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4 key climate change markers hit record highs last year: WMO

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NEW DELHI: Four key climate change indicators — greenhouse gas concentrations, a rise in sea level, ocean heat and ocean acidification — set new records in 2021, the World Meteorological Organisation (WMO) noted in its 'State of Climate' report released Wednesday. The last seven years, from 2015 to '21, were globally the warmest years on record, it stated, adding the average global temperature last year was about 1.1 degree Celsius above the pre-industrial level (1850-1900).

STATE OF CLIMATE REPORT 2021

TEMPERATURE	OCEAN	
<p>Global mean temperature in 2021: 1.11 ± 0.13 degree C above the 1850-1900 average</p>	<p>Higher</p> <ul style="list-style-type: none"> ➤ Global mean sea level reached a new record high in 2021 ➤ Increased at an average 4.5 mm per year over the 	

➤ 2021 was sixth warmest during the most recent seven years (2015-2021)



➤ 2021 was less warm than some recent years due to the influence of La Niña conditions at the start and end of the year

➤ 2015-2021 were, however, the seven warmest years on record

4.5 mm per year over the period 2013 -2021

➤ This is more than double the rate between 1993 and 2002 due to the accelerated loss of ice mass from the ice sheets

➤ This has major implications for hundreds of millions of coastal dwellers

➤ It increases vulnerability to tropical cyclones

Hotter

➤ Ocean heat was record high, affecting marine life

➤ The upper 2000m depth of the ocean continued to warm in 2021

➤ It is expected that it will continue to warm in the future

➤ All data sets agree that ocean warming rates show a particularly strong increase in the past two decades

➤ Much of the ocean experienced at least one 'strong' marine heatwave at some point in 2021

More Acidic

➤ Ocean acidification increases, reaching new record level

➤ Higher acidification threatens organisms and ecosystem services, and hence food security, tourism and coastal protection

GREENHOUSE GAS (GHG)

➤ GHG concentrations reached a new global high in 2020, and continued to increase in 2021 and even in early 2022

➤ Increase in GHG levels in the atmosphere happens due to human activities



MELTING OF ICE

➤ On an average, the world's reference glaciers have thinned by 33 meters (ice-equivalent) since 1950, with 76% of this thinning since 1980

➤ 2021 was a particularly punishing year for glaciers in Canada and the US northwest with record ice mass loss as a result of heatwaves and fires



"The report is a dismal litany of humanity's failure to tackle climate disruption. We must end fossil fuel pollution and accelerate the renewable energy transition, before we incinerate our only home... Time is running out," UN secretary general Antonio Guterres said.

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SEA OF WORRIES

- **Concentration of greenhouse gases** that leads to global warming at a new high, WMO report states
- Highest ever global mean **sea level**, a big concern for millions of coastal dwellers
- **Ocean heat** touches record high, thereby adversely affecting all marine life
- **Ocean acidification** up to new record level, threatening organisms and ecosystem

The WMO also listed individual extreme weather events around the world, noting how these events led to loss and damages of more than \$100 billion in 2021 and severely impacted food security.

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The global mean sea level reached a new record high in 2021, rising an average of 4.5 mm per year over the 2013-2021 period -- a clear sign of how global warming is likely to be disastrous for coastal areas as the catastrophic level of 1.5 degree C rise is not far away.

Such indicators clearly show how the oceans were hotter, higher and more acidic last year, affecting not just human population along the coasts but also the marine life endangering biodiversity and food security. The global mean sea level increased at more than double the previous rate due to accelerating loss of ice mass, making people in coastal areas, including in India,

more vulnerable.

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WMO called extreme weather events like heat waves, cyclones and floods "day-to-day face of climate change" and urged for immediate actions to substantially reduce GHG emissions.

The scary trend on climate change indicators in the report prompted UN Secretary General Antonio Guterres to call for ending fossil fuel pollution, saying that "fossil fuels are a dead end — environmentally and economically".

The UN chief also underlined that the war in Ukraine and its immediate effects on energy prices is yet another wake-up call.

Though the report noted that 2021 was a bit less warm because of a La Niña (cooler than normal waters in the tropical Pacific Ocean) event at the start and end of the year, it said this did not reverse the overall trend of rising temperatures. WMO has already flagged that there is a 50:50 chance of the annual average global temperature temporarily reaching 1.5 degree C above the pre-industrial level at least in one of the next five years -- a situation which may lead to disastrous consequences across the globe with occurrence of more extreme weather events.

"It is just a matter of time before we see another warmest year on record. Our climate is changing before our eyes. The heat trapped by human-induced greenhouse gases will warm the planet for many generations to come... Some glaciers have reached the point of no return and this will have long-term repercussions in a world in which more than two billion people already experience water stress," said WMO secretary general Petteri Taalas.

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Enlisting extreme weather events from across the globe, the report flagged cyclonic events - such as Tauktae (that led to 144 deaths) and Gulab - and floods in India and noted how such events resulted in displacement of more than one lakh people last year.

The report also flagged exceptional heatwaves of western North America and the Mediterranean, Hurricane Ida of North Atlantic, and deadly floods of Henan province of China and Western Europe where some of its most severe flooding was recorded in mid-July last year.