# CAPACITY OF CHYM MODEL TO REPRODUCE FLOW DISCHARGE IN THE SANAGA RIVER BASIN (CAMEROON)


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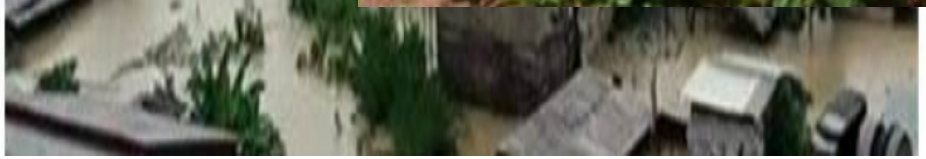
# Outline

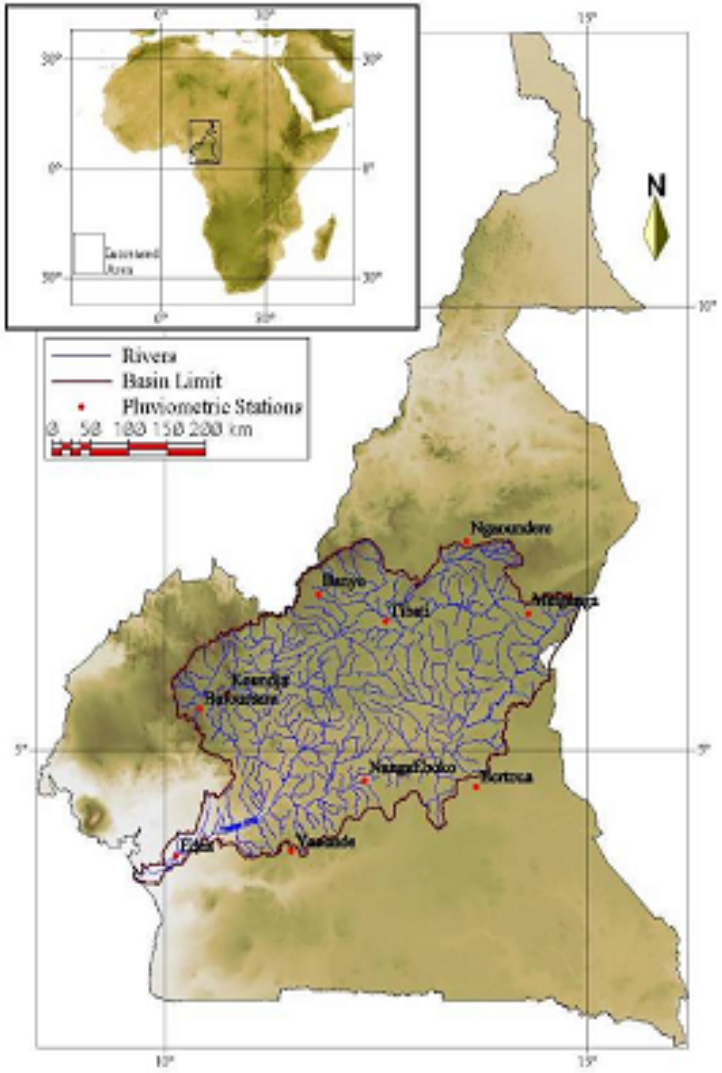
- Introduction
- Study Area
- Data and Methodology
- Results and Analysis
- Conclusion

# INTRODUCTION

In Cameroon, water resources are unevenly distributed between North and South. The South part of territory up to 6N, enjoys a wet sub-tropical climate with annual rainfall between 1500 and 4000 mm and the North of this, there is gradual change leading to the arid sahelian zones in the northernmost (13N) part of the territory, with annual rain less than 400 mm (Mkankam, 2001). The same is true between seasons.



# STUDY AREA AND DATA




Lat: 3°22N - 7.22°N
Lon: 9°45 E – 14.57°

They include: the altitudinal tropical climate of the Adamawa, the tropical climate, the equatorial climate, the coastal equatorial climate, the coastal tropical climate and the mountainous tropical climate of the West.

This basin possesses a major surface water (Sighomnou, 2004) leading to the construction of three regulatory dams between 1969 and 1987 (Mbakaou, Mape and Bamendjin) and two hydroelectric dams (Songloulou and Edea). Presently, a fourth regulatory dam is undergoing construction at Lom Pangar.

**Fig. 1** - Location of the Sanaga basin in Cameroon and rainfall stations used (Kpoumié el al., 2012)

# DATA and METHODOGY

To achieve this work , we use

- We also use PERSIANN(The Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks) with 0.25° spatial resolution
- ERA-interim with 0.25° spatial resolution
- Daily observed Flow discharge

**Nash coefficient**

$$R_{NS}(Q) = 1 - \frac{\sum_{t=1}^{n}\left(Q_{obs,t} - Q_{sim,t}\right)^2}{\sum_{t=1}^{n}\left(Q_{obs,t} - \overline{Q_{obs}}\right)^2} \quad (1)$$

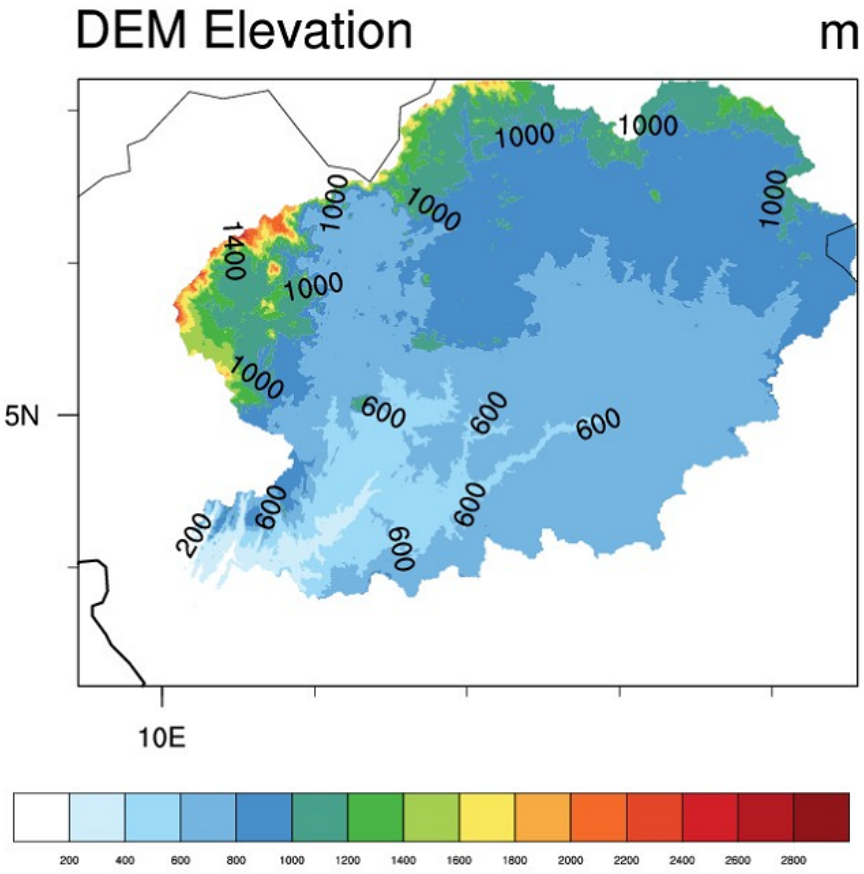
**Relative Volume Bias**

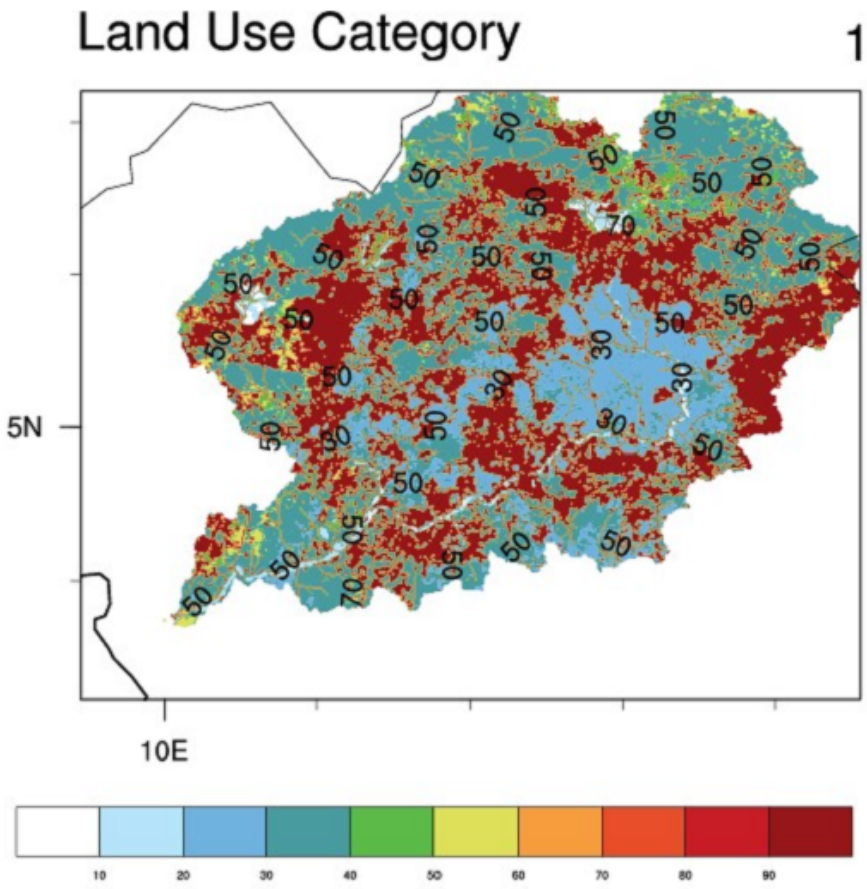
$$BR(\%) = \frac{\sum_{t=1}^{n} Q_{sim,t} - \sum_{t=1}^{n} Q_{obs,t}}{\sum_{t=1}^{n} Q_{obs,t}} \times 100 \quad (2)$$

***Root Mean Square Error***

$$RMSE = \sqrt{\frac{\sum_{t=1}^{n}\left(Q_{obs,t} - Q_{sim,t}\right)^2}{n}} \quad (3)$$

# RESULTS ET ANALYSIS



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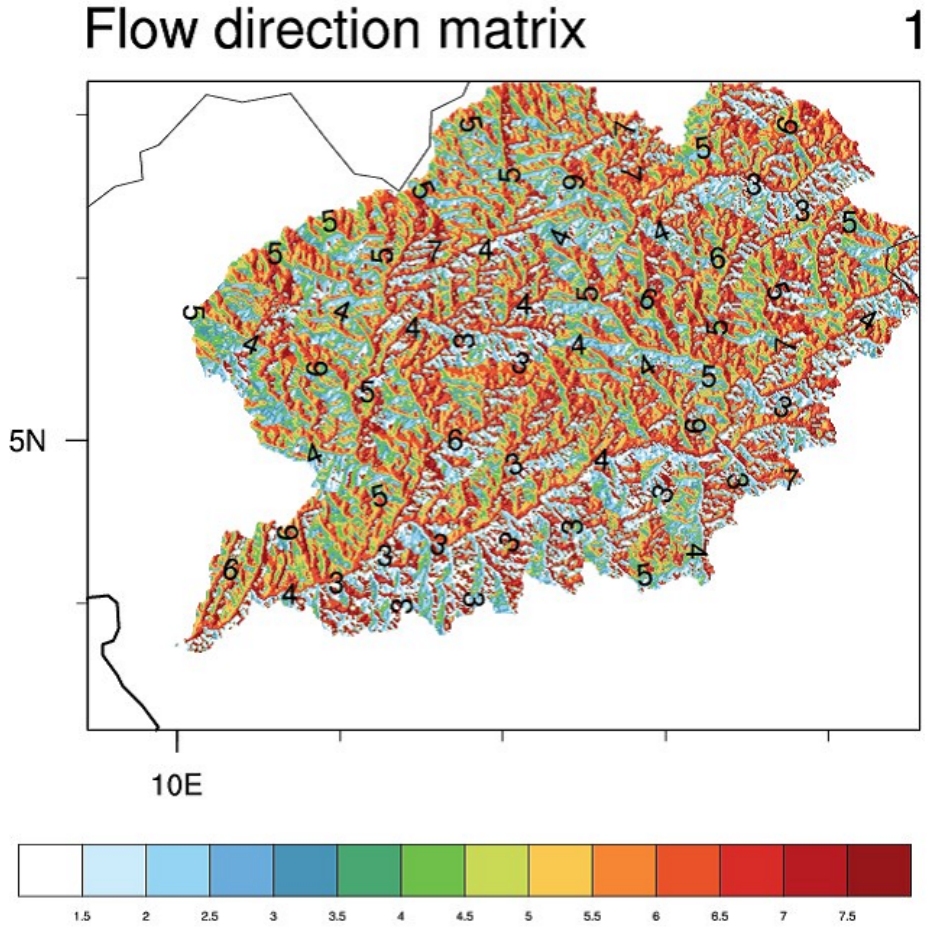


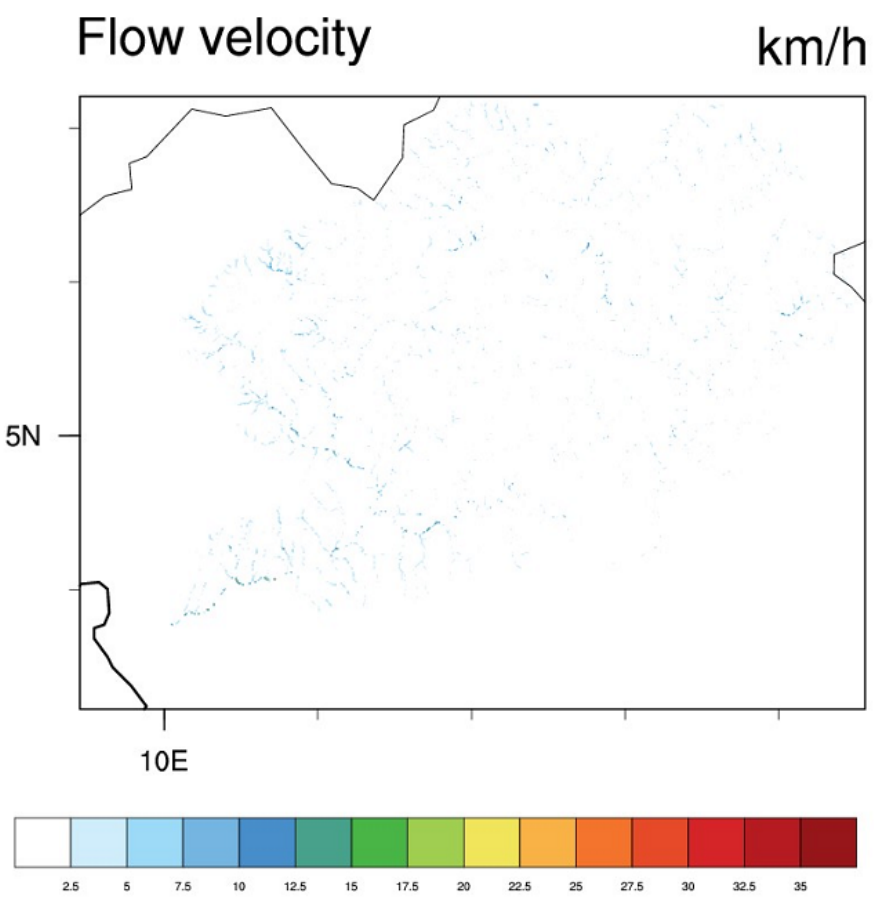

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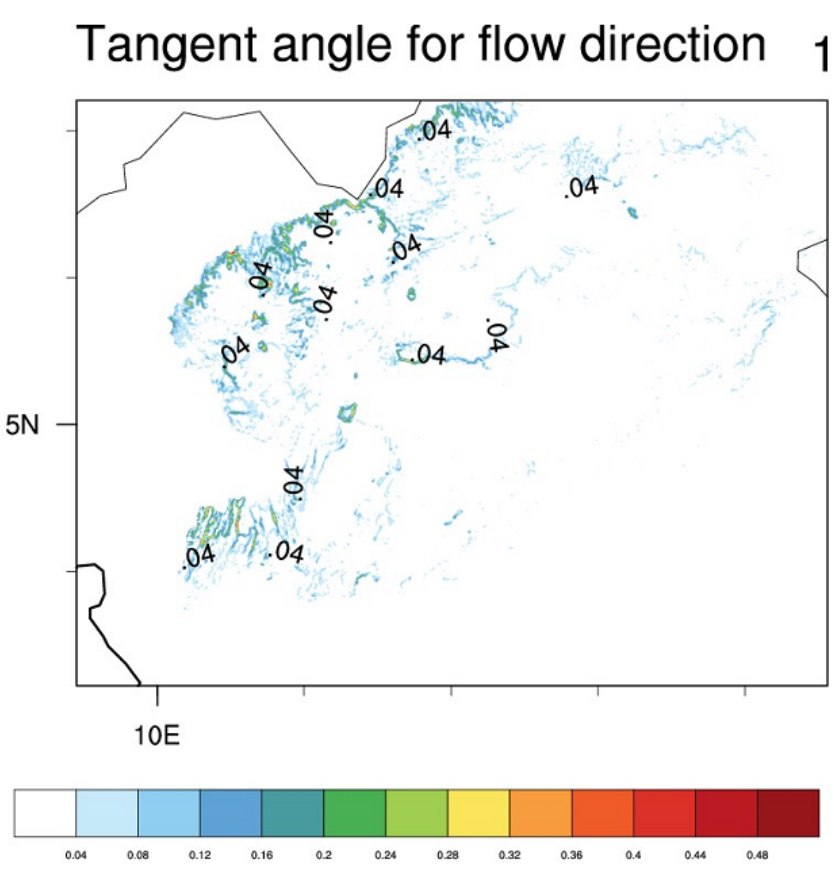


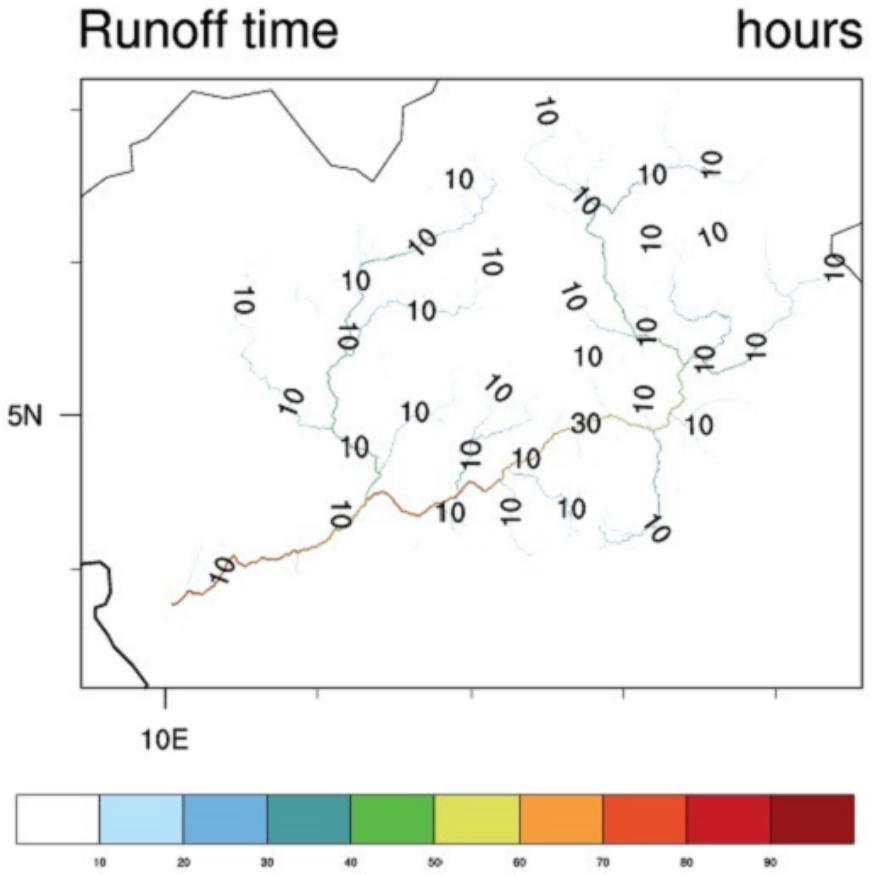

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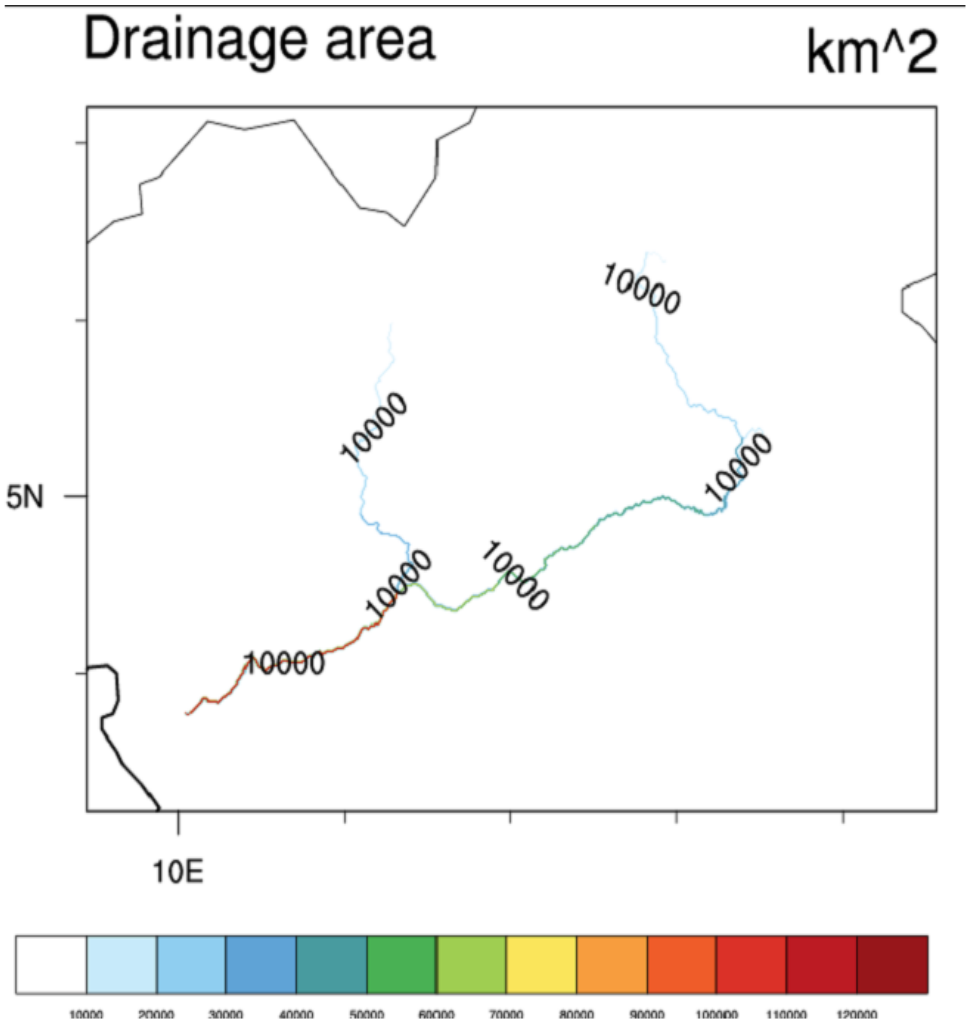

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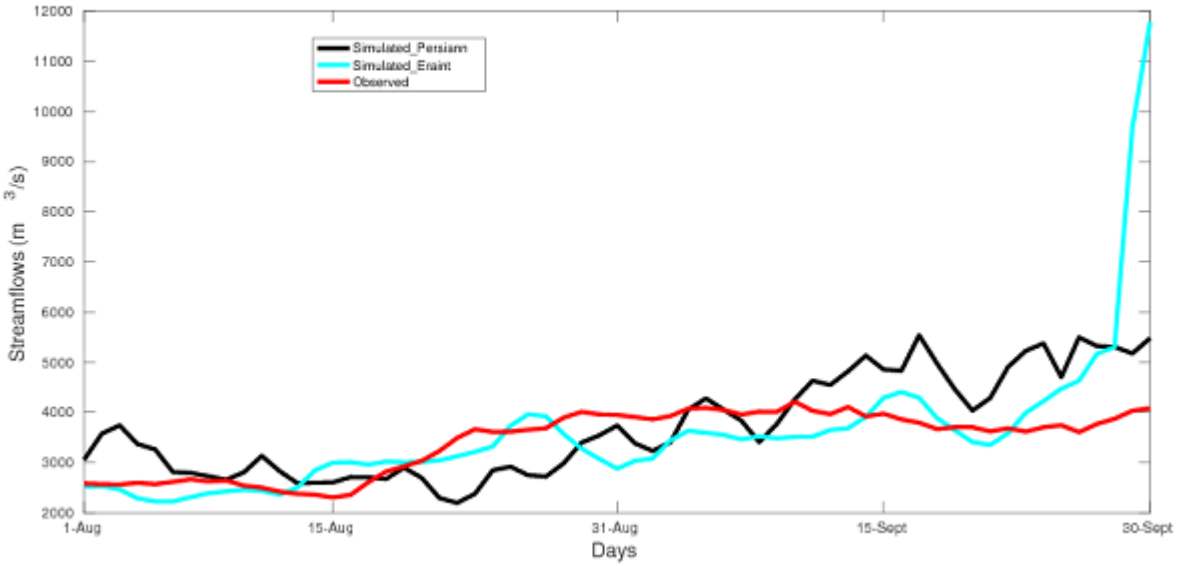


| | NASH | Correlation coef | PBIAS | RMSE |
|---|---|---|---|---|
| PERSIANN | -0.88 | 0.599 | 8.52 | 850.74 |
| ERAINT | -3.57 | 0.488 | 4.44 | 1324.5 |

# CONCLUSION

- CHyM model able to capture our Watershed.

- CHYM model simulated well some importants Characteristics of watershed

- CHyM model failed to reproduce flow discharge in our Watershed and need a calibratrion.

# *THANK YOU*