

**“We are very SPATIAL people, but...”**  
**GIS Staffing Issues**

**Introduction**

Would you ask your electrician to fix your plumbing? Probably not! 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.

Just because someone is in the construction business does not make them an expert in plumbing, electrical, carpentry, etc...likewise, performing GIS functions does not make someone a programmer, database guru, network administrator, etc... 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. This paper will discuss essential roles and responsibilities that commonly exist in support of a GIS program and offer suggestions for reducing the role conflict and staffing issues that may arise in your organization.

**Staffing Approaches at Arkansas Game & Fish Commission (AGFC)**

In 1998, 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 in order to support growth and to realign job functions from the existing position.

For the next two years, two staff members carried out all duties pertaining to the program, 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 the agency 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 work necessary to process the new data set required the hiring of extra personnel. A first attempt was to use temporary labor.

The complexity of the work and necessary understanding of the data being processed was beyond that which could be fulfilled by temporary labor, therefore the use of that resource failed a few months into the work. As a result, a new position was added to the program from an existing vacated position. The low level position was used to acquire a qualified GIS technician.

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

Program utilization has continued to grow beyond the work capacity of current staff. It has been over three years since additional staff has been added to support the program's growth. The program has managed to utilize temporary labor, interns, and extra labor to keep up with additional workload; however there are some aspects of the program which require professionally trained personnel that are not easily acquired through these means.

### **Enterprise Models**

There are three basic models for an enterprise GIS. These are the centralized model, decentralized model, and one that combines aspect from both models. The later is sometimes referred to as a hybrid. In a centralized model, all GIS work is carried out in one department or section of some other department, such as the Information Technology Department or separate GIS Department. In a decentralized model, GIS is carried out by individuals in various departments throughout the organization. Each user is responsible for data and projects within their area. A hybrid includes aspects of both centralized and decentralized models.

Due to the nature of business at AGFC, our GIS program utilizes a hybrid program model. This model is commonly used in organizations. It includes aspects of a centralized and decentralized model. In layman's terms this means we have a dedicated staff that performs GIS projects for the agency, as well as individuals within divisions that utilizes the hardware, software, and data for their work. This is one of the most difficult models to manage, however its use in our agency is greatly justified by the diversity in the work we perform.

### **Functional Areas and Staffing Options**

An organization that utilizes any of these models, especially the centralized model or hybrid will most likely require a staff with skills in several functional areas. There are several main functional areas required to carry out work in our division. These are not uncommon. They are normal requirements for GIS work in an organization. The functional areas required by AGFC are management, coordination, system support, applications development, database development and maintenance, technical support, data collection and processing, analysis, and production. The current staff shares in most of these duties, however we have continually struggled to perform in the database and programming functions.

There are two main reasons for our inability to carry out this type of work. First, regardless of the size of an organization, it is important to have a proficient database administrator available for your GIS systems. Many organizations, including AGFC, try to get by without this expertise, and it can be a major stumbling block! Second, sometimes an organization tries to train a current employee to perform in this capacity. Although, not impossible, taking this approach is very difficult. A proficient database

administrator is not normally someone who received on the job training while continuing their current job. It would be someone who has received a formal education in information technology. The individual would have completed much course work in programming and databases. Even if our current staff had the time to attend training to learn the ends and out of databases, it would be several years before they would be ready to perform in that capacity!

If you are staffing a GIS department from scratch, this can be quite a daunting task. Some of the most common GIS staffing options are to hire someone who already has necessary skills to operate in one or more functional areas, to retrain existing personnel to perform various job functions, or contract with vendors who specialize in GIS. Each course of action has advantages and disadvantages. There are some things that make sense to outsource, for others; this is not a good choice.

### **Steering Committee and User Groups**

Although steering committees and users groups are not part of a formal GIS work group, they play a vital role in a GIS program. It is important especially in larger organizations to have a GIS steering committee that is made of people from each segment of the business and who represent varying levels of knowledge. This will help insure you are providing services and products to reach the most diverse groups of consumers. You should have a good communication plan for the users of your products and services, especially if they do some work themselves. E-mail is a perfect way to accomplish this. You can 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. Another way to communicate with users is through a webpage, newsletter, or by holding a quarterly or annual user group meeting to showcase and discuss projects.

### **Project Management Skills**

Having a staff or at least a few staff members who are familiar with project management methodologies can be a tremendous advantage. It is important to define a good workflow process for your department and spending time defining common projects steps will save time down the road and reduce the likelihood of overlooking something. If you are a GIS manager or coordinator, you would benefit greatly from some formal PM training. The Project Management Institute is a good resource and can be found on the web. You will find a wealth of project management books at any major bookstore. A couple of good PM reference books are “A Guide to the Project Management Body of Knowledge” PMBOK® and “Project Management A Systems Approach to Planning, Scheduling, and Controlling” by Harold Kerzner.

### **Job Descriptions and Salaries**

Salary and job descriptions are probably not so much of a problem in the private sector, but in the public sector this is one area that has caused much frustration. The use of GIS has grown rapidly over the last 15-20 years, but the public agencies that determine job descriptions and pay grades have lagged behind on getting GIS defined. Slowly, a few efforts are being 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 there was no such thing as GIS defined by personnel management. Only in the last year, was a collective effort 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. The first is the "Model Job Descriptions for GIS Professional" and the "2003 Salary Survey for IT/GIS Professional". Both of these publications offer a good start in defining job duties and determining salary ranges. There are many other on-line resources that are appearing on the Internet.

### **Upper Management and Client Perceptions**

It is important that the major functional areas of a GIS department be accepted and recognized by all. One of the major issues facing GIS managers, especially in the public sector, is the misperception by clients and administrators that the GIS staff members are capable of performing all functions. There are some very talented people who are comfortable working in any capacity that is required of GIS work; however this is not the norm. Many, who work in the GIS field, came to do so as a result of learning GIS in order to perform their primary job, which may have previously had nothing to do with technology.

As this discipline has expanded, colleges and universities have added programs that provide learning opportunities specific to GIS and in combination with many fields common to GIS work. There are programs that provide opportunities for certification, associates degrees, bachelor's degrees, master's degrees in GIS and a few beyond.

One hurdle that has to be overcome is educating those who are not immersed in the profession about the distinct differences and necessities of staff that possess the skills beyond GIS. There are many functions that are necessary in support of a GIS program that require individuals with primarily expertise beyond GIS. One of the most critical components of GIS is data. One of the most critical staff positions in support of a GIS program is a dedicated data manager or database administrator. These can be one in the same or divided into two separate positions, depending upon how the program is setup.

For most organizations, this position will be difficult to outsource. A person in this position must understand the business and information of the organization for which they work. They must work on a daily basis with clients and understand the subject matter. Ideally, a person serving in the 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 could perform in both capacities; however they must be familiar with GIS.

This is only one of many areas that are being overlooked. Too often organizations overlook those key positions that are vital in the support and growth of a GIS. They do this because they do not know better. GIS is unfamiliar territory for many. It is up to the GIS Community to work together to educate and provide consistency when it comes to 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 map making and it is up to all of us to change that perception.

I would like to thank those who have supported the GIS efforts at AGFC. There are many who do “get it” and even those who do not, mean well. We’ll get there in time.

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