

Forecasting El Niño: Science's Gift to the 21st Century

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Thank Heaven for the 1982-83 El Niño event! But why would anyone thank Heaven for a natural disaster? Well, this particular disaster was like an early wake-up call. It was the biggest El Niño in about 100 years and provided the scientific community with convincing arguments about why research funding for an improvement in the understanding of the phenomenon would be of great value to societies around the world.

What El Niño Is

El Niño is a recurrent, quasi-periodic appearance of warm sea surface water in the central and eastern equatorial Pacific Ocean. There is a lack of agreement in the scientific literature regarding its return period. One view suggests that a minor El Niño event returns every two to three years and a major event every eight to 11 years. Another suggests that it returns every four to seven years.

A minor event is one during which the sea surface temperatures in the central and eastern equatorial Pacific increase by only a few degrees Celsius, over a relatively small area. A major event is accompanied by a large increase in sea surface temperatures covering a large expanse of the equatorial Pacific. The larger the increase, the more destructive the impacts of El Niño are likely to be.

Folklore suggests that the warming of these particular waters was named El Niño, after the Christ Child, because of the short-term annual warming for a few months beginning in December. Although it originally referred to the local condition along Peru's northwestern coast, usage of the term "El Niño" has been broadened by many to represent all sea surface warmings in the equatorial Pacific. The phenomenon has other names as well, such as "warm event."

El Niño is also associated with changes in sea level pressure at locations at opposite sides of the Pacific basin. In the early decades of the twentieth century Sir Gilbert Walker identified a seesaw pressure pattern between Darwin (Australia) and Tahiti. When pressure is high in Tahiti it is low in Darwin and vice versa. This pattern is referred to as the Southern Oscillation. These two natural processes --- El Niño and the Southern Oscillation --- combine to form ENSO. Many scientists refer to the warming of sea surface temperatures in the equatorial Pacific as ENSO, but the lay public still refers to these air-sea interactions as El Niño.