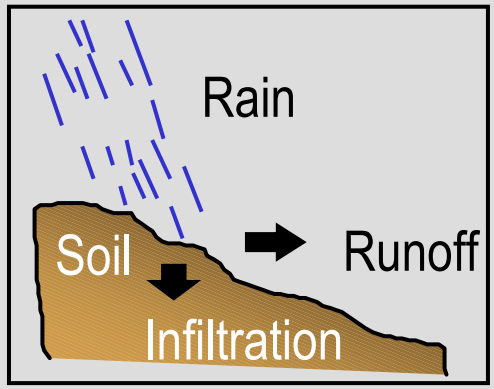
“Helping People Understand Soils”

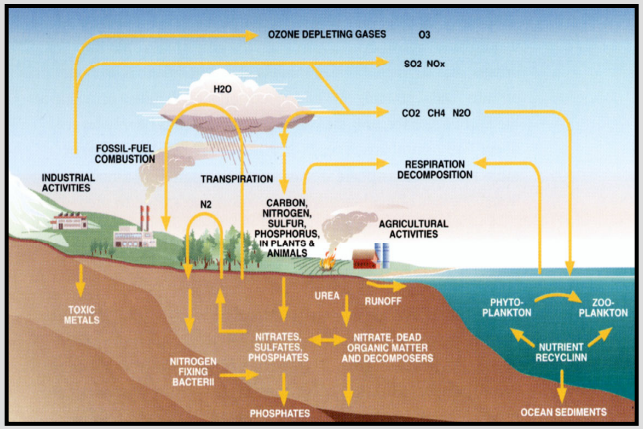
Ten Key Messages

Soils Perform Vital Functions

Sustaining plant and animal life below and above the surface

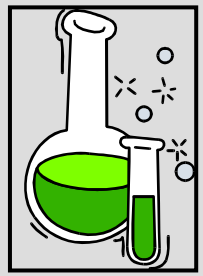
Regulating and partitioning water and solute flow





Filtering, buffering, degrading, immobilizing, and detoxifying

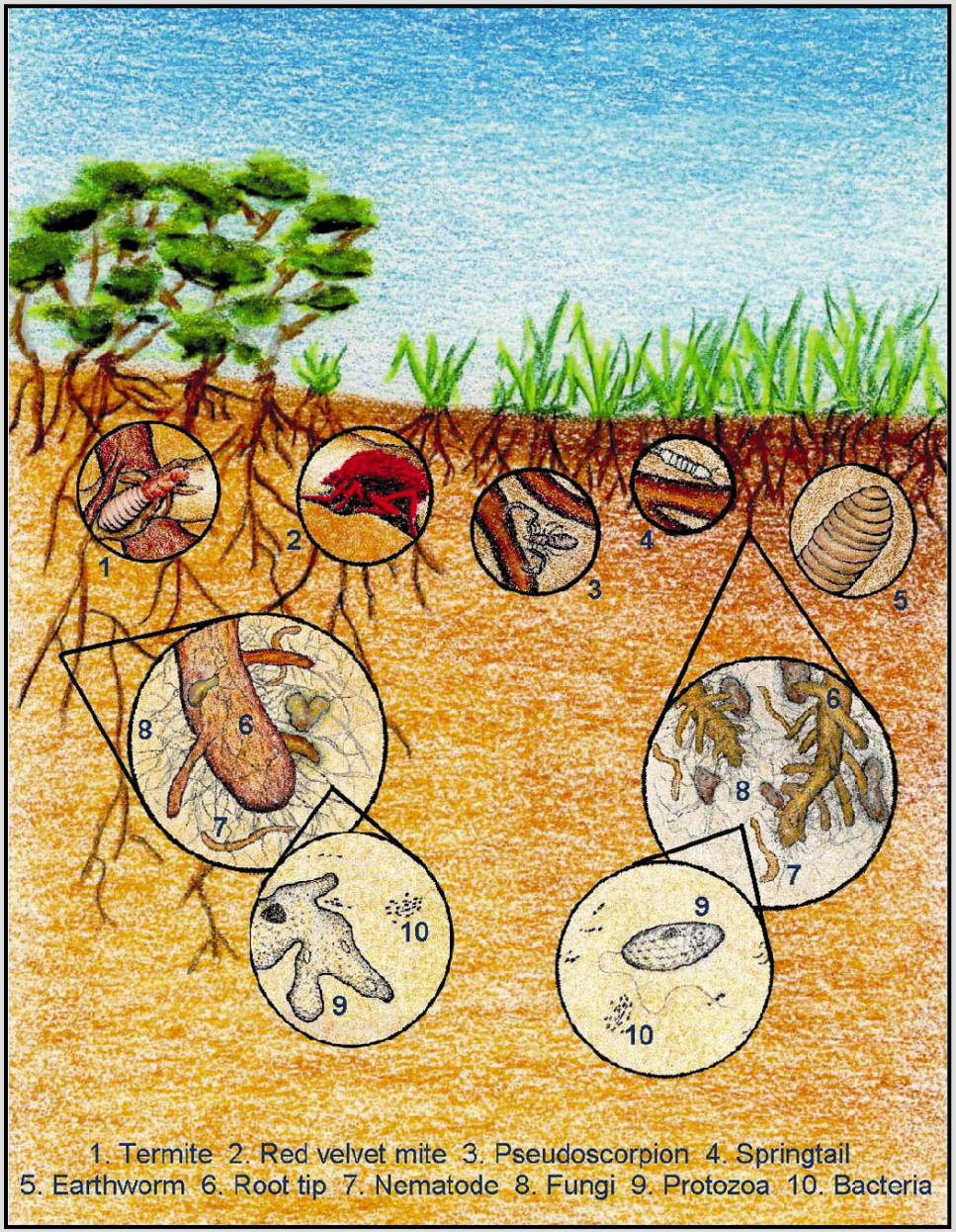
Storing and cycling nutrients



Providing support to structures

Soil is the Basis of the Ecosystem

The living systems occurring above and below the ground surface are determined by the properties of the soil. We often ignore the soil because it is hard to observe.



Soils Support Life

Organism Types

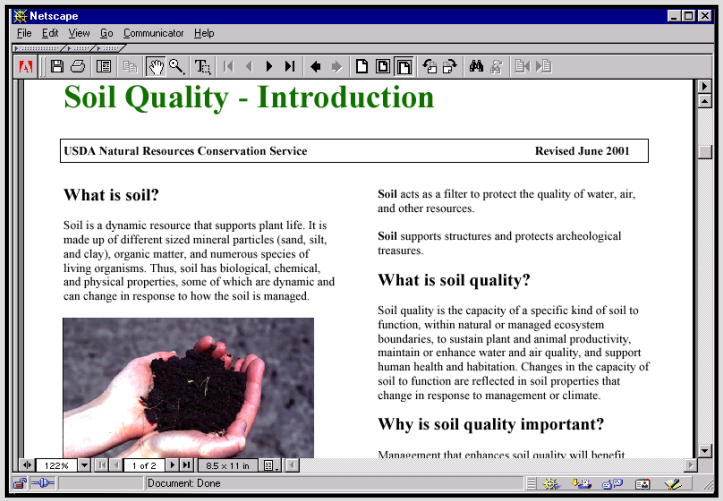
bacteria
fungi
protozoa
nematodes
arthropods
earthworms

Roles & Benefits

decomposition
release nutrients
create pores
stabilize soils

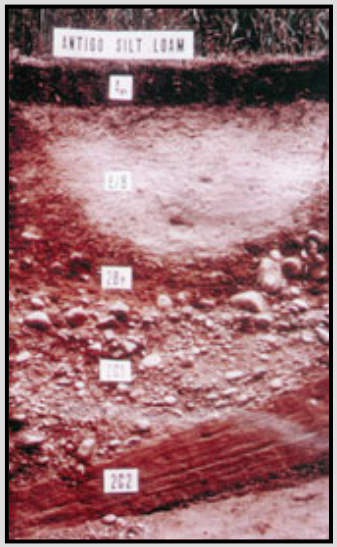
Soil Management Affects Soil Quality

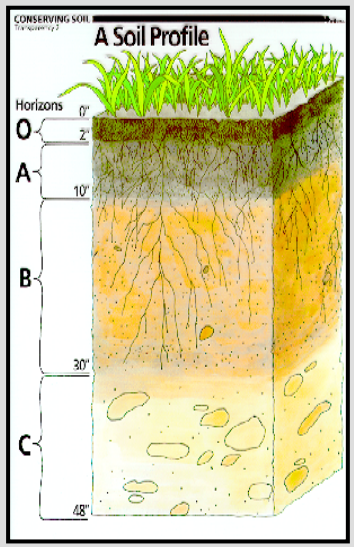
Soil Quality



Soils Have Unique Physical, Chemical, and Biological Properties Important to Their Use

color
texture
structure
consistence
roots
pores
other features





Soil is a natural body of solids, liquid, and gases, with either horizons, or layers or the ability to support rooted plants.

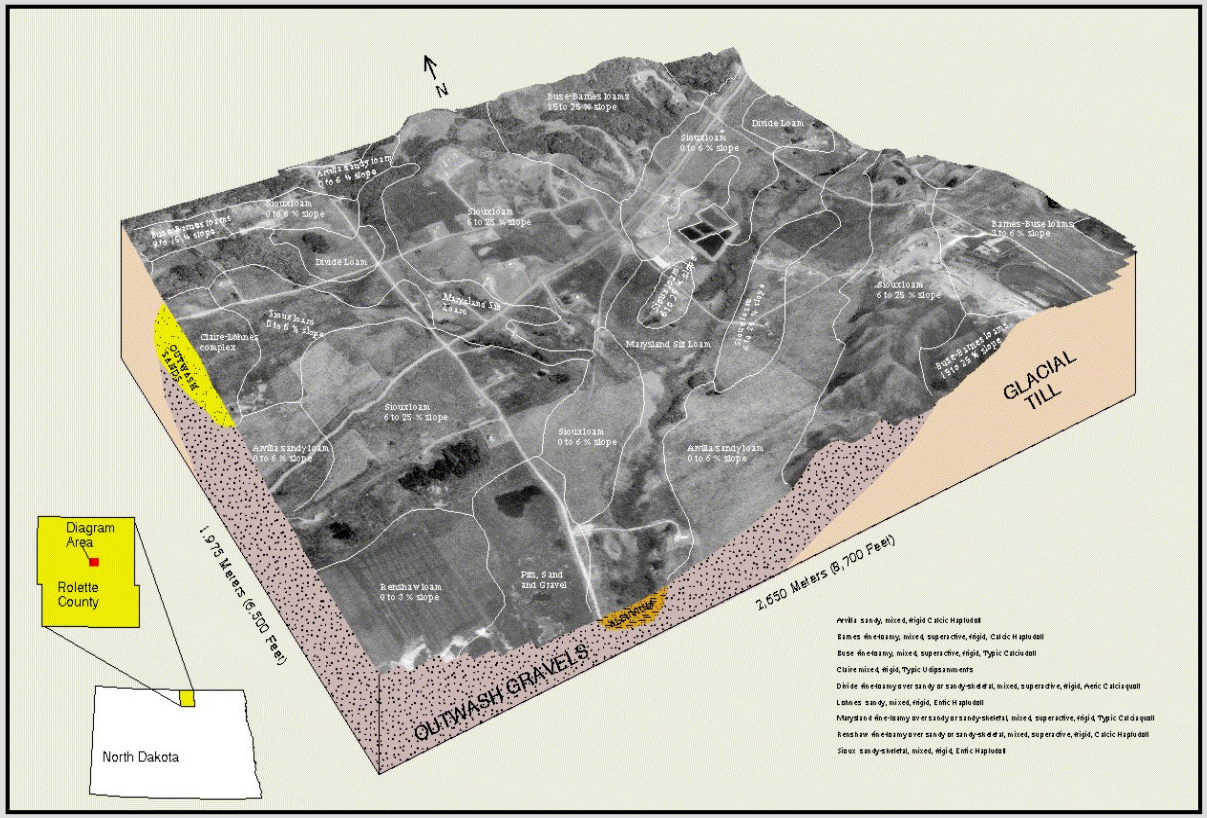
Pedology, the study of soil, is a unique discipline.

Soil-Forming Factors Determine the Location and Kind of Soil

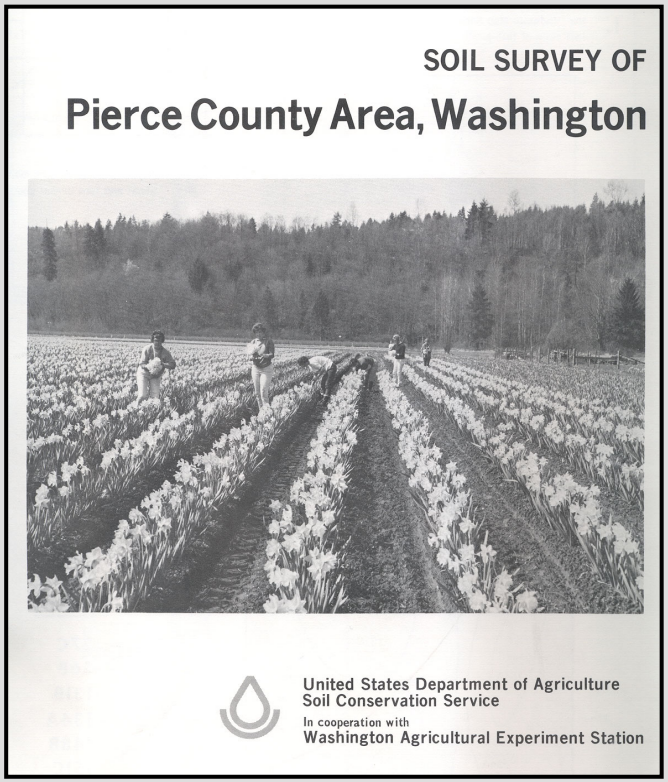
There are 23,000 soil series in various combinations with different slopes and surface textures in the U.S.

Soil Forming Factors:

Parent Material
Climate
Living Organisms
Topography
Time

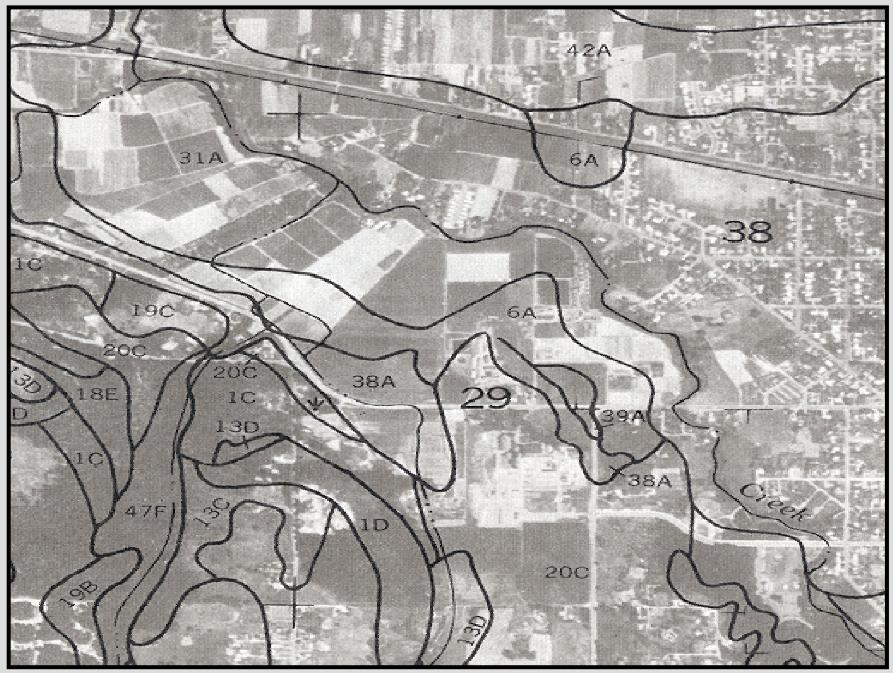


Soil Survey is a Scientifically-Based Inventory



A soil survey includes maps, descriptions, properties, climate, and interpretations. These are excellent sources of information.

About 3000 counties in the United States have a soil survey.



Soils Have Limitations Which Must Be Understood

Concerns for life and properties

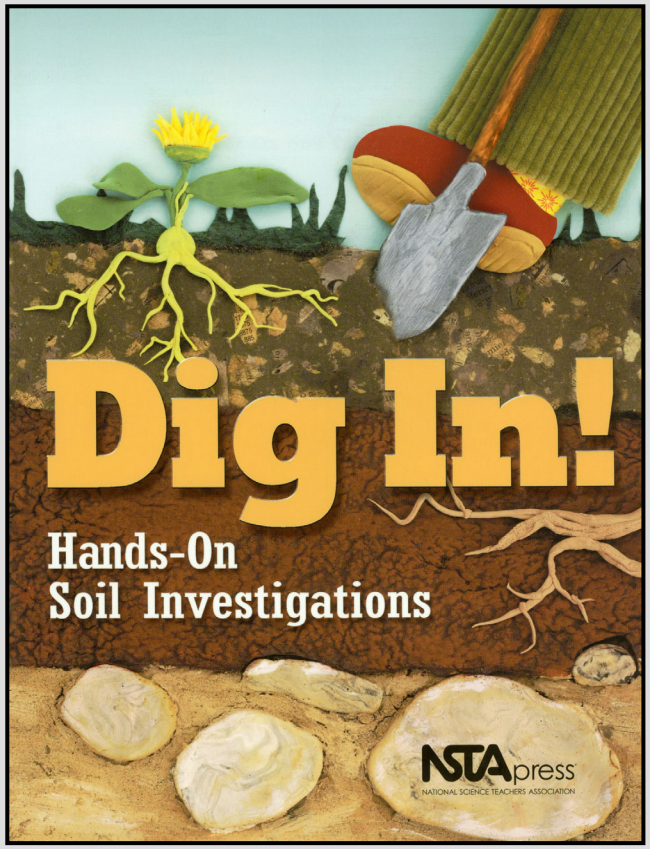
allergies
corrosivity
dust
flooding
gypsum dissolution
piping
rapid runoff
sand blowing
septic failure
sinkholes
soil borne disease
sulfidic materials
water tables
contaminants
crop loss
erosion
frost action
liquefaction
radon
salt build up
sedimentation
shrink-swell
slope failures
subsidence
urban hydrology

Scientific Names for Soils Reduce Ambiguity

- Like plants and animals, **soils are classified**
- The **system** is called **Soil Taxonomy**
- The **highest level** is the **soil order** (12)
- The **lowest level** is the **soil series**, often a place name

Soil Order	Formative terms
Alfisols	Alf from combination of al (aluminum) and f (ferrous) iron
Andisols	Ando from Japanese term dark referring to dark volcanic ash
Aridisols	Latin, aridies, dry arid
Entisols	Ent meaningless, root recent
Gelisols	Latin gelare, to freeze
Histosols	Greek, histos, tissue
Inceptisols	Latin, incepum, beginning, inception
Mollisols	Latin, mollis, soft, mollify
Oxisols	French oxide
Spodosols	Greek spodos, wood ash
Ultisols	Latin ultimus, last, ultimate
Vertisols	Latin verto, vertical cracking

Soil Science Can Be Usefully Incorporated Into Other Studies



Science
ecology, biology, chemistry

Social Studies
world trade, land use

Mathematics
soil loss over one hectare

History
settlement of the U.S., dust bowl

Art
soil crayons, acrylic paints