

Ensuring Drinking Water for Metropolitan Washington, DC

ICPRB Study Forecasts Water Demand and Availability for 2040

The residents of the Washington, D.C., metropolitan area (WMA) have the luxury of taking their drinking water for granted. Turn a tap, and water, primarily from the Potomac River, flows. The system that today provides ample water to the area may become less reliable in coming decades, especially during droughts, as the population continues to grow.

The region has a robust water supply because of decades of planning by water utilities and management agencies. These organizations work to ensure that the more than four-million people in the area have enough safe drinking water to meet demand, even during severe droughts.

An important part of that process is periodically forecasting the region's future needs, assessing the current water supply system's ability to serve a growing population, and identifying potential new efficiencies or water sources. This analysis is conducted every five years to incorporate new data and allow time for additional resources to be developed if needed.

Part 1 of the *2010 Washington Metropolitan Area Water Supply Reliability Study -- Demand and Resource Availability for the Year 2040*, has been completed by the Section for Cooperative Water Supply Operations on the Potomac (CO-OP) of the Interstate Commission on the Potomac River Basin (ICPRB). This study is funded by the WMA water suppliers.

The 2010 study estimates that water demand in the area served by the WMA suppliers (see figure 2) will rise from its current level of approximately 500 million gallons per day (MGD) to between 610 and 665 MGD by the year 2040. Over this same period, population in this area is projected to increase from 4.2 million to 5.3 million.

The study concludes that the current water supply system is likely adequate to meet 2030 demands, but may become strained given forecasted 2040 demands. For a scenario of high 2040 demands and under conditions similar to the worst drought on record (in the year of 1930), study results indicate that emergency water use restrictions would likely be required, portions of the system would have water supply shortfalls, and the system's reservoirs could experience shortages.

Part 2 of the study, scheduled for completion in 2011, will address the potential impact of climate change on water demand and availability.

Study Conclusions

1. The WMA's current water supply system will likely meet demands through 2030, under a range of hydrologic conditions similar to those experienced during the past 78-year period of historical record.
2. By the year 2040, the current system may have difficulty meeting the region's demands during periods of severe drought without emergency water use restrictions, and/or the development of additional supply resources.
3. Summertime outdoor water use may be increasing in some areas of the WMA, offsetting the benefits of the adoption of more water-efficient indoor fixtures and appliances.
4. The system's largest reservoir, Jennings Randolph, appears to be losing storage capacity due to sedimentation at a higher rate than previously estimated.

The full report can be downloaded at www.potomacriver.org.

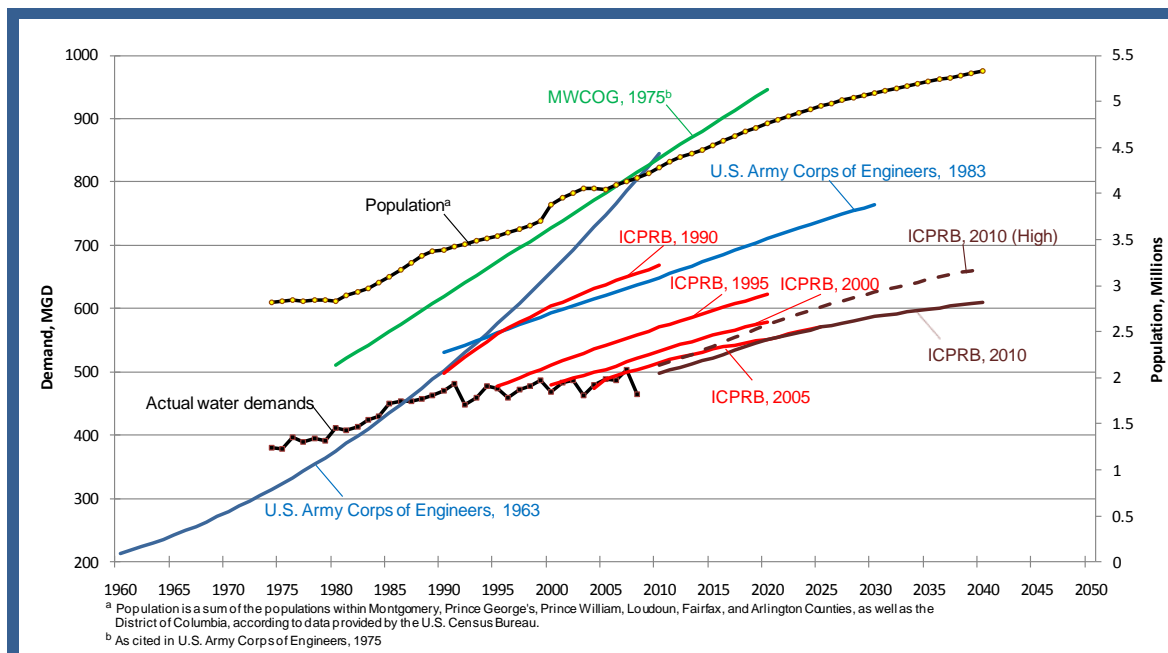


Figure 1: Comparison of actual WMA average annual water demand, in million gallons per day (MGD), with forecasts from previous studies and from the current study (labeled ICPRB, 2010 and ICPRB, 2010 (High)). Actual and forecasted population, in millions of people, is shown by the brown and yellow dotted line.

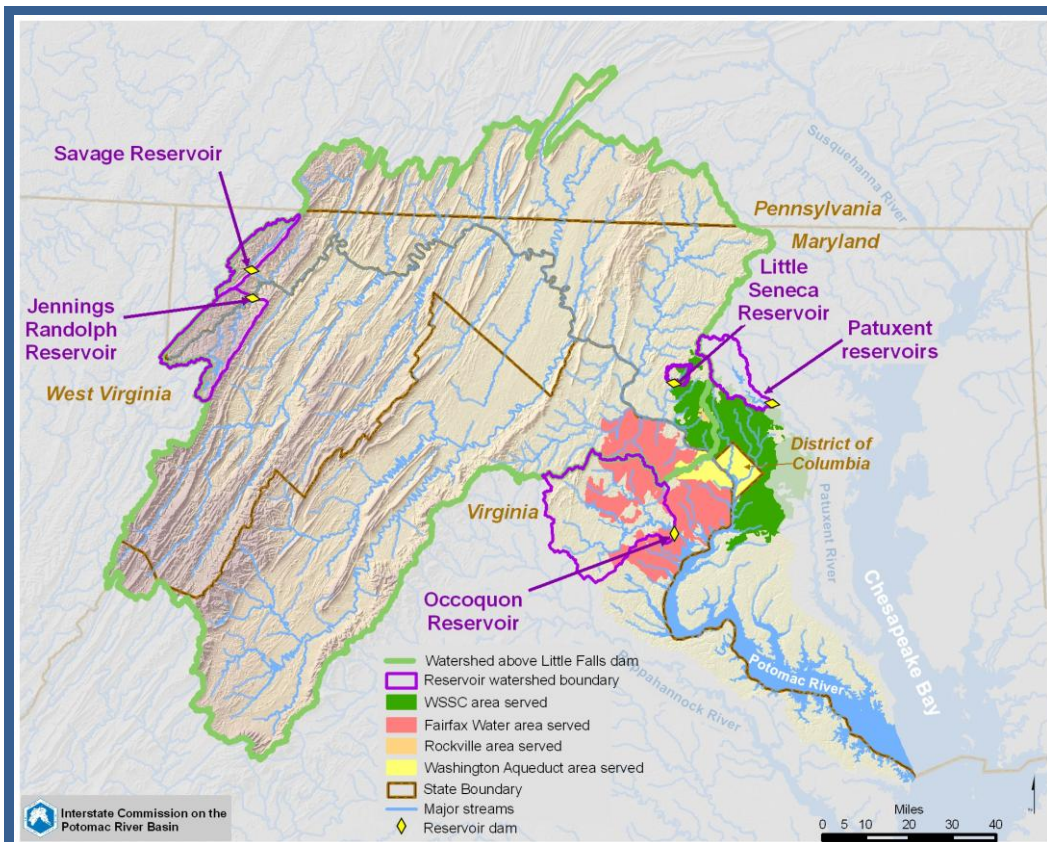


Figure 2: Map of the Potomac River basin, showing WMA water supply system resources and areas served by the WMA water suppliers.

WMA Water Supply System

The WMA has a unique cooperative system of water supply management based on a set of agreements signed in the early 1980s. This cooperative arrangement helps optimize use of available resources during periods of drought, providing more reliable and less expensive water supply for the region and helping to protect aquatic resources. WMA system resources consist of the Potomac River, the Occoquan and Patuxent reservoirs, and additional upstream reservoirs that can release water to augment low Potomac flow levels (see figure 2). The WMA water suppliers and their wholesale customers are:

Washington Aqueduct, serving the District of Columbia via the D.C. Water and Sewer Authority (DC Water), as well as portions of northern Virginia - Arlington County, the City of Falls Church, and the Town of Vienna.

Washington Suburban Sanitary Commission (WSSC), serving Montgomery and Prince George's counties in Maryland, and provides a limited amount of water to Howard and Charles counties, and water on an emergency basis to the City of Rockville and DC Water.

Fairfax Water, serving most of Fairfax County, Virginia, and the following wholesale customers in Virginia: Dulles International Airport, Fort Belvoir, Town of Herndon, Loudoun Water, Prince William County Service Authority, and the Virginia American Water Company (serving the City of Alexandria and Dale City).

Methodology

Demand Forecasting

Forecasts of average annual water demand were developed by combining water supplier billing data, current and future geographic extents of areas served by WMA suppliers, and demographic forecasts from the Metropolitan Washington Council of Governments.

Water use data were grouped into three categories for forecasting purposes: single family households, multi-family households (apartments), and employees (including commercial, industrial, and institutional use). Two forecasts were developed to address uncertainties: one forecast based on a most likely demand scenario, and a second, "high" demand forecast based on higher population growth and water use assumptions.

Resource Analysis

The resource analysis assessed the ability of the current WMA water supply system to meet the forecasted demands.

This analysis uses the Potomac Reservoir and River Simulation Model (PRRISM), an ICPRB computer model that estimates future water demand and availability based on forecasted demands and the historical hydrologic and meteorological record.

PRRISM simulates on a daily basis the processes that govern water supply and demand in the WMA system. These include Potomac River flow; reservoir inflows, storage, and releases; WMA water supplier withdrawals and net withdrawals by upstream users.

About ICPRB and CO-OP

Created with an interstate compact by an Act of Congress in 1940, the Interstate Commission on the Potomac River Basin (ICPRB) is composed of commissioners representing the federal government, the states of Maryland, Pennsylvania, Virginia, and West Virginia, and the District of Columbia. The ICPRB mission is *to enhance, protect, and conserve the water and associated land resources of the Potomac River basin and its tributaries through regional and interstate cooperation.*

ICPRB's Section for Cooperative Water Supply Operations on the Potomac River (CO-OP), a special section of the Commission, was created in 1979 to serve as a technical center for management and coordination during low flow periods of upstream reservoir and WMA water supply operations for the purpose of enhancing water supply reliability and protecting water quality and aquatic ecosystems.

