

### Z-Boat 1800 Application Note #1

## Surveyors Conduct Remote Cable Route Surveys Using the Z-Boat 1800

### Summary



The benefits of remotely operated hydrographic surveying with the Oceanscience Z-Boat 1800 were exploited to great effect by surveyors from Shafer, Kline and Warren during cable route surveys in Ohio. The survey locations were inaccessible by a manned boat, and water velocities were too high to have people wading in the water. The Z-Boat 1800 offered the only solution to get high quality survey data that their client needed before laying cables under the river.

### Background

Before cables are laid under rivers, accurate hydrographic survey information is required to properly inform the cable laying operators of the environment through which they will be running the cables; the cables need to be a certain distance below the river bed. Professional hydrographic survey companies are typically called upon to undertake this task and may use single beam depth sounders and accurate RTK GPS systems to generate a bathymetric map of the river bed close to the cable crossing point.

Sometimes, cable routes may be in locations far from roads and river access points making the process of getting a trailer and boat to the survey location quite a headache. In addition, manned boats are limited in their usefulness in the most shallow of environments where grounding the propeller is a concern. If the river water velocity is high then wading is also impossible for safety reasons. To overcome all these problems, hydrographic surveyors may use a remotely

controlled survey boat such as the Z-Boat 1800 from The Oceanscience Group (San Diego, CA).

### The Shafer, Kline and Warren Z-Boat 1800 System

For remote cable surveys, SKW surveyors use the Z-Boat 1800 system shown in Figure 1. The boat is powered by twin 24V high power outdrives allowing operation in up to 10kt (5m/s) currents. A Trimble R8 RTK GPS system was integrated onto the boat using custom cable sets, and a Seafloor Systems SonarM8 single beam echo sounder was selected. Both instruments were connected to the Z-Boat's Control and Communications Module (CCM) where data are combined and transmitted to the shore laptop. Real time position, depth soundings, and heading (from the on-board compass) are available on the laptop and processed using HYPACK just like a conventional survey on a manned boat.



Figure 1. Shafer, Kline and Warren Z-Boat 1800.

## Mobilizing the Z-Boat 1800

In order to reach the survey site, the Z-Boat was strapped to the back of an ATV. The boat was deployed through the numerous fallen trees and logs, and the survey was then conducted by the principal surveyor standing on the river bank with just the remote control transmitter and a laptop.



Figure 2. Transit to the survey site by Arctic Cat ATV.

The high power remote control system offers a remote control range of over 750m, which is more than enough to handle river sections for these surveys. The difficulty of accessing this particular survey site can be seen in Figure 3.



Figure 3. Conducting the Z-Boat survey from the shore.

## Survey Outcome and Results

The data quality offered by the Seafloor Systems 200kHz depth sounder met the standards required and bottom following performance was excellent even in the shallowest survey areas that typically cannot be reached by a manned boat. The low (8 inch) draft of the Z-Boat was quite useful throughout this survey. Data acquisition was accomplished using HYPACK, as shown on Figure 4.

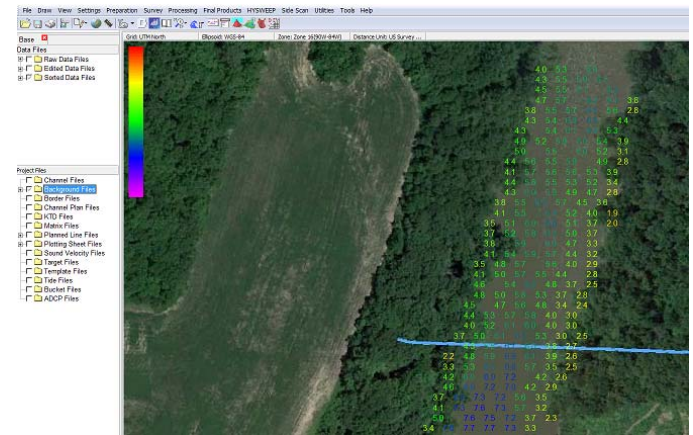


Figure 4. Successful data acquisition across the river.

## Other Z-Boat Applications

SKW do not just use the Z-Boat for cable surveys. To get rapid and accurate volume estimations completed for storage ponds, the Z-Boat is ideal as a result of its short mobilization time. Several ponds can be surveyed in a day saving time and allowing a very competitive solution for clients. SKW are already investigating deployment of other sonar systems on the Z-Boat, such as sub bottom profilers and side scan sonar systems for more complex bed surveys.

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