Experts

El Nino is predicted to return in 2023, and experts warn of record-breaking temperatures

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El Nino is a weather phenomenon characterised by the warming of the Pacific Ocean near the equator. It can have significant impacts on weather patterns around the world, leading to increased

precipitation in some areas and drought in others. The National Oceanic and Atmospheric Administration (NOAA) has predicted that a weak El Nino event is likely to occur in 2023, but it is difficult to say for certain what the exact impacts of this event will be or whether it will cause record-breaking temperatures. It is important to note that El Nino is just one of many factors that can influence global weather patterns, and its effects can vary widely from year to year.

This year is expected to be hotter than 2022, currently ranked by many worldwide databases as the fifth or sixth hottest year. Since El Nino often arrives in the northern hemisphere winter and its warming influence takes months to be felt, 2024 has a much better chance of setting a new world temperature record than any year before.

Average world temperatures have risen by around 1.2 °C due to the greenhouse gases released by human activity. Millions of people have already been hurt by the disastrous heatwaves in the United States and Europe and the raging floods in Pakistan, Nigeria including Malaysia.

The head of a long-range prediction at the UK Met Office, Professor Adam Scaife, has stated, “It is highly conceivable that the next major El Nino might take us beyond 1.5 °C.” There is now about a 50/50 chance that the first year will occur at 1.5 °C during the next five years.

The effects of climate change are increasing, and he stated, “We know that under climate change, the impacts of El Nino events are likely to be stronger.” By combining these two factors, it is predicted that the next El Nino will bring record-breaking heat waves.

Scaife noted that the El Nino–La Nina cycle’s varying effects were visible in many parts of the world. In today’s world, we may use scientific knowledge to predict the occurrence of such events up to a few months in advance. Therefore, we must put it to good use and be more prepared, from the state of emergency services to the selection of agricultural seeds.

Professor James Hansen of Columbia University in New York and his colleagues recently declared, “We suggest that 2024 is likely to be off the chart as the warmest year on record. La Nina is not expected to last for a fourth year. An El Nino of modest strength should be enough to cause unprecedented global warming.” He added that the decreasing air pollution in China, which filters the sun, was also contributing to the rise in temperature.

Scientists agreed that El Nino would amplify already harsh weather but disagreed on how much it would worsen.

As Professor Bill McGuire of University College London in the United Kingdom put it, “When El Nino arrives, the extreme weather that has rampaged across our planet in 2021 and 2022 will fade into insignificance.” Professor Tim Palmer from Oxford University said, “The association between extreme weather and world mean temperature is not that strong, but the thermodynamic consequences of climate change are going to make the anomalies we get from an El Nino year just that much more dramatic.”

After three years of above-average rainfall, Australia may see one of the warmest, driest El Nino seasons on record, raising the likelihood of extreme heatwaves, droughts, and fires, according to climate modelling data released in early January by the country’s Bureau of Meteorology. The chances of an El Nino developing between August and October were pegged at 66% by the United States National Oceanic and Atmospheric Administration in December.

The predicted El Nino magnitude was still unknown. According to Professor Andy Turner of the University of Reading, many seasonal projection models suggest the introduction of moderate El Nino conditions from the summer of 2023. In June, the experts predicted a clearer picture will emerge.

The El Nino–La Nina phenomenon is the primary driver of global climatic variability. In La Nina years, the trade winds that blow across the Pacific Ocean from east to west are more robust, which causes the region's warm surface waters to be blown to the west and the region's deeper, colder water to be drawn to the east. When the trade winds die, El Nino occurs because the warmer waters may move back eastward, which overwhelms the calmer waters and raises world temperatures.

It gets hotter and drier in the countries that border the West Pacific, such as Australia and Indonesia. Scaife observed, "You tend to get lots of droughts, lots of wildfires," while China can experience flooding in the Yangtze basin following large El Ninos.

It is also possible to control the monsoons in India and the rains in southern Africa. More precipitation and flooding are possible in other areas, including those experiencing droughts, such as East Africa and the south of the US. The Amazon is drier than the rest of the continent in South America, despite rapidly approaching a potentially catastrophic tipping point.

According to Turner, "The effects of El Nino may also be felt as far as the northern hemisphere mid-latitudes," with wetter circumstances in Spain from the summer onwards and drier conditions on the eastern seaboard of the US in the following winter and spring.

"That is crucially significant for countries looking at long-term adaptation and will need much higher-resolution climate models," Palmer said, referring to whether climate change favours more El Nino or more La Nina events. Larger computing systems are required for that to happen.

Like the Large Hadron Collider, which brings together particle physicists from around the world to do what no one country could, Palmer and his colleagues have advocated for creating a $1 billion worldwide centre for climate modelling.

In Malaysia, we have the Mean Projections page that gathers the indicators to be used by the Climate Change Knowledge Portal (CCKP) to conduct an in-depth analysis of potential outcomes of future climate scenarios and risks that may arise from climatic shifts. Seasonal change over extended periods is visualised via a spatial presentation of data as a seasonal cycle, time series, or heat plot and can be explored as the projected mean or anomaly (change). Each month's data is available for download on the Data Download page, and it is possible to conduct annual or seasonal analyses on the data. Additional customisation of the analysis is possible by switching between several climatological and emission projections or Shared Socioeconomic Pathways (SSPs). SSPs aim to provide insight into potential future climates based on specified emissions, mitigation efforts, and development pathways.

Both multi-model ensemble and model-specific indicator research are possible. The range and distribution of the most likely projected outcomes of change in the climate system for a chosen SSP are represented by multi-model ensembles, whereas understanding the variability across projected climates can be aided by examining individual models. It is important to exercise caution when analysing results from individual models due to the potential for significant bias. Some modelling groups did not report humidity, pressure, or wind fields on a daily basis, limiting the number of models that could be used to compute certain climate indicators. Unless one has a solid grasp of the

assumptions and biases inherent in a single model, it is recommended that analysis relies on multi-model ensembles.

The Coupled Model Inter-comparison Projects (CMIPs) compile global climate models, and their results are used to make projections about the future under the watchful eye of the World Climate Research Program. The presented data are CMIP6, which was collected during the CMIPs' sixth phase. The IPCC Assessment Reports' data come from the CMIPs.

Additionally, CIMPs allow for evaluating the performance of climate change models against observational data, which helps improve the models and increase their credibility. Overall, CMIPs play a key role in advancing our understanding of the Earth's climate system and the potential impacts of human activities on it.

References

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Ts. Dr. Azizul Helmi Sofian

The writer is a Senior Lecturer at the Faculty of Chemical and Process Engineering Technology (FTKKP), Universiti Malaysia Pahang (UMP).

E-mail: azizulh@ump.edu.my