

YR11 and SG12: Paired projects to explore linkage between East Asian Summer Monsoon and Westerly Jet during the Holocene

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Hydrological cycle in Asia is strongly influenced by spatial pattern and intensity of East Asia Summer Monsoon (EASM). Recent study by Sampe and Xie (2010), based on detailed analysis of meteorological data set, revealed a close genetic relation between the westerly jet (WJ) and EASM front. Preliminary examination of our paleoclimatic data set also suggests the relationship between the position of WJ over East Asia and the intensity of EASM precipitation over South China on millennial time-scale during the Holocene. In order to confirm this relationship and test whether the similar relationship is maintained on shorter time-scales, we organized two projects YR11 and SG12.

YR11 is a project to reconstruct distribution of EASM precipitation over the Yangtze River drainage during the late Holocene with decadal time-scale. To accomplish this objective we first examine provenance of detrital silt and sand throughout the drainage of modern Yangtze River so as to develop a new method to estimate relative contribution of detrital sediments from various branches of Yangtze River to the sediments discharged to the Yangtze River Delta. Next, we will drill the Yangtze River Delta to retrieve sediment cores that are expected to preserve high resolution record of Yangtze River discharge with flood events. By applying a newly developed method to quantitatively estimate the provenance, we hope to reconstruct changes in the area of heavy precipitation over the Yangtze River drainage.

SG12 is a project to reconstruct the changes in the position of WJ axis over East Asia during the Holocene with decadal to annual resolution using the Lake Suigetsu sediments. Our previous studies proved applicability of the provenance tracing method of eolian dust to the Lake Suigetsu sediments. Because the Lake Suigetsu sediments have annual lamination and extremely well-dated through the extensive studies under SG06 project (lead by Nakagawa), the sediments will provide us a rare opportunity to examine changes in eolian dust flux, grain size and provenance on annual time-scale. To accomplish this objective, we plan to drill Lake Suigetsu again in this summer.

The outline of the paired projects and preliminary result of YR-11 project will be presented at the meeting.

Keywords: East Asian Summer Monsoon, Westerly Jet, Yangtze River, Lake Suigetsu, sediments, eolian dust