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Impact of climatic and environmental changes on flood-duration-frequencies in the Fengle Rriver (YangTze Basin, China)

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Future water management challenges such as flood risk are highly relevant to climate and land use changes. Climate change is expected to lead to an ongoing intensification of effects on changes in precipitation and evapotranspiration which could exacerbate flooding issues. Land use changes, modifications of agricultural practices and urbanization alter the apportionment of the different hydrological processes at the basin scale and could significantly affect the seasonality of streamflow. At the local scale, the consequences of climate and land use changes on flood occurrence and magnitude are a major issue for the economic development and management policy of basin area.
This study apply a methodology for investigating the potential consequences of land use ,as well as precipitation and temperature changes on flood occurrence, duration and magnitude, accounting for uncertainties in scenario data and hydrological model parameters. The discharge time series predicted for the future were simulated from a calibrated and validated distributed hydrological model. The model was run from inputs which are
-predicted rainfall time series based on scenarios of changes identified from a literature review,
-future evapotranspiration rates assessed from temperature changes identified from a literature review
-and scenarios of land-use changes

The study area, the Fengle River basin (1500 km2), is located in the northeast part of Yangtze basin. The river is one of the main tributaries of the Chao Lake, the fifth largest natural lake of China. The lake catchment is 9130 km2 in area, including the city of Hefei and a large extent of agricultural and rural areas. Many changes are expected in land use and agricultural practices in the future, due to the touristic appeal of the Chao Lake shore and the growth of the city of Hefei. Climate changes are also expected in this region, with a high impact on rainfall regime. In the current period heavy storms and floods occur predominantly during summer.
Using the above methodology the future dynamics of the Fengle River is characterized on discharge-duration-frequency curves. Results will be discussed with regards to the sensitivity of predicted flood occurrence, duration and magnitude by quantifying the impact of rainfall, temperature and land-use changes.