We would like to thank the Referee #1 for his evaluation. Please find below the point-by-point replies for the comments of Anonymous Referee # 1 (The reviewer's comments are in italic).

Comments by Anonymous Referee #1:

Fig. 1 I find it difficult to understand. It's not easy to distinguish position of radar, discharge gaging stations and the dam. I suggest to you use more distinguishable marks and associated legend to show relevant elements.

We followed your suggestion and we have introduced more distinguishable marks. The legend is detailed in the caption. The reviewed figure also includes the recommendations from Referee #2:

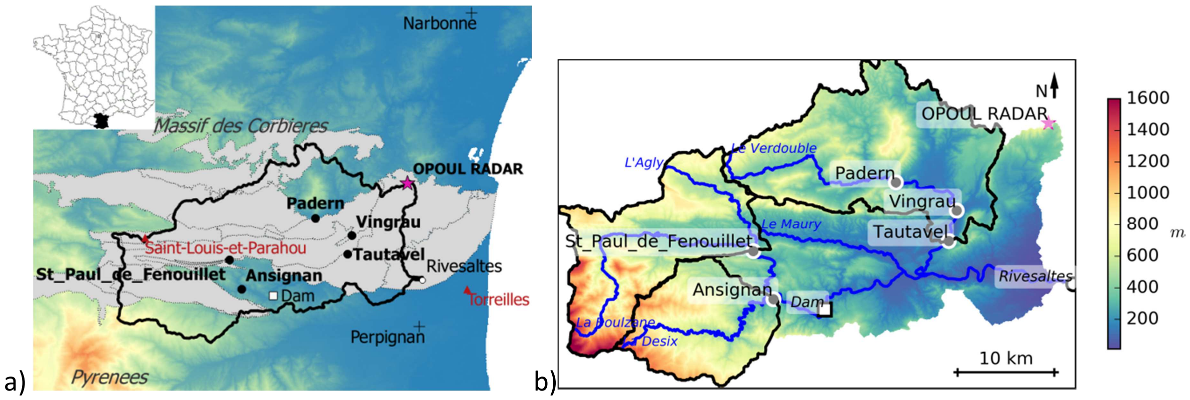

Figure 1: a) Location of the Agly catchment. The pink star illustrates the position of the meteorological radar while shaded grey areas denote the karstic areas underlying the Agly catchment (from BDLISA v.2: Base de Donnée des Limites des Systèmes Aquifères, https://bdlisa.eaufrance.fr/ accessed June 18, 2019). b) Digital terrain model of the Agly catchment (Source: IGN; MNT BDALTI). Also included the main tributaries (blue lines, source: IGN, BD CARTHAGE), the radar location (pink star: OPOUL RADAR), the discharge gaging stations (black dots), the dam (white square) and the outlet (white circle).

P. 4 L 2. Area of tributaries and basin intercepted by dam are mentioned. I suggest to give information about total basin area that is reported in Table 1 (is it 1053 km2?). I think this is relevant to understand how dam can affect hydrograph of outlet section.

The total basin area of 1053 km^2 is reported on Table 1 for information purpose only as the gauging stations studied in the paper are not impacted by the dam: n°1 Ansignan and n°2 St-Paul-de-Fenouillet are located upstream the dam and n°3 Padern, n°4 Vingrau and n°5 Tautavel are located on a tributary of the Agly river.

P. 4 L. 18. Rain-gauge network are provided by the regional flood forecast service. I suggest to add a reference to figure 2 that shows locations of raingages across the investigated area.

Reference added:

Figure 2: Spatial variability of the cumulative rainfall for event 20130304_3d (top), 20131116_4d (middle) and 20141128_4d (bottom), according to the observations: PLU (left) the operational hourly rain-gauge network (from Hydroreel, Serveur de données hydrométriques en temps reel, Bassin Rhône-Méditerranée et Région Auvergne-Rhône-Alpes, https://www.rdbrmc.com/hydroreel2/listestation.php accessed on November 20,2019) and JP1 (right) 1 km^2 merging of radar data and rain-gauges measurements.

P.7 L2-3 There's no need to give details about how Thiessen polygon interpolation method works.

The explanations about the Thiessen polygon interpolation method have been removed.

P. 8 what is the spatial resolution used in the hydrological model?

The spatial resolution of the MARINE model on the Agly subcatchment is $\Delta x = \Delta y = 500$ m. It has been added in the text (§ 3.2):

> "The spatial resolution of the MARINE model on all the Agly subcatchments is of 500 m."

P.8 L22. How the spatial daily root-zone humidity maps are used to initialize the hydrological model?

To initialize the hydrological model, we use the output Météo-France's SIM operational chain corresponding to a saturation state, that is, the ratio of the soil water content to the soil storage capacity. The initial soil water content is therefore directly obtained by multiplying the saturation state by the soil storage capacity of each cell. This has been clarified in the text (§ 3.1):

> "This is done by using the spatial daily root-zone saturation state, i.e. the ratio of the soil water content to the soil storage capacity at a spatial resolution of 8×8 km, output from Météo-France's SIM operational chain (Habets et al., 2008). The initial soil water content for MARINE is therefore directly obtained by multiplying the saturation state by the soil storage capacity of each cell."

P9 L16 The Bransby Williams formula is used for computing time of concentration. There are many equations in literature for time of concentration and the spread they do is very high. Why did you choose this one? May the model performance assessment affected by the choice of formula for time of concentration?

This formula has been adopted as it performed reasonably well when compared with characteristic minimum times of rise of observed hydrographs for Mediterranean catchments. However the point there was mostly to normalize the peak time delay (P9 L11 in equation 1) with a characteristic time of the catchment so the most important point is to always use the same procedure to make this term dimensionless in the cost function of equation 1. This has been clarified in the text (§ 3.2):

> "Here, the formula for time of concentration is only used to normalize the peak time delay in the third term of equation 1 with a characteristic time of the catchment, so the most important point is to always use the same procedure to make this term dimensionless."

P 9 L 26 Can raingages distribution explain, at least partially, the different performance of the model across the basins?

It is difficult to link directly the rain-gauges distribution with the performances of the model for 2 reasons:

- First, the rain-gauge network is quite dense in this catchment and rather well distributed: with 19 rain-gauges for an area of around 1000 km^2, the rain-gauges density is about 1 for 50 km^2 whereas the rain-gauge density for the full network over mainland France is of 1 for 120 km^2 (Mounier et al., 2012).

- Secondly, it's not always for the same part of the catchment that the model has the best performance: it depends on the event. Therefore, the same distribution of rain-gauges sometimes leads to a correct simulation in term of L_{NP} cost function (equation 1 in the manuscript) for a given even, while leads to an unsatisfactory simulation for another event.

This has been added in the manuscript (§ 3.2):

> "This result doesn't seem to be directly linked with the rain-gauged distribution because first of all, the rain-gauge network is quite dense in this catchment and rather well distributed: with 19 rain-gauges for an area of around 1000 km^2, the rain-gauges density is about 1 for 50 km^2 whereas the rain-gauge density for the full network over mainland France is of 1 for 120 km^2 (Mounier et al., 2012). In addition, it's not always for the same part of the catchment that the model has the best performance: it depends on the event. Therefore, the same distribution of rain-gauges sometimes leads to a correct simulation in term of L_{NP} cost function (Eq. 1) for a given even, while leads to an unsatisfactory simulation for another event."

Mounier, F., Lassègues, P., Gibelin, A.-L., Céron, J.-P. and Veysseire, J.-M.: Radar-guided control and interpolation of rain gauge precipitation data over France. Report EURO4M project (European Reanalysis and Observations for Monitoring project). http://www.euro4m.eu/Publications/Report_Flore_Mounier_EURO4M_201203.pdf, accessed December 6, 2019. 2012.