Geophysical Research Abstracts
Vol. 19, EGU2017-7076-2, 2017
EGU General Assembly 2017

Fluvial landscapes evolution in the Gangkou River basin of southern Taiwan: Evidence from the sediment cores

Jia-Hong Chen (1,2), Shyh-Jeng Chyi (1), Jiun-Yee Yen (3), Li-Hung Lin (4), I-Chin Yen (5), Neng-Ti Yu (6), Lih-Der Ho (1), and Chia-Hung Jen (1)

(1) Dept. of Geography, National Kaohsiung Normal University, Kaohsiung, Taiwan, (2) jiahong1017@gmail.com, (3) Dept. of Natural Resources and Environmental Studies, National Dong Hwa University, Hualien, Taiwan, (4) Dept. of Geosciences, National Taiwan University, Taipei, Taiwan, (5) YIC Geological Office, Penghu, Taiwan, (6) Department of Applied Science, National Tsing Hua University, Hsinchu, Taiwan

The Gangkou River basin is the largest basin in the eastern Hengchun Peninsula of Taiwan. Its main river length is 31km and the basin area is 102sq. km. The width of the active channel is relatively narrow, but the valley from the middle to downstream is remarkably wide, indicating a feature of underfit stream.

We drilled two sediment cores in the downstream area, including a 30m core (core-A) from a higher terrace, which is 14m above mean sea level, and a 20m core (core-B) from a lower terrace, which is 4m above mean sea level. Most of the sediments in the core-A are mud, which represents the flood plain facies, and 14C dates in the core-A range from 11ka to 7ka BP. Furthermore, the sediment layers reveal signals of marine events at the core depths of 5m to 11m by X-ray fluorescence. In the core-B, there is an erosional surface at the core depth of 5m. The age of the fluvial gravel layer above the erosional surface is about 0.4ka BP, and the mud layer top the surface is about 8.5ka BP.

The preliminary results show that (1) as the tectonic uplift rate induced by the marine terraces around the basin is 1.0 to 2.5 mm/yr, and the accumulation rate of the mud layer in the basin is 6.7 to 8.7 mm/yr, the sediments infilling (more than 30-meters-thick) in the downstream area of the basin should be the results of the lower tectonic uplifting and the higher post-glacial sea level rise and; (2) the marine sediment layer with 14C dates of 7.5ka to 8.5ka BP is very likely the remain of the maximum flooding surface (MFS) in the early Holocene. These results indicate that the fluvial landscapes evolution of the basin was controlled by the sea-level; (3) the erosional surface in the core-B indicates the Gangkou River continuously erode the infilling sediments from 7ka to 0.4ka BP. Previous studies show that the sea-level around Taiwan gradually declined from its high stand since 6ka, we proposed that the continuous erosion was probably the results of tectonic uplifting and eustatic sea-level fall.