

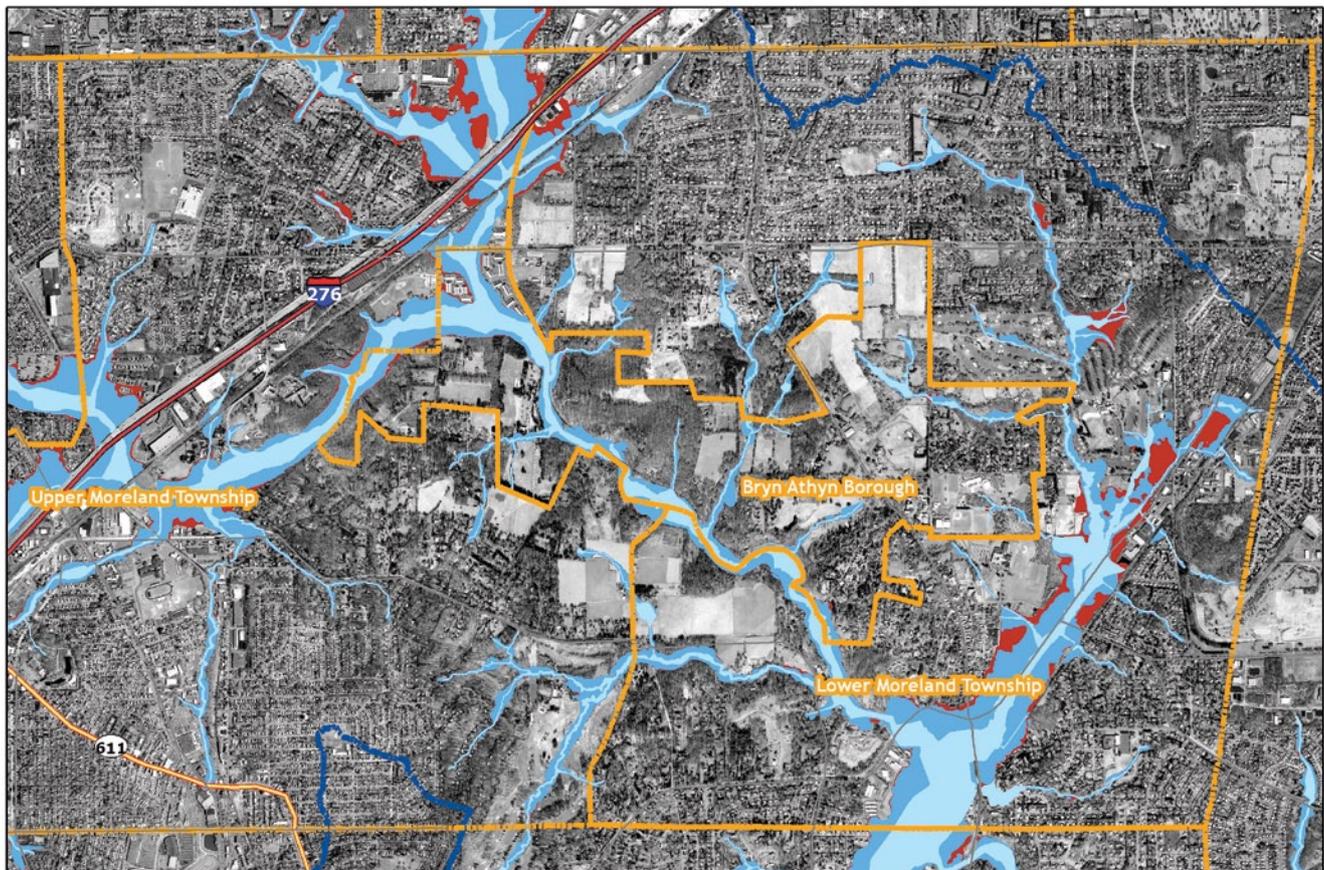


By Wendy Lathrop, LS, CFM

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Between a Rock and a Wet Place

Pennypack Creek Watershed Study >> Draft Floodplains: Lower Moreland Township, Bryn Athyn Borough



Data Sources: Temple University, DVRPC, FEMA
Map Prepared by the Center for Sustainable Communities, Temple University Ambler, Date: June 06, 2006



Watershed Boundary Floodway 100 YR Floodplain 500 YR Floodplain

Complaints about the inaccuracies of flood hazard mapping are common everywhere that such maps exist. Some folks actually try to do something about the problem, by filing for appropriate Letters of Map Change, to better depict the true risks of inundation and damage. Others, like the state

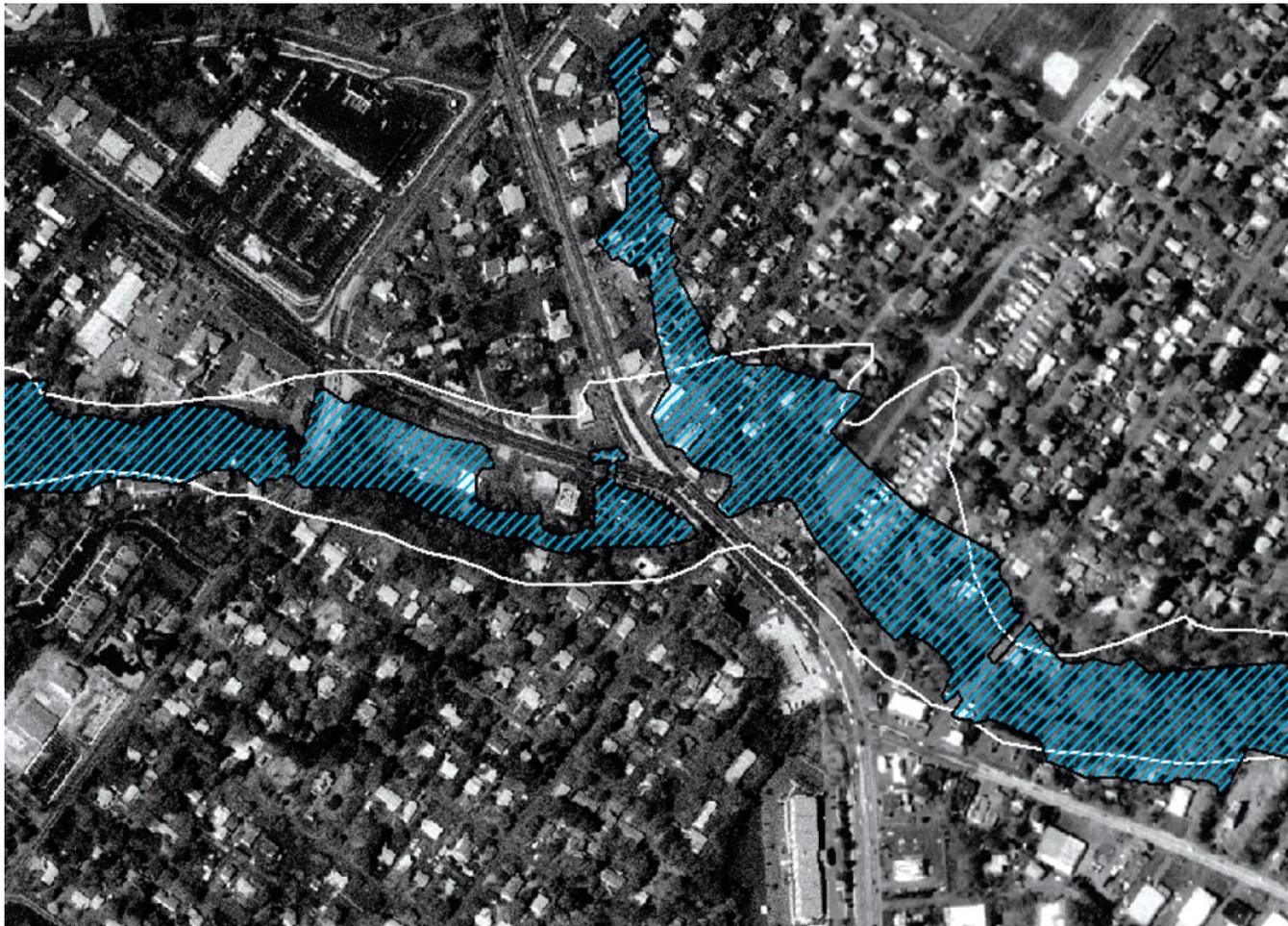
The cumulative effects of studying a watershed (dark blue line) transcends municipal and county limits (orange lines), as indicated in this map from the report. *Courtesy The Center for Sustainable Communities, Temple University, Ambler*

of North Carolina, undertake their own massive re-mapping efforts from scratch, not bothering with the federal maps they consider too outdated or too inaccurate to even begin to fix. Now southeastern Pennsylvania has undertaken new map-

ping, but the repercussions of improved flood risk identification have caught residents and municipal officials off guard.

Pennypack Creek runs through the common corner of southeastern

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 Montgomery County, southwestern Bucks County, and northeastern Philadelphia, with a watershed encompassing 56 square miles, 12 municipalities, and about 640,000 residents. This watercourse bears the brunt of runoff from ballooning development upstream, and is known to flood; thus it bears a mapped Special Flood Hazard Area (SFHA, 1% annual chance floodplain) on FEMA's Flood Insurance Rate Maps. Since 1999, the watershed has been the scene of 14 flood-related deaths, and in the 30-odd years since first mapped through the NFIP (National Flood Insurance Program), almost \$30,000,000 have been paid out in flood insurance claims.

The Federal Emergency Management Agency (FEMA) is always looking for partners to share the expense and efforts involved in improving the nation's flood hazard mapping. So when Temple University's Center for Sustainable Communities (Temple) stepped forward in 2002 offering to participate in a study of the Pennypack, FEMA produced a \$192,500 grant. Eleven municipalities

The current FEMA mapping of the SFHA, shown as a white line, varies in extent and location from the watershed study results, indicated as dark blue shading. Courtesy The Center for Sustainable Communities, Temple University, Ambler

within the watershed contributed an additional \$70,000 to the \$700,000 remapping project (Philadelphia declined to participate), and Temple contributed an additional \$95,000. The balance came from a local charitable foundation.

Temple's Center for Sustainable Communities website bears a banner summarizing its objectives: "Mapping out community floodplains in order to preserve the watershed and enhance community life in a streamlined, effective, holistic manner." So, Temple undertook a detailed multi-disciplinary study of the flooding factors, culminating in a new map of the true risks along the Pennypack Creek, identifying problems with unplanned land development, poor stormwater management, impaired water quality and outdated floodplain maps. (To read more about the project in detail

visit Temple University's Center for Sustainable Communities at www.temple.edu/ambler/csc/pennypack/index.htm and www.temple.edu/ambler/csc/projects/projects_pennypack.htm.)

Temple completed its studies in the summer of 2006, and presented its findings to FEMA. The reaction was unexpected. While acknowledging that they were likely better than what the agency itself had published, FEMA told Temple that it could not accept the new maps, because they were based on a level of detail that contradicted FEMA's standards for flood hazard mapping. According to this line of thought, the maps must be uniform across the country so that regulation of floodplains is uniform as well.

However, surveyors should note that communities may always adopt and enforce more stringent regulations than the FEMA standards outlined in Title 44 of the Code of Federal Regulations, Part 60 (44 CFR 60), and that the Community Rating System was implemented in 1990 to further encourage communities to exceed minimum

NFIP standards in their floodplain management activities.

The researchers had included small tributaries typically omitted, as well as clogged culverts and storm drains as flooding factors. Smaller more frequent storms (the principal shapers of stream channels) were modeled for erosion and sedimentation they contributed not only to flooding but also non-point source pollution. As a result, the new mapping included an additional 131 buildings

There were no easy decisions to be made. Citing the benefits of addressing complicated multi-jurisdictional problems that had previously only been addressed in piecemeal fashion, Temple urged the municipalities to utilize the study to guide them in recommending best management practices and land use planning, telling them that they had the right to do so. There is, incidentally, precedent for such proactive planning, such as in Charlotte-Mecklenberg in

The most accurate floodplain map to date brought with it unforeseen consequences.

and 24 percent more land within the SFHA than the current effective maps.

On September 29, 2006, Temple and FEMA met with about thirty town managers, zoning officials, engineers, planners, and funding partners to present the results of the four-year study. Community representatives found themselves between a rock and a wet place in wrestling with the decision between accepting maps that included more structures and more land within the SFHA or maintaining the less accurate older maps. While the greater accuracy of the flood hazards yield a better assessment of potential harm to structures in the area, it also means that people who have never before been required to purchase flood insurance, by virtue of being located beyond the mapped limits of the mandatory insurance area of the SFHA, would now be paying annual premiums, and not inexpensively.

Community officials were left shaking their heads in confusion. If they adopted the new study, it would mean that other areas within their jurisdictions that were in different watersheds would be regulated less stringently (due to different mapping), yielding a double standard. If they didn't adopt the new maps, they would knowingly be allowing unsafe development in risky areas, and therefore contributing to public harm. If they did adopt the maps and constituents were unhappy with new restrictions, insurance premiums, and lessened property values, the officials could be voted out of office.

North Carolina and the Denver Urban Water District in Colorado, which have adopted maps that depict, and therefore allow regulation of, the floodplain at ultimate build-out of the watershed.

Months went by, with no resolution. But in January of this year, after ongoing consultation with the municipalities involved, FEMA announced that it could, after all, accept the new maps that had previously been labeled as "too good"; protecting public safety was a paramount factor. Noting that the study was unsurpassed in detail, FEMA Region III staff said that Temple's approach could become a model for assessing flood risk in high-growth areas across the country.

The Philadelphia Inquirer has posted an interactive map on a special page to allow viewers to compare the current FEMA identification of the SFHA with the new Temple University delineation of those flood prone areas. Crossing county and municipal boundaries, those artificial barriers to regulating human interaction with our environment, the watershed-wide map employs zooming and panning to better study areas of interest. While some parts of the map indicate somewhat less area affected by flood risk, most not only widen the floodplain, but also extend it significantly along the streams and tributaries feeding into and running out from the Pennypack Creek. (http://inquirer.philly.com/graphics/pennypack_zoom/default.asp) 

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and is entitled to the reward. What then is the difference in his employing GPS-enabled equipment rather than hiring a survey crew? If we require him to hire the crew, despite his knowing that the alternative GPS method would better suit his operations, we have engaged in featherbedding: the practice of requiring the employment of a certain type of people even after technology has obsoleted their job. Is that where we want to be?

Opportunity

There are many aspects of construction machine control in which we should involve ourselves, including initial control setup, quality control, performance monitoring, etc. Additionally, my experience has been that digital files from many designers are not really three-dimensional files, but instead are a series of two dimensional files. In other words, the designers have used a computer like a pencil, and have not taken advantage of its potential in creating a seamless target terrain model. Obviously such a digital product would be of no use to the GPS-enabled contractor, and thus an opportunity exists to create one that the contractor can use. This will probably diminish over time as older designers die off and true three-dimensional design takes hold in civil shops. In the meantime, however, it has been the surveyors all along who have been interpreting those designs. And, as a class, we have been computer-savvy from way back. We serve as a go-between for the contractor and designer. Not by fiat, but as a natural fit.

So here is how I see it: There should not even be a hint of featherbedding surrounding our practice. (Nothing encourages cynicism on the part of our clients and allied professions faster.) When surveying skills are *genuinely* required, the law ought to require licensed surveyor involvement. And when they are not, the law ought to be silent. (In my opinion, construction stakeout falls outside of required surveyor involvement – there are too many examples of success, despite our non-involvement, in the marketplace.) We ought to *encourage* our contractor clients to convert to GPS-enabled equipment, and stand ready to assist them in the support tasks that conversion will engender. There will be work for those able to see around the corner. 