



New approaching for addressing challenges in the watershed hydrologic modeling

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Abstract (less than 250 words)

To address flooding, drought, water resource shortage and water pollution problems, research on the coupling mechanism of atmosphere-land surface-hydrology processes are proposed as an urgent scientific issue, especially the impacts of climate changes and human activity on water cycles. Present studies of the topic were reviewed in this article from three aspects: distributed hydrological modeling, meso-scale atmosphere-land surface coupling and flood forecasting. Existing shortages and problems of present coupling mechanisms were presented; the atmosphere-land surface-hydrology coupling study should take into account multi-scale effect, human activities and climate change. Further studies were needed to conduct simultaneous field observation of hydrologic processes, and develop new generation of distributed hydrology models and atmosphere-land surface-hydrology coupling models for addressing the nonlinear issue, heterogeneity, scale effects and uncertainty in the distributed hydrologic modeling.

Keywords (less than 5): Atmosphere-land surface-hydrology processes; coupling mechanism; hydrologic modeling system; flood forecasting.