

# Proposal for Simple Creation Method of Flood Risk Information in Small and Medium-sized Rivers

(Research period: FY2018)

OYAMA Riku, Researcher, ITAGAKI Osamu, Head,  
Flood Disaster Prevention Division, River Department

Keywords: flood risk, LP data, pond model, crisis management plan

## 1. Importance of sharing of flood risk information in society

Intensification and frequency of heavy rains due to climate changes are increasing in recent years and many places in Japan have been seriously damaged by river flood, etc. including the July 2018 Heavy Rain. In order to prevent destructive damage to community, it is important to formulate a crisis management plan, etc. so that flood damage may be minimized even in the event of a flood that cannot be prevented by the facilities.

When considering evacuation routes and emergency vehicle traffic routes in formulating such a plan, it would be important to avoid the use of roads with high risk of inundation to the extent possible. In consideration of the routes above, it is possible to use the flood-prone area and inundation records officially published for large rivers, while it is not easy for the inundation risk of small and medium-sized rivers to obtain necessary inundation risk information about many rivers. We have therefore developed in the past year a simple method of creating inundation risk information in small and medium-sized rivers flowing through valley plains and published it as a guide <sup>1)</sup> in December 2018. In addition to this, we are advancing R&D for a simple method of creating inundation risk information in small and medium-sized rivers flowing through level terrain, which is introduced as follows.

## 2. Provisional calculation of simple inundation risk information based on LP data in level terrain

Issues in creation of inundation risk information for small and medium-sized rivers include limited existing data on cross section profile of river channel and limited budget and personnel for conducting flood simulations. In this study, risk information was provisionally calculated (Fig. blow) through (i) simplification using LP data in grasping cross-section profile of river channel and inland topography (elevation data including topography obtained by irradiating laser beams from an airplane), (ii) simplification using rational formula in run-off calculation and labor saving by using the evaluation system for the safety level of flood control in small and medium-sized rivers, and (iii) simplification using the pond model (i.e., method of calculating the inundation area and depth for the designated flood

volume by organizing the relationships between volume, inundation depth, and inundation advance) for flood simulations. Note that areas that partially have a runoff type flood which expected inundation area cannot be modeled by the pond model, outline drawing of the inundation area on the road crossing the water fall line was drawn by drawing water fall lines from the expected inundation area.

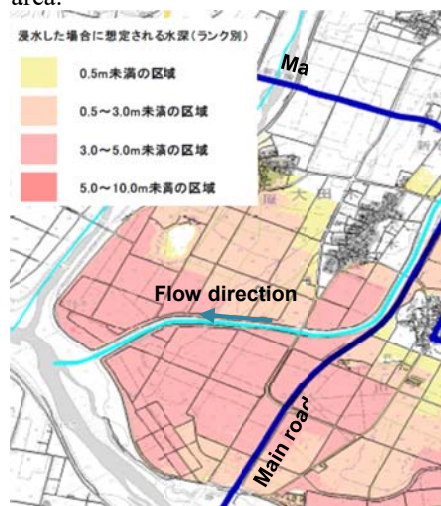


Fig.: Example for trial production of flood risk information in level terrain

## 3. For future use of the simple information

Based on the results of trial calculation, we are studying on the use of the risk information for the formulation of a crisis management plan. We intend to continue study on how to use the risk information in urban planning.

☞ See the following for details.

1) Guide to Creation of Simple Flood Risk Information in Small and Medium-sized Rivers (2018)

[http://www.mlit.go.jp/river/shishin\\_guide\\_hou\\_kaninarisuku\\_tebiki.pdf](http://www.mlit.go.jp/river/shishin_guide_hou_kaninarisuku_tebiki.pdf)