



Real-Time Investigation of the Impacts of the 2015-16 El Niño on Water Resources in the CNMI



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One of the primary concerns of water resource managers throughout the tropical Pacific islands is drought. Major drought is often a serious consequence of El Niño. However, the El Niño-related droughts, while severe, are short-lived (i.e., ~6 months), with normal rains thereafter. Two of the most severe El Niño-related droughts occurred in the latter decades of the 20th Century: The 1982-83 El Niño and the 1997-98 El Niño. The 1997-98 El Niño event is still regarded as the strongest in the historical record. El Niño developed during early 2015 and became strong by the end of the year, rivaling the intensity of the epic El Niño events of 1982-83 and 1997-98.

All the Mariana Islands from Guam through the Commonwealth of the Northern Mariana Islands (CNMI) are vulnerable to damaging extremes of weather during the roughly 18-month course of an El Niño event. The year 2015 indeed saw many weather extremes, including an unusual abundance of named tropical storms and typhoons passing through regional waters. A particularly severe typhoon (Typhoon Soudelor) heavily damaged Saipan during the night of August 2015. This typhoon was at the Category 4 level of intensity and caused severe damage on Saipan. Saipan is still recovering from Soudelor and other typhoons of 2015. To make matters worse, in the first few months of the calendar year that follow a strong El Niño (this will be the case for 2016), the rainfall on Saipan and the other islands of the CNMI tends to be well below normal. Streamflow is sharply reduced, forests and grasslands dry to the point that wildfires become a problem, and municipal wells see an increase in Chloride. Many of Saipan's wells have a sea salt concentration that severely degrades the taste and smell of the water supply, and may even pose a health risk. Major drought in 2016 would pose a threat to both water quality and water quantity on Saipan.

The overall objective of the proposed project will be to study the impact of the anticipated El Niño drought on Saipan, with a focus on the impacts to the municipal water system through the year. Physical properties of the wells, such as the well head and water quality measurements will be monitored. In partnership with local water system managers, this project will also document impacts to the extraction and distribution components of the municipal water system (e.g., pumping rates, storage, line pressures, and usage patterns) through the anticipated dry year. The physical data, water agency responses and the lessons learned over the course of the drought will undergo a comprehensive review at a workshop tailored for Saipan water system managers and other water resource managers and stakeholders.



Drought conditions on Saipan, CNMI.