



Develop a GIS Model for Analysis of Groundwater Quality Data in Saipan



Funded by:
US Geological Survey, Water Institute Program

Principal Investigators:
Yuming Wen & Brian Bearden

Water quantity and quality is essential to sustainable development and quality of life in tropical islands. The Commonwealth of the Northern Mariana Islands (CNMI), composed of a chain of 14 tropical islands in the western Pacific, is facing problems with water resources and quality. The water quantity and quality is affected not only by natural forces such as tropical storms/typhoons, droughts, climate change and sea level rise, but also by anthropogenic activities. Human activities have contributed a lot to the increase of pollutants into water bodies. The increase of impervious surfaces is related to human induced activities, affects water quantity in CNMI due to aquifer recharge and degrades the quality of water including drinking water. The US Census data of 2000 and 2010 indicate that most of population (about 90% for both census years) lived on Saipan. Therefore, environmental concerns, and water quantity and quality issues should be paid specific attention on Saipan. In order to improve water quality and

protect the environment in the inhabited islands, it is important to evaluate water quality of the aquifers in Saipan, locate drinking wells with quality deficiency, and monitor trends of water quality from drinking water wells.

The main objectives of this project are listed as follows.

1. Processing groundwater quality data in a way so that they can be further processed and linked to a GIS format;
2. Analyzing groundwater quality data geographically and over time;
3. Identifying drinking water wells that have deficient water quality or that may develop deficient water quality.
4. Establishing a GIS-based model for visualization of groundwater quality data, and analysis of groundwater quality geographically and over time.