

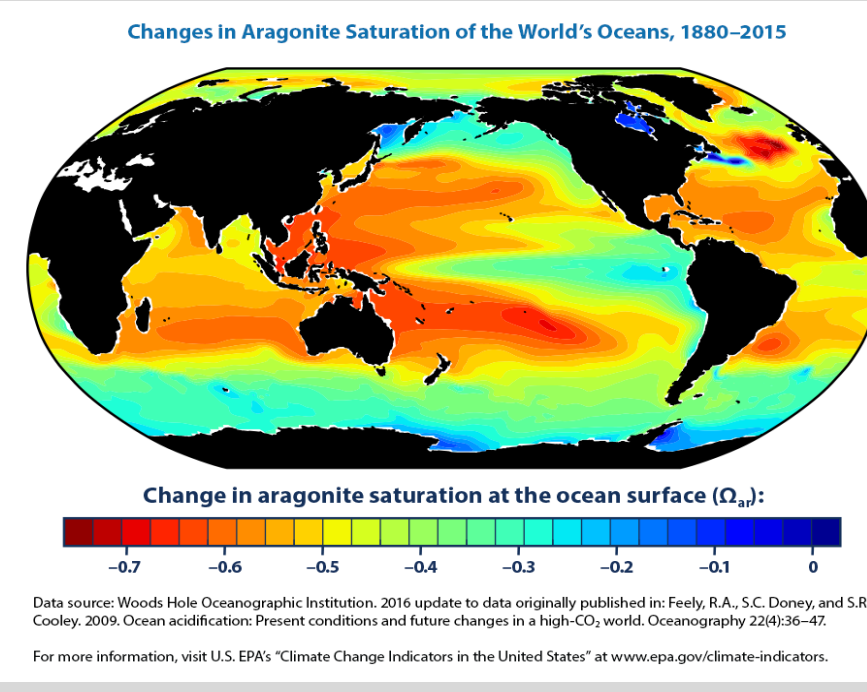
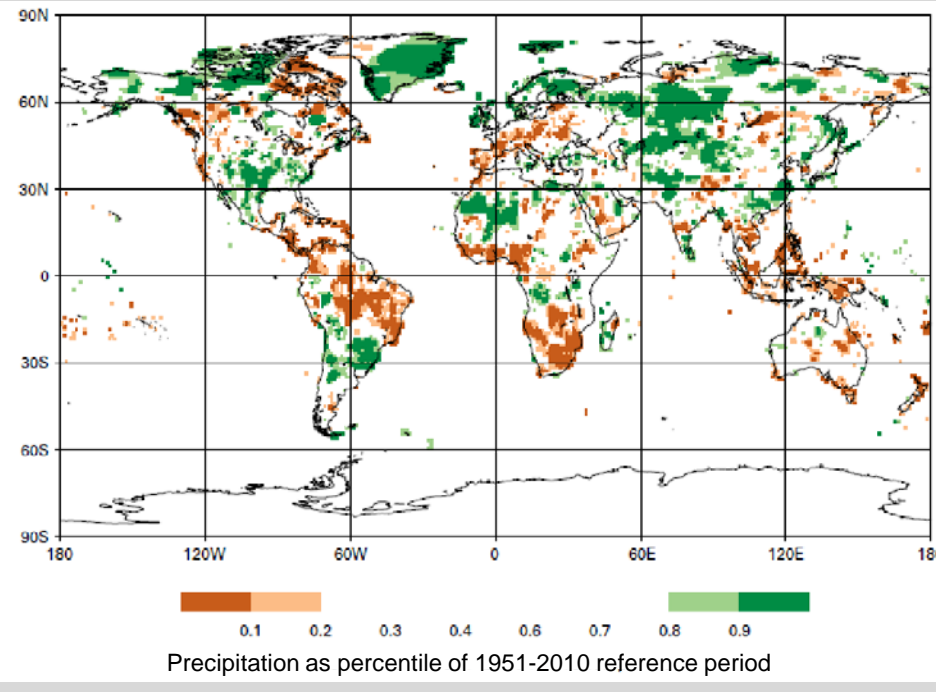
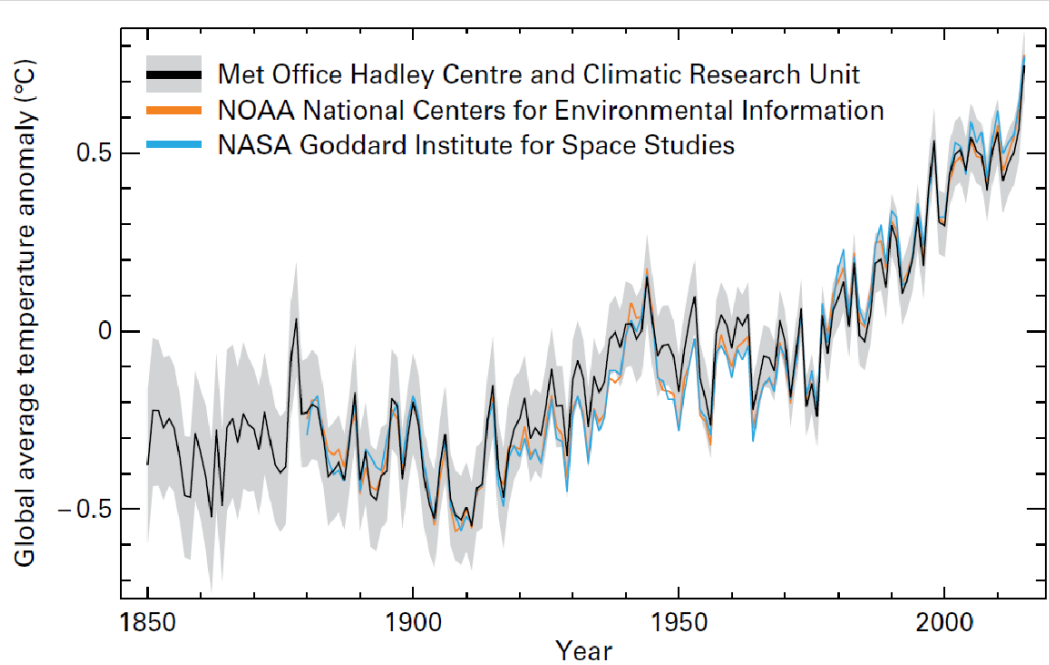


## How climate observations will play a role in the global stocktake



### State of the Global Climate System

### National Scale Climate Information



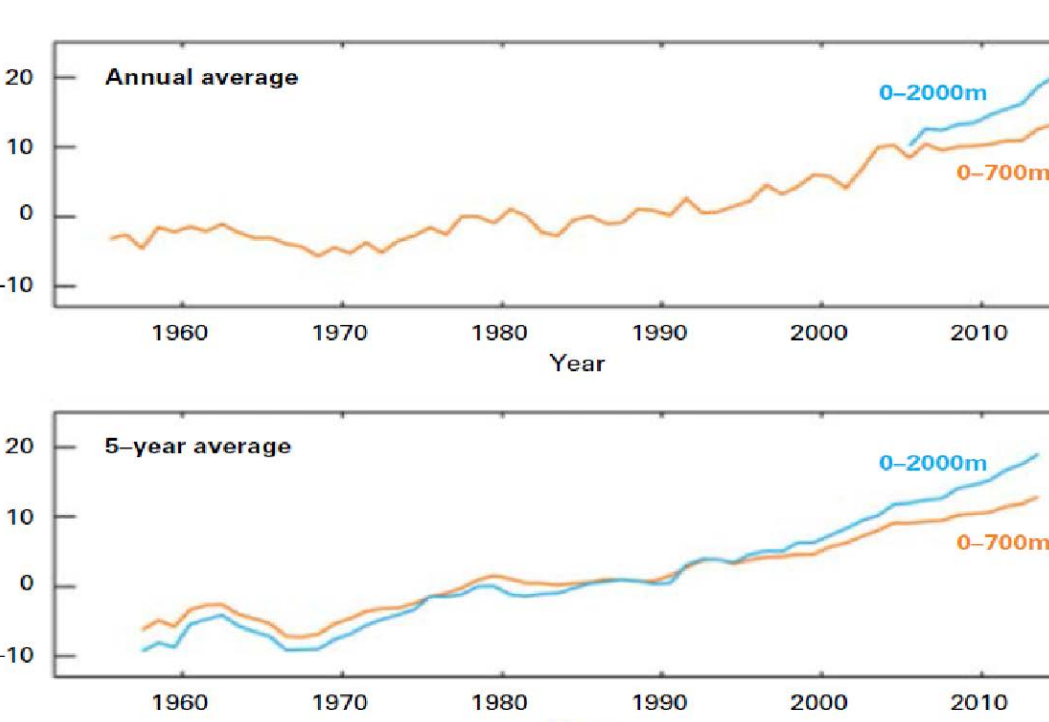
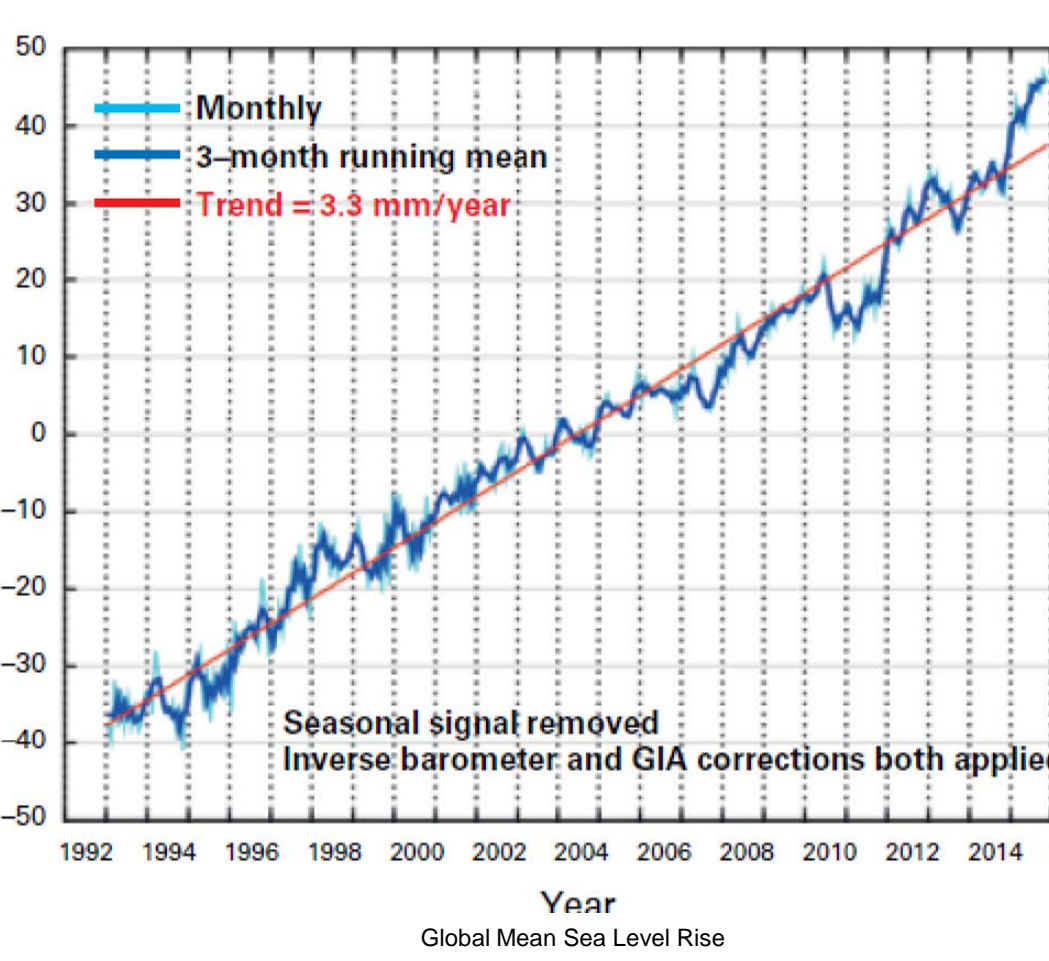
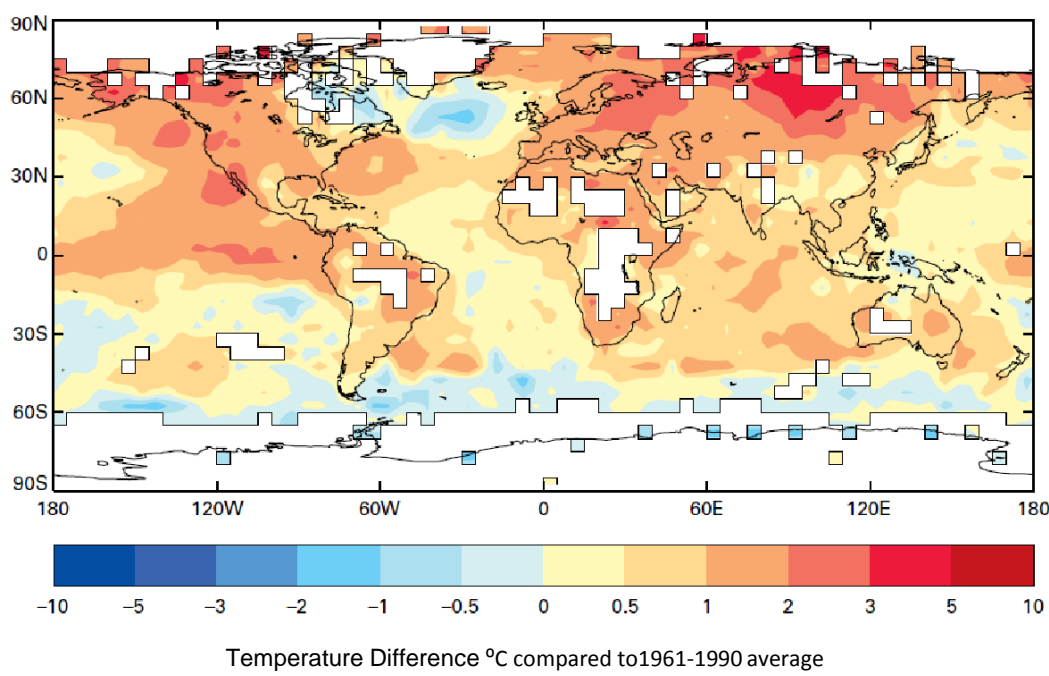
Global observations of the Essential Climate Variables allow the current state of the climate system and how it is changing to be monitored.

While a temperature reduction is the goal of the Paris Agreement there are many other important changes that need to be monitored and understood in order to adapt and minimise future risks.

These changes include:

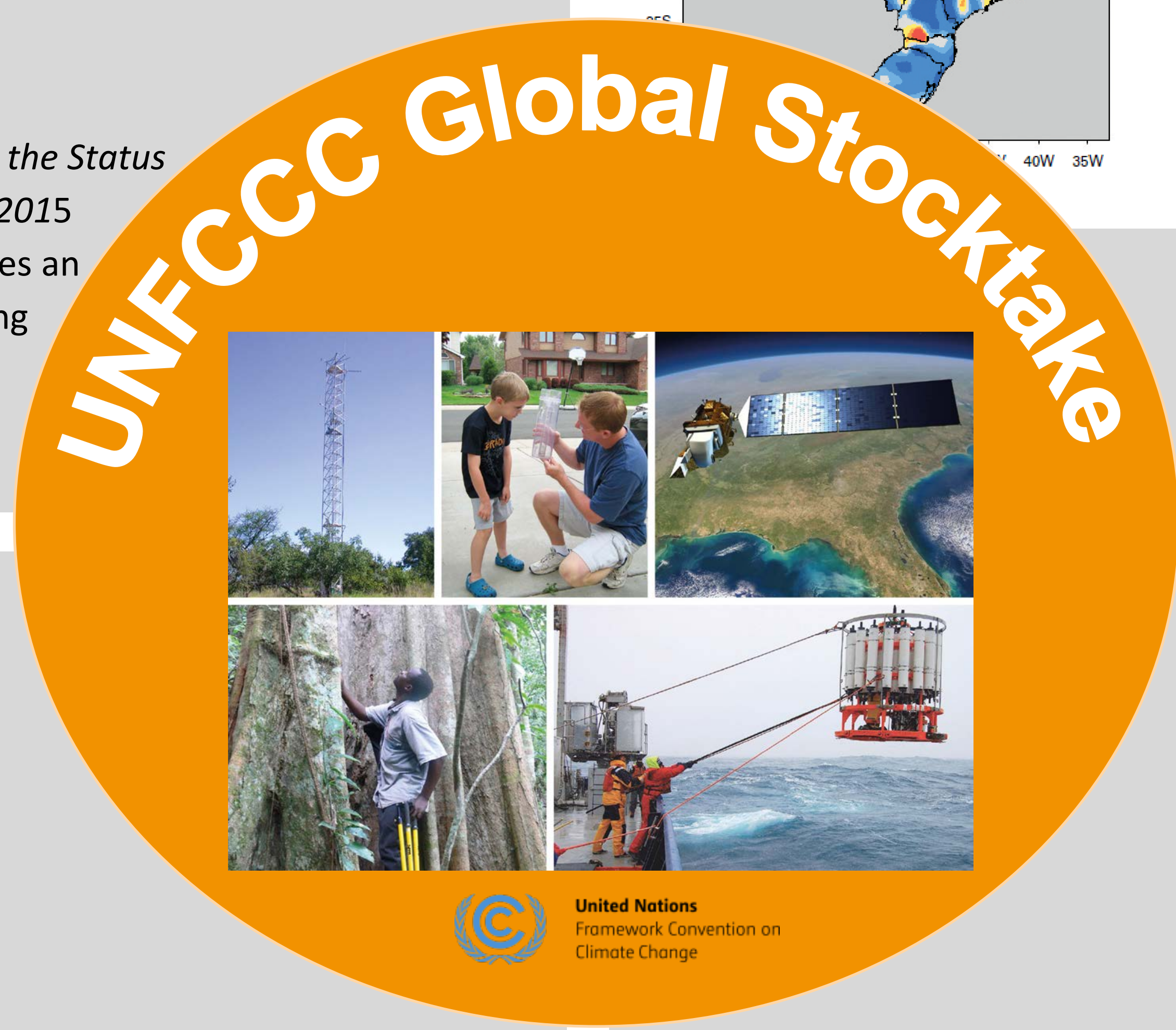
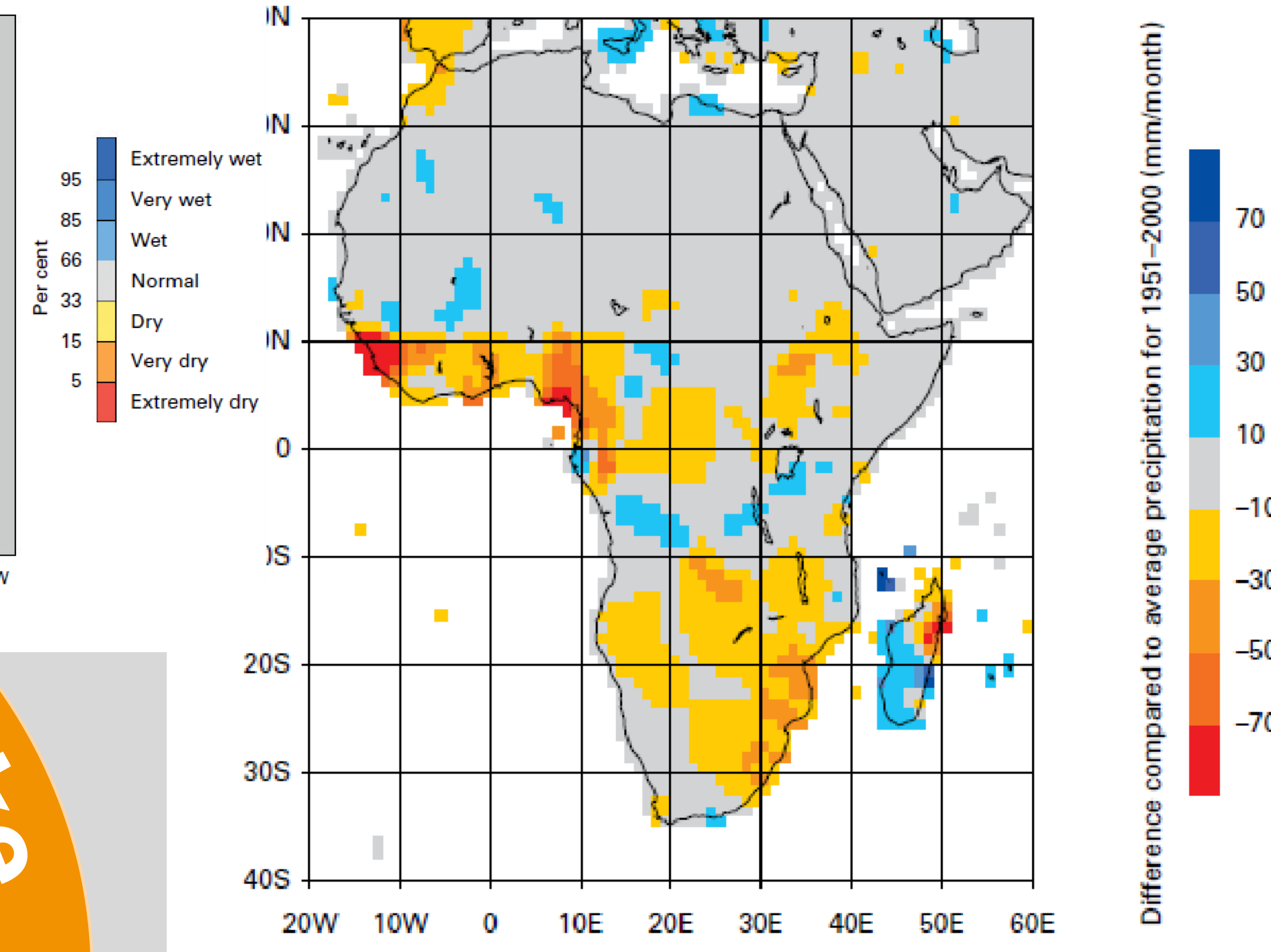
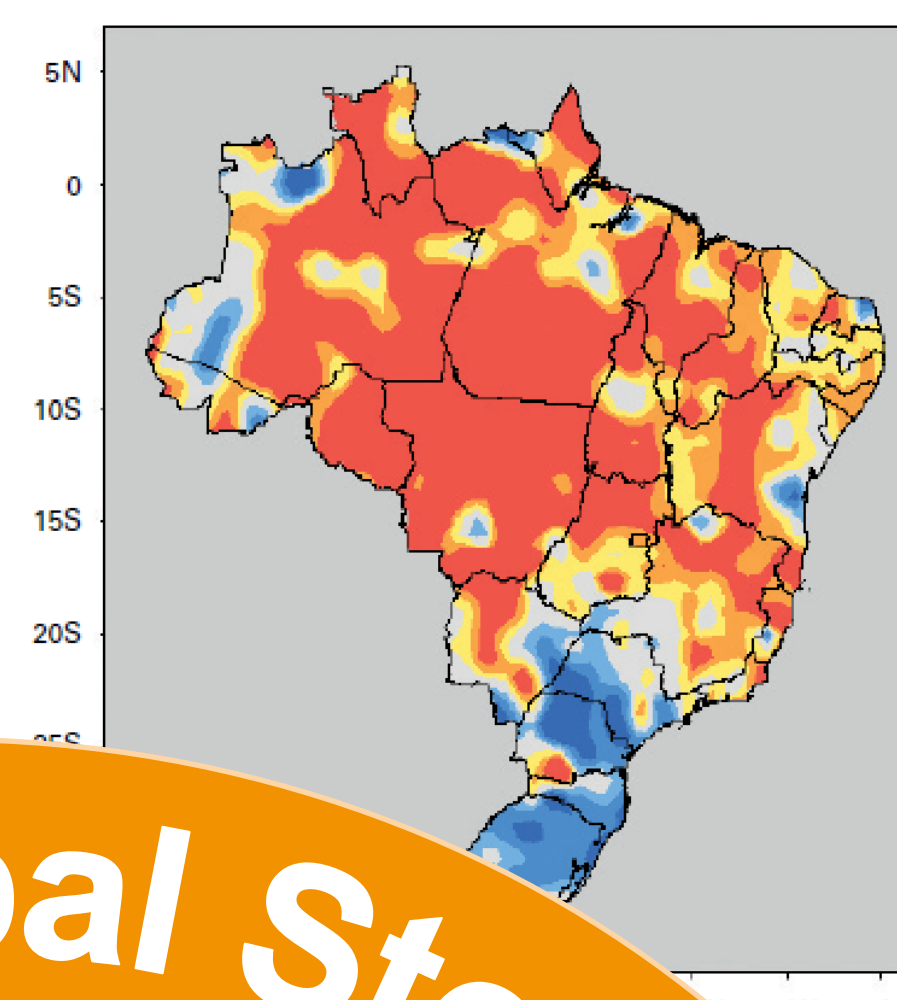
- Temperature (both global and local, annual and hourly)
- Precipitation
- Sea level
- Sea Ice Extent
- Ice cap and glacier melting
- Ocean Heat content
- Ocean Acidification

The WMO Statement on the Status of the Global Climate in 2015 (WMO-No. 1167) provides an example of such reporting and many of these examples.



The observations that GCOS facilitates will also provide information for countries at a more local scale in a number of ways:

- Most national climate monitoring is performed by national meteorological and hydrological agencies. Additional parameters and gap filling can be provided by global data sets. Some satellite observations are starting to be made at higher resolutions (10-30m) and are freely available. Data is also available using reanalysis and downscaling from global models. GCOS is encouraging the greater availability of these datasets;
- GCOS provides climate monitoring principles, agreed by the UNFCCC, and guidelines and ECV product requirements which, if adhered to, will ensure that national and regional observations are of high quality and comparable and consistent with other data;
- While GCOS has identified significant improvements in observations there are still gaps and limitations in some parts of the world e.g. Africa. The GCOS Cooperation mechanism is a fund that supports on-the-ground improvements to observational systems.



Observations made according to GCOS principles and requirements are vital for a wide range of users from global initiatives to national and local action.



GCOS defines Essential Climate Variables (ECV). It provides product requirements, climate monitoring principles and guidelines.

Observations are made by a range of organizations: meteorological and hydrological agencies, ocean observing systems, satellite agencies, academia and others.

Data is processed into information useful information, global and regional datasets and forms the basis of projections.

Data is checked, archived, and made available.

- UNFCCC for Global Stocktake
- Global Framework for Climate Services
- National Adaptation
- Climate Science, understanding and prediction
- Other Users

Essential Climate Variables cover the amount of carbon, in the atmosphere and oceans and terrestrial pools such as vegetation, soil carbon, permafrost and peat. The 2016 GCOS implementation plan also highlighted the need to measure all major fluxes of greenhouse gases.

Observations of land cover are important for monitoring changes and for reporting to the UNFCCC. Forest monitoring is required for mitigation such as REDD+.

Estimates of global emissions of carbon and other greenhouse gases need to be made maintained and improved.

Observations of the composition of the atmosphere also allows estimates to be made on the fluxes of gases through modelling techniques that allow broad scale checking of the estimates of the carbon cycle. The implementation plan promotes the development of these methods that should help improve inventory estimates and also asks for improved monitoring of the coastal zones where knowledge of the transport of carbon and nutrients is poor.

