

Monitoring of vegetation change in the alpine zone by using time series aerial photograph and drone observation

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The vulnerability of alpine ecosystems to climate change, as pointed out by IPCC, and the necessity to conduct monitoring in the alpine zone have been recognized worldwide. In this research, we analyzed using aerial photographs acquired in June 1963 and July 2007 to quantify the change of alpine vegetation distribution in Mt.Rishiri. The study area is in the range of 400 m to 1000 m altitude the western and north slope of Mt.Rishiri. The aerial photograph were digitized and classified into five categories of vegetation community and non-vegetation, quantified the changes in the vegetation distribution of about half a century. It was found that the distribution of *Pinus pumila* communities around altitude of 500 m decreased or disappeared. In order to investigate in detail, high resolution aerial photography by drone was performed in 2010 and 2016 for 2 ha. When extracting the change of 6 years from the obtained digital image, it was confirmed that *P. pumila* community decreased and changed to *Sasa kurilensis* community.

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