

Prioritization of valorization scenarios for sediment deposits management – VALSE project

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Introduction: Nord-Pas-de-Calais region has been strongly marked by an industrial and mining past which has resulted in soil and sediment contamination in the waterways. The Nord-Pas-de-Calais river basin includes 186 historic onshore sediments deposits managed by VNF. Prioritization of the valorization scenarios needs to take account of social-economic context and of sediment quality. The objectives are therefore to provide a decision-making aid tool constructed from indicators and dealing with scenarios for valorization of these deposits. This study is a part of the Interreg V France-Wallonia-Flanders VALSE [1] project and this part focus on historic deposits valorization. The project VALSE leads by ISSeP aims to propose and validate valorization scenarios for sediments.

Methods: The first step of the study have included the creation of a database of a subset (119 sites) of the 186 known sites. Sediment data characterization (8 heavy metals, 7 PCBs, 16 PAHs) where compiled with GPS location of each sediment sample.

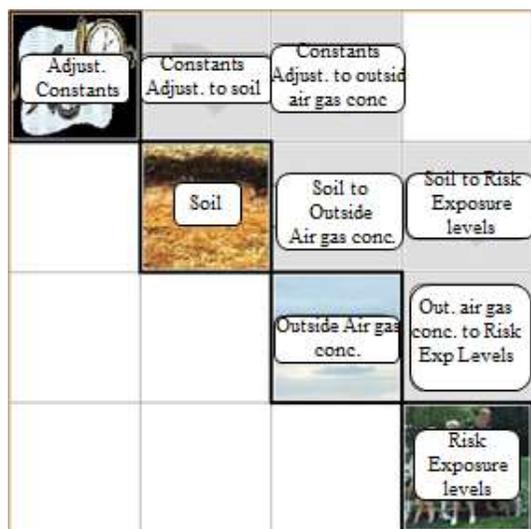


Fig. 1: Exposure Matrix used for a scenario (green park)

The others major steps were the selection of 2 valorization scenarios, health risk assessment for 2 scenarios (green park, hunting area), selection of the more discriminating scenario (green park), creation of a social-economic parameter and building of 2 overall health and social-economic indicators. Health risk assessment was done with the MODUL'ERS tool [2].

The approach used for creation of a social-economic parameters was inspired from Caudeville & al. [3].

Results: The database including 2 new indicators allows to select with the help of a GIS the different sites with a combination of indicators/area of interest. At the regional scale, selection from the social-economic indicator gives economic influences in the Nord-Pas-de-Calais river basin. This indicator highlights several parts of the river basin, including a fraction of the Valenciennois region. The map of the health risk indicator creates a view of impacts of large cities and industrial area on sediments quality, taking account of specific scenario used (green park opened to the public). As distances between the dredging and the deposits are generally limited (a few kilometers) this type of maps give a view of sediment general quality and of footprint of industrial past. At the local scale, the data allows a comparison between the deposits.

Discussion: The proposed approach aims to be applicable to broad fields (onshore management of sediments, abandoned sites and soils, contaminated sites and soils) within territories, with a link to the economic context. This approach treats the needs to manage high sediment volumes/deposits or large number of contaminated sites. Hauts de France region, Wallonia and Flanders share the need to manage this type of sites or significant sediment volumes. Further studies are also needed to explore links between the sediment deposits quality, contaminated sites and discharges in the river basin scale.

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References: [1] <https://valse.info/>; [2] <https://www.ineris.fr/fr/recherche-appui/risques-chroniques/logiciel-modulers>; [3] Caudeville & al. (2016) *Environnement, Risques and Santé*, 15:39-47.