CEE HydroSystems™

CASE HISTORY

CEE-LINE™ Enables Shallow Canadian River Surveys with Midwest

Faced with a survey project in the remote poorly accessible Red Deer River flowing through Alberta and Saskatchewan, engineering firm Midwest added the CEE-LINE™ single beam echo sounder kit to their Trimble TSC7 and R12i GNSS-based data acquisition setup. The CEE-LINE™ was installed on an inflatable raft that was paddled up the river with survey depths often just a few inches below the transducer.

Midwest is a 75 year old engineering company providing survey services throughout Canada. Often working in remote locations, Midwest has been performing river crossing surveys across Western Canada since the early 2000s. Over the years, equipment and methods have been adapted to handle a wide range of water bodies, from small wading creeks to large navigable waterways.

For smaller crossings, Midwest's field crews typically use RTK GNSS systems, while larger rivers require a 15-foot inflatable boat powered by a 40hp jet motor and equipped with a mounted single-beam echo sounder.

However, some rivers present unique challenges. The upper reaches of the Red Deer River are a prime example: a highly braided system with a narrow, deep main channel and no boat launches. Even if a motorized boat could be launched, shallow gravel bars would just block access later on. So a lightweight portable echo sounder system was needed to mount on a small inflatable raft for this extremely shallow environment.

The project data acquisition was successfully realized with the Trimble R12i GNSS and TSC7 data collector, combined with the CEE-LINE™ echo sounder.

Trimble TSC7 data collector used with CEE-LINE™.

The CEE-LINE™ and TSC7 combination presents an ideal simplified survey setup. The CEE-LINE™ is connected with a single USB cable, with a true “plug-and-play” outcome. The CEE-LINE CONNECT™ app can control the hardware while Trimble Access collects the survey points.

Typical shallow Red Deer River environment.

Midwest’s client has been monitoring bank erosion and riverbed scour at this site for over a decade. During that time, the river has undergone dramatic changes. The main channel shifted approximately 1,000 meters (from the west bank of the valley to the east bank) and in the past three years, the east bank has receded by roughly 5 meters, threatening critical infrastructure.

The crew launched upstream of the target area and paddled downstream, completing multiple passes to capture accurate riverbed positions and elevations. By integrating echo sounder data with RTK measurements of the banks and shallow areas, Midwest generated a detailed 3D Digital Elevation Model (DEM) for engineering analysis.

Midwest surveyors had a positive experience with their new CEE-LINE™ echo sounder:

“Without the CEE-LINE™ system, completing this survey would not have been possible. This innovative approach allowed us to deliver precise data for our client’s ongoing erosion and asset protection efforts.”