

Establish a Society Aware of Flood Disaster Prevention Using the Lessons Learned from Floods

River Department

In response to concerns over more frequent flood disasters and intensified flooding due to climate change, it is necessary to prepare against large-scale floods that cannot be completely prevented by existing facilities. We aim to achieve a society that is resistant to flooding by way of highly accurate early forecast and warning technologies and disaster mitigation technologies, which includes improvements to facilities and evacuation methods.

Social background and issues

- In August 2016, four typhoons landed and caused serious flood disasters including human damage mainly in the Hokkaido and Tohoku Regions. In order to prevent human damage from flooding or inundation, it is necessary to provide appropriate information that contributes to quick evacuation.
- Mainly in small and medium-sized rivers, large scale bank erosion and riverbed degradation occurred and many structures including revetments, levees and bridges suffered serious damage. It is, therefore, necessary to develop resilient structures that contribute to evacuation and can be recovered from damage quickly.

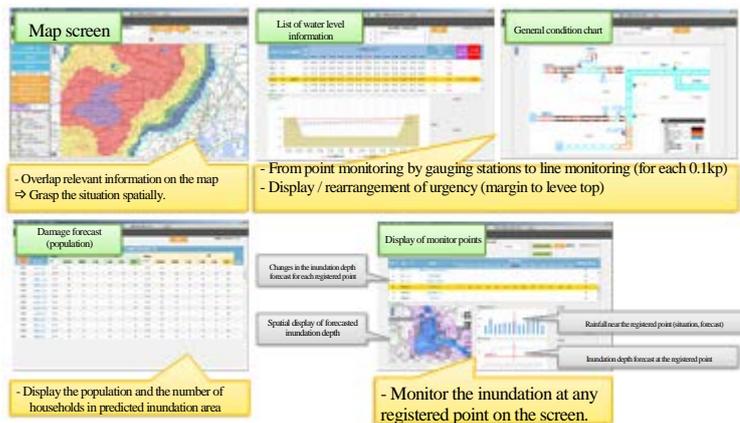
Content of study

Study on flood / inundation forecast (Forecast and visualization)

Develop a system to forecast flooding and inundation in a river basin. The system consists of a run-off model and river hydraulic model that compute longitudinal river water level profiles. Potential inundation areas can be predicted from the river water level and drainage water level, if necessary. Both observed rain radar data and forecasted rain data are used. We aim to provide preliminary information to secure the lead time necessary for evacuation by developing a highly reliable system with high forecast accuracy.

About lead time

A Japanese English word meaning the time required from start to the end of a project. To ensure safe evacuation, lead time should be longer to the extent possible, but forecast techniques need to be improved since forecast accuracy declines as the prediction time becomes sooner.



Sketch of the inundation forecast system

Study on disaster mitigation technologies to prepare for large-scale floods

We conduct a technical study for disaster mitigation even to reduce damage for large-scale floods that cannot be prevented only with existing facilities. We study on development of facilities having functions to prevent rapid rise in water level near residential area so that evacuation time can be secured even in the event of a flood, prevent isolation due to flood, and ensure quick recovery even in case of damage. We also develop an evacuation simulation system that contributes to formulation of effective evacuation plan.



Example of disaster by Typhoon No. 10



Evacuation plan evaluation tool

Realize the minimization of flood risk using all the possible smart disaster prevention / mitigation facilities (structural measures) and techniques to forecast flood / inundation accurately (non-structural measures).

☞ Related articles are as follows.

- Strengthen measure for urban water disaster by forecasting inundation
- Direction of Recovery being Clarified from the Disaster Investigation in the Omoto River etc. etc.