# Aquifers, Faults, Subsidence, and Lightning Databases

**Kathleen S. Haggar, Les R. Denham, and H. Roice Nelson, Jr.**

Dynamic Measurement LLC., 16515 Hedgecroft, Ste. 320, Houston, Texas 77060

## ABSTRACT

**In discussing characteristics of aquifers, faulting, subsidence, and lightning databases, we recognized similar measurement and monitoring issues and solutions.**

**Lightning data occurs everywhere, covering the spatial extent of aquifers. In this paper, we highlight lightning attribute maps at regional and prospect scales, and relate these maps to aquifer and subsidence maps. Lightning strikes cluster, these clusters are somewhat consistent over time, and the resulting lineaments tie to fault lines. Lightning strikes are impacted by earth tides, and the impact of tides on marshes and swamps increases with increasing subsidence.**

**Lightning databases open new ways to measure and monitor natural resources, including aquifers, faults, and subsidence. Lightning data are evergreen, in that new lightning strike measurements are added to lightning databases every time there is a thunderstorm. Lightning strikes are primarily controlled by earth currents. Earth currents are modified by aquifers (resistive, if fresh water, and more conductive with increased salinity), faults (disrupting lateral flow of electrons along conductive layers), and subsidence (changes in compaction change conductivity).**