

BRIEF UPDATE:

Water Audit Trends in the Delaware River Basin: 2012-2021

Water Management Advisory Committee (WMAC)

Michael Thompson, P.E

June 28, 2023



This presentation was given at the June 28, 2023, WMAC Meeting.

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1. Population Served

Method #1

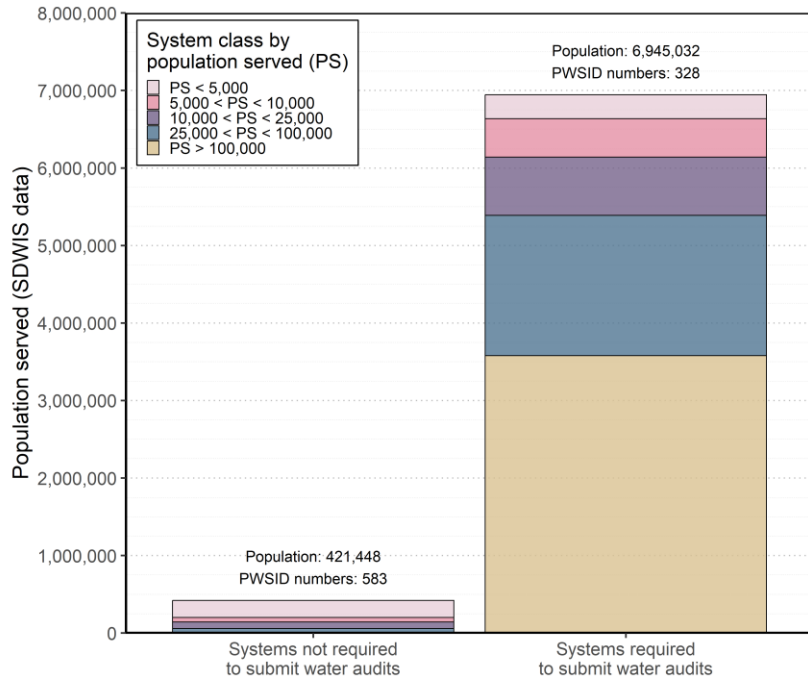
- (Thompson & Pindar, 2021) The 2010 in-Basin population (~8.252 MM people), 86% reside within PWS service areas (7.106MM)

- Revised estimate:** 87%, (7.157 MM people)

Method #2

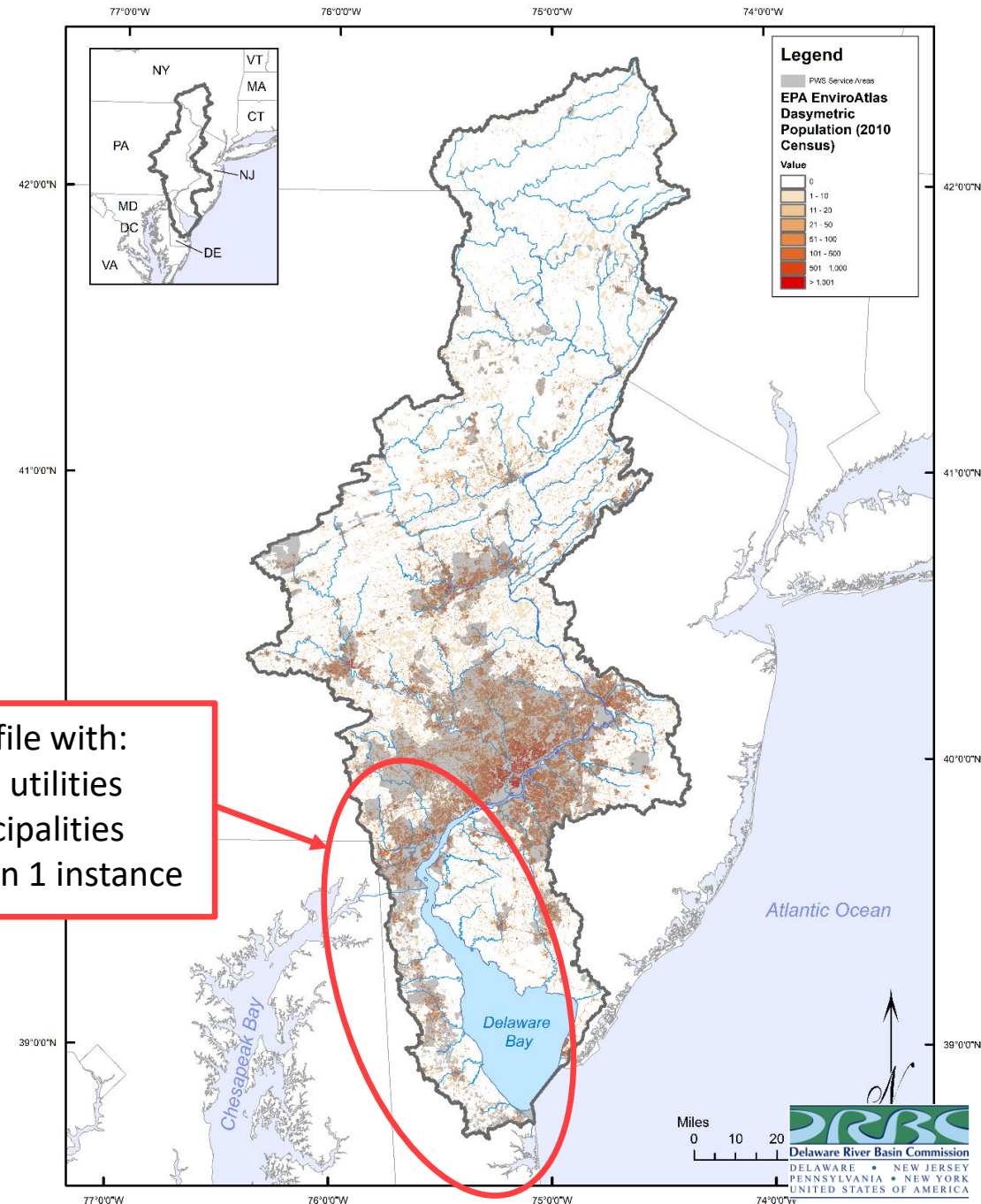
- ~900 PWSIDs across the Basin
- ~328 PWSIDs covered in the Water Audit program
- Population served data from EPA SDWIS for each PWSID: 7.366 MM people

Population served by public water supply in the Delaware River Basin



Replaced DE CPCN shapefile with:

- (1) GIS data from private utilities
- (2) CPCN areas for municipalities
- (3) Municipal boundary in 1 instance

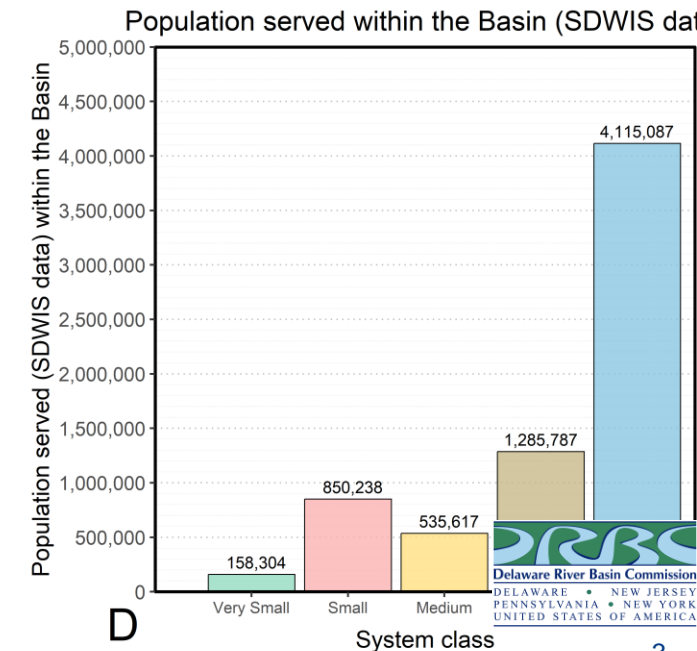
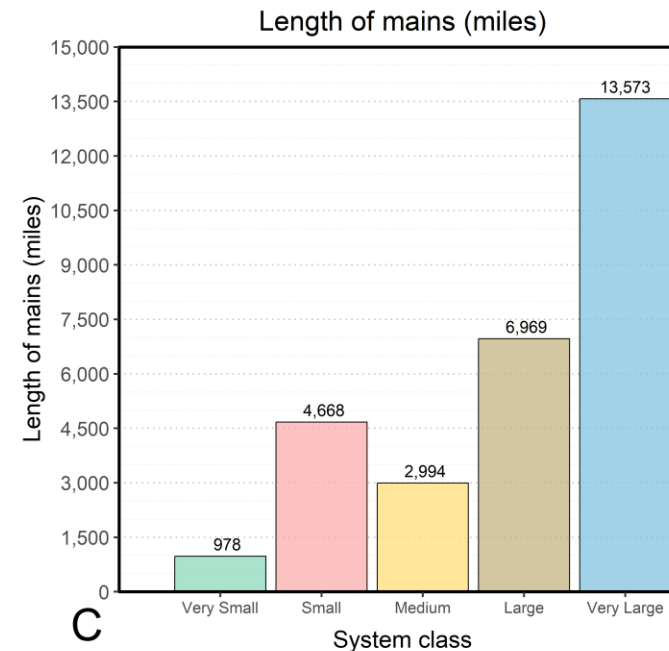
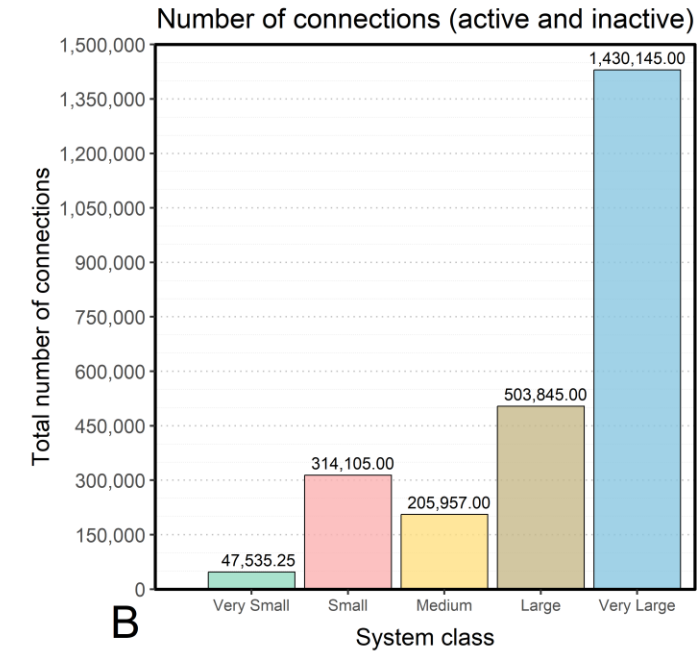
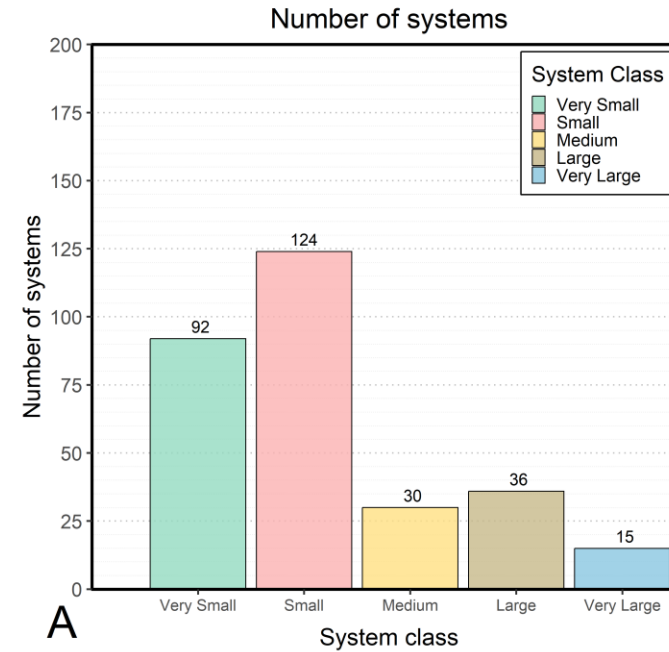


2. CY2021 Audit Statistics

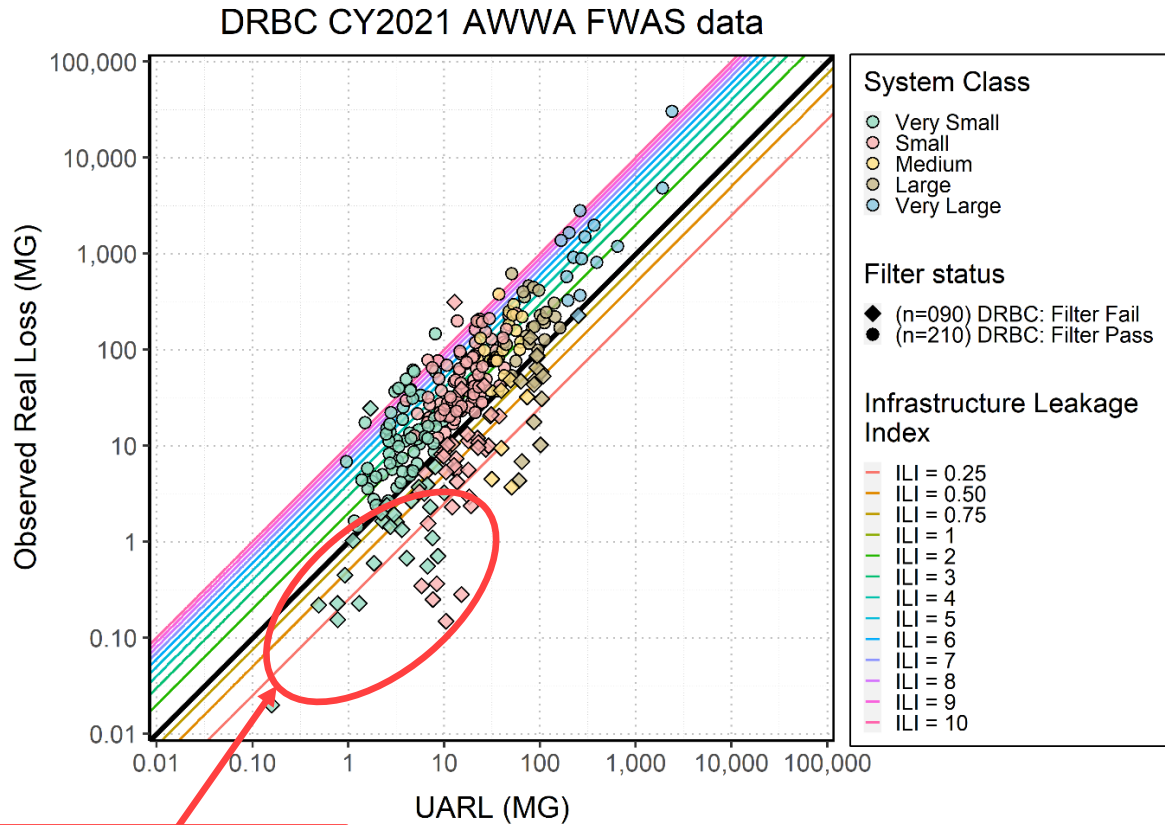
- Bin the systems into “classes” based on number of connections

System size class	Abbv.	Active/Inactive Connections
Very-Small	VS	< 2,000
Small	S	[2,000, 10,000)
Medium	M	[10,000, 25,000)
Large	L	[25,000, 100,000)
Very-Large	VL	≥ 100,000

- CY2021: 297 systems required to submit water audits (328 PWSIDs)
- 29,000 miles of water main
(the circumference of Earth is 24,902 mi)
- 2.506 million active and inactive service connections
- ~14,700 miles of service lines



3. CY2021 Real Loss Reduction Potential (RLRP)

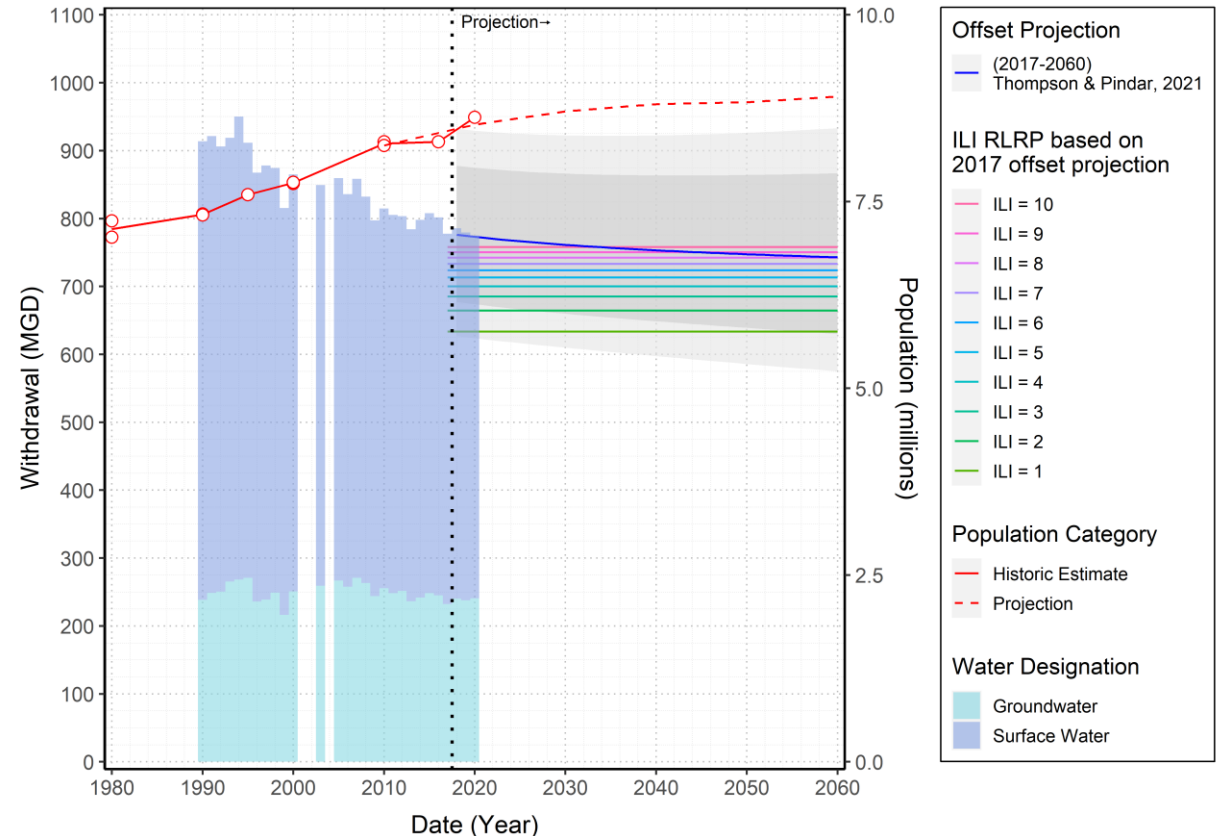


Possibly looking into current research on System Correction Factors for small system ILIs...

Assess potential real loss reductions based on assessment of ILI

** Also perform a Frontier Analysis

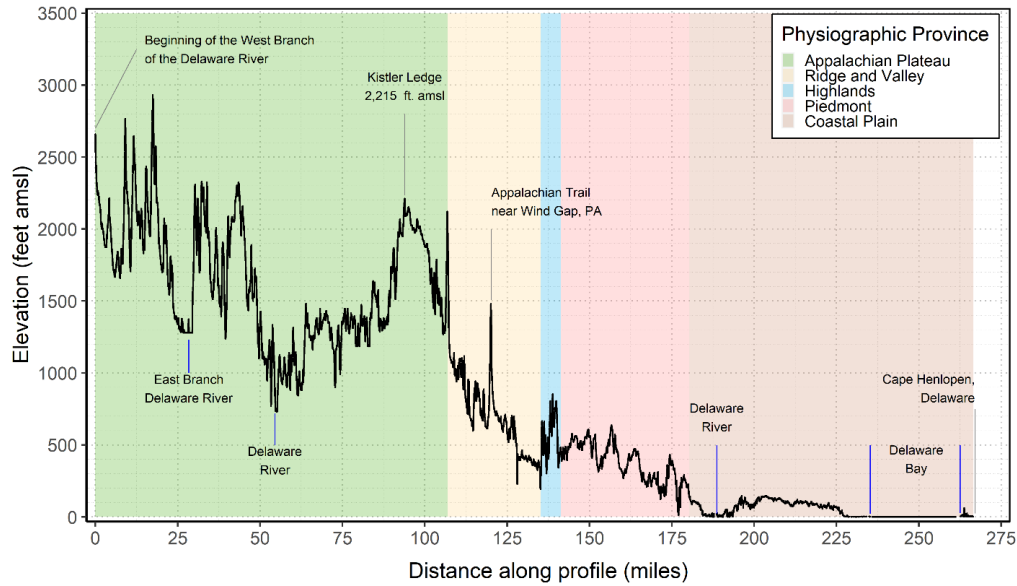
Public water supply withdrawals from the Delaware River Basin with comparison to the in-Basin population



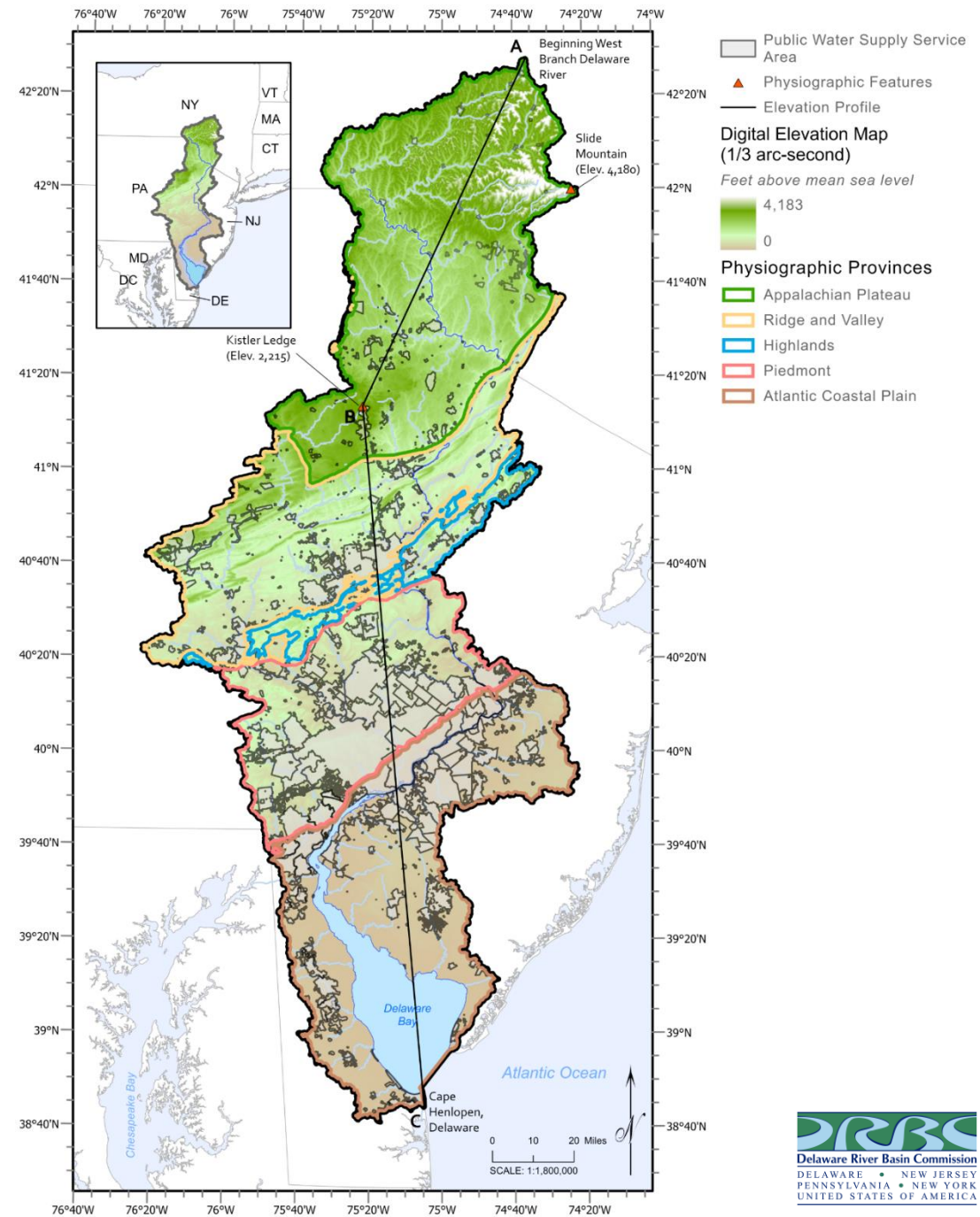
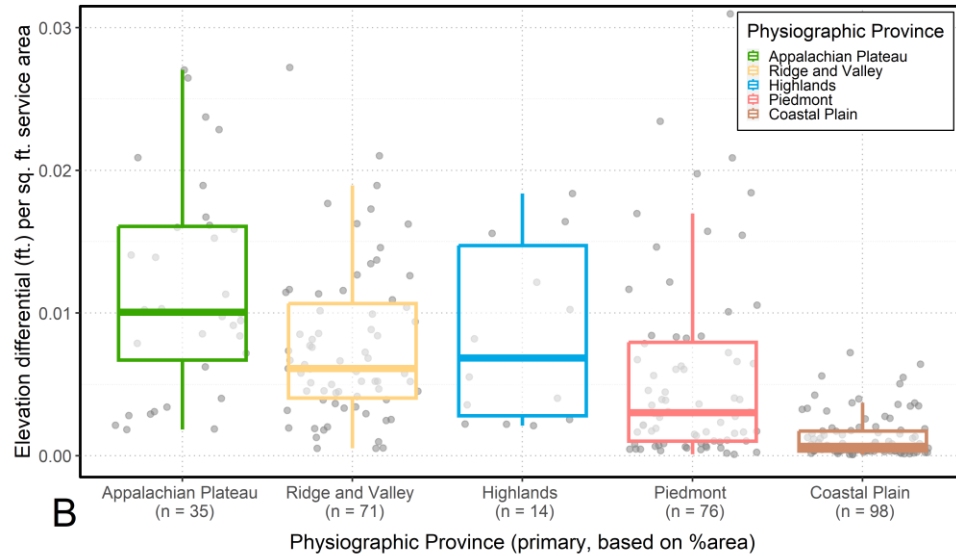
Assess how those reductions might stack up against projections

4. Physiographic analyses

Elevation profile for the Delaware River Basin



System elevation differential (normalized by area)



5. Audit Program Observations

The DRBC Audit Program spans many versions of AWWA FWAS...

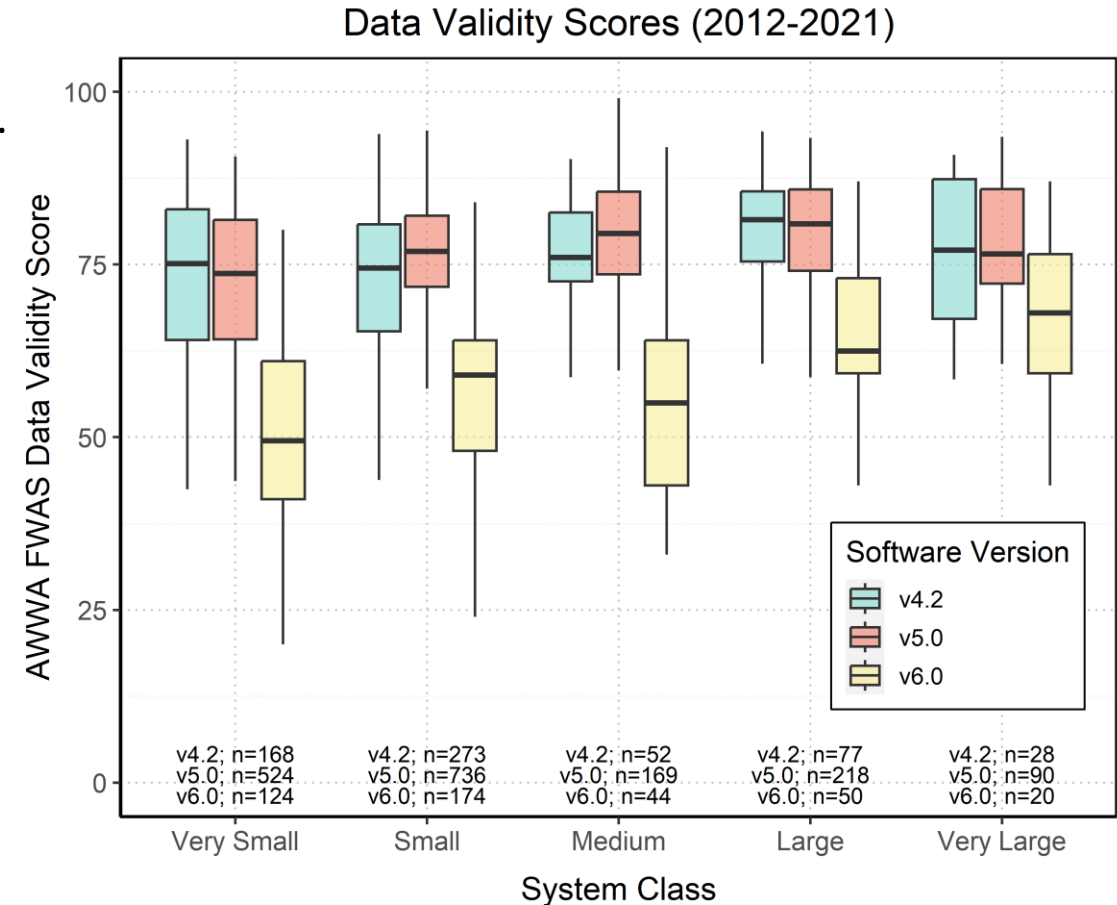
Year	First Year	Last Year	Expected	Missing	v4.1	v4.2	v5.0	v6.0	Received	Compliance
2012	306	2	306	62	3	240	1	0	244	80%
2013	0	2	304	44	2	255	3	0	260	86%
2014	0	2	302	43	1	95	163	0	259	86%
2015	0	0	300	35	0	6	259	0	265	88%
2016	0	0	300	11	0	1	288	0	289	96%
2017	1	0	301	8	0	0	293	0	293	97%
2018	2	5	303	8	0	0	295	0	295	97%
2019	5	3	303	19	0	1	283	0	284	94%
2020	1	1	301	17	0	0	150	134	284	94%
2021	0	0	300	18	0	0	4	278	282	94%

Without 100% compliance, need to backfill data for apples-to-apples comparison between years...

}	YEAR	VOS	}
	2012	121.000	
	2013		
	2014		
	2015		
	2016	93.230	
	2017	75.545	
	2018	82.466	
	2019		
	2020	80.712	
2021	94.000		

→

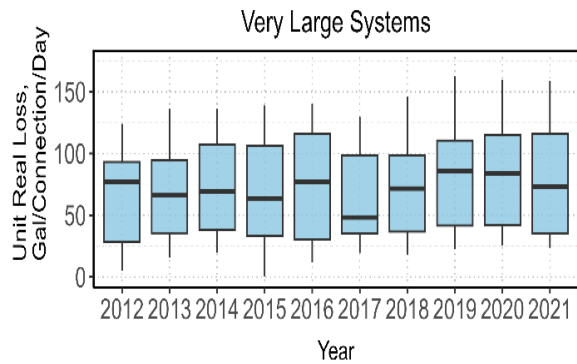
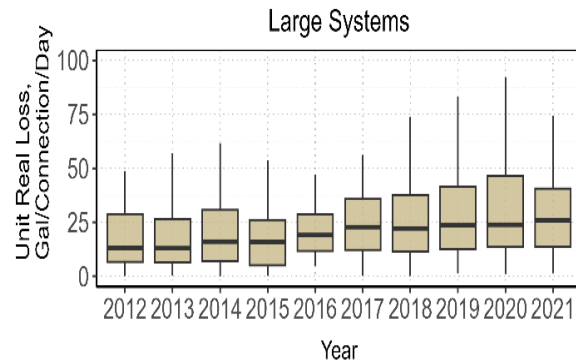
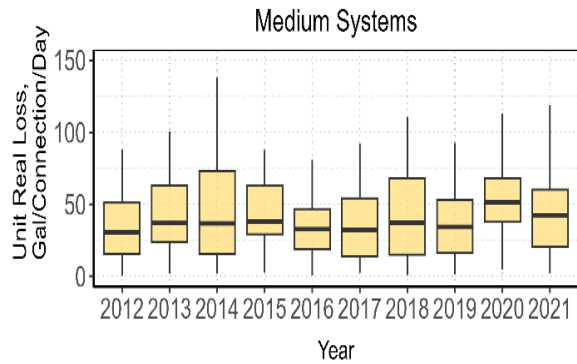
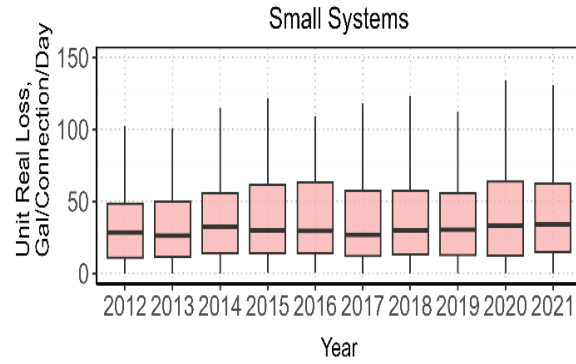
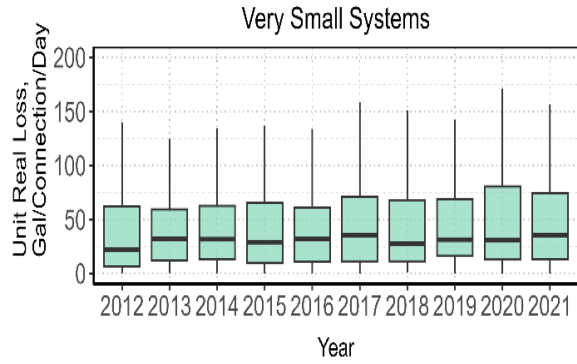
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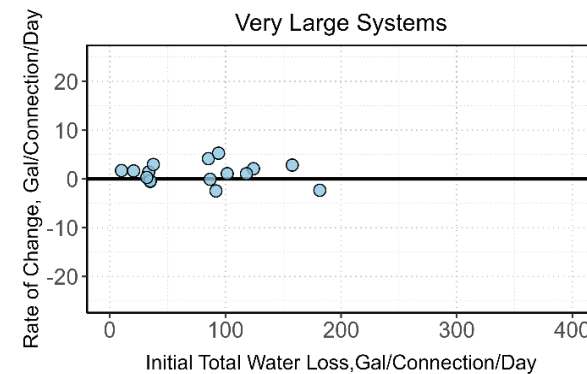
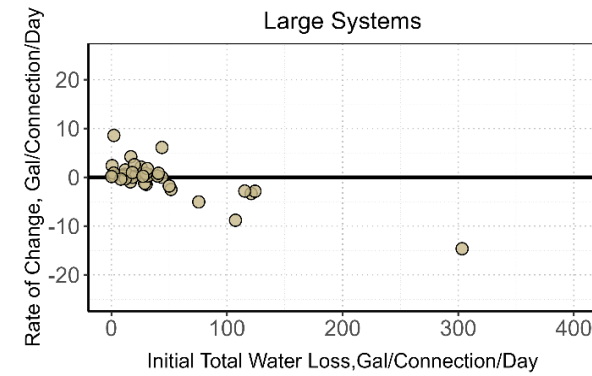
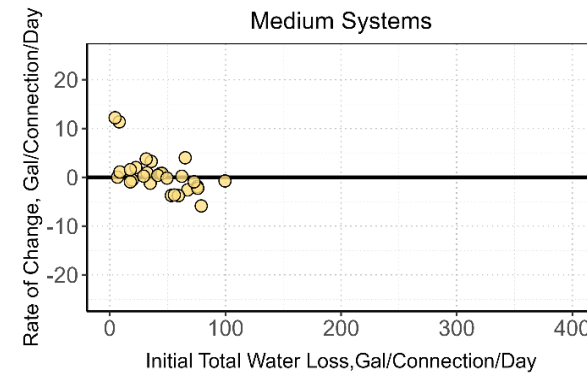
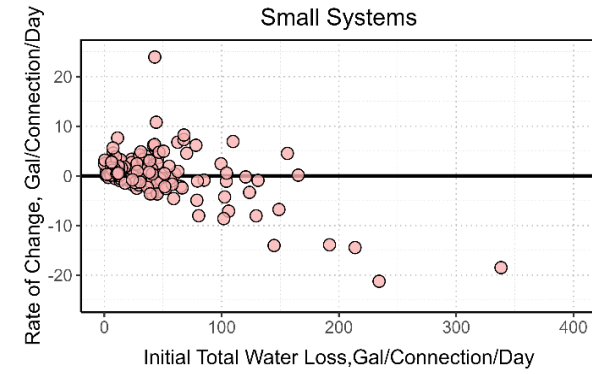
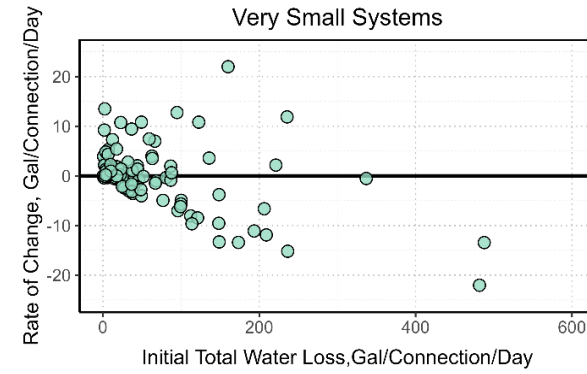
Interesting observations between software versions. Notably the data validity score drop by switching to v6...

6. Trends

Unit Real Water Loss over Time



Change in Water Loss



7. Questions?



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