Dynamic regression to determine length and intensity of the effect of flow increase in salts concentration in Ebro river (Spain).

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The present work studies the existing relation between the river flow and water salts concentration measured by electric conductivity being done on time series collected on these parameters on four sampling points belonging to the Ebro river basin. One of the sampling points is located near the source of the river, another in the middle, the next after a great capacity dam and the last point close to the mouth. The river basin is located in the NE of Spain between the Iberian and Pyrenees Mountains.

The relationship between time series is done through Dynamic Regression. The study was realized independently for each of the sampling points. The series have monthly and extend for a period of at least 25 years.

Dynamic Regression is a Regression Model that includes former values of the explicative variables. Relationship between response variable (conductivity) and the explicative series (flow) is modelled by using a transfer process. As a consequence the model will predict how the increase or drop of the flow will affect in time, degree or length salts concentration.

In conclusion it is found that sampling points closer to the mouth maintain a bigger effect of flow increase or flow drop than those near the source. All models explain over 50% the conductivity variability from flow changes, this proportion being more relevant as we get closer to the mouth.