

## Soil Classification Crib Sheet

Order

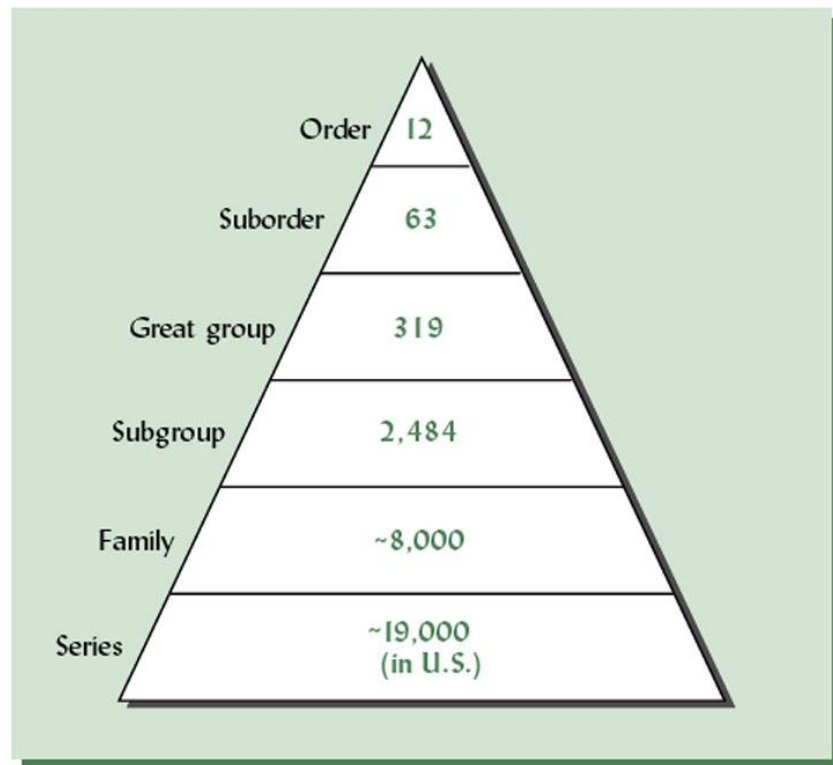
Suborder

Great Group

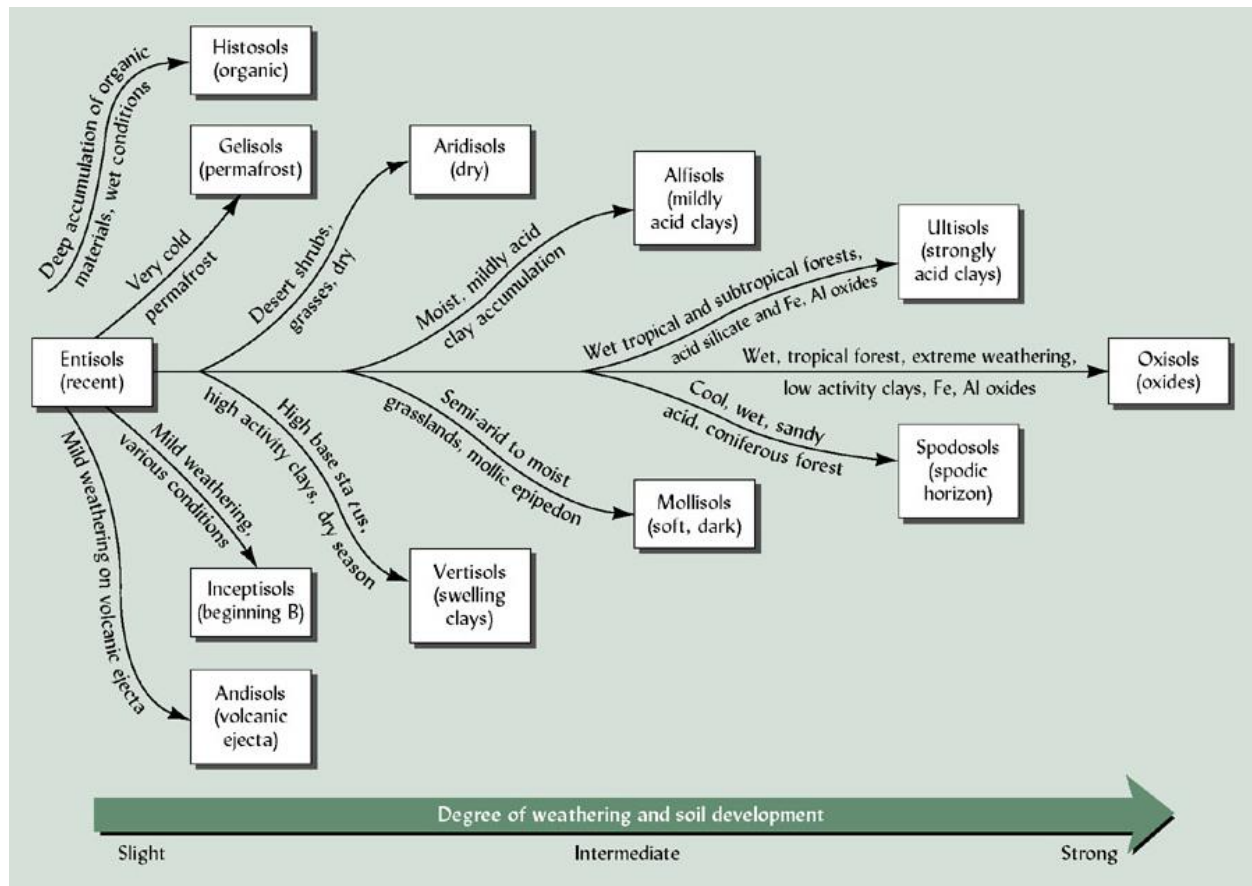
Subgroup

Family

Soil Series



## Orders



# Suborders

**TABLE 3.6** Formative Elements in Names of Suborders in Soil Taxonomy

Formative element	Derivation	Connotation of formative element
alb	<i>L. albus</i> , white	Presence of albic horizon (a bleached eluvial horizon)
anthr	Gk. <i>anthropos</i> , human	Presence of anthropic or plaggen epipedon
aqu	<i>L. aqua</i> , water	Characteristics associated with wetness
ar	<i>L. arare</i> , to plow	Mixed horizons
arg	<i>L. argilla</i> , white clay	Presence of argillic horizon (a horizon with illuvial clay)
calc	<i>L. calcis</i> , lime	Presence of calcic horizon
camb	<i>L. cambriare</i> , to change	Presence of cambic horizon
cry	Gk. <i>kryos</i> , icy cold	Cold
dur	<i>L. durus</i> , hard	Presence of a duripan
fibr	<i>L. fibra</i> , fiber	Least decomposed stage
fluv	<i>L. fluvius</i> , river	Floodplains
fol	<i>L. folia</i> , leaf	Mass of leaves
gyps	<i>L. gypsum</i> , gypsum	Presence of gypsic horizon
hem	Gk. <i>hemi</i> , half	Intermediate stage of decomposition
hist	Gk. <i>histos</i> , tissue	Presence of histic epipedon
hum	<i>L. humus</i> , earth	Presence of organic matter
orth	Gk. <i>orthos</i> , true	The common ones
per	<i>L. per</i> , throughout time	Of year-round humid climates, perudic moisture regime
psamm	Gk. <i>psammos</i> , sand	Sand textures
rend	Modified from Rendzina	Rendzinalike—high in carbonates
sal	<i>L. sal</i> , salt	Presence of salic (saline) horizon
sapr	Gk. <i>sapros</i> , rotten	Most decomposed stage
torr	<i>L. torridus</i> , hot and dry	Usually dry
turb	<i>L. turbidus</i> , disturbed	Cryoturbation
ud	<i>L. udus</i> , humid	Of humid climates
ust	<i>L. ustus</i> , burnt	Of dry climates, usually hot in summer
vitr	<i>L. vitreus</i> , glass	Resembling glass
xer	Gk. <i>xeros</i> , dry	Dry summers, moist winters

# Great Groups

**TABLE 3.7 Formative Elements for Names of Great Groups and Their Connotation**

*These formative elements combined with the appropriate subordinate names give the great group names.*

Formative element	Connotation	Formative element	Connotation	Formative element	Connotation
acr	Extreme weathering	fol	Mass of leaves	petr	Cemented horizon
agr	Agric horizon	fragi	Fragipan	plac	Thin pan
al	High aluminum, low iron	fragloss	See <i>frag</i> and <i>gloss</i>	plagg	Plaggen horizon
alb	Albic horizon	fulv	light-colored melanic horizon	plinth	Plinthite
and	Ando-like	gyps	Gypsic horizon	psamm	Sand texture
anhy	Anhydrous	gloss	Tongued	quartz	High quartz
aqu	Water saturated	hal	Salty	rhod	Dark red colors
argi	Argillic horizon	hapl	Minimum horizon	sal	Salic horizon
calc, calci	Calcic horizon	hem	Intermediate decomposition	sapr	Most decomposed
camb	Cambic horizon	hist	Presence of organic materials	somb	Dark horizon
chrom	High chroma	hum	Humus	sphagn	Sphagnum moss
cry	Cold	hydr	Water	sulf	Sulfur
dur	Duripan	kand	Low-activity 1:1 silicate clay	torr	Usually dry and hot
dystri, dys	Low base saturation	lithic	Near stone	ud	Humid climates
endo	Fully water saturated	luv, lu	Illuvial	umbr	Umbric epipedon
epi	Perched water table	melan	Melanic epipedon	ust	Dry climate, usually hot in summer
eutr	High base saturation	moli	With a mollic epipedon	verm	Wormy, or mixed by animals
ferr	Iron	natr	Presence of a natric horizon	vitr	Glass
fibr	Least decomposed	pale	Old development	xer	Dry summers, moist winters
fluv	Floodplain				

# Subgroups

Table 7.10 (cont.)		
Adjective	Derivation <sup>a</sup>	Connotation
Aquultic		Combination of Aquic and Ultic; intergrade to an Aquult
Arenic	L. arena, sand	Has thick, sandy epipedon
Angiaquic		Combination of Argic and Aquic
Argic		Has an argillic (Bt) horizon, enriched in illuvial clay
Argidic		Combination of Argic and Aridic; intergrade to an Argid
Argiduridic		Combination of Argic, Duric and Aridic; intergrade to an Argidurid
Aridic		Intergrade to an Aridisol, often implying that the soil moisture regime is borderline Aridic or Torric
Calcargidic		Combination of Calcic, Argic and Aridic; intergrade to a Calcargid
Calcic		Has a calcic horizon
Calcidic		Combination of Calcic and Aridic; intergrade to a Calcid
Cambidic		Combination of Cambic and Aridic; intergrade to a Cambid
Chromic	Gr. chroma, color	High chroma (bright-colored, not gray); usually implies "low in organic matter"
Cumulic	L. cumulus, heap	Overthickened, dark epipedon
Duric		Has a duripan or a mostly- cemented, duripan-like layer
Duridic		Combination of Duric and Aridic; intergrade to a Durid
Durinodic	L. durabilis, lasting or enduring, and L. nodus, knot	Has significant amounts of durinodes or is brittle
Dystric		Low base saturation, acid
Entic		Intergrade to an Entisol, often implying that some part of the soil is more weakly developed than is typical for the great group
Epiaquic		Combination of epi- and aquic; surface wetness, usually implying a perched water table within the profile
Eutric		High base status or pH
Fibric		Contains some organic materials with a low degree (fibric) of decomposition
Fluvaquentic		Combination of Fluv-, Aquic and Entic; intergrade to a Fluvaquent
Fluventic		Combination of Fluv- and Entic; intergrade to a Fluvent
Fragiaquic		Combination of Fragic and Aquic

(cont.)



Table 7.10 (cont.)		
Adjective	Derivation <sup>a</sup>	Connotation
Fragic	L. grossus, thick, and L. aren, sand	Has a fragipan (Bx or Btx horizon) or a fragic-like horizon, brittle and dense
Glacic		Presence of ice lenses or wedges
Glossaquic		Combination of Glossic and Aquic
Glossic		Has a glossic horizon, tonguing horizon boundaries
Grossarenic		Has thick, sandy epipedon
Gypsic		Has a gypsic horizon
Halic		Has high amounts of soluble salts
Haplargdic		Combination of Haplic, Argic and Aridic; intergrade to a Haplargid
Haplic		Minimum horizonation, not a "complicated" profile
Haplocalcidic		Combination of Haplic, Calcic and Aridic; intergrade to a Haplocalcid
Haploduridic		Combination of Haplic, Duridic and Aridic; intergrade to a Haplodurid
Haploxeralfic		Combination of Haplic, Xeric and Alfic; intergrade to a Haploxeralf
Haploxerollic		Combination of Haplic, Xeric and Mollic; intergrade to a Haploxeroll
Hemic		Contains some organic materials of intermediate degree (hemic) of decomposition
Histic		Intergrade to a Histosol; can imply that the soil has an O horizon thinner than is required for a Histic epipedon
Humaqueptic		Combination of Humic, Aquic and Inceptic; intergrade to a Humaquept
Humic		Has abundant organic matter
Hydraquentic		Combination of Hydric, Aquic and Entic; intergrade to a Hydraquent
Hydric		Presence of water, often implying a layer of water in inorganic clays and humus, or simply a layer of water within the profile
Inceptic		Not strongly developed
Kandic	L. lamina, thin plate	Dominated by 1:1 phyllosilicate clays; probably has a Bt horizon that nearly qualifies as a kandic horizon
Kandiudalfic		Combination of Kandic, Udic and Alfic; intergrade to a Kandiudalf
Kandiustalfic		Combination of Kandic, Ustic and Alfic; intergrade to a Kandiustalf
Kanhaplic		Combination of Kandic and Haplic
Lamellic		Argillic horizon that consists entirely of lamellae (clay bands)

(cont.)

**Table 7.10** (cont.)

Adjective	Derivation <sup>a</sup>	Connotation
Leptic	Gr. <i>leptos</i> , thin	Has thin solum
Limnic	Modified from Gr. <i>limne</i> , lake	Presence of limnic materials (lake sediments) at depth
Lithic	Gr. <i>lithos</i> , stone	Shallow to hard bedrock (lithic contact)
Mollic		Intergrade to a Mollisol, often implying that A horizon is not quite dark and/or thick enough to be a mollic epipedon
Natrangidic		Combination of Natric, Argic and Aridic; intergrade to a Natrangid
Natric		Has a natric (Btn) horizon, rich in sodium
Natrixeralfic		Combination of Natric; Xeric and Alfic; intergrade to a Natrixeralf
Ochreptic		Combination of Ochre- and Inceptic; intergrade to an Ochrept
Ombroaquic		Water on the soil surface; saturated in the upper solum at times of the year
Oxic		Intergrade to an Oxisol, often implying a low CEC or a dominantly oxide clay mineralogy
Oxyaquic		Oxygenated water occupies saturated soil horizons for at least some part of the year
Pachic	Gr. <i>pachys</i> , thick	Has a thick epipedon
Paleargidic		Combination of Pale-, Argic and Aridic; intergrade to a Paleargid
Palexerollic		Combination of Pale-, Xeric and Mollic; intergrade to a Palexeroll
Paralithic	Gr. <i>para</i> , beside and <i>lithic</i> (stone)	Shallow to soft and/or weathered bedrock (paralithic contact)
Petrocalcic		Has a petrocalcic horizon
Petrocalcicidic		Combination of Petro-, Calcic and Aridic; intergrade to a Petrocalcicid
Petroferric	Gr. <i>petra</i> , rock, and L. <i>ferrum</i> , iron	Shallow to ironstone (petroferric contact)
Petrogypsic		Has a petrogypsic horizon
Petronodic		Has significant amounts of nodules or concretions
Placic		Has a thin ironpan (placic horizon)
Plagganthreptic		Combination of Plaggen, for plaggen epipedon, produced by long-time manuring, Anthropic and Inceptic; intergrade to a Plagganthrept
Plinthaquic		Combination of Plinthic and Aquic
Plinthic		Presence of plinthite
Psammentic		Combination of Psamm- and Entic; intergrade to a Psamment
Rhodic		Dark red color
Ruptic	L. <i>ruptum</i> , broken	Intermittent or broken horizons, often over bedrock

(cont.)

**Table 7.10** | (cont.)

Adjective	Derivation <sup>a</sup>	Connotation
Salic		Has a salic (Bz) horizon, dominated by salts more soluble than gypsum
Salidic		Combination of Salic and Aridic; intergrade to a Salid
Sapric		Contains some organic materials of advanced degree (sapric) of decomposition
Sodic	Modified from sodium	Abundant sodium in the profile
Sombric		Has a sombric (acid, Bh) horizon
Sphagnic		Dominated by fibers of Sphagnum moss
Spodic		Intergrade to a Spodosol, often implying that the soil has a Bs or Bh horizon that is spodic-like but fails to meet one or more criteria for a spodic horizon
Sulfaqueptic		Combination of Sulfic, Aquic and Inceptic; intergrade to a Sulfaquept
Sulfic or Sulfuric		Presence of sulfides or their oxidation products; may have a sulfuric horizon
Terric	L. terra, earth	Organic soils with a mineral layer within 1.5 m of the surface
Thaptic	Gr. thapto, buried	Soils profile contains a buried soil or horizon
Thapto-Histic	Gr. thapto, buried, and histos, tissue	Combination of Thapto and Histic; soil profile contains a buried organic soil or soil horizon
Torrertic		Combination of Torric and Vertic; intergrade to a Torrent
Torrifluventic		Combination of Torric, Fluv- and Entic; intergrade to a Torrifuvent
Torriorthentic		Combination of Torric, Orthic and Entic; intergrade to a Torriorthent
Torripsammentic		Combination of Torric, Psamm- and Entic; intergrade to a Torripsamment
Torroxic		Combination of Torric and Oxic; intergrade to a Torrox
Typic	Typical, normal	Central concept; not normally grading toward another type of profile
Udandic		Combination of Udic and Andic; intergrade to a Udand
Udertic		Combination of Udic and Vertic; intergrade to a Udert
Udic		Grading toward a udic soil moisture regime
Udifluventic		Combination of Udic, Fluv-, and Entic; intergrade to a Udifluent
Udollic		Combination of Udic and Mollic; intergrade to a Udoll
Udorthentic		Combination of Udic, Orth- and Entic; intergrade to a Udorthent
Udoxic		Combination of Udic and Oxic; intergrade to a Udox

(cont.)

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(cont.)



Family

TABLE 3.9 Some Commonly Used Particle-Size, Mineralogy, Cation Exchange Activity, and Temperature Classes Used to Differentiate Soil Families.

The characteristics generally apply to the subsoil or 50 cm depth. Other criteria used to differentiate soil families (but not shown here) include the presence of calcareous or highly aluminum toxic (allic) properties, extremely shallow depth (shallow or micro), degree of cementation, coatings on sand grains, and the presence of permanent cracks.

Particle-size class	Mineralogy class	Cation exchange activity class <sup>b</sup>		Soil temperature regime class		
		Term	CEC / % clay	Mean annual temperature, °C	>6°C difference	<6°C difference
					between summer and winter	between summer and winter
Ashy	Mixed	Superactive	0.60	<-10	Hypergelic <sup>c</sup>	—
Fragmental	Micaceous	Active	0.4 to 0.6	-4 to -10	Pergelic <sup>c</sup>	—
Sandy-skeletal <sup>a</sup>	Siliceous	Semiactive	0.24 to 0.4	+1 to -4	Subgelic <sup>c</sup>	—
Sandy	Kaolinitic	Subactive	<0.24	<+8	Cryic	—
Loamy	Smectitic			<+8	Frigid <sup>d</sup>	Isofrigid
Clayey	Gibbsitic			+8 to +15	Mesic	Isomesic
Fine-silty	Gypsic			+15 to +22	Thermic	Isothermic
Fine-loamy	Carbonic			>+22	Hyperthermic	Isohyperthermic
Etc.	Etc.					

<sup>a</sup> Skeletal refers to presence of up to 35% rock fragments by volume.  
<sup>b</sup> Cation exchange activity class is not used for taxa already defined by low CEC (e.g., kandic or oxic groups).  
<sup>c</sup> Permafrost present.  
<sup>d</sup> Frigid is warmer in summer than Cryic.