Tsunami record of the last 700 years in bottom sediment of lake Kasumi-ga-ura, southeastern part of Ibaragi Prefecture

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Lake Kasumi-ga-ura connects the Pacific Ocean via Tone River. Sampling site in this lake lies more than 50km far from the river mouth of Tone. Maximum tidal height at March 11, 2011 was +2.5m at the river mouth of Tone and +1.6m at water gate located 18km from the river mouth. Based on these facts, we started studies on tsunamiites in bottom sediment of Lake Kasumi-ga-ura. Cored sediment of 77cm length was taken at the central part of the lake where water depth is 6m on August 21, 2018. CT scan photograph was taken and samples for grain size analysis at each 1cm thickness were taken. Tephra seams of Asama-A in 1873 A.D. and Fuji Hoei in 1707 A.D. were observed at depth 42cm and 50cm respectively. Shells of *Corbicula japonica* were observed at depth from 70 to 73cm. More than 10 event layers were observed having more than 10 micrometers in mean diameter and relatively less transparency in X-ray. Sand size particles are chiefly composed of minerals of quartz, feldspar, pyroxene etc. and fragments of pumices and scorias and sometimes minor plant fragments and shell fragments. Sedimentary ages of event layers estimated based on dry weight of sediment and ages and depths of tephras show good correlation to historical large tsunamis. As mentioned above, Lake Kasumi-ga-ura locates more than 50km far from the river mouth of Tone. Tidal height is supposed to decrease rapidly. But existence of event sediments in Lake Kasumi-ga-ura shows that large tsunamis could reach that lake. Those sediment can be correlated to tsunamis of Showa Sanriku in 1933, Chiba Boso in 1909, Meiji Sanriku in 1896, Chile in 1877 or 1837, Genroku in 1703, Enpou Boso in 1677, keichou in 1605 or Keichou Sanriku in 1611, Tenshou in 1586, Meiou in 1498 or Kyouroku in 1454 and Shouhei in 1361.

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