URBAN GREENING EXPLORER

An Interactive Dashboard for Exploring Vancouver's Public Trees

Progress Report 3

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Course: CSIS 4495 – Applied Research Project

Section Number: 071

Work Logs

Date	Hours	Description of Work Done
Oct 11, 2025	2.5	Implemented the Explore Trees tab and initialized a Folium map with Vancouver-centric defaults. Added neighbourhood boundary overlay from Local Area polygons.
Oct 12, 2025	2.0	Built sidebar filters for Local Area, species (Latin), common name, minimum planting year, and minimum diameter. Wired filters to a working copy of the dataset.
Oct 14, 2025	2.5	Added coordinate validity checks and point sampling for performance. Implemented rich tooltips for tree points showing common name, species, planting date, diameter, and local area.
Oct 16, 2025	2.0	Created a Key Stats panel (trees shown, unique species, average diameter, planting year range) and added filtered distributions (Top 15 common names and planting-year histogram).
Oct 18, 2025	1.5	Enabled neighbourhood highlighting on the map when a Local Area is selected and added layer controls. Refined layout and captions for clarity.
Oct 19, 2025	1.5	Performed end-to-end testing of filters, map responsiveness, and charts. Updated requirements.txt to ensure mapping dependencies are covered and committed changes.
Oct 22, 2025	1.5	Improved the user interface layout and captions for readability. Adjusted sidebar filter defaults and ensured responsive performance across devices.
Oct 25, 2025	2.0	Conducted final midterm demo preparation, verified datasets and dependencies, refined visuals for presentation, and ensured reproducibility of all results.

Description of Work Done

Between October 11 and October 25, the project evolved from basic neighborhood summaries into a complete, interactive Explore Trees experience.

The app now features a fully functional Folium map that displays thousands of public tree points with sampling for smooth performance and overlays for Vancouver's Local Area boundaries. When users select a neighborhood, it is highlighted visually, and each tree marker provides an informative tooltip including the tree's common name, species, planting date, diameter, and local area.

An extensive filter panel in the sidebar allows users to dynamically refine the data by local area, species (both Latin and common names), minimum planting year, and minimum diameter. The filtered dataset updates in real time across all visual components of the dashboard.

The Key Stats panel provides live metrics based on the user's filters — including the total number of trees, unique species, average diameter, and planting-year range — while the accompanying charts visualize the top 15 tree species and a histogram of planting years. These visualizations create an intuitive and data-driven workflow for exploring Vancouver's greenery.

From October 20 to 25, additional refinements were made to polish the user experience and prepare for the midterm presentation. Interface text and layout were improved, filter defaults were optimized, and final validation ensured all dependencies and data integrations worked seamlessly. These final touches made the dashboard presentation-ready, stable, and aligned with the project's research goals.

Current state of the web application is as follows:

The current application consists of two main tabs:

1. Explore Trees – Provides an interactive Folium map with local area boundaries, optional neighbourhood highlighting, sampled tree points with tooltips, and a responsive sidebar filter. Below the map, the Key Stats panel and live charts summarize filtered results in real time.
2. Neighbourhood Summary – Retains the earlier tabular summary of key neighborhood indicators such as total trees, unique species, average diameter, planting-year range, and trees per square kilometer.

Both tabs use the same standardized data processing and spatial join pipeline, ensuring consistency and reproducibility across the analysis.

Figure 1: Visualize all trees in Vancouver

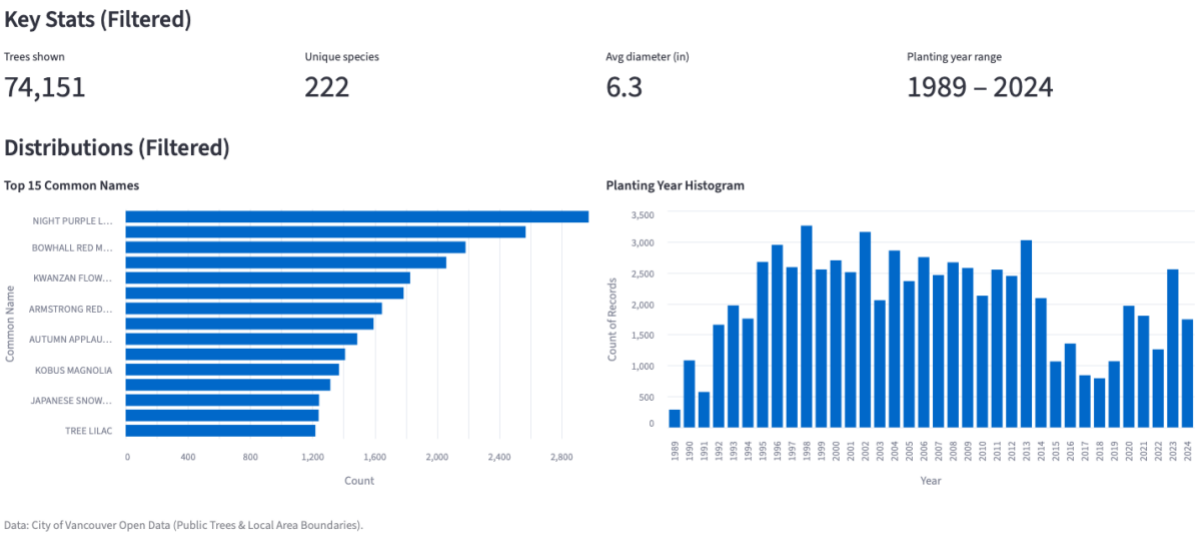

Figure 2: Key Stats based on tree distribution

Figure 3: Filter according to local area (ex: Downtown)

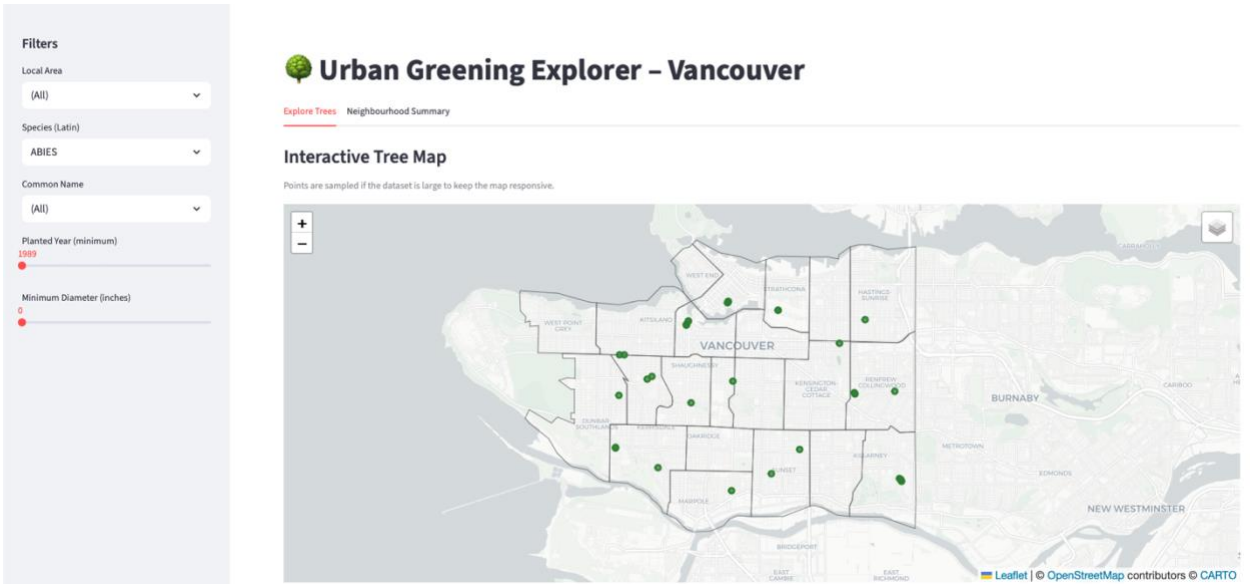

Figure 4: Filter according to Species name (ex: ABIES)

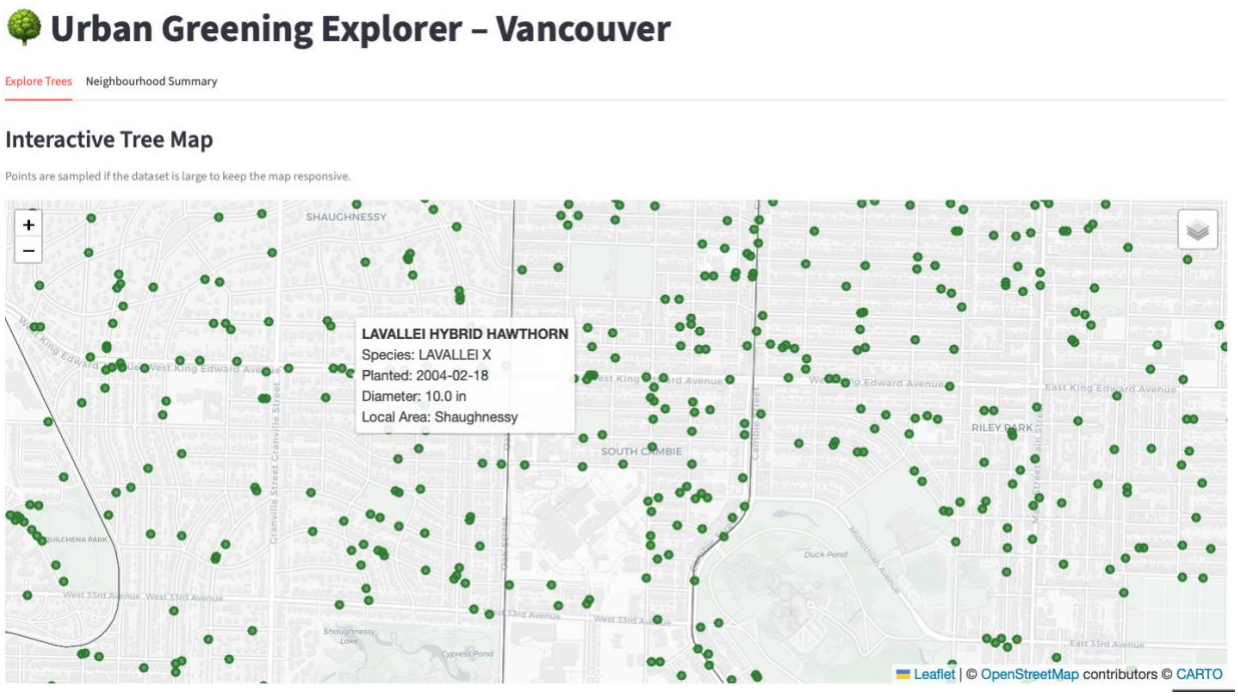

Figure 5: Each tree point showing more details in a tooltip

Urban Greening Explorer – Vancouver

Explore Trees | Neighbourhood Summary

Neighbourhood Summary (All Trees)

	LOCAL_AREA	trees	unique_species	avg_diameter	oldest_year	newest_year	AREA_KM2	trees_per_km2
0	Arbutus Ridge	6206	149	12.4208	1989	2024	3.7006	1677.0161
1	Downtown	7133	140	8.937	1989	2024	4.6742	1526.0278
2	Dunbar-Southlands	9589	176	15.0705	1989	2024	9.0798	1056.0749
3	Fairview	4702	143	11.7349	1990	2023	3.6354	1293.4068
4	Grandview-Woodland	6921	169	12.6765	1989	2024	4.7541	1455.7854
5	Hastings-Sunrise	13343	206	11.9512	1990	2024	8.3323	1601.3642
6	Kensington-Cedar Cottage	12689	191	12.3862	1989	2024	7.2525	1749.6038
7	Kerrisdale	9707	173	15.0456	1989	2024	6.6089	1468.7753
8	Killarney	8401	165	11.1823	1989	2024	6.934	1211.5682
9	Kitsilano	9531	204	15.7408	1990	2024	6.3629	1497.9125

Data: City of Vancouver Open Data (Public Trees & Local Area Boundaries).

Figure 6: Neighbourhood Summary table

Repo Check-in of Implementation Completed

The GitHub repository has been updated to include the following files under **Implementation** folder:

1. **app.py** – Updated with the Explore Trees tab, Folium map integration, sidebar filters, point sampling, rich tooltips, neighbourhood highlighting, Key Stats panel, and live filtered distributions.
2. **requirements.txt** – Expanded to include additional dependencies for mapping and visualization to ensure reproducibility.