

A heavy rainfall-induced disaster-mitigation system for railways based on precipitation forecast data

Takuya Urakoshi
Railway Technical Research Institute

Abstract

Natural disasters, excluding earthquakes, on railways in Japan has been decreasing to less than 1,000 times a year with effective measures. Train operation control regulation under rain is one of the measures, and it requires a train operation commander to order train drivers to stop trains if the amount of precipitation exceeds predefined threshold. Remained issues of this regulation are preventing detection omission of localized heavy rainfall and optimization of the stopping position of trains.

To solve the remained issues and to improve railway operational safety, a prototype system to mitigate disasters due to heavy rain has been newly developed. This system conducts following four analyses: (1) calculation of rainfall indices using precipitation forecast data from a third-party provider, (2) runoff and inundation analysis, (3) large-scale landslide analysis, and (4) train operation analysis to prevent trains from approaching hazardous area. This system is currently undergoing improvement for practical use.

Curriculum Vitae

Name: Takuya URAKOSHI

Title: Senior Researcher (Geology), Disaster Prevention Technology Division

Company: Railway Technical Research Institute (RTRI)

E-mail address: urakoshi.takuya.38@rtri.or.jp



Education:

May 2013 Professional Engineer, P.E.Jp (Applied Science)

March 2005 Master of Engineering, University of Tokyo in Japan

March 2003 Bachelor of Engineering, University of Tokyo in Japan

Expertise:

Mr. Urakoshi has been a Senior Researcher at the Geology Laboratory of the Disaster Prevention Technology Division since October 2020. His major research fields are groundwater, water-rock interaction, and applied geology for prevention and mitigation of natural disaster.