

## **El Niño Returns**

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Data being collected by oceanographers indicates that another El Niño event is on its way, news which strikes dread in the hearts of all those involved in marine mammal rescue. The magnitude of the 1997-98 event was foreshadowed when northern fur seal pups began stranding along the central California coast, an unusual occurrence given their normal location south on the Channel Islands or in deep waters off the continental shelf. That year, El Niño driven torrential storms along the northern and central California coast resulted in record numbers of marine mammals rescued as well as tragic loss of human life and billions of dollars in property damage.

The Center is preparing for the next El Niño event because we know what to expect based on the admissions of 1998—a record number of marine mammal stranded, with a total of 1124 animals admitted. Compared to 629 in 1997 and only 300 in 1999, the impact of El Niño on marine mammals is clear.

As we learned in 1997, they knew before we did that El Niño was happening. This time, we will be more prepared for what may come.

The powerful El Niño event is a periodically occurring weather pattern that involves changes in wind direction, ocean temperature and ocean circulation. When barometric pressure falls in the eastern Pacific, easterly winds weaken or reverse direction. This suppresses upwelling, a process in which deep, cold, nutrient-rich water comes close to the surface to replace warm surface water pushed away by the wind. The thermocline (the dividing layer between warm water and cold water) then plunges deeper, and sea surface temperatures rise. This in turn causes heavy rains to move eastward, toward the Pacific Coast.

El Niño affects marine mammals in a variety of ways, the primary result being increased pup strandings and reduced pup survival because of inadequate nutrition for mother and pup and the impact of heavy storms on beach habitat. Older animals whose health may have been compromised by El Niño related conditions also strand more frequently.

Of the 1124 animals rescued in 1998, 784 were California sea lions, many of them weaned too soon or suffering from diseases and parasites brought on by nutritional deficiencies. During an El Niño, warmer water often pushes prey deeper or farther

away from traditional foraging areas, forcing them to work harder to find food. The suppression of upwelling leads to a decline in food production, and breeding and birthing activities are affected.

Scores of other sea lions, suffering from neurological problems brought on by a harmful algal bloom, stranded in late spring of 1998. Sea lions eating plankton-eating fish ingest concentrated levels of domoic acid produced by the alga *Pseudonitzschia australis*. This bloom may have been connected to El Niño, as it followed a period of heavy agricultural runoff. This increased nutrient load would have sparked an intense bloom. However, we continue to see animals that show signs of domoic acid toxicity, and scientists are currently studying these events.

The impact on both elephant and harbor seals was greatest during the pupping season, due to the increased frequency of winter storms. Heavy surf and storm surge easily separates pups from their mothers. By the end of the 1998 elephant seal pup season, we had rescued twice as many pups as in 1997.

Harbor seal pups are usually born in March and April. For example, in 1997 the first harbor seal pup was rescued in mid-March. In 1998, several premature harbor seal pups were rescued as early as January. Winter storms and the difficulty of finding food probably led many pregnant harbor seals to abort or abandon their pups. By the end of the 1998 harbor seal pup season (early June), we had rescued twice as many harbor seal pups as the previous year.

El Niño also affects sea otters by causing a decline in kelp production as a result of storms and decreased upwelling. Sea otters depend on kelp forests for food and shelter. In 1998, The Center rescued 11 otters, compared to seven or less in all other years since 1995.

The animals we rescue are sensitive indicators of ecosystem conditions. The research we are able to conduct while rescuing, rehabilitating, and releasing these animals provides valuable insights into their populations and the health of the ocean environment that we depend upon as well. When considering El Niño's affects on marine mammals it is important to consider that it is a natural phenomenon. Marine mammals may have experienced it to varying degrees for thousands or perhaps millions of years. However, it remains to be seen whether human activities are having an effect on the intensity and frequency of such natural cycles. Perhaps marine mammals can help us find the answer.

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