

ENSO and its implications for Australia

Lesson Map:

<https://storymaps.arcgis.com/stories/72044706e85f4c90b092707e80609af6>

Engage

Enso since the beginning.

- ➔ Click on the map URL above to open this lesson's Story Map, titled *ENSO and its implications for Australia*. Scroll down to begin.
- ? What does ENSO Stand for? [*El Niño-Southern Oscillation*]
- ? What is ENSO? [*El Niño-Southern Oscillation climate phenomenon characterized by the periodic fluctuation in sea surface temperatures and atmospheric conditions in the tropical Pacific Ocean.*]
- ? What is the difference between el Niño and la Niña events? [*El Niño: warmer-than-average sea surface temperatures in the central and eastern Pacific. La Niña: cooler-than-average sea surface temperatures, resulting in opposite atmospheric effects*]

Explore

- Explore the Swipe map for Sea Temperatures and precipitation.
 - Is the information of sea temperatures map and sea temperatures images consistent? [*It is consistent in general patterns, however there are slight variations as there are different El Niño and La Niña years.*]
 - Which conclusions can you draw from the sea and surface temperatures comparison swipe web maps and images? [*During La Niña periods warmer sea temperatures in the east of Australian continent. Conversely, during El Niño western coast sea temperatures increase and eastern remain "stable".*]
 - Which conclusions can you draw from the precipitation comparison swipe web maps? [*Precipitation levels during La Niña periods are higher for the Australian Continent, specifically in the eastern and northern sectors. During El Niño generalized dryer conditions among all the continent*]

Download student worksheet [here](#).

Time
45 minutes

Activity

Investigate ENSO and its implications to Australia.

Learning Outcome

Students will be able to:

- Define key terminology of the ENSO and understand its calculations.
- Examine the spatial relationship temperature and rainfall during ENSO events.
- Understand the implications of ENSO in Australia.
- Consider which strategies that can be used to mitigate impacts generated by ENSO.

ACARA Curriculum Link

Senior secondary curriculum:
[ACSES030](#), [ACSES057](#)

F – 10 Curriculum: [ACSIS203](#), [ACSIS205](#)
(Grade 10)

Teacher Feedback:

To share your feedback on this, or any Spatial Activity, please contact education@esriaustralia.com.au

Explain

Deep dive into ENSO

- Scroll down and read *the roadmap that shows the impacts of ENSO during El Niño - La Niña time frames*. Take notes if required and stop to discuss any necessary points, complementary research may be required for answering following questions.

- ? Why do you think Darwin and Tahiti are the locations chosen for evaluating the strength of El Nino and la Nina? [*Because of their strategic positions on opposite sides of the equatorial Pacific, provide a useful measure of the atmospheric pressure changes associated with the El Niño-Southern Oscillation (ENSO). They serve as key locations for the Southern Oscillation Index (SOI) calculation.*]

- ? During 1982-1983 El Niño event which were the most affected crops by water shortages? Hint: you may need to do extra research beyond the StoryMap [*Mainly wheat and barley.*]

- ? Which was a positive effect during 2020-2021 La Niña event? [*Reservoir Filling: Many reservoirs and dams that had previously experienced drought-related declines in water levels saw a significant increase in their capacity*]

- ? Which were the effects on Mangrove's due to ENSO in Gulf of Carpentaria? [*mass dieback of mangroves due to extreme oscillations in mean sea level destabilize critical shoreline*]

Extend

Consolidating my knowledge of ENSO

- ➔ Scroll down and read the section titled *What can we do about ENSO?* Take notes if required and stop to discuss as necessary.
- Create a one-sentence example strategy for each point of alternatives to mitigate ENSO in your country:

Term	Strategy
Early Warning and Monitoring	<i>Answers might vary, one example provided: local farms and small landowners to be connected by a network of environmental indicators that indicate seasons of moisture, dryness, fertility, etc.</i>
Adaptive Strategies	<i>Answers might vary, one example provided: Build water storage facilities to be filled in wet and cool periods, to be used during drought.</i>
International Cooperation	<i>Answers might vary, one example provided: Alliance of Pacific Ocean countries affected by ENSO for humanitarian help missions.</i>
Research and Education	<i>Answers might vary, one example provided: Research on comprehending duration and drivers that contribute to intensity of ENSO Events.</i>

Next Steps:

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