

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:

1. 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.
2. Require Executive agencies and encourage all others to transform their data to be compatible with and connected to that base map by 2018.
3. Allocate \$50 million to this effort.

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