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Prediction of littoral drift with artificial neural networks

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Abstract. The amount of sand moving parallel to a coastline forms a prerequisite for many harbor design projects. Such information is currently obtained through various empirical formulae. Despite so many works in the past an accurate and reliable estimation of the rate of sand drift has still remained as a problem. The current study addresses this issue through the use of artificial neural networks (ANN). Feed forward networks were developed to predict the sand drift from a variety of causative variables. The best network was selected after trying out many alternatives. In order to improve the accuracy further its outcome was used to develop another network. Such simple two-stage training yielded most satisfactory results. An equation combining the network and a non-linear regression is presented for quick field usage. An attempt was made to see how both ANN and statistical regression differ in processing the input information. The network was validated by confirming its consistency with underlying physical process.

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