El Niño or La Niña

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In previous articles I have claimed that long term weather predictions are not very accurate. That is still true. The climate in New Zealand is chaotic and difficult to forecast. Our warm oceanic climate is full of surprises. As growers you probably know this only too well. I recently heard a good saying I would like to share with you. "Climate is what we think will happen, weather is what we actually get". However, we do have one thing we can look at to see what the weather might be like. The Southern Oscillation Index. . Notice I say 'might'. It isn't a guarantee but it will be worth a look.

What is it?

The Southern Oscillation Index is a natural feature of our climate and is very complicated. In simple terms it refers to the periodic warming of the ocean on the tropical South American coast and along the equator. It is calculated from the pressure difference between Tahiti and Darwin. There are two typical states, El Niño and La Niña. El Niño or little boy is negative and La Niña or little girl is positive. It has been measured for a long time as shown in Table 1. From this table you should be able to see how high and low the index can go and also how quickly it can move. A good example is April to May 1998. The index moved from -24.4 to 0.5 in one month. Quite a big and rapid move. The high is 34.8 in August 1917 and as low as -42.6 in April 2005. Recent values are about half that so it gives you some idea of the range.

What does it mean to me?

In terms of the effects you may notice, it depends on where you live. Below are extracts from the NIWA website.

El Niño

> "During El Niño, New Zealand tends to experience stronger or more frequent winds from the west in summer, typically leading to drought in east coast areas and more rain in the west. In winter, the winds tend to be more from the south, bringing colder conditions to both the land and the surrounding ocean. In spring and autumn south–westerly winds are more common."

La Niña

> "La Niña events have different impacts on New Zealand's climate. More north–easterly winds are characteristic, which tend to bring moist, rainy conditions to the north–east of the North Island, and reduced rainfall to the south and south–west of the South Island. Therefore, some areas, such as central Otago and South Canterbury, can experience drought in both El Niño and La Niña. Warmer than normal temperatures typically occur over much of the country during La Niña, although there are regional and seasonal exceptions."

It is important to note that the probability of these events increases. It doesn't mean they will happen. Every El Niño event doesn't produce a drought and every La Niña event doesn't produce warmer weather.

Apple growers in Hawkes Bay will remember the 1998 season. The values for that year are shown in Figure 1. It produced a lot of water core in Cox Orange Pippin and Braeburn. Figure 1 shows that year was a strong El Niño year that was very hot in summer. The estimated cost to New Zealand was $1 billion.

You would do well to plan your management around any extremes in the Southern Oscillation Index when we have an El Niño or La Niña event forecasted.

The current situation

According to NIWA "La Niña conditions, which redeveloped in the tropical Pacific during December, are expected to continue through autumn, and then dissipate." According to the MetService "After several months of being in neutral ENSO (El Nino Southern Oscillation) territory, sea surface temperatures (SST) in the eastern equatorial Pacific Ocean cooled during December swinging the ocean into a La Nina pattern. Sub-surface temperatures are also showing a cooling trend east of the dateline, spreading westwards. Computer models have caught up with these changes and their recent output indicates La Nina conditions are likely to persist until at least March 2009." We can see what they are referring to by looking at Figure 1. Definitely a La Niña pattern. HortPlus clients who access MetWatch Online can track the index themselves by looking at the new "Southern Oscillation Index" feature we have introduced.

Futher reading

There has been a lot written on this subject. Probably your best bet is to start your favourite internet search tool and try searching for "Southern Oscillation Index" or "ENSO" [this stands for El Niño – Southern Oscillation]. You could also try "El Niño or La Niña". I would recommend you read the following as well:

http://www.niwa.cri.nz/edu/students/enln
http://www.bom.gov.au/climate/glossary/soi.shtml
http://www.ogp.noaa.gov/mpe/csi/econhd/2003/shea.htm
http://www.pmel.noaa.gov/tao/elnino/nino-home.html

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1875	11.3	11.8	0.2	9.4	6.8	17.2	-5.6	12.3	10.5	-8.0	-2.7	-3.6
1877	-9.7	-4.5	-4.7	-9.6	3.6	-16.8	-10.2	-8.2	-17.2	-16.0	-12.6	-12.6
1878	-8.7	-21.1	-16.5	-8.9	-2.1	-1.1	16.9	13.8	17.7	16.9	15.1	17.9
1879	12.7	14.3	13.2	12.7	2.1	16.4	21.8	22.6	18.9	15.2	9.6	-5.5
1880	18.9	7.7	14.2	6.3	12.3	9.1	1.6	14.3	8.1	4.8	7.2	-1.9
1881	-7.2	-5.5	1.8	0.2	-4.2	-4.7	-5.6	-11.4	-13.6	-23.9	7.2	3.8
1882	4.6	-1.3	5.1	1.2	6.8	-12.8	-21.3	-26.4	-14.0	-2.6	2.6	18.3
1883	8.0	9.1	-25.3	14.4	23.9	3.4	-10.2	1.4	-8.2	4.8	5.2	-15.2
1884	-12.5	-5.8	9.4	-15.4	1.3	9.1	-3.0	-5.0	-7.0	4.2	-1.4	-12.8
1885	-16.3	1.6	5.1	-0.5	-4.3	-14.4	-5.0	-9.5	-4.0	-17.8	-15.9	5.2
1886	-0.8	1.8	2.9	4.5	6.8	-5.8	7.4	13.6	13.8	13.4	18.5	14.4
1887	12.2	11.8	10.0	9.4	-4.3	5.8	4.9	4.6	8.1	4.8	-5.3	5.2
1888	-3.6	-2.2	-11.7	-23.6	-9.8	-16.0	-14.7	-8.9	-9.4	-14.7	-12.6	-2.4
1889	-25.9	-9.7	-27.5	-0.5	-1.8	22.8	1.6	2.1	11.1	4.2	23.0	22.0
1890	26.9	11.8	14.3	6.8	3.6	6.8	-2.3	-3.1	9.3	3.6	2.6	3.6
1891	15.6	-3.6	-5.3	4.5	0.3	-1.5	-5.3	-8.9	-16.8	8.6	-4.7	-4.5
1892	2.7	-10.2	11.1	6.8	10.8	19.6	7.4	5.9	6.3	8.5	-0.7	3.7
1893	11.3	7.7	-1.4	1.2	-3.5	10.7	14.8	7.9	5.7	7.9	2.6	3.6
1894	17.6	10.8	5.6	-3.0	-5.1	-1.5	2.3	-5.7	-1.8	1.8	7.2	0.1
1895	5.6	3.0	-0.3	-7.1	-8.2	-4.7	-8.4	-8.3	-4.0	-4.6	-9.6	-3.6
1896	1.3	-4.9	-6.3	-8.8	-42.2	-30.5	-20.6	-22.4	-19.0	-19.0	-11.9	-14.2
1897	-12.5	-7.4	-16.6	-17.8	-16.8	0.2	-2.3	0.6	8.2	1.8	-9.6	18.3
1898	7.0	4.3	19.2	15.1	-1.9	-2.3	5.1	2.1	3.2	-8.7	-2.7	-0.4
1899	13.2	9.1	13.6	4.5	-7.4	-10.4	-5.6	-10.1	-1.6	6.1	15.8	-3.6
1900	-7.3	-4.6	-26.3	-18.7	-7.2	-26.1	10.8	7.9	-16.6	-17.2	-4.6	-5.5
1901	-9.1	3.0	9.4	4.6	-6.1	19.8	14.8	5.9	-18.0	-32.1	-8.6	-1.9
1902	17.0	-2.2	11.6	7.8	7.6	2.6	1.6	-8.9	-17.8	-7.4	-3.4	-3.6
1903	-9.2	-10.2	17.6	17.7	7.4	-8.6	5.1	6.1	8.7	4.2	1.3	15.9
1904	14.1	16.2	9.4	31.7	5.2	-7.1	-8.9	0.8	8.2	1.2	-17.2	2.6
1905	-9.3	-16.9	-30.3	-22.6	-37.4	-31.4	-21.3	-7.6	-7.0	-4.6	-17.9	-13.1
1906	-3.5	-7.4	-5.2	-8.8	1.3	-3.9	6.8	15.5	18.3	9.1	21.7	4.7
1907	5.1	1.6	-0.3	4.5	10.8	8.3	-4.3	-8.2	8.2	8.6	-2.8	8.8
1908	19.6	7.7	0.2	16.8	-1.1	-2.3	2.2	5.3	17.7	7.9	2.6	-5.5
1909	-2.5	-3.2	-0.3	-14.5	2.1	22.8	10.7	9.6	5.8	4.2	9.2	4.7
1910	6.6	16.2	12.7	6.3	0.6	22.8	20.6	9.8	15.3	10.3	19.7	15.9
1911	3.2	1.6	3.5	2.8	-8.2	-12.0	-12.8	-12.1	-8.8	-11.7	-7.3	-1.4
1912	-9.7	-17.3	-9.8	-24.1	-13.8	-6.3	-6.8	-2.6	-4.0	-6.0	2.6	-8.0
1913	-3.5	-5.8	1.3	-6.3	-8.2	-3.9	-1.7	-7.6	-9.4	-3.2	-11.9	-7.8
1914	-5.4	2.0	9.4	-14.5	-6.3	-16.8	-10.8	-17.2	-12.4	-8.6	-11.9	-1.4
1915	-21.6	-2.2	-30.4	-17.8	-12.3	6.6	14.8	7.2	7.5	2.8	-14.6	9.8
1916	5.6	-3.6	-6.3	-0.5	6.8	9.1	25.7	16.2	4.5	8.1	9.6	15.4
1917	5.1	10.8	18.1	21.8	21.8	21.2	28.3	34.8	29.7	15.2	21.0	22.5
1918	14.6	16.6	-2.9	16.8	10.8	-4.7	-14.1	-4.4	-8.2	-5.0	1.2	-8.8
1919	-14.9	-11.2	-12.8	-3.0	-7.4	-10.4	-8.9	-8.9	-5.8	-18.5	-11.3	-9.1
1920	1.8	-1.7	-4.1	0.3	-2.7	6.6	9.4	5.3	5.1	-4.3	-0.1	9.8
1921	10.8	9.7	8.9	-7.1	2.1	22.8	2.9	-6.9	5.1	9.7	8.5	8.2
1922	8.0	9.1	5.6	-6.5	-5.1	5.8	2.2	-1.2	5.1	5.1	8.5	11.0
1923	5.6	4.4	8.9	9.6	2.1	1.8	-11.5	-19.5	-14.8	-4.2	-12.6	2.1
1924	-5.4	1.1	2.4	-15.4	11.5	8.3	7.4	10.4	8.1	7.9	11.6	9.2
1925	5.6	13.8	13.9	14.4	1.1	-4.7	-13.4	-16.8	-9.4	-12.9	-9.3	-7.8
1926	-4.4	14.6	-13.3	-7.1	-2.7	-1.1	-1.0	2.6	1.4	4.2	1.2	6.2
1927	5.1	1.1	18.1	6.8	6.8	8.3	6.1	-5.0	-8.4	-4.3	-8.8	7.7
1928	18.1	10.5	13.8	11.9	-2.7	7.9	-8.4	9.8	8.1	8.1	2.6	11.8
1929	16.0	18.8	9.1	4.5	-12.2	1.8	1.6	6.1	-8.4	7.9	11.1	5.7
1930	12.7	7.7	1.8	-3.8	2.1	-4.5	-4.3	-1.8	-7.0	3.6	1.9	-1.4
1931	7.0	-14.9	5.6	8.8	13.1	19.8	9.4	6.1	5.1	-12.9	-4.7	4.7
1932	1.8	-3.6	-2.5	-2.1	2.8	-4.7	-5.0	-6.9	-8.8	-4.3	-4.7	3.2
1933	-11.1	4.9	-2.9	3.6	6.8	-3.9	3.5	-9.5	3.0	3.6	7.2	8.2
1934	6.5	8.1	0.2	6.1	-7.4	10.7	2.9	-22.4	-8.4	4.2	13.1	-2.4
1935	6.5	-4.6	12.2	2.8	-6.6	-2.3	-6.8	2.1	6.3	7.5	3.8	-4.6
1936	-2.8	8.6	1.8	22.6	4.4	1.6	4.2	-8.9	2.6	-8.1	-13.9	3.6
1937	9.4	-5.8	-6.2	2.8	-6.3	3.4	-5.6	2.3	8.6	-2.5	-2.6	-6.7
1938	7.5	1.4	3.9	3.6	13.1	19.8	18.5	13.8	7.5	-12.8	1.9	11.9
1939	17.0	7.7	11.8	9.4	-1.1	-1.8	8.1	-8.5	-9.4	-14.7	-8.8	-8.8
1940	-0.1	-4.1	-10.6	-9.6	-14.5	-19.3	-18.4	-18.6	-19.6	-18.4	-4.7	-29.4
1941	-9.7	-15.4	-10.8	-11.2	-5.9	-14.4	-20.9	-19.1	-8.2	-29.2	-9.3	-9.6
1942	-13.0	-3.6	-5.8	-5.5	5.2	8.3	-1.0	4.0	8.7	8.5	-4.8	13.0
1943	9.4	10.5	4.8	13.6	2.8	-7.9	2.9	7.8	5.7	9.1	3.9	-9.6
1944	-9.2	-3.9	-5.8	-5.5	-1.1	-3.9	-8.9	3.3	2.6	-8.8	-4.7	4.2
1945	5.1	6.3	13.2	-7.1	-0.3	8.3	3.5	11.7	8.7	2.4	-3.4	9.7
1946	-2.5	4.4	-2.9	9.6	-11.4	-8.6	-10.2	-4.4	-15.0	-12.3	-1.4	-5.5
1947	-4.9	-4.1	11.6	-4.6	-13.7	2.6	9.4	7.2	11.7	-1.9	9.2	5.2
1948	-3.6	3.7	-4.1	2.8	-3.6	-4.7	0.9	-9.4	-7.6	4.1	4.6	-5.6
1949	-7.3	2.0	6.6	1.2	-5.8	-12.8	-1.7	-4.4	2.0	9.4	-6.3	7.7
1950	8.1	17.9	17.6	16.8	7.6	26.3	21.1	12.3	6.9	17.1	12.5	23.0
1951	16.5	9.6	-1.4	-1.3	6.6	5.8	-8.2	-8.5	-7.0	-8.0	-3.4	-3.6
1952	-9.2	-7.9	0.2	-8.8	6.8	7.4	3.5	-3.7	-3.4	1.8	-0.7	-12.6
1953	2.2	-4.6	-5.8	-0.5	-31.9	-2.3	-1.0	-17.2	-13.0	-8.1	2.6	-4.8
1954	9.0	-3.6	-0.3	6.8	4.4	-1.5	4.2	10.4	4.5	1.8	3.9	12.8
1955	-5.4	15.2	2.9	-3.0	13.1	16.4	19.2	14.9	14.1	16.2	15.1	9.2
1956	11.3	12.4	9.4	11.1	17.9	12.3	12.5	11.9	8.2	16.3	1.9	18.3
1957	5.6	-2.2	-0.3	1.2	-12.2	-2.3	0.9	-9.5	-18.6	-1.3	-11.9	-3.5
1958	-14.8	4.9	-1.4	1.2	-6.2	0.2	2.2	7.8	-3.4	-1.9	-4.7	-9.6
1959	-8.7	-14.0	8.4	-3.8	2.8	-8.3	-5.0	-5.0	6.2	4.2	11.1	3.2
1960	8.3	-2.2	5.6	7.8	5.2	-3.3	4.8	6.6	8.9	-0.7	7.2	6.7
1961	-2.5	9.3	-20.8	9.4	1.3	-1.1	2.2	6.1	6.9	-5.0	7.2	13.9
1962	17.0	3.3	-1.4	1.2	12.3	5.8	-8.4	4.6	5.1	10.3	5.2	9.6
1963	9.4	7.0	7.3	6.1	2.8	9.6	1.0	-2.4	-5.2	-12.9	-9.3	11.6
1964	-4.0	-0.3	8.4	13.5	2.8	7.4	6.8	14.3	14.1	12.8	2.6	3.8
1965	-8.8	1.6	2.9	-12.9	-0.3	-12.8	-22.6	-11.4	-13.2	-11.1	-17.9	1.6
1966	12.0	-4.1	-13.8	-7.1	-9.0	1.8	-1.0	4.0	-2.2	-3.5	-0.1	-4.8
1967	14.6	12.8	7.8	-3.8	-3.5	5.6	1.6	5.9	5.1	-4.1	-4.8	-5.5
1968	4.1	9.6	-3.3	-3.8	12.7	12.3	7.4	8.1	-2.8	-1.8	-3.4	2.1
1969	13.6	-4.9	1.8	-8.8	-8.6	5.8	-8.9	-4.4	-10.8	-11.7	-0.1	2.7
1970	-18.1	-10.7	1.8	-4.6	2.1	9.8	-5.6	4.0	12.9	10.3	19.7	17.4
1971	2.7	15.7	19.2	22.6	9.2	2.6	1.6	14.4	15.1	17.7	7.2	2.1
1972	3.7	8.2	2.4	-5.5	-16.1	-12.8	-18.6	-8.9	-14.8	-11.1	-3.4	-12.1
1973	-3.6	-13.5	0.8	-2.1	2.8	12.3	6.1	12.3	13.6	9.7	21.6	16.9
1974	20.8	16.2	20.3	11.1	10.7	2.8	12.8	6.6	12.3	8.5	-1.4	-0.5
1975	-4.9	3.3	11.6	14.4	6.6	15.8	21.1	20.7	22.5	17.7	13.8	19.6
1976	11.9	12.9	13.2	1.2	2.1	0.2	12.9	-12.1	-13.0	3.0	9.8	-3.8
1977	-4.8	7.7	-9.5	-9.6	-11.4	-17.7	-14.7	-12.1	-9.4	-12.9	-14.6	-18.6
1978	-3.8	-24.4	-6.9	-7.9	16.3	5.8	6.1	1.4	8.8	-4.2	-2.8	-0.8
1979	-4.8	6.7	-3.9	-5.5	3.8	5.8	-8.2	-5.0	1.4	-2.5	-4.7	-7.3
1980	2.2	1.1	-6.5	-12.9	-3.5	-4.7	-1.7	1.4	-8.2	-1.9	-3.4	-0.9
1981	2.7	-3.2	-19.8	-5.5	7.6	11.5	9.4	5.9	7.5	-5.0	2.6	4.7
1982	9.4	8.6	2.4	-3.8	-8.2	-20.1	-19.3	-23.6	-21.4	-28.2	-31.1	-21.3
1983	-28.6	-30.3	-29.8	-17.8	6.6	-3.1	-7.6	6.1	9.9	4.2	-9.7	9.1
1984	1.3	5.8	-5.8	2.8	6.1	8.7	2.2	2.7	2.0	-5.8	3.9	-1.4
1985	-3.5	8.7	-2.9	18.4	2.8	-9.6	-2.3	8.5	8.2	-9.6	-1.4	2.1
1986	8.0	-10.7	0.8	1.2	6.6	10.7	2.2	-7.6	-5.2	6.1	11.9	13.6
1987	-6.3	-12.6	-16.8	-24.4	-21.6	-20.1	-18.6	-14.0	-11.2	-5.6	-1.4	-4.5
1988	-1.1	-4.6	2.4	-1.3	10.8	-3.9	11.3	14.9	20.1	14.6	21.0	19.8
1989	13.2	9.1	6.7	21.6	14.7	7.4	9.4	-8.3	8.7	7.3	-2.8	-5.6
1990	-1.1	-17.3	-8.5	-0.5	13.1	1.8	6.5	-5.0	-7.6	1.8	-8.3	-2.4
1991	5.1	8.6	-10.6	-12.9	-19.1	-5.5	-1.7	-7.6	-16.9	-12.9	7.5	14.7
1992	-25.4	-9.3	-24.2	-18.7	0.5	-12.8	-6.9	1.4	8.8	-17.2	-7.2	-5.5
1993	-9.2	-7.9	-6.5	-21.1	-8.2	-16.0	-10.8	-14.0	-7.6	-13.6	9.6	1.6
1994	-3.6	8.6	-10.6	-22.8	-13.3	-10.4	-16.0	-17.2	-17.2	-14.1	-7.3	-11.6
1995	-4.0	-2.7	3.8	-16.2	-8.0	-1.8	4.2	8.8	3.2	-1.3	1.2	-5.9
1996	9.4	1.1	6.2	7.8	1.1	13.8	6.8	4.6	6.9	4.2	-0.1	7.2
1997	4.1	13.3	-5.5	-16.2	-22.4	-24.1	-9.5	-19.6	-14.8	-17.8	-15.2	-9.1
1998	23.6	-19.2	-30.5	-24.3	0.6	9.8	14.8	9.8	11.1	10.9	13.5	13.3
1999	15.6	8.6	8.9	19.5	1.3	1.8	4.8	2.1	-8.4	9.1	13.1	12.8
2000	5.1	12.8	9.4	10.8	3.6	-5.5	-3.7	5.3	8.9	8.7	22.6	7.7
2001	8.9	11.9	6.7	0.3	-9.0	1.9	3.0	-8.9	1.4	-1.9	7.2	-9.1
2002	2.7	7.7	-5.2	-3.8	-14.5	-8.3	-7.6	-14.6	-7.6	-7.4	-6.8	-10.6
2003	-3.6	-7.4	-6.8	-5.5	-7.4	-12.8	2.9	-1.8	-2.2	-1.9	-3.4	9.8
2004	11.6	8.6	0.2	-16.4	13.1	-14.4	-8.9	-7.6	-2.8	-3.7	-8.3	-8.8
2005	1.8	-29.1	0.2	-11.2	-14.5	2.6	0.9	-8.9	3.9	10.9	-2.7	8.6
2006	12.7	9.1	13.8	15.2	-9.8	6.5	8.9	-15.9	-4.1	-15.3	-1.4	-3.8
2007	-7.3	-2.7	-1.4	-3.8	-2.7	5.3	-4.3	2.7	1.5	9.4	9.8	14.4
2008	14.1	21.3	12.2	4.5	-4.3	6.8	2.2	9.1	14.1	13.4	17.1	13.3
2009	9.4											

Table 1 : Historical Southern Oscillation Index values

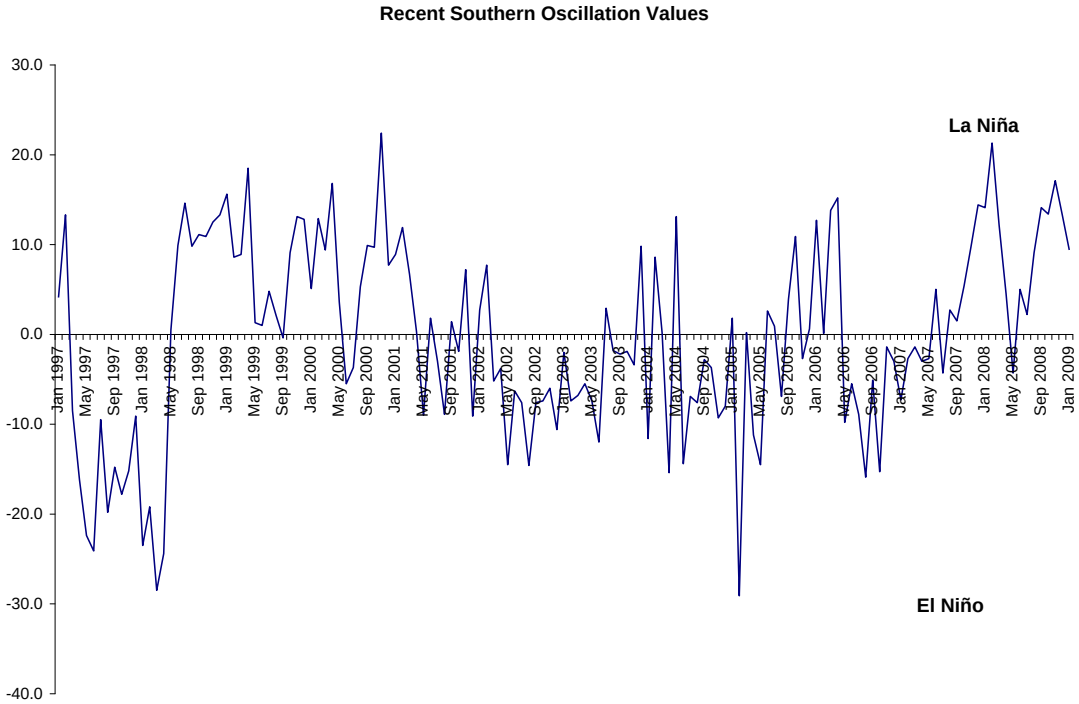
Recent Southern Oscillation Values
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
La Niña
El Niño
Jan 1997
May 1997
Sep 1997
Jan 1998
May 1998
Sep 1998
Jan 1999
May 1999
Sep 1999
Jan 2000
May 2000
Sep 2000
Jan 2001
May 2001
Sep 2001
Jan 2002
May 2002
Sep 2002
Jan 2003
May 2003
Sep 2003
Jan 2004
May 2004
Sep 2004
Jan 2005
May 2005
Sep 2005
Jan 2006
May 2006
Sep 2006
Jan 2007
May 2007
Sep 2007
Jan 2008
May 2008
Sep 2008
Jan 2009

Figure 1