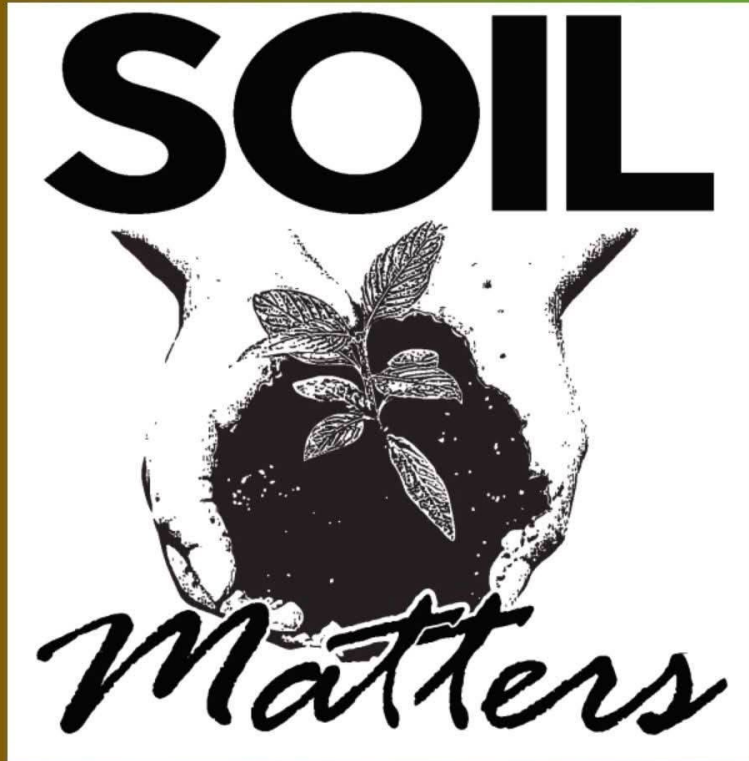


SNEC 2026 Conference



Healthy Soils and Nature Based Solutions

Soil Matters

SWCS-SNEC Summer
Conference

July 27, 2026

Denise Savageau
Environmental Planner

Soil.

Where it all Begins



NACD Stewardship Week 2026

Two Crises: Climate Change and Biodiversity

“Climate change is a major driver of biodiversity erosion, and loss of biodiversity also accelerates climate change processes, as the capacity of degraded ecosystems to assimilate and store CO₂ tends to decrease. Humanity therefore has a global responsibility to address these two challenges and the interactions between them.

Ecosystem services and Nature-Based solutions, which depend on a healthy biodiversity, make essential contributions to climate change mitigation and adaptation, and are effective vehicles for transformational change.”

UNESCO

<https://www.unesco.org/en/climate-change/biodiversity#man-and-the-biosphere-mab-programme>



Nature Based Solutions = Nature As The Solution

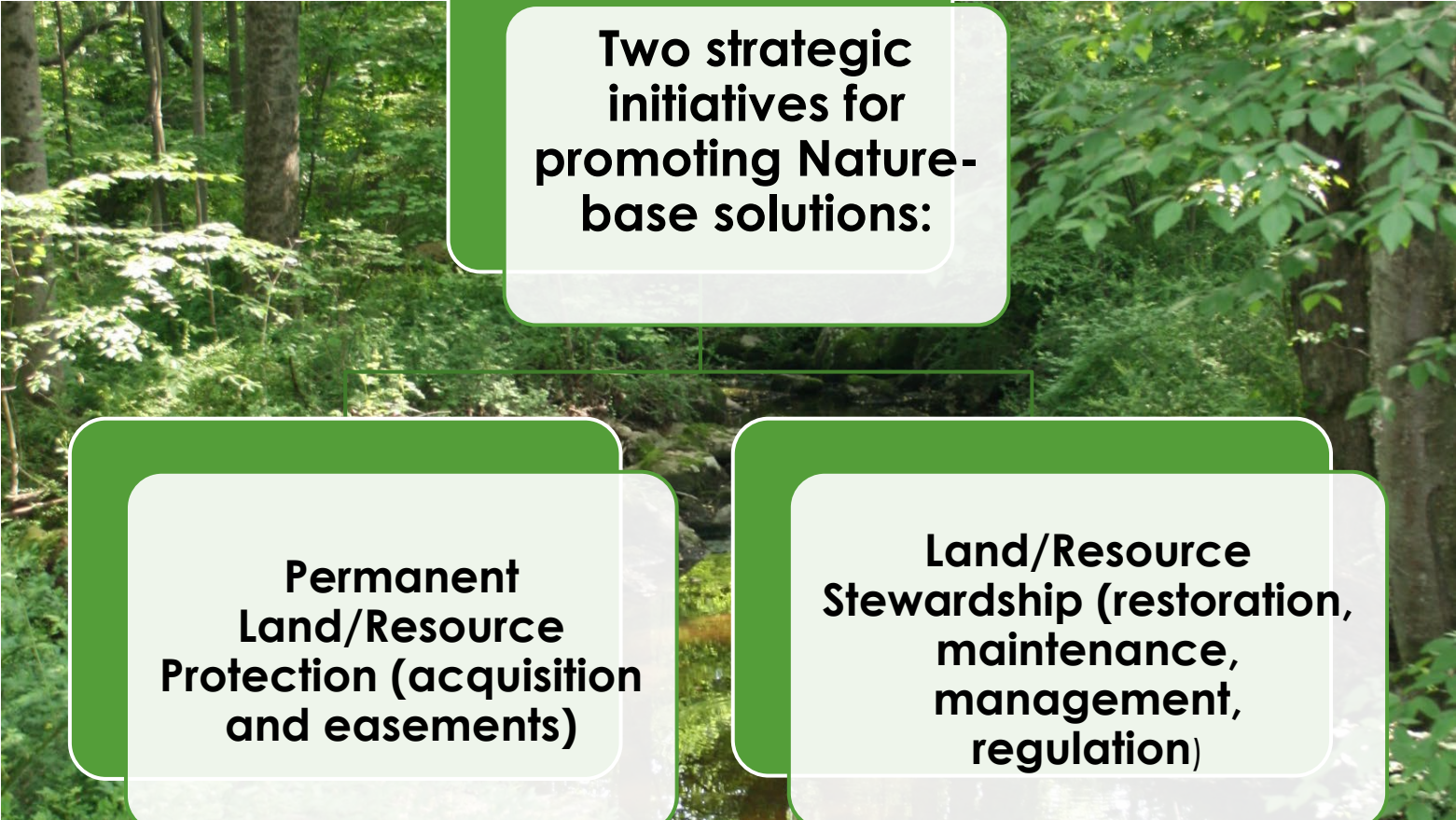
The overall construct of nature-based solutions recognizes that nature IS the solution and that protecting natural systems is essential.



We must acknowledge, as lessons learned from Indigenous Peoples, that we are part of and not separate from the natural world and that to address the challenges of climate change and biodiversity we need to start with protecting natural systems and the ecosystem services that they provide.



Nature-based solutions, therefore, are the programs and policies that work to ensure healthy, intact ecosystems.



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graph TD; A[Two strategic initiatives for promoting Nature-based solutions:] --> B[Permanent Land/Resource Protection (acquisition and easements)]; A --> C[Land/Resource Stewardship (restoration, maintenance, management, regulation)];
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Two strategic initiatives for promoting Nature-based solutions:

**Permanent
Land/Resource
Protection (acquisition
and easements)**

**Land/Resource
Stewardship (restoration,
maintenance,
management,
regulation)**

Four key natural
systems for protection
and stewardship:

Soils

Promoting soil health
across all landscapes

Forests

Keeping Forests as
Forests

Wetlands

Protection/restoration
both tidal and inland
wetland

Water Resources

Streambank
stabilization, riparian
buffers,

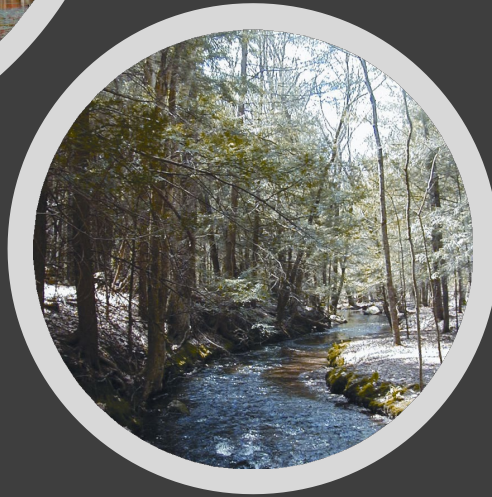
Ecosystem Services of Natural and Working Lands								
		Inland Wetlands	Tidal Wetlands	Near Coastal Waters	Inland Waters	Forests	Soils	Agricultural lands*
Provision services	Food	X	X	X	X	X	X	X
	Raw materials	X	X	X	X	X	X	X
	Fresh water	X			X	X	X	X
	Medicines	X	X	X	X	X	X	X
Regulating services	Local climate modification	X	X	X	X	X	X	X
	Biomass - ecosystem productivity	X	X	X	X	X	X	X
	Carbon sequestration & storage	X	X	X		X	X	X
	Water purification and filtration	X	X			X	X	X
	Erosion and sediment control	X	X			X	X	
	Water flow control	X	X			X	X	
	Moderation of extreme storms	X	X			X	X	
Support services	Species Habitat	X	X	X	X	X	X	X
	Biodiversity	X	X	X	X	X	X	X
Cultural services	Recreation	X	X	X	X	X	X	X
	Sense of Place	X	X	X	X	X	X	X
	Aesthetic	X	X	X	X	X		X
	Tourism	X	X	X	X	X		X
	Physical and mental health	X	X	X	X	X		X

Importance of Nature Based Solutions

- Supply effective mitigation and adaptation to climate change at low cost
- Maintain or restore biodiversity
- Provide for multiple benefits, not just climate change resiliency

**Nature based solutions =
Green infrastructure =
Healthy, Resilient, and
Sustainable Communities**

* Note = Agricultural lands refers to crops & pastureland above ground only. Usually combined with soils and forests on farm properties.



The *good news* is that these same ecosystems provide nature based-solutions for mitigation and adaptation to climate change.

- Healthy soils
- Wetlands and riparian zones
- Intact forests – Keeping Forests As Forests
- Local sustainable food systems
- Open space protection/land stewardship
- Oyster reefs and shellfish beds

What is Soil? Soil Health?

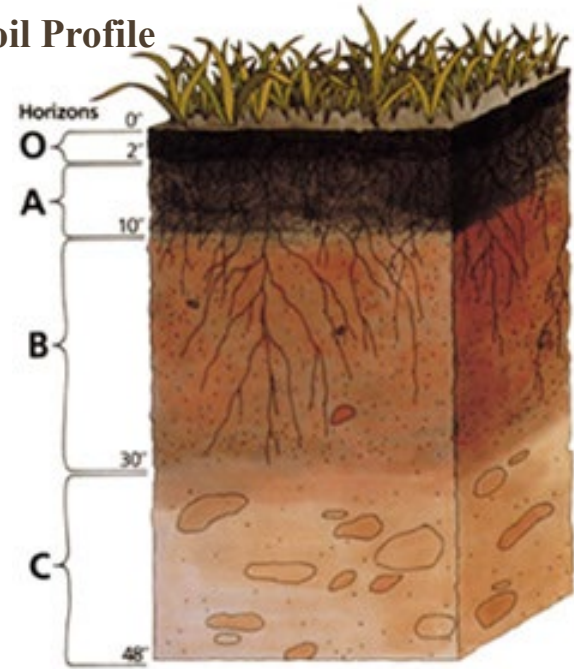
Soil is the unconsolidated layer of solid, water and gaseous materials that covers the earth's surface

Soil is made of a 45 % mineral, 25 % water, 25 % air, and 5 % organic matter.

Soil is a dynamic, living ecosystem and its make-up is constantly changing due local environmental conditions.

“Soil health, also referred to as soil quality, is defined as the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.” USDA NRCS

Soil Profile



Healthy soils are:

- Teeming with life
- High in organic matter
- Physically well structured



Healthy Soil provides for:

- Biodiversity and ecosystem health
- Increased water infiltration and storage
- Drought resiliency
- Filtration of pollutants
- Nutrient recycling of carbon and nitrogen
- Healthier plants and increased biomass
- Carbon storage especially in highly organic soils

We need to promote soil health on across all landscapes.

Soil Quality

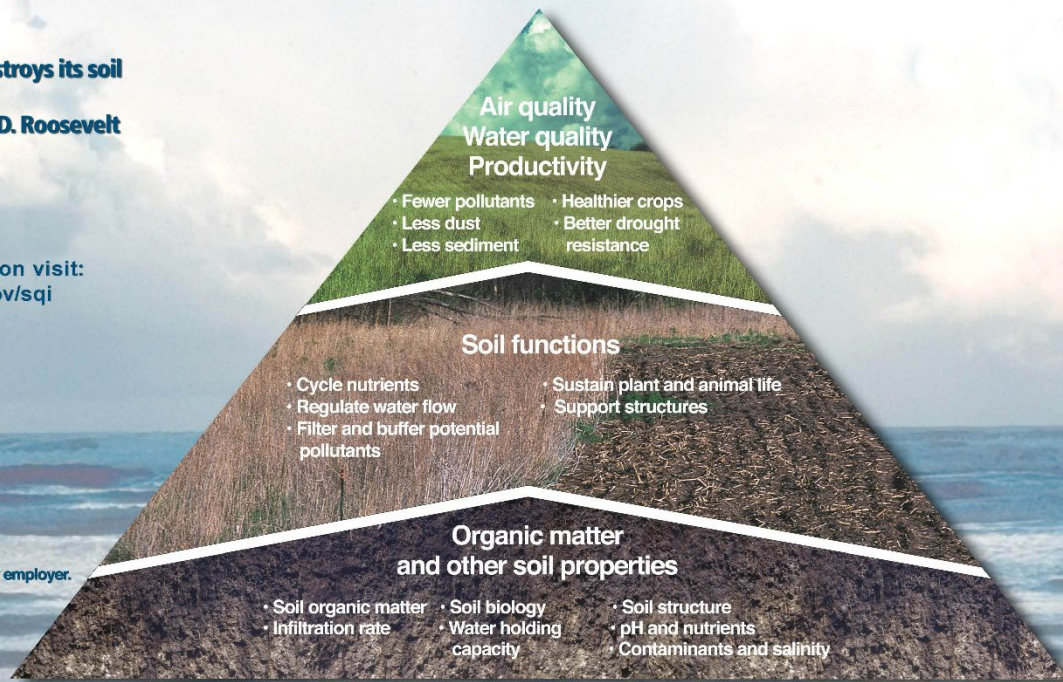
The Foundation of Air and Water Quality

**"The nation that destroys its soil
destroys itself."**

– Franklin D. Roosevelt

For more information visit:
<http://soils.usda.gov/sqi>

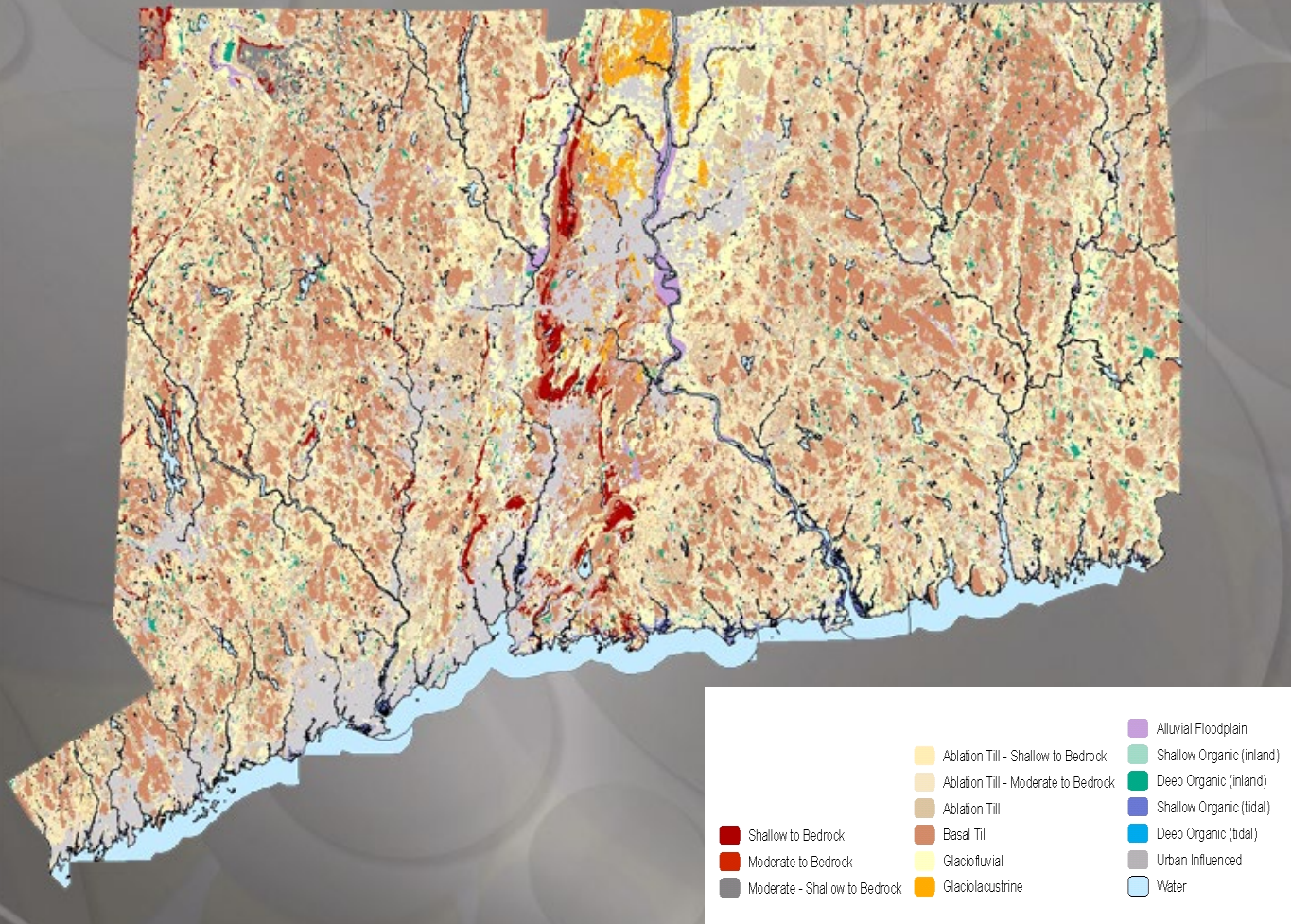
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Soil Health and Soil Landscapes are tied to water quality & quantity



Major Soil Landscapes of CT

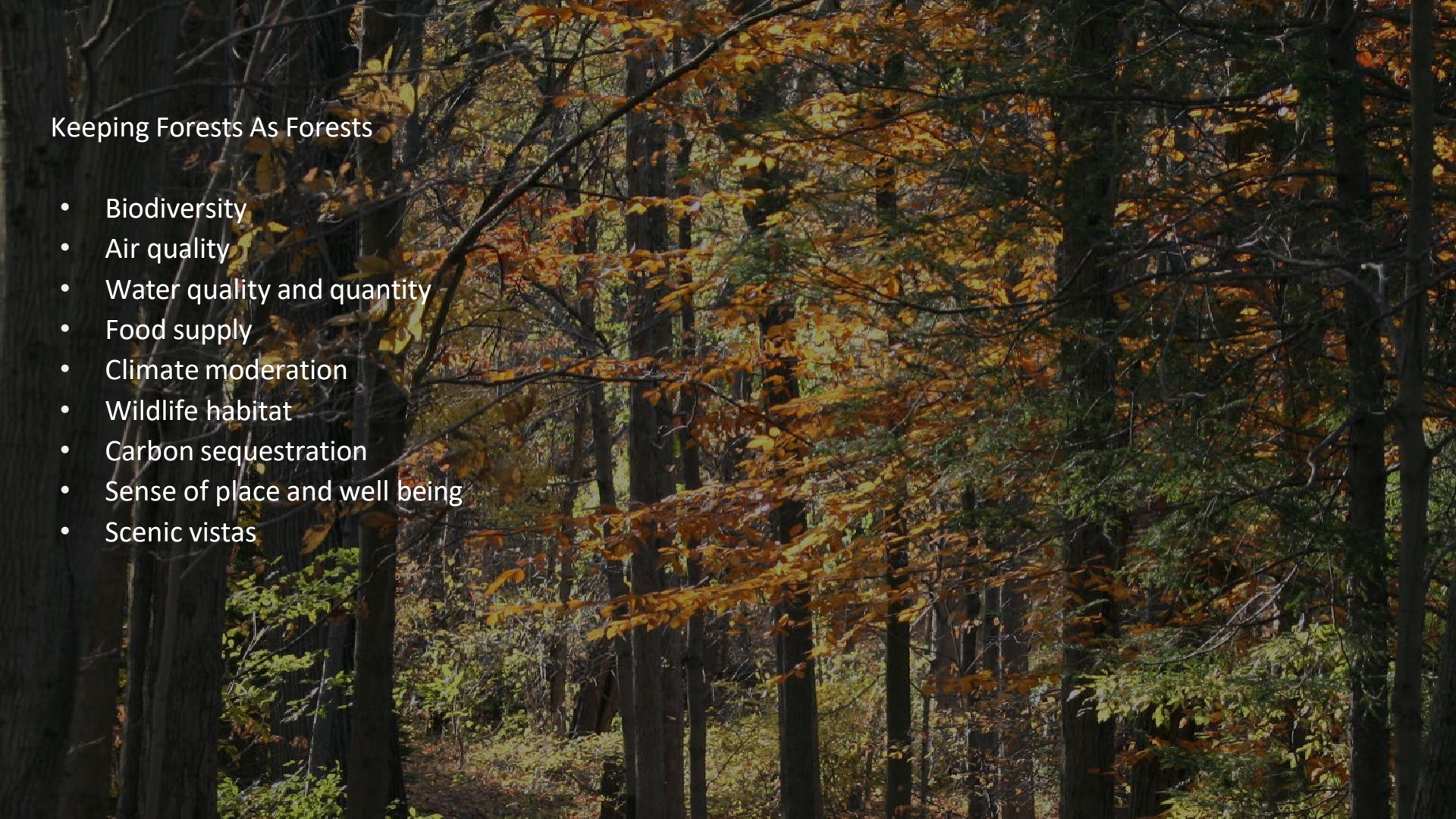


All of these factors result in increased stormwater runoff and reduced filtration of pollutants. They also lead to release of carbon, fueling climate change and impacts to water resource.



Factors leading to poor soil health:

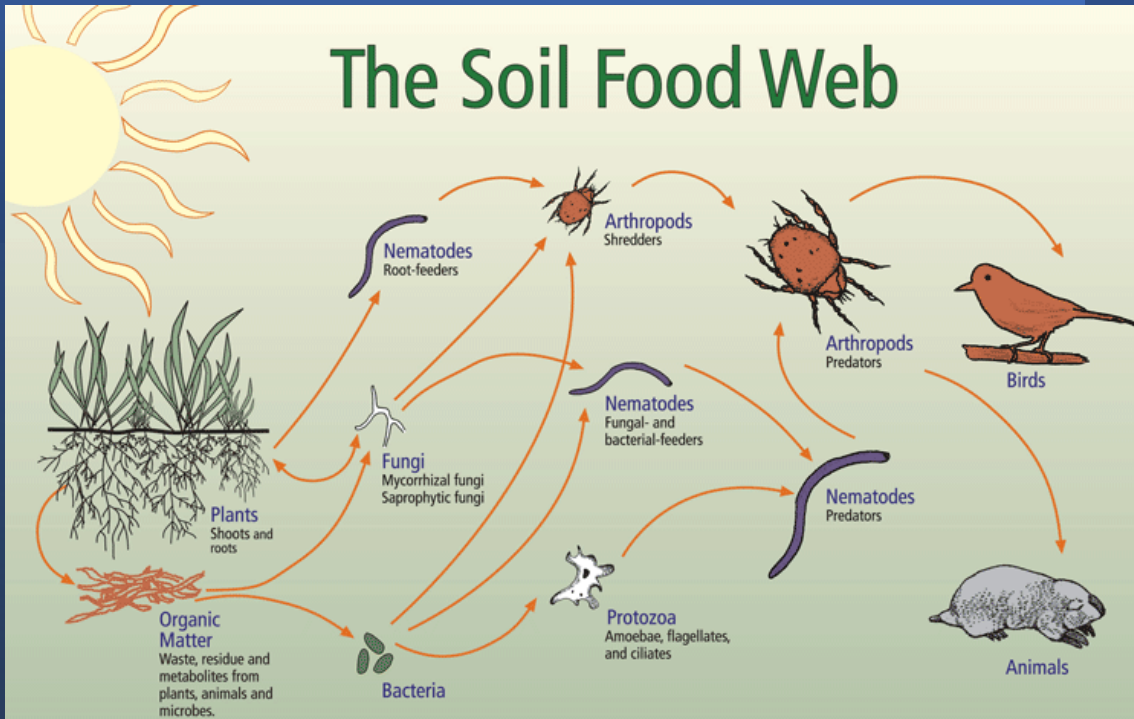
- compaction
- erosion
- mining of topsoil
- loss of organic matter
- monocultures
- loss of native perennials
- over-watering
- over-fertilization
- pesticides
- salt buildup
- industrial contaminants



Keeping Forests As Forests

- Biodiversity
- Air quality
- Water quality and quantity
- Food supply
- Climate moderation
- Wildlife habitat
- Carbon sequestration
- Sense of place and well being
- Scenic vistas

The Soil Food Web



First trophic level:
Photosynthesizers

Second trophic level:
Decomposers
Mutualists
Pathogens, Parasites
Root-feeders

Third trophic level:
Shredders
Predators
Grazers

Fourth trophic level:
Higher level
predators

Fifth and higher trophic levels:
Higher level
predators

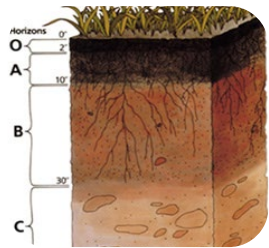


The term **blue carbon** is used to describe carbon in tidal wetlands. **Teal carbon** is used to describe carbon in inland wetlands. *Although tidal wetlands store and sequester more carbon per acre, there are more acres of inland wetlands – both are big carbon sinks.*

Wetlands and Riparian Zones

- Highly organic soils sequester carbon
- Moderate/regulate hydrology – reducing impacts of flooding and drought
- Trap sediments/filter pollutants important for water quality
- Edge habitats support biodiversity

The CT Inland Wetlands and Watercourses Act is landmark legislation that uses soils to define wetlands but also vegetation and hydrologic features when defining watercourses.



“Wetlands” means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the Natural Resources Conservation Service of the United States Department of Agriculture



“Watercourses” means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation



NATURE-BASED SOLUTIONS (NBS) INITIATIVE

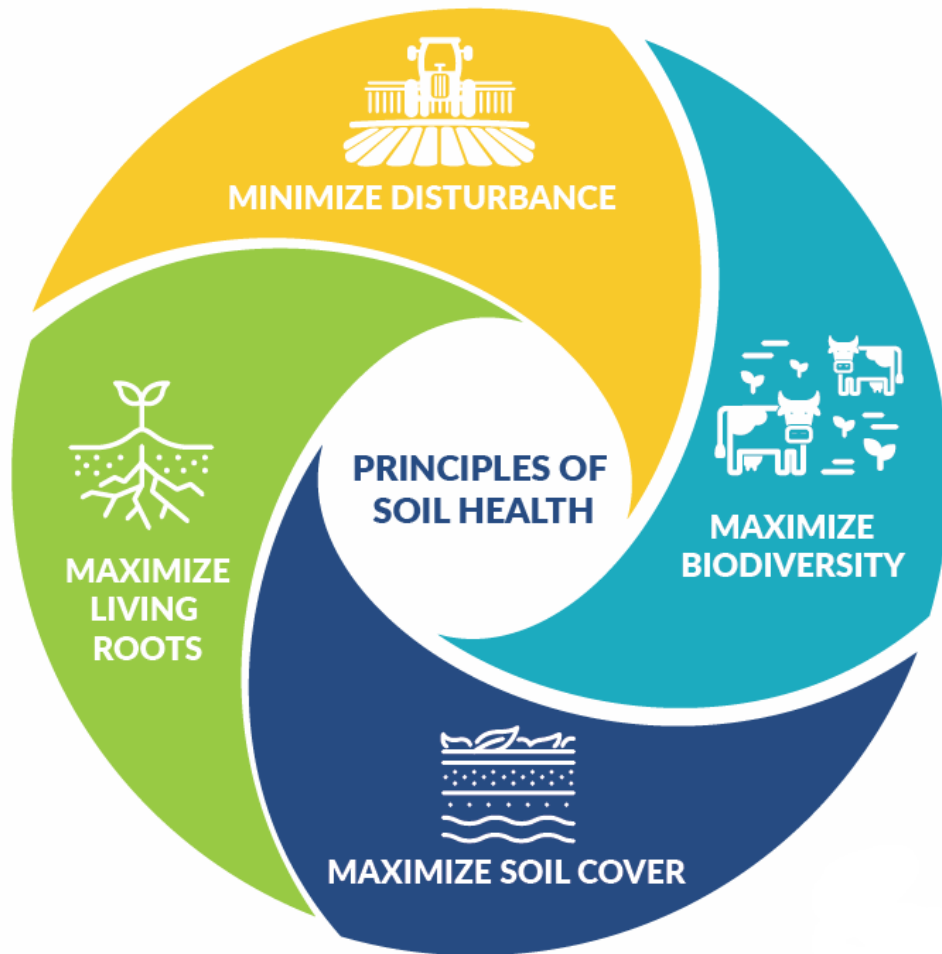
A program evaluation required pursuant to Section 12 of Public Act 25-125



JULY 1, 2026

CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION

- In 2025, the CT General Assembly passed [Public Act 25-125](#) which identifies climate change, biodiversity loss, and ensuring community resilience as the primary challenges that NBS can help address. Section 12 of P.A. 25-125 required DEEP to produce a report on NBS that features DEEP's efforts to integrate and advance NBS programs, certain NBS practices, as well as highlight the efforts of 7 other state agencies. This report was finalized July 1, 2026.
- <https://portal.ct.gov/deep/planning/nature-based-solutions>
-



- **F. Develop Statewide NBS Implementation Roadmap and Soil Health Plan**

- A significant number of public comments on the Draft NBS Initiative Program Evaluation identified two statewide action plans as top priorities –a **Statewide NBS Implementation Roadmap** and a **Soil Health Plan for Connecticut**. Both are resource-intensive and important efforts that would involve many partners and funding beyond existing resources to implement.

Questions?

Denise Savageau, President
CT Association of Conservation
Districts and Chair, CT Council on
Soil and Water Conservation

