
Monitoring dredged-dumped sediment dispersal off the Bay of Seine (N France) using environmental magnetism.

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Résumé

In this study, we developed a novel approach for fingerprinting dredged-dumped sediments at sea using magnetic susceptibility. Several magnetic measurements were performed on discrete sedimentary samples from the dredged areas in the Seine river and from the Bay of Seine seafloor before and after dumping. The dredged sediments showed higher susceptibility values than the undisturbed seafloor, which allowed the mapping of the dispersion of dredged-dumped sediments. In the vicinity of the coast and the estuary, high-susceptibility terrestrial input from rivers could also be mapped by this technique, therefore monitoring of the dumping by the susceptibility proxy is limited to the offshore areas. This susceptibility signal is controlled by the ferromagnetic fraction of the sediment. Furthermore, a constant magnetite-dominated magneto-mineralogy is observed in the study area. In addition to the susceptibility, a magnetic grain size parameter of the low-coercive fraction was also found to be sensitive to dumping. Both tracers showed an in-progress resilience of the sedimentary environment during a six-month survey.

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