2023–24 El Niño likely to cause record-breaking average temperatures in some areas

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Several areas of the globe—including the Bay of Bengal, the Philippines, and the Caribbean Sea—are likely to experience record-breaking average surface air temperatures in the year period up to June 2024 as a

result of the ongoing El Niño phenomenon. The modeling results, [published](#) in *Scientific Reports*, also suggest that there is an estimated 90% chance of record-breaking global mean surface temperatures occurring over the same period under a moderate or strong El Niño scenario.

The El Niño-Southern Oscillation, centered in the tropical Pacific, is a key driver of climate variability around the world. Both its warm phase, El Niño, and its colder phase, La Niña, influence weather conditions, with the heat released to the atmosphere from the western Pacific Ocean during an El Niño leading to an accelerated rise in annual global mean surface temperatures (GMST). A slight increase in GMST has been strongly linked to significant increases in surface air temperatures during extreme regional heating events.

Congwen Zhu and colleagues modeled the effects of the 2023–24 El Niño on the [regional variation](#) in average surface air temperatures from the 1951–1980 mean between July 2023 and June 2024. They used this period to ensure that the typical peak of an El Niño event, between November and January, was always included.

The authors found that under a moderate El Niño scenario, the Bay of Bengal and the Philippines were predicted to experience record-breaking average surface air temperatures over the period.

Under a strong El Niño, the Caribbean Sea, South China Sea, and areas of the Amazon and Alaska were also predicted to experience record-breaking average surface air temperatures.

The authors also modeled the effects of El Niño on GMST over the same period and found that under a moderate or stronger El Niño, there was a 90% chance that GMST would break the historical record. In the moderate scenario, the authors estimated the 2023–24 GMST as being

1.03–1.10 °C above the benchmark 1951–1980 mean, while for the strong scenario, they estimated GMST as 1.06–1.20 °C above that mean.

The authors warn that record-breaking average temperatures will likely challenge regions' current capability to cope with the consequences of excess heat.

They also note that high surface air temperatures can lead to a significant increase in the likelihood of extreme climate events—including wildfires, tropical cyclones, and heat waves—particularly in oceanic and coastal areas where the higher heat capacity of the ocean leads to climate conditions persisting for extended periods of time.