Seasonal change of water property in Tonlé Sap Lake, Cambodia

KAWAHATA, H[1,] SUZUKI, A.[2,] UCHIDA, E.[3,]

[1] University of Tokyo, kawahata@aori.u-tokyo.ac.jp
[2] AIST, a.suzuki@aist.go.jp
[33] Waseda Univ. weuchida@waseda.jp

Cambodia provides a unique opportunity to study the hydraulic conditions of rivers and lakes. The Mekong River, one of the world's largest rivers, and the Tonlé Sap Lake, the largest freshwater lake in Southeast Asia, is located in the center of the country. Both are significantly influenced by the dry and rainy season cycles associated with the Asian monsoon season. CAT_{carb} and CAT_{sil} are important parameters that represent the fraction of all the cationic charge derived from carbonate and silicate weathering, respectively, based upon cationic charge balance of water. Using the method proposed by *Galy and France-Lanord* (1999) and *Dalai et al.* (2002), 78%–80% of the total alkalinity budget of the Mekong River and 43%–51% of the total alkalinity budgets of the Tonlé Sap Lake during the dry season resulted from carbonate weathering. As the elevation of the water level during the rainy season rises, the water flows from the Mekong River to the Tonlé Sap Lake. The CAT_{carb} values of the Tonlé Sap Lake increased to 55%–61% during the early rainy season and 63%–67% during the prime rainy season. The CAT_{sil} values decreased from 34%–42% during the dry season to 21%–27% during the early rainy season and 15%–20% during the prime rainy season. This water property reconfirmed that the total Himalayan watersheds account for only about 10% of the total global CO_2 consumption by silicate weathering (Manaka et al., 2015), which suggests that chemical weatherin, working as long-term sink of CO_2, as hypothesized by *Raymo et al.* [1988] and *Raymo* [1991], is dubious. The water volume in the lake increased to 80 times in prime rainy seasons. The Tonlé Sap Lake were significantly influenced by the Mekong River in chemistry in the primary rainy season. The expansion of the Tonlé Sap Lake due to its high water levels (approximately 10 m) during the rainy season could reallocate nutrients and particles to the flooded area in order to make the agricultural area fertile.