

Interactive comment on “Importance of stream temperature to climate change impact on water quality” by A. Ducharne

Anonymous Referee #5

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The sensitivity of water quality to climate change is a major issue for hydrology and earth system sciences especially in human influenced regional watersheds. This paper presents relevant results on dissolved oxygen, nutrients and chlorophyll on the Seine River downstream Paris simulated by the water quality Riverstrahler model based on stream order distribution of biogeochemical and hydrological control factors and is focused on the estimation of water temperature in the context of climate change. The boundary conditions are derived from three physically-based models (agronomical, hydrogeological and land surface model) which are described on a previous work. The innovative aspect of this paper is the regional analysis of the relationships between water temperature and lagged moving average of air temperature (2 to 15 days), which

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depend on Stream order. The parameters of regressions between water/air temperatures are very consistent. They show that on high Strahler stream order, the water temperature converges toward equilibrium temperature. The performance of statistical model is less convincing: when Strahler order decreases other variables are needed such as solar radiation, altitude ?

This paper is a valuable contribution to the climate change impact on impacted river-basins and can be accepted in HESSD as such but it could be improved if the authors could:

- (table 1) : Explain why the biases of the linear relationships between water temperature on the one hand and the lagged moving average of air temperature on the other hand for different Strahler stream orders are always negative.
- Page 2438: equation 1: define the index “i”

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 2425, 2007.

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