



In 1985, Mark Cane and his student, Steve Zebiak, published the results of a model they developed to predict the movement of warm water across the tropical Pacific Ocean in a cyclical phenomenon known as the El Niño Southern Oscillation, or ENSO. When it forms, El Niño's meteorological reach spans the globe, causing a well-known pattern of extreme weather events.

The 2009 El Niño, for example, resulted in deep droughts in India and the Philippines and deadly rains in Uganda. Aside from the regular progression of the seasons, no other phenomenon influences Earth's short-term climate as profoundly as ENSO.

Despite its impact, in the early 1980s there was still no accepted theory for how it worked. "If you're predicting the weather you get to verify your models every three or four days," said Cane. "For El Niño, you have to wait four years to find out if you're right."

The Zebiak-Cane model showed a moderate El Niño developing in late 1986. People in Peru, Australia and elsewhere still had vivid memories of the devastating effects of the powerful El Niño that formed in 1982 and 1983, so many scientists opposed publishing forecasts they didn't yet understand. "People said, 'What if you're wrong?'" said Cane. "I said, 'What if we're right and we don't tell anyone?'"

Cane and Zebiak published their forecast in *Nature* in June of that year, which gave anyone who cared to listen time to prepare. Despite a delay in its formation early in the forecast window, by the autumn of 1986, the predicted El Niño developed, bringing its associated weather patterns to much of the globe.

Most of Cane's work since that time relates to the impacts of human-induced climate change and natural climate variability on people around the world, such as a seminal paper studying the implications of El Niño on maize yields in Zimbabwe. He has also created a highly successful master's degree program in Climate and Society that prepares students to understand and cope with the impacts of climate variability and climate change on society and the environment.

"Science should be more than just an academic exercise," said Cane. "We're not just predicting this thing in the Pacific, we're trying to predict all these consequences around the world that people care about."

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Predicting El Niño

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