

The Potomac River basin, home to more than five million people, includes our nation's capital and some of

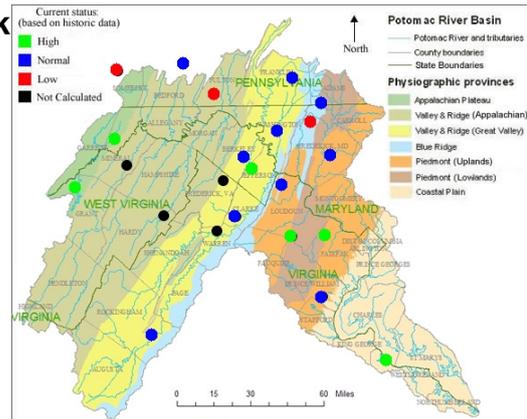


the fastest growing cities in the U.S. Residents, farmers, and industries tap into the water resources through a variety of means. In the upper portions of the basin, water is withdrawn from wells drilled into bedrock aquifers, and from streams and rivers, which are fed by these aquifers. In the lower basin, most water is obtained from wells in the deep sand and gravel aquifers of the Coastal Plain region. In Washington, D.C., and surrounding areas, the primary source of water is the Potomac River itself. Water is also shared by the plants and animals of the basin. In streams where flows are reduced because of human water use, aquatic ecosystems may experience reductions in habitat area or other adverse impacts.

ICPRB is working to develop a set of tools to help water managers assess the impact of future growth on ground water resources:

- [Potomac basin real-time monitoring well network](#)
- [Monocacy River basin ground water/stream flow modeling effort](#)
- [Watershed water budget estimates](#)
- [Coastal Plain aquifers](#)

## Potomac basin real-time monitoring well network



ICPRB and USGS worked jointly to establish a network of [real-time ground water monitoring wells](#) for the Potomac basin, with funding provided by the US Department of the Interior and local partners. Data from this network is made available online by the USGS's Pennsylvania District. Click on the map to the left to view real-time well level data.

## Monocacy River basin groundwater/stream flow modeling effort

## Groundwater

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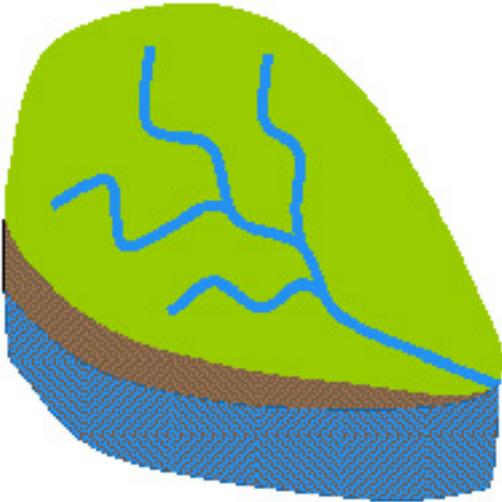


The Monocacy River, a tributary of the Potomac, has a 970 square mile drainage area which covers portions of Adams and Franklin Counties in Pennsylvania and Frederick, Carroll and Montgomery Counties in Maryland. Localities in the the Monocacy basin, including Frederick, Md., and Gettysburg, Pa., are experiencing rapid population growth due to proximity to the Washington, D.C. metropolitan area, and there is concern that future development will strain water resources.

ICPRB is currently developing a groundwater stream flow model of the upper Monocacy River basin with a grant from the National Wildlife Foundation (NFWF). This model simulates summertime aquifer levels and stream base flows. Learn more about ICPRB's [Upper Monocacy groundwater/stream flow model](#)

- ICPRB recently completed a steady-state model for the entire Monocacy basin which simulates long-term average aquifer levels and stream base flows. Download the report: [Ground-water/Stream Flow Model of the Monocacy River Basin, Maryland and Pennsylvania - Phase I: Steady-State Model, ICPRB Report No. 07-5, by J.B. Palmer, K. Bergman, and C.L. Schultz, June 2007](#)

### Watershed water budget estimates



Groundwater availability is extremely difficult to characterize on a regional scale, and water management agencies often rely on a watershed water budget approach, which provides a relatively simple accounting of water inflows and outflows to the system of interest. Water budgets are particularly useful for assessments of watersheds underlain by fractured bedrock aquifers, where ground water and surface water are closely interconnected and stream flow data can be used to help estimate important water budget components. Depending on the assumptions used, water budget analyses for a watershed may include estimates of precipitation, aquifer recharge, evapotranspiration, ground water discharge to streams, surface water runoff during storm events, ground water withdrawals, as well as other types of basin inflows and outflows.

- Download ICPRB's pilot study on annual and seasonal water budgets: [\*Annual and seasonal water budgets for the Monocacy/Catoctin drainage area – Final report, ICPRB Report No. 04-04, C. Schultz, J. Palmer, and D. Tipton, 2004.\*](#)
- Download ICPRB's study of Potomac basin ground water recharge: [\*Basin-wide annual baseflow analysis for the fractured bedrock unit in the Potomac River basin, ICPRB Report No. 07-6, Nebiyu Tiruneh, 2007.\*](#)
- View presentation on watershed water budgets: Water resource assessments for aquifer stream systems, ICPRB, 2008.

### **Coastal Plain Aquifers**

Most of the lower Potomac basin, downstream of Washington, DC, is underlain by a system of deep sand and gravel aquifers of the Coastal Plain. These aquifers contain large reserves of ground water which are believed to have accumulated over the course of thousands of years.

Ground water stored in the Coastal Plain aquifers is replenished through a relatively small recharge area located at the systems' edge, in the vicinity of the "Fall line", that is, the boundary between the Coastal Plain and the Piedmont Plateau.

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Public water suppliers in these areas have documented steadily declining water levels in public water supply wells throughout the past several decades.

ICPRB has organized two workshops to discuss water resources issues in the Coastal Plains:

- Workshop held on June 14, 2005, La Plata, MD – [click here to see agenda](#)
- Workshop held on March 9, 2006, in Dalgren, VA
- [View workshop brochure](#)
- View presentations:
  - [Ground Water Basics, James Palmer, ICPRB](#)
  - [Science Plan for the Management of Maryland's Coastal Plain Aquifers, Robert Shedlock, USGS - Baltimore](#)
  - [Maryland – America in Miniature, David Bolton, Maryland Geologic Survey](#)
  - [Virginia Ground Water Withdrawal Permit Program, Robin Patton, Virginia Department of Environmental Quality](#)
  - [Water Use and Appropriation of Maryland's Waters, Maryland Department of Environment](#)

Below are some links to recent work on Coastal Plain issues by other organizations:

- Report: [\*A Science Plan for a Comprehensive Regional Assessment of the Atlantic Coastal Plain Aquifer System in Maryland, OFR-2007-1205, by Robert J. Shedlock, David W. Bolton, Emery T. Cleaves, James M. Gerhart, and Mark R. Nardi. Prepared by USGS in cooperation with Maryland Geological Survey and the Maryland Department of the Environment\*](#)
- [Project website for Virginia Coastal Plain Aquifer System Analysis](#)
- Report: [\*Water-Supply Potential of the Coastal Plain Aquifers in Calvert, Charles, and St. Mary's Counties, with Emphasis on the Upper Patapsco and Lower Patapsco Aquifers, Report of Investigations No. 76, David D. Drummond, Maryland Geologic Survey, 2007\*](#)

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