

## El Niño and the southern oscillation index

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noticed that at intervals of about 3–6 years the water became warmer than usual, and that this produced flooding rain and poor anchovy catches. They called these events El Niño, which means 'Christ child', so named because the events occurred at Christmas time.

### What happens in an El Niño?

During an El Niño event, the strong westerly trade winds over the Pacific break down and the pool of warm water in the equatorial western Pacific moves east. While the waters off Peru warm up more than is normal, the waters in the western Pacific cool down, and not as much moisture is picked up by

### Introduction

Each year, around Christmas time, the waters off the Peruvian coast warm up a little. The locals

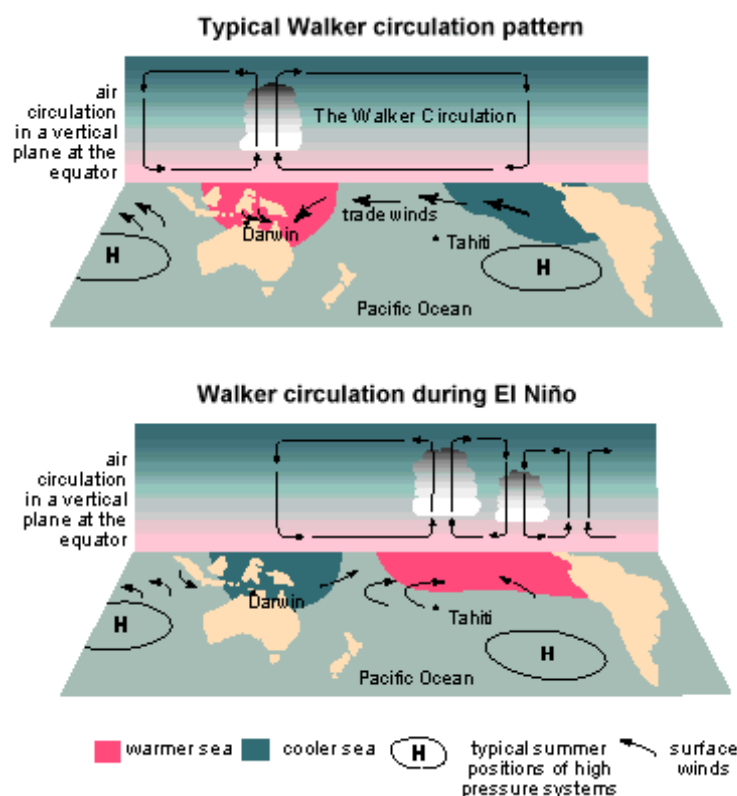


Figure 1: The El Niño phenomenon changes the weather pattern known to meteorologists as the Walker circulation. Diagrams courtesy of the Australian Bureau of Meteorology.

the weakened trade winds blowing to Australia. There is also subsidence (highs) rather than uplift (lows) in the western equatorial Pacific. As a result, rainfall is often less than average in eastern Australia. Not all major droughts in eastern Australia have been associated with an El Niño, but the vast majority have. For this reason, if an El Niño establishes, you should be cautious in your management.

## The SOI

The El Niño has an influence on the air movement over the Pacific through heat transfer to the atmosphere. This is most readily picked up in the southern oscillation index (SOI), which measures the difference in air pressure between Darwin and Tahiti and compares it with the seasonal norm. Most commonly used is the 30-day or end-of-month SOI. Negative SOI is frequently seen with El Niño ocean conditions.

## Using El Niño in management decisions

It is important to establish how relevant the SOI is in indicating the likely weather for your district. The connection is not the same for all regions of Australia. It is often better in winter and spring than at other times, but this also is not consistent over all regions.

The stronger the correlation, the more you can make management decisions based on the SOI. The SOI can be used to help establish the chance of many events, such as late frost or summer rainfall. This can be particularly useful in summer cropping areas and when you are making decisions on planting times for frost-sensitive crops. Another use would be in helping you make decisions about fertiliser application. If the SOI predicts above-average rainfall, the yield potential of your crop may be higher and you may want to apply extra urea or fertiliser, or increase your plant densities, or grow longer-season varieties which are often higher yielding.

With livestock enterprises, you can use the SOI to help weigh up decisions on numbers of stock to have, whether to conserve forage, to jet or drench sheep (if a wet summer is expected), and many other management decisions.

The El Niño drives changes in the SOI, which is merely one tool that can be used to help manage climatic risk in your business.

It should not be used in isolation, but rather with other forecasts, computer software, historical records, commodity prices and all the other sources of management information. In the past, we have paid a lot of attention to managing all the other factors in the farming system, while the weather has been passed off as something completely out of our control. Although we cannot control the weather, we can manage around it better – in much the same way that we manage commodity prices despite having no control over them.

NSW Department of Primary Industries can provide climate risk management workshops for land managers. These workshops look at such factors as weather maps and satellite pictures, forecasting tools like the SOI and El Niño, local historical data showing drought frequency, depth and duration, and how to use this information to improve our ability to manage around the climatic variability that exists.

## Further information

Further information is available on Drought and climate forecasting [www.dpi.nsw.gov.au/reader/climate/8416](http://www.dpi.nsw.gov.au/reader/climate/8416)

## Acknowledgment

The authors wish to acknowledge the assistance given by Bruce Buckley, formerly of the Bureau of Meteorology.

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ISSN 1832-6668

Replaces Agnote ET-8

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Job number 7185