



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



Funded by:  
US Geological Survey, Water Institute Program

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At the time of this writing (December 2015) a major El Niño is nearing its peak (Rasmussen and Carpenter 1982, Ropelewski and Halpert 1987, and PEAC 2015), with commonly used indices of El Niño rising to levels seen only two other times in the past 60 years: the epic El Niño events of 1982-83 and 1997-98. All states of the FSM are vulnerable to damaging extremes of weather during the roughly 18-month course of an El Niño event. Through the first year of a strong El Niño, the region typically experiences an abundance of typhoons, other extremes of heavy rainfall, and high surf raised by the typhoons and unusual monsoonal winds. The year 2015 indeed saw such conditions, with nearly all the islands of the FSM experiencing damaging effects from typhoons and other severe weather conditions. Two particularly intense typhoons caused severe damage: Typhoon Maysak destroyed much of Ulithi Atoll in April, and a month later, Typhoon Dolphin tracked across the Chuuk Lagoon, bringing destructive winds to most of the islands therein. In the first few months of the calendar year that follows a strong El Niño (this will be the case for 2016), the rainfall across all of Micronesia tends to be well below normal. Sharply reduced rainfall can quickly become a life-threatening emergency as reservoirs and rain catchment systems run dry, and agricultural plants are damaged. This is especially true on atolls where the water lenses are thin and rain catchment is a prominent source of drinking water. Micronesia-wide severe droughts in 1983, 1992 and 1998 required the deployment of U.S. military assets to the islands of the FSM to help transport and generate drinking water supplies.

Since widespread drought across the FSM typically follows a strong El Niño, it is therefore potentially foreseeable a few months in advance. Indeed, nearly all local and regional meteorological and hydrological service agencies (e.g., the Weather Forecast Offices of the FSM, the Guam Weather Service Forecast Office, the Pacific ENSO Applications Climate Center, and additional international agencies) anticipate a

Micronesia-wide severe drought during the first 6 months of 2016.

The objectives of this project are to: a) Travel to all four states of the FSM in May or June of 2016 to observe and gather data on the effects of the 2015-16 El Niño in the region, b) Visit with representatives of water resource management (e.g. water treatment facility operators) to get a detailed picture of the impacts in each state of the 2015-16 El Niño-related typhoons, extreme rains, sea inundations and drought, c) Determine the efficacy of practices taken (if any) to lessen the impacts of the 2015-16 El Niño, and d) Develop an outreach itinerary for group discussion of drought during FSM visits.



**Water supply reservoir in Yap State, FSM during 2009 drought.**