

# CASE STORY

## Geophysical survey- Groundwater | TEM - Transient Electro Magnetics |

### ► TEM use to quantify ground-water distribution

#### CUSTOMER PROFILE

Palmyra Atoll National Wildlife Refuge is located in the Central Pacific Ocean. Palmyra Atoll is 4,6 sq mi (12km<sup>2</sup>) and is administered by the U.S. Fish and Wildlife Services in the U.S Department of the Interior.

#### CHALLENGE

Wanting to quantify small island fresh groundwater distribution in response to climatic stress in Palmyra Atoll National Wildlife Refuge.

#### SOLUTION

Electromagnetic induction (EMI) is well suited to evaluate the variable distribution of fresh and salty groundwater, and can be augmented by long-term monitoring well data (salinity, pressure, temperature) and comprehensive small unoccupied aircraft system (sUAS)-based vegetation surveys.

#### CONCLUSION

The ABEM WalkTEM provided a critical portable method to fully-map the fresh-brackish-salty transition along island-scale (e.g. 2 km) transects, understanding that was limited by the GEM-2 depth of investigation. The combined methodology of monitoring well time-series, multi-scale EMI, and broad sUAS multispectral coverage allows comprehensive characterization of small island fresh groundwater resources.

#### PROJECT

▷ Site: Palmyra Atoll

▷ Citation: Briggs, M., Lane, J. Kulongoski, J., Adams, J., Holmquist-Johnson, C., Hanson, L., Struckhoff, M. and Kropidowski, S.(2017). *“Using multi-scale electromagnetic induction and small unoccupied aircraft system surveys to quantify small island fresh groundwater distribution in response to climatic stress”*. SAGEEP.

▷ Method: TEM (Transient Electro MAGnetics)

