



## Sustainable Conjunctive Use of Groundwater and Rain Catchment Water under Variable Climatic Scenarios for Atoll Island Communities



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Water shortages are a persistent concern for residents of atoll islands. Under normal rainfall conditions, water demand is able to be met by rooftop rain catchment, but prolonged droughts, such as those associated with ENSO events in the western Pacific region, can exhaust water storage, leaving residents dependent on groundwater or imported water from distant islands. With island residents dependent upon both rain catchment water and groundwater, a complete assessment of water resources available to atoll island communities must include a time-dependent analysis of both stored rain catchment water and available fresh groundwater. Furthermore, the conjunctive dependence on both sources of water varies in time according to climatic stresses such as decadal patterns in rainfall variability, drought, and sea-level rise, and hence these must be taken into account in the analysis. In order for conclusions of such an analysis to be adopted by local island communities, clear and concise presentations and training for the water resource managers and government officials of the FSM should be conducted, and basic water

conservation practices should be communicated to the general population.

This project aims to building on the previous year's results by using the new groundwater-rain catchment storage calculator to assess daily freshwater water supply for specific islands in the FSM. This assessment will be performed under various climatic scenarios, such as rainfall variability, drought, and sea-level-rise to provide a broad range of application. Presentation and training to the FSM water and environmental officials will occur at the FSM Advisory Council in October 2014, and educational pamphlets will be created for distribution to FSM atoll island schools. To date, demographic and rain catchment infrastructure information is available for several islands (Mwoakilloa, Pohnpei; Pakein, Pohnpei) (Taborosi and Martin, 2009; Taborosi and Collazo, 2010), which will be used as test cases. (Items II.4, II.8 and II.15 of Water Quantity Projects, and Items III.2, III.3 of Education and Professional Training, FSM Critical Water Resources Research, October 10, 2013).