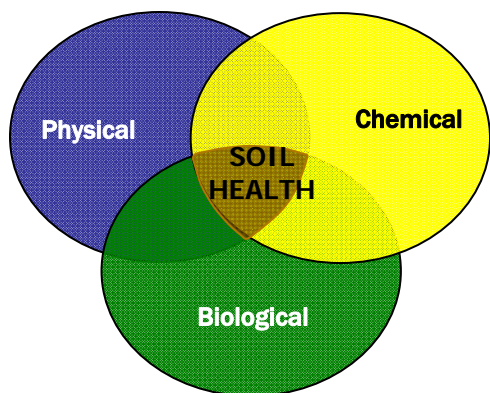


How do you use the Barnegat Bay Soil Health Scorecard?

Focus on physical indicators to provide information related to aeration and hydrologic status of soil, such as water entry into the soil profile and the capacity of soil to hold water in the root zone. Since soil physical properties influence rooting depth and volume, they also affect nutrient availability and plant growth. Physical properties also provide information related to the soil's ability to withstand physical forces associated with splashing raindrops or rapid water entry into soil that contribute to aggregate breakdown, soil dispersion and erosion.

Soil Health is a concept that integrates the physical, chemical and biological properties of a soil for improved productivity and environmental quality. This soil health scorecard provides a baseline from which to measure subsequent human induced changes in soil function.



Soil health degradation may be caused by compaction, surface crusting, low organic matter, damage from diseases, soil erosion, excessive pesticide use, as well as reduced amounts and diversity of beneficial organisms. Soil health can be improved over time by reducing or alleviating compaction, adding organic matter in the form of compost, manure, or crop residues, reducing tillage, keeping the soil covered with vegetation at all times and by not working the ground with heavy machinery when the soil is wet. By making these changes, the soil will function as the living ecosystem that it is, and act as a sponge to filter nutrients and recharge groundwater supplies for future generations.

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Soil Health is the capacity of a soil to function, to sustain plant and animal productivity and to maintain or improve water quality.



A healthy functioning soil will:

- **Reduce nutrient leaching into groundwater**
- Minimize runoff and erosion so water infiltrates into the soil and doesn't runoff into surface water
- **Filter pollutants**
- Provide a healthy plant rooting environment
- **Create the proper habitat for plants, animals, and microbes that live in and above the soil**

THE BARNEGAT BAY SOIL HEALTH ASSESSMENT DRAFT

Tools Needed: Shovel or Spade, Wire Flag, and Visual Observation

Directions: Follow this assessment to the best of your ability and dig a hole at least 8-12" deep to make relevant observations

Soil Health Parameter	When to Sample	Rating Value GOOD=5	Rating Value FAIR=3	Rating Value POOR=1
Surface Hardness Soil Compaction (PHYSICAL COMPONENT)	<i>Spring, Summer, or Fall Need good soil moisture, not too wet not too dry</i>	Wire flag penetrates easily with fingers within top 8-16"	Flag can be penetrated with some resistance, have to push hard with fist	Very hard, cannot penetrate with wire flag, wire bends when inserting flag
Soil Tilth/ Friability Consistence (PHYSICAL COMPONENT)	<i>Need good soil moisture, not too wet not too dry</i>	Friable (crumbly) easily broken up	Somewhat hard, cloddy visible crumb structure	Looks like brick or concrete, cloddy, flaky, powdery, massive, blows apart, hard to work
Erosion (PHYSICAL COMPONENT)	<i>After a heavy rainfall</i>	No gullies or rills, clear or no runoff on sloping ground	Few rills or gullies, gullies up to 2" deep, runoff cloudy in appearance, noticeable sediment deposition at the end of slopes	Large gullies over 2" deep joined to others, thin or no topsoil, muddy runoff, sediment deposition widespread at end of slopes
Drainage/ Infiltration (PHYSICAL COMPONENT)	<i>After rainfall</i>	No ponding, no runoff, water moves through soil steadily in a downward top to bottom sequence, soil not too wet, not too dry	Water dries out within 1 day after rain, little or no ponding on flat surfaces, eventually drains	Water is ponded for at least one day after rain on flat surfaces, evaporates more than it drains and always very wet or soggy ground
Organic Matter Color/Roots (BIOLOGICAL COMPONENT)	<i>Spring, summer, or fall</i>	Topsoil color (within top 8" of surface) clearly defined, darker than subsoil >4% organic matter Roots go down deep into the soil >12-20"	Topsoil color (within top 8" of surface) closer to subsoil color (deeper than 8") 2-4% organic matter Some root development at a depth between 6-12"	Topsoil color (within top 8" of surface) similar to subsoil color <2% organic matter roots are confined within 0-6" of the surface
Earthworms & Other Soil Organisms (BIOLOGICAL COMPONENT)	<i>Spring/Fall with good soil moisture, not too wet, not too dry</i>	10+ worms in top sq ft of soil, lots of casts and holes in soil clods, small beetles, ants and root hyphae filaments evident and in good numbers, slight organic smell	2-10 worms in top sq ft of soil, few casts, holes, some hyphae around roots, slight "organic smell", little evidence of other soil organisms present	0-1 worm in top sq ft of soil, no casts or holes, little or no smell, no other soil organisms present
Plant growth Visual observation (BIOLOGICAL COMPONENT)	<i>Spring, summer or fall, during the growing season with good soil moisture, not too wet not too dry</i>	Normal healthy dark green color, excellent growth and uniform vegetative development, good drought resistance, very good root system 12-20"	Fair growth, somewhat uneven vegetative development, lighter green color, sometimes shows drought stress, good root system 6-12"	Uneven vegetative development, problem growing throughout season, poor growth, yellow or purple color, displays drought stress, root development shallow or nonexistent 0-6"
Nutrient Holding Capacity/ Ph (CHEMICAL COMPONENT)	<i>Over a 3-5 year period, always at the same time each year</i> Values based on laboratory soil test results from Rutgers University or others	Soil tests reflect nutrient needs of desired planting Proper pH for desired plant community	Little change in plant growth in relation to nutrient needs Easily correctable pH for desired plant community	Soil test shows more fertilizer than plants can use Hard to correct pH for desired plant community