Geochemical and mineralogical data for soils of the conterminous United States

Metadata also available as - [Outline]

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What does this data set describe?

Title:

Geochemical and mineralogical data for soils of the conterminous United States

Abstract:

In 2007, the U.S. Geological Survey initiated a low-density (1 site per 1,600 square kilometers, 4,857 sites) geochemical and mineralogical survey of soils of the conterminous United States as part of the North American Soil Geochemical Landscapes Project. Sampling and analytical protocols were developed at a workshop in 2003, and pilot studies were conducted from 2004 to 2007 to test and refine these recommended protocols. The final sampling protocol for the national-scale survey included, at each site, a sample from a depth of 0 to 5 centimeters, a composite of the soil A horizon, and a deeper sample from the soil C horizon or, if the top of the C horizon was at a depth greater than 1 meter, from a depth of approximately 80–100 centimeters. The <2-millimeter fraction of each sample was analyzed for a suite of 45 major and trace elements by methods that yield the total or near-total elemental content. The major mineralogical components in the samples from the soil A and C horizons were determined by a quantitative X-ray diffraction method using Rietveld refinement. Sampling in the conterminous United States was completed in 2010, with chemical and mineralogical analyses completed in May 2013. The resulting dataset provides an estimate of the abundance and spatial distribution of chemical elements and minerals in soils of the conterminous United States and represents a baseline for soil geochemistry and mineralogy against which future changes may be recognized and quantified. This report (1) describes the sampling, sample preparation, and analytical methods used; (2) gives details of the quality control protocols used to monitor the quality of chemical and mineralogical analyses over approximately six years; and (3) makes available the soil geochemical and mineralogical data in downloadable tables.

1. **How should this data set be cited?**

   Smith, D.B., Cannon, W.F., Woodruff, L.G., Solano, Federico, Kilburn, J.E., and Fey, D.L., 2013, Geochemical and mineralogical data for soils of the conterminous United States: U.S. Geological Survey Data Series 801, 19 p.

   Online Links:

   - <http://pubs.usgs.gov/ds/801/>

2. **What geographic area does the data set cover?**

   West_Bounding_Coordinate: -124.4019
   East_Bounding_Coordinate: -67.5201
   North_Bounding_Coordinate: 48.9835
   South_Bounding_Coordinate: 25.1376

3. **What does it look like?**
4. **Does the data set describe conditions during a particular time period?**

   Beginning_Date: 2007
   Ending_Date: 2013

Currentness_Reference: Sample collection and analysis period

5. **What is the general form of this data set?**

   Geospatial_Data_Presentation_Form: tabular data

6. **How does the data set represent geographic features?**
   a. **How are geographic features stored in the data set?**

      This is a point dataset. It contains the following vector data types (SDTS terminology):

      - point (4857)

   b. **What coordinate system is used to represent geographic features?**

      Horizontal positions are specified in geographic coordinates, that is, latitude and longitude. Latitude and longitude values are specified in decimal degrees. Latitudes are given to the nearest 0.0001. Longitudes are given to the nearest 0.0001.

7. **How does the data set describe geographic features?**

`Top5`
Data related to the samples collected from the top 5 centimeters of soils. (Source: USGS)
`Top5_LabID`
Unique identifier assigned to each individual sample by the analyzing laboratory.
`SiteID`
Unique identifier assigned to each individual sampling site.
`StateID`
Code for the state as established by NIST.
`Latitude`
Latitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum.

Range of values	
Minimum:	25.1376
Maximum:	48.9835
Units:	Decimal degrees

`Longitude`
Longitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum. Negative values indicate locations west of the Greenwich Meridian.

Range of values	
Minimum:	-124.4019
Maximum:	-67.5201
Units:	Decimal degrees

CollDate
Date of collection of the sample, as reported in the field sheet, given as mm/dd/yyyy.
LandCover1
Primary land cover classification from the National Land Cover Database 1992 Classification System.
LandCover2
Secondary land cover classification from the National Land Cover Database 1992 Classification System.
Top5_Depth
Depth or depth interval from which the sample was collected in the top 5 level.

Range of values	
Minimum:	0
Maximum:	5
Units:	centimeter

Top5_Quartz
Quartz in the top 5 level, determined from the interpretation of the XRD scan.

Range of values	
Units:	percent by weight (wt.%)

Top5_Tot_K_fs
Total potassium feldspar in the top 5 level, determined from the interpretation of the XRD scan.

Range of values	
Units:	percent by weight (wt.%)

Top5_Tot_Plg
Total plagioclase in the top 5 level, determined from the interpretation of the XRD scan.

Range of values	
Units:	percent by weight (wt.%)

Top5_Tot_Flds
Total feldspar in the top 5 level, determined from the interpretation of the XRD scan.

Range of values	
Units:	percent by weight (wt.%)

Top5_Tot_14Å
Total 14Å clays in the top 5 level, determined from the interpretation of the XRD scan.

Range of values	
Units:	percent by weight (wt.%)

Top5_Tot_10Å
Total 10Å clays in the top 5 level, determined from the interpretation of the XRD scan.

Range of values	
Units:	percent by weight (wt.%)

Top5_Kaolinit
Kaolinite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Tot_Clay
Total clays in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Gibbsite
Gibbsite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Calcite
Calcite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Dolomite
Dolomite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Aragon
Aragonite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Tot_Carb
Total carbonates in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Analcime
Analcime in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Heuland
Heulandite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Tot_Zeol

Total zeolites in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Gypsum

Gypsum in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Talc

Talc in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Hornbl

Hornblende and related amphiboles in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Serpent

Serpentine in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Hematite

Hematite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Goethite

Goethite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Pyroxene

Pyroxene in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Pyrite

Pyrite in the top 5 level, determined from the interpretation of the XRD scan.

	Range of values
Units:	percent by weight (wt.%)

Top5_Other

Other mineral phase(s) in the top 5 level, that were detected occasionally, determined from the interpretation of the XRD scan.

Range of values	
Units:	percent by weight (wt.%)

Top5_Amorph

Amorphous in the top 5 level, determined from the interpretation of the XRD scan.

Range of values	
Units:	percent by weight (wt.%)

Top5_Ag

Silver (Ag) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	7.7
Units:	milligrams per kilogram (mg/kg)

Top5_Al

Aluminum (Al) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.02
Maximum:	15.3
Units:	percent by weight (wt.%)

Top5_As

Arsenic (As) concentration in the top 5 level, measured by hydride-generation atomic absorption spectrometry (HG-AAS) after fusion of the sample in sodium peroxide and sodium hydroxide. Precision of one decimal place.

Range of values	
Minimum:	<0.6
Maximum:	830
Units:	milligrams per kilogram (mg/kg)

Top5_Ba

Barium (Ba) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values

Minimum:	5
Maximum:	4770
Units:	milligrams per kilogram (mg/kg)

Top5_Be

Beryllium (Be) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	17.3
Units:	milligrams per kilogram (mg/kg)

Top5_Bi

Bismuth (Bi) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.04
Maximum:	694
Units:	milligrams per kilogram (mg/kg)

Top5_C_Tot

Empty field, because total carbon (C) concentration in the top 5 level was not measured. Field included to facilitate vertical pasting of horizons.

Range of values	
Units:	percent by weight (wt.%)

Top5_C_Inorg

Empty field, because inorganic carbon (C) concentration in the top 5 level was not determined. Field included to facilitate vertical pasting of horizons.

Range of values	
Units:	percent by weight (wt.%)

Top5_C_Org

Empty field, because organic carbon (C) concentration in the top 5 level was not determined. Field included to facilitate vertical pasting of horizons.

Range of values	
Units:	percent by weight (wt.%)

Top5_Ca

Calcium (Ca) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	32.8
Units:	percent by weight (wt.%)

Top5_Cd

Cadmium (Cd) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	76.8
Units:	milligrams per kilogram (mg/kg)

Top5_Ce

Cerium (Ce) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.65
Maximum:	415
Units:	milligrams per kilogram (mg/kg)

Top5_Co

Cobalt (Co) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	216
Units:	milligrams per kilogram (mg/kg)

Top5_Cr

Chromium (Cr) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	4120
Units:	milligrams per kilogram (mg/kg)

Top5_Cs

Cesium (Cs) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<5
Maximum:	97
Units:	milligrams per kilogram (mg/kg)

Top5_Cu

Copper (Cu) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	996
Units:	milligrams per kilogram (mg/kg)

Top5_Fe

Iron (Fe) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	13.3
Units:	percent by weight (wt.%)

Top5_Ga

Gallium (Ga) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.1
Maximum:	45.1
Units:	milligrams per kilogram (mg/kg)

Top5_Hg

Mercury (Hg) concentration in the top 5 level, measured by cold-vapor atomic absorption spectrometry (CVAAS) after digestion in HNO3 and HCl. Precision of two decimal places.

Range of values

Minimum:	<0.01
Maximum:	56.4
Units:	milligrams per kilogram (mg/kg)

Top5_In

Indium (In) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.02
Maximum:	4.54
Units:	milligrams per kilogram (mg/kg)

Top5_K

Potassium (K) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	5.44
Units:	percent by weight (wt.%)

Top5_La

Lanthanum (La) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	239
Units:	milligrams per kilogram (mg/kg)

Top5_Li

Lithium (Li) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	300
Units:	milligrams per kilogram (mg/kg)

Top5_Mg

Magnesium (Mg) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	13.6
Units:	percent by weight (wt.%)

Top5_Mn

Manganese (Mn) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<5
Maximum:	7780
Units:	milligrams per kilogram (mg/kg)

Top5_Mo

Molybdenum (Mo) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.05
Maximum:	75.7
Units:	milligrams per kilogram (mg/kg)

Top5_Na

Sodium (Na) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	6.41
Units:	percent by weight (wt.%)

Top5_Nb

Niobium (Nb) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1

Maximum:	80.1
Units:	milligrams per kilogram (mg/kg)

Top5_Ni

Nickel (Ni) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	1890
Units:	milligrams per kilogram (mg/kg)

Top5_P

Phosphorus (P) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<50
Maximum:	9120
Units:	milligrams per kilogram (mg/kg)

Top5_Pb

Lead (Pb) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	12400
Units:	milligrams per kilogram (mg/kg)

Top5_Rb

Rubidium (Rb) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	299
Units:	milligrams per kilogram (mg/kg)

Top5_S

Sulfur (S) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	16.1
Units:	percent by weight (wt.%)

Top5_Sb

Antimony (Sb) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.05
Maximum:	482
Units:	milligrams per kilogram (mg/kg)

Top5_Sc

Scandium (Sc) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	42.3
Units:	milligrams per kilogram (mg/kg)

Top5_Se

Selenium (Se) concentration in the top 5 level, measured by hydride-generation atomic absorption spectrometry (HG-AAS) after digestion of the sample in HNO3, HF, and HClO4. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	6.9
Units:	milligrams per kilogram (mg/kg)

Top5_Sn

Tin (Sn) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values

Minimum:	<0.1
Maximum:	88.9
Units:	milligrams per kilogram (mg/kg)

Top5_Sr

Strontium (Sr) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	0.5
Maximum:	2620
Units:	milligrams per kilogram (mg/kg)

Top5_Te

Tellurium (Te) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	50.5
Units:	milligrams per kilogram (mg/kg)

Top5_Th

Thorium (Th) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	78.3
Units:	milligrams per kilogram (mg/kg)

Top5_Ti

Titanium (Ti) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	2.47
Units:	percent by weight (wt.%)

Top5_Tl

Thallium (Tl) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	8.8
Units:	milligrams per kilogram (mg/kg)

Top5_U

Uranium (U) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	102
Units:	milligrams per kilogram (mg/kg)

Top5_V

Vanadium (V) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	530
Units:	milligrams per kilogram (mg/kg)

Top5_W

Tungsten (W) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	1150
Units:	milligrams per kilogram (mg/kg)

Top5_Y

Yttrium (Y) concentration in the top 5 level, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	0.2

Maximum:	191
Units:	milligrams per kilogram (mg/kg)

Top5_Zn

Zinc (Zn) concentration in the top 5 level, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	11700
Units:	milligrams per kilogram (mg/kg)

A_horizon

Data related to the samples collected from the A horizon of the soil (Source: USGS)

A_LabID

Unique identifier assigned to each individual sample by the analyzing laboratory.

SiteID

Unique identifier assigned to each individual sampling site.

StateID

Code for the state as established by NIST.

Latitude

Latitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum.

Range of values	
Minimum:	25.1376
Maximum:	48.9835
Units:	Decimal degrees

Longitude

Longitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum. Negative values indicate locations west of the Greenwich Meridian.

Range of values	
Minimum:	-124.4019
Maximum:	-67.5201
Units:	Decimal degrees

CollDate

Date of collection of the sample, as reported in the field sheet, given as mm/dd/yy.

LandCover1

Primary land cover classification from the National Land Cover Database 1992 Classification System.

LandCover2

Secondary land cover classification from the National Land Cover Database 1992 Classification System.

A_Depth

Depth or depth interval from which the sample was collected from the A horizon.

Range of values	
Units:	centimeter

A_Quartz

Quartz in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	100
Units:	percent by weight (wt.%)

A_Tot_K_fs

Total potassium feldspar in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	41.9
Units:	percent by weight (wt.%)

A_Tot_Plag

Total plagioclase in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	70.5
Units:	percent by weight (wt.%)

A_Tot_Flds

Total feldspar in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	79.6
Units:	percent by weight (wt.%)

A_Tot_14Å

Total 14Å clays in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	28
Units:	percent by weight (wt.%)

A_Tot_10Å

Total 10Å clays in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	45.8
Units:	percent by weight (wt.%)

A_Kaolinit

Kaolinite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	43.7
Units:	percent by weight (wt.%)

A_Tot_Clay

Total clays in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	68.9
Units:	percent by weight (wt.%)

A_Gibbsite

Gibbsite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	12.9
Units:	percent by weight (wt.%)

A_Calcite

Calcite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	69.8
Units:	percent by weight (wt.%)

A_Dolomite

Dolomite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	57.2

Units:	percent by weight (wt.%)

A_Aragon

Aragonite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	41.9
Units:	percent by weight (wt.%)

A_Tot_Carb

Total carbonates in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	71.5
Units:	percent by weight (wt.%)

A_Analcime

Analcime in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	9.6
Units:	percent by weight (wt.%)

A_Heuland

Heulandite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	29.3
Units:	percent by weight (wt.%)

A_Tot_Zeol

Total zeolites in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	29.3
Units:	percent by weight (wt.%)

A_Gypsum

Gypsum in the A horizon, determined from the interpretation of the XRD scan.

Range of values

Minimum:	<0.2
Maximum:	84.7
Units:	percent by weight (wt.%)

A_Talc

Talc in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	20
Units:	percent by weight (wt.%)

A_Hornbl

Hornblende and related amphiboles in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	33.8
Units:	percent by weight (wt.%)

A_Serpent

Serpentine in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	17.9
Units:	percent by weight (wt.%)

A_Hematite

Hematite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	12.8
Units:	percent by weight (wt.%)

A_Goethite

Goethite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	15
Units:	percent by weight (wt.%)

A_Pyroxene

Pyroxene in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	34.4
Units:	percent by weight (wt.%)

A_Pyrite

Pyrite in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	0.6
Units:	percent by weight (wt.%)

A_Other

Other mineral phase(s) in the A horizon, that were detected occasionally, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	24.9
Units:	percent by weight (wt.%)

A_Amorph

Amorphous in the A horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	90.4
Units:	percent by weight (wt.%)

A_Ag

Silver (Ag) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	14
Units:	milligrams per kilogram (mg/kg)

A_Al

Aluminum (Al) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.01
Maximum:	15.6
Units:	percent by weight (wt.%)

A_As

Arsenic (As) concentration in the A horizon, measured by hydride-generation atomic absorption spectrometry (HG-AAS) after fusion of the sample in sodium peroxide and sodium hydroxide. Precision of one decimal place.

Range of values	
Minimum:	<0.6
Maximum:	1110
Units:	milligrams per kilogram (mg/kg)

A_Ba

Barium (Ba) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	6
Maximum:	4850
Units:	milligrams per kilogram (mg/kg)

A_Be

Beryllium (Be) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	22.1
Units:	milligrams per kilogram (mg/kg)

A_Bi

Bismuth (Bi) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.04

Maximum:	129
Units:	milligrams per kilogram (mg/kg)

A_C_Tot

Total carbon (C) concentration in the A horizon, measured by combustion. Precision of two decimal places.

Range of values	
Minimum:	0.04
Maximum:	60.2
Units:	percent by weight (wt.%)

A_C_Inorg

Inorganic carbon (C) concentration in the A horizon, reported as the result of stoichiometric calculation of carbon present in calcite, dolomite, and/or aragonite as determined by X-ray diffraction (XRD). The formula used was ((A_Calcite * 0.12)+(A_Dolomite * 0.1304)+(A_Aragon * 0.12)). Calculated values for a very small percentage of samples (less than 0.005%) were lower than 0 and are reported as N.D. (non-detect). Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	8.6
Units:	percent by weight (wt.%)

A_C_Org

Organic carbon (C) concentration in the A horizon, reported as the difference between measured total carbon (A_C_Tot) and inorganic carbon (A_C_Inorg). Precision of one decimal place if inorganic carbon is reported, two decimal places otherwise.

Range of values	
Minimum:	0
Maximum:	60.1
Units:	percent by weight (wt.%)

A_Ca

Calcium (Ca) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	29.7
Units:	percent by weight (wt.%)

A_Cd

Cadmium (Cd) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	46.6
Units:	milligrams per kilogram (mg/kg)

A_Ce

Cerium (Ce) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.05
Maximum:	487
Units:	milligrams per kilogram (mg/kg)

A_Co

Cobalt (Co) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	184
Units:	milligrams per kilogram (mg/kg)

A_Cr

Chromium (Cr) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	3850
Units:	milligrams per kilogram (mg/kg)

A_Cs

Cesium (Cs) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<5

Maximum:	97
Units:	milligrams per kilogram (mg/kg)

A_Cu

Copper (Cu) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	5090
Units:	milligrams per kilogram (mg/kg)

A_Fe

Iron (Fe) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	13.9
Units:	percent by weight (wt.%)

A_Ga

Gallium (Ga) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.08
Maximum:	40.8
Units:	milligrams per kilogram (mg/kg)

A_Hg

Mercury (Hg) concentration in the A horizon, measured by cold-vapor atomic absorption spectrometry (CVAAS) after digestion in HNO3 and HCl. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	8.24
Units:	milligrams per kilogram (mg/kg)

A_In

Indium (In) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.02
Maximum:	4.61
Units:	milligrams per kilogram (mg/kg)

A_K

Potassium (K) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	5.10
Units:	percent by weight (wt.%)

A_La

Lanthanum (La) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	205
Units:	milligrams per kilogram (mg/kg)

A_Li

Lithium (Li) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	315
Units:	milligrams per kilogram (mg/kg)

A_Mg

Magnesium (Mg) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01

Maximum:	13.3
Units:	percent by weight (wt.%)

A_Mn

Manganese (Mn) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<5
Maximum:	6850
Units:	milligrams per kilogram (mg/kg)

A_Mo

Molybdenum (Mo) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.05
Maximum:	70.3
Units:	milligrams per kilogram (mg/kg)

A_Na

Sodium (Na) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	6.60
Units:	percent by weight (wt.%)

A_Nb

Niobium (Nb) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	96.8
Units:	milligrams per kilogram (mg/kg)

A_Ni

Nickel (Ni) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	2310
Units:	milligrams per kilogram (mg/kg)

A_P

Phosphorus (P) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<50
Maximum:	7650
Units:	milligrams per kilogram (mg/kg)

A_Pb

Lead (Pb) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	2200
Units:	milligrams per kilogram (mg/kg)

A_Rb

Rubidium (Rb) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	461
Units:	milligrams per kilogram (mg/kg)

A_S

Sulfur (S) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01

Maximum:	16.6
Units:	percent by weight (wt.%)

A_Sb

Antimony (Sb) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.05
Maximum:	630
Units:	milligrams per kilogram (mg/kg)

A_Sc

Scandium (Sc) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	48.9
Units:	milligrams per kilogram (mg/kg)

A_Se

Selenium (Se) concentration in the A horizon, measured by hydride-generation atomic absorption spectrometry (HG-AAS) after digestion of the sample in HNO3, HF, and HClO4. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	8.3
Units:	milligrams per kilogram (mg/kg)

A_Sn

Tin (Sn) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	375
Units:	milligrams per kilogram (mg/kg)

A_Sr

Strontium (Sr) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	7080
Units:	milligrams per kilogram (mg/kg)

A_Te

Tellurium (Te) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	9.6
Units:	milligrams per kilogram (mg/kg)

A_Th

Thorium (Th) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	84.1
Units:	milligrams per kilogram (mg/kg)

A_Ti

Titanium (Ti) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.01
Maximum:	2.76
Units:	percent by weight (wt.%)

A_Tl

Thallium (Tl) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1

Maximum:	11.5
Units:	milligrams per kilogram (mg/kg)

A_U

Uranium (U) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	105
Units:	milligrams per kilogram (mg/kg)

A_V

Vanadium (V) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	524
Units:	milligrams per kilogram (mg/kg)

A_W

Tungsten (W) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	299
Units:	milligrams per kilogram (mg/kg)

A_Y

Yttrium (Y) concentration in the A horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	0.2
Maximum:	254
Units:	milligrams per kilogram (mg/kg)

A_Zn

Zinc (Zn) concentration in the A horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	2130
Units:	milligrams per kilogram (mg/kg)

C_horizon
Data related to the samples collected from the C horizon of the soil (Source: USGS)
C_LabID
Unique identifier assigned to each individual sample by the analyzing laboratory.
SiteID
Unique identifier assigned to each individual sampling site.
StateID
Code for the state as established by NIST.
Latitude
Latitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum.

Range of values	
Units:	Decimal degrees

Longitude
Longitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum. Negative values indicate locations west of the Greenwich Meridian.

Range of values	
Units:	Decimal degrees

CollDate
Date of collection of the sample, as reported in the field sheet, given as mm/dd/yy.
LandCover1
Primary land cover classification from the National Land Cover Database 1992 Classification System.
LandCover2
Secondary land cover classification from the National Land Cover Database 1992 Classification System.
C_Depth
Depth or depth interval from which the sample was collected in the C horizon.

Range of values	
Units:	centimeter

C_Quartz
Quartz in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	99.4

Units:	percent by weight (wt.%)

C_Tot_K_fs

Total potassium feldspar in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	45.2
Units:	percent by weight (wt.%)

C_Tot_Plag

Total plagioclase in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	67
Units:	percent by weight (wt.%)

C_Tot_Flds

Total feldspar in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	80.1
Units:	percent by weight (wt.%)

C_Tot_14Å

Total 14Å clays in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	44.1
Units:	percent by weight (wt.%)

C_Tot_10Å

Total 10Å clays in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	65.1
Units:	percent by weight (wt.%)

C_Kaolinit

Kaolinite in the C horizon, determined from the interpretation of the XRD scan.

Range of values

Minimum:	<0.2
Maximum:	79.9
Units:	percent by weight (wt.%)

C_Tot_Clay

Total clays in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	86.3
Units:	percent by weight (wt.%)

C_Gibbsite

Gibbsite in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	30.4
Units:	percent by weight (wt.%)

C_Calcite

Calcite in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	84.1
Units:	percent by weight (wt.%)

C_Dolomite

Dolomite in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	81.4
Units:	percent by weight (wt.%)

C_Aragon

Aragonite in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	65.3
Units:	percent by weight (wt.%)

C_Tot_Carb

Total carbonates in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	84.1
Units:	percent by weight (wt.%)

C_Analcime

Analcime in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	9.2
Units:	percent by weight (wt.%)

C_Heuland

Heulandite in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	38
Units:	percent by weight (wt.%)

C_Tot_Zeol

Total zeolites in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	38
Units:	percent by weight (wt.%)

C_Gypsum

Gypsum in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	96.5
Units:	percent by weight (wt.%)

C_Talc

Talc in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	16.4

Units:	percent by weight (wt.%)

C_Hornbl

Hornblende and related amphiboles in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	62.6
Units:	percent by weight (wt.%)

C_Serpent

Serpentine in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	26.7
Units:	percent by weight (wt.%)

C_Hematite

Hematite in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	13.5
Units:	percent by weight (wt.%)

C_Goethite

Goethite in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	14.1
Units:	percent by weight (wt.%)

C_Pyroxene

Pyroxene in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	33.6
Units:	percent by weight (wt.%)

C_Pyrite

Pyrite in the C horizon, determined from the interpretation of the XRD scan.

Range of values

Minimum:	<0.2
Maximum:	0.4
Units:	percent by weight (wt.%)

C_Other

Other mineral phase(s) in the C horizon, that were detected occasionally, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	35.9
Units:	percent by weight (wt.%)

C_Amorph

Amorphous in the C horizon, determined from the interpretation of the XRD scan.

Range of values	
Minimum:	<0.2
Maximum:	95.2
Units:	percent by weight (wt.%)

C_Ag

Silver (Ag) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	3
Units:	milligrams per kilogram (mg/kg)

C_Al

Aluminum (Al) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.02
Maximum:	18.6
Units:	percent by weight (wt.%)

C_As

Arsenic (As) concentration in the C horizon, measured by hydride-generation atomic absorption spectrometry (HG-AAS) after fusion of the sample in sodium peroxide and sodium hydroxide. Precision of one decimal place.

Range of values	
Minimum:	<0.6
Maximum:	397
Units:	milligrams per kilogram (mg/kg)

C_Ba

Barium (Ba) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	5
Maximum:	9360
Units:	milligrams per kilogram (mg/kg)

C_Be

Beryllium (Be) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	31.6
Units:	milligrams per kilogram (mg/kg)

C_Bi

Bismuth (Bi) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.04
Maximum:	8.41
Units:	milligrams per kilogram (mg/kg)

C_C_Tot

Total carbon (C) concentration in the C horizon, measured by combustion. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	43
Units:	percent by weight (wt.%)

C_C_Inorg

Inorganic carbon (C) concentration in the C horizon, reported as the result of stoichiometric calculation of carbon present in calcite, dolomite, and/or aragonite as determined by X-ray diffraction (XRD). The formula used was ((C_Calcite * 0.12)+(C_Dolomite * 0.1304)+(C_Aragon * 0.12)). Calculated values for a very small percentage of samples (less than 0.025%) were lower than 0 and are reported as N.D. (non-detect). Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	10.6
Units:	percent by weight (wt.%)

C_C_Org

Organic carbon (C) concentration in the C horizon, reported as the difference between measured total carbon (C_C_Tot) and inorganic carbon (C_C_Inorg). Precision of one decimal place if inorganic carbon is reported, two decimal places otherwise.

Range of values	
Minimum:	0
Maximum:	43
Units:	percent by weight (wt.%)

C_Ca

Calcium (Ca) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	32.3
Units:	percent by weight (wt.%)

C_Cd

Cadmium (Cd) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	36.4
Units:	milligrams per kilogram (mg/kg)

C_Ce

Cerium (Ce) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.5
Maximum:	914
Units:	milligrams per kilogram (mg/kg)

C_Co

Cobalt (Co) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	316
Units:	milligrams per kilogram (mg/kg)

C_Cr

Chromium (Cr) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	4620
Units:	milligrams per kilogram (mg/kg)

C_Cs

Cesium (Cs) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<5
Maximum:	144
Units:	milligrams per kilogram (mg/kg)

C_Cu

Copper (Cu) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	2540

Units:	milligrams per kilogram (mg/kg)

C_Fe

Iron (Fe) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	15.3
Units:	percent by weight (wt.%)

C_Ga

Gallium (Ga) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	0.13
Maximum:	50.4
Units:	milligrams per kilogram (mg/kg)

C_Hg

Mercury (Hg) concentration in the C horizon, measured by cold-vapor atomic absorption spectrometry (CVAAS) after digestion in HNO3 and HCl. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	1.75
Units:	milligrams per kilogram (mg/kg)

C_In

Indium (In) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.02
Maximum:	4.39
Units:	milligrams per kilogram (mg/kg)

C_K

Potassium (K) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	5.67
Units:	percent by weight (wt.%)

C_La

Lanthanum (La) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<0.5
Maximum:	283
Units:	milligrams per kilogram (mg/kg)

C_Li

Lithium (Li) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	280
Units:	milligrams per kilogram (mg/kg)

C_Mg

Magnesium (Mg) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	16.8
Units:	percent by weight (wt.%)

C_Mn

Manganese (Mn) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<5
Maximum:	12000
Units:	milligrams per kilogram (mg/kg)

C_Mo

Molybdenum (Mo) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.05
Maximum:	94.7
Units:	milligrams per kilogram (mg/kg)

C_Na

Sodium (Na) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	5.54
Units:	percent by weight (wt.%)

C_Nb

Niobium (Nb) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	289
Units:	milligrams per kilogram (mg/kg)

C_Ni

Nickel (Ni) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	2870
Units:	milligrams per kilogram (mg/kg)

C_P

Phosphorus (P) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values

Minimum:	<50
Maximum:	27400
Units:	milligrams per kilogram (mg/kg)

C_Pb

Lead (Pb) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	681
Units:	milligrams per kilogram (mg/kg)

C_Rb

Rubidium (Rb) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	267
Units:	milligrams per kilogram (mg/kg)

C_S

Sulfur (S) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	16.2
Units:	percent by weight (wt.%)

C_Sb

Antimony (Sb) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.05
Maximum:	40.6
Units:	milligrams per kilogram (mg/kg)

C_Sc

Scandium (Sc) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	70.8
Units:	milligrams per kilogram (mg/kg)

C_Se

Selenium (Se) concentration in the C horizon, measured by hydride-generation atomic absorption spectrometry (HG-AAS) after digestion of the sample in HNO3, HF, and HClO4. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	7.5
Units:	milligrams per kilogram (mg/kg)

C_Sn

Tin (Sn) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	30.9
Units:	milligrams per kilogram (mg/kg)

C_Sr

Strontium (Sr) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.5
Maximum:	10900
Units:	milligrams per kilogram (mg/kg)

C_Te

Tellurium (Te) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1

Maximum:	6.1
Units:	milligrams per kilogram (mg/kg)

C_Th

Thorium (Th) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.2
Maximum:	55.9
Units:	milligrams per kilogram (mg/kg)

C_Ti

Titanium (Ti) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Range of values	
Minimum:	<0.01
Maximum:	3.42
Units:	percent by weight (wt.%)

C_Tl

Thallium (Tl) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	4.3
Units:	milligrams per kilogram (mg/kg)

C_U

Uranium (U) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	63
Units:	milligrams per kilogram (mg/kg)

C_V

Vanadium (V) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	1080
Units:	milligrams per kilogram (mg/kg)

C_W

Tungsten (W) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	<0.1
Maximum:	199
Units:	milligrams per kilogram (mg/kg)

C_Y

Yttrium (Y) concentration in the C horizon, measured by inductively coupled plasma–mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Range of values	
Minimum:	0.2
Maximum:	288
Units:	milligrams per kilogram (mg/kg)

C_Zn

Zinc (Zn) concentration in the C horizon, measured by inductively coupled plasma–atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Range of values	
Minimum:	<1
Maximum:	653
Units:	milligrams per kilogram (mg/kg)

Entity_and_Attribute_Overview:

The Top5 table contains the chemical analyses for soil samples collected from a depth of 0–5 centimeters at the sampling sites. The mineralogy columns are empty because no mineralogy analyses were performed for this sample medium, but because the columns coincide with columns of mineralogical data in the tables for the A and C horizons, they were included here to allow users to seamlessly paste the three tables together. Samples

lost or not collected for this particular sample type are reported as N.S. Precision for geochemical analyses varies and it is indicated for each element.

FIELD_NAME	FIELD_TYPE	UNITS	METHOD	FIELD_DESCRIPTION
Top5_LabID	Text	n/a	n/a	Unique identifier assigned to each individual sample by the analyzing laboratory.
SiteID	Integer	n/a	n/a	Unique identifier assigned to each individual sampling site.
StateID	Text	n/a	n/a	Code for the state as established by NIST.
Latitude	Number	n/a	n/a	Latitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum.
Longitude	Number	n/a	n/a	Longitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum. Negative values indicate locations west of the Greenwich Meridian.
CollDate	Date/Time	n/a	n/a	Date of collection of the sample, as reported in the field sheet, given as mm/dd/yyyy.
LandCover1	Text	n/a	n/a	Primary land cover classification from the National Land Cover Database 1992 Classification System.
LandCover2	Text	n/a	n/a	Secondary land cover classification from the National Land Cover Database 1992 Classification System.
Top5_Depth	Text	cm	n/a	Depth or depth interval from which the sample was collected, in centimeters.
Top5_Quartz	Text	wt. %	XRD	Quartz, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Tot_K_fs	Text	wt. %	XRD	Total potassium feldspar, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Tot_Plg	Text	wt. %	XRD	Total plagioclase, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Tot_Flds	Text	wt. %	XRD	Total feldspar, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Tot_14A	Text	wt. %	XRD	Total 14Å clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Tot_10A	Text	wt. %	XRD	Total 10Å clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Kaolinit	Text	wt. %	XRD	Kaolinite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Tot_Clay	Text	wt. %	XRD	Total clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Gibbsite	Text	wt. %	XRD	Gibbsite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.

Top5_Calcite Text wt. % XRD Calcite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Dolomite Text wt. % XRD Dolomite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Aragon Text wt. % XRD Aragonite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Tot_Carb Text wt. % XRD Total carbonates, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Analcime Text wt. % XRD Analcime, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Heuland Text wt. % XRD Heulandite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Tot_Zeol Text wt. % XRD Total zeolites, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Gypsum Text wt. % XRD Gypsum, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Talc Text wt. % XRD Talc, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Hornbl Text wt. % XRD Hornblende and related amphiboles, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Serpent Text wt. % XRD Serpentine, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Hematite Text wt. % XRD Hematite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Goethite Text wt. % XRD Goethite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
Top5_Pyroxene Text wt. % XRD Pyroxene, in percent by weight (wt.%), determined from the interpretation of the >RD scan.
Top5_Pyrite Text wt. % XRD Pyrite, in percent by weight (wt.%), determined from the interpretation of the >RD scan.
Top5_Other Text wt. % XRD Other mineral phase(s), in percent by weight (wt.%), that were detected occasionally, determined from the interpretation of the >RD scan.
Top5_Amorph Text wt. % XRD Amorphous, in percent by weight (wt.%), determined from the interpretation of the >RD scan.
Top5_Ag Text mg/kg ICP-MS Silver (Ag), concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Top5_Al Text wt. % ICP-AES Aluminum (Al) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Top5_As Text mg/kg HG–AAS Arsenic (As) concentration, in milligrams per kilogram (mg/kg), measured by hydride generation atomic absorption spectrometry after fusion of the sample in sodium peroxide and sodium hydroxide. Precision of one decimal place.

Top5_Ba Text mg/kg ICP-AES Barium (Ba) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Top5_Be Text mg/kg ICP-MS Beryllium (Be) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Top5_Bi Text mg/kg ICP-MS Bismuth (Bi) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Top5_C_Tot Text wt. % COMBUSTION Empty field, since Total carbon (C) concentration, in percent by weight (wt.%), was not measured. Field included to facilitate vertical pasting of horizons.

Top5_C_Inorg Text wt. % XRD Empty field, since Inorganic carbon (C) concentration, in percent by weight (wt.%), was not determined. Field included to facilitate vertical pasting of horizons.

Top5_C_Org Text wt. % DIFF Empty field, since Organic carbon (C) concentration, in percent by weight (wt.%), was not determined. Field included to facilitate vertical pasting of horizons.

Top5_Ca Text wt. % ICP-AES Calcium (Ca) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Top5_Cd Text mg/kg ICP-MS Cadmium (Cd) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Top5_Ce Text mg/kg ICP-MS Cerium (Ce) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Top5_Co Text mg/kg ICP-MS Cobalt (Co) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Top5_Cr Text mg/kg ICP-AES Chromium (Cr) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
Top5_Cs Text mg/kg ICP-MS Cesium (Cs) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
Top5_Cu Text mg/kg ICP-AES Copper (Cu) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_Fe Text wt. % ICP-AES Iron (Fe) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
Top5_Ga Text mg/kg ICP-MS Gallium (Ga) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
Top5_Hg Text mg/kg CVAAS Mercury (Hg) concentration, in milligrams per kilogram (mg/kg), measured by cold-vapor atomic absorption spectrometry (CVAA) after digestion in HNO3 and HCl. Precision of two decimal places.
Top5_In Text mg/kg ICP-MS Indium (In) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
Top5_K Text wt. % ICP-AES Potassium (K) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
Top5_La Text mg/kg ICP-MS Lanthanum (La) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_Li Text mg/kg ICP-AES Lithium (Li) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
Top5_Mg Text wt. % ICP-AES Magnesium (Mg) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
Top5_Mn Text mg/kg ICP-AES Manganese (Mn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after

a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Top5_Mo Text mg/kg ICP-MS Molybdenum (Mo) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Top5_Na Text wt. % ICP-AES Sodium (Na) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Top5_Nb Text mg/kg ICP-MS Niobium (Nb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Top5_Ni Text mg/kg ICP-AES Nickel (Ni) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Top5_P Text mg/kg ICP-AES Phosphorus (P) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Top5_Pb Text mg/kg ICP-MS Lead (Pb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Top5_Rb Text mg/kg ICP-MS Rubidium (Rb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Top5_S Text wt. % ICP-AES Sulfur (S) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Top5_Sb Text mg/kg ICP-MS Antimony (Sb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

Top5_Sc Text mg/kg ICP-MS Scandium (Sc) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

Top5_Se Text mg/kg HG–AAS Selenium (Se) concentration, in milligrams per kilogram (mg/kg), measured by hydride generation atomic absorption spectrometry after digestion of the sample in HNO3, HF, and HClO4. Precision of one decimal place.

Top5_Sn Text mg/kg ICP-MS Tin (Sn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_Sr Text mg/kg ICP-AES Strontium (Sr) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_Te Text mg/kg ICP-MS Tellurium (Te) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_Th Text mg/kg ICP-MS Thorium (Th) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_Ti Text wt. % ICP-AES Titanium (Ti) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
Top5_Tl Text mg/kg ICP-MS Thallium (Tl) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_U Text mg/kg ICP-MS Uranium (U) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_V Text mg/kg ICP-AES Vanadium (V) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
Top5_W Text mg/kg ICP-MS Tungsten (W) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_Y Text mg/kg ICP-MS Yttrium (Y) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
Top5_Zn Text mg/kg ICP-AES Zinc (Zn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Entity_and_Attribute_Detail_Citation:

database designer/metadata author Federico Solano; see Data_Quality_Information/Lineage/Process_Step/Process_Contact/Contact_Information.

Entity_and_Attribute_Overview:

The A_Horizon table contains the results of the mineralogical determinations of major minerals and the results of the chemical analyses for the soil samples collected from the A horizon. N.D. indicates an undetected mineral phase. Samples lost or not collected for this particular level are reported as N.S. One decimal place is reported for all mineral phases. For chemical analyses, precision varies and is indicated for each element.

FIELD_NAME	FIELD_TYPE	UNITS	METHOD	FIELD_DESCRIPTION
A_LabID	Text	n/a	n/a	Unique identifier assigned to each individual sample by the analyzing laboratory.
SiteID	Integer	n/a	n/a	Unique identifier assigned to each individual sampling site.
StateID	Text	n/a	n/a	Code for the state as established by NIST.
Latitude	Number	n/a	n/a	Latitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum.
Longitude	Number	n/a	n/a	Longitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum. Negative values indicate locations west of the Greenwich Meridian.
CollDate	Date/Time	n/a	n/a	Date of collection of the sample, as reported in the field sheet, given as mm/dd/yy.
LandCover1	Text	n/a	n/a	Primary land cover classification from the National Land Cover Database 1992 Classification System.
LandCover2	Text	n/a	n/a	Secondary land cover classification from the National Land Cover Database 1992 Classification System.
A_Depth	Text	cm	n/a	Depth or depth interval from which the sample was collected, in centimeters.
A_Quartz	Text	wt. %	XRD	Quartz, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Tot_K_fs	Text	wt. %	XRD	Total potassium feldspar, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Tot_Plag	Text	wt. %	XRD	Total plagioclase, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Tot_Flds	Text	wt. %	XRD	Total feldspar, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Tot_14A	Text	wt. %	XRD	Total 14Å clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Tot_10A	Text	wt. %	XRD	Total 10Å clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.

A_Kaolinit Text wt. % XRD Kaolinite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Tot_Clay Text wt. % XRD Total clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Gibbsite Text wt. % XRD Gibbsite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Calcite Text wt. % XRD Calcite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Dolomite Text wt. % XRD Dolomite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Aragon Text wt. % XRD Aragonite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Tot_Carb Text wt. % XRD Total carbonates, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Analcime Text wt. % XRD Analcime, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Heuland Text wt. % XRD Heulandite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Tot_Zeol Text wt. % XRD Total zeolites, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Gypsum Text wt. % XRD Gypsum, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Talc Text wt. % XRD Talc, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Hornbl Text wt. % XRD Hornblende and related amphiboles, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Serpent Text wt. % XRD Serpentine, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Hematite Text wt. % XRD Hematite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Goethite Text wt. % XRD Goethite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Pyroxene Text wt. % XRD Pyroxene, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Pyrite Text wt. % XRD Pyrite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Other Text wt. % XRD Other mineral phase(s), in percent by weight (wt.%), that were detected occasionally, determined from the interpretation of the XRD scan.

A_Amorph Text wt. % XRD Amorphous, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
A_Ag Text mg/kg ICP-MS Silver (Ag) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
A_Al Text wt. % ICP-AES Aluminum (Al) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
A_As Text mg/kg HG-AAS Arsenic (As) concentration, in milligrams per kilogram (mg/kg), measured by hydride generation atomic absorption spectrometry (HYD-AA) after fusion of the sample in sodium peroxide and sodium hydroxide. Precision of one decimal place.
A_Ba Text mg/kg ICP-AES Barium (Ba) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
A_Be Text mg/kg ICP-MS Beryllium (Be) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
A_Bi Text mg/kg ICP-MS Bismuth (Bi) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
A_C_Tot Text wt. % COMBUSTION Total carbon (C) concentration, in percent by weight (wt.%), measured by combustion. Precision of two decimal places.
A_C_Inorg Text wt. % XRD Inorganic carbon (C) concentration, in percent by weight (wt.%), reported as the result of stoichiometric calculation of carbon present in calcite, dolomite, and/or aragonite as determined by >-ray diffraction (>RD). The formula used was ((A_Calcite * 0.12)+(A_Dolomite * 0.1304)+(A_Aragon * 0.12)). Calculated values for a very small percentage of samples (less than 0.005%) were lower than 0 and are reported as N.D. (non-detect). Precision of one decimal place.
A_C_Org Text wt. % DIFF Organic carbon (C) concentration, in percent by weight (wt.%), reported as the difference between measured total carbon (A_C_Tot) and inorganic carbon (A_C_Inorg). Precision of one decimal place if inorganic carbon is reported, two decimal places otherwise.
A_Ca Text wt. % ICP-AES Calcium (Ca) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
A_Cd Text mg/kg ICP-MS Cadmium (Cd) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-

total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Ce Text mg/kg ICP-MS Cerium (Ce) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

A_Co Text mg/kg ICP-MS Cobalt (Co) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Cr Text mg/kg ICP-AES Chromium (Cr) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

A_Cs Text mg/kg ICP-MS Cesium (Cs) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

A_Cu Text mg/kg ICP-AES Copper (Cu) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Fe Text wt. % ICP-AES Iron (Fe) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

A_Ga Text mg/kg ICP-MS Gallium (Ga) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

A_Hg Text mg/kg CVAAS Mercury (Hg) concentration, in milligrams per kilogram (mg/kg), measured by cold-vapor atomic absorption spectrometry (CVAA) after digestion in HNO3 and HCl. Precision of two decimal places.

A_In Text mg/kg ICP-MS Indium (In) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

A_K Text wt. % ICP-AES Potassium (K) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

A_La Text mg/kg ICP-MS Lanthanum (La) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Li Text mg/kg ICP-AES Lithium (Li) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
A_Mg Text wt. % ICP-AES Magnesium (Mg) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
A_Mn Text mg/kg ICP-AES Manganese (Mn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
A_Mo Text mg/kg ICP-MS Molybdenum (Mo) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
A_Na Text wt. % ICP-AES Sodium (Na) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
A_Nb Text mg/kg ICP-MS Niobium (Nb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
A_Ni Text mg/kg ICP-AES Nickel (Ni) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
A_P Text mg/kg ICP-AES Phosphorus (P) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
A_Pb Text mg/kg ICP-MS Lead (Pb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
A_Rb Text mg/kg ICP-MS Rubidium (Rb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
A_S Text wt. % ICP-AES Sulfur (S) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
A_Sb Text mg/kg ICP-MS Antimony (Sb) concentration, in milligrams per kilogram (mg/kg), measured by

inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

A_Sc Text mg/kg ICP-MS Scandium (Sc) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Se Text mg/kg HG-AAS Selenium (Se) concentration, in milligrams per kilogram (mg/kg), measured by hydride generation atomic absorption spectrometry (HYD-AA) after digestion of the sample in HNO3, HF, and HClO4. Precision of one decimal place.

A_Sn Text mg/kg ICP-MS Tin (Sn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Sr Text mg/kg ICP-AES Strontium (Sr) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Te Text mg/kg ICP-MS Tellurium (Te) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Th Text mg/kg ICP-MS Thorium (Th) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Ti Text wt. % ICP-AES Titanium (Ti) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

A_Tl Text mg/kg ICP-MS Thallium (Tl) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_U Text mg/kg ICP-MS Uranium (U) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_V Text mg/kg ICP-AES Vanadium (V) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

A_W Text mg/kg ICP-MS Tungsten (W) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

A_Y Text mg/kg ICP-MS Yttrium (Y) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
A_Zn Text mg/kg ICP-AES Zinc (Zn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Entity_and_Attribute_Detail_Citation:

database designer/metadata author Federico Solano; see Data_Quality_Information/Lineage/Process_Step/Process_Contact/Contact_Information.

Entity_and_Attribute_Overview:

The C_Horizon table contains the results of the mineralogical determinations of major minerals and the results of the chemical analyses for the soil samples collected from the C horizon. N.D. indicates an undetected mineral phase. Samples lost or not collected for this particular level are reported as N.S. Precision is one decimal place for all mineral phases. For chemical analyses, precision varies and is indicated for each element.

FIELD_NAME	FIELD_TYPE	UNITS	METHOD	FIELD_DESCRIPTION
C_LabID	Text	n/a	n/a	Unique identifier assigned to each individual sample by the analyzing laboratory.
SiteID	Integer	n/a	n/a	Unique identifier assigned to each individual sampling site.
StateID	Text	n/a	n/a	Code for the state as established by NIST.
Latitude	Number	n/a	n/a	Latitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum.
Longitude	Number	n/a	n/a	Longitude coordinate of a sample site, reported in decimal degrees, with WGS-84 datum. Negative values indicate locations west of the Greenwich Meridian.
CollDate	Date/Time	n/a	n/a	Date of collection of the sample, as reported in the field sheet, given as mm/dd/yy.
LandCover1	Text	n/a	n/a	Primary land cover classification from the National Land Cover Database 1992 Classification System.
LandCover2	Text	n/a	n/a	Secondary land cover classification from the National Land Cover Database 1992 Classification System.
C_Depth	Text	cm	n/a	Depth or depth interval from which the sample was collected, in centimeters.
C_Quartz	Text	wt. %	XRD	Quartz, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Tot_K_fs	Text	wt. %	XRD	Total potassium feldspar, in percent by weight (wt.%), determined from the interpretation of the XRD scan.

C_Tot_Plag Text wt. % XRD Total plagioclase, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Tot_Flds Text wt. % XRD Total feldspar, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Tot_14A Text wt. % XRD Total 14Å clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Tot_10A Text wt. % XRD Total 10Å clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Kaolinit Text wt. % XRD Kaolinite, in percent by weight (wt.%), determined from the interpretation of the >RD scan.
C_Tot_Clay Text wt. % XRD Total clays, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Gibbsite Text wt. % XRD Gibbsite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Calcite Text wt. % XRD Calcite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Dolomite Text wt. % XRD Dolomite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Aragon Text wt. % XRD Aragonite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Tot_Carb Text wt. % XRD Total carbonates, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Analcime Text wt. % XRD Analcime, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Heuland Text wt. % XRD Heulandite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Tot_Zeol Text wt. % XRD Total zeolites, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Gypsum Text wt. % XRD Gypsum, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Talc Text wt. % XRD Talc, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Hornbl Text wt. % XRD Hornblende and related amphiboles, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Serpent Text wt. % XRD Serpentine, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Hematite Text wt. % XRD Hematite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.

C_Goethite Text wt. % XRD Goethite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Pyroxene Text wt. % XRD Pyroxene, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Pyrite Text wt. % XRD Pyrite, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Other Text wt. % XRD Other mineral phase(s), in percent by weight (wt.%), that were detected occasionally, determined from the interpretation of the XRD scan.
C_Amorph Text wt. % XRD Amorphous, in percent by weight (wt.%), determined from the interpretation of the XRD scan.
C_Ag Text mg/kg ICP-MS Silver (Ag) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
C_Al Text wt. % ICP-AES Aluminum (Al) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_As Text mg/kg HG-AAS Arsenic (As) concentration, in milligrams per kilogram (mg/kg), measured by hydride generation atomic absorption spectrometry (HYD-AA) after fusion of the sample in sodium peroxide and sodium hydroxide. Precision of one decimal place.
C_Ba Text mg/kg ICP-AES Barium (Ba) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
C_Be Text mg/kg ICP-MS Beryllium (Be) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Bi Text mg/kg ICP-MS Bismuth (Bi) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_C_Tot Text wt. % COMBUSTION Total carbon (C) concentration, in percent by weight (wt.%), measured by combustion. Precision of two decimal places.
C_C_Inorg Text wt. % XRD Inorganic carbon (C) concentration, in percent by weight (wt.%), reported as the result of stoichiometric calculation of carbon present in calcite, dolomite, and/or aragonite as determined by >-ray diffraction (>RD). The formula used was ((C_Calcite * 0.12)+(C_Dolomite * 0.1304)+(C_Aragon * 0.12)). Calculated values for a very small percentage of samples (less than 0.025%) were lower than 0 and are reported as N.D. (non-detect). Precision of one decimal place.

C_C_Org Text wt. % DIFF Organic carbon (C) concentration, in percent by weight (wt.%), reported as the difference between measured total carbon (C_C_Tot) and inorganic carbon (C_C_Inorg). Precision of one decimal place if inorganic carbon is reported, two decimal places otherwise.
C_Ca Text wt. % ICP-AES Calcium (Ca) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_Cd Text mg/kg ICP-MS Cadmium (Cd) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Ce Text mg/kg ICP-MS Cerium (Ce) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_Co Text mg/kg ICP-MS Cobalt (Co) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Cr Text mg/kg ICP-AES Chromium (Cr) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
C_Cs Text mg/kg ICP-MS Cesium (Cs) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
C_Cu Text mg/kg ICP-AES Copper (Cu) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Fe Text wt. % ICP-AES Iron (Fe) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_Ga Text mg/kg ICP-MS Gallium (Ga) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_Hg Text mg/kg CVAAS Mercury (Hg) concentration, in milligrams per kilogram (mg/kg), measured by cold-vapor atomic absorption spectrometry (CVAA) after digestion in HNO3 and HCl. Precision of two decimal places.
C_In Text mg/kg ICP-MS Indium (In) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-

total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

C_K Text wt. % ICP-AES Potassium (K) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

C_La Text mg/kg ICP-MS Lanthanum (La) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

C_Li Text mg/kg ICP-AES Lithium (Li) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

C_Mg Text wt. % ICP-AES Magnesium (Mg) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

C_Mn Text mg/kg ICP-AES Manganese (Mn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

C_Mo Text mg/kg ICP-MS Molybdenum (Mo) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

C_Na Text wt. % ICP-AES Sodium (Na) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.

C_Nb Text mg/kg ICP-MS Niobium (Nb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

C_Ni Text mg/kg ICP-AES Nickel (Ni) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

C_P Text mg/kg ICP-AES Phosphorus (P) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

C_Pb Text mg/kg ICP-MS Lead (Pb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.

C_Rb Text mg/kg ICP-MS Rubidium (Rb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_S Text wt. % ICP-AES Sulfur (S) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_Sb Text mg/kg ICP-MS Antimony (Sb) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_Sc Text mg/kg ICP-MS Scandium (Sc) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Se Text mg/kg HG-AAS Selenium (Se) concentration, in milligrams per kilogram (mg/kg), measured by hydride generation atomic absorption spectrometry (HYD-AA) after digestion of the sample in HNO3, HF, and HClO4. Precision of one decimal place.
C_Sn Text mg/kg ICP-MS Tin (Sn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Sr Text mg/kg ICP-AES Strontium (Sr) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Te Text mg/kg ICP-MS Tellurium (Te) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Th Text mg/kg ICP-MS Thorium (Th) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Ti Text wt. % ICP-AES Titanium (Ti) concentration, in percent by weight (wt.%), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of two decimal places.
C_Tl Text mg/kg ICP-MS Thallium (Tl) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_U Text mg/kg ICP-MS Uranium (U) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-

total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_V Text mg/kg ICP-AES Vanadium (V) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.
C_W Text mg/kg ICP-MS Tungsten (W) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Y Text mg/kg ICP-MS Yttrium (Y) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-mass spectrometry (ICP-MS) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one decimal place.
C_Zn Text mg/kg ICP-AES Zinc (Zn) concentration, in milligrams per kilogram (mg/kg), measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES) after a near-total digestion in a mixture of HCl, HNO3, HClO4, and HF. Precision of one unit.

Entity_and_Attribute_Detail_Citation:

database designer/metadata author Federico Solano; see Data_Quality_Information/Lineage/Process_Step/Process_Contact/Contact_Information.

Who produced the data set?

1. **Who are the originators of the data set?** (may include formal authors, digital compilers, and editors)
    - David B. Smith
    - William F. Cannon
    - Laurel G. Woodruff
    - Federico Solano
    - James E. Kilburn
    - David L. Fey
2. **Who also contributed to the data set?**
3. **To whom should users address questions about the data?**

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Why was the data set created?

This dataset was initiated, designed, and populated to compile and integrate mineralogical and geochemical data from soil samples collected over the conterminous United States in order to establish a geochemical and mineralogical baseline to (1) map the abundance and spatial distribution of the analyzed chemical elements and minerals, (2) gain insight to the processes that caused the observed elemental and mineralogical distribution, and (3) provide a geochemical and mineralogical baseline against which future changes may be recognized and quantified. The dataset serves as a data warehouse in support of present and future geological or geochemical projects.

How was the data set created?

1. **From what previous works were the data drawn?**
2. **How were the data generated, processed, and modified?**

   Date: 2007 (process 1 of 1)
   This dataset was created from chemical and mineralogical analyses of samples collected as part of the Soil Geochemical Landscapes of the Conterminous United States Project. At each site, three samples were collected from (1) the top 5 centimeters of soil, (2) the A horizon, and (3) the C horizon. Each sample at a given site was documented in the field using a standardized field sheet with annotations of measurements and observations carried out by the sampling crews. The samples were prepared at the U.S. Geological Survey's lab in Denver, Colo., where splits were taken to send for chemical and mineralogical analyses. All the results of the chemical and mineralogical analyses were stored in spreadsheets and then organized in three final tables, which are presented along with this report.

   Person who carried out this activity:

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3. **What similar or related data should the user be aware of?**

How reliable are the data; what problems remain in the data set?

1. **How well have the observations been checked?**

   The data of this dataset represent geochemical and mineralogical analyses of soil samples collected in support of the USGS Soil Geochemical Landscapes Project. A written protocol was established prior to the initiation of the field work as several crews from the U.S. Geological Survey, State geological surveys, and the Natural Resources Conservation Service (NRCS) were expected to be involved with the collection of samples. The protocol described the collection procedures and the design of the field sheet used to record the support data related to each sample site. The following attributes were considered and are included in the database:
   (1) Location coordinates: All crews were equipped with global positioning system (GPS) receivers set to determine geographic positions using the WGS-84 datum. Coordinates were recorded as decimal degrees of latitude and longitude in both the GPS units and the field sheets. Data included in the database are reported in this manner.
   (2) Geocoding: The protocol called for the submission of descriptive information (geocoding) related to the sampling site. Some fields were mandatory and others were optional; the completeness varies.
   (3) Soil horizons: The identification of soil horizons is a process involving the experience and expertise of the person(s) collecting the sample(s). The identification of precise boundaries between horizons is not always obvious.
   (4) Chemical analytical data: The samples in this dataset were chemically analyzed by a uniform and standardized set of techniques between 2008 and 2013. The use of standard reference materials, blanks, and duplicates analyzed along with the regular sample batches documented the quality (bias and precision) of the data.
   The precision of the values reported for chemical analytical data varies depending on the element, either 0, 1, or 2 decimal places. The number of decimal places is indicated as part of the description of the tables.
   (5) Qualifiers: Data in the chemical tables include the following qualifiers:
   < —The concentration of the element is reported as lower than the lower limit of determination for the particular method.
   <= —This qualifier is used in a few instances of organic carbon values. The organic carbon is reported as the difference between measured total carbon and the inorganic carbon content determined from the carbonate minerals. When there is no sample available for mineralogical analysis, the organic carbon is assumed to be less than or equal to the total measured carbon.
   INS —In a very few instances, the concentration of the element was not determined because there was insufficient sample available for an analytical method to be performed.
   (6) Mineralogical data: The samples were prepared and analyzed using the X-ray diffraction (XRD) method. Mineral species were determined for the major components of the sample fraction having crystalline structure and having been documented with a set of measured dimensions for the crystalline lattice. The addition of an internal standard consisting of 10% zincite (ZnO) with a purity of at least 99.5% allows for the

quantification of the crystalline fraction. The remaining fraction is reported as amorphous. All values for mineral phases are reported with a precision of one decimal place.
Undetected mineral phases are reported as "N.D."

2. **How accurate are the geographic locations?**
3. **How accurate are the heights or depths?**
4. **Where are the gaps in the data? What is missing?**

"N.S." indicates that a sample is not available because it was either lost in shipping or not collected.
This dataset provides chemical data for Ag, Al, As, Ba, Be, Bi, Total C, Inorganic C, Organic C, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Hg, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Sb, Sc, Se, Sn, Sr, Te, Th, Ti, Tl, U, V, W, Y, and Zn.
The dataset provides location and descriptive information for each sample. Not all the descriptive fields contain information for a particular sample either because it was not recorded by the field crew or because it was lost in shipping after collection.
The analytical methods used were selected based on the goals of the project and remained the same throughout the dataset. The methods used were available through the USGS contract laboratory.
This dataset provides mineralogical data for quartz, total potassium feldspar, total plagioclase, total feldspars, total 14Å clays, total 10Å clays, kaolinite, total clays, gibbsite, calcite, dolomite, aragonite, total carbonates, analcime, heulandite, total zeolites, gypsum, talc, hornblende, hematite, goethite, pyroxene, pyrite, other minerals, and the amorphous content.
The analytical methods, sample preparation protocols, and quality control protocols used for the analyses of these samples are described in this publication. The primary reference that documents the chemical analytical procedures used by the USGS is Taggart, J.E., Jr., ed., 2002, Analytical methods for geochemical analysis of geologic and other materials, U.S. Geological Survey: U.S. Geological Survey Open-File Report 02–223, available at <http://pubs.usgs.gov/of/2002/ofr-02-0223/OFR-02-0223.pdf >.

5. **How consistent are the relationships among the observations, including topology?**

The dataset was constructed by processing data collected in the field and recorded in the field sheets and from laboratory based chemical and mineralogical analyses. The following criteria were chosen for the reporting of the data:
- Each sample site has a unique identifier (SiteID).
- Each sample site has a set of geographic coordinates (latitude and longitude).
- Each sample collected in the field and analyzed for chemistry in the lab has a unique lab number.
- Each analytical determination is linked to a valid, unique lab number.

How can someone get a copy of the data set?

Are there legal restrictions on access or use of the data?
Access_Constraints: none
Use_Constraints:

Users are required to determine the suitability of use for any particular purpose.
Except for the site identification and the geographic coordinates, which are numeric fields, the mineralogic and chemical data fields are given as text to account for the inclusion of the non-numerical values N.S. (no sample available), N.D. (no detect or under the detection limit), INS (insufficient amount of sample to perform an analysis), and those values with the less than (<) or less than/equal to (<=) qualifiers.

1. **Who distributes the data set?** (Distributor 1 of 1)

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2. **What's the catalog number I need to order this data set?**

U.S. Geological Survey Data Series 801

3. **What legal disclaimers am I supposed to read?**

This database, identified as DS 801, has been approved for release and publication by the Director of the USGS. Although this database has been subjected to rigorous review and is substantially complete, the USGS reserves the right to revise the data pursuant to further analysis and review.
These data are released on the condition that neither the U.S. Geological Survey (USGS) nor the United States Government may be held liable for any damages resulting from authorized or unauthorized use. The USGS makes no warranties, either expressed or implied as to any other matter, whatsoever, including, without limitation, the condition of the product, or its fitness for any particular purpose. The burden for determining fitness for use lies entirely with the user.
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Although these data have been processed successfully on a computer system at the U.S. Geological Survey, no warranty expressed or implied is made regarding the display or utility of the data on any other system, or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. The U.S.

Geological Survey shall not be held liable for improper or incorrect use of the data described and/or contained herein.

4. **How can I download or order the data?**
   - **Availability in digital form:**

     Data format: geochemical and mineralogical sample locations and analyses in format Microsoft Excel (.xls), and text (.txt) files

     Network links: <http://pubs.usgs.gov/ds/801/>

   - **Cost to order the data:** none

Who wrote the metadata?

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Last modified:

Metadata author:

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Metadata standard:

FGDC Content Standards for Digital Geospatial Metadata (FGDC-STD-001-1998)

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