Building Mapping and Change Detection

9/19/2016
How to Map Buildings

• History
• In-house
• Specialized tools
• Professional Services
How to Map Buildings

• Leveraging existing data
  – 2011/13 6/12 inch imagery
  – 2011/13 lidar
  – *2016-18 3/6/12 inch imagery
  – *2017-18 QL2 lidar
Feature Extraction Process

**Process**
- DEM
- SEVIRI
- RADAR
- LiDAR
- Elevation Derivatives
- Radar Reflectance
- Landform Probability Index
- Supervised classification (ENVI/Imagine)
- Wetland Probability Index
- Existing NWI
- 0.5m Stereoscopic Imagery
- 1m Natural Color
- Stereo Models
- Head-up Digitizing and Editing
- Wetland Maps

**Output**
- Slope surface
- Curvature surface
- Watershed map
- Depression map
- Landform probability index
- Wetland probability index
- Lakes map
- Ponds map
- Vegetation texture map
- Wetland probability map
- Summer feature objects
- Wetland polygons

**APE Process and Classification**
- 0.5m Stereoscopic Imagery
- Stereo Models
- Wetlands Feature Objects

**Photo Interpretation and Cartography**
- Classification Accuracy Rules
- Mapping Accuracy Rules
- Attribute Rules

**Map Accuracy and Quality Check**
- Meets Classification and Mapping Accuracy
  - Yes
  - NWI Update
- NWI Update
- Map Accuracy Report
- Classification Accuracy Report
- NWI Update
Feature Extraction

• Transforming data into information
• Data can be processed together (RGBIR + Z + intensity) or separately
Lidar

- Topology Determination
  - Plane detection by segmentation
Lidar

- Topology Determination
- Plane detection by segmentation
Lidar

- Topology Determination
  - Plane detection by segmentation
Lidar

- Polygon Generation
- Plane detection by segmentation
Results
Change Detection
Change Detection

• Multi-Criteria Evaluation of Probabilistic Representation (M-CEPR)
  – Hypothesize
  – Evaluate
  – Verify
  – Quantify
  – Classify (New, Removed, Replaced, Verified Changed, Possible Change, Unchanged, Unknown)
  – Assign
  – Compare and Review
M-CEPR
Change Detection

• New structure
Change Detection

• In-ground pool
Change Detection

• Possible change
Change Detection

• Possible Replacement
Change Detection

- New deck?
Change Detection

• 2006 - 2011
Change Detection

• Integration
Why?

• Reproducible
• Reduce field work
• Reduces manual edits at the office
• Simplifies the comparison process
• Leverages existing data!
Questions / Comments

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