

EL NIÑO & LA NIÑA PHENOMENA

Understanding the Climate Pattern in Malaysia



WHAT IS ENSO?

The El Niño–Southern Oscillation (ENSO) is a naturally occurring climate pattern arising from interactions between the tropical Pacific Ocean and atmosphere. It involves changes in sea-surface temperatures, atmospheric pressure, winds and rainfall. El Niño and La Niña events recur irregularly, typically every 2–7 years, and can influence weather worldwide.

Three Phases of ENSO



Neutral

Neither El Niño nor La Niña is present. Equatorial Pacific sea-surface temperatures, trade winds and rainfall patterns are generally near their long-term averages.



El Niño (Warm Phase)

Warmer-than-average sea-surface temperatures in the central and eastern equatorial Pacific occur alongside weaker easterly trade winds. Tropical Pacific rainfall shifts eastwards, influencing weather patterns worldwide.



La Niña (Cool Phase)

Cooler-than-average sea-surface temperatures in the central and eastern equatorial Pacific occur alongside stronger easterly trade winds. Rainfall generally increases over the western equatorial Pacific and decreases over the central equatorial Pacific.

KEY ENSO INDICATORS

OCEANIC NIÑO INDEX (ONI)

Three-month running mean of sea-surface temperature anomalies in the Niño 3.4 region, measured in °C relative to a 30-year climatological baseline.

NIÑO 3.4 REGION

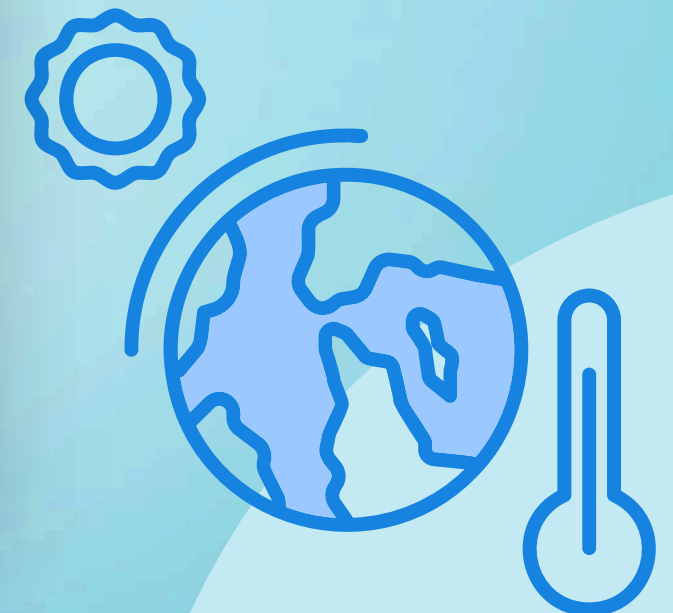
Central equatorial Pacific zone (170°W–120°W, 5°S–5°N) monitored for warm/cool shifts.

MULTIVARIATE ENSO INDEX (MEI)

An index combining sea surface temperature, sea level pressure, surface winds, and outgoing longwave radiation over overlapping two-month periods.

SOUTHERN OSCILLATION INDEX (SOI)

Atmospheric pressure differential between Tahiti and Darwin, Australia.



EL NIÑO REGIONAL DYNAMICS

Atmospheric Shifts and Seasonal Rainfall in Malaysia

Global Atmospheric Mechanics

During El Niño, the Pacific Walker circulation weakens and reorganises, shifting tropical convection and rainfall towards the central and eastern equatorial Pacific. This generally favours reduced rainfall over parts of Southeast Asia, including Malaysia, although effects vary between locations, seasons and events.

Seasonal Distribution in Malaysia

- Sabah and Sarawak: Moderate or strong El Niño events can bring substantial rainfall deficits. METMalaysia highlights June–August and November–February as typical affected periods
- Peninsular Malaysia: METMalaysia highlights June–August rainfall deficits. However, the response varies, and deficits can also occur during the winter monsoon, depending on the El Niño event.



Source from The Star February 2026



Source from The Star August 2026

EL NIÑO (WARM PHASE) IMPACTS ON MALAYSIA



Heatwaves & Drought

El Niño brings significantly reduced rainfall and prolonged hot, dry spells across Malaysia, leading to extreme ambient temperatures, water supply strain, and increased health risks.



Transboundary Haze

Dry conditions severely worsen local peatland and forest fires and accelerate transboundary haze, resulting in poor air quality (PM2.5) and reduced visibility.



Agricultural Stress

Critical soil moisture deficits disrupt crop development, lowering seasonal yields for oil palm and paddy.

LA NIÑA (COOL PHASE): IMPACTS ON MALAYSIA



Heavy Rainfall & Flooding

Intense rainfall across Malaysia, leading to widespread flooding in low-lying areas. Rivers overflow, causing damage to homes and infrastructure.



Agricultural Disruption

Waterlogged fields submerge crops, delay planting schedules, and ruin harvests (paddy and oil palm).



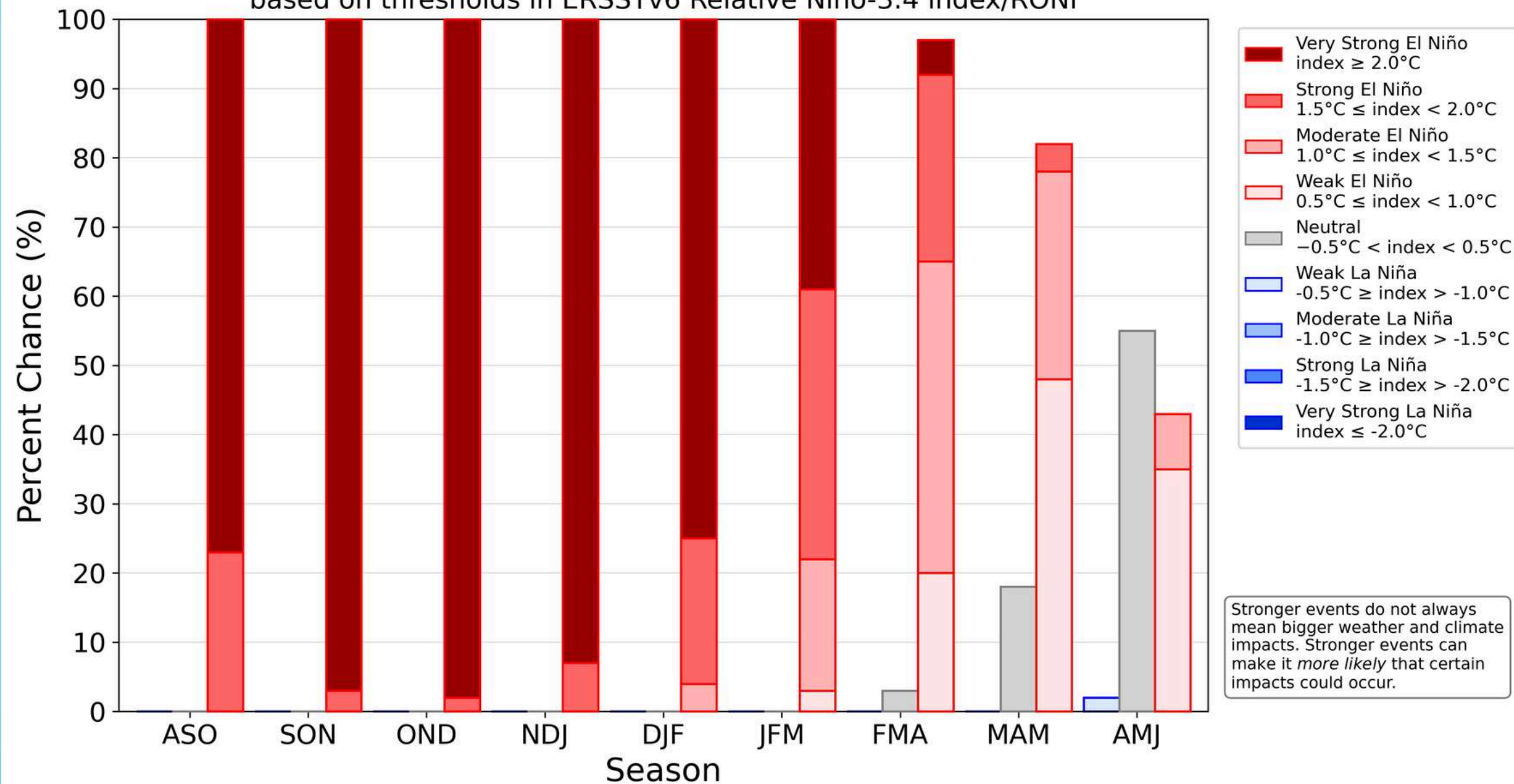
Supply Chain Disruption

Flooded roads and heavy weather disrupt port operations and logistics, leading to market delivery delays and price increases.

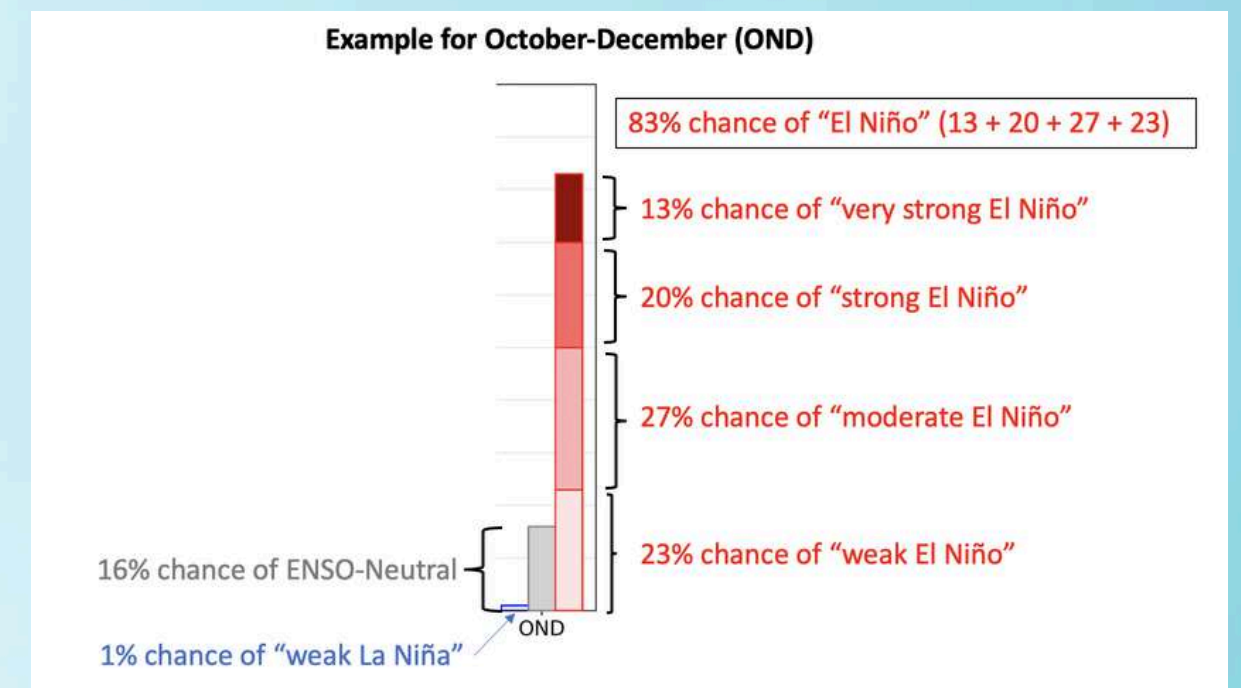
ENSO STRENGTH PROBABILITIES

NOAA CPC ENSO Strength Probabilities (issued September 2026)

based on thresholds in ERSSTv6 Relative Niño-3.4 index/RONI



NOAA Climate Prediction Center provides 3-month overlapping seasonal forecasts tracking probabilities of Weak, Moderate, Strong, and Very Strong events.



Source from Official NOAA CPC ENSO Strength Probabilities issued September 2026

SUPER EL NIÑO IN MALAYSIA

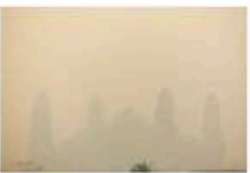

Start preparing for Super El Nino now

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By VENESA DEVI and BENJAMIN LEE
Sunday, 26 Jul 2026




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JOHOR BARU: Malaysia must prepare for the expected Super El Nino that is likely to also lead to potential water shortage, say climate experts.

Universiti Kebangsaan Malaysia (UKM) Institute of Climate Change senior lecturer Dr Zulfaqr Sa'adi said the effects of the phenomenon can potentially become more severe in the months that follow.

"The World Meteorological Organisation and Malaysian Meteorological Department (MetMalaysia) estimate that a Super El Nino could hit us sometime between October and January 2027, which coincides with the northeast monsoon season when there is normally more rainfall," he said.

While he believes there should be sufficient rain to replenish reservoirs during the northeast monsoon, which lasts from November to March, he is worried about the post-monsoon period, where peninsular Malaysia typically sees less rainfall, especially around March and April.

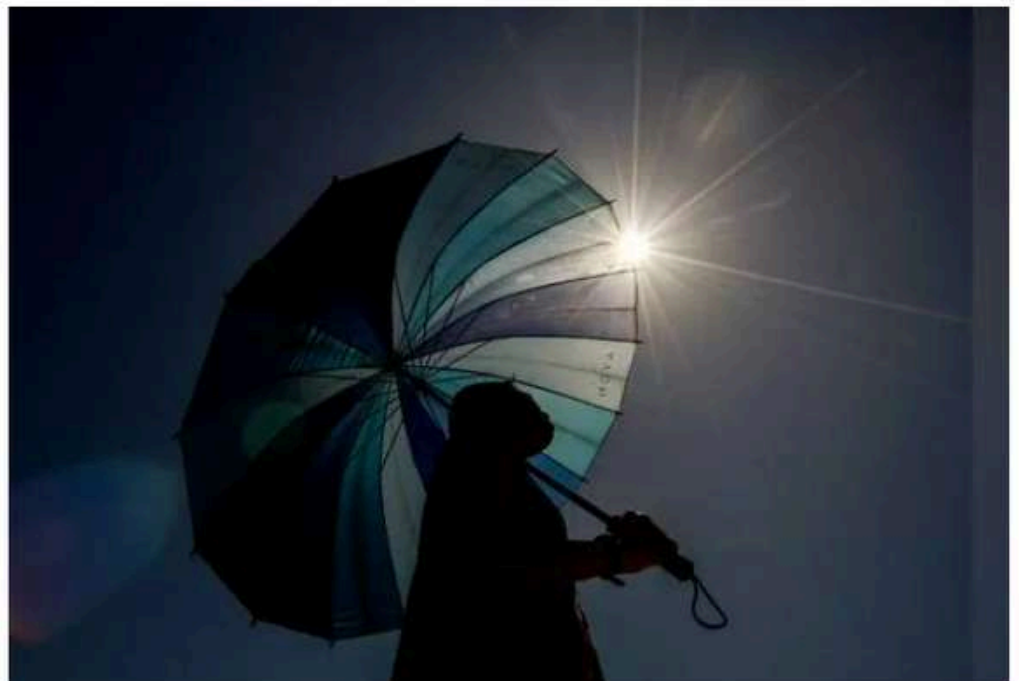
"If the Super El Nino reduces the amount of rainfall during the monsoon, there may not be enough water stored for the months to come," he said in cautioning authorities to be mindful of this when carrying out controlled water releases from reservoirs before the monsoon.

Source from The Star July 2026


LIVE Video Malaysia Dunia Politik Hiburan Bisnes Sukan Rancangan Gaya

Potensi El Nino Super kini melebihi 90 peratus, boleh setanding situasi 1997/98 - MetMalaysia

Bernama
18/08/2026 | 21:35 MYT



Fenomena El Nino 2026-2027 berpotensi menjadi antara paling ekstrem pernah direkodkan dan dijangka melepasi atau sekurang-kurangnya menyamai impak pada tahun 1997 hingga 1998. - Gambar fail

Source from Astro Awani August 2026


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sebelum inilah macam Super Nino pada tahun 1997

El-Nino dan Jerebu, Apa puncanya? #BAWAOTAK

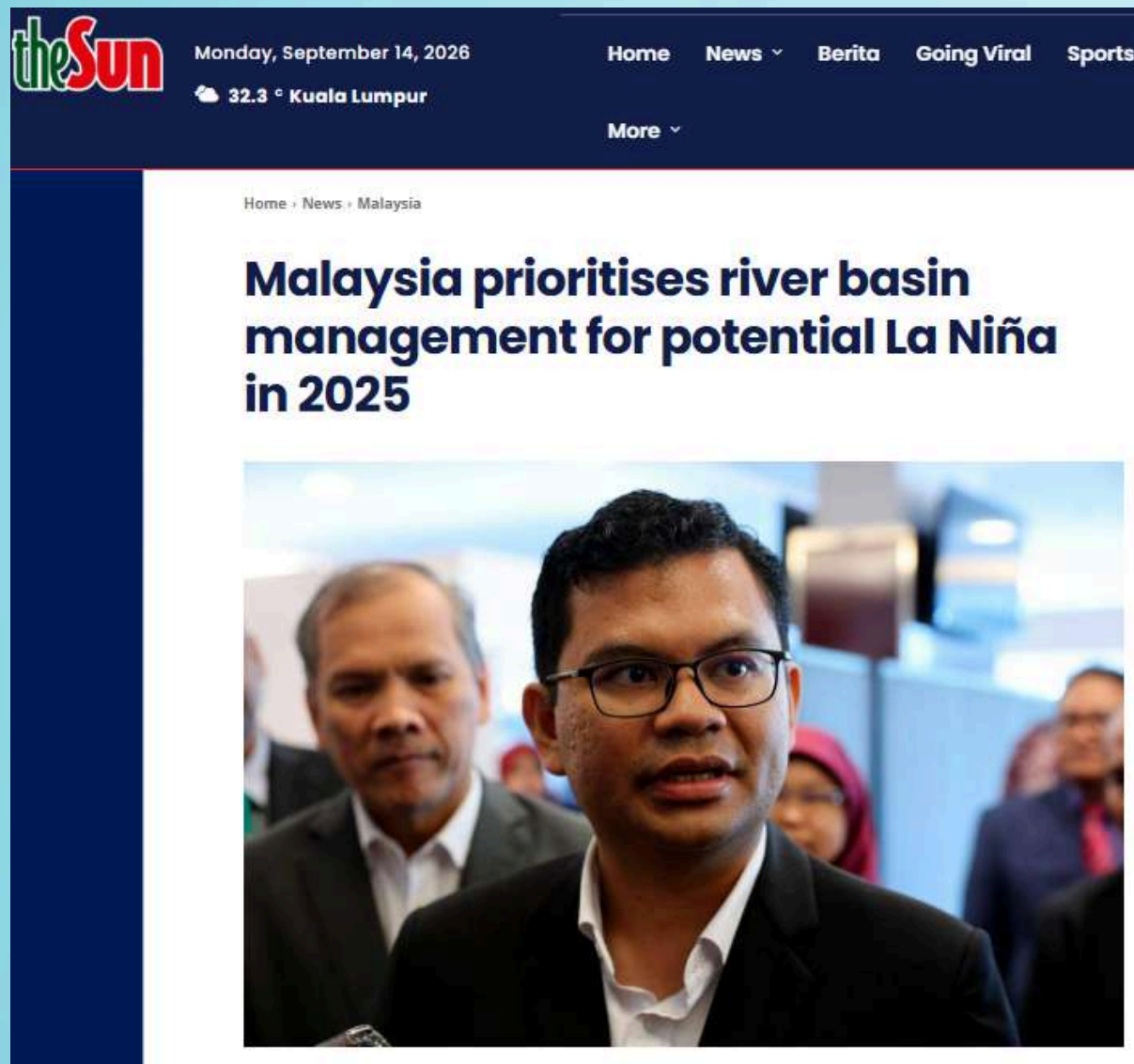
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Panel untuk episod kali ini adalah Dr Maggie Chel Gee Ooi yang merupakan Pengerusi Institut Perubahan Iklim, Universiti Kebangsaan Malaysia (UKM).

Website: ...more

Source from Youtube UKMPakarunding

LA NIÑA IN MALAYSIA



Source from The Sun Malaysia September 2025



Source from malaymail October 2025



Source from The Star December 2025

DATA SOURCES & RESOURCES

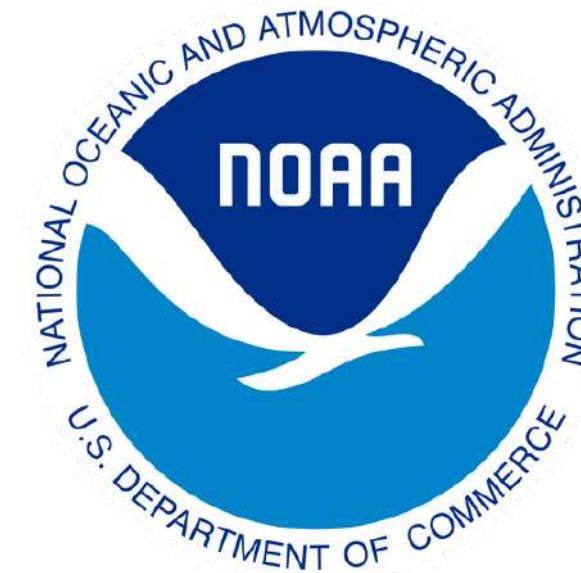
MALAYSIA



METMalaysia

National data, reports and climate forecast
<https://www.met.gov.my/>

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CONCLUSION

El Niño brings complex impacts that present both unexpected challenges and opportunities, making it essential to look beyond the risks and capture potential benefits.

Unlike sudden natural disasters, El Niño is highly predictable months in advance. This long lead time gives communities, businesses, and governments the crucial window needed to prepare rather than just react. Raw weather data is not enough. We need practical intelligence that turns forecasts into clear steps so everyone knows their risk levels and exactly what actions to take.

We build a safer nation by making climate awareness part of daily life, using early warnings to assess risks, take quick action, and keep learning for the future.

