

A COMPARISON OF SHORELINE MEASUREMENT TECHNIQUES: GPS SURVEY, AIR PHOTO INTERPRETATION. AND TOTAL STATION SURVEY.

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Several methods of shoreline position measurement were evaluated for relative accuracy, time efficiency, and ease of measurement. Air photos taken of Round Island in February, 1993 at a scale of 1:10,000 were interpreted for the high-tide water line and digitized. The island shoreline was surveyed with a total station and prism in August, 1993, and at the same time the shoreline was surveyed with a mapping-grade GPS unit. A survey-grade GPS unit was used to measure the same shoreline in October, 1993, and GPS measurements were differentially corrected. Control points were placed at visible marks on the air photos using averaged GPS positions, and the same control points were used to correctly orient each surveyed data set in AutoCAD. A comparison of total island area and shoreline position found with each method is made by overlaying each data set corrected to the same control points. GPS measurement is by far the fastest method, requiring only a walk-around of the shoreline with a unit and antenna. Accuracy of position measurements with mapping-grade units is on the order of 2-5 meters. Survey-grade GPS units decrease the error to about 0.5-2 meters, but at a significant increase in unit cost. Total station measurements are the most accurate, but instrument cost is high and the time and man-power required are also high. Air photo interpretation and digitization is the least accurate, about plus or minus 10 meters, but the relative cost and time involved are the lowest.