Study of erosive issues in the Hauts de France: Understanding of mud flow mechanisms and their role on the quality of waterways

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Three questions :

- How effective are policies for erosion control ?
- Can we have a predictive approach for sedimentary matter flux ?
- What is the role of particles on the quality of surface water ?

Three complementary methods implemented to try to answer these questions:

- High-frequency monitoring of particulate flows and the surface characteristics of agricultural soils
- Modeling of the hydro-sediment flow with the WaterSed model
- Monitoring of pesticides related to material in transit on the agricultural plot / river continuum

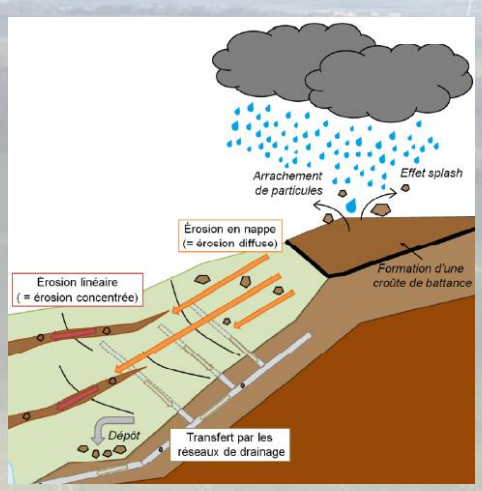

Figure 1 : different types of erosion (Cailleaud, 2017)

Figure 2 : High frequency measuring station (flow measurement, turbidity and sampling)

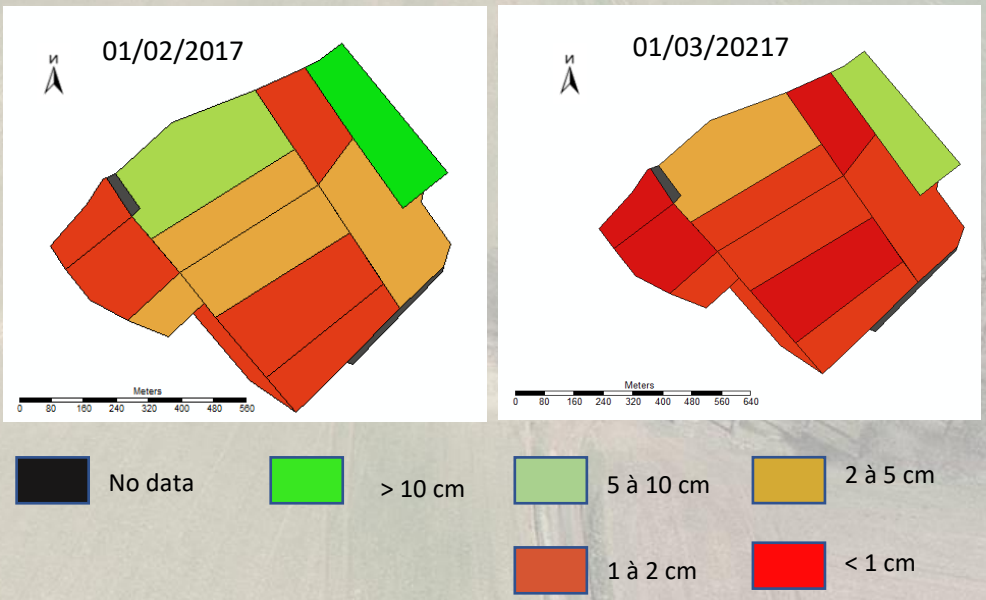

Figure 3 : Mapping of the evolution of roughness in an elementary watershed (data from Patault, 2018). Useful data for modeling and understanding erosive phenomena

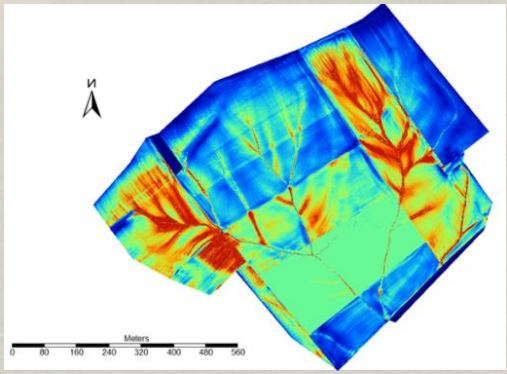

Figure 4 : modeling of the hydro-sedimentary flow linked to a rain event (WaterSed model, Landemaine 2021)