Water Demand and Supply in the Potomac Basin

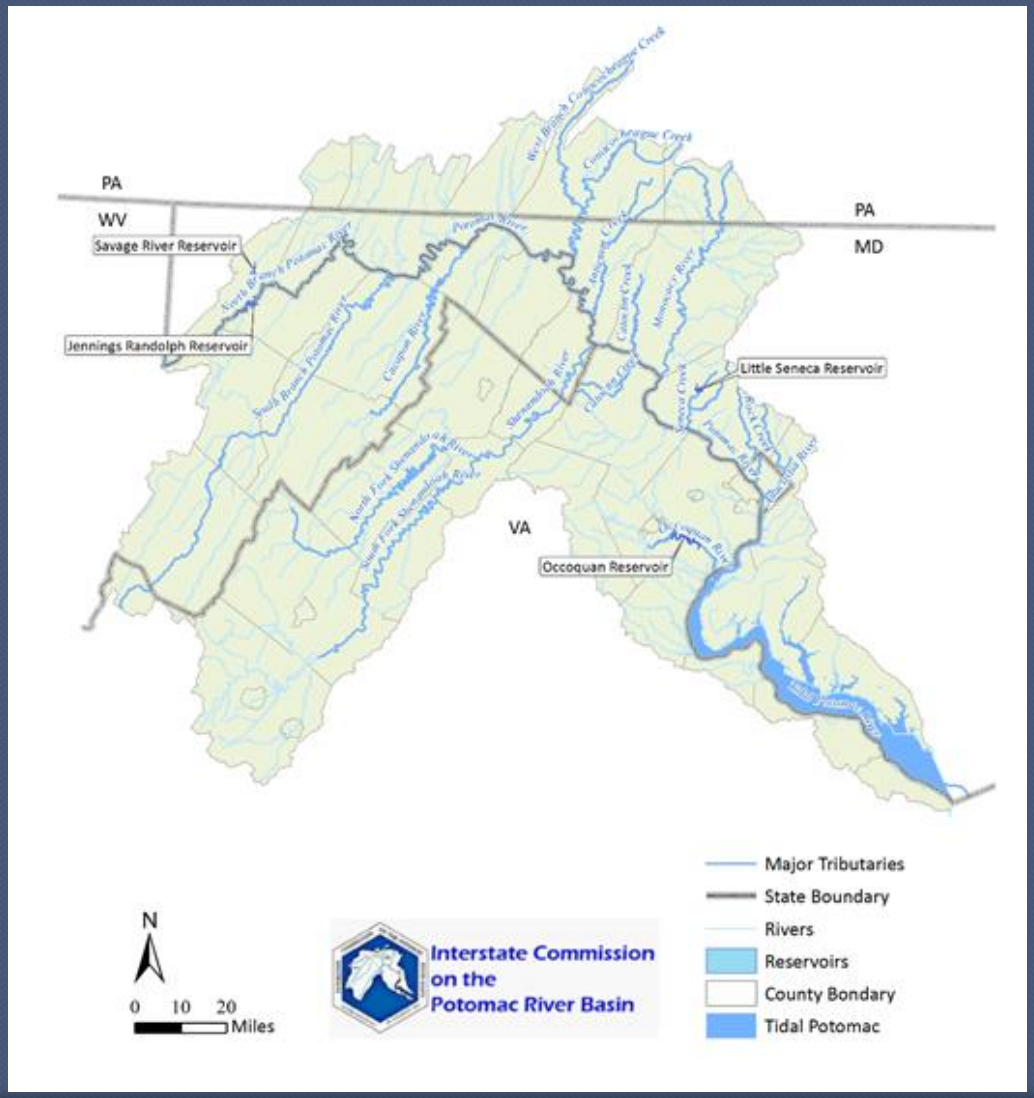
Occoquan Reservoir during 1960's drought. Photographer: ICPRB

Comprehensive Plan
Advisory Committee
May 23, 2017

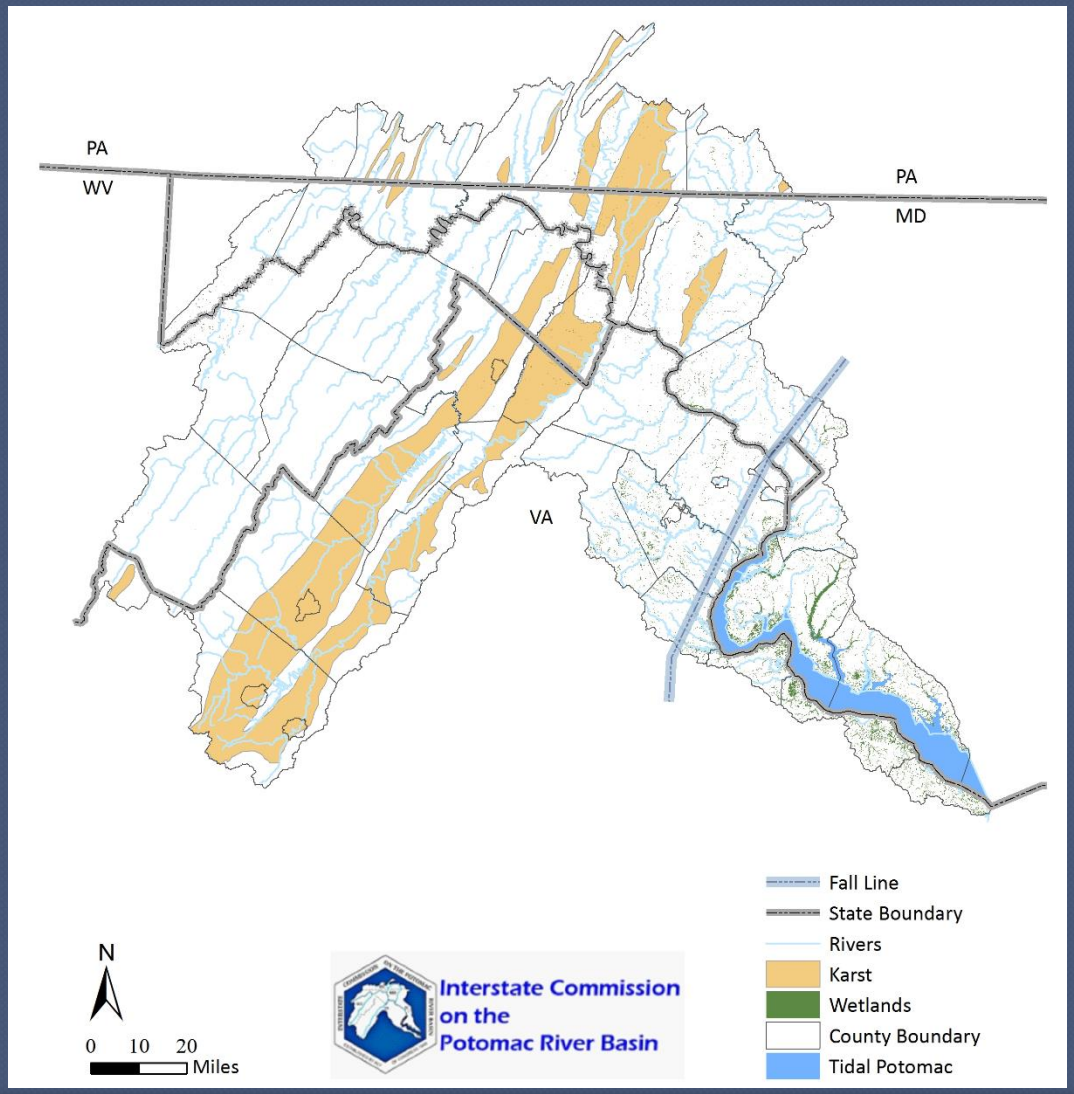
Outline

- Hydrology and Hydrogeology
- Water Availability
- Water Uses
- Water Supply Planning Studies
- Role of Plan

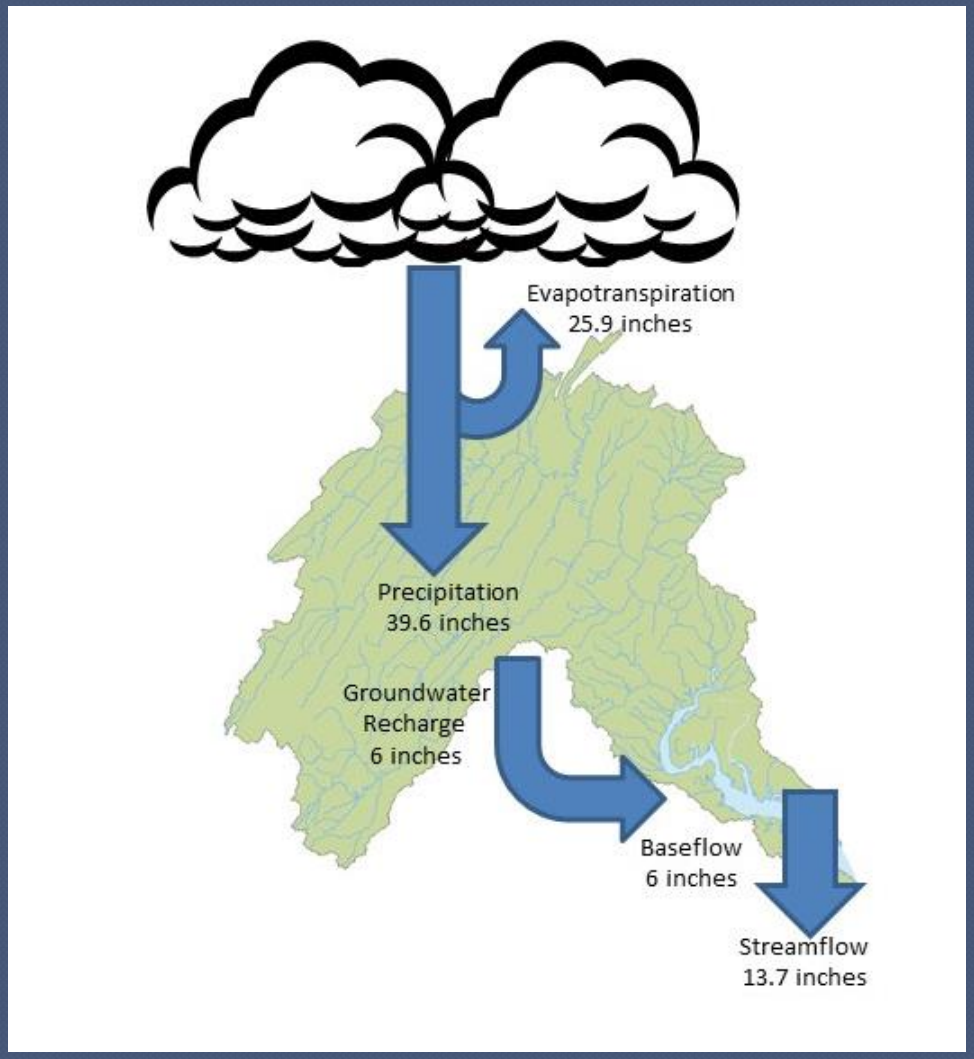
Surface Water



Groundwater



Water Budget



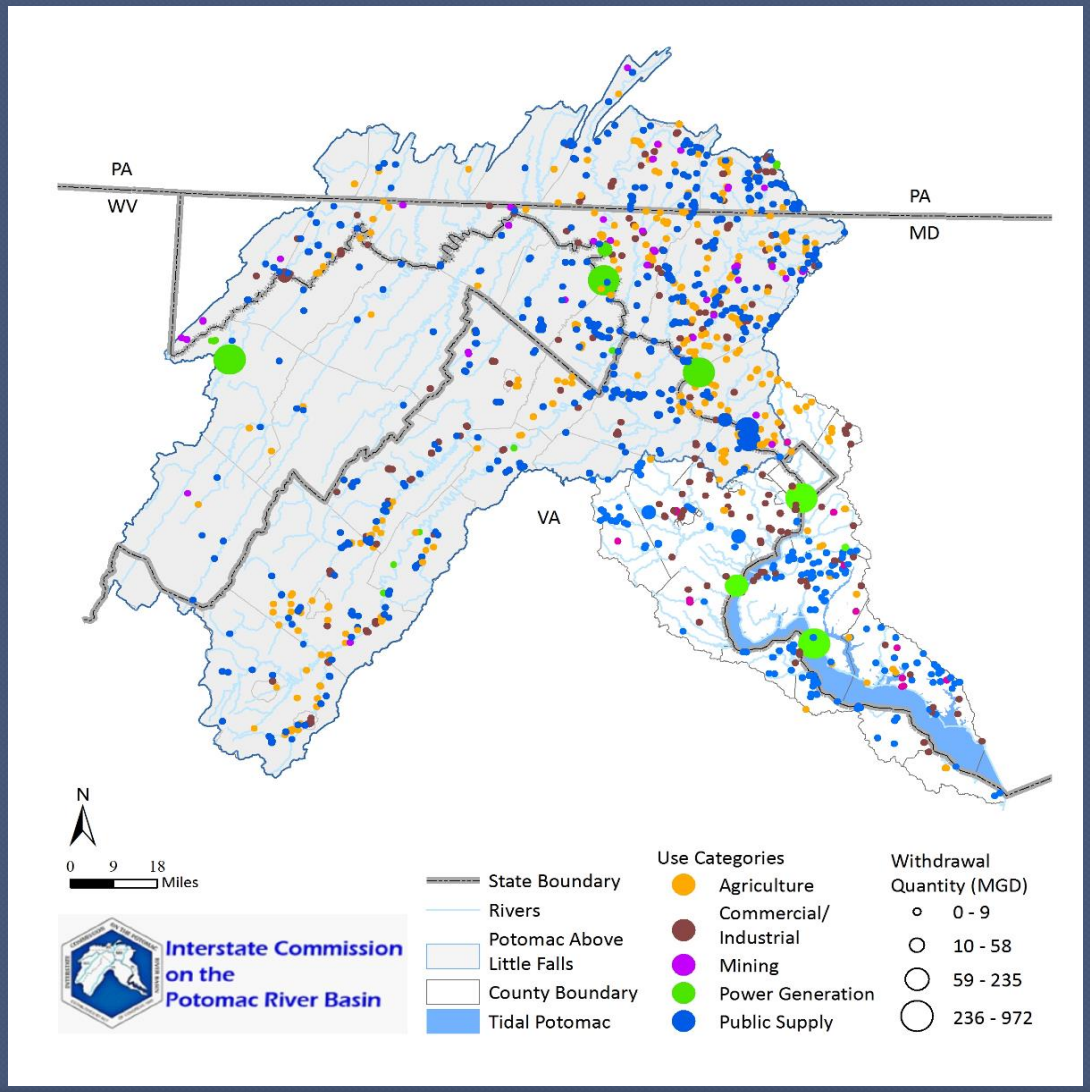
Water Availability

- High flow: 275 BGD (March 1936)
- Low flow: 388 MGD (Sept 1966)
- Avg flow: 7 BGD

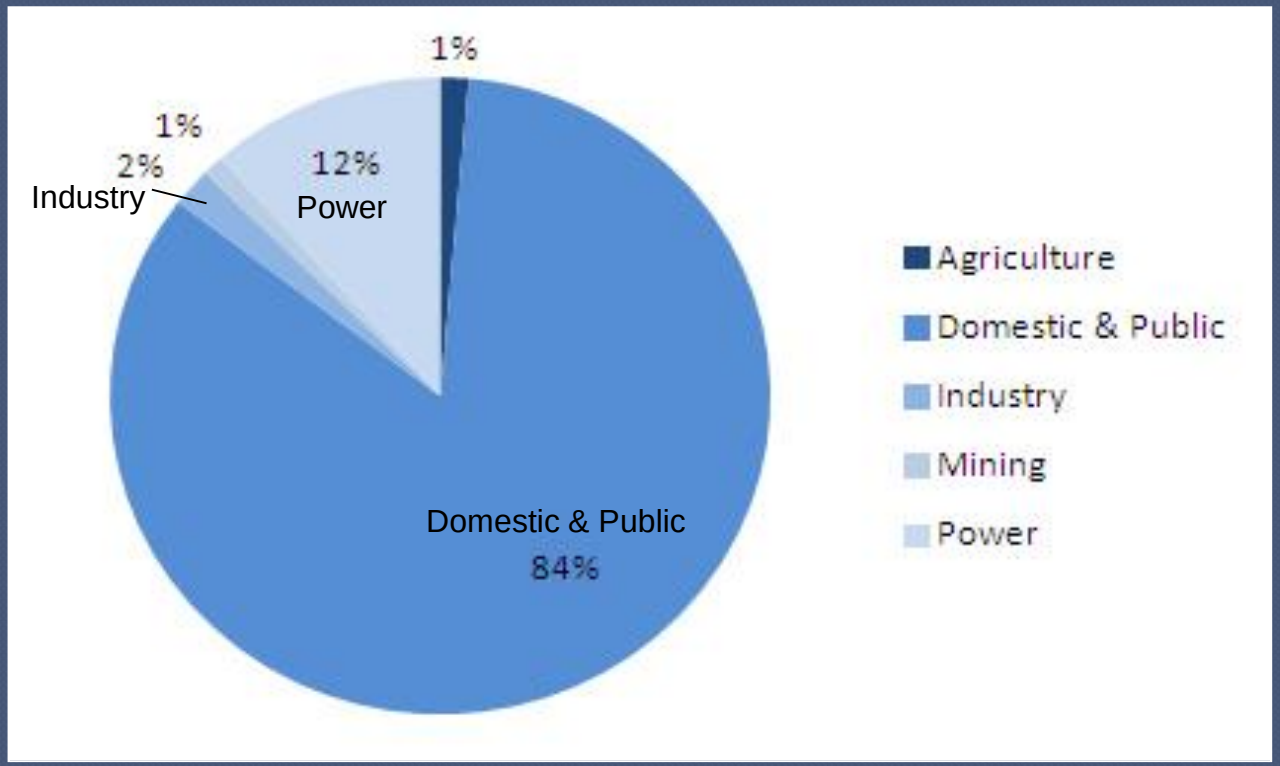
147,000 cfs, March 12, 2011
Photographer: J. Palmer, ICPRB

100-250 cfs, early September 1966
Photographer: unknown

Water Uses


PA
WV
PA
MD
VA
N
0 9 18
Miles
Interstate Commission on the Potomac River Basin
State Boundary
Rivers
Potomac Above Little Falls
County Boundary
Tidal Potomac
Use Categories
Agriculture
Commercial/ Industrial
Mining
Power Generation
Public Supply
Withdrawal Quantity (MGD)
0 - 9
10 - 58
59 - 235
236 - 972

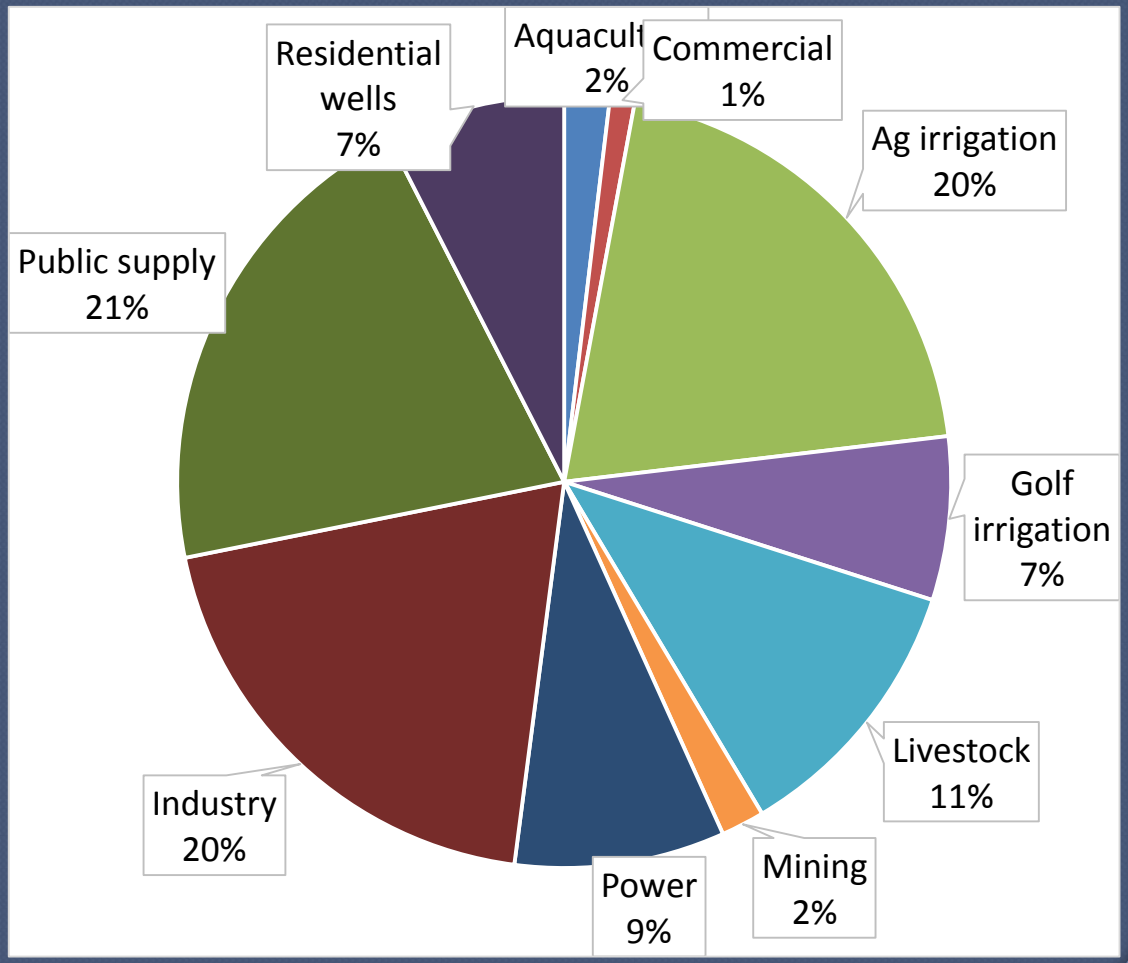
Average Annual Consumptive Use



Source: Middle Potomac River Watershed Assessment, Appendix B, 2005 Data

Summer Consumptive Use

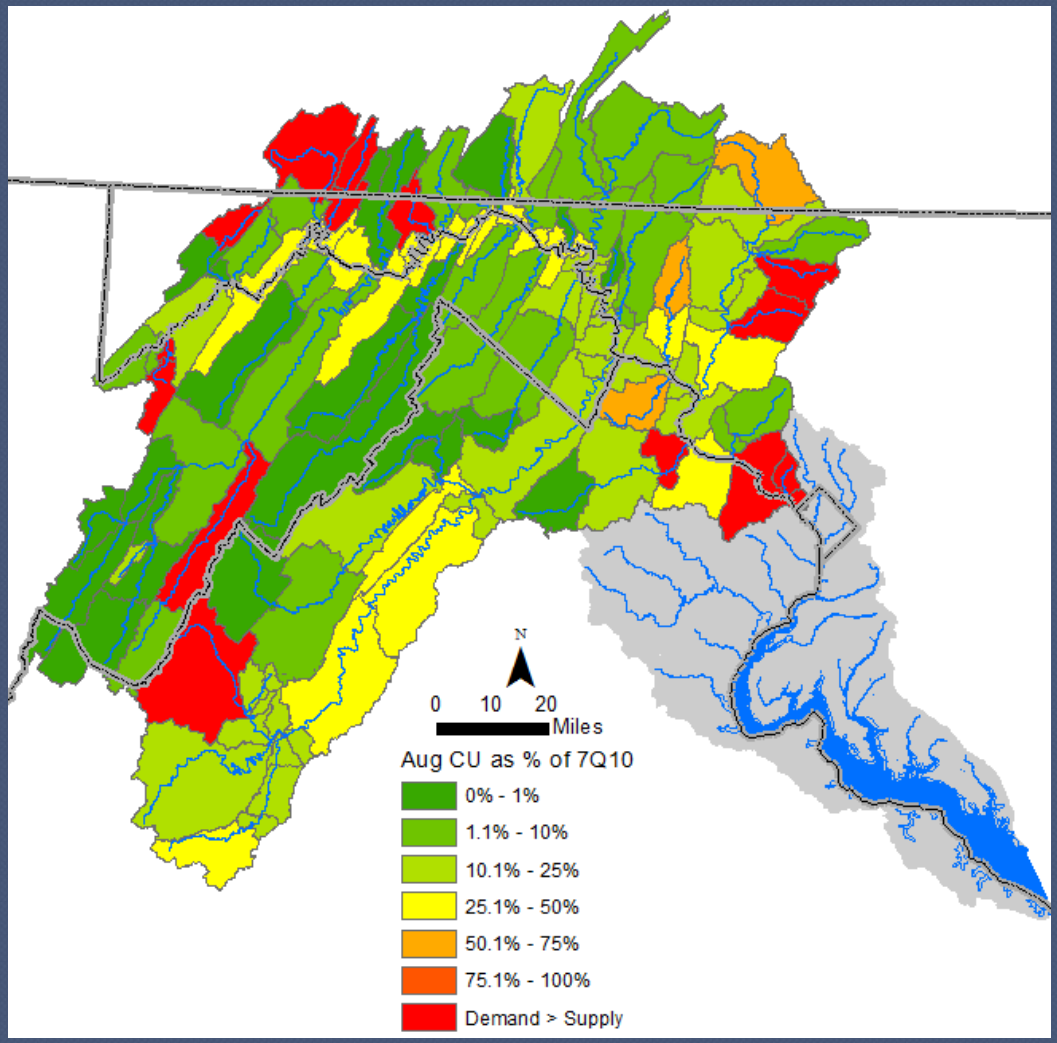
- Based on ICPRB's basin-wide database
- Many uncertainties:
  - agriculture
  - power sector
  - golf
- Public supply sector growing



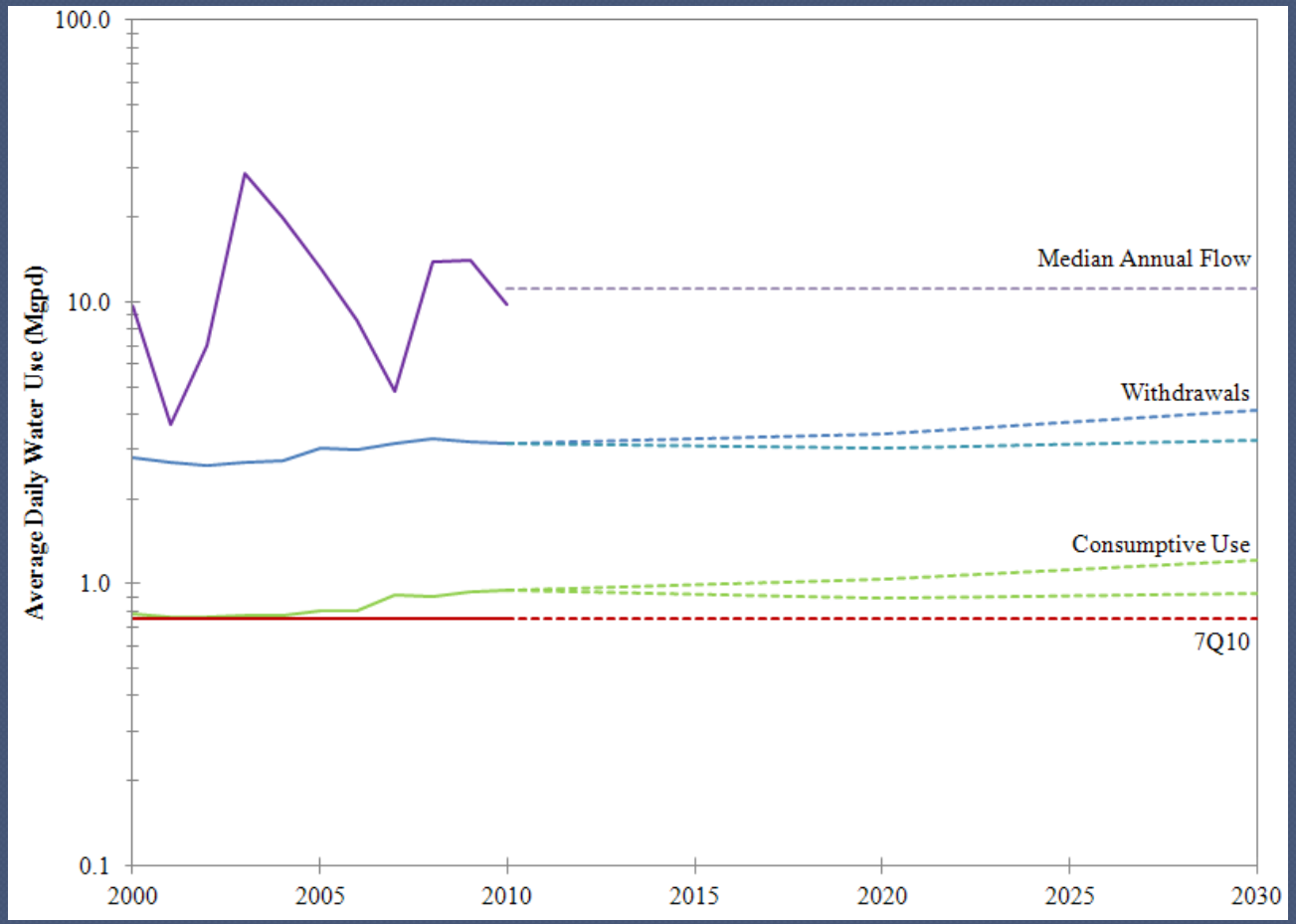
2005-2008 Demand:Supply

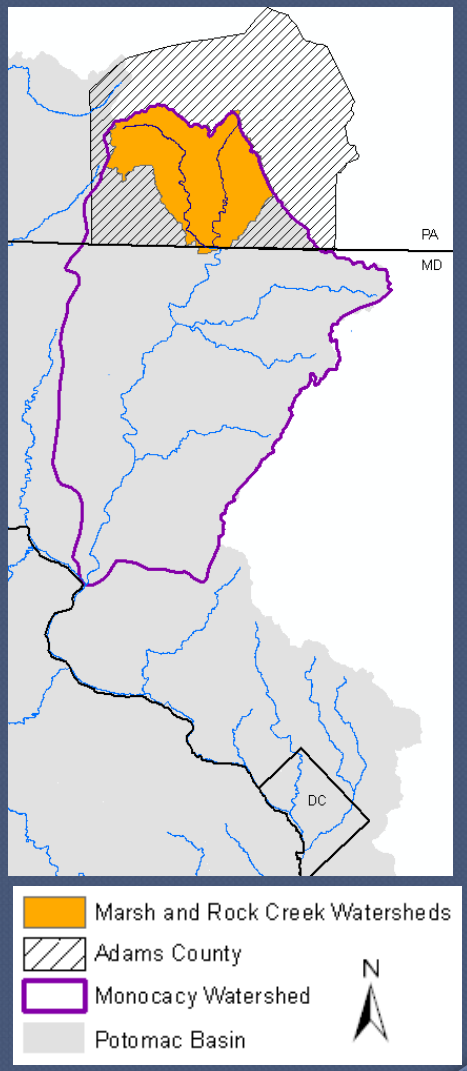
Avg Aug CU 2005-2008
185 MGD

Avg Aug CU 2040
230 MGD



Marsh and Rock Creeks, PA





Impact of Climate Change

Results from 2013 watershed model indicate that potential impacts of climate change add considerable uncertainty (CO-OP 2013 climate study).

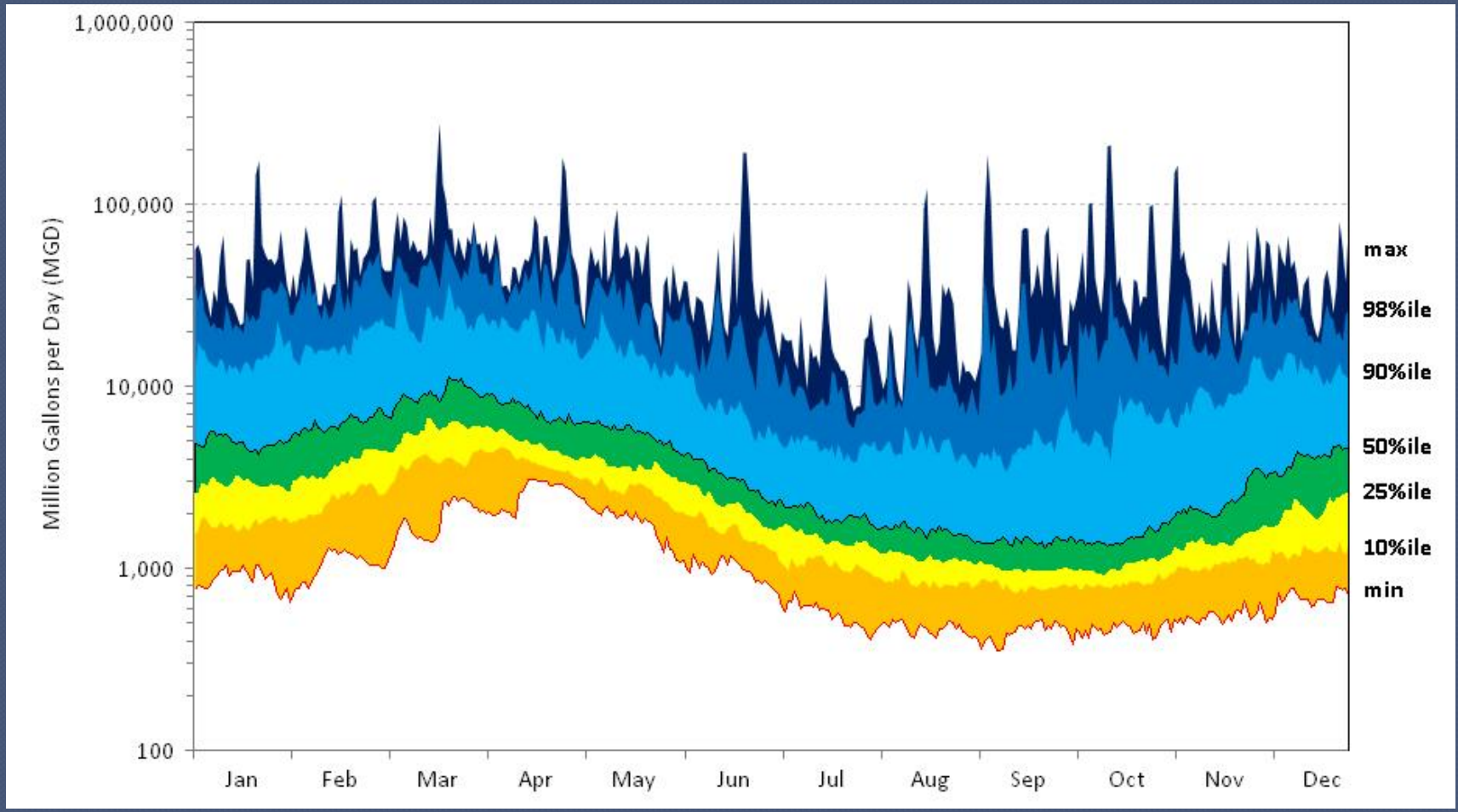
A "vulnerability" grid, predicting percent change in Potomac River flow based on potential changes in climate

← Average change in temp, °F

← Average change in precipitation →

	-10.0%	-7.5%	-5.0%	-2.5%	0.0%	2.5%	5.0%	7.5%	10.0%
0.0	-23	-17	-11	-6	0	6	11	17	23
0.5	-24	-19	-13	-8	-2	4	9	15	21
1.0	-26	-21	-15	-9	-4	2	7	13	19
1.5	-28	-23	-17	-11	-6	0	6	11	17
2.0	-30	-24	-19	-13	-8	-2	4	9	15
2.5	-32	-26	-21	-15	-9	-4	2	7	13
3.0	-34	-28	-23	-17	-11	-6	0	6	11
3.5	-36	-30	-24	-19	-13	-8	-2	4	9
4.0	-38	-32	-26	-21	-15	-9	-4	2	7

Ecological Uses: Sept 8th Meeting



Logarithmic projection of the distribution of daily mean flows at the Point of Rocks, MD USGS stream gage for each day of the year (2/1/1895-9/30/2008)
Source: Potomac Basin Large River Environmental Flow Needs

Role of Plan in Addressing Water Use Concerns

- WU Goal:
  - The diverse users of the basin's water resources have clean, reliable, and resilient water resources for current and future generations.
- WU Challenges:
  - Improving information about water demands and resource capacities
  - Addressing concerns including declining groundwater levels (Coastal Plain, fractured bedrock) and increasing consumptive use
  - Protecting source waters
  - Preventing and responding to spills
  - Improving, updating, and expanding water resources management infrastructure
  - Conserving and re-using water
  - Providing for instream uses, including recreation, fisheries, and aquatic habitat
  - Enhancing resilience in water supply
- Role of the Plan:
  - Within existing framework and responsibilities
  - Interstate planning, coordination, and information sharing

Example Recommendations

- Source: Advisory Committee Members
  - Improving interstate coordination,
  - Identifying and addressing information needs,
  - Enhancing water resources management,
  - Improving drought management,
  - Expanding the work of DWSPP, and
  - Providing/expanding information clearinghouse capacities
- Source: GMU Students
  - Estimate or obtain water uses that fall below state water reporting thresholds