

Unabara Hydrographics™

Measuring Siltation Thickness with Z Axis-2F™



Siltation is generally thought of as the accumulation of fine grain, soft sediment over the more consolidated, “harder” water bottoms. In many cases, this fine grain sediment contains organic detritus and various chemical components (i.e. fertilizer run-off) which favor bacterial and/or algal growth. An anoxic (absence or near absence of oxygen) condition in the near-bottom waters may result. That, together with formation of gases such as hydrogen sulfide and/or methane may result harming the water quality and producing unpleasant odors. Wind and boat traffic may churn this soft sediment and cause increased turbidity in the water body and reduction in water quality.

Governmental entities and property owners associations alike are increasingly taking steps to monitor siltation and remove excess with “surgical” dredging techniques. Siltation can be of considerable consequence in developments like that pictured above. This shows a small part of a large residential development which is centered around miles of inland canals. This development is located on the Atlantic coast of Florida, near Coco Beach.

Survey lines are shown across various cross sections of “Canal # 24”. Bathymetric measurements were made using Unabara’s Z Axis-2f™ Dual Frequency Hydrographic Echo Sounder; geoposition along survey lines was by RTK GPS. High frequency (200 Khz.) derived depth (surficial depth) and low frequency (24 Khz.) derived depth (consolidated sub-bottom layer) was collected on a Windows-10 tablet PC with HydroMagic™ Mapping software (Eye4Software of The Netherlands). Contour maps (*not shown in this application paper*) for both frequencies derived depths were generated. Canal depths derived from the high frequency ranged from 3.4 feet to 10.8 feet. For the low frequency, depths ranged from 3.4 feet to 11.5 feet. The thicknesses of the siltation layer in various parts of the canal are shown on the map below. *The siltation thickness ranged from 0.0 to 4.9 feet.* (Thickness calculations & map automatically done by HydroMagic™).

