

The impacts of NOM from on the water quality of the streams and lakes

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The COD levels of the Lake Daechung, one of a major source of drinking water, have been increased since 1994 whereas the BOD levels have been decreased. Those increases raise the concerns about the effectiveness of water treatment system or the unmanageable contaminant sources such as ROMs (Refractory Organic Matters). Nine basic water quality factors such as COD, TOC, DOC, T-N, T-P, etc. (every week) and NOM (Natural Organic Matters, every month) in the up and down streams of Juwon and Pumgok and related junction with the Lake Daechung were monitored from June to Nov., 2015 in order to investigate the impacts on the water quality of the Lake Daechung.

Resulting from the monitoring, the increases in the COD, TOC and DOC suggested that the heavy rainfall (>50 mm/day) could lead to the influx of ROM to the streams. Furthermore, increases in the EE intensities of EEM in July, Aug., and Sep., suggested that the rainfall would deliver the terrestrial ROM to the streams. However, it is difficult to recognize the similar changes in the lake Daechung due to the larger water capacity.

The water samples collected from streams during the rainy period were fractionated using XAD columns and pH adjustment. The DOC composition(%) of humic and fulvic fraction in upstream of which basin was composed by forestry were higher than those in downstream affected by various land uses implying that more organic materials in upstream would be originated from the forestry than those in downstream. and hydrophilic The increases in the DOC of the related fractions, SUVA and EEM of the samples collected during the rainy season implied that heavy rainfall would lead for the terrestrial NOM to enter the streams whereas the concentration of the biopolymer were increased in the streams during the dry season.

In summary, this study suggested that the ROM originated from forestry could be entered in the streams and some of anthropogenic chemicals such as biocide and nitrophenols accumulated in the lake. The further studies on the quantitative and qualitative source tracking and monitoring can help to understand the fate of the ROM from forestry to the relevant lake.