USDA

United States Department of Agriculture

2015 SOILS PLANNER

International Year of Soils,

Healthy Soils for a Healthy Life

2015 International Year of Soils

Soil Science Society of America

2015 is the year to celebrate the soil!

During the International Year of Soils, the United States Department of Agriculture, Natural Resources Conservation Service (NRCS) will celebrate the success of conservation on private lands and the benefits of conservation practices that protect our Nation's precious soil resources. NRCS was born out of the Dust Bowl of the 1930s. This was an environmental disaster caused by over-cultivation, drought, and record-breaking temperatures that led to millions of acres of soil blowing away. On April 27, 1935, Congress passed Public Law 74-46, in which it recognized that "the wastage of soil and moisture resources on farm, grazing, and forest lands…is a menace to the national welfare" and established the Soil Conservation Service (SCS) as a permanent agency in the USDA. For decades, private landowners have voluntarily worked with SCS–now NRCS–conservationists to prevent erosion, improve water quality, and promote sustainable agriculture.

NRCS' *Unlock the Secrets in the Soil* outreach and education campaign continues to inspire and motivate private landowners across the country to make healthy soil a reality on even more farms and ranches. As world population and food production demands rise, keeping soil healthy and productive is critical. Improving the health of our Nation's soil is one of the most important conservation endeavors of our time, and 2015 is the year to communicate the vital importance of the soil.

NRCS was established 80 years ago as the Soil Conservation Service to help farmers improve the health and productivity of their soils in the wake of the Dust Bowl. Since then, we've expanded our focus to air, water, and wildlife, while holding fast to our commitment to the soil. Across the Nation, NRCS uses sound science and proven conservation practices to help our customers improve the health of their land.

Healthy soils are the foundation of agriculture. In the face of mounting challenges such as a growing global population, climate change, and extreme weather events, soil health is critical to our future. Healthy soil is essential as global demands rise for food, fuel, and fiber. Healthy soils also have a greater capacity to hold nutrients and water, which can help agricultural operations during drought and mitigate flooding downstream during heavy rainfall. They keep water and nutrients in the soil where they should be and increase organic matter, aggregate stability, structure, infiltration, and available water-holding capacity of the soil.

unlock the SECRETS IN THE SOIL

This is an exciting year for soil health. The United Nations designated 2015 as the *International Year of Soils* to bring worldwide attention to the importance of soil health for ensuring a sustainable future. This year also marks the third year of NRCS' *Unlock the Secrets in the Soil* campaign, and exciting new activities are ahead for spreading the soil health message across the country.

The 2015 Soils Planner illustrates how soils are fundamental to our lives today.
I hope you'll join me in spreading the word.
Find out more at www.nrcs.usda.gov.

Jason Weller
Chief, USDA-Natural Resources Conservation Service

This year marks a milestone for soils enthusiasts – an international year-long celebration of soils. The member countries of the United Nations Food and Agriculture Organization (FAO) designated 2015 the International Year of Soils to recognize the importance of soil sustainability as the basis of food systems, fuel, and fiber production and to raise awareness of the limits on our soil natural resource.

For the International Year of Soils, the Soil Science Society of America (SSSA) has developed monthly themes that reflect the diversity and value of soils to the environment and society. Information related to a theme, a lesson plan, and other outreach activities will be available each month at the Society's dedicated International Year of Soils webpage: https://www.soils.org/IYS. All of us have a role in communicating the importance of soils to others. And remember, December 5 is World Soil Day, a special day to celebrate the importance of soil *every* year.

SSSA is an international scientific society with a membership of over 6,000 scientists and certified professionals from more than 80 countries committed to advancing the field of soil science. SSSA supports its members through research-based publications, educational programs, professional certification, and science policy. SSSA is pleased to continue our partnership with the USDA Natural Resources Conservation Service in producing this 2015 International Year of Soils Planner for our members, the public, and the greater science community.

Carolyn Olson
President, Soil Science Society of America
www.soils.org

International Year of Soils (IYS)

The international soil community has long complained about the insufficient attention given to soils by policymakers and the public at large, despite current alarming threats to this essential natural resource. The year 2015 offers us a great opportunity since it was designated as the *International Year of Soils* by the General Assembly of the United Nations. There are many encouraging signs that this opportunity will be put to good, practical use in serving the cause of soil conservation and sustainable soil management throughout the world. In this auspicious context, it is important that the users of this Soils Planner are made fully aware of the new alliance embodied by the Global Soil Partnership (GSP). Formally launched at the end of 2012 under the auspices of the Food and Agriculture Organization, the United Nations' specialized agency in charge of food and agricultural matters, the GSP embraces both the national authorities of all interested countries and the wide range of institutions dealing with soils willing to participate in its work. The goal is to generate a new momentum for intensive international cooperation and more effective regional and national action in order to reverse soil degradation and make sustainable soil management the norm in development. I invite all readers (whether individuals or those working in soil-related institutions) to visit our website: http://www.fao.org/globalsoilpartnership/en/ to learn more about the GSP scope and activities and, as appropriate, assess where and how they could contribute to its goals.

Ronald Vargas
Secretary of the Global Soil Partnership

Soils Sustain Life

Soil is one of four elements we cannot live without—soil is essential for life. There are tens of thousands of different soils on every continent.

The Life Under Our Feet:

Without soils, life on earth as we know it would not exist. The condition of soil ecosystems affects global warming, carbon sequestration, the quantity and quality of fresh water, the productivity and nutritional value of plants growing in soil, the impacts of invasive organisms, the health of bays and estuaries, and the availability of new medicines for human health.

Did you know?

The Art of Soil Color.

The soil profile is the basis for understanding and interpreting soils. Describing a soil involves an understanding of physical, chemical, and biological components. It also involves an artistic eye to identify color. Soil scientists use a book of standard color chips to classify the color of soil. The chips are comparable to those at a paint store but follow the Munsell System of Color Notation, which has been used for more than 55 years to classify the color of soil.

"Land, then, is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals."
– Aldo Leopold, A Sand County Almanac, 1949

January

December 2014

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February 2015

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18	19 Birthday of Martin Luther King, Jr.	20	21	22	23	24
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Soils Support Urban Life —Europe

Vertical garden in Madrid, Spain, designed by French botanist Patrick Blanc.

Urban gardens in Gödöllő, Hungary

Urban soils are often intensely modified by human activity. There is a growing trend to revitalize vacant property in urban areas and convert it to green infrastructure or urban agricultural areas. Urban agriculture plays a key role in two global challenges: urbanization and food security. It can provide important contributions to sustainable, resilient urban development and to the creation and maintenance of multifunctional urban landscapes.

Did you know?

By 2050, the world's population is expected to surpass 9 billion. By 2020, approximately 80 percent of Europeans will be living in urban areas. The benefits of urban farming are numerous. Locally grown food reduces the environmental impact in terms of fuel usage, saves on food costs, and strengthens community spirit.

"Each soil has had its own history. Like a river, a mountain, a forest, or any natural thing, its present condition is due to the influences of many things and events of the past."
– Charles Kellogg, The Soils That Support Us, 1956

February

January 2015

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March 2015

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15	16 Presidents' Day	17	18	19	20	21
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Spodosol-France

Soils Support Agriculture

—Asia / Japan

This family farm in Japan's Ehime prefecture is managed by the descendants of natural farming pioneer Masanobu Fukuoka (1913-2008). The farm still employs the sustainable farming methods he discussed in his book, *One-Straw Revolution*.

Soil is the foundation of agriculture. Without healthy soils, feeding the world's people becomes even more challenging. Throughout human history, our relationship with the soil has affected our ability to cultivate crops and influenced the success of civilizations. Farmers can protect and improve soil health and soil quality in many ways. Ideal soils for agriculture have a proper balance of mineral components, clay, organic matter, air, and water.

Did you know?

One-Straw Revolution: *An Introduction to Natural Farming was* written in 1975 by Masanobu Fukuoka. This best-selling book described his life's journey, his philosophy, and his natural farming techniques. He was a proponent of no-till, no-herbicide grain cultivation farming methods that were traditional to many indigenous cultures. From these methods, he created a particular method of farming commonly referred to as "Natural Farming" or "Do-Nothing Farming." He was considered a leader in the worldwide sustainable agriculture movement.

"The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life."
– Wendell Berry, The Unsettling of America: Culture and Agriculture, 1977

March

February 2015

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April 2015

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15	16	17	18	19	20 Spring Equinox	21
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29	30	31				

Andisol-Japan

Soils Clean & Capture Water

—Asia (Cambodia / Bangladesh)

Yearly flooding in Cambodia's Mekong River loads sediment onto floodplains, helping to regulate the quality of soil and water in the region.

Matthew Polizzotto, an assistant professor of Soil Science at North Carolina State University, studies and teaches about soil chemical processes that control contaminants in soils, sediments, and groundwater. His work in Cambodia and Bangladesh investigates arsenic contamination of water used for drinking and irrigation.

Healthy Soil=Healthy Water

Soil normally filters and cleans water. However, rainwater that drains across and through contaminated soil before arriving in lakes and streams could contaminate water. The effect of soil on water quality is one reason why healthy soil is so important.

Did you know?

Soil helps clean the water we drink and the air we breathe. Pollutants such as toxins, viruses, manufacturing oils, and bacteria enter the water system every day. The soil in forests, in wetlands, and along rivers prevents many of these potentially harmful substances from entering the drinkable water supply. In the United States, soils treat wastewater for about 25 percent of the population in rural, suburban and urban areas. Soil is the largest single wastewater treatment plant!

"Out of the long list of nature's gifts to man, none is perhaps so utterly essential to human life as soil."
– Hugh Hammond Bennett, 1881 - 1960, first SCS Chief.

April

March 2015

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May 2015

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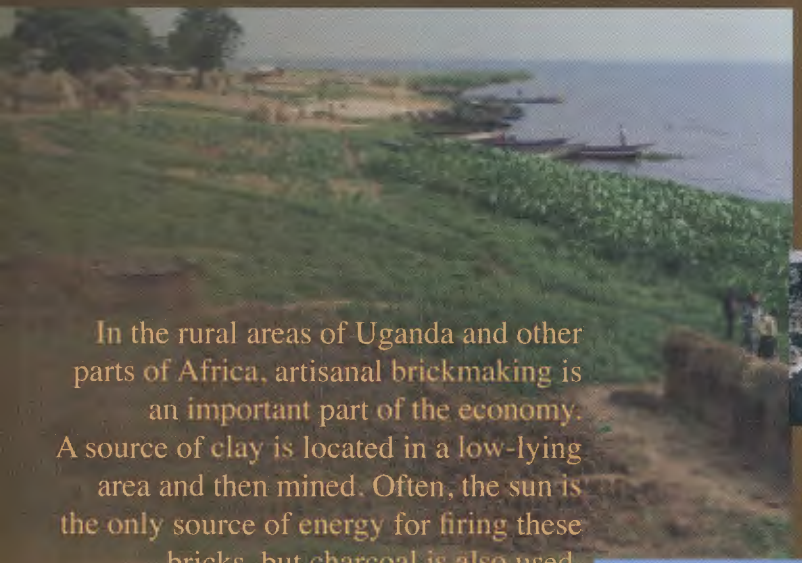
19	20	21	22 Earth Day	23	24	25
26	27 80th Anniversary of NRCS	28	29	30		

Oxisol-Thailand

Soils Support Buildings

—Africa / Uganda



In the rural areas of Uganda and other parts of Africa, artisanal brickmaking is an important part of the economy. A source of clay is located in a low-lying area and then mined. Often, the sun is the only source of energy for firing these bricks, but charcoal is also used.

Wattle constructed cave dwellings in Matmata, Tunisia.

Wattle and daub construction has been used for millennia and is still practiced in Africa today. A woven lattice of wooden strips (wattle) is covered with a mixture of wet soil, lime, animal dung, and straw.

We build on soil, as well as in it and with it. Soil provides the support for the physical foundations of houses, factories, roads, railways, and other buildings. Just as using soil for agriculture or forestry requires a special knowledge of the soil, so does using soil for building sites. Because soils vary in their texture, properties, and behavior from place to place, it is essential to have a good understanding of the soils where buildings are to be constructed.

Did you know?

Soils play an important role in construction. Houses and roads are damaged where soils shrink and swell. Soil properties are important to consider when constructing roads and buildings. Engineers and soil scientists measure soil strength to determine how easily a soil changes shape or shifts and to determine if it will bear the weight of structures.

"We know more about the movement of celestial bodies than about the soil underfoot."
– Leonardo da Vinci (1452-1519)

May

April 2015

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Alfisol-South Africa

Soils Support Recreation

A hiking trail in the Blue Ridge Mountains of North Carolina and a soccer field are outdoor areas where soil health is important.

Soils are the foundation for our national forests, our hiking trails, our parks, and all the outdoor areas that we enjoy. Proper management of recreational areas, such as trails used for hiking, all-terrain vehicles and bicycles, and fields used for sports, is important to minimize the negative impacts of erosion.

Did you know?

Spending time outdoors is linked to positive effects on physical health. In fact, a strain of bacterium in soil, *Mycobacterium vaccae,* has been found to trigger the release of serotonin, which in turn elevates mood and decreases anxiety.

"Here is your country. Cherish these natural wonders, cherish the natural resources, cherish the history and romance as a sacred heritage, for your children and your children's children. Do not let selfish men or greedy interests skin your country of its beauty, its riches or its romance."
– Theodore Roosevelt (1858-1919)

June

May 2015

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July 2015

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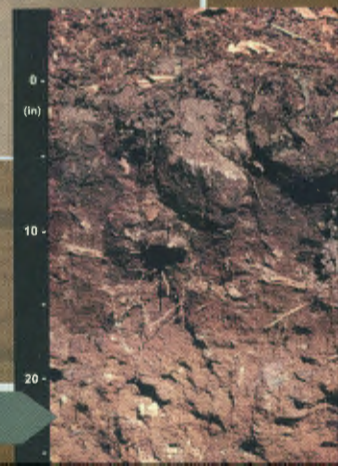

Inceptisol-United States

Soils Are Alive —Australia

A ranch along Great Ocean Road near Warrnambool, Victoria, Australia. This area typically has alkaline soils that contain large amounts of calcium, sodium, and magnesium and are generally formed on coastal sands and limestone.

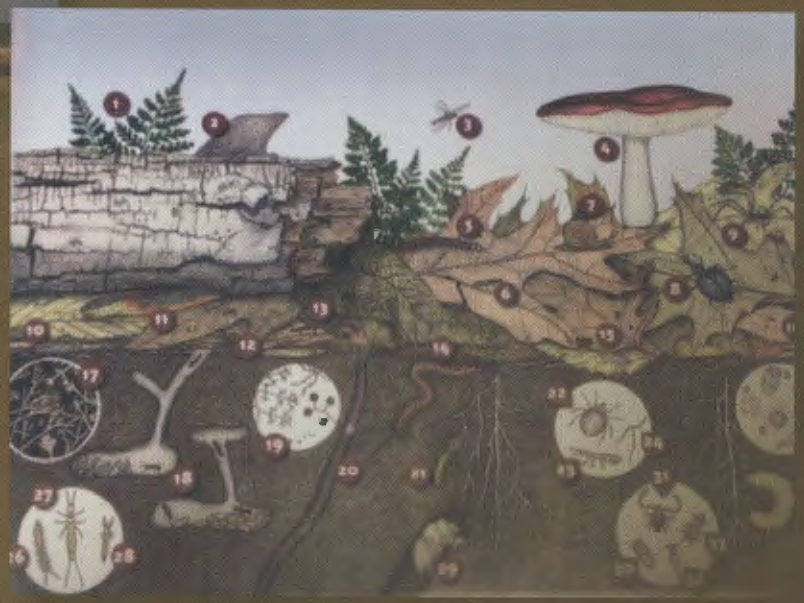

Illustration by Jim Nardi.

Soils support more life beneath their surface than exists above. Soil is a living, dynamic resource at the surface of the earth. It is a complex habitat of mineral and organic particles; living organisms including plant roots, microbes, and larger animals; and pores filled with air or water.

In a thimble full of soil – about a gram in weight – you can expect to find:

- 100 million to 1 billion bacteria
- several thousand protozoa (up to several hundred thousand in forest soils), and
- 10 to several hundred nematodes.

Did you know?

Some organisms in soil are large and easily seen with the unaided eye, and others have to be magnified by 1,000 times. It has been said that a handful of soil can have more living organisms than there are people on planet Earth!

"Heaven is under our feet as well as over our heads."
– Henry David Thoreau, Walden, 1854.

July

June 2015

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August 2015

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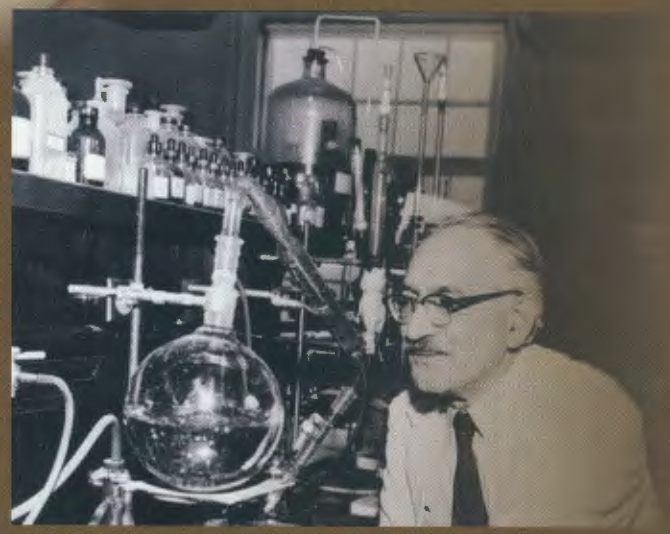
Vertisol-Australia

Soils Support Health

About 120 prescription drugs sold worldwide today are derived directly from rainforest plants. According to the U.S. National Cancer Institute, more than two-thirds of all medicines found to have cancer-fighting properties come from plants supported by rainforest soils.



Dr. Selman Abraham Waksman

Although many people recognize the important duties that soil performs in our everyday lives, most do not realize that soil has also served as an important source of commonly used antibiotics. Many of the antibiotics we use to fight illnesses were derived from soil organisms.

Cyclosporine, a drug widely used to prevent transplant patients from rejecting new organs, is derived from a soil fungus.

Did you know?

Selman Abraham Waksman was a Ukrainian-American inventor, biochemist, and microbiologist whose research into organic substances (largely into organisms that live in soil and their decomposition) promoted the discovery of Streptomycin and several other antibiotics. He was awarded the Nobel Prize in 1952.

"The earth will open and bring forth salvation."
– Epitaph of Selman Waksman (1888 -1973).

August

July 2015

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September 2015

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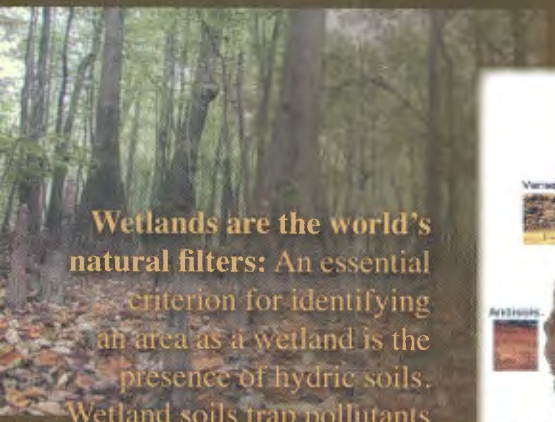
Andisol-Hawaii

Soils Protect the Natural Environment

—North America



Wetlands are the world's natural filters: An essential criterion for identifying an area as a wetland is the presence of hydric soils. Wetland soils trap pollutants such as phosphorus and heavy metals, transform dissolved nitrogen into nitrogen gas, and break down suspended solids to neutralize harmful bacteria.

Soil color is one of the most visually striking properties recorded by soil scientists around the world. This map of soil color was developed by soil scientists at the NRCS National Soil Survey Center in Lincoln, Nebraska, and the Pacific Region Soil Survey Office in Davis, California. The colors were extracted from the more than 20,000 Official Series Descriptions.

Soils provide anchorage for plant roots, hold water long enough for plants to use it, and store nutrients that sustain life. Soils are the biggest filter in the world. They remove contaminants through their chemical, biological, and physical properties–in other words, they are the kidneys of all earth ecosystems!

Did you know?

Wetlands have sometimes been called "nurseries of life" because they provide safe habitat for young fish, crabs, and other small creatures before they are old enough to venture into open waters.

"A nation that destroys its soil destroys itself."
- Franklin D. Roosevelt, excerpt from letter to all State Governors on a Uniform Soil Conservation Law, 1937.

September

August 2015

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October 2015

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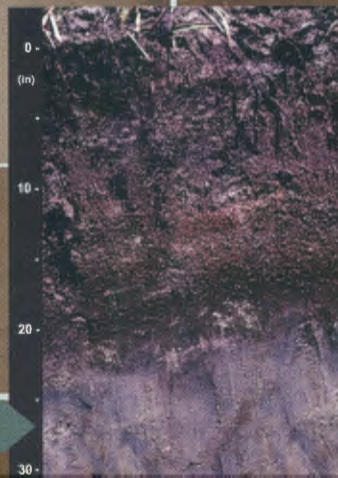

Histosol-United States

Soils & Products We Use

—South America

Ecuador, the smallest of the Andean countries, is predominantly agricultural. In the highlands, subsistence agriculture and the production of staples for the urban areas are predominant. Crops include maize, wheat, barley, potatoes, and various vegetables. Ecuador's major resource is its soil, which, along with the country's generally adequate rainfall and diverse climates, allows for a wide variety of agricultural production. Particularly rich soils are on the flood plains along the Guayas and other rivers, on the coast, and on the flats, floodplains, and volcanic slopes of the highlands.

Soil is the earth's living skin. It supports our daily lives by providing us with the resources we need to live. It is critical to our food, fiber, and shelter. Soil is used every day to improve health and beauty, make useful items, and increase the efficiency and comfort of homes.

Did you know?

Soil plays a vital role in the Earth's ecosystem. Without soil, human life would be impossible. Soil provides plants with necessary nutrients to grow, filters rainwater, and regulates the discharge of excess precipitation. Well-managed soil reduces the hazard of flooding and is capable of storing large amounts of organic carbon. It buffers against pollutants, protects groundwater quality, and provides essential materials for construction and manufacturing.

"Essentially, all life depends upon the soil.
There can be no life without soil and no soil without life; they have evolved together."
– Charles Kellogg, 1938.

October

September 2015

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November 2015

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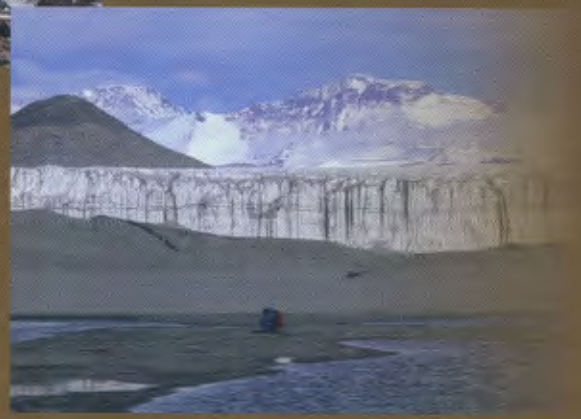
Ultisol-Brazil

Soils & Climate —Antarctica

Cathy Seybold and Deb Harms of NRCS conduct maintenance and download data at a soil climate station at Mt. Fleming, Antarctica.

The Antarctic Dry Valleys are regarded as one of the harshest areas on Earth because of the extremely cold and dry conditions. Soils in these areas will respond to climate change differently than soils in temperate regions, and research is underway to determine what that response will be. Scientists have found that, despite the extreme environment and lack of large plants, the soils contain organic carbon, small invertebrates, and microbes. In a warmer climate, the Antarctic Dry Valleys will be wetter because of melting glaciers, and microbial life is expected to flourish in the soils.



A soil scientist collects soil samples along an ephemeral glacier-fed lake in Antarctica.

Did you know?

Scientists have documented an acceleration in the melt rate of permafrost (underlying soil that remains permanently frozen) in Antarctica. The melt rates are comparable with the Arctic, where accelerated melting of permafrost has become a regularly recurring phenomenon, and the change could offer a preview of melting permafrost in other parts of a warming Antarctic continent.

"Most of all one discovers that the soil does not stay the same, but, like anything alive, is always changing and telling its own story. Soil is the substance of transformation."
– Carol Williams, Bringing a Garden to Life, 1998.

November

October 2015

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December 2015

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

Gelisol-Antarctica

Soils, Culture, and People

Soils can exhibit beautiful contrasts in colors, layers, and textures.

Soils are part of the tapestry of civilization and have been used for spiritual and artistic purposes for ages. The environmental art movement known as Land Art began in the 1950s, and many art works of the movement featured soils. The arts offer innovative and inspiring ways to communicate soil and environmental issues to the greater public, and soil colors serve as pigments in bricks, pottery, and art work.

Did you know?

In 2002, The International Union of Soil Sciences (IUSS) made a resolution proposing December 5 as World Soil Day to annually celebrate the importance of soil as a critical component of the natural system and as a vital contributor to human well-being. In June 2013, the Food and Agriculture Organization of the United Nations unanimously endorsed World Soil Day.

Jay Noller of Oregon State University is a soil scientist who finds inspiration for his paintings in the soil profiles he studies in the field. His "Slackwater Terroir" is a 10-foot by 16-foot painting created with acrylic paints mixed with soils as pigment and applied to steel-framed concrete panels. It tells the story of the Willamette Valley under repeated cycles of glacial flood deposition and intervening soil development. The modern profile is the rightmost panel.

"Civilization itself rests upon the soil."
– Thomas Jefferson (1743-1826)

December

November 2015

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January 2016

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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5 World Soil Day
6	7	8	9	10	11	12
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20	21	22 Winter Solstice	23	24	25 Christmas Day	26
27	28	29	30	31 New Year's Eve		

Ultisol-United States

2015 Events

Organization	Event	Location	Date
National Association of Conservation Districts (NACD)	2015 Annual Meeting	New Orleans, LA	February 1-4, 2015
Soil Science Society of America (SSSA)	National Soil Judging Contest	University of Arkansas at Monticello	April 19-24, 2015
International Union of Soil Sciences Working Group	Inaugural global workshop on Digital Soil Morphometrics	University of Wisconsin Madison, WI	June 1-4, 2015
International Union of Soil Sciences (IUSS)	7th International Symposium of Interactions of Soil Minerals with Organic Components and Microorganisms	McGill University, Montréal, Qc, Canada	July 5-10, 2015
Soil and Water Conservation Society (SWCS)	International Annual Conference	Greensboro, NC	July 26-29, 2015
Ecological Society of America (ESA)	100th Annual Meeting	Baltimore, MD	August 9-14, 2015
Institute of Soil Science, Chinese Academy of Sciences	20th International Soil Tillage Research Organization (ISTRO) Conference	Nanjing, China	September 14-18, 2015
International Union of Soil Sciences (IUSS)	Pedometrics 2015	Cordoba, Spain	September 15-18, 2015
International Union of Soil Sciences (IUSS)	5th International Symposium on Soil Organic Matter	Göttingen, Germany	September 20-24, 2015
Institutes of Geology and Geography of the National Autonomous University of Mexico (UNAM) and the Mexican Soil Science Society	8th International Conference of the Working Group on Soils in Urban, Industrial, Traffic and Mining Areas (SUITMA) of the International Union of Soil Sciences (IUSS)	Mexico City, Mexico	September 20-25, 2015
International Union of Soil Sciences (IUSS)	Soil Functions and Climate Change–Do We Underestimate the Consequences of New Disequilibria in Soil Properties?	Christian Albrechts University, Kiel, Germany	September 23-25, 2015
International Society for Selenium Research	4th International Conference on Selenium in the Environment and Human Health	Cuiaba, Brazil	October 18-21, 2015
Soil Science Society of America (SSSA)	2015 Annual Meeting	Minneapolis, MN	November 15-18, 2015

January 2016

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April 2016

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August 2016

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September 2016

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October 2016

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November 2016

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December 2016

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Natural Resources Conservation Service

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