Research Trends and Results

Protect Urban Functions by Speedy Inundation Forecast

ONUMA Katsuhiro, Senior Researcher, ITO Hiroyuki, Head, HOSODA Satoshi, Researcher

Flood Disaster Prevention Division, River Department

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1. Introduction

Since sudden localized torrential downpours (so-called "guerrilla downpours") have been increasing in recent years, it has become necessary to establish disaster prevention / mitigation measures for more speedy and accurate flood control activities, evacuation guidance, etc.

This study aims to develop a program by fiscal 2016 to more speedily and accurately forecast inundation, using observation data of water levels in rivers, etc. and rainfall data, and to build a prototype system for distributing the computation results of the inundation forecast.

2. Development of inundation forecast program

We are developing an inundation forecast program for processing data on inland and river floods as a whole by integrating the models of river and sewerage hydraulic analysis and flood analysis covering the basins of Kanda River and Shakujii River. This program aims to improve the accuracy of forecast by using real-time data on river level, etc. and have the high-speed performance enough to distribute computation results every 10 minutes. In fiscal 2015, we are working to improve the accuracy of models and to refine models for key areas including the vicinity of Shinjuku Station.

3. Establishment of an inundation forecast information distribution system

We are also working to build a system having the functions to collect the aforementioned data on real time, convert the data for input in the inundation forecast program, and convert computation results into the data format for distribution to distribute them on the web (see Figure). We are going to study the contents to be distributed by grasping information needs of expected users including local governments through hearing, etc. and reflect the study results in the system.

4. Perspectives for implementation of urban inundation countermeasures using inundation forecast information

This system is expected to support speedy and accurate disaster prevention / mitigation activities in urban areas, including the issuance of evacuation recommendations, etc. by local governments, opening of evacuation shelters, flood control activities, evacuation guidance and inundation countermeasures in underground shopping centers and subway stations, and water cut-off measures for stores and offices.

We aim to complete and put into service this system by reflecting the rainfall data from a new type of radar to be developed by other institution, and the rainfall forecasts based on that data, and by tooling this system for disaster prevention activities through social experiments.
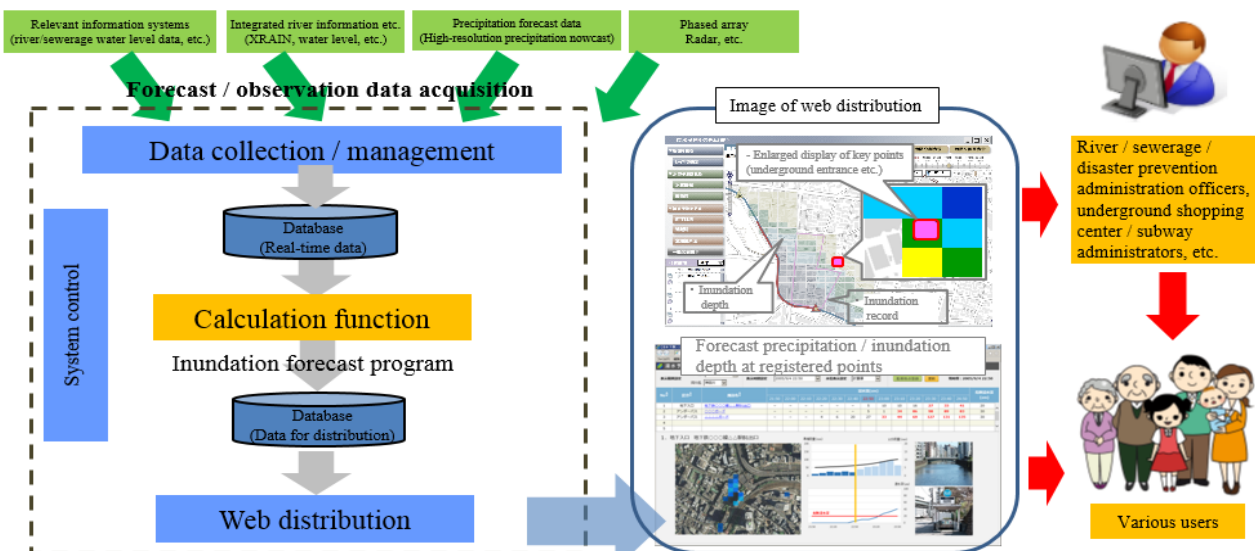
Figure: Whole picture of the system