El Niño cooks up unusual hurricane season

As hurricane Pauline raked Mexico's Pacific coast last week, leaving a 600-mile-long path of destruction, the Atlantic Ocean served up an anemic tropical storm barely strong enough to earn a name. This personality contrast between the Atlantic and Pacific, which has persisted throughout the 1997 hurricane season, stems in part from El Niño, say meteorologists.

The sporadic ocean warming has produced record increases in water temperatures in the equatorial central and eastern Pacific this summer, knocking normal weather patterns for a loop around the globe (SN: 8/2/97, p. 75).

El Niño has prolonged the lives of hurricanes along the west coast of North and Central America, says Jerry D. Jarrell, deputy director of the National Hurricane Center in Miami. Hurricanes draw their strength from warm ocean water and quickly lose steam when passing over water less than 80°F. With above-average temperatures prevailing along the coast of mainland Mexico and Baja California this year, "hurricanes have had a chance to get 200 miles farther north than they normally do," says Jarrell.

This explains how hurricanes Linda—the strongest storm on record in the eastern North Pacific—and Nora retained their strength long enough to threaten Baja California and the United States. Linda spared North Americans by staying more than 1,000 miles offshore. Nora whipped up near-hurricane-force gales as far inland as southwestern Utah.

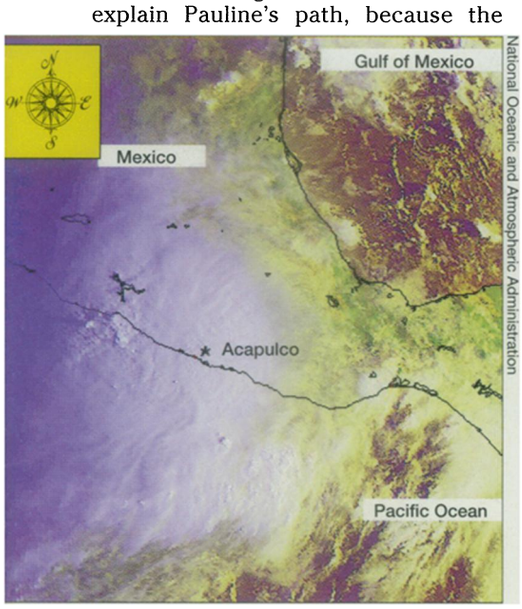
The link between hurricane Pauline and El Niño is less clear, says Jarrell. Record warming of the oceans cannot explain Pauline's path, because the storm developed southeast of Acapulco, in an area where water temperatures are always high enough to spawn hurricanes. Still, El Niño apparently played some role, says Jarrell. Hurricanes typically do not develop east of Acapulco, but this year the region brewed up six.

All told, the number of eastern Pacific storms this year has remained close to average. In a typical storm season, which tapers off at the end of October, there are 16 named tropical storms, 9 of which reach hurricane status, with winds exceeding 73 miles per hour. This year has totaled 16 named storms, 8 of them hurricanes, says Jarrell.

The Atlantic, in contrast, has produced only six tropical storms, one of which grew into a hurricane. The long-term average exceeds nine tropical storms, six of them hurricanes.

El Niño has kept the Atlantic quiet this year by weakening the high-altitude winds that typically blow westward off the coast of Africa. Without these high winds, acting in concert with lower-altitude winds, growing storms are sheared apart before they develop fully, says Vernon E. Kousky of the National Oceanic and Atmospheric Administration's Climate Prediction Center in Camp Springs, Md.

—R. Monastersky



Satellite shot of Hurricane Pauline's clouds engulfing Acapulco.

Scientists finally find where to scratch

One of humanity's age-old quests may be nearing an end. Researchers in Europe report identifying a new kind of nerve fiber that is probably responsible for transmitting the sensation of itching.

The characteristics of the nerve fibers fit a previously proposed model for so-called itch units and may help explain why the fibers haven't been observed before, the scientists report in the Oct. 15 JOURNAL OF NEUROSCIENCE.

Neurobiologists have long surmised that itch units are a type of nerve fiber especially sensitive to histamines, says pain researcher H. Erik Torebjörk of Sweden's University of Uppsala. Histamines are chemicals released when any of a variety of irritants triggers the body's many allergic responses, one of which is itching.

Furthermore, scientists had evidence that the itch units are unmyelinated—that is, they lack an insulating sheath of white, fatty material called myelin. Histamine-induced itching does not stop when the transmission of electric impulses along myelinated nerve fibers is blocked. However, such itching does cease if the skin is treated with capsaicin, the chemical that makes peppers hot and temporarily disables unmyelinated nerve endings (SN: 11/14/92, p. 333).

The skin contains thousands of unmyelinated nerve endings. In a study of 53 people, Torebjörk and his colleagues used the itching response to locate 56 unmyelinated nerve fibers branching from one of the major nerves in the lower leg. The researchers caused itching by applying a histamine gel and driving it into the skin with a mild electric current.

By inserting a probe deep into each volunteer's knee, the researchers monitored the patterns of electric impulses as they traveled along the major nerve from the skin of the shin and foot to the brain.

Eight of the 56 nerve fibers showed a long-lasting electric response to the histamine. Consistency between the pattern of electric signals in the nerve fibers and the itching sensation reported by volunteers provides strong evidence that the team has found the itch units scientists have sought for more than a century, says Torebjörk.

There are several reasons why previous searches for the elusive itch units proved fruitless, he adds. The small diameter of the nerve fibers and their lack of a myelin sheath make them difficult to detect, but the primary reason may be related to the response of the nerve fibers.

Few studies have used reactions to histamines to search for nerve endings. Until recently, most scientists thought that every unmyelinated nerve fiber in human skin is polymodal—capable of responding to several stimuli, including heat, touch, and chemicals such as histamines.

In the recent study, however, none of the eight nerve fibers that showed a strong reaction to histamine responded to touch, and only five responded to heat. Because researchers typically use pressure to search for nerve endings, these "silent" nerve fibers have gone unnoticed, Torebjörk says.

Although the newly found nerve fibers are small, their ends branch into tendrils that cover a lot of territory—for a nerve, that is. The average polymodal nerve fiber in the lower leg covers an area only 2.4 centimeters in diameter; one of the fibers that the researchers found branches to cover an area of skin 8.5 cm across.

M.W. Greaves, a dermatologist at St. John's Institute of Dermatology in London, says the new results are "interesting but of uncertain relevance" because the itch units described make up only a small proportion of all the nerve fibers identified by the researchers.

Moreover, Greaves says, the study shows only that the newly discovered nerve endings are sensitive to histamines, whereas itching can be caused by other substances as well. *—S. Perkins*