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Characteristics of surface erosion and sedimentation by the 2011 Tohoku Tsunami

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Distribution, thickness, and geological features of tsunami deposits formed by the 2011 Tohoku Tsunami were investigated on natural coasts in Aomori and Iwate prefectures, northeastern Japan. Tsunami inundation distance and deposit thickness varied along the coast. For some sites, the tsunami heights were more than 30 m above the sea level and the inundation distances were more than 1 km from the beach. On gentle topography, the tsunami left continuous sand deposits on the surface. The thicknesses of the deposits are less than 20 cm and it thicker where large dune or sandy beach exists at the valley mouth. For most of the cases, the deposit thickness tends to decrease with distance from the sea. Near to the inundation boundary, only sand particles are scattered on land. The tsunami deposition was patchy in areas without eroded landforms. The deposits are composed mainly of sand, and their particle size gradually decreases in a landward direction. Thickness and grain size of the tsunami deposits seem unrelated to wave heights.

Keywords: Tsunami deposit, Landform, Erosion, the 2011 Tohoku Tsunami