

## Drought and La Niña

### New data sets focus on rainfall, streamflow

BY DAVE AMBER  
The Battalion

Two different groups of scientists released reports this month bringing new insight into the El Niño and La Niña weather phenomena and their effects on weather patterns in the United States.

The first report is a collection of global rainfall data assembled by NASA that gives climate researchers physical data for testing climate models.

The second is an analysis of U.S. streamflow data by the U.S. Geological Survey (USGS) that will help determine when the effects of La Niña might cause wetter or drier conditions across the country.

The reports come at a time when Texas and the Southwest have been grappling with another period of drought that scientists generally blame on the current La Niña.

"Weather across the United States has been consistent with a La Niña pattern," Dr. John Nielsen-Gammon, acting Texas state climatologist and Texas A&M associate professor of Atmospheric Sciences, said.

"We have a strong La Niña pattern in place, and according to long-term weather models, we have a high probability of warmer and drier weather than normal through most of the spring," Travis Miller, an agronomist with the Texas Agricultural Extension Service, said.

"This, to a large degree, explains the drought conditions and warm weather we have been experiencing throughout the summer and fall," he said.

#### Studying precipitation levels to test climate models

The new data set compiled by NASA scientists brings forth information about precipitation levels around the world.

The analysis, covering a 20-year period, should help researchers understand climate variations by using real observations to aid in determining the effectiveness of models for future climate changes.

Dr. Robert Adler, a NASA scientist at the Goddard Space Flight Center in Greenbelt, Md. and project leader for the agency's Global Precipitation Climatology Project (GPCP), unveiled the database this month at a California meeting of the American Meteorological Society.

"Before we can use models to successfully predict El Niño's and other climate phenomena, they must be able to reproduce these observations," Adler said.

"With this information, we can better understand these phenomena and the critical regional precipitation variations associated with them."

Only in the past few years have scientists been able to create sophisticated simulations.

"The data sets would be good tests for new models when we simulate climate change and as we look at surface changes," A&M's Nielsen-Gammon said. "The models will help us to predict future climate changes."

#### Studying streamflows to predict La Niña effects

The report from USGS climate scientists said something that many farmers in Texas already knew.

This spring, rivers in Texas and the Southwest may be among the driest in recorded history as the region experiences its third year out of four years with drought conditions.

The climatologists place blame for current weather conditions on La Niña.

From statistical surveys of streamflows of past La Niña years, the researchers have developed new maps to help predict the effects of future ones.

Based on the researchers' analyses of

thousands of streamflow gauges, these maps show which parts of the country should experience high or low flows during the La Niña period.

"We've looked at La Niña years and determined where there's a higher chance of having unusually high flows and where there's a higher chance of having unusually low flows," Dr. Michael Dettinger, a USGS hydrologist, said.

The researchers predicted that for the first six months of 2000, streamflow in parts of the Southwest will be in the lower third of recorded levels.

These predictions are important to state water managers who are tasked with making sure there is a sufficient supply of water available for rural and urban areas.

"We can't control precipitation. Either it comes or it doesn't. But we can manage water," Dettinger said.

"We can decide now to intervene and make changes to reservoirs or divert water long before an emergency happens if we know the likelihood of having a problem is increased. So the streamflow forecasts are of special interest."

#### Drought hurting Texas agriculture

For Travis Miller, June 26, 1999 is a date he wants to wash from his memory.

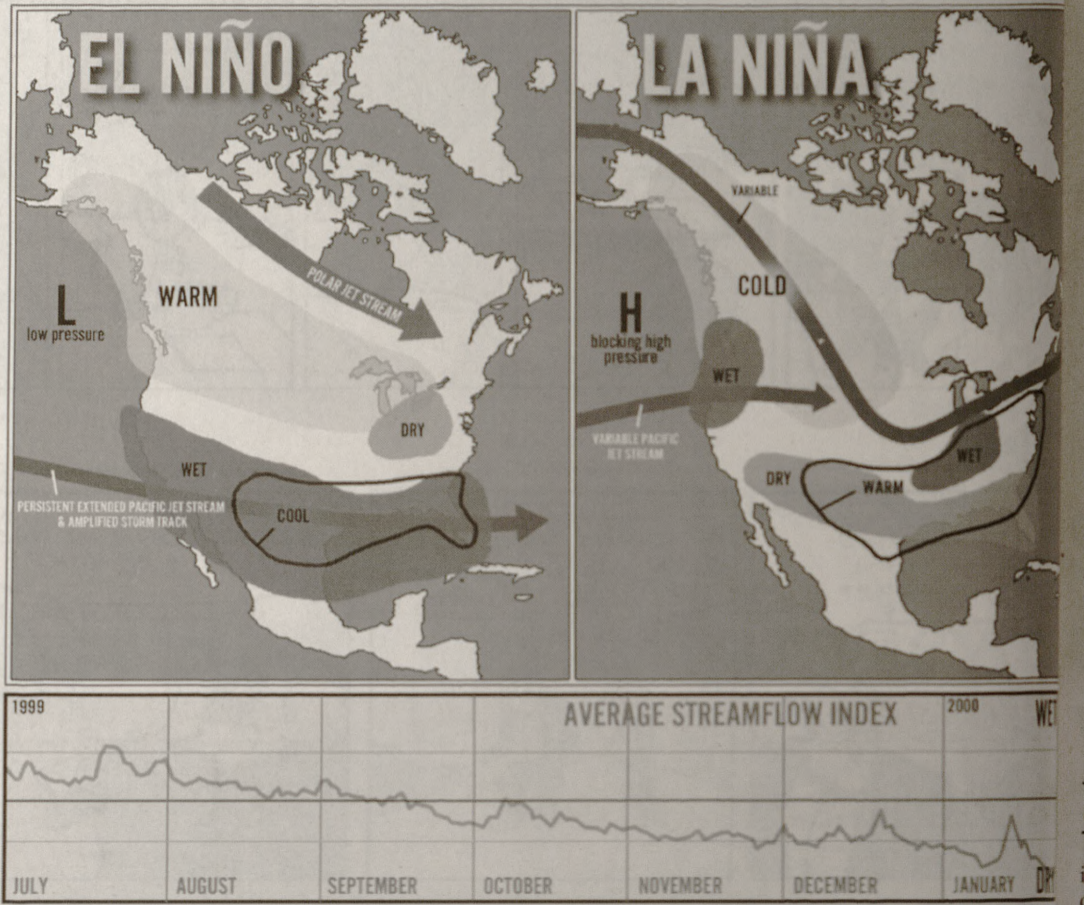
"That was the last time large areas of the state were covered in rainfall," Miller, who serves on the state's Drought Advisory Council, said.

Texas, now in the middle of the winter wheat growing season and heading into corn season, is suffering its third year of drought in four years.

The water shortages and unseasonably high temperatures are hurting the agricultural economy in Texas and other parts of the Southwest.

"The agriculture economy is in tatters," Miller said.

State Agriculture Commissioner Susan



El Niño and La Niña refer to two extremes of a climate cycle known as the El Niño Southern Oscillation, or ENSO. In El Niño, unusually warm surface waters move through the eastern Pacific near the equator, caused by the weakening of the normal east to west trade winds along the equator. This allows warm water to build up along the coast of South America. During La Niña, the other extreme of ENSO, the trade winds become stronger and coastal upwelling raises the water to the surface. The eastern Pacific becomes colder than normal. Texas streamflow has been decreasing during the La Niña period.

Combs said that the Texas agricultural industry, which has not fully recovered from the 1996 and 1998 droughts, is heading for a crisis.

Problems with drought led 75 Texas counties to be declared eligible for federal disaster assistance, with 13 more waiting for approval.

"The dry winter is taking many of our farmers into a spring planting season with no surface soil moisture and no subsurface soil moisture," Combs said.

"We are six weeks away from planting corn in South Texas, and soil moisture is needed. If it doesn't start raining, many areas of the state may not see any spring planting."

According to Miller, because agricultural and urban areas ultimately consume water from the same sources, water conservation efforts play an important role in mitigating the drought crisis.

For example, in San Antonio, the city and the counties west of the city all draw

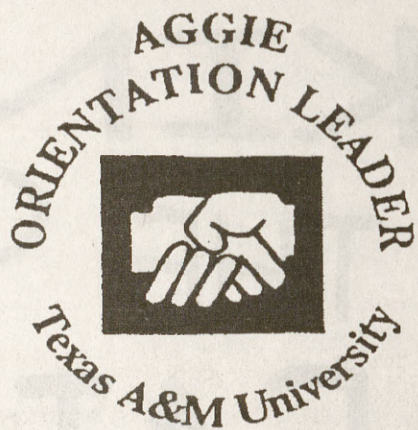
water from the Edwards Aquifer.

"In the end we are all using the same water," Miller said. "So we must cooperate on cooperative efforts between agricultural areas."

Locally, Miller said that there is a large amount of competition for agricultural and highly populated areas.

He said the aquifer serving the College Station area also serves the area consisting of mainly pasture and lower water demand than farming

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