

PAMAGIC MATTERS

MARCH 2013

Our Unfinished Base Map

The first state-supported base map for the Commonwealth was delivered in 1822 by cartographer John Melish in response to a Legislative mandate established on March 19, 1816. It was in many ways just a continuation of William Penn's guidance in settling Pennsylvania – he encouraged a clear system to patent property rights and validate them through surveys and maps. That tradition of publicly authoritative mapping and land title records has continued and developed through the present day, easily justified as an important basis for economic growth and citizens' rights in the land.

A more recent example of publicly authoritative data was the development of the PAMAP Program within DCNR's Topographic and Geologic Survey. The primary accomplishments of that program were the complete statewide collection and public access to state-of-the-art color imagery and contour data between 2003 and 2010. An unintended benefit of PAMAP is that it created base data prior to the development of the Marcellus Shale (pre-existing conditions) as well as proving invaluable for engineering, logistics planning, and environmental permitting associated with that shale gas industry. It is less well-known that the modern digital base map is the result of a 100-year partnership between the Commonwealth and the US Geologic Survey to provide ever more accurate and authoritative mapping. As with the land records, the economic value of topographic mapping was never in doubt across the centuries. It is rather ironic now that at a time

when more citizens than ever are accessing PAMAP imagery (through PASDA, Google and Bing for example) that the state is not collecting that base map data in any systematic way anymore, essentially a victim of a difficult economy and changing technology.

Even if the Commonwealth decides actively that the current base map is its last, there are some critical components of the "last base map" that remain incomplete. Most unsettling of all is the rudimentary nature of our current water data. The majority of maps and data that we use to represent the water resource are spatially incompatible with the rest of our modern, digital base map; they have basic accuracy of about 50 feet as compared to 5 feet or so for the more recent imagery and for engineering and environmental data collected nowadays – i.e. they do not even overlay properly. Perhaps more disconcerting than the data inaccuracy is the fact that, depending on the program and department, we maintain more than one of these "low accuracy" base maps. The end result is that *all the data is less credible*, and that we do not have a complete picture of the state of our water resource. Lastly, this situation is occurring at a time when we are collecting more and better information - quality/chemistry readings, precise wetland locations, aquatic habitat data, storm water infrastructure systems - related to water because of the shale gas development process.

We have made dramatic advances in improving our knowledge of the water resource and its quality over the last 40 years, mending damage from centuries of societal ignorance and abuse. In pursuit of clean water we have tended to segment our activities into manageable chunks, and perhaps we need to think about our water resources holistically again. Are water quantity and water quality really distinct enough that we separate floodplain management and storm water management, when the difference is just a matter of scale? Are we really taking advantage of the power of modern computing, modeling, and communications when we can't even compile and compare what we know in a singular, common model?

One of the great advantages we have in the Commonwealth is our abundant water. **It is in no way acceptable that we do not have a modern, digital base map and unified database for that resource.** Our State Water Plan should be no more complex than this:

- Create a modern, digital base map for Waters of the Commonwealth at a scale suitable for local resolution, and which includes storm water infrastructure as part of the surface water network.
- Require Executive agencies and encourage all others to transform their data to be compatible with and connected to that base map by 2018.
- Allocate \$50 million to this effort.

Eric Jespersen

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ESRI Mid Atlantic Conference Review

The 2012 Esri Mid-Atlantic User Conference (MUC) in Baltimore was worth attending. The plenary session was genius as usual. The technical sessions added insight on new ways of working with esri software. The user presentations introduced us to how practitioners and students use GIS in their respective field. One user presentation specifically was great. It was titled "Using GIS and Census Data to Analyze Demographic Data for Pastoral Planning Within the Archdiocese of Philadelphia".

This was my first presentation at an esri event, I was not sure what to expect, nor did I know what was expected of

my presentation. But being an esri software user for over 10 years I felt comfortable explaining my work. I introduced the geographical area of the Archdiocese of Philadelphia and discussed some of the territoriality of the local Catholic Church. I then explained how we tie the Catholic territories to the US Census data. I then explained how we introduce Catholic demographic data into the mix. We are the only source in town, when it comes to local Philly Catholic demographic data. I concluded the presentation by showing some of the many many (yes I said many twice) maps and reports that we prepare to analyze demographic and church data.

After the presentation I was approached by an interested professional that had some thoughts on the process. I listened to the suggestions and have been considering trying the suggested technique. I do have to say that I do feel our technique served our purposes perfectly. I am looking forward to doing a comparison of the two different ways to see the pros and cons of each process. So, to that end I must say that the conference was a success. I hope to be able to attend future conferences in efforts to continue learning new techniques and ways of using esri GIS software.

Tom Denton, PAMAGIC
Board Member

Calendar of Events

PA GIS Conference—
June 3-5—PennStater,
State College

**2013 Central PA GIS
Day—November 20** FREE
registration, free exhibit
space) HACC Midtown

If you have an event that you would like to share with the PA GIS community, email it to our [newsletter editor](#).

Post-Analysis of 2008 Strategic Plan

Background

In response to a federal initiative to encourage coordinated mapping and data development among the states, the County Commissioners Association of Pennsylvania (CCAP) secured a grant to investigate and justify the creation of a formal Council for coordinating geospatial activities among all levels of government, and engaging the broader GIS community as well. During the fall of 2008 a series of six stakeholder workshops was held across the state. Through this process a recurring theme emerged of *there being a void in geospatial coordination across governmental entities*.

A number of factors brought Pennsylvania to a watershed moment for addressing broader geospatial coordination in 2008. These factors include:

- Increasing **public awareness** of GIS through GPS-based navigation of cars and boats, election reporting and the popular use of tools such as MapQuest or Google Earth.
- A **long history** of geospatial activity dating to the early 1980's in public and

private entities.

- A **strong geospatial data clearinghouse** in the form of the Pennsylvania Spatial Data Access (PASDA) operation that readily makes public geospatial information accessible to the general public.
- **Active and engaged organizations** – such as PaMAGIC, PA chapter of MAPPs and County GIS Pros – aimed at **promoting and coordinating GIS activity**.
- Government-wide **funding stresses emanating from the economic downturn** that impacted geospatial programs at all levels of government.
- The **elimination of funding for Pennsylvania's statewide base mapping program**.
- The **failure of numerous efforts to create a statewide geospatial coordinating council**.

Those factors led the people involved to focus on a legislatively authorized Coordinating Council as a remedy for the limited communication and collaboration. This may have been circular logic, since a goal of the federal "Fifty States Initiative"

included formal coordination in each state. Nevertheless, the steering committee created a **Vision Statement** for the Council that is true and correct regardless of the motivation:

Complex geospatial technology decisions and investments will be simplified and improved through open communications, collaborative efforts and unified planning.

In addition, based on input gained through the workshops and the survey, the steering committee helped to identify the **Primary Roles** that a new council would fulfill. These are:

- **Advocate** for statewide geospatial initiatives and programs
- Generate and maintain a **statewide geospatial strategic plan**
- **Advise on the prioritization** of statewide geospatial initiatives and programs
- Advocate for **sustainable funding** for geospatial activity
- **Review and comment** on legislation with geospatial provisions
- Serve as the **focal point for statewide geospatial communication** and coordination

Eric Jespersen, Board Member

Post-Analysis of 2008 Strategic Plan

Results and Analysis

Now, from a vantage point four years later one can see that simply advocating for a Council at the Legislature has not yet worked despite regular and ongoing educational efforts in the Legislature, and despite the existence of Champions within the Legislature for the concept from time to time. *The education and advocacy takes much longer than envisioned, and has never been directed at the entire Legislature but rather at individual Members.*

The pivotal role of Counties and regional groupings of Counties for GIS in transportation, economic development and public safety is clear. Perhaps the most important result of the study is CCAP's own view of its role; it has been much more engaged in promoting a Council and collaboration in general since leading this study. *We are not taking full advantage of the County role in convincing the Legislature and the Executive to collaborate and plan for geospatial technologies as an enterprise.*

State budget limitations have continued, such that the statewide base map programs are not active

at the present time. Note: In May 2009 the steering committee had reported that the program and projects were unfunded and would remain incomplete, but all PAMAP LiDAR products are fully processed and freely available. *It is puzzling that the economics of joint action (economies of scale, simplified data sharing) have not been more attractive at a time when joint actions save money.*

The extraordinary and lasting value of the base mapping program has been proven in support of Marcellus Shale development as well as in environmental monitoring of that same development. The availability of a high quality, common base map has supported billions of dollars invested in the Commonwealth. The Marcellus Shale Advisory Committee (MSAC) report and recommendations included many areas where data sharing and increased communications scream for coordinated GIS. *It is not necessary to compute returns for a base mapping program in PA, as the value is long established and it should be a budget line item forever.*

The tightly controlled inputs by state agencies to the coordination

strategic plan illustrated real barriers to coordination and joint planning, and those are unresolved. There is an obvious disconnect between state-level agencies and GIS activities in the rest of the 'enterprise', which is particularly painful given the high level of knowledge and expertise of the GIS professionals within the agencies, and the acknowledged role of local data. Factors contributing to that disconnect include:

- Budgets have never included money explicitly for coordination. The potential benefits are strangled before they can be analyzed because *there are little or no resources allocated to outward discussions.*
- Good ideas or information from the local government have no path into agency GIS planning functions. This is anachronistic given the fact that state mandates easily flow down to local governments. *GTO should facilitate more outward orientation among agencies and mechanisms to seek local knowledge and partners.*

- We have always defined "champion" as someone of influence who can understand and advance the en-tire gamut of geospatial technologies and applications. *We need to seek and encourage champions for smaller portions of the spectrum.*
- Certain levels of government are already the "authoritative source" for specific data but we do not necessarily accommodate their data as such; we seek to define new stewards when we *should be assisting the real stewards to publish consistent data.*

The Strengths and Weaknesses reported in 2008-09 are summarized on the following page, and are little changed from 4 years ago. That alone indicates a drifting GIS Community, or at least one that is fragmented. *There is no strategic vision or plan to guide Geospatial development in Pennsylvania.*

Eric Jespersen, PAMAGIC Board

U.S. Census Update

TIGER/Line Shapefiles pre-joined with Demographic Data: New releases with 2006-2010 ACS 5-Year Estimates Data Profiled and 2007-2011 ACS 5-Year Estimates Data Profiles. Available for counties, Metro and Micro areas census tracts (by State). <http://www.census.gov/geo/maps-data/data/tiger-data.html>

Census Data Mapper-Beta. The Census Data Mapper is a web mapping application intended to provide users with a simple interface to view, save and print county-based demographic maps of the United States. The data are from the 2010 Census. <http://www.census.gov/geo/maps-data/maps-datamapper.html>

Data Visualization Gallery. The Census Bureau is working to increase our use of visualization in making data available to the public, and we have begun a weekly census data visualizations gallery to help users explore Census data. <http://www.census.gov/dataviz/>



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Whither Enterprise GIS?

Some Observations by Peirce Eichelberger

I hope I am not recognizing a long-term trend, but I think enterprise GIS is coming into some hard times. I hope I am wrong because enterprise GIS provides so many benefits to the organization that can adopt an enterprise-wide GIS perspective.

Lately, I see some brewing battles among GIS “professionals” and GIS “tool users”. For a long time enterprise GIS has suffered from centrifugal forces that want to pull it apart. The centripetal forces that keep enterprise GIS working well are also often under attack.

Let me describe some of these trends. Many disciplines are benefiting from the use of GIS as a powerful tool. Students and practitioners are learning to use GIS as an indispensable tool in their daily work. Water management, planning, transportation, health, police, emergency management, elections, public works, parks, utilities and assessment staff are all using GIS on a daily basis. Staff in these positions have a professional title probably without “GIS” necessarily in their title. In most cases I might describe these professionals as GIS “tool” users, in no way taking away from their professional perspective in their given disciplines. I suspect that this is a growing segment of the governmental workforce in many different types of organizations including regional, state and the Federal governments? Interestingly enough there are some large organizations (read State governments) that still do not have GIS job titles!

GIS professionals on the other hand must have a much more in depth knowledge of all the technical underpinnings of GIS, plus project management skills with technical staff in order to get most anything accomplished. Current GIS Pros need to have an advanced vocabulary able to converse with the Police, Fire Chief, Assessor or the Recorder/Clerk. In addition, they need to be conversant with

other levels of government (sharing data, cost sharing, Consortia approaches), the general public and the business community (producing valuable products that the private sector can use). Other needed skills by GIS Pros includes the following:

- Full understanding of the land record and survey underpinnings of the GIS base map
- All things dealing with data modeling, Foreign Keys and data linkages
- A full range of IT skills including rDBMS, networking, new programming skills, www based technologies, and
- Willingness to visualize the government-wide architecture that GIS can support, especially among separately elected officials and diverse governmental functions.

The notion of GIS Professionals and GIS tool users is, in it self, a centrifugal force pulling at enterprise GIS. Tool users might not see the benefits in following standards or procedures that they may see as not directly affecting their immediate work effort. They might not appreciate the need to maintain something for later use or for sharing with others.

I find that many GIS “Managers” have very little understanding of enterprise GIS. They may be very hard pressed to handle many of the skills mentioned above. They may not be well versed enough to even recognize enterprise GIS opportunities however they present themselves..

Some illustrative examples might help here. I am reminded of a project to locate all the 189 cell towers for a wireless/9-1-1 project, most with multiple antennas. The task was to address the towers so a dispatch could be made to a caller without the latest GPS enabled wireless telephone. The emergency vehicle could get fairly “close” to

the caller in distress. This database, after some negotiations, could be shared with the assessment folks who saw substantial income in the towers, often in church steeples or upon municipal, tax-exempt water towers. The County could then value significant additional revenue streams for the municipalities, school districts and the County, just by sharing some data.

Another prime example is the use of solid address databases built to support the entire gamut of E-911 and emergency dispatch. What we discovered was that the rich set of situs (location) addresses became the most often used key to modernize land record interfaces with our Recorder of Deeds Office thus providing workflow enhancements to GIS and Assessment bringing in an additional \$6M with untold workflow improvements.

Let’s jump to some of the centripetal forces that should be supporting enterprise GIS. I still see ongoing battles among IT forces and GIS ones. Maybe it is headcount, priorities or where programming resources report, to the GIS staff or buried in the IT organization. Maybe it is the gee wiz factor—the information content of a good GIS map tells a complete story, a pile of paper that is an IT report may tell a story but not nearly as effectively. Enterprise GIS by its very nature is a framework for tying things together, exactly what IT should be doing but often cannot for many reasons. Do not get me wrong some IT people get it and embrace it, they see the benefits of enterprise GIS.

In tough budget cycles GIS is often hit hard. Maybe it is a buffer between staff cuts and traditional IT headcount? Maybe it has not been around as long as other governmental functions? Maybe the decision makers think that cuts can be made and GIS will not suffer, they should know better, but don’t.

Whether this is a trend or not we need to talk about all these issues.

Let’s get to and understand some of these real issues. URISA can lead the charge! Email me if you agree or think I am off the mark? What would you like to see URISA do?

Thanks for reading.....

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Feedback Requested!

PaMAGIC is engaged with a Geospatial Coordinating Coalition* to promote the idea of a formal Geo-Council, and to prepare some materials helpful to any Council that eventually exists. Please write and send short and sweet responses to the following:

- **Briefs on opportunities missed since we have not had a Council or other formal coordinating body**
- **Briefs on forward opportunities (technologies, trends, alliances)**
- **Strategic priorities, including approximate timing, for the Commonwealth.**

Send these to Eric Jespersen (ecj@epix.net) and include any information (however sketchy) that would be useful for future fiscal notes. Please send them to me by March 15th. We will use them to update the Strategic Plan done in 2008-09.

**Primary coalition members include: Pa-MAGIC, PA-MAPPS, PA County GIS Professionals, PMAA, PA-SSHE GIS, PSLS, APA-PA, PA One Call and PaBAR.