



Autonomous Underwater Vehicle Demonstration at the Burns Waterway Small Boat Harbor, Portage, IN

ERDC Dredging Operations Technical Support Program (DOTS)

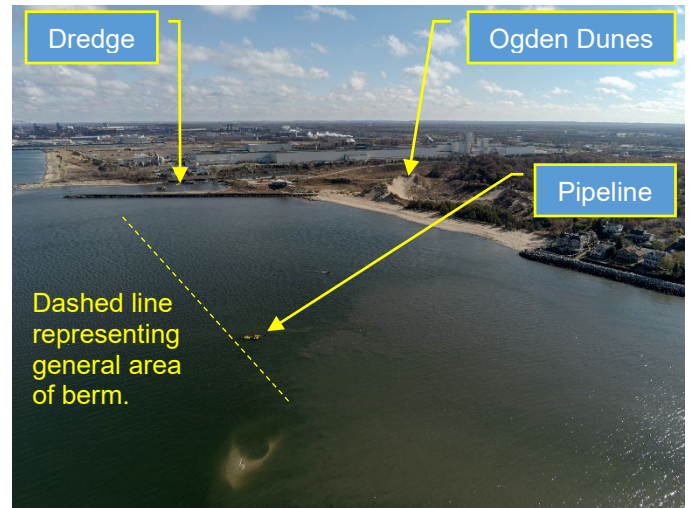
U.S. ARMY CORPS OF ENGINEERS

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Response Summary:

The US Army Corps of Engineers, Chicago District, requested a demonstration of an autonomous underwater vehicle, the EcoMapper (i3XO EcoMapper, YSI, USA), at the Burns Waterway Small Boat Harbor in Portage, Indiana. A relatively small cutterhead pipeline dredge was being used for maintenance dredging of the waterway. The dredged sediment was pumped through a pipeline and placed in a nearshore berm in Lake Michigan, in front of the Ogden Dunes, part of the Indiana Dunes National Park. The nearshore berm served to mitigate shoreline erosion near the dunes.

To gain insights into the characteristics of the turbidity plume, the EcoMapper was deployed in the nearshore berm area, surveying through it as well as along the shoreline up and down from the berm. The EcoMapper is capable of generating high-resolution maps of water quality, bathymetry, and sonar imagery in waters deeper than one meter. It also supports subsurface operations down to a depth of 100 meters, following survey plans preprogrammed by the operator.



Period of Performance:

October to November 2024.

Benefits of the Response to the USACE Dredging/Navigation Program:

Nearshore berms are being constructed or proposed for construction by districts in the Great Lakes states. Concerns are often raised that turbidity plumes generated by dredging or the placement of sediment at a nearshore berm could potentially impact the environment. These concerns sometimes necessitate the implementation of additional management practices, such as the use of silt curtains or alternative placement sites, to mitigate potential effects.

Deliverable:

Turbidity was measured along preprogrammed survey paths at the water surface, mid-depth, and near the bottom. Water samples were collected to determine total suspended sediments (TSS, in mg/L) and were correlated with turbidity measurements. A small unmanned aerial system was also used to capture photographs of turbidity plume conditions. The data were utilized to create a heatmap of turbidity conditions and to gain insights into the spatial and temporal extent of the plume. These findings are being incorporated into a broader study on the use of nearshore berms in the Great Lakes.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance navigation and dredging missions

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