



Should the Poyang Lake be dammed or not: from a hydrological drought perspective based on the Standardized Streamflow Index?

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The Poyang Lake is the largest freshwater lake in China, and is also one of the few lakes that remain naturally connected to the Yangtze River. The Lake receives water inflows from its five major tributaries including Ganjiang River, Fuhe River, Xinjiang River, Raohe River, Xiushui River, and discharges to the Yangtze River at Hukou (the junction of the Yangtze River and the Poyang Lake) in the north. The combined effects of catchment inflows and the interaction with the River result in a considerable seasonal variation of about 10 m in the Lake water level. The significant seasonal fluctuations in the Poyang Lake water levels and in the associated water surface area create extensive wetland ecosystem across an ephemeral region of some 3000km². During recent decades, however, it has been well noted that the Poyang Lake water level has been declining significantly, particularly in dry seasons, which resulted in severe water supply, irrigation and ecological flow requirement problems. To solve the dryness of the Lake and to minimize the impacts on local socio-economic development and lake wetland functions, constructing dam at the Lake's outlet has been proposed which causes keen public concern and discussion. The purpose of the paper will be focused on the following aspects: (1) Spatio-temporal variation patterns of the hydrological drought in the Poyang Lake during recent ~65 years; (2) Drought driving forces of the Poyang Lake from water balance perspective; (3) Drought trend of the Poyang Lake in the foreseeable future. Based on long-term hydrological and meteorological data of the Poyang Lake, a comprehensive assessment of hydrological drought by the first using Standardized Streamflow Index (SSI) in the Poyang Lake has been carried out and the driving forces were further explored by investigating its inflow, precipitation within Lake, outflow regimes respectively. The output could provide valuable references for local government making management strategies for the Poyang Lake.