



Potomac River at the Great Falls, May 2007
[Photo by Ilse Genovese]

We're "spatial" people, right? We observe, measure, map, and visualize terra firma. So, one could say, we're very spatial, right? But ... there is always a "but," isn't there? ... we may also be very "territorial." "My space" is not something only teenagers worry about. We also have a space that needs refinement and updating so we're "au courant." Read Tracy Moy's article [originally published in *ArcUser*, June 2007) and a rather irreverent [but very much on the spot] blog I came across when googling "spatial."

Dealing with GIS staffing issues

—by Tracy Moy, Chief, GIS Division, Arkansas Game & Fish Commission



People who perform GIS come from many disciplines and possess varying levels of expertise. I like to think we are very spatial people, but I believe few are experts in everything. Performing GIS functions does not make someone a programmer, database guru, or network administrator. Often the consumers of GIS inadvertently think we are proficient in all of these roles. As an organization grows beyond the single-user desktop application, considerations should be given to securing a staff that is knowledgeable in several key areas of GIS.

In 1998, the Arkansas Game & Fish Commission (AGFC) added one full-time position dedicated to the development of a GIS program. As with most organizations starting a new technical program, the first few years were spent educating users, acquiring necessary hardware and software, performing pilot tests, completing a needs analysis, and preparing a plan of implementation. Two years after the program was initiated, a second position was added to support growth and to realign the job functions of the existing position.

For the next two years, two staff members carried out all the program's duties including, but not limited to, coordination, program planning, staff training, server updates and maintenance, data acquisitions, software installations, minor database development, project development, and record keeping.

In 2002, as a result of a multi-agency partnership, AGFC acquired aerial photography of the entire state. Approximately one terabyte of data needed to be acquired, processed, and stored. The only media available to the program at the time was compact disc. The volume of work necessary to process the new data set required hiring extra personnel, and initially, this was temporary labor.

The complexity of the work and necessary understanding of the data being processed were beyond the capabilities of a temporary worker, and that strategy failed within a few months. The low-level existing but vacant position was used to acquire a qualified GIS technician for the program.

As expected, program utilization grew expansively. One year after the third staff member was added, two more staff were transferred into the program as full-time GIS analysts to assist with coordination and to support the growing number of field personnel.

Program utilization continues to grow beyond the capacity of the current staff.

It has been more than three years since additional staff members were added. The program has managed by using temporary labor, interns, and extra labor to keep up with the additional workload; however, there are some aspects of the program that require professionally trained personnel who are not easily acquired through these means.

An enterprise GIS can be organized in a centralized or decentralized manner, or it can combine aspects of both models. The latter is sometimes referred to as a hybrid. In a centralized model, all GIS work is carried out in one department; one section of another department, such as the information technology department; or a separate GIS department. In a decentralized model, GIS is carried out by individuals in various departments throughout the organization. Users are responsible for the data and projects for their area. A hybrid includes aspects of both centralized and decentralized models.

Like many other organizations, AGFC uses a hybrid model, which includes aspects of a centralized and decentralized model. In layman's terms, this means a dedicated staff performs GIS projects for the agency, and individuals within agency divisions use the hardware, software, and data for their work. This is one of the most difficult models to manage but its use by AGFC is more than justified by the diversity of the work the agency performs.

Each model will likely require staff with skills in several functional areas. For the GIS work at AGFC we require core capabilities for management, coordination, system support, applications development, database development and maintenance, technical support, data collection and processing, analysis, and production. The current staff members share most of these duties but continually struggle to perform the database and programming functions—because, unrealistically, our course until now has been “to get by” with limited expertise in this area.

Illustration by Joy Merryweather, ESRI



GIS project skills

A major issue facing GIS managers, especially in the public sector, is the mis-perception by clients and administrators that GIS staff members are capable of performing all functions. There are very talented people who are comfortable working in any capacity required for GIS work but this is not the norm. Many people who work in the GIS field learned GIS to perform their primary job, which may not originally have had anything to do with GIS.

As GIS as a discipline has expanded, colleges and universities have added programs that provide learning opportunities specific to GIS and other fields that combine GIS with fields that commonly use GIS. There are programs that provide opportunities for certification; associate degrees; and bachelor's, master's, and more advanced degrees in GIS. One hurdle to be overcome is educating those not immersed in the profession about the necessity of having staff with skills beyond GIS.

Many functions necessary to support a GIS program require individuals with primary expertise beyond GIS. One of the most critical components of GIS is data and one of the most critical staff positions in support of a GIS program is a dedicated data manager or database administrator. These responsibilities can be handled by the same individual or divided between two positions depending on how the program is set up.

For most organizations, this position will be difficult to outsource. A person in this position must understand the business and information of the organization, work on a daily basis with clients, and understand the subject matter. Ideally, a person serving in this capacity will work in the GIS department and be dedicated to the program. Many organizations may possess database expertise within the information technology or computer support department. In some cases, those individuals can perform in both capacities; however, they must be familiar with GIS.

Also, having a staff or at least a few staff members who are familiar with project management methodologies can be a tremendous advantage. A person with demonstrable management skills will appreciate the need to define a good workflow process for the department. Spending time defining common project steps will save time down the road and reduce the likelihood that something will be overlooked. If you are a GIS manager or coordinator, you would benefit greatly from some formal project management training. The Project Management Institute (www.pmi.org) is a good resource and so are the many project management books available at any major bookstore. A couple of good project management reference books are *A Guide to the Project Management Body of Knowledge* published by the Project Management Institute and *Project Manage-*

ment: A Systems Approach to Planning, Scheduling, and Controlling by Harold Kerzner.

These are just a few of the many areas of GIS staffing that are not always sufficiently understood. Too often organizations, out of ignorance, fail to realize the key positions vital to support and grow a GIS. GIS is unfamiliar territory for many. It is up to the GIS community to work together to educate and provide consistent job descriptions, salaries, and operational functions. Too often it is easy, when asked, "What do you do?" to answer "Uh . . . make maps." GIS is much more than mapmaking, and it is up to all members of the GIS community to change that perception. ■

Staffing mini-primer: If you are staffing a GIS department from scratch, this can be a daunting task. Some common options are hiring someone who has the necessary skills to operate in one or more functional areas, retraining existing personnel to perform various job functions, or contracting with vendors who specialize in GIS. Each course of action has advantages and disadvantages. For some things, outsourcing makes sense; for others, this is not a good choice.

Job descriptions and salaries: Though probably not as much of a problem in the private sector, salary and job descriptions have caused much frustration in the public sector. The use of GIS has grown rapidly over the last 15 to 20 years, but the public agencies that determine job descriptions and pay grades have lagged in defining GIS. A few efforts have been made to define GIS jobs and pay scales at the federal, state, and local levels. At AGFC, information technology job titles and classifications had to be used because GIS classifications had not been defined by personnel. Only in the last year has a collective effort been made to define and standardize GIS jobs. One of the best resources for GIS job descriptions and salary ranges has been put together by the Urban and Regional Information Systems Association (URISA). URISA offers two publications on the topic, *Model Job Descriptions for GIS Professionals* and the *URISA 2003 Salary Survey for IT/GIS Professionals*. Both publications offer a good start in defining job duties and determining salary ranges. There are also many online resources that are appearing on the Internet.

Communication: Although steering committees and user groups are not part of a formal GIS work group, they play a vital role in a GIS program. In larger organizations, it is important to have a GIS steering committee that includes people drawn from each segment of the business who represent various levels of knowledge. This will help ensure that the program is providing services and products that reach the most diverse groups of consumers.

Have a good communications plan for these users, especially if they do some GIS work themselves. E-mail is a perfect way to accomplish this. Set up a group or list serve that includes all users. These resources can be used to post common questions or to distribute information such as updates or maintenance information. Other ways to communicate with users are through a Web page, newsletter, or quarterly or annual user group meetings that showcase and discuss projects.