



Impervious Area Mapping as an Accurate Stormwater Runoff Indicator

06/28/2016



Agenda

- Identifying and mapping impervious surfaces
- Measuring impervious surfaces using GIS
- Examples
- Comment / Q&A

Definition

- Any material natural or man-made that prevents the infiltration of surface water to the underlying strata
 - Buildings
 - Roads
 - Sidewalks
 - Parking lots
 - Other paved surfaces
- Pervious surfaces
 - Gravel
 - Compacted earth

Impervious Surfaces Mapping (the past)

- Traditional mapping methods
 - Photogrammetric techniques (3D capture)
 - Heads-up digitizing (2D capture)
 - Time consuming
 - Cost prohibitive
 - Human error
 - Not reproducible



Impervious Surfaces Mapping

GIS Approach:

- Feature extraction based on OBIA and remote sensing
 - Transforming data into information
 - Reduction of data dimensionality

Feature Extraction

Input Datasets

- Digital Ortho-Imagery



Natural Color

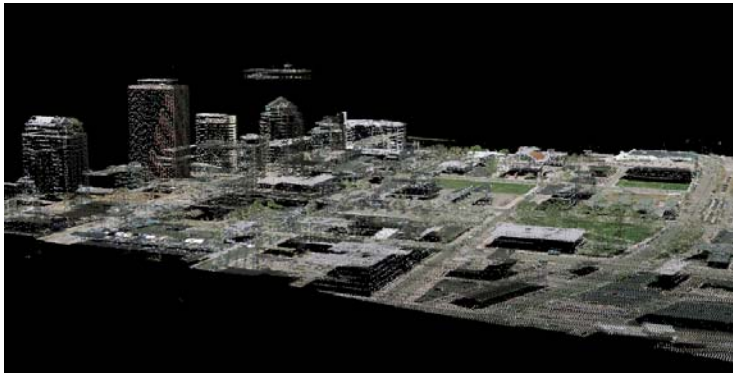


Color Infrared

Feature Extraction

Input Datasets

- Aerial LiDAR (Light Detection And Ranging)
 - 1-meter or denser point spacing



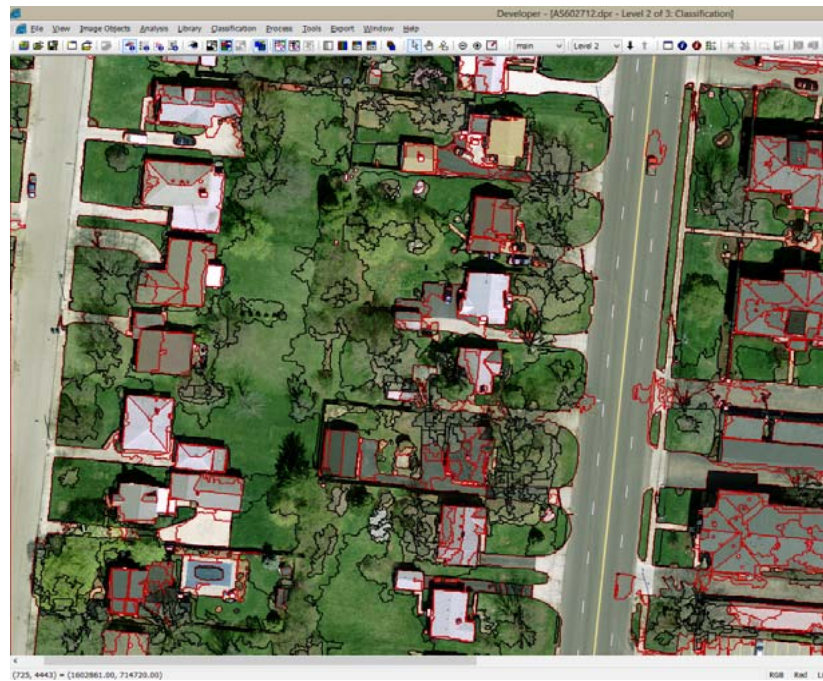
Intensity



Patterning

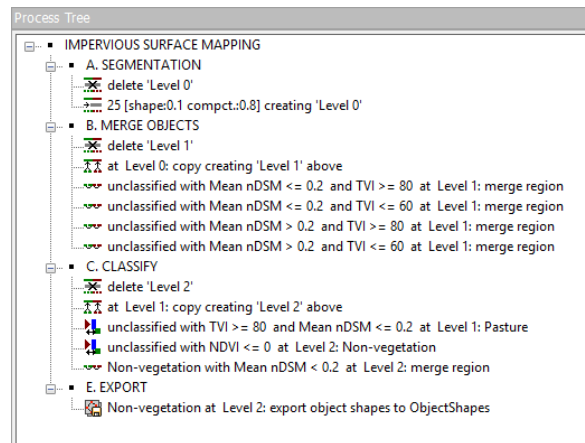
Feature Extraction

Object Based Data Analysis and Remote Sensing



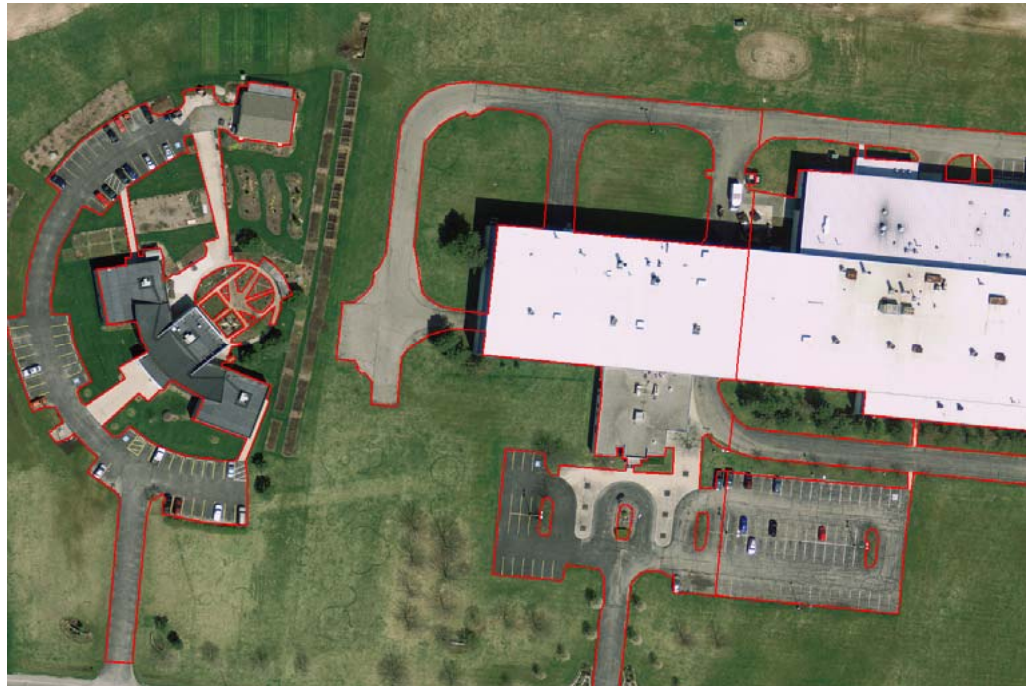
Feature Extraction

Object Based Data Analysis and Remote Sensing



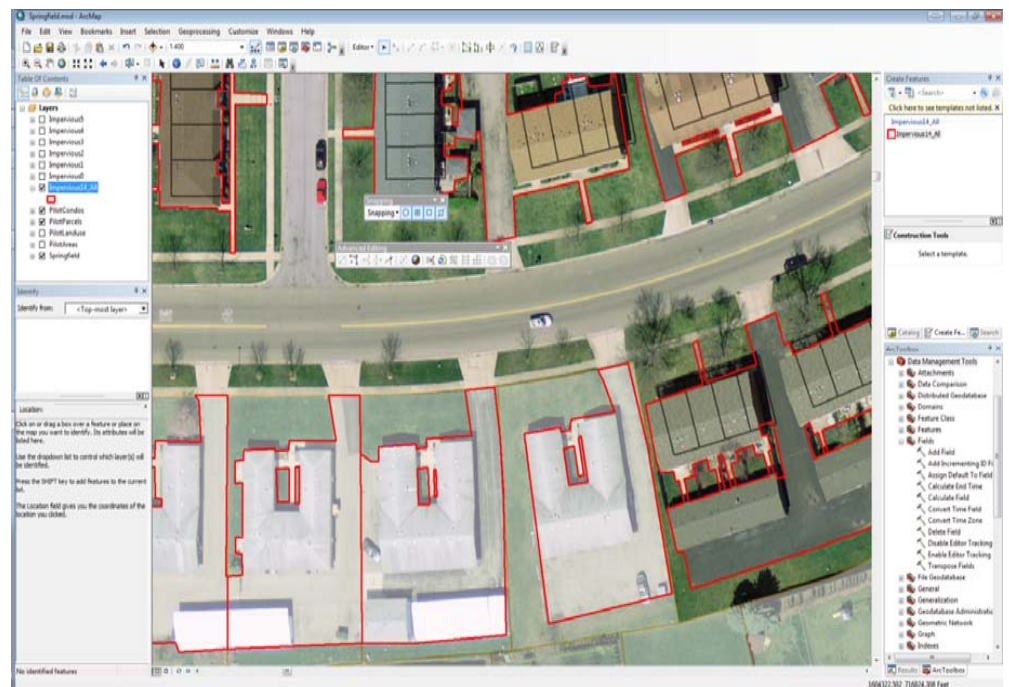
Feature Extraction

ArcGIS



Impervious Surfaces Mapping

Integration with owner and billing systems



Advantages

- Analysis of multiple data sources
- Reproducible results and repeatability
- Versatility and adaptability
- Provide a fair assessment of impervious surfaces
- Provide a streamlined and cost effective process
- Release technicians to perform other tasks

Examples

- City of Hamilton, Ohio
 - Existing : 62,570,095.26 sq. ft.
 - New : 66,350,221.65 sq. ft.
 - Change : +3,780,126.39 sq. ft.



Q & A

- Questions / comments