THE PLANTS DATABASE: PROVIDING BASIC PLANT INFORMATION

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ABSTRACT

The PLANTS database provides basic plant information to the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), its clients, cooperators, and the general public via the World Wide Web (Fig. 1). The foundation of PLANTS is a taxonomic backbone (checklist) of the vascular and nonvascular plants of North America (north of Mexico) and United States territories in the Caribbean and Pacific regions. Attribute data are appended to this backbone pertaining to distribution, vegetative specifications, nativity, federal and state status, crop data, growth form, growth parameters, species abstracts, and images.

KEYWORDS

Plant, database, checklist, taxonomy, crop, attributes, agriculture, biodiversity, distribution

INTRODUCTION

PLANTS (Plant List of Attributes, Nomeclature, Taxonomy, and Symbols) is a dynamic database that evolved from the National List of Scientific Plant Names (USDA, SCS 1982) or NLSPN. The NLSPN initially began life about 1960 as a loose-leaf binder system that was used by the Natural Resources Conservation Service (then known as the Soil Conservation Service) to standardize scientific plant names and their representative alphanumeric symbols to facilitate range survey data collection and data entry activities.

Currently PLANTS provides a broad array of plant information both within and outside of the NRCS. Of particular importance is the use of PLANTS to serve as the automation standard for plant names and symbols across disciplines and agencies. This standardization fosters the exchange of natural resources information across the artificial boundaries between disciplines and agencies. Additionally, the PLANTS database has expanded to function as the storage and dissemination facility for plant data that are utilized in many specific database and decision-making tools used by natural resource agencies.

METHODS

The responsibility for PLANTS resides with the National Plant Data Center (NPDC), located on the campus of Southern University, Baton Rouge, Louisiana USA. This Center is one of the three national centers (soils, plants, and climate) administered by the NRCS Deputy Chief for Soil Science and Resource Assessment, Washington, D.C. Working both with cooperators and internally, the NPDC staff develop and integrate data into the PLANTS database. Software development is undertaken by the NRCS' Information Technology Center assisted by the USDA, Office of Information Resources Management, National Computer Center, Fort Collins, Colorado USA.

The data within the PLANTS database are derived from many sources, primarily from the plant sciences community. The backbone is an outgrowth of checklists published in hard copy, such as that by Kartesz (1994) for vascular plants. Much of the data are compiled through cooperative relationships with universities, botanical gardens, and plant specialists. The development of the foundation checklists that comprise the taxonomic backbone are coordinated by botanical specialists. The vascular plant checklist is developed by Dr. John Kartesz, The Biota of North America Program (BONAP), Chapel Hill, North Carolina; the mosses by Dr. Marshall Crosby, Missouri Botanical Garden, St. Louis, Missouri; the lichens by Dr. Robert Egan, University of Nebraska, Omaha, Nebraska; and the liverworts by Drs. Raymond Stotler and Barbara Crandall-Stotler, Southern Illinois University, Carbondale, Illinois. Major updates of these data are on a 1-2 year cycle.

Attribute data (Fig. 2) are linked to the appropriate scientific name and bibliographic data. Work is currently underway to integrate images and bibliographic data associated with individual species information. Cooperative relationships are also being developed with other non-traditional data developers, such as amateur photographers associated with botanical gardens throughout the country to obtain images of the native and naturalized plants of the nation and institutions interested in biocontrol for expanded information on noxious weeds.

PLANTS is currently maintained in an Oracle™ database with various reports available via a World Wide Web browser (the current version of Netscape™ is recommended) or telnet session. The front end is developed in OraPerl™. Not all data are currently accessible via the Web site. Further report capabilities will be developed following user needs and comments. The database and its related applications are proposed for redesign activities in 1997-98.

RESULTS AND DISCUSSION

The PLANTS database receives 14,000+ hits a month via the Web and its use is growing about twenty percent per month. PLANTS provides software applications across the NRCS with common plant data for use in natural resource databases and decision-making software. PLANTS information is also available to the 3,000 NRCS Field Offices servicing counties throughout the U.S. via the NRCS Field Office Computing System (FOCS). Selected PLANTS information is accessible through the FOCS Plants module to service local applications, such as the Grazing Land Administration software, plus the module provides clients plant information directly.

The PLANTS taxonomic backbone is also being utilized by a federation of U.S. Federal agencies (Agricultural Research Service, Environmental Protection Agency, Geological Survey, National Biological Service, National Oceanic and Atmospheric Administration, Natural Resources Conservation Service, and Smithsonian Institution) as the plant portion of the Interagency Taxonomic Information System (1996) database. The aim of the Interagency Taxonomic Information System (ITIS) is to provide U.S. Federal agencies with a taxonomic backbone for all biota through cooperation with taxonomic specialists. ITIS is focusing on the biota of the U.S. and its territories.

Also, the NRCS is cooperating with the U.S. Forest Service and the Bureau of Land Management to integrate their information systems and processes with PLANTS as their plant information foundation. This will permit increased information exchange to occur within these agencies and with cooperating agencies and organizations. From a more general perspective, the PLANTS Interagency Advisory Team

consisting of representatives from fourteen U.S. Federal agencies periodically meets to discuss plant information needs and make recommendations to NRCS regarding their common needs from PLANTS.

REFERENCES

Interagency Taxonomic Information System. 1996. ITIS database (http://www.itis.usda.gov). National Biological Service, Washington, D.C.

Kartesz, John T. 1994. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. Volumes 1 and 2. 2nd Edition. Timber Press, Portland, Oregon.

USDA, NRCS. 1996. The PLANTS database. National Plant Data Center, Baton Rouge, Louisiana 70874-4490.

USDA, SCS. 1982 National list of scientific plant names. Volumes 1 and 2. SCS-TP-159. Washington, D.C.

Figure 1

PLANTS on the Web

http://plants.usda.gov

Figure 2

Some PLANTS Data Items

common name

accepted scientific name

synonyms

plant symbol

state/county distribution

habit

U.S. nativity

Federal/state status

National Wetland Indicator status

noxious status

bibliographic data

plant parameters

growth requirements

vegetative specifications

adaptation characters

species abstract

images