Simple Evaluation Method for Flood Risk Using Rainfall Intensity Data and Machine Learning

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Floods especially pluvial flooding, is a major disaster in Japanese urban areas. Simulations are often used to assess flood risk, but such approaches tend to be highly complicated. Therefore, some simple methods using topographical indices, land use and rainfall data with statistical approach have been proposed. However, the accuracy of such methods is still low. This study aims to analyze the characteristics of flooded areas in the 23 wards of Tokyo and construct a simple method for evaluating flood risk using rainfall intensity data and machine learning. Radar rainfall data from the Japan Meteorological Agency were analyzed using Random Forest, a method of machine learning. The accuracy of the models constructed by Random Forest for flooded areas is almost 100% in many districts, but the accuracy for non-flooded areas are low. It means that the models can well predict flood occurrence, but many non-flooded areas are estimated as flooded areas. Therefore, it is necessary to improve the model.

Keywords: flood, rainfall inrensity, machine learning, GIS