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Vulnerability Assessment of Saltwater Intrusion using GALDIT model for Jeju Island, KOREA

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Saltwater intrusion is the major environmental threat to the groundwater resources in coastal regions. Recently, studies have been conducted based on various methods to examine the current and future vulnerability of aquifers. In the present study, a coastal groundwater vulnerability test by overlay and index ranking was performed by using the GALDIT model to investigate the current status of saltwater intrusion to the coastal aquifer throughout Jeju Island,. The GALDIT (Chachadi, 2001) used in this study was developed to assess the vulnerability of a coastal aquifer to saltwater intrusion. The GALDIT method uses the hydrogeological parameters such as aquifer properties, hydraulic conductivity, groundwater level, distance from the coastline, current severity of saltwater intrusion, and aquifer thickness to make saltwater intrusion vulnerability indices. The GALDIT gives a weight to each of the indices, and prioritize the indices through a decision-making process, and then assess the possibility of saltwater intrusion by a numerical calculation. In this study, the local characteristics of saltwater intrusion were investigated by using the parameter data obtained at monitoring wells in Jeju Island and the spatial mapping were acquired by using GIS techniques to show the intrinsic vulnerability to saltwater intrusion quantitatively. Finally, the range of the individual parameters and the method of giving weight to each parameter were examined to reduce the subjectivity included in the result obtained by the GALIDT method.

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