

3.4.5.3.1 Soil Moisture Regimes - These approximate climatic zones, though landscape position and soil available water holding capacity alter classification based strictly on precipitation. The regimes are classified relative to the soil control section, defined below.

soil control section - zone of most active root growth; depth wetted by a minimum of 2.5 cm (1") and a maximum of 7.5 cm (3") of water added to a dry soil. Range is texture dependent: clays ~8-25 cm (3.1-9.8"); sands ~20-60 cm (7.8-23.4")

Aquic usually wet with enough anaerobic saturation to produce visual evidence of poor aeration (gleying and/or redoximorphic features - previously called mottling)

Udic adequate water for plant growth throughout the year, e.g., Corn Belt - summer crop can be grown without irrigation

Ustic deficient water, summer (growing season) rainfall pattern with dry winters, e.g., Wheat Belt

Xeric deficient water, winter rainfall, dry summer, e.g., Mediterranean climate; California makes the news in late winter/early spring for mud flows after the wet winter, then makes news in late fall for forest fires after the dry summer

Aridic very water deficient; long dry periods with short wet periods

Torric aridic, specific places (some subgroup names for euphony) in Taxonomy

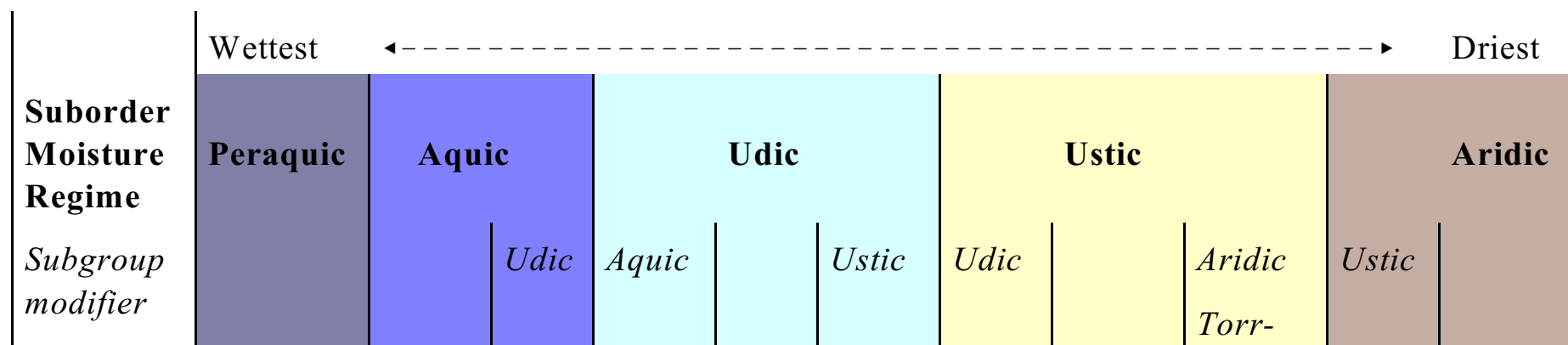
Per- This prefix used with aquic and udic implies no seasonal pattern: peraquic - always saturated; perudic - always adequate moisture

Since humans are imposing discrete classes on a natural system, problems arise when soil water availability of a given soil nears a class boundary. Then the words are used in combination to indicate the class. The diagram on the next page attempts to show this usage.

Soil Moisture Regime Continuum

When the soil is on a border of a moisture regime, the primary regime is noted at the suborder level, and the modifier is used in the suborder name, e.g., Aridic Paleustalf (Amarillo soil in previous example), or Torrertic Paleustoll (Pullman in previous example). Both occur in an ustic moisture regime, but are on the drier side, hence the modifier to communicate that information to the reader. A Udic Haplustert is on the wetter side of the ustic moisture regime, while an Aquic Eutrudept is on the wetter side of the udic moisture regime.

Some thought about parts of speech is needed here. Adjectives modify nouns. Many adjectives end with -ic. The subgroup classifications all end with -ic, thus they are all adjectives modifying nouns. What is the noun they are modifying? The Great Group classification. Thus, any subgroup modifier is always supplying more information about what the Great Group communicates. In fact, all of Soil Taxonomy works that way: Each successive level modifies all previous levels, providing more information. This is counter to our reading from left to right, and thinking the first word we encounter is the most important. In Soil Taxonomy, the most important part is at the end, and everything in front is some sort of modifier supplying more information about the higher levels.



3.4.5.3.2 Soil Temperature Classes

Based on mean annual soil temperature, average summer temperature, and difference between mean summer and mean winter temperatures. Soil temperature classes are given in the family name.

Pergelic	≤ 0 C (32°F); permafrost present (unless dry)
Cryic	0-8 C (32-47°F); summer soil temperature ≤ 15 C
Frigid	0-8 C (32-47°F); summer soil temperature ≥ 15 C. Though the mean annual soil temperatures are the same for frigid and cryic, frigid has a warmer summer, enabling a short growing season. (North Dakota and north)
Mesic	8-15 C (47-59°F) (Canadian River to North Dakota)
Thermic	15-22 C (59-72°F) (San Antonio to Canadian River)
Hyperthermic	≥ 22 C (72°F)
Iso-	This prefix can be used with cryic, frigid, mesic, thermic, and hyperthermic, and implies the temperature is essentially constant year-round (less than 5 degrees difference in warm and cool season mean soil temperatures).

Should you ever have a need to remember all twelve soil orders, the following mnemonic device might help. (It helps to pretend you are Italian or in “The Godfather when you read it.) You will not have to recall all twelve in this class, nor will you have to remember the six levels of classification, since they are provided as options on the exam testing your ability to interpret taxonomic classifications.

G, I Have A Mousa

***G* elisols**

***I* nceptisols**

***H* istosols**

***A* ndisols**

***V* ertisols**

***E* ntisols**

***A* lfisols**

***M* ollisols**

***O* xisols**

***U* ltisols**

***S* podosols**

***A* ridisols**

3.4.5.4.3.2 Hints for the process

Order - words end in -sol (or -sols)

Mollisol

Suborder - prefix + root (from order)

Ustoll = Ust + oll

Great Group - prefix + prefix + root ⇒ prefix + Suborder

Paleustoll = Pale + ust + oll ⇒ Pale + ustoll

Subgroup - Two (or three) words, -ic and Great Group

Vertic Paleustoll = Vert + ic + Paleustoll

Three words may be used in the subgroup classification for the sake of euphony (Greek: eu, good; phony, sound) if a pronounceable one word prefix could not be constructed, e.g., Alfic Lithic (Could you pronounce Alflithic or Lithalfic without sounding like you had a lisp?). The same is true for some vowels in the Great Group levels, e.g., Calciudoll (Could you pronounce Calcudoll? A “c” followed by an “i” has a soft “ess” sound, whereas a “c” followed by a “u” had a hard “k” sound.)

Do not forget to look back at the order roots when considering modifiers, as in Vertic, which comes from Vertisol. However, this soil is a Mollisol (ends in -oll), not a Vertisol. As everything in front modifies everything that follows, this soil is a Mollisol in an ustic moisture regime with a strongly developed argillic horizon that has high shrink-swell clays (vertic properties).

Complete this table, including only the information provided by the name. All cells in the table will not be filled.

Classification	Level	Order	Diagnostic feature	Moisture Regime	Other Horizons	Other Features
Mollic Endoaquents						
Humults						
Oxisols						
Torrertic Calciustolls						
Xererts						
Haplocalcids						
Alfic Lithic Argiustolls						
Cryands						
Haplosalids						
Glossocryalfs						
Aridic Paleustalfs						
Epiaquods						
Quartzipsamments						
Inceptisols						
Humic Haplaquox						
Andisols						