# Article information:

Remote Sensing | Free Full-Text | Runoff Estimation in the Upper Reaches of the Heihe River Using an LSTM Model with Remote Sensing Data  
<https://www.mdpi.com/2072-4292/14/10/2488>

# Article summary:

1. Runoff estimations are important for water resource planning and management.

2. This study used remote sensing data to estimate monthly runoff in the upstream reach of the Heihe River basin in China from 2001 to 2016.

3. The results showed that inputting multiple remote sensing parameters improved the quality of runoff estimation compared to using rain gauge observations.

# Article rating:

Appears well balanced: The article presents the information in a reliable and balanced way, without biases and prejudices. The claims made in the article are well supported and, where applicable, all sides of the argument are given opportunity to present their point of view. The article appears trustworthy and reliable.

# Article analysis:

The article is generally reliable and trustworthy, as it provides a detailed overview of the research conducted on runoff estimation in the upper reaches of the Heihe River using an LSTM model with remote sensing data. The authors provide a clear description of their methodology, which includes collecting data from various sources such as MOD13A2 normalized difference vegetation index (NDVI), TRMM3B43 precipitation (P), MOD11A2 land–surface temperature (LST), MOD16A2 evapotranspiration (ET) and hydrological station data, and then applying a fully connected long short–term memory (LSTM) model to estimate monthly runoff. The results show that inputting multiple remote sensing parameters improves the quality of runoff estimation compared to using rain gauge observations, with an increase in R2 from 0.91 to 0.94 and Nash–Sutcliffe efficiency (NSE) showing an improvement from 0.89 to 0.93 when incorporating both satellite data and rain gauge data into the model.

The article does not appear to have any major biases or one-sided reporting, as it presents both sides equally by providing evidence for its claims and exploring counterarguments where necessary. Furthermore, there is no promotional content or partiality present in the article, as it focuses solely on presenting scientific evidence for its claims without any bias towards any particular viewpoint or opinion. Additionally, possible risks are noted throughout the article, such as potential errors due to inaccurate measurements or incomplete datasets which could lead to incorrect conclusions being drawn from the results obtained by the LSTM model used in this study.

In conclusion, this article is reliable and trustworthy due to its comprehensive coverage of all aspects related to estimating runoff using an LSTM model with remote sensing data in the upper reaches of the Heihe River basin in China from 2001-2016, including detailed descriptions of methodology used and results obtained along with evidence for its claims and exploration of counterarguments where necessary without any promotional content or partiality present throughout its entirety.

# Topics for further research:

* Runoff estimation methods
* Long short-term memory (LSTM) models
* Remote sensing data
* Normalized difference vegetation index (NDVI)
* Evapotranspiration (ET)
* Hydrological station data

# Report location:

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