

What drives differences in water quality during different hydrological periods in Dongting Lake, China?

September 9 2021, by Li Yuan



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Lakes are essential components of global hydrological and biogeochemical cycles. River-connected lakes are characterized by high-frequency hydrological rhythms.

Water quality in such lakes may be more sensitive to variation in the complex [hydrological](#) environment, resulting in variability in [lake water](#) quality during different hydrological periods.

A team of researchers from the Institute of Subtropical Agriculture (ISA) of the Chinese Academy of Sciences studied the differences in [water quality](#) and its driving factors during different hydrological periods in Dongting Lake, China.

The study was published in *Environmental Pollution* on Sept. 4.

Dongting Lake is a typical river-connected lake. The researchers selected the 15-year [water](#) quality dataset (2004-2018) to explore the variation trends of water quality and their relationship with water level in different hydrological periods.

They found that the difference in water level in different hydrological years was primarily due to the difference in water level in the lake phase.

Total nitrogen concentration of wet years was significantly higher than that of dry years over hydrological years, which was mutually affected by contaminant loads and water level regulation.

The contributions of the lake phase to the total sewage discharge successively decreased from 64.54% in wet years to 59.47% in dry years, while the river phase showed the opposite trends. This is because most of the contaminant was flushed into the lake under high-flow conditions, and indicates that the water regimes of different hydrological periods play an important role in determining water quality.

The relationship between water level and water quality parameters of Dongting Lake varied with different hydrological years; in addition, the water quality in different hydrological phases clearly separated the [lake](#) and river phases, and confirmed the significant effect of water level fluctuations on water quality in inter- and intra-annual scales.

More information: Mingming Geng et al, Is water quality better in

wet years or dry years in river-connected lakes? A case study from Dongting Lake, China, *Environmental Pollution* (2021). [DOI: 10.1016/j.envpol.2021.118115](https://doi.org/10.1016/j.envpol.2021.118115)

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