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Green Infrastructure Monitoring with the City of Vancouver

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Vancouver,BC

2022

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Novion

The future of climate intelligence

Founded in 2019 and based in Vancouver, Canada, Novion is a climate intelligence company that provides cities with insights on how to plan and build for climate resiliency through infrastructure monitoring.

Case Study

Green Infrastructure Monitoring with the City of Vancouver

In 2022, Vancouver-based Novion successfully launched a project with the City of Vancouver to remotely monitor the performance of several green infrastructure sites across the city.

The infiltration rates of each site was monitored using water level sensors connected to Novion's proprietary Internet of Things (IoT) enabled Data Loggers and real-time insights were generated through Novion's Climate Intelligence Platform.

The objective of the monitoring program is to inform decisions on future planning, compliance, design optimization, and maintenance.

The City of Vancouver : Quick Facts

- The City has 312 green infrastructure assets.
- The performance data from over 48 major rainfall events has been collected and is on-going.
- The initial data obtained will support the implementation of over 10,000 green infrastructure assets over the next 30 years.

A Plug and Playable Solution

Novion eliminates site visits and manual work with an end-to-end solution that handles everything from the procurement of sensors to installation and insights generation. Novion's solution has two components:

Novion IoT Data Logger

A weatherproof and sensor agnostic data logger that can remotely collect information from multiple sensor types. It is *massively scalable* and *deployable in minutes*.



Novion Climate Intelligence Platform

A central platform for all green infrastructure data and analytics. The platform turns 12 months of manual data collection into 12 seconds.

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The Case for Green Infrastructure Monitoring

Meeting Impact Goals

Green infrastructure consists of permeable membranes used to absorb and filter rainwater where it lands. It is used to lower flood risk, improve water quality, and reduce the load on stormwater pipes.

Due to variations in local climate conditions and materials available, monitoring is the key to verifying that stormwater management practices are performing as expected.

Monitoring Methods

- Water level for infiltration and capacity
- Rain gauges for marking rainfall events
- Soil sensor for volumetric water content
- Ultrasound for flow rates in under-drains

4 Key Benefits of Green Infrastructure Monitoring

1. Post-Construction Performance Testing

Monitoring can be used to confirm project characteristics such as:

- contributing drainage area
- storage volume
- inlet capture efficiency
- slow release discharge parameters.

2. Maintenance

Changes in performance are used to pin-point sites that require additional maintenance and optimize maintenance schedules. For example, slower draw-down rates can indicate clogging that needs to be tended to. Meet your green infrastructure experts

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3. Compliance

Surface Ponding Duration: Surface ponding should not be present longer than 24 hours for public safety. Any ponding longer than 7 days can allow mosquitos to hatch.

Subsurface Drawdown: After a storm event, subsurface storage should be empty within 72 hours to ensure sufficient space is available for the next event.

Retention and Filtration: Over 24 hours, GI systems should retain or filter 90% of annual runoff volume, or 48mm over 24 hours. This ensures water-quality and load reduction targets are met.

4. Design Optimization

Improving and refining the designs of green infrastructure can be used to improve the cost effectiveness and quality of construction.

By monitoring performance, factors such as material composition, size, and location can be properly assessed for design optimization.

E.g: A subsurface storage that drains faster than infiltration can indicate that a larger drainage area can be accommodated to reduce costs.

