# Identifying early Holocene tsunami deposit in Suruga Bay coast using facies and ostracode assemblages in drilling cores

# Osamu Fujiwara[1]; Toshiaki Irizuki[2]; Yoshikazu Sampei[3]; Ayumi Haruki[4]; Akira Tomotsuka[5]; Kohei Abe[6]

[1] Active Fault Research Center, AIST, GSJ; [2] Dep. Geosci., Shimane Univ.; [3] Geoscience, Shimane Univ; [4] Dept. Geoscience., Shimane Univ.; [5] none; [6] Grad. Sch. Life & Environ. Sci., Univ. Tsukuba

Tsunami deposits have been commonly recognized by the presence of exotic materials such as marine sand sheets in coastal plains and lakes, or the presence of allochthonous fossils in coastal sequences that evidence landward transportation of marine sediments.

A sand sheet observed in drilling cores from coastal lowland along Suruga Bay, central Japan has sedimentological and paleontological signals that show the sand sheet was deposited by inundation of open marine water into the closed embayment. The sand sheet is intercalated in the early Holocene muddy sequence deposited in an enclosed bay and distributed around -20.0 meters underground (Fujiwara et al., 2008). The sand sheet is observed in two cores, Cores F-7 and F-8. Core F-7 is located about 750 m north of Core F-8. Detailed 14C age determination indicates the sand sheet was deposited around 5600-5400 BC.

The sand sheet is composed of an alternation of sand and gravel beds with total thickness of 110 cm in Core F-8. In Core F-7, the sand sheet consists of stratified coarse to medium grained muddy sand bed of 45 cm thick. In both cores, the sand sheet shows a scoured base, inverse and normal grading and general fining-upward trend, and includes abundant rip-up clasts. Unlike the underlying and overlying mud beds, the sand sheet yields shallow marine molluscan shells.

Ostracode assemblages from the sand sheet in Core F-7 show a marked contrast between lower and upper part of the sand sheet. The lower part is characterized by bay mouth and open sea ostracode assemblages. On the other hand, the upper part of the sand sheet is characterized by enclosed inner bay or estuary ostracode assemblages.

Depositional facies shows that the sand sheet was formed by a high-energy sediment flow intruded in a low-energy enclosed bay. General fining of the sand sheet from Core F-8 to F-7 indicates the domination of northward sediment transport. Landward sediment transport is not identified only from this data, because the reconstruction of former landform is insufficient. Ostracode assemblages resolved this problem. Landward sediment transport is dominant in the lower part of the sand sheet. Conversely, seaward sediment transport is dominant in the upper part of the sand sheet. The sand sheet is composed of a set of lower up-flow unit and upper return-flow unit. A tsunami inundated into the enclosed bay is the possible source of the sand sheet.

References

Fujiwara, O. et al.(2008) Annual report on active fault and paleoearthquake researches, No. 8, 163-185 (in press).