

Name SUZUKI Seiji	Job Title Associate Professor	Area of Expertise Environmental Hydraulics River Engineering
1. Main Research Topics ① Development of the Real-time inundation area information provision system In recent years, heavy rain disasters such as river flooding and slope collapses have become more severe in Japan, and there has been no end to the flood damage and human casualties caused by river flooding and inland flooding. In order to protect from flooding during a disaster, it is necessary to accurately understand the locations of flooding and the risk level of your current location. Therefore, we are developing a "Real-time Flood Area Information System" that could become the most useful evacuation support tool during disasters. The system we are developing is divided into three major phases in order to enable the provision of real-time flood information during floods. The first phase involves developing a disaster prevention app that efficiently collects data from the entire watershed, including photos and videos taken by many residents with their mobile phones during floods, and collecting a large amount of flooded photos and videos with location and time information. In the second phase, image data recording flood conditions is collected in real time, and data on the time and location of the image is acquired. AI applying image analysis technology is then used to automatically estimate flood depth. Based on the large amount of estimated flood depth data, real-time flood depth maps and maps of predicted flood depths several minutes later are created. In the third phase, the created real-time flood area information and predicted flood area maps are provided to registered residents of the river basin via an app, for effective use in supporting evacuation decisions and evacuation route selection. Fig Real-time inundation area information system ② Development of hydrosphere environment management technology with machine Learning Aquatic environments are formed by a complex interplay of not only physical but also biochemical phenomena. This complexity makes predicting aquatic environments extremely difficult. Therefore, we are attempting to use machine learning, which has been rapidly evolving in recent years, to predict aquatic environments and utilize it for aquatic environmental management. Using image data acquired from UAV, we are developing methods to accurately extract water areas and create elevation data (DEM) that take water areas into account, as well as a method to predict the occurrence of red tides using machine learning. Fig DEM Fig Extraction of water area		
2. Keywords Disaster, inundation, water quality, machine learning, hydrosphere environment		
3. Remarks and Websites As water disasters become more severe and rapid changes in aquatic ecosystems become apparent, the importance of appropriate management and conservation of the water environment, including disaster prevention and mitigation, is increasing, and social demand for the development of low-cost, simple aquatic management technologies is expected to increase further. researchmap: https://researchmap.jp/read0150870 Laboratory: https://www.cee.nagasaki-u.ac.jp/~suiken/		