

# WMO says 2014 will be hottest year ever measured on Earth

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This year will likely be the hottest on record for the planet, with global temperatures 1.03 degrees Fahrenheit higher than the 1961-to-1990 average, according to a new report from the World Meteorological Organization.

This would make 2014 the 38th consecutive year with an anomalously high annual global temperature.

The estimate comes from the WMO's annual compendium on the "Status of the Global Climate." This year's report was released during the U.N. climate talks in Lima, Peru, where diplomats are negotiating a new global climate deal to be signed in Paris next year.

The report uses data from the National Oceanic and Atmospheric Administration, NASA and the United Kingdom's Met Office. To place the findings in a historical context, scientists usually compare temperatures with "normal" temperatures averaged over a 30-year stretch, usually 1961 to 1990.

Driving the temperature rise in 2014 were the oceans -- the Pacific, the polar and subtropical north Atlantic, parts of the south Atlantic, and the Indian Ocean all experienced the warmest temperatures ever recorded. Global sea surface temperatures were 0.45 degree Celsius above the 1961-90 normal.

On land, temperatures were 0.86 C above normal.

## A year for extremes

Scientists do not know what is going on with the oceans this year. In general, oceans absorb much of the heat of global warming, but scientists do not have a good grasp on the phenomenon. They are beginning to study this parameter in the deep oceans, and data for 2014 are available to a depth of 2,000 meters. Scientists have found that the ocean heat content in 2014 was similar to 2013, which set a heat-content record since measurements began in 1955.

As the oceans absorb heat, the water molecules expand and sea levels rise. In early 2014, sea levels rose to a record high. The average sea-level rise over the past two decades has been 3.2 millimeters per year.

The Arctic in 2014 saw the sixth-lowest ice cover in September, covering 1.24 million square kilometers less than the 1981-2010 normal.

Meanwhile, the Antarctic set a high record for ice cover, covering 560,000 square kilometers more than the previous record set in 2013. Scientists are studying the Antarctic to understand why its sea ice extent has been growing since 1979.

Notable heat waves were recorded in South Africa and Tunisia. High temperatures were recorded in Arctic regions of Russia, particularly in the spring.

"In April, ice break up began on the River Ob in Siberia two weeks earlier than normal, the earliest it has happened in the last 100 years," the report states.

Above-average temperatures were recorded in parts of South America, Asia, Europe and Australia. In fact, the United States was the only cool spot in an otherwise sweltering world.

Droughts were recorded in parts of South Africa, China and Brazil, and, in the United States, California, Nevada and Texas were in exceptional drought, receiving just 40 percent of the normal expected rainfall.

India received 12 percent less rainfall than average during its monsoon season. Rainfall deficits were also recorded in New Zealand and Western Europe.

### **Flooding up, tropical storms down**

Floods affected parts of South Africa in March and had an impact on more than 4,000 families. In Kenya, flash floods due to rainfall killed 10 in February. Floods were recorded in northern Pakistan and India in September, which killed 250 people and displaced 100,000.

Extremely heavy rainfall was recorded in parts of Russia, Japan, the United States, Argentina, Serbia and France.

Some 72 tropical storms have occurred in 2014 so far, which is below the 1981-2010 average.

Levels of CO<sub>2</sub> in the atmosphere climbed to 396 parts per million in 2013, the latest year for which data are available. That was 142 percent higher than the levels in the atmosphere at the start of the Industrial Revolution in the 1800s.

About 45 percent of the CO<sub>2</sub> emitted by humans since 2003 went into the atmosphere; the rest was taken up by oceans and land.