

## ***Interactive comment on “Modeling suspended sediment sources and transport in the Ishikari River Basin, Japan using SPARROW” by W. Duan et al.***

### **Anonymous Referee #1**

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This paper shows an example of the application of the statistical SPARROW model to the Ishikari River basin. As a result, the modeled result is likely reasonable to the observed annual sediment load as shown by Fig. 6. However, the Ishikari River basin is located in the subarctic region with high snow depth in winter. It should be noted that: i) The Ishikari River basin has a long period of low flow and sediment load in December to mid-March with high snowfall. For this period, sediment load is very low except for the temporary snowmelt at positive degree air temperature. ii) High flow and sediment load are observed in the snowmelt season of mid-March to May and in heavy rainfalls in May - late November. Thus, (1) the sediment load estimated by the SPARROW

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model should focus only on the snowmelt and/or rainfall river runoffs. Otherwise, the authors should explain such a natural condition as the background of the river basin to the readers, and apply the SPARROW model to river runoffs for the limited period. (2) If the “developing land” produces the high sediment yield even in winter, they have to state why and how the high sediment yield is produced. The authors had better explain the sedimentary situation of the developing land in detail. (3) The explanation of data sets utilized in the model is not enough: How and when were the sediment load data acquired at the 31 gauging stations? (4) If many data are missing, is there some criterion for the limit of the application of SPARROW? (5) Actual evapotranspiration from the river basin is never explained in the text. The effective rainfall in the rainfall season is one of important parameters to produce river runoffs and sediment load. The authors should utilize the MET data at many weather stations in the river basin for the modelling.

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