Title: Northern New Mexico Climate, Water Year 2012 at Los Alamos National Laboratory, Poster, Individual Permit for Storm Water, NPDES Permit No. NM0030759

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Intended for: Public

Purpose: This poster was prepared for the June 2013 Individual Permit for Storm Water (IP) public meeting. The purpose of the meeting was to update the public on implementation of the permit as required under Part 1.I (7) of the IP (National Pollutant Discharge Elimination System Permit No. NM0030759). The poster will be available on Los Alamos National Laboratory’s (LANL’s) public website.
What is a Water Year?
The water year begins on October 1 and ends on September 30 of the following year. As of October 1, 2011, we are in the 2012 water year. The water year is a more hydrologically sound measure of climate and hydrological activity than is the standard calendar year.

June
Dry conditions began in late December and intensified through June in New Mexico. The western half of New Mexico received less than 5 percent of the average rain in June.

July
Drought conditions did not change much from June. About 80 percent of New Mexico was classified with at least experiencing a severe drought.

August
Although the monsoon precipitation brought some short-term relief from the drought, it left much of New Mexico extremely dry.

September
Monsoon rainfall brought some improvements to short-term drought conditions, however New Mexico continued to experience severe drought, mostly due to longer-term deficits in precipitation.

ENSO
El Niño and La Niña are weather patterns that are part of what’s known as the El Niño–Southern Oscillation (ENSO). These weather patterns originate between the east and west Pacific Ocean where the oceanic surface air temperature and surface air pressures naturally fluctuate.

New Mexico Monsoon
New Mexico receives up to half of its annual rainfall during the summer monsoon season. Driven by the sun heating up the land and the Pacific Ocean, the warm land creates low pressure zones as hot air rises. As this pattern establishes, winds shift, and pressure differences between hot southwestern air and cool Mexican air cause the year’s first monsoonal precipitation in northern Mexico in May. The moisture-laden monsoon air eventually travels north to Arizona and New Mexico.

Climate Change
Earth’s global temperature has risen by 1.4°F and is projected to rise to 11.5°F within next 100 years as a result of increased greenhouse gases in the atmosphere. These rising global temperature have caused changes in rainfall, resulting in more floods, drought, or intense rain, as well as more frequent and severe heat waves. The Southwest is particularly susceptible to climate change because of its aridity. Within the region, climate change is projected to cause drier conditions and eventually lead to increased drought. In conjunction with regional drought, precipitation is projected to decrease, however, rain events may become more intense and cause more destructive flooding.

REFERENCES:
Environmental Protection Agency (EPA). Climate Change. Available at: www.epa.gov/climatechange

LANL 2012 Precipitation
The meteorological tower network located on Los Alamos National Laboratory property has been operational since approximately 1990 and was installed to assist with air, water and vegetation monitoring. The precipitation gauges on the meteorological towers are used to estimate the historical mean and variability, or baseline, of rainfall across the lab. Only data from 1992 to 2010 (19 years) is used to compute this baseline, as there were various problems with the equipment and data prior to 1992.

In the graph above, the mean (gray line) and 90th, 75th, 25th, and 10th percentiles (light to dark gray shaded areas) represent the historical baseline, 19-year precipitation across the lab. As one can see, the lab receives the largest amount of precipitation from July through October, or during the monsoonal period. Also on this plot are the monthly total precipitation amounts for 2011 (light blue bars) and 2012 (dark blue bars) for comparison to the historical baseline. 2011’s monsoon was much stronger than 2012’s, with 2011’s precipitation around the mean of 90th percentile of the historical baseline (except July) and 2012’s precipitation around the 25th percentile of the historical baseline.

Climate Assessment for the Southwest (CLIMAS). The University of Arizona Institute of the Environment. Tucson, AZ. Available at: www.climas.arizona.edu
Southwest Climate Change Network. Institute of the Environment. Tucson, AZ. Available at: www.southwestclimatechange.org
Environmental Protection Agency (EPA). Climate Change. Available at: www.epa.gov/climatechange