Interactive comment on "Does forest replacement increase water supply in watersheds? Analysis through hydrological simulation" by Ronalton Evandro Machado et al.

Anonymous Referee #2

ANSWER:

Questions:

General comments:

I did not analyze the water balance in the basin. For this, I would have to compute also, the PERC (water that percolates past the root zone) and GW_Q (Groundwater contribution to streamflow) – to see water balance equation in question 1 in specific comments below.

Specific comments:

1. P7L5-10: what is water balance equation in sub-basin?

P= ET + WYLD + SW + PERC - GW_Q (SWAT Documentation, version 2012)

Where:

P= Precipitation

ET= Evapotranspiration

WYLD= Water Yield

SW= Soil Water storage

PERC= water that percolates past the root zone

GW_Q= Groundwater contribution to streamflow

2. P7L6: Partition of rainfall into Q, E, S are watershed water balance, not watershed hydrological regime. 3.

As I did not analyze the hydrological balance in the basin but rather hydrological variables, I modified the expression "hydrological regime" for "hydrological processes".

3. P8L10-15: Some sentences are repeating written.

I rewritten the sentence:

Where, Q_{CU} represents baseline scenario events (current use) in the period and and Q_{ESA} the results of the alternative scenario (ESAs) in the period. Percent bias calculation of the analyzed event (PBIAS) is important because it takes into account potential errors in the compared data. For this method, the higher the value of PBIAS (+ or -), the greater the difference in sediment yield and changes in hydrological processes between scenarios.

4**. P8L22:** what is the meaning of "flows in intervals of 5 in 5% of flow-duration curve…".

According to Fig. 3, I compared the flows simulated by the model and those obtained by the hydrological regionalization at each interval of 5% of the probability of occurrence of the flow-duration curve.

I rewritten the sentence:

"The NSE applied to compare the regionalized and simulated flows at each intervals of 5% of the flow-duration curve was 0.93."

5. Figure 8: legend of lithosols and cambisols are not clear, check hydrography's legend.

I modified legend of Figure 8 accord to WRB (World Reference Base for Soils Resources).

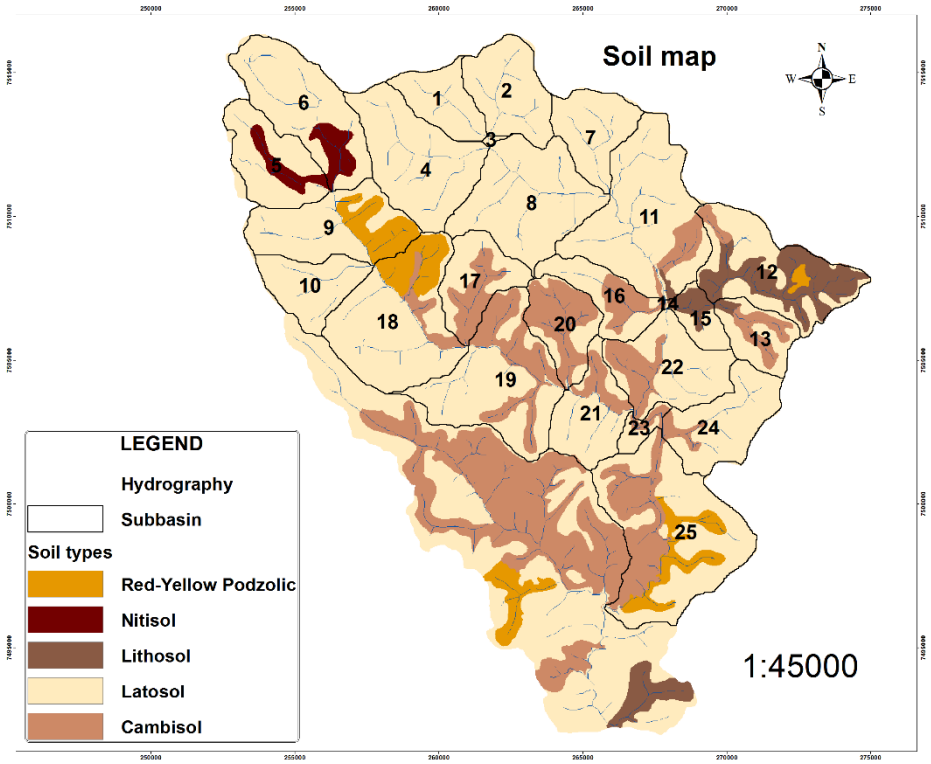

Figure 8 – Pinhal River watershed's soil map (Source: Oliveira, 1999). Legend accord to WRB (World Reference Base for Soils Resources)

6. Table 4: adding one more row for total number.

I added one row for total number:

Table 4. Cross tab between land use changes in the scenarios for cambisols and lithosols in the Pinhal River watershed.

	Cambisol				Lithosol			
Land use type	**Current use**		**ESAs scenario**		**Current use**		**ESAs scenario**	
	Area (ha)	**Area (%)**	**Area (ha)**	**Area (%)**	**Area (ha)**	**Area (%)**	**Area (ha)**	**Area (%)**
Forest	1278	22.4	3894	68.3	275	24.3	1089	95.7
Pasture	947	16.6	399	7.0	169	14.9	10	0.9
Sugarcane	997	17.5	142	2.5	350	30.9	8	0.7
Other uses	2476	43.5	1263	22.2	339	29.9	31	2.7
Total	5698	100	5698	100	1138	100	1138	100

7. P15L9: replace Figure 7 with Figure 5.

I replaced Figure 7 by Figure 5.

8. P17L1: increased forest cover in the watershed in Table 3 is 373.67%.

I corrected the value for 373.67%.

9. P17L5: How SWAT incorporate greater infiltration rate from more forest area?

Land cover characteristics (SWAT Documentation, version 2012)

"The plant canopy can significantly affect infiltration, surface runoff and evapotranspiration. As rain falls, canopy interception reduces the erosive energy of droplets and traps a portion of the rainfall within the canopy. The influence the canopy exerts on these processes in a function of the density of plant cover and the morphology of the plant species."

10. P17L13: P17L13: replace water yield (-45.8%) with (-19.3%).

I replaced (-19.3%) by (-45.8%).

11. Figure 14: its caption should be 14(a) whole, 14(b) wet 14(c) dry 12.

I altered caption Figure 14

12. Figure 15: similar to Figure 14.

I altered Figure 15 like Figure 14.