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Using Artificial Neural Network model to produce high resolution forest soil property maps

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Soil property maps are considered as the most important input information for decision support and policy making in agriculture, forestry, flood control as well as environmental protection. Traditionally, soil property maps are mainly obtained from field surveys. Field soil survey is generally time consuming and expensive, which limited it application over a large area. As such, high resolution soil property maps are only available for small areas, very often, being obtained for research purposes. In this research, artificial neural network technology was used to generate high resolutions soil property maps. Hydrological parameters derived from digital elevation maps combined with information extracted from existing coarse resolution soil maps were used as input for the proposed model. Detailed soil survey information from Black Brook Watershed in Northern New Brunswick was used to test the model performance. We found that ANN models base model can be used to predict soil texture, soil drainage classes and soil organic matter content across landscape with reasonable accuracy. The high resolution soil maps derived with this method could be used for growth and yield assessment, silviculture design and making forest management plans.