International Journal of Civil Engineering (IJCE)
ISSN(P): 2278-9987; ISSN(E): 2278-9995
Vol. 3, Issue 1, Jan 2014, 85-94

International Academy of Science, Engineering and Technology
Connecting Researchers; Nurturing Innovations

MAPPING OF GROUNDWATER QUALITY OF A COASTAL WATERSHED USING GIS

K. EZHISAIVALLABI & S. POONGOTHAI

Department of Civil Engineering, Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu, India

ABSTRACT

Coastal watersheds differ from others by their unique features, including proximity to the ocean, weather and rainfall patterns, subsurface features, and land covers. Land use changes and competing needs for valuable water and land resources are especially more distinctive to such watersheds. Coastal groundwater aquifers are negatively affected by land use changes, with associated reduction in recharge and increase in chemical use, and are subjected to the threat of saltwater intrusion. Water quality of receiving waters, such as estuaries, bays, and near shore waters, are negatively impacted by stream chemical, biological, and sediment pollutants. Limited water resources and concerns regarding water quality necessitate the need for best management practices. Hence, there is need for a better understanding of the various physical, chemical, and biological processes involved. The purpose of the present study is to estimate the groundwater quality in a coastal watershed and thematically represent it using GIS for understanding of the present scenario at a glance. Geographic information system (GIS) is an efficient and effective tool in solving problems where spatial data are important. Therefore, it is widely used for assessment of water quality and developing solutions for water resources related problems. In this study an attempt is made to estimate the ground water quality of Adappa watershed, which is a coastal watershed located on the tail end of Tamilnadu and existing both in Nagappatinam and Thiruvarur districts, India. More than 30 samples of the ground water are collected from the bore wells which were aerially distributed all over 55 villages of the study area. The samples were analyzed using standard procedures in the laboratory. Watershed map has been collected and digitized using ArcGIS 9.3. The database obtained from water quality analysis is used as attribute database for preparation of thematic maps showing distribution of various water quality parameters. The results of the water quality analysis were presented in the form of maps which can be used for better understanding of the present water quality scenario of the study area. The spatial variations of water quality parameters were discussed.

KEYWORDS: Coastal Watershed, Ground Water, Water Quality Parameters, Spatial Mapping, GIS