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Comparing Cart and Random forest for the monitoring of wetland vegetation with multispectral data.

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Abstract

This work is based on worldview 2 data acquired over the Camargue’s former saltworks recently purchased by the Conservatoire du Littoral, a French public organization created to ensure the protection of outstanding natural areas along the coast. Multiplication of breaches in inner and sea-front dikes translates into a fast-evolving site with increasingly difficult access. Its dynamic represents an interesting challenge for the statistical modeling of remote sensing data. Non-parametric classifiers such as rule-based methods are increasingly used to enhance the accuracy of wetland classification with remote sensing data. Classification trees easily accommodate data from all measurements scales. With Random forest, resampling statistical methods such as bagging have been said to improve their accuracy, but they also make the interpretation of the results more complex. In this study, we compared CART and Random Forest algorithms according to two main criteria: application and classification accuracy. Our results show that CART can offer equal accuracy to Random forest when attention is paid to the ecological knowledge of the gathered data combined to proper but simple resampling methods. It determines the robustness and statistical resistance of the resulted models that can be easily applied.

Keywords : CART, multispectral, model, Random forest, wetland.