

Reconsideration about the distribution of Narugo-Nizaka tephra (Nr-N)

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Narugo volcano is a Quaternary volcano located in the northwest of Miyagi Prefecture. It consists of caldera of about 7 km in diameter and a lava dome cluster in its central part. Narugo-Nizaka tephra (Nr-N : SODA, 1989) is thought the biggest eruption that has formed about 90 ka (MACHIDA and ARAI, 2003). It consists of some fallout deposits composed of alternating pumice and ash beds, and an overlying nonwelded Nizaka pyroclastic flow deposit (ISHIDA, 1978. TSUCHIYA et al., 1997), but past reports indicated that there was no fallout deposits distribution area. The purpose of this report is to indicate that there is fallout deposits distribution area, and estimated that mode of eruptions.

According to SODA (1989), Nr-N is divided into five members. From the lower member, N1 is pumice fall deposit, N2 is alternating pumice and ash fall deposit, N3 is pyroclastic flow deposit, N4 is very fine glassy ash fall deposit, which is estimated to co-ignimbrite ash fall deposits, and N5 is layering ash fall deposit.

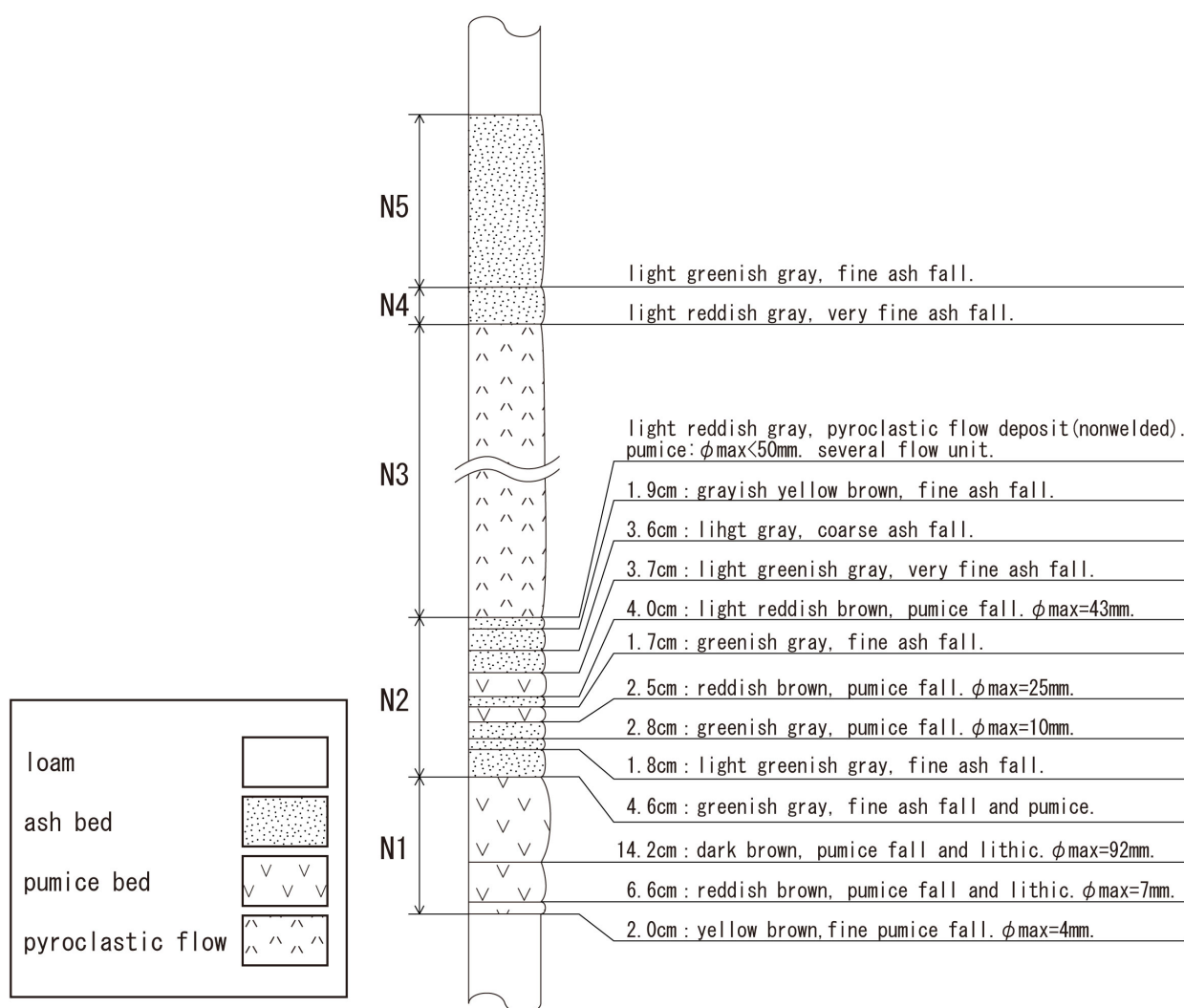
This report has taken up main fall deposit members N1, N2, and N5, and investigated with the sequence defined by SODA (1989), and confirmed that it was Nr-N based on the measured refractive index of volcanic glass and orthopyroxene.

Based on the field survey, we considered distribution axial direction. We considered from a relation between azimuth from Narugo volcano and maximum thickness of each tephra members outcrop. The distribution axis of N1, comes to an inclination of 75~90 degrees direction, N2 is 80~95 degrees direction. The distribution axis of N5 indicates bimodal, along 55~85 degrees and 105~130 degrees. On the other hand, there was no deposit which indicates a suspended period between N1 and N2, and distribution axis of N1 and N2 are similar. Because of this, we assumed that N1 and N2 are series of eruption. As a result of the reconsideration, the distribution axis of N1+N2 comes to an inclination of 80~105 degrees direction.

On the basis of these distribution axes, we made isopach maps. Synthesized isopach maps of N1+N2 and N5 shows good response to isopach map of MACHIDA and ARAI (2003). For reference, we calculated eruption volumes, using the 3D-modeling method by SUDO et al. (2007). The eruption volume of N1+N2 and N5 are estimated at 1.55 km³ and 1.46km³ respectively.

According to volcanic glass form and others, mode of eruption of each member is assumed as follows. Volcanic glass of N1 and N2, pumice type occupies a subject (90-70%). N1 and N2 are guessed at with Plinian eruption. Ash fall deposit part of N2 is being considered. There is a lot of volcanic glass of bubble-wall type more than N1 in N2 that suggests change in the eruption condition. There are few contents of volcanic glass in N5, therefore it's difficult to presume the mode of eruption. But the percentages of volcanic glass which is formed by quenched fragmentation of N5 is more than other members. N5 is suggested with Phreatomagmatic eruption.

Keywords: Narugo volcano, Narugo-Nizaka tephra, Nr-N, isopach map, pyroclastic fall deposit



Nr-N tephra schematic column