ICPRB's Washington Metropolitan Area Water Supply Reliability Study

Part 1: Demand and Resource Availability Forecast for the Year 2040

Overview

- **Purpose of Study**
- **Current Resources, Capacity, and Population**
- **Prediction Scenarios**
- **Supply Shortage:**
  - When Shortfall Might Occur
  - Scenarios and Projections
  - Predicted Causes of Shortfalls
- **Recommendations**

Purpose of Study

- **Provides forecasts of water demand and availability in the Washington D.C. metro area**
  - Through year 2040
- **This is Part 1 of a two part study:**
  - Includes the demand forecast
  - Analysis of resources
  - Summary of potential resource alternatives
- **Part 2 (in a separate report that is not yet complete)**
  - Will assess the impacts of global climate change

Background

- **Three WMA water suppliers have a long history of cooperation**
  - Washington Aqueduct Division of U.S. Army Corps of Engineers (Washington Aqueduct)
  - Fairfax County Water Authority (Fairfax Water)
  - Washington Suburban Sanitary Commission (WSSC)

- **Signed Agreements in late 1970s and early 1980s**
  - Low Flow Allocation Agreement (LFAA)
    - Allocates the amount of water each supplier can withdraw from the Potomac in the event that total flow is not sufficient to meet all needs
  - Water Supply Coordination Agreement (WSCA)
    - Provides for coordinated operation of the major water supply facilities in the region during low flows

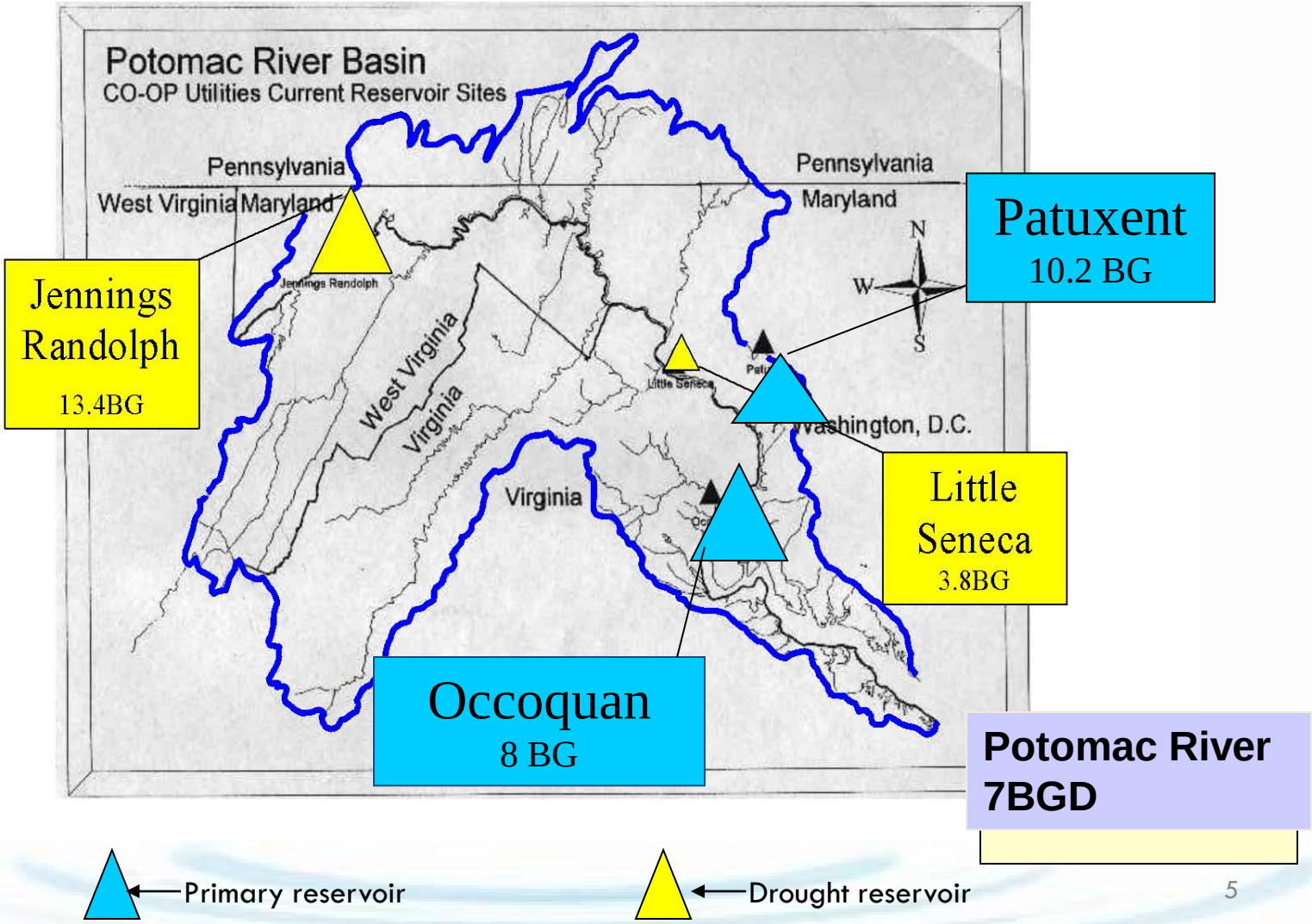
- **Potomac River is the primary source of raw water for the region, providing approximately 78%**
  - Occoquan Reservoir in Virginia and the Patuxent River reservoir in Maryland provide the remaining 22%

- **Water Suppliers jointly pay to reserve a portion of the water stored in two reservoirs to augment flow**
  - Jennings Randolph
  - Little Seneca
    - Combined storage of Occoquan, Patuxent, Jennings Randolph and Little Seneca
      - approximately 35 billion gallons

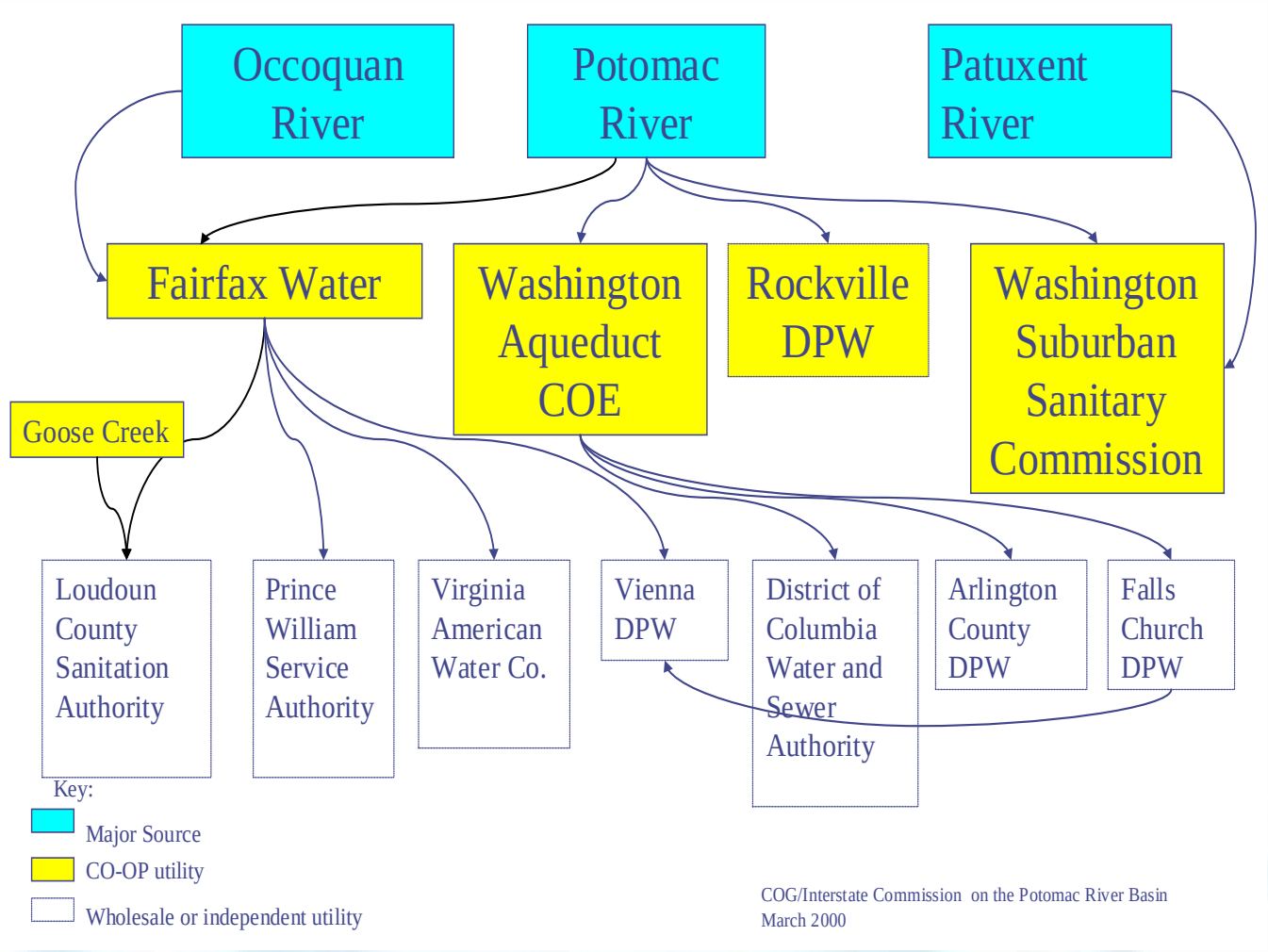
NCR - Major Water Supply Sources

The NCR uses about 500 million gallons per day (mgd)

Annual avg. Potomac River flow is 7000 mgd



Schematic of NCR Water Supply System



Demand Forecasts

- **Forecasts were developed by**
  - combining recent water used information from billing data
  - Information on current and future extent of the areas supplied with water from supplies and planning agencies
  - Most recent demographic forecasts from MWCOG
- **Water Forecasts are notoriously inaccurate**
  - Due to uncertainties in both demographic forecasts and predictions in future water behavior
  - Due to this fact, study provided two scenarios
- **Scenario 1 – Likely Forecast**
  - Based on MWCOG Round 7.2 growth forecasts.
  - Assumes that both single family and multi-family household unit water use will decrease throughout the forecast period due to the increased use of low flow plumbing fixtures as mandated by the Energy Policy Act of 1992.
- **Scenario 2 – High Demand Forecast**
  - Based on MWCOG Round 7.2 growth forecasts, with preliminary estimates of additional water demand due to potential growth in certain areas not considered in the Round 7.2data.
  - Assumes that only multi-family household unit water use will decrease throughout the forecast period and that no water use reductions will occur in single family households because reductions from the Energy Policy Act of 1992 and other indoor conservation measures will be offset by increases in summertime outdoor water use.

Table ES-2: WMA demand forecasts, including demand from wholesale customers, for Scenario 1 –most likely demands, and Scenario 2 – high demands (mgd).

	2010	2015	2020	2025	2030	2035	2040
Scenario 1 - Fairfax Water	175.2	186.9	199.4	210.2	218.2	223.8	228.9
Scenario 2 - Fairfax Water	187.2	201.7	217.8	234.2	247.3	259.0	269.1
Scenario 1 - Washington Aqueduct	150.9	157.7	164.8	168.7	172.2	174.2	177.8
Scenario 2 - Washington Aqueduct	150.9	158.6	166.6	171.4	175.5	178.1	182.4
Scenario 1 – WSSC	171.9	177.5	186.7	191.6	197.1	201.1	203.8
Scenario 2 – WSSC	171.9	179.6	190.4	196.9	203.5	208.7	212.5
Scenario 1 - WMA Supplier Subtotal	497.9	522.1	551.0	570.6	587.5	599.1	610.5
Scenario 2 - WMA Supplier Subtotal	509.9	540.0	574.8	602.5	626.3	645.7	664.0
Scenario 1 - City of Rockville DPW	4.8	5.0	5.3	5.6	5.8	6.1	6.3
Scenario 2 - City of Rockville DPW	4.8	5.0	5.4	5.7	6.0	6.3	6.5
Scenario 1 - TOTAL WMA Suppliers plus Rockville	**502.7**	**527.1**	**556.3**	**576.2**	**593.3**	**605.1**	**616.8**
Potential additional demand from growth areas	12	13	15	19	23	28	32
Additional demand assuming constant SFH unit use	0.0	4.9	8.9	13.0	16.0	18.9	21.7
Scenario 2 - TOTAL WMA Suppliers plus Rockville	**514.7**	**545.0**	**580.2**	**608.2**	**632.3**	**652.0**	**670.5**

Note: SFH = single family home

Shortfalls

- **Current water supply system will continue to be able to meet demands up until 2030**
- **Current system may have difficulty meeting region's demands during drought periods by 2040**
- **Summertime outdoor water use may continue to increase, offsetting the benefits of efficient indoor fixtures and appliances**

Recommendations

- Complete the evaluation of water supply alternatives to determine most beneficial and cost-effective resources
- New hydrographic surveys to measure updated/current storage capacity
- New watershed protection efforts to reduce watershed erosion
- Investigation in water supply study of changes and impacts of summertime outdoor water use

Copies of the report are available on ICPRB's website:

www.potomacriver.org under "Publications"
or call 301-984-1908.

Sarah N. Ahmed (sahmed@icprb.org)
Karin R. Bencala(kbencala@icprb.org)
Cherie L. Schultz (cschultz@icprb.org)