



Development of flood forecasting system over Japan and application to 2018 Japan floods event

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Today's Earth (TE) is near real time global terrestrial analysis system of hydrological quantities jointly developed by JAXA and U-Tokyo. As operational application of this system, JAXA and U-Tokyo have developed "TE-Japan," which is a regional high-resolution hydrological forecasting system. From TE-Japan, hydrological quantities including flooded area, river flow rate, etc. are forecasted at about 1 km resolution over whole Japan every 3 hours at nearly real time, up to 39 hours ahead. As atmospheric forcing data, it uses Radar-Amedas precipitation analysis and MSM-GPV numerical weather forecast of Japan Meteorological Agency. In this study, prediction skill of river flow rate and flooded area was tested for 2018 Japan floods in July.

Due to the influence of Typhoon Prapiroon, it brought a large amount of rainfall throughout the western Japan from 5th to 8th July 2018. In the Takahashi River (Okayama prefecture), Mabi Town was flooded around the confluence point with the Oda River, around 0 o'clock on July 7, mainly due to the breakdown of the left bank of the Oda River. As a result, several dozen people were killed. In Hiji River, Ozu city was inundated near the confluence point with the Yagi River, around 9 o'clock on July 7 due to the overflow from the temporary fixed bank around the confluence point. There was no direct death caused by the flooding on the contrary.

Our analysis showed that TE-Japan could predict the risk of the above two inundations from more than 24 hours ahead the floods, respectively. Currently, the official operational flood forecast of Japanese MLIT tries to issue warnings and evacuation orders at most three hours ahead of flooding. However, there may be some cases that the warning is not so helpful because it is issued in the middle of severe situation and/or during mid night. Our result indicates that it is possible to predict floods for more than ten to twenty hours ahead. This would give plenty of time for citizen to protect themselves and it helps mitigating damage.