

gis notes

Software

The Tektronix version of GRASS (for the Opus Systems processor and the Tektronix 4325 UNIX workstation) is currently under construction. We expect completion this summer.

Translators for moving data to and from SAGIS and AutoCAD are in place. The SAGIS-to-AutoCAD translator creates AutoCAD .dxf files for polygons, lines, or points. The AutoCAD-to-SAGIS translator creates SAGIS mapfiles for AutoCAD polyline, line, or point data.

A set of DOS programs exist for creating SAGIS mapfiles from dBASE data. These programs automatically create a properly formatted text file from appropriate dBASE fields for input to SAGIS. Once read in to SAGIS, the data may be repeatedly used with dBASE for analyses and plots.

Hardware

I have prepared a sample set of requisitions for acquiring GIS hardware, including items from the DOI GIS peripherals contracts (**Park Science**, Winter and Spring '88). The requisitions are intended as an aid in acquiring GIS hardware and are to be used in conjunction with your NPS-62 (ADP justification).

Staffing

I have prepared a generic position description for a GIS specialist. It may be useful as a source of ideas for your own park GIS specialist position.

CADD vs. GIS

I am frequently asked about the differences between CADD systems and GIS's. To many people they both seem to do the same thing (automated mapping), and CADD software and hardware may seem more accessible and easier to get started with. In fact, if all you want to do is automated mapping, then CADD is very likely the way to go. If, however, you are interested in analytical capabilities, such as buffering, proximity analyses, counting, length determinations, intersection analyses, modeling, use of satellite data, and so forth, then GIS is probably the direction to take.

Capabilities aside, the fundamental difference between CADD and GIS lies in the nature and, particularly, the **structure** of the data. Because they are **design-oriented**, CADD systems work with drawings. Linework and text occur on drawing **layers** and have certain intrinsic and associated display characteristics, such as line type (dashed, solid, double, etc.), color, symbology (gates, rocks, fire, etc.), or fonts. You access the drawing elements by calling up and combining the layers as you wish to compose a unique

drawing specifically tailored to your particular requirements. The data themselves are typically referenced to a relative coordinate system based upon a digitizing table or the drawing itself. A wide variety of powerful display operations, such as zooming, scaling, rotating, shading, and even 3-D, are possible.

In contrast, GIS's work with discrete spatial objects, such as points, lines, polygons, or cells. Each object is either individually accessible or accessible as a group, such as a group of polygons or cells constituting a given vegetation type, soils class, or ownership category. The concept of a "drawing layer" does not exist, although like objects, such as all vegetation types, may, merely for convenience of access, be grouped into one thematic file, such as vegetation. The data are typically referenced to a real-world coordinate system, such as UTM or long-lat.

Each spatial object relates in a precise way to every other spatial object: polygons share common arcs with neighboring polygons and have clockwise-ordered vertices, holes (exclusion areas within polygons) may be contained within polygons and have counter-clockwise-ordered vertices, nodes snap, and each object has an associated "tag," or feature name, which allows it to be accessed and manipulated individually. Text and display characteristics, such as line color, shading patterns, symbology, and the like, are not stored; typically, these are generated on the fly, i.e., whenever output is required, although text may also be stored for repetitive recall and use, if desired. The ability of GIS's to work with raster (i.e., cell-type) data is also an important difference between CADD and GIS systems; I do not know of any CADD system that can handle raster data.

GIS's are particularly well-suited to analyzing and combining different kinds of spatial data, although they normally are no slouches at displaying the data, either. They may not have all the symbology, line styles, and text fonts of CADD systems, but they can usually produce a pretty decent-looking plot. A GIS is very likely the system of choice where analysis and modeling of spatial data is the predominant requirement.

Whichever software system is more suited to your needs – and you can use both, if you like – one essential requirement prevails: the ability to move the spatial data back and forth between the two systems. It is vital that the data be as universally useful as possible, so that time, expense, and energy are not wasted constructing a single-purpose data base.

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