MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE
Liberté Égalité Fraternité

VIGICRUES

Flood risk assessment on small catchment with ECMWF ensemble forecasts in operational conditions

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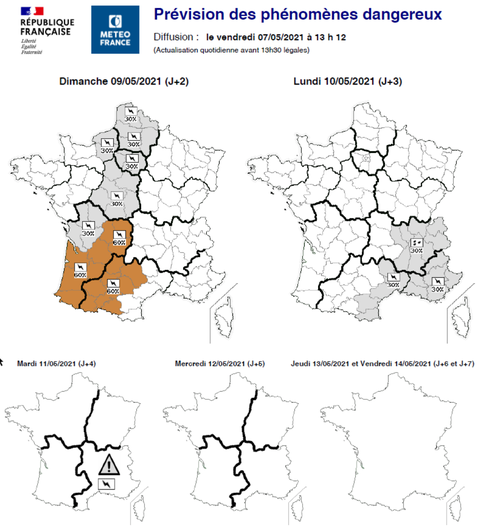
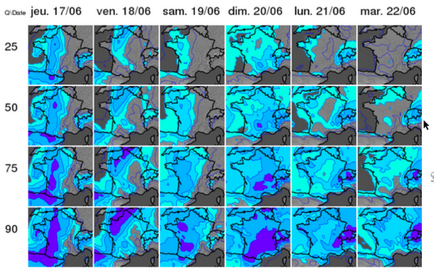
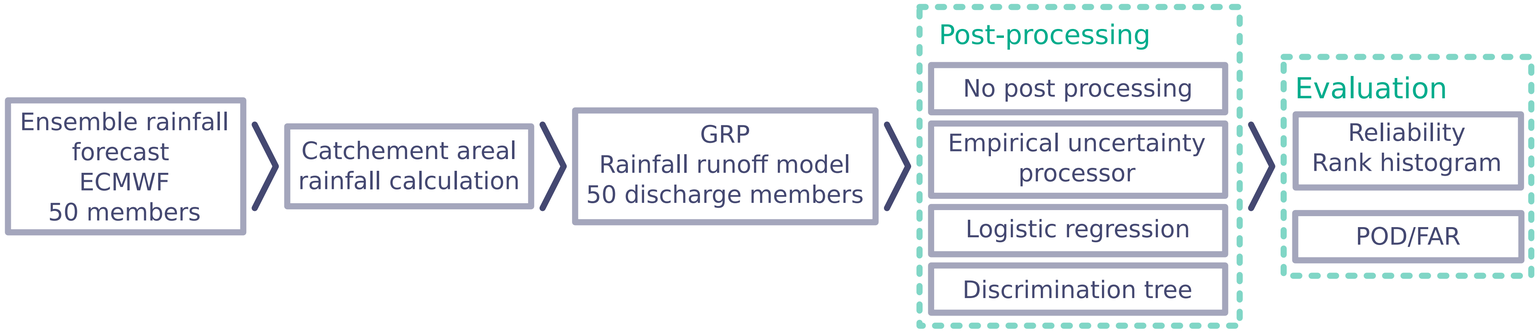
Goals

- Better anticipate flood risk
- Internal organisation
- Medium term flood risk map
- Goals evoluted during study from discharge forecasting to risk assessment





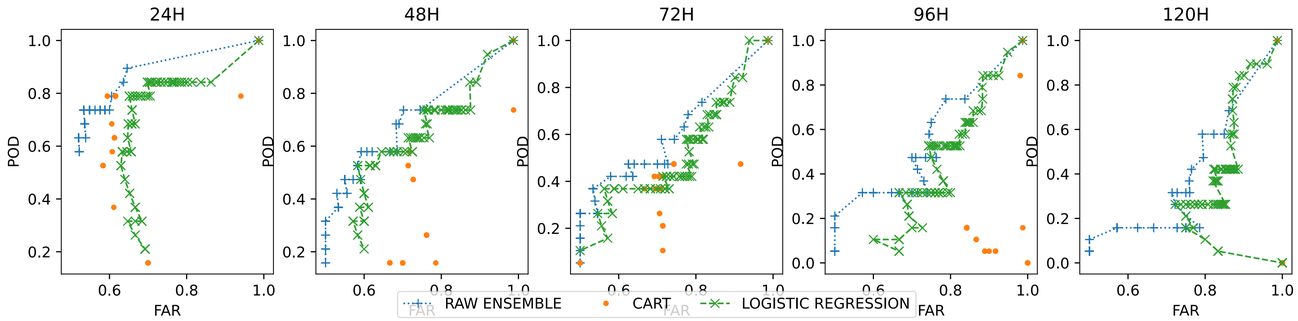
Method



Study period 2017-2020
GRP : continuous - lumped - storage type rainfall runoff model from INRAE
One catchment : le Grand Morin à Pommeuse (770 km²) response time ~16h

Raw ensemble and statistical post-processing

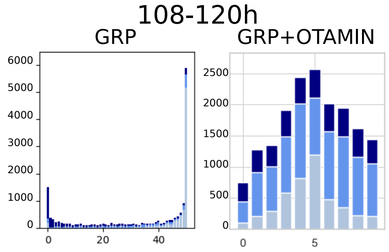
- Predict risk of flood event - Discharge>Threshold
- Predictors = 50 daily maximum discharge from GRP ensemble sorted by values
- Raw ensemble = P(Q>Threshold)
- Logistic regression & CART : predictor selection & cross-validation

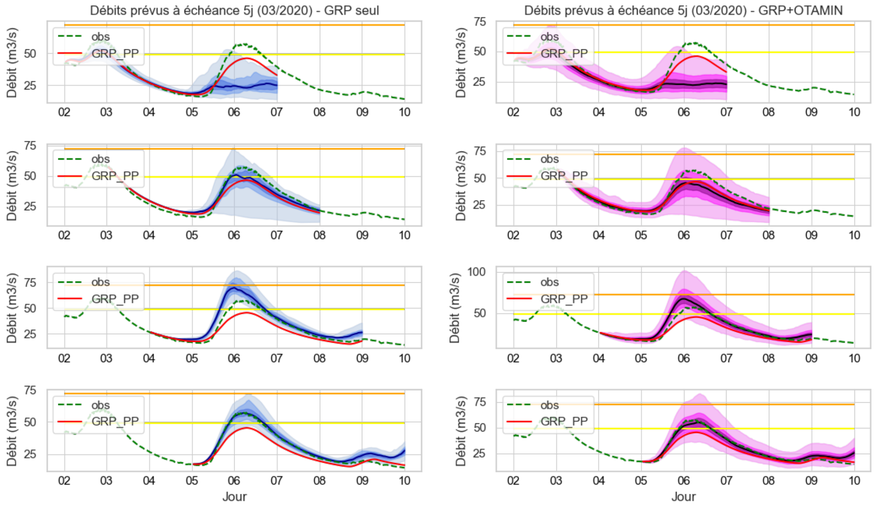


Empirical uncertainty processor

- OTAMIN : [Bourgin, F. (2014)]
- Improves reliability
- Losing of temporal coherency
- No improvement of event detection

Rank histogram
108-120h





Conclusion

Results

- Challenge of rare event prediction
- Can detect ~75% of the events with ~75% of false alarm
- No improvement with statistical post processing on test sample

To be continued

- More catchments : mediteranean area...
- Spatial aggregation
- Longer study period

Bourgin, F. (2014). Comment quantifier l'incertitude prédictive en modélisation hydrologique?: Travail exploratoire sur un grand échantillon de bassins versants (Doctoral dissertation, AgroParisTech)