

Arielle Mimouni

GIS in Water resources – Fall 2013

Surface and groundwater nitrate contamination in the Seine basin

Progress report



Limits of the Seine Basin River and its network



Legend

- Seine_RAPID_cell_manning
- Seine basin limits

I am working on modelling nitrate loads on the Seine River, using Ahmad Tavakoly's results and available measured data.

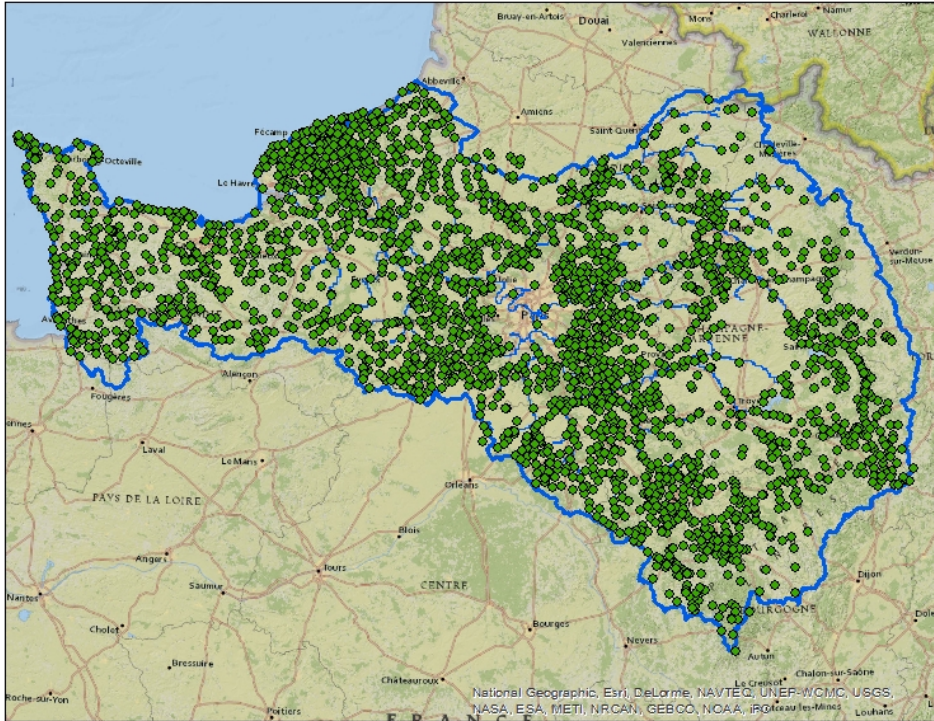
I have been reading papers (Ledoux et al. 2007) to understand better the model Ahmad used to compute the daily leaching mass in the Seine River, and hydraulic parameters of the Seine River.

On the map above, the river network is described by a limited number of cells computed using the Manning method. I will use this representation for my study.

I have started to look at wastewater treatment plants data in order to see their impact on nitrate loads in the Seine River. This data hasn't been taken into account so far to compute nitrate loads. I am using 9 files provided by the Geosciences and Geoengineering Research Department of MINES ParisTech/ARMINES. They

describe the annual characteristics (location, water quality, discharge) of all the wastewater treatment plants of the Seine Basin.

Wastewater treatment plants in the Seine Basin in 2007



The next steps will be to:

- Compile the wastewater treatment files into one file describing the year, the location, and the nitrate load for all the wastewater treatment plants. Then, I will compare nitrate generation for all the years and set a threshold to select the wastewater treatment plants that might have an impact on nitrate load. Eventually, I hope to be able to point out the plants that should be considered in nitrate modeling of the Seine Basin.
- Model the nitrate leaching mass using ArcGIS. The nitrate loads computed by Ahmad are currently in a compressed non-usable format and we can't use them in ArcGIS. We are in the process of converting them.

So far, the difficulties come from the fact that we have a lot of data but we don't always know what they represent because they are abbreviated and in French. There is a lot of interesting work to be done and I am, in this project, preparing the ground for a full analysis of the data Ahmad has generated last spring.