

LiDAR Lifecycles New York City

Oct 18th 2017

**New York State GIS Association
2017 NYGeoCon**

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LiDAR Lifecycles New York City: Two Current Initiatives

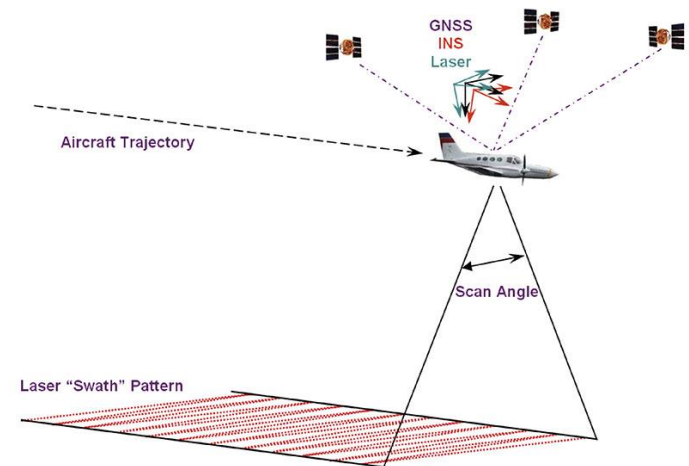
Mobile



Collects point clouds from moving platform

Used to analyze road infrastructure, buildings, urban trees, for ex.

Airborne



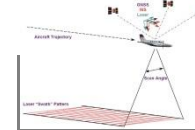
Laser scanner attached to a plane creates a 3D point cloud model of the landscape

Used to create digital elevation models (DEM) and bathymetric models in shallow water

LiDAR Lifecycles New York City: Two Current Initiatives



Mobile



Airborne

Principle motivation

DOF: Property valuation/assessment

ORR: Climate adaption planning

History

~~Philly: Tree inventory~~

First capture

2010 most recent capture

Capture

**8,693 linear miles for 6 years;
Once per year**

**Citywide capture +
bathymetry; 14 months**

Deliverables

Streetscape imagery

- **Measurement accuracy +/- 2cm**
- **Positional accuracy +/- 10cm**

GlobeSpotter - a dashboard for measurement and viewing

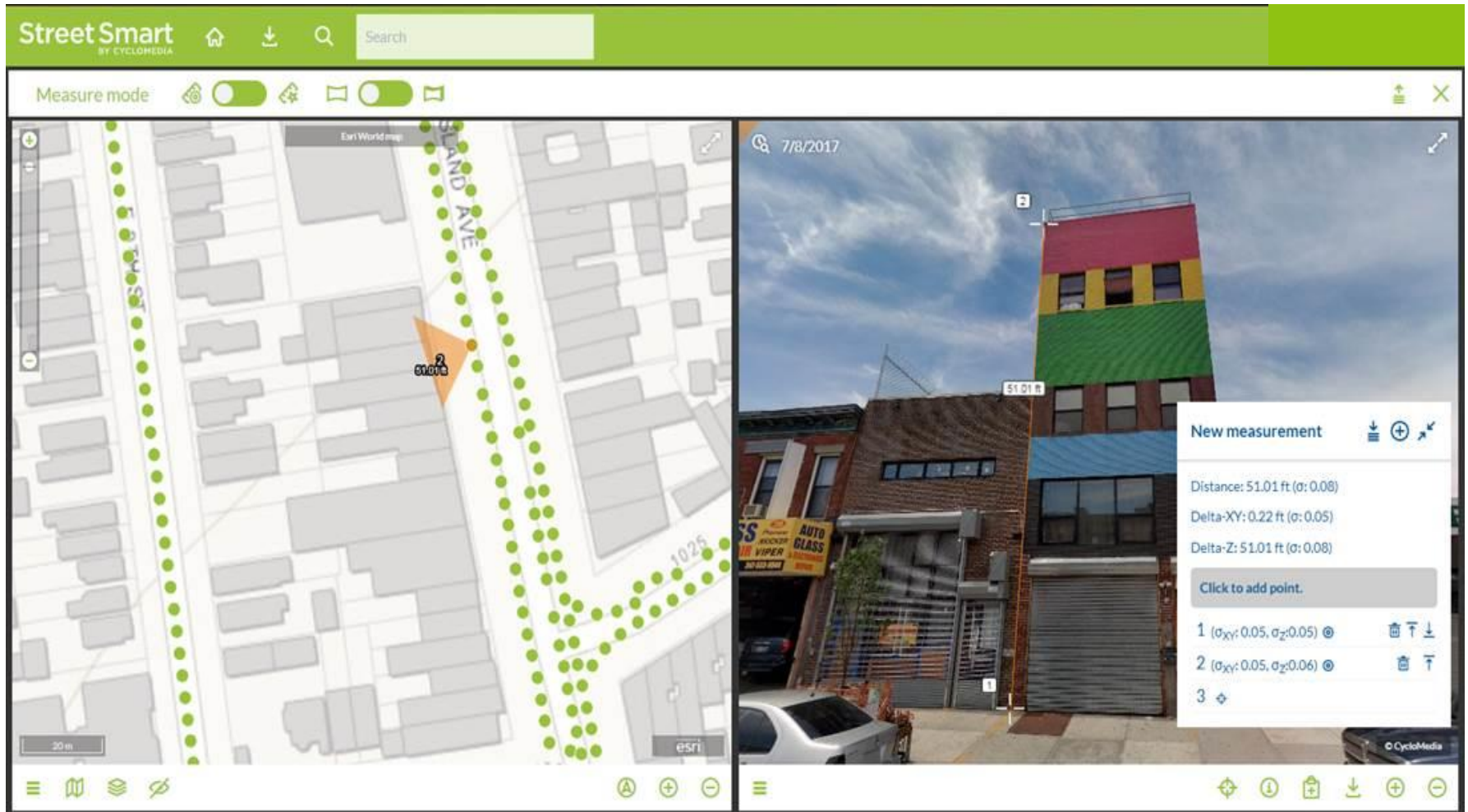
- **Classified/Unclassified LAS (tidally coordinated)**
- **2 Digital Elevation Models**
 - **Topographic**
 - **Hydroenforced**
- **Updated Land Cover**
- **Topobathy**

Data storage

Web-based

DoITT / TBD

LiDAR Lifecycles New York City: Cyclomedia



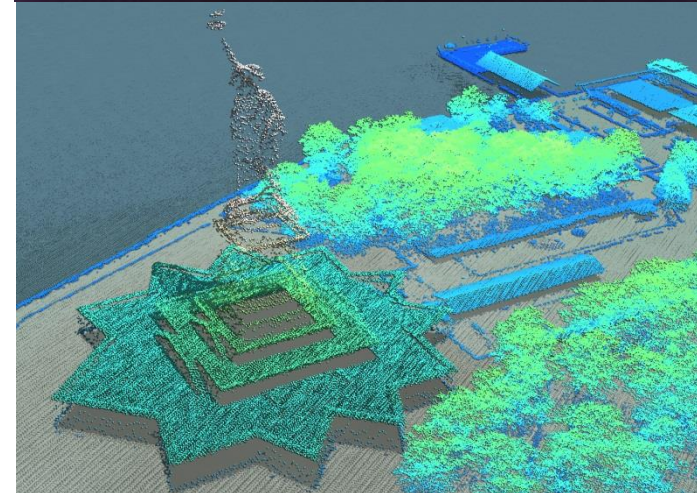
LiDAR Lifecycles New York City: Overview

LiDAR & Derived Products

Lifecycle: 2010 – 2017

Overview:

- Scope Development
- Coordination
- Acquisition
- Remaining tasks
- Lessons Learned so far



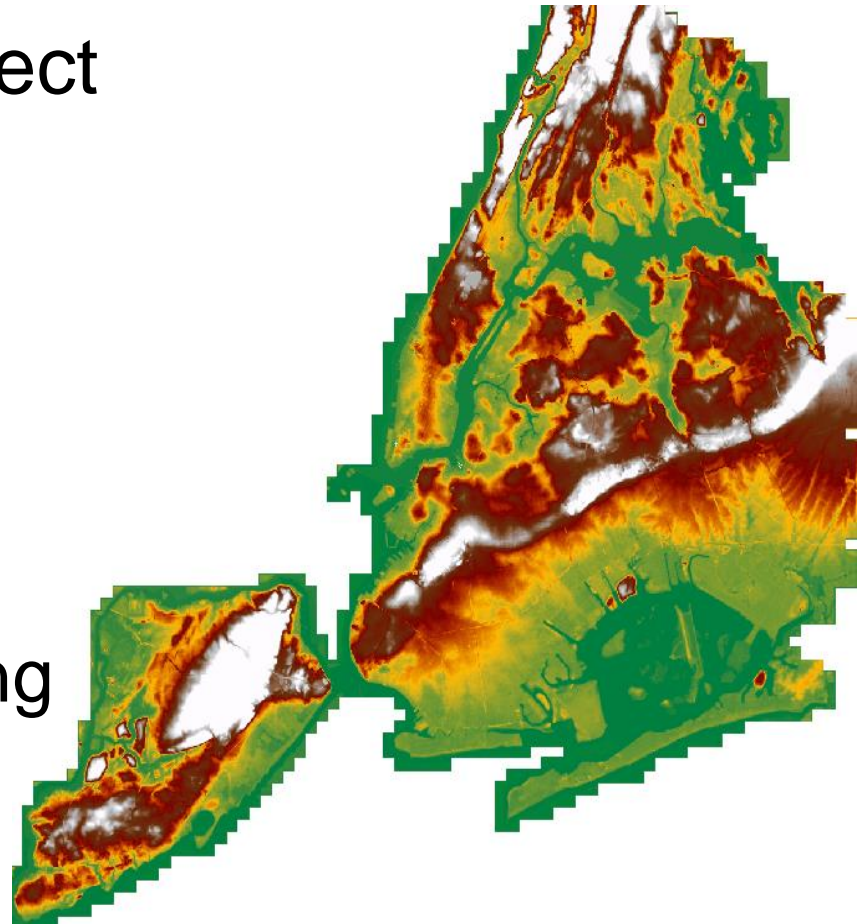
LiDAR Lifecycles New York City: 2010 LiDAR Project

Update on 2010 LiDAR Project

- 1' DEM
 - non-hydro enforced
 - non-tidally coordinated
- Land Cover dataset

Dataset Uses:

- Resiliency & Green Planning Initiatives
 - Flood risk assessment & mitigation
 - Tree canopy analysis & planning



LiDAR Lifecycles New York City: 2017 Participating Agencies (Complexities)

3 Central Agencies



NYC Parks



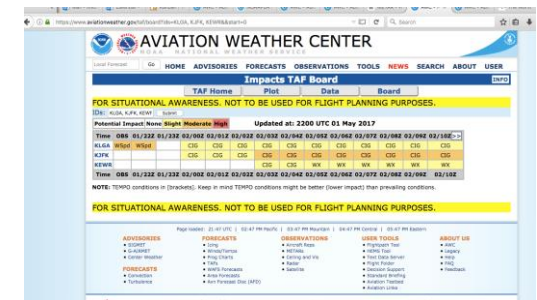
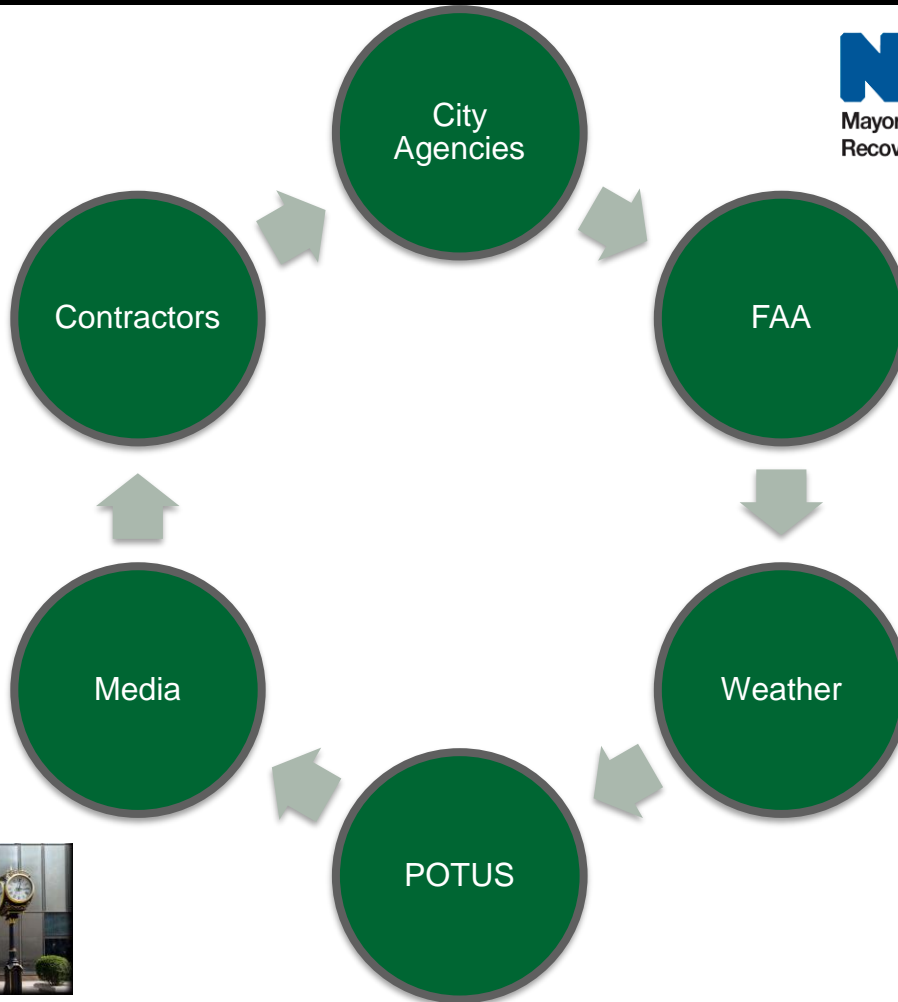
Other Stakeholder Agencies



FEMA

Others...

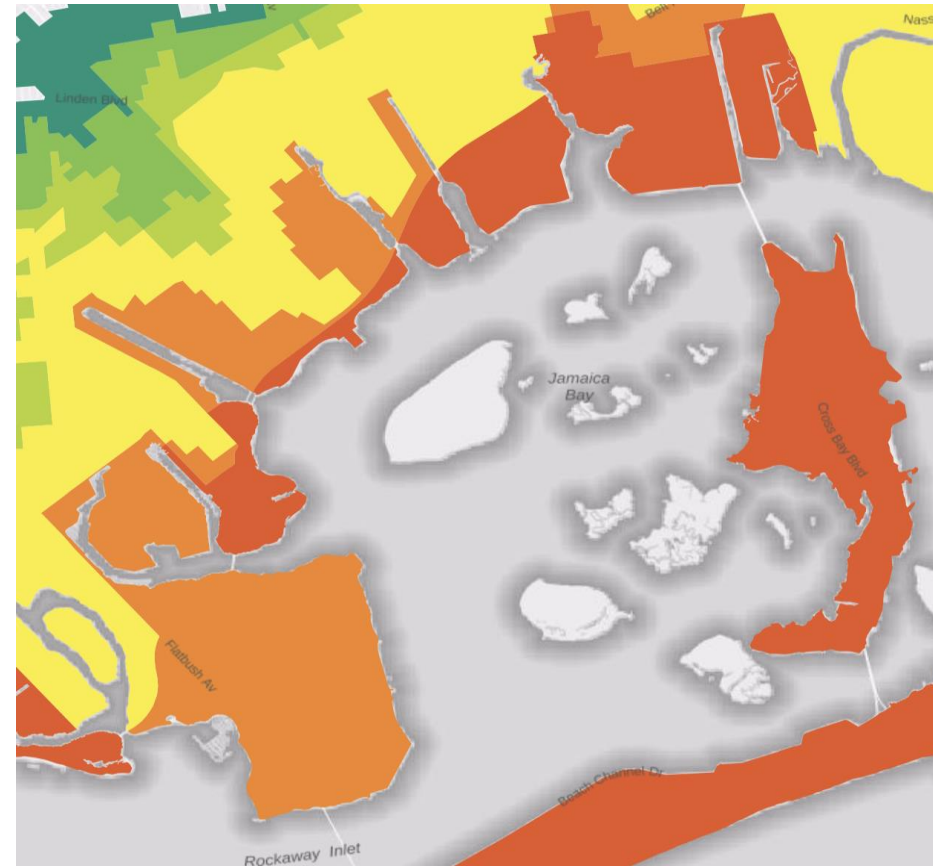
LiDAR Lifecycles New York City: 2017 How – Coordination



LiDAR Lifecycles New York City: 2017 Data Needs

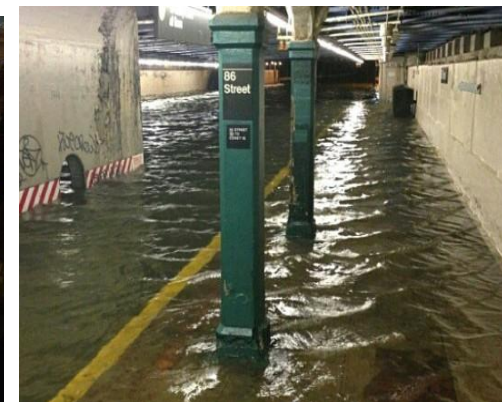
Data needs for LiDAR Update:

- 1' DEM
 - hydro enforced
 - tidally coordinated
- 1' Bathymetric Surface
 - tidally coordinated
- Shoreline update
- Land Cover update
- Tree Canopy change



LiDAR Lifecycles New York City: 2017 Business Needs

Business Needs for Update:



LiDAR Lifecycles New York City: 2017 Business Needs

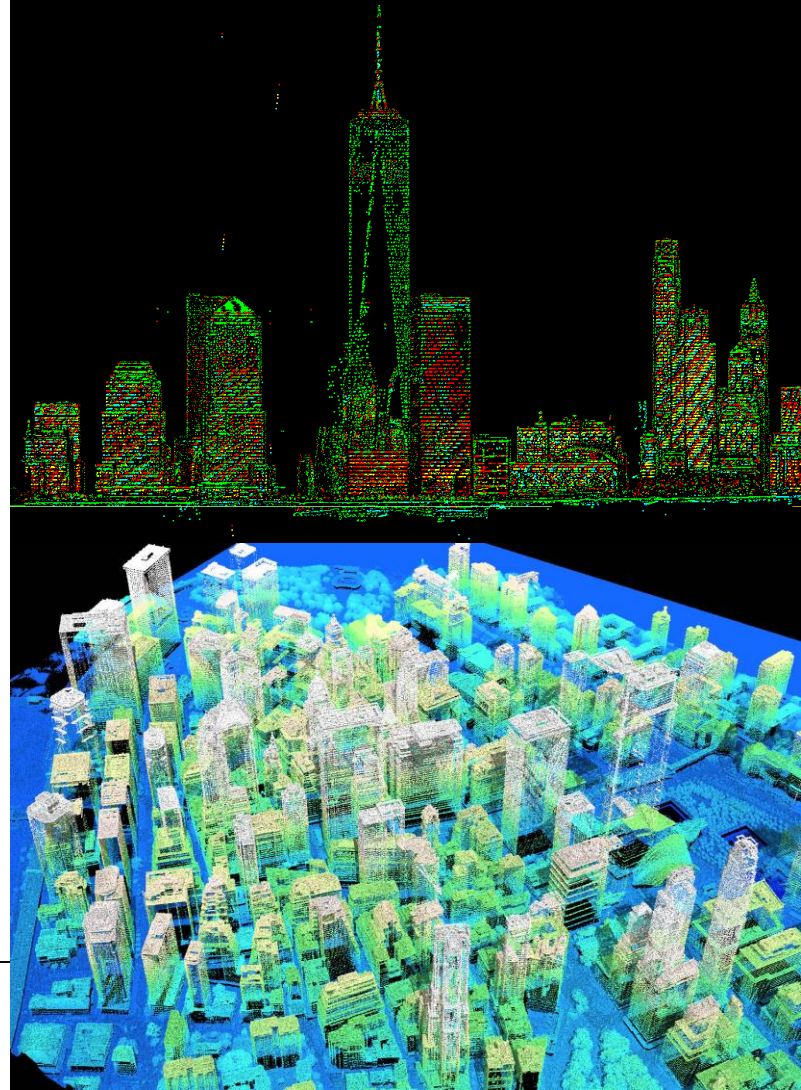
Business Needs for Update:

- Major Storms since 2010
- Require Resiliency planning & adaptation:
 - Watershed/Drainage/Flood Inundation Analysis
 - Elevation/Erosion Analysis
 - Shoreline Analysis
 - Land Cover (Weather & Impervious Surface)

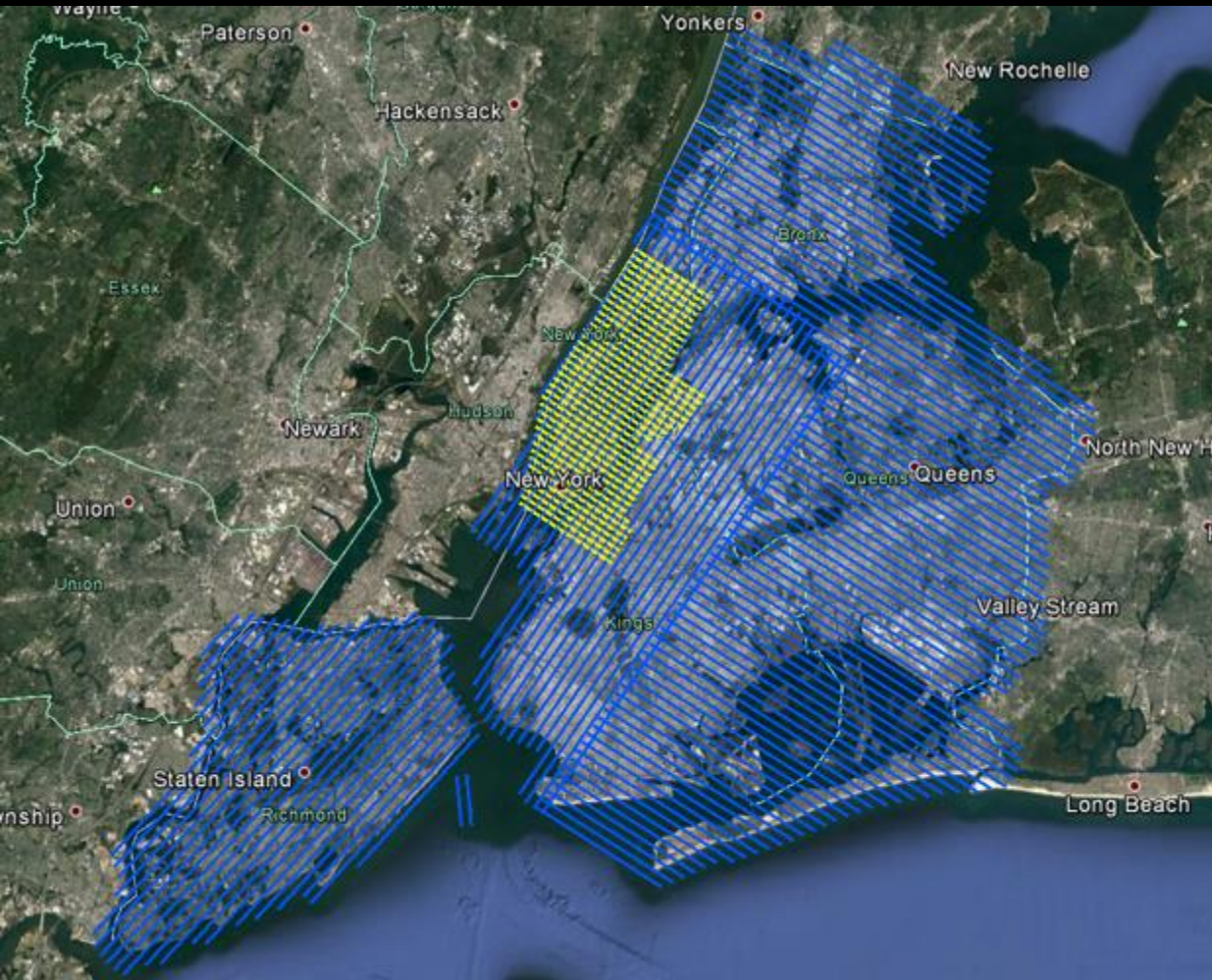
LiDAR Lifecycles New York City: Acquisition Types

Dual flight missions

- Topographic LiDAR
- Bathymetric LiDAR



LiDAR Lifecycles New York City: Urban Topographic Challenge



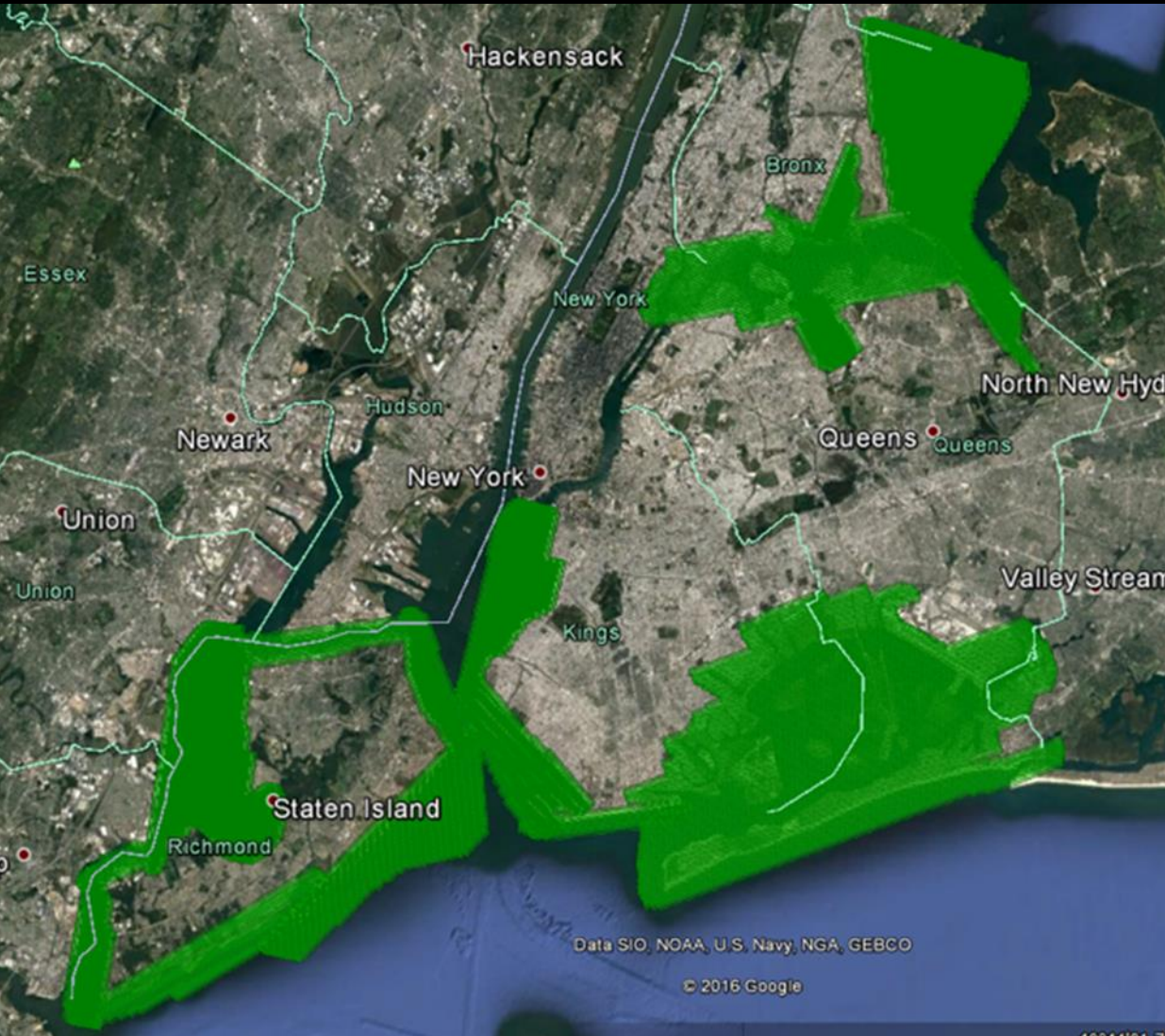
Cessna Caravan



Leica
ALS80
LiDAR
Sensor

Acquisition Dates:
5/03/17 – 5/17/17
Contracted Area – 325mi²
Surveyed Altitude – 5,400'

LiDAR Lifecycles New York City: Bathymetric Acquisition



QSI Pilot in Cessna



Riegl
VQ 820G
Bathy
Sensor

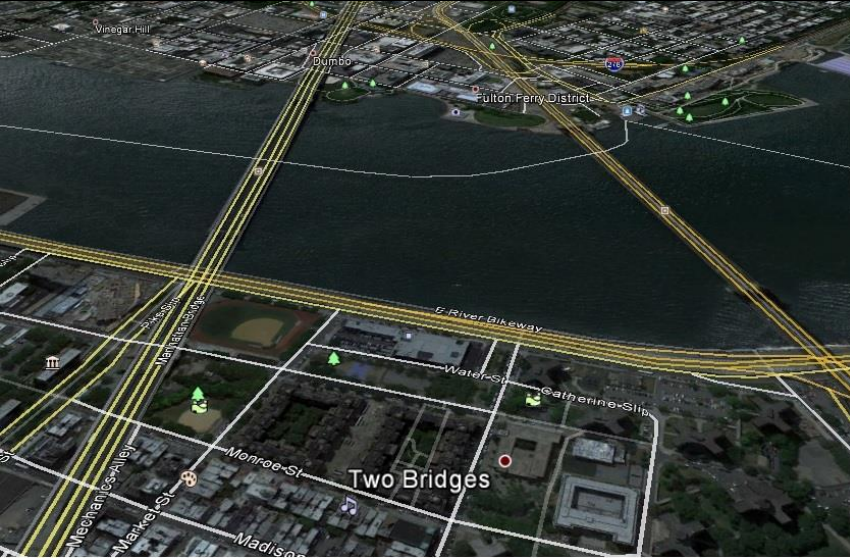
Acquisition Dates:

7/04/17 – 7/26/17

Contracted Area – 112mi²

Surveyed Altitude – 1,350'

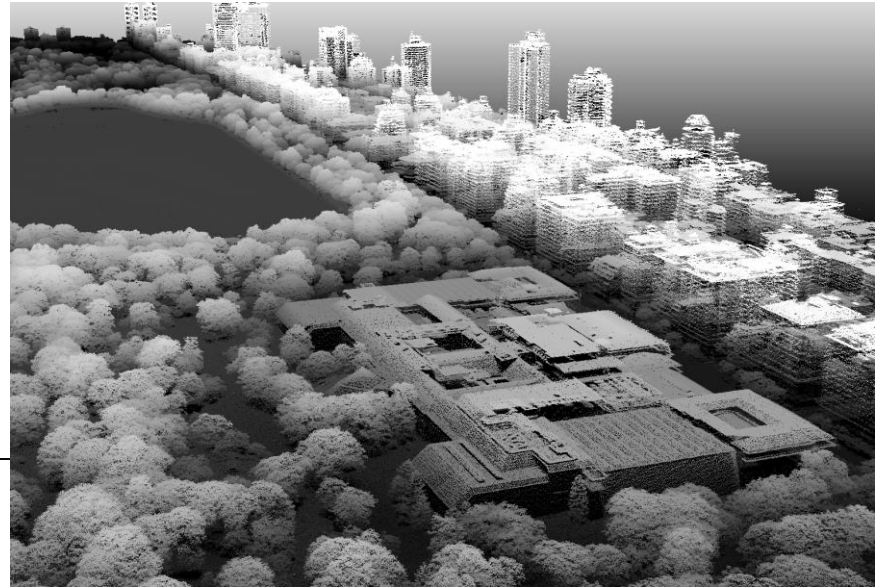
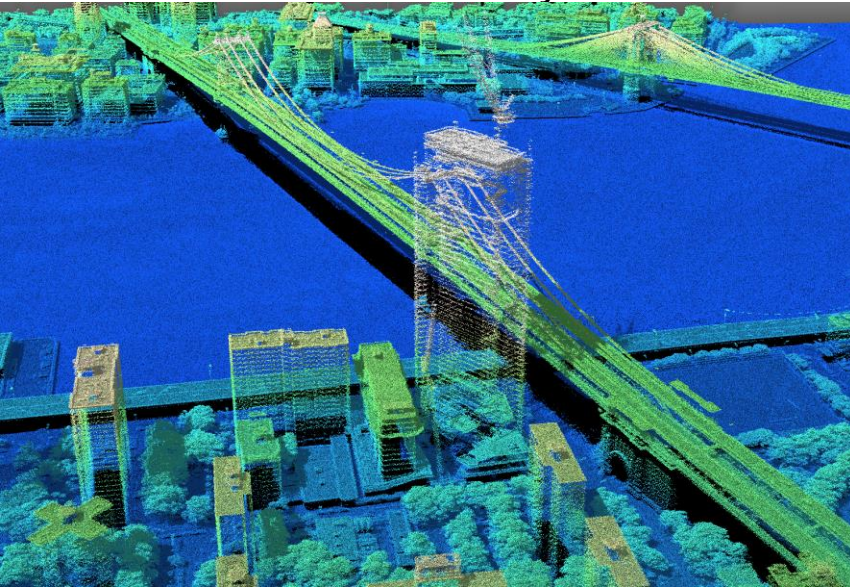
LiDAR Lifecycles New York City: Preliminary Images



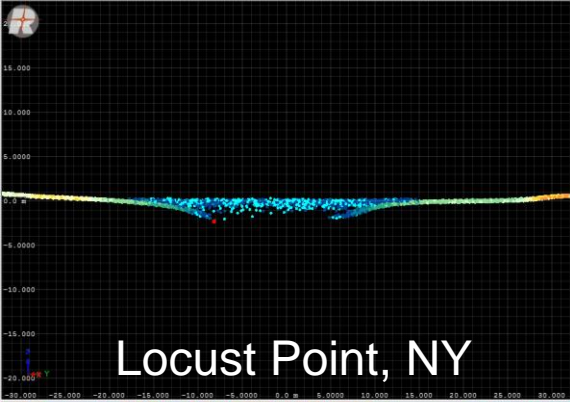
Manhattan/Brooklyn



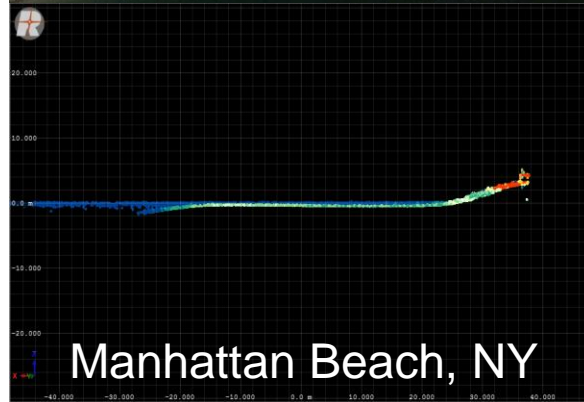
Central Park



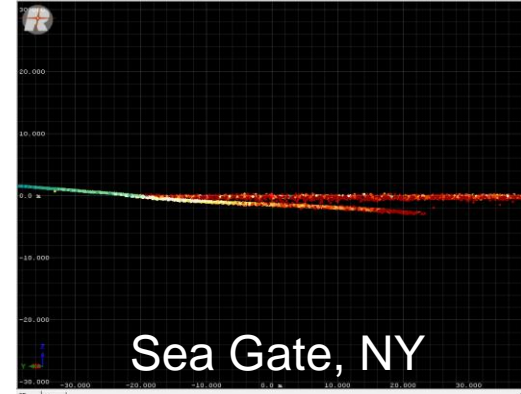
LiDAR Lifecycles New York City: Preliminary Bathymetric



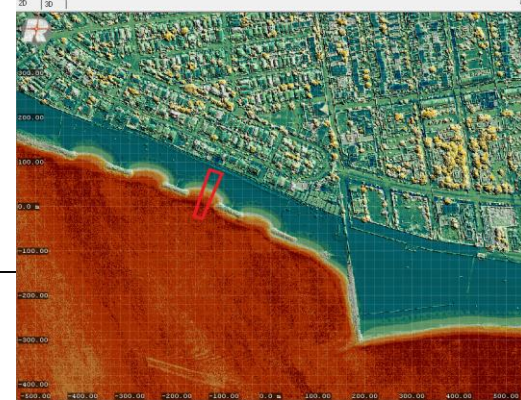
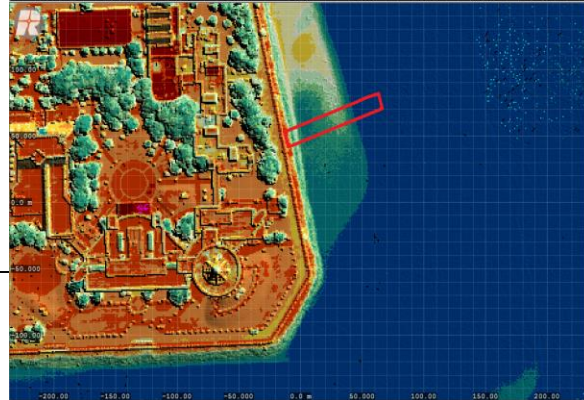
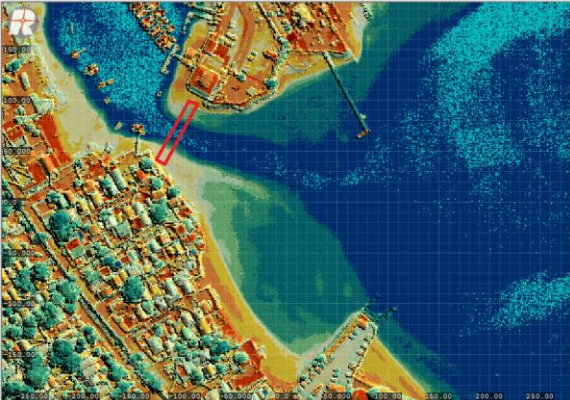
Locust Point, NY



Manhattan Beach, NY



Sea Gate, NY



LiDAR Lifecycles New York City: Derived Products: Land Cover



LiDAR Lifecycles New York City: Lessons Learned To Date

- Competencies:
 - LiDAR Point Cloud QA/QC
 - DEM QA/QC
 - Knowledge/Software/Processes
- Technical Environment:
 - Massive Data Volume with Point Clouds
 - Storage/Network capacity

LiDAR Lifecycles New York City: Miscellaneous Pictures



LiDAR Lifecycles New York City

Thanks!

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