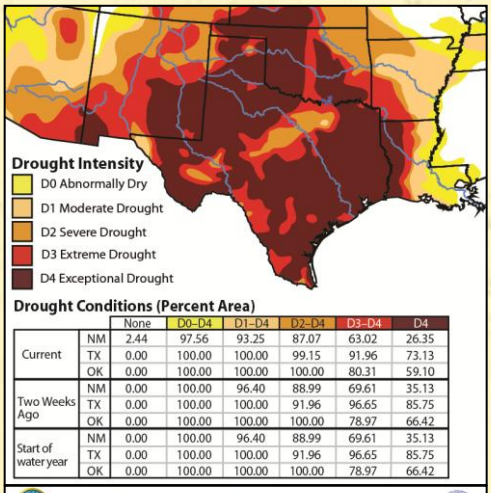
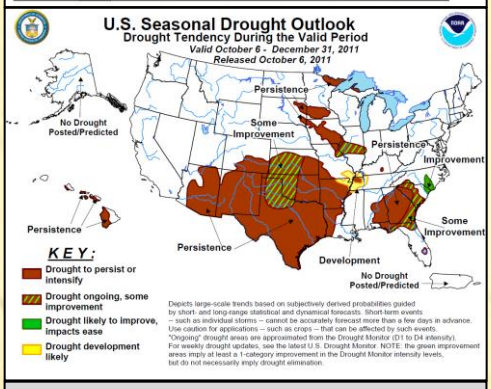
MANAGING DROUGHT IN THE SOUTHERN PLAINS

Webinar Topic: La Nina and Prospects for Continued Drought
October 13, 2011



Drought Conditions (Percent Area)

		None	D0–D4	D1–D4	D2–D4	D3–D4	D4
Current	NM	2.44	97.56	93.25	87.07	63.02	26.35
	TX	0.00	100.00	100.00	99.15	91.96	73.13
	OK	0.00	100.00	100.00	100.00	80.31	59.10
Two Weeks Ago	NM	0.00	100.00	96.40	88.99	69.61	35.13
	TX	0.00	100.00	100.00	91.96	96.65	85.75
	OK	0.00	100.00	100.00	100.00	78.97	66.42
Start of water year	NM	0.00	100.00	96.40	88.99	69.61	35.13
	TX	0.00	100.00	100.00	91.96	96.65	85.75
	OK	0.00	100.00	100.00	100.00	78.97	66.42



Is drought properly classified in your region? If not, let us know by:

- Adding to the Impact Reporter
- Contacting your State Climatologist
- E-mailing the Drought Monitor Authors at: droughtmonitor@unl.edu

Regional Drought Summary

Despite heavy rains in parts of Texas and Oklahoma, little improvement was shown in the Drought Monitor this past week. Rainfall amounts in excess of 5 inches were recorded in north central Texas northwards into central Oklahoma, but extremely dry soils eagerly absorbed most of the liquid. Minor response in farm ponds and very little runoff into streams and lakes were the result. Consequently, in most cases only one category improvement, usually from D4 (exceptional drought) to D3 (extreme drought) was shown in the areas of heaviest rainfall. Outside those areas, the depiction remained largely unchanged.

In the coming several days, there appears little chance of rainfall within the region. The best chances for rainfall lie to the east and temperatures are expected to range 6-9 degrees above normal over the next five days, as the heat maintains itself into the fall. Over the next two weeks, warm temperatures are expected to continue across most of the West, all the way up to Alaska. The Drought Outlook, issued before the recent rainfall, showed continued drought with improvement limited to the area where heavy rain was forecast in the short-term (the actual rainfall was displaced eastward and southward). Remember that some improvement could mean as little as a one-category change, much like what was seen this past week.

For temperature and precipitation outlooks, visit the Climate Prediction Center: http://www.cpc.ncep.noaa.gov/

Feature Product

Reports of drought impacts are a critical part of the Drought Monitor process. Knowing how people and the environment are affected in specific locations helps us make a connection between the dryness being recorded by our instruments and the impact of that dryness in the world around us, especially in data poor regions. To support this effort, the National Drought Mitigation Center has launched a new and improved Drought Impacts Reporter (see Resources below). You can view different categories, different overlays, and search for impacts and reports. Tell us what is happening where you live!

Resources

U.S. Drought Portal
http://www.drought.gov

National Drought Mitigation Center
http://drought.unl.edu

Drought Impact Reporter
http://droughtreporter.unl.edu

Southern Climate Impacts Planning Program (SCIPP)
http://www.southernclimate.org

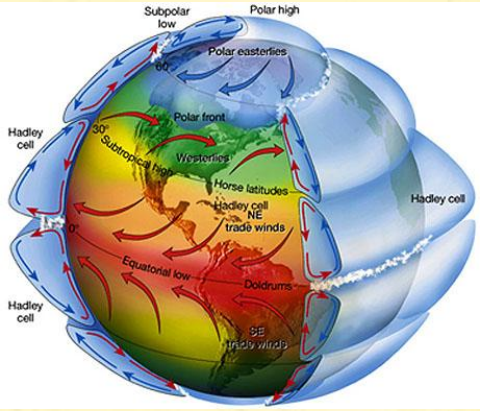
State Climatologists
http://www.stateclimate.org

Climate Assessment for the Southwest (CLIMAS)
http://www.climas.arizona.edu

Past webinars, summaries, and Federal/State Assistance
http://www.drought.gov/portal/server.pt/community/southern_plains

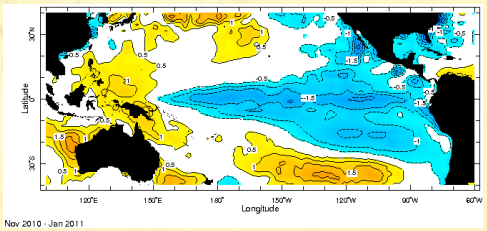
La Niña, PDO, AMO and Alphabet Soup

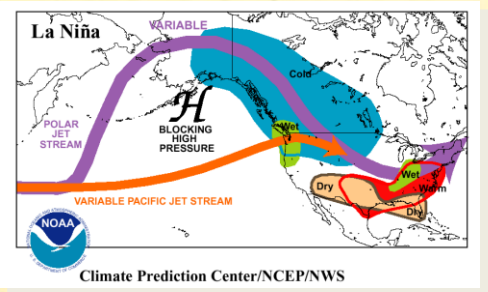
It is remarkable that the Pacific Ocean can influence weather and climate patterns in our region. The key connection is the location and strength of the jet stream. The jet stream, as we know it, is part of the prevailing westerlies, a band of air that generally travels from west to east about midway between the equator and the poles in both the northern and southern hemispheres. However, the westerlies are just one part of the global circulation. Near the equator and near the poles, the air at the surface actually travels from east to west, although not usually as strongly. This motion may be apparent in the paths of hurricanes that travel westward across the ocean before turning northward and eastward as they get to higher latitudes.



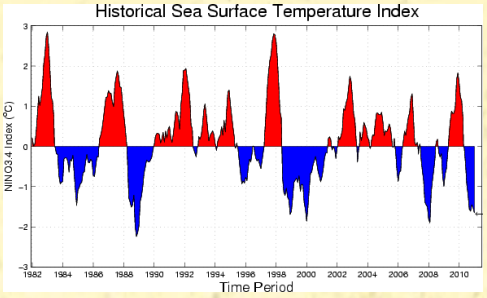
Uneven heating of the earth from the sun creates warm air – and water – near the equator and cold air near the poles. The heat near the equator causes air to rise and form thunderstorms and towering ran showers. But what goes up, must come down. The rising air in the tropics travels northward and sinks in the subtropics, roughly between 20 and 40 degrees latitude. Sinking air creates surface high pressure systems, while rising air near the equator creates low pressure at the surface. A similar circulation pattern happens northward, resulting in two jet streams – a sub-tropical jet to the south and a midlatitude or polar jet to the north, both forming in the band of westerlies.

The easterly winds near the equator push warm water westward, allowing colder water from below to rise to the surface (to "upwell") along the coast of Peru. During La Niña, this pattern is intensified with the warmer water pushed farther westward, leaving the water in the central and eastern Pacific cooler than normal, what scientists often call a "cool anomaly". The warm water in the western Pacific enhances convection (storms), strengthening the low-pressure and the tropical easterlies and meanwhile strengthening the high pressure north and east of the area as the air sinks. The stronger-than-normal high pressure diverts the jet stream northward, which enhances storminess in the Pacific Northwest, along the position of the midlatitude jet stream, and weakens the subtropical jet stream. The storms eventually may turn southward again further east, bringing storms to the eastern U.S. but leaving the southwest and Gulf Coast region relatively dry. During the winter of 2010-2011, this persistent pattern kept storms from the area, although several events did make it into the region.





This past winter was a moderate-to-strong La Niña event which moderated in the spring and ended in May. It is not unusual to have a second La Niña event follow on its heels, as seems to be the case this year, with a new La Niña event developing since August. It is important to recognize that the weather over the past year has been extreme by any measure; a second La Niña does not necessarily mean that the rainfall again will be less than half of normal. However, drought consequences for water supplies tend to be cumulative, so even a moderately below-normal year would produce a worsening of water supply conditions in many areas.



La Niña, and its warm-anomaly counterpart El Niño, vary substantially from one year to the next. However, there are longer-term variations in the North Pacific Ocean, called the Pacific Decadal Oscillation (PDO) and the Atlantic Ocean, called the Atlantic Multi-Decadal Oscillation (AMO). Negative values of the PDO generally favor consistently dry patterns in the Southern U.S. Likewise, dry Plains are associated with a positive AMO, which implies unusually warm temperatures in the northern half of the Atlantic Ocean. The last time a negative PDO aligned with a positive AMO was the 1950s-1960s, which includes the drought-of-record in both Texas and Oklahoma. Since they became aligned again, around 2000, the region has suffered several short-term droughts, lasting up to 18 months. The general pattern favoring dryness could continue for 3-15 years, although individual wet years associated with El Niño conditions would lessen the impacts substantially.