

Exploring Coastal Wetlands of the southern Kyushu (Japan) with Consideration of their Preservation Potential for Tsunami Deposits

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This research project is based on tsunami geology. Specifically, it addresses making pertinent inventories of coastal wetlands in the southern Kyushu (Japan) that faces the East China Sea, with the Ryukyu trench (an active fault of great extent) being situated farther south. Thus the present research is aimed at assist in the assessment of recurrent intervals (or such related matters) of great earthquakes that may be generated by the rupture along the Ryukyu trench. The important consideration herein is as follows: A targeted wetland should be such that it is sensibly away from the shoreline and is protected by a natural beach ridge or so, permitting the deposition of peaty or clayey sediment under normal calm conditions, over a prolonged period of time (say several thousand years or more). Moreover, such a targeted wetland should, ideally, have been exposed to rare event (run-up of tsunami flows or so), leaving evidences that would be identifiable from a scientific means.

With the above-mentioned in mind, the examination of the field information available led the author to select a total of eleven coastal wetlands as sort of geo-archives (ten wetlands along the 130-km-long coastline of the Satsuma peninsula; one wetland on the 25-km-long coastline of the Koshikijima island). In all of the eleven wetlands, we retrieved a total of fourteen continuous sediment cores and subjected a number of (plant) specimens to the C-14 dating methodology. The results together confirmed that the retrieved sediment cores covered a span of recent six thousand years or longer. It is of particular interest herein to state that at the Nakayama wetland in the Koshikijima island, we found a few event layers being intercalated in a thick deposit of peat. The peat extends directly from the ground surface (elevation 3.3m) down to a depth of 9 m and is underlain by a marine deposit 4 meters or so thick. Each event layer consisted of an assembly of platy gravel of slate. Note herein that on the beach a great many number of platy slate gravel can be seen scattered. It is thus concluded that a sizable amount of the platy slate gravel were transported landwards by seawater flows over the beach, and were eventually deposited on to the peaty soil surface in the wetland. It is too premature, however, to judge the type and nature (tsunami or storm wave) of the responsible fluid forcing. Yet it is important to note that the occurrence of the events concentrated in the period between 2500 years B.P. and 3500 years B.P. In order to clarify the geological meaning of the particular time period, one should take a close look at the sequence of formation of the wetland. A tentative inference is as follows: Initially, there was a concave coastal planform toward the ocean; Alongshore sediment transport then facilitated the development of spit-like sedimentary features, eventually becoming a bay-mouth barrier; Then, the water body behind the barrier was gradually buried with terrigenous sediment, forming a peaty wetland. It is a subject for future studies to perform a detailed survey of cross-shore profiles through each of the selected wetlands, enabling one to assess the power of fluid forcing enough to transport a variety of sediment including platy gravel.

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