

## Soil Salinity from Wastewater Irrigation in Urban Greenery

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**Abstract :** The potential risk of salt leaching through wastewater irrigation is of concern for most local governments and city councils. Despite the necessity of salinity monitoring and management in urban greenery, most attention has been on agricultural fields. This study was defined to investigate the capability and feasibility of monitoring and predicting soil salinity using near sensing and remote sensing approaches using EM38 surveys, and high-resolution multispectral image of WorldView3. Veale Gardens within the Adelaide Parklands was selected as the experimental site. The results of the near sensing investigation were validated by testing soil salinity samples in the laboratory. Over 30 band combinations forming salinity indices were tested using image processing techniques. The outcomes of the remote sensing and near sensing approaches were compared to examine whether remotely sensed salinity indicators could map and predict the spatial variation of soil salinity through a potential statistical model. Statistical analysis was undertaken using the Stata 13 statistical package on over 52,000 points. Several regression models were fitted to the data, and the mixed effect modelling was selected the most appropriate one as it takes to account the systematic observation-specific unobserved heterogeneity. Results showed that SAVI (Soil Adjusted Vegetation Index) was the only salinity index that could be considered as a predictor for soil salinity but further investigation is needed. However, near sensing was found as a rapid, practical and realistically accurate approach for salinity mapping of heterogeneous urban vegetation.

**Keywords :** WorldView3, remote sensing, EM38, near sensing, urban green spaces, green smart cities

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