The state is entering its second straight winter with La Nina conditions in the Equatorial Pacific, but the Nebraska state climatologist said that won't necessarily mean the same kind of winter in 2012.

With the redevelopment of La Nina conditions this fall, there was considerable discussion among climatologists as to whether 2011 winter trends would return in force during this upcoming winter, said Al Dutcher, Nebraska state climatologist.

So far the answer is no, he said.

First and foremost, equatorial sea surface temperatures are averaging about 1.5 degrees Celsius below normal, while last year at this time the basin was nearly three degrees Celsius below normal, Dutcher said.

"In layman terms, the current La Nina is rated as a weak to moderate event, compared to last year's rating of exceptionally strong," he said.

In addition, since La Nina was so strong last year, the northern jet stream was especially active and winter storm activity was concentrated across the northern and north central Rockies eastward through the Great Lakes and northeast.

Seasonal snowfall across the southern Rockies during the 2011 winter was less than 60 percent of normal as the primary storm track remained north of this area.

Also, the jet stream pattern has exhibited a tendency toward a split flow pattern once systems move into the Pacific Northwest.

"A portion of the energy moves into the northern Rockies, then shifts into the northern Plains," Dutcher said. "The remaining energy dives down into the southwestern U.S., then the subsequent cutoff upper air low slowly drifts around the southern Great Basin region. Only when another trough approaches the Pacific Northwest is there enough energy to kick the low eastward toward Texas."

What Does This Mean?

Essentially, the upper air lows moving across Texas are robbing the northward transport of moisture into the northern Plains, he said. As a result, the upper Plains trough moisture patterns are dependent on Pacific Ocean moisture instead of the Gulf of Mexico.

"Unfortunately, this Pacific moisture is intercepted by the northern Rockies and Cascades before it reaches the northern plains," Dutcher said. "During the past 30 to 45 days, more moisture has fallen across portions of south central Kansas, eastern Oklahoma, and north central through northeast than fell in the previous 12 month period.

"Nebraska has been caught dead center between these two pieces of energy," Dutcher said.

If the southern plains low begins to lift northeastward before the northern plains trough arrives, enough moisture moves northward to produce rain and/or snow. If the northern Plains trough wins out, then a dry and cold pattern materializes and the southern plains moisture gets shunted east of Nebraska, he said.

The two competing forces of energy eventually merge east into a strong upper air trough east of Nebraska, which results in heavy moisture events for the eastern Corn Belt.

"As long as this pattern continues, areas of southwest through east central Nebraska will likely have the best opportunity to receive normal to above normal moisture," he said. "Unfortunately, the established northern Corn Belt dry pattern will likely continue for north central and northeast Nebraska. Even if moisture returns to normal, soil temperatures will be a key as to the effectiveness of the precipitation events."

Dutcher said with the absence of significant snowfall across the Plains region of Montana and the Dakotas, he would currently rate the flooding potential this coming spring as low.

"We are seeing decent snow accumulations across the northern Rockies, but not like last winter. Winter storm production has hit all parts of the Rockies, so moisture is not being concentrated in one region so far this winter," he said.

Precipitation and
Temperature Forecasts

The latest Climate Prediction Center forecast for the January-March temperature forecast indicates above normal temperatures for the southern Plains, extending northward to the extreme southeastern Nebraska. The precipitation forecast indicates below normal moisture for the southern Plains, extending northward to the Kansas-Nebraska border. Wet conditions are anticipated for the northern Rockies and eastern Corn Belt.

A more worrisome forecast for Nebraska would be the February-April and March-May precipitation forecasts, Dutcher said.

The CPC indicates that below normal moisture should cover the southern and central Plains region, extending northward to include much of Nebraska. This scenario would suggest that the northern Plains dryness is not likely to disappear until April or later.

Lincoln, Neb., climate data also suggests that drier than normal, less than 50 percent of normal moisture, occurs during the months of February and March when the Equatorial Pacific is under the influence of a La Nina signal.

It also suggests that the eastern Corn Belt will remain wet and flooding and/or planting delay issues will likely occur this spring in the Ohio and mid-Mississippi river valleys.

Snowfall activity should increase across the northern Rockies in spring, Dutcher said.

The current snow pack is rated normal to below normal in the headwater region of the Platte and Missouri watersheds because most of the recent snows have been across the southern Rockies.

"There is enough reservoir storage space in these two watersheds to handle normal to slightly above normal snowfall without major flood concerns," he said. "However, if snowstorm activity picks up by winter's end, then this outlook could change. But for right now, I would rate the flood potential as average to below average."