

LBA Regional Organic Soil Carbon and Nitrogen Data (Zinke et al.)

Description:

The data were obtained from soil surveys by Zinke (1965,1974,1976,1978,1979,and 1984) and soil survey literature. The main samples for laboratory analyses were collected at uniform soil increments and included bulk density determinations. Many samples reported in the literature did not have uniform soil increments or bulk density determinations. Only soil profiles that had been sampled either to a meter in depth or to actual depth were included in this data base from soil survey literature. In literature where bulk densities were absent, densities were estimated by regressions based on organic carbon content of the soil samples associated with the profile using 1800 soil profiles for which bulk densities were known.

The "lba_zinke_soil.csv" file contains a subset of the Worldwide Organic Soil Carbon and Nitrogen (Zinke et al.) data set. The subset is for Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) in South America.

Background Information

Site: Amazonia in South America
Westernmost Longitude: -85
Easternmost Longitude: 30
Northernmost Latitude: 10
Southernmost Latitude: -25

Subset extractions of this data were performed by Oak Ridge National Laboratory:

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Data File Information

This data set consists of 1 ASCII data file, "lba_zinke_soil.csv". Each row of the data file contains the soil profile number and location, carbon content (kg/m²), nitrogen content (g/m²), sample site latitude, latitude hemisphere (N/S), longitude, longitude hemisphere (E/W), elevation (meters), source of data, sample profile classification by Holdridge life zone, Olson ecosystem type, parent material. A sample of the data is shown below.

0059001 U115PN,53.3,898,8.1,N,81,W,100,27,\$,29,MISS
0059002 U117PN,50.9,1349,8.1,N,81,W,100,27,\$,29,MISS
0059003 U125PN,27.9,909,8.1,N,81,W,100,27,\$,29,MISS
0059004 U126PN,34.2,1035,8.1,N,81,W,100,27,\$,29,MISS
0059005 U127PN,36.4,1155,8.1,N,81,W,100,27,\$,29,MISS
0059006 U128PN,23,1076,8.1,N,81,W,100,27,\$,29,MISS
0059007 U129PN,19.6,689,8.1,N,81,W,100,27,\$,29,MISS
0059008 U130PN,22.7,1338,8.1,N,81,W,100,27,\$,29,MISS
0059009 U131PN,36,1096,8.1,N,81,W,100,27,\$,29,MISS
0059010 U132PN,32,1209,8.1,N,81,W,100,27,\$,29,MISS

Coded values:

Source of data -- See Zinke et al, 1986, Table E, Reference List

Holdridge life zone -- See "Table B" below

Olson ecosystem type -- See "Table C" below

Parent material -- See "Table D" below

MISS = missing value

Procedure Used to Create the South American Subset

The data were obtained from the ORNL-DAAC website.

The data file was modified to a .csv file that contained ID#, longitude decimal degrees, and latitude decimal degrees and imported into ArcInfo. A point coverage was then generated and added to a view in ArcView 3.1.

In addition to the point coverage, a polygon was created in ArcInfo using the guidelines for the LBA Study Area.

Bounding Coordinates: West : -85
East : 30
North: 10
South: -25

Once the points and the polygon were displayed, an ArcView shapefile containing only the points located inside the polygon was created.

Finally the matching attributes from the Worldwide Organic Soil Carbon and Nitrogen data were joined and a comma delimited file was created.

Legend & Additional Sources of Information

References:

Post, W.M., W.R. Emanuel, P.J. Zinke, and A.G. Stangenberger. 1982. Soil carbon pools and world life zones. *Nature*, 298:156-159.

Post, W.M., J. Pastor, P.J. Zinke, and A.G. Stangenberger. 1985. Global patterns of soil nitrogen storage. *Nature* 317:613-616.

Zinke, P.J., A.G. Stangenberger, W.M. Post, W.R. Emanuel, and J.S. Olson. 1986. Worldwide Organic Soil Carbon and Nitrogen Data, NDP-018 [<http://cdiac.esd.ornl.gov/ndps/ndp018.html>]. Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Zinke, P.J., A.G. Stangenberger, W.M. Post, W.R. Emanuel, and J.S. Olson. 1984. Worldwide organic soil carbon and nitrogen data. ORNL/TM-8857. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Coded Data Value Reference Tables from Zinke et al, 1986:

Table B. Key to Holdridge life zone codes

Life zone	Code	Life zone	Code
Dry tundra	1	Warm temperate wet forest	L
Moist tundra	2	Warm temperate rain forest	M
Wet tundra	3	Subtropical desert	N
Rain tundra	4	Subtropical desert bush	O
Boreal desert	5	Subtropical thorn woodland	P
Boreal dry bush	6	Subtropical dry forest	Q
Boreal moist forest	7	Subtropical moist forest	R
Boreal wet forest	8	Subtropical wet forest	S
Boreal rain forest	9	Subtropical rain forest	T
Cool temperate desert	A	Tropical desert	U
Cool temperate desert bush	B	Tropical desert bush	W
Cool temperate steppe	C	Tropical thorn woodland	W
Cool temperate moist forest	D	Tropical very dry forest	Y
Cool temperate wet forest	E	Tropical dry forest	Z
Cool temperate rain forest	F	Tropical moist forest	\$
Warm temperate desert	G	Tropical wet forest	#
Warm temperate desert bush	H	Tropical Rain Forest	*
Warm temperate thorn steppe	I	Disturbed/agricultural	Blank
Warm temperate dry forest	J	Unclassified	?
Warm temperate moist forest	K		

Table C. Key to ecosystem codes

Ecosystem	Code	Ecosystem	Code
Main taiga	20	Marsh, swampwoods and littoral	45
Main taiga	21	Mediterranean scrub/wood/savanna	46
Cool conifer forest	22	Sparse woodland or shrubland	47
Cool hardwoods-conifer mixed woods	23	Warm semiarid woodlands	48
Warm broad-leaved conifer mixed woods	24	Low scrub	49
Cool deciduous forest	25	Sand/scrub/herbs or bare desert	50
Warm broad-leaved forest	26	Hot subdesert/desert shrubland	51
Warm conifer forest	27	Cool/cold semidesert/desert shrubland	52
Tropical/subtropical broad-leaved humid forest	29	Tundra	53
Cool farms or grass/scrub	30	Cool farms, grass/scrub with woods	55
Warm farm or grass/scrub	31	Warm forest/farm complex	56
Seasonally dry tropical woodland	32	Cool forest/farm complex	57
Paddylands and associated woods	36	Warm farm, grass, or scrub with woods	58
Cool grassland	40	Tropical thorn/succulent woods	59
Miscellaneous grassland	41	Midcontinental southern taiga	60
Cold rangelands	42	Northern or maritime taiga/subalpine	62
Tropical savanna and woodland	43	Wooded tundra	63
Bogs and bog woods	44	Heath, moorland	64

Table D. Coding for parent rocks

Code	Rock	Code	Rock
0XX	ACID INTRUSIVE	6XX	METAMORPHIC ROCKS
00X	Granites	60X	Hornfelses
01X	Syenites	61X	Slates and phyllites
02X	Nepheline syenites	62X	Schists
03X	Monzonites	63X	Amphibolites
04X	Diorites	64X	Gneisses
05X	Quartz diorites	65X	Granulites
1XX	BASIC INTRUSIVE	66X	Cataclastic, mylonites, and phyllonites
10X	Gabbros	67X	Marble
11X	Alkali gabbros	68X	Quartzite
12X	Basic feldspathoids	69X	Autometamorphic
2XX	ULTRABASIC	7XX	SEDIMENTARY ROCKS (weakly consolidated—terraces, river sediments, dunes, etc.)
20X	Peridotites	70X	Sandstone materials
21X	Serpentine	71X	Argillaceous materials
3XX	ACID EXTRUSIVE	72X	Calcareous materials
30X	Rhyolites	73X	Siliceous materials
31X	Trachytes	74X	
32X	Phonolites	75X	
33X	Latites	76X	
34X	Dacites	8XX	ORGANIC MATERIAL
35X	Andesites	0XX	ACID INTRUSIVE
4XX	BASIC EXTRUSIVE	00X	<i>Granite</i>
40X	Basalt	000	Alaskite
41X	Tephrites	001	Graphic granite
42X	Basaltic nephelinites	002	Alkali granite
43X	Limburgites	003	Charnockite
5XX	SEDIMENTARY ROCKS (consolidated)	004	Luxullianite
50X	Sandstones	005	Granite porphyry
51X	Argillaceous rocks	006	Aplite
52X	Calcareous rocks	007	Granite pegmatite
53X	Siliceous rocks	008	
54X	Iron rich sediments	009	
55X	Phosphatic sediments		
56X	Anhydrites and gypsum		
57X	Conglomerate (consolidated clastic)		
58X	Mixed conglomerate (consolidated)		
59X	Unconsolidated materials		

Table D (continued)

Code	Rock	Code	Rock
01X	<i>Syenite</i>	05X	<i>Quartz diorites</i>
010	Quartz syenite	050	Quartz diorite (tonalite)
011	Alkali syenite	051	Quartz diorite porphyry
012	Pulaskite	052	Quartz diorite aplite
013	Nordmarkite	053	Quartz diorite pegmatite
014	Larvikite	054	
015	Shonkinite	055	
016	Syenite porphyry	056	
017	Syenite aplite	057	
018	Syenite pegmatite	058	
019		059	
02X	<i>Nepheline Syenite</i>	1XX	BASIC INTRUSIVE
020	Leucite syenite	10X	<i>Gabbros</i>
021	Sodalite syenite	100	Gabbro-clinopyroxene
022	Foyaite	101	Norite
023	Malignite	102	Olivine gabbro
024	Ditroite	103	Troctolite
025	Nepheline syenite porphyry	104	Anorthite
026	Nepheline aplite	105	Quartz gabbro
027	Nepheline pegmatite	106	Gabbro porphyry
028		107	Gabbro aplite
029		108	Gabbro pegmatite
03X	<i>Monzonites</i>	109	Diabase
030	Quartz monzonite	11X	<i>Alkali gabbros</i>
031	Quartz monzonite porphyry	110	Theralite
032	Quartz monzonite aplite	111	Essexite
033	Quartz monzonite pegmatite	112	Teschenite
034	Monzonite	113	Olivine theralite
035	Monzonite prophyry	114	Theralite porphyry
036	Monzonite aplite	115	
037	Monzonite pegmatite	116	
038	Nepheline monzonite	117	
-39	Nepheline monzonite porphyry	118	
04X	<i>Diorites</i>	12X	<i>Basic feldspathoids</i>
040	Grandiorite	120	Missourite
041	Grandiorite porphyry	121	Ijolite
042	Grandiorite aplite	122	Fergusite
043	Grandiorite pegmatite	123	Meliliteia
044	Diorite	124	
045	Diorite porphyry	125	
046	Diorite aplite	126	
047	Diorite pegmatite	127	
048	Trondhjemite	128	
049		129	

Table D (continued)

Code	Rock	Code	Rock
2XX	ULTRABASIC	32X	<i>Phonolites</i>
20X	<i>Peridotites</i>	320	Phonolite
200	Peridotite-pyroxene and olivine	321	Phonolite porphyry
201	Harzburgite	322	Leucite phonolite
202	Picrite	323	Tinguaite
203	Dunite	324	Wyomingite
204	Pyroxenite	325	Generalized volcanic
205	Hornblendite	326	Pumice
206	Peridotite porphyry	327	
207	Kimberlite	328	
		329	
21X	<i>Serpentinite</i>	33X	<i>Lattites</i>
210	Serpentine (pure mineral)	330	Quartz latite
211	Serpentine schist	331	Quartz latite porphyry
212	Serpentine talc	332	Latite
213		333	Latite porphyry
214		334	Nepheline latite
215		335	Nepheline latite prophyry
216		336	
217		337	
218		338	
219		339	
3XX	ACID EXTRUSIVE	34X	<i>Dacites</i>
30X	<i>Rhyolitesn</i>	340	Dacite
300	Rhyolite	341	Dacite porphyry
301	Rhyolite porphyry	342	Dacite obsidian
302	Rhyolite obsidian	343	Dacite pitchstone
303	Rhyolite pitchstone	344	Dacite vitrophyre
304	Rhyolite pumice	345	Dacite perlite
305	Rhyolite perlite	346	Dacite pumice
306	Rhyolite scoria	347	Dacite scoria
307	Rhyolite vitrophyre	348	Dacite tuff
308	Rhyolite tuff	349	Dacite tuff-breccia
309	Tuff-breccia		
31X	<i>Trachytes</i>	35X	<i>Andesites</i>
310	Trachyte	350	Andesite
311	Trachyte porphyry	351	Andesite porphyry
312	Trachyte obsidian	352	Andesite obsidian
313	Trachyte pitchstone	353	Andesite pitchstone
314	Trachyte pumice	354	Andesite vitrophyre
315	Trachyte perlite	355	Andesite perlite
316	Trachyte scoria	356	Andesite pumice
317	Trachyte vitrophyre	357	Andesite scoria
318	Trachyte tuff	358	Andesite tuff
319	Trachyte tuff-breccia	359	Andesite tuff-breccia

Table D (continued)

Code	Rock	Code	Rock
4XX	BASIC EXTRUSIVE	5XX	SEDIMENTARY ROCKS (consolidated)
40X	<i>Basalts</i>	50X	Sandstone
400	Basalt	500	Wackes and graywackes
401	Basalt porphyry	501	Lithic wackes and graywackes
402	Olivine basalt	502	Lithic arenite
403	Analcite basalt	503	Arkosic sandstone
404	Quartz basalt	504	Feldspathic sandstone
405	Oceanite	505	Quartz arenites
406	Basalt scoria	506	
407	Basalt glass (tachylite)	507	
408	Basalt tuff	508	
409	Basalt tuff-breccia	509	
41X	<i>Tephrites</i>	51X	<i>Argillaceous rocks</i>
410	Tephrite	510	Shale
411	Tephrite porphyry	511	Silty shale
412	Leucite tephrite	512	Clay shale
413	Basanite	513	Black pyritic shale
414	Leucite basanite	514	Red shale
415		515	Glauconitic shale
416		516	Siltstone
417		517	Claystone
418		518	Clay minerals
419		519	
42X	<i>Basaltic nephelinites</i>	52X	<i>Calcareous rock</i>
420	Nephelinite	520	Limestone
421	Leucitite	521	Organic limestone
422	Nepheline basalts	522	Clastic limestone
423	Leucite basalt	523	Aphaitic limestone
424	Melilitite	524	Dolomitic limestone
425		525	Dolomite
426		526	Autigenic silicates in organic limestone
427			
428		527	
429		528	
		529	
43X	<i>Limburgites</i>	53X	<i>Siliceous sediments</i>
430	Limburgite	530	Siliceous shale
431	Limburgite porphyry	531	Opal and chacedony
432		532	Chert
433		533	Porcellanite
434		534	Diatomite
435		535	Spiculites
436		536	
437		537	
438		538	
439		539	

Table D (continued)

Code	Rock	Code	Rock
54X	<i>Iron-rich sediments</i>	58X	<i>Mixed conglomerates</i>
540	Ironstones		(consolidated)
541	Glauconitic rocks	580	Mixed pebble conglomerate
542	Sideritic and chamositic ironstones	581	Mixed cobble conglomerate
543	Hematitic ironstones	582	Argillaceous mixed conglomerate
544	Pyritic strata	583	Glacial till
545		584	Tillite (indurated till)
546		585	Fanglomerate
547		586	Siliceous mixed conglomerate
548		587	Clacareous mixed conglomerate
549		588	Ferruginous (limonite or hematitic) mixed conglomerate
		589	Carbonaceous mixed conglomerate
55X	<i>Phosphatic sediments (phosphorites)</i>	59X	<i>Unconsolidated materials</i>
550	Collophane		(recent gravels, cobbles, sand, and silt; usually river bottoms, dunes, etc.)
551		590	Gravels
552		591	Cobbles
553		592	Gravels and cobbles
554		593	Gravels, cobbles, and sand mixtures
555		594	Gravels, cobbles, sand, and silt mixtures
556		595	Sand
557		596	Sand and silt
558		597	Sand, silt, and clay
559		598	Saliceous derived alluvial silt
56X	<i>Andydrate and gypsum</i>	599	
560		6XX	METAMORPHIC ROCK
561		60X	<i>Hornfelses</i>
562		600	Pelitic hornfelses
563		601	Quartzo-feldspathic hornfelses
564		602	Contact marbles
565		603	Calc-silicate marbles and sparns
566		604	Basic hornfelses
567		605	Magnesian hornfelses
568		606	
569		607	
		608	
		609	
57X	<i>Homogeneous conglomerates (consolidated clastics)</i>		
570	Conglomerate		
571	Quartz pebble conglomerate		
572	Chert cobble conglomerate		
573	Argillaceous conglomerate		
574	Siliceous conglomerate		
575	Calcareous conglomerate		
576	Ferruginous (limonite or hematitic) conglomerate		
577	Carbonaceous conglomerate		
578	Phosphatic conglomerate		
579			

Table D (continued)

Code	Rock	Code	Rock
61X	<i>Slates and phyllites</i>	65X	<i>Granulites and eclogites</i>
610	Slate	650	Pyroxene granulite
611	Spotted slate	651	Olivinite
612	Phyllite	652	Eclogite
613		653	
614		654	
615		655	
616		656	
617		657	
618		658	
619		659	
62X	<i>Schists</i>	66X	<i>Cataclasites, mylonites, and phyllonites</i>
620	Mica schist and quartz-albite schist	660	Mylonites
621	Calc-schist (low grade)	661	Cataclasites
622	Greenschist	662	Phyllonites
623	Magnesian schist	663	Fault gouge; shear zone materials
624	Glaucophane schist	664	
625	Pelitic schist	665	
626	Quartzo-feldspathic schist	666	
627	Calc-schists (high grade)	667	
628	Foliated marble	668	
629	Chlorite schist	669	
63X	<i>Amphibolites (hornflende schist)</i>	67X	<i>Marbles</i>
630	Epidote amphibolite	670	Brucite
631	Garnet-pyroxene amphibolite	671	
632		672	
633		673	
634		674	
635		675	
636		676	
637		677	
638		678	
639		679	
64X	<i>Gneisses</i>	68X	<i>Quartzites</i>
640	Granite gneiss	680	Orthoquartzite
641	Mica gneiss	681	
642		682	
643		683	
644		684	
645		685	
646		686	
647		687	
648		688	
649		689	

Table D (continued)

Code	Rock	Code	Rock
69X	<i>Autometamorphism</i> (list of processes forming secondary minerals by hydrothermal alteration and other metamorphic processes)	73X	<i>Siliceous material</i>
		730	
		731	
		732	
		733	
690	Propylization	734	
691	Uralitization	735	
692	Chlorization		
693	Silification	74X	<i>Conglomerate</i> (homogeneous)
694	Saussurization	740	
695	Kaolinization of granites	741	
696	Greenstone	742	
697		743	
698		744	
699		745	
7XX	SEDIMENTARY ROCKS (weakly consolidated—terraces, dunes, etc.)	75X	<i>Conglomerate</i> (mixed)
		750	
		751	
		752	
70X	<i>Sandstone materials</i>	753	
701		754	
702		755	
703			
704		76X	<i>Air-deposited sediment</i>
705		761	Loess
		762	Volcanic ash
71X	<i>Argillaceous material</i>	763	Volcanic ash over loess
710		764	Micaceous loess
711		765	Calcareous loess
712		766	Sand dunes
713			
714			
715			
72X	<i>Calcareous material</i>		
720	Marl		
721			
722			
723			
724			
725			