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June 23, 2011

Mr. Jim Scurry
South Carolina DNR
1000 Assembly St.
Columbia, SC 29202

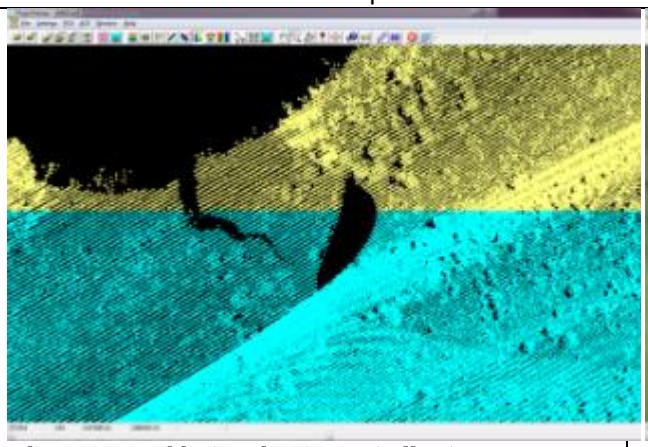
Re: Pickens County

Dear Mr. Scurry,

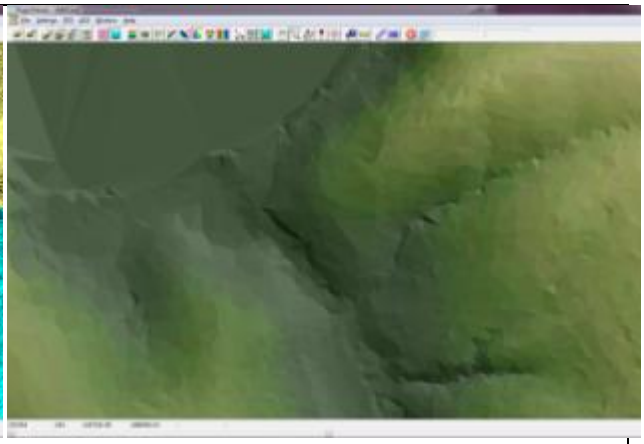
As part of the LiDAR production process Dewberry reviews data provided by our acquisition subcontractors to ensure the data meets the acquisition requirements. This review checks for completeness of coverage, calibration accuracy, and vertical accuracy in open terrain. By performing these checks early on Dewberry is able to identify potential issues impacting classification and finalization of the products. During the review of the source LiDAR for Pickens County, Dewberry has identified a potential issue with the completeness of the LiDAR coverage. The following memo outlines the issue that was discovered along with two options for resolving the issue.

Issue:

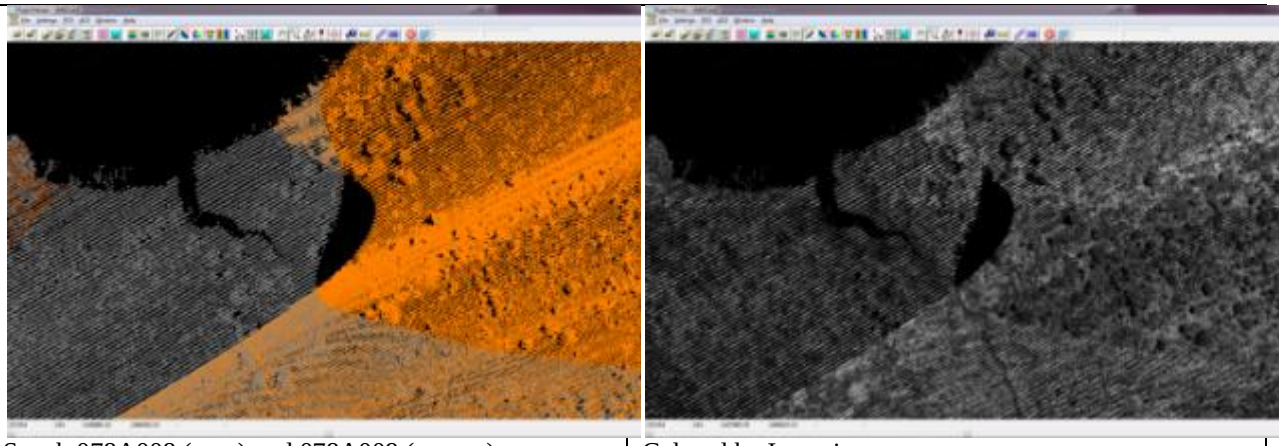
During the review of Pickens County, a small data void was discovered between two adjacent flight lines. The data void covered 11,000 square feet. The void affects tiles 4037-02 and 4038-04 in the statewide tiling scheme. The images below show the adjoining tiles, TIN model, flight lines, and intensity in the area of interest. The screen captures below outline the location and extent of the data void.



Tiles 4037-02 (blue) and 4038-04 (yellow)



TIN



Swath 078A008 (grey) and 078A009 (orange)	Colored by Intensity

Figure 1 – Data Void

Resolution Option 1:

After the identification of the data void, Dewberry contacted Towill to discuss possible solutions. By providing Dewberry with data normally trimmed from the edges of the swaths, we were able to shrink the void by fifty percent. The void now covered 4,800 square feet. Using synthetic points generated in TerraScan, Dewberry can fill in the remaining 4,800 sq. ft. Figure 2 shows the original data void, Towill's additional LiDAR points from the edge of swath (green), and the synthetic points created by Dewberrry (red) from left to right. While edge points are not typically used because of the potential to introduce error along the edge of the swath Dewberry has reviewed these edge points to ensure that they meet the project accuracy requirements and are appropriate for use in the ground. Dewberry proposes the addition of synthetic points in this area to fill the data void. The synthetic points will be attributed with a specific flight line number to differentiate them from other points and placed in Class 2 ground. The area has an even slope and the elevations for the synthetic points will be derived from a TIN model. The final figure shows the preliminary DEM incorporating the synthetic points and the aerial imagery for the area of interest.

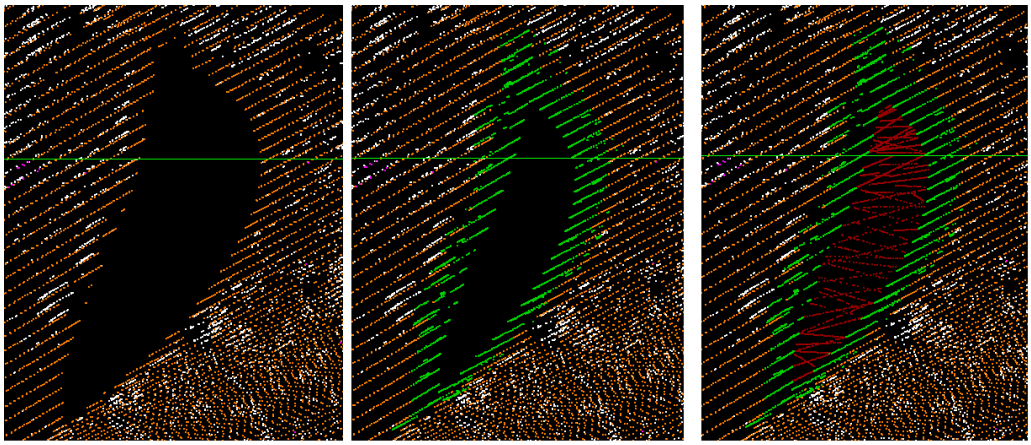


Figure 2 – Data Void, Data Void with Towill's points, Data Void with synthetic points.

Figure 3 – TIN model of the area before final edits and hydro-flattening have been applied (top) and aerial imagery of the same area.

Resolution Option 2:

If the proposed resolution in option 1 does not meet the needs of South Carolina, Dewberry proposes to re-acquire this area during the fall and spring of 2011/2012 during acquisition of the remaining counties. The newly acquired LiDAR data will be calibrated and integrated seamlessly into the existing data to fill the data void. Due to the location of the data void no additional modifications to the breaklines will need to be made and only the two impacted LiDAR tiles and DEMs will need to be updated and redelivered.

Summary:

Either solution will be fully documented in the project reports and metadata to be provided along with project deliverables for Pickens County. Dewberry would also like to proceed with providing all of the deliverables for Pickens County incorporating the resolution from option 1 and providing the replacement deliverables, if requested, after acquisition of the remaining counties. Because the data void is small and in an area where the impact is minimal, the products delivered with the resolution from option 1 should meet the needs of many, if not all, of the users of the data. By delivering the final products in this fashion, South Carolina can begin utilizing the data without significant delays in delivery.