

Inland fining and inland lightening characteristics of tsunami deposit

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Inland fining is one of the most commonly observed characteristics of sheet-like distributing tsunami deposit. Similarly, there is also a report that inland lightening can also be seen in the deposit. In a case where the topography and surface situation is simple, these tendencies are thought to reflect those sand particles carried in the tsunami flow deposit in descending order of their settling velocity. In this study, we examined the combination of inland fining and inland lightening features of the 2011 tsunami deposits left in the coastal forest in Misawa, Aomori Prefecture. The tsunami and coastal sand consist of iron sand by 60% or more by weight. We studied 15 excavation sites at 5 m intervals on an 80 m profile perpendicular to the coast. The maximum deposit thickness is ca. 30cm and decreases toward the tsunami inundation limit. The average grain size of the tsunami deposits is about 2.2 ϕ in the first half of the profile and fines inland to be 3 ϕ . On the other hand, the specific gravity of the deposit decreases inland through the profile. In order to analyze this trend more precisely, the sand was divided into sand iron and other (here called non-iron sand) using a magnet. The specific gravity of the iron sands ranges from 3.4 to 3.6 and that of the non-iron sands is constant at 2.7. From the specific gravity and the grain size of the iron sands and the non-iron sands, we calculated the settling velocities of the particles and found that both the iron sands and the non-irons sands were almost the same value. It is inferred that both inland fining and inland lightening reflects changes in the characteristics of sand expressed by the settling velocity.

Keywords: tsunami deposit, sandy layer, settling velocity, inland fining, inland lightning