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Summary of Changes to Keys to Soil Taxonomy January 2010

Chapter and page numbers refer to
Keys to Soil Taxonomy, tenth edition, 2006.

Chapter 1 – The Soils That We Classify

No substantive changes.

Chapter 2 – Differentiae for Mineral Soils and Organic Soils

- Distinction between Mineral and Organic Soils, P.4 – Added two sentences to clarify the state of decomposition required for plant materials to be O horizons. Italicized the word "Sphagnum".
- Definition of Organic Soils, P.4 – Added the Histels to Histosols as the taxonomic concept of organic soils.

Chapter 3 – Horizons and Characteristics Diagnostic for the Higher Categories

- Second paragraph in chapter, P.5 – Added sentence about required characteristics for individual horizons and features being arranged in key format.
- Anthropic epipedon, P.5 – Revised item 5. for clarity.
- Mollic epipedon & Umbric epipedon, P.7 & 8 – Revised item 6. for clarity.
- Gypsic horizon, P.12
  - Deleted word “illuvial” and added mention of transformation to brief definition and required characteristics.
  - Changed the acceptable thickness of laterally continuous cementation to exclude the minimum thickness value for the petrogypsic horizon.
  - Deleted the formula for calculating gypsum content.
- Natric horizon, P.12
  - Revised definition and required characteristics of the natric horizon to make them stand alone from the argillic horizon by adding 3 items for minimum thickness, evidence of clay illuviation, and clay increase requirements.
  - Revised item on structure requirement by changing kind of structure from noun to adjective.
- Petrogypsic horizon, P. 13
  - Deleted word “illuvial” and added mention of transformation to definition.
  - Deleted word “indurated” and added the range of all cementation classes to the definition.
  - Changed minimum thickness from 10 cm to 5 mm.
  - Changed minimum gypsum content from 5 percent to 40 percent gypsum, by weight.
  - Deleted the formula for calculating the index of accumulation (thickness in cm times percent gypsum).
- Durinodes, P.16
  - Added mention of concretions in first sentence to validate the last sentence in the paragraph.
  - Corrected first word of last sentence from “Most” to “Some”.
- Free Carbonates – Added paragraph to redefine this old term which is used as criteria.
- Identifiable Secondary Carbonates, P.17 – Added residuum from limestone as example of a calcareous parent material in first paragraph.
- Linear Extensibility (LE), P.17 – Added sentence on the use of LE as a criterion for vertic subgroups.

- Plinthite, P.19 – Added 15 new sentences for information transfer.
- Volcanic Glass & Weatherable Minerals, P.20 – Minor additions for accuracy.
- Aquic conditions, P.23 – Added additional clarification to the concept of artificial drainage in the first paragraph.
- Lithic contact, P.25 – Added one sentence and modified another in second paragraph about critical depths for lithic subgroups in organic soils (Histels and Histosols).

- Normal years, P.26
  - Changed the format of the text in the paragraph to clarify that two separate criteria are in the definition.
  - Added second paragraph to allow use of precipitation data from periods of above and below normal precipitation.
- Soil Temperature Regimes, P.28
  - Added gelic soil temperature regime.
  - Corrected criteria to exactly 6 degrees C for non-iso temperature regimes.
- Sulfidic Materials, P.28
  - Condensed three paragraphs into two with revised text on minerals.
  - Added a set of required characteristics.
- Sulfuric Horizon, P.29
  - Added three paragraphs of discussion preceding set of required characteristics.
  - Revised item 1. a. (mineral criterion) and deleted item 1.b (Munsell color criterion) from set of required characteristics.
- Literature Cited, P.29 – Added two references (Fanning, et al.) to list.

Chapter 4 – Identification of the Taxonomic Class of a Soil

- Key to Soil Orders, P.31 –
  - Added sentence before Key to Soil Orders to clarify the concept of diagnostic horizons being "within" versus "with the upper boundary within" a specified depth.
  - Clarified use of particle-size classes as proxies for both fine-earth texture classes or grain-size composition when referred to in context of horizons not within the particle-size control section.
  - Added phrase "or gelic temperature regime" in three places for the Spodosol order (section C.) and in one place for the Inceptisol order (section K.).

Chapter 5 – Alfisols

- Albaqualfs, P.35 – Clarified the criterion on saturated hydraulic conductivity and added units in cm/hr.
- Vertic subgroups – Replaced word aggregates with peds in 1st criterion throughout the chapter.
- Removed phrases “that has its upper boundary” from criteria for several great groups (e.g. Fragiaqualfs, p.35) and subgroups (e.g. Salidic Natrustalfs, p.65).
- Arenic and Grossarenic subgroups – Clarified wording of arenic and grossarenic subgroups for sandy or sandy-skeletal particle-size class criteria as proxies for sandy texture classes.
- Inceptic Hapludalfs, P.55 – Corrected error by deleting kandic and natric horizon from 1st criterion.
- Paleustalfs, P.59 – Clarified clay content requirement by replacing particle-size class criterion with percent noncarbonate clay.
- Inceptic Haplustalfs, P.62 – Corrected error by deleting kandic and natric horizon from 1st criterion.
- Palexeralfs, P.71– Clarified clay content requirement by replacing particle-size class criterion with percent noncarbonate clay.
- Inceptic Haploxeralfs, P.74 – Corrected error by deleting natric horizon from 1st criterion.

Chapter 6 – Andisols

- Key to Suborders & Key to Great Groups for Aquands, P.77 – Replaced temperature criterion with gelic soil temperature regime for Gelands and Gelaquands, respectively.
- Acric and Dystric subgroups – Clarified for Acraquoxic (e.g. Acraquoxic Melanaquands), Acrudoxic (e.g. Acrudoxic Durudands), Dystric Vitric (e.g. Dystric Vitric Haplustands), and Dystric (e.g. Dystric Haplustands) subgroups that the chemical criterion is “a sum of” extractable bases plus 1N KCL-extractable Al^{3+}.
- Gelaquands, P.79
  - Added 1 new subgroup:
    - Turbic Gelaquands
- Fulvicryands, P.82
  - Added 1 new subgroup:
    - Folistic Fulvicryands

- Haplocryands, P.82
  - Added 1 new subgroup:
    - Folistic Haplocryands
- Vitricryands, P.83
  - Added 1 new subgroup:
    - Folistic Vitricryands
- Vitrigelands, P.84
  - Added 1 new subgroup:
    - Turbic Vitrigelands
- Eutric Thaptic Hapludands and Eutric Hapludands, P. 89 – Added the measurement method (by NH_4OAc) for the sum of extractable bases used in the criteria.
- Removed phrases "that has its upper boundary" from criteria for several great groups and subgroups.

Chapter 7 – Aridisols

- Vertic subgroups – Replaced word aggregates with peds in 1st criterion throughout the chapter.
- Removed phrases "that has its upper boundary" from criteria for several suborders (e.g. Durids, p. 97), great groups (e.g. Petrocryids, p.112), and subgroups (e.g. Leptic Haplogypsids, p.120).
- Arenic subgroups – Clarified wording of arenic subgroups for sandy or sandy-skeletal particle-size class criteria as proxies for sandy texture classes in Calciargids, Haplargids, and Paleargids.
- Edits for consistent wording of the moisture requirements in xeric and ustic subgroups throughout the chapter, including the addition of "normal years" to the statements.

Chapter 8 – Entisols

- Fluvents and Fluv subgroups – Added phrase "one or both" to paired criteria (deep organic-carbon and irregular decrease in organic-carbon)
- Vertic subgroups – Replaced word aggregates with peds in 1st criterion throughout the chapter.
- Humic & Mollic subgroups – Revisions for consistent wording.
- Key to Suborders, P.123 – Added new suborder Wassents for subaqueous soils with 6 great groups and associated subgroups which are all new taxa:
  - Added great group Fluviwassents with 5 subgroups:
    - Sulfic Fluviwassents
    - Lithic Fluviwassents
    - Thapto-Histic Fluviwassents
    - Aeric Fluviwassents
    - Typic Fluviwassents
  - Added great group Frasiwassents with 7 subgroups:
    - Hydric Frasiwassents
    - Lithic Frasiwassents
    - Psammentic Frasiwassents
    - Thapto-Histic Frasiwassents
    - Fluventic Frasiwassents
    - Aeric Frasiwassents
    - Typic Frasiwassents
  - Added great group Haplowassents with 4 subgroups:
    - Sulfic Haplowassents
    - Lithic Haplowassents
    - Aeric Haplowassents
    - Typic Haplowassents
  - Added great group Hydrowassents with 5 subgroups:
    - Sulfic Hydrowassents
    - Grossic Hydrowassents
    - Lithic Hydrowassents
    - Thapto-Histic Hydrowassents
    - Typic Hydrowassents

- Added great group Psammowassents with 5 subgroups:
  - Sulfic Psammowassents
  - Lithic Psammowassents
  - Fluventic Psammowassents
  - Aeric Psammowassents
  - Typic Psammowassents
- Added great group Sulfiwassents with 6 subgroups:
  - Lithic Sulfiwassents
  - Haplic Sulfiwassents
  - Thapto-Histic Sulfiwassents
  - Fluventic Sulfiwassents
  - Aeric Sulfiwassents
  - Typic Sulfiwassents

- Key to Great Groups for Aquents, P.124 – Replaced temperature criterion with gelic soil temperature regime for Gelaquents.
- Key to Great Groups for Fluvents, P.128 – Replaced temperature criterion with gelic soil temperature regime for Gelifluvents.
- Key to Great Groups for Orthents, P.133 – Replaced temperature criterion with gelic soil temperature regime for Gelorthents.
- Gelorthents, P.134
  - Added 1 new subgroup:
    - Aquic Gelorthents

Chapter 9 – Gelisols

- Key to Suborders, P.143 – Revised Histels by removing saturation criterion from item 3.
- Haplorthels, P.146
  - Added 1 new subgroup:
    - Folistic Haplorthels
- Mollorthels, P.147
  - Added 1 new subgroup:
    - Folistic Mollorthels
- Umbrorthels, P.148
  - Added 1 new subgroup:
    - Folistic Umbrorthels
- Haploturbels, P.149
  - Added 1 new subgroup:
    - Folistic Haploturbels
- Molliturbels, P.150
  - Added 1 new subgroup:
    - Folistic Molliturbels
- Umbriturbels, P.151
  - Added 1 new subgroup:
    - Folistic Umbriturbels

Chapter 10 – Histosols

- Lithic subgroups in Fibrists, Saprists, and Hemists – Changed wording of lithic subgroups in Fibrists, Saprists, and Hemists from the lithic contact being "within" the control section, to being "at the lower boundary of" the control section.
- Key to Suborders, P.153 – Minor revision of organic material criterion b. for Fibrists and 2. for Saprists.
- Key to Suborders, P.153 – Added new suborder Wassists for subaqueous soils with 3 great groups and associated subgroups which are all new taxa:
  - Added great group Frasiwassists with 3 subgroups:
    - Fibric Frasiwassists
    - Sapric Frasiwassists

        - Typic Frasiwassists
    - Added great group Haplowassists with 4 subgroups:
        - Sulfic Haplowassists
        - Fibric Haplowassists
        - Sapric Haplowassists
        - Typic Haplowassists
    - Added great group Sulfiwassists with 3 subgroups:
        - Fibric Sulfiwassists
        - Sapric Sulfiwassists
        - Typic Sulfiwassists

Chapter 11 – Inceptisols

- Fluv subgroups – Added phrase "one or both" to paired criteria (deep organic-carbon and irregular decrease in organic-carbon) in Fluvaquentic, Fluventic, Fluventic Humic, Dystric Fluventic, Torrifluventic, Udifluventic, and Cumulic subgroups throughout the chapter.
- Vertic subgroups – Replaced word aggregates with peds in 1st criterion throughout the chapter.
- Key to Suborders, P.159 & Key to Great Groups for Aquepts, P.160 – Replaced temperature criterion with gelic soil temperature regime for Gelepts and Gelaquepts, respectively.
- Humic & Mollic subgroups in Endoaquepts, P.162 and in Epiaquepts, P.163 – Revisions for consistent wording.
- Gelaquepts, P.163
    - Added 1 new subgroup:
        - Turbic Gelaquepts
- Duric Halaquepts, P.164 – Revised criterion on horizon versus aggregated subhorizons to parallel other duric/durinodic subgroups.
- Cryepts, P.166 – Removed phrase "that has its upper boundary" from criteria for Calcicryepts
- Dystrocryepts, P.166
    - Added one new subgroup:
        - Folistic Dystrocryepts
    - Revised format of criteria for Fluvaquentic subgroup to parallel others in the chapter.
- Haplocryepts, P.169 – Revised format of criteria for Fluvaquentic subgroup to parallel others in chapter.
- Humicryepts, P.170 – Revised format of criteria for Fluvaquentic subgroup to parallel others in chapter.
- Gelepts, P.171
    - Added new great group Humigelepts with 8 new subgroups:
        - Lithic Humigelepts
        - Andic Humigelepts
        - Aquic Humigelepts
        - Oxyaquic Humigelepts
        - Fluventic Humigelepts
        - Turbic Humigelepts
        - Eutric Humigelepts
        - Typic Humigelepts
    - Moved great group Dystrogelepts up one place in key to great groups.
    - Made the great group Eutrogelepts obsolete by adding the new great group Haplogelepts
    - Made the subgroup Humic Dystrogelepts obsolete (Most are now Typic Humigelepts).
    - Added 2 new subgroups of Dystrogelepts:
        - Fluventic Dystrogelepts
        - Turbic Dystrogelepts
    - Made all 5 subgroups of Eutrogelepts obsolete:
        - Lithic Eutrogelepts
        - Andic Eutrogelepts
        - Aquic Eutrogelepts
        - Humic Eutrogelepts
        - Typic Eutrogelepts

- Added 6 subgroups of Haplogelepts:
  - Lithic Haplogelepts
  - Andic Haplogelepts
  - Aquic Haplogelepts
  - Fluventic Haplogelepts
  - Turbic Haplogelepts
  - Typic Haplogelepts

- Udepts, P.172
  - Removed phrase "indurated soil layer" from criterion for Durudepts in key to great groups.
  - Removed phrases about "upper boundary" of diagnostic horizons from criteria for Durudepts and Fragiudepts in key to great groups.
  - Added new great group Humudepts with 17 new subgroups:
    - Lithic Humudepts
    - Vertic Humudepts
    - Aquandic Humudepts
    - Andic Oxyaquic Humudepts
    - Andic Humudepts
    - Vitrandic Humudepts
    - Fluvaquentic Humudepts
    - Aquic Humudepts
    - Oxyaquic Humudepts
    - Psammentic Humudepts
    - Oxic Humudepts
    - Cumulic Humudepts
    - Fluventic Humudepts
    - Pachic Humudepts
    - Eutric Humudepts
    - Entic Humudepts
    - Typic Humudepts
- Dystrudepts, P.175
  - Deleted umbric or mollic epipedon from criterion and added color (value) as criteria for the Humic Lithic, Aquic Humic, Humic Psammentic, Fluventic Humic, and Humic subgroups.
  - Made the subgroup Humic Pachic Dystrudepts obsolete (Most are now Pachic Humudepts).
  - Moved the Ruptic-Alfic and Ruptic-Ultic subgroups higher in key to subgroups (precedes Humic subgroup).
- Eutrudepts, P.175
  - Deleted umbric or mollic epipedon from criterion and added color (value) as criteria for the Humic Lithic and Humic subgroups.
  - Replaced phrase "free carbonates" with "a $CaCO_3$ equivalent" in criteria for Rendollic subgroup.
  - Moved the Ruptic-Alfic subgroup higher in key to subgroups (precedes Humic subgroup).
- Fragiudepts, P.177
  - Revised Humic subgroup by adding color (value) criteria as a second option.
- Ustepts, P.177
  - Removed phrases about "upper boundary" of diagnostic horizons from criteria for Durustepts and Calciustepts in key to great groups.
  - Replaced phrase "Are either calcareous" with "Have free carbonates" in criteria for Calciustepts in key to great groups.
  - Added new great group Humustepts with 7 new subgroups:
    - Lithic Humustepts
    - Andic Humustepts
    - Vitrandic Humustepts
    - Oxyaquic Humustepts
    - Oxic Humustepts
    - Aridic Humustepts
    - Typic Humustepts

- Dystrustepts, P.179
  - Deleted umbric or mollic epipedon from criterion and added color (value) criteria for the Humic subgroup.
- Haplustepts, P.180
  - Removed phrases about "upper boundary" of diagnostic horizons from criteria for Gypsic, Haplocalcidic, Calcic Udic, and Calcic subgroups in key to subgroups.
- Xerepts, P.184
  - Removed phrases about "upper boundary" of diagnostic horizons from criteria for Durixerepts, Calcixerepts, and Fragixerepts in key to great groups.
  - Replaced phrase "Are calcareous" with "Free carbonates" in criteria for Calcixerepts in key to great groups.
  - Moved great group Fragixerepts up one place in key to great groups (precedes Calcixerepts).
  - Added new great group Humixerepts with 11 new subgroups:
    - Lithic Humixerepts
    - Aquandic Humixerepts
    - Andic Humixerepts
    - Vitrandic Humixerepts
    - Aquic Humixerepts
    - Oxyaquic Humixerepts
    - Cumulic Humixerepts
    - Fluventic Humixerepts
    - Pachic Humixerepts
    - Entic Humixerepts
    - Typic Humixerepts
- Dystroxerepts, P.186
  - Deleted umbric or mollic epipedon from criterion and added color (value) criteria for the Humic Lithic, Fluventic Humic, and Humic subgroups.
- Fragixerepts, P.187
  - Revised Humic subgroup by adding color (value) criteria as a second option.
- Haploxerepts, P.188
  - Deleted umbric or mollic epipedon from criterion and added color (value) criteria for the Humic Lithic and Humic subgroups.

Chapter 12 - Mollisols

- Key to Suborders, P.191, 192
  - Added a 4th criterion that excludes soils with a cryic or gelic soil temperature regime from classifying in Albolls.
  - Replaced temperature criterion with gelic soil temperature regime for Gelolls.
- Fluv subgroups – Added phrase "one or both" to paired criteria (deep organic-carbon and irregular decrease in organic-carbon) in Fluvaquentic, Fluvaquentic Vertic, Fluventic, Torrifluventic, and Cumulic subgroups throughout the chapter.
- Vertic subgroups – Replaced word aggregates with peds in 1st criterion throughout the chapter.
- Removed phrases "that has its upper boundary" from criteria for several suborders (e.g. Aquolls, p. 191), great groups (e.g. Duraquolls, p.193), and subgroups (e.g. Petrocalcic Calcicryolls, p.198).
- Vertic Duraquolls, P. 194 and Vertic Durixerolls, P. 224 – Revised header statements and criteria above the duripan for clarity.
- Arenic and Grossarenic subgroups – Clarified wording of arenic and grossarenic subgroups for sandy or sandy-skeletal particle-size class criteria as proxies for sandy texture classes in Argiaquolls and Argiudolls.
- Free carbonates – Replaced phrase "are calcareous" with "free carbonates" in criteria for great groups Calcicryolls, Calciudolls, Calciustolls, and Calcixerolls and subgroups Calcic Paleudolls and Entic Paleustolls. Clarified that free carbonates are required in some subgroups (e.g. Vermic Hapludolls).
- Duric subgroups – Qualified rupture-resistance class requirement for most duric subgroups by adding words "at least" (e.g. Duric Natrustolls).

- Haplogelolls, P.200
  - Added 2 new subgroups:
    - Oxyaquic Haplogelolls
    - Turbic Haplogelolls
- Key to Great Groups for Ustolls, P.209 – Clarified that noncarbonate clay is used in item 2.b. for Paleustolls.
- Duric Argiustolls, P. 213 and Duric Haplustolls, P. 219 – Clarified the diagnostic features.
- Key to Great Groups for Xerolls, P.224 – Clarified clay content requirement by replacing particle-size class criterion with percent noncarbonate clay.
- Argixerolls, P.225
  - Added 1 new subgroup:
    - Aridic Lithic Argixerolls
- Calcixerolls, P.227
  - Added 1 new subgroup:
    - Aridic Lithic Calcixerolls
- Haploxerolls, P.229
  - Added 1 new subgroup:
    - Aridic Lithic Haploxerolls
- Ultic Argixerolls, P.233 – Clarified the base saturation method (by sum of cations) required for criteria.

Chapter 13 – Oxisols

- Removed phrases "that has its upper boundary" about depth to the kandic horizon from Kandi great groups (e.g. Kandiperox, p.236) and Kandi subgroups (e.g. Kandiudalfic Eutroperox, p.238).
- Corrected two typos (e.g. Plinthaquox, p.236).

Chapter 14 – Spodosols

- Key to Suborders, P.251 – Replaced temperature criterion with gelic soil temperature regime for Gelods.
- Key to Great Groups for Aquods, P.251, Cryods, P.253, Humods, P. 256, and Orthods, P.256 – Removed the phrases “soil layer that has its upper boundary” and “soil layer that does not slake in water after air drying and has its upper boundary”, and added the word “horizon” for Duraquods, Duricryods, Durihumods, and Durorthods.
- Duric Alaquods, P.251 and Duric Cryaquods, P.252 – Same revision as above for Dur great groups was made for these Duric subgroups.
- Alfic, Alfic Oxyaquic, and Aqualfic subgroups – Corrected wording of criteria by listing method of measurement (by sum of cations) directly following base saturation.
- Arenic and Grossarenic subgroups – Clarified wording of arenic and grossarenic subgroups for sandy or sandy-skeletal particle-size class criteria as proxies for sandy texture classes.
- Haplocryods, P.254
  - Added 1 new subgroup:
    - Folistic Haplocryods
- Humicryods, P.254
  - Added 1 new subgroup:
    - Folistic Humicryods
- Haplogelods, P.255
  - Added 1 new subgroup:
    - Turbic Haplogelods
- Humigelods, P.255
  - Added 1 new subgroup:
    - Turbic Humigelods

Chapter 15 – Ultisols

- Albaquults, P.261 – Clarified the criterion on saturated hydraulic conductivity.

- Fragiaquults, P. 261 – Removed phrase "with an upper boundary" about depth to the fragipan.
- Arenic and Grossarenic subgroups – Clarified wording of arenic and grossarenic subgroups for sandy or sandy-skeletal particle-size class criteria as proxies for sandy texture classes.
- Vertic subgroups – Replaced word "aggregates" with "peds" throughout the chapter.
- Rhodic Kandiustults, P.278 – Corrected typo in criteria.

Chapter 16 – Vertisols

- Key to Great Groups for Aquerts, P.283 – Revised Natraquerts to require a natric horizon.
- Removed phrases "that has its upper boundary" and "has its upper boundary", from the Sal, Dur, and Calci- great groups as well as Leptic, Entic, Petrocalcic, Gypsic, and Calcic subgroups.
- Corrected errors in criteria for subgroups Oxyaquic Hapluderts and Leptic Udic Haplusterts.

Chapter 17 – Families and Series Differentiae and Names

- Definition of Particle-Size Classes and Their Substitutes, P.295
  - Added new text for discussion on substitutes for particle-size class to recognize high gypsum content (new gypseous classes) and rock fragments (fragmental class).
  - Added Psammowassents, Psammoturbels, and Psammorthels great groups to list of taxa excluded from using a particle-size class unless they are ashy.
- Control Section for Particle-Size Classes and Their Substitutes, P.296 – Revisions to highlight the concept of root-limiting layers before the key to particle-size classes and their substitutes.
- Key to Particle-Size Classes, P.297
  - Edit for clarity in criteria for Cindery class.
  - Corrected typo (glass) in criterion of item B. 1. b.
  - Added 3 new substitute classes in section B as new item 4. (follows Hydrous class):
    - Gypseous-skeletal
    - Coarse-gypseous
    - Fine-gypseous
  - Replaced phrase "rock fragments up to 7.5 cm in diameter", with word "gravel" in criteria for coarse-loamy, fine-loamy, coarse-silty, and fine-silty classes.
- Strongly Contrasting Particle-Size Classes, P.299
  - Added sentence about classes not being listed in a key format.
  - Minor edits for consistency in phrases.
  - The list of classes was re-alphabetized.
  - Added 7 new classes:
    - Ashy-skeletal over clayey (follows ashy over sandy or sandy-skeletal)
    - Clayey over coarse-gypseous
    - Clayey over fine-gypseous
    - Clayey over gypseous-skeletal
    - Loamy over coarse-gypseous
    - Loamy over fine-gypseous
    - Loamy-skeletal over gypseous-skeletal
- Key to Mineralogy Classes (for mineral soils), P.301
  - Added sentence in first paragraph of text (before the actual key) reiterating that a mineralogy class is assigned to all mineral soils except for Quartzipsamments.
  - Added the Hypergypsic mineralogy class to section B. of the key (precedes Amorphic class).
  - Revised Gypsic mineralogy class in section C. by removing $CaCO_3$ as accessory criterion.
  - Corrected error in section E by restoring waiver for Quartzipsamments in introductory part.
  - Raised grain count limit for Micaceous mineralogy class in section E from 40 to 45 percent.
  - Made the Paramicaceous mineralogy class in section E obsolete by removing it from the key.
  - Edited the "all other soils" criterion of the Mixed mineralogy classes in sections A, B, D, & E for consistency.
- Key to Cation Exchange Activity Classes, P.303
  - Revised one sentence and added one to first paragraph of text on cation-exchange activity classes to clarify why certain taxa, substitute classes, and mineralogy classes are excluded.
  - Added Psamments, Psamm great groups, and Psammentic subgroups to the list of excluded taxa.

    - Corrected text about fragmental not being a substitute for particle-size class.
    - Reformatted the key to set apart the excluded taxa and classes from the included classes and chemical properties for clarity and ease of use.
- Use of Calcareous and Reaction Classes, P.304
    - Added Gelisols, gelic suborders, and gelic great groups as taxa using.
    - Added Hypergypsic mineralogy class as additional exclusion.
    - Added Histels as additional taxon excluded.
    - Revised Control Sections by adding criterion (1.) for Gelisols and gelic taxa to Calcareous class and renumbered criteria 2 through 4.
    - Added another group of two criteria (1. is for Gelisols and gelic taxa) for the control sections that apply to the acid and nonacid classes.
    - Edited remaining text that now applies only to the control section for the allic class in Oxisols.
- Soil Depth Classes (for mineral soils and histels), P.305 – Revised the text and the keys to correct for the omission of Gelisols composed of organic soil materials (Histels).
- Mineralogy classes and Key to Mineralogy Classes (for histosols and histels), P.307
    - Added Folists to sentence listing taxa excluded from using Ferrihumic mineralogy class.
    - Clarified section A of Key to group all the excluded taxa together within parentheses.
- Soil Depth Classes (for histosols), P.308 – Corrected text about fragmental not being a substitute for particle-size class.

Chapter 18 – Designations for Horizons and Layers

- Revision of second item of evidence for B horizon adding transformation of carbonates and/or gypsum.
- Other minor edits for O and C horizons or layers.
- Revised suffix ‘j’ (jarosite) as suggested by D. Fanning to clarify mineral species and mode of origin.
- Revised suffix ‘m’ (cementation) to replace lime with carbonates in symbol kqm.
- Revised suffix ‘r’ (weathered bedrock) to replace cemented layers with bedrock.
- Revised suffix ‘u’ (artifacts) to correct punctuation in coal combustion by-products.
- Revised suffix ‘v’ (plinthite) as suggested by South Region Conference 2008 (must be less than strongly cemented).
- Revised suffix ‘w’ (color or structure) to emphasize it’s use only with B horizons.
- Revised suffix ‘y’ (gypsum) to clarify it’s use versus the new suffix ‘yy’.
- Added suffix ‘yy’ (dominance of horizon by gypsum).
- Added rule 6. on Conventions for using letter suffixes.
- Clarified sections on vertical subdivision, discontinuities, and the use of the prime symbol.

Appendix

- Clarified reference to the second edition of Soil Taxonomy.
- Converted some units to SI to reflect current SSL datasheets.
- Added conversion for meq/liter to SI units.
- Added formula for calculating percent organic carbon in calcareous soils.
- Corrected several typographical errors in text and references.
- Added exponents (-1) to several occurrences of an SI unit and units of charge (positive and negative) to mmol/L for extractable cations and anions.
- Revised and moved sentence about potassium hydroxide-extractable aluminum to discussion about ammonium oxalate-extractable aluminum.
- Added sentence to discussion on petrographic analysis about other isotropic grains (plant opal, sponge spicules, and diatoms) that are identified and quantified in glass counts.