The characteristics of tsunami deposits at Idagawa polder, Minami-soma City, Fukushima Prefecture.

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In the Tohoku region along Japan Trench, great earthquakes often occur with large tsunamis before the 2011 Tohoku-Oki earthquake. In particular, a historical tsunami with 869 Jogan earthquake caused serious damage, and the estimated magnitude was Mw 8.4 or larger (Sawai *et al.* 2012). The results of tsunami deposit surveys in Sendai plain show tsunami deposit between 869 Jogan and 2011 Tohoku-Oki earthquake might correspond with 1454 Kyotoku or 1611 Keicho earthquake, and average recurrence interval of large tsunamis were estimated about 500-600 years (Sawai *et al.* 2015).
We carried out the tsunami deposit survey to investigate the tsunami deposits with 869 Jogan and 1454 Kyotoku or 1611 Keicho earthquakes at Idagawa polder, Minami-soma City, Fukushima Prefecture. The sedimentary environment was stable, because there was the inner-bay or lagoon of fresh-blackish water until the 1921 and there was no massive river in this area. Although there were several previous studies around this area, the number of survey and analysis locations was too few (Aoyama and Goto, 2005, Oikawa et al. 2011 and Oota and Hoyanagi, 2014). In this study, we took the 13 cores of length 2.0-2.5 m in the 11 locations 0.6-2.7 km away from the coast. We will discuss about these results for the elemental analysis by using the X-Ray Fluorescence (XRF), grain-size analysis and radiocarbon age measurement.
Ordinary deposits were consisted of the inner bay silt and the median grain size was about 15 μm. The 5 continuous event layers (EV1-EV5) were found in ordinary deposits (Goto et al. 2015, Kusumoto et al. 2015). These layers were consisted of the coarse, median and fine sand, and the weak elements (Na, K and Ca) and strong elements (Si, Fe and Al) for the chemical weathering were more abundant than ordinary deposits. However, the top event layer (EV1) and about 10 cm of ordinary deposits under EV1 showed the increase for the oxides of phosphorus and the decrease for the oxides of sulfur, and these trends differ from the others. They may indicate the closure of inner-bay and the beginning of the reclamation.
The most of event deposits had sedimentary signatures like tsunami deposits, such as the significant erosional contacts, multiple graded beddings and rip-up clasts (e.g. Dawson and Stewart, 2007 and Switzer and Jones, 2008). In addition, the median grain size of these event deposits is about 0.28 mm. Only the second event layer (EV2) shows a bimodal distribution that it has the peak both the median sand and silt. If it is assumed that the sources of all event deposits are the same, the phenomenon of EV2 may be weaker than the others.
Being a result of radiocarbon age measurement, the sedimentary age of EV2, EV3-EV4 and EV5 were estimated AD1520-AD1920, AD130-AD1440 and 140BC-AD130, respectively. Compared with tsunami deposits in Sendai plain, EV2, EV3-EV4 and EV5 may correspond to tsunami deposits with 1454 Kyotoku or 1611 Keicho, 869 Jogan and the older earthquakes, respectively.
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