

Weather and climate services for ACP countries

Partnering for implementation

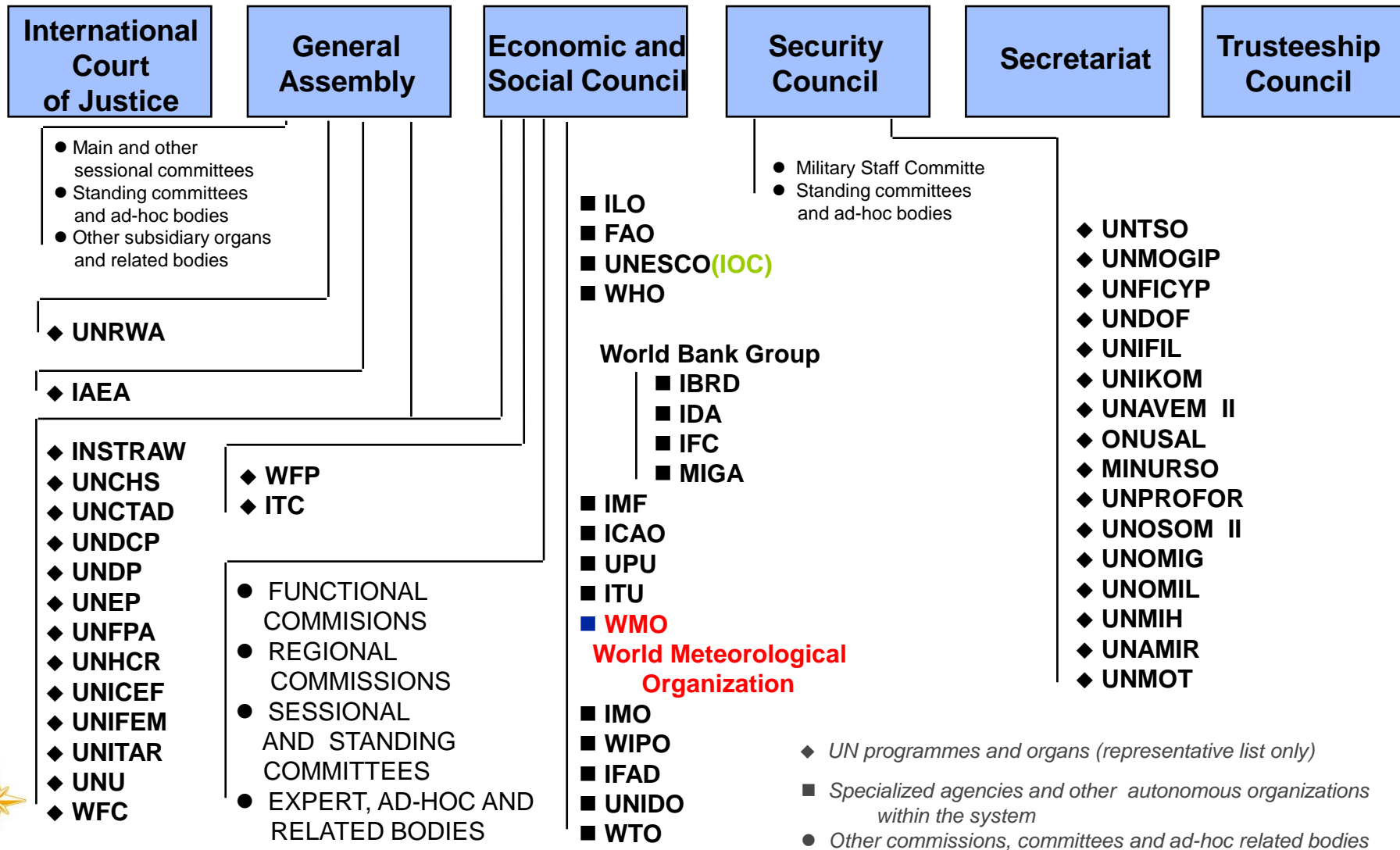


WORLD
METEOROLOGICAL
ORGANIZATION

P. Taalas
Secretary-General

ACP Special Post-COP21 Meeting
Brussels, 22-23 March 2016

WMO: United Nations System's authoritative voice on weather, climate, water and related environmental issues. (est. 1873, now 191 Members)





SUSTAINABLE DEVELOPMENT GOALS/WMO



**Weather
resilience**



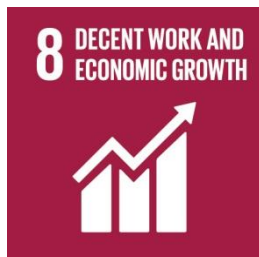
**Climate change &
-services**



**Water resource
management**



**Solar, wind &
hydro use**



**Climate
resilience**



**Big data,
innovations**



**Air quality, heat
waves, flooding**



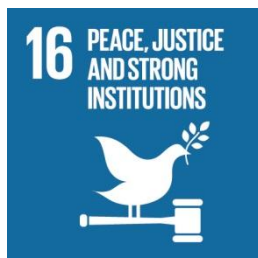
**DRR, Adaptation,
carbon & climate
monitoring**



**Sea level rise,
climate<->oceans**



**Climate change
<->ecosystems**



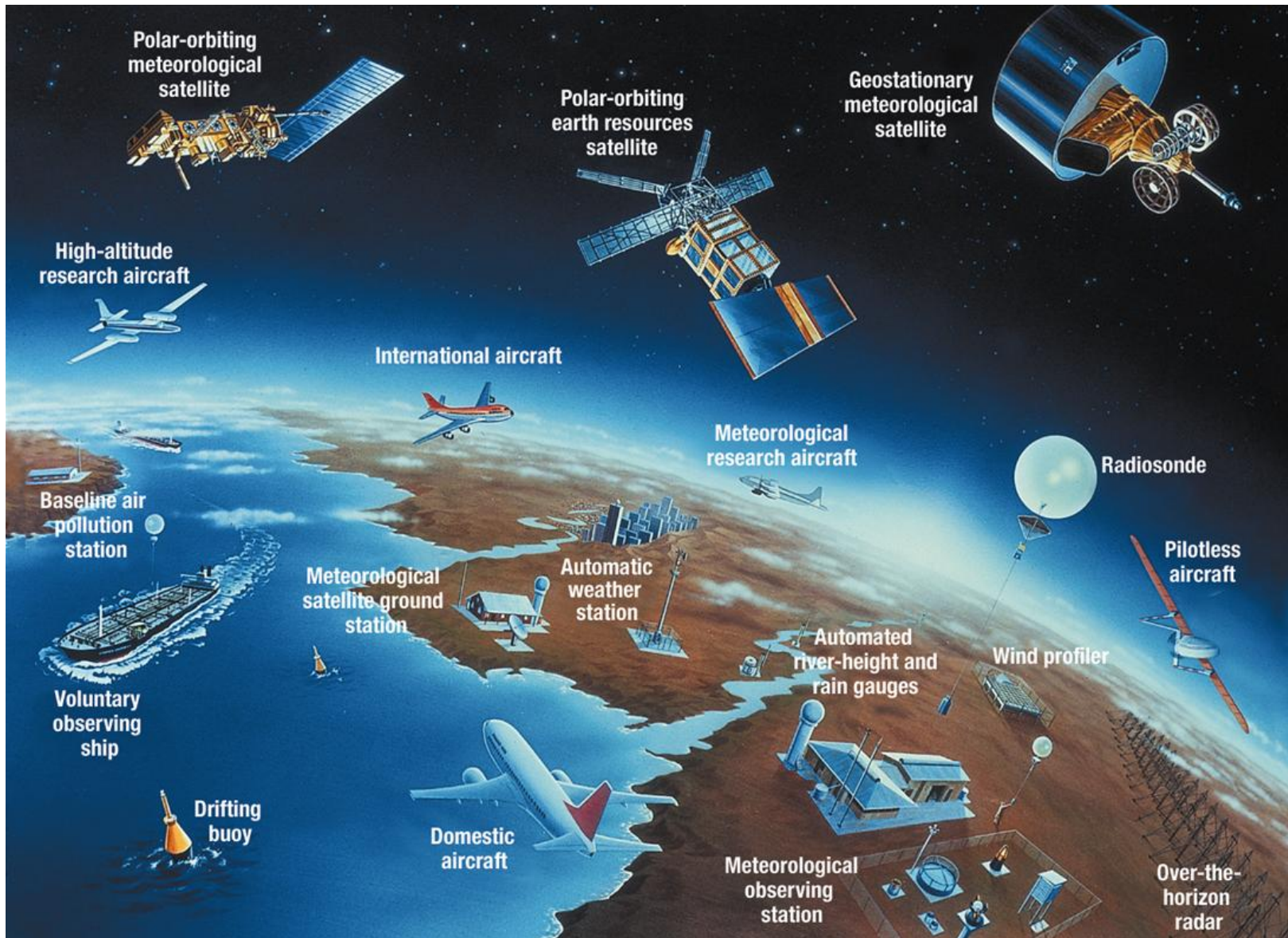
**Climate driven
conflicts**



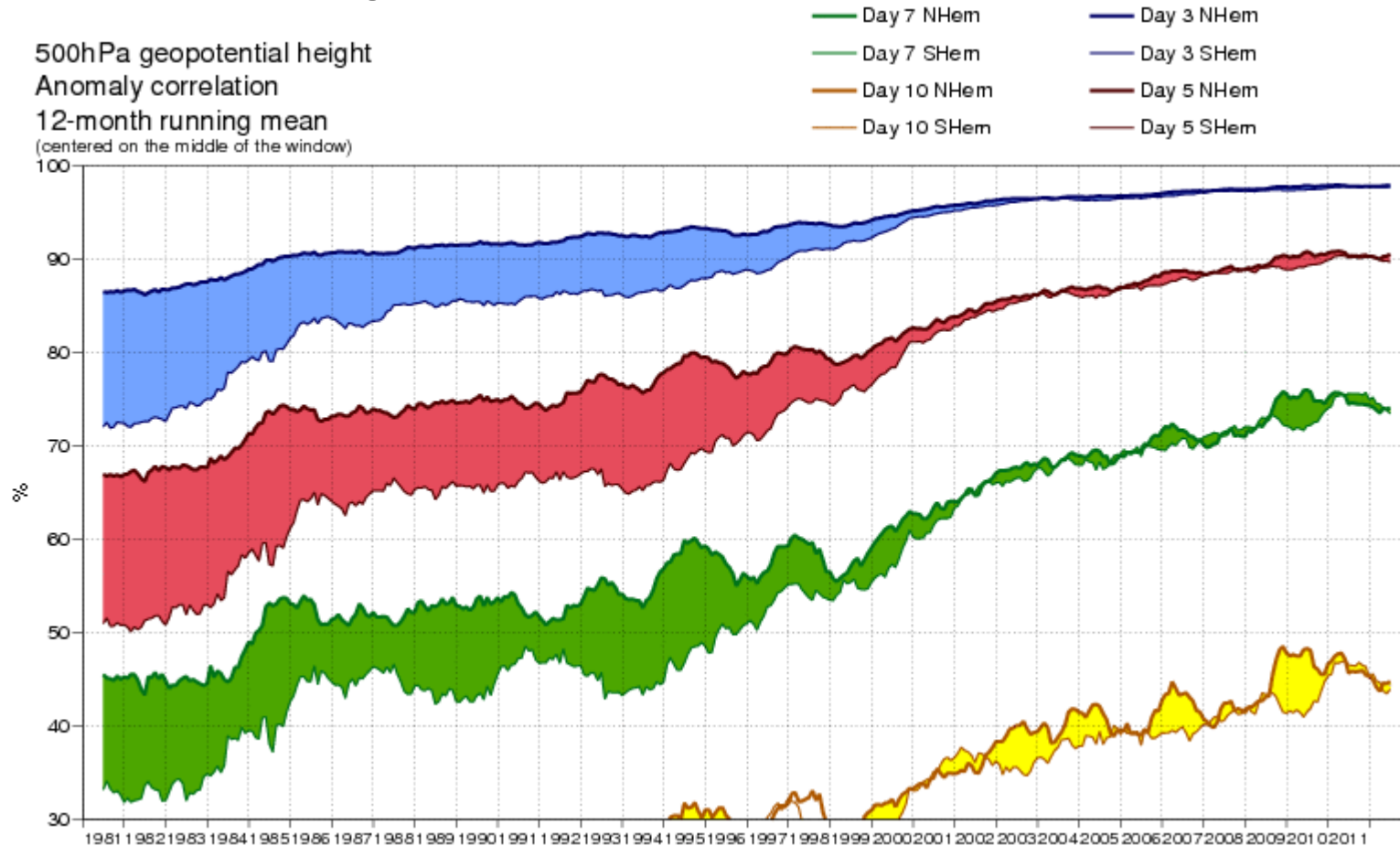
**Resources for
climate adaptation
& DRR**



Integrated weather and climate observing system

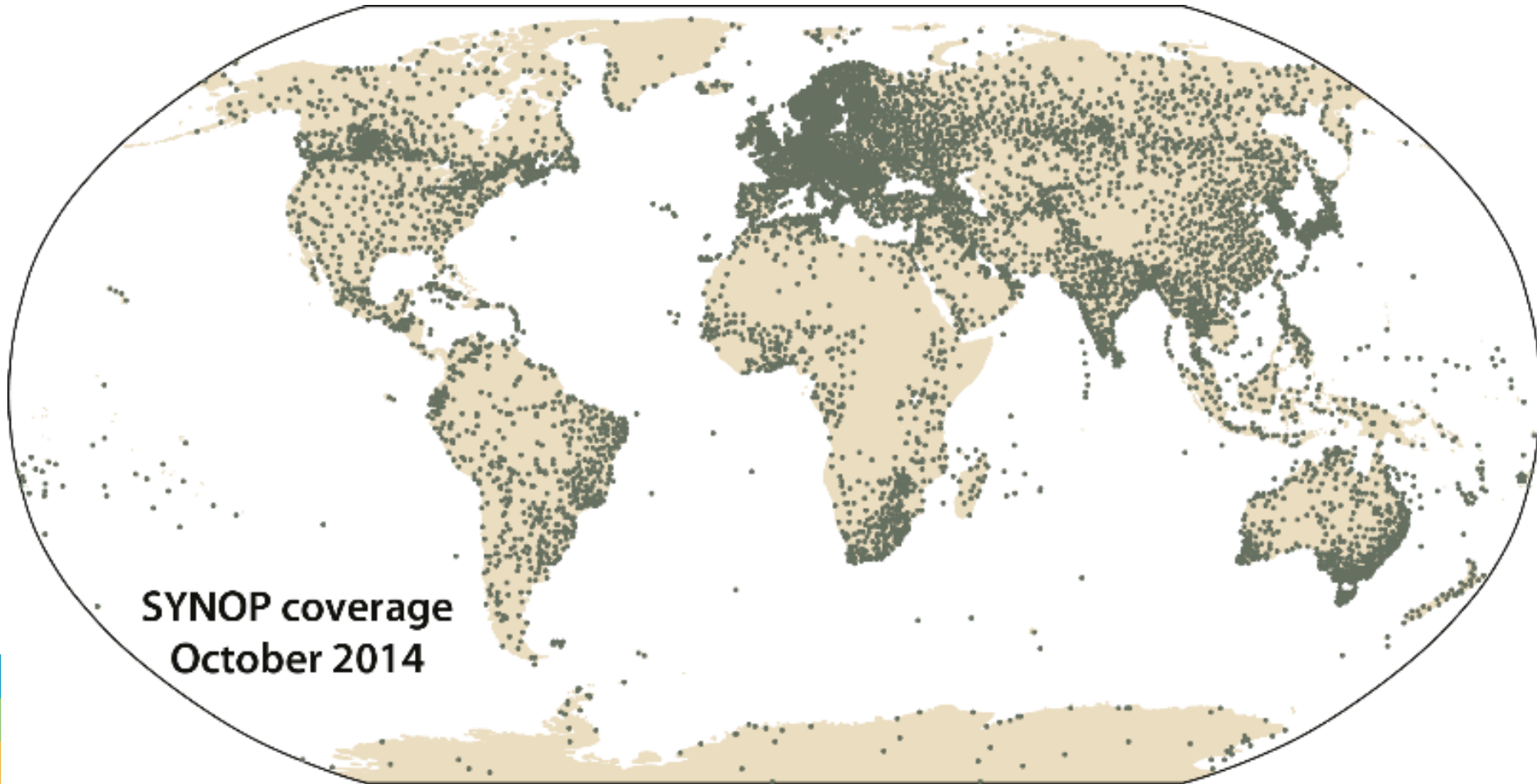


Improved weather forecasts



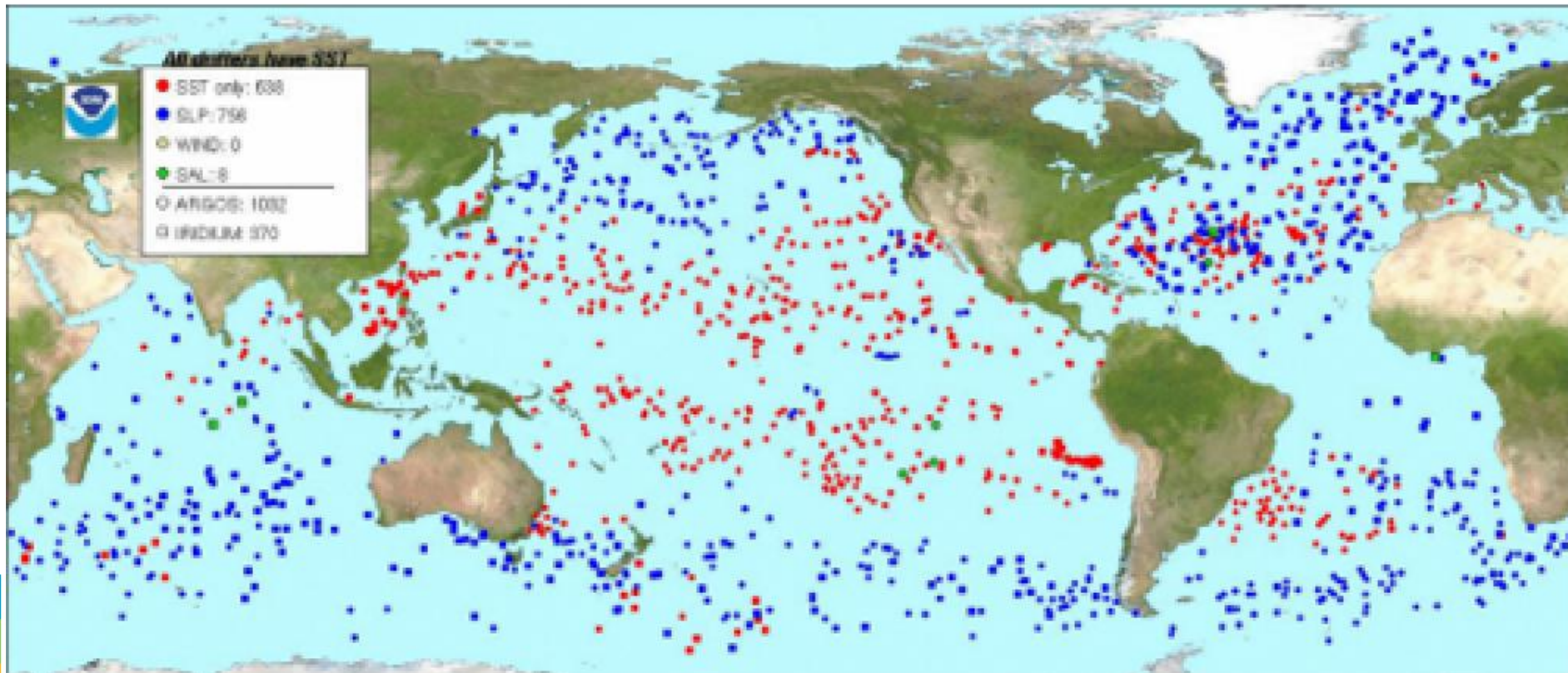
Improvements in anomaly correlation of 500 hPa height forecasts of the European Centre for Medium-Range Weather Forecasts (ECMWF) for the northern and southern hemispheres linked to the increase in satellite observations and skill of numerical models

Functioning surface observing stations in 2014

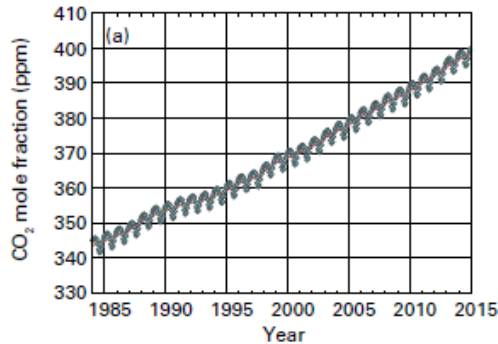


Weather observations from drifting buoys

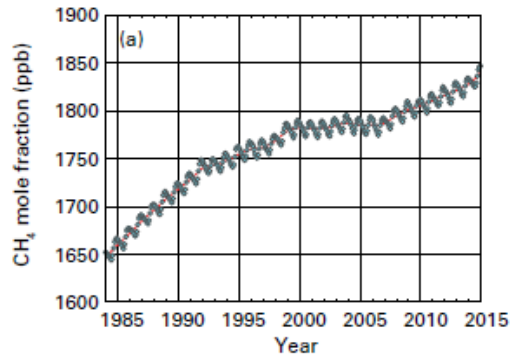
Red: Drifting buoys without barometers



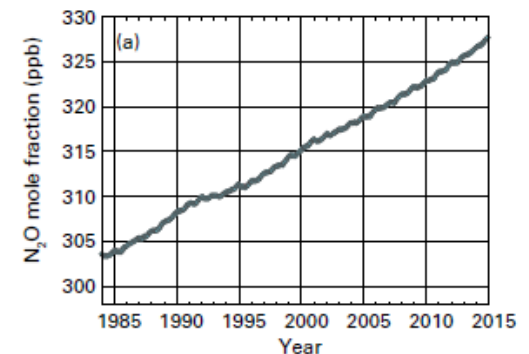
Greenhouse gases concentrations: new record



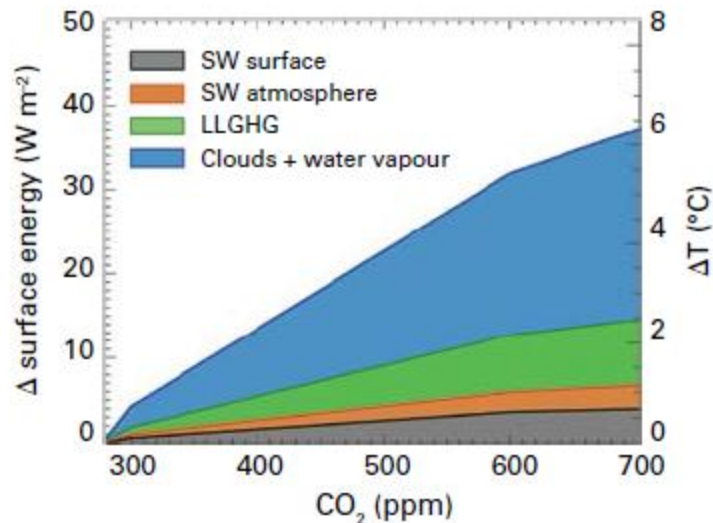
Carbon dioxide (CO₂)



Methane (CH₄)



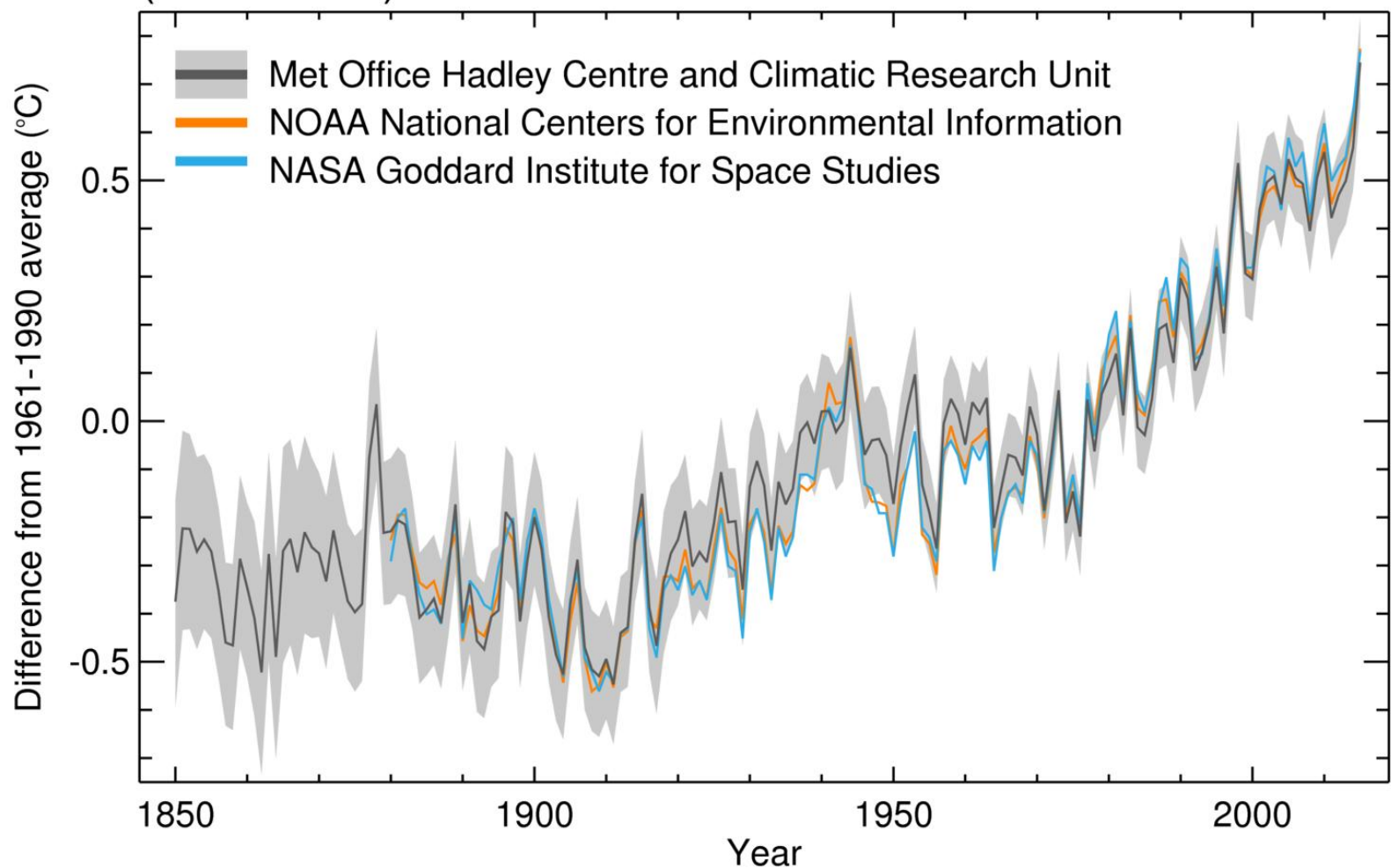
Nitrous oxide (N₂O)



Water vapour and CO₂ are the major greenhouse gases, with CO₂ the main driver of climate change. Water vapour changes largely happen as a response to the change in CO₂.



Global average temperature anomaly (1850 – 2015)



Reference period **1910-2000**, Data source **NOAA**



January-February global temperature increase vs. 1881-1910

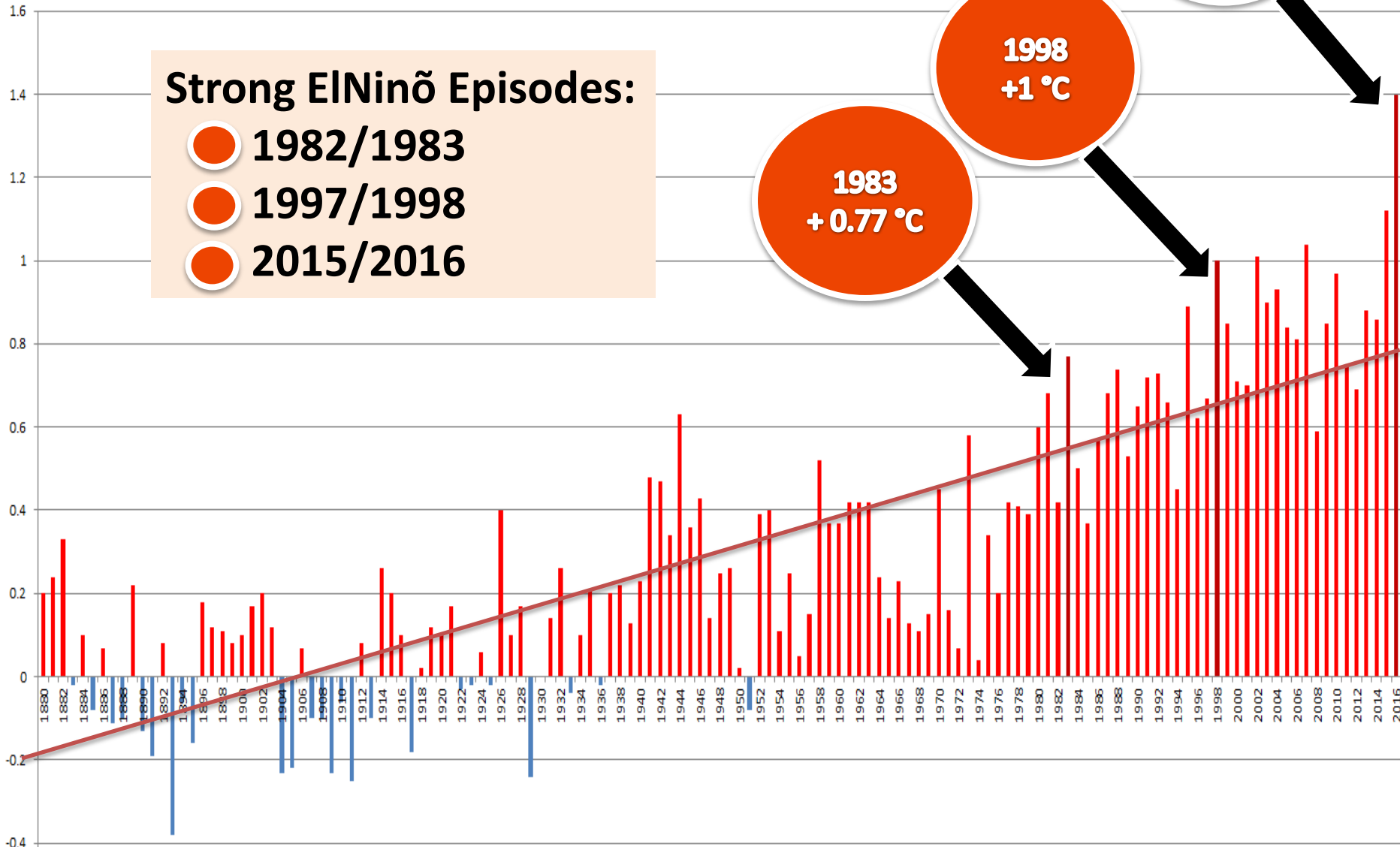
Strong ElNiño Episodes:

- 1982/1983
- 1997/1998
- 2015/2016

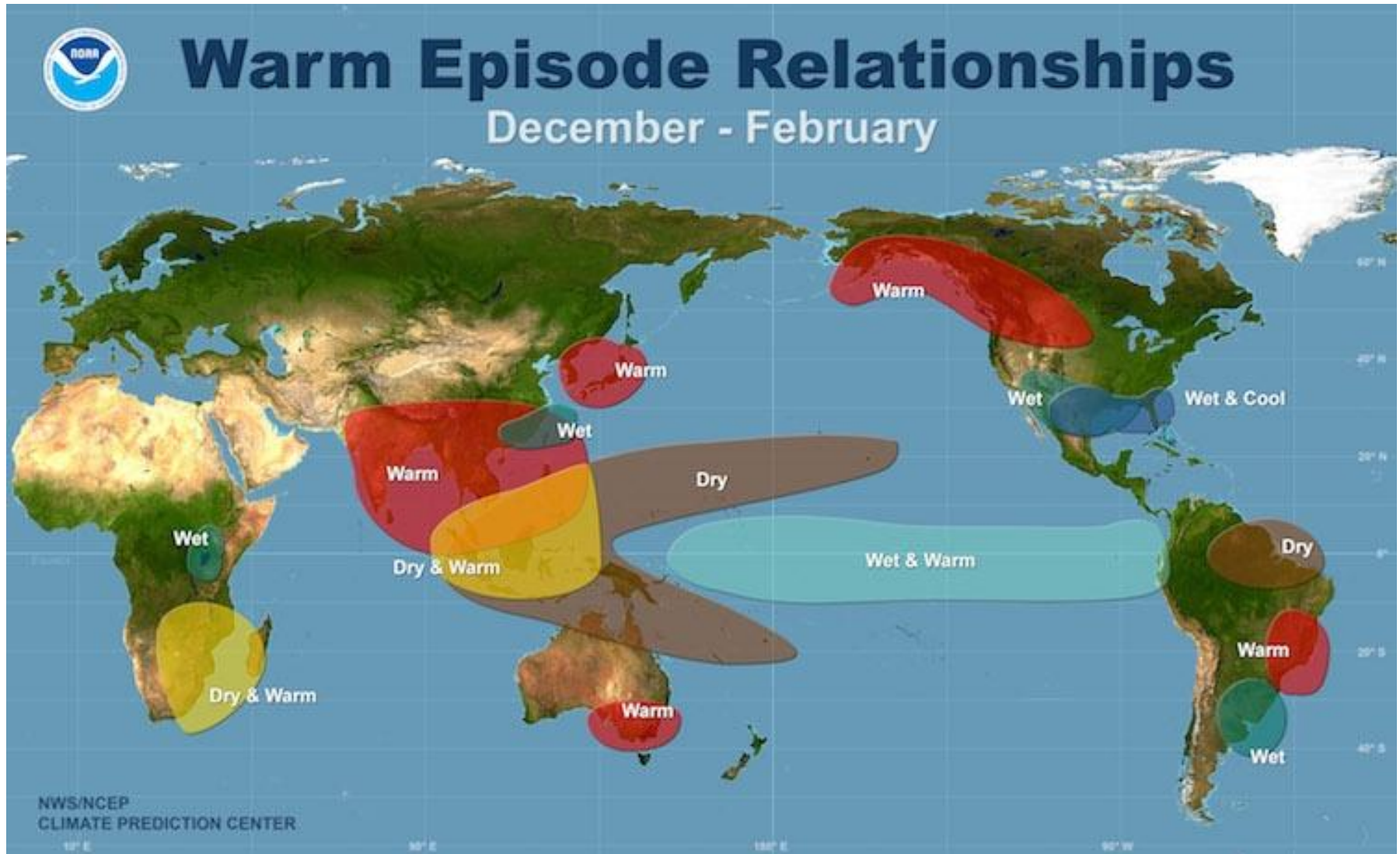
**1983
+ 0.77 °C**

**1998
+ 1 °C**

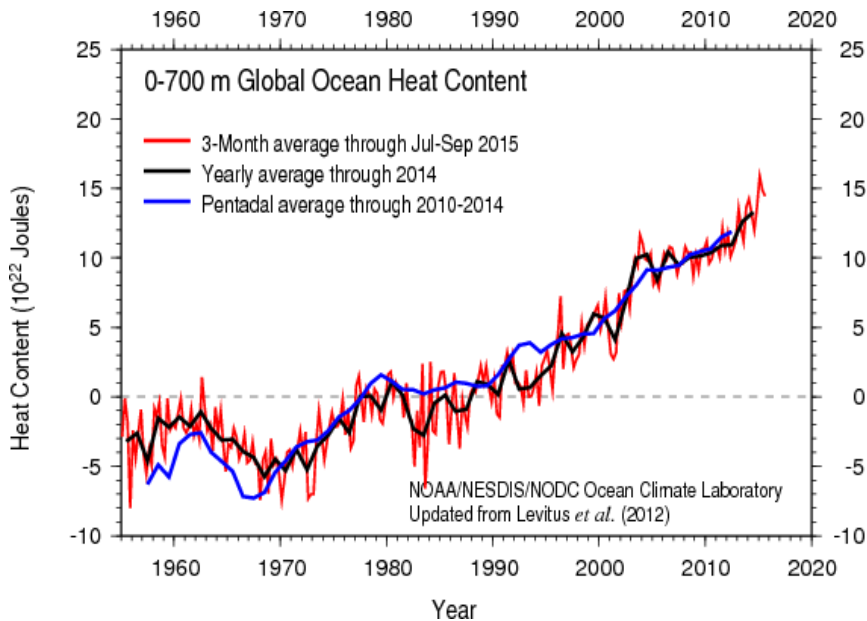
**2016
+ 1.4 °C**



Typical impacts of El Niño

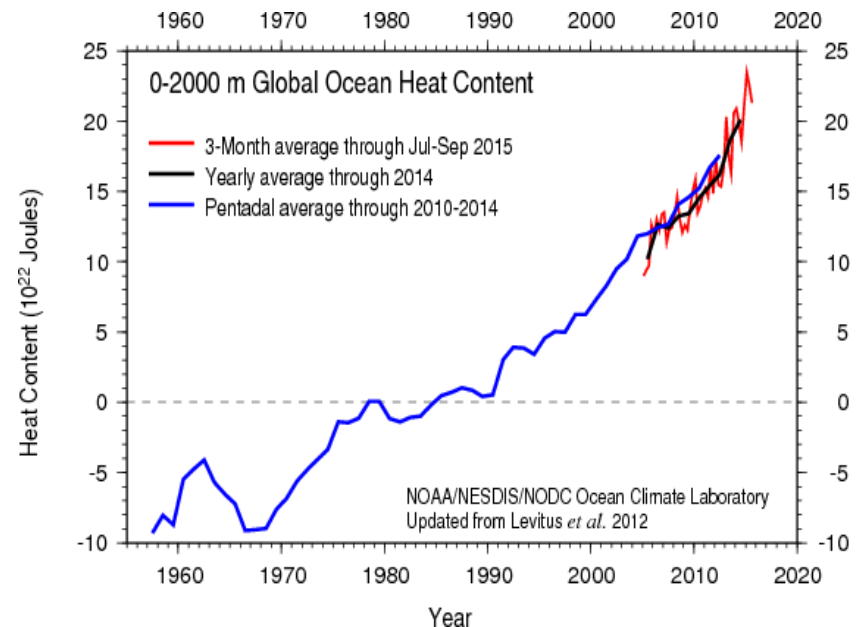


Global ocean heat content 1955-2015

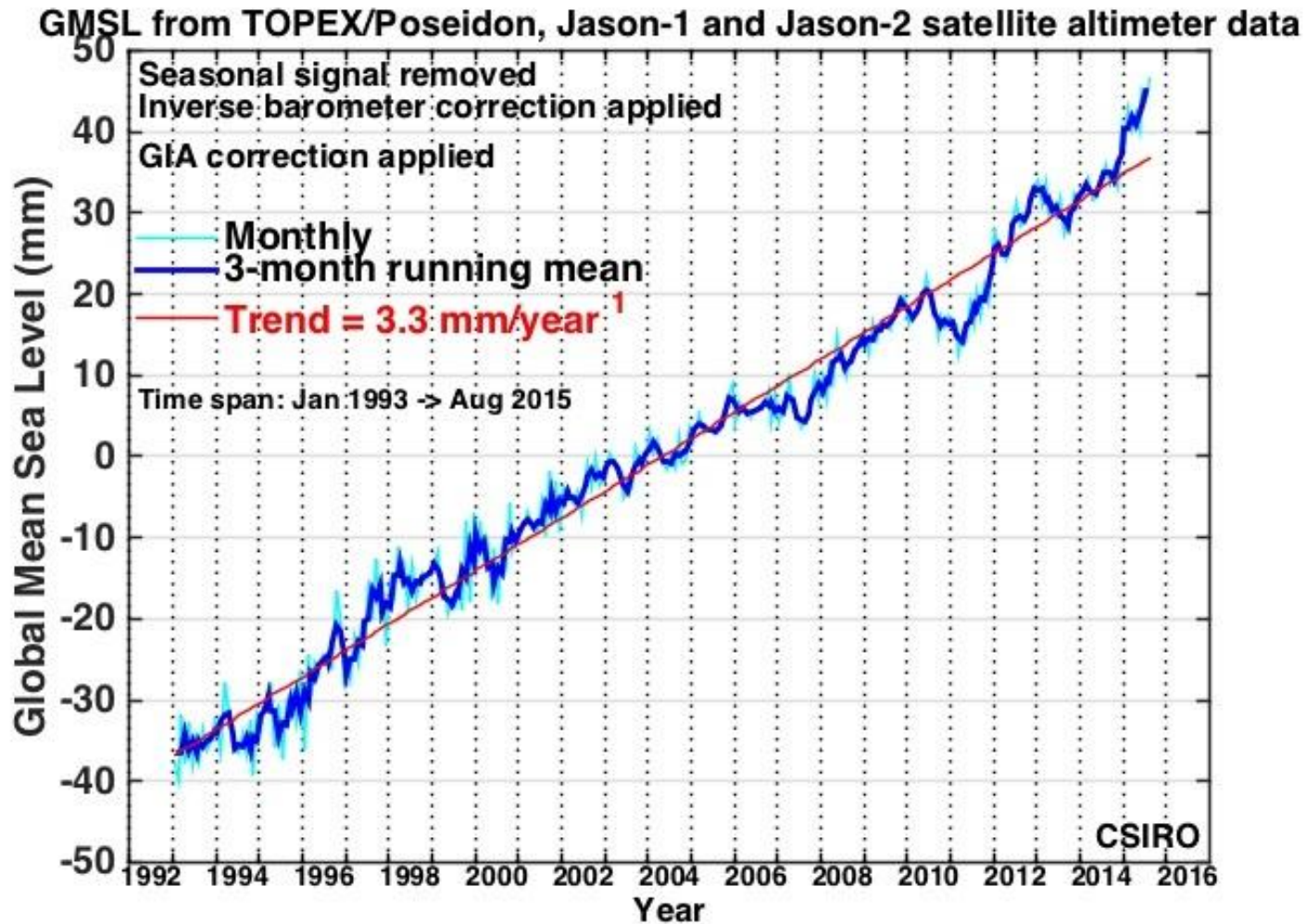


0-700 m global ocean heat content

0-2000 m global ocean heat content



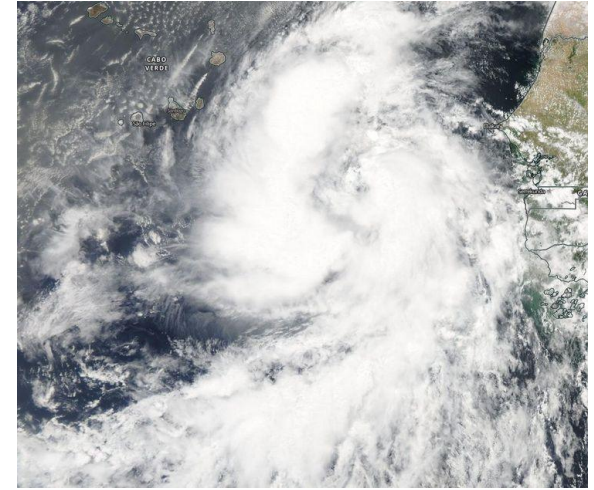
Sea level rise 1992-2015



Increasing damages by extreme weather



March 2015, Vanuatu: cyclone Pam



August 2015, Cabo Verde:
tropical storm Fred



September 2015, Dominica:
tropical storm Erika



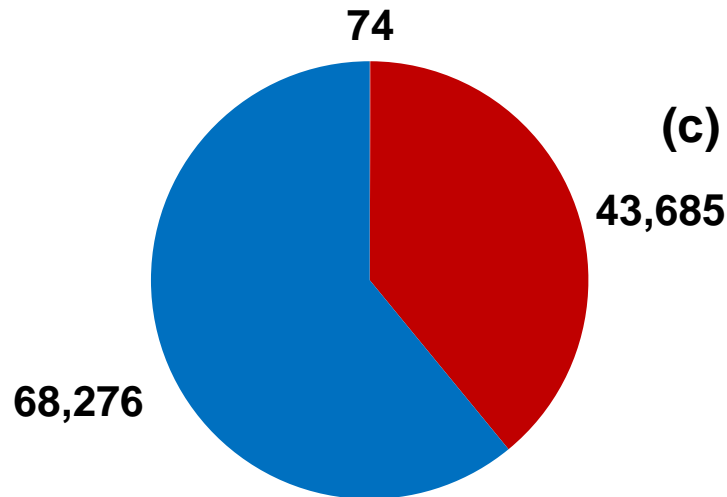
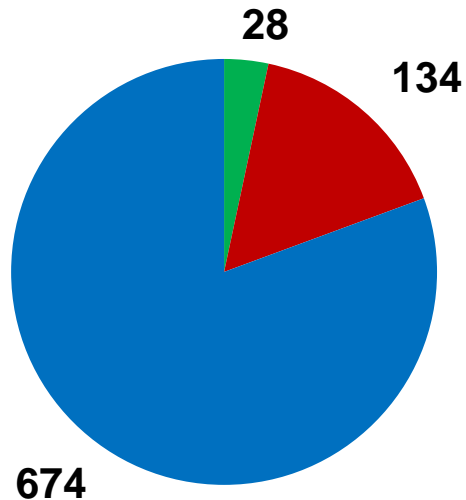
February 2016, Fiji:
cyclone Winston



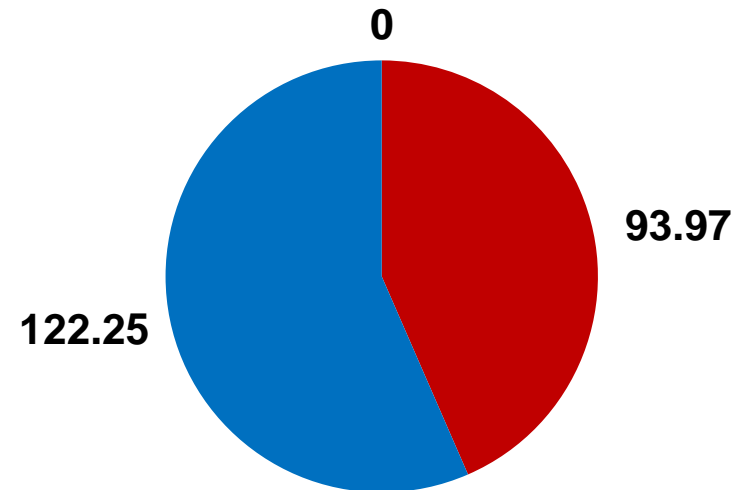
Natural disasters (1970–2014)

(b) Deaths

(a) Number of natural disasters



(c) Total economic losses (US\$ billion)

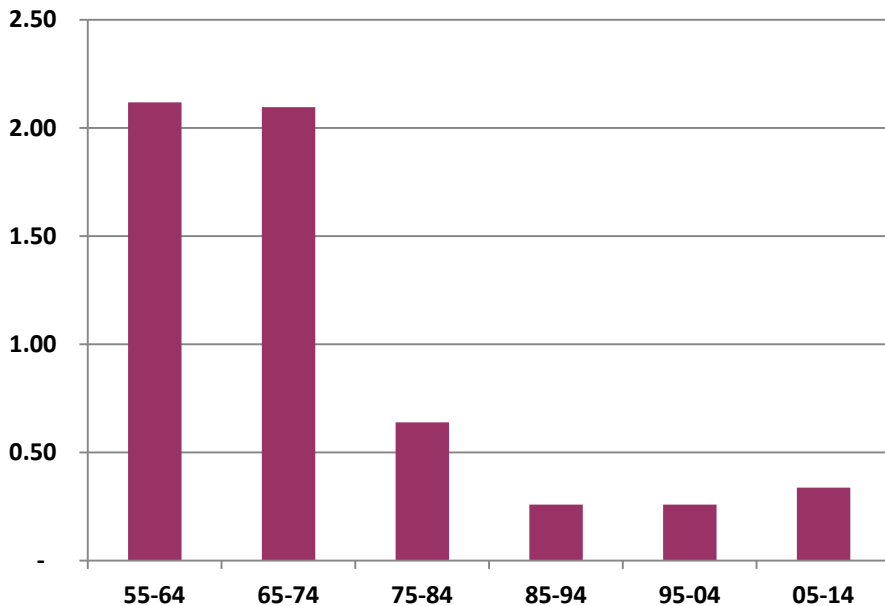


- Climatological (droughts, wildfires), hydrological (floods, landslides), meteorological (extreme temperatures, storms)
- Geophysical (earthquakes, mass movements dry, volcanic activity)
- Biological (epidemics, insect infestations)

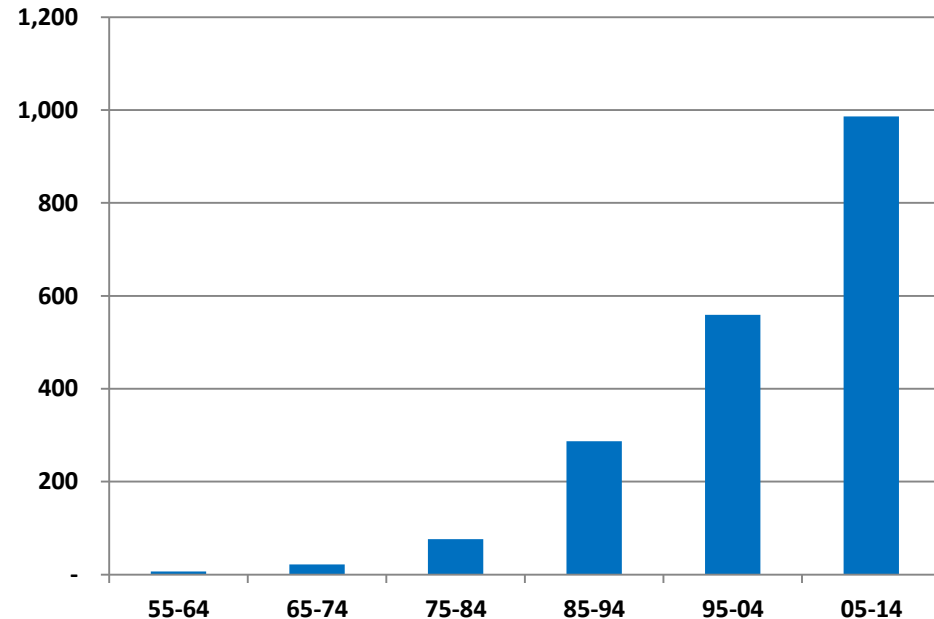


Impacts of hydrometeorological and climatological hazards (1955–2014)

Human losses by decade
(millions)



Economic losses by decade
(billions of US\$ adjusted to 2013)

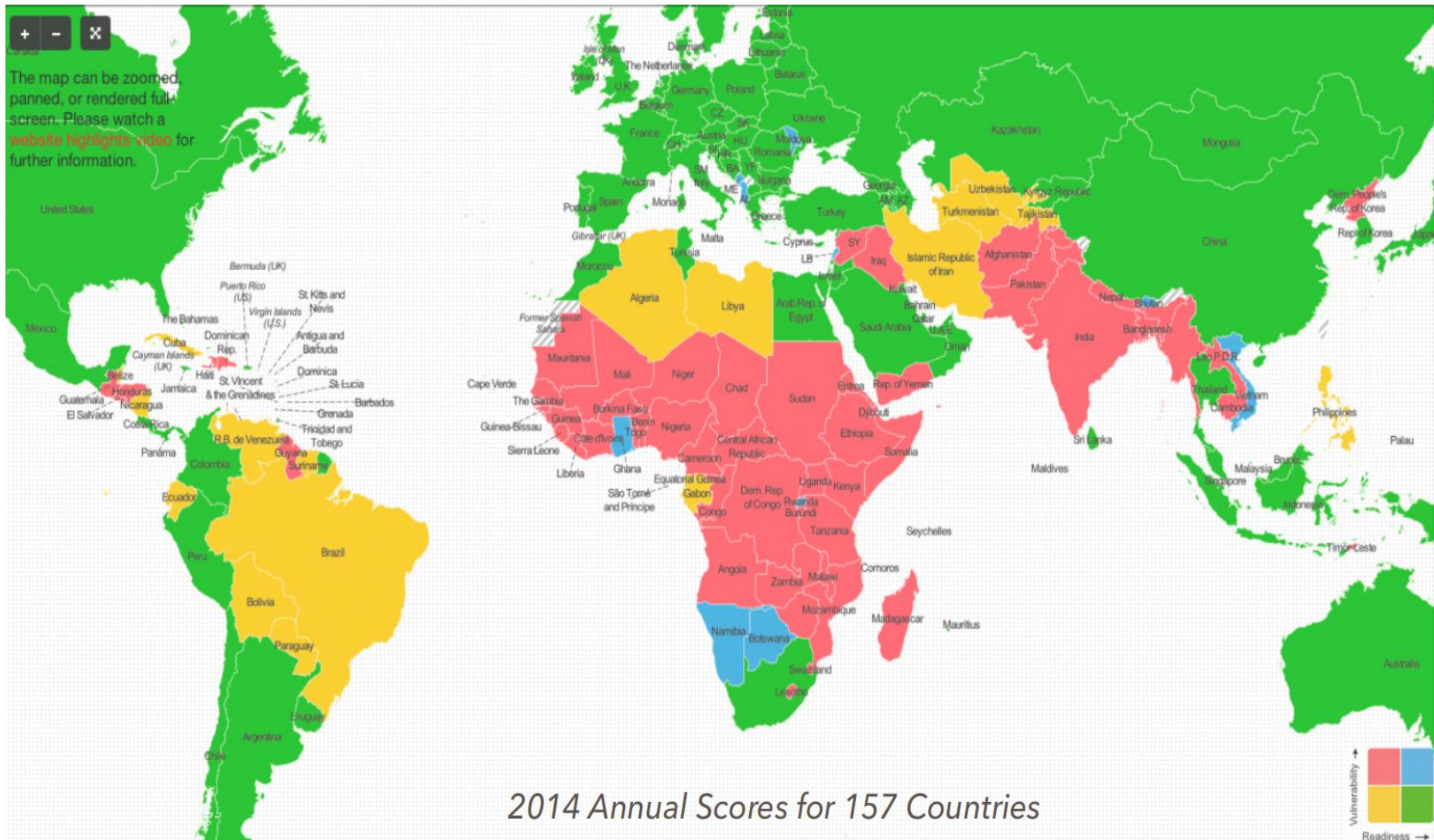


Epidemics and insect infestations are not included

Reduction of the number of victims thanks to greater effectiveness of early warning systems and prevention measures



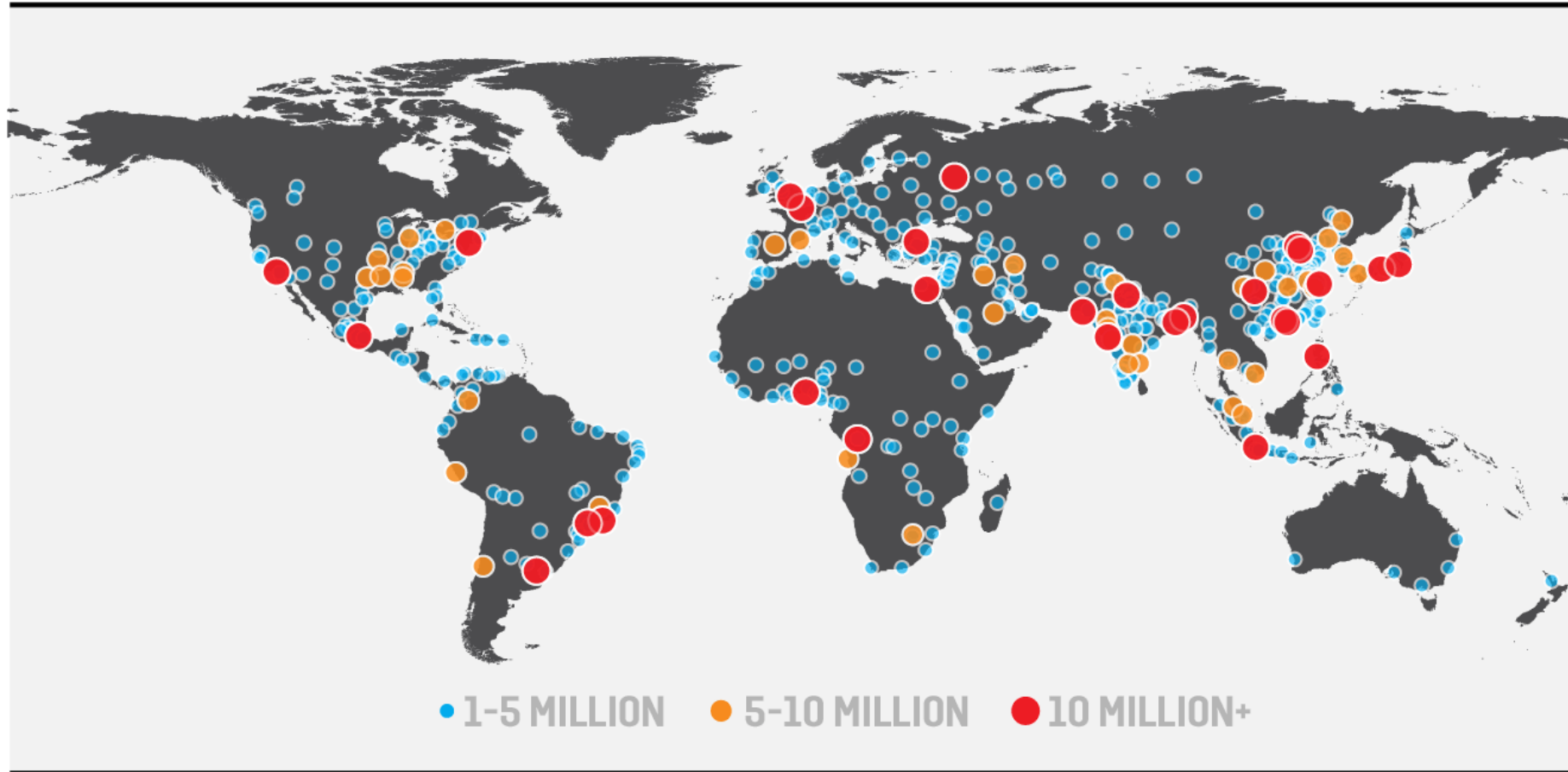
Global adaptation index



Coastal cities are very sensitive to extreme weather events and to climate change



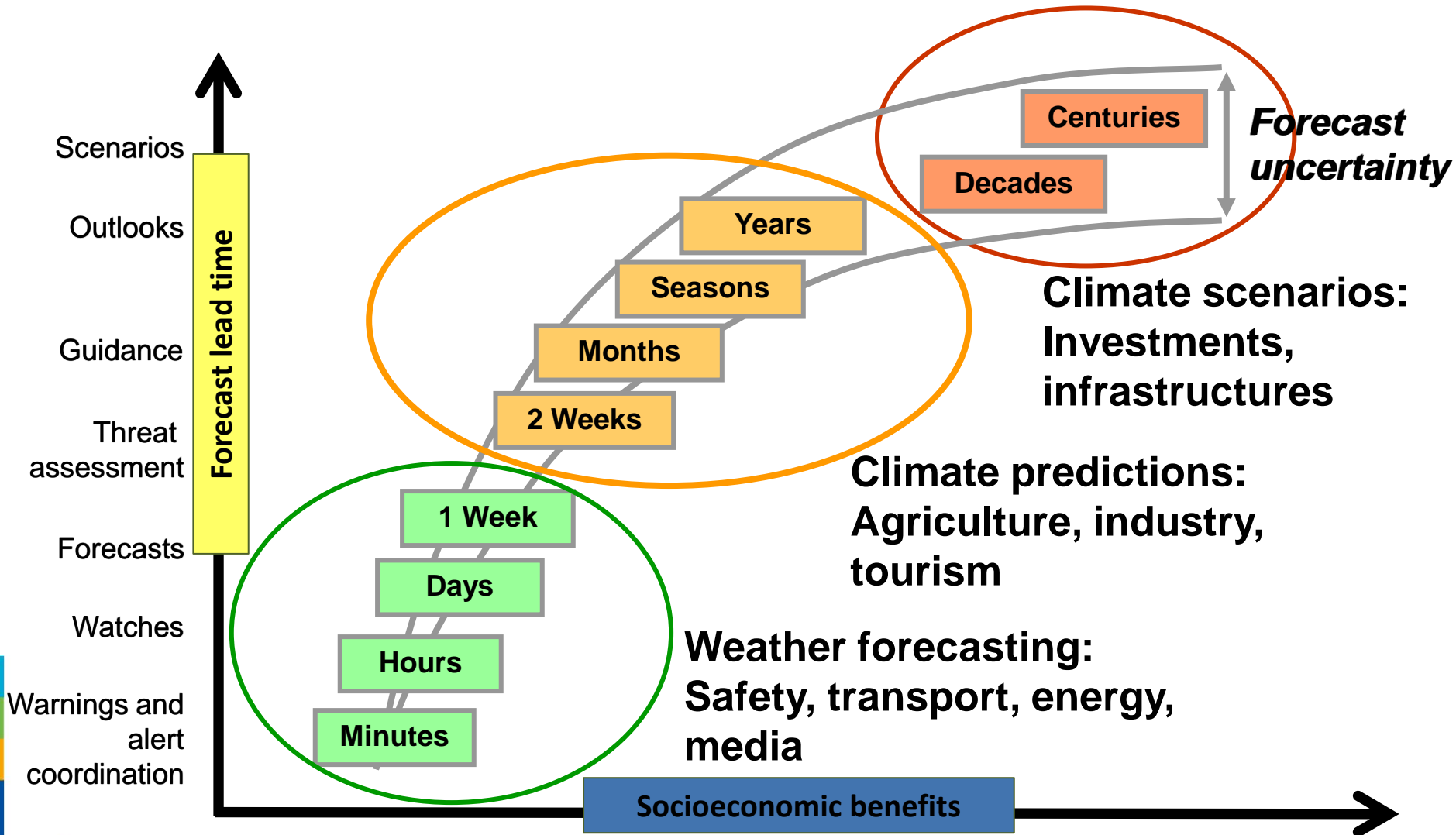
Distribution of Cities 2014



FOREIGN POLICY / DATA VIA THE UNITED NATIONS



Scales of weather and climate services & their customers



Lack of proper weather & climate services hinders development especially in ACP countries:



- 70 WMO Members do not have climate services
- More than 100 WMO Members could improve their weather service skills
- World Bank: return of investment to weather and climate services is 10 or more
- External financial resources are needed for transferring know-how & technology from developed to developing countries (EC, WB, GCF...)
- National governments have to ensure proper resourcing for maintenance of the service capabilities



Climate adaptation in Africa



- GFCS Climate Services Adaptation Programme in Africa
- Priorities: disaster risk management, food security and health
- Partners: CGIAR/CCAFS, CICERO, CMI, IFRC, WFP, WHO
- Funded by Norway (USD 10 million)



Improving agricultural productivity in Tonga



The 2014 drought destroyed 80% of squash harvests in Tonga -- squash is the main primary production export for Tonga

- Joint WMO/GFCS and APEC Climate Center initiative
- Improving agricultural productivity through climate data and enhanced agrometeorological services
- Expected results:
 - 2–7 day warnings for pests and diseases
 - Suite of tools supporting farming in decisions on planting dates and crop varieties
 - Other advisory services derived from seasonal climate forecasts

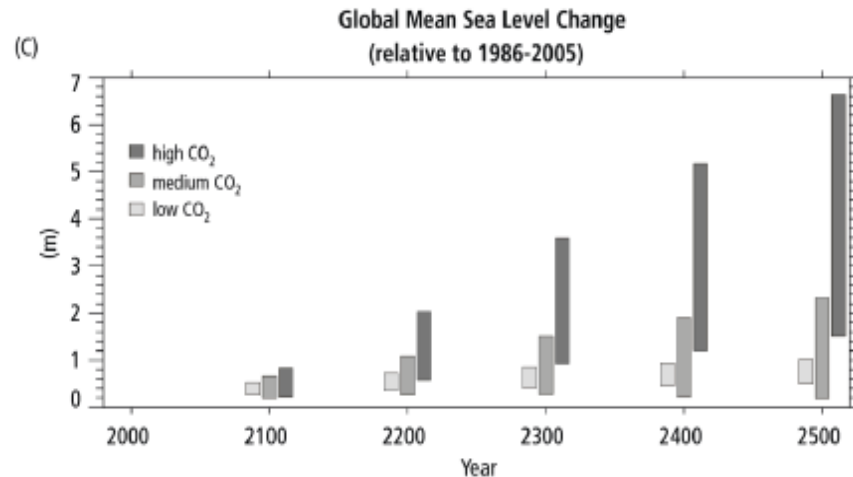
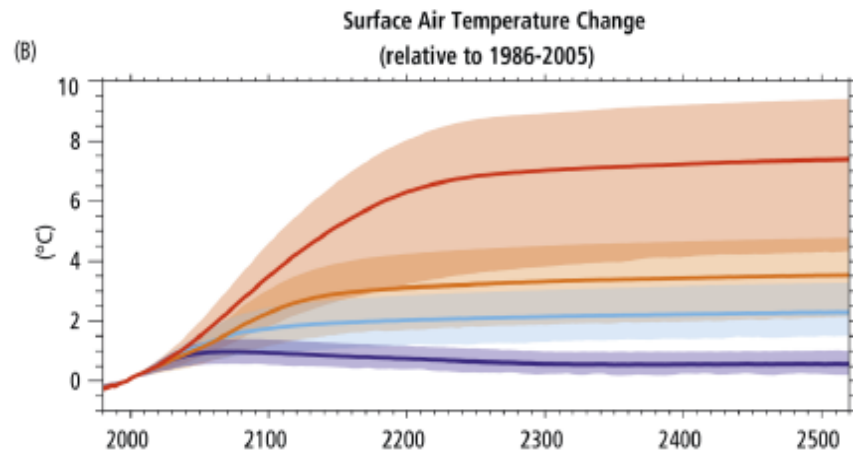
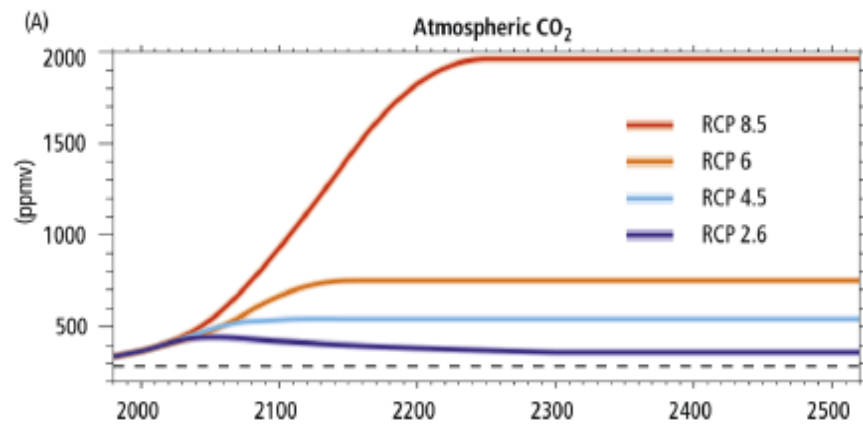


Climate Risk and Early Warning Systems (CREWS)

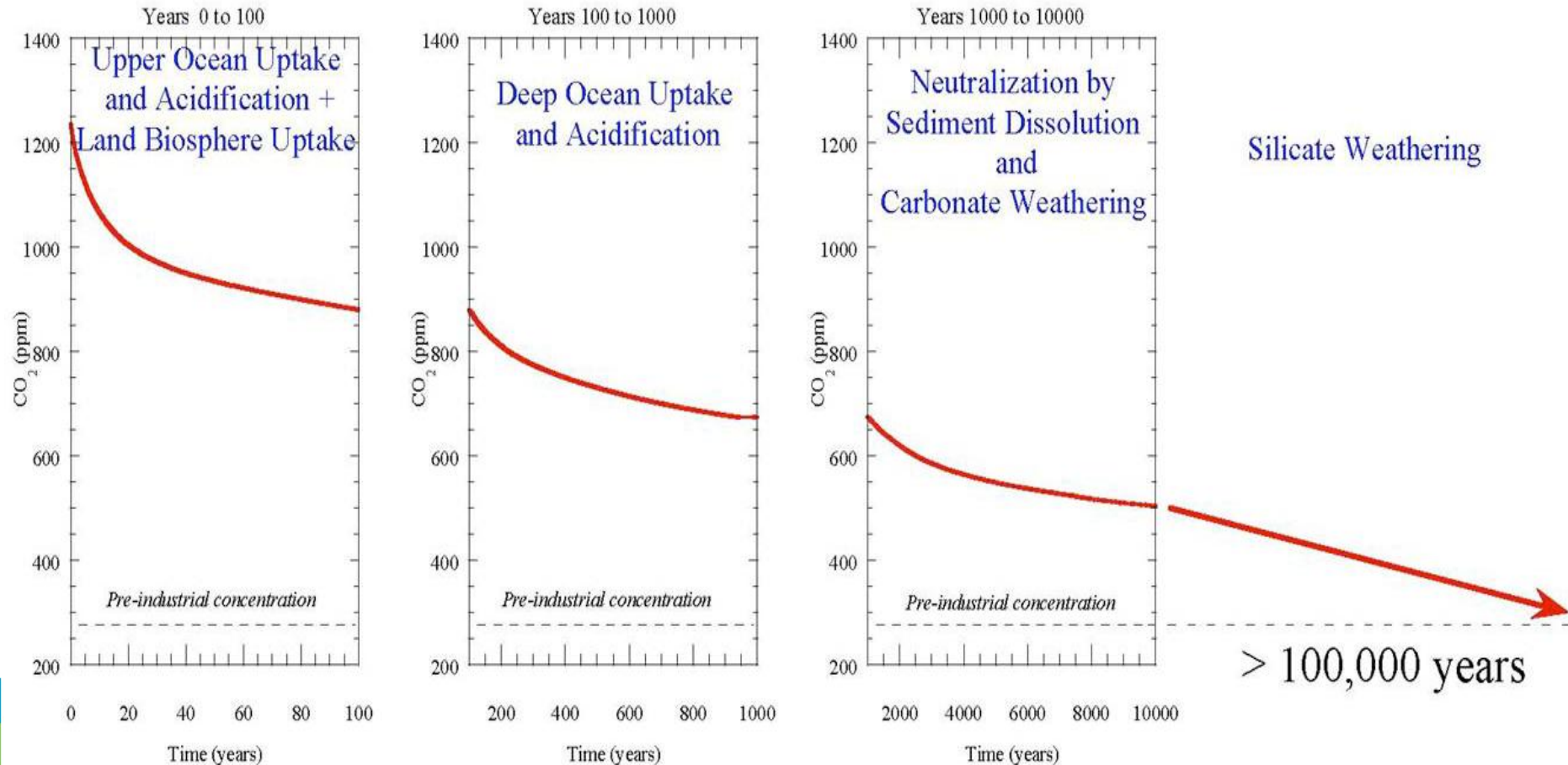
- Significantly increase capacity for multi-hazard early warning systems
- By 2020, moderate early warning system and risk information capacities in SIDS and LDCs (~80 countries)
- Mobilize US \$100 million by 2020 to fill gaps
- Around US\$ 80 million already pledged by 8 countries
- WMO, UNISDR and World Bank's Global Facility for Disaster Reduction and Recovery to act as technical implementation agencies
- Canada has pledged 10 M CAD specifically for MHEWS in SIDS and Southeast Asia through the WMO – currently being programmed



2000-2500? Various emission pathways:

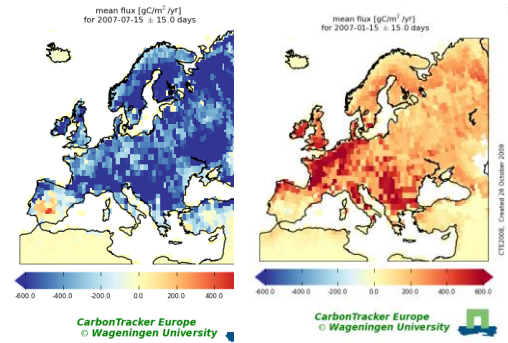
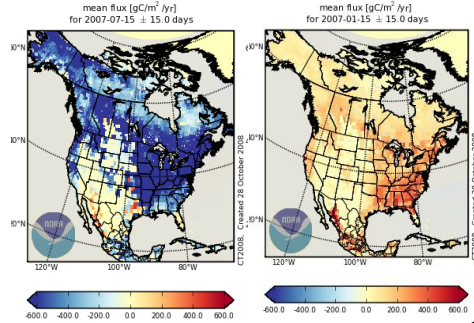
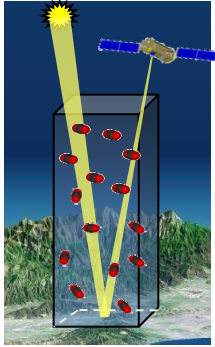


Return to pre-industrial CO₂ level takes up to 100 000 years

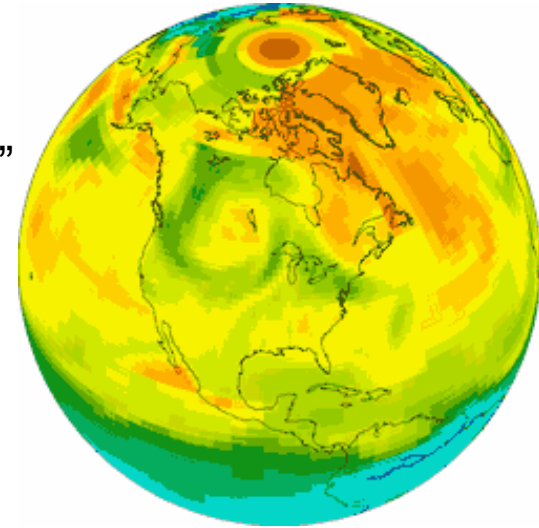


Integrated Global Greenhouse Gas Information System (IG3IS)

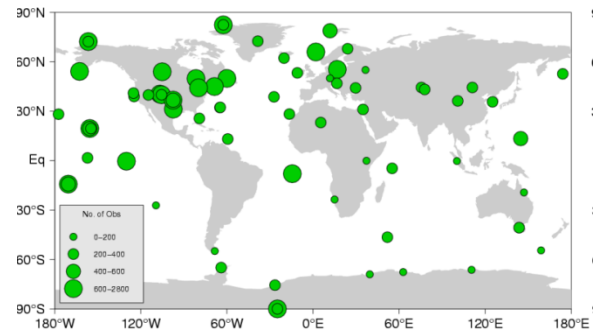
Satellites



“Carbon Weather”



Current Network



TCCON

China



SE Asia



Earth Networks



Brazil



Thank you



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