

Climate change: 'Uncharted territory' fears after record hot March

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BBC News Climate & Science



Several parts of India have reported heatwave conditions in recent weeks

Climate change could move "into uncharted territory" if temperatures don't fall by the end of the year, a leading scientist has told the BBC.

The warning came as data showed last month was the world's warmest March on record, extending the run of monthly temperature records to 10 in a row.

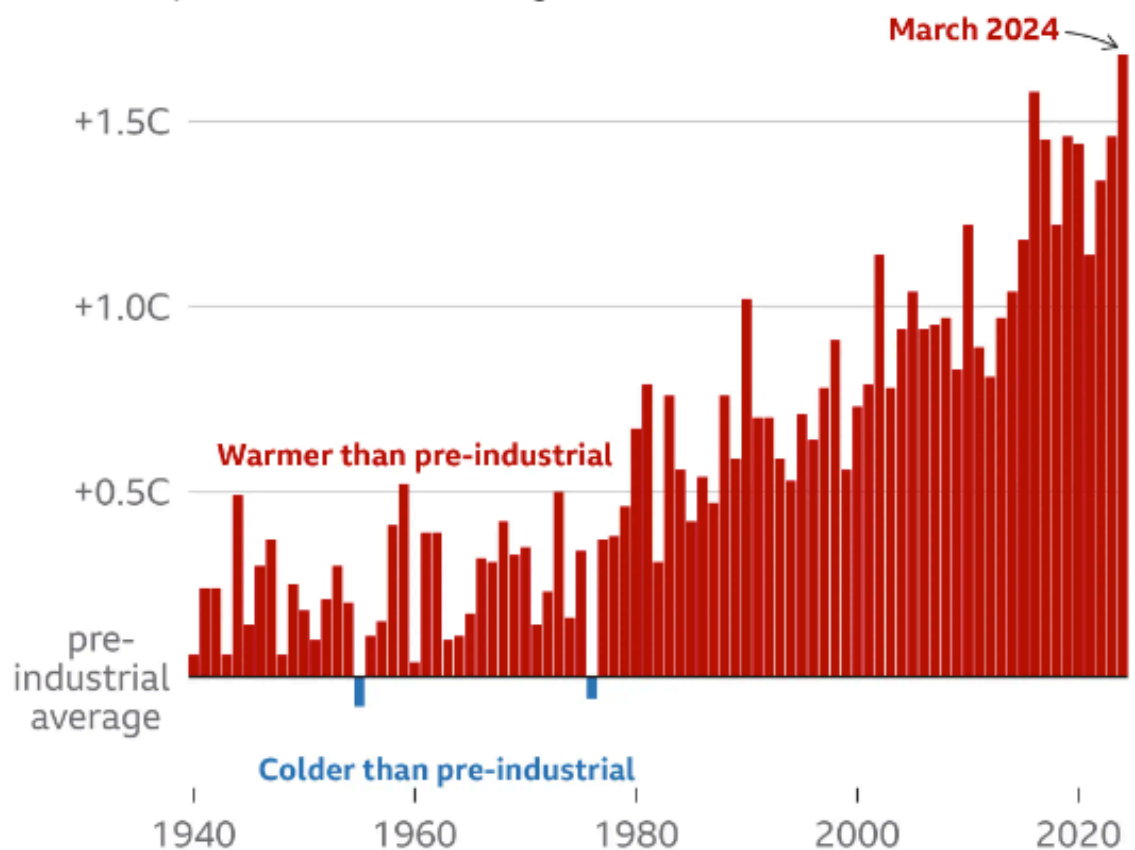
It's fuelled concerns among some that the world could be tipping into a new phase of even faster climate change.

A weather system called El Niño is behind some of the recent heat.

Temperatures should temporarily come down after El Niño peters out in coming months, but some scientists are worried they might not.

March 2024 hottest on record

Global average March temperature by year, compared with the pre-industrial average for March, 1850-1900



Source: ERA5, C3S/ECMWF

BBC

"By the end of the summer, if we're still looking at record breaking temperatures in the North Atlantic or elsewhere, then we really have kind of moved into uncharted territory," Gavin Schmidt, the director of Nasa's Goddard Institute for Space Studies, told BBC News.

- [A simple guide to climate change](#)
- [What are El Niño and La Niña, and how do they change the weather?](#)

March 2024 was 1.68C warmer than "pre-industrial" times - before humans started burning large amounts of fossil fuels - according to the EU's Copernicus Climate Change Service.

For now, longer term warming trends are still pretty much consistent with expectations, and most researchers don't yet believe that the climate has entered a new phase.

But scientists are struggling to explain exactly why the end of 2023 was so warm.

The March record was expected. El Niño, which began last June and peaked in December, has been adding heat to the warmth put into the atmosphere by the burning of fossil fuels, the main driver of high temperatures.

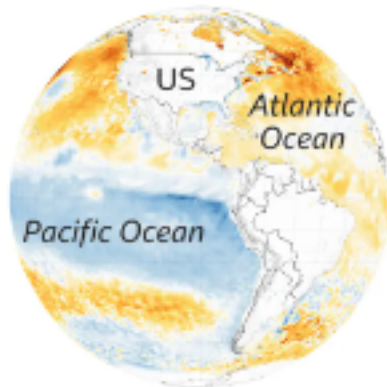
But temperatures began breaking records by a particularly large margin around last September, and back then, El Niño was still developing, so can't explain all of the extra warmth.

El Niño conditions reaching an end

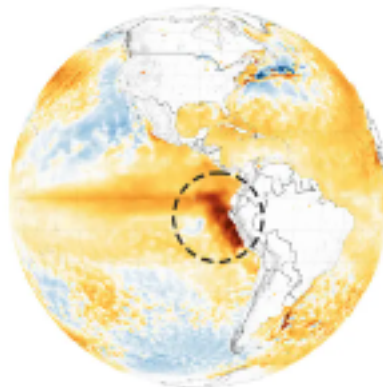
Average monthly sea surface temperature, compared with 1991-2020 average for respective month



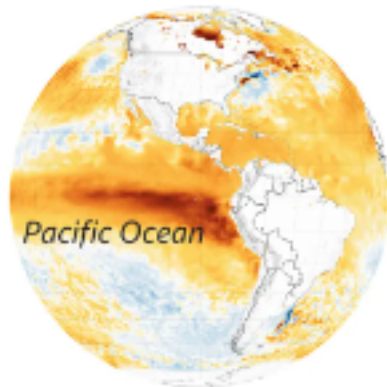
October 2022
La Niña phase - colder than usual ocean temperatures



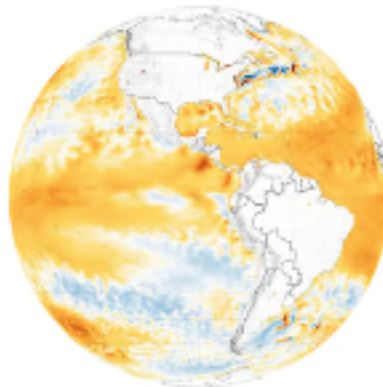
May 2023
Warm El Niño developing in east Pacific



October 2023
El Niño strengthening across the Pacific



March 2024
El Niño weakening in east Pacific



Source: ERA5, C3S/ECMWF



'Harder to predict the future'

Dr Schmidt is concerned about what this means for predictions going forward.

"Our predictions failed quite dramatically for the specifics of 2023, and if previous statistics don't work, then it becomes much harder to say what's going to happen in the future," he said.

"We're still trying to understand why the situation changed so dramatically in the middle of last year, and how long this situation will continue, whether it is a phase shift or whether it's a blip in long-term climate trends," agrees Dr Samantha Burgess from Copernicus. The current El Niño is now waning, and will likely end in the next couple of months.

While scientists aren't sure exactly how conditions in the Pacific will evolve, current predictions suggest it could be replaced by a full La Niña cool phase later this year. That cooling of the sea surface would normally see a temporary drop in global air temperatures, but it remains to be seen exactly how this will evolve.

"We're definitely seeing a weakening of El Niño, but the question is, where will we end up?" says Michelle

L'Heureux, a scientist with the NOAA climate prediction centre.

But scientists are certain about one thing: the way to stop the world warming is to rapidly cut emissions of planet-warming gases.

"We have this window in the coming years to try and mitigate the impacts of climate change, by cutting emissions," says Dr Angélique Melet from Mercator Ocean International.

"I do understand the challenges but it's also true that if we don't act, we are committing ourselves towards a future where 2023 will be the new normal."

"How fast will that happen? It depends on us."