Remote Sensing at Auckland Council NZ Esri User Conference August 2017



Remote Sensing Data

- What do we mean by Remote Sensing Data?
- For AC purposes:
 - UAV surveys
 - Lidar
 - Aerial Imagery
- But there are a few other types of data around



UAV Data

- Data collected over small areas
 - Aerial photography
 - Elevation data
- 5 projects have been received by the Geospatial team
- Latest helicopter survey by Healthy Waters

 A manned helicopter was used as HW found that the CAA UAV requirements were potentially too restrictive



UAV Data



Aerial Photography



Elevation Data



- Last data collection was in 2013
 - Raster mosaic using data from:
 - 2006
 - 2007
 - 2008
 - 2009
 - 2010
 - 2013
- Full regional coverage underway



- Data accessibility:
 - Digital Elevation Models
 - External LINZ Data Service (LDS)
 - Point clouds
 - opentopography.org
 - Contours
 - <=2010 on Auckland Council GeoMaps viewer
 - (clip, zip & ship)



- 2016 / 2017 LiDAR
 Full regional coverage
 - Planned 2016 capture
 - Concurrent Imagery



- Data collected with NEP specifications in mind
 - Auckland 1946 VD and NZVD2016
 - Point density >= 4 points per m^2
 - Deliverables to LINZ
 - las
 - DEM (1m grid)
 - DSM (1m grid)



- 2016 / 2017 LiDAR
 - Point cloud classification
 - Contours
 - DEM / DSM
 - Concurrent Imagery











Classified Raw Point Cloud







Bare-ground







Above Ground

























DEM



LiDAR



LiDAR



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DEM (2006)







DSM (2016)







DEM (2016)



- Concurrent Imagery
 - Captured simultaneously with LiDAR when flying during daylight hours, where conditions allow





Concurrent Imagery



LiDAR





LiDAR



































- Latest data collected in 2017
 - Previous dataset collected in 2016
 - CBD (True Orthos) collected in November 2015











- CBD data
 - 0.075m GSD
 - Collected 13/11/2015
 - True Orthophotos
 - 3D Building Outlines





CBD Extent





Orthophoto (2010)





True Orthophoto (2015)





Building Outlines





- Non-CBD data
 - 0.075m GSD
 - Collected between 23/02/2016 and 27/04/2016
 - Orthorectified but not True Orthos
 - Flown within 2 hours of low tide





2016 non-CBD coverage





Very good nontrue orthophotos



- LINZ historic scanning project
 - Non-georeferenced jpegs
 - Index sheet of footprint locations
 - Internal process to get scans clipped, georeferenced and mosaicked
- Retrolens LGGA initiative to make the scans freely available









Hunua Ranges



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- ArcGIS Pro used to calculate impervious surfaces
 - Concice walkthrough on learn.arcgis.com
 - <u>https://learn.arcgis.com/en/projects/calculate-impervious-surfaces-</u> from-spectral-imagery
- 2010/2011 RGBI imagery
- Three main steps
 - Segment
 - Classify
 - Calculate Area



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Reclassified





Highlighting Change





Playground and Tree fall Risk Analysis

Brandon Vista, Principal Asset Spatial Advisor, AMIS Kerrin Sime, Senior Asset Spatial Advisor, AMIS



Methodology



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Preliminary Results by Playground

Maximum Height Values	Tahi	Rua	Toru	Wha	Rima	Total
0 – 10 metres	47	18	59	40	66	230
11 – 20 metres	106	81	65	84	120	456
21 – 30 metres	31	18	32	30	26	137
31 – 40 metres	7	6	5	12	6	36
41 – 50 metres	1	0	0	0	4	5
Total	192	123	161	166	222	864

Maximum Height Value by Cluster





Uses – LiD<u>AR</u>

 Panuku 3D modelling







What Next?

- Completion of existing projects
 - LIDAR
 - Aerial Photography
 - Communication
 - When data goes live and/or updated
- Regional, rural-spec. aerial imagery – Potentially using satellite sensors
- Council-wide Remote Sensing Strategy
 - Standardised data capture and dissemination
 - Engagement with stakeholders
 Internal and external users



Thank you

Questions?

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