Predicting how a central Pacific El Niño will evolve

El Niño events, in which warmer than usual sea surface temperatures occur in the equatorial Pacific Ocean, are known to have a major influence on weather patterns worldwide. To help improve predictions, Yu and Kim categorized the ways in which certain types of El Niño events evolve. They focused on an El Niño known as the central Pacific (CP) type, in which sea surface warming occurs mainly in the central Pacific Ocean rather than in the eastern Pacific, where most common El Niño sea surface warming occurs. The two types of El Niño events have different effects on weather patterns and may respond differently to global warming. The CP type has occurred more frequently in recent decades.

On the basis of events that occurred between 1958 and 2007, the researchers identified three distinct patterns through which central Pacific El Niño events evolve. They also showed that the pattern of evolution was linked to the depth of the thermocline, the transition layer where the temperature drops sharply between surface waters and deep waters.

The researchers found that, in general, during a CP-type El Niño, if the thermocline was at a shallower than normal depth, then eastern Pacific cooling was likely to occur, ending the El Niño abruptly. If the thermocline was at normal depth, the El Niño would likely decay about as quickly as it grew. If the thermocline was deeper than normal depth, then eastern Pacific warming would likely occur, slowing the ending of the El Niño. The results could be useful for predicting the duration of CP-type El Niño events. (Geophysical Research Letters, doi:10.1029/2010GL042810, 2010)

Satellites monitor air pollutant emissions in China

A new satellite study verifies that Chinese emission control efforts did reduce power plant emissions of sulfur dioxide (SO\(_2\)), a harmful gas that causes acid rain and can form sulfate aerosols; these aerosols play an important role in the climate system by affecting clouds and precipitation patterns and altering the amount of sunlight that is reflected away from Earth.

However, in 2008 they observed dramatic reductions in SO\(_2\), likely because power plants had begun to use desulfurization devices more extensively in response to government policy. The study demonstrates that satellites can be useful in monitoring air quality and air pollutant emissions. (Geophysical Research Letters, doi:10.1029/2010GL042594, 2010)

—Ernie Tretkoff, Staff Writer