

Track the past coastal disasters and environmental change in Lake Kitagata sediment using by diatom observation and chemical analysis

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We investigated the past tsunami disaster and environmental change using the sediment cores collected from lake Kitagata that is located along the Sea of Japan. Three cores collected in 2014 were analyzed. Age constraints are given by ¹³⁷Cs radioactivity and ¹⁴C ages. Two possible tsunami layers, in addition to a tephra layer probably by the eruption of Mt Hakusan, are identified. Two tsunami layers show a decrease in water content, an increase in carbonate amount, and coarsening of mineral particle size. These layers contain many seawater diatom species and fragment of *Thalassiosira eccentrica*. The concentrations of Ca and Sr, which are major element found in sea water, are also increased. Upper possible tsunami layer is dated as around 1600 CE, when no historical record was reported (or Tensho tsunami?). The lower layer corresponds to the Taiho tsunami that occurred in 701 years. The change in lake environment is also confirmed at around 1130 BC by the reduction in density, which is from the x-ray CT scanning, water content, the appearance of shell fossils that habitat in the intertidal zone, and the extinction of *Aulacoseira granulata* that is freshwater diatom species. These changes indicate the influx of seawater to lake Kitagata. caused by artificial development in the area which is found in historical documents.

Keywords: Tsunami deposit, Lake sediment, Diatom, Tephra layer, Chemical analysis