Dec 3rd, 12:00 AM

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DIGITAL SOIL MAPS FOR IOWA

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Introduction

The Iowa Cooperative Soil Survey (ICSS) initiated a program in 1987 to transfer printed soil maps in each county soil survey report to an electronic database. The purpose of this cooperative project is to provide a computerized database of the county soil maps to support federal, state, local and private sector decision-making concerning use and management of Iowa's soil resources.

Digitized soil maps and a computerized file of soil attributes and interpretations result in ready access to each county soil survey. Users have access to a one-to-one transfer of published soil maps in an electronic format as well as updated interpretations and a listing of soil properties not printed in published soil survey.

Computer software for the digitized soils data is available through the Iowa Soils Program (ISOIL). ISOIL consists of digital soil survey maps and the Iowa Soil Properties and Interpretations Database (ISPAID). The computerized soil map data provides users with the capability to view one legal land section (640 acres if uncorrected during the original land survey), to manipulate the soil map units (soil delineations) within the section and to summarize the interpretations and properties on a map unit basis.

The ISOIL program consists of a total of 80 different soil interpretations and soil properties for each soil map unit. Examples of soil interpretations include selected crop yield estimates, corn suitability rating, land capability classes, and soil permeability classes. Soil properties include such attributes as depth to carbonates, topsoil thickness, percent organic matter in the surface layer, and cation exchange capacity.

The ISOIL program provides users with the capability to delineate sub-tracts within a legal land section. Sub-tracts within a legal section can be of any size and shape. In addition, users can calculate the acreage by soil map unit within the sub-tract and calculate weighted averages for different interpretations for the land section or sub-tracts within the section.
Hardware Requirements and Recommendations

Requirements:

There are two sets of requirements that must be met by the user in hardware selection in order to support the development of soil survey map data and run software programs used to access, display, and interpret digital soil maps.

The soil map data requires that the microcomputer have either a 5 1/4 inch or a 3 1/2 inch floppy disk drive for data input. A forty M-byte (40M-byte) hard disk is needed to store the data if the coverage of an entire county is being acquired. For a few of the larger Iowa counties, a sixty M-byte (60M-byte) hard disk may be necessary. The soil survey map data is delivered in tier-range increments of approximately 1.5M-bytes per legal township. A standard 16-township county will occupy approximately 25M-bytes of the 40M-byte hard disk. The remaining storage on the hard disk will contain programs, interpretive data files and extracts from the map data created by the user as well as other user programs.

The second set of requirements relates to the programs used to retrieve, interpret and display soils information from databases. These programs require an EGA color graphics card with 256K of video memory, MS-DOS operating system (2.2 or later version and IBM-PC compatible) and at least 512K bytes of memory (RAM).

A summary of requirements includes:

- IBM-PC compatible microcomputer
- 5 1/4 or 3 1/2 inch floppy drive system
- 40M-byte hard disk system for an entire county (60M-byte for larger counties)
- 512 bytes of memory (RAM)
- Minimum of EGA color display adapter with 256K of video memory and color monitor
- MS-DOS operating system (2.2 or later version)

Users that are now considering purchase options are encouraged to consider as a minimum a 386/33 IBM compatible microcomputer with 4M-byte of RAM, 120M-byte hard drive, SVGA color monitor, either or both 5 1/4 or 3 1/2 inch high-density floppy drive(s), and a current DOS operating system. This recommendation is based on future capabilities and potentials of the program and its ability to interact with other potential software.
Optional Equipment:

Digitizing tablet: This allows the user to delineate land areas from an aerial photograph or other map sources. Any tablet supporting summagraphics data format is compatible with the program.

Recommendations:

Printers: The current software supports the HP Paintjet, the HP Laserjet and any dot matrix printer that can emulate an Epson.

Users need to check with staff at the ICSS Resource Facility concerning supported printers and digitizing tablets before purchasing the ISOIL software.

Digital Soil Survey Maps - Availability

Users can purchase the digital soil survey maps on a legal township basis (36 sections) or on a whole county basis. Inquiries as to availability of these maps can be directed to: ICSS Resource Facility, 2142 Agronomy Hall, Iowa State University, Ames, IA 50011; phone - 515/294-5429.

As of December 1, 1992, there are 57 counties completed in digital form and released for purchase. The project is scheduled to release digital maps for each Iowa county by the end of calendar year 1993 or when the soil survey fieldwork is completed and the soil legend correlation is finalized. Counties where fieldwork is currently underway include Humboldt, Monona, Polk and Van Buren. A list of available county computer databases is available from the ICSS Resource Facility.

Cooperating Agencies

The Digital Soil Survey Maps Program is a product of the Iowa Cooperative Soil Survey Program. Cooperating agencies are:

Cooperative Extension Service
Iowa State University

Iowa Agriculture and Home Economics Experiment Station
Iowa State University

Iowa Department of Agriculture and Land Stewardship
Division of Soil Conservation

USDA Soil Conservation Service