Materials: Marine sediments seeking valorization

Dredging sludge represents a considerable resource. Yet, its reuse is struggling to take off despite research efforts and pilot projects.

Stéphanie Frank, Published on June 1, 2026 at 8:00 a.m, le Moniteur

The construction of a polder dedicated to offshore renewable energy in the port of Brest is one of the major marine sediment valorization projects in France.
In Gujan-Mestras (Gironde), within the sediment management unit of the Intermunicipal Syndicate of the Arcachon Basin (Siba), stands a small house designed by architect Quentin Prost as part of a thesis defended in 2025. Its walls are made of dredged sediments from the basin. After three years of storage to leach out the salt, the material was molded into bricks and then used to fill a timber frame.
An exceptional use: sediments reused on land are generally employed as fill, in road engineering, or in agriculture. However, the 32 million cubic meters dredged in 2024 across all of France's maritime coastlines, according to Cerema figures, make it possible to view them as an abundant resource, both for preserving coastal sediment flows and for replacing conventional aggregates in civil engineering. Yet 96% of this material is returned to the marine environment. Of the remaining 4%, a small half is used to replenish beaches, and only 2.2% is managed on land in storage or valorization facilities.
"These sediments often have characteristics that are unfavorable for civil engineering supply chains — heterogeneous particle size distribution, high fine fraction, presence of organic matter, chemical substances, salts — which limit scaling up for construction actors," explains Yannick Mamindy-Pajany, Director of Research, Innovation and International Affairs at Cerema. In addition, "the flows, produced according to dredging operations, are irregular and the sediments must be stored for a long time in basins to reduce their salt content and increase their dry matter content," adds Antoine Faure, project engineer at Setec Lerm.

Proving utility and safety

The silts, which contain silt and clay along with organic matter and possible contaminants, are classified as waste and require treatment. "It is necessary to demonstrate that they are not hazardous, carry out additional characterization so they can enter valorization channels, technically confirm their utility, and then verify their environmental and health safety depending on the intended use," says Yannick Mamindy-Pajany. Ultimately, "the economic gap often remains unfavorable, especially when natural aggregates remain relatively inexpensive locally." For Antoine Faure, who wrote a thesis on sediment valorization in hydraulic binder production, particularly in cement plants, "it is therefore necessary to target sectors that need fine materials such as cement plants, brickworks, hydraulic binders, and pozzolanic materials."

A much-awaited regulation

On the regulatory side, the range of available guides remains incomplete. While a project developer can do without them by demonstrating a sediment's utility and its environmental and health safety, "understanding all the implications of the process makes this a technically and regulatory complex subject for project owners and their advisers," notes Yannick Mamindy-Pajany.

In the Hauts-de-France region, the eco-transition center of excellence CD2E has developed Sédimatériaux, a complementary approach to existing documents. Organized into three guides (road engineering, landscaping, and concrete), it has helped frame around fifteen valorization projects in the region. While he confirms that progress is slow, Cyril Scribot, engineer and consultant at CD2E, remains optimistic: “More and more construction actors are taking an interest in these new materials because sediment management is costly, whereas they could be made available in a way that is economically beneficial for everyone.”

Sector stakeholders are eagerly awaiting the publication of Cerema’s methodological guide on the use of alternative materials in maritime and river works (coastal roads, reclaimed land structures, submerged objects, etc.), which is expected in 2028. For now, documents exist to validate the environmental and health acceptability of using these materials in roads and land development projects.

A dedicated application guide on the use of sediments in linear terrestrial transport infrastructure should also be published by Cerema in the coming months.

Normandy: from port platform to farmland, Haropa Port is testing all options

Each year, Haropa Port dredges 12.5 million cubic meters of sediments in the ports of Rouen and Le Havre (Seine-Maritime), producing about 6 million tons of dry material.

Although the vast majority of these volumes are dumped at sea, the Seine-axis operator nevertheless manages to valorize 200,000 m3 of these dewatered sediments. It is also conducting two research projects in partnership with the specialized consultancy Neo-Eco, following the Sédimatériaux methodology: Sédinnove, launched in 2019, and Sédiseine, which began in 2023. The total budget for these experiments amounts to €1.3 million.

“Sédinnove uses slightly saline fine sands taken near the Normandy Bridge, for which we have identified two valorization channels,” explains Ludovic Grabner, Director of Channel and Maritime Works at Haropa Port. The first led to the use of 82,000 tons of sand between 2019 and 2024 to build the base layer of a port platform in Honfleur (Calvados). The second concerns the use of sediments in XS3 marine concrete, with a pilot project to repair seawalls planned for 2027, also in Honfleur.

The Sédiseine project, meanwhile, uses clayey sediments from the upstream port of Rouen, which produces nearly 100,000 m3 per year. Part of it will be used in road engineering, as in the Sédinnove project, “but with a different formulation that will allow 40% of sediments to be incorporated into the base layer,” says Ludovic Grabner. It will result in 2027 in the creation of a cycle path on the Cailly promenade, within the Rouen-Normandie metropolitan area. The second application is the retexturing of agricultural land, meaning the modification of the grain size of very sandy soil. The barley plot used as a test site saw its yield increase by 50%. A pilot project is now being prepared on 2 hectares of maize. “The approach of finding outlets and carrying out pilot projects is a way of getting things started before letting the construction industry optimize the use of these materials,” says Ludovic Grabner.

Haropa Port can also be pleased with a collateral advantage of its initiatives: “The socio-economic studies conducted as part of these experiments highlighted the existence of a substitute material for natural materials that is significantly cheaper. We sell it much more easily today,” says the manager.

Toulon: reuse serving the future aircraft carrier

To accommodate the future next-generation aircraft carrier, named France Libre, the Infrastructure Service of Defense (SID), which manages dredging and sediment valorization operations for the Ministry of the Armed Forces, is preparing to build two reclaimed areas of more than 10 hectares each and an access channel at the Toulon naval base (Var). “The dredging operations to be carried out concern between 1 and 2 million cubic meters,” says Laurent Sannier, operations manager at the PA-NG division of SID Méditerranée.

This is a resource whose valorization is not without difficulty.

“Since there is no methodological guide for onshore sediment management for maritime structures, each project owner must define its own method to identify valorization options, then its testing framework in order to establish its management plan,” explains Laurent Sannier.

In Toulon, SID has joined forces with a consortium made up of Cerema, Envisan France, and Cerib, with the support of Ineris, in a project worth €4.15 million excluding tax. Together, they are developing a multi-step process: characterization of the resource in terms of volume and quality; identification of outlets compatible with the PA-NG project; development of specifications for geotechnical, environmental, and health acceptability studies for the extracted materials; and implementation of a testing program. “After identifying the dredging by-products we wanted to valorize, we launched a campaign to collect materials of different types and lithologies from the future deposit,” explains Laurent Sannier.

Just over 1,100 m3 of sediments representative of the future deposit were sampled in January 2025, and the tests proved satisfactory. “We achieved our objectives in terms of environmental and health qualification; regarding geotechnical qualification, an improvement in the hydraulic binder dosage should make it possible to achieve it,” summarizes the operations manager. The results, which suggest strong potential for land-based valorization, were communicated to the groups bidding for the Toulon project. The ongoing tender includes a requirement for the valorization rate. The first dredging operations are scheduled for 2027.