IMDC

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International Marine and Dredging Consultants (IMDC) is an engineering and consultancy company specialized in a vast range of water related projects. Our highly qualified staff offers advice based on recent research results of leading universities and research institutes and hands-on experience acquired throughout the years. One of IMDC's core activities is presented in this product sheet : Dredging Consultancy

More information can be found on our website www.imdc.be

Dredging Consultancy

Ever since its foundation, now already more than 40 years ago, dredging consultancy forms one of the core activities of IMDC's business. With a team of experts, of which many have worked in the field with renowned dredging contractors, IMDC can bring in valuable practical expertise to the benefits of our wide and diverse range of clients seeking for support in their often multi-disciplinary marine projects. While dredging sometimes is just one of the many activities to be done, it can have a huge impact on the timing and budget of the total project, and therefore needs careful consideration and planning.

The dredging expertise you will find at IMDC is unique and hard to find outside a dredging company. We can cover just about any stage of your dredging project, ranging from feasibility study and permitting stage till full support in the procurement and contractor selection process and supervision of the works afterwards. Besides this, IMDC can assist you in the O&M phase, helping you to optimize your maintenance dredging works and/or equipment performance and minimize any adverse environmental impact. In other words, we can go all the way with you!

Equipment selection and optimisation studies

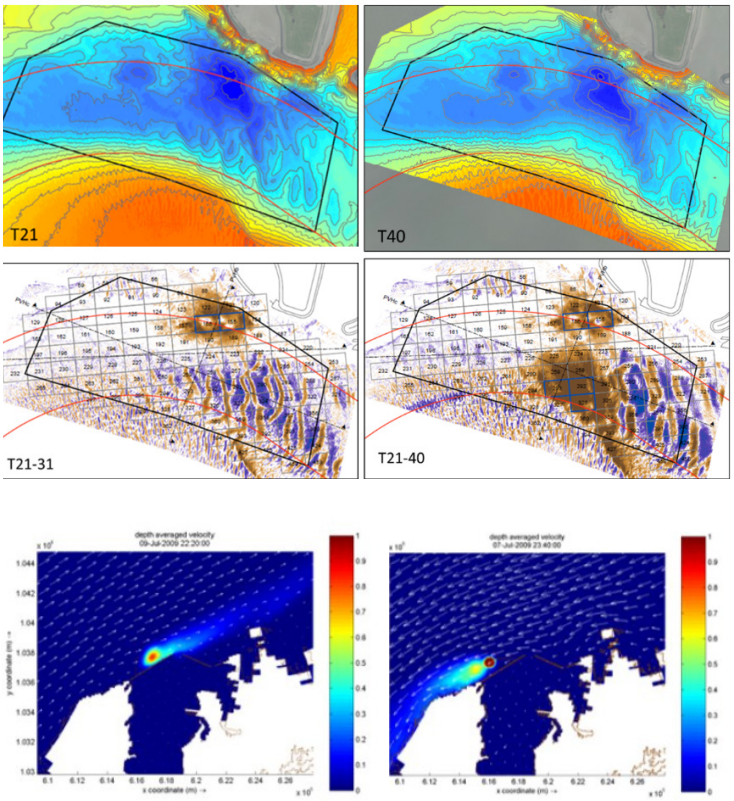
Using appropriate dredging equipment for the job is of utmost importance for the successful execution of a project. IMDC assists clients in choosing the most efficient dredging methodology and following out of this, the most appropriate dredging equipment.

Whether a client wants to purchase, hire, or modify a dredger, IMDC provides objective, multi-criteria analysis to support the best decision. If new equipment is needed, IMDC can look into the different scenarios and advise the client on the best options based on an objective multi-criteria analysis. When the choice for acquisition of new equipment has been made, IMDC will support in the selection and dimensioning so that the optimal dredger is obtained for the job that needs to be done. Our expertise also lies in evaluating and optimizing, where possible, the operational and technical performance of clients' existing dredgers and, on a larger scale, provide them with advice on their future fleet composition.

Dredging and Reclamation studies

Dredging and reclamation are activities that always have been part of many large multi-disciplinary projects like the creation or deepening of ports and waterways, the realization of artificial islands, offshore windfarms, infrastructure to protect against flooding, etc. Usually several parties are involved in the different project stages and they all might require different inputs :

- Feasibility and design studies, where the best dred-ging and/or reclamation method needs to be determined, so that a realistic and reliable cost and execution time estimate can be prepared, with the support of modelling studies (e.g. turbidity model-ling, sedimentation transport)
- Detailed design (volume calculations, investiga-tion of potential reuse of dredged material, Nature Based Solutions, detailed phasing & planning)
- The preparation of tender documents and assis-tance during the procurement process
- Support during the permit application process and technical input demanded in EIA's
- Contract and interface management during the project execution.



Site supervision and Contract management

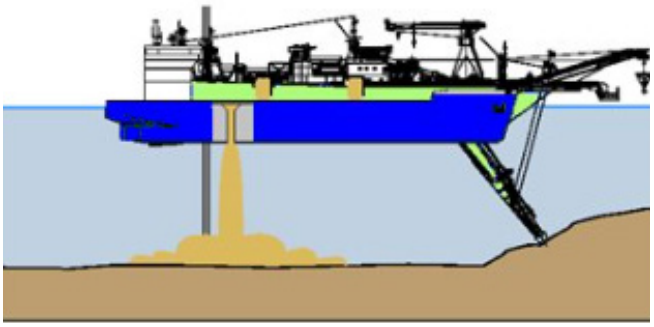
IMDC can supervise the contractor on site via client representatives or monitor remotely with expert knowledge, so that the works are executed and completed in full compliance with the client's needs and expectations. This can include daily progress monitoring, review of the method statement, quality checks and expert advice on optimization of the dredging operations, if deemed needed.

Sediment Management

Depending on the nature of industrial activities in the hinterland, dredged sediments can be heavily contaminated with PFAS and other pollutants. In such cases, the disposal of these sediments has historically led to large-scale soil and groundwater contamination, sometimes with regional consequences. This environmental risk is directly linked to port development and the establishment of new industrial zones. A successful port development strategy must therefore integrate PFAS remediation as a core component of sediment management.

IMDC offers comprehensive sediment management services that address both environmental and operational requirements, including:

- Assessing the disposal and, if necessary, treatment options of dredged material available, ensuring compliance with environmental regulations and careful selection of appropriate treatment or disposal method
- Actively promoting the beneficial re-use of dredged material, turning a potential waste stream into a resource, whether that is suitable for land reclamation, beach nourishment, habitat restoration or construction fill
- Containment area design.

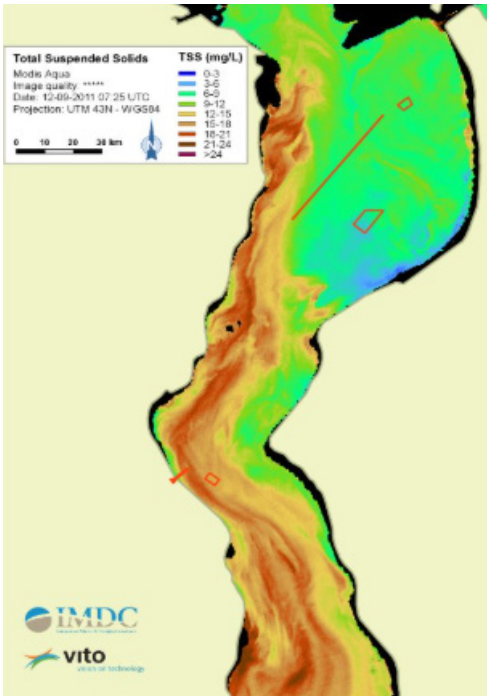


Monitoring and Modelling of environmental impact

The environmental aspects related to dredging projects are often of critical importance during the permitting and execution phase. Not only the final destination and management of the dredged material, contaminated or not, but also the turbidity created during the dredging operations turns to be a major point of attention. IMDC has extensive experience in the assessment of the impact of turbidity-generating activities through intensive monitoring and modelling of sediment plumes, and in the estimation of overflow losses. Propeller wash has been studied numerously for near-field (a few hundred meters) and far-field (1-100 km) impacts in various metocean conditions and for various soil types and project areas.

IMDC has also developed EcoPAM, an online Sediment Plume forecasting system that supports clients in managing the dredge works environmentally and is contributing to the Adaptive Management concept development for sediments and water quality in the dredging industry within the CEDA organization

IMDC has specialized equipment to perform both stationary or vessel-based measurements of the turbidity and sediment plumes as well as 10- years of experience together with partner VITO-TAP in providing sediment maps based on remote sensing images (satellite, airplane or drone platforms).



Key references

Engineering support for FSRU Wilhelmshaven development

Country: Germany

FSRU GmbH commissioned the construction of an LNG terminal in Wilhelmshaven, Germany. IMDC, acting as the Owner's Engineer, was among other tasks responsible for the turning basin design and the monitoring of the capital and maintenance dredging campaigns. This included a sediment plume dispersion study aiming to assess any dredging environmental impact, UXO clearance, hydrographic survey planning and quality control. IMDC assessed the Contractor's proposed dredging methodology and followed up during the execution with site supervision. A combination of trailing suction hopper dredger with a plough vessel resulted in a total of approximately 800,000 m³ of sandy material being dredged and safely disposed.

Sustainable Development Goals

Study on the improvement of the navigability of the Paraguay-Parana river

Country: Brazil

HBSA provides integrated logistics services in South America, including waterway transportation, terminal operation, and coastal shipping and currently operates on the Paraguay-Paraná Waterway that runs through Brazil, Paraguay and Argentina. HBSA requested IMDC to support them in improving the navigation conditions in certain sections of the Paraguay-Paraná Waterway and the Alto Paraná region that during recent years have suffered from falling water levels due to drought. IMDC provided modelling services for optimal dredging & dumping strategies, as well as design and environmental services.

Sustainable Development Goals

Deepening and widening of the Szczecin-Swinoujscie fairway

Country: Poland

The joint venture formed by Dredging International and Van Oord, has been awarded the contract for design and execution of the deepening and widening of Szczecin-Swinoujscie fairway till -12,5m, in Poland. IMDC was part of the engineering team that had to provide the general data for execution of the design as well as the different design packages including building permit designs and construction design.

The fairway to be deepened is approximately 62 km long and works also included the construction of anti-scour bank and bottom protection in certain stretches of the fairway. The dredged material was reused to build two artificial islands in the central zone of the lagoon located in Szczecin. With more than 38M m³ of reused dredged material, a new natural habitat was created. IMDC was involved in all the different design phases, from wave modelling to construction execution assistance.

Sustainable Development Goals

Multiple framework agreement plan and project preparation infrastructure and dredging for fairway management

Country: Belgium

IMDC, in collaboration with partners from the Netherlands and Belgium, was selected by the Maritime Access Department of the Flemish Government to provide technical-scientific support in relation to the preparation, permitting and implementation of large infrastructure projects in seaports and dredging works for the maintenance of navigational passes in the Natura 2000 areas in and around the Scheldt and North Sea. The project consists of the several tasks, including: Project management, Development of acceptance criteria for the disposal of dredged materials in the Lower Sea Scheldt and the North Sea, Support for Flexible Disposal campaigns, and the development and application of an idealized morphological model and coupling with the transport of environmental parameters (eg. PFAS) . The latter included the evaluation and updating of the current acceptance criteria for dumping dredged material back into the Lower-Zeescheldt by paying due attention to PFAS, which are present both at the sites to be dredged and at the disposal sites. As part of this subtask, it was investigated how the (preliminary) PFAS standards framework relates to the dredged material and how the framework can be interpreted in the context of future permit applications. In addition, based on the testing of the chemical quality of the water bottom against the various standards frameworks, it was examined whether an update of the current acceptance criteria for the other parameters was appropriate.

Sustainable Development Goals

Technical feasibility study for the mechanical dredging of the Gbaga channel and the restoration of associated ecosystems

Country: Togo

In a joint assignment between the two competent ministries in Togo and Benin, IMDC, as the head of a consortium, carried out a feasibility study around the rehabilitation of the channel Gbaga that lies on the border between Togo and Benin. The aim of this study was to ensure that this canal could once again provide a good flow and guarantee a better exchange of water between the Mono River and the Atlantic Ocean. The first step was to determine the critical zones for flooding and to choose the best locations for mechanical dredging. Secondly, an intervention program for the future maintenance of the channel had to be set up. The planning of the interventions had to take into account the presence of sensitive aquatic environments and the restoration of degraded areas (including mangroves) and the protection of the flora and fauna of the area. The project also embraced the search for a suitable temporary storage place for the dredged material produced during the dredging works, and the search for a possible reuse based on the environmental and construction quality of this material.

Sustainable Development Goals