Watershed Restoration in an Ultra-urban Environment

November 30, 2012

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My USGS Friends
Impervious Cover model supports the findings from this study.
Not Much Effect From Current Watershed Treatment

- The extent or effectiveness of watershed treatment has seldom been measured and is often incomplete
- Most development was built before stormwater controls
- Biological Conditions Gradient can help to model improvements associated with remediation
Streams were piped to control flooding and disease

Baltimore City
Streams and Harbor Shoreline in 1934 and Present

Dunne and Leopold, 1978
Baltimore City Stream-pipe network today

- Streams = 43.6 miles
- Storm drains = 1,100 miles

- The red lines used to be small streams
- The blue lines are the remaining streams
There are two other pipe networks that affect the quality of our surface waters—drinking water and wastewater.

- The black lines comprise thousands of miles of sewage pipes.
- Pipes are placed side by side under the streets (below).
With a price tag to meet the new Stormwater Permit and Chesapeake Bay TMDL in the order of $30-50 million per year, what is the best approach to meeting these mandates?
The most obvious solution is to integrate the 3-pipe system so that solutions for one benefit all.
The ultimate goal of restoring the ecological condition of our waterways has to include the restoration of the communities that drain to them.
Protecting and restoring what natural resources remain
Using vacant lots to control stormwater

Impervious Cover Reduction

Soil Restoration

Before

After
Bioretention installed for stormwater runoff control and as an amenity to the community.
Watershed-wide practices such as “School Greening”
Community “driven” Green Infrastructure Plans

Figure 10: Bump out at Collington and Lombard Street
Two summary points

• While the price tag for restoring our waterways is expensive, we are beginning to identify synergies among regulatory programs (3-pipes)
• Restoring our waterways can help to restore our communities. This should factor into the cost.