

# Environmental information, monitoring station field visits and building height characteristics

New Zealand FME User Conference

James Sturman

Climate, Freshwater & Ocean Science



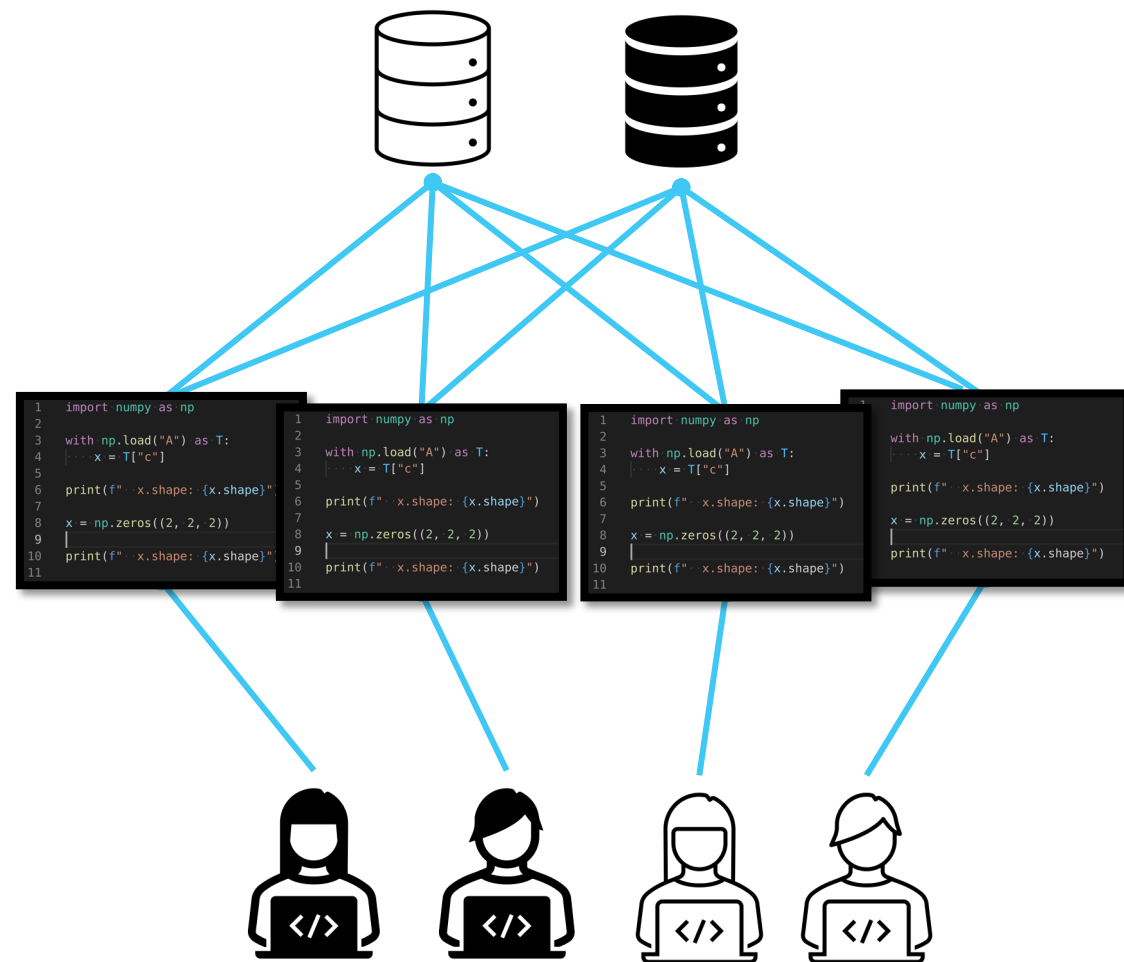
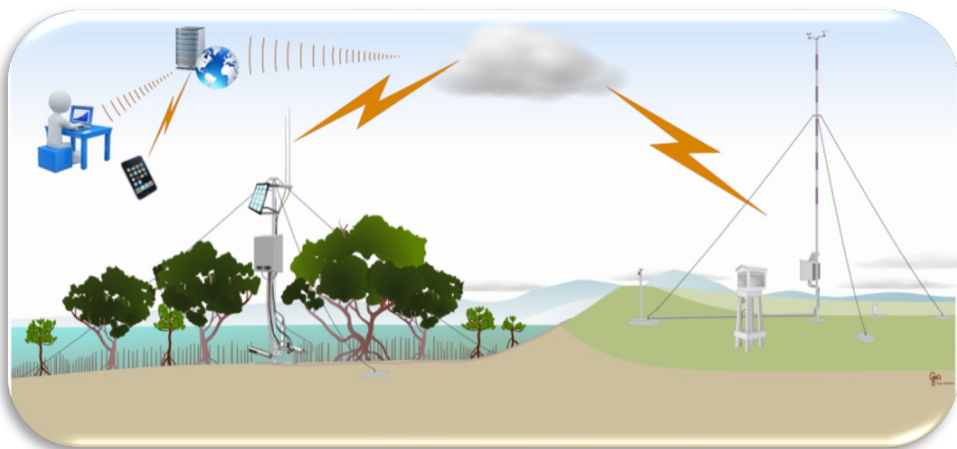
# Environmental Observation Networks

- Environmental monitoring
  - weather stations
  - water quality
  - water flow and irrigation control systems
  - wave gauges / wave buoys
  - atmospheric chemistry
  - remote sensing
- Data servers and databases
  - Neon software system
  - Aquarius Database
  - Climate Database CliDB
  - Station Information Management System SIMS



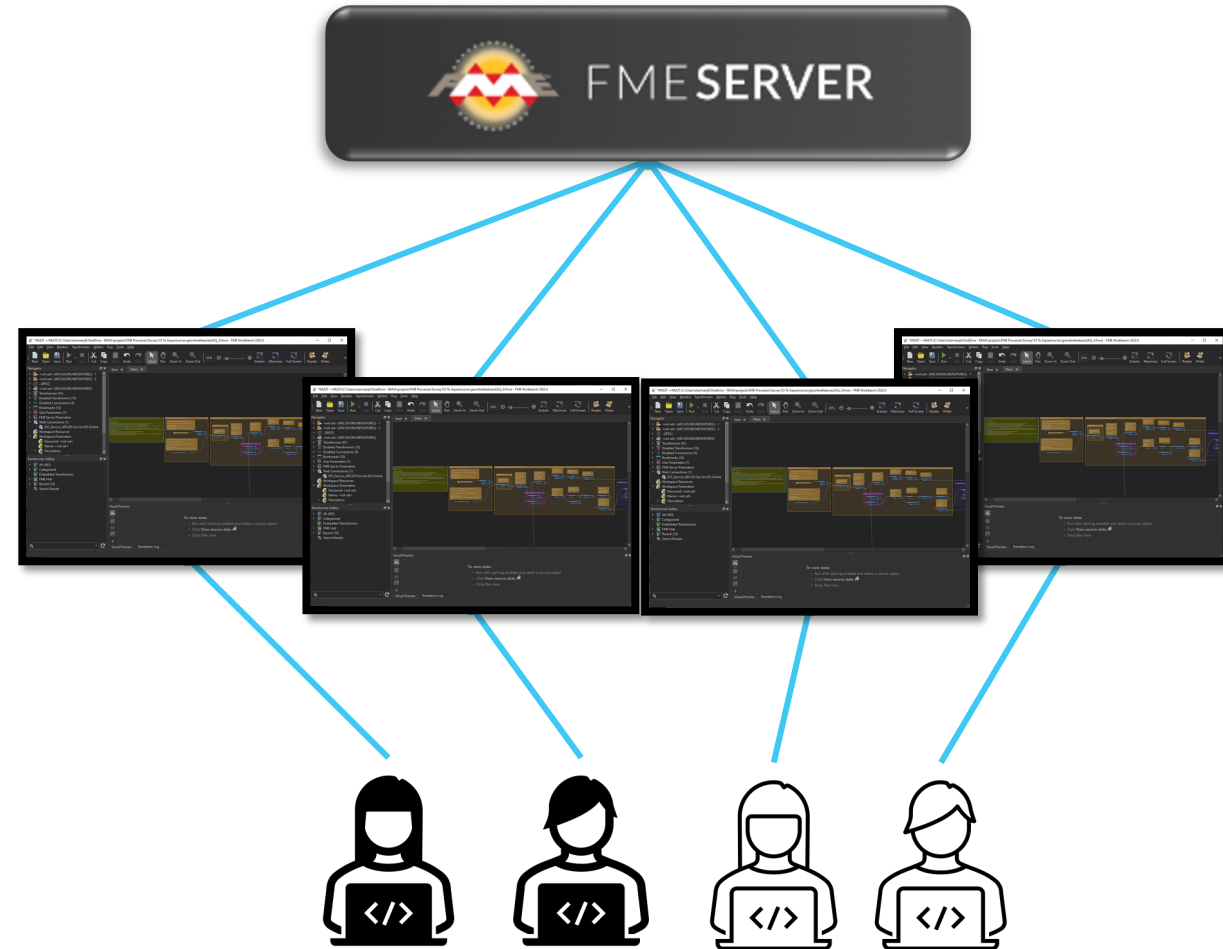
# Extract Transform Load (ETL)

- Teams of technical/domain experts
- Internal/external stakeholders
- Telemetry systems
- Database processing
- Neon automated reports
- Custom code deployed to servers
- File transfers



# Why FME Server?

- Centralised Extract Transform Load Platform
- Teams of technical/domain experts
- FME designed data workflows
- Workbenches deployed to FME Server
- Automations configured in FME Server
- FME Server Apps
- Application integration – ArcGIS Online
- Standardisation
- Workbench documentation
- Job monitoring and email alerts



# Example 1: Environment Canterbury Water Abstraction Reporting

Request: Can we push water abstraction monitoring data to Ecan's water abstraction APIs?

Step 1: Register new metering point.  
POST request to /metering-point

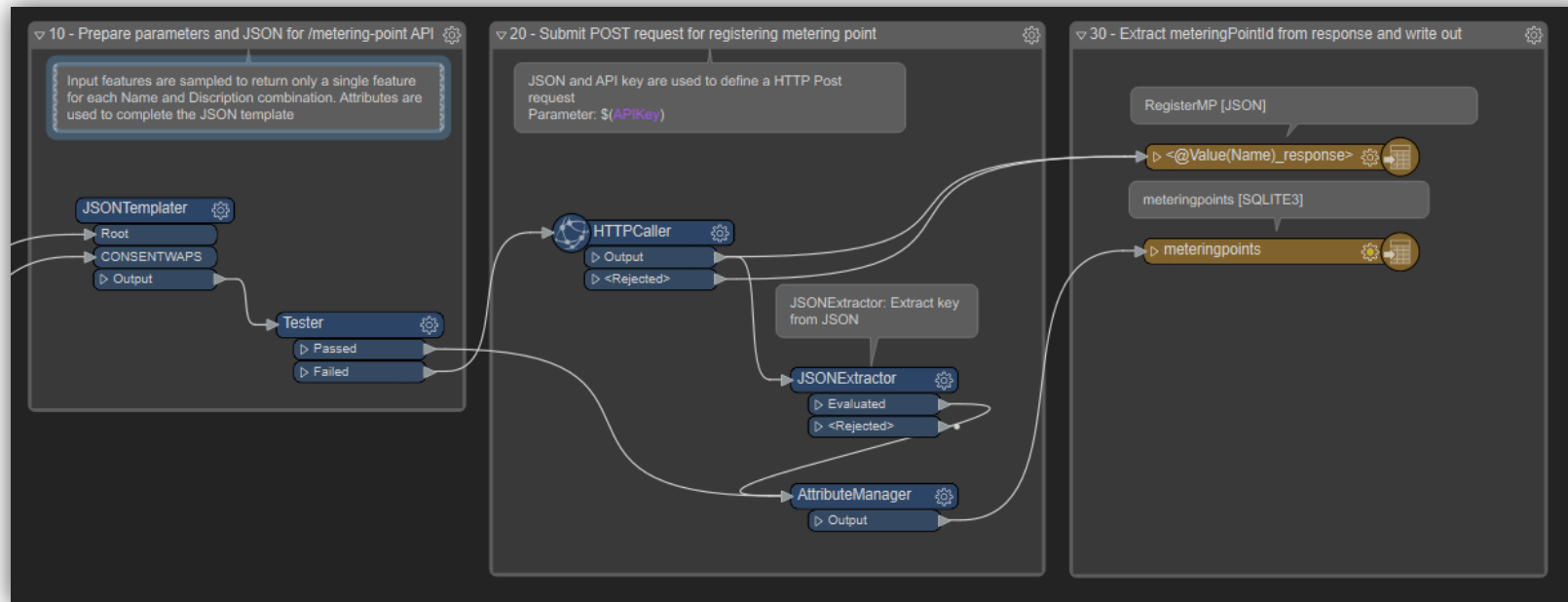
Step 2: Submit water abstraction data.  
POST request to /metering-point/{key}/waterabstraction

[Water Abstraction API FAQ - Developer Data Portal | Environment Canterbury \(ecan.govt.nz\)](#)



# Step 1: Registering a new metering point

- Collect metering point metadata
- POST request via JSONTemplater to HTTPCaller
- API response contains the metering point key
- Response captured and written to JSON file and SQLite table







# FME Server App

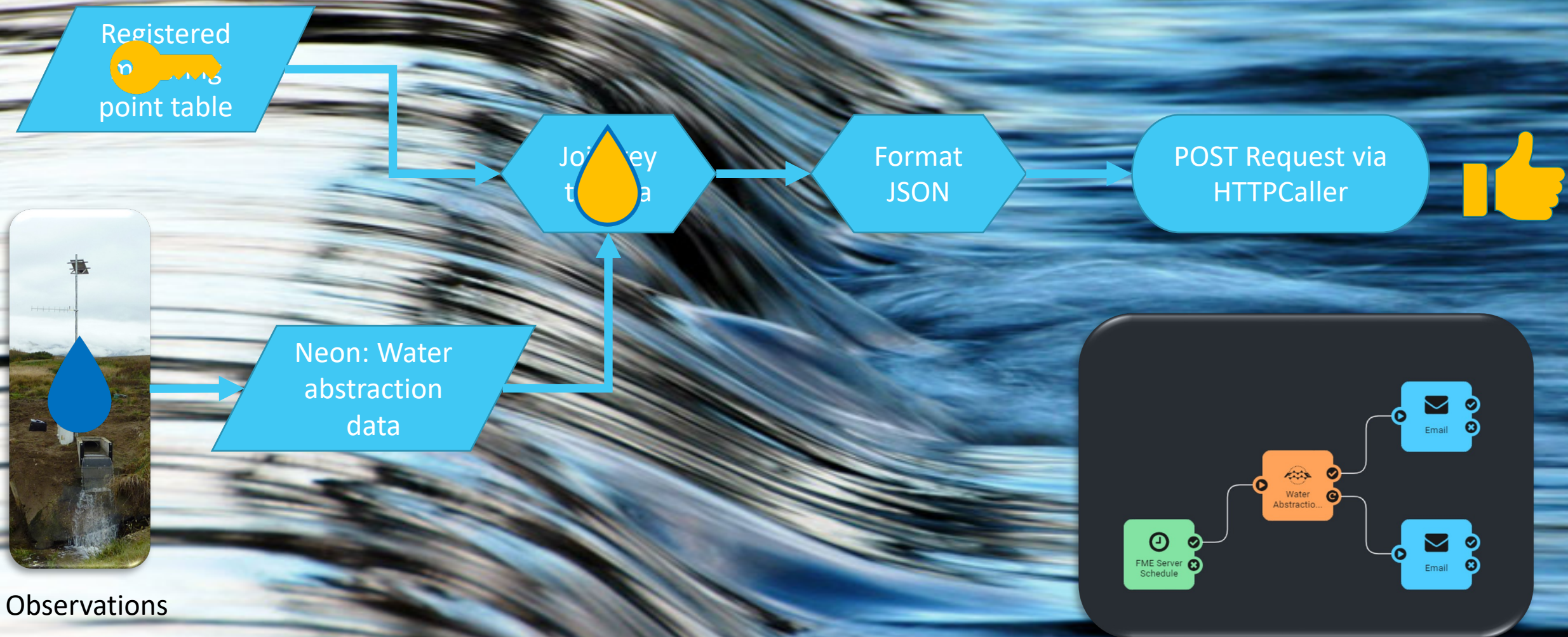
Climate, Freshwater & Ocean Science

## Ecan Register Metering Point

Server application to register a new water abstraction metering point via Ecan's Metering Point API.

Enter a metering point name	<input type="text" value="NIWA Christchurch"/>	
Enter a metering point description	<input type="text" value="NZ FME User Conference"/>	
Enter Latitude	<input type="text" value="123"/>	
Enter Longitude	<input type="text" value="456"/>	
Enter WAP Code	<input type="text" value="Z99/9999"/>	
Enter consent numbers (comma separated)	<input type="text" value="CRC999999, CRC111111"/>	
Enter Channel	<input type="text" value="Flow(AVG)"/>	
Enter Unit of Measure	<input type="text" value="Instantaneous L/s"/>	
Enter Interval	<input type="text" value="5"/>	
Enter An Existing Key (Optional) (optional)	<input type="text" value="abc123abc-abc123abc-abc123abc-abc12"/>	

## Step 2: Submission of abstraction data





## Example 2: Station Field Visits

Request: Can we push station field visit data captured in Survey123 to our Aquarius Database?



Climate, Freshwater & Ocean Science

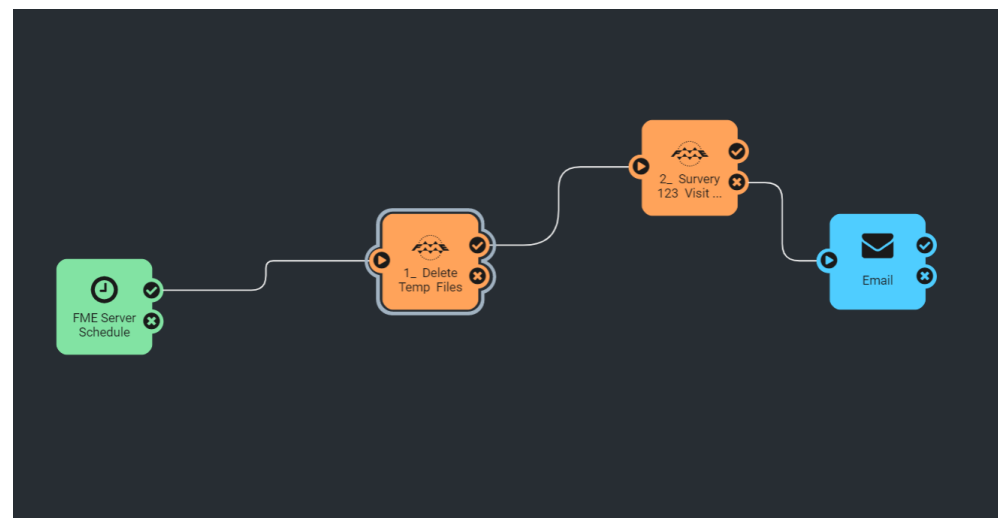


# AQUARIUS

Analytics Software for the Natural Environment to Monitor  
Flooding, Water Quality, Stormwater, and more.

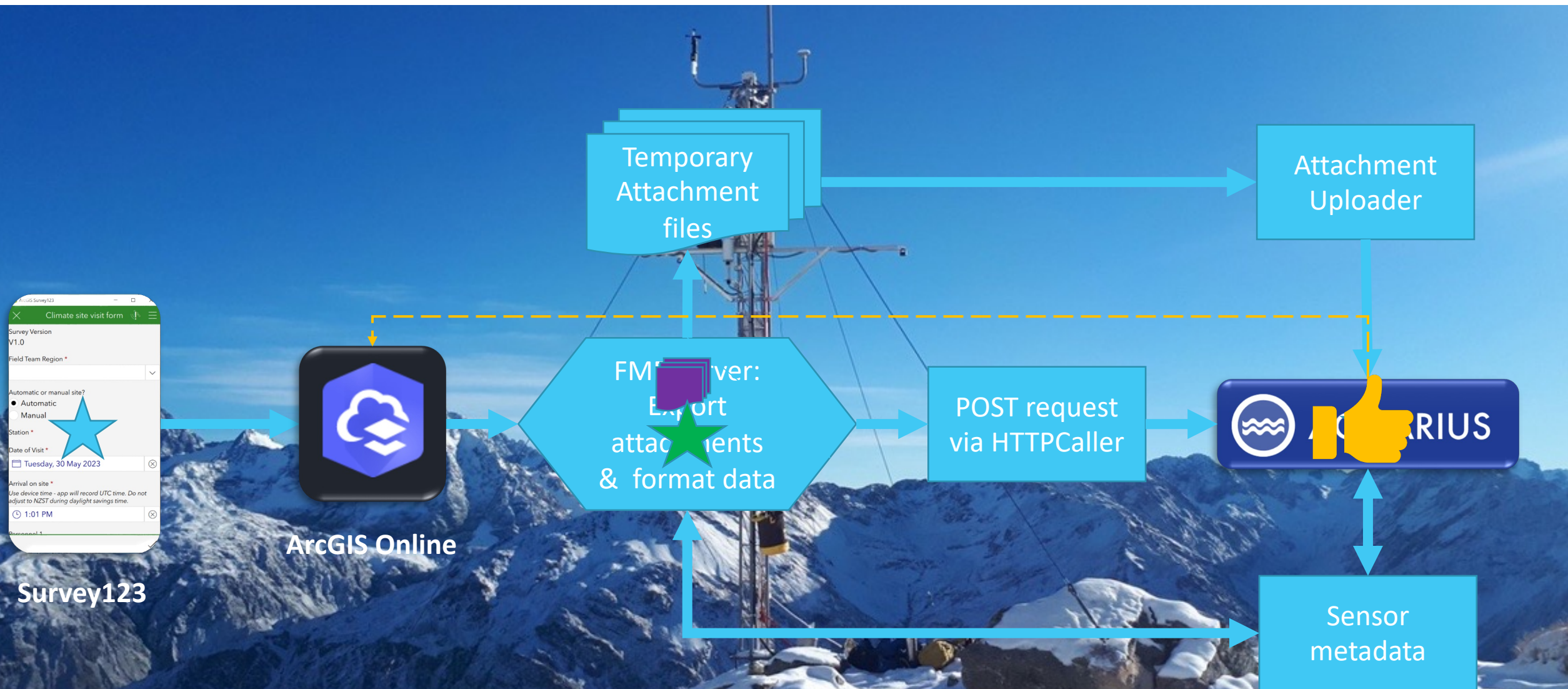
# Key components

- ArcGIS Online integration
- Esri ArcGIS Online Web Connection
- Custom Aquarius attachment uploader tool
- TOML configuration file
- FME Server automation



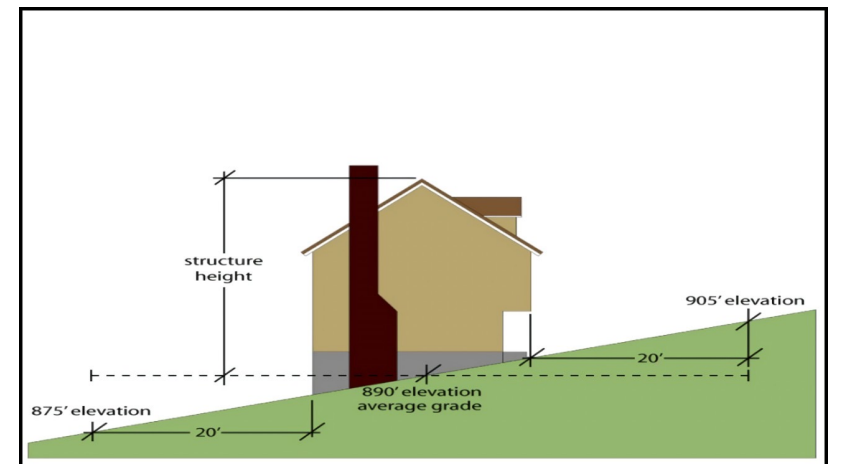
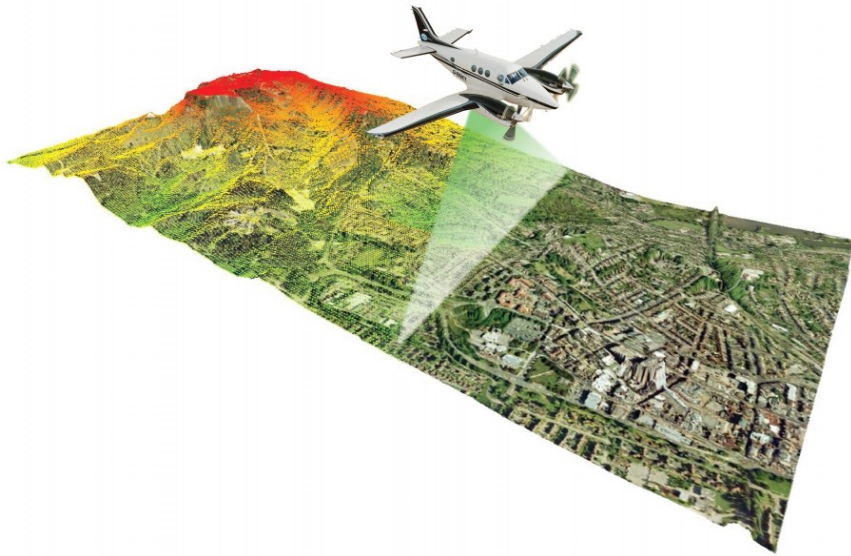


# Uploading Survey123 data to Aquarius



# Example 3: Extracting Building Height from LiDAR Data

Request: Can we extract building height information from LiDAR point cloud data?



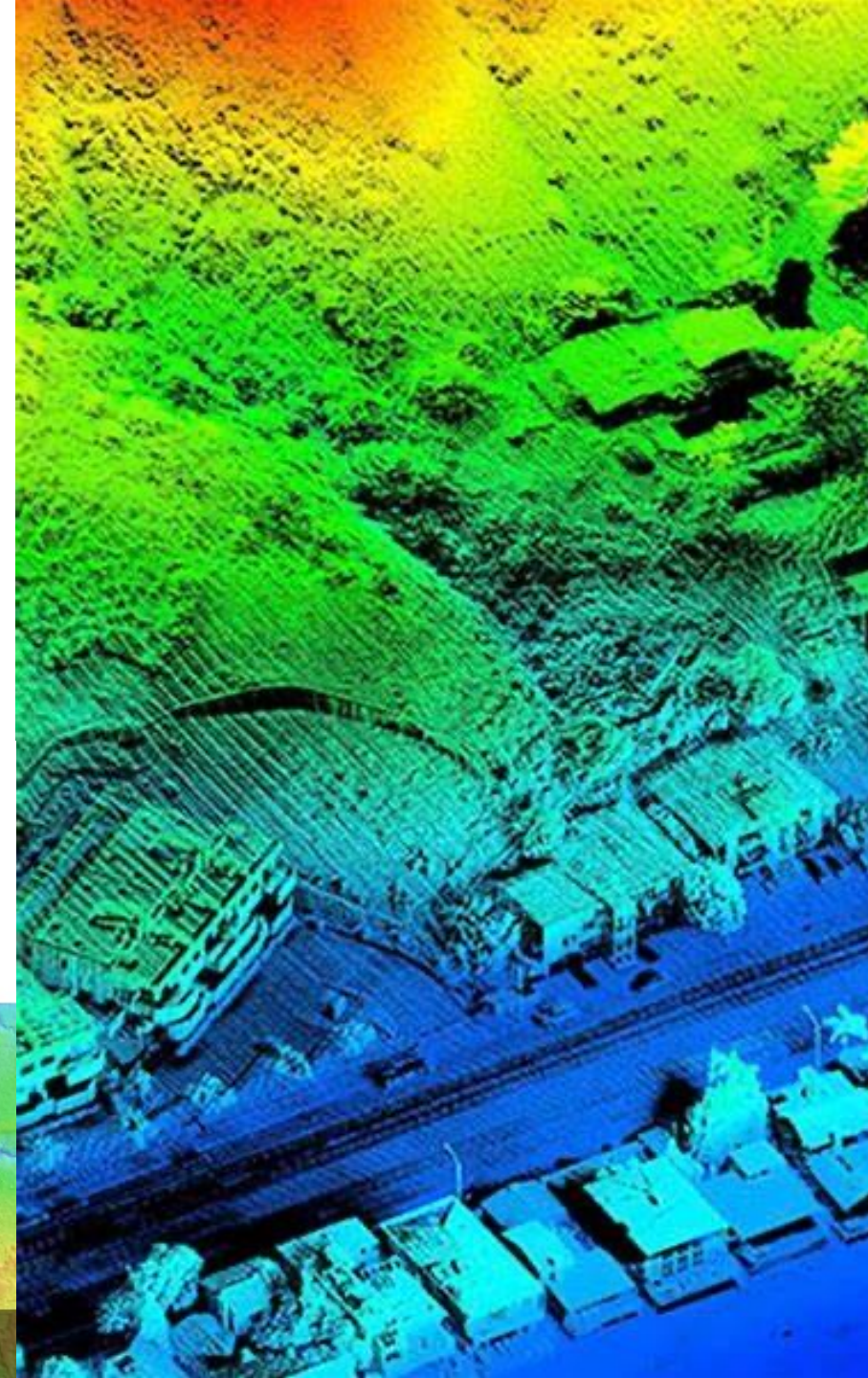


# Key details

- FME Point Cloud Transformers
- OpenTopography.com
- Other sources of point cloud data
- LINZ New Zealand building footprints

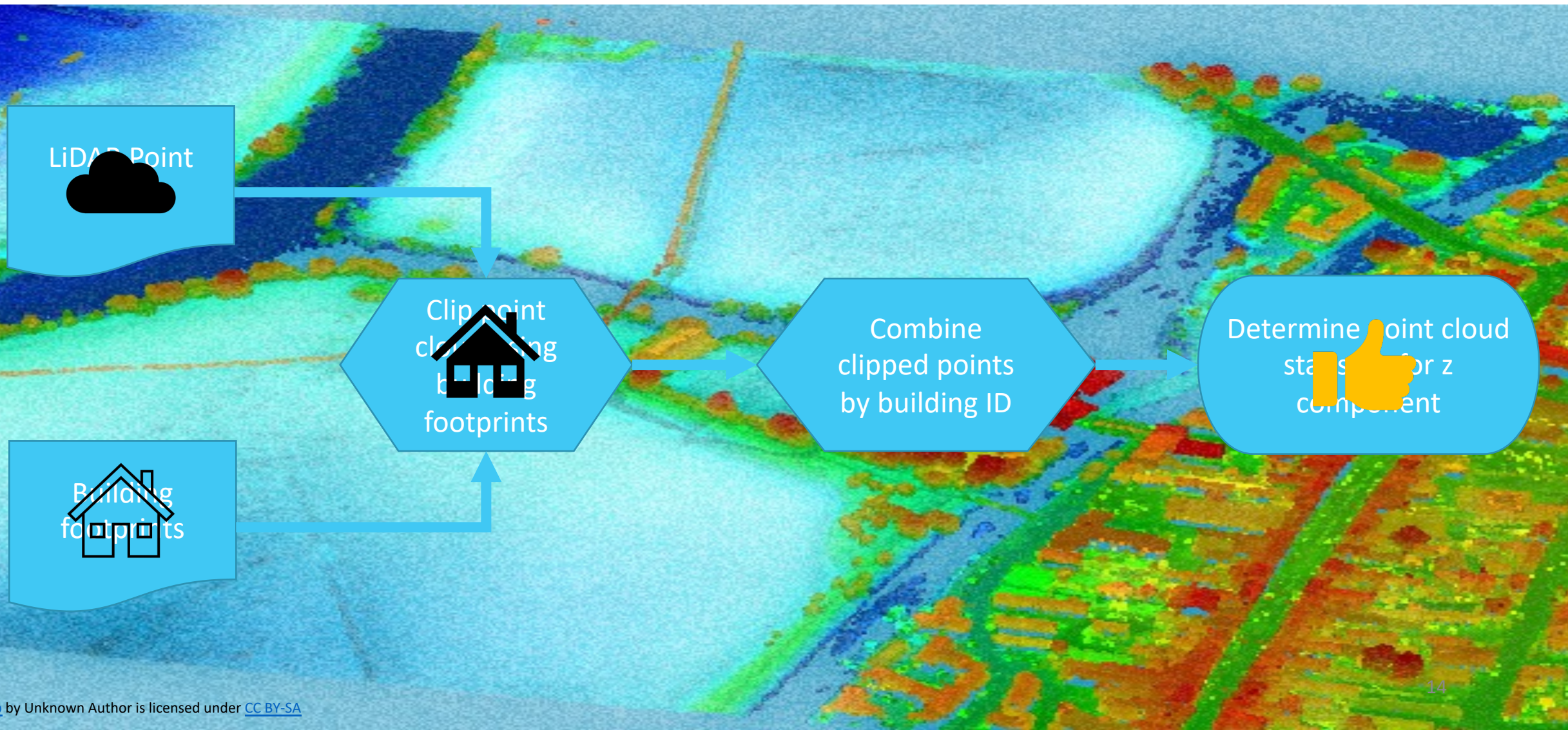


Black Rock Desert Wilderness, Nevada





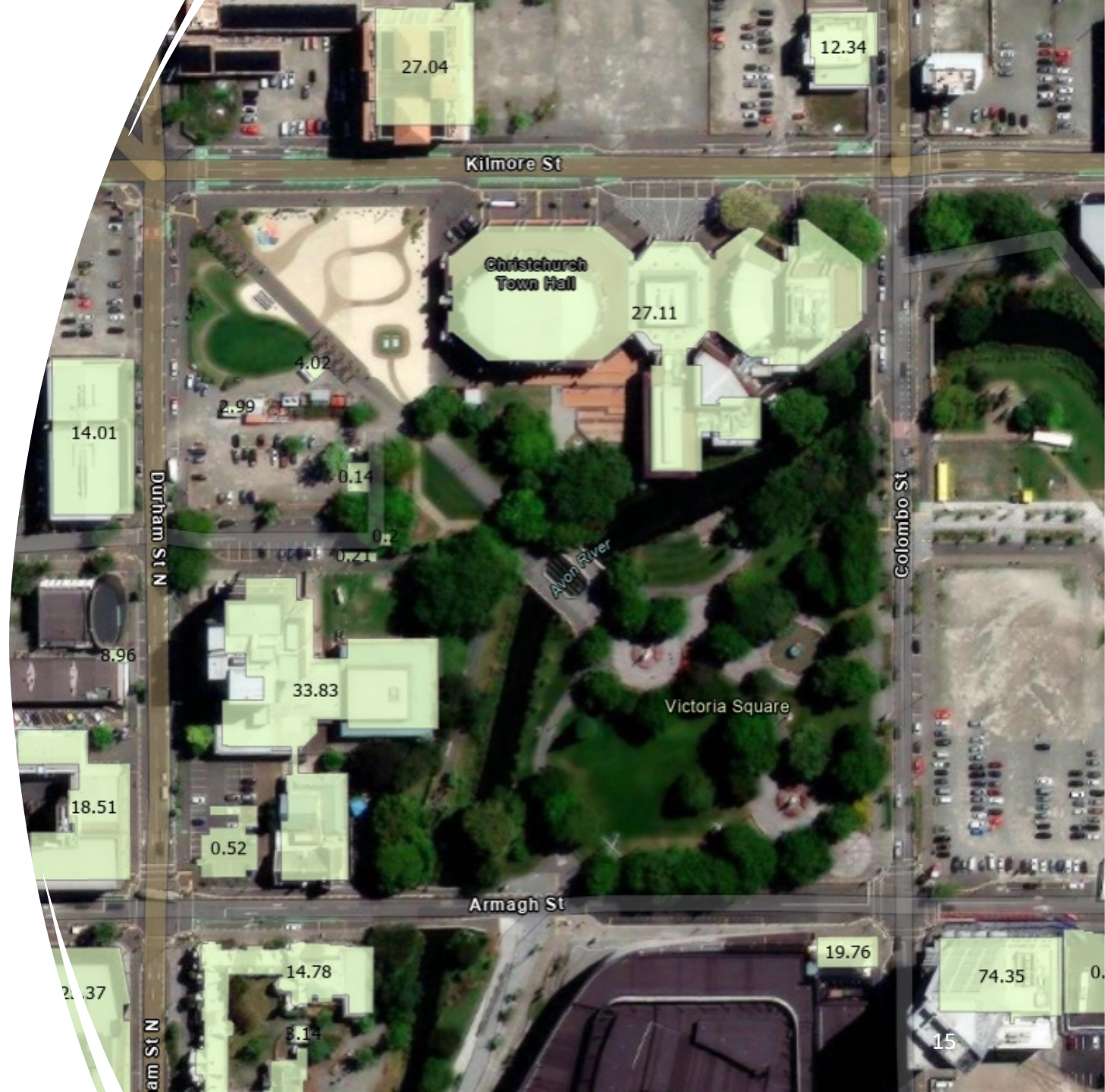
# Extracting Building Heights from LiDAR





# Outcome

- Total of approximately 3.3 million buildings
- Over 1.9 million buildings assigned height statistics
- Issues with overhanging vegetation
- Buildings constructed after LiDAR flights
- Planning for future updates to the dataset
  - updated building footprints
  - new LiDAR data



# Questions?