Table schemas for soil database

Note that soil data comes in four hierarchical levels:

1. *an area (legend) is composed of several map units*
2. *a map unit is composed of several components*
3. *a component is composed of several horizons/layers*
4. *a horizon/layer is the most granular unit*

In the analytic phase, features will be aggregated up the hierarchy to the legend/area-level.

Table name: **legend**

Field	Description	Data Type	Notes	Min	Max	Nulls
areasymbol	A symbol that uniquely identifies a single occurrence of a particular type of area (e.g. Lancaster Co., Nebraska is NE109).	STRING				
lkey	A non-connotative string of characters used to uniquely identify a record in the Legend table	BIGINT	primary key			0
areaname	The name given to the specified geographic area.	STRING				
mlraoffice	An NRCS business unit responsible for oversight of soil survey production activities of a particular soil survey area.	STRING				
areaacres	The acreage total of all land and water areas in the specified geographic area.	INT				
mbrminx	The minimum X coordinate for a soil survey area's minimum bounding rectangle, expressed in decimal degrees west or east of the prime meridian. Minimum corresponds to the southwest corner of the bounding rectangle.	FLOAT	min longitude	-170.846799	171.027177	0
mbrminy	The minimum Y coordinate for a soil survey area's minimum bounding rectangle, expressed in decimal degress north or south of the equator. Minimum corresponds to the southwest corner of the bounding rectangle.	FLOAT	min latitude	-14.373856	64.744283	0
mbrmaxx	The maximum X coordinate for a soil survey area's minimum bounding rectangle, expressed in decimal degrees west or east of the prime meridian. Maximum corresponds to the northest corner of the bounding rectangle.	FLOAT	max longitude	-170.097125	171.76386	0
mbrmaxy	The maximum Y coordinate for a soil survey area's minimum bounding rectangle, expressed in decimal degress north or south of the equator. Maximum corresponds to the northest corner of the bounding rectangle.	FLOAT	max latitude	-14.155361	65.642982	0

Table name: **mapunit**

Field	Description	Data Type	Notes	Min	Max	Nulls
mukey	A non-connotative string of characters used to uniquely identify a record in the Mapunit table.	BIGINT	primary key			0
muname	Correlated name of the mapunit (recommended name or field name for surveys in progress).	STRING				
mukind	Code identifying the kind of mapunit. Example: C - consociation.	STRING				
muacres	The number of acres of a particular mapunit.	INT	use as weighting factor	0	2693865	0
farmlndcl	Identification of map units as prime farmland, farmland of statewide importance, or farmland of local importance.	INT				
museq	An integer number used to order the map units in a legend.	INT				
nationalmusym	The symbol used to uniquely identify the soil mapunit nationally. The value is generated by NASIS, and is the based on the muiid from the Mapunit table, expressed in base 36. It is a combination of numberic and lowercase alphabetic characters.	STRING				
lkey	A non-connotative string of characters used to uniquely identify a record in the Legend table	BIGINT	foreign key (to legend)			1329

Table name: **component**

Field	Description	Data Type	Notes	Min	Max	Nulls
cokey	A non-connotative string of characters used to uniquely identify a record in the Component table.	BIGINT	primary key			0
compname	Name assigned to a component based on its range of properties.	STRING				
mukey	A non-connotative string of characters used to uniquely identify a record in the Mapunit table.	BIGINT	foreign key (to mapunit)			0
comppct_r	The percentage of the component of the mapunit.	INT	use as weighting factor	0	100	17115
localphase	Phase criterion to be used at a local level, in conjunction with "component name" to help identify a soil component.	STRING				
slope_r	The difference in elevation between two points, expressed as a percentage of the	FLOAT	use as feature	0	200	175925

	distance between those points. (SSM)					
compkind	Identifies the kind of component of the mapunit. Examples are series and miscellaneous areas.	STRING				
majcompflag	Indicates whether or not a component is a major component in the mapunit	STRING				
drainagecl	Identifies the natural drainage conditions of the soil and refers to the frequency and duration of wet periods. An example of a drainage class is well drained.	STRING				
taxpartsize	Particle-size classes are used as family differentiae. Particle-size refers to grain-size distribution of the whole soil and is not the same as texture. (Soil Taxonomy).	STRING				
runoff	Runoff potential class for the soil	STRING				
tfact	The maximum amount of erosion at which the quality of a soil as a medium for plant growth can be maintained.	INT	use as feature	1	5	260676
wei	A value in tons/acre/year that is a factor in calculating soil loss by wind. The values are acquired from WEG.	STRING				
erocl	Class of accelerated erosion. (SSM)	STRING				
hydricrating	A yes/no field that indicates whether or not a map unit component is classified as a "hydric soil". If rated as hydric, the specific criteria met are listed in the Component Hydric Criteria table.	STRING				
elev_r	The vertical distance from mean sea level to a point on the earth's surface	FLOAT	use as feature	-70	7300	297632
aspectrep	The common, typical, or expected direction toward which the surface of the soil faces, expressed as an angle between 0 and 360 degrees measured clockwise from true north.	INT				
nirrcapcl	The broadest category in the land capability classification system for nonirrigated soils	STRING				
irrcapcl	The broadest category in the land capability classification system for irrigated soils.	STRING				
frostact	An interpretation rating of the susceptibility of the soil to frost heaving.	STRING				
hydgrp	A group of soils having similar runoff potential under similar storm and cover conditions. Examples are A and A/D. (NSSH)	STRING				
taxceactcl	Cation exchange activity classes are used as family criteria differentiae. It is the relative cation exchange (CEC) activity level of the soil based on the CEC to clay ratio. (Soil	STRING				

	Taxonomy)					
taxreaction	Indicates the presence or absence of carbonates and the reaction. They are treated together because of their intimate relationship, and are used to indicate family differentiae. (Soil Taxonomy)	STRING				
taxtempcl	The taxonomic family temperature class used to construct the official classification name. It may be null when the taxonomic family temperature class is embedded in the classification name. The actual taxonomic temperature regime is recorded in another place.	STRING				

Table name: **chorizon**

Field	Description	Data Type	Notes	Min	Max	Nulls
chkey	A non-connotative string of characters used to uniquely identify a record in the Horizon table	BIGINT	primary key			0
cokey	A non-connotative string of characters used to uniquely identify a record in the Component table.	BIGINT	foreign key (to component)			0
hzdept_r	The distance from the top of the soil to the upper boundary of the soil horizon.	INT	use to compute weighting factor	0	445	283
hzdepb_r	The distance from the top of the soil to the base of the soil horizon.	INT	use to compute weighting factor	0	1332	489
hzname	The concatenated string of four kinds of symbols (five data elements) used to distinguish different kinds of layers in the soil. (SSM)	STRING				
hzthk_r	A measurement from the top to bottom of a soil horizon throughout its areal extent.	FLOAT				
fraggt10_r	The percent by weight of the horizon occupied by rock fragments greater than 10 inches in size.	FLOAT				
frag3to10_r	The percent by weight of the horizon occupied by rock fragments 3 to 10 inches in size.	FLOAT				
sieveno4_r	Soil fraction passing a number 4 sieve (4.70mm square opening) as a weight percentage of the less than 3 inch (76.4mm) fraction.	FLOAT				
sieveno10_r	Soil fraction passing a number 10 sieve (2.00mm square opening) as a weight percentage of the less than 3 inch (76.4mm) fraction.	FLOAT				

sieveno40_r	Soil fraction passing a number 40 sieve (0.42mm square opening) as a weight percentage of the less than 3 inch (76.4mm) fraction.	FLOAT				
sieveno200_r	Soil fraction passing a number 200 sieve (0.074mm square opening) as a weight percentage of the less than 3 inch (76.4mm) fraction.	FLOAT				
sandtotal_r	Mineral particles 0.05mm to 2.0mm in equivalent diameter as a weight percentage of the less than 2 mm fraction.	FLOAT	use as feature	0	100	389202
sandvc_r	Mineral particles 1.0mm to 2.0mm in equivalent diameter as a weight percentage of the less than 2 mm fraction.	FLOAT				
sandco_r	cos Mineral particles 0.5mm to 1.0mm in equivalent diameter as a weight percentage of the less than 2 mm fraction.	FLOAT				
sandmed_r	Mineral particles 0.25mm to 0.5mm in equivalent diameter as a weight percentage of the less than 2 mm fraction.	FLOAT				
sandfine_r	Mineral particles 0.10 to 0.25mm in equivalent diameter as a weight percentage of the less than 2 mm fraction.	FLOAT				
sandvf_r	Mineral particles 0.05 to 0.10mm in equivalent diameter as a weight percentage of the less than 2 mm fraction.	FLOAT				
silttotal_r	Mineral particles 0.002 to 0.05mm in equivalent diameter as a weight percentage of the less than 2.0mm fraction.	FLOAT	use as feature	0	100	393682
siltco_r	Mineral particles ranging in size from 0.02mm to 0.05mm in equivalent diameter as a weight percentage of the less than 2.0mm fraction.	FLOAT				
siltfine_r	Mineral particles ranging in size from 0.002 to 0.02mm in equivalent diameter as a weight percentage of the less than 2.0mm fraction.	FLOAT				
claytotal_r	Mineral particles less than 0.002mm in equivalent diameter as a weight percentage of the less than 2.0mm fraction.	FLOAT	use as feature	0	97.9	323421
claysizedcarb_r	Carbonate particles less than 0.002mm in equivalent diameter as a weight percentage of the less than 2.0mm fraction	FLOAT				
om_r	The amount by weight of decomposed plant and animal residue expressed as a weight percentage of the less than 2 mm soil material.	FLOAT	use as feature	0	100	352233
awc_r	The amount of water that an increment of soil depth, inclusive of fragments, can store that is available to plants. AWC is expressed as a volume fraction, and is commonly estimated as the difference between the water contents	FLOAT	use as feature	0	0.7	247489

	at 1/10 or 1/3 bar (field capacity) and 15 bars (permanent wilting point) tension and adjusted for salinity, and fragments.					
wtenthbar_r	The volumetric content of soil water retained at a tension of 1/10 bar (10 kPa), expressed as a percentage of the whole soil.	FLOAT				
wthirdbar_r	The volumetric content of soil water retained at a tension of 1/3 bar (33 kPa), expressed as a percentage of the whole soil.	FLOAT				
wfifteenbar_r	The volumetric content of soil water retained at a tension of 15 bars (1500 kPa), expressed as a percentage of the whole soil.	FLOAT				
wsatiated_r	The estimated volumetric soil water content at or near zero bar tension, expressed as a percentage of the whole soil.	FLOAT				
kwfact	An erodibility factor which quantifies the susceptibility of soil particles to detachment and movement by water. This factor is adjusted for the effect of rock fragments.	STRING				
kffact	An erodibility factor which quantifies the susceptibility of soil particles to detachment by water.	STRING				
caco3_r	The quantity of Carbonate (CO3) in the soil expressed as CaCO3 and as a weight percentage of the less than 2 mm size fraction.	FLOAT				
gypsum_r	The percent by weight of hydrated calcium sulfate in the less than 20 mm fraction of soil.	FLOAT				
sar_r	A measure of the amount of Sodium (Na) relative to Calcium (Ca) and Magnesium (Mg) in the water extract from saturated soil paste.	FLOAT				
ec_r	The electrical conductivity of an extract from saturated soil paste.	FLOAT				
cec7_r	The amount of readily exchangeable cations that can be electrically adsorbed to negative charges in the soil, soil constituent, or other material, at pH 7.0, as estimated by the ammonium acetate method.	FLOAT	use as feature	0	325	1016982
ecec_r	The sum of NH4OAc extractable bases plus KCl extractable aluminum.	FLOAT				
sumbases_r	The sum of NH4OAc extractable bases (pH 7.0), reported on less than 2mm base.	FLOAT				
ph1to1h2o_r	The negative logarithm to the base 10, of the hydrogen ion activity in the soil using the 1:1 soil-water ratio method. A numerical expression of the relative acidity or alkalinity of a soil sample. (SSM)	FLOAT	use as feature	2	10.8	296829
ph01mcacl2_r	The negative logarithm to base of 10 or the hydrogen ion activity in the soil, using the 0.01M CaCl2 method, in a 1:2 soil:solution	FLOAT				

	ratio. A numerical expression of the relative acidity or alkalinity of a soil sample. (SSM)					
freeiron_r	The secondary iron oxides such as geothite, hematite, ferrihydrite, lepidocrocite and maghemite. This form of iron may occur as discrete particles, as coatings on other particles, or as cementing agents between soil mineral grains. It is iron extracted by dithionite-citrate.	FLOAT				
feoxalate_r	The amount of ammonium oxalate extractable iron in the less than 2mm fraction. It is considered a measure of noncrystalline iron in the soil.	FLOAT				
ptotal_r	The estimate of the total phosphorous content of the soil, measured after total dissolution of a size fraction of the soil material. It is reported as a gravimetric percent oxide of the size fraction used.	FLOAT				