Water Quality – Accotink Creek, Fairfax County

Accotink Creek, which flows through heavily developed areas in Fairfax County, violates the Virginia standard for fecal coliform bacteria. USGS is determining the dominant sources of fecal coliform bacteria in Accotink Creek using ribotyping. This technique uses genetic “fingerprints” consisting of the section of DNA coded for ribosomal RNA production that is unique to each warm-blooded animal species—to positively identify the bacteria sources in streamwater.

Many pesticides were detected in water samples collected from Accotink Creek from 1992 to 1996 (Ator and others, 1998). These pesticides are used on rights-of-way, turf, golf courses, and as additives to asphalt and other building materials.

<table>
<thead>
<tr>
<th>Pesticides detected in Accotink Creek</th>
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</thead>
<tbody>
<tr>
<td>atrazine</td>
</tr>
<tr>
<td>carbofuran</td>
</tr>
<tr>
<td>chlorpyrifos</td>
</tr>
<tr>
<td>diuron</td>
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<tr>
<td>isoproturon</td>
</tr>
</tbody>
</table>

Detected at the highest concentration measured in the Potomac River Basin
Detected at the highest concentration measured nationwide
Detected at the highest frequency and at the highest concentrations in the basin, occasionally exceeding the maximum contaminant level of 4 ppb.

Water Quality – Lake Anne in Reston, Fairfax County

This “real-estate lake” is located in a densely populated watershed, and the lake shoreline is surrounded by dwellings. Lake outflow drains to the Potomac River. USGS hydrologist Karen Rice compared concentrations of arsenic and copper in samples of precipitation and streamwater collected from Bear Branch, a forested watershed on Catoctin Mountain, Md. (Church and others, 1998), to samples from the Lake Anne watershed (Rice, in preparation).

Population density was positively related to the sum of concentrations of copper, mercury, lead, and zinc.

Medium concentrations of cadmium, chromium, copper, mercury, lead, nickel, and zinc were significantly greater (p < 0.05) at urban sites compared to nonurban sites.

These trace elements are considered very toxic, are relatively accessible in the environment, and are on the USEPA’s list of 126 Priority Pollutants.

References
Rice, K.C., in preparation, Historical reconstruction of the deposition of lake sediments and associated arsenic and copper concentrations during land-use change from forested to suburban in a northern Virginia catchment: Ph.D. Dissertation, University of Virginia Department of Environmental Sciences.

Graphics, editing, and layout by Martha Erwin, Theodore Samuels, III, and R. Brent Banks, III; Computer support by Willet Wilson.