

# River Engineering for Adaptation to Climate Change

## River Department

We are conducting a study to provide flood risk information, which is useful for estimation future rainfall and flood characteristics as well as flood prevention activities and evacuation guidance, in order to advance disaster prevention by river development etc. and disaster mitigation after flood occurrence, in consideration of the serious flood damage that frequently occurs recently and change in heavy rain due to climate change.

## A social background and issues

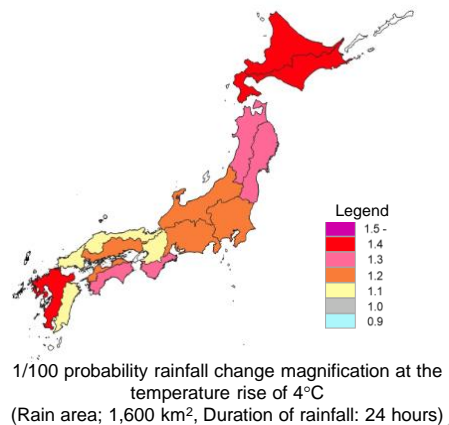
- In recent years, flood disasters with human damage frequently occur due to the frequent occurrence of heavy rain, such as Typhoon No. 19 in FY2019.
- Further, it is also necessary to consider disaster prevention / mitigation for rainstorms etc. including the impact of climate change.
- Accordingly, it is important to advance river development based on future rainfall and flood characteristics and to provide flood risk information so that local governments and residents may take actions properly to prepare for flood.

## Study contents

### Future changes in the target rainfall of river plan

It is pointed out that the scale of heavy rain causing river flooding frequently in recent years has been becoming large due to the impact of climate change. To address such changes in large-scale flood, it is required to reflect quantitatively future changes due to climate change in rainfall as external force, which is the target of river development and to implement river development adapted to climate change systematically and promptly. Then, Water Cycle Division of the River Department is analyzing future changes in the target precipitation of river planning using the climate forecast data based on the latest climate model.

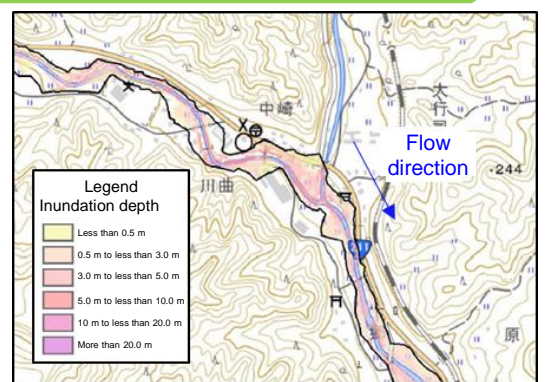
The right Figure shows an example for calculation of the ratio of past and future precipitation ("precipitation change magnification") in a planned scale for each of the 15 areas divided across the country. Considering such future changes in rainfall as external force, river planning adapted to climate change is expected to proceed across the country.



### Support the creation of flood risk information based on the limited available data on small- and medium-sized rivers

For flood control measures under climate change, promotion of the damage prevention / mitigation measure in case of flood, as development of flood control facilities, is much more important. For damage prevention / mitigation measure in case of flood, crisis management actions are important, for which flood risk information such as inundation estimation map is necessary. However, river lengthwise and cross / longitudinal leveling data etc. necessary for creation of the inundation estimation map is short due to the limited budget and personnel for small- and medium-sized rivers extending across the country, so that there is an issue of how to eliminate flood risk information vacuum areas.

Flood Disaster Prevention Division of the River Department has developed a method of creating a simple inundation estimation map based on the airborne laser survey (LP) data for eliminating such information vacuum areas and advancing the study for social implementation.



Example for trial creation of a simple inundation estimation map based on LP data

Support the creation of flood risk information necessary for crisis management actions as well as river facility development to prepare for climate change.

☞ Related articles are here.

- Changes in River Plan Target Precipitation due to Climate Change (p. 51)
- For Solution of Flood Risk Information Vacuum Areas in Small- and Medium-sized Rivers (p. 55)