

Putting Your System on the Map, Part III

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Welcome back to the third in a series of three articles on system mapping using GIS and GPS technologies. In the previous two articles, we discussed several topics. Some of those topics were:

GIS... what is it? Geographic Information Systems are comprised of computer hardware and software used for the systematic storage, processing and retrieval of geographically referenced spatial data and the corresponding attribute data. The important functions of the GIS is the technique known as "overlaying" which is the capability of combining different maps irrespective of scale/information to create new maps and the capability of the data being automatically updated when the spatial data is modified. The cost range for programming is from \$1200 to \$40,000.

GPS... what is it? Global Positioning Systems (GPS) determines location by computing the difference between the time that a signal is sent and the time it is received. GPS satellites carry atomic clocks that provide extremely accurate time. The time information is placed in the codes broadcast by the satellite so that a receiver can continuously determine the time the signal was broadcast. The signal contains data that a receiver uses to compute the locations of the satellites and to make other adjustments needed for accurate positioning. The receiver uses the time difference between the time of signal reception and the broadcast time to compute the distance or range from the receiver to the satellite. The receiver must account for propagation delays or decreases in the signal's speed caused by the ionosphere and the troposphere. With information about the ranges to three satellites and the location of the satellite when the signal was sent, the receiver can compute its own three-dimensional position. The cost range for GPS receivers is from \$350 for a sportsman's hand-held to over \$100,000 for a top-of-the-line survey quality Total Station.

Once armed with an understanding of GIS and GPS the next step is to decide what you would like to see on a map. Do you need the option of being able to input specific GPS coordinates? Some systems may choose a GIS program that allows that option while

another may decide it is not necessary. The specific configuration of a GIS program is something that each system must decide. Some of the GIS systems I have previewed are *GBA Water Master@*, *Water Map*, and *Manifold@ System*. Each system has its own strengths, so do your homework before you decide to spend the money and lock yourself into an operating platform.

Once you have decided on a GIS program and a GPS receiver its time to start accumulating the data. The quickest way is to follow the meter route and take a point on each system appurtenance. This may be the best way to go if you are accumulating the data for the first time. You may decide to pick-and-choose the appurtenances along the course of normal business operations. This is a much slower method of data accumulation but it may fit your operation better than any other method. The quickest and easiest way may be to hire a GIS mapping firm to come in and get your mapping system up and running. This is a viable option and may even be less expensive than purchasing the GPS receiver.

Over the next year, OAWU will be putting on a series of classes throughout the state on Water System Mapping Using GIS/GPS. If this is a topic that interests you, keep your eye out for the flier or contact the OAWU office and arrange for me to come speak with you.