

Vertical and horizontal accuracy assessment of multibeam surveys using a plate check approach

Mutschler Mike¹, Conway Nicholas², Cardenas Alexis³

¹ Principal – Senior Hydrographer, Seahorse Geomatics, USA

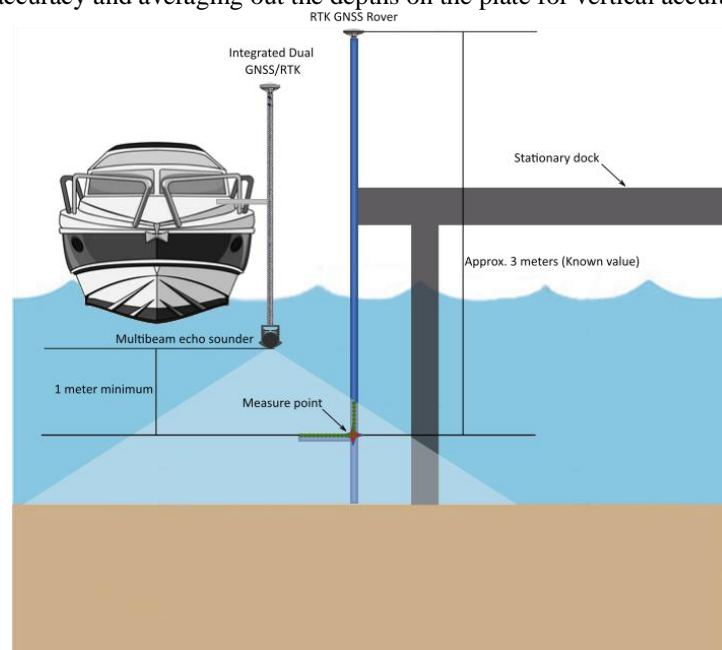
² Senior Hydrographic Engineer, Seahorse Geomatics, USA

³ Hydrospatial Solutions Executive, Seahorse Geomatics, Canada

alexis@seahorsegeomatics.com

Objectives

The vertical and horizontal accuracy assessment using a plate check is an objective multibeam sounding accuracy assessment where two independent systems are used to check the overall sounding performance of a quickly deployed check plate placed on a survey rod with a RTK GNSS rover. The overall sounding accuracy of the complete shipboard system is assessed by averaging the easting and northing of the survey rod for horizontal accuracy and averaging out the depths on the plate for vertical accuracy.



Methods

A check plate is affixed to a 25-foot survey rod roughly 2 meters from the bottom of the rod. A GNSS rover is attached to the top of the rod and the distance between the plate and rover measure point is measured. The rod (with the plate) is lowered into the water from a stationary dock to a point where it will no longer move up or down. The elevation of the plate should NOT change during the assessment. The final plate position should be >0.5 meters above the bottom:

- Bring the vessel alongside the survey rod (GNSS solution = Narrow Lane RTK) such that the sonar is positioned above the plate.
- With vessel system fully setup with a Narrow Lane RTK solution, use multibeam water column data to ensure plate and survey rod are visible.
- Log a 10-60 second-long survey file while pinging above the plate (rod & plate visible in water column)
- Using a level hold the survey rod level and take a rover shot of 60 observations or more.

Conclusion

For a properly configured system this method often yields vertical accuracy results to within 0.03m and horizontal accuracy results to 0.05m and provides confidence that the highest quality multibeam soundings are collected. Further confidence is achieved by ensuring discrete RTK base stations for each device.