

# 2006 Soils Planner



18TH WORLD CONGRESS OF SOIL SCIENCE

# History of Soil Science

Soil science is a relatively young science. It has borrowed tools and techniques from the fundamental sciences (chemistry, biology, physics, and mathematics) and the applied sciences (geo-statistics, agriculture, earth sciences, and forest sciences) and these have been applied to agricultural and environmental problems. In less than a century, soil science has become a true science in its own right, with its own set of tools and techniques.

The establishment of the International Society of Soil Science was a key element in blending the knowledge of many related disciplines into the field of Soil Science. The International Society of Soil Science (ISSS) was founded in 1924 after 15 years of discussion and planning and 4 international conferences that explored the idea of a specialized science. The purpose of the International Society of Soil Science was to provide a forum worldwide to establish standardized methods of soil analysis and soil classification. In order to foster all branches of soil science and its applications, the society has organized World Soil Congresses and conferences dealing with special problems associated with soil science. Since 1927, the ISSS has organized 17 World Soil Congresses, each bringing together soil scientists from all over the globe. An important benefit of the World Soil Congresses is that it provides an opportunity for soil scientists to meet, establish contact and exchange ideas. The 18th World Soil Congress is in Philadelphia, Pennsylvania, U.S.A., July 9-15, 2006, and will have the theme Frontiers of Soil Science: Technology and the Information Age.

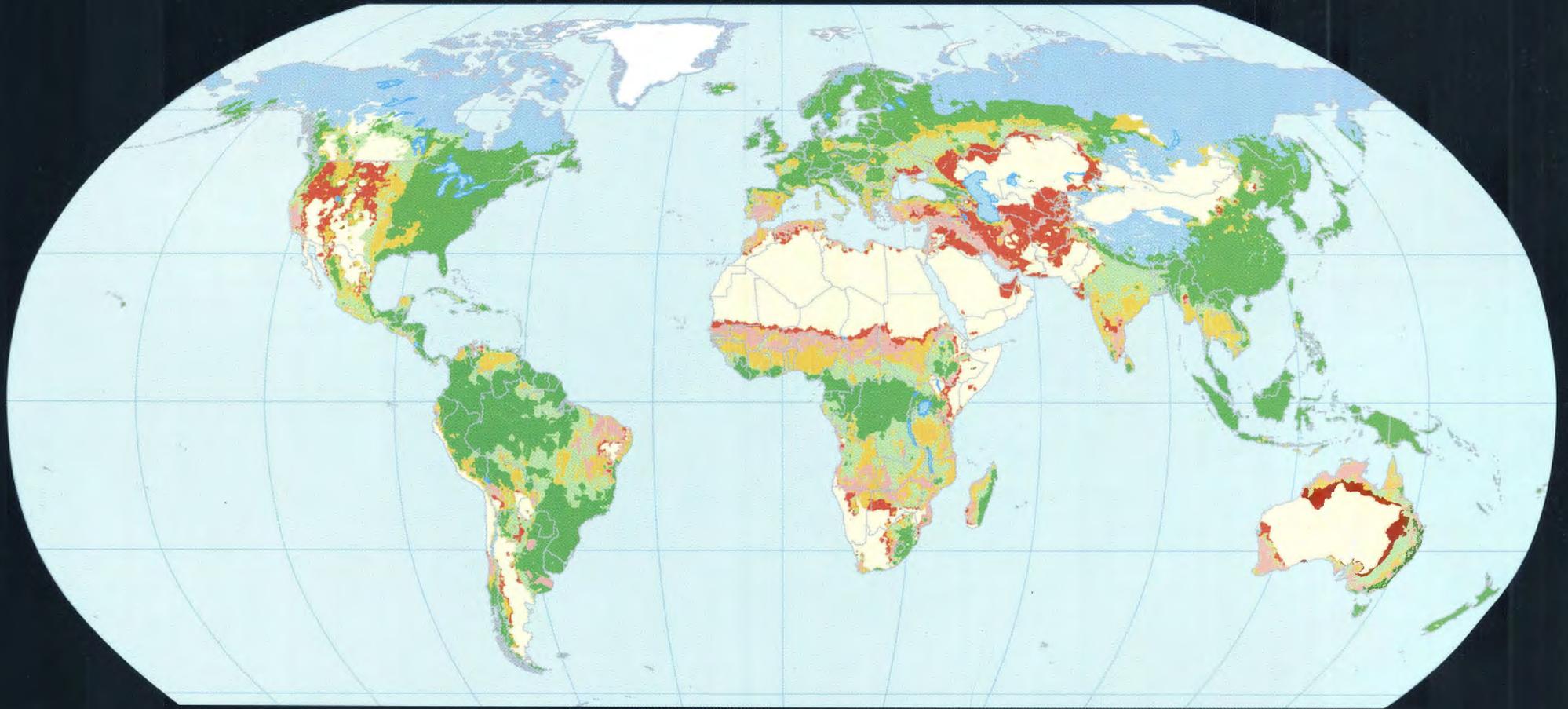
The purpose of a World Soil Congress is to handle the business of the ISSS and make certain the advancement of soil science and its uses. Since 1950 such congresses have been held every 4 years. Of the 17 congresses, eight have been held in Europe, four in the Americas, three in Asia, one in Australia, and one in Africa. The first World Soil Congress was in Washington, D.C., in 1927 and the last World Soil Congress held in the USA was in Madison, Wisconsin, in 1960. In the past 80 years, nearly 10,000 papers have been presented at the World Soil

Congresses. Major ideas that are now building blocks of soil science were first introduced at World Soil Congresses to be discussed among peers internationally. The first conferences recommended building uniform methods of soil analysis and soil classification, organizing of soil research in all countries worldwide, and introducing the study of soils into high school and college curricula. The 1956 World Soil Congress (Paris, France) discussed ideas to build a world soil map and explore worldwide soil classification systems. In 1960 in Madison, WI, the U.S. soil taxonomy system (7th Approximation) was launched worldwide.

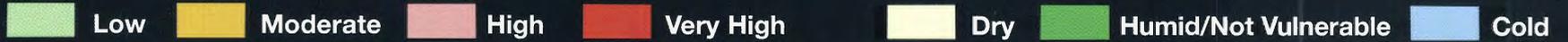
The maps that you see in this 2006 Planner are a representation of a mature soil taxonomy system, the product of 25 years of worldwide collaboration by the World Soil Resources, Soil Survey Division, Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture (USDA). These maps show the worldwide distribution of soils classified into the 12 Soil Orders of U.S. Soil Taxonomy. The maps have an attribute database that has been used to evaluate the potential for land degradation and broad land use applications to combat desertification.

Today, soil scientists and land managers are challenged with blending an overwhelming amount of scientific information concerning soils, hydrology, ecology, and management applications to ensure a quality environment and productive landscape. Helping people to understand soils and their importance in land management and conservation is an important goal for the USDA Natural Resources Conservation Service (NRCS). Communities and local governments work with NRCS State Offices and local USDA Service Centers to help them protect their natural resources. To find out more about the soil in your State, county, or local community, look to the National Cooperative Soil Survey web site at <http://soils.usda.gov/> and click on the Web Soil Survey. For more information about natural resources and conservation in your own backyard, contact the NRCS at <http://www.nrcs.usda.gov> or volunteer locally by calling 1-888-LANDCARE.

# World Soil Desertification Vulnerability



## Vulnerability Classes



Areas not considered by the United Nations Convention to Combat Desertification

*2006 - International Year of Deserts and Desertification*

# Introduction

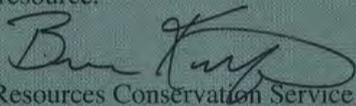
At the 16th World Congress of Soil Science in Bangkok, Thailand, in 2002, the U.S. delegation offered to host the 18th World Congress of Soil Science in 2006. The Natural Resources Conservation Service (NRCS), through its partnership within the U.S. National Cooperative Soil Survey, the U.S. National Committee for Soil Science, and the Soil Science Society of America, has worked with soil scientists all over the U.S. and the world to help plan this scientific meeting.

The World Soil Congress, to be held July 9-15, 2006, in Philadelphia, Pennsylvania, will have the theme *Frontiers of Soil Science: Technology and the Information Age*. NRCS is particularly excited about this theme, since we are launching the U.S. Web Soil Survey to the public Internet and looking forward to sharing it with the global soil science community at this 18th World Soil Congress in Philadelphia. The Web Soil Survey at <http://soils.usda.gov/survey> will be updated and maintained online as the single authoritative source of soil survey information for the United States. Currently, NRCS has soils maps and data available online for more than 95 percent of the Nation's counties and anticipates having 100 percent in the near future.

As a landowner and farmer, I never bought a piece of land unless I consulted a soil survey map. This simple but critical step is often the difference between profit and loss when it comes to land use and conservation activities. I am very pleased to deliver Internet access to the public.

At the Natural Resources Conservation Service, we seek to help farmers and ranchers protect the soil and water on private land for public benefit. Over the past 70 years, our programs have expanded and changed, but our mission will always remain the same: to provide leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment. This Soil Planner for 2006 highlights the U.S. soil survey community working throughout the world to help people understand soils and help people help the land. We encourage everyone to get involved in sustaining the earth and our productive soil resource.

Bruce I. Knight  
Chief, Natural Resources Conservation Service



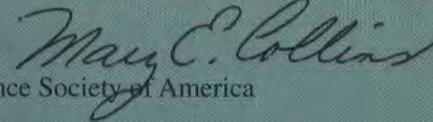
It is indeed an honor for the United States to host the 2006 World Congress of Soil Science! The Soil Science Society of America (SSSA) is delighted to be a key participant in the events of the Congress. This is a cooperative venture with the International Union of Soil Science, the National Academy of Sciences' National Committee for Soil Science, and the USDA's Natural Resources Conservation Service. It has been more than 45 years since the Congress was held in the USA. During those four decades many scientific advancements have been made, including remote sensing techniques, geographic information systems, development of supercomputers and software, DNA sequencing, nanoscale analytical procedures, and the concept of precision agriculture. The United States has always been a nation of people from the four corners of the world. As the population of the world and soil science become more global, we have to understand, cooperate, and network with other cultures, philosophies, and beliefs. Thus, the World Congress is an extension of our role in globalization.

To paraphrase, "the mission of SSSA is to enhance the sustainability of soils, the environment, and society ...for the wise stewardship of soil and natural resources, and to advance the discovery, practice, and profession of soil science through excellence ...to address challenges facing society...." This mission statement is universal. SSSA is an international society with approximately 20 percent of our members coming from 84 countries. Our global members have been an integral part of our society and our science.

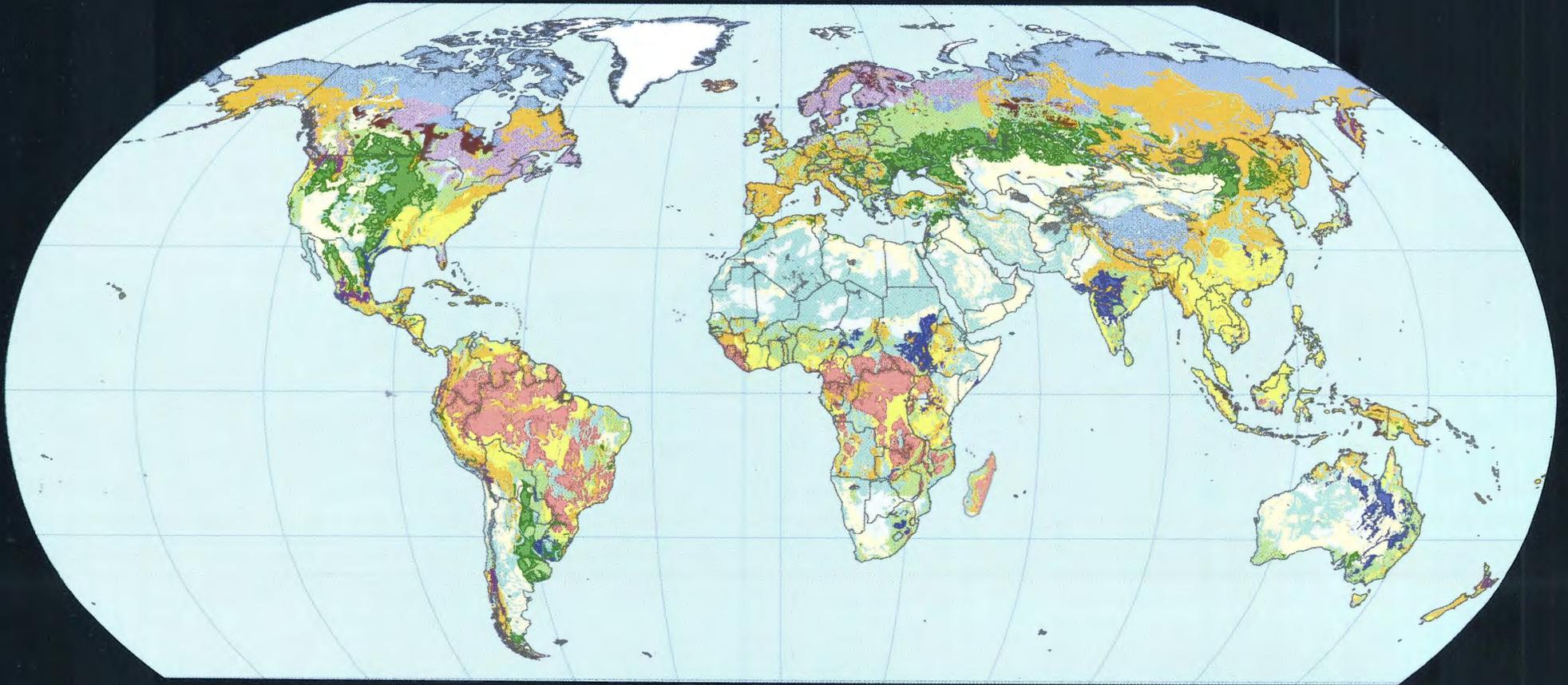
The World Congress is being held in Philadelphia, the "City of Brotherly Love." It was the home of Benjamin Franklin, one of the best known Colonial Philadelphians. His career included being an inventor, writer, researcher, and finally, a diplomat. Benjamin Franklin stated that "Well done is better than well said." We hope that is your lasting impression of the 18th World Congress of Soils (<http://www.18wcss.org>).

We hope you enjoy the 2006 Soil Planner, and please attend the World Congress of Soil Science in July. See you in Philadelphia!

Mary E. Collins  
President, Soil Science Society of America



# Global Soil Regions



## Soil Orders

 Alfisols	 Entisols	 Inceptisols	 Spodosols	 Rocky Land
 Andisols	 Gelisols	 Mollisols	 Ultisols	 Shifting Sand
 Aridisols	 Histosols	 Oxisols	 Vertisols	 Ice/Glacier

# Alfisols

India

Most Alfisols were or are forested, with moderate to high base saturation. Typically they have a light-colored surface layer over a horizon of silicate clay accumulation (argillic). The cooler Alfisols tend to form a belt between the grassland Mollisols and the Spodosols of the more humid climates.

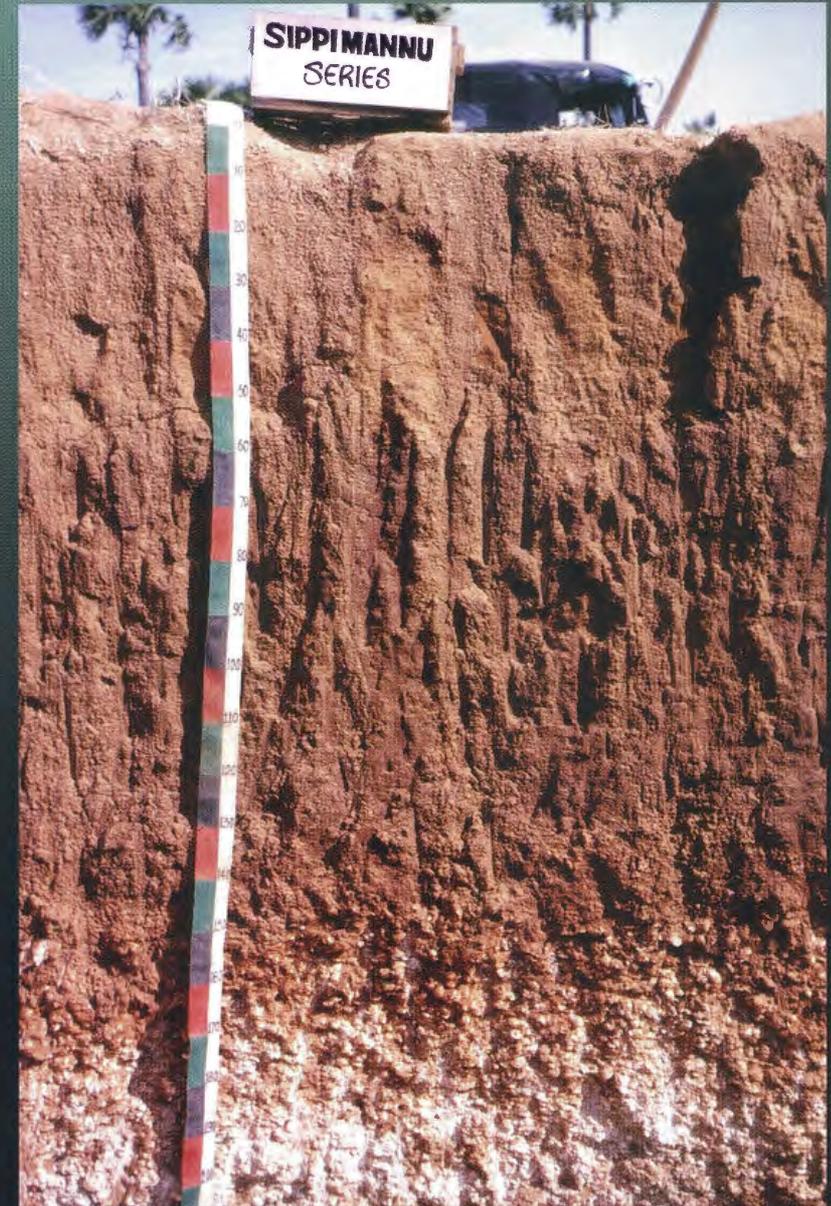
Where temperatures are warmer they form a belt between the Aridisols and the older Ultisols and Oxisols. Along with Mollisols, Alfisols account for a major portion of soils that are used to grow crops in the world.

## Taxonomic Class

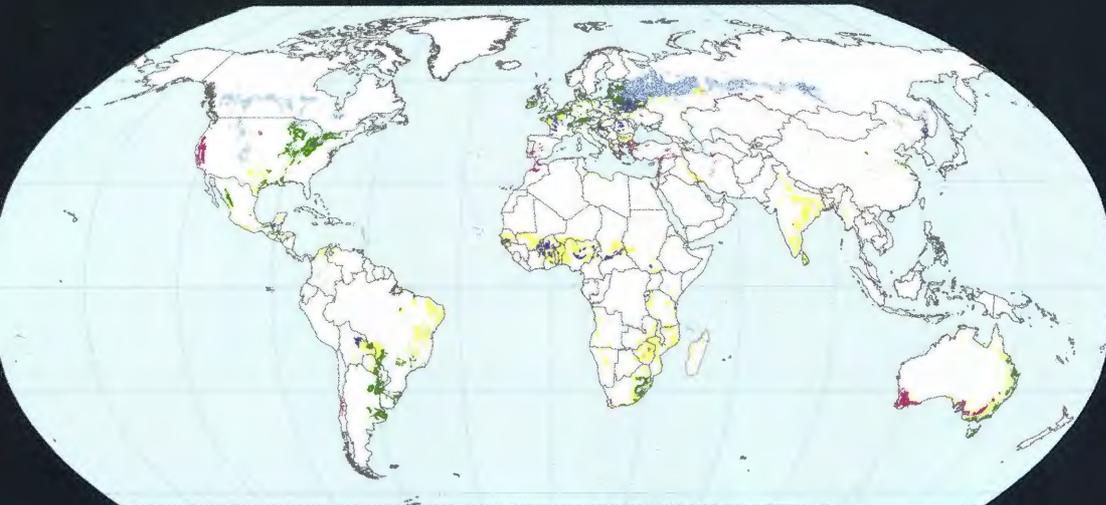
Ustalfs

## Alfisols % of global

Aqualfs	0.6%
Cryalfs	1.9%
Ustalfs	4.3%
Xeralfs	0.7%
Udalfs	2.1%



## Alfisols Soil Regions



Aqualfs

Cryalfs

Ustalfs

Xeralfs

Udalfs

# JANUARY 2006

December						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

February						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 <b>NEW YEAR'S DAY</b> <i>(Observed)</i>	3	4	5	6	7
8	9	10	11	12	13	14
15	16 <b>MARTIN LUTHER KING, Jr.'s BIRTHDAY</b> <i>(Observed)</i>	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



## EVENTS

**Jan. 8-12** Ecology in an Era of Globalization: Challenges and Opportunities for Environmental Scientists in the Americas, Merida, Yucatan, Mexico; [www.esa.org/mexico](http://www.esa.org/mexico) or [mexico@esa.org](mailto:mexico@esa.org).

**Jan. 22-27** 14th World Fertilizer Congress, Thailand

*Right: On May 3, 1899, with an appropriation of \$16,000 Dr. Whitney began field operations. In four separate soil surveys about 720,000 acres were mapped that first year. Cecil County, Maryland, and Connecticut Valley, Connecticut, concentrated on tobacco lands.*



# Andisols

Japan

Soils formed on volcanic ash and cinders and having andic properties are distributed along the circum-Pacific belts and occur sporadically elsewhere. The Andisols have mineralogical composition ranging from volcanic glass, short-range order minerals such as allophane and imogolite, and variable amounts of halloysite. This mineralogical association gives unique properties to such soils including a high phosphate-fixing capacity, low cation retention, and a high water-holding capacity. Many of these soils are found on volcanic slopes or are developed through the weathering of plateau basalts.

**Taxonomic Class**  
Udands

**Andisols % of global**

Cryands	0.2%
Torrands	<0.01%
Xerands	0.02%
Vitrands	0.2%
Ustands	0.05%
Udands	0.2%
Gelands	0.05%



**Distribution of Andisols**



# FEBRUARY 2006

January

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

March

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20 WASHINGTON'S BIRTHDAY <i>(Observed)</i>	21	22	23	24	25
26	27	28				



## EVENTS

**Feb. 2-3** ASTM International Symposium on Perchlorate Exposures from Food and the Environment; keith.hoddinott@apg.amedd.army.mil.

**February 16-18** American Indian Science and Engineering Society, AISES Spring Leadership Conference, Albuquerque, NM, USA



*In 1879, V.V. Dokuchaev (right) presented a conceptual framework for soil classification that has served as the basis for modern soil classification systems.*

# Aridisols

Texas

Aridisols, as their name implies, are soils that do not have water available to mesophytic plants for long periods. During most of the time when the soil is warm enough for plants to grow, soil water is held at potentials less than permanent wilting point or it is salty, or both. There is no period of 90 consecutive days when moisture is continuously available for plant growth. In areas bordering deserts, the absolute precipitation may be high but due to runoff or a very low storage capacity of the soil or both, the actual soil moisture regime is aridic.

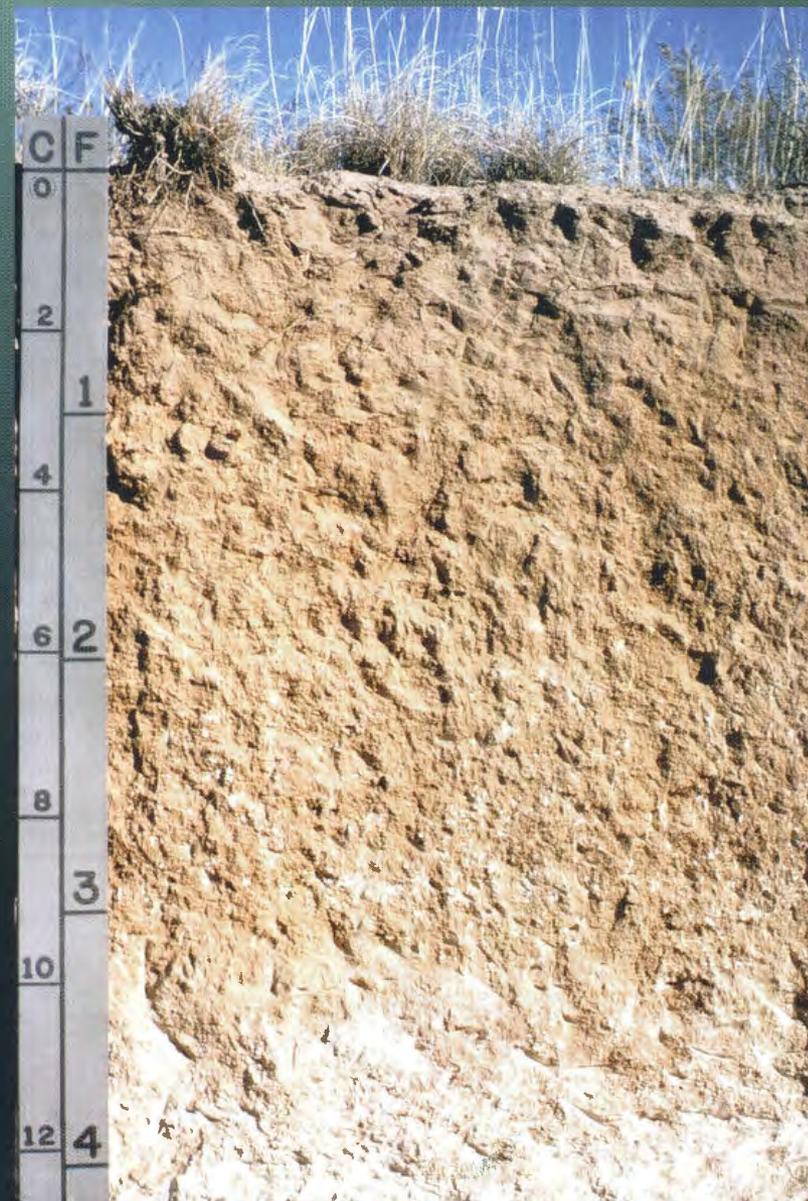
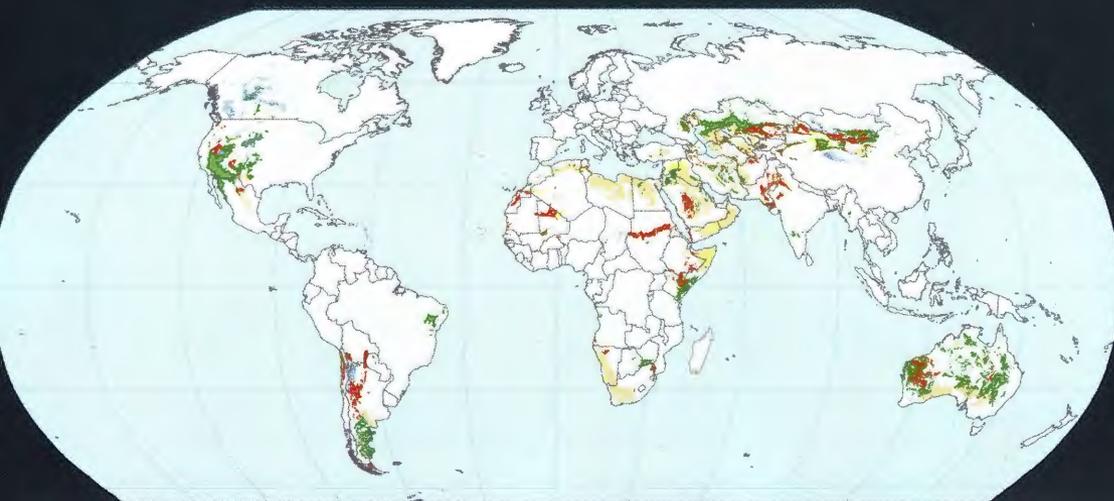
## Taxonomic Class

Cambids

## Aridisols % of global

Cryids	0.8%
Salids	0.6%
Durids	<0.01%
Gypsisds	0.5%
Argids	4.1%
Calcids	2.2%
Cambids	11.9%

## Aridisols Soil Regions



# MARCH 2006

February

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

April

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
<sup>23</sup> / <sub>30</sub>	24	25	26	27	28	29

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	



## EVENTS

**March 23-25**  
National American  
Indian Science &  
Engineering Fair  
(NAISEF),  
Albuquerque, NM,  
USA; Albuquerque  
Convention Center

**March 31-April 2**  
National Society  
for Minorities in  
Agriculture,  
Natural Resources  
and Related  
Sciences (MANRRS),  
St. Louis, MO, USA

*In 1909, Dr. Milton Whitney (right) participated in the First International Conference of Agroecology, which was a precursor to the World Soil Congress.*



# Entisols

Germany

The Entisols have little or no evidence of soil formation. They are most extensive on sub-recent alluvial plains and valleys or on steep slopes where erosion is rapid. The rate of soil formation is reduced for several reasons. Generally, time has not elapsed since deposition of the material for soil-forming processes to act. In some of these soils, peraquic conditions prevail where the soil is saturated with water during the whole year. The soil is permanently reduced, preventing cambic horizon formation. On steep slopes, rapid erosion results in shallow soils where weathered parent materials rest on hard rock.

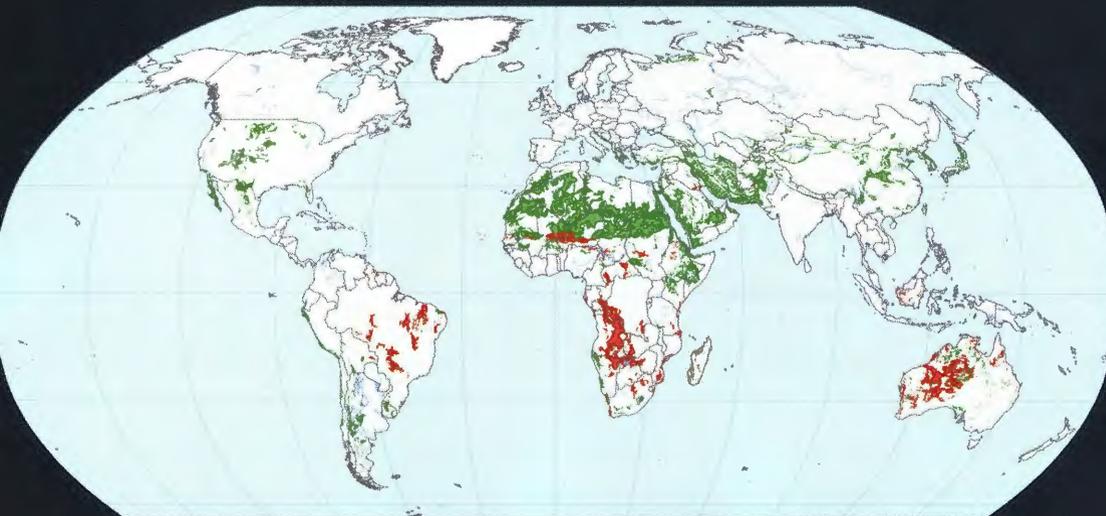
## Taxonomic Class Fluents

### Entisols % of global

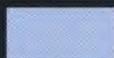
Aquents	0.1%
Psamments	3.4%
Fluents	2.3%
Orthents	10.6%



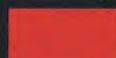
## Entisols Soil Regions



Aquents



Fluents



Psamments



Orthents

# APRIL 2006

March

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

May

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
<sup>23</sup> /30	24	25	26	27	28	29



## EVENTS

**April 6-9**  
National Science  
Teachers Association,  
NSTA National  
Convention,  
Anaheim, CA, USA

**April 8-12**  
Conference on  
Hydrology and  
Management of  
Forested Wetlands,  
New Bern, NC, USA



*Right: In 1927 the first World Congress of Soil Science was held in the U.S.. This involved a tour across the U.S. and Canada by train and cars. Many ideas were shared and the basis of the classification system of 1935 was developed during this congress.*

# Gelisols

Alaska

In areas where the mean annual soil temperature is less than 0°C, the soils are frozen for long periods of the year and thaw out during the short warmer spells. The freezing and thawing processes promote physical changes in the soil. If there is sufficient water and the warm period is long enough, vegetation establishes and organic matter accumulates on the soil. Organic-rich soils or peat develop. Due to low temperatures, these Arctic soils have unique features such as ice-lenses or a layer of ice may underlie the soil. Gelisols cover 9% of the ice-free land and support 0.5% of the world's population.

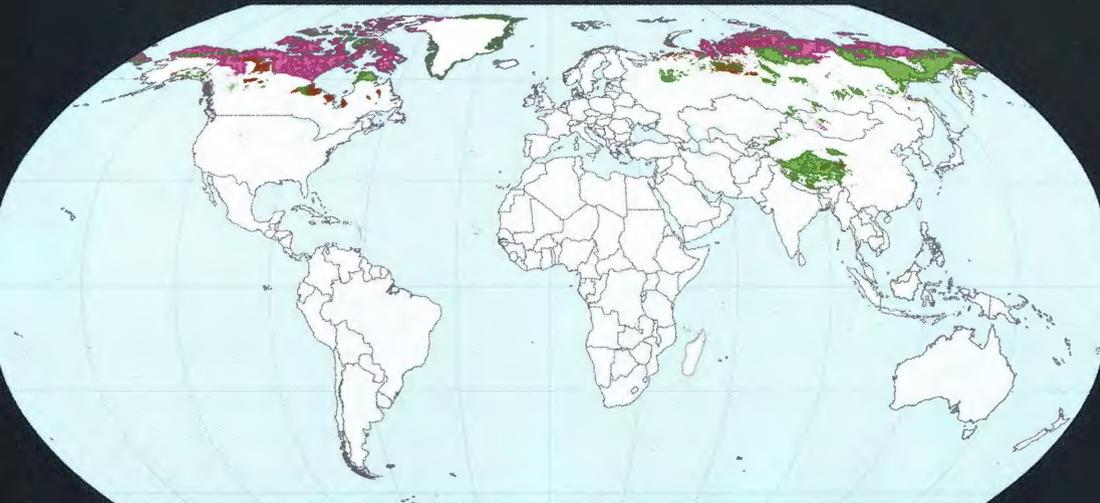
**Taxonomic Class**  
Orthels

**Gelisols % of global**

Histels	0.8%
Turbels	3.9%
Orthels	4.4%



**Gelisols Soil Regions**



Histels



Turbels



Orthels

# MAY 2006

April

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

June

S	M	T	W	T	F	S
					1	2 3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

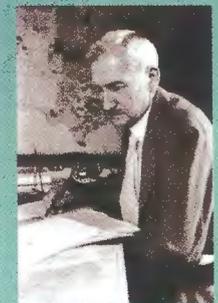
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29 MEMORIAL DAY	30	31			



## EVENTS

**May 22-26** North-east Region National Cooperative Soil Survey Conference, Bordentown, NJ, USA

**May 22-24** American Institute of Biological Sciences Annual Meeting, Washington, DC, USA; [www.aibs.org/annual-meeting](http://www.aibs.org/annual-meeting).



*Dr. Curtis F. Marbut (right), director of the Division of Soil Survey from 1911 to 1934, presented the outline of U.S. Soil Classification System at the First World Soil Congress in Washington, D.C.*

# Histosols

Florida

Most soil classifications including Soil Taxonomy separate mineral soils from organic soils. Histosols are soils that consist of dominantly organic soil materials. They develop where the rates of organic matter accumulation exceed decomposition and removal. Most of these soils formed under saturated conditions where the soil was saturated or nearly saturated with water most of the year. These soils have been referred to as bogs, moors, peat, or mucks. To be farmed, most Histosols must be drained. Management of the water table depth is critical to their use. When drained, Histosols oxidize and subside, and require further drainage.

**Taxonomic Class**  
Saprists

**Histosols % of global**

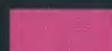
Folists	<0.01%
Fibrists	0.2%
Hemists	0.8%
Saprists	0.3%



**Histosols Soil Regions**



Fibrists



Hemists



Saprists

# JUNE 2006

May

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

July

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3 <i>BIB</i>
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	



## EVENTS

**June 11-16 South Region National Cooperative Soil Survey Conference, Oklahoma City, OK, USA**

**June 19-22 West Region National Cooperative Soil Survey Conference, Park City, UT, USA**

**June 26-30 North Central Region NCSS Conference, Medora, North Dakota, USA**



*Right: A group of soil scientists receiving soil survey training in 1935.*

# Inceptisols

North Carolina

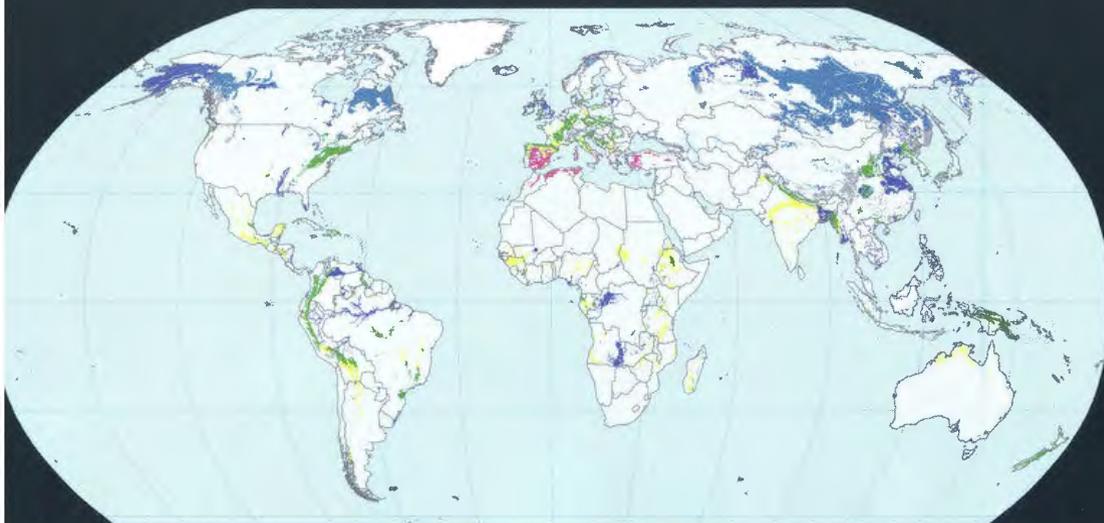
The initial stage of soil formation in Inceptisols is exemplified by several attributes, which are the result of the presence or absence of certain processes. Soil formation on rocks consists of weathering of the rock, which is essentially a geo-chemical process accompanied by soil-forming processes acting on the weathered products. In cool humid climates, the soil-forming process may be the accumulation of organic matter to give rise to a mollic or umbric epipedon. In warmer climates, cambic horizon formation takes place, which is expressed by clay formation or release of iron to form a 'color B' horizon.

## Taxonomic Class Udepts

## Inceptisols % of global

Aquepts	3.2%
Anthrepts	<0.01%
Cryepts	2.0%
Ustepts	3.2%
Xerepts	0.5%
Udepts	3.2%
Gelepts	4.6%

## Inceptisols Soil Regions



# JULY 2006

June						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

August						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4 INDEPENDENCE DAY	5	6	7	8
9	10	11	12	13	14	15
18th WORLD CONGRESS OF SOIL SCIENCE, "FRONTIERS OF SOIL SCIENCE," JULY 9-15						
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29



## EVENTS

**July 4-7** Second Global workshop on digital soil mapping, Rio de Janeiro, Brazil

**July 9-15** 18th World Congress of Soil Science, USA

**July 16-21** Zeolite '06, 7th International Conference on the Occurrence, Properties, and Utilization of Natural Zeolites, Socorro, NM; [www.ees.nmt.edu/Zeolite06](http://www.ees.nmt.edu/Zeolite06)



*In 1956, George Aubert of France (right) introduced the "Sol Brun Acide," the predecessor of the Inceptisols.*

# Mollisols

North Dakota

To a large extent Mollisols are the breadbasket of the world—the prairies in the United States, the steppes of Russia, and the pampas of Argentina. Most Mollisols are cultivated; in fact, there are only limited areas in the world where they have not been cultivated. Mollisols may initially be farmed with no additions of fertilizers. However, to sustain the high yields of corn, soybeans, sorghum, and small grains of today, fertilizers must be used. Soil temperature and moisture are principally used to separate all but two (Albolls and Rendolls) of the eight suborders of Mollisols.

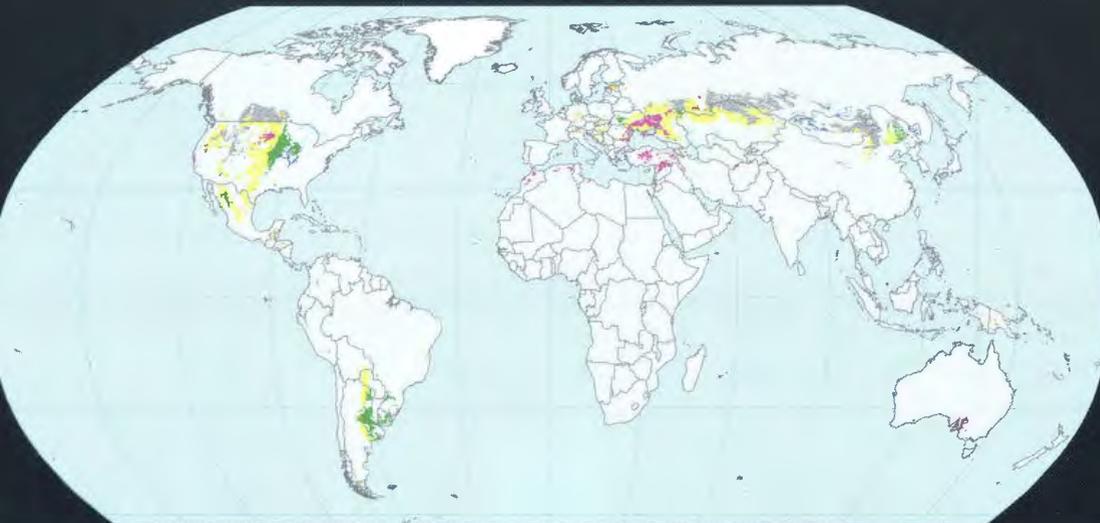
**Taxonomic Class**  
Albolls

**Mollisols % of global**

Albolls	0.01%
Aquolls	0.1%
Rendolls	0.2%
Xerolls	0.7%
Cryolls	1.9%
Ustolls	3.0%
Udolls	0.9%
Gelolls	0.1%



**Mollisols Soil Regions**



# AUGUST 2006

July

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
<sup>23</sup> / <sub>30</sub> <sup>24</sup> / <sub>31</sub>	25	26	27	28	29	

September

S	M	T	W	T	F	S
						1 2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

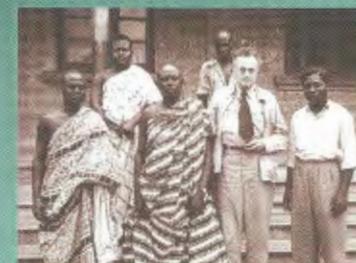


## EVENTS

**August 20-26**  
100 years of soil science in Romania, The XVIIIth Conference of the Romanian National Society of Soil Science Transylvania, Romania

**Aug. 28-Sept. 3**  
Sustainability-Its Impact on Soil Management and Environment, 17th ISTRO Conference, Keil, Germany

*In 1954 the fifth World Congress was held in Leopoldville, Belgian Congo, with 176 papers. The picture to the right shows Dr. Charles Kellogg visiting in Ghana before the Congress.*



# Oxisols

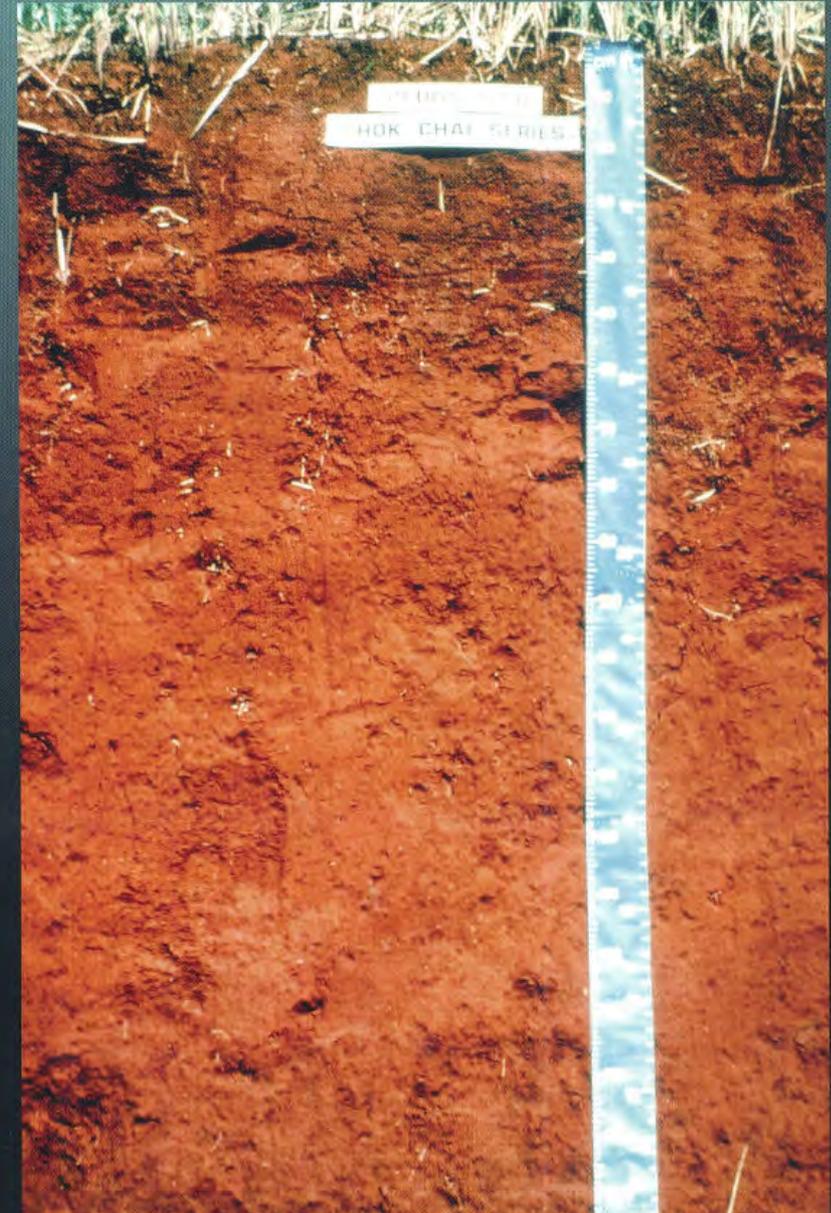
Thailand

Oxisols are reddish, yellowish, or grayish soils. They are most common on the gently undulating surfaces of geologically old landscapes in tropical and subtropical regions. The most extensive areas of Oxisols are on the interior plateaus of South America, the lower portion of the Amazon Basin, significant portions of the Central African Basin, and important areas in Asia, northern Australia, and several tropical islands of the Pacific. Their profiles are distinctive because of the lack of obvious horizons. Their surface horizons are usually somewhat darker in color than the subsoil, but the transition of subsoil features is gradual.

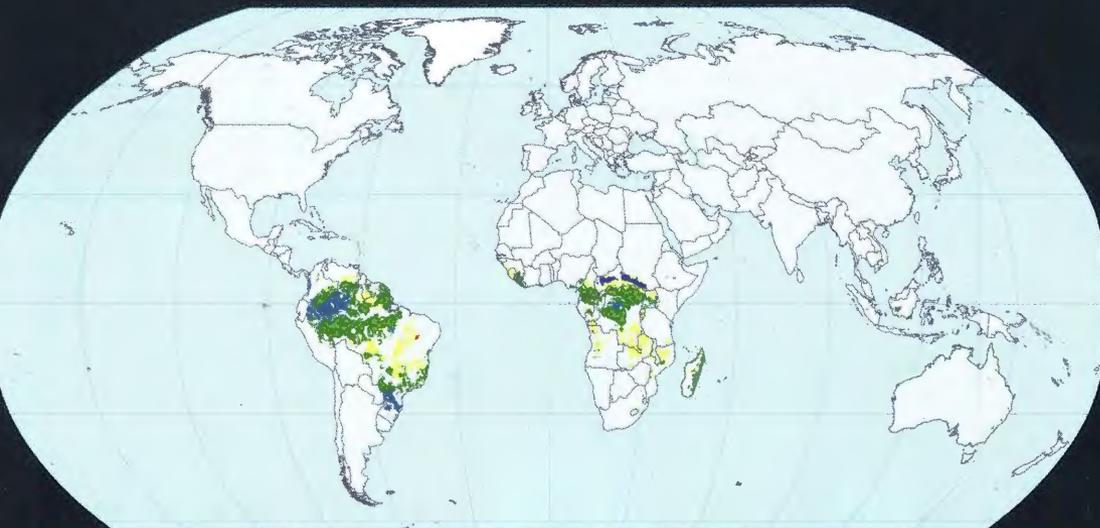
**Taxonomic Class**  
Ustox

**Oxisols % of global**

Aquox	0.2%
Torrox	0.02%
Ustox	2.4%
Perox	0.9%
Udox	3.9%



Oxisols Soil Regions



# SEPTEMBER 2006

August						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

October						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4 LABOR DAY	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30



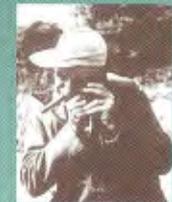
## EVENTS

**Sept. 4-6**  
IX European Society  
of Agronomy  
Congress, Warsaw,  
Poland; [www.esagr.org/structure/](http://www.esagr.org/structure/)

**Sept. 4-7**  
Agroenviron 2006:  
Fifth International  
Symposium on  
the Agricultural  
Environment, Ghent,  
Belgium

**Sept. 12-15**  
International ESSC  
Conference on "Soil  
& Water Conserva-  
tion under Changing  
Land Use," Lleida,  
Catalonia, Spain

*In 1960, the seventh ISSS World Congress was held in Madison, Wisconsin, USA, with 322 papers from 7 Commissions. Guy Smith (right) launched the modern U.S. Soil Taxonomy System internationally at this congress.*



# Spodosols

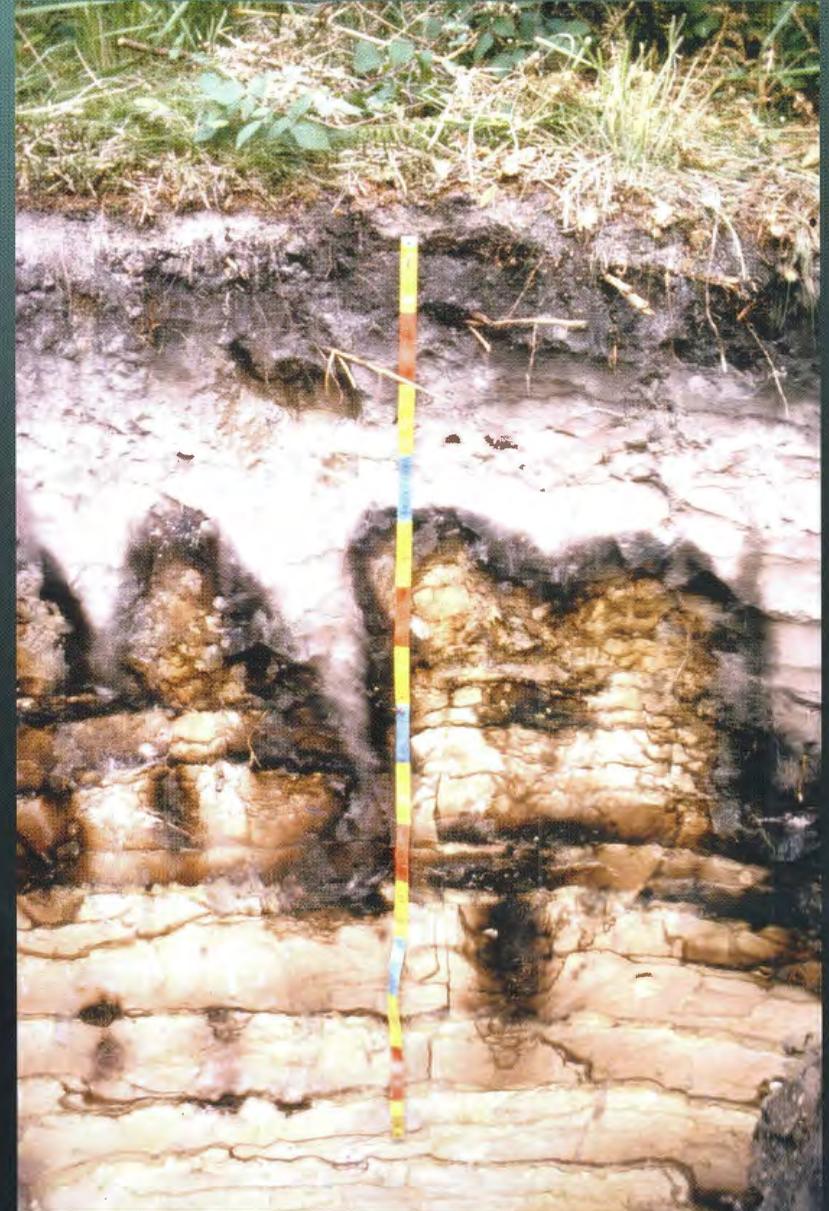
France

A black, reddish brown to strong brown subsoil (spodic) horizon is the primary identifying characteristic of a Spodosol. It is often overlain by a gray to light-gray eluvial horizon. The simple explanation for this horizon sequence holds that under cool, humid or perhumid climates, organic acids from a litter layer leach amorphous mixtures of organic matter and aluminum with or without iron from the eluvial horizon and deposit them in the illuvial spodic horizon. Most Spodosols have formed under such conditions and thus are common in the northern latitudes where most of these soils are to be found.

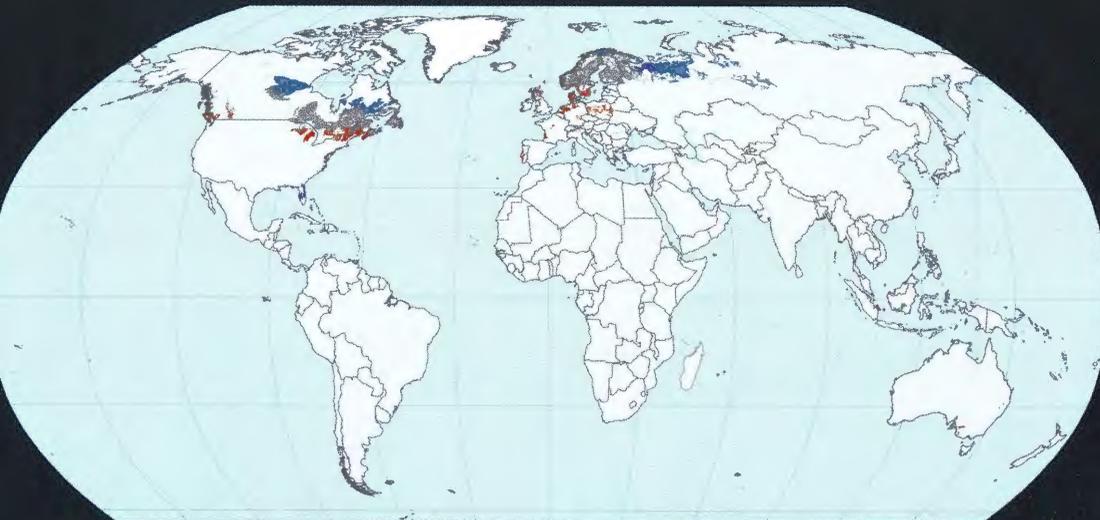
Taxonomic Class  
Humods

Spodosols % of global

Aquods	0.1%
Cryods	1.9%
Humods	0.04%
Orthods	0.5%
Gelods	0.9%



Spodosols Soil Regions



# OCTOBER 2006

September

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

November

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9 COLUMBUS DAY	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



## EVENTS

**Oct. 28-31**  
Hispanic Association of Colleges and Universities 20th Annual Conference, San Antonio, TX, USA; [www.hacu.net](http://www.hacu.net)

**Oct. 25-28**  
79th National Future Farmers of America (FFA) Convention, Indianapolis, IN, USA



*Spodosols have distinctive and contrasting colors that make them easily identifiable, although there are always exceptions. At right a Spodosol profile is seen in its natural landscape.*

# Ultisols

Taiwan

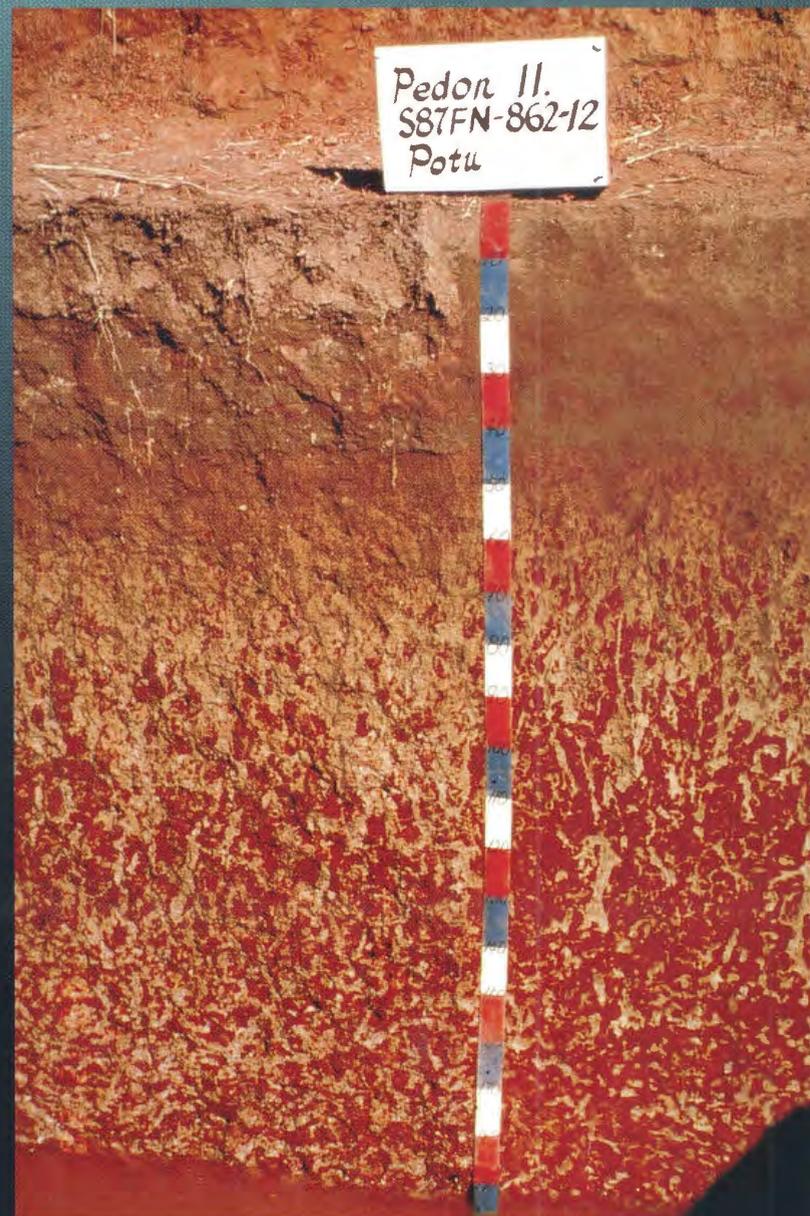
Ultisols are similar to Alfisols in having a subhorizon of clay accumulation but have few bases especially at depth. Most Ultisols are acid although some may have a high pH in the surface horizons due to vegetation recycling or due to aerosolic additions. From a process point of view, the ideal Ultisol has a subsurface horizon of clay enrichment due to clay translocation from the surface horizons. If the surface horizons have more than 40% clay, for practical purposes, these soils with textural change with depth are considered as Ultisols. If there is less than 40% clay, then they are classified as Oxisols.

## Taxonomic Class

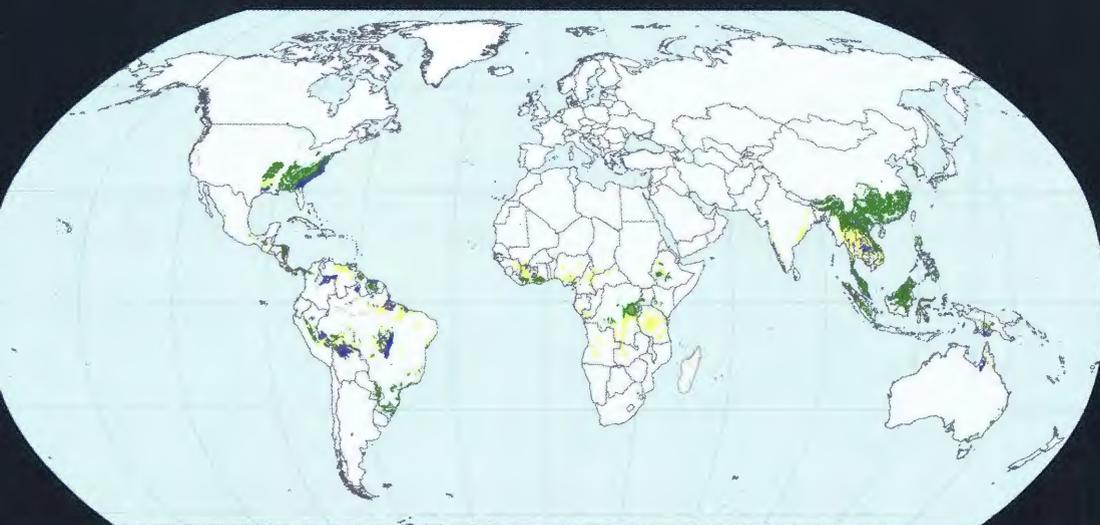
Udults

## Ultisols % of global

Aquults	1.0%
Humults	0.3%
Udults	4.2%
Ustults	2.9%
Xerults	0.01%



## Ultisols Soil Regions



Aquults



Humults



Xerults



Ustults



Udults

# NOVEMBER 2006

October

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

December

S	M	T	W	T	F	S
						1 2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
<sup>24</sup> / <sub>31</sub>	25	26	27	28	29	30

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10 VETERANS DAY	11
12	13	14	15	16	17	18
19	20	21	22	23 THANKSGIVING DAY	24	25
26	27	28	29	30		



## EVENTS

**Nov. 2-4 American Indian Science and Engineering Society AISES National Conference, Detroit, MI, USA; Michigan COBO Center**

**Nov. 4-8 SSSA, ASA, CSSA National Meetings; New Orleans, LA, USA; New Orleans Convention & Visitors Bureau; [www.neworleanscvb.com](http://www.neworleanscvb.com). Society-Sponsored Symposia and Conferences**



*In 1968, the first draft of the Soil Map of the World by Food and Agriculture Organization was presented at the Adelaide, Australia World Congress of Soil Science.*

# Vertisols

Texas

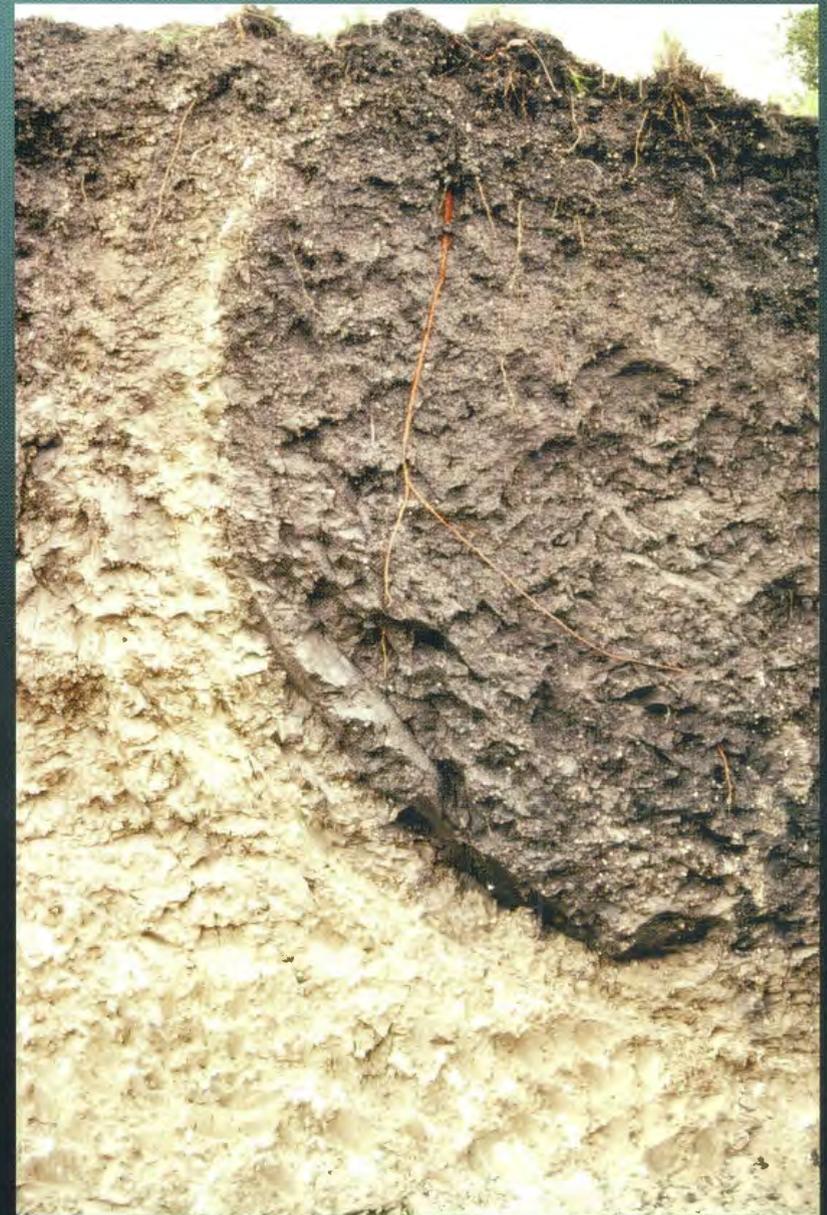
Vertisols are clayey soils, which have deep, wide cracks on some occasions during the year and slickensides within 100 cm of the soil surface. They shrink when dry and swell when moistened. Vertisols make up a relatively homogeneous order of soils because of the amount and kind of clay that is common to them. In many countries where Vertisols are common, they are known by their local names. For example, Gilgai soils (Australia), Adobe (Philippines), Sha Chiang (China), Black Cotton Soils (India), Smolnitza (Bulgaria), Tirs (Morocco), Makande (Malawi), Vleigrond (South Africa), and Sonsosuite (Nicaragua).

## Taxonomic Class

Aquerts

## Vertisols % of global

Aquerts	<0.01%
Cryerts	0.01 %
Xererts	0.1%
Torrerts	0.7%
Usterts	1.4%
Uderts	0.3%



## Vertisols Soil Regions



# DECEMBER 2006

November

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

January

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
<sup>24</sup> / <sub>31</sub>	25 CHRISTMAS	26	27	28	29	30



## EVENTS

**December 11-15**  
2006 American  
Geophysical Union  
Fall Meeting, San  
Francisco, CA, USA



*Natural landscape of Vertisol in Texas (upper right). Cracking on the surface of Vertisols is a very distinctive feature of hexagonal pattern (lower right).*

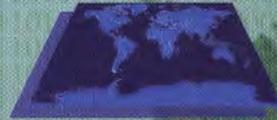
# Web Soil Survey

<http://soils.usda.gov/survey>

## Customers



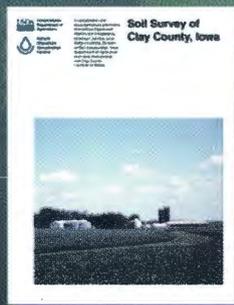
## Digital Database



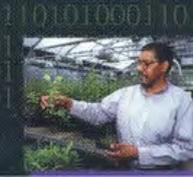
## Key points

- Convenient Internet access to maps and reports
- Up-to-date soil information
- Tailored to an area of interest
- Ability to calculate acreage
- Downloadable to local GIS systems
- Ability to print or save information
- Thousands of soil surveys available day or night

## Soil Survey Data



## Uses



# JANUARY 2007

December

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
<sup>24</sup> / <sub>31</sub>	25	26	27	28	29	

February

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	<b>1</b> NEW YEARS DAY	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
<b>14</b>	<b>15</b> MARTIN LUTHER KINGS, Jr.'s BIRTHDAY	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>
<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>			



**Uses:**

- Building Sites
- Conservation Plans
- Erosion Control
- Farm and Ranch Appraisals
- Nutrient Management Pipelines
- Range and Forest Management
- Risks and Hazards Identification
- Road Building
- Water Conservation
- Wetlands
- Wildlife Management

*The National Cooperative Soil Survey is an effort of Federal and State agencies, universities, and professional societies to deliver scientifically based soil information.*

**References:**

van Baren, H., A.E. Hartemink and P.B. Tinker, 2000. *75 Years The International Society of Soil Science*. *Geoderma* 96:1-18

*Transactions of the 7th International Congress of Soil Science*, Madison Wisc., U.S.A. 1960, Vol. IV, International Society of Soil Scientists, N.V. Dijkstra's Drukkerij V.H. Boekdrukkerij Gebr. Hoitsema, Groningen, Netherlands, 1960, 1-562 p.

Soil Survey Staff, 1999. *Soil Taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition*. Agriculture Handbook Number 436. United States Department of Agriculture, Natural Resources Conservation Service. 869 pp.

Soil Survey Staff, 2003. *Keys to Soil Taxonomy: 9th edition*. United States Department of Agriculture, Natural Resources Conservation Service. 332 pp.

**Photo Credits:**

Hari Eswaran

Bob Nichols, USDA

John Kelley, North Carolina State Office

Texas State Office

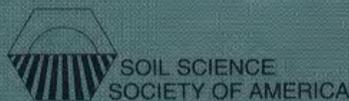
**Map Credits:**

Hari Eswaran

Paul Reich

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.



*Printed on recycled paper*