

# Major greenhouse gases hit record highs in 2014: report

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Amid worldwide heat records, eastern North America was the only major region of the world to experience below-average annual temperatures

In 2014 the world's oceans swelled, major greenhouse gases that fuel global warming hit record highs and the planet's surface temperature reached its hottest point in 135 years, international researchers said Thursday.

The findings are contained in the 2014 State of the Climate report, a peer-reviewed study that examines temperature, precipitation and weather events around the world.

A total of 413 scientists from 58 countries around the world contributed to the report, the 25th in a series that is based on data collected by environmental monitoring stations and instruments on land, water, ice and in space.

The warmth reached deep into the oceans and high into the atmosphere, and scientists warned that the climate continues to change quickly compared to the pre-industrial era, with no end in sight.

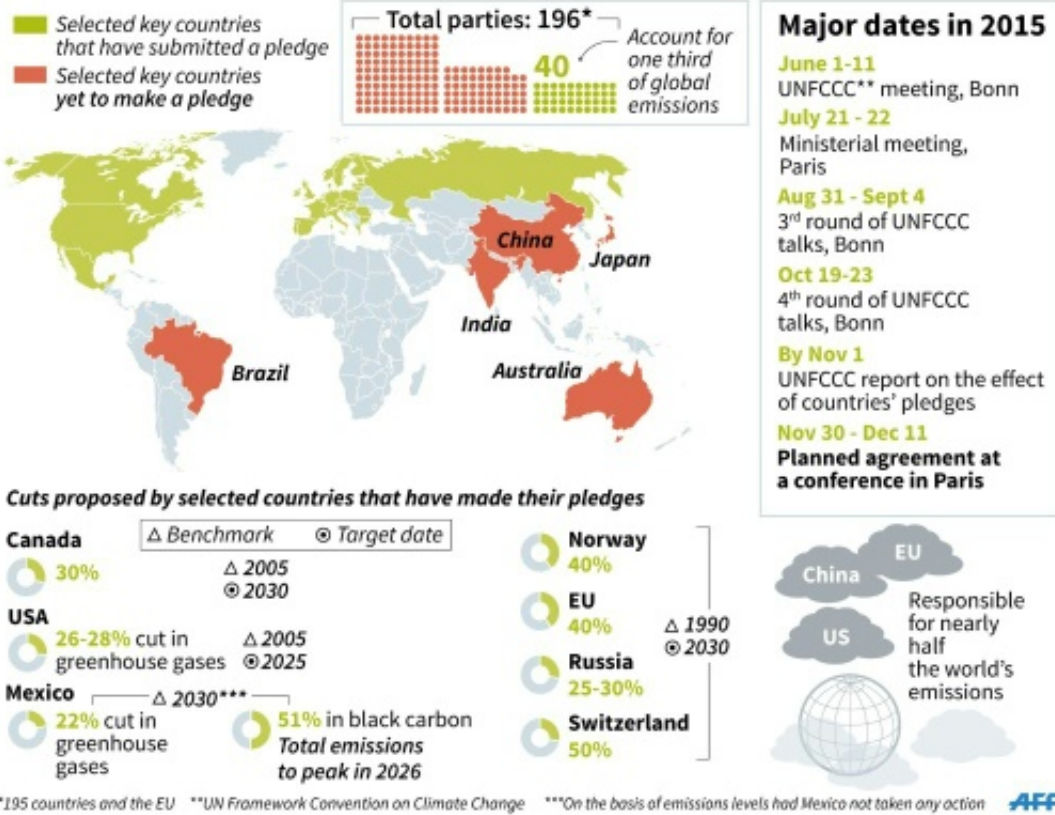
"If we were to freeze greenhouse gases at their current levels, the seas would actually continue to warm for centuries to millennia," said oceanographer Greg Johnson of the National Oceanic and Atmospheric Administration (NOAA) Pacific Marine Environmental Laboratory.

"And that means as they warm they expand, and sea level would continue to rise," he told reporters on a conference call to discuss the report.

## **'Consistent picture'**

Many of the same trends seen in the past two decades continued in 2014.

## National pledges to reduce carbon emissions



Graphic showing pledges made by countries to reduce carbon emissions, and those yet to make a pledge (135 x 111 mm)

"Carbon dioxide, methane, and nitrous oxide—the major greenhouse gases released into Earth's atmosphere—once again all reached record high average atmospheric concentrations for the year," it said.

Amid worldwide heat records, eastern North America was the only major region of the world to experience below-average annual temperatures.

"Europe observed its warmest year on record by a large margin, with close to two dozen countries breaking their previous national

temperature records," it said.

"Many countries in Asia had annual temperatures among their 10 warmest on record; Africa reported above-average temperatures across most of the continent throughout 2014; Australia saw its third warmest year on record, following record heat there in 2013."

In Latin America, Mexico had its warmest year on record, while Argentina and Uruguay each had their second warmest year on record.

"It is a fairly consistent picture," said Thomas Karl, director of NOAA's National Centers for Environmental Information.

## **Oceans rise**

The world's oceans experienced record warmth last year, and sea level was at its highest in modern times, too.

"Owing to both ocean warming and land ice melt contributions, global mean sea level in 2014 was also record high and 67 millimeters (2.6 inches) greater than the 1993 annual mean," when satellite measurements of ocean levels began, said the report.

Johnson said the oceans are a good measure of global warming because they absorb much of the heat and carbon dioxide given off by the burning of fossil fuels.

Unfortunately, even if humankind took strong action to curb fossil fuel use, the trend would not reverse anytime soon, he said.

"I think of it more like a fly wheel or a freight train. It takes a big push to get it going," said Johnson.

"But it is moving now and it will continue to move long after we stop pushing it."

The full report is published in the *Bulletin of the American Meteorological Society*.

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