Urban Agriculture

Climate Impact Tracking (CIT) Toolkit

Developed for: Ecosource's Iceland Teaching Garden

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Brief Project Description:

Urban agriculture has become a growing priority in Mississauga, especially since the City declared a food security emergency in late 2024. This project directly supports the goals set out in the City's Urban Agriculture Strategy (2022) by helping track the environmental benefits of local food production and strengthening community resilience.

What is the Climate Impact Tracking (CIT) Toolkit?

The **Climate Impact Tracking (CIT) Toolkit** was developed to strengthen climate resilience in urban agriculture at Ecosource's Iceland Teaching Garden in Central Mississauga. It provides a framework for monitoring key factors such as rainfall, soil moisture, and pest presence. By tracking these indicators, Ecosource and community gardeners can identify challenges early, adapt management practices, and reduce risks from extreme weather, invasive pests, and plant diseases. This proactive approach supports sustained food production, enhances local food security, and aligns with broader urban agriculture and sustainability goals in Mississauga.

Who is the CIT Toolkit for?

The **CIT Toolkit** was developed primarily for youth volunteers at the Iceland Teaching Garden to help track plant growth, monitor soil and weather conditions, and record changes

in the garden to support healthy and sustainable food production. The Toolkit is also a valuable resource for the wider community and can be easily shared and adapted by community or home gardeners, farm businesses, or partner organizations, making it useful for any food-growing site looking to strengthen climate resilience across the region.

Required Tools & Materials:

Item	Purpose
Notebook, Tracking Sheet and Pen:	Used for recording observations within the garden, both quantitative (ie., rainfall levels) and qualitative (ie., plant health issues like wilting or drooping).
Rain Gauge:	Used to measure rainfall to compare natural precipitation with the garden's watering needs.
Multi-Purpose Soil Tester/Meter:	Used to regularly document levels of dryness, saturation, and any pH shifts to support optimal plant health.
Camera (Phone or Tablet):	Used to document changes in the garden through photos and videos, capturing progress, seasonal shifts, and key milestones.

Identified Metrics for Tracking Climate-Impacts:

CIT Toolkit Metrics	Quantitative	Qualitative
Water Availability & Rainfall	✓	
Soil Health: Moisture & pH Balance	✓	
Pest Presence & Impact		✓

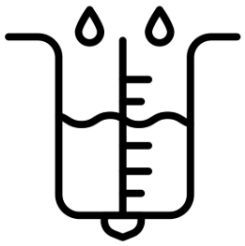
The Climate Impact Tracking (CIT) Toolkit focuses on three key metrics, identified from an initial set of ten qualitative and quantitative measures. By combining both types of data, the toolkit encourages users to strengthen their ability to observe, record, and respond to climate-related impacts in urban agriculture.

Water Availability & Rainfall Monitoring:

Why measure water availability and rainfall levels?

Measuring water availability and rainfall levels is essential for understanding the natural moisture your garden receives. Monitoring these factors helps identify periods of drought or flooding, both of which can negatively affect plant health, crop yields, and soil structure. By tracking water availability and rainfall levels, Ecosource gardeners can make informed irrigation decisions, improve water use efficiency, and reduce plant stress caused by inconsistent moisture conditions.

How to track water availability and rainfall levels?



Tool: Rain Gauge

Description: A rain gauge is a simple device used to collect and measure rainfall. For this toolkit, we are using the **Garden Club Continental Magnifying Rain Gauge (31.5 cm)**, a reliable tool featuring a clear cone with precise gradient markings that allow for accurate readings. Its design provides flexibility, as it can be placed on level ground or mounted on a fence, making it easy to adapt to different garden setups.

Placement & Use: Position the rain gauge in an open area, away from trees, buildings, or other obstructions. After rainfall, read the measurement at eye level using the gauge's markings. Record values to one decimal place (e.g., 10.1 mm) for accuracy and always log results in **millimeters (mm)** in the garden's tracking sheet (then transfer to the digital record for safekeeping). After recording, empty the rain gauge to ensure the next measurement reflects only new rainfall.

Analysis: When reviewing results, consider soil type and drainage to understand how rainfall impacts plant growth and overall garden health.

When to record measurements?

Check water availability and rainfall levels:

- Twice per week during the growing season (even if no rain occurred).

This approach balances accuracy with the capacity of a volunteer-led team.

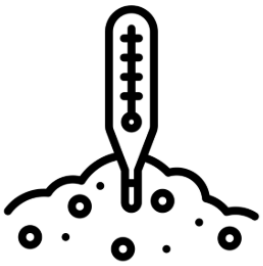
Soil Health Monitoring – Moisture & pH Balance:

Why measure soil moisture and pH balance?

Measuring soil moisture and pH balance is essential because both directly impact plant health and growth. Soil moisture indicates whether plants are receiving adequate water, helping to prevent drought stress or overwatering. Monitoring pH levels reveals soil acidity or alkalinity, which affects nutrient availability and microbial activity critical to plant development. By regularly tracking these factors, Ecosource gardeners can optimize irrigation and soil management, reduce crop stress, and enhance overall yield and soil health.

How to track soil health?

Tool: Digital Moisture Meter & Digital Soil pH Meter



Description: Digital meters provide quick, easy-to-read measurements. For this toolkit, we are using the **Panacea – HoldAll Digital Moisture Meter** to assess soil moisture and the **Panacea – HoldAll Digital Soil pH Meter** to test acidity/alkalinity levels. Both tools feature simple probes and digital displays for accurate results.

Placement and Use: Before use, clean the probe shaft with the supplied green pad to remove any oxides from the metal surface, then wipe from tip toward the body. Gently break up and crumble the soil at the measurement site, then insert the probe vertically to root level. Never force the meter into compacted soil. For readings, press the power button and insert the probe into the following areas as directed below.

Record moisture and pH readings at three marked (flagged) points in each bed: one at the center and one at each end, one end adjacent to a rain barrel and the other without. This helps determine whether moisture and/or pH levels vary along the bed based on proximity to the primary watering source.

After recording individual results, calculate the average across three spots per bed and log the data in the tracking sheet (then transfer to the digital record). Always record to one decimal place (e.g., pH = 7.2) for consistency.

Troubleshooting: Erratic readings may occur if stones or organic matter touch the electrode, or if the probe is placed too close to bed edges or drip tape. If there is no response, the probe may need cleaning, the soil may be too dry, or the probe may be damaged.

Analysis: When reviewing results, consider soil type, drainage, and recent weather conditions to better understand moisture retention and overall soil health.

When to record measurements?

Check soil moisture and pH:

- Twice per week during the growing season (preferably on the same day each week)

Optional recordings

- After heavy rainfall or irrigation to monitor changes
- Before planting new crops and after harvest to track seasonal soil changes

This approach balances accuracy with the capacity of a volunteer-led team.

Pest Presence & Impact Monitoring:

Why measure pest presence and impact?

Measuring pest presence and impact is important because it enables early detection of potential threats to plants, allowing for timely and effective management before significant damage occurs. Tracking pest presence and behavior helps Ecosource gardeners understand pest patterns, assess the effectiveness of control methods, and adapt strategies to changing environmental conditions, ultimately protecting plant health and maximizing crop yields.

How to track pest presence and impact?

Tool: Tracking Sheet and Pen

Guidelines: Record the date, location, type of pest, and visible plant damage. Note additional details such as plant health, recent weather, and any actions taken (e.g., removal or treatment). If you observe a species not yet listed in the Iceland Teaching Garden Pest

Management Library, add it to the collection to expand records of pest activity at the garden. Regular tracking supports pattern recognition, severity assessment, and informed prevention and management strategies.

Qualitative Observations: Should be written clearly and legibly so that anyone reading can interpret them. Be descriptive yet concise, focusing on details that capture the condition without unnecessary wording

When to record measurements?

Monitor pest activity:

- Once per week during the growing season
- After significant temperature changes or shifts in humidity (can trigger outbreaks)
- When new plant growth appears (tender leaves are more vulnerable and susceptible to pest damage)
- Immediately after noticing signs of damage (holes in leaves, discoloration)
- At the start and end of each major crop cycle to compare pest pressure

This approach balances accuracy with the capacity of a volunteer-led team.

Iceland Teaching Garden Pest Management Library

The library includes the following species:

- Cabbage Lopper
- Colorado Potato Beetle
- Harvestmen
- Squash Bug
- Spotted Lady Beetle
- Japanese Beetle
- Cucumber Beetle

Supplementary Monitoring Metrics:

Beyond the core metrics, the Iceland Teaching Garden tracks important data such as harvest yields and crop rotation practices. At the Iceland Teaching Garden, yields are recorded for each specific type of vegetable and fruit harvested. This detailed tracking allows for assessment of productivity, identification of trends over time, and evaluation of crop performance under varying conditions. Crop rotation plays a crucial role in nutrient recycling and soil balance. By rotating crops from different plant families, the garden replenishes

essential nutrients, prevents soil depletion, and reduces pest and disease buildup. These practices support soil health and promote sustainable, long-term productivity. Additionally, crop selections and rotations are thoughtfully designed to reflect the diverse cultural communities in Mississauga. Ecosource prioritizes growing vegetables and fruits that are culturally significant to local residents. Collecting data on crop rotation alongside yields informs planting strategies, improves nutrient management, and celebrates community heritage through culturally meaningful crops.

Example Tracking Logs:

Example Water Availability & Rainfall Level Tracking Log:

Date:		
Rainfall Levels (mm)		
Precipitation (mm)	**Notes (e.g., weather conditions, flooding, etc):**	**Recorder Initials:**
10.2 mm	N/A	SP.

Example Soil Health - Moisture & pH Level Tracking Log:

Date:								
	Moisture Reading				**pH Reading**			
Bed Number:	**Rain Barrel**	**Middle**	**End**	**Average**	**Rain Barrel**	**Middle**	**.....**	**Recorder Initials:**
12 – Garlic					6.7	6.8		SP.

Example Pest Presence & Impact Monitoring Tracking Log:

Date:				
Bed Number:	**Pest Observed (e.g., species):**	**Plant Damage (e.g., holes, discoloration):**	**Suggested Action (e.g., neem spray, etc):**	**Recorder Initials:**

1 – Eggplant	Colorado Potato Beetle	Holes in leaves.	Remove insects by hand.	SP.

Smart Tips for Tracking & Monitoring the Garden:

Whether it's your first time tracking garden data or you've been volunteering for a while, using good habits makes a big difference. Here are some helpful tips to keep in mind:

- Be accurate: When taking measurements (like soil moisture), double check your readings to make sure they're correct.
- Write clearly: Jot down your data in neat, easy to read handwriting or use a digital tool if that's what your group prefers.
- Label everything: Always include the date, time, and what you're measuring. This helps everyone stay organized and makes comparing data easier later on.
- Stay consistent: Try to measure things the same way every time. For example, always measure from the base of the plant to the top, and do it around the same time of day.
- Take photos: If possible, take pictures of the garden or specific plants to go along with your notes. This adds helpful visual info!
- Watch for patterns: Over time, the data you collect will start to show trends, like which plants grow fastest or when pests usually appear. This helps with future planning and problem solving.
- Work as a team: Tracking is a group effort! Share your observations and talk about what the data might mean. Everyone sees different things.
- Bonus Tip: Don't stress about being perfect! Mistakes happen, and it's all part of learning how to monitor a garden like a pro.

Next Steps for Implementation:

As the first toolkit of its kind at Ecosource, the initial year of tracking will act as a pilot phase to test and refine recommendations based on real world use. Following this, Ecosource staff may revise the toolkit to improve usability and impact.

The next stage will focus on analyzing the collected data. A supplementary resource will be developed to guide this process, offering direction on review frequency, interpretation of results, and turning insights into meaningful strategies that strengthen climate resilience in urban agriculture over time.