Earth Science-2013

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Earth Science & Climate Change

July 22-24, 2013 Embassy Suites Las Vegas, USA

Decomposition of deep groundwater signals for climate variability in the central plain of Thailand

Uma Seeboonruang

King Mongkut's Institute of Technology, Thailand

Email: muggletong@hotmail.com

Abstract

Climate variability, climate change, and anthropogenic activities have impacts on the availability of water resources, i.e. rainfall, evapotranspiration, surface water, and groundwater. Climate change is a significant and irreversible change due to global warming in the distribution of weather patterns over periods ranging from decades to millions of years resulting in a change in average trend weather conditions. On the other hand, natural climate variability is a change of weather patterns in cycles and appears to be periodic variation on various time scales. Anthropogenic processes include pumping for irrigation, industrial usage, and human consumption and may be altered from rules and regulations and indirectly from the climate change. Abrupt implementation of regulations, e.g. increasing groundwater usage fee or prohibiting the use of groundwater, can create rapid and continuing change in groundwater level. Deep groundwater is considered to be not only a decent buffer material due to the resistance nature of deep groundwater but may also absorb and memorize various events in their signals. The study area is the Lower Chao Phraya Groundwater Basin located in the Central Plain of Thailand. This deep multi-layer aquifer system situates in a highly populated area with the history of land subsidence due to heavy pumping. The method involves decomposing deep groundwater signals into long-term trend and periodic cycles employing Fourier series analysis. The indicators of climate change and human activities suppress in the long term trend or low frequency signal of groundwater levels. The climate variability results in periodicity or high frequency signal.

Biography

Uma Seeboonruang has completed her Ph.D. from University of California, Davis and postdoctoral studies also from the same university and Kyushu, Tokai University majoring in groundwater flow and contaminant transport. She has conducted numerous research projects and published a number of papers regarding to soil, groundwater acidity and salinity problems and recently has started the study of the impact of climate change on groundwater and soil salinity in Thailand.