|  |
| --- |
| **Type the title of your abstract**Evaluation of Disaster Prevention and Mitigation Functions of Mangrove Forests against Storm Surge by Remote Sensing |
| **Introduction/Aim:** Mangroves are distributed in the intertidal zone of tropical and subtropical coastal areas and serve as a buffer zone between marine and land areas. The recent rise in sea level caused by global climate change and the frequent occurrence of large typhoons have resulted in unprecedentedly large storm surges and storms, increasing the risk of disasters in coastal areas. This has led to great interest in the disaster prevention and mitigation functions of coastal areas, including mangrove ecosystems. Therefore, the purpose of this study is to evaluate the disaster prevention and mitigation functions of mangrove forests on a broad scale.**Methods:** The study site is a mangrove forest around Xuan Thuy National Park in Nam Dinh Province, Vietnam. This area, which covers more than 15,000 ha, has been reforested with mangroves by local residents under various projects.WorldView-2 data, GEDI data, and drone data were used as remote sensing data.In order to evaluate the disaster prevention and mitigation functions of mangrove forests over a wide area, information on the extent of mangrove forests is necessary to determine the width of the forest zone, and in addition, it is necessary to calculate the amount of mangroves as an obstacle to the direction of waves. Therefore, we used data from the WorldView-2 satellite to classify and extract areas of mangrove forests. Next, to calculate how much waves pass through the mangroves, we calculated the area of mangroves at 100 m width to the bank relative to the direction of the waves for various directions from the ocean to the land. Finally, height classification was performed using the mangrove height information from the drone data and GEDI data as teacher data and the texture of the WorldView-2 data. Using these results, the degree of disaster prevention/mitigation function of mangrove forests was evaluated by calculating how many mangroves are located within a 100-m width for each wave direction as obstacles that reduce waves.**Results:** Accuracy of mangrove classification was improved by masking the area around the mangroves to avoid misclassification. In the target area, the period of afforestation was limited to a relatively narrow period, so the values of forest canopy height obtained from the drone and GEDI were both concentrated at approximately 3 to 5 meters. Since a larger integrated value of mangroves in a 100 m width for various wave directions can be considered to have disaster prevention/mitigation functions, the integrated values were coloured to show the enhancement of mangrove forests and land, so that the relative disaster prevention/mitigation functions can be visually captured.**Conclusion:**The method presented in this study for broad-area evaluation of the disaster prevention and mitigation functions of mangrove forests is a method that takes practicality into consideration and allows for relative evaluation of functions. In contrast, by accumulating information on areas where tidal wave overtopping has occurred, this indicator will clarify which areas should be prioritized for countermeasures. |

*Please note the headings provided are optional, please remove or change to best suit your content.*