You get what you pay for: Understanding the business case

LiDAR Inventory Planning to Implementation

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Outline

1. Tesera Systems Inc.
2. Through The Looking Glass
3. LiDAR: Basic Principles
4. LiDAR: Forest inventory
5. On the Other Side of the Looking Glass
... and why: the most important (routine) decisions in forestry
What is *forest* inventory?

- Stand Structure
- Species Composition
- Trees
- Forest Site Characteristics
- Forest Inventory Classifications

*Doors to a complex world*

Using LiDAR, high-res digital imagery and data analytics
Desired Forest Inventory Attributes

- Precise (accurate)
- Known level of precision
- Detailed (tree lists)
- High resolution
- Flexible (attribution / interpretations)
- Strategic and tactical
- Linked to growth and yield (modeling and measurement)
The next generation

Multimedia: LiDAR + CIR

Resolution

Scale

Sample based
Level of detail
Known precision

Using LiDAR, high-res digital imagery and data analytics
Precision: Predicted vs. actual

Dominant Tree Height (m)

Merch Volume (m³)

Basal Area (m² ha⁻¹)

Stems Per Hectare


... & how much does it cost?

Cost of LiDAR based Forest Inventory vs. Area

This is a generalized relationship of the cost of LiDAR based inventories versus the size of the area to be inventoried. This is for discussion purposes only. There are many project specific details that can cause costs to depart from those described by this curve.

- Precision
- LiDAR
- Multi/Hyper-spectral
- Attributes
- Analysis method
- Weather
- Access
- Ground Plots
You get what you pay for.
### Inventory: The next generation ...

<table>
<thead>
<tr>
<th>Sampling &amp; imputation (Data Analytics)</th>
<th>Census based inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory as science of relationships (measure)</td>
<td>Inventory as trained art of perception (assess)</td>
</tr>
<tr>
<td>Compatibility: Strategic &amp; operational applications</td>
<td>Incompatibility: Strategic vs. operational applications</td>
</tr>
<tr>
<td>Inventory as process</td>
<td>Inventory as product</td>
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<tr>
<td>Flexibility to address many specific questions</td>
<td>Designed primarily for single purpose</td>
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<tr>
<td>Multimedia / multi sensor</td>
<td>Single media &amp; sensor</td>
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<tr>
<td>Short production times</td>
<td>Long production times</td>
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<tr>
<td>Frequent update</td>
<td>Infrequent update</td>
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<tr>
<td>Opportunistic ~ D &amp; S</td>
<td>Supply side economics</td>
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</tbody>
</table>

... revisited. It is here now.

Using LiDAR, high-res digital imagery and data analytics