

**HOTTER**

**DRIER**

**WETTER**

**FACE THE FUTURE**



**World  
Meteorological  
Organization**

Weather · Climate · Water

**WORLD METEOROLOGICAL DAY  
23 MARCH 2016**

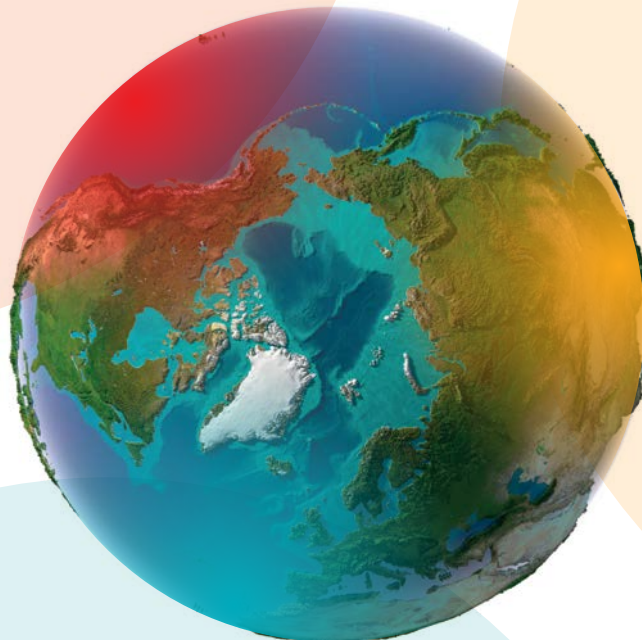
**Our climate is changing. This is not just a future scenario. It is happening now. The climate will continue to change over the coming decades as more and more heat-trapping greenhouse gases emitted by human activities accumulate in the atmosphere.**

Each of the past several decades has been significantly warmer than the previous one. The period 2011–2015 was the hottest on record, and the year 2015 – with an extra boost from a powerful El Niño – was the hottest since modern observations began in the late 1800s.

But rising temperatures tell only part of the story. Climate change is disrupting the natural pattern of the seasons, and it is increasing the frequency and intensity of certain extreme weather events, such as heatwaves, droughts and heavy rainfall. These ongoing changes provide a foretaste of a hotter, drier, wetter future.

It is still possible to minimize the damage. In December 2015 the world's governments unanimously adopted the Paris Agreement, providing for rapid and deep cuts in greenhouse gas emissions. This historic agreement commits all countries to undertake ambitious efforts to respond to the urgent threat of climate change on the basis of their "common but differentiated responsibilities". It also addresses financial support to developing countries, climate resilience and adaptation, loss and damage, technology transfer, capacity-building, and education, training and public awareness.

Meanwhile, scientific advances are making it possible to produce increasingly useful climate information and services to support climate resilience, adaptation and mitigation. The World Meteorological Organization and the global network of National Meteorological and Hydrological Services have a major role to play in providing the scientific observations, research and operational climate services that society will need in order to face the future.



# HOTTER, DRIER, WETTER.

**Greenhouse gases in the atmosphere reached new record levels in 2015. Carbon dioxide crossed the symbolic barrier of 400 parts per million (ppm) during the northern hemisphere spring (compared to pre-industrial levels of 280 ppm), and its global average concentration is expected to cross this threshold for the entire year in 2016.**

Global temperatures have also reached a symbolic and significant milestone. The average global temperature of the air above the Earth's surface broke all previous records last year by a significant margin, measuring around 1 °C above the pre-industrial period. This is already more than halfway towards the Paris Agreement's objective to hold

the increase in the global average temperature to well below 2 °C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5 °C. If this is not achieved, life on the planet is expected to become ever more precarious.

Past emissions constrain the planet to further warming. Because carbon dioxide remains in the atmosphere for centuries, and because the oceans store more than 90% of the extra energy that is accumulating in the climate system, temperatures – and sea levels – will continue to rise. Indeed, the heat content of the global ocean is now at a record high.

As part of the general warming trend, many countries are reporting unprecedented spikes in both maximum daytime and minimum night-time temperatures, as well as more intense heatwaves. Major droughts are being observed in some parts of the world. Simultaneously, "once in a generation" heavy rainstorms are becoming more frequent.



## A FEW EXAMPLES FROM 2015 ILLUSTRATE THIS NEW REALITY:



**Heatwaves affected many regions of the world**, and many local heat records tumbled. Spain saw a new temperature record of 46.2 °C in Valencia and Lanzarote in May, which was 6 °C higher than the previous record for that month. In Egypt, the maximum temperature reached 47.6 °C in Luxor in July. South Africa recorded 48.4 °C in Vredendal in October.

**Drought continued its multi-year parching** of north-east Brazil and western North America, leading to a record-breaking wildfire season in Alaska. Central America, the Caribbean and southern Africa also suffered deficient rainfall (aggravated by El Niño). South-west monsoon rainfall was below normal in India, and drought in Indonesia contributed to extreme wildfires, which affected neighbouring countries.



**Heavy rainfall events are increasing** in response to the warming atmosphere's ability to hold more moisture. Malawi saw its worst-ever flooding in January, and May was the wettest month on record for the contiguous United States of America. Events where 24 hour rainfall totals exceed the normal monthly mean are on the rise. During the monsoon in Pakistan, one station recorded 540 millimetres (mm) of rain in 24 hours, compared to the country's annual average of 336 mm. The Indian city of Chennai received 500 mm of rain in a 24 hour period on 1–2 December – a deluge not witnessed in living memory – and the United Kingdom of Great Britain and Northern Ireland broke its 24 hour rainfall record on 5 December, with 341.4 mm of rainfall recorded in Cumbria.



# FACE THE FUTURE.

**Fortunately, the world's governments are now fully convinced of the scientific evidence of climate change and the need to take urgent action. More research and investment is needed for advancing low-carbon technologies, particularly in the energy sector. But already many policies, technologies and actions are available, and their deployment needs to be scaled up. Individual citizens, community leaders, businesses, civil society organizations, governments and the United Nations system must all contribute.**

Science will continue to play a vital role. Continued and improved scientific observations of the climate system will make it possible to monitor progress in reducing emissions of heat-trapping greenhouse gases. Continued and improved scientific research will lead to a better understanding of climate change at the national and regional levels, of its impacts, and of solutions for adaptation. Science will also help to identify practical solutions for reducing greenhouse gas emissions and steering the international community towards a greener future.

The World Meteorological Organization is committed to contributing to these efforts. WMO co-sponsors and hosts the Intergovernmental Panel on Climate Change, whose regular assessment reports provide a strong basis for policy action. WMO is also the main co-sponsor and the



host of the Global Climate Observing System and the World Climate Research Programme. The growing network of WMO Regional Climate Centres and Climate Outlook Forums is building capacity at the national and regional levels. WMO plans to develop an integrated greenhouse gas monitoring system for informing decision-makers about progress in reducing greenhouse gas emissions.

The world's National Meteorological and Hydrological Services and their partners are also collaborating through WMO to implement the Global Framework for Climate Services. Climate services translate scientific knowledge into practical action for climate resilience, climate adaptation and mitigation, and sustainable development. By integrating climate information, climate predictions, and socioeconomic and other relevant data and information into customized products, climate service providers empower decision-makers to address climate risks and opportunities. Climate services are already guiding action in such climate-sensitive sectors as agriculture, water resources, disaster management, public health and energy.

Because climate change poses a fundamental challenge to humanity, it is integrated into the United Nations Sustainable Development Goals that will drive the global agenda through the year 2030. By acting on the basis of the best available science, and drawing on growing reserves of political will and public support, the international community can succeed in building an environmentally sustainable and economically prosperous world.

**To learn more about climate science for decision-making, please visit these websites:**

[www.wmo.int](http://www.wmo.int)  
[www.gfcs-climate.org](http://www.gfcs-climate.org)  
[www.ipcc.ch](http://www.ipcc.ch)  
[www.wcrp-climate.org](http://www.wcrp-climate.org)  
[www.wmo.int/pages/prog/gcos/](http://www.wmo.int/pages/prog/gcos/)

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