

Soil Surveys: A Useful Tool in Community Planning

I'm pleased to be with you in a historic place in the United States, in terms of people and natural resources--

. Glaciers gave your county quite a face-lifting about 15,000 years ago, and began the soil-forming processes that produced the land you know today.

. The Indians of North America used this area for hundreds of years, and then it became one of the first areas of the Great Lakes country to be visited by white men. It has had a full history since then, under many flags.

. Niagara Falls has become the honeymoon capital of the world. Not so many people know that Niagara Falls also is the largest electrochemical and electrometallurgical center in the world because of the tremendous power of the Niagara River.

I'm pleased to join you in celebrating another step in the soil survey of Niagara County. I say another step because for many of you this new publication does not mark a beginning in the use of some of the information in it. You have been peeking at the field sheets for some time, and getting help from SCS people in interpreting the data in terms of your land and your objectives.

Material for talk by Norman A. Berg, Associate Administrator, Soil Conservation Service, at a meeting to present the Niagara County soil survey report, Lockport, New York, May 15, 1973.

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I say another step because publication should not mark the end of the line for curiosity about the land in Niagara County and its capabilities and needs. Unless the facts in this document are understood and used to produce ideas and plans and decisions and action and a better environment, then this labor of several years may as well be a ~~booster seat~~ or a door stop.

I would like to talk for a few minutes today about the published soil survey of your county and what it can and can't do for you, and mention the progress we've made in New York and throughout the United States in soil surveys. Then I'd like to relate the soil survey to some broader questions of land use planning and land use policy that are of current concern in Lockport ^{Niagara Co.} and Albany and Washington.

First of all, there is a lot of interesting information in this thick book. It took a long time and a ~~lot of~~ people to compile it--12 man-years of work by soil scientists to map and describe the soils, at a cost of \$145,000, plus technical supervision and editing that took another \$15,000. As the cover indicates, most soil surveys in the State are done cooperatively by the Soil Conservation Service and Cornell University's Agricultural Experiment Station. But important inputs also are provided by many others, including several colleges at Cornell; the College of Environmental Science and Forestry at Syracuse University; and New York's Department of Transportation, Cooperative Extension Service, and Department of Environmental Conservation.

From all these efforts we've put together a book of 200 pages of text and tables, nearly 70 detailed maps, and a general soil map in the back.

There is specific technical resource information for people who own or use a tract of land and must make decisions about it. There's also an opportunity in here for every citizen in Niagara County to learn more about his county. Take a look at the general soil map in the pocket in the back. Your county is made up of dozens of kinds of soil, with differences in the way they were formed, the way they look, and the way they behave. But in general there are 11 soil associations or groups of soils you usually find together in some regular pattern. Some were formed by the glaciers that pushed through this part of the country and then melted away; some were formed from the sediment deposited when much of your county was part of a glacial lake.

You can see that Lockport and many of the other communities in Niagara County are built on a grouping of soils formed in glacial till. They're pretty deep and are pretty likely to have a fine textured subsoil. They're also subject to some drainage problems, although the areas to the south and west are more likely to have wet feet. Most of Route 104 that bisects the county appears to be built on soils that have a more coarse-textured subsoil on top of gravel and sand.

J. Underwood

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This map is highly generalized but it can help you get oriented and it can be used for some general ^{field} planning. Right next to the general map in the published survey is a map that is broken up into squares to help you find which of the detailed maps you want. Look at any one of those, say sheet 40 that shows Lockport, and you'll see that the pattern of soils is pretty complex. Even here, there is some generalization, because it isn't practical to show on a map all the small, scattered bits of soil of some other kind that have been seen in an area that is mostly one type. The soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management. But these sheets give a lot more detail than the generalized map. What we do in the soil survey is try to strike a happy medium between the great detail we could produce and the amount of information any one user would want. We try to select a scale and level of detail that is useable, and provide a practical summary of soil characteristics that people can understand and use.

The purpose of the text and tables in the survey is to explain what the symbols on the maps mean--what the soils are called, what they are like, and what their use is or could be.

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The first section gives a good deal of information about the soil associations that are marked on the general soil map. You can learn, for example, that soils in the Lockport association are not very good for farming or community development, but have a fairly good potential for wildlife. Soils in the Howard-Arkport-Phelps association support some of the best fruit farms in the county; but homes built on these soils are prone to have wet basements, and erosion can be a serious hazard along steep bluffs.

The next section describes the use and management of the soils for farming purposes, woodland, wildlife habitat, engineering uses, and many non-farm uses. Helping farmers understand their soils as a base for land use and treatment decisions has been a major part of SCS technical assistance for many years. But today's soil survey also can tell you a particular soil's suitability as a source of topsoil or sand and gravel. It can suggest soil features that might affect its suitability for highway location, foundations, ponds, drainage and irrigation systems, terraces, and waterways. It can suggest some limitations for use of the soil for homesites; septic tank effluent disposal; streets and parking lots; underground utilities; campsites; hiking and riding trails; picnic and sports areas; and lawns and fairways.

The third section gives detailed descriptions of each soil series in Niagara County. These get down to the nitty-gritty of physical and chemical characteristics that help soil scientists and engineers and others make highly technical interpretations. But they still make pretty interesting reading.

to those who want to dig a little.

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I think the next two sections make interesting reading for anyone. The part beginning on page 184 talks about how soils were formed, and where they fit into the national system of naming soils. The last part is an excellent description of the county you live in--its physical makeup, water supply, climate, history, agriculture, industry, and community facilities. Finally, there's a useful glossary of some of the terms in the survey.

In all, the Niagara County soil survey should be a useful tool for everyone from the new resident to the farmer, engineer, urban planner, and wildlife enthusiast. In fact, I understand that your survey information has already been used for such things as:

- . Planning and applying conservation practices on farms
- . Locating suitable soils for disposal of waste oil
- . Locating sources of sand and gravel
- . Choosing alternate highway routes to preserve valuable farm land
- . Appraising the value of land for tax purposes
- . Choosing the best grape-growing areas
- . Disposing of milkhouse wastes
- . Locating a site for Niagara County Community College
- . Checking the soil before buying house lots
- . Seeking answers to some unusual soil problems such as a sinkhole here in Lockport.

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If the information in the survey is properly interpreted and used, it should have a long and useful life--at least 25 years. It should pay for itself within a year, so the rest is gravy. For each dollar of soil survey cost, the benefits often reach \$45 or more for wooded areas; more than \$60 for mixed agricultural areas; and more than \$120 for land surrounding the fast-expanding metropolitan areas.

The higher benefits in urbanizing areas are due to the high investments for land and buildings and equipment, and to the fact that once you commit a resource to concrete it is essentially irretrievable for another purpose.

Even so, the soil survey won't solve all your urban-fringe problems for you. If you're considering heavy buildings or roads or pipelines, the soil survey is only a guide or a warning flag. You'll need on-site evaluation by soil scientists and geologists and engineers. For farming or gardening purposes, though, the detail probably is sufficient.

The soil survey also is very useful as a base map on which planners can plot many other kinds of useful data and interpretations. We couldn't include all the color maps needed to interpret soil facts for the variety of potential land uses--the publication would be 15 inches thick instead of one and it wouldn't be available for several years. So the user must make his own overlays for his desired uses. This isn't too difficult a job.

The soil survey is a basic package of resource information. You should understand its uses and limitations--what you can safely do with it and what you can't. I think you'll find that the more you work with the soil survey, the more you'll learn.

There are more than 30 soil scientists working in New York on soil surveys, and about half of the counties have been mapped. The long-range goal is to complete the soil survey of the state in about ten years. Since 1962, 25 counties have provided local funds to speed up surveys. This is helping considerably. For towns within a county where need for soils information is more urgent, interim or special reports can be made to facilitate immediate use of the survey facts. Our goal is to get basic resource data in the hands of decision makers as early as possible to obtain the best use of land in accord with environmental concerns.

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In the Nation as a whole, 815 million acres of detailed and reconnaissance soil surveys have been mapped so far--more than 40 million acres last year. Last year we did nearly 450 interim or special reports, and the figure should reach nearly 600 this fiscal year. Last year federal agencies and local governments contributed over a million and a half dollars to speed up soil surveys for use in land-use planning.

What's the rush? New Yorkers inherited an abundance of natural resources. From that reservoir, earlier generations carved a frontier society that has since progressed to a strong mixture of farming, industry, and a highly urbanized way of life. Today, your natural resources are still impressive. But they can continue to sustain New York's thriving economy only as long as those who use them realize their true value and take precautions to retain their useful properties.

New Yorkers are more numerous, more affluent, and more mobile than ever before, placing increasingly heavy demands on their resources. Urban centers in your state swallow nearly 20,000 acres of cropland a year-- Buffalo included. Not all of this development has enhanced the beauty or the usefulness of the landscape. In some areas of the country where development is not carefully guided, trees and open space and unique agricultural land such as grape-growing areas fall victim to the bulldozer, fish die in polluted rivers, and the air is blackened by pollutants from crowded highways and factories. "Progress" there means the deterioration of environmental quality.

But in other parts of America, communities are actively engaged in making sure that progress is for the better. To provide quality living in the face of rapid urbanization in the 1970's and beyond will require the best efforts of all of us in resource management.

How land and related resources should be used is one of the major issues any community faces today. Some rural communities may well say, "We can wait a while on land-use policy decisions." But as you travel to rural communities in almost any State, using major interstate highways, you do see many evidences of rapid urban development along the highway corridors. Too many communities were not prepared to fully guide that growth and it is not all good or desirable.

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We have tended to take the land for granted, perhaps because of our long frontier tradition. We need now to renew our sense of stewardship for the land. Indeed, in no area of our life as a people is there a greater opportunity for personal and community responsibility that exists than with respect to land-use.

The current nationwide concern and interest in land-use policy grows out of a concern that the Nation may run out of land resources for critical uses, including assurance of a quality environment.

Improved use of non-Federal lands is perhaps the number one environmental priority facing the Nation today. The problems of air and water pollution have tended to seize public attention because of their obvious and immediate impacts on human health and well-being. Our Nation has responded to this concern. We have moved to bring these problems under control. Certainly, we still have a long way to go before we can be satisfied with air and water quality levels. Yet we have turned the corner in dealing with pollution. We are beginning to see positive evidence of improvement in specific areas. We also have seen the remarkable recovery capacity demonstrated by the natural environment.

Thus, as we reduce or stop the introduction of pollutants into the air and water, the natural biotic systems recover and resource quality can be restored. In the case of land-use, however, man-induced changes are more apt to be irreversible. The drained wetland, the flooded valley, the prime farmland that is subdivided or paved can never be restored in any practical sense. Land-use decisions tend to be permanent and thereby limit future options.

With a still growing population and, even more importantly, with a population that continues to concentrate in ever greater densities, it is imperative that we increasingly make some land-use choices with more than a local overview. Effective land-use policy should not be looked upon as a matter of stopping decisions or of restricting freedom of choice but rather of (1) assuring that land-use choices are made wisely, (2) that a full range of alternatives is considered, and (3) that decisions which impact broadly on society are made in a process that provides reasonable opportunity for the interests of society as a whole to be taken into account.

Perhaps the most urgent demand on our land resource base today, and one which will remain important for some time to come, is the imbalance in living space. Some 1500 of the 3000 counties lost population for two decades. Other major issues concerning the Nation's land resources arise from time to time, including prime land used for agriculture and the ways in which returns from its use are distributed among those who work on the land. National and State land-use policy can provide a means for examining important land use issues as a basis for designating policy and program objectives. Once the objectives have been agreed upon, there are many ways to implement plans and programs. And there is much experience with land-use planning--mostly by local governments. Many of the techniques for land-use planning can be used in implementing a State or National policy, but new State legislation and change in attitude also will be required before the States can become truly effective in carrying out land-use planning and control or regulatory processes.