**EcoFaith Recovery Community Carbon Project**

**Update from St. Andrew Community Carbon Pilot Citizen Science & Yard Survey Team**

**November 2019**

**Our objective**: The objective of our pilot study was to establish a baseline of the range of carbon content in young suburban clay soils in Washington County. In part, we have accomplished that objective and have begun addressing the larger objective, which is to answer the question: Do our suburban soils have the capability to significantly reduce the level of carbon in our atmosphere by using soil as a carbon bank?

**What we have learned**: To date, our observations, data, and insights indicate that the soils and trees that we have in our suburban yards have the capability to sequester a significant amount of carbon from atmospheric carbon dioxide. To maximize this result, most of us must commit to modest changes in how we manage our property.

**What you can do now:** There are several actions that each and every one of us can start to do now and in spring 2020. These are listed below. The primary objective of these actions is to make big increases in the amount of organic material covering our soil surfaces which will result in increasing the amount of sequestered carbon held in the soil. To understand the underlying science, read the primer on soil formation on the back of this note.

These actions are not time consuming and they are not cost prohibitive. You can start the process of making a meaningful impact in just one Saturday. Develop a Soil Garden. Start small in one area of your yard and, over time, increase the area improved, until most of your soil surface is included. Although your actions will be infrequent, they need to be ongoing and long-term to have an impact. In addition to significantly increasing carbon sequestration, the proposed actions will provide direct benefit to your landscape, improving wildlife habitat, reducing erosion and runoff, lessening the need for supplemental watering, and reducing reliance on pesticides and herbicides.

**Actions that we recommend**

* Develop “Soil Gardens” in your yard. Soil Gardens are small areas (300-500 sq. ft.) where the existing soil is covered with a three-inch layer of compost and mulch. These gardens are commonly planted with shrubs or trees at the time of development.
* Plant shrubs and trees to sequester carbon and enhance the value of your landscape. Consider native varieties as they are adapted to our environment and provide benefits to native birds, butterflies, and other native biota.
* Remove landscape cloth and replace it with a thick layer of compost and mulch for weed suppression.
* Restrict or eliminate use of pesticides/herbicides and non-organic fertilizers, which are known to be toxic to the microbiota, earthworms, and other creatures living in the soil.

**What is next for us**: While we plan to continue to measure yards in the spring, the Yard Survey Team is developing a parallel project to help homeowners act immediately to sequester much more carbon in their yards. More about that will be forthcoming.

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**What it helps to understand about soil formation:**

* Soil comprises a mixture of mineral matter (clay, silt, sand) and organic matter (humus);
* New, growing (Young) soil requires a supply of organic material (compost, mulch, leaves, grass) that will be digested by soil microbiota to create humus;
* Humus is mixed into the clay sub-soil by the activity of earthworms, nematodes, protozoa, etc.;
* The activity of both the microbiota (bacteria and fungi) and the worms is strongly enhanced by the amount and texture of organic matter available, by a protective cover (compost/mulch, grass, cover crops), and by moderation and consistency in both temperature and moisture content:
  + Significant activity occurs if the environment is warm and damp,
  + No or low activity happens if the environment is cold and/or dry;
* The microbiota, worms, and other subterranean creatures are nearly always present in our yards; they just need favorable circumstances to do their thing. (To misquote *Field of Dreams*, “If you provide favorable circumstances, they will do their thing!”

**Significant observations that we have made since July**:

* We have observed new Young Soil everywhere we have sampled in the yards measured. These Young Soils are soils that have developed at the interface of the clay sub-soil in our yards and the grass or compost/mulch covering the clay since the time our homes were constructed.
* Most of those soils are “starved” of sufficient organic matter to develop into thick layers of soil. As a consequence, the amount of carbon in the soils of measured suburban yards is quite modest.
* We discovered one significant exception to the thin, carbon-starved soils in a swale behind Pastors Robyn’s and Janet’s yard. In that untended swale, a 10- to 12-inch layer of Young Soil is covered by a thick growth of five foot tall grass. Study of that soil and the favorable conditions behind its development, led us to conclude that significant amounts of atmospheric carbon dioxide can be sequestered from the atmosphere and stored as carbon in the soil. Recognizing this possibility, we recommend the development and expansion of Soil Gardens.
* In addition to providing more organic material for sequestration, thick layers of mulch used to create a Soil Garden provide other benefits to suburban landscapes. Thick mulch effectively suppresses weeds and retains moisture throughout the dry summer months.
* We also measured all of the trees in each of the nine yards we surveyed, noting species, diameter, and height. Using a free professionally developed website (i-Tree), we calculated the amount of carbon stored in the trees and the current rate of sequestration of atmospheric carbon. The trees we measured store about four times the amount of carbon currently stored in the soils of our measured yards.
* The amount of carbon in the soils under suburban grass lawns is similar to the amount under mulch-covered soils. Unfortunately, we have not been able to identify conditions in lawns that would significantly increase the amount of soil carbon that grass lawns can store.
* At three of the nine yards we measured, we identified thick layers of Heritage Soil. Heritage Soil, as we define it, is a layer of soil that was created over a period of hundreds to thousands of years in oak woodlands and remains mostly undisturbed by farming or development.