USDA soil taxonomy

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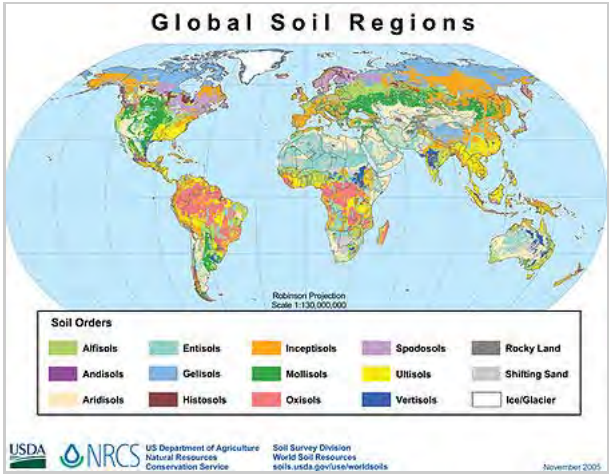
USDA Soil Taxonomy developed by United States Department of Agriculture and the National Cooperative Soil Survey provides an elaborate classification of soil types according to several parameters (most commonly their properties) and in several levels: *Order*, *Suborder*, *Great Group*, *Subgroup*, *Family*, and *Series*.

Contents

Soil Orders



Global distribution of Soil Orders in the USDA soil taxonomy system. A much larger version of the map is also available.

Name of Soil Orders in Soil Taxonomy with Their Major Characteristics

Name	Major Characteristics	Name	Major Characteristics
Alfisols	Must have argillic, natric, or kandic horizon; High-to-medium base saturation; Moderately weathered; Commonly form under boreal or broadleaf forests; Rich in iron and aluminum; Common in humid areas, semi-tropics, and mediterranean climates; 9.6% of global & 14.5% of U.S. ice-free land	Andisols	Form from volcanic ejecta, dominated by allophane or Al-humic complexes; Must have andic soil properties: high in poorly crystalline Fe and Al minerals, high in phosphorus, low bulk density, and high proportions of glass and amorphous colloidal materials, such as allophane, imogolite and ferrihydrite; High Organic Matter content, sometimes melanic epipedon; 0.7% of global & 1.7% of U.S. ice-free land
Aridisols	Dry soil (i.e., must have aridic moisture regime); Ochric epipedon is common; Sometimes argillic or natric horizon; Must have some diagnostic subsurface horizon; Commonly in deserts; 12.7% of global & 8.8% of U.S. ice-free land	Entisols	Least soil profile development; Ochric epipedon is common; No B horizons; most common order by surface area (16.3% of global & 12.2% of U.S. ice-free land)
Gelisols	Soils with permafrost within 100 cm or cryoturbation (frost churning) within 100 cm plus permafrost within 200 cm; Commonly at high latitudes and elevations; 8.6% of global & 7.5% of U.S. ice-free land	Histosols	Must have histic epipedon; Usually aquic soil moisture regime; No diagnostic subsurface horizons; Rapid decomposition when aerated; Peat or bog; >20% organic matter; Organic soil materials extending down to an impermeable layer or with an organic layer that is more than 40 cm thick and without andic properties Commonly in wetlands (swamps, marshes, etc.); 1.2% of global & 1.3% of U.S. ice-free land
Inceptisols	Similar to Entisol, but beginning of a B horizon is evident; No diagnostic subsurface horizons; On landscapes continuously eroded or young deposits; Cambic, sulfuric, calcic, gypsic, petrocalcic, or petrogypsic horizon, or with a mollic, umbric, or histic epipedon, or with an exchangeable sodium percentage of >15% or fragipan; 9.9% of global & 9.1% of U.S. ice-free land	Mollisols	Must have mollic epipedon; High base saturation of >50%; Dark soils; Some with argillic or natric horizons; Common in grasslands; 6.9% of global & 22.4% of U.S. ice-free land
Oxisols	Most soil profile development; Must have oxic horizon within 150 cm of	Spodosols	Must have spodic horizon within 2 m of soil surface and without andic

	soil surface; Low nutrient availability; No argillic horizon; Highly weathered; Dominated by end-member clays, Al and Fe oxides; Commonly in old landscapes in tropics; 7.6% of global & <0.01% of U.S. ice-free land		properties; Usually have albic horizon; High in Fe, Al oxides and humus accumulation; Acidic soils; Common in coniferous or boreal forests; 2.6% of global and 3.3% of U.S. ice-free land
Ultisols	Must have argillic or kandic horizon; Low base saturation of <35% at 2 m depth or 75 cm below a fragipan; Common in subtropical regions; often known as red clay soils; 8.5% of global & 9.6% of U.S. ice-free land	Vertisols	Usually mollic epipedon; High in shrinking and swelling clays; >30% clay to a depth of 50 cm; Deep cracks (called gilgai) form when soil dries; Form from parent material high in clay (e.g., shales, basins, exposed Bt horizons of old soils); 2.4% of global & 1.7% of U.S. ice-free land

Example of classification of a soil type

Order: Entisols

Suborder: Fluvents
Great Group: Torrifluvents
Subgroup: Typic Torrifluvents
Family: Fine-loamy, mixed, superactive, calcareous, Typic Torrifluvents
Series: Jocity, Youngston.

Another Example

Order: Alfisols

Suborder: Xeralfs
Great Group: Durixeralfs
Subgroup: Abruptic Durixeralfs
Family: Fine, Mixed, Active, thermic Abruptic Durixeralfs
Series: San Joaquin (soil)

Link to Official Series Description: ftp://ftp-fc.sc.egov.usda.gov/NSSC/StateSoil_Profiles/ca_soil.pdf

Alfisol

Andisol

Aridisol

Entisol

Gelisol

Histisol

Inceptisol

Mollisol

Oxisol

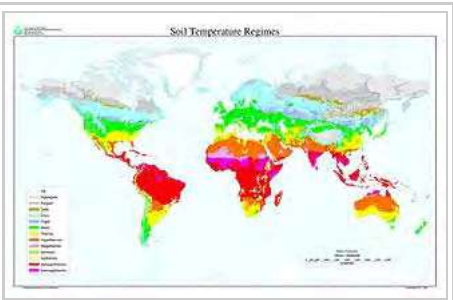
Spodosol

Ultisol

Vertisol

Soil Temperature Regimes (STR)

Soil temperature regimes, such as frigid, mesic, and thermic, are used to classify soils at some of the lower levels of the Soil Taxonomy. The cryic temperature regime distinguishes some higher-level groups. These regimes are based on the mean annual soil temperature (MAST), mean summer temperature, and the difference between mean summer and winter temperatures all at a soil depth of 50 cm. It is normally assumed that the MAST (in °C) equals the sum of the mean annual air temperature plus 2°C. If the difference between mean summer and winter temperatures is less than 6°C, then add "Iso" at the front of the name of the Soil Temperature Class.



Global Distribution of Soil Temperature Regimes

Soil Temperature Regime	Temperature Range
Pergelic	~ -8°C to -4°C
Subgelic	~ -4°C to 0°C
Frigid	~ 0°C to 8°C
Mesic	8°C to 15°C
Thermic	15°C to 22°C
Hyperthermic	22°C or higher

Soil Moisture Regimes (SMR)

The soil moisture regime, often reflective of climatic factors, is a major determinant of the productivity of terrestrial ecosystems, including agricultural systems. The soil moisture regimes are defined based on the levels of the groundwater table and the amounts of soil water available to plants during a given year in a particular region. Several moisture regime classes are used to characterize soils.

Soil Moisture Regime	Major Characteristics
Aquic	Soil is saturated with water and virtually free of gaseous oxygen for sufficient periods of time, such that there is evidence of poor aeration (gleying and mottling); Common in wetlands
Udic	Soil moisture is sufficiently high year-round in most years to meet plant requirement; Common in humid regions
Ustic	Soil moisture is intermediate between Udic and Aridic regimes; generally, plant-available moisture during the growing season, but severe periods of drought may occur; Common in semi-arid regions
Aridic	Soil is dry for at least half of the growing season and moist for less than 90 consecutive days; Common in arid (desert-like) regions
Xeric	Soil moisture regime is found in Mediterranean-type climates, with cool, moist winters and warm, dry summers. Like the Ustic Regime, it is characterized as having long periods of drought in the summer

Map of United States Distribution of Soil Moisture Regimes

Map of Global Distribution of Soil Moisture Regimes

See also

- FAO soil classification
- International Committee on Anthropogenic Soils (ICOMANTH)
- Soil classification
- Soil horizon
- 1938 USDA soil taxonomy
- Soil
- Soil in the United States

References

External links

- USDA / NRCS soil taxonomy webpage (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/class/taxonomy/)
- Soil taxonomy document (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051232.pdf)
- USDA-NRCS Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/)

Wikimedia Commons has media related to ***USDA Soil taxonomy***.

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Categories: Soil in the United States | Soil science | Types of soil | Pedology | Land management

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