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Date:
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ARCADIS Project No.:
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Subject:
Comparison of the 2011 and 2007 Bathymetric Surveys
Acid Brook Delta, Pompton Lakes, New Jersey

The objective of this document is to compare the lake bed elevations measured during bathymetric surveys performed in Pompton Lake in 2007 and 2011. Each of the surveys were performed using single beam acoustic soundings along transects spaced at approximately 50-foot intervals in Acid Brook Delta. Transect spacing varied in the river channel between the two surveys. The 2007 survey was conducted in April by Ocean Surveys, Inc. and the 2011 survey was conducted in November by Severson Environmental Services' subcontractor Gahagan and Bryant. The data generated during these surveys was compared to evaluate potential changes in lake bed elevation.

Two individual surfaces were created using the 2011 and 2007 bathymetry data, respectively. The surface for each event was created by generating a triangulated irregular network (TIN) from the bathymetry data. The TINs use the actual measured elevation at each survey point and linearly interpolates the elevations between the measured points as a network of triangles to create a surface. These two surfaces were then compared against each other using ESRI's ArcInfo software to assess changes between the two surfaces. Given the alignment of the 2011 and 2007 transects, the comparison of the surfaces results in comparing actual measured survey values to interpolated values. As such, there is some uncertainty associated with the comparison of the 2011 and 2007 surfaces.

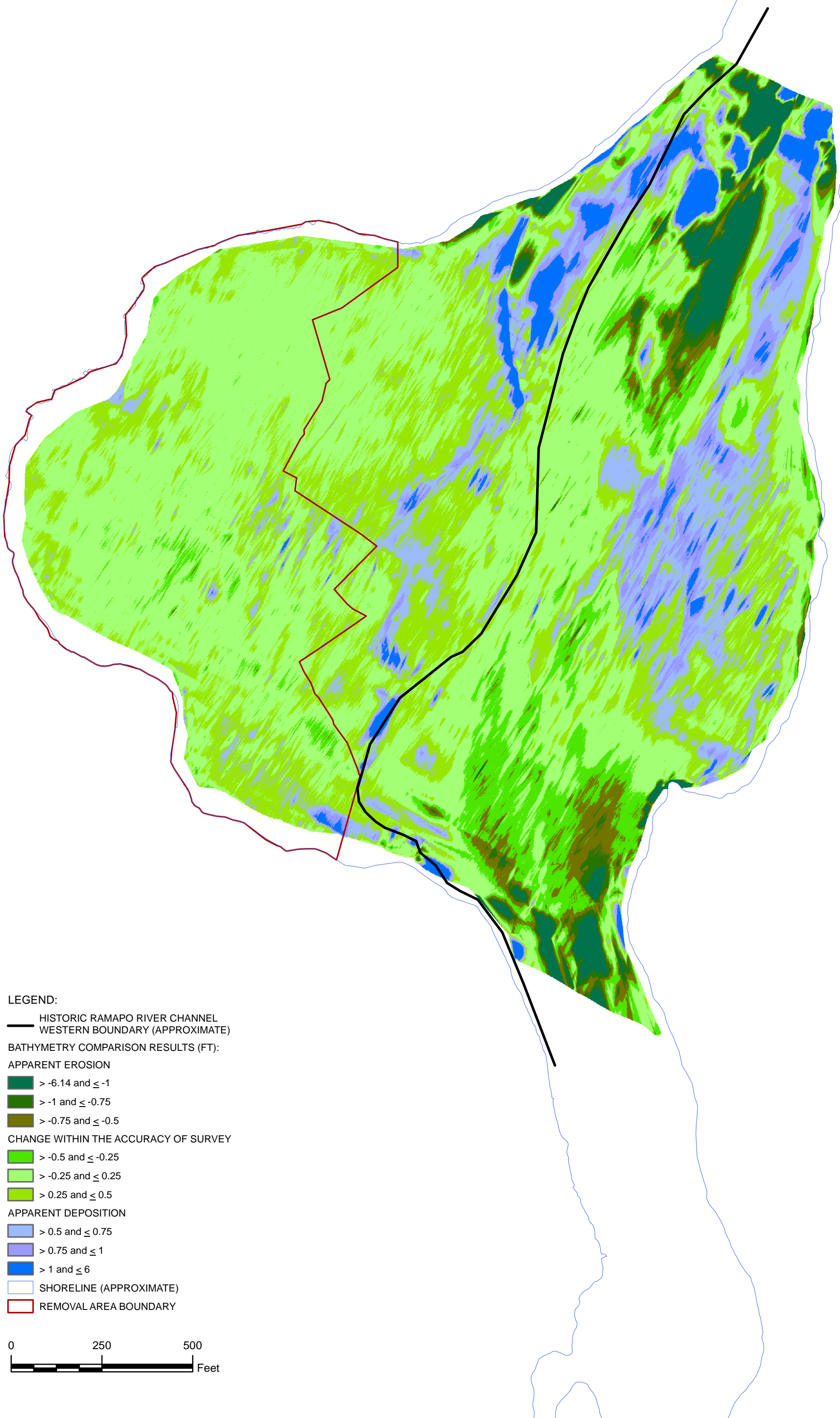
The results of the surface comparison for the 2011 and 2007 bathymetric surveys are provided on Figure 1, with color-coding used to indicate the differences in lake bed elevations between the surveys. The likely accuracy of each survey given the shallow water depth is 2-3 inches (0.25 feet). As a result,

elevation differences observed within 0.25 to 0.50 feet represent changes that fall within the accuracy of the combined surveys.

Based on the evaluation of the 2007 and 2011 bathymetric data within the ABD removal area only, using the methodology described above, the following conclusions are made:

- Comparison of the 2007 to the 2011 lake bottom elevation surfaces indicated that elevations differences over 99% of the remediation project area were within the accuracies of the combined surveys or showed a slight increase in elevation potentially indicative of deposition. The areas where slight decreases in elevation of the lake bottom were observed do not appear to be consistent across the project area which could be the result of methodology interpolation between actual survey points.
- A comparison of individual measured points (1,663 actual points) from the 2007 and 2011 surveys that are within 1 foot of each other (spatially) across the remediation project removal area indicated that 100% of these points were within the accuracies of the combined surveys or showed slight increases in elevation.

**BATHYMETRY COMPARISON RESULTS:
2011 BATHYMETRY SURFACE MINUS
2007 BATHYMETRY SURFACE**



LEGEND:

— HISTORIC RAMAPO RIVER CHANNEL
— WESTERN BOUNDARY (APPROXIMATE)

BATHYMETRY COMPARISON RESULTS (FT):

APPARENT EROSION

- > -6.14 and ≤ -1
- > -1 and ≤ -0.75
- > -0.75 and ≤ -0.5

CHANGE WITHIN THE ACCURACY OF SURVEY

- > -0.5 and ≤ -0.25
- > -0.25 and ≤ 0.25
- > 0.25 and ≤ 0.5

APPARENT DEPOSITION

- > 0.5 and ≤ 0.75
- > 0.75 and ≤ 1
- > 1 and ≤ 6

— SHORELINE (APPROXIMATE)

— REMOVAL AREA BOUNDARY



FIGURE