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A Detection of Temporal Limnological Fluctuations By an Intensive Sampling Strategy and The Role of Intensity of the Summer Monsoon to Their Dynamics

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This study demonstrates seasonal variabilities through the intensive monitoring strategy of limnological parameters and some significance of monsoon intensity to their dynamics. The magnitude of seasonal variation in thermal structure, hypoxia, conductivity, nutrients, and light regime was largely determined by theoretical water residence time (TWRT). External river inputs dominated the reservoir processes in high-flow year and produced large longitudinal heterogeneities of nutrients, inorganic solids, algal chlorophyll-a (Chl), and transparency due to sedimentation processes, density currents, and differences in TWRT. Thus, effects of flushing or light limitation on algal growth were evident in the headwaters during monsoon of high-flow year, while phosphorus limitation was consistent near the dam site. In the mean time, internal cycling associated with destratification was predominant in low-flow year and the magnitude of variation in the water quality in the low-flow year was much less than the high-flow year. The response of Chl corresponding to concentrations of TP was consistent with nutrient loading theory, but the seasonal patterns differed from those that typify conditions in non-monsoon regions. As such, sampling frequency should increase during the monsoon to quantify temporal response to external inputs, but is less important during low-inflow periods. Overall reservoir patterns were mainly regulated the monsoon intensity during the short period of July August.

Key words : intensive monitoring, temporal fluctuation, phosphorus, chlorophyll-*a*, retention time.