

monitoring programs. Vulnerability results varied according to, and within, each geological unit, although generally surficial units were more vulnerable than bedrock units. The bedrock (Wolfville, Blomidon, and Horton formations) and surficial (outwash, kames and eskers, and alluvial deposits) units found to be most vulnerable to potential contamination were also the units most promising in terms of aquifer quantity and quality.

Modeling groundwater vulnerability in the Annapolis Valley, Nova Scotia, using DRASTIC in a GIS

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The Geological Survey of Canada, in conjunction with various partners, has been undertaking a groundwater characterization project in the Annapolis Valley, Nova Scotia for the past three years. A significant component of this study has been the modeling of groundwater vulnerability, which utilizes the concept that the degree of vulnerability to potential contamination can be mapped as a function of hydrologic conditions. A regional view of the vulnerability to potential contamination of groundwater resources within the Annapolis Valley was modeled using the DRASTIC methodology. This index-overlay method uses the seven hydrogeologic parameters of Depth to water, net Recharge, Aquifer media, Soil media, Topography, Impact of the vadose zone, and hydraulic Conductivity, and was programmed using object modeling available in ArcGIS.

To take into account several issues, including data quality, data quantity, and potential variability in the hydrogeologic conditions, seven different groundwater vulnerability scenarios were determined and examined for both bedrock and surficial aquifers throughout the Annapolis Valley. This exercise indicated that the vulnerability model produced by the DRASTIC method can be significantly altered by seemingly minor variations in data precision and accuracy for discreet parameters. Some of those parameters that have the highest impact on the weighting of the vulnerability model (net recharge, depth to water, and impact of the vadose zone) commonly exhibit low dataset precision and accuracy, which is an important consideration in the establishment of groundwater protection and