Analysis of water resources variability in the Yellow River of China using a distributed hydrological model

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Abstract Drying up of the main river along the lower reach of the Yellow River has occurred since 1972, and the situation has become more and more serious over the last 30 years. By incorporating historical meteorological data and the available geographic information related to the land surface conditions, a distributed hydrological model (GBHM) has been employed to simulate the natural runoff of this basin. Based on the simulated and observed river discharges, a quantitative analysis of the water resources in this basin over a long-term period of 50 years was carried out, which focuses on understanding the variability in the water resources due to climate change and human activity. In contrast to what might be believed based on common sense, it is found that the main reason for the aggravation of the drying up of the main river along the lower reach that occurred in the 1990s is climate change.

Key words Yellow River; water shortage; climate change; human activity; distributed hydrological model