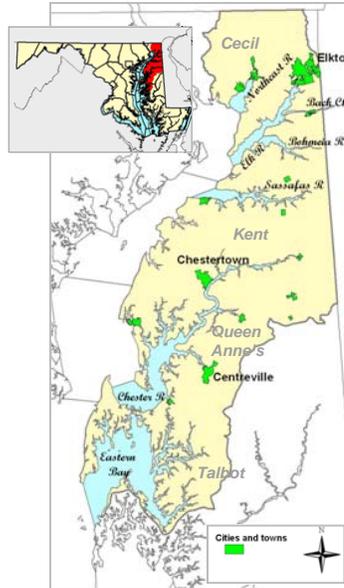


Upper Eastern Shore Water Quality and Habitat Assessment Summary

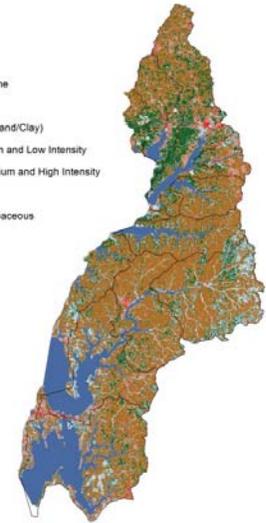
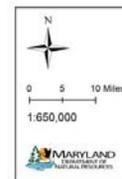
Upper Eastern Shore Basin

Maryland's Upper Eastern Shore basin drains 940 square miles in Kent County and portions of Cecil, Queen Anne's, and Talbot Counties. This basin includes the Northeast, Elk, Bohemia, Sassafras, and Chester Rivers. Back Creek forms the western end of the Chesapeake and Delaware Canal and the basin ends in the south at Eastern Bay. In 2010 there were approximately 150,000 people living in the basin in Maryland and an additional 110,000 in Pennsylvania and Delaware. The dominant land use in the Upper Eastern Shore basin is forest (42%), followed by agriculture (31%) and urban use (24%). Between 2000 and 2010, urban land use increased by 7% and impervious surfaces cover 5% of the overall basin.



Land Use/Land Cover

2011 Land Use



Overall Conditions (1999–2015)

Northeast River

- Poor water quality with high nitrogen and sediment levels
- Poor water clarity and high algal densities, but underwater grass coverage increased to 94% of restoration goal in 2015
- Summer dissolved oxygen levels are good

Bohemia River

- Water quality is fair with high sediment levels
- Poor water clarity and high algal densities have led to poor underwater grass habitat—but grass coverage increased to 92% of restoration goal in 2015
- Good summer dissolved oxygen levels

Chester River

- Poor but improving water quality in upper river; fair in lower river with high nitrogen levels
- Poor water clarity and high algal densities in lower river—underwater grass coverage was 16% of restoration goal in 2015
- Poor summer dissolved oxygen levels in lower river and bottom dwelling animal populations are not healthy

Elk River

- Poor water quality with high nitrogen, phosphorus, and sediment levels
- Decreasing water clarity and increasing algal densities have led to fair underwater grass habitat—grass coverage surpassed 100% of restoration goal in 2015
- Summer bottom dissolved oxygen levels are good

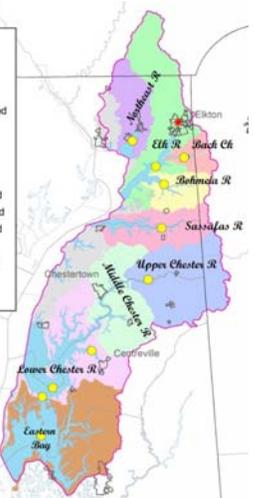
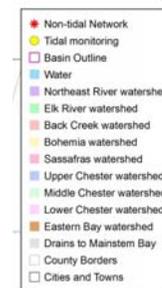
Back Creek (C&D Canal)

- Poor water quality due to high nitrogen and sediment levels
- Poor water clarity and increasing algal densities have led to fair underwater grass habitat, and grass coverage surpassed 100% of restoration goal in 2015
- Good summer dissolved oxygen levels

Eastern Bay

- Good water quality with low nutrient levels
- Habitat quality for underwater grasses is good, and grass coverage increased to 36% of restoration goal in 2015
- Poor summer dissolved oxygen levels and unhealthy bottom dwelling animals

Monitoring Stations



Sassafras River

- Fair water quality due to high sediment levels
- Poor water clarity and high algal densities have led to poor underwater grass habitat—grass coverage was 14% of restoration goal in 2015
- Good summer bottom dissolved oxygen levels
- Harmful algal blooms in most years have led to human health impacts and beach closures at Betterton

Improving Water & Habitat Quality: What's been done and what needs to be done?

- Upgrades to six of the seven largest wastewater treatment plants in the basin have been completed and upgrades at the final facility, which discharges to the Northeast River, are scheduled to be completed in 2016; upgrades have reduced nitrogen and phosphorus loadings to or below management goals
- 710 septic system retrofits were completed between 2008 and 2013, and stormwater retrofits have reduced nitrogen loadings and prevented 2,500 pounds of nitrogen from entering the rivers since 2003
- In 2014, over 112,000 acres of cover crops were planted between growing seasons to absorb excess nutrients and prevent sediment erosion
- Fencing on 1,900 acres of farmland was used to keep livestock out of streams and prevent streambank erosion and over 25,000 acres of stream buffers are in place to reduce runoff and erosion
- More than 330 containment structures have been built to store animal wastes and allow these nutrients to be applied to the land in the manner most effective to reduce runoff
- Over 36,000 acres have been protected and preserved through various programs such as Program Open Space, the Rural Legacy Program, the Maryland Environmental Trust, and the Maryland Agricultural Land Preservation Program
- Efforts to lower nutrient and sediment loadings from urban and agricultural areas are needed to improve water clarity and algal densities, and reducing nutrient loadings from septic systems and other point sources should also be a priority
- An integrative assessment of the water and habitat quality of the Upper Eastern Shore Rivers for 1985-2010 is available online at: <http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/UpperEasternShoreWQandHAssessment2012.pdf>



Corsica River near Centreville is a tributary of the Chester River

What Can You Do?

There are many things you can do to help improve water and habitat quality on the Upper Eastern Shore.

- **Plant trees along streamside property.** Tree roots will slow erosion and absorb the flow of nutrient runoff.
- **Pump out septic tanks regularly (every 3-5 years).** A failing system can contaminate groundwater.
- **Conserve water.** Use rainwater for plants, take shorter showers, and turn off the faucet when brushing your teeth.
- **Drain gutter spouts into rain barrels or grassy areas.** This will reduce erosion, which adds sediment to rivers.
- **Carpool, or try biking or walking.** Exhaust fumes contain nitrogen oxides, which can end up in rivers and bay.
- **Dispose of household chemicals properly.** Toxic chemicals poured down the drain could end up in rivers.
- **Use fertilizer sparingly.** If you must fertilize, try doing it in autumn, when it will have less of an impact on rivers.
- **Support land protection initiatives.** Preserving existing green space is much easier than restoring degraded areas.
- **Get involved.** Let county, state, and local officials know that water and habitat quality is important to you.

Water quality data from the Upper Eastern Shore are available at: www.eyesonthebay.net

Please report fish kills, algal blooms, or any other events or problems to the toll-free Chesapeake Bay Safety and Environmental Hotline at **1-877-224-7229**

Larry Hogan, Governor

Mark Belton, DNR Secretary



Maryland Department of Natural Resources; Tawes State Office Building; 580 Taylor Avenue; Annapolis, Maryland 21401
Toll free : 1-(877)- 620-8DNR(8638) in Maryland Out of state call: 410-260-8638 TTY users call via the Maryland Relay
www.dnr.maryland.gov



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*This summary is taken from the full Water Quality and Habitat Assessments prepared by members of the DNR Tidewater Ecosystem Assessment Division: Renee Karrh primary author
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