How to model with LiDAR data in ArcGIS 9.3

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ESRI

The World Leader in Geographic Information Systems
Presentation Content

- Introduction
- Demo: Terrain Dataset
- Qcoherent
- PenBay Media
- Demo: 3D Facilities Management
ESRI as a Company

- Founded in 1969
- Zero-Debt Posture
- Strong Commitment to R&D
- Consistent Annual Revenue Growth
- Dedicated to our users
ESRI Regional Offices and International Distributors

- Headquartered in Redlands, California
- 11 Domestic Regional Offices
- Distributors in More than 80 Countries
- Users in More than 150 Countries
ESRI Mission…

- Support Our Users in the Successful Implementation of GIS and further its development.
ESRI Business Partner Program

• More than 2,200 Partners Worldwide
  – Value-Added Resellers
  – Application Developers
  – Consultants/System Integrators
  – Data Providers
  – Authorized Instructors

• Annual Business Partner Conference

www.esri.com/partners
QCoherent Software
ESRI Business Partner

- Formed in 2006
- Privately held company specializing in LiDAR software
- 1st product aimed at integrating point clouds into ArcGIS
- 2008 ESRI Worldwide New Business Partner of the Year
Penobscot Bay Media
ESRI Business Partner

• ESRI Business Partner for 10 Years
• Specializing in in-building GIS
• Enterprise GIS experts
• Unique in-building data collection capabilities
What is GIS?

- Geographic Information Systems
  - Organizes information by its location
  - An integral component of most business data

- Resulting in
  - Improved communications
  - Enhanced decision making
What is Spatial Data?

- Subjective abstraction of real-world features
- Portrays spatial relationships

- Buildings
- Topography
- Road Centerlines
- LIDAR & Photogrammetry
- Utility Services
ArcGIS: A complete GIS
ArcGIS Desktop: 3D Analyst Extension

ArcGIS Desktop Applications

- ArcMap
- ArcCatalog
- ArcScene
- ArcGlobe

3D Analyst Extension
3D Analyst Capabilities

With 3D Analyst, users can:

• **View** a surface from multiple viewpoints

• **Query** a surface

• **Create** realistic perspective imaging in ArcGlobe and ArcScene

• **Visualize** the visual impact of building new structures

• **Analyze** atmospheric, surface, and subsurface pollution dispersion

ArcGIS is a 3D GIS!
LIDAR Data in ArcGIS

- Represented as point / multipoint feature class
- Leveraged into a Terrain Dataset
- A Terrain Dataset is a multi-resolution TIN surface
- Multiple feature classes participate in terrain creation
- Rules specify how features are used to define surfaces
Multi-Resolution Surface Model

Points and Breaklines

Terrain Pyramids

Low Resolution

Medium Resolution

High Resolution

Multi-resolution terrain dataset (TIN structure)
Terrain Dataset Workflow

Data Conversion
Proprietary or de-facto standard formats

LIDAR post processed data (points)
SONAR post processed data (points)
Photogrammetric data (points & lines)

Product Generation
ArcGIS Terrain Dataset

Surface Integration
Pyramid TIN surfaces

Contours
Points
Breaklines
DEM
TIN
DEMO: LIDAR and the Terrain Dataset
Resources

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