

EGU2020-12796

<https://doi.org/10.5194/egusphere-egu2020-12796>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



## Quantitatively assessing the impacts of climate variability and human activities on runoff

Yanhua Qin<sup>1</sup>, Xun Sun<sup>2</sup>, and Baofu Li<sup>3</sup>

<sup>1</sup>School of Geographic Sciences, East , East China Normal University, Shanghai, China (qinyanhua76@163.com)

<sup>2</sup>School of Geographic Sciences, East , East China Normal University, Shanghai, China (xs2226@columbia.edu)

<sup>3</sup>School of Geography and Tourism, Qufu Normal University, Rizhao, China (libf@qfnu.edu.cn)

To quantitatively evaluate the impacts of climate variability and human activities on runoff at different time scales is a challenging task. In this study, a nonlinear hybrid model integrating extreme-point symmetric mode decomposition, back propagation artificial neural networks and weights connection method based on the physical nonlinear relationship between impact factors and runoff were developed to explore an approach for solving this problem. To validate the applicability of the nonlinear hybrid model, the Hotan River was employed to assess the impacts of climate variability and human activities on runoff. Results illustrated that a good performance was presented by this model. The contribution of the upper-air temperature at 500 hPa was the highest (70.5%), which is the most important factor for runoff change. At different time scales, this factor also has the highest contributions. However, the water vapor content was responsible for 22.0% of the runoff change. Furthermore, the human activities were only accounted for 7.5%, indicating that runoff in the Hotan River is more sensitive to climate variability than human activities.