75 Years—A Legacy of Conservation

The 2011 Soils Planner is dedicated to the international work of the National Cooperative Soil Survey (NCSS) and soil scientists around the world. NCSS is a nationwide partnership of Federal and State agencies, universities, and professional societies that cooperatively investigate, inventory, document, classify, interpret, disseminate, and publish information about soils of the United States and its trust territories and commonwealths. The U.S. Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS) provides leadership and coordination to NCSS, operates and provides access to the NCSS soil inventory, and works to extend soil survey technology to global applications.

“Helping people help the land” and using soil science to improve conservation worldwide are historically important goals for NRCS. Hugh Hammond Bennett, the agency’s first Chief, believed that our ability to use soil conservation methods could be “increased by an investigation of conditions in other countries with longer agricultural histories.” Through Soil Taxonomy: A Basic System of Soil Classification for Making and Interpreting Soil Surveys, NRCS has provided leadership in creating a taxonomy for analyzing soils worldwide. To access the NCSS U.S. soil inventory at State, county, and community levels, go to www.soils.usda.gov and click on “Web Soil Survey;” for information on NRCS’ international soils work, click on “World Soils.”

NRCS and other soil scientists in the field use their knowledge to conserve and improve productive lands and address emerging issues such as land degradation and climate change, as the many examples in the 2011 Soils Planner show. In the coming year, NRCS will take additional steps to bring soil science and survey technology to new parts of the world and to work with international colleagues to harmonize classification systems to create a universal soil taxonomy.

Dave White
Chief, USDA-Natural Resources Conservation Service
http://www.nrcs.usda.gov

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service
Soil Science Footprints: 75 years of SSSA

The Soil Science Society of America (SSSA) is an international scientific society that fosters the transfer of knowledge and practices to sustain global soils, advances the field of soil science, and connects members around the world. SSSA currently has nearly 6,000 members in over 80 countries.

To communicate changes in soil science research, the Society publishes or co-publishes several peer-reviewed journals, including Soil Science Society of America Journal, Journal of Environmental Quality, Vadose Zone Journal, and Soil Survey Horizons. SSSA has a robust Web site and develops a variety of publications, including monograph and book series and topical book titles. Through its Science Policy Office in Washington, D.C., SSSA is an active participant in policy discussions related to soil and soil science. In addition, SSSA manages a professional certification program for Certified Professional Soil Scientists and Certified Professional Soil Classifiers.

SSSA commemorates its 75th anniversary in 2011. A year-long celebration with a variety of outreach activities and multimedia projects is planned, culminating with special events at the 2011 SSSA Annual Meeting in San Antonio, Texas, October 16–20, 2011. During this anniversary year, we hope to remain true to these words written by the SSSA Historian J. Fulton Lutz in 1977, "The history of the Soil Science Society of America is a history of dedicated soil scientists working independently and collectively to enhance our knowledge of soils."

Charles W. Rice
President, Soil Science Society of America
http://www.soils.org
Global Soil Regions

Soil Orders
- Alfisols
- Andisols
- Aridisols
- Entisols
- Gelisols
- Histosols
- Inceptisols
- Mollisols
- Oxisols
- Spodosols
- Ultisols
- Vertisols

Robinson Projection
Scale 1:130,000,000

Soil Survey Division
World Soil Resources
www.nrcs.usda.gov

July 2006
**Soil Taxonomy**

**Gelisols** - Soils with permafrost within 2 meters of the surface.

**Andisols** - Soils formed in volcanic ash.

**Aridisols** - Soils of arid environments with subsurface horizon development.

**Alfisols** - Moderately leached soils with a subsurface zone of clay accumulation and >35 percent base saturation.

**Histosols** - Organic soils.

**Oxisols** - Intensely weathered soils of tropical and subtropical environments.

**Ultisols** - Strongly leached soils with a subsurface zone of clay accumulation and <35 percent base saturation.

**Spodosols** - Acid forest soils with a subsurface accumulation of metal-humus complexes.

**Vertisols** - Clayey soils with high shrink/swell capacity.

**Mollisols** - Grassland soils with high base status.

**Inceptisols** - Soils with weakly developed subsurface horizons.

**Entisols** - Soils with little or no morphological development.

*Soil Taxonomy: A Basic System of Soil Classification.*
Web Soil Survey

The NRCS Web Soil Survey (WSS) features soil data and information produced by the National Cooperative Soil Survey and is one of the largest natural resource information systems in the world. NRCS soil maps and data are available online for more than 95 percent of the Nation’s counties and territories; information for all counties is anticipated in the near future.

Web Soil Survey “area of interest” delineated on screen.
January

2011 Calendar

**New Year's Day**

**Martin Luther King Jr. Holiday**

**Last Quarter Moon** on January 25
Rwanda—Africa

East and Central African countries are moving toward increased cooperation through a regional approach to adaptation strategies in their effort to cope with accelerating climate change. Maxine Levin, an NRCS soil scientist, received a 2008 U.S. Embassy Science fellowship to conduct a feasibility study in Kigali, Rwanda, to build a virtual regional biodiversity center. The Government of Rwanda accepted her recommendation to develop an integrated geographic database combining soil survey, climate, vegetation, and biological diversity for habitat analysis and to develop a data sharing policy. The database will aid in conservation and climate change mitigation efforts.


Agriculture is maintained on extremely steep slopes.

Potato farming edges up against protected forest habitat for gorillas and golden monkeys.

Fertile soil in bottomlands is used for organic vegetable gardens.

Climate change adaptation strategies use a state-and-transition model based on ecological site descriptions.
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- **President's Day**
- **Rich soil creates big worms!**
Agriculture is the main source of income for the Afghanistan economy. Despite the fact that only 12 percent of Afghanistan's total land area is arable and less than 6 percent is cultivated, more than 80 percent of Afghanistan's population is involved in farming, herding, or both. USDA is helping Afghanistan through a variety of activities aimed at rebuilding agricultural markets and improving management of natural resources. The NRCS–Soil Survey Laboratory (NRCS-SSL) is conducting soil surveys, teaching local nationals about soil and water conservation, and building capacity in Afghanistan's agricultural sector.

Map of Afghanistan showing general area of soil sampling.

Map of Afghanistan showing soil sampling sites.

Note: Ed Tallyn, Jason Nemecek, and Bruce Dubee are USDA field soil scientists who sampled soils in several provinces of Afghanistan. They taught local nationals about soil and water conservation, and techniques for describing a soil. They also promoted capacity building of the agricultural sector in Afghanistan last year as part of USDA's effort to support the Afghanistan military campaign, Operation Enduring Freedom.
Typical landscape (mountain and river valley) in Kunar Province.
Iraq and United Arab Emirates—Middle East

In 2008, USDA helped facilitate two workshops in which Iraqi soil scientists discussed issues related to agricultural soil and water programs with relevant Iraqi ministries. The goal was to initiate actions to prevent erosion and improve water quality. The workshops concentrated on gypsiferous soils, which occur primarily in Iraq and parts of the southwestern desert in the United States.

In 2008, NRCS soil scientists provided a technical review of the soil survey for the United Arab Emirates, which became available in 2010.
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Soil survey crew working in United Arab Emirates.
Canada—North America

NRCS and West Virginia University host the North American node for the GlobalSoilMap.net project, a consortium creating a global digital soil map using state-of-the-art technologies. Several digital soil mapping projects are ongoing along the North Dakota and Manitoba borders, thanks to the partnership of Agriculture and Agri-Food Canada (AAFC) and the Canadian Soil Information Service (CanSIS). The global soil map will help promote better decisions on global issues such as food production and hunger eradication, climate change, and environmental degradation.

Map of soil bulk density using gridded soils information of the border between Canada and the United States.

Map of soil carbon using gridded soils information of the border between Canada and the United States.

Map of soil bulk density using gridded soils information of the border between Canada and the United States.
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**Memorial Day**

- May 8: First Full Moon
- May 23: Last New Moon
Mexico—North America

In 2009, NRCS converted a soil survey of Presidio el Jabali, Mexico, into U.S. soil taxonomy for the Food and Agriculture Organization of the United Nations (FAO). The area now uses the Web Soil Survey legend, descriptions, tables, reports, maps, and soil interpretations for conservation planning of ecological restoration.

Dr. Juan Manuel Torres Rojo, Director General for Mexico's National Forestry Commission (CONAFOR), invited the NRCS Soil Survey Division to collaborate in a series of workshops to assist Mexico in the assessment and restoration of degraded ecosystems. USDA’s soil taxonomy and ecological site descriptions will be used to assist Mexico in identifying the appropriate conservation practices and vegetation types for restoration and reforestation.

NRCS soil scientists Dr. Thomas Reinsch and Wayne Gabriel, describing a forest volcanic soil pedon north of Guadalajara (Nevado de Colima).

CONAFOR specialists gathered around Playa Lake describing a soil pit.

Web Soil Survey shows soil interpretations of Presidio el Jabali.

FAO General Soil Map of Mexico.
Typical soil profile in Presidio el Jabali, Mexico.
China—Asia

NRCS soil scientists Mike Wilson and John Kelley and Ming Chen (then at the University of Florida, Gainesville) traveled to China in 2002 on a technical exchange study tour. They visited several Chinese universities and government agencies focusing on soils and agriculture. As part of the technical exchange with professors at South China Agricultural University, they collected soil samples in Guangdong Province in southeastern China.

Soil profile sampled by South China Agricultural University and NRCS measuring soil properties in a highly manipulated, cultivated rice paddy landscape.

Soil sampling in Guangdong Province in southeastern China.

Rice paddy landscape and soil pit in Guangdong Province.
NRCS soil scientists have been involved in a cooperative soil climate monitoring project in the McMurdo Dry Valleys and other ice-free areas of the Ross Island Region of Antarctica since 1999 through the Global Climate Change Program. The cooperative link was established because soils in polar regions are thought to be particularly sensitive to climate change. Currently, seven soil climate stations in Antarctica monitor ambient atmospheric parameters, soil moisture, and soil temperature. They are part of an international cooperative project led by Landcare Research, Hamilton, New Zealand, and supported by Antarctic New Zealand in Christchurch.

Map of the Ross Sea region of Antarctica showing the locations of the seven soil climate stations.
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**August 2011**
Spain—Europe

A detailed soil survey of Catalonia, Spain, was undertaken in 1984 by the Departament d’Agricultura, Alimentació i Acció Rural (DAR) of the Generalitat de Catalunya. Working at a scale of 1:25,000, the survey used the U.S. system of soil taxonomy at the series level. The criteria used to define the more than 500 soil series in Catalonia are the following: parent material, effective depth, drainage class, textural class, content of gypsum and carbonate, and horizon thickness. The University of Catalonia would like to increase its knowledge of moisture and temperature regimes and ecological sites with the soil survey and has begun a workshop study with NCSS scientists.

Landscape of Catalonia.

Precipitation map.
September

Ancient terraces in Catalonia.
Thailand and Vietnam—Southeast Asia Coastal Protection With Mangrove Restoration

Mangrove reforestation is an important community adaptation strategy in Thailand and Vietnam for addressing sea level rise, coastal erosion, and fisheries' nursery restoration. As part of a U.S. Embassy Science Fellowship in Thailand, NRCS provided information on the Conservation Reserve Program and the Wetlands Reserve Program as excellent examples of incentive payments to encourage private landowners to invest in coastal and river forest buffer restoration. In addition, NRCS determined that the study of subaqueous soils with carbon measurements in these coastal systems has potential to identify adaptive solutions to land change in these sensitive and highly productive lands. Vietnam is also considering plans for dikes and canals in the Mekong Delta to control rice land irrigation, salt water intrusion, flooding, sediments, water quality, and drought/low flow/dam release from upstream sources as well as coastal erosion and sea level rise.

Satellite image of the Bay of Thailand.

Mangrove restoration in the Bay of Thailand.

Mangrove seedlings for planting.

Coastal mangrove restoration near Hue, Vietnam.
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Map of salt intrusion, Lower Mekong Delta Region in Southern Vietnam.
Chile—South America

For a 2008 international soil taxonomy workshop hosted by the University of Chile, the NRCS Soil Survey Laboratory assisted in a workshop field trip by sampling the soils and providing analyses of the soil horizons. For example, the Quillayes series with indurated horizons was sampled to represent a shallow soil formed in volcanic parent material and used for viticulture. Lessons learned from this area may be applied to similar volcanic Mediterranean climatic regions in Northern California in the United States.
Soils of the Quillayes series in Chile are shallow, well drained, and suited to vineyards.
Australia, World Soil Congress 2010, Universal Soil Classification

A new International Union of Soil Scientists (IUSS) committee has been formed to mediate a harmonization of the U.S. soil classification system (Soil Taxonomy), the European Commission World Reference Base (WRB), and the legacy FAO system into a universal soil classification. Criteria for a global system are:

- the relevance of the soil characteristics for environmental and management functions;
- the availability of soils information (legacy and modern); and
- the ability to map soil characteristics at a scale of 1:250,000 or smaller.

Ultimately, this will further the goal of soil scientists working together across the globe to “make a world of difference.”

Scientists from around the world compare classification systems for completeness.
Telephone poles tip with high clay soils.

Landscape of Vertisol in Darling Downs, Australia.

Water harvesting in heartlands of Australia.

Christmas Day

New Year's Eve
2011 EVENTS

January
January 4–8, Google Earth: Visualizing the Possibilities for Geoscience Education and Research, Google Inc. Headquarters (GooglePlex), Mountain View, California
January 24–27, Recent Advances in Understanding Production, Transfer, and Burial of Terrestrial and Marine Materials on the Earth Surface, American Geophysical Union (AGU) Chapman Conference, Oxnard, California

February
January 30–February 2, National Association of Conservation Districts (NACD) Annual Meeting, Nashville, Tennessee
February 6–10, Society for Range Management (SRM) Annual Meeting, Billings, Montana
February 10–13, Maryland Association for Environmental and Outdoor Education (MAEOE) Annual Conference: Educating for Sustainability, College Park, Maryland

March
March 6–9, Global Conference on Entomology, Chiang Mai, Thailand
March 21–25, Climates, Past Landscapes, and Civilizations, AGU Chapman Conference, Santa Fe, New Mexico

April
April 2–8, Diverse Rangelands for a Sustainable Society, Ninth International Rangeland Congress, Rosario, Argentina
April 9–13, American Planning Association 2011 National Planning Conference, Boston, Massachusetts
April 26–29, National Ecosystem and Mitigation Banking Conference, Baltimore, Maryland

May
May 2–6, Coastal Sediments ’11: Bringing Together Theory and Practice, Miami, Florida
May 2–13, United Nations Commission on Sustainable Development, 19th Session (CSD-19), New York, New York

June
June 6–10, 12th International Symposium on Soil and Plant Analysis (ISSPA), Mediterranean Agronomic Institute of Chania, Crete, Greece
June 27–29, Sixth International Conference: Climate Change—The Karst Record, Birmingham, United Kingdom

July

August
August 1–5, National Conference on Ecosystem Restoration (NCER 2011), Baltimore, Maryland
August 7–12, Ecological Society of America (ESA) Annual Meeting: Planetary Stewardship—Preserving and Enhancing Earth’s Life-Support Systems, Austin, Texas

September

October
October 5–9, International Conference of the Soils of Urban, Industrial, Traffic, Mining, and Military Areas (SUITMA) Working Group of the International Union of Soil Science (IUSS), Marrakech, Morocco
October 9–12, Geological Society of America Annual Meeting, Minneapolis, Minnesota

November
November 10–12, American Indian Science and Engineering Society (AISES) National Conference, Minneapolis, Minnesota

December
December 5–9, American Geophysical Union 2011 Fall Meeting, San Francisco, California
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This 2011 Planner is dedicated to the work of the NRCS World Soil Resources staff led by Dr. Hari Eswaran, who retired June 30, 2010, after 21 years of service.

Photos and References

All photos are from the NRCS Soil Survey Division photo library.


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