Connecting Nature

Adam Mickiewicz University Poznań

POZnań

Monitoring and Assessment of NBSs Impact - Experiences from Poznań

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Bringing cities to life, **Bringing life into cities.**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730222

Data from city Spatial Information System & open repositories

1. **WebGIS Portals**
   - ✔ SIP Poznań (for Poland only) http://sip.geopoz.pl/sip/
   - ✔ Earth Explorer (USGS) Landsat 8 thermal satelite images (all countries) https://earthexplorer.usgs.gov/
2. **National, regional and local institutions managing spatial data:**
   - ✔ Polish Official Database of Topographical Objects (BDOT10k) (for Poland only)
3. **Copernicus Land Monitoring Service (EU Countries):**
   - ✔ Urban Atlas

   https://land.copernicus.eu/

   Copernicus Europe's eyes on Earth — Land Monitoring Service
4. **Google Maps (all countries)**

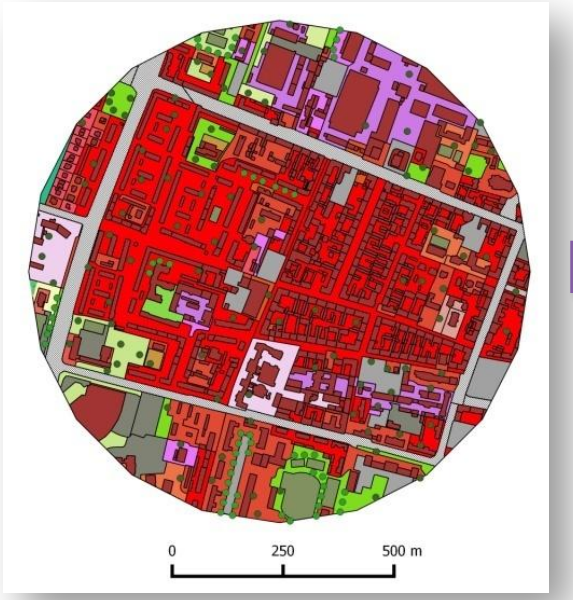
Public green space distribution
Green space area

- ✔ Site scale mapping od detail land cover including green spaces, e.g.:
  - ✔ street trees,
  - ✔ green walls,
  - ✔ lawns,
  - ✔ flowerbeds,
  - ✔ hedges,
- ✔ surface area [m2],
- ✔ surface cover type (UGF)

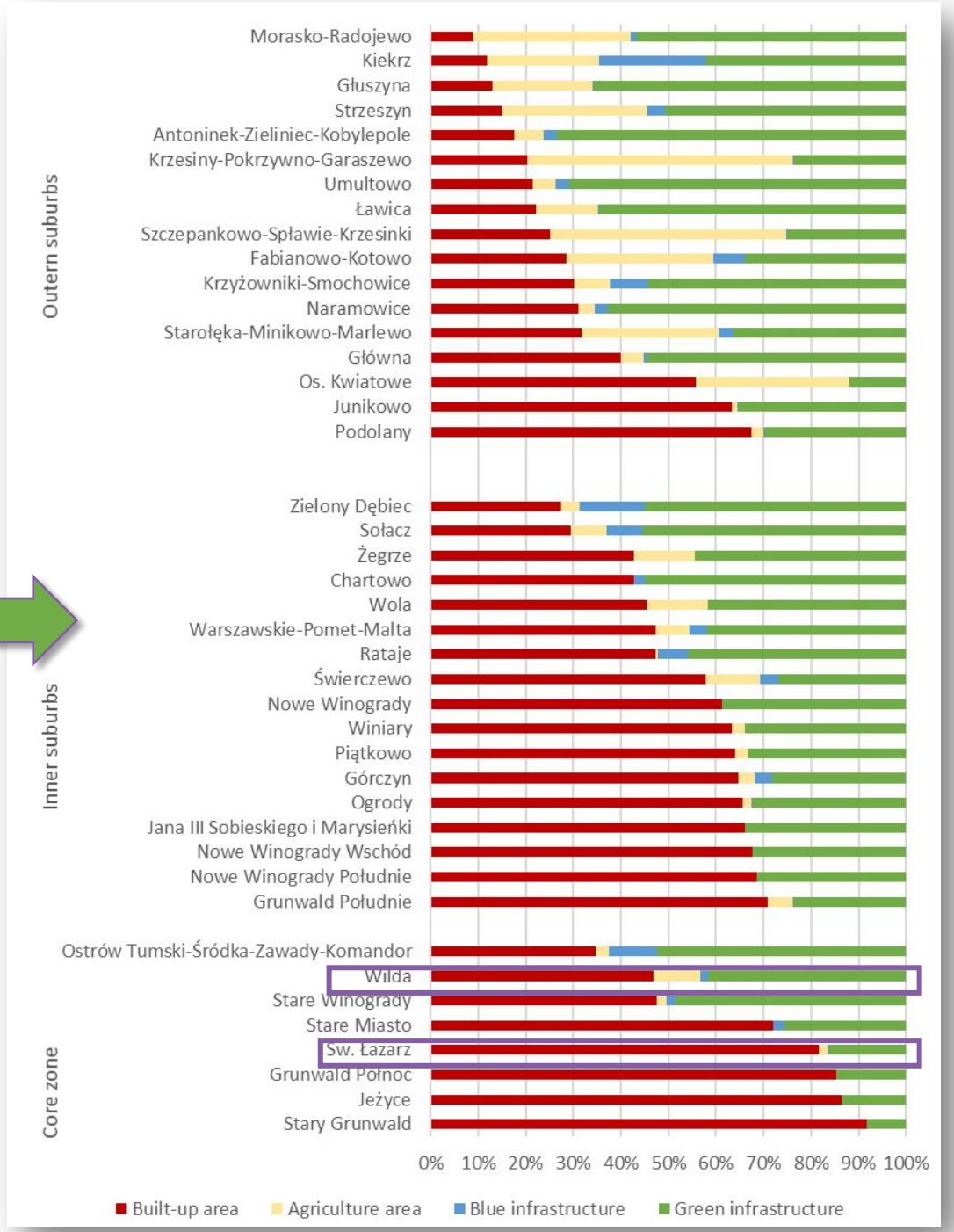
Site scale

City scale

Polish Official Database of Topographical Objects (BDOT10k)

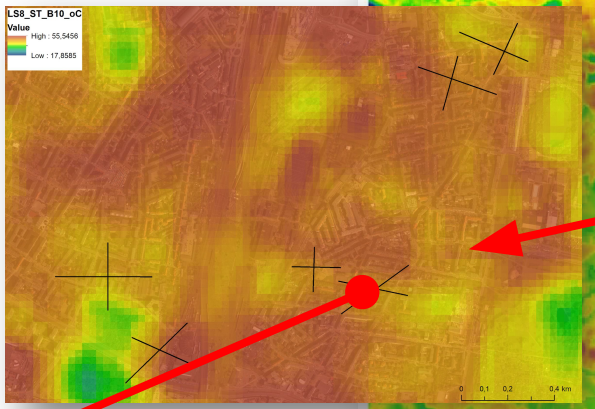


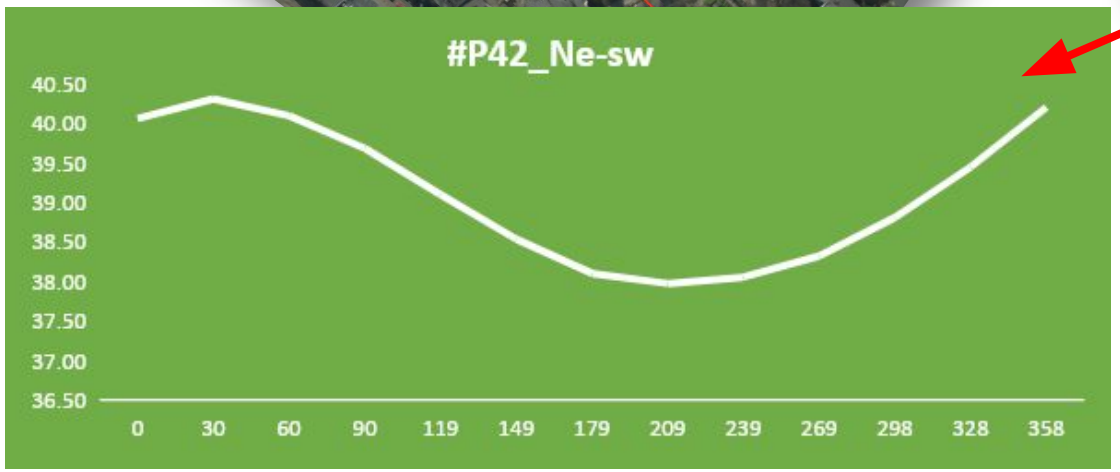
Geometric resolution 1:10 000
Minimum surface area of unit 0,1 ha*
* unless the specific rules provide otherwise

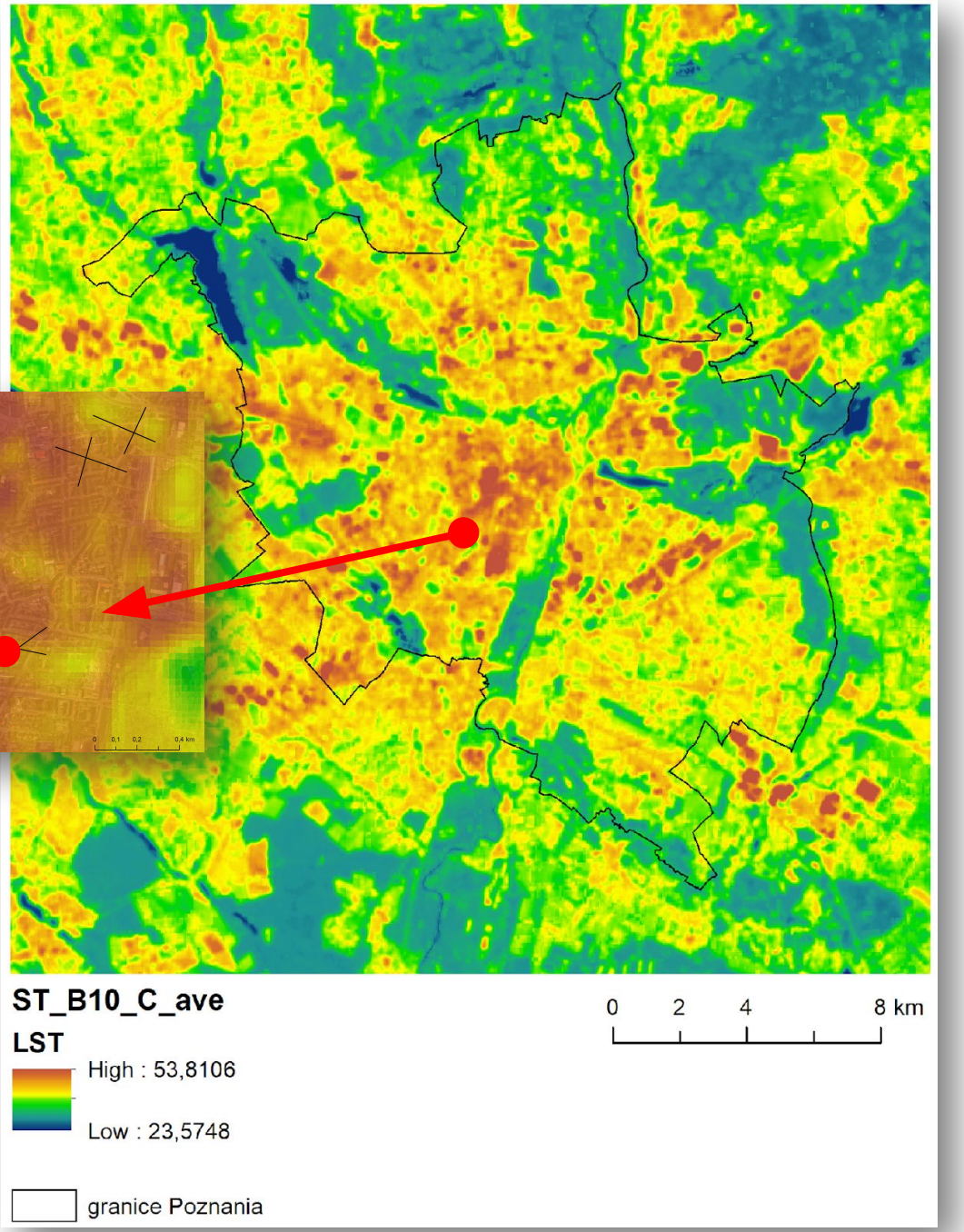


Average land surface temperature
City scale vs local scale

- ✔ mean = 34,5 °C
- ✔ min = 23,6 °C
- ✔ max = 53,8 °C
- ✔ range = 30,2 °C







Air temperature reduction & Tree shade for local heat reduction (site scale)

- ✔ Temperature differences show the impact of NBS design and scale of NBS impact,
- ✔ Measurement of the impact of tree shading on air temperature by comparing land surface temperature,
- ✔ Stationary meteorological stations (continuous 1 hour interval measurement),
- ✔ Temperature and humidity mobile sensors HOBO U23-001 (periodic measurement),

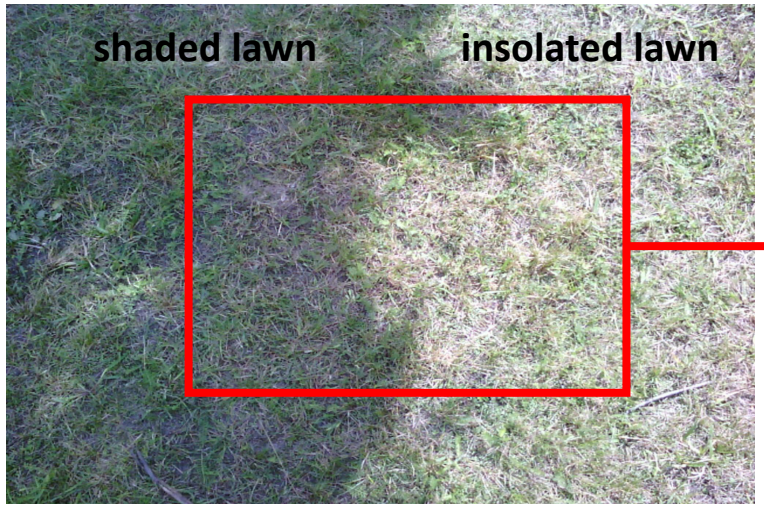
Testo 871 Thermal Camera

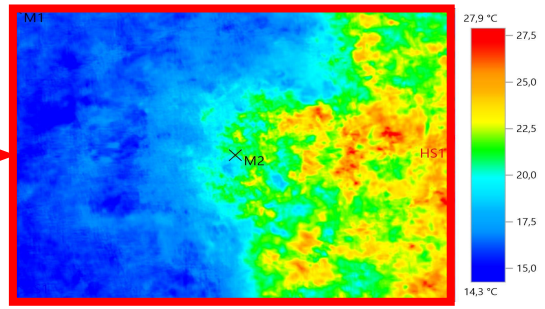
Air temperature and humidity sensor – HOBO U23-001

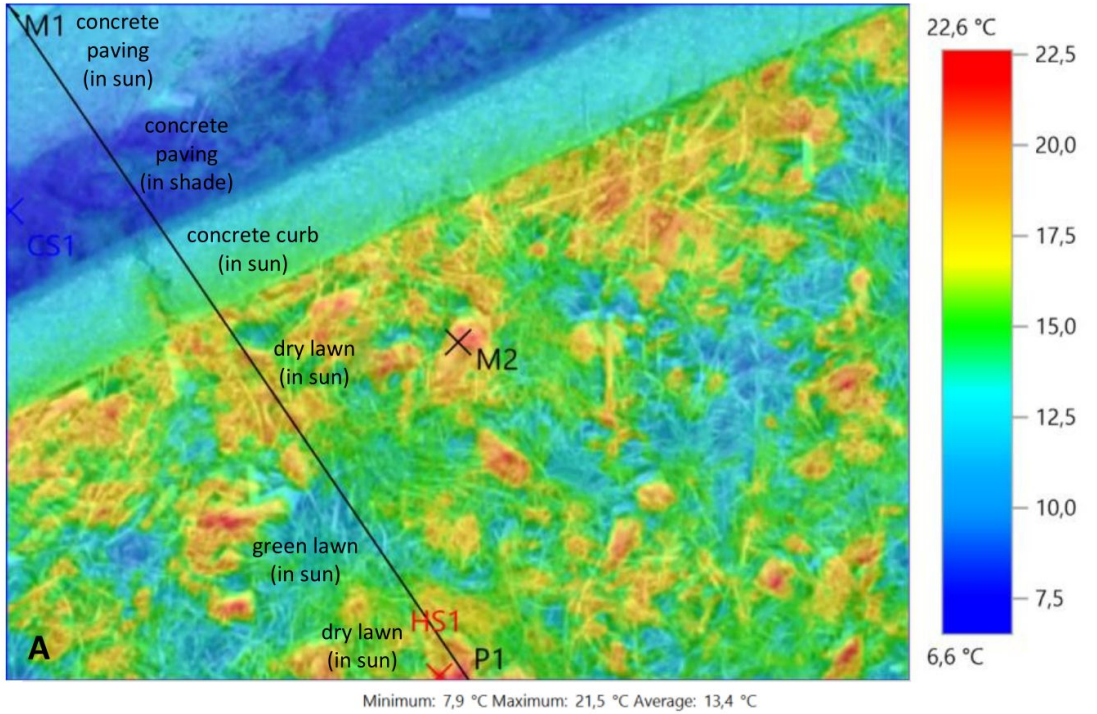
Meteorological station Davis Vantage Pro 2

Air temperature reduction & Tree shade for local heat reduction (site scale)

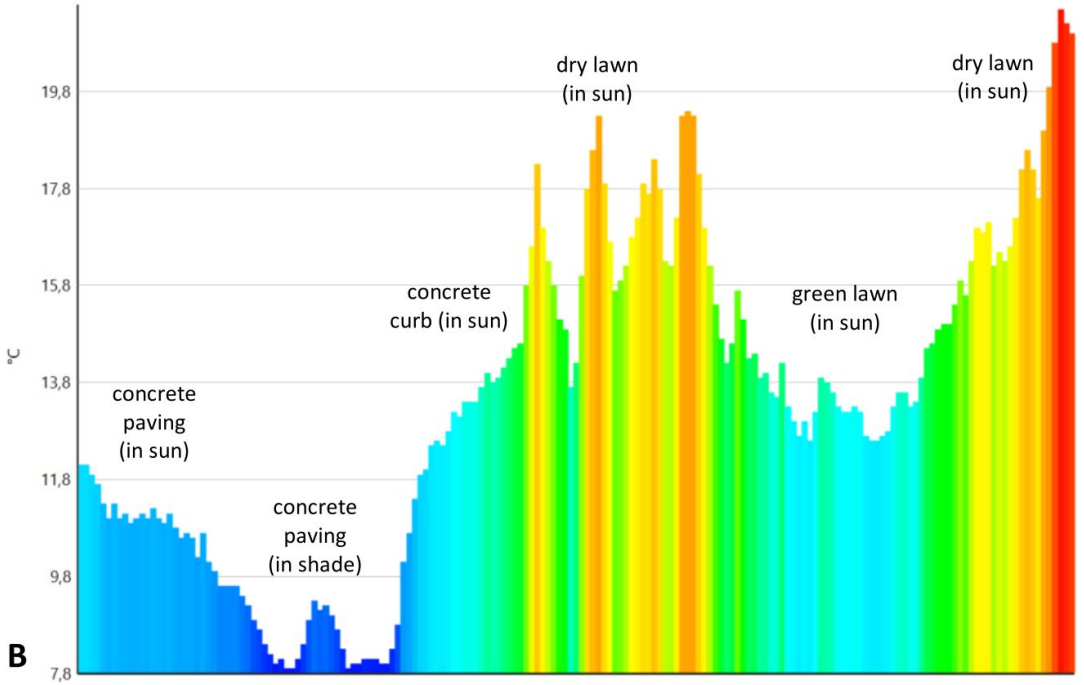
- ✔ Thermal camera to capture the distribution of land surface temperature on site





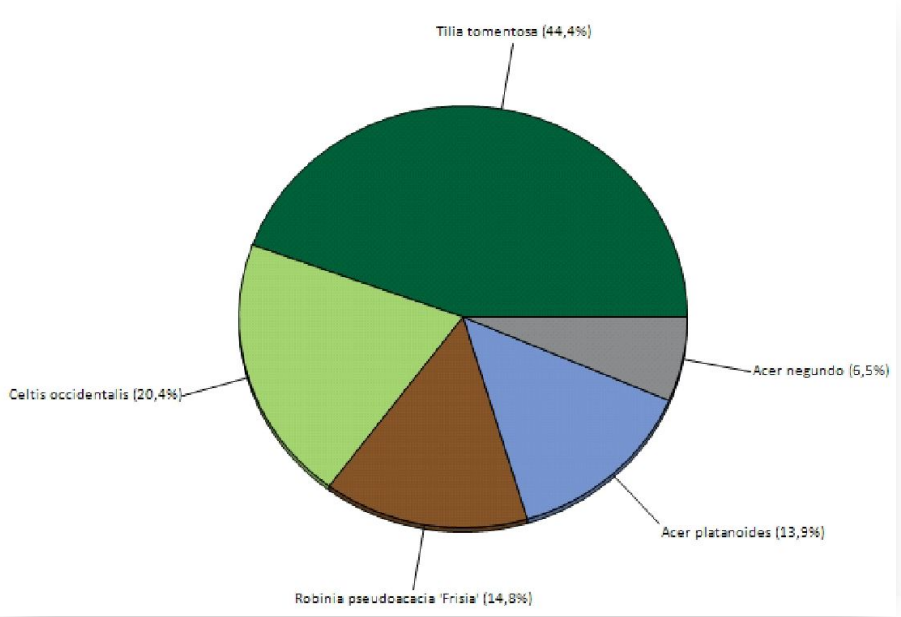


Minimum: 7,9 °C Maximum: 21,5 °C Average: 13,4 °C



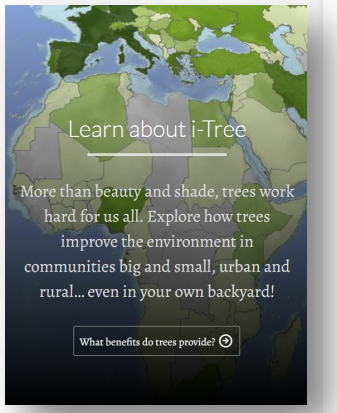
Change in ecosystem service provision (site scale)

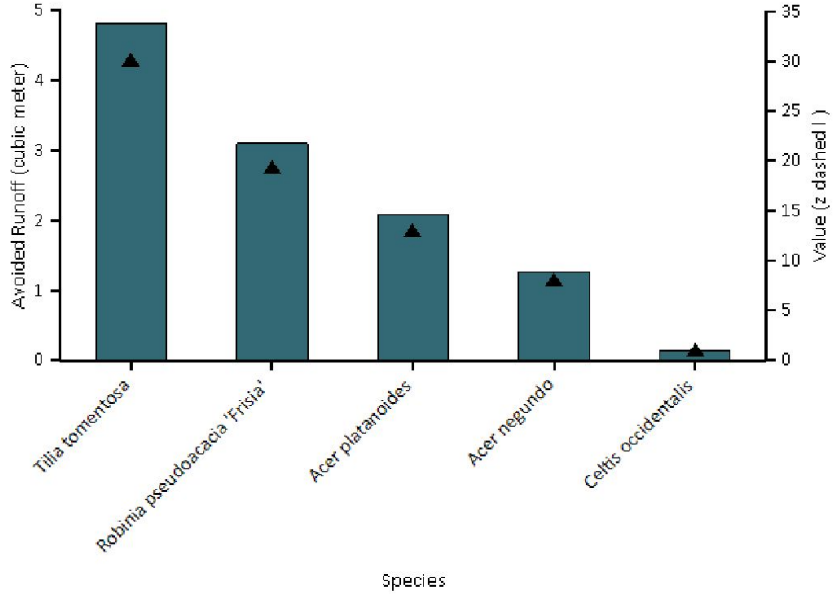
- Measurement of ecosystem services provided by trees in pocket park:
  - ✔ carbon storage and sequestration (**115,8 metric tons, 2,058 metric tons**)
  - ✔ oxygen production (**5,487 metric tons/year**)
  - ✔ avoided runoff (**10,08 cubic meters/year**)
  - ✔ air pollution removal (CO, NO_2, O_3, PM2.5, SO_2) (in progres)



Species	*Oxygen (metric ton)*	*Gross Carbon Sequestration (kilogram/yr)*	*Number of Trees*	*Leaf Area (hectare)*
Tilia tomentosa	2,74	1 027,35	48	0,89
Acer platanoides	1,75	657,60	15	0,38
Acer negundo	0,81	302,50	7	0,23
Celtis occidentalis	0,13	48,96	22	0,02
Robinia pseudoacacia 'Frisia'	0,06	21,30	16	0,57

Site scale Pilot assessment





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Thank you!

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