# **Urban Soils Basics Info Sheet**

A condensed quide to understanding soils in urban areas

Additional Urban Soils Resources found at Urbansoils.org

## What are (Urban) Soils?

Soils are the life-supporting layer of the earth - they make all terrestrial life possible. Another way of looking at it is that soils are a complex combination of earth materials (gravel, sand, silt & clay), organic matter, water, air, and organisms, providing the interface for nutrients to enter the roots of plants.

Urban soils are soils found in human-settled areas like cities, generally characterized as having been altered by anthropogenic (human-created) activities, such as land-use and development. They are separate from agricultural soils, that are typically used for farming, however urban soils can become agricultural soils.

# Why Does We Pluralize 'Soils'?

All soils are incredibly diverse in their composition across geographical areas, and especially urban soils. Urban soils are particularly heterogenous, acting as a 'sponge' for the unique land-use characteristics of a given area. Every parcel of urban soils is unique - there could be a dozen distinct types of urban soils on a single city block. As a result, we pluralize the term 'soils', to reflect their unique characteristics.

Soils Taxonomy

Soils are classified by the method in which they are formed; typically ending with the suffix -sol. Urban soils that contain significant amounts of artefacts from human influence are called technosols.

# Why Should You Care About Urban Soils?

## Carbon Capture



Over 95% of biomass comes from the atmosphere - soils take this carbon and store it. In fact, soils store more than 2x the amount of carbon than the atmosphere does. We can increase the amount of carbon that urban soils hold

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#### **Urban Farming**

Urban soils can provide us with some the food we need, right in our back yards. Produce grown in urban soils solves food insecurity, doesn't need to travel as far, and can be sold at affordable prices while creating local jobs



## Immune System Benefits

Exposure to healthy soil microorganisms during early childhood may significantly improve immune system function and reduce asthma risk, according to research from the University of Arizona College of Medicine1. 

#### Climate Adaptation

Urban soils are necessary for capturing stormwater (from rainfall) and greywater (from sinks & showers), which allows plants cool our environment. Cities are hotter than rural areas, but urban soils can make a big difference.



# Soils Characteristics & Significance

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Texture ·



**Nutrient Content** 



**Organic Content** 



Contamination



What Is It?

Characteristic

pH is the measure of how . acidic or alkaline soils are.

Soil texture refers to the percentage of a given soil is particle size classifications

nitrogen, phosphorus and potassium - the primary essential elements needed in of a given soil composed of and living organisms

Organic matter acts as a

'nutrient fund", enhances

naturally-occurring levels and environmental health risks. Typically measured in Parts Per Million (ppm), or mg/kg

Why Do I Need It? Determines the solubility of certain chemicals (good & Plants can only uptake nutrients that are soluble in typically in the 5.5-8 range.

ability to hold on to water, and its ability to retain nutrients. For most plants, a balanced optimal; but changes depending on intended use

Texture determines a soil's

Soils lacking in macronutrients and micronutrients do not be replenished through organic compost, fish meal, bone

meal, and others.

water storage capacity, allows soil to bind into aggregates, prevents erosion, and serves as a habitat for organisms. Soils ideally should contain 7Soils contaminants can make soils unsuitable for growth, and enter the groundwater. to soil contaminants can be classify as inorganic (metals like lead), or organic (hydrocarbons like gasoline)

How Do I Test It?

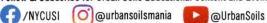
- Field pH soil probes (less precise)
- Laboratory wet chemistry using a desktop pH (more precise)
- 'Ribbon' Test: performed using your hands (less precise)
- Jar Test in laboratory setting (more precise) Hydrometer in a laboratory

setting (more precise)

- Field NPK Test Kit from stores (less precise)
- Laboratory wet chemistry for nutrient extraction from freshly prepared samples (more precise)
- Field Visual determination
- (less precise) Loss on Ignition test in a laboratory setting (more precise)
- Field x-ray screening for heavy metals (less precise)
- ICP-MS or gas laboratory setting (more precise)

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1. How soil and gut microbiota interact to promote health or disease -Donata Vercelli, University of Arizona College of Medicine; Presented for USI's  $5^{th}$  Annual Symposium. Video Recording available on our YouTube channel