

SOIL SYSTEMS



Improved soil at Porter family farm, once a thriving CSA,
now an oilfield industrial yard.

Emmy's Earth: Soil systems

Goal: Soil Systems: To **restore soil health** and prevent soil erosion. In my yard, you will see:

1. different composting methods,
2. wind breaks,
3. soil cover,
4. soil sponges,
5. slow, spread, infiltrate water, and
6. regenerative farming practices (I am just learning!)



Start with the End in Mind

And why does this matter?

- Normally it takes about 500 years to build up an inch of topsoil; 3,000 years required to build up a reasonable topsoil
- In 2012, the USDA reports that 1.67 **BILLION** tons of topsoil were lost to erosion, equal to **190,000 tons an hour**
- About a third of the world's soil has already been degraded.
- By these estimates that means that farming has a limited life span if degradation continues.



And it is not just wind and water erosion but:

- Chemical-heavy farming techniques
- Deforestation
- Warming temperatures

No Soil, No Farms, No Food

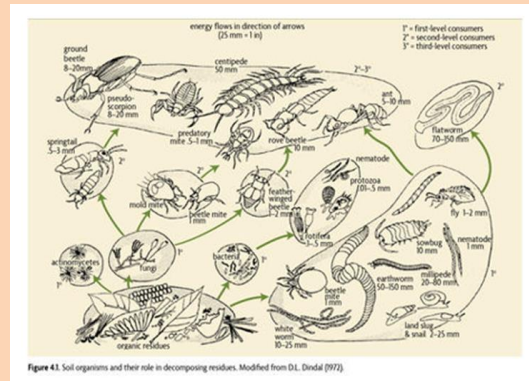
Soil is more than the sum of its physical parts...

We know that soil....

- Filters water
- Stores water short term
- Sequesters carbon
- Anchors roots
- Provides plant nutrients
- Is composed of broken-down rock fragments, humus, and soil organisms

But soil is also a communication network

- Soil is a living microcosm...
- Most of those organisms help maintain soil health.



- Plant communication and nutrient exchange happens through this natural internet!

[Building Soils for Better Crops \(sare.org\)](https://www.sare.org/)

Chap 4. The Living Soil p.38

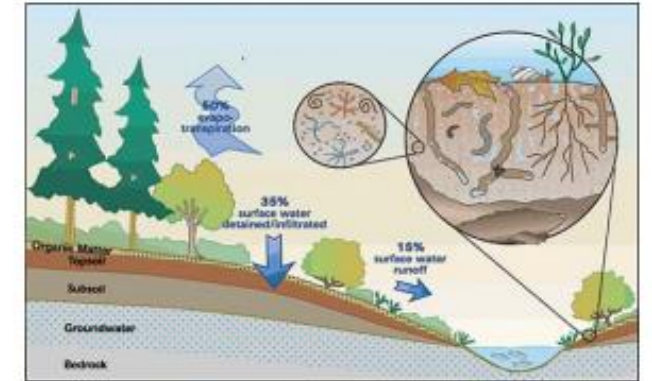


Figure 3.4: Water movement on a natural landscape with a plant cover. This landscape is in a humid area. In the drier regions, the stream level is higher than the surrounding land.

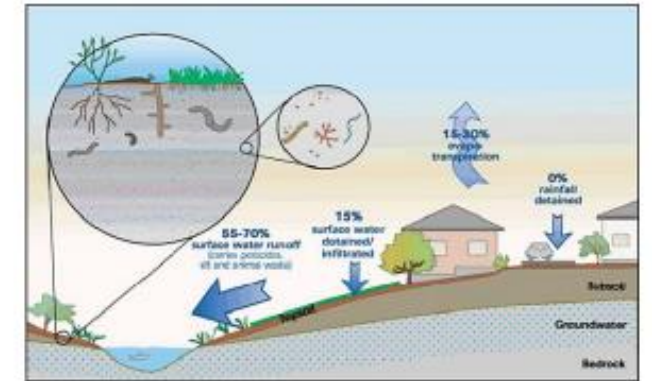
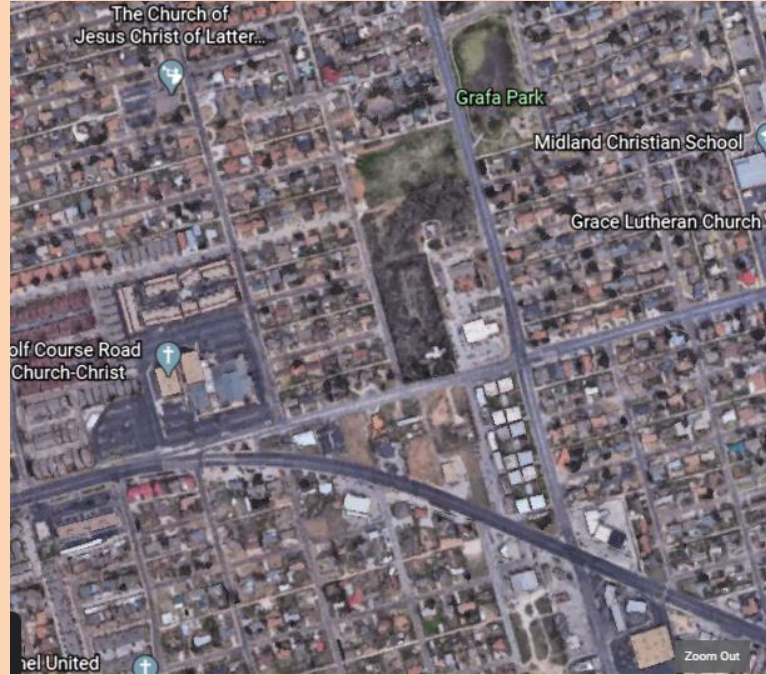



Figure 3.5: Water movement on a disturbed urban landscape with limited vegetation and impervious surfaces. This landscape is in a humid area. In the drier regions, the stream level is higher than the surrounding land.

Have you ever seen gardeners make a mudball?



 **Burr Williams**
1944 where corner of golf course and midkiff is now



**We have seen
change over time!**

Table 3.3: TR-55 Runoff Curve Numbers by Housing Density and Vigor of Cover

Cover type	Increasing runoff (RCN) by decreasing infiltration (HSG)				Soil condition
	A	B	C	D	
Paved driveway	98	98	98	98	impervious
Commercial district	89	92	94	95	85% impervious
Newly graded area	77	86	91	94	no vegetation
Housing lot <1/8 acre	77	85	90	92	65% impervious
Housing lot 1/4 acre	61	75	83	87	38% impervious
Housing lot 1/2 acre	54	70	80	85	25% impervious
Housing lot 2 acres	46	65	77	82	12% impervious
"Poor" open lawn	68	79	86	89	<50% grassed
"Good" open lawn	39	61	74	80	>75% grassed

Excerpt from table 2.2a in TR-55, "Urban Hydrology for Small Watersheds." RCN is the runoff curve number (30-98). The number 30 indicates the least runoff. HSG is hydrologic soil group (A-D). Group A consists of soils characterized by rapid infiltration.

Soil Covers

- Heavy weight row cover
- 2-inch binder clips
- ½ inch PVC pipe
- Rebar or conduit to anchor large frames in ground; small frames can just be pushed into the ground
- How easy is this!
Some woman designed it!



I cover my soil covers with tarps for the winter to extend the winter growing season...



...and also use them in summer to extend the growing season for lettuce and other cool season crops.

Soil Sponges

- Select materials: only natural biodegradable material!
- Dig 1 to 2-foot trench or pit. Scrape to the side and save top layer of soil with seed bank.
- Place materials in trench
- Cover with saved soil.
- Replace top layer with seed bank.

No polyester dress!





“The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life.” Wendell Berry