MODEL COMPARISON: HEC-HMS vs CHyM

CASE STUDY – IBICUI RIVER BASIN

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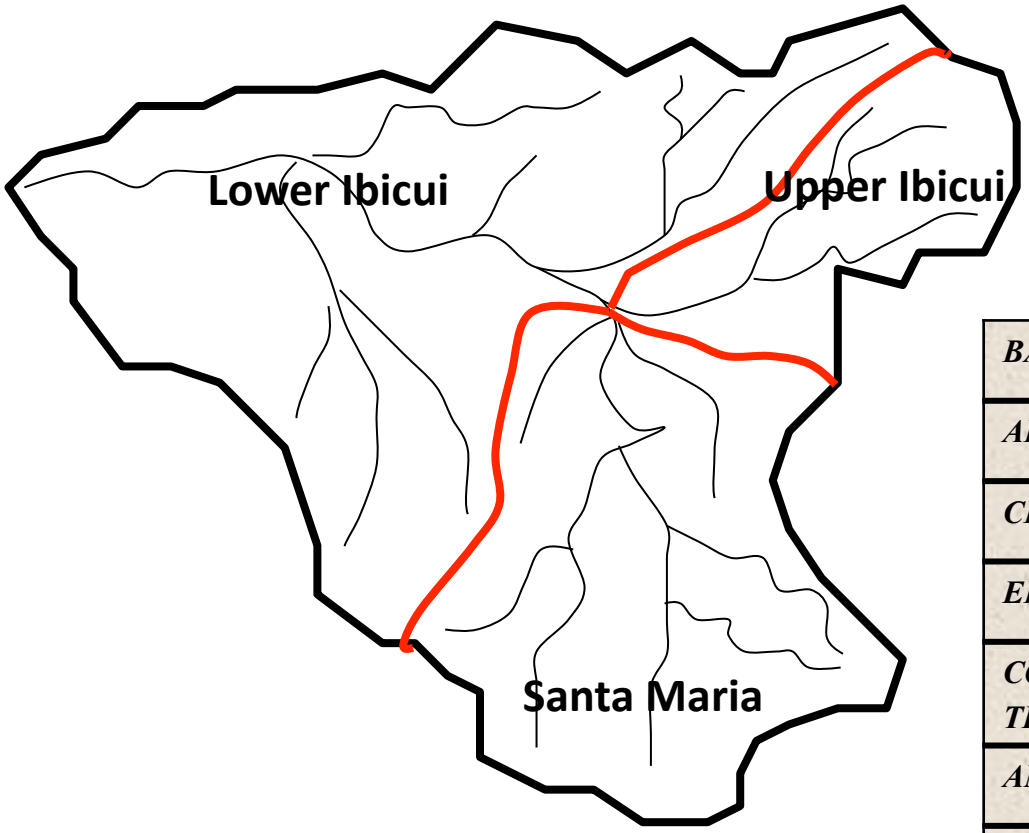
Objective:

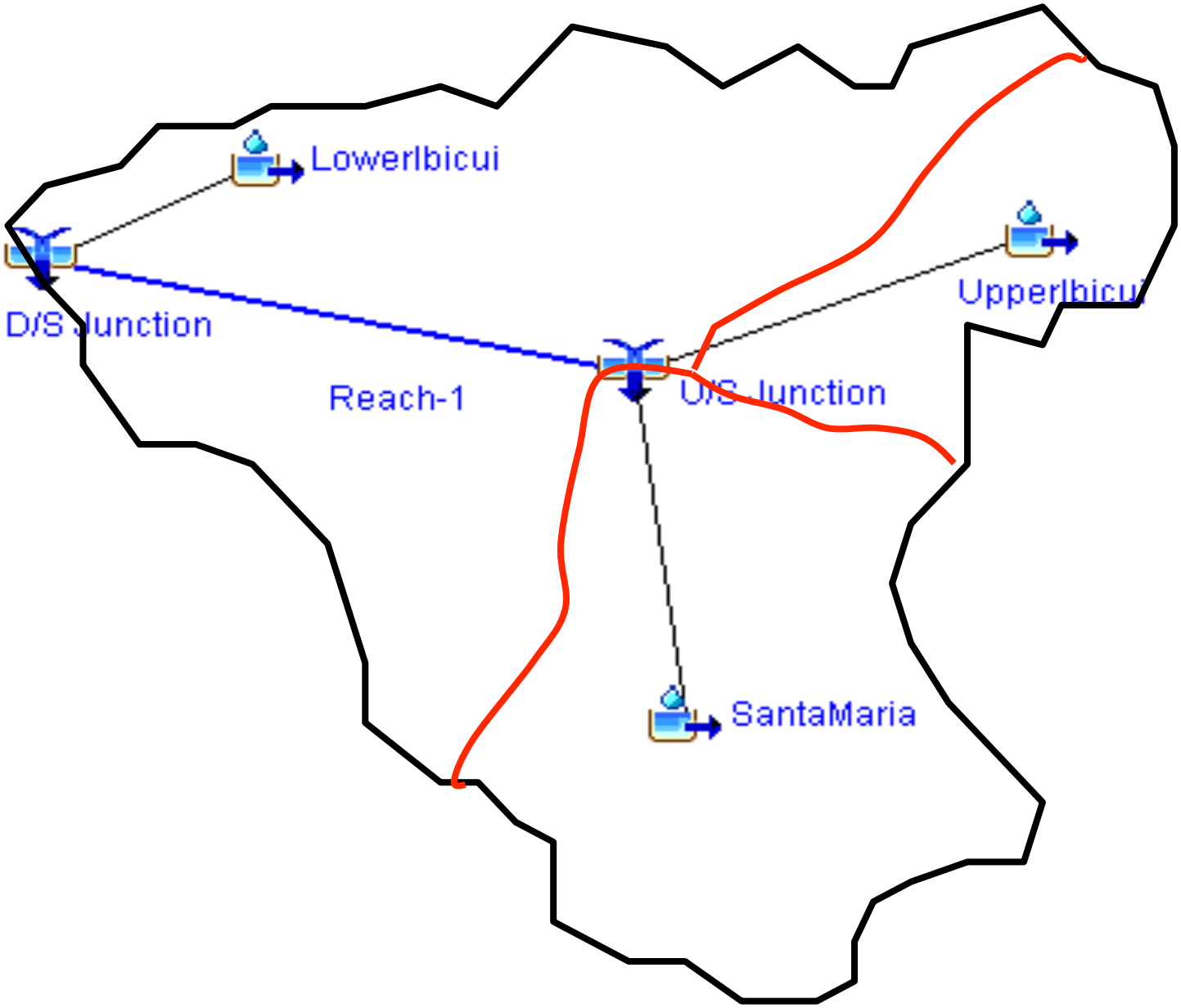
Comparison of a lumped event-driven model (HMS) with a physically-based distributed continuous one (CHyM).

Basin Characteristics



BASIN	*IBICUI*
AREA	*46,000 sq.km*
CENTROID LAT-LON	*29° 40' S - 55° 20' W*
ELEVATION RANGE	*100-550 mamsl*
CONCENTRATION TIME	**5.1** *days*
ANNUAL RAINFALL	*1,600 mm*
ANNUAL EVAPOTRANSPIRATION	*900 mm*
ANNUAL RUNOFF	*650 mm*
ANNUAL FLOW RATE	*880 cumecs*
RATIO MEAN ANNUAL FLOW : RAINFALL	*40%*

HEC-HMS – Basin model



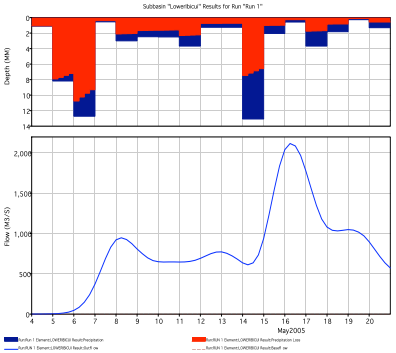
HEC-HMS

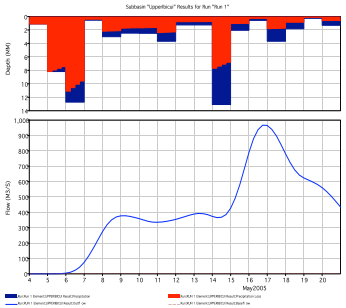
Models of choice

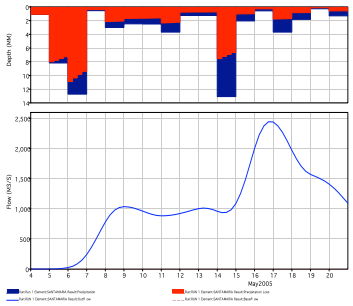
- **Loss (production function): SCS Curve number**
- **Transform (transfer function): SCS triangular unit hydrograph**
- **Baseflow: None**
- **Hydrologic routing: Muskingum**

HEC-HMS

Rainfall – Runoff at the sub-basins

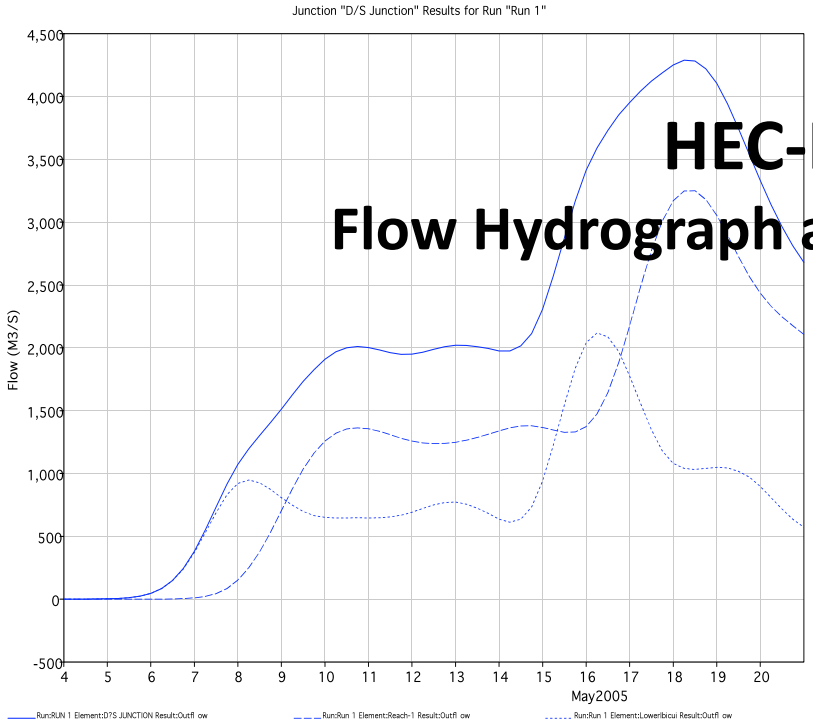




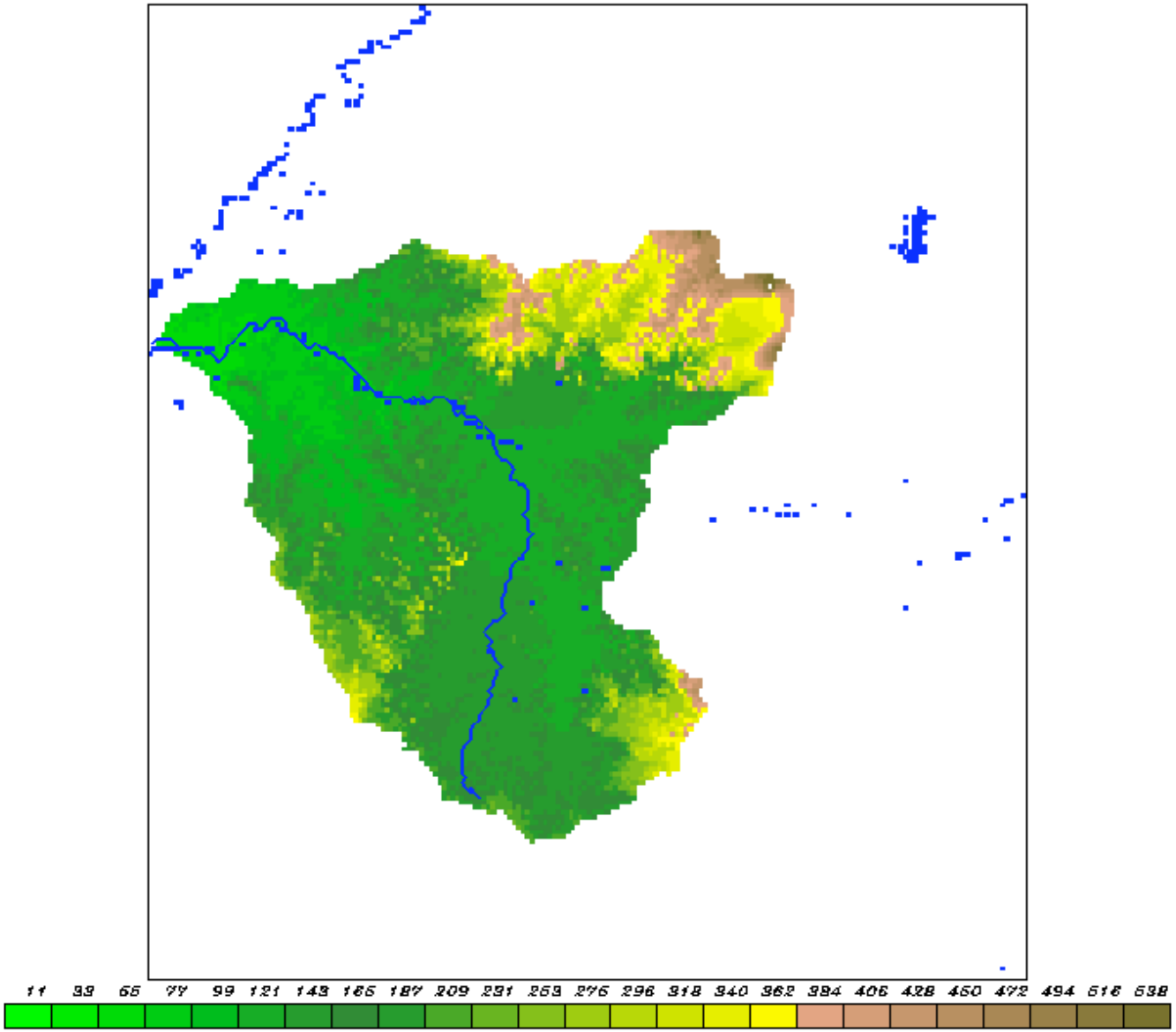


HEC-HMS

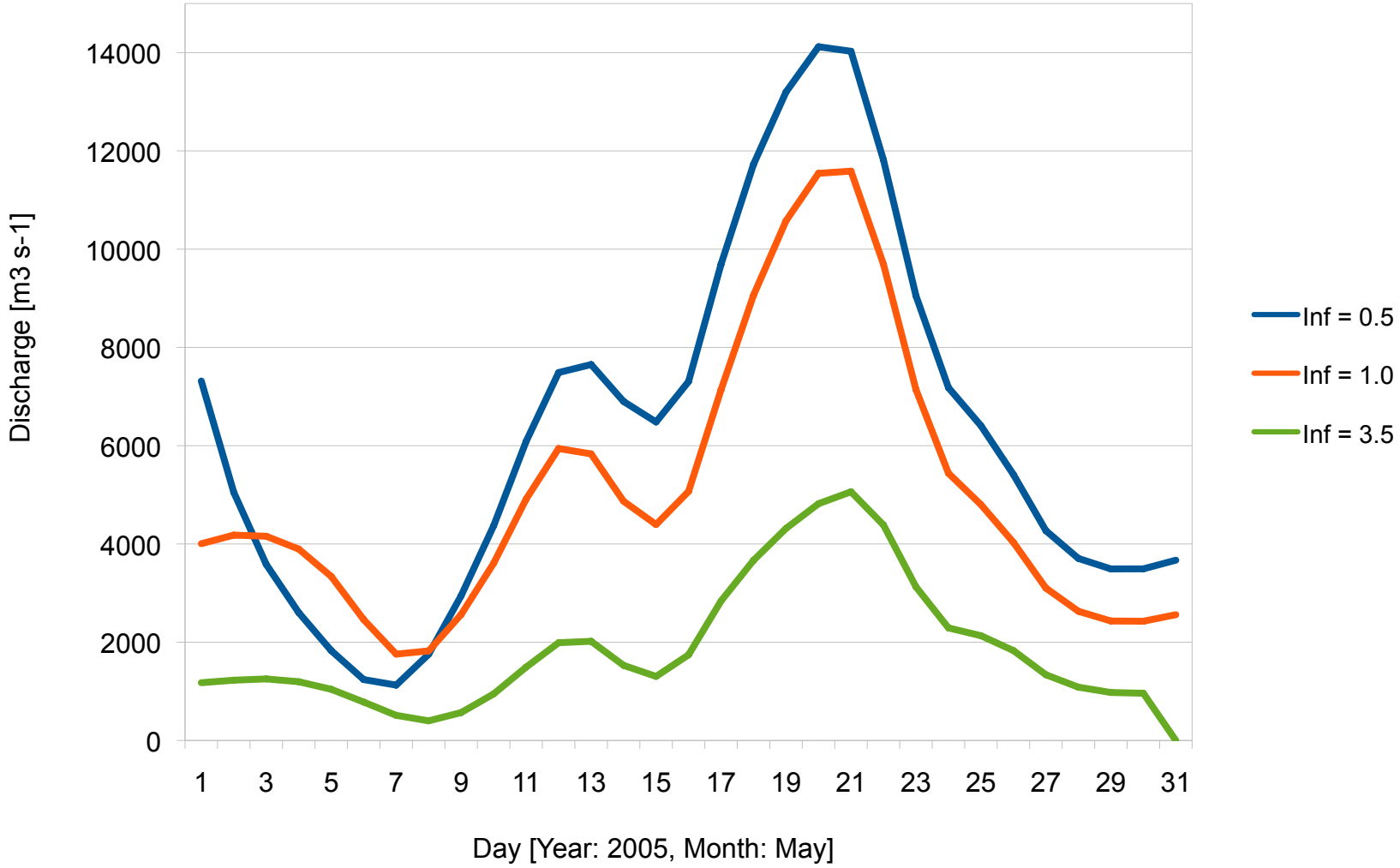
Flow Hydrograph at the basin outlet



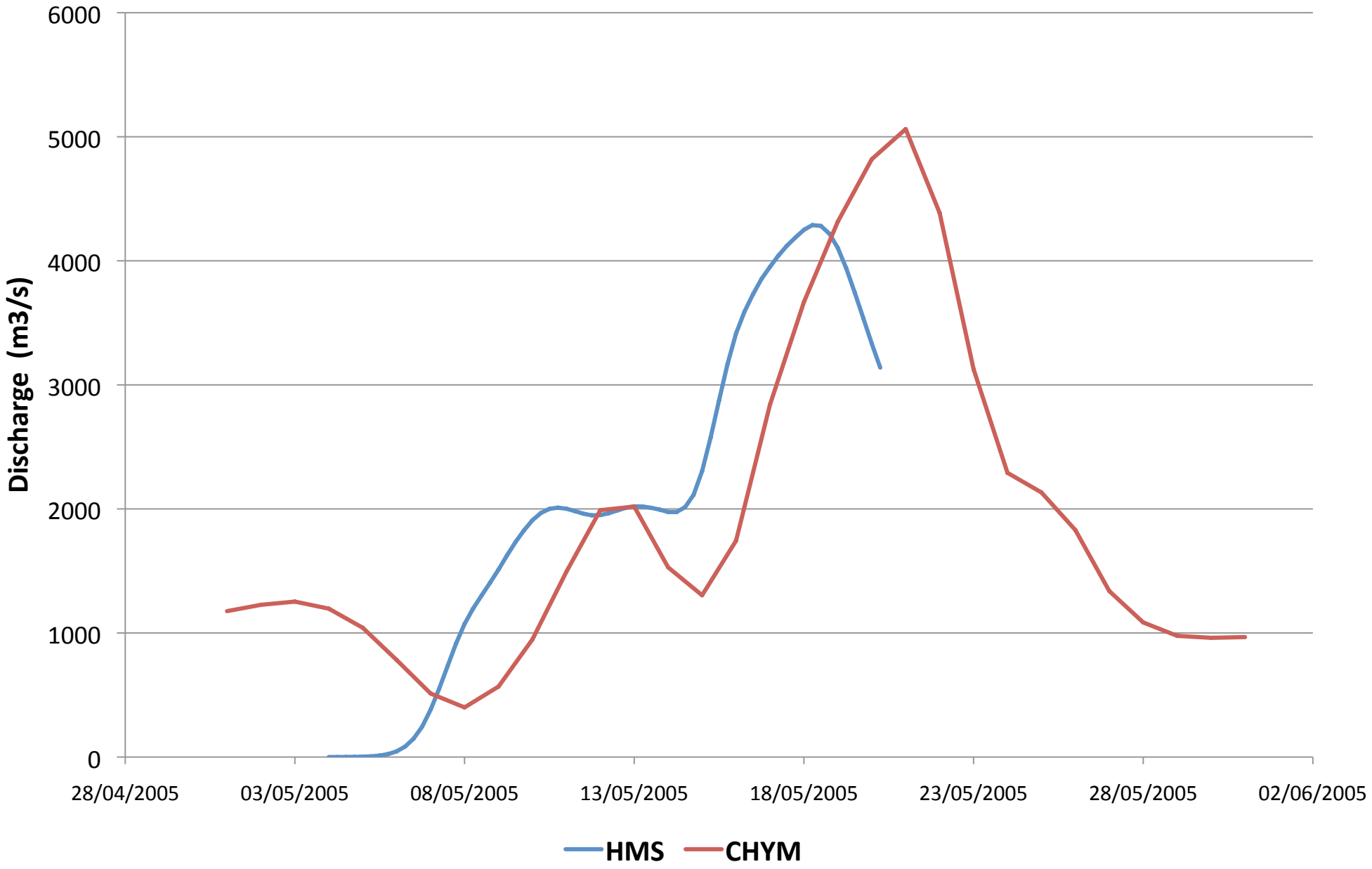
CHyM – Basin delineation



CHyM – Flow Hydrograph at the basin outlet
Sensitivity to an infiltration parameter



CHyM – HMS: Flow hydrographs at the basin outlet



Conclusions

- Only preliminary conclusions can be made from the results of two uncalibrated models
- The models reproduced similar hydrographs in terms of volume, and peak magnitude, at least for the model event. Timing is not equally modeled
- Further calibration and tests have to be performed before stating more definite conclusions

THANK YOU FOR YOUR ATTENTION