

Shallow Water Survey 2008

Reson 8125 Operations, with a Twist

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For the 2008 field season, NOAA Ship *Rainier* personnel installed a Reson 8125 multibeam with a 30 degree starboard tilt on one of her near-shore survey launches to better ensound steep, near-shore bathymetry. In this configuration, the starboard outer beams are launched nearly at the horizontal and the survey vessel is able to remain in 10 meters of water while surveying the 8, 4, and often up to the 0 m isobath, depending on the slope of the seafloor, tidal stage, and other conditions.

In conjunction with the Navigational Limit Line (NALL), this configuration has increased *Rainier's* safety, productivity, and survey quality in the steep, rocky near-shore environment. With a standard "straight-up" multibeam configuration *Rainier* personnel found it difficult to acquire data to the inshore survey limit without putting the vessel very close to the rocks. The survey launch had to make multiple passes successively working closer to the steep rock in question costing valuable survey time with diminishing returns. With the 8125 "with a twist," the vessel can remain 50-70 m away from any dangerous rocks, reefs, or ledges and still acquire quality data to the inshore limit of the survey in one pass. Similarly, in areas rich with cultural features such as harbors and ports, the tilted configuration acquires data on dolphins, piles, and pier faces nearly up to the waterline in one pass; in fact, the configuration eliminates the so-called "cone of silence."

Although this configuration is a very valuable tool in *Rainier's* survey toolbox, there is, as always, room for improvement and additional work: 1) Along-track and across-track beam spacing both tend to become sparse at large range scales in this configuration. This can cause issues when trying to acquire data meeting NOAA's complete multibeam specification. 2) The Total Propagated Error (TPE) model as calculated in Caris does not account for the slope of the seafloor when determining sounding TPE. For this reason, the starboard outer beams are assigned TPE values that are unexpectedly high, e.g. 10 m TPE in 2 m of water. 3) Although the additional data on cultural features can be very informative, it is undesirable to include the bathymetry from these features in the final surface deliverable of the survey. A good processing methodology needs to be developed to handle these useful, but non-seafloor bathymetry, data.

This paper will address the operational considerations of deploying a multibeam in the tilted configuration as well as the benefits and concerns addressed above.