

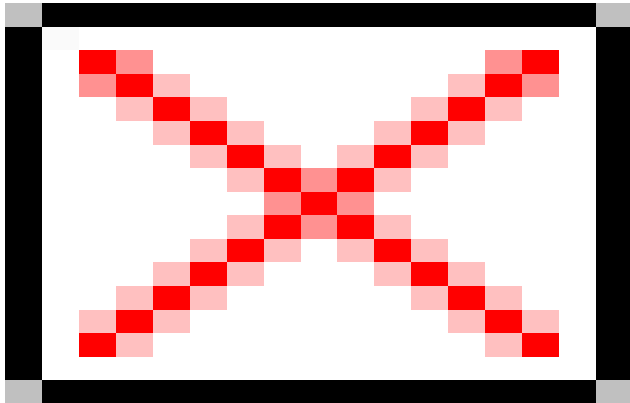
IMDC  
Dredge plume monitoring

Location:

France

Client:

SDI



## Project Contact Information

For more information about this project, please contact:

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SDI asked IMDC to setup a scientific follow-up system to determine the environmental effects of gravel dredging. After approval by a multidisciplinary scientific committee, IMDC performed a measurement campaign to determine the plume that is generated by a Trailing Suction Hopper Dredged (TSHD) while mining gravel at the French Channel.

In this project, two different measurement campaigns were performed. An initial measurement campaign was performed in order to determine the conditions at the measurement side in undisturbed conditions (i.e. when no dredging is performed). This campaign consisted of a through tide measurement using an ADCP to measure flow velocity profiles and the in-house developed SiltProfiler to measure suspended sediment concentration profiles.

The main measurement campaign consisted of the monitoring of the dredging plume using a separate survey vessel during the dredging process. This campaign took place during three consecutive days, on each of which two different transects were sailed. The measurements started before the dredging process was started, continued during dredging and ended after the dredging has finished and the plume had disappeared.

The survey vessel was equipped with an ADCP (Acoustic Doppler Current Profiler), OBS (Optical Backscatter Sensor) and the SiltProfiler. The ADCP was used to measure flow velocity and backscatter intensities, which was related to suspended sediment concentrations using a semi-automated calibration procedure with the SediView software. The OBS was used to measure the sediment concentration close to the free surface. The SiltProfiler was used to obtain high resolution vertical sediment concentration profiles at selected instances in time.

Simultaneously, samples of the discharged material were taken in the overflow of the TSHD using an airlift pump that was developed in house. These samples were analysed in the laboratory to determine the sediment concentration of the discharged material and its particle size distribution. Together with the log data of the TSHD, these data were used to estimate the total amount of discharged material from the overflow into the sea.

Different measurement protocols were used at the survey vessel in order to sample the plume as well as possible and to have a clear picture of the length of the plume as function of time, its width and the time it needed to disappear after the dredging had stopped.

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