SOIL TAXONOMY- CHARACTERISTICS OF SOIL ORDERS

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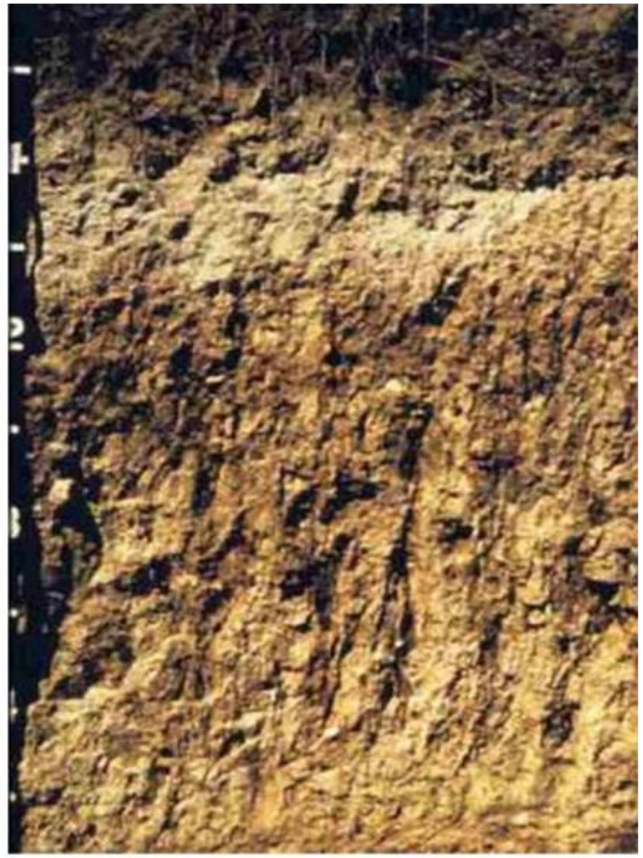
SOIL ORDERS

Table 3.1
NAMES OF SOIL ORDERS IN *SOIL TAXONOMY* WITH THEIR DERIVATION AND MAJOR CHARACTERISTICS
The bold letters in the order names indicate the formative element used as the ending for suborders and lower taxa within that order.

Name	Formative element	Derivation	Pronunciation	Major characteristics
Alfisols	alf	Nonsense symbol, Aluminum Al, iron Fe	Ped**alf**er	Argillic, natric, or kandic horizon; high-to-medium base saturation
Andisols	and	Jap. *ando*, "black soil"	**And**esite	From volcanic ejecta, dominated by allophane or Al-humic complexes
Ar**id**isols	id	L. *aridus*, "dry"	Ar**id**	Dry soil, ochric epipedon, sometimes argillic or natric horizon
Entisols	ent	Nonsense symbol	Rec**ent**	Little profile development, ochric epipedon common
Gel**i**sols	el	Gk. *gelid*, "very cold"	J**el**ly	Permafrost, often with cryoturbation (frost churning)
Hist**o**sols	ist	Gk. *histos*, "tissue"	Hist**o**logy	Peat or bog; >20% organic matter
Incept**i**sols	ept	L. *inceptum*, "beginning"	Incept**i**on	Embryonic soils with few diagnostic features, ochric or umbric epipedon, cambic horizon
Mollisols	oll	L. *mollis*, "soft"	**Moll**ify	Mollic epipedon, high base saturation, dark soils, some with argillic or natric horizons
Oxisols	ox	Fr. *oxide*, "oxide"	**Ox**ide	Oxic horizon, no argillic horizon, highly weathered
Spod**o**sols	od	Gk. *spodos*, "wood ash"	Pod**z**ol; odd	Spodic horizon commonly with Fe, Al oxides and humus accumulation
Ultisols	ult	L. *ultimus*, "last"	**Ult**imate	Argillic or kandic horizon, low base saturation
Vertisols	ert	L. *verto*, "turn"	Inv**ert**	High in swelling clays; deep cracks when soil is dry

Alfisols (term *Pedalfer* – aluminum and iron)

- Similar to Ultisols but are less intensively weathered and less acidic.
- Tend to be more inherently fertile and base saturated than Ultisols
- Located in similar climatic regions, typically under forest vegetation.
- More common than Ultisols, occupy about 10% of the land surface.

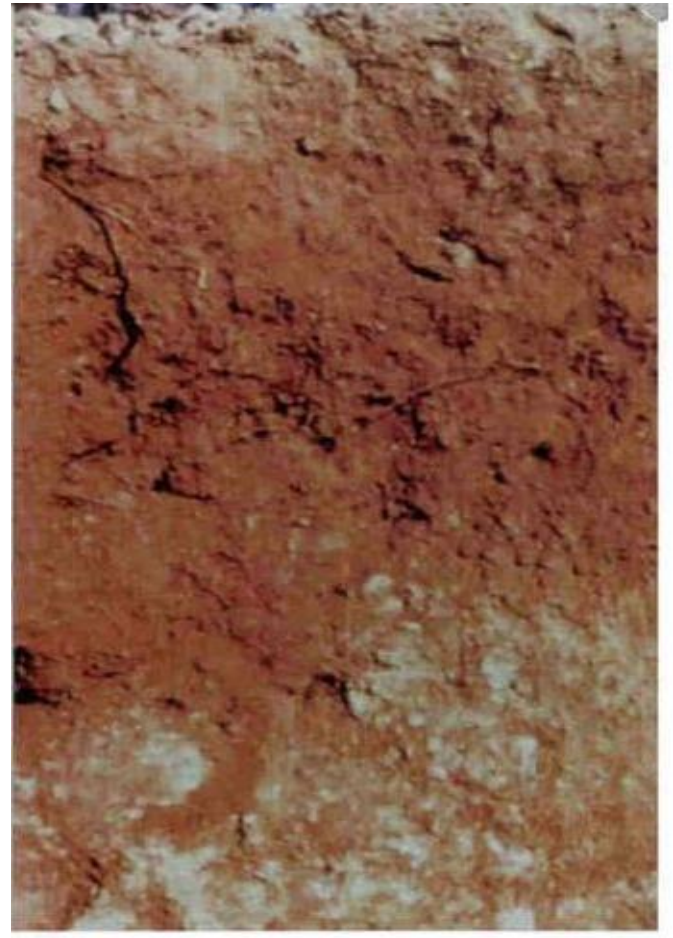


Andisols (Japanese *ando* – black soil)

- Developed from weathering of volcanic ash with amorphous minerals.
- Include weakly weathered soils with volcanic glass, as well as more strongly weathered soils.
- Minerals have an unusually high capacity to hold both nutrients and water and are very productive and fertile.
- Typically occur in areas with moderate to high rainfall and cool temperatures.
- Tend to be highly erodible in sloppy terrain
- Make up about 1% of the glacier-free land surface.

Aridisols (Latin *aridus* – dry)

- Soils that occur in climates that are too dry for "mesophytic" plants—plants adapted to neither too wet nor too dry environments—to survive.
- Climate in which Aridisols occur also restricts soil weathering processes.
- Often contain accumulations of salt, gypsum, or carbonates,
- Found in hot and cold deserts worldwide.
- Occupy about 12% of the Earth's glacier-free land area, including some of the dry valleys of Antarctica.

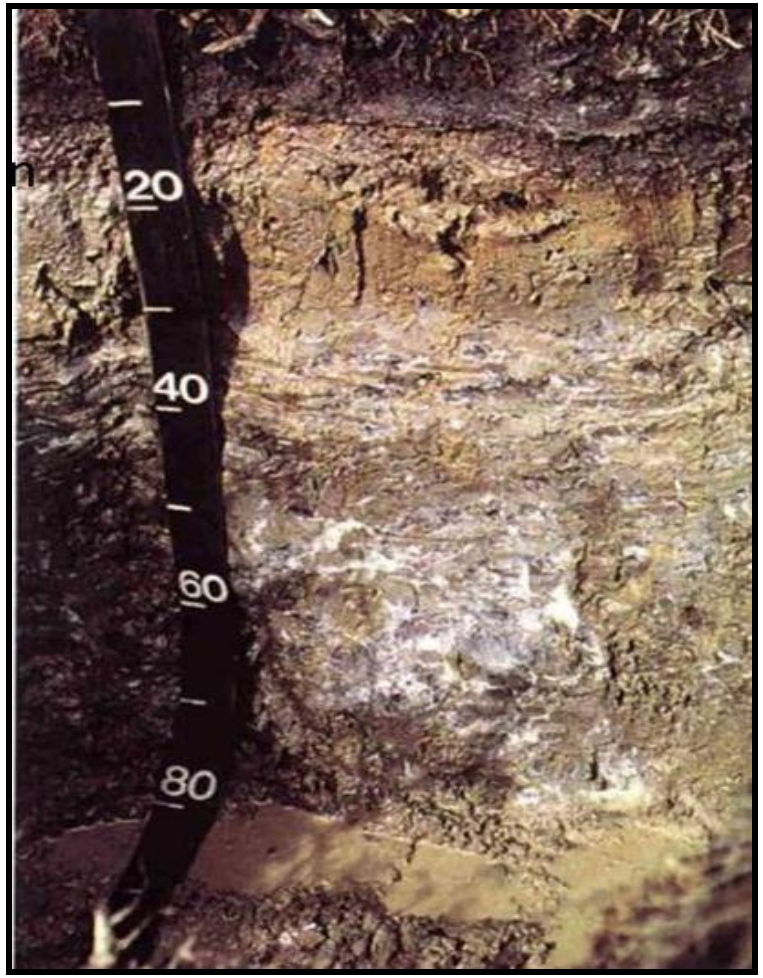


Entisols (from *recent* – new)

- Youngest order in soil taxonomy
- Exhibit little to no soil development other than the presence of an identifiable topsoil horizon. Soils occur in areas of recently deposited sediments,
- Occur in places where deposition is faster than the rate of soil development.
- Some typical landforms where Entisols are located include are active flood plains, dunes, landslide areas, and behind retreating glaciers.
- Common in all environments.
- Make up the second largest group of soils after Inceptisols, occupying about 16% of the Earth's surface.

Gelisols (Latin *gelare* – to freeze)

- . Soils that are permanently frozen (permafrost**)** with **e**vidence near the soil surface.
- Found in the Arctic and Antarctic, and extremely high elevations.
- Permafrost influences land use through its effect on the downward movement of water and freeze-thaw activity (cryoturbation) such as frost heaves.
- Permafrost can also restrict the rooting depth of plants.
- Cover 9% of the world's glacier-free land surface



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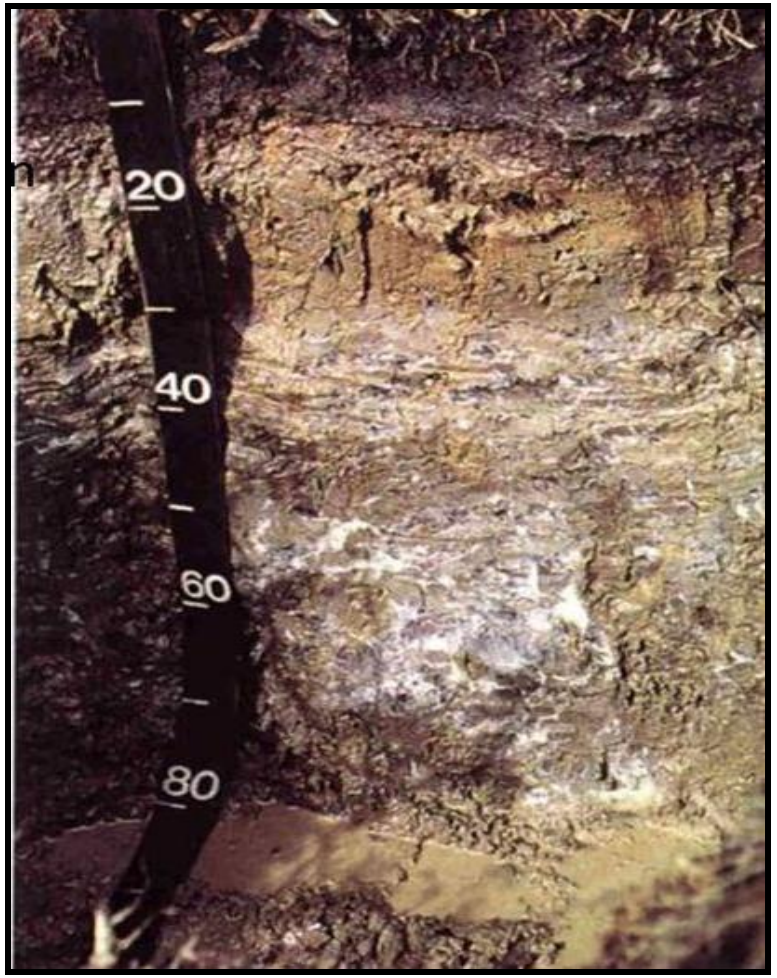
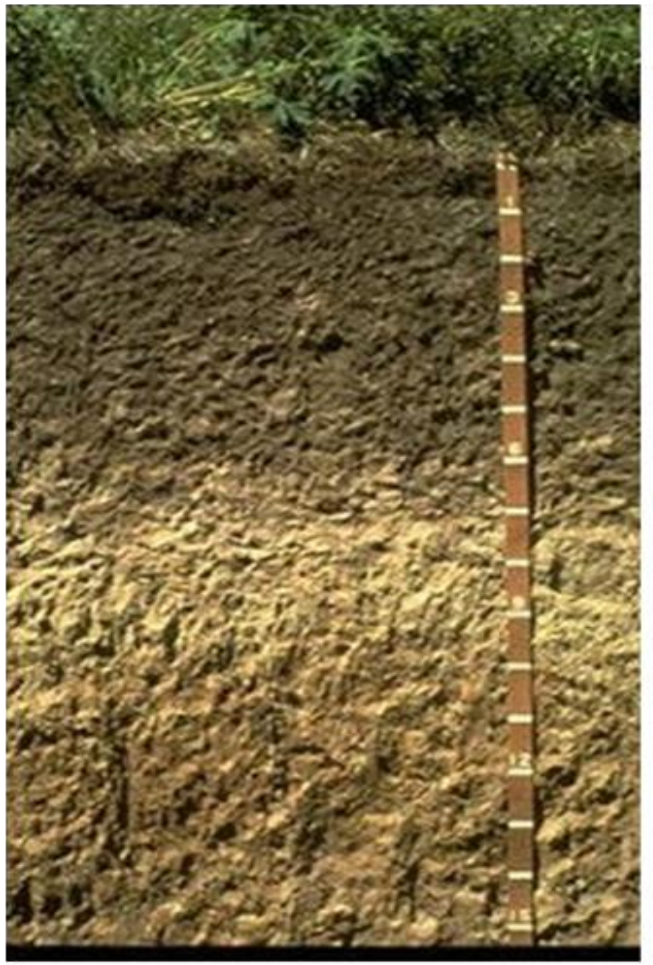


Histosols (Greek *histos* – tissue)

- Dominantly composed of organic material in the upper portion, can be highly productive farm lands
- Called as bogs, moors, peat lands, muskegs, fens, or peat and muck
- **S**oils form, when organic matter, (leaves, mosses, or grasses) decomposes more slowly than it accumulates due to decreased microbial decay
- Occurs mostly in extremely wet/ water logged areas mostly saturated all year-round.
- Drained Histosols are extremely acidic decompose rapidly and exhibit subsidence
- Not stable for foundations or roads
- Histosols make up about 1% of the world's glacier-free land surface

Mollisols (Latin *mollis* – soft)

- Highly fertile, and rich in "bases" such as calcium and magnesium and has high base saturation
- Dark surface horizon comes from the yearly addition of organic matter from the roots of prairie plants.
- Mollisols are often found in climates with pronounced dry seasons.
- Make up approximately 7% of the glacier-free land surface.

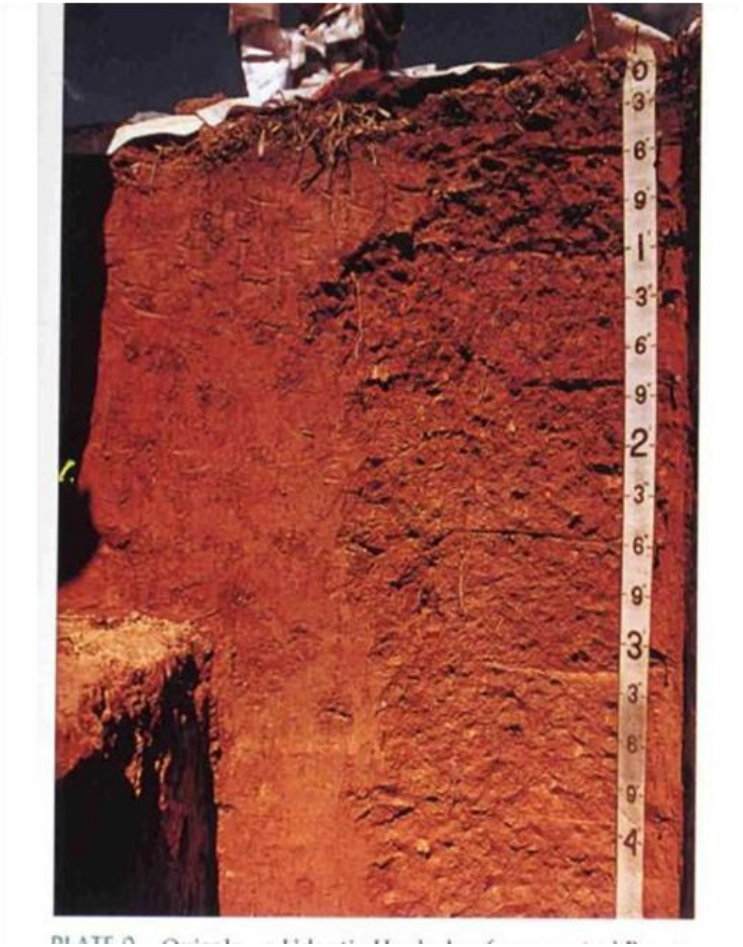


Inceptisols (Latin *inceptum* – beginning)

- Exhibit moderate degree of soil development
- Lack significant clay accumulation in the subsoil
- Occur over a wide range of parent materials and climatic conditions
- Exhibit wide characteristics.
- Extensively occur covers approximately 17% of the earth's glacier-free surface.

Oxisols (from the French *oxide* – oxide)

- Soils of tropical and subtropical regions, dominated by iron oxides, quartz, and highly weathered clay minerals such as kaolinite.
- Typically found on gently sloping land surfaces of great age that have been stable for a long time.
- Mostly featureless soils without clearly marked horizons.
- Highly weathered, low natural fertility and made productive through wise use of fertilizers and lime.
- Oxisols are found over about 8% of the glacier-free land surface.

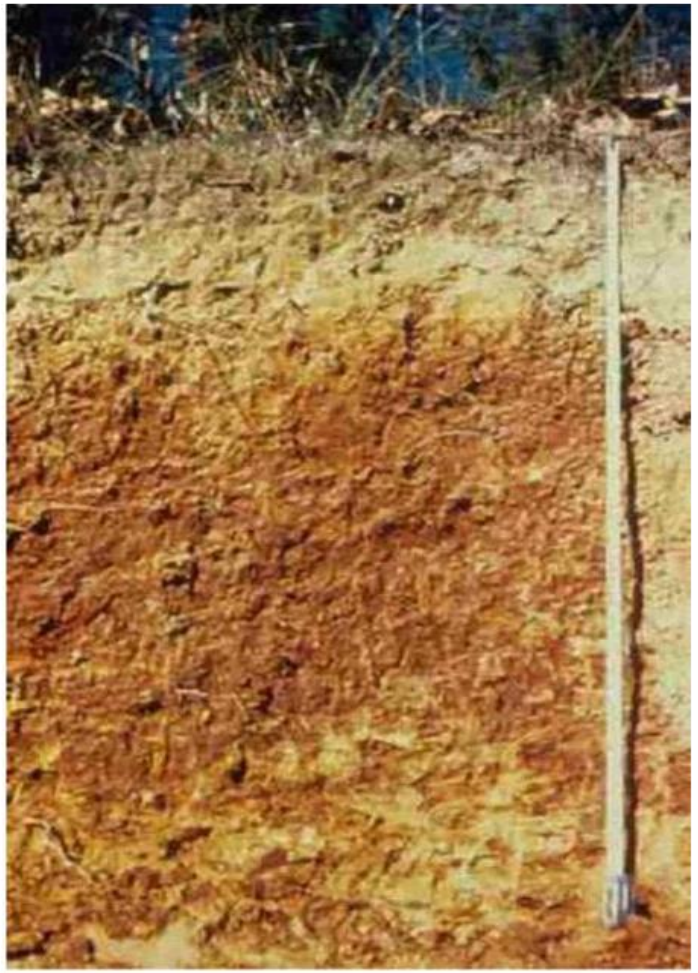


Spodosols – (Greek *spodos* – wood ash)

- Often have a dark surface underlain by an eluvial ashy gray layer, followed by a reddish, rusty, coffee-colored, or black illuvial horizon.
- Rainwater with acidic vegetative litter, from the needles of conifers form organic acids dissolve iron, aluminum, and organic matter in the topsoil forming ashy gray (eluvial) horizon followed by dark colored illuvial subsoil horizon of dissolved materials
- Spodosols most often develop in coarsely textured soils under coniferous vegetation in humid regions of the world and have low fertility
- Occupy about 4% of the world's glacier-free land surface.

Ultisols (from Latin *Ultimus* – last**)**

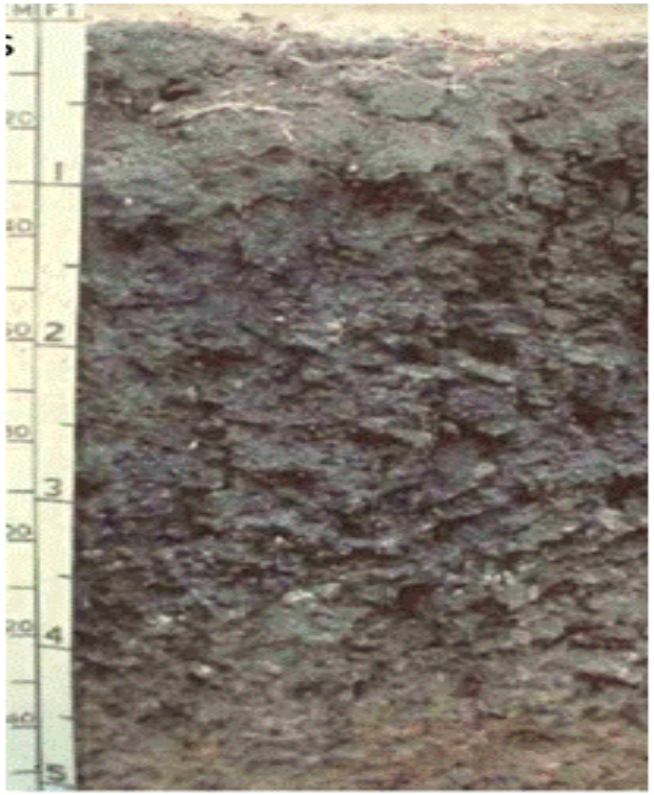
- Soils that have formed in humid areas with high temperature, rainfall and are intensely weathered.
- Typically contain a subsoil horizon that has an appreciable amount of translocated /illuvial clay
- Relatively acidic,most nutrients are held in the upper soil horizons and are generally of low fertility
- Respond to management and are productive with additions of fertilizer and lime.
- Ultisols make up about 8% of the glacier-free land surface.



Vertisols (Latin *verto* – turn)

- Clay-rich soils that contain an "expansive" 2:1 clay that shrinks and swells
- Soils therefore shrink as they dry and swell when wet.
- When dry, vertisols form large cracks that are more than one meter deep and several cms / inches, wide.
- Movement of these soils can crack building foundations and buckle roads
- Very fertile, due to high clay content water tends to pool on their surfaces when wet due to poor movement
- Vertisols formed from base rich parent materials required for formation of expansive 2:1clay minerals.
- Occupy about 2% of the glacier-free land surface.

Black soil profile

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