National Cooperative Soil Survey Newsletter

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Editor's Note

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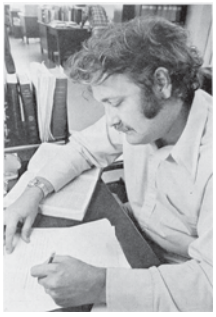
You are invited to submit stories for this newsletter to Stanley Anderson, National Soil Survey Center, Lincoln, Nebraska. Phone—402-437-5357; FAX—402-437-5336; email—stan.anderson@lin.usda.gov.



A Case for Urban Planning: Action Required

By Karl W. Hipple, National Leader, Soil Survey Interpretations, NRCS, National Soil Survey Center, Lincoln, Nebraska.

Historically, the Natural Resources Conservation Service (NRCS) and its predecessor, the Soil Conservation Service (SCS), have promoted land resource planning by providing technical assistance to land owners, land managers, other Federal Government agencies, multiple levels of State and local government, and other customers. The long-term goals of land resource planning have been to conserve, enhance, and protect our basic essential life-sustaining resources. The sustainability of the U.S. food and fiber production begins with the land but includes the fundamental associated component, water.

Each year, billions of dollars are spent worldwide on issues related to the protection, enhancement, and wise use of natural resources. The U.S. monitors conversion of its prime farmland and other natural resources through the National Resources Inventory (NRI). NRCS provides financial incentives to farmers and ranchers to improve land and water resources and to help direct land management policies. The U.S monitors net acres converted from agriculture to other land uses. Also, new tools, such as edge density measurements, are being developed to monitor fragmentation of agricultural land and measure the extent of the resulting interface between agriculture and other land uses. Some interesting trends are emerging as these new tools are developed and tested. Land conversion to residential use increases fragmentation, while conversion to commercial and industrial uses decreases fragmentation (Clark, Park, and Howell, 2006).

Olympic Sculpture Park, Seattle.

Garrett Hardin's controversial 1974 journal article "Lifeboat Ethics: The Case Against Helping the Poor" (www.garretthardinsociety.org), which focused mainly on the "food lifeboat," debates the question "Does everyone on earth have an equal right to an equal share of the earth's resources?" Its arguments are considered harsh by some, but they focus attention on sustaining worldwide food and fiber production by protecting the land resources needed to produce them. Additional contemporary "lifeboats," such as oil, minerals, greenhouse gases, and water, are now recognized as important.

Historically, humankind's living habits are inherently dynamic. They change as society's needs, values, living standards, and ambitions change. Our society successively changed from a mostly agrarian society to an urban one and from an urban society to a society migrating to suburban areas and, now, to exurbia. This process has

accelerated in the last 60 or 70 years. Small segments of society are beginning to return to inner-city areas, bringing urban renewal and redevelopment.

"Edge cities" are sprawl-enhancers that cluster office buildings around commercial strip malls and shopping malls. Loft apartments, row houses, green areas, pocket parks, and townhouses are key elements of contemporary redevelopment and urban renewal. They are often accompanied by the controversial legal instruments of eminent domain and by massive costs. Local governments use differential property assessment, agricultural zoning, and other tools to manage agricultural land conversions to alternative uses.

The U.S. Government recognizes the importance of maintaining adequate land resources to produce food and fiber. The USDA's Farm and Ranch Lands Protection Program (FRPP), first established in 1996 and reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill), has provided matching funds to State, tribal, and local governments and to nongovernmental organizations with existing farm and ranch land protection programs. These funds are used to purchase conservation easements that protect land that is to be developed. NRCS reports that, through 2003, more than 300,000 acres has been protected in 42 States (www.nrcs.usda.gov/programs/farmbill/2002/). Although very costly, these approaches appear to partially resolve a portion of the land use dilemma. Continued urban pressures, linked to robust increases in world population, reduce some of the gains. Many programs are intended to protect resources and guide development. Strong financial investment and political will are required to maximize these programs.

Urban wetland (photo courtesy of South Florida Water Management District).

Another problem of urbanization is the significant degradation of local wetland quality from urban storm-water runoff, sediment deposition, nutrient enrichment, chloride inputs, and pollutant accumulation (www.eli.org). The beneficial ecosystem roles of wetlands are marginalized by even small increments of poorly planned additional urbanization. Positive roles for soil scientists in the wetland arena are well documented.

Many people have moved 30 or 40 miles from a large urban area to enjoy the relaxed pace of rural life and the benefits of larger homes for less money, better schools, lower taxes, and less crime. Twenty or thirty years later, many of these people are again immersed in the typical urban issues and problems they thought they had left behind. In the 1950s, A.C. Spectorsky coined the term "exurbs" ("extra urban") to define these areas (www.arikah.net/encyclopedia/Exurb). Exurbia has been summarized as "living large in the middle of nowhere." Exurbs are urban dependent, and they typically emerge at the expense of the best farmland, rangeland, and forestland. Exurbs created around bodies of water often provide the initial mechanism for degraded water quality.

These phenomena place additional pressure on, and establish a new competition for, global land resources. New technologies, protocols, political tools, and perspectives are required to deal with areas that have changed fundamentally from production landscapes to consumption landscapes. The original landscape planning functions of soil, water, air, plants, and animals (SWAPA factors) are too often forgotten in urban settings until mitigation efforts are required to address structural failures and/or major resource-related problems retroactively.

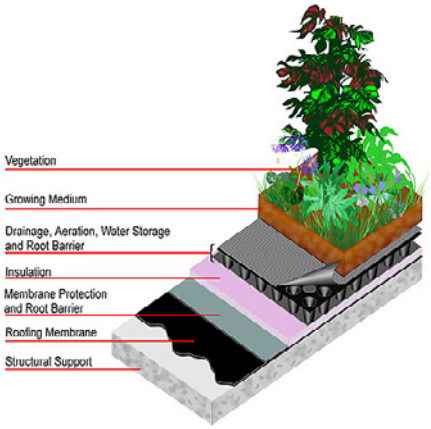
Regional, city, urban, and county planners provide new concepts, such as Transit Oriented Development (TOD), Location Efficient Development (LED), Green Area Ratios (GARs), and High-Density Clustered Development, to make planning activities more relevant, efficient, scientific, and palatable to government entities and to citizens. One goal of GARs is to mitigate progressively extensive soil impermeability as urban areas coalesce and become high-density urban areas. Many American cities are now dividing their infrastructure into "gray" and "green" categories. The gray infrastructure includes roads, sidewalks, utilities, and buildings, and the green infrastructure includes trees, shrubs, soils, and open spaces. The Funders' Network for Smart Growth and Livable Communities (www.fundersnetwork.org) helps organizations to build more livable communities by developing multidisciplinary issue papers on aspects of smart growth and by identifying sources of funds that assist growth organizations in the development of plans for sustainable urbanization. By managing their green infrastructure, cities are rewarded with cost-effective methods for managing air and water quality, storm water, carbon storage, and urban heat buildup. The skills of soil scientists are directly

related to green infrastructure components and their interactions.

A strong segment of industry now supplies planning and technologies for the green infrastructure. Green roofs are one component of green technology that receive added interest and qualify for tax incentives in many areas. Green roofs are costly to install but save owners money in the long term. An example is the Ford Motor Company Rouge Truck Plant Assembly building in Dearborn, Michigan. It has 10.4 acres of green roof and is recognized in the *Guinness World Book of Records* as the largest green roof in the world.

In many cases, new planning tools and activities are more science-based than they were before. Smart Growth initiatives are spreading across the nation and are making an impact on land conversion through a variety of programs that use both private and public funds. The urban-suburban planning term "urban ecology" has been used for about 20 years. It reflects a trend of accounting for and maximizing ecological interactions among and between the basic natural landscape factors. The urban-suburban planning interface with science (soil and landscape functions) is a significant area demanding the direct involvement of soil scientists.

Example of green roofs.



Green roof design components

How do soil scientists fit into urban planning and land development solutions? What products do urban-suburban planners want or need from soil scientists? What skills are needed to manage the green infrastructure of cities? These are questions soil scientists must address. Soil scientists have the skills to respond and must become fundamental partners with community planners in the development of community expansion scenarios.

For many years, NRCS soil scientists have assumed that we knew what our urban customers needed and wanted. We continued to focus on supporting existing interpretations or developing or enhancing interpretations aligned with agronomic, forestland, and rangeland needs. Soil scientists worked with a limited urban customer base that underestimated the needs of urban planners. Traditional soil survey products do not necessarily meet the needs of all involved stakeholders.

The National Soil Survey Center (NSSC) in Lincoln, Nebraska, has been responding to NRCS staff requests for nontraditional products and services. There remains a significant workload in this arena. States are working closely with urban planners and conservation districts to develop new products and services. Joyce Scheyer, Urban Soil Interpretation Specialist at the NSSC, has been coordinating efforts to expand the urban soil interpretations product line and provide additional assistance to nontraditional customers. The *Urban Soil Primer*, the *Land Development Soil Guide* slated for a 2007 release, and the Urban Soils Long-Range Strategic Plan are examples of NSSC's efforts to realign strategic products with the needs of urban customers. The National Soil Interpretations Advisory Group (NSIAG) is working to provide Soil Survey Division leadership recommendations for further developing and enhancing NCSS urban products and services.

NSIAG's Urban Subcommittee conducted a listening session at the NSSC in Lincoln. Key members of Lincoln's Community Planning Team, planners from adjacent small towns, a District Conservationist from the St. Louis area, and a planner from Wildwood, Missouri, were invited to speak and detail the tools needed and products used for community planning. Soil surveys and existing soil interpretations were not the main tools identified by the majority of this group. Some planners used soil survey information, but most agreed that soil data were preferred to standard soil interpretations. One presenter identified a custom product that had been designed for them (a topsoil mining interpretation). The design and use of

this interpretation provide new dimensions to urban development and the established and revered NRCS concepts of prime farmland, unique farmland, and farmland of statewide and local importance..

The *Urban Soil Primer*, which focusses on soil function, is intended to cause nontechnical urbanites to look at their environment in a new manner. Urban soil interpretations must reflect landscape function and provide urban planners tools to combat urban sprawl and use land resources wisely. Soil scientists must interact with specialists from other disciplines in the community planning arena, including engineers, geologists, and ecologists. Soil scientists must learn to be comfortable and function successfully within the political environment.

The NSSC's Soil Survey Interpretations staff is working to respond to urban-suburban customer needs. A cadre of soil scientists that have urban knowledge and experience can assist the NSSC in addressing urban issues. An urban needs survey that is under development will provide those attending the annual meeting of the American Planning Association (APA) in Philadelphia in April 2007 a chance to inform NRCS of their needs. Along with demonstrating some of the existing NCSS products, including LESA (Land Evaluation and Site Assessment), Web Soil Survey, plant materials applications, and Soil Data Viewer, NRCS intends to ask the APA members what they need from us. As we reach out to these nontraditional users, soil scientists must be creative and flexible in order to assist urban customers. The training of soil scientists provides knowledge and skills that tie urban environmental factors and functions together in a meaningful package. Soil scientists must become more proactive in the urban planning arena.

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Retirement of Dewayne Mays

Major Dewayne Mays, Assistant National Leader, Soil Survey Investigations, at the National Soil Survey Center in Lincoln, Nebraska, retired effective January 3, 2007, after more than 39 years of federal service. Dewayne was born in Lexa, Arkansas. He obtained his B.S. in Agronomy from the University of Arkansas-Pine Bluff, his M.S. in Soil Management from Kansas State University, and his Ph.D. in Agronomy from the University of Nebraska-Lincoln.

Dewayne started his career with the Soil Conservation Service in Nacogdoches, Texas, as a student trainee and later served as a soil scientist there. In April 1977, he transferred from Athens, Texas, to the National Soil Survey Laboratory in Lincoln, Nebraska. He assumed his duties as lead scientist in the Particle Size Analysis Section of the laboratory and later became supervisory soil scientist. When the National Soil Survey Center was formed in 1988, Dewayne was selected for a position on the Soil Interpretations Staff. In 1994, he returned to the laboratory as Head. He assumed his present position in 2004.

During his long and productive career, Dewayne made important contributions to a variety of soil science concerns, including efforts in the initial development and testing of fuzzy logic criteria used in soil interpretations, dynamics of soil phosphorus in agricultural landscapes, and soil micromorphology. During his tenure with the Soil Survey Laboratory, improvements were made in methods analyses, detection limits, and quality assurance. Dewayne was very active in educational activities within NRCS and in recruiting new employees to work in the soil survey program.

Dewayne and his wife, Jareldine, plan to remain in Lincoln for the time being. ■

2007 National Cooperative Soil Survey National Conference

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

The 2007 NCSS National Conference will be held in Madison, Wisconsin, June 3-8. The theme of the conference is "Soil Survey—Future Directions in Soil Health and Supporting Productive Lands." For information about registration, accommodations, the agenda, contacts, committees, and tours, click on the following:

http://soils.usda.gov/partnerships/ncss/conferences/2007_national/

The three standing committees and three in-house committees will begin deliberations by email and teleconference in late February and will give final reports at the conference. Any NCSS cooperators or interested parties are welcome to review the charges of the committees and contribute comments to the reports. ■

Kit Paris's Island Adventures

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

In the course of editing the soil survey of the Channel Islands in California, I sent Kit Paris, Soil Quality Specialist, NRCS, Davis, California, the following message after he provided me some information about the survey area:

Kit—

Thanks for the info. I have an idea. Let's go visit CA688. It's 10 degrees F here and dropping.

Kit responded as follows:

It may not be as warm and cuddly on the Channel Islands as you think. This time of year it is rather foggy and if that isn't present, it gets windy. But it sure is warmer than 10 degrees.

That survey was a real adventure as there are no commercial facilities of any kind. We stayed in old Navy barracks or old ranch houses, some without electricity or hot water. You have to ride a boat with all your food for a week-long stay. My first visit, we had to storm the beach in small skiffs and hand load luggage on to the island because the pier was under repair. It wasn't all so Spartan at the Navy Base or Research station, but phone and especially computer connections were difficult at best.

I will say my favorite place was an old ranch house called Rancho Del Norte. There was no electricity, but the refrigerator ran on propane and we had hot water, kerosene lanterns, and bunk beds. It was real cute and it was reportedly a favorite stay of musician Joe Walsh of the Eagles (this was on Nature Conservancy land actually). Here is a picture of the ranch house.

Rancho Del Norte.

Gull Island off the coast of Santa Cruz Island.

Subsequent messages from Kit:

Stan,

I have been doing a lot of islands lately and they all have different challenges than mainland soils mapping. Like the trip I took to do a Field Review on the Northern Mariana Islands where we lived on a boat and had to land an 8-foot tub on the rocky beach every day. And I had it easy—the crew was camping out for 20 to 40 days at a time.

The tub reference may not be nautically correct terminology, but it was a pretty small boat for the roughness of the ocean. I will see if we have a picture. The problem is that we were all so busy trying to stay out of the sea, sometime pictures weren't taken. I think one of the other characters in this saga may have some photos.

Here are some conveyances used in these surveys. The Ataloa was used in the Marianas Islands. It is a 40-foot fishing boat that was sunk off the coast of Alamagan Island after the survey was through.

The Prisoner's Harbor picture is from the back of the National Park Service boat leaving Santa Cruz Island (Channel Islands).

The Catalina picture just shows the comparative luxury of the latest island survey.

Kit

Riding to work in a "tub."

The Ataloa.

Volcanic hills west of Prisoner's Harbor.

Avalon Harbor, Catalina Island.

Stan,

I told you this "boat" was a tub. Here's proof that my perception was pretty close. The other picture shows the best of the "beaches" we landed on. These pictures came from Gary Parks, soil scientist from Hutchinson, KS, who was on detail for the Marianas project.

Kit

Beach on Sarigan Island in the Marianas.

Sea gulls on Santa Barbara Island.

Working on Santa Barbara Island.

Mike Golden and Chris Smith coming ashore on Ngerchong Island.

Stan,

This was the last island mapped—Santa Barbara Island (Channel Islands). Matthew Ballmer and Carrie Alexander had to stay out there for a whole week—no trees, just tons of sea gulls and plenty of fog. I understand the nasty old birds were a nuisance and the guano was rather prevalent.

Kit

Stan,

I was trying to assemble pictures of pedons on our Palau Soil Survey update project and came across this picture of the Final Field Review. This shows Mike Golden and Chris Smith coming ashore on Ngerchong Island in the Republic of Palau. I worked on (and am working on) this survey, but didn't actually get to go on this trip. They are going to one of the Rock Islands of Palau to evaluate the mapping on the limestone islands. ■

A Digital Collection of Publications on Soil Survey and Soil Classification

By William R. Effland, Ph.D., Soil Scientist, USDA, National Resources Conservation Service.

The two-volume CD set "A Digital Collection of Selected Historical Publications on Soil Survey and Soil Classification in the United States of America" comprises a selection of scanned maps, photographs, unpublished reports, and government publications that provide some historical perspective on soil survey activities and the development of soil classification in the United States. The objectives of the project were (1) to preserve and increase access to historical soil maps and "gray literature" and (2) to encourage research, study, and use of historical documents for soil science and soil survey. The scanned documents cover various topics, such as tropical soils, the history of the National Cooperative Soil Survey, historical development and theory of soil classification, field excursions organized for 1st and 7th International Congresses of Soil Science, soil survey investigations, and *Soil Taxonomy*. The series of historical soil maps, 1909-1998, illustrates several conceptual changes in soil geography and soil classification at the national and regional (province-based) scales.

Project contributors were William R. Effland, Douglas Helms, Hari Eswaran, Paul Reich, Sharon Waltman and Amy Yeh. Initially, Douglas Helms suggested scanning several historical documents for distribution at the 18th World Congress of Soil Science in Philadelphia, July 9 to 15, 2006. Several years earlier, in conjunction with a university soil geography class,

Sharon Waltman provided the original version of Marbut's 1931 soil map, which helped catalyze scanning additional national scale soil maps. Amy Yeh meticulously scanned most of the reports, including the five-volume bibliography of soils of the tropics by A.C. Orvedal.

The project was a preliminary effort to distribute selected historical maps and documents. Some scanned documents may have minor errors in spelling, etc. because of the limitations associated with optical character recognition (OCR) technology and various page formats that were difficult to scan correctly. Interested persons with questions about the scanned files or requests for the CDs can email the project leader at:

william.effland@wdc.usda.gov

The "Publication Sources" lists the references for each report, map, or photograph. The list is organized by "folder" name. Specific references are located within each folder

CD Volume 1 Contents

Folder = Bibliography_Tropical_Soils

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Photograph of 1960 Field Trip in Wisconsin with the 7th International Congress of Soil Science

Photograph of 1960 Field Trip in California with the 7th International Congress of Soil Science

Photograph of 1960 Field Trip in Iowa with the 7th International Congress of Soil Science. Symbol and Motto of 7th International Congress of Soil Science, 1960

Folder = Posters

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1909 United States Soil Provinces
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1913 US soil map (Figure 4)
United States soil map [map]. Scale not given. IN: Marbut, C.F., H.H. Bennett, J.E. Lapham, and M.H. Lapham. 1913. Soils of the United States. U.S. Department of Agriculture, Bureau of Soils Bulletin 96 (Figure 4). Washington, D.C.

1913 Soil Provinces and Soil Regions of the United States (Plate II)
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CD Volume 2 Contents

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