

Solutions for the Reduction of Oceanic Sediment Pollution in the Dredging Industry

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INTRODUCTION

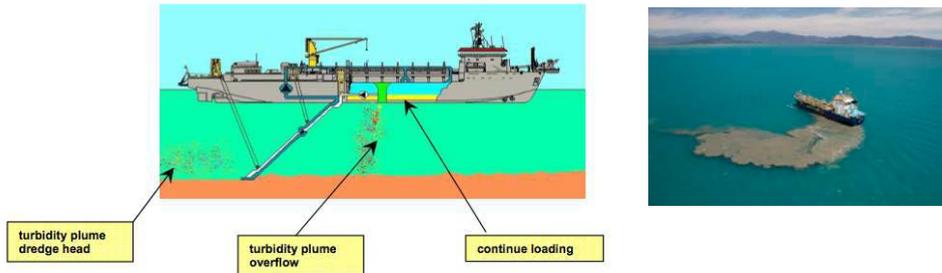


Figure 1: Dredging overflow (left) in a *Dredging Hopper* and dredged sediment dumping (right) from a *Split Barge Hopper*

Dredging - the excavation of sediment, sand or rocks from beneath bodies of water such as rivers and oceans - is a global, € 11bn industry. It is often conducted in connection with coastal and offshore construction projects, but also to keep sailing paths navigable. Dredging can have an extremely negative impact on oceanic ecosystems, due to sediment pollution. While the dredging industry reuses a large portion of the 9 billion m³ of matter it excavates every year, somewhere between 22-25 % of all dredged sediment is dumped offshore. Furthermore, a large portion of the matter excavated, is spilled directly into the ocean due to overflow in *Dredging Hoppers*. Sediment pollution from dredging has adverse long term effects, as the dumped sediment will remain in the water column for up to half a year. The small grains of sand cause harm to small organisms, results in deoxygenation, and disturbs the balance in marine ecosystems. As such, the dredging industry is strictly regulated, resulting in very high environmental costs, and sometimes even fines.

METHODS OF MITIGATION

By utilizing newly discovered fluid mechanical principles, two solutions have been developed. One drastically reduces overflow in dredging hoppers, while the other permanently prevents sediment dumped from split barges, from spreading in the water column. These solutions could be implemented on existing ships, and would reduce costs to such an extent, that they would in essence pay for themselves. The solutions are currently being patented by DTU, which is why the core functional principles behind the solutions cannot be disclosed as of yet. The expectation is however, that the solutions will be in place of the first dredging ships within a year.

RESULTS AND PERSPECTIVES

Using the solutions developed, the industry could reduce overflow considerably, and completely remove the adverse effects of sediment dumping. Widespread use would result in lowered dredging costs, a healthier oceanic environment, lowered fuel consumption and ultimately cheaper offshore structure, such as wind turbines, bridges and power cables.