**NASA DEVELOP National Program**

****Mobile County Health Department

**Summer 2015**

**Short Title: Coastal Texas Water Resources**

**Updated Abstract**

This project partnered with the National Park Service (NPS) to help analyze the correlation between mesquite trees and the salinity of the Laguna Madre of Padre Island National Seashore. The lagoon is a hypersaline estuary; however, there is historical evidence that this was not always the case. It is hypothesized that the increase in the number of honey mesquite trees (*Prosopis grandulosa var. glandulosa)* in the area has contributed to the Laguna Madre’s increased salinity by decreasing the groundwater inflow to the lagoon. These mesquite trees have long taproots capable of extracting significant amounts of groundwater. This project utilized Earth observation data in ERDAS IMAGINE and ArcGIS software to create map time series and analyze the data. Landsat 5, 7, and 8 data were used to create land use/land cover (LULC) maps in order to analyze the change in the occurrence of mesquite trees over time. Thermal maps of the lagoon were generated using Landsat 5 and 8 data to understand changes in groundwater inflow. In addition, TRMM and GRACE derived changes in root zone soil moisture content data were compared over the study period. By investigating the suspected positive correlation between the mesquite trees and the salinity of the Laguna Madre, the NPS can improve future land management practices.

Awesome!