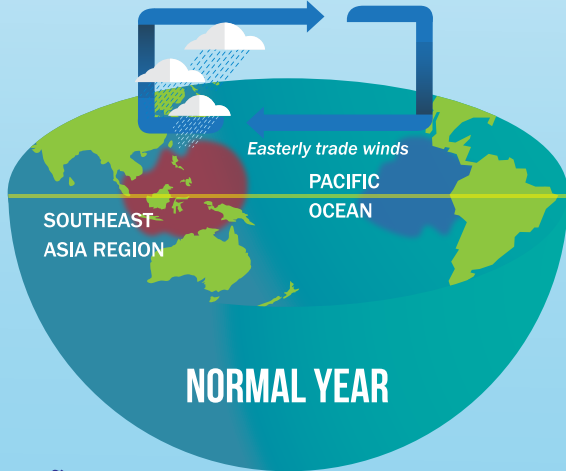


EL NIÑO

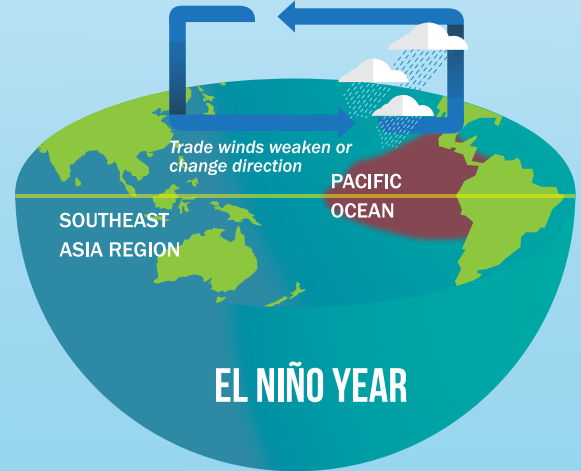
An El Niño occurs when the sea surface temperature in the eastern and central tropical Pacific is much warmer than normal over a sustained period. It is known to disrupt normal weather patterns in various regions of the world, and occurs on average every 3-5 years. La Niña, the opposite of El Niño, occurs when the sea surface temperature in the tropical Pacific is cooler than normal.

The westward blowing trade winds lead to cold water in the equatorial eastern Pacific Ocean



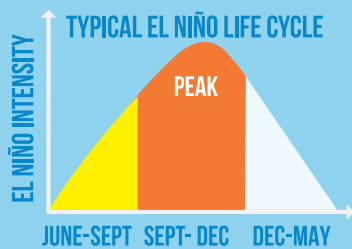
The trade winds weaken or reverse direction, leading to warmer waters in the equatorial eastern Pacific Ocean

EQUATOR



EL NIÑO EVENT

- 1 Changes in the sea surface temperature over the tropical Pacific Ocean alter the atmospheric circulation above it.
- 2 As a result of changes in atmospheric circulation, large-scale system of rain clouds over the western tropical Pacific shift eastward.
- 3 The shift in large-scale rain clouds disrupts local and regional weather patterns.



EL NIÑO EPISODES OCCUR EVERY **3~5** YEARS

IN THE LAST 30 YEARS

7 La Niña Events

8 El Niño Events

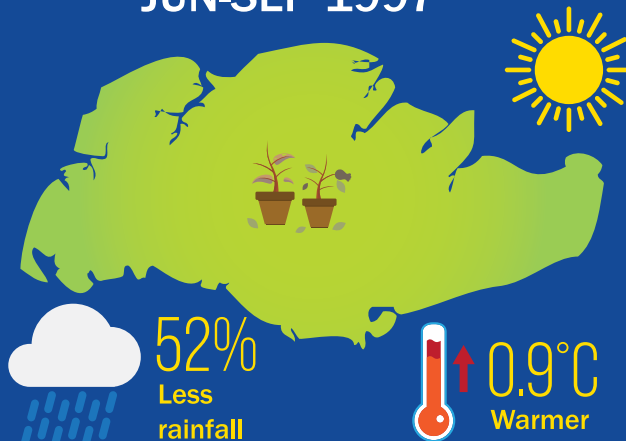
IMPACT ON SINGAPORE

TYPICALLY LESS RAINFALL AND WARMER TEMPERATURES ESPECIALLY DURING THE SOUTHWEST MONSOON SEASON (JUN-SEP)

EVERY EL NIÑO IS DIFFERENT IN TERMS OF ITS:

1. **MAGNITUDE** of warming of the tropical Pacific Ocean sea-surface temperatures
2. **IMPACT** of each event is different and not necessarily strongly linked to its strength

JUN-SEP 1997

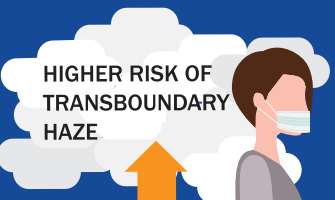


MAIN IMPACT



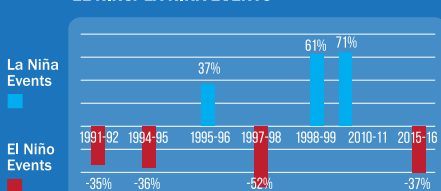
MAIN IMPACT IS USUALLY FELT DURING THE SOUTHWEST MONSOON SEASON (JUN - SEP), ALTHOUGH OTHER SEASONS MAY BE AFFECTED AS WELL

HIGHER RISK OF TRANSBOUNDARY HAZE



Due to prolonged drier weather during the Southwest Monsoon season

RAINFALL IMPACT FROM NOTABLE PAST EL NIÑO/LA NIÑA EVENTS



Percentage increase or decrease in rainfall for Jun-Sep in the starting year of the El Niño or La Niña events with respect to 1981-2010 climatological average

1997-1998 EL NIÑO IS ONE OF THE STRONGEST ON RECORD

STRONG 2015-16 EL NIÑO IS COMPARABLE TO THE 1997-98 EVENT