

## ***Interactive comment on “Transport at basin scales: 2. Applications” by A. Rinaldo et al.***

### **Anonymous Referee #2**

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This contribution is the second of a series of two papers dealing with transport at the basin scale. More specifically, the authors apply the theoretical framework developed in the first paper for modeling the nitrogen load contributed to the Venice lagoon by the Dese, a river crossing a densely populated, and intensive agricultural, area surrounding the lagoon. Overall this is a valuable contribution to modeling of contaminant transport at the basin scale. What makes this contribution particularly interesting is the fact that it provides a clear link between runoff production and solute transport without resorting to statistical methodologies or phenomenological models. The model is continuous in time and operates at a hourly time scale, which make it particularly suitable for modeling the loads during high flow events. This feature of the proposed modeling approach is a step forward in our capability of predicting nutrient loads in fragile aquatic ecosystems such as lakes and lagoons, since a significant portion of the annual load is mobilized and transported during high flow events, which cannot be properly captured with models constructed for operating at daily, or monthly, timescales. From a more

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technical point of view I observe that the material is well presented and the results are interesting and open new perspectives in this important, and surprisingly almost ignored, branch of hydrological studies.

### Specific comments

Apparently, during the calibration period of the transport model (from 20 October to 12 November 1993) the water discharge was not recorded. This fact may be a source of uncertainty for the transport model which computes the mass flux rather than the flux concentration at the control section. It would be nice if the authors comment on the possible implications of calibrating the transport model on periods when water discharges are not available. Stating it differently, I am wondering if the match between measured and computed mass fluxes would have improved if measurements of the water discharge were available during the calibration period.

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