

## **Statistical approaches and hydrochemical modelling of groundwater system in a small tropical island**

### **Abstract**

The aquifer of Manukan Island of Borneo, Malaysia had been found to be affected by seawater intrusion associated with excessive groundwater exploitation. This research attempted to characterize the chemistry of an impacted zone in the island using factor analysis (FA), cluster analysis (CA) and a hydrochemical model package (PHREEQC). The factor scores were used to plot the spatial map and to group the relationships among the monitoring wells using CA. The results of FA analysis revealed that the three main processes associated with the seawater intrusion event are aquifer salinization, cation exchange process and redox sequences. Output from the PHREEQC simulation was used to support the findings from the multivariate analysis