Learning and valuing urban trees through citizen science

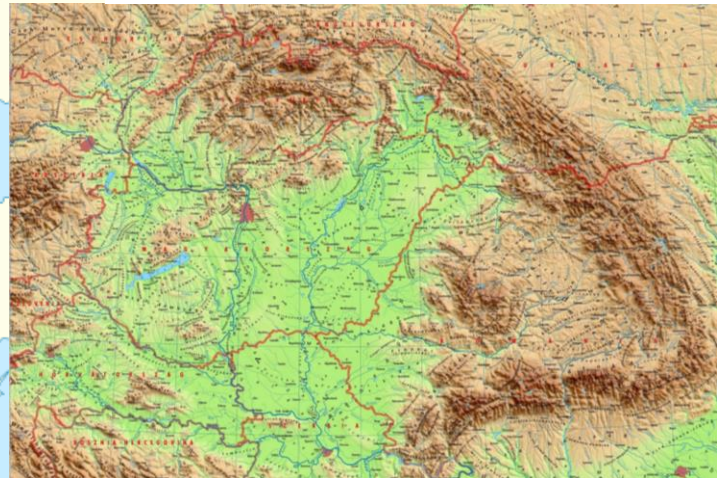
Natalya Voloshyn, FORZA, Ukraine

Steps Forward - New Approaches to ESD in the Carpathians and Beyond
Educational festival
Kosice, 12-14 November 2024

Co-funded by the European Union

NGO FORZA: Who we are and where we work

- Non-governmental non-profit organization, founded in 2009 to preserve the legacy of the Swiss-Ukrainian Forest Development Project in Zakarpattya, FORZA (2004-2010).
- Main territorial focus of interventions: forests and communities of Carpathian mountains, otherwise the whole territory of Ukraine.



PEOPLE

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WHAT WE DO

- Local economic development
- Sustainable urban mobility
- Nature-based solutions

- Multifuctional forest management and close-to-nature silviculture
- Climate change adaptation

- Forest pedagogics
- Lifelong learning for forestry practitioners
- Women in forestry

CLOSE TO NATURE – CLOSE TO PEOPLE

The sequence of appearance

- We learned about forest pedagogics at around 2012 from our colleagues from NLC, Zvolen, when working on “Foresters towards life long learning for better forest management” HU-SK-RO-UA project (2012-2014).
- In 2014 we started a joint NO-SK-UA project FORSOC: “Forests for the society – forests without barriers” aimed at unfolding of cultural and social potential of forest resources, as well as at the increase of knowledge about forests and all their values and products and deepen the understanding of nature, especially among the youth, where a group of Ukrainian foresters and school teachers as well as extra-curriculum activities pedagogs were trained as Forest Guides.

Co-funded by the European Union

The sequence of appearance

- Since that time, we practice Forest pedagogics tools and approaches among Ukrainian children, looking for new ideas and tools to enrich the experience of connection to nature.
- Once we heard of iTree – the tool to inventory and assess ecosystem values of both alone standing trees and green areas. We decided we want to try this tool in Ukraine and became a partner in “iTree4UA” project, funded by the USFS.
- One of our current HORIZON EUROPE projects **RURACTIVE** is aimed at social innovations, including tools for community participation, climate adaptation and mitigation, ecosystem services management.

DAVEY

Co-funded by
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Once we learned about iTree

Aim: to scientifically and number-based prove the high value of quality urban green for the comfort of the citizens and the way to combat the effects of climate change

The challenge we faced in Uzhhorod

- absence of a transparent and participatory system of urban green management
- lack of cooperation among the municipality and civil society experts around urban green management
- loss of trees → all the negative consequences

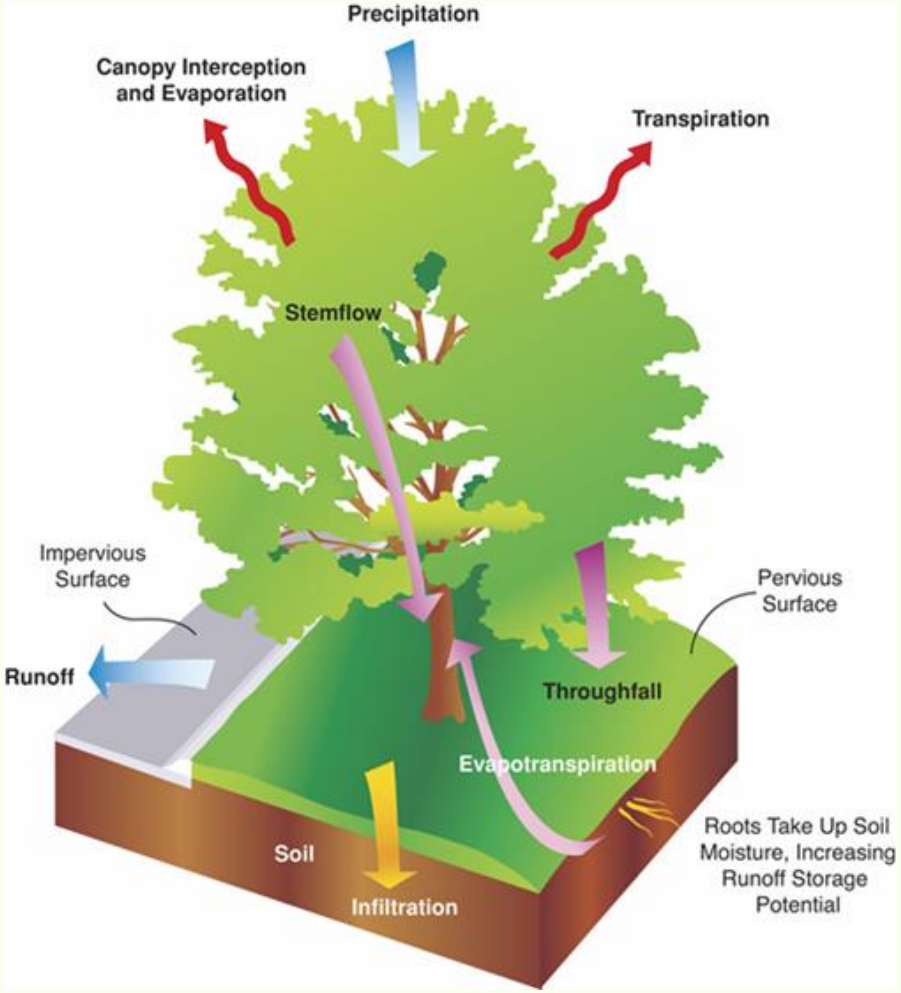
What are the benefits of trees?

- Carbon sequestration
- Carbon storage
- Oxygen production
- Erosion Control
- Aesthetics
- Energy Conservation
- Storm Water Interception
- Pollution Control
- Quality of Life

DAVEY

Tree Benefit: Stormwater reduction

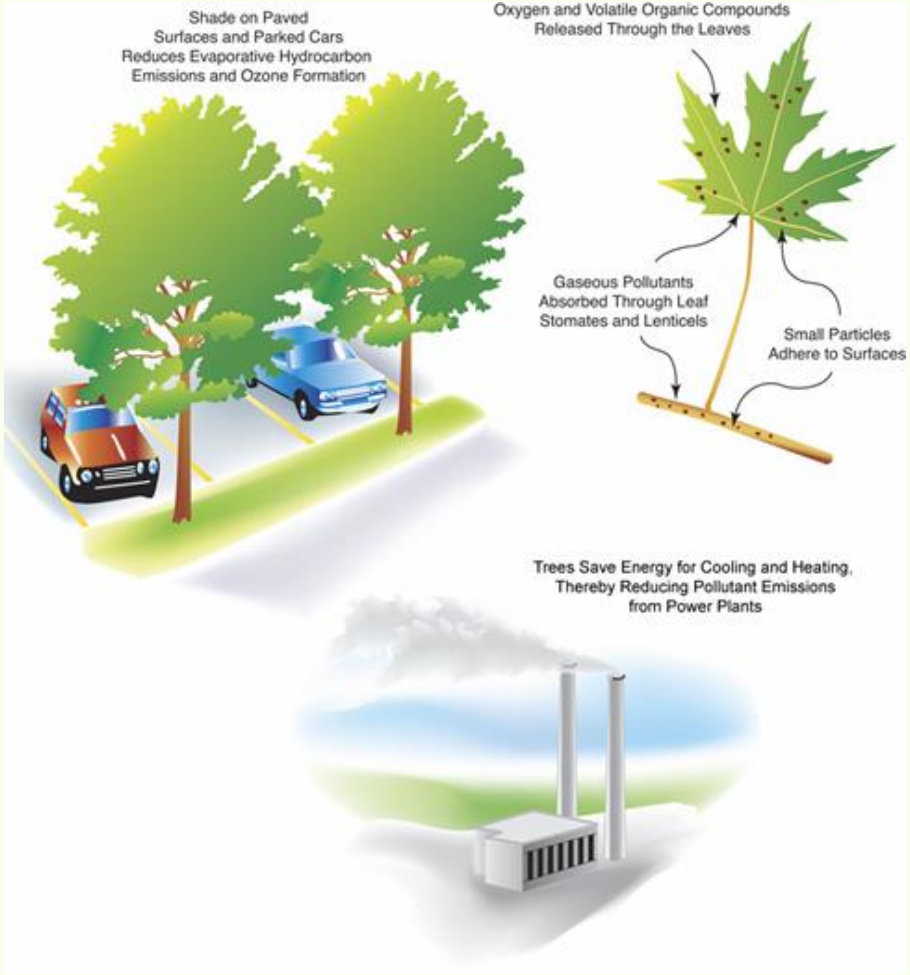
- Intercepts and holds rain on leaves, branches, and other surfaces
- Reduces stormwater runoff
- Increases water storage in soil
- Reduces erosion



DAVEY

Tree Benefit:
Improve air quality

- Absorb pollutants through leaf surfaces
  - O_3 (ozone)
  - NO_2 (nitrogen dioxide)
  - SO_2 (sulfur dioxide)
- Intercept dust and/or particulate matter (PM10 and PM2.5)
- Reduction in **energy** production needs reduces creation of many pollutants
- Release oxygen



DAVEY

Tree Benefit:
Reduce Carbon Dioxide CO_2

- Trees are largely made of carbon so they take carbon out of the air and turn it into tissue (bark, leaves, wood, etc.)
- Tree reduce home **energy** needs and help avoid carbon released from power plants in the first place (*Secondary benefit or avoided*)

DAVEY

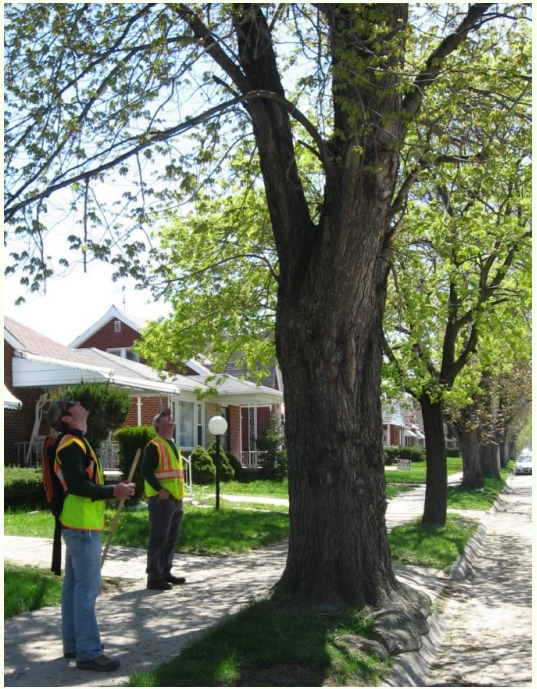
Tree Benefit: Energy Effects

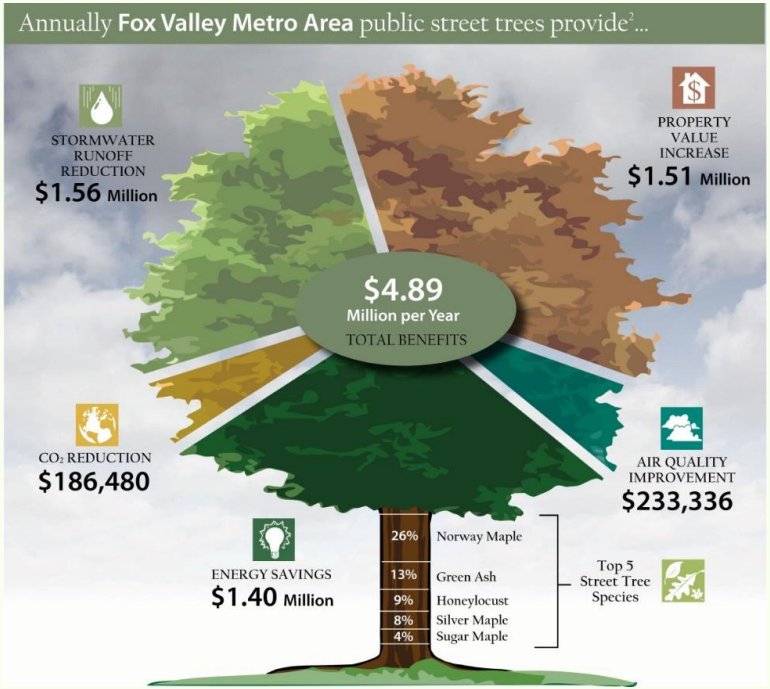
- Trees shade buildings an built surfaces (summer)
- Act as a wind break reducing heat loss in (winter)

- Trees cool the air – (climate effect)
- Reduce energy demand at power generation source (*Secondary benefit or avoided negative impacts*)

DAVEY

i-Tree: Demonstrating Tree Value





DAVEY

The Basic Science: data collection

- **Basic field data:**

Tree specie

DBH

- **Other recommended field data needed to estimate ecosystem services:**

Crown dieback (%)

Total tree height

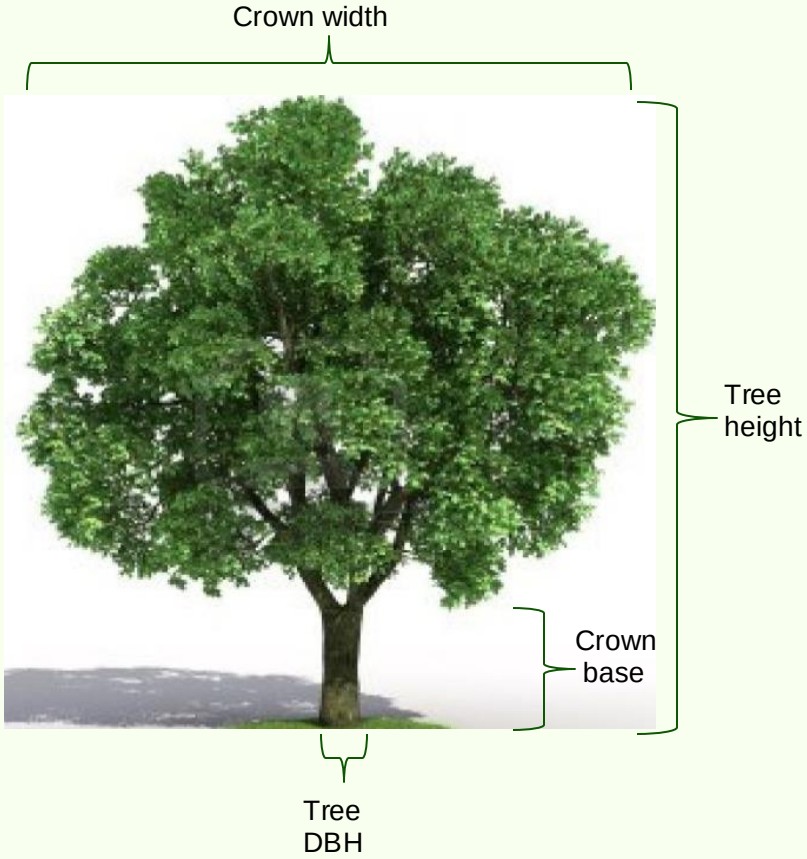
Crown top height

Crown base height

Crown width (N/S, E/W)

Crown missing (%)

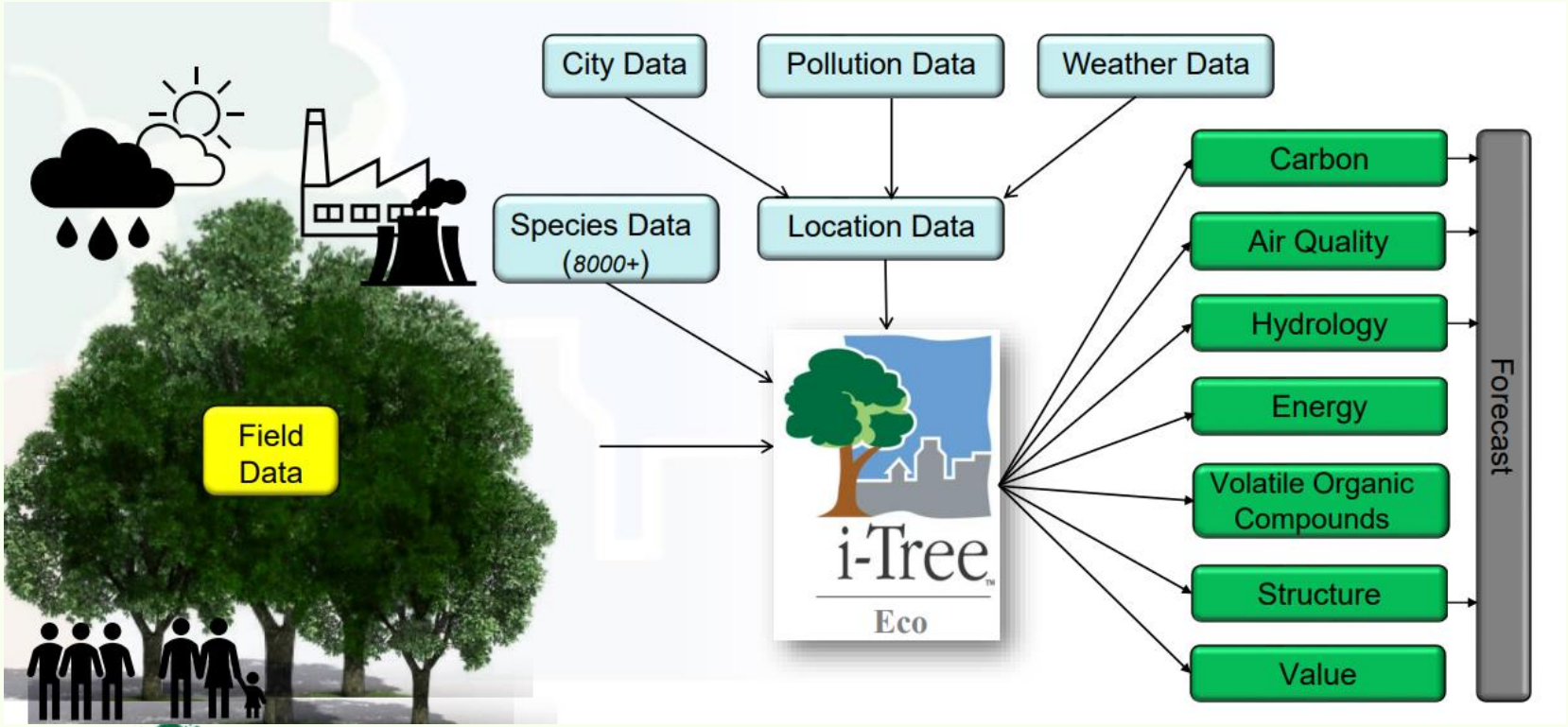
Crown light exposure (1-5 sides)



DAVEY

www.itreetools.org/resources/archives.php

i-Tree Eco Model Schematic



DAVEY

www.itreetools.org/resources/archives.php

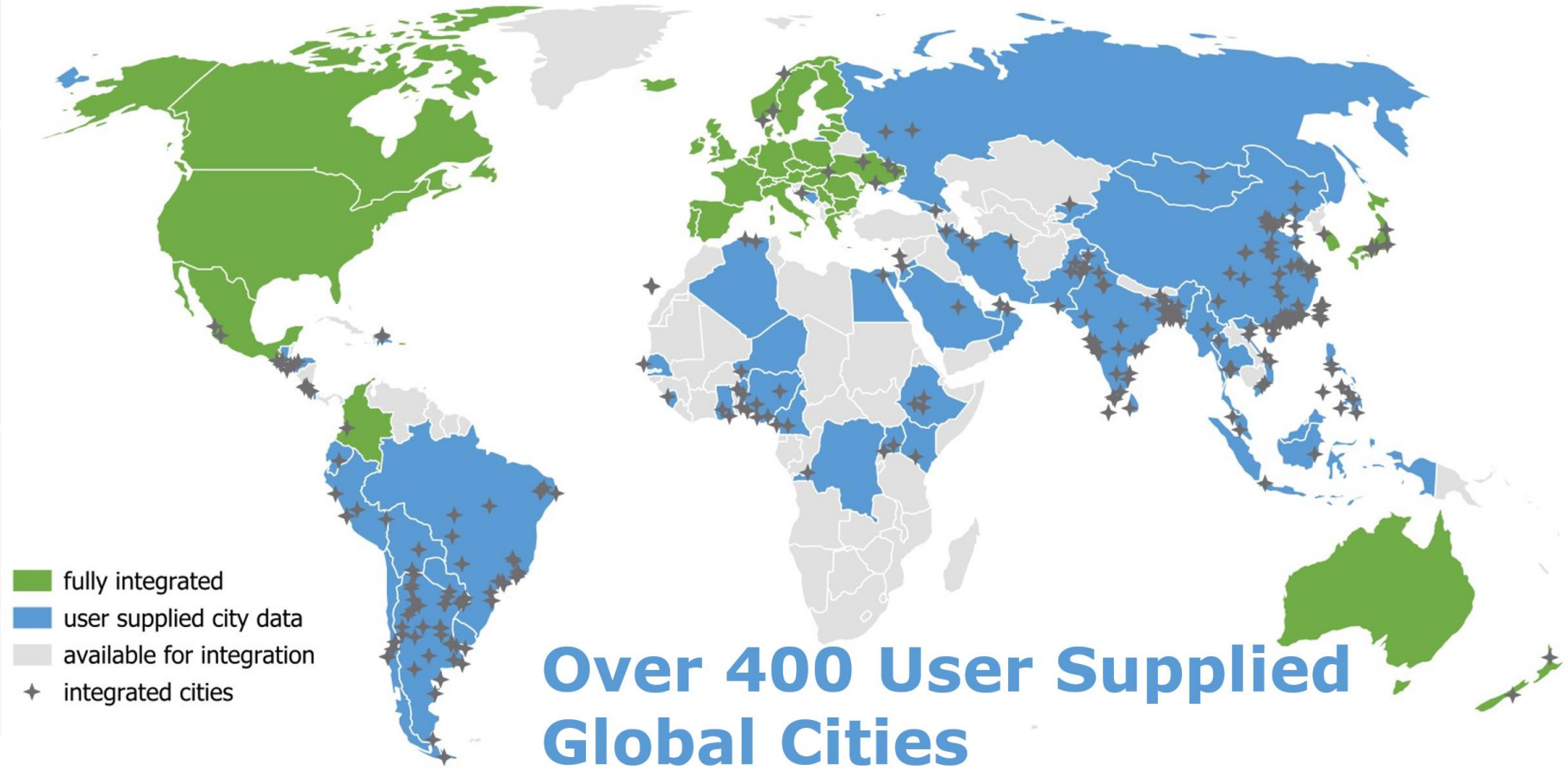
What is citizen science?

Citizen science (similar to **community science**, **crowd science**, **crowd-sourced science**, **civic science**, **participatory monitoring**, or **volunteer monitoring**) is research conducted with participation from the general public, or amateur/nonprofessional researchers or participants for science, social science and many other disciplines.

Citizen science is used in a wide range of areas of study including ecology, biology and conservation, health and medical research, astronomy, media and communications and information science.[1]

Participation in citizen science projects also educates the public about different specific topics.

i-Tree Eco our flagship tool: Available in more places



Help

Data > Inventory Data > Trees
February 2022

The Eco species list has been updated to remove synonyms and cultivars

If there are species in this project that are no longer on the Eco species list there will be exclamation symbols indicating those cells. To correct the unmatched species, click on the Check Data button at the top of the window.

For more information concerning this change go here:
https://forums.itreetools.org/viewtopic.php?f=19&t=6486

The **Trees** table seen in the action panel to the right displays the tree data that you collected in the field (see Notes below). This is where you will enter your tree data manually or edit your previously added or imported data. While working in this table, you may use the tools in the **Actions** group to help manually enter new data or edit data that has already been added.

Steps to Manually Add/Edit Data:
1. Click in the box where you would like to enter data and begin typing.
2. Use the Tab key on your keyboard or the left and right arrows to move from side to side within a record.
3. Use the up and down arrows on the keyboard to move from top to bottom between records.
4. For boxes that contain drop-down lists, you can choose your data from the list or begin typing and the matching label will be automatically filled in.
5. For boxes where dates are entered, a calendar pop-up will appear if you click on the calendar icon in the right-hand side of the cell. Select the date from the calendar. Click the header at the top of the pop-up to see other available months. Click the header again to see additional available years.

Steps for Using Actions Tools:
1. When you click on the **Trees** function, the **Actions** group will become available in the ribbon.
2. Use the **New** tool to create a new record in the tree table.
3. Use the **Delete** tool to remove the selected record(s) from the table.

Notes:
- Taxonomic classes (i.e., Magnoliopsida, Pinopsida, Ginkgoopsida, Liliopsida, Filicopsida, Cycadopsida) should be used sparingly when identifying the species of live trees. These classes can be used to represent the more generic classifications. However, species data is important to the calculation of ecosystem services – more specific species identification provides better model estimates.
- If you have imported your data from the mobile data collector using the **Retrieve from Mobile** function of the **Data** tab, you will see all of the imported field data for your project here.
- If you opened a project or are working with data that was previously entered, you will see all of the field data for your project here.
- Some data fields are defined on the **Project Configuration** tab. If you do not see the options you want from the drop-down list for a certain data field, you will need to go back to the **Project Configuration** tab to edit the list of options for that data field.
- Use the **CSV** function in the ribbon to export the tree data here to a "comma separated values" (csv) file. Data exported as a csv file are compatible with Microsoft Excel and text editors such as WordPad and Notepad.
- If you recorded the GPS coordinates (latitude and longitude) of each tree during field data collection, you will be able to make use of Eco's **KML**

Data > Inventory Data > Trees

ID	Crew	Survey Date	Status	Species	Land Use	Photo ID	DBH 1 (in)	DBH 1: Height (ft)	DBH 1: Measured?	DBH 2 (in)	DBH 2: Height (ft)	DBH 2: Measured?	DBH 3 (in)	DBH 3 Height
1	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Norway maple (Acer platanoides)	Park		31,0	4,26	☑			☑		
2	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Norway maple (Acer platanoides)	Park		1,3	4,26	☑			☑		
3	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Littleleaf linden (Tilia cordata)	Park		9,1	4,26	☑			☑		
4	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Norway maple (Acer platanoides)	Park		1,3	4,26	☑			☑		
5	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Littleleaf linden (Tilia cordata)	Park		11,0	4,26	☑			☑		
6	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		10,7	4,26	☑			☑		
7	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Scots pine (Pinus sylvestris)	Park		16,0	4,26	☑			☑		
8	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Ash-leaved maple (Acer negundo ssp. negundo)	Park		10,3	4,26	☑			☑		
9	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		13,8	4,26	☑			☑		
10	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		17,8	4,26	☑			☑		
11	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		14,0	4,26	☑			☑		
12	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Norway maple (Acer platanoides)	Park		1,3	4,26	☑			☑		
13	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Royal paulownia (Paulownia tomentosa)	Park		1,5	4,26	☑			☑		
14	ARR Zakarpattya	08.07.2022 0:00:00	Planted	Green ash (Fraxinus pennsylvanica)	Park		16,4	4,26	☑			☑		
15	Team 2	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		13,8	4,26	☑			☑		
16	Team 2	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		15,6	4,26	☑			☑		
17	Team 2	08.07.2022 0:00:00	Planted	Green ash (Fraxinus pennsylvanica)	Park		19,4	4,26	☑			☑		
18	Team 2	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		18,8	4,26	☑			☑		
19	Team 2	08.07.2022 0:00:00	Planted	Norway maple (Acer platanoides)	Park		32,6	4,26	☑			☑		
20	Team 2	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		11,7	4,26	☑			☑		
21	Team 2	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		13,4	4,26	☑			☑		
22	Team 2	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		22,1	4,26	☑			☑		
23	Team 2	08.07.2022 0:00:00	Planted	Chinese catalpa (Catalpa ovata)	Park		10,7	4,26	☑			☑		
24	Team 2	08.07.2022 0:00:00	Planted	Littleleaf linden (Tilia cordata)	Park		23,1	4,26	☑			☑		
25	Team 2	08.07.2022 0:00:00	Planted	Chinese catalpa (Catalpa ovata)	Park		14,0	4,26	☑			☑		
26	Team 3	08.07.2022 0:00:00	Planted	Green ash (Fraxinus pennsylvanica)	Park		22,6	4,26	☑			☑		
27	Team 3	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		19,4	4,26	☑			☑		
28	Team 3	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		23,8	4,26	☑			☑		
29	Team 3	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		15,7	4,26	☑			☑		
30	Team 3	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		21,9	4,26	☑			☑		
31	Team 3	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		28,2	4,26	☑			☑		
32	Team 3	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		20,7	4,26	☑			☑		
33	Team 3	08.07.2022 0:00:00	Planted	Horse chestnut (Aesculus hippocastanum)	Park		26,3	4,26	☑			☑		
34	Team 3	08.07.2022 0:00:00	Planted	Chinese catalpa (Catalpa ovata)	Park		16,6	4,26	☑			☑		
35	Team 3	08.07.2022 0:00:00	Planted	English oak (Quercus robur)	Park		29,5	4,26	☑			☑		

iTree Eco practical usage

Process

Participatory tree measuring and assessment (inventory) with volunteers: school children and teachers, youth, internal migrants:
A. Rotary (2 steps, up to 3 hours each), 189 trees, 1,7 ha
B. School No.6 in Uzhhorod, 30 trees (2 hours)
C. Beginning of London plane alley, 5 trees (1 hour)

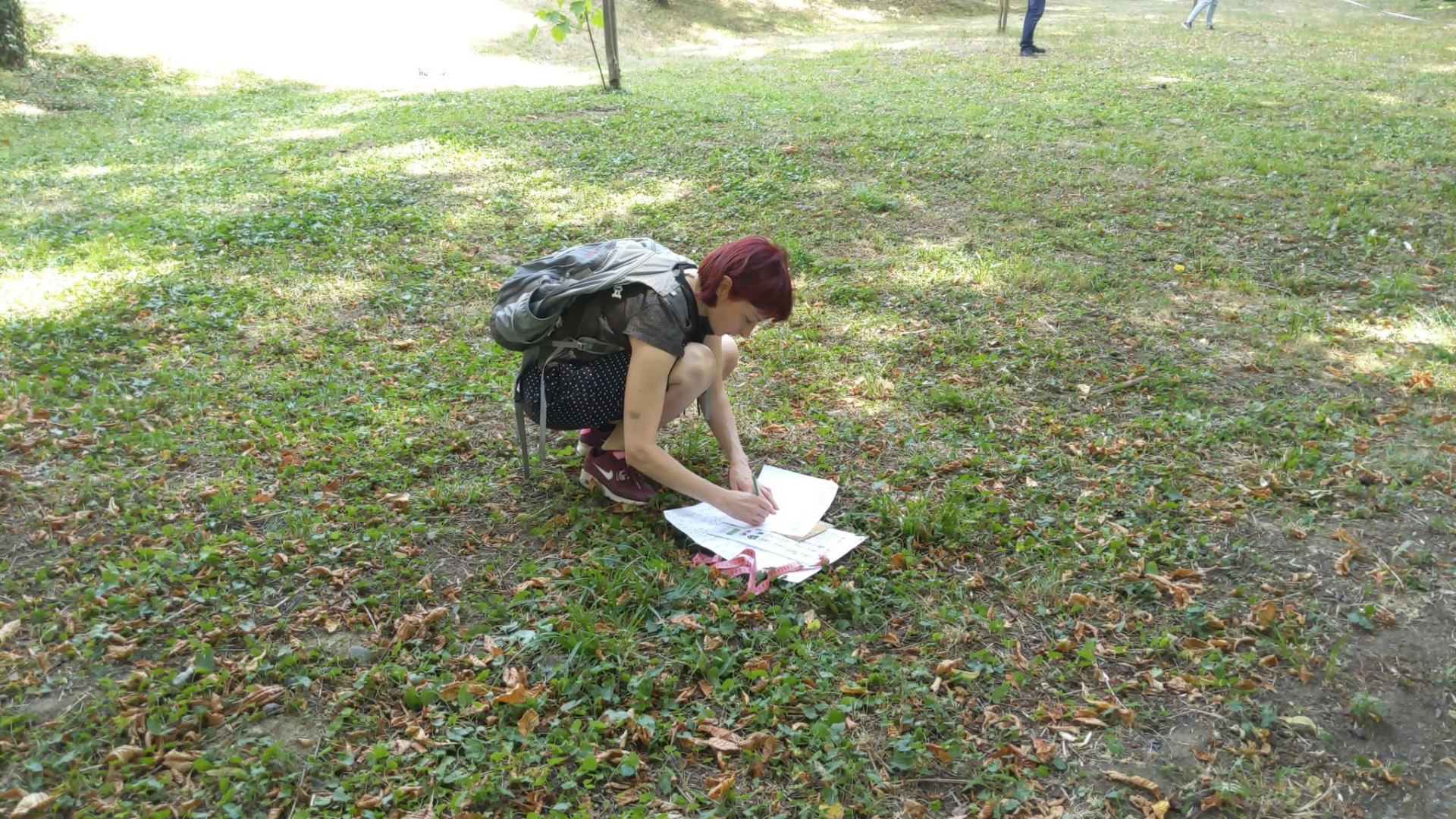
Easy measurement of tree parameters as per instructions, provided by iTree developers

iTree Eco software calculates the value of the trees (inc. monetary) based on calculations of each ecosystem service

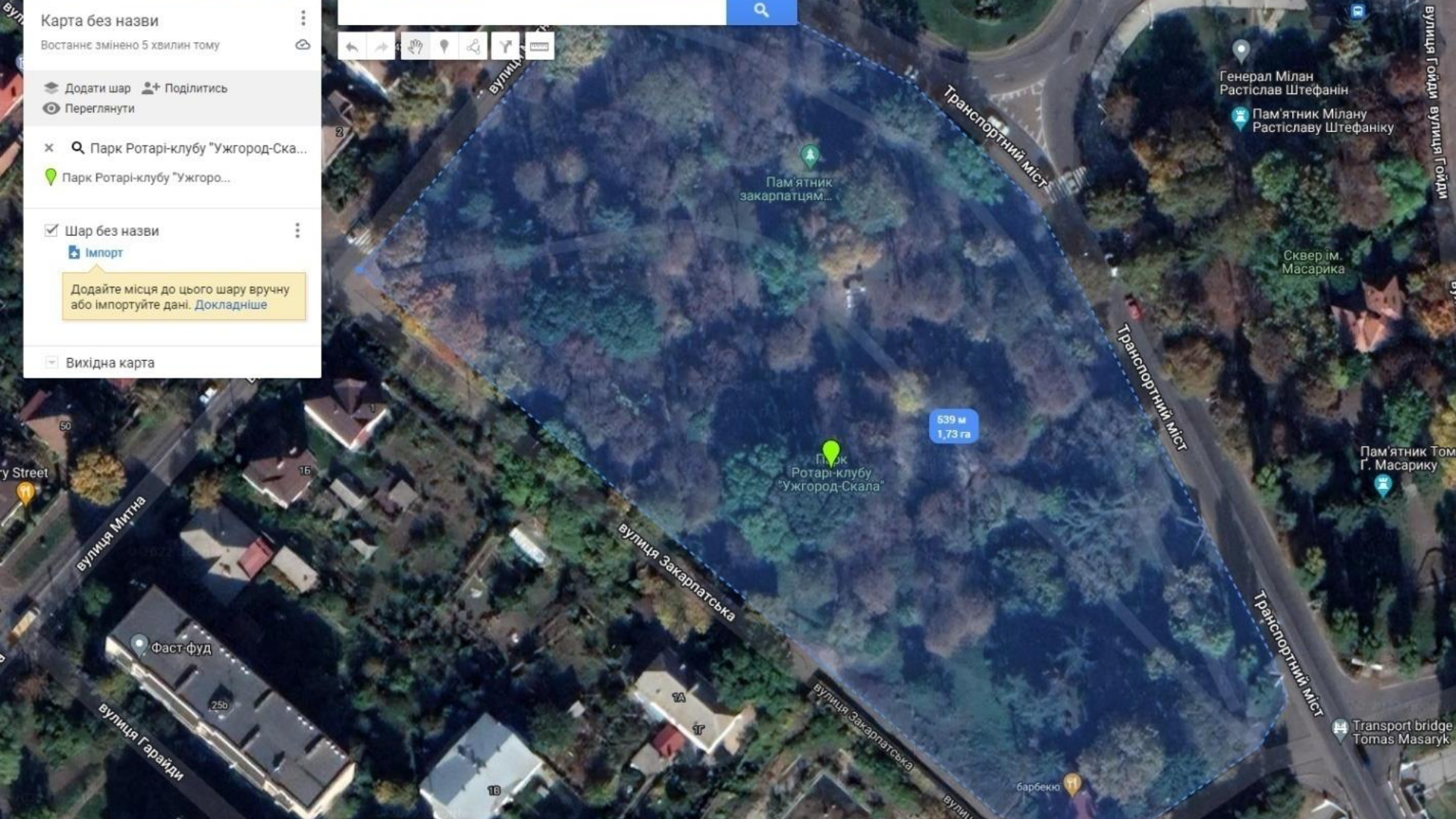
iTree Eco practical usage

Results

- Participation of people in the process of tree inventory.
- Communication of tree benefits to local inhabitants.
- Report for the ecosystem services numerical and monetary values for each individual tree and group/groups of trees.
- Forecast for future development of the green area.
- Tree tags, communicating tree benefits to the public.
- Increased understanding of the role, benefits and values of urban trees and green areas.




STAR
WARS


Карта без назви
Востаннє змінено 5 хвилин тому
Додати шар
Поділитись
Переглянути
Парк Ротарі-клубу "Ужгород-Ска...
Парк Ротарі-клубу "Ужгоро...
Шар без назви
Імпорт
Додайте місця до цього шару вручну або імпортуйте дані. Докладніше
Вихідна карта
Транспортний міст
Пам'ятник закарпатцям...
Генерал Мілан Растіслав Штефанін
Пам'ятник Мілану Растіславу Штефаніку
Сквер ім. Масарика
Пам'ятник Т. Г. Масарику
539 м
1,73 га
Парк Ротарі-клубу "Ужгород-Скала"
вулиця Митна
вулиця Закарпатська
вулиця Гойди
вулиця Гарайди
Фаст-фуд
барбекю
Transport bridge Tomas Masaryk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DAVEY

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