The Totuskey Creek watershed spans approximately 68 square miles in Richmond County, Virginia. Totuskey Creek is 17 miles long and Little Totuskey Creek flows into the mainstem 4 miles upstream from the mouth. Totuskey is a tributary of the Rappahannock River, which flows into the Chesapeake Bay. Part of Totuskey Creek is listed as impaired for recreational and shellfish use due to exceedances of bacteria standards.
A retrospective analysis of dissolved oxygen data, shows that average scores for the watershed have been good for dissolved oxygen since at least 2004. There is some variability between sites. The site on Little Totuskey is consistently lower than most of the sites on the mainstem, except for Site 3 in recent years. Site 1 usually has the highest grades, possibly because it is upstream of where Little Totuskey joins the mainstem. The most downstream site (4) also has consistently better grades than the mid-watershed sites, except in 2007. DO is essential for aquatic life survival. Excess nutrients fuel algae blooms, which use up the oxygen when they decompose. Warm water holds less oxygen, so low DO can be an issue in the summer. The Virginia water quality standard is 5.0 mg/L for open waters and 4.0 mg/L for tidal and nontidal waters.

On the other hand, the average water clarity scores have been poor. Site 1 did see some increase in water clarity scores, with a peak in 2007. Water clarity generally decreases as you follow the sites downstream, with Site 4 consistently having the worst score. This could be due to either an accumulation of sediment runoff, churning of sediment in the open water area or a combination of both. For the middle two sites and the Little Totuskey site, there is no long-term trend in improvement or degradation of water clarity. When sediment runoff decreases water clarity, aquatic life is affected by interfering with the penetration of sunlight. Underwater grasses require light for photosynthesis, which also provides oxygen for fish and habitat for young aquatic life.
According to the 2006 National Land Cover Dataset, approximately 28% of the watershed is agricultural lands (pasture and cropland) and only about 4% is developed lands. Stormwater runoff carries pollutants such as nutrients from these areas to the stream, which can negatively affect dissolved oxygen and water clarity. Excess nutrients fuel algae blooms, which use up oxygen when they decompose and make the water cloudy.

The watershed also has some forested areas. When streambanks are forested, trees create a buffer to filter stormwater runoff and prevent streambank erosion.

VA Department of Environmental Quality (VA DEQ) annually rotates monitoring at stations throughout the state. In 2007, VA DEQ collected Total Nitrogen (TN) and Total Phosphorus (TP) data at three stations in the Totuskey Creek watershed. While there is not enough data to calculate a grade for these parameters, some general observations can be made. The sites have been labeled DEQ 1, 3, and Little to correspond with the closest citizen monitoring stations.

As seen in the table, TN observations are mostly above the recommended 1.0 mg/L threshold at the Little Totuskey Creek site, below the threshold at Site 1, and mostly below the threshold at Site 3. On the other hand, TP levels are below the recommended 0.05 mg/L threshold at the Little Totuskey Creek site, but above the threshold at the sites on Totuskey Creek.

There is a need for more continuous monitoring of nutrients to determine if there are any long-term trends. The Alliance for the Chesapeake Bay hopes to add nutrient analysis to its suite of volunteer water quality monitoring parameters.

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<th>Date</th>
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</table>

2007 Total Nitrogen and Total Phosphorus Observation at 3 VA DEQ sites.
Reduce Your Watershed Footprint

Everyone can help keep pollution from entering our waterways. Here are a few tips for reducing your watershed footprint:

- Reduce fertilizer and pesticide use.
- Pick up your pet’s waste.
- Install a rain barrel or rain garden and plant native species to keep stormwater on your property.
- Watch (and smell) for sewage overflows and contact your city or county.
- If you have a septic system, have it inspected and pumped regularly.
- Support sewage treatment plant and septic system upgrades.
- Farmers can implement Best Management Practices (BMPs): plant cover crops, fence livestock out of streams, and reduce fertilizer use.
- Businesses can use green practices that are protective of water quality.
- Leave or plant tree buffers on stream banks.
- Volunteer with or form a watershed organization.

Tree buffers: Trees provide buffers on Little Totuskey Creek.

Native Plants: Purple coneflower and black eyed susans.

Volunteers attend a water monitoring training.

This report was funded by a Chesapeake Bay Restoration Fund grant to the Alliance for the Chesapeake Bay (Alliance). The Alliance’s mission is to restore the Chesapeake Bay through collaborative engagement with the communities that work and live in the Bay watershed. The Alliance coordinates RiverTrends, a regional volunteer water quality monitoring program with 40 active sites in Virginia. This program has been coordinated by the Alliance since 1985. Many thanks to Dayle Collins, our long-time citizen scientist in the Totuskey Creek watershed!

For more water quality data collected through these efforts, please visit the Alliance’s Database at http://www.acb-online.org/monitoring/data/site.cfm. To find out how to become a water quality monitor, visit www.allianceforthebay.org. For information on the protocols used for determining the grades, see “Sampling and data analysis protocols for Mid-Atlantic tidal tributary indicators” by the Integration and Application Network (IAN).