LiDAR Acquisition (FY16-17)

- Upper St. Johns River Basin (Fort Drum Area)
  - ~485 Square Miles
  - 16ppm

- City of Palm Coast
  - ~ 144 Square Miles
  - 8ppm
  - Funding agreement with City of Palm Coast

- Paynes Prairie
  - ~ 24 Square Miles
  - Partnering between City of Gainesville, SJRWMD, and FDEP to pay for it
PROJECT DRIVEN LiDAR ACQUISITION

Upper St Johns River Basin Boundary

FY 18 acquisition area

Note: More about this piece later
Puzzle Lake
~ 687 square miles
USGS: 3DEP, QL 1+
ANPD = 16 pts / m²
Kick-off meeting: Dec. 15, 2017
Bureau of Watershed Management and Modeling

LiDAR projects

FY15 – Recap: St Johns Marsh Conservation Area
• 2012 DEM; ANPD = 12
• LiDAR-derived DEM elevation was consistently lower than recent survey
• Discovered that LiDAR processing had “under-identified” ground points

FY16 – extended to larger footprint, 2D model boundary

FY17 – extended to larger footprint still, non-inundated area of original footprint
FY15 – Project Details

Vertical Accuracy Results of the Original LiDAR dataset

<table>
<thead>
<tr>
<th>100% of Totals</th>
<th># of Points</th>
<th>RMSEz (ft) Spec=0.75 ft</th>
<th>Vertical Accuracy ((RMSEz x 1.9600) Spec=1.47 ft)</th>
<th>Mean (ft)</th>
<th>Median (ft)</th>
<th>Skew</th>
<th>Std Dev (ft)</th>
<th>Min (ft)</th>
<th>Max (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Points Surveyed</td>
<td>221</td>
<td>0.55</td>
<td>1.07</td>
<td>-0.42</td>
<td>-0.40</td>
<td>-0.28</td>
<td>0.34</td>
<td>-1.75</td>
<td>0.83</td>
</tr>
</tbody>
</table>

I did a quick calculation to volume (10 ft grid) and the difference comes to **1,438,061,897 gallons** (7,500 acres)
FY15 – Dewberry results

Error (difference between survey and LiDAR-derived DEM)

Original median = -0.40 ft
New median = 0.03 ft

Survey = blue
Unclassified = gray
Ground = orange
Bureau of Watershed Management and Modeling

LiDAR projects

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From modeling perspective

“Extended overland weir” that “disrupts” modeled flow direction and consequential water depth

Clip (from model) in ArcScene
With vertical exaggeration
From modeling perspective

= “extended overland weir”
that “disrupts” modeled flow direction and consequential water depth

SPOILER ALERT: Turned out to be a challenging recalibration project
Bureau of Watershed Modeling and Management
FY17 project
UF/FLASPRS
Spring 2018
LiDAR Workshop

Figure 1: Elevation difference between data before and after calibration fix.

Nick Kules, Dewberry
Bureau of Watershed Modeling and Management

FY 18 - - - ?
FINI

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