

El Niño & La Niña relation with typhoon

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一 · 前言及研究動機：

由於前年大陸發生雪災，台灣也受自然災害(颱風)影響，因此我們希望找尋 El Niño and La Niña 和 typhoon 彼此的關係！

二 · 研究步驟：

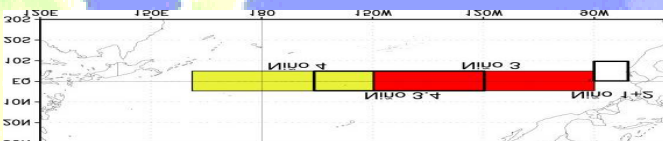
1 · 定義：El Niño & La Niña

- Use NOAA
- El Niño: characterized by a positive ONI greater than or equal to $+0.5^{\circ}\text{C}$
- La Niña: characterized by a negative ONI less than or equal to -0.5°C
- Oceanic Niño Index (ONI)

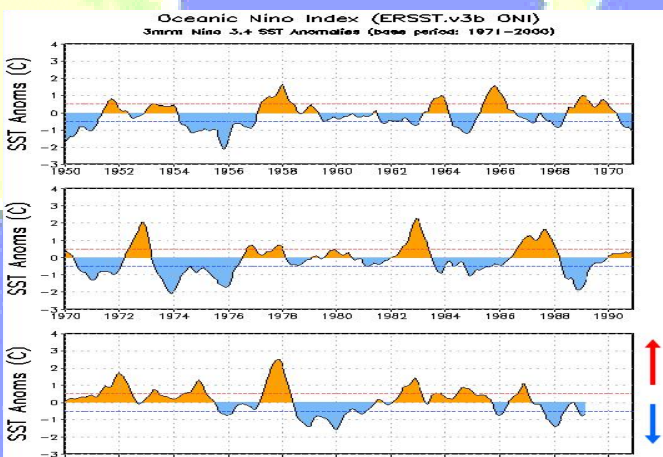
--By historical standards, to be classified as a full-fledged El Niño or La Niña episode, these thresholds must be exceeded for a period of at least 5 consecutive overlapping 3-month seasons.

Year	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1950	-1.7	-1.5	-1.3	-1.4	-1.3	-1.1	-0.8	-0.8	-0.8	-0.9	-0.9	-1.0	
1951	-1.0	-0.9	-0.6	-0.3	-0.2	0.2	0.4	0.7	0.7	0.8	0.7	0.6	
1952	0.3	0.1	0.1	0.2	0.1	-0.1	-0.3	-0.3	-0.2	-0.2	-0.1	0.0	
1953	0.2	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	
1954	0.5	0.3	-0.1	-0.5	-0.7	-0.7	-0.8	-1.0	-1.2	-1.1	-1.1	-1.1	
1955	-1.0	-0.9	-0.9	-1.0	-1.0	-1.0	-1.0	-1.0	-1.4	-1.8	-2.0	-1.9	
1956	-1.3	-0.9	-0.7	-0.6	-0.6	-0.6	-0.7	-0.8	-0.8	-0.9	-0.9	-0.8	
1957	-0.5	-0.1	0.3	0.6	0.7	0.9	0.9	0.9	0.9	1.0	1.2	1.5	
1958	1.7	1.5	1.2	0.8	0.6	0.5	0.3	0.1	0.0	0.0	0.2	0.4	
1959	0.4	0.5	0.4	0.2	0.0	-0.2	-0.4	-0.5	-0.4	-0.3	-0.2	-0.2	
1960	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	
1961	-0.2	-0.2	-0.2	-0.1	0.1	0.2	0.0	-0.3	-0.6	-0.6	-0.5	-0.4	
1962	-0.4	-0.4	-0.4	-0.5	-0.4	-0.4	-0.3	-0.3	-0.8	-0.6	-0.7	-0.7	
1963	-0.6	-0.3	0.0	0.1	0.1	0.3	0.6	0.8	0.9	0.9	1.0	1.0	
1964	0.8	0.4	-0.1	-0.5	-0.8	-0.8	-0.9	-1.0	-1.1	-1.2	-1.2	-1.0	
1965	-0.8	-0.4	-0.2	0.0	0.3	0.6	1.0	1.2	1.4	1.5	1.6	1.5	
1966	1.2	1.0	0.8	0.5	0.2	0.2	0.2	0.0	-0.2	-0.2	-0.3	-0.3	
1967	-0.4	-0.4	-0.6	-0.5	-0.3	0.0	0.0	-0.2	-0.4	-0.5	-0.4	-0.5	
1968	-0.7	-0.9	-0.8	-0.7	-0.3	0.0	0.3	0.4	0.3	0.4	0.7	0.9	
1969	1.0	1.0	0.9	0.7	0.6	0.5	0.4	0.4	0.6	0.7	0.8	0.7	
1970	0.5	0.3	0.2	0.1	0.0	-0.3	-0.6	-0.8	-0.9	-0.8	-0.9	-1.1	
1971	-1.3	-1.3	-1.1	-0.9	-0.8	-0.8	-0.8	-0.8	-0.8	-0.9	-1.0	-0.9	
1972	-0.7	-0.4	0.0	0.2	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.1	
1973	1.8	1.2	0.5	-0.1	-0.6	-0.9	-1.1	-1.3	-1.4	-1.7	-2.0	-2.1	
1974	-1.9	-1.7	-1.3	-1.1	-0.9	-0.8	-0.6	-0.5	-0.7	-0.9	-0.7	-0.7	
1975	-0.6	-0.6	-0.7	-0.8	-0.9	-1.1	-1.2	-1.3	-1.5	-1.6	-1.7	-1.7	

2 · Niño regions :

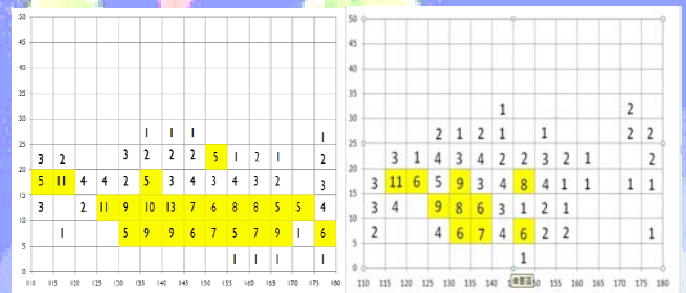


3 · ONI



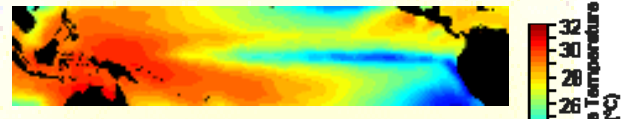
El Niño

La Niña

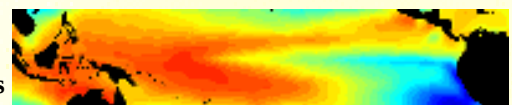


5 · La Niña & Normal Conditions & El Niño

La Niña

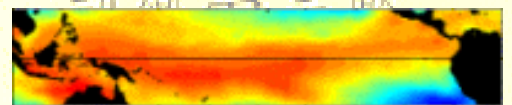


Normal

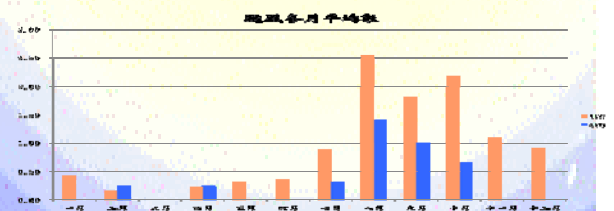


Conditions

El Niño



6 · El Nino & La Nina 颱風 (紅: El Nino 藍: La Nina)



三 · 總結：

- 1 · 颱風在 La Niña 發生時，生成位置較偏西邊
- 2 · La Niña 發生時，颱風生成時間，較集中於颱風季前半部 (7~10 月)

四 · 參考資料&文獻：

- NOAA、IRI、IPCC、中央氣象局、unisys、JTWC、日本氣象廳
- Atmospheric Sciences ([The Interannual Variability of the Atmosphere and Ocean in the Tropical Pacific Region : Sea Surface Temperature, Low-Level Atmosphere, And Typhoon](#))