

Efforts to Grasp Precursors from "Twitter Information" for Mitigation of Damage by Sediment-related Disaster

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1. Introduction

About 40 percent of deaths in natural disasters are said to have been killed by sediment-related disasters, and various places in Japan have suffered serious damage by sediment-related disaster as represented by the Hiroshima Sediment Disaster caused by heavy rain in August 2014. In such situations, in order to avoid at least human damage, the Cabinet Office requires local governments to use the announcement of sediment disaster warning information as a decision criterion for evacuation recommendation. However, since sediment disaster warning information is announced at the initial stage where possibility of sediment-related disaster has increased, another indicator is required to determine increase in urgency after announcement of the same information. Then, the Guideline above positions precursors such as "rumbling of the mountain" and "flow of woody debris" as a criterion to decide evacuation instructions. In order for administration to grasp the occurrence of such precursors, it has to rely on information provided from residents who perceive such precursor, but there are few cases where precursor was reported when recognized, which is not sufficient from the viewpoint of use as disaster prevention information.

For these reasons, the Division has started a research to find out precursors of sediment-related disasters contained in users' "twitters" stating uncertainties or fears about heavy rain etc. and incorporate them into the warning / evacuation system by analyzing social media information in real time which exists on the Internet in a large amount jointly with Fujitsu Laboratories.

2. Details of research and analytical cases

In this research, we are considering the use of twitter, which is characteristic of real-time information and easy exchange / transfer of information with / to other users, and the adoption of an approach that collects twitter information with key words related to precursors and estimates "time" "location" of posted information to grasp increase in urgency of sediment-related disaster in applicable areas. As an example, we examined the Aso Area, which suffered enormous damage by the July 2012

Northern Kyushu Heavy Rain, and found twitters posted (Figure 1-(a), (b)) concerning the occurring of landslide in the neighboring area before the time zone (Figure 1-(c), (d)) when debris flow etc. occurred intensively. Therefore, twitter information may be available as precursor information for intensive landslide. For other cases of disasters, it was also found that it is possible to collect information concerning the precursor of sediment-related disaster, etc. at an early stage by analyzing twitter information in real time in case of heavy rain and estimating the location of municipality.

3. Conclusion

With this research, we aim to identify locations being exposed to danger and then grasp precursors etc. for sediment-related disaster, and enhance the reliability of the grasped information by combining objective information such as rainfall distribution so that techniques in this research may be utilized for issuing evacuation instructions etc. at an early stage and for independent evacuation by residents. With this aim, we will continue the research.

[Reference]

1) KUNITOMO Masaru and KAMIYAMA Joko: -- Can twitter grasp the precursor of sediment-related disasters?" Monthly J-LIS, Vol. 1, No. 10, pp.44-49, 2015

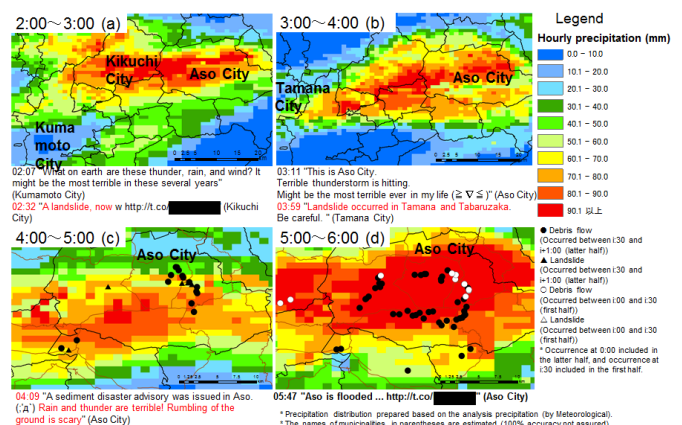


Figure 1. Changes in Locations of Sediment-related Disaster and Main Twitter Information