LandView III and the CEIS Digital Library of the State of the Environment

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Introduction

LandView III is an innovative public domain mapping package (Marshall, 1998) that displays EPA-regulated sites, selected 1990 Census data, TIGER/Line 1995 detailed road networks, and USGS schools, public buildings and other important community sites. The EPA databases include: air facilities, air quality monitoring sites, Brownfield Pilots, hazardous waste facility information, hydrologic area boundaries, Superfund sites, toxic release inventory sites, and waste water discharger sites (see **http://www.census.gov/apsd/pp98/pp.html** for the product profile from the Census Bureau).

LandView delivered on the Web and CD-ROM has been credited with supporting the democratization of Government spatial databases by making them readily available in an easy to use form (Federal Computer Week, September 22, 1997). In fact, LandView III is the kind of "societal GIS that is easy, fast, relevant, affordable, and accessible" that the GIS industry is moving towards (Dangermond, 1998). The 1998 Recommended Specifications for Public Access Work Stations in Federal Depository Libraries, April 20, 1998, include LandView III as suggested applications software.

LandView has its origins in EPA's need to visualize the location of sources of pollution with respect to the surrounding community infrastructure which is important for at least four reasons:

1. Emergency Planning where LandView has been used by local governments to plan for chemical emergencies;
2. Community Right-To-Know laws where citizens have a right to know the nature of chemical hazards in their neighborhoods;
3. Environmental Justice where EPA and other agencies are required to insure that disadvantaged populations are not disproportionately exposed to pollution; and
4. Risk Management Plans (RMPs) to provide offsite consequence analysis guidance required by regulations.

The release of LandView III has expanded its utility by developing partnerships with other Federal agencies to include their national spatial databases, particularly the USGS which has begun to use LandView III for publishing scientific geospatial databases. LandView has also been available for download for individual counties from the RTKNet (see **http://rtk.net/landview**. The Right-To-Know Network is an independent, non-profit organization, not part of the Environmental Protection Agency. There have been over 40,000 downloads of LandView II and III from the Internet to date.

The new 11 CD-ROM LandView III includes a Guided Tour Tutorial as well as LandView Help and Technical Documentation. EPA also offers LandView training classes, and the manual, Every Community's Right to Know: A Guide to Community Outreach and Education on Environment & Health Information, includes the use of LandView in developing so-called community profiles of environmental and health data. The LandView III installation Readme file is included in Appendix A.

The New EPA Center for Environmental Information & Statistics (CEIS)

In February 1997, EPA Administrator Carol M. Browner announced creation of the Center for Environmental Information and Statistics (CEIS) as EPA's new one-stop source of integrated, cross-media data and information on environmental quality, status and trends. CEIS's customers are EPA's national, regional, state and local audiences for environmental information.

These audiences are diverse, ranging from:

- community citizenry in search of information about environmental conditions where they live;

- state and local Government decision makers;

- congressional staff, lobbyists, and industry consultants in search of data supporting various positions and policies;

- scientists and academics in need of consistent environmental data of known statistical quality.

CEIS is focusing on initially providing three tools and content vehicles on the Agency's Web site to be released August 5, 1998, namely, environmental profiles, a digital library of environmental quality, and an atlas [**http://www.epa.gov/ceis**].

The first tool that community citizens usually want and need is a paper map. Unfortunately, the available paper maps usually do not show the locations of the facilities in EPA's databases. In the meantime, EPA provides electronic maps (see "Maps on Demand" at **http://www.epa.gov/**). However, electronic maps have limitations in showing both large areas like complete counties and the locations of individual pollution sources at street-level. The CEIS and others are working on delivering GIS-type functionality to electronic maps on the Web so users can zoom-in and pan around; however, that type of GIS functionality and

others is already available on the LandView III CD-ROM which is available to the public without Internet access.

A Web version of LandView III developed in support of universal access for demonstration at the Federal Webmaster's Workshop [**http://cdserver.er.usgs.gov/fedweb97.htm** delivers electronic maps for selected communities showing the locations of facilities in EPA's databases [**http://cdserver.er.usgs.gov/ceisprof.htm**. It will be noted that most maps show a high degree of overplotting (clustering of source locations) that makes it impossible to distinguish the individual sources; however, this overplotting is useful in showing the degree of geographic coincidence in pollution source locations. A list of the individual facilities in the LandView III-EPA databases is also provided. The steps followed in creating these maps are provided so community citizens can acquire the LandView III CD-ROM and repeat these steps and zoom-in and pan around to see the locations of individual pollution sources in relationship to their own neighborhoods. In addition, community citizens and others can add their own spatially reference data to LandView III and create their own electronic and paper maps!

At the recent EPA-sponsored Toxics Release Inventory and Right-To-Know Conference, September 8-10, 1997, in Washington, DC (see **http://www.rtk.net/triconf** a Community Outreach Training session was conducted by the John Snow Institute that provided techniques for improving outreach efforts and training in how to better access data and information to develop Community Profiles of Environmental and Health Data [**http://cdserver.er.usgs.gov/jsiprofl.htm**. The training materials included a Guide based on the Local Environmental Information Centers (LEIC) program, conducted in Massachusetts by the John Snow Institute for Environmental Health Studies and sponsored by EPA Region 1 and the EPA Office of Pollution Prevention and Toxics. The Community Profile presented at this recent conference has been used to begin the development of community profiles for the 84 largest cities selected in the EMPACT program. The Environmental Monitoring for Public Access and Community Tracking (EMPACT) project, an EPA initiative, is designed to improve the quantity and quality of environmental information that is made available to the public in an understandable manner.

The Digital Library of the State of the Environment [**http://cdserver.er.usgs.gov/ceisoe.htm** is compiling the existing state of the environment reports and indexing them (see example in Appendix B using a form of the Dublin Core) and packaging the community maps, profiles, and key documents so that community libraries can use them on CD-ROM and the Web to help citizens. The Environmentalist's Guide to the Public Library produced by Libraries for the Future says librarians serve as " information advocates—listening to people's needs, guiding them to useful data, and helping them to synthesize and centralize information." (Updated 1997 edition, Libraries for the Future, New York, NY [**http://www.lff.org**)

HUD also offers a new community mapping and planning tool (Community 2020) in partnership with whose commercial Maptitude product has been tailored for HUD users to be the lowest priced, full-featured desktop mapping (GIS) software on the market. Caliper Corporation has added hundreds of macros that make map creation easy for novice users of GIS software. The Community 2020 Data Library includes:

- U.S. Streets and Highways,
- Cities, Towns, States and Counties,
- Census Tracts and Block Groups,
- Congressional Districts,
- 5-Digit ZIP Codes,
- MSAs, ADIs, and DMAs,
- Low- and Moderate-Income Areas,
- Empowerment Zones and Enterprise Communities,
- Detailed Census Demographic Data,
- HUD Program Data for Urban and Rural Areas, and
- Public Housing Data.

Version 2.0 of Community 2020 will be released soon with additional databases and functionality in response to user requests. A training manual and Discussion Forum are available on the Web (see **http://www.hud.gov/cpd/2020soft.html** and **http://www.hud.gov/cpd/cpdboards/c2020dis/cpdboard.html**).

The Urban Institute has created for HUD a catalogue on state and local data sources and 17 community mapping applications in 5 cities called Mapping Your Community (HUD-1092-CPD, October 1997). This excellent publication contains a description of 42 nation-wide or urban-area databases in 6 main categories, namely,

- economy (6),
- education (3),
- health (5),
- social services (5),
- safety and security (6),
- community resources and participation (6),
- housing (5), and
- environment (6).

Demonstration Scripts

The LandView III script from the Digitial Library's Guide to National and Community Profiles of the State of the Environment is provided in Appendic C. This script and results illustrate the LandView III product design goals:

1. easy-to-learn intuitive interface designed for first-time GIS users,
2. simple enough that training classes and conventional software support systems are not required, and
3. does not compete with commercial packages and software code is in the public domain and can be modified and distributed by anyone.

Some Next Steps

An Interagency LandView Team is developing a strategic plan to pursue the principal goals of:

1. adding more national databases,
2. creating metadata and a clearinghouse,
3. promoting interoperability through the Open GIS Consortium, and
4. developing additional applications for educational purposes. An initial framework for LandView Distributed Geographic Information is provided at **http://cdserver.er.usgs.gov/lvonline.htm**.

Some of the LandView III maintenance and development issues are:

1. including the MrSID Extension for basemap images,
2. making the Web-Connection to EPA's EnviroFacts and other spatial database Web sites,
3. providing for import of additional formats like shape files,
4. ongoing bug fixes and suggested improvements, and
5. possible inclusion of LandView III on the Microsoft-USGS TerraServer [**http://www.research.microsoft.com/terraserver/**].

Finally, some of the LandView III products being worked on or discussed are:

- a DVD for schools,
- a GIS Starter Kit, and
- LandView III on the EPA Toxic Release Inventory 1998 CD-ROM.

The Digital Library of the State of the Environment Digital Library is evolving to a warehouse of repurposed, value-added, interlinked documents on the Web and as a series of Web-connected CD-ROMs. The Digital Library of the State of the Environment is also enlarging its multimedia contents with video clips, large images in compressed form, statistical analyses, and other elements that provide a decision support resource for decision makers and the public.

References

Marshall, Patrick, 1998: Public-Domain GIS Programs, civic.com, **http://www.civic.com/pubs/1998/january/civ-jan-review.htm**

LandView III Product Profile **http://www.census.gov/apsd/pp98/pp.html**

GIS Maps Out Approach for 'Democratization' of Government Data,

L. Scott Tillett, Federal Computer Week, September 22, 1997

Jack Dangermond, Vision for the Future: National GIS Architecture, 1998 ESRI Federal User Meeting, April 30, 1998

1998 Recommended Specifications for Public Access Work Stations in Federal Depository Libraries, April 20, 1998

LandView III Guided Tour Tutorial, September 1997 (LandView III 11 CD-ROM set, December 1997)

Every Community's Right to Know: A Guide to Community Outreach and Education on Environment & Health Information, prepared by JSI Research and Training Institute, Inc., Center for Environmental Health Studies, 44 Farnsworth St., Boston, MA 02210, 617-482-9485 [**http://www.jsi.com**] and U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, Information Management Division, 401 M St., SW, Washington, DC 20460 [**http://www.epa.gov**]

EPA Center for Environmental Information and Statistics, EPA 235-F-98-001, June 1998, Office of Policy (2161), Washington, DC 20460

Community 2020 HUD Community Planning Software, Version 2.0 Fact Sheet, May 1998

Mapping Your Community, HUD-1092-CPD, October 1997, available free from the Community Connections Hotline at (800) 998-9999 and ask for the Community 2020 Help Desk.

Appendix A - LandView III Readme File

Introduction to the LandView (tm) III CD-ROM, Version 1.0, October, 1997

LandView III is a desktop mapping system that includes database extracts from the Environmental Protection Agency, the Bureau of Census, the U.S. Geological Survey, the Nuclear Regulatory Commission, the Department of Transportation, and the Federal Emergency Management Agency. These databases are presented in a geographic context on maps that show jurisdictional boundaries, detailed networks of roads, rivers, and railroads, census block group and tract polygons, schools, hospitals, churches, cemeteries, airports, dams, and other landmark features.

Minimum and Recommended Configurations

The minimum configuration required to run this CD-ROM:

- o PC with a 486-class processor, or
- o Macintosh with a 68020 processor,
- o 8MB of RAM,
- o 10MB of free hard disk space,
- o VGA color display,
- o 2X CD-ROM drive,
- o Windows 3.1 (for PC),
- o System 7.0 (for 68K Mac),
- o System 7.1.2 (for Power Mac)

To maximize performance the recommended configuration is:

- o PC with 586 or Pentium-class processor, or
- o Macintosh with PowerPC processor,
- o 16 MB RAM,
- o SVGA color display,
- o 4X CD-ROM drive,
- o Windows 95 or Windows NT (for PC),
- o System 7.1.2 or higher (for Macintosh).

Installation Instructions

Place this disc in your CD-ROM drive.

For Windows users:

25. Run the program "D:\INSTALL\WINDOWS\SETUP.EXE" (where "D" is your CD-ROM drive letter). Indicate where to install LandView, click OK.
26. Install the MARPLOT fonts by choosing Fonts from the Windows Control Panel, then "Install New Font" from the File menu (in Windows 3.1, press the Add button). Then choose the directory where LandView has been installed (usually C:\LV3). The fonts MARPLOTP and MARPLOTD should appear in the font list window. Press the "Select All" button, and then the OK button.
27. LandView III is designed to run in Windows 95 and Windows NT. You can, however, run it in Windows 3.1 if you install the 32-bit processor, called WIN32S. To install WIN32S, go to the \INSTALL\WIN32S\DISK1 directory on the LandView CD, and run SETUP.EXE. (Note: do not run _MSSETUP.EXE or _MSTEST.EXE). If you are running Windows from a network file server rather than from your local hard drive, you may need the assistance of your network administrator to install WIN32S.

For Macintosh users:

28. Double-click the LV_PPC.sea icon in the INSTALL:POWERPC folder, or the LV_68K.sea icon in the INSTALL:MAC_68K folder, click Continue, indicate where to install LandView, and click Save.
29. Drag the following files into your System Folder:

    FOXTOOLS.MLB (must go in Extensions subfolder)

    MARPFONT (must go in Fonts subfolder)

30. Restart your machine.

Documentation

LandView III comes with several documentation and tutorial files:

- o LandView III Guided Tour (in PDF format),
- o LandView III Help (in both PDF and Windows Help file formats),

- o MARPLOT user manual and technical documentation (in PDF format), and
- o MARPLOT Help (in Windows Help file format).

The Adobe Acrobat Reader for viewing PDF files is included on this CD.

LandView III version 1.0 Notes

The maps and data in LandView III, as in its predecessor LandView II, are divided into 10 geographic areas, each on its own CD-ROM, plus an additional CD covering the entire United States (see below for a list of states on each CD).

The detailed networks of roads, rivers, and railroads come from the Bureau of Census TIGER/Line 1995 files, and are present on CDs #1-10, but are absent from the national CD (#11). (Since the LandView Guided Tour refers to the map of Prince William County, VA, that map, as well as the maps for the District of Columbia and the State of Delaware, is included on the national CD.)

The national CD has been augmented by the addition of major roads from the Department of Transportation (refer to the Help system under "U.S. Highways" for more details), and major streams and rivers from the U.S. Geological Survey 1:2 Million scale Digital Line Graph (DLG) files.

The following layers were not part of LandView II, but are included in LandView III:

- o schools
- o hospitals
- o religious institutions
- o cemeteries
- o airports (including runways)
- o dams
- o nuclear sites
- o Canadian Province boundaries
- o Canadian major roads and railroads
- o Mexican State boundaries
- o Mexican major roads and railroads
- o EPA Watershed Assessement data
- o EPA Ozone Non-attainment areas
- o EPA Brownfields Pilot areas

The Population Estimation feature now offers two methods, one that uses Block Group Centroids (like LandView II), and another that uses Block Group Polygons, and prorates the population statistics based on the land area within the radius.

Macintosh users may experience problems doing population estimation for large radii (100 miles or greater). This is a memory management issue that will be addressed in a future version. No such problems have been detected in the Windows version.

State list for the 10 LandView CDs

> CD #1: Connecticut, District of Columbia, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont

> CD #2: Maryland, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia

> CD #3: Alabama, Florida, Georgia, and Mississippi

> CD #4: Illinois, Indiana, Kentucky, Michigan, and Ohio

> CD #5: Iowa, Minnesota, North Dakota, South Dakota, and Wisconsin

> CD #6: Arkansas, Kansas, Missouri, and Oklahoma

> CD #7: Louisiana, and Texas

> CD #8: Arizona, Colorado, Nebraska, New Mexico, and Utah

> CD #9: Idaho, Montana, Oregon, Washington, and Wyoming

> CD #10: Alaska, American Samoa, California, Guam, Hawaii, Northern Mariana Islands, Nevada, Puerto Rico, and U.S. Virgin Islands

> CD #11: Entire United States and territories, but with a less-detailed network of roads and rivers.

Appendix B - LandView III Script from the Guide to National and Community Profiles of the State of the Environment

The steps in retrieving the selected environmental indicators and creating the maps from the LandView III CD-ROM are as follows:

49. Start the LandView III CD-ROM.
50. From the LandView Menu, do File-Census Data.
51. Select a State: Massachusetts, and a County: Suffolk, and Click Show on Map.
52. From the MARPLOT Menu, do List, Layer List and make the list Hide everything but the following:
aaa.   Counties (Show) – Color: Black and Line Style: Solid Heavy
bbb.   States (Show) – Color: Black and Line Style: Lightest
ccc.   Shoreline (Show) – Color: Light Blue and Line Style: Lightest
ddd.   Water (Show) – Color: Blue and Pattern: Fill
eee.   AIR_FACL (Show) – Color: Black and Symbol: Power Plant

fff. AIR_QUAL (Show) – Color: Yellow and Symbol: AQ

ggg.   Brownfields Pilots (Range) – Color: Brown and Pattern: Cross-hatch

hhh.   HAZ_WASTE_FACL (Show) – Color: Purple and Symbol: Barrel

iii. SUPERFUND_NPL (Show) – Color: Red and Symbol: Letter S

jjj. TRI (Show) – Color: Dark Green and Symbol: Chemistry Beaker

kkk.   WASTEWATER (Show) – Color: Olive and Symbol: Water Pipe Discharge

lll. Hospitals (Range) – Color: Black and Symbol: Holy Cross

mmm.   Schools (Range) – Color: Black and Symbol: Building with Flag

5. From the MARPLOT Menu, do View, Legend, Show and View, Scale Bar, Show and position the Legend and Scale to minimize covering the plotted information as much as possible. (Note: Use the zoom-in, zoom-out, and grabber tools to get the best looking map.)
6. From the MARPLOT menu, do File, Save as Picture, and select a file name and either the bitmap or metafile format options. (Note: The metafile file format gives a smaller file size for Web sites.)
7. From the MARPLOT Menu, do List, Search, Search for Objects: select "that are inside or touched by" and select "the currently selected objects" (leave as is since the county selected is still selected); Maps to search: "maps in view (leave as is); Layers to Search: select "multiple layers" and click AIR_FACL, AIR_QUAL, Brownfields Pilots, HAZ_WASTE_FACIL, SUPERFUND_NPL, TRI, and WASTEWATER so that a total of 7 layers are selected. Click on Search.
8. In the Search Collection, click on Show All on Map.
9. From the MARPLOT Menu, do File Export, Export (leave the other settings as they are) and select a file name and the text file format option.

Appendix C - Example from the Master Index of the Digital Library of the State of the Environment

State of the Environment Australia 1996

http://www.environment.gov.au/portfolio/dest/soe/soe96/soe96.html

Sound Byte: An independent report presented to the Commonwealth Minister for the Environment by the State of the Environment Advisory Council provides a summary on the Web and how to order their comprehensive, fully illustrated book and CD-ROM.

Summary

This is the first ever independent and comprehensive State of the Environment Report for Australia. It links land, water, air, plants and animals, human settlements and how we value them. An independent advisory council and seven expert groups prepared the report. It draws on the knowledge and skills of more than 200 eminent scientists and other experts. The report shows that Australia has a beautiful, diverse and often unique environment which is a priceless heritage and should be a source

of pride to all Australians. Some aspects of the Australian environment are in relatively good condition by international standards. In some areas our approach to environmental management has won international recognition. In many other areas it is not possible to decide whether our environmental management is adequate. We urgently need better information and understanding, which will require data collection and research. The report also shows that Australia has some very serious environmental problems. If we are to achieve our goal of ecological sustainability, these problems need to be dealt with immediately. This will be no small task. The problems are the cumulative consequences of population growth and distribution, lifestyles, technologies and demands on natural resources over the last 200 years and more. No single Government or sector is to blame for these problems. We are all responsible. Changes are needed in Government policies and programs, corporate practices and personal behavior. Australians are among the most environmentally aware people in the world. All sections of the community now recognise the need to do more to tackle environmental issues. Most of the problems identified in the report do have solutions. The report details many positive and successful initiatives. Our actions have been most effective where they have taken a comprehensive and systematic approach, integrating different aspects of the overall problem. By contrast, failures tend to be piecemeal efforts that treat symptoms rather than underlying causes. Australia has an international responsibility to protect its rich biological diversity and its unique environmental features such as the Great Barrier Reef and other World Heritage Areas. We also have a national responsibility towards future generations of Australians. Australia has a better opportunity than perhaps any other nation to protect its environment and use its natural and heritage resources sustainably. We need to do much more if we are not to lose this opportunity. Progress towards ecological sustainability requires recognition that human society is part of the ecological system and integration of ecological thinking into all social and economic planning.

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Background summary

Key threats to sustainability

o   Keywords

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