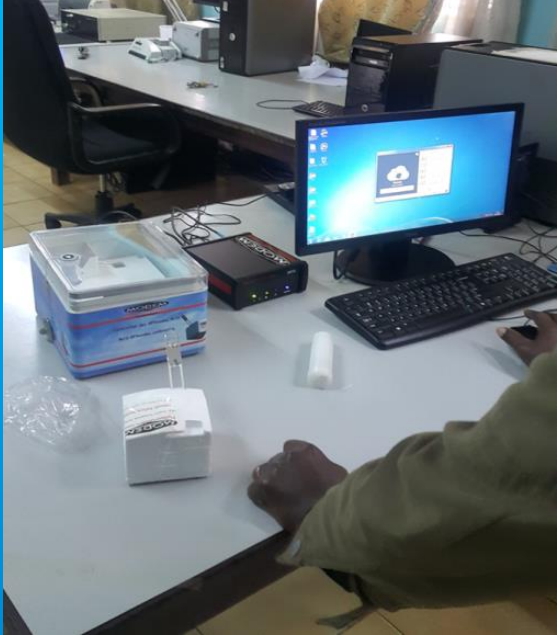




Regional distribution of many ECVs: Satellites + ground stations = global picture

Sea Level CCI ECV v1/1 (1993–2014) ESA/CLS/LEGOS





GCOS Cooperation Mechanism



Following the GCOS Implementation Plan

securing and improving observation systems

1

supporting countries implement the appropriate observations that meet their needs and priorities

2

providing open access to observations and data access

3

ensuring the delivery of high resolution global products

4

will contribute to successful adaptation and mitigation, reduced climate risks, enhanced livelihoods, and food & water security



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