

BathyBoat (Figure 1) is a new, cost-effective, easily-deployable, water depth mapping tool for restricted harbors and other hard-to-access remote locations. The University of Michigan Marine Hydrodynamics Laboratory (MHL) in collaboration with the Michigan Tech Research Institute (MTRI) has designed, fabricated, and field tested this remotely controlled and electrically powered boat to conduct precision bathymetric surveys.

The BathyBoat system consists of the vessel equipped with a high-resolution GPS unit, a precision depth sounder, water temperature and conductivity sensors, a data recording and storage device, and a radio communication package. BathyBoat's location is remotely controlled from shore or boat and information from the boat is transmitted real-time and displayed on a laptop computer. Customized software shows GPS location, heading, speed, depth, temperature, conductivity, and battery life superimposed on a satellite image while out in the field. BathyBoat data is also stored onboard for later retrieval and analysis. Customized Geographic Information System (GIS) software creates shapefile, kml, and Microsoft Excel outputs of the data for display in a GIS or in GoogleEarth.



Figure 1. BathyBoat is three feet in length and weighs 30 pounds.

BathyBoat is ideal for use in restricted water bodies such as harbors, marinas (with and without moored boats) (Figure 2), rivers, lakes, and shallow water estuaries. The boat is also non-polluting for use in sensitive areas. The boat is three feet in length and the boat, computer, and remote control land-based unit weigh less than 40 pounds. This allows for deployment from helicopter or ship in remote locations such as the North Slope of Alaska.

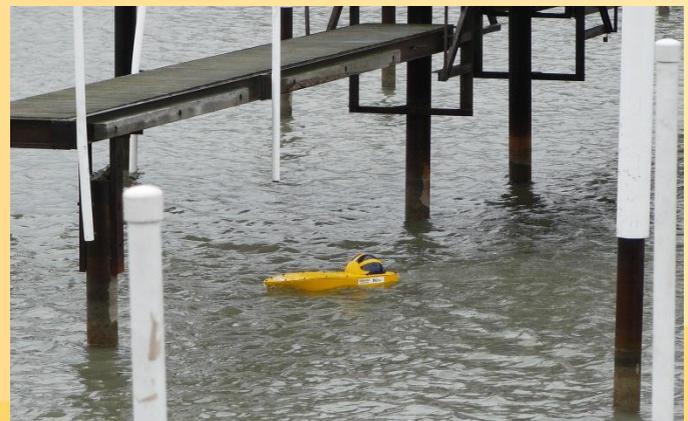


Figure 2. BathyBoat is ideal for conducting bathymetric surveys in hard-to-access locations.

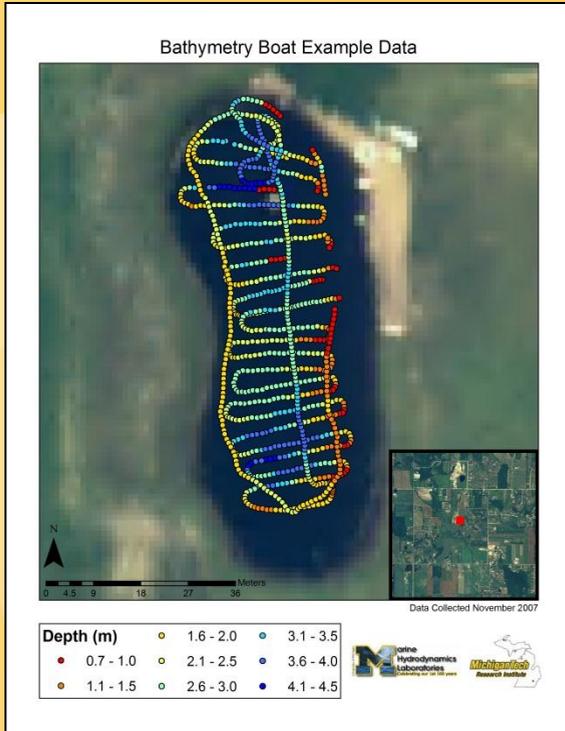


Figure 3. Example data collection.

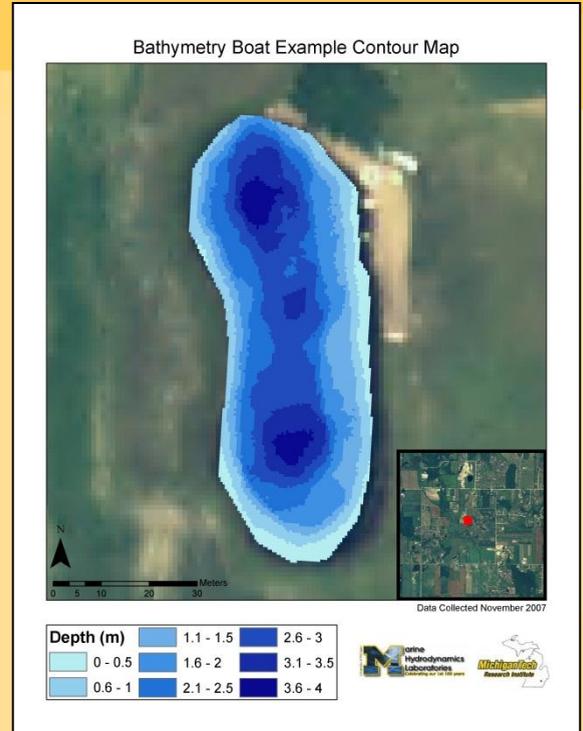


Figure 4. Example contour map.

An example data collection is shown in Figure 3. This one acre lake was sampled effectively with very high resolution (approximately 2,000 data points) by a single BathyBoat operator. A depth contour map generated using BathyBoat data is shown in Figure 4. Note the data can be overlaid on a standard GoogleEarth map or any georeferenced, standard overhead photo, image, or map.

The BathyBoat has a battery life of approximately three to seven hours depending on operating conditions. The optimum operating speed is approximately two knots (one meter per second) with a nominal sampling rate of once per second depending on the bottom substrate. Depth values are recorded to an accuracy of 0.05 meters. The location accuracy of each depth value is better than five feet. The boat operates within line of sight.

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