SOILS IN THE UNITED STATES

The following arrangement is alphabetical by order and by taxa in a category. General soil definitions are given for the three categories used—namely, order, suborder, and great group. Present dominant land use is given for the suborder. Names of orders, the highest category, end in "sol," for example, "Alfisol." Names of suborders have two syllables, the final syllable being taken from the order name; for example "Aqualf" is a suborder of "Alfisol." Names of great groups have one or more syllables as a prefix to a suborder name; for example, "Albaqualf" is one of the great groups of the suborder "Aqualf." Names that correspond approximately to those used in the 1938 classification system and additional names commonly used since about 1950 are also given.

The map units are mostly associations of phases of great groups. Only the principal kinds of soil are named for each map unit. The most extensive is listed first and the least extensive, last. Other kinds of soil are present in each map unit but are not extensive enough to be listed as inclusions.

Classes used for the approximate slope of each map unit are:

Gently sloping-------Slope mainly less than 10 percent.
Moderately sloping----Slope mainly between 10 and 25 percent.
Steep-----------Slope mainly steeper than 25 percent.

For complete definitions of the taxa see:

Soil Survey Staff, 1960, Soil classification, a comprehensive system, 7th approximation: U.S. Dept. Agriculture Soil Conserv. Service, 265 p.

------1967, Supplement to soil classification system (7th approximation): U.S. Dept. Agriculture Soil Conserv. Service, 207 p.

For explanation of the 1938 system and revisions see:

Thorp, James, and Smith, Guy D., 1949, Higher categories of soil classification—Order, suborder, and great soil groups: Soil Sci., v. 67, no. 2, p. 117-126.

U.S. Dept. of Agriculture, 1938, Soils and Men, yearbook of agriculture 1938: U.S. Dept. Agriculture, 1232 p.

Grumusols are defined in:

Oakes, Harvey, and Thorp, James, 1951, Dark-clay soils of warm regions variously called Rendzina, black cotton soils, regur, and tirs: Soil Sci. Soc. America Proc., v. 15, p. 347-354.

Sols Bruns Acides are defined in:

Tavernier, R., and Smith, Guy D., 1957, The concept of braunerde (Brown forest soil) in Europe and the United States, *in* Advances in agronomy, v. 9: New York, Academic Press Inc., p. 217-289.

Calcisols are defined in:

Harper, W. G., 1957, Morphology and genesis of calcisols: Soil Sci. Soc. America Proc., v. 21, no. 4, p. 420-424.

Hydrol Humic and Humic Ferruginous Latosols are defined in:

Cline, Marlin G., 1955, Relationships among soils of Hawaii: U.S. Dept. Agriculture Soil Conserv. Service Soil Survey, Territory of Hawaii, ser. 1939, no. 25, p. 67-88.

Calcium Carbonate Solonchaks are defined in:

McClelland, J. E., Mogen, C. A., Johnson, W. M., Schroer, F. W., and Allen, J. S., 1959, Chernozems and associated soils of eastern North Dakota—Some properties and topographic relationships: Soil Sci. Soc. America Proc., v. 23, no. 1, p. 51-56.

ALFISOLS

Soils that are medium to high in bases (base saturation at pH 8.2) and have gray to brown surface horizon and subsurface horizons of clay accumulation; usually moist but during the warm season of the year some are dry part of the time.

AQUALFS—Seasonally wet Alfisols that have mottles, iron-manganese concretions, or gray colors; used for general crops where drained and for pasture and woodland where undrained.

Albaqualfs (formerly Planosols).—Aqualfs that have a bleached (white) upper horizon and changes abruptly in texture into an underlying horizon of clay accumulation.

A1-1—Albaqualfs plus Argialbolls and Argiudolls, gently sloping.

A1-2—Albaqualfs plus Hapludalfs, gently sloping.

A1-3—Albaqualfs plus Natraqualfs and Fragiudalfs, gently sloping.

A1-4—Albaqualfs plus Ochraqualfs, gently sloping.

Fragiaqualfs (formerly Low-Humic Gley soils with fragipan).—Aqualfs that have a dense brittle but not indurated horizon (fragipan).[1]

Glossaqualfs (formerly Planosols).—Aqualfs that have tongues of an upper bleached (white) horizon in an underlying horizon of clay accumulation.[1]

Natraqualfs (formerly Solonetz soils).—Aqualfs that have a subsurface horizon of clay accumulation with alkali (sodium).[1]

Ochraqualfs (formerly Low-Humic Gley soils).—Aqualfs that change gradually in texture into the underlying horizon.

A2-1—Ochraqualfs plus Haplaquepts and Hapludalfs, gently sloping.

A2-2—Ochraqualfs plus Hapludalfs, gently sloping.

A2-3—Ochraqualfs plus Psammaquents, gently sloping.

BORALFS.—Alfisols of cool to cold regions; used for woodland, pasture, and some small grain.

Cryoboralfs (formerly Gray Wooded).—Boralfs of cold regions.

A3-1—Cryoboralfs plus Cryorthods, steep.

A3-2—Cryoboralfs plus Cryorthods, Cryoborolls, Cryaquolls, and Rock land, steep.

Eutroboralfs (formerly Gray Wooded soils).—Boralfs that have a subsurface horizon high in bases and a horizon that is dry for short periods in most years.

A4-1—Eutroboralfs, gently or moderately sloping.

A4-2—Eutroboralfs plus Fragiboralfs, gently or moderately sloping.

A4-3—Eutroboralfs plus Haplaquepts, gently or moderately sloping.

A4-4—Eutroboralfs plus Haplustolls, Ustorthents, and Rock land, gently sloping to steep.

A4-5—Eutroboralfs plus Histosols (plant residues not decomposed), gently sloping.

Fragiboralfs (formerly Gray Wooded soils with fragipan).—Boralfs that have a horizon of clay accumulation within 2 feet of the soil surface and a dense brittle but not indurated horizon (fragipan).[1]

Glossoboralfs (formerly Gray Wooded soils).—Boralfs that are always moist or are low in bases. They usually have tongues of an upper bleached (white) horizon in an underlying subsurface horizon of clay accumulation.

A5-1—Glossoboralfs plus Eutroboralfs, gently sloping.

UDALFS.—Alfisols that are in temperate to tropical regions. Soils usually moist but during the warm season of the year may be intermittently dry in some horizons for short periods; used for row crops, small grain, and pasture.

Fragiudalfs (formerly Gray-Brown Podzolic soils with fragipan).—Udalfs that have a dense brittle but not indurated horizon (fragipan) usually below a horizon in which clay has accumulated.

A6-1—Fragiudalfs, gently sloping.

A6-2—Fragiudalfs plus Fragiaqualfs and Haplaquepts, gently sloping.

A6-3—Fragiudalfs plus Fragiaqualfs and Hapludolls, gently sloping to steep.

A6-4—Fragiudalfs plus Fragiochrepts, gently sloping.

A6-5—Fragiudalfs plus Glossaqualfs, gently sloping.

A6-6—Fragiudalfs plus Hapludalfs, gently sloping.

A6-7—Fragiudalfs plus Hapludalfs, both moderately sloping, and Rock land, steep.

A6-8—Fragiudalfs plus Natraqualfs, gently sloping.

A6-9—Fragiudalfs plus Ochraqualfs and Fragiaqualfs, gently sloping.

Hapludalfs (formerly Gray-Brown Podzolic soils without fragipan).—Udalfs that have a subsurface horizon of clay accumulation that is relatively thin or is brownish.

A7-1—Hapludalfs, gently sloping.

A7-2—Hapludalfs, moderately sloping.

A7-3—Hapludalfs plus Albaqualfs, Humaquepts, and Ochraqualfs, gently sloping.

A7-4—Hapludalfs plus Argiaquolls, gently sloping.

A7-5—Hapludalfs plus Argiudolls, gently sloping.

A7-6—Hapludalfs plus Argiudolls, gently or moderately sloping.

A7-7—Hapludalfs plus Cryandepts, moderately sloping or steep.

A7-8—Hapludalfs plus Fragiudalfs, gently sloping.

A7-9—Hapludalfs plus Fragiudalfs, moderately sloping.

A7-10—Hapludalfs plus Haplaquolls, gently sloping.

A7-11—Hapludalfs plus Haplaquolls and Argiudolls, gently sloping.

A7-12—Hapludalfs plus Haplaquolls and Glossoboralfs, gently sloping.

A7-13—Hapludalfs plus Haplaquolls and Udipsamments, all gently sloping.

A7-14—Hapludalfs plus Hapludults, moderately sloping.

A7-15—Hapludalfs plus Ochraqualfs, gently sloping.

A7-16—Hapludalfs plus Paleudalfs, Hapludults, and Hapludolls, moderately sloping.

A7-17—Hapludalfs, moderately sloping, plus Rock land, steep.

Paleudalfs (formerly Red-Yellow Podzolic and Gray-Brown Podzolic soils).—Udalfs that have a thick reddish horizon of clay accumulation.

A8-1—Paleudalfs plus Hapludalfs and Dystrochrepts, gently sloping to steep.

A8-2—Paleudalfs plus Hapludults and Rock land, gently or moderately sloping.

USTALFS.—Alfisols that are in temperate to tropical regions. Soils mostly reddish brown; during the warm season of the year, they are intermittently dry for long periods; used for range, small grain and irrigated crops.

Haplustalfs (formerly Reddish Chestnut and Reddish Brown soils).—Ustalfs that have a subsurface horizon of clay accumulation that is relatively thin or is brownish.

A9-1—Haplustalfs plus Argiustolls, gently or moderately sloping.

A9-2—Haplustalfs plus Calciustolls and Argiustolls, gently sloping.

A9-3—Haplustalfs plus Haplustolls and Calciustolls (shallow), gently sloping.

A9-4—Haplustalfs plus Paleustalfs, gently sloping.

A9-5—Haplustalfs plus Ustipsamments, gently sloping.

Paleustalfs (formerly Reddish Chestnut and Reddish Brown soils).—Ustalfs that have an indurated (petrocalcic) horizon cemented by carbonates or a horizon having one or both of the following: A thick reddish clay accumulation or a distribution that is clayey in the upper part and abruptly changes in texture into an overlying horizon.

A10-1—Paleustalfs plus Argiustolls, gently sloping.

A10-2—Paleustalfs plus Haplustalfs, gently sloping.

A10-3—Paleustalfs plus Ustorthents (shallow), gently sloping.

Rhodustalfs (formerly Reddish Prairie soils).—Ustalfs that have a red subsurface horizon of clay accumulation that is relatively thin.[1]

XERALFS.—Alfisols that are in climates with rainy winters but dry summers; during the warm season of the year these soils are continually dry for a long period; used for range, small grain and irrigated crops.

Durixeralfs (formerly Noncalcic Brown soils with a hardpan).—Xeralfs that have a hardpan (duripan) that is cemented with silica.

A11-1—Durixeralfs plus Palexeralfs, gently sloping.

Haploxeralfs (formerly Noncalcic Brown soils).—Xeralfs that have a subsurface horizon of clay accumulation that is relatively thin or is brownish in color.

A12-1—Haploxeralfs plus Haplaquolls, Palexeralfs, and Xerorthents, gently sloping.

A12-2—Haploxeralfs plus Palexeralfs and Xerorthents (shallow), moderately sloping to steep.

A12-3—Haploxeralfs plus Xerorthents (shallow) and Chromoxererts, moderately sloping or steep.

Palexeralfs (formerly Noncalcic Brown soils).—Xeralfs that have an indurated (petrocalcic) horizon cemented by carbonates or a horizon having one or both of the following: A thick reddish clay accumulation or a distribution that is clayey in the upper part and abruptly changes in texture into an overlying horizon.

A13-1—Palexeralfs plus Durixeralfs, gently sloping.

A13-2—Palexeralfs plus Xerorthents and Haplaquolls, gently sloping.

ARIDISOLS

Soils that have pedogenic horizons and are low in organic matter and are never moist as long as 3 consecutive months.

ARGIDS.—Aridisols that have a horizon in which clay has accumulated with or without alkali (sodium); used for mostly range and some irrigated crops.

Durargids (formerly Desert, Red Desert, Sierozem and some Brown soils, all with hardpan).—Argids that have a hardpan (duripan) that is cemented with silica.

D1-1—Durargids plus Durorthids and Calciorthids, all gently sloping; also Haploxerolls and Argixerolls, steep.

Haplargids (formerly Sierozem, Desert, Red Desert and some Brown soils).—Argids that have a loamy horizon of clay accumulation with or without alkali (sodium).

D2-1—Haplargids plus Argiustolls, Ustorthents, and Calciustolls, gently sloping.

D2-2—Haplargids plus Argixerolls, Durargids, and Haploxerolls, gently sloping to steep.

D2-3—Haplargids plus Calciorthids, gently sloping.

D2-4—Haplargids plus Calciorthids, Natrargids, and Camborthids, gently sloping.

D2-5—Haplargids plus Calciorthids, and Natrargids, all gently sloping; also Torriorthents (shallow) and Camborthids, both steep.

D2-6—Haplargids plus Durargids and Torriorthents, gently sloping.

D2-7—Haplargids plus Paleorthids, Torriorthents, and Rock land, gently or moderately sloping.

D2-8—Haplargids plus Paleorthids, Torripsamments, Paleargids, and Calciorthids, gently sloping to steep.

D2-9—Haplargids plus Torrifluvents, Calciorthids, and Paleorthids, gently sloping to steep.

D2-10—Haplargids plus Torriorthents and Argiustolls, gently or moderately sloping.

D2-11—Haplargids plus Torriorthents, Argiustolls, and Torripsamments, gently sloping.

D2-12—Haplargids plus Torriorthents (shallow) and Calciorthids, gently sloping to steep.

D2-13—Haplargids plus Torriorthents, Calciorthids, and Camborthids, gently sloping to steep.

D2-14—Haplargids plus Torriorthents, Calciorthids, and Paleorthids, gently sloping to steep.

D2-15—Haplargids plus Torriorthents (shallow) and Calciustolls, gently sloping to steep.

D2-16—Haplargids plus Torriorthents (shallow) and Paleorthids, moderately sloping.

D2-17—Haplargids and other Aridisols plus Torriorthents and Rock land, gently or moderately sloping.

D2-18—Haplargids plus Torriorthents and Salorthids, all gently sloping; also Torriorthents (shallow), steep.

D2-19—Haplargids plus Torriorthents, Torriorthents (shallow) and Paleargids, gently or moderately sloping.

D2-20—Haplargids plus Torripsamments, Natrargids, and Salorthids, gently sloping.

Nadurargids (formerly Solonetz soils with hardpan).—Argids that have a subsurface horizon of clay accumulation with alkali (sodium) overlying a hardpan (duripan) that is cemented with silica.[1]

Natrargids (formerly Solonetz soils).—Argids that have a horizon of clay and alkali (sodium) accumulation.

D3-1—Natrargids, gently sloping.

D3-2—Natrargids plus Haplargids and Haplaquolls, gently sloping.

D3-3—Natrargids plus Nadurargids, Haplaquolls, and Torriorthents, gently sloping.

D3-4—Natrargids plus Salorthids and Torriorthents, gently sloping.

Paleargids (formerly Sierozems, Desert, and Red Desert soils).—Argids that have an indurated (petrocalcic) horizon cemented by carbonates or have a clayey subsurface horizon with or without alkali (sodium) that abruptly changes in texture into an overlying horizon.

D4-1—Paleargids plus Argiustolls, gently or moderately sloping.

ORTHIDS.—Aridisols that have accumulations of calcium carbonate, gypsum, or other salts more soluble than gypsum but have no horizon of accumulation of clay. They may have horizons from which some materials have been removed or altered; used for mostly range and some irrigated crops.

Calciorthids (formerly Calcisols).—Orthids that have a horizon in which large amounts of calcium carbonate or gypsum have accumulated.

D5-1—Calciorthids plus Calciorthids (shallow), Torriorthents, Paleorthids, and Torrifluvents, gently sloping.

D5-2—Calciorthids plus Durorthids, Torriorthents (shallow), and Rock land, gently or moderately sloping.

D5-3—Calciorthids plus Haplargids and Torriorthents, gently sloping.

D5-4—Calciorthids plus Torriorthents (shallow), gently sloping.

D5-5—Calciorthids plus Torriorthents (shallow), Camborthids, and Rock land, gently or moderately sloping.

D5-6—Calciorthids plus Torriorthents, Torripsamments, and Gypsum dune land, gently sloping.

Calciorthids (shallow; formerly Lithosols).—Calciorthids that are shallower than 20 inches to bedrock.[1]

Camborthids (formerly Sierozems, Desert, and Red Desert soils).—Orthids that have horizons from which some materials have been removed or altered but have no accumulation of large amounts of calcium carbonate or gypsum.

D6-1—Camborthids plus Calciorthids, Torriorthents, and Rock land, gently to moderately sloping.

D6-2—Camborthids plus Duraquolls, Durorthids, and Torripsamments, gently sloping.

D6-3—Camborthids (shallow) plus Haploxerolls, both steep; also Durorthids and Haplargids, gently sloping.

D6-4—Camborthids plus Torriorthents and Calciorthids, gently sloping.

D6-5—Camborthids plus Torriorthents and Torripsamments, gently sloping.

D6-6—Camborthids plus Torriorthents, Torripsamments, Calciorthids, and Badlands, gently or moderately sloping.

D6-7—Camborthids plus Xerolls, moderately sloping.

Durorthids (formerly Regosols, Calcisols, or Alluvial soils, all with hardpan).—Orthids that have a hardpan (duripan) that is cemented with silica.[1]

Paleorthids (formerly Calcisols).—Orthids that have a hardpan (petrocalcic horizon) cemented with carbonates.[1]

Salorthids (formerly Solonchaks).—Orthids that have a horizon in which large amounts of salts have accumulated.[1]

ENTISOLS

Soils that have no pedogenic horizons.

AQUENTS.—Entisols that are either permanently wet or are seasonally wet and that have mottles or gray colors; limited use for pasture.

Haplaquents (formerly Low-Humic Gley soils).—Aquents that have textures of loamy very fine sand or finer.[1]

Hydraquents.—Aquents that are permanently wet, have textures of loamy very fine sand or finer, and offer little resistance to applied weight, including grazing livestock.[1]

Psammaquents (formerly Low-Humic Gley soils and some poorly drained Regosols).—Aquents that have textures of loamy fine sand or coarser.

E1-1—Psammaquents plus Haplaquods, gently sloping (includes swamps).

E1-2—Psammaquents plus Sideraquods and Histosols (plant residues not decomposed), gently sloping.

FLUVENTS (formerly Alluvial soils).—Entisols that have organic-matter content that decreases irregularly with depth; formed in loamy or clayey alluvial deposits; used for range or irrigated crops in dry regions and for general farming in humid regions.

Torrifluvents (formerly Alluvial soils).—Fluvents that are never moist as long as 3 consecutive months.

E2-1—Torrifluvents plus Natrargids, Salorthids, and Haplargids, gently or moderately sloping.

E2-2—Torrifluvents plus Torriorthents, Calciorthids, Haplargids, and Salorthids, gently or moderately sloping.

Udifluvents (formerly Alluvial soils).—Fluvents that are usually moist.[1]

Xerofluvents (formerly Alluvial soils).—Fluvents that are in climates with rainy winters and dry summers; during the warm season of the year, these soils are continually dry for a long period.[1]

ORTHENTS.—Loamy or clayey Entisols that have a regular decrease in organic-matter content with depth; used for range or irrigated crops in dry regions and for general farming in humid regions.

Cryorthents (formerly Alluvial soils, Regosols, and Lithosols).—Orthents of cold regions.[1]

Torriorthents (formerly Regosols).—Orthents that are never moist as long as 3 consecutive months.

E3-1—Torriorthents plus Haplargids and Torrifluvents, gently or moderately sloping.

E3-2—Torriorthents plus Torrifluvents and Salorthids, gently sloping.

E3-3—Torriorthents plus Torriorthents (shallow), Camborthids, and Badlands, gently or moderately sloping.

E3-4—Torriorthents plus Torriorthents (shallow), Haplargids, and Rough stony land, moderately sloping or steep.

Torriorthents (shallow; formerly Lithosols).—Torriorthents that are shallower than 20 inches to bedrock.

E4-1—Torriorthents (shallow) plus Haplargids and Badlands, moderately sloping or steep.

E4-2—Torriorthents (shallow to soft bedrock) plus Haplargids, Camborthids, and Rock land, moderately sloping or steep.

E4-3—Torriorthents (shallow to soft bedrock) plus Haplargids, Torrifluvents, and Natrargids, gently sloping to steep.

E4-4—Torriorthents (shallow) plus Rough stony land, gently or moderately sloping.

E4-5—Torriorthents (shallow) plus Rough stony land and Calciorthids, steep.

Udorthents (formerly Regosols).—Orthents that are usually moist.[1]

Ustorthents (formerly Regosols).—Orthents that during the warm season of the year are intermittently dry for long periods.

E5-1—Ustorthents plus Argiustolls and Argiudolls, moderately sloping.

E5-2—Ustorthents plus Argiborolls and Natriborolls, moderately sloping.

E5-3—Ustorthents plus Haploborolls, moderately sloping or steep.

E5-4—Ustorthents plus Torriorthents, Camborthids, Argiustolls, and Haplargids, moderately sloping.

Ustorthents (shallow; formerly Lithosols).—Ustorthents that are shallower than 20 inches to bedrock.

E6-1—Ustorthents (shallow to soft bedrock) plus Badlands, steep.

E6-2—Ustorthents (shallow) plus Haploborolls and Argiborolls, steep.

E6-3—Ustorthents (shallow) plus Ustorthents, moderately sloping.

Xerorthents (formerly Regosols, Brown, or Alluvial soils).—Orthents that are in climates with rainy winters but dry summers; during the warm season of the year, they are continually dry for a long period.

E7-1—Xerorthents plus Calciorthids, Haploxerolls, Argixerolls, and Palexerolls, gently sloping to steep.

E7-2—Xerorthents plus Durixeralfs, Haploxeralfs, Xerofluvents, and Palexeralfs, gently sloping.

E7-3—Xerorthents plus Haploxeralfs, Xerofluvents, and Haplaquolls, gently sloping.

Xerorthents (shallow; formerly Lithosols).—Xerorthents that are shallower than 20 inches to bedrock.

E8-1—Xerorthents (shallow) plus Haploxeralfs, both steep.

PSAMMENTS.—Entisols that have textures of loamy fine sand or coarser; used for range, wild hay, and some hardy vegetables in Alaska, woodland pasture and small grains where warm and moist, pasture and citrus in Florida, and range and irrigated crops where warm and dry.

Cryopsamments (formerly Regosols).—Psamments of cold regions.

E9-1—Cryopsamments plus Cryaquepts, Cryorthents, and Cryandepts, gently or moderately sloping.

Quartzipsamments (formerly Regosols).—Psamments that consist almost entirely of minerals highly resistant to weathering, mainly quartz.

E10-1—Quartzipsamments plus Paleudults, gently sloping.

E10-2—Quartzipsamments plus Paleudults, gently or moderately sloping.

E10-3—Quartzipsamments plus Ochraquults, gently sloping.

E10-4—Quartzipsamments plus Umbraquults, gently or moderately sloping.

Torripsamments (formerly Regosols).—Psamments that contain easily weatherable minerals; they are never moist as long as 3 consecutive months.

E11-1—Torripsamments plus Camborthids, gently or moderately sloping.

E11-2—Torripsamments plus Paleargids and Haplargids, gently sloping.

Udipsamments (formerly Regosols).—Psamments that contain easily weatherable minerals; they are usually moist in all parts of the soil in most years.

E12-1—Udipsamments plus Eutroboralfs and Haploborolls, gently or moderately sloping.

E12-2—Udipsamments plus Hapludalfs and Haplaquolls, gently or moderately sloping.

E12-3—Udipsamments plus Histosols (undifferentiated), gently sloping.

Ustipsamments (formerly Regosols).—Psamments that contain easily weatherable minerals; during the warm season of the year, they are intermittently dry for long periods.

Ustipsamments.—Psamments that contain easily weatherable minerals; during the warm season of the year, they are intermittently dry for long periods.

E13-1—Ustipsamments, moderately sloping.

E13-2—Ustipsamments plus Paleustalfs (sandy), gently or moderately sloping.

Xeropsamments—Psamments that are in climates with rainy winters but dry summers; during the warm season of the year, they are continually dry for a long period.

E14-1—Xeropsamments plus Camborthids, gently sloping.

HISTOSOLS

Wet organic (peat and muck) soils; includes soils in which the decomposition of plant residues ranges from highly decomposed to not decomposed; formed in swamps and marshes; used for mostly woodland or lie idle, but some drained areas have truck crops. Histosols are classified here only according to stage of plant-residue decomposition.

Plant residues not decomposed; formerly called peat. Histosols of cool regions.

H1-1—Histosols plus Psammaquents and Haplorthods, gently sloping.

Plant residues moderately decomposed or highly decomposed; formerly called peat or muck. Histosols of warm regions.

H2-1—Histosols (plant residues moderately decomposed), gently sloping.

H2-2—Histosols (plant residues highly decomposed), gently sloping.

H2-3—Histosols (plant residues moderately decomposed or highly decomposed), gently sloping.

INCEPTISOLS

Soils that have weakly differentiated horizons; materials in the soil have been altered or removed but have not accumulated. These soils are usually moist, but during the warm season of the year some are dry part of the time.

ANDEPTS.—Inceptisols that either have formed in ashy (vitric pyroclastic) materials, have low bulk density and large amounts of amorphous materials, or both; used for woodland and range or pasture.

Cryandepts (formerly Brown Podzolic or Gray-Brown Podzolic soils).—Andepts of cold regions.

I1-1—Cryandepts plus Cryochrepts and Cryorthods, steep.

I1-2—Cryandepts plus Cryorthods, Eutrandepts, Xerochrepts, and Haploxerolls, steep.

I1-3—Cryandepts plus Cryumbrepts, Cryorthods, and Haplumbrepts, steep.

I1-4—Cryandepts plus Rock land, Cryaquepts, and Histosols (plant residues not decomposed), gently or moderately sloping.

Dystrandepts (formerly Ando soils).—Andepts that have a thick dark-colored surface horizon that is low in bases or that have a light-colored surface horizon.

I2-1—Dystrandepts plus Andaquepts, gently sloping to steep.

I2-2—Dystrandepts plus Eutrandepts, moderately sloping to steep.

I2-3—Dystrandepts plus Hydrandepts and Rubble land, moderately sloping or steep.

Eutrandepts (formerly Brown or Reddish Brown soils).—Andepts that have a thick dark-colored surface horizon that is high in bases.

I3-1—Eutrandepts plus Vitrandepts and Rubble land, moderately sloping or steep.

Hydrandepts (formerly Hydrol Humic Latosols).—Andepts that harden permanently if dried.[1]

Vitrandepts (formerly Regosols).—Andepts mostly formed in pumice or slightly weathered volcanic ash.[1]

AQUEPTS.—Seasonally wet Inceptisols that have an organic surface horizon, sodium saturation, mottles, or gray colors; used for pasture, hay, and where drained, hardy vegetables in Alaska, woodland pasture, and where drained, row crops in Southeastern United States.

Andaquepts (formerly Humic-Gley and Alluvial soils).—Aquepts that either have formed in ashy (vitric pyroclastic) materials, have low bulk density and large amounts of amorphous materials, or both.[1]

Cryaquepts (formerly Tundra).—Aquepts of cold regions.

I4-1—Cryaquepts plus Cryorthents, Cryopsamments, and Cryumbrepts, gently or moderately sloping.

I4-2—Cryaquepts plus Cryorthents, Histosols (plant residues not decomposed), and Cryorthods, gently or moderately sloping.

I4-3—Cryaquepts plus Cryumbrepts, Histosols (plant residues not decomposed), and Rock land, moderately sloping or steep.

I4-4—Cryaquepts plus Cryumbrepts, Histosols (plant residues not decomposed), and Rock land, gently or moderately sloping.

Fragiaquepts (formerly Low-Humic Gley soils with fragipan).—Aquepts that have a dense brittle but not indurated horizon (fragipan).[1]

Haplaquepts (formerly Low-Humic Gley soils).—Aquepts that have either a light-colored or a thin black surface horizon.

I5-1—Haplaquepts plus Haplaquods, gently sloping.

I5-2—Haplaquepts plus Haplaquolls, Udifluvents, and Hapludalfs, gently sloping.

I5-3—Haplaquepts plus Ochraqualfs, Haplaquolls, and Natraqualfs, gently sloping.

I5-4—Haplaquepts plus Ochraquults, Paleudults, and Hapludults, gently sloping.

I5-5—Haplaquepts plus Psammaquents, Haplaquents, and Haplaquods, gently sloping.

Humaquepts (formerly Humic-Gley soils).—Aquepts that have an acid dark surface horizon.

I6-1—Humaquepts plus Hydraquents and Psammaquents, gently sloping (Tidal marsh).

OCHREPTS.—Inceptisols that have formed in materials with crystalline clay minerals, have light-colored surface horizons, and have altered subsurface horizons that have lost mineral materials; used for woodland and range in Alaska and Northwestern United States, pasture, wheat, sorghum and hay in Oklahoma and Kansas, and pasture, silage corn, small grain, and hay in Northeastern United States

Cryochrepts (formerly Subarctic Brown Forest soils).—Ochrepts of cold regions.

I7-1—Cryochrepts plus Cryaquepts, Histosols (plant residues not decomposed), Cryorthents, and Cryorthods, gently or moderately sloping.

I7-2—Cryochrepts plus Rock land, Cryumbrepts, and Cryandepts, steep.

Dystrochrepts (formerly Sols Bruns Acides and some Brown Podzolic and Gray-Brown Podzolic soils).—Ochrepts that are usually moist and low in bases and have no free carbonates in the subsurface horizons.

I8-1—Dystrochrepts, gently sloping.

I8-2—Dystrochrepts, gently sloping to steep (dissected plateaus).

I8-3—Dystrochrepts plus Fragiochrepts and Hapludalfs, moderately sloping.

I8-4—Dystrochrepts, steep, plus Hapludalfs and Hapludults, both moderately sloping.

I8-5—Dystrochrepts, steep, plus Paleudalfs and Hapludults, both moderately sloping.

I8-6—Dystrochrepts plus Rock land and Hapludults, steep.

Eutrochrepts (formerly Brown Forest soils).—Ochrepts that are usually moist and are either high in bases, have free carbonates in the subsurface horizons, or both.

I9-1—Eutrochrepts, steep.

I9-2—Eutrochrepts plus Dystrochrepts, gently sloping.

I9-3—Eutrochrepts plus Chromuderts, gently sloping.

Fragiochrepts (formerly Sols Bruns Acides and some Brown Podzolic and Gray-Brown Podzolic soils, all with fragipans).—Ochrepts that have a dense brittle but not indurated horizon (fragipan).

I10-1—Fragiochrepts plus Dystrochrepts (both stony), steep.

I10-2—Fragiochrepts plus Fragiaquepts and Dystrochrepts, gently sloping.

I10-3—Fragiochrepts plus Fragiaquepts and Dystrochrepts, moderately sloping.

I10-4—Fragiochrepts plus Fragiaquepts and Dystrochrepts, gently sloping to steep.

Ustochrepts (formerly Reddish Chestnut soils).—Ochrepts that during the warm season of the year are intermittently dry for long periods.[1]

Ustochrepts (shallow; formerly Lithosols).—Ustochrepts that are shallower than 20 inches to bedrock.

I11-1—Ustochrepts (shallow) plus Haplustalfs, both moderately sloping.

Xerochrepts (formerly Regosols).—Ochrepts that are in climates with rainy winters but dry summers; during the warm season of the year, the soils are continually dry for a long period.[1]

TROPEPTS (formerly Latosols).—Inceptisols of tropical climates; used for pineapple and irrigated sugarcane in Hawaii.

I12-1—Tropepts plus Ustox and Rock land, gently sloping to steep.

UMBREPTS.—Inceptisols with crystalline clay minerals, thick dark-colored surface horizons, and altered subsurface horizons that have lost mineral materials and that are low in bases; used for woodland and range.

Cryumbrepts (formerly Tundra soils).—Umbrepts of cold regions.

I13-1—Cryumbrepts plus Cryorthods, Haplorthods, and Rock land, steep.

Haplumbrepts (formerly Brown Forest soils).—Umbrepts of temperate to warm regions.

I14-1—Haplumbrepts plus Haplorthods, Humaquepts, Haplaquepts, and Histosols (undifferentiated), gently or moderately sloping.

I14-2—Haplumbrepts, steep, plus Haploxerolls, Dystrandepts, and Vitrandepts, gently sloping.

Xerumbrepts (formerly Regosols).—Umbrepts that are formed in climates with rainy winters but dry summers; during the warm season of the year, the soils are continually dry for a long period.[1]

MOLLISOLS

Soils that have nearly black friable organic-rich surface horizons high in bases; formed mostly in subhumid and semiarid warm to cold climates.

ALBOLLS.—Mollisols of flat places and high closed depressions. They have a seasonal perched water table and a nearly black surface horizon underlain by a bleached (white) mottled horizon over a horizon of clay accumulation that has mottles or gray colors; used for small grain, peas, hay, pasture, and range.

Argialbolls (formerly Planosols and Soloths).—Albolls that have a horizon of clay accumulation without alkali (sodium).[1]

AQUOLLS.—Seasonally wet Mollisols that have a thick nearly black surface horizon and gray subsurface horizons; used for pasture, and where drained, small grains, corn, and potatoes in the North-Central States, and rice and sugarcane in Texas.

Argiaquolls (formerly Humic-Gley soils).—Aquolls that have a subsurface horizon in which clay has accumulated.[1]

Calciaquolls (formerly Calcium Carbonate Solonchaks).—Aquolls that have a horizon near the surface in which large amounts of calcium carbonate have accumulated.

M1-1—Calciaquolls, gently sloping.

M1-2—Calciaquolls plus Haploborolls, gently sloping.

Cryaquolls (formerly Alpine Meadow soils).—Aquolls of cold regions.[1]

Duraquolls (formerly Humic-Gley soils with hardpan).—Aquolls that have a hardpan (duripan) that is cemented with silica.[1]

Haplaquolls (formerly Humic-Gley soils).—Aquolls that have horizons in which materials have been altered or removed but no clay or calcium carbonate has accumulated.

M2-1—Haplaquolls, gently sloping.

M2-2—Haplaquolls (clayey) plus Calciaquolls, both gently sloping.

M2-3—Haplaquolls plus Histosols (plant residues highly decomposed) and Haplaquepts, gently sloping.

M2-4—Haplaquolls plus Udifluvents, Hapludolls, and Hapludalfs, gently sloping.

M2-5—Haplaquolls plus Udipsamments, both gently sloping.

M2-6—Haplaquolls plus Udipsamments and Humaquepts, all gently sloping.

BOROLLS.—Mollisols of cool and cold regions. Most Borolls have a black surface horizon; used for small grain, hay, and pasture in North-Central States and range, woodland, and some small grain in Western States.

Argiborolls (formerly Chernozems).—Borolls of cool regions. They have a subsurface horizon in which clay has accumulated.

M3-1—Argiborolls, moderately sloping.

M3-2—Argiborolls, gently sloping.

M3-3—Argiborolls plus Eutroboralfs, moderately sloping.

M3-4—Argiborolls plus Haploborolls, gently sloping.

M3-5—Argiborolls plus Haploborolls, gently sloping to steep.

M3-6—Argiborolls plus Haploborolls and Calciaquolls, gently or moderately sloping.

M3-7—Argiborolls plus Haploborolls, Natrargids, and Calciborolls, gently sloping.

M3-8—Argiborolls plus Natriborolls and Haploborolls, gently sloping.

M3-9—Argiborolls plus Ustorthents, gently sloping.

M3-10—Argiborolls plus Ustorthents (shallow) and Boralfs, steep.

Cryoborolls (formerly Chernozems).—Borolls of cold regions.

M4-1—Cryoborolls plus Cryorthents and Haplargids, moderately sloping.

M4-2—Cryoborolls plus Haplustalfs and Argiustolls, greatly sloping to steep.

Haploborolls (formerly Chernozems).—Borolls of cool regions. They have no horizon of clay accumulation.

M5-1—Haploborolls, gently sloping.

M5-2—Haploborolls, moderately sloping.

M5-3—Haploborolls plus Argiborolls, moderately sloping.

M5-4—Haploborolls plus Haplaquolls, and Calciaquolls, gently sloping.

M5-5—Haploborolls plus Natriborolls, gently sloping.

Natriborolls (formerly Solonetz soils).—Borolls that have a subsurface horizon of clay accumulation with alkali (sodium).[1]

RENDOLLS (formerly Rendzinas).—Mollisols with subsurface horizons that have large amounts of calcium carbonate but no accumulation of clay; used for cotton, corn, small grains, and pasture.

UDOLLS.—Mollisols of temperate climates. Udolls are usually moist and have no horizon in which either calcium carbonate or gypsum has accumulated; used for corn, small grains, and soybeans.

Argiudolls (formerly Brunizems and Reddish Prairie soils).—Udolls that have a subsurface horizon in which clay has accumulated.

M6-1—Argiudolls, gently or moderately sloping.

M6-2—Argiudolls plus Albaqualfs and Paleudolls, gently sloping.

M6-3—Argiudolls plus Argiaquolls, gently sloping.

M6-4—Argiudolls plus Argiaquolls and Argialbolls, gently or moderately sloping.

M6-5—Argiudolls plus Argiustolls, Argiaquolls, and Ustipsamments, gently sloping.

M6-6—Argiudolls plus Haplaquolls, gently sloping.

M6-7—Argiudolls plus Hapludalfs and Haplaquolls, gently or moderately sloping.

Hapludolls (formerly Brunizems and some Regosols, Brown Forest, and Alluvial soils).—Udolls that have horizons from which some materials have been removed or altered but have no subsurface horizon of clay accumulation.

M7-1—Hapludolls, gently sloping.

M7-2—Hapludolls, gently or moderately sloping.

M7-3—Hapludolls plus Argiudolls, gently sloping.

M7-4—Hapludolls plus Argiudolls, Udorthents, and Hapludalfs, gently or moderately sloping.

M7-5—Hapludolls plus Eutrochrepts and Udifluvents, gently sloping.

M7-6—Hapludolls plus Haplaquolls, gently sloping.

M7-7—Hapludolls plus Ustorthents, gently sloping.

Hapludolls (shallow; formerly Lithosols).—Hapludolls that are shallower than 20 inches to bedrock.

M8-1—Hapludolls (shallow) plus Argiustolls and Argiudolls, moderately sloping.

USTOLLS.—Mollisols that are mostly in semiarid regions. During the warm season of the year, these soils are intermittently dry for a long period or have subsurface horizons in which salts or carbonates have accumulated; used for wheat or small grains, and some irrigated crops.

Argiustolls (formerly Chernozem, Chestnut, and some Brown soils).—Ustolls that have a subsurface horizon of clay accumulation that is relatively thin or is brownish.

M9-1—Argiustolls, gently sloping.

M9-2—Argiustolls plus Calciustolls and Paleustolls, gently sloping.

M9-3—Argiustolls plus Chromusterts, Rhodustalfs, Argiborolls and Torriorthents (shallow), gently sloping to steep.

M9-4—Argiustolls plus Haplargids, Ustorthents, and Paleustolls, gently sloping.

M9-5—Argiustolls plus Haploborolls and Argiborolls, moderately sloping.

M9-6—Argiustolls plus Haplustolls, gently sloping.

M9-7—Argiustolls plus Haplustolls, gently sloping to steep.

M9-8—Argiustolls plus Haplustolls, Chromusterts, Ustorthents, and Ustipsamments, gently or moderately sloping.

M9-9—Argiustolls plus Haplustolls, Paleustolls and Calciustolls, gently sloping.

M9-10—Argiustolls plus Haplustolls (shallow), Paleustolls and Ustorthents, gently sloping.

M9-11—Argiustolls plus Haplustolls, Ustorthents (shallow) Argiborolls and Rock land, gently sloping to steep.

M9-12—Argiustolls plus Natrustolls, gently or moderately sloping.

M9-13—Argiustolls plus Paleustolls, gently sloping.

M9-14—Argiustolls plus Paleustolls and Haploborolls, gently sloping to steep.

M9-15—Argiustolls plus Paleustolls and Ustorthents, gently sloping.

M9-16—Argiustolls plus Ustipsamments, gently sloping.

M9-17—Argiustolls plus Ustipsamments and Ustochrepts, gently or moderately sloping.

M9-18—Argiustolls plus Ustorthents, gently sloping.

M9-19—Argiustolls plus Ustorthents (shallow), gently sloping.

Calciustolls (formerly Calcisols).—Ustolls that are calcareous throughout and have either an indurated (petrocalcic) horizon cemented by carbonates or a horizon in which calcium carbonate or gypsum has accumulated.

M10-1—Calciustolls plus Haplustolls, Argiustolls, and Ustochrepts (shallow), gently or moderately sloping.

Calciustolls (shallow; formerly Lithosols).—Calciustolls that are shallower than 20 inches to bedrock.

M11-1—Calciustolls (shallow) plus Argiustolls, both gently sloping.

M11-2—Calciustolls (shallow) plus Pellusterts and Torrerts, all gently sloping.

Haplustolls (formerly Chernozem, Chestnut, and some Brown soils).—Ustolls that have a subsurface horizon high in bases but without large accumulations of clay, calcium carbonate, or gypsum.

M12-1—Haplustolls plus Argiustolls and Calciustolls (shallow), gently sloping.

M12-2—Haplustolls plus Argiustolls and Haplustalfs, gently sloping.

M12-3—Haplustolls plus Argiustolls and Ustorthents, gently sloping.

M12-4—Haplustolls plus Pellusterts, gently sloping.

M12-5—Haplustolls plus Ustorthents, moderately sloping.

M12-6—Haplustolls plus Ustorthents and Camborthids, moderately sloping.

Haplustolls (shallow; formerly Lithosols).—Haplustolls that are shallower than 20 inches to bedrock.

M13-1—Haplustolls (shallow) plus Haplustolls, both gently or moderately sloping.

M13-2—Haplustolls (shallow) plus Torriorthents (shallow) and Calciorthids, all moderately sloping or steep.

Natrustolls (formerly Solonetz soils).—Ustolls that have a horizon of clay and alkali (sodium) accumulation.

M14-1—Natrustolls plus Argiborolls, gently sloping.

XEROLLS.—Mollisols that are in climates with rainy winters but dry summers; during the warm season of the year, these soils are continually dry for a long period; used for wheat, range, and irrigated crops.

Argixerolls (formerly Brunizems).—Xerolls that have a subsurface horizon of clay accumulation that is relatively thin or is brownish.

M15-1—Argixerolls plus Argialbolls and Haploxerolls, gently or moderately sloping.

M15-2—Argixerolls plus Argiborolls and Haploxerolls, steep.

M15-3—Argixerolls plus Argiborolls and Cryaquolls, moderately sloping.

M15-4—Argixerolls plus Cryandepts and Haploxerolls, moderately sloping or steep.

M15-5—Argixerolls plus Haploxerolls, moderately sloping.

M15-6—Argixerolls plus Haploxerolls, gently or moderately sloping.

M15-7—Argixerolls plus Haploxerolls and Haplaquolls, gently sloping.

M15-8—Argixerolls plus Haploxerolls, Haplargids, and Camborthids, gently or moderately sloping.

M15-9—Argixerolls plus Haploxerolls, Xererts, and Palexerolls, moderately sloping or steep.

M15-10—Argixerolls plus Haploxerolls, Xerorthents (shallow), and Rock land, gently or moderately sloping.

M15-11—Argixerolls plus Xerorthents (shallow), Haploxerolls, and Rock land, steep.

M15-12—Argixerolls plus Xerorthents (shallow), Xeralfs, and Rock land, steep.

Calcixerolls (formerly Calcisols).—Xerolls that have a calcareous surface horizon and subsurface horizons in which large amounts of calcium carbonate, with or without cementation, or gypsum have accumulated.[1]

Durixerolls (formerly Brunizems with hardpan).—Xerolls that have a hardpan (duripan) that is cemented with silica.[1]

Haploxerolls (formerly Chestnut and Brown soils).—Xerolls that have a subsurface horizon high in bases but without large accumulations of clay, calcium carbonate, or gypsum.

M16-1—Haploxerolls plus Argixerolls, Chromoxererts, and Xerothents (shallow), steep.

M16-2—Haploxerolls plus Argixerolls and Haploxerolls (shallow), moderately sloping.

M16-3—Haploxerolls plus Argixerolls and Xerorthents, gently sloping to steep.

M16-4—Haploxerolls plus Calciaquolls and Argixerolls, gently or moderately sloping.

M16-5—Haploxerolls plus Calcixerolls and Xerofluvents, gently sloping.

M16-6—Haploxerolls plus Camborthids and Calciorthids (shallow), moderately sloping or steep.

M16-7—Haploxerolls plus Haplaquolls, Durixerolls, and Rock land, moderately sloping.

Palexerolls (formerly Brunizems).—Xerolls that have a hardpan (petrocalcic horizon) cemented with carbonates or a horizon of clay accumulation that is thick and reddish or is clayey in the upper part and changes abruptly in texture into an overlying horizon.[1]

OXISOLS

Soils that are mixtures principally of kaolin, hydrated oxides, and quartz and that are low in weatherable minerals; formed on gentle or moderate slopes at low or moderate elevations in tropical or subtropical climates.

HUMOX.—Oxisols that are moist all or most of the time. They have a high content of organic matter but are low in bases; used for sugarcane, pineapple, and pasture in Hawaii.

Gibbsihumox (formerly Humic Ferruginous Latosols).—Humox that have nodules or sheets cemented with hydrated aluminum oxides.[1]

ORTHOX (formerly Latosols).—Oxisols that are moist all or most of the time. They have moderate to low content of organic matter and are relatively low in bases; used for sugarcane, pineapple, and pasture in Hawaii. (These soils are not classified here below the level of suborder.)

01-1—Orthox plus Gibbsihumox, gently or moderately sloping.

USTOX (formerly Latosols).—Oxisols that are continually dry in some part of the soil for a long period during the year; used for pineapple, irrigated sugarcane, and pasture in Hawaii. (These soils are not classified here below the level of suborder.)

02-1—Ustox plus Andepts and Aquepts, gently sloping to steep.

02-2—Ustox plus Chromusterts, Tropepts, and Andepts, gently or moderately sloping.

02-3—Ustox plus Tropepts, Andepts, and Rock land, gently sloping to steep.

SPODOSOLS

Soils with low base supply that have in subsurface horizons an accumulation of amorphous materials consisting of organic matter plus compounds of aluminum and usually iron; formed in acid mainly coarse-textured materials in humid and mostly cool or temperate climates.

AQUODS.—Seasonally wet Spodosols; formed in humid climates of arctic to tropical regions; used for mostly pasture, range, or woodland and some citrus and truck crops in Florida.

Haplaquods (formerly Ground-Water Podzols).—Aquods that have a subsurface horizon that contains dispersed aluminum and organic matter but only small amounts of free iron oxides; used for woodland, pasture, and where drained, some truck crops and citrus.

S1-1—Haplaquods plus Quartzipsamments, gently sloping.

Sideraquods (formerly Ground-Water Podzols).—Aquods that have appreciable amounts of free iron in subsurface horizons.[1]

ORTHODS.—Spodosols that have a horizon in which organic matter plus compounds of iron and aluminum have accumulated; used for woodland, hay, pasture, fruit, and, on gently sloping areas, potatoes and truck crops.

Cryorthods (formerly Podzols).—Orthods of cold regions.

S2-1—Cryorthods plus Histosols (plant residues not decomposed) and Cryaquepts, gently or moderately sloping.

S2-2—Cryorthods plus Histosols (plant residues not decomposed) plus Cryandepts and Cryaquepts, moderately sloping or steep.

Cryorthods (shallow; formerly Podzols).—Cryorthods that are shallower than 20 inches to bedrock.[1]

Fragiorthods (formerly Podzols and Brown Podzolic soils, both with fragipans).—Orthods that have a dense brittle, but not indurated horizon (fragipan) below a horizon that has an accumulation of organic matter and compounds of iron and aluminum.

S3-1—Fragiorthods, moderately sloping.

Haplorthods (formerly Podzols and Brown Podzolic soils).—Orthods of cool regions. They have a horizon in which organic matter plus compounds of iron and aluminum have accumulated, but they have no dense, brittle, or indurated horizon (fragipan).

S4-1—Haplorthods (loamy), gently sloping.

S4-2—Haplorthods (sandy), gently or moderately sloping.

S4-3—Haplorthods plus Fragiorthods, gently sloping.

S4-4—Haplorthods plus Fragiorthods, moderately sloping.

S4-5—Haplorthods plus Fragiorthods and Rock land, steep.

S4-6—Haplorthods plus Glossoboralfs, gently sloping.

S4-7—Haplorthods plus Glossoboralfs and Udipsamments, moderately sloping.

S4-8—Haplorthods plus Haplaquepts and Fragiochrepts, gently or moderately sloping.

S4-9—Haplorthods plus Haplaquepts and Ochraqualfs, gently sloping.

S4-10—Haplorthods plus Quartzipsamments and Hapludults, gently sloping.

S4-11—Haplorthods plus Rock land, moderately sloping or steep.

ULTISOLS

Soils that are low in bases and have subsurface horizons of clay accumulation; usually moist, but during the warm season of the year, some are dry part of the time.

AQUULTS.—Seasonally wet Ultisols that have mottles, iron-manganese concretions, or gray colors. Used for limited pasture and woodland, and where drained, some hay, cotton, corn, and truck crops.

Fragiaquults (formerly Planosols with fragipan).—Aquults that have a dense brittle but not indurated horizon (fragipan).[1]

Ochraquults (formerly Low-Humic Gley soils).—Aquults that have either a light-colored or a thin black surface horizon.

U1-1—Ochraquults plus Glossaqualfs and Paleudults, gently sloping.

U1-2—Ochraquults plus Paleudults and Hapludults, gently sloping.

U1-3—Ochraquults plus Quartzipsamments, gently sloping.

U1-4—Ochraquults plus Umbraquults and Tidal marsh, gently sloping.

Umbraquults (formerly Humic-Gley soils).—Aquults that have a thick black surface horizon.[1]

HUMULTS.—Ultisols that have a high content of organic matter; formed in temperate or tropical climates that have high amounts of rainfall throughout the year; used for woodland and pasture where steep, small grain and truck and seed crops in Oregon and Washington, and pineapple and irrigated sugarcane in Hawaii where gently or moderately sloping.

Haplohumults (formerly Reddish-Brown Lateritic soils).—Humults that either have a subsurface horizon of clay accumulation that is relatively thin, a subsurface horizon having appreciable weatherable minerals, or both; formed in temperate climates.

U2-1—Haplohumults plus Haplumbrepts, moderately sloping or steep.

U2-2—Haplohumults plus Xerumbrepts and Haploxerolls, moderately sloping or steep.

Tropohumults (formerly Reddish-Brown Lateritic soils).—Humults that either have a horizon of clay accumulation that is relatively thin, a subsurface horizon having appreciable weatherable minerals, or both; formed in tropical climates.

U3-1—Tropohumults plus Dystrandepts and Rubble land, moderately sloping or steep.

U3-2—Tropohumults plus Tropepts, gently sloping to steep.

U3-3—Tropohumults plus Tropepts and Rock land, gently sloping to steep.

UDULTS.—Ultisols that are usually moist and that are relatively low in organic matter in the subsurface horizons; formed in humid climates that have short or no dry periods during the year; used for general farming, woodland and pasture, and cotton and tobacco in some parts.

Fragiudults (formerly Red-Yellow Podzolic soils with fragipan).—Udults that have a dense brittle but not indurated horizon (fragipan) in or below a horizon in which clay has accumulated.

U4-1—Fragiudults plus Paleudults, gently or moderately sloping.

Hapludults (formerly Red-Yellow Podzolic and some Gray-Brown Podzolic soils).—Udults that either have a subsurface horizon of clay accumulation that is relatively thin, a subsurface horizon having appreciable weatherable minerals, or both.

U5-1—Hapludults gently or moderately sloping.

U5-2—Hapludults, gently sloping to steep (mostly dissected plateaus).

U5-3—Hapludults, moderately sloping.

U5-4—Hapludults, steep.

U5-5—Hapludults plus Dystrochrepts, moderately sloping.

U5-6—Hapludults plus Dystrochrepts, steep.

U5-7—Hapludults plus Dystrochrepts, gently or moderately sloping, and Rock land, steep.

U5-8—Hapludults plus Fragiudults, gently sloping.

U5-9—Hapludults plus Hapludalfs and Dystrochrepts, steep.

U5-10—Hapludults plus Hapludalfs and Rock land, moderately sloping or steep.

U5-11—Hapludults plus Ochraquults, gently sloping.

U5-12—Hapludults plus Paleudults, moderately sloping.

U5-13—Hapludults plus Paleudults and Dystrochrepts, gently sloping to steep.

Paleudults (formerly Red-Yellow Podzolic soils).—Udults that have a thick horizon of clay accumulation without appreciable weatherable minerals.

U6-1—Paleudults, gently sloping.

U6-2—Paleudults plus Fragiudults, gently sloping.

U6-3—Paleudults, moderately sloping, plus Fragiudults, gently sloping.

U6-4—Paleudults plus Fragiudults, moderately sloping.

U6-5—Paleudults plus Hapludults, gently sloping.

U6-6—Paleudults plus Hapludults, both moderately sloping, and Fragiudults, gently sloping.

U6-7—Paleudults plus Ochraquults and Fragiaquults, gently or moderately sloping.

U6-8—Paleudults plus Paleudalfs, Hapludults, and Hapludalfs, gently or moderately sloping.

U6-9—Paleudults plus Quartzipsamments, gently sloping.

U6-10—Paleudults plus Quartzipsamments, moderately sloping.

U6-11—Paleudults plus Rhodudults, moderately sloping.

Rhodudults (formerly Reddish-Brown Lateritic soils).—Udults that have dark-red subsurface horizons of clay accumulation.[1]

XERULTS.—Ultisols that are relatively low in organic matter in the subsurface horizons. They are in climates with rainy winters but dry summers; during the warm season of the year, these soils are continually dry for a long period; used for range and woodland.

Haploxerults (formerly Reddish-Brown Lateritic and some Red-Yellow Podzolic soils).—Xerults that either have a subsurface horizon of clay accumulation that is relatively thin, a subsurface horizon having appreciable weatherable minerals, or both.

U7-1—Haploxerults plus Haploxerolls, Xerochrepts, and Xerumbrepts, moderately sloping to steep.

U7-2—Haploxerults plus Xerumbrepts and Xerorthents, steep.

VERTISOLS

Clayey soils that have wide, deep cracks when dry; most have distinct wet and dry periods throughout the year.

TORRERTS (formerly Grumusols).—Vertisols that are usually dry and have wide, deep cracks that remain open throughout the year in most years; used for range and some irrigated crops.

UDERTS.—Vertisols that are usually moist. They have wide, deep cracks that usually open and close one or more times during the year but do not remain open continuously for more than 2 months or intermittently for periods that total more than 3 months; used for cotton, corn, small grains, pasture and some rice.

Chromuderts (formerly Grumusols).—Uderts that have a brownish surface horizon.

V1-1—Chromuderts plus Eutrochrepts, gently sloping.

PELLUDERTS (formerly Grumusols).—Uderts that have a black or dark gray surface horizon.

V2-1—Pelluderts plus Pellusterts and Rendolls, gently sloping.

USTERTS.—Vertisols that have wide, deep cracks that usually open and close more than once during the year and remain open intermittently for periods that total more than 3 months but do not remain open continuously throughout the year; used for general crops and range plus some irrigated cotton, corn, citrus, and truck crops in the Rio Grande valley.

Chromusterts (formerly Grumusols).—Usterts that have a brownish surface horizon.

V3-1—Chromusterts plus Paleustalfs, gently sloping.

Pellusterts (formerly Grumusols).—Usterts that have a black or dark-gray surface horizon.

V4-1—Pellusterts plus Chromusterts, gently sloping.

V4-2—Pellusterts plus Camborthids and Torrerts, gently sloping.

XERERTS.—Vertisols that have wide, deep cracks that open and close once each year and remain open continuously for more than 2 months; used for irrigated small grains, hay, and pasture.

Chromoxererts (formerly Grumusols).—Xererts that have a brownish surface horizon.

V5-1—Chromoxererts plus Pelloxererts and Humaquepts, gently sloping.

Pelloxererts (formerly Grumusols).—Xererts that have a black or dark-gray surface horizon.[1]

MISCELLANEOUS LAND TYPES.—Barren or nearly barren areas that are mainly rock, ice, or salt and some included soils. Mostly not used for crops but some in warm, moist climates have vegetation.

X1—Rock land plus Andepts, steep.

X2—Rock land plus Andepts and Stony land, steep.

X3—Rock land plus Cryandepts, Cryumbrepts, Cryaquepts, and Cryorthods (shallow), all moderately sloping or steep (includes icefields and glaciers).

X4—Rock land plus Rough broken land, Andepts, and Tropepts, steep.

X5—Salt flats and Playas, gently sloping.

[1] No map units are listed under this great group (or phase) because it is not the most extensive soil in any map unit.

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