

WMO Statements on the Status of the Global Climate

Providing information on global climate on annual and multi-year timescales in support of policy and decision making

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Organisation météorologique mondiale

Background

- Since 1993, WMO has released annual and multi-year Statements on the Status of the Global Climate
- These provide updated climate information annually, 5 years, complementing the IPCC Assessment Reports
- The Statements draw primarily on input and observations from Governments' National Meteorological and Hydrological Services, and partners
- Frequent and regular updates on key climate indicators and extreme events, relevant to the Paris Agreement, in succinct Statements in six languages



Climate indicators included and relevant for the global stocktake

- Temperature
- Precipitation
- GHG concentrations in the atmosphere
- Oceanic indicators at surface and sub-surface
- Sea levels
- Cryosphere: sea ice, ice-sheets, snow cover, etc
- Major modes of climate variability
- Extreme events
- Socio economic impacts (new)

2011-2015: Key findings?

WMO, in collaboration with Members, began issuing annual statements on the status of the global climate in 1993. This publication was issued in collaboration with the African Centre of Meteorological Applications for Development (ACMAD), Niger; European Centre for Medium-Range Weather Forecasts (ECMWF), United Kingdom of Great Britain and Northern Ireland; Japan Meteorological Agency (JMA); Met Office Hadley Centre, United Kingdom; Climatic Research Unit (CRU) at the University of East Anglia, United Kingdom; Climate Prediction Center (CPC), the National Centers for Environmental Information (NCEI) and the National Hurricane Center (NHC) of the National Oceanic and Atmospheric Administration (NOAA), United States of America; National Aeronautics and Space Administration, Goddard Institute for Space Studies (NASA GISS), United States; Global Precipitation Climatology Centre (GPCC), Deutscher Wetterdienst, Germany; National Snow and Ice Data Center (NSIDC), United States; Commonwealth Scientific and Industrial Research Organization (CSIRO) Marine and Atmospheric Research, Australia; Global Snow Lab, Rutgers University, United States; International Research Centre on El Niño (CIIFEN), Ecuador; Royal Netherlands Meteorological Institute (KNMI), Netherlands; Institute on Global Climate and Ecology (IGCE), Russian Federation; All-Russian Research Institute for Hydrometeorological Information – World Data Center (ARIHMI-WDC), Russian Federation; *Bulletin of the American Meteorological Society*, annual State of the Climate reports; Centre for Research on the Epidemiology of Disasters (CRED), Université catholique de Louvain, Belgium; World Glacier Monitoring Service, University of Zurich, Switzerland; Joint Typhoon Warning Center (JTWC), Honolulu, United States; National Institute for Space Research (INPE), Brazil; Niger Basin Authority, Niamey; Intergovernmental Authority on Development (IGAD) Climate Prediction and Applications Centre (ICPAC), Nairobi; WMO Regional Climate Centres in Europe, Asia (Tokyo Climate Center), southern and western South America, and eastern and northern Africa; WMO Global Atmosphere Watch and Global Cryosphere Watch programmes; World Food Programme (WFP); United Nations Environment Programme (UNEP); and Office of the High Commissioner for Refugees (UNHCR). Other contributors are the National Meteorological and Hydrological Services or equivalent of: Algeria; Antigua and Barbuda; Argentina; Armenia; Australia; Austria; Azerbaijan; Barbados; Belarus; Belgium; Bosnia and Herzegovina; Brazil; Bulgaria; Burkina Faso; Canada; Chile; China; Colombia; Croatia; Cuba; Cyprus; Czechia; Denmark (including Greenland); Dominican Republic; Egypt; Estonia; Ethiopia; Fiji; Finland; France (including French Pacific, Caribbean and Indian Ocean territories); Germany; Haiti; Hong Kong, China; Hungary; Iceland; India; Indonesia; Iran, Islamic Republic of; Ireland; Israel; Italy; Jamaica; Japan; Jordan; Kenya; Libya; Lithuania; Luxembourg; Madagascar; Malawi; Malaysia; Mali; Mauritius; Mexico; Montenegro; Morocco; Netherlands; New Zealand; Niger; Norway; Pakistan; Panama; Papua New Guinea; Paraguay; Peru; Philippines; Poland; Qatar; Republic of Korea; Republic of Moldova; Russian Federation; Saint Lucia; Senegal; Serbia; Seychelles; Singapore; Slovakia; Slovenia; South Africa; Spain; Sudan; Sweden; Switzerland; Thailand; Turkey; Ukraine; United Kingdom; United Republic of Tanzania; United States; Uruguay; and Vanuatu.



GLOBAL TEMPERATURE INCREASE CONTINUES

2015:

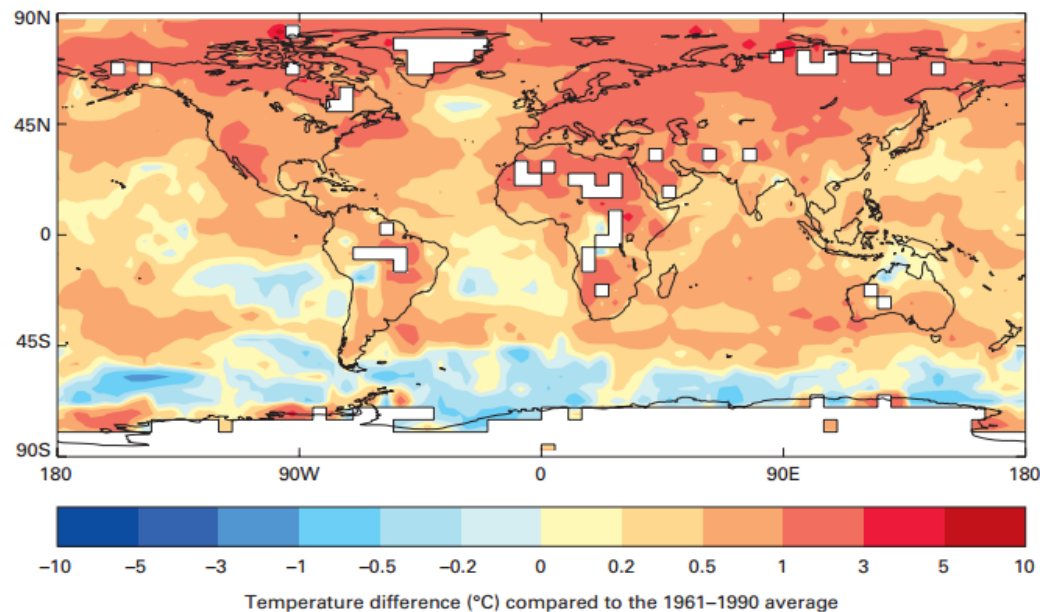
Warmest year,
over 1° higher than
pre-Industrial period

2011-2015:

Warmest
five-year period

2001-2010:

Warmest decade



Global five-year average temperature anomalies (relative to 1961–1990) for 2011–2015. The analysis uses HadCRUT4 analysis produced by the Met Office Hadley Centre in collaboration with the Climatic Research Unit at the University of East Anglia, United Kingdom.



CONCENTRATION OF LONG-LIVED GREENHOUSE GASES CONTINUES TO INCREASE

In 2015, the annual mean concentrations in the atmosphere of



**400 parts
per million**



**1 845 parts
per billion**



**328 parts
per billion**

These concentrations increased consistently throughout
the period from 2011 onward.

**GHG concentration reached the symbolic threshold
of 400 ppm CO₂ concentration in the atmosphere
for the first time**



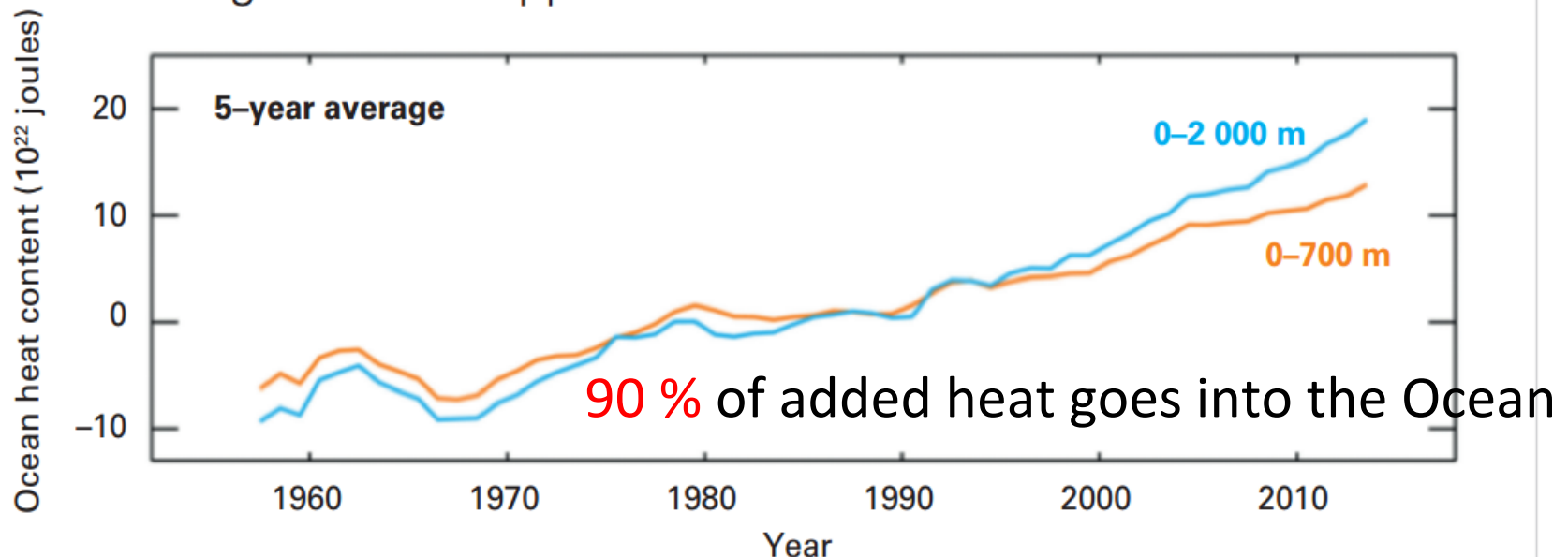
Ice melting

- Arctic sea ice extent continued to decline. The 2011-2015 mean September sea ice extent was nearly **30% below** the 1981-2010 average (NISDC)
- Greenland surface melting expanded. 2012 saw **the most extensive surface melting** of any year in the satellite record (NSIDC)
- Mountain glaciers continued to decline. Reference glaciers lost **600 to 1200** liters of water equivalent per m² surface area each year of the period 2011-2015 (World Glacier Monitoring Service)



RECORD WARMING AT OCEAN SURFACE AND SUBSURFACE

In 2015, global ocean heat content reached record levels through both the upper 700 m and 2 000 m of the oceans

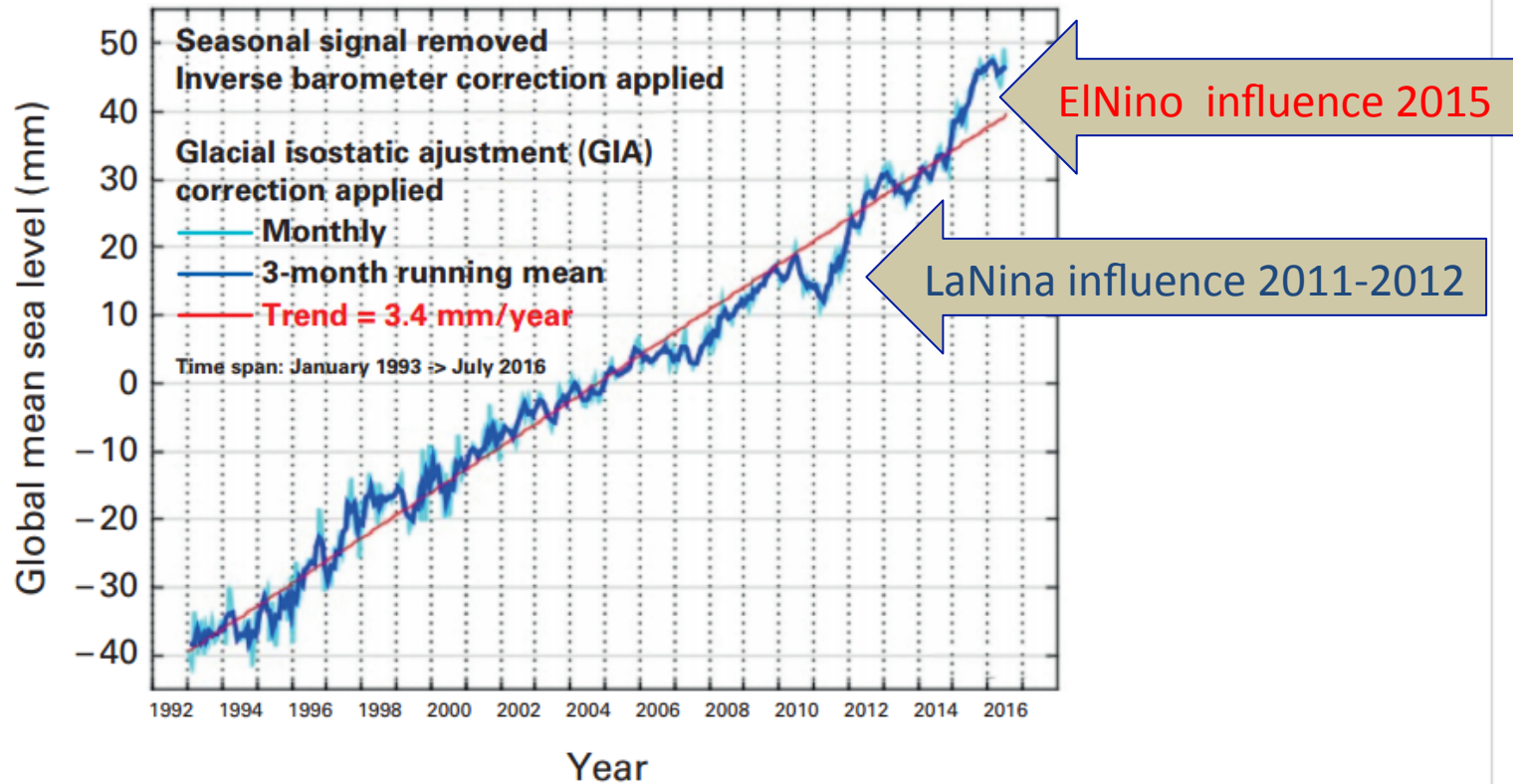


Five-year moving average ocean heat content in the upper 700 m (orange) and 2 000 m (blue)
(Source: Data from NOAA NCEI Ocean Climate Laboratory, United States, updated from Levitus et al. (2012))



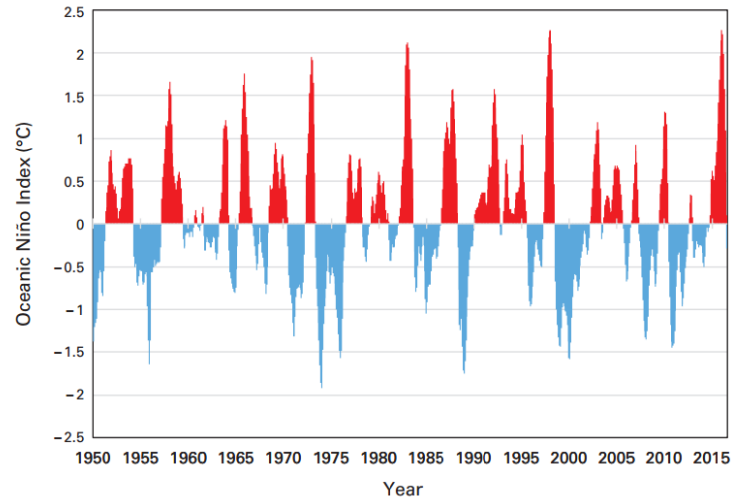
SEA LEVELS CONTINUE TO RISE

Global sea levels continued to rise over the period 2011–2015. The level of interannual variability in global sea level over the period was high by the standards of the satellite era.



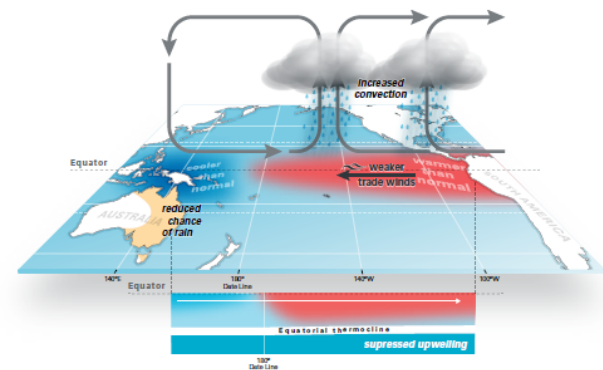
(Source: Commonwealth Scientific and Industrial Research Organization, Australia)

MAJOR OSCILLATIONS SHAPED CLIMATE VARIABILITY

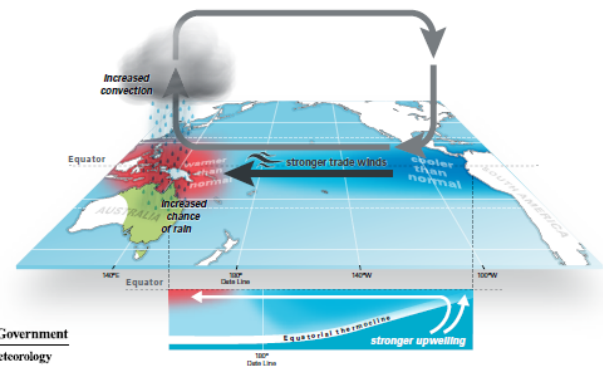


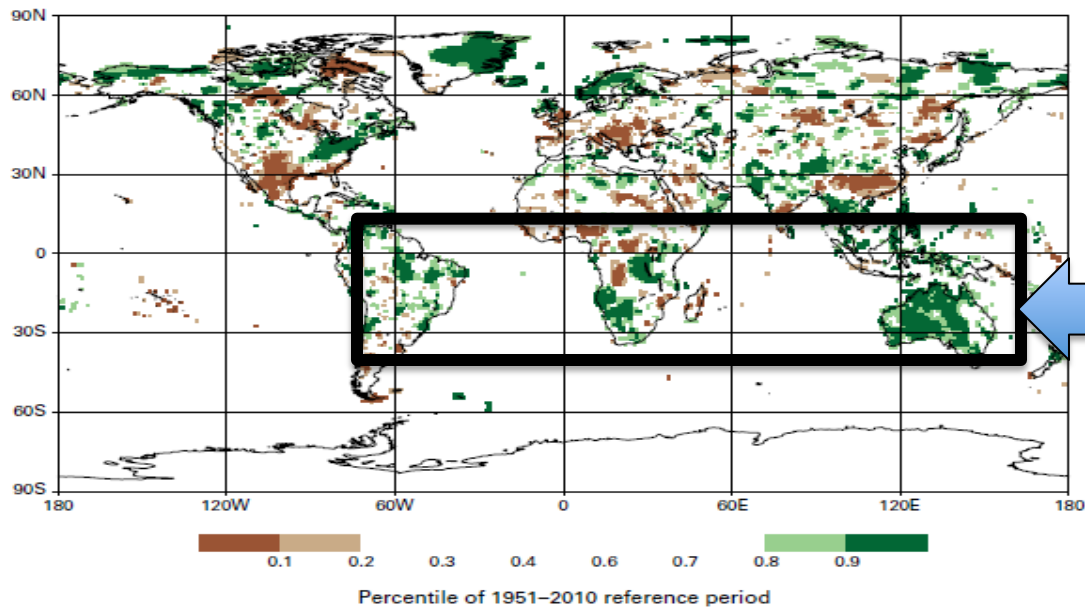
Three month running means of the sea-surface temperature anomaly in the Niño 3.4 region (the NOAA Oceanic Niño Index)
(Source: Data provided by NOAA)

El Niño

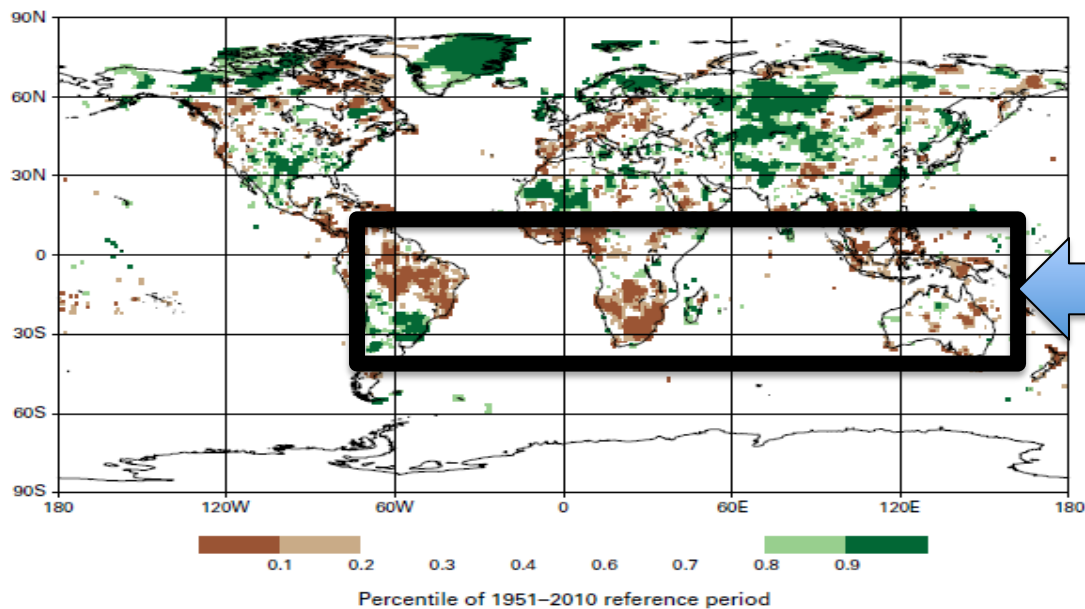


La Niña





2011
Strong LaNina
Influence
on the very wet
conditions



2015
Strong influence
of ElNino on
very dry
conditions



HIGH IMPACT EXTREMES

>7 800
deaths in the
Philippines
attributed to
Typhoon Haiyan,
2013

**>US\$
67 billion**
Economic losses
attributed to
Hurricane Sandy,
2012

>250 000
Excess deaths attributed
to drought and famine in
2011–2012 in the
Horn of Africa

>4 100
deaths attributed to
heatwaves in
Pakistan and India,
2015

**X10
Extreme
Events**
Probability that
climate change
affected occurrence of
many extremes

Sources for the information on impacts include:

D. Guha-Sapir, R. Below, Ph. Hoyois - EM-DAT: International Disaster Database –www.emdat.be – Université Catholique de Louvain – Brussels – Belgium;
The United Nations High Commissioner for Refugees;
The World Food Programme;
The U.N. Office for the Coordination of Humanitarian Affairs;
The World Bank; The U.S. National Oceanic and Atmospheric Administration
National Centers for Environmental Information; The Famine Early Warning Systems Network.



Concluding Remarks

1) The 5 year climate statement

- Brings in retrospective data and analysis (e.g. on event attribution, impacts information from other UN agencies)
- Allows climate change signals to be separated more clearly from natural modes of variability (e.g. El Niño-Southern Oscillation)
- It captures a wider interval of variability around the longer term trend

2) The provisional annual Statement on climate in 2016 will be released Monday next week (14 November)

Thank you



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