

# Urban Soils Basics Info Sheet

A condensed guide to understanding soils in urban areas

Additional Urban Soils Resources found at [Urbansoils.org](http://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

### 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 Medicine<sup>1</sup>.

### 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

	pH	Texture	Nutrient Content	Organic Content	Contamination
Characteristic					
What Is It?	pH is the measure of how acidic or alkaline soils are. This is one of the most important characteristics	Soil texture refers to the composition of the soil - what percentage of a given soil is made up of sand, silt and clay. Please note that this refers to particle size classifications	Soil macronutrients are nitrogen, phosphorus and potassium - the primary nutrients that plants need to grow. Soil micronutrients are essential elements needed in smaller quantities	Expressed as a percentage, organic content is fraction of a given soil composed of stable humus, decomposing plant matter, and living organisms	Any substance that exceeds naturally-occurring levels and poses human and/or 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 & bad ones) found in the soil. Plants can only uptake nutrients that are soluble in water. Healthy soils pH is typically in the 5.5-8 range.	Texture determines a soil's ability to hold on to water, and its ability to retain nutrients. For most plants, a balanced mixture of sand (40%), silt (40%), and clay (20%) is optimal; but changes depending on intended use	Soils lacking in macronutrients and micronutrients do not easily support plant life. Additional soil nutrients can be replenished through organic soil amendments such as compost, fish meal, bone meal, and others.	Organic matter acts as a "nutrient fund", enhances water storage capacity, allows soil to bind into aggregates, prevents erosion, and serves as a habitat for organisms. Soils ideally should contain 7-15% organic matter	Soils contaminants can make soils unsuitable for growth, and enter the groundwater. Humans and animals exposed to soil contaminants can be harmed. Contaminants classify as inorganic (metals like lead), or organic (hydrocarbons like gasoline).
How Do I Test It?	<ul style="list-style-type: none"> <li>Field pH soil probes (less precise)</li> <li>Laboratory wet chemistry using a desktop pH (more precise)</li> </ul>	<ul style="list-style-type: none"> <li>'Ribbon' Test: performed using your hands (less precise)</li> <li>Jar Test in laboratory setting (more precise)</li> <li>Hydrometer in a laboratory setting (more precise)</li> </ul>	<ul style="list-style-type: none"> <li>Field NPK Test Kit from stores (less precise)</li> <li>Laboratory wet chemistry for nutrient extraction from freshly prepared samples (more precise)</li> </ul>	<ul style="list-style-type: none"> <li>Field Visual determination (less precise)</li> <li>Loss on Ignition test in a laboratory setting (more precise)</li> </ul>	<ul style="list-style-type: none"> <li>Field x-ray screening for heavy metals (less precise)</li> <li>ICP-MS or gas chromatography in a laboratory setting (more precise)</li> </ul>

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1. How soil and gut microbiota interact to promote health or disease – Dr. Donata Vercelli, University of Arizona College of Medicine; Presented for USI's 5<sup>th</sup> Annual Symposium. Video Recording available on our YouTube channel