Research on inundation hazard map in Hiroshima city, 2007

Year of Research | 2007

(Purpose)
In recent years, local torrential rain has increased in urban areas of Japan. Effective ways to quickly and efficiently reduce inundation damage include not only promoting public hard measures, but also promoting self-help soft measures like hazard map. In this research was undertaken to prepare an inundation hazard map of 2600ha of Hiroshima city, and to provide advance inundation information to citizens. Last year we describe Ozu, Misasa, and Kannon district, and we describe Yoshijima, Ujina, and Asahimachi district this year.

(Results)
(1) Outline
1) Preparation of the predicted inundation district map
   We investigate following terms, run simulations, and make supposed inundation area map to make hazard map.
   ① Basic survey, ② Analysis of features of drainage district, ③ Selection of simulation methods, ④ Setting the target rainfall, ⑤ Water level of the river receiving the runoff water, ⑥ Modeling of target area and facilities, ⑦ Verifying simulation model and performing the inundation simulations, ⑧ Setting the map of the district where inundation by inner water is predicted, ⑨ Indicating inundation depths
2) Preparing the inner water hazard map
   We sort out the necessary information based on items in section 1) and prepared the hazard map.
3) Verification effects of the facilities against inundation
   It was verified effects of the facilities against inundation with simulations.

(2) Results
1) We simulated about peak intensity 81 mm/hr as largest recorded which is more than waste water maintenance standards, 53 mm/hr which happens the 10-year return period, and 65 mm/hr which is middle rain between 53 and 81 mm/hr.
2) Hazard map (Figure 1) was made from the inundation area map when it rained 81mm/hr as largest recorded rainfall.
   We simulated not only about largest recorded rain, but also about 15, 25, 40, and 53 mm/hr rain. By showing the state of inundation for each simulation along with illustrations, users can visually understand the inundation area and damage.
3) As a result, there were many places in the area that has few manholes to be different from the simulation result and past record. So we revised the simulation result based on the ground height, and river depth.
4) We also describe simulated results on hazard map about peak intensity which is 53 mm/hr drastic wastewater facilities plan is prepared. After drastic measure was prepared, those inundation districts were eliminated about ten-year probable rainfall (53 mm/hr).

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Key words
inundation method, hazard map, 10-year return period rain, inundation area, largest recorded rain