

Delaware River Basin Commission

Water Utility Auditing and Water Use Trends in the Delaware River Basin

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Water Resource Planner

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AWWA NJ Annual Conference



Delaware River Basin Commission

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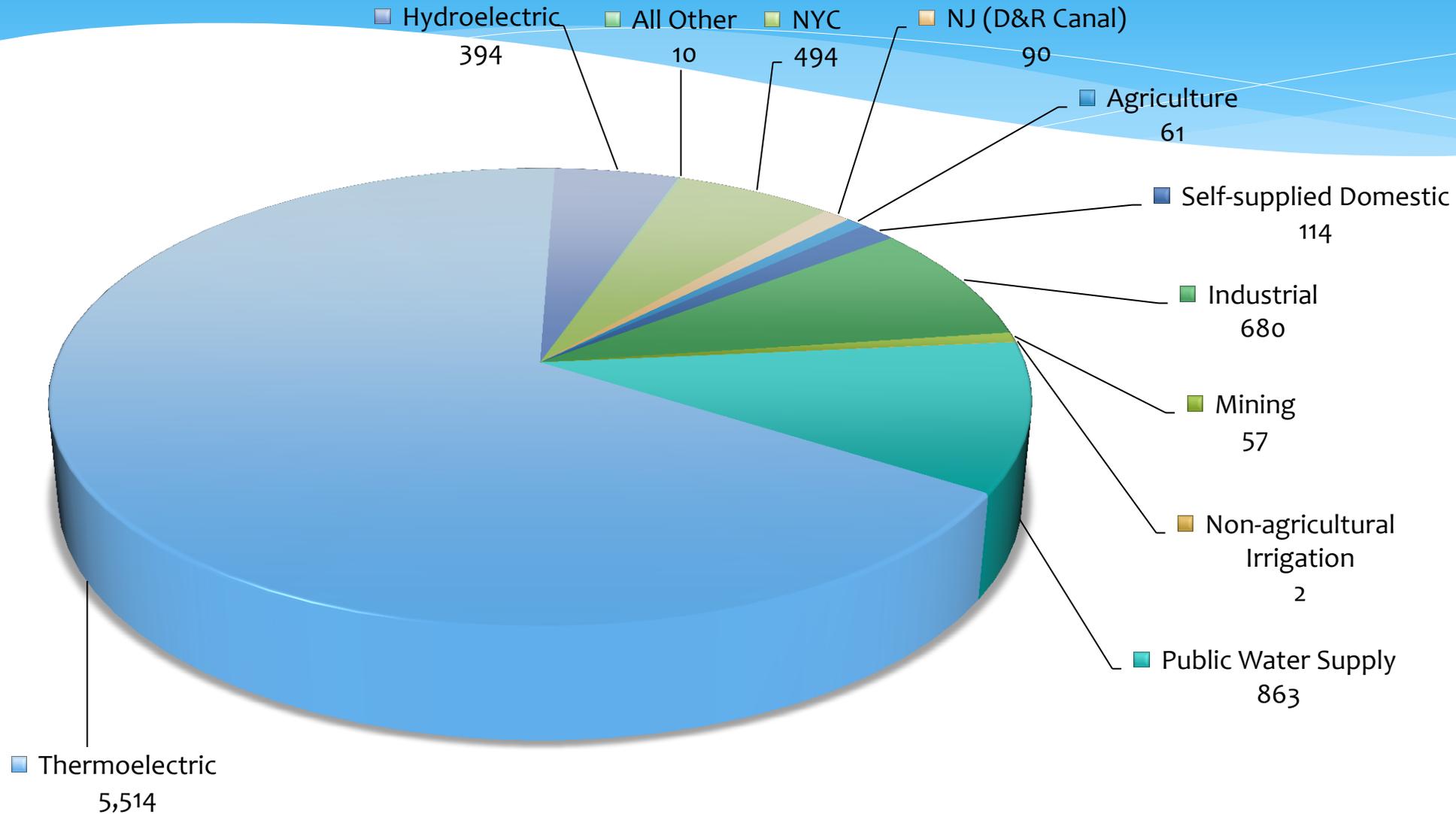
Water Utility Auditing and Water Use Trends in the Delaware River Basin

Today's talk will cover...

- Water Use Trends in the DRB : Industrial, Power Generation, Public Water Supply and largest Basin exports
- The DRBC water audit
 - Brief history
 - Program Results from CY2014

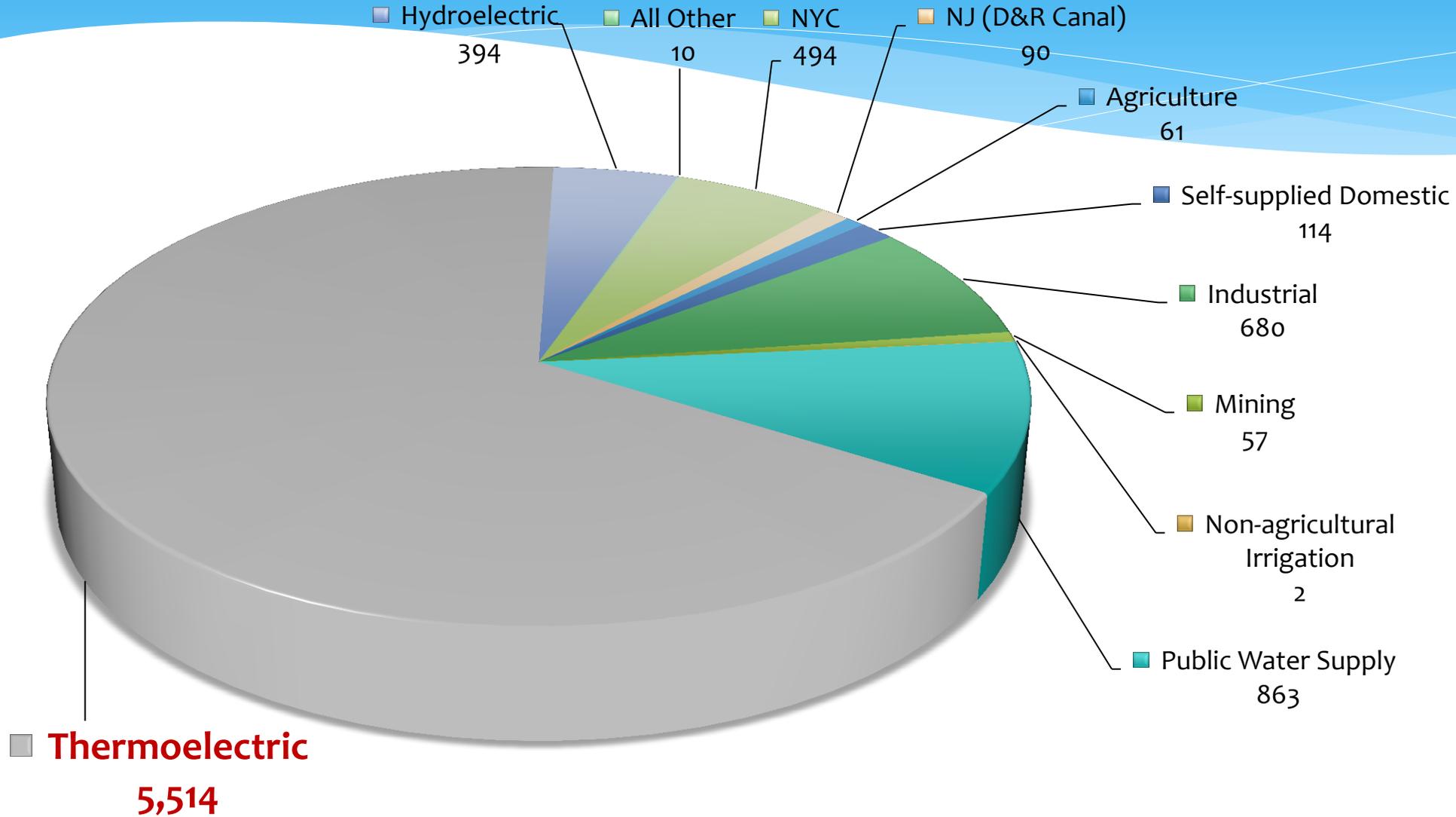
DRB – Total Withdrawals

8,279 Million Gallons / Day



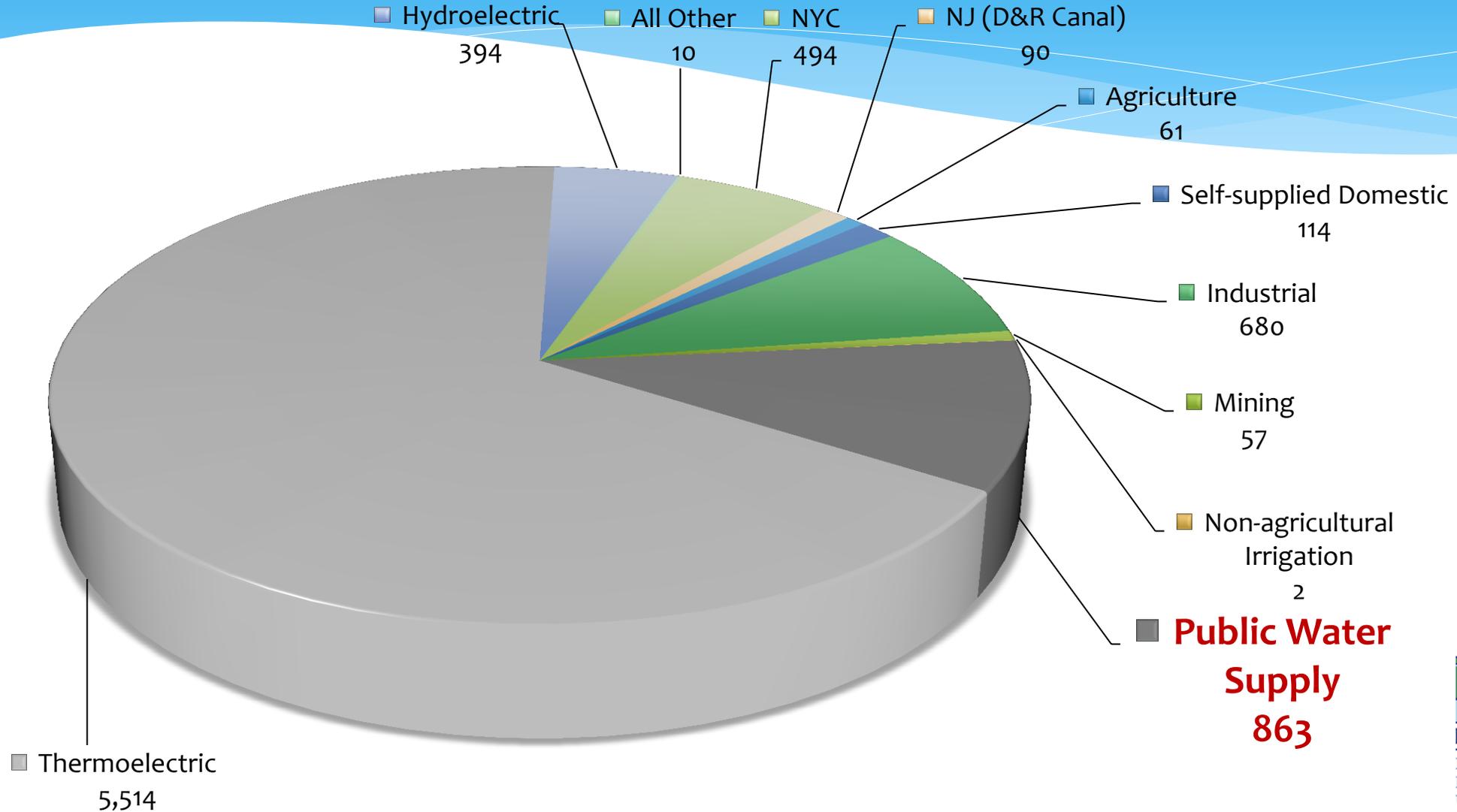
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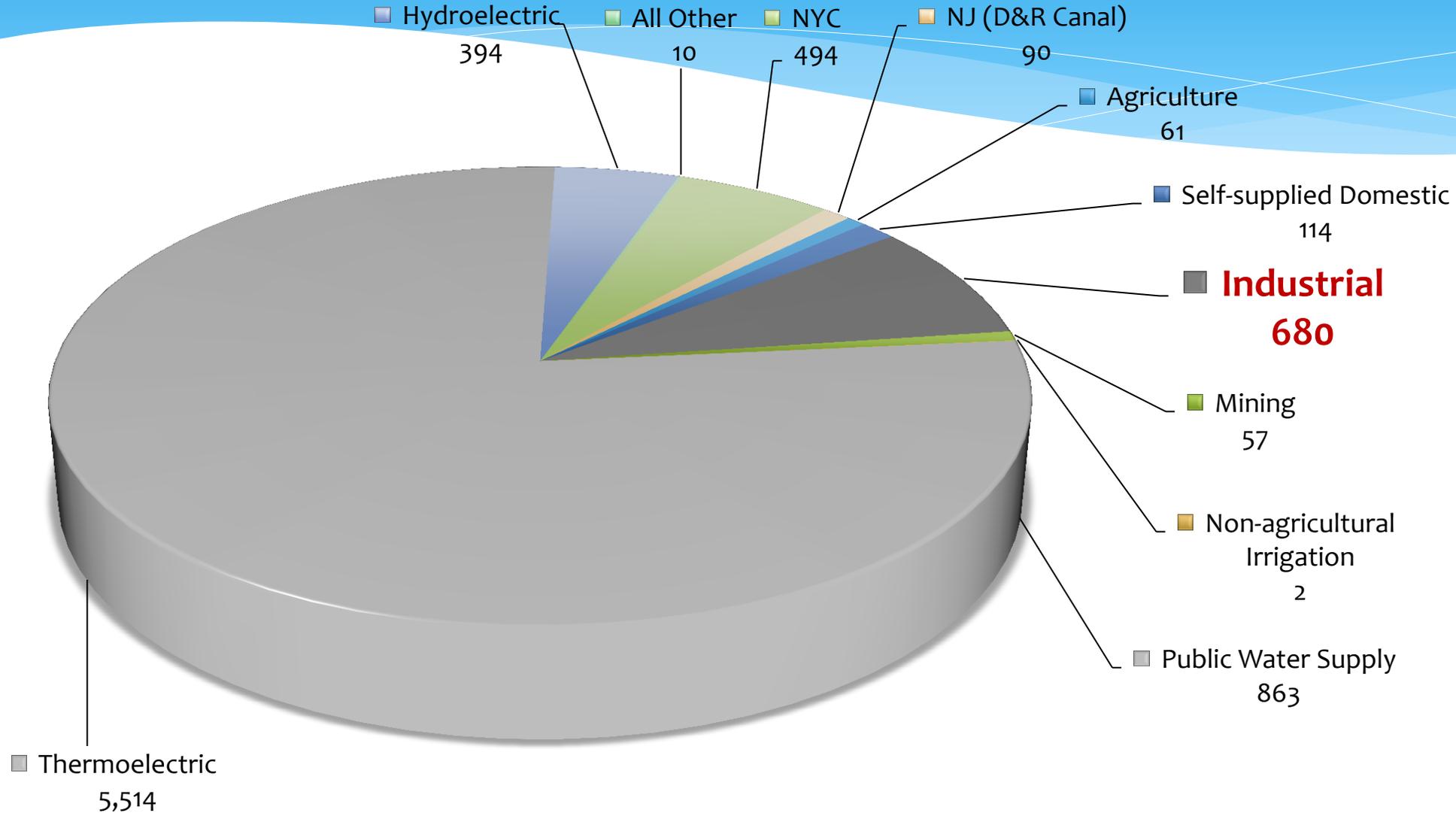
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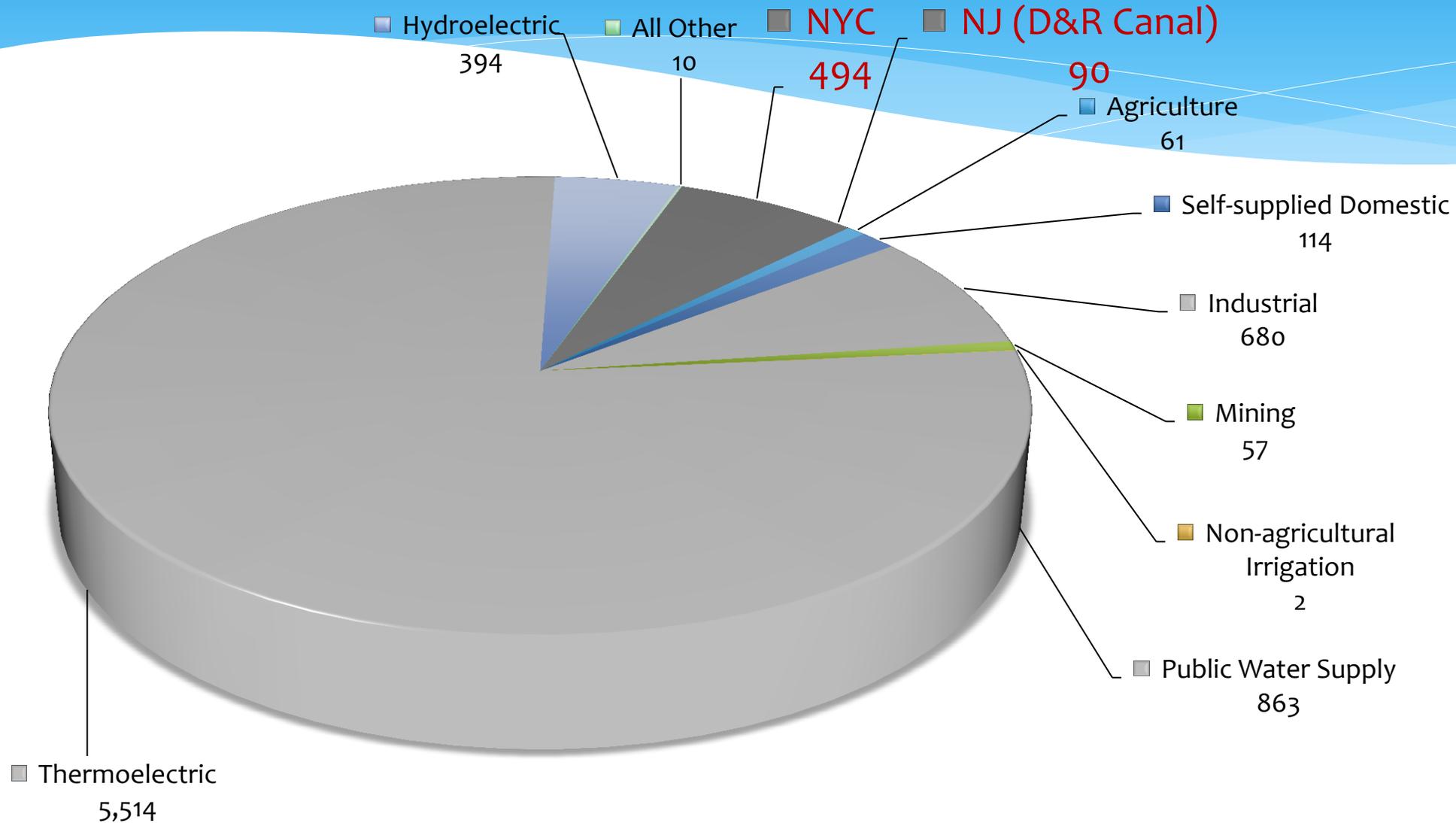
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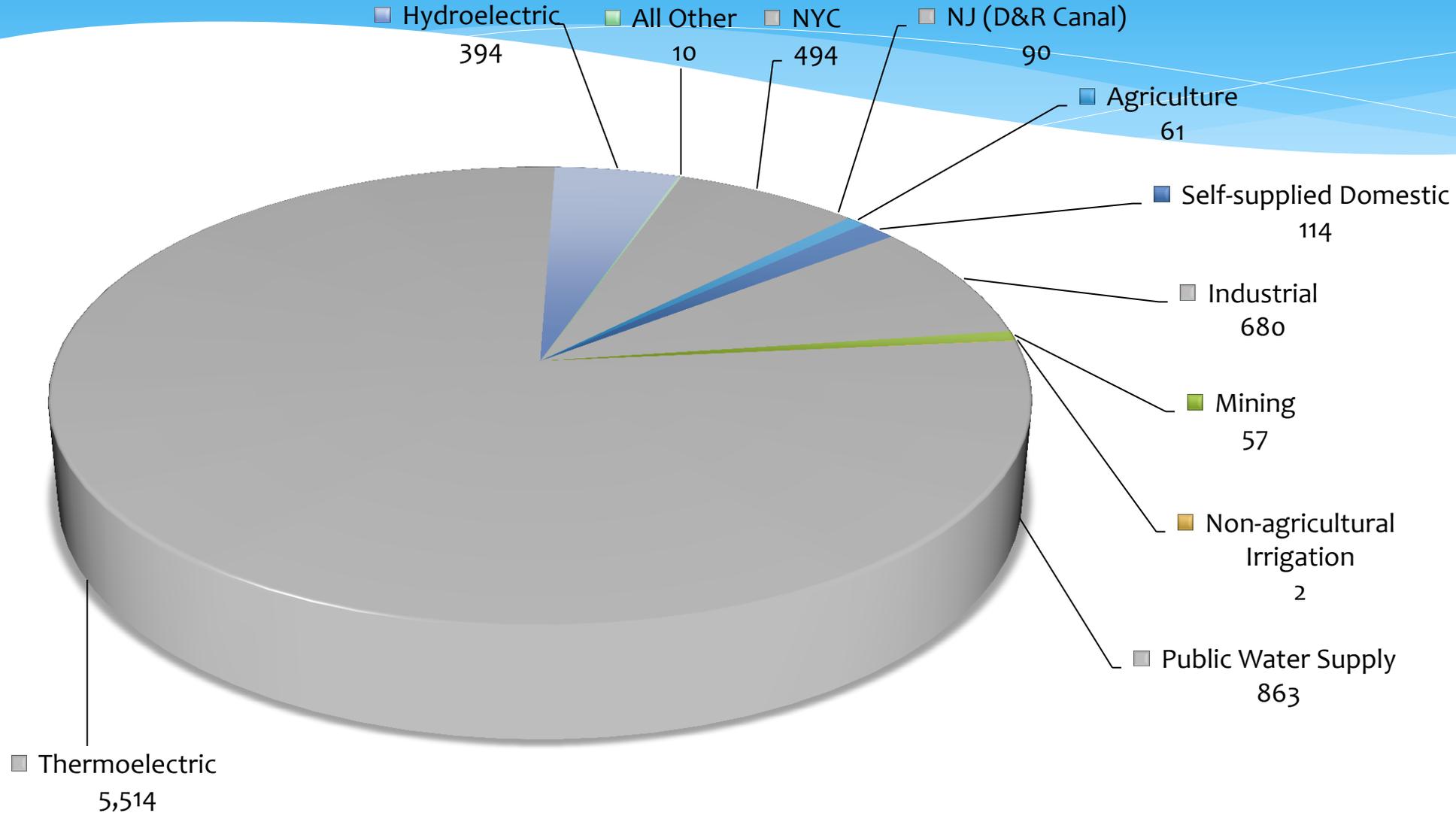
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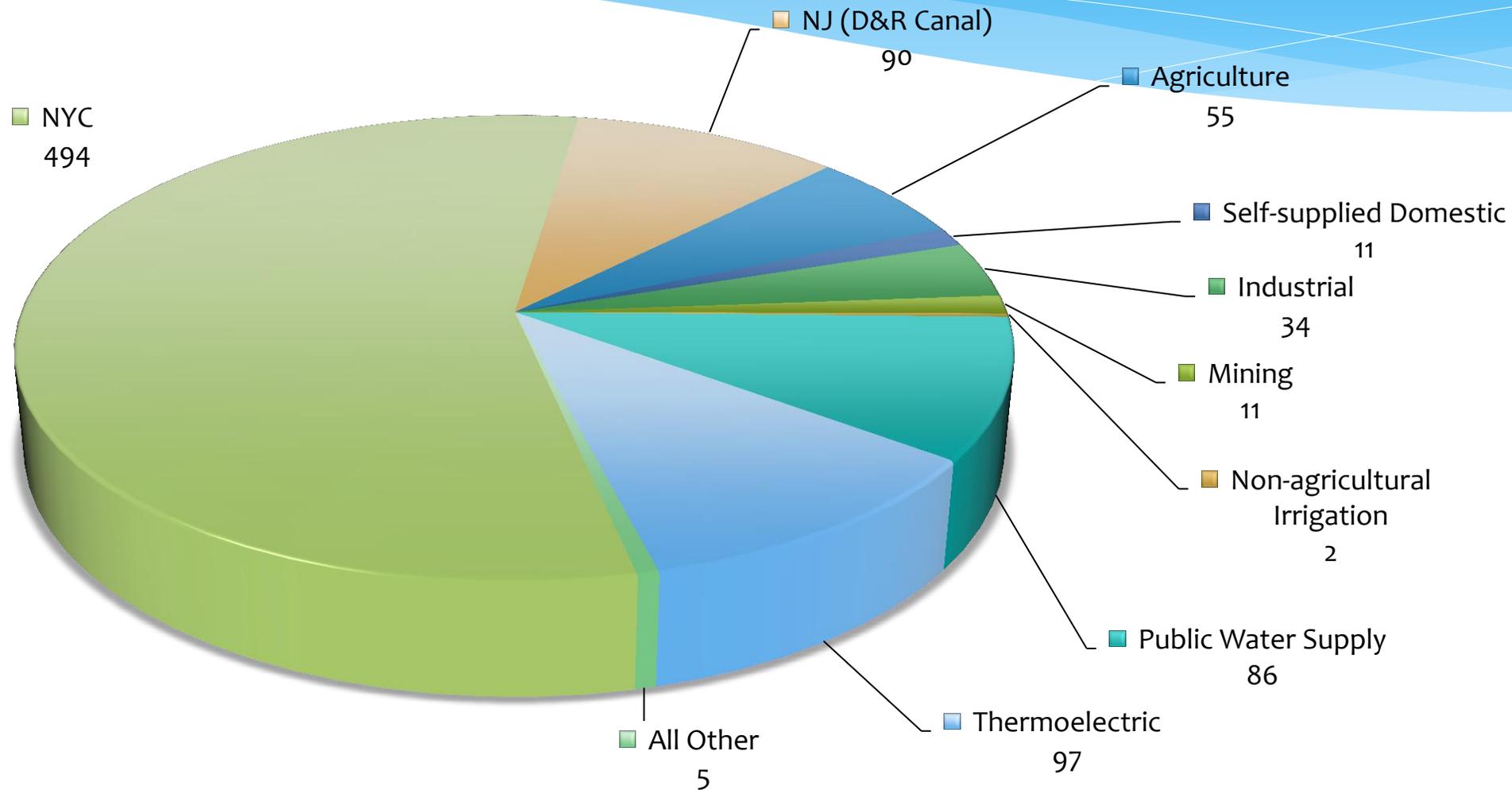
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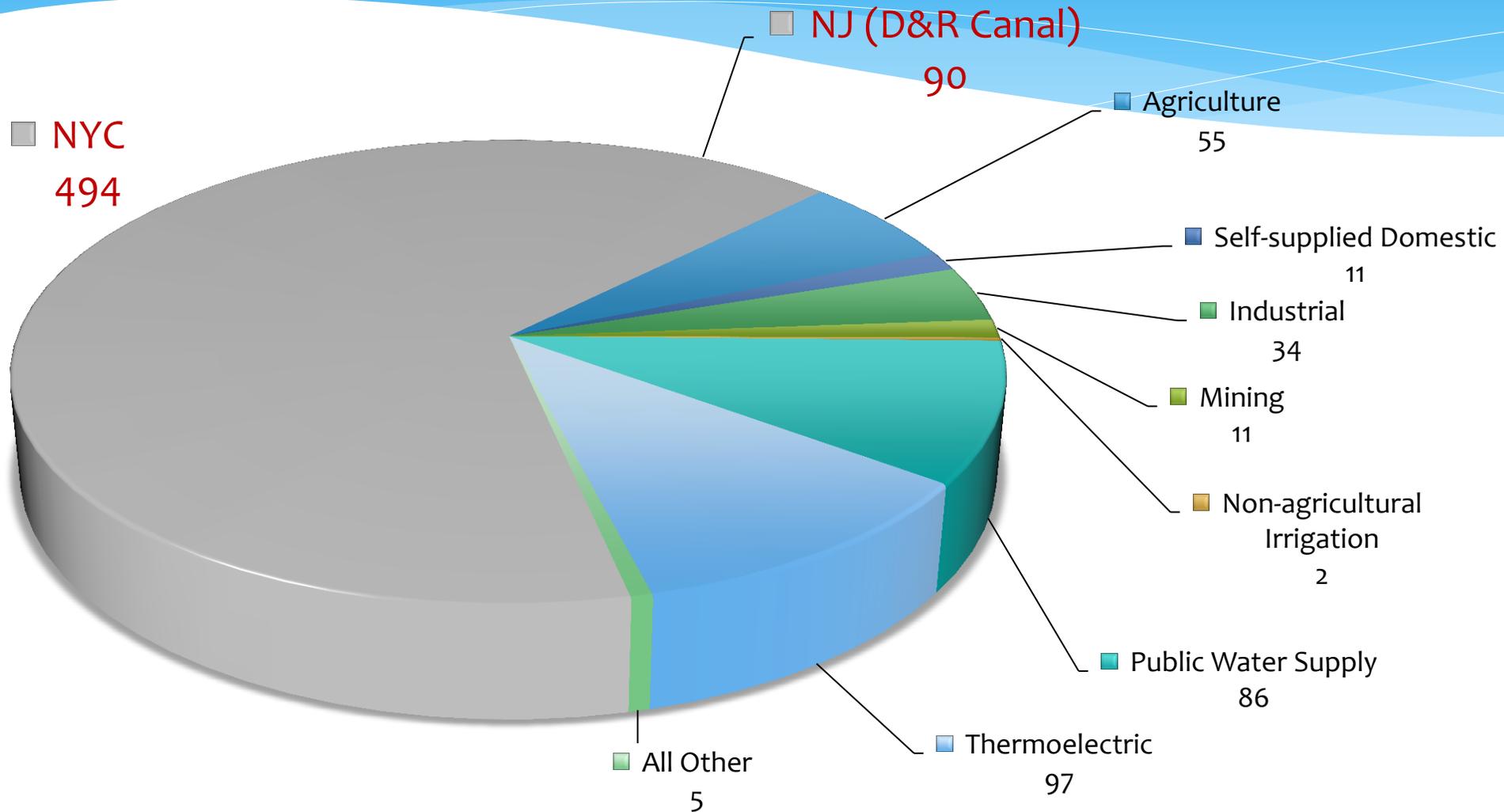
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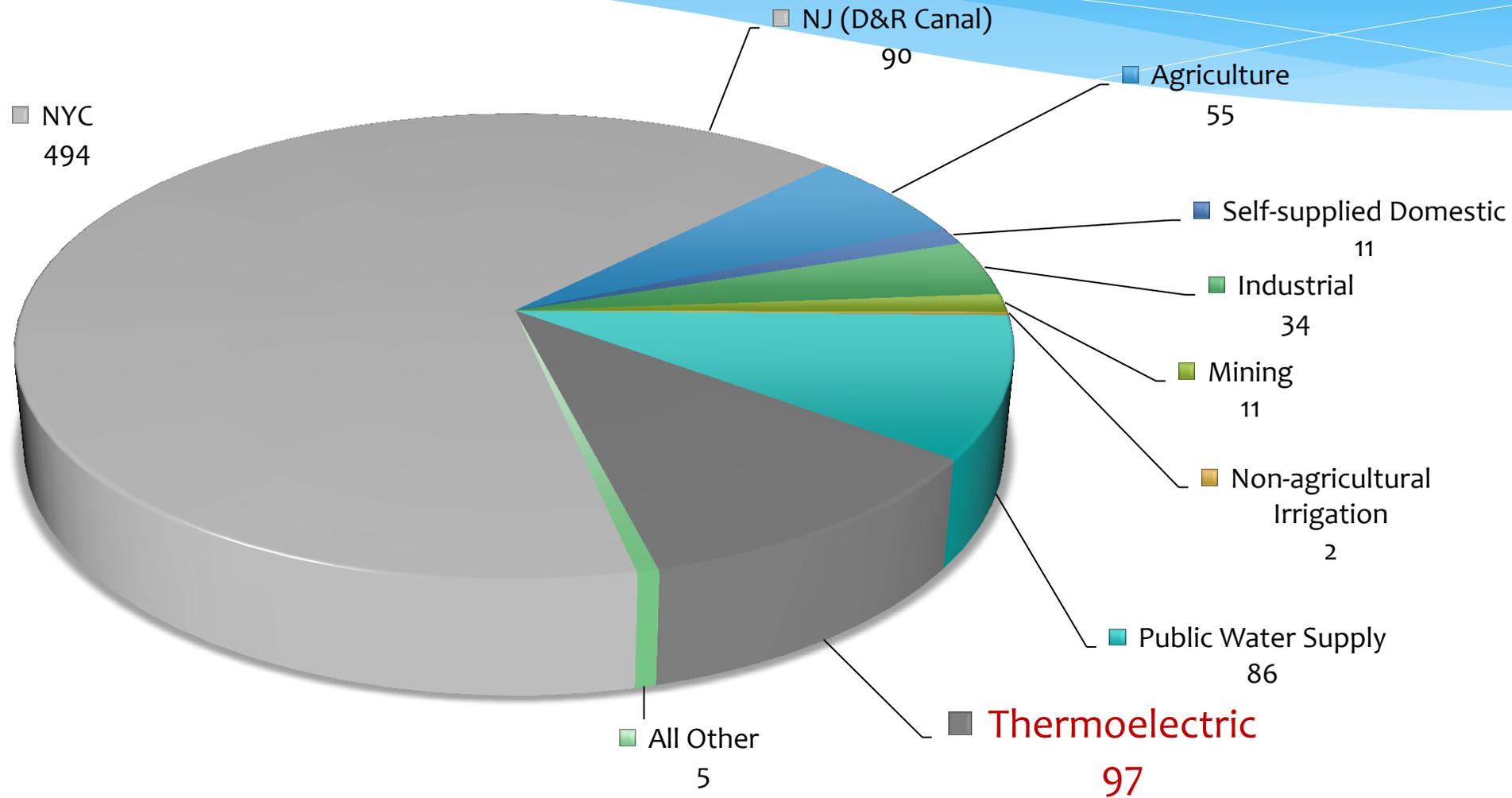
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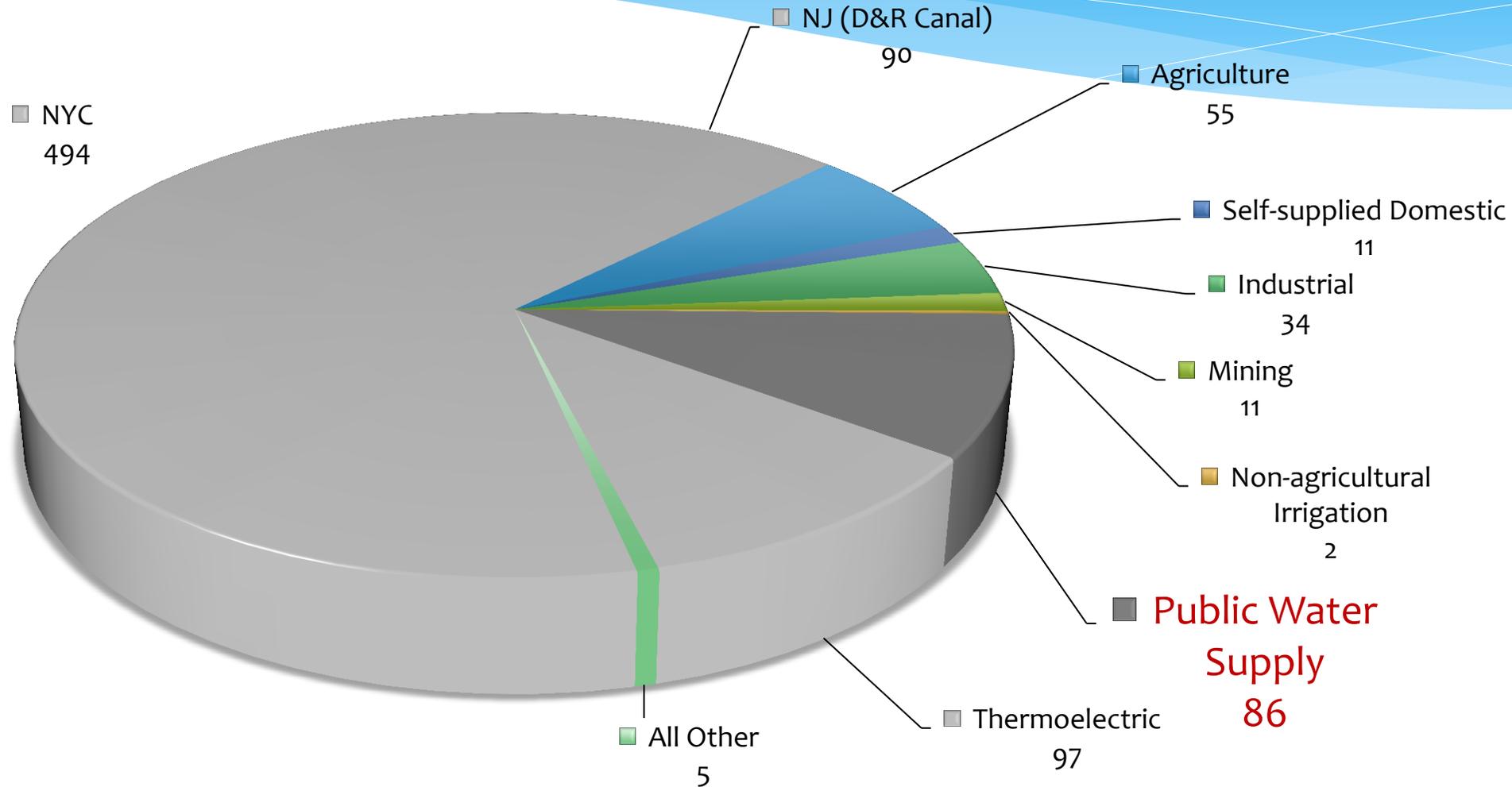
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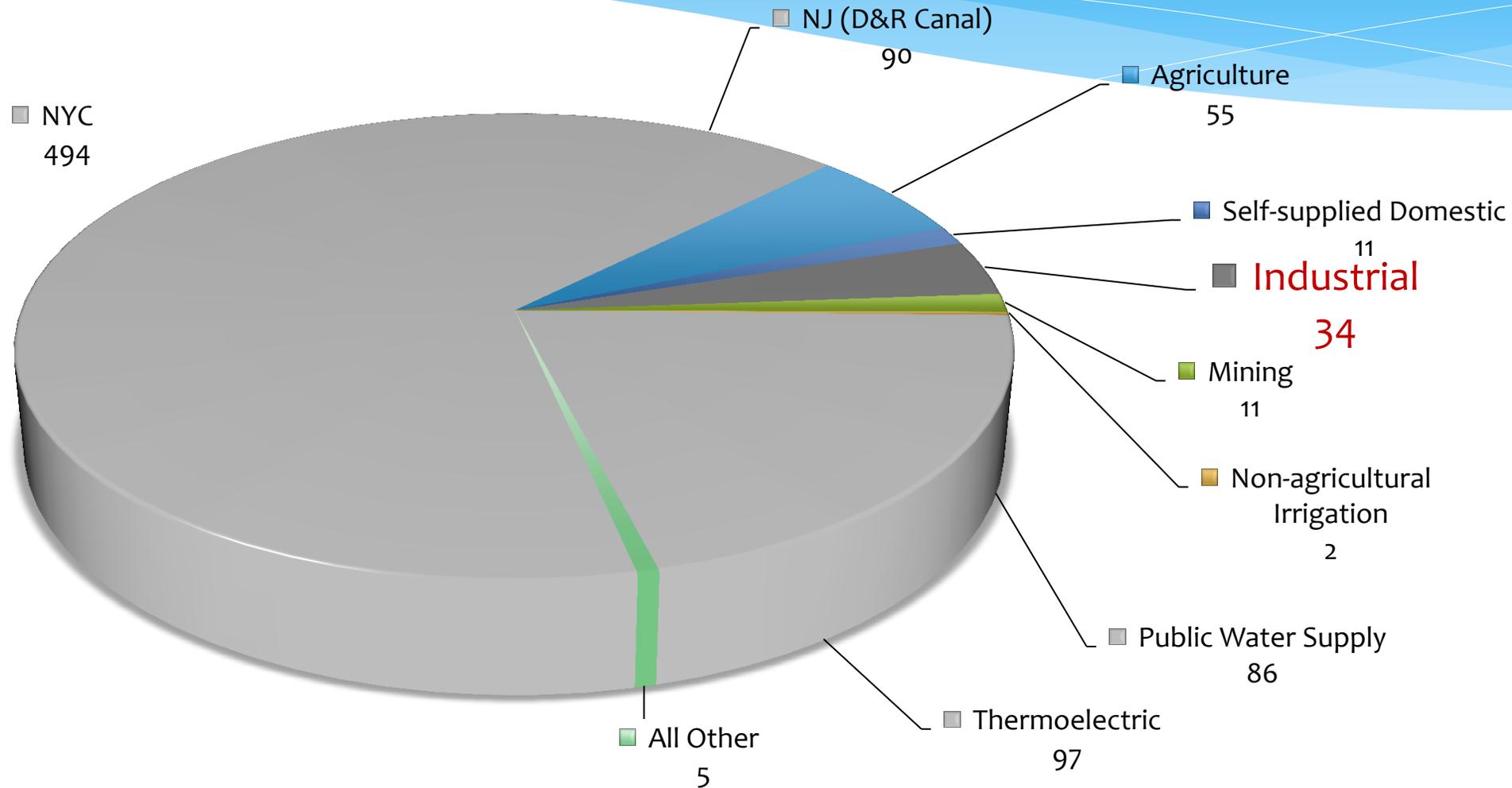
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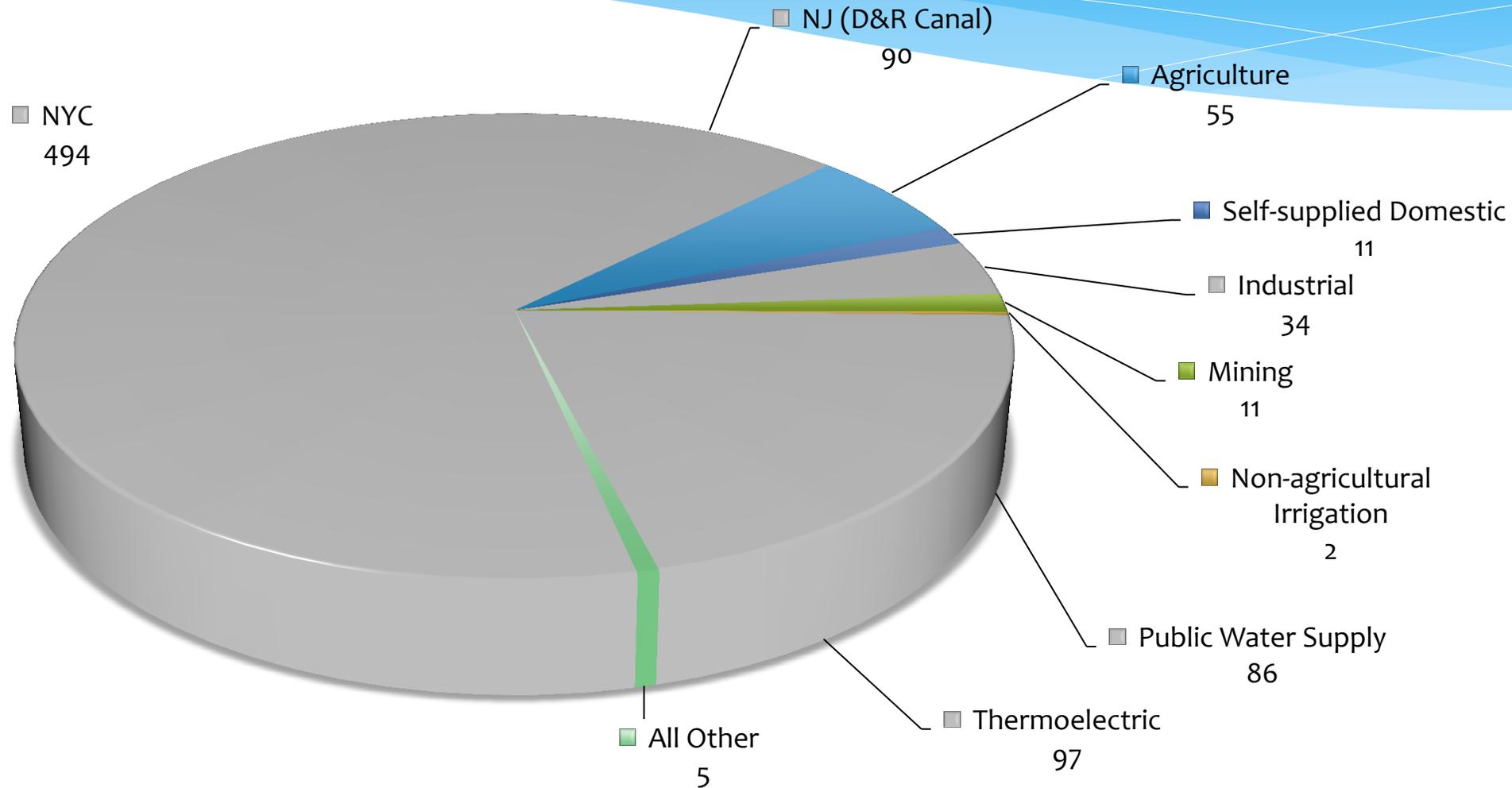
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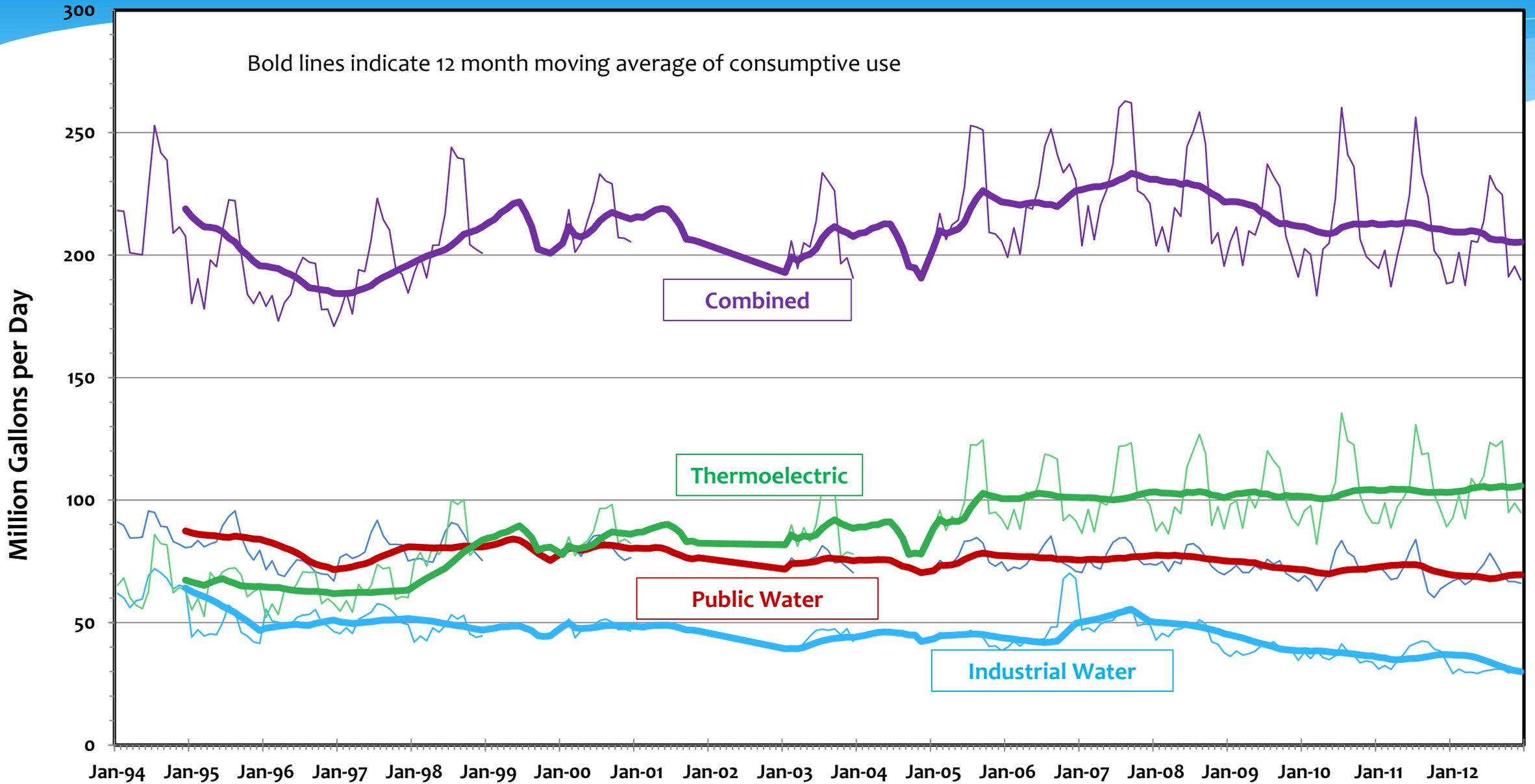


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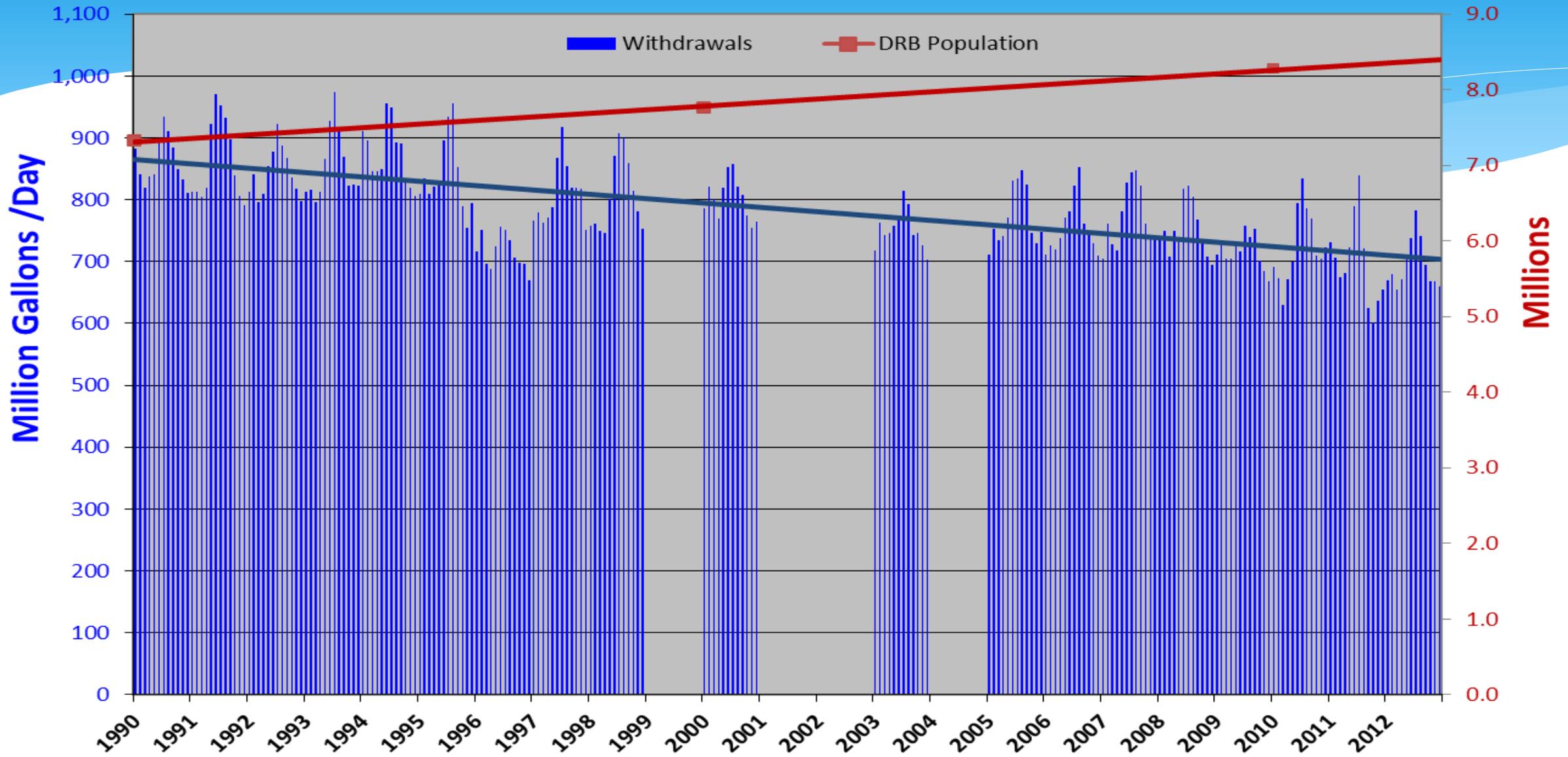
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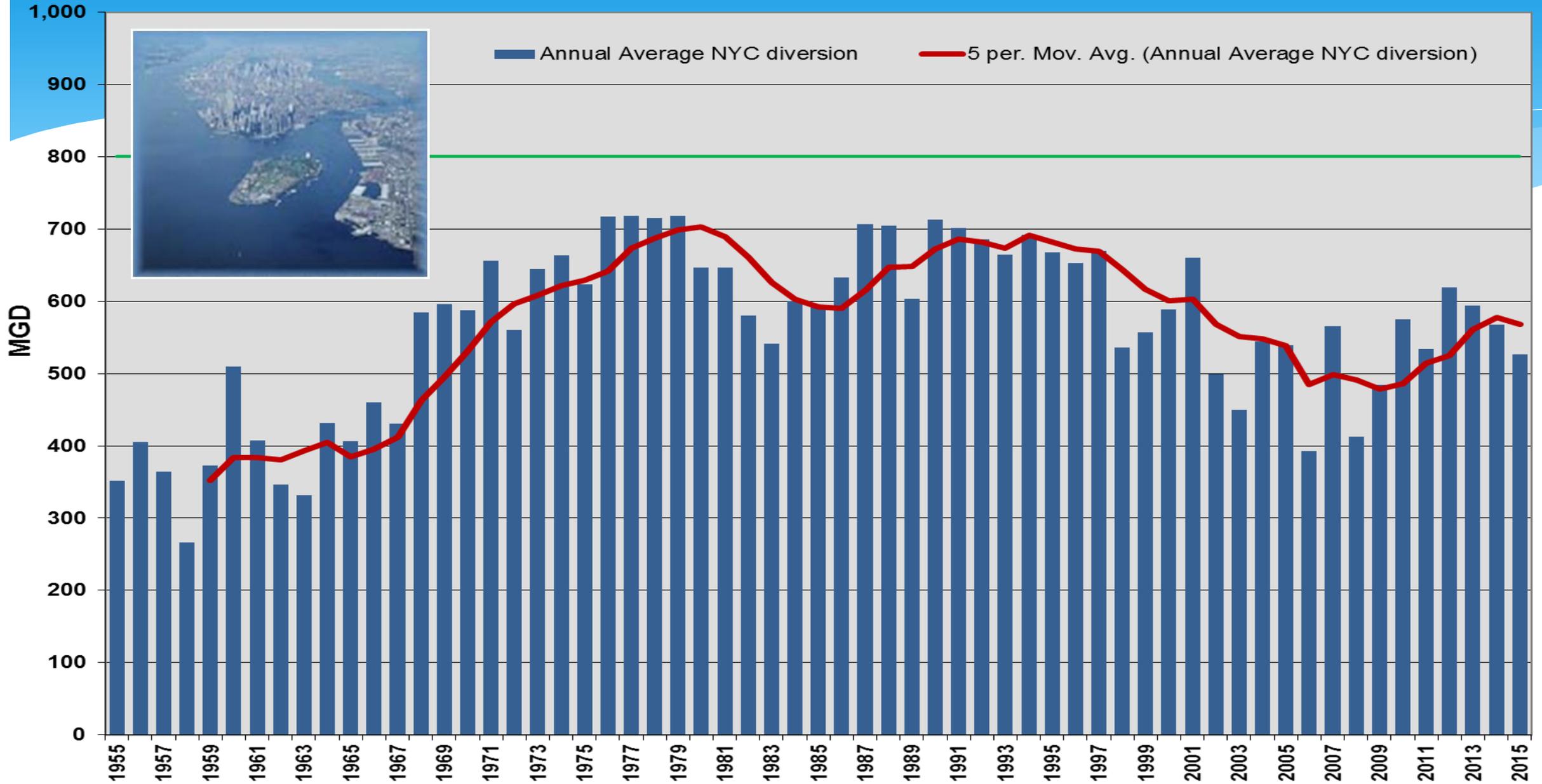
Consumptive Use Trends 1994 - 2012



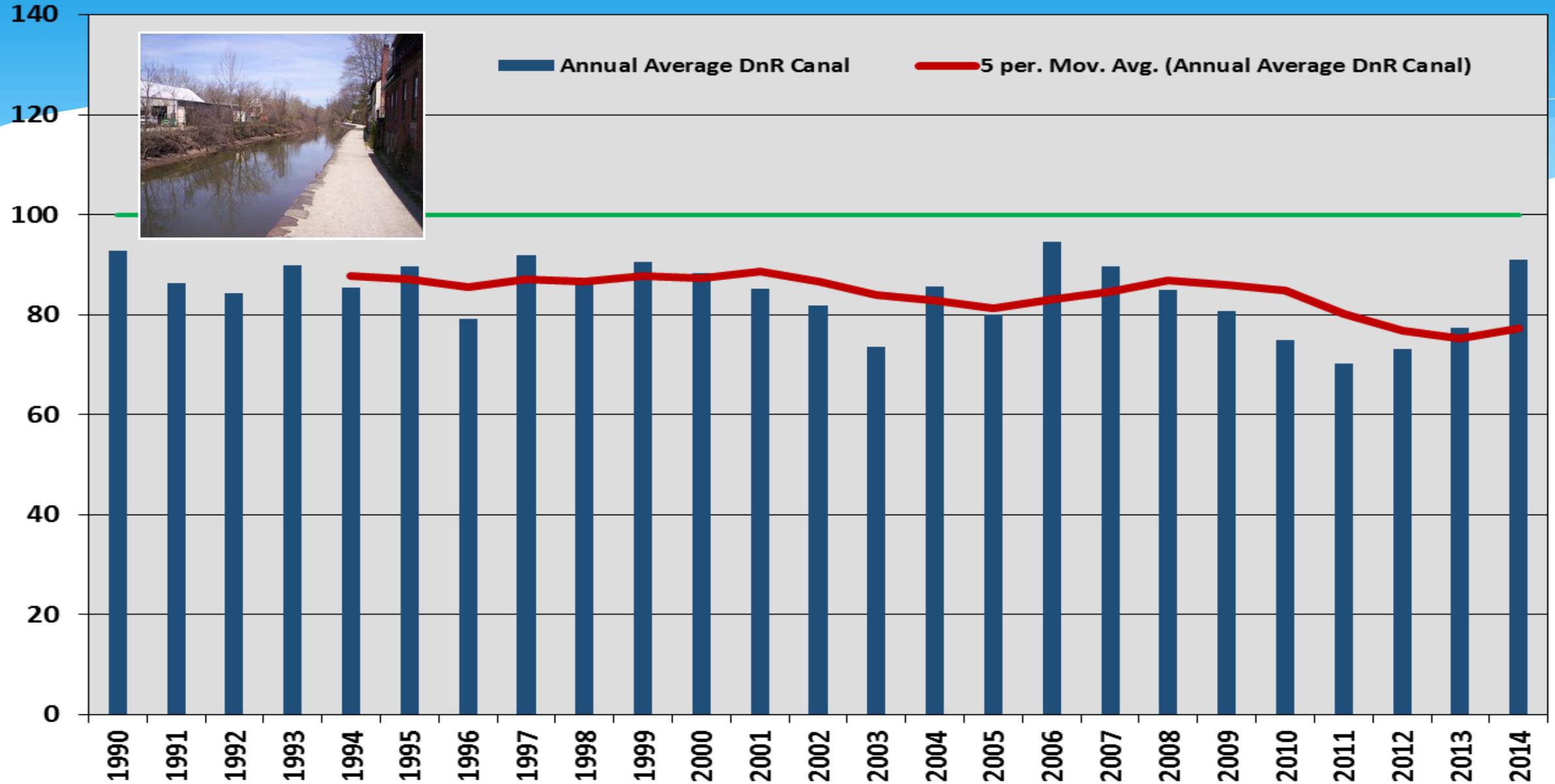
Aggregate Withdrawals of 40 Public Water Supply Systems in the DRB (Million Gallons/Day)



Water Exported to New York City from Delaware River Basin 1955 - 2015 (Annual Data)



Water Exported via D & R Canal from Delaware River Basin 1990 - 2014 (Annual Data)



What does it all mean?

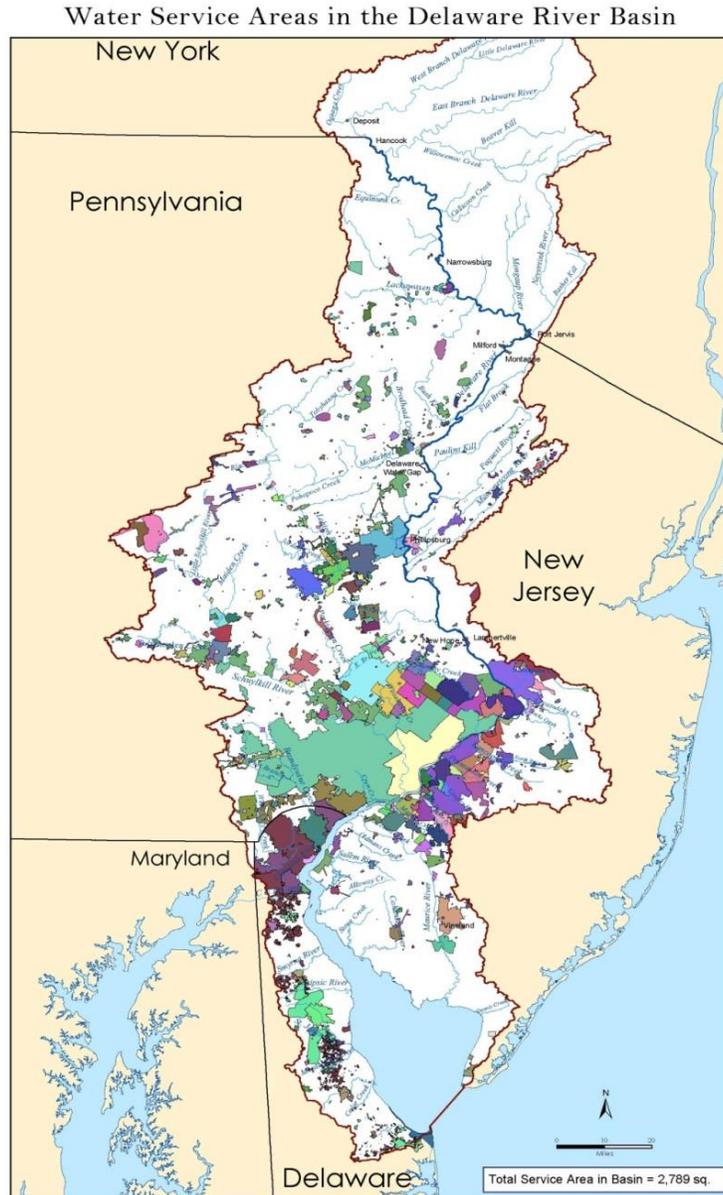


- **Big picture:** Relatively flat demand w/localized demand pressures (geographically and by sector)
- **Power:**
 - Trend is away from Once Through Cooling to Evaporative Cooling , which results in much less total water use but increases in consumptive use
- **Industry:**
 - Decreased water use over time, sensitive to loss of large facilities
- **PWS:**
 - Conservation efforts have helped to offset population growth, a trend that is likely to continue
 - Implementation of Water Loss Accounting could continue this trend

DRBC Water Audit Program: What is it?

The purpose of DRBC's water audit program is to track how efficiently water is moved from its source to the customer (within a public water supply system) and to ensure that systems quantify and are accountable for water losses.

Public Water Supply Service Area in the Delaware River Basin



- Total PWS withdrawals:
~863 MGD
- 2nd largest water use sector in the Basin
- Approx. 21% of Basin covered by service area
- Serve 6.7 million customers (80% of basin residents)
- Approx. 306 systems subject to Water Audit Requirement

History of DRBC Water Conservation Regulations

- 1986:** Source & Service Metering
- 1987:** Leak Detection & Repair (UFW)
- 1988:** Conservation Plumbing Standards
- 1992:** Water Conservation Pricing
- 2006-9:** Water Loss Accountability (Committee)
- 2009-11:** “Water Audit” Rule/Outreach
- 2012:** First year for new water audit format
- 2013:** First water audit reports due

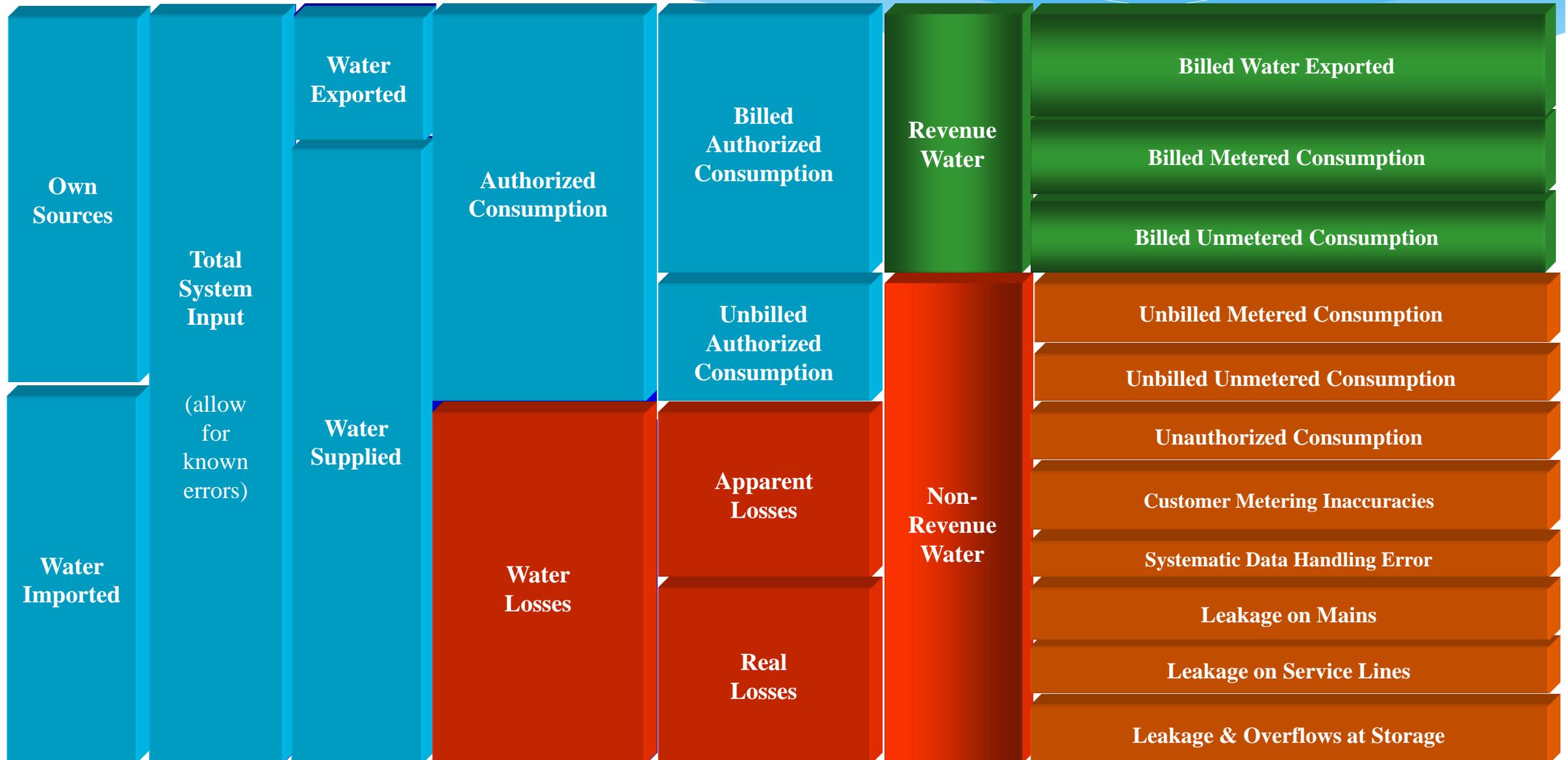
DRBC Rule change

~~Unaccounted for water (UFW)~~

IWA/AWWA Water Audit
Methodology



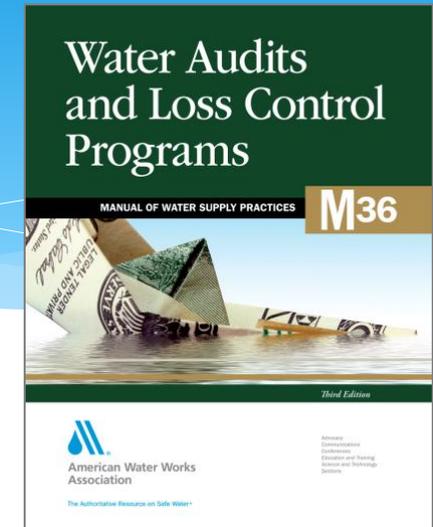
IWA/AWWA Water Audit Components



Benefits of the IWA/AWWA Water Audit Methodology

- UFW:
 - Vague / inconsistent definitions / value
 - Negative UFW values reported!?
- AWWA Method:
 - **Best Practice** Approach
 - Standardized definitions / terminology
 - Meaningful indicators (ILI, gpd/conn)
 - Real losses vs apparent losses
- Better Indicators = better water management

- M36 Water Audit manual
- Free interactive audit software available
 - DRBC provided a key role in software design and development
- Data grading capability assesses the validity of the input data
- Instructions, definitions provided in software



AWWA Free Water Audit Software: Reporting Worksheet

Water Audit Report for: Philadelphia Water Department
 Reporting Year: 2013 1/2013 - 12/2013

Please enter data in the white cells below. Where available, metered values should be used. If metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades.

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Category	Item	Grade	Value	Unit
WATER SUPPLIED	Volume from own sources	7	87,417.500	MG/yr
	Water imported	n/a	0.000	MG/yr
	Water exported	10	5,402.000	MG/yr
	WATER SUPPLIED:		80,628.500	MG/yr
AUTHORIZED CONSUMPTION	Billed metered	7	49,907.000	MG/yr
	Billed unmetered	n/a	0.000	MG/yr
	Unbilled metered	n/a	0.000	MG/yr
	Unbilled unmetered	8	1,959.000	MG/yr
	AUTHORIZED CONSUMPTION:		51,866.000	MG/yr
WATER LOSSES (Water Supplied - Authorized Consumption) 28,762.500 MG/yr				
Apparent Losses				
	Unauthorized consumption	8	2,425.500	MG/yr
Unauthorized consumption volume entered is greater than the recommended default value				

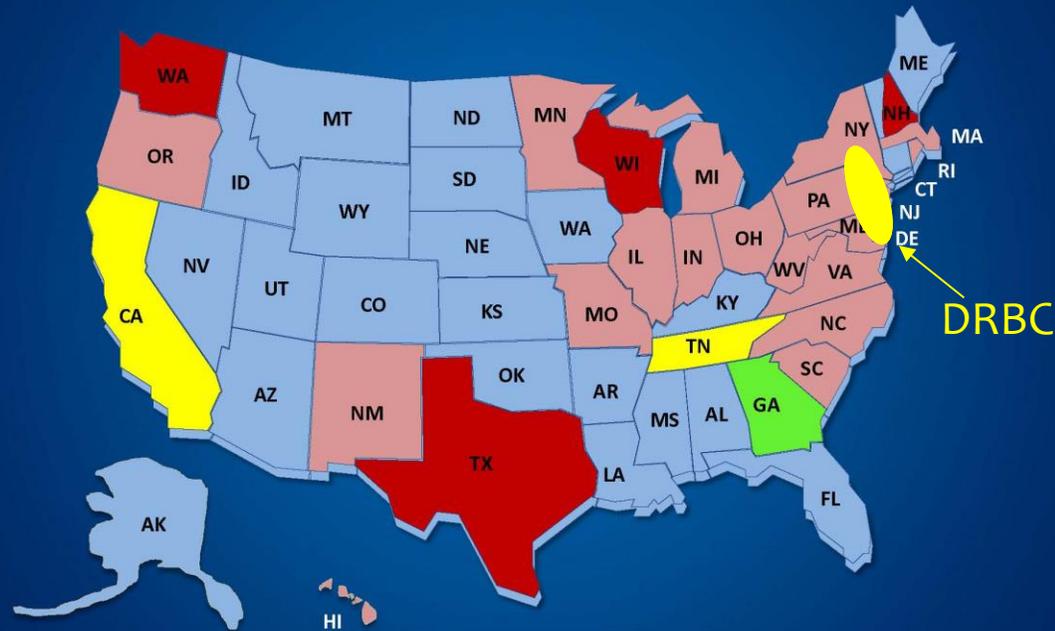
Master Meter Error Adjustments

Item	Grade	Value	Unit
Master Meter Error Adjustments	10	1,304.420	MG/yr
Master Meter Error Adjustments	10	-82.580	MG/yr
Unbilled Unmetered volume entered is greater than the recommended default value		1,959.000	MG/yr
Unauthorized consumption		2,425.500	MG/yr

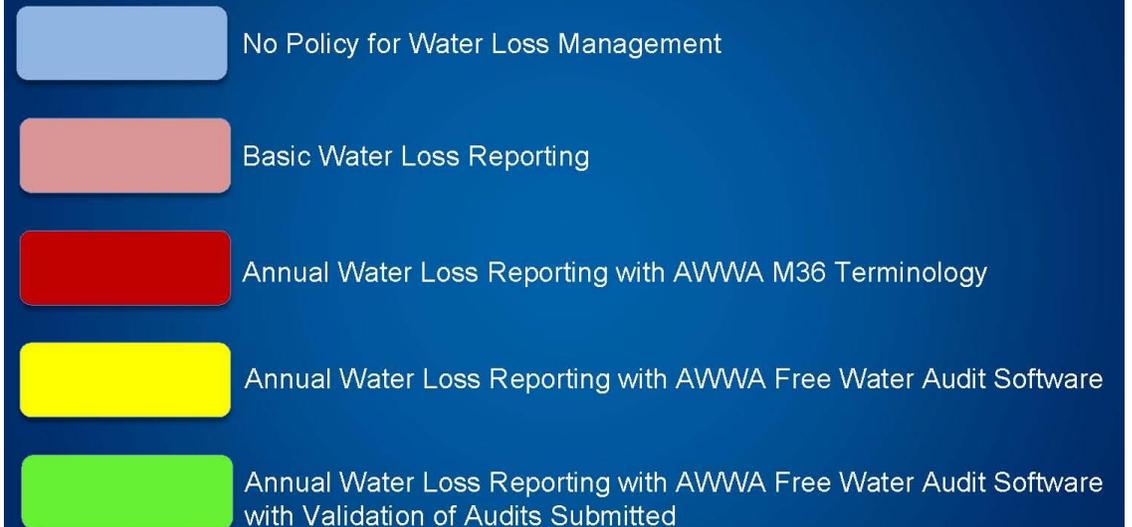
AWWA v5.0
 American Water Works Association
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Water Loss – National Perspective

Landscape of Varying Levels of Water Loss Management Policy



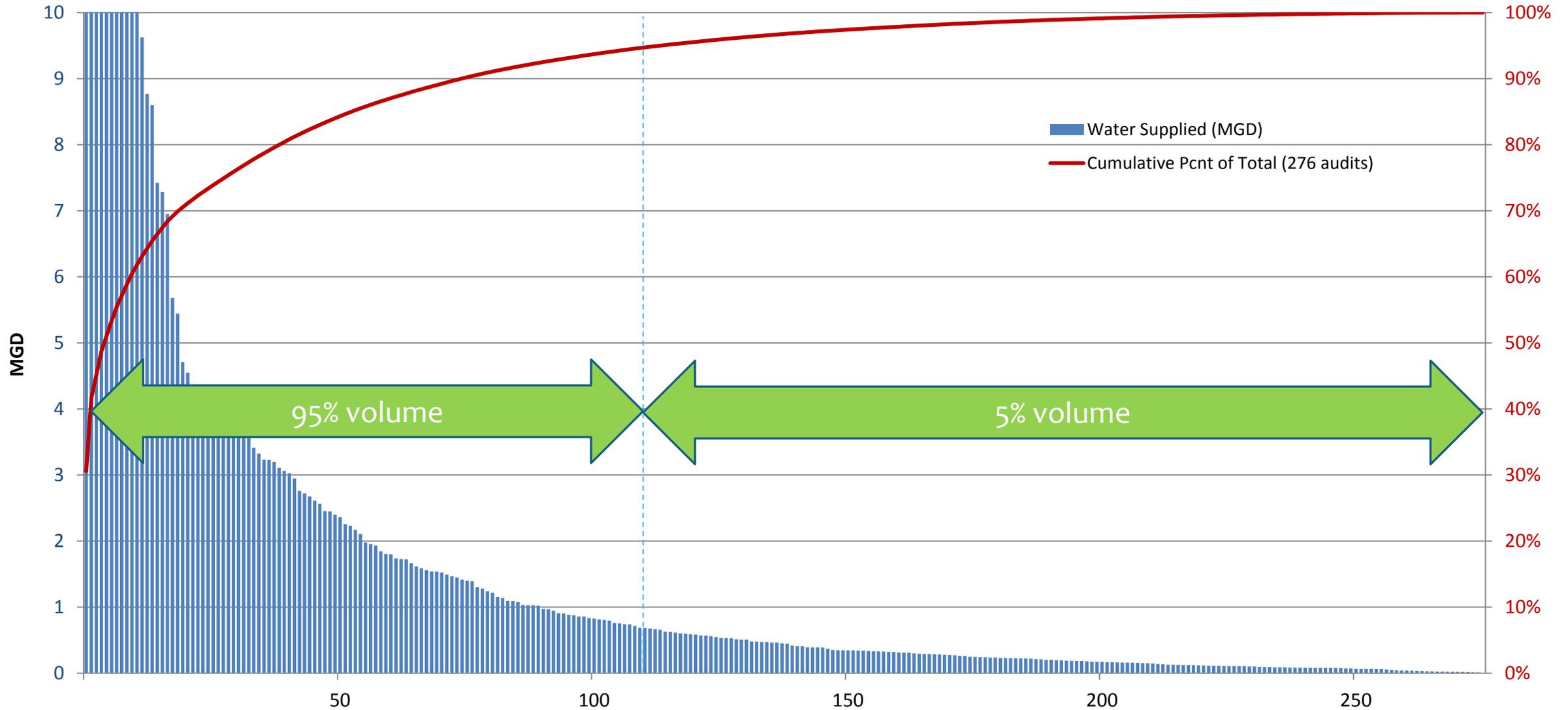
Landscape of Varying Levels of Water Loss Management Policy



Water Audit Data Analysis: CY2014 Results for the Delaware River Basin...

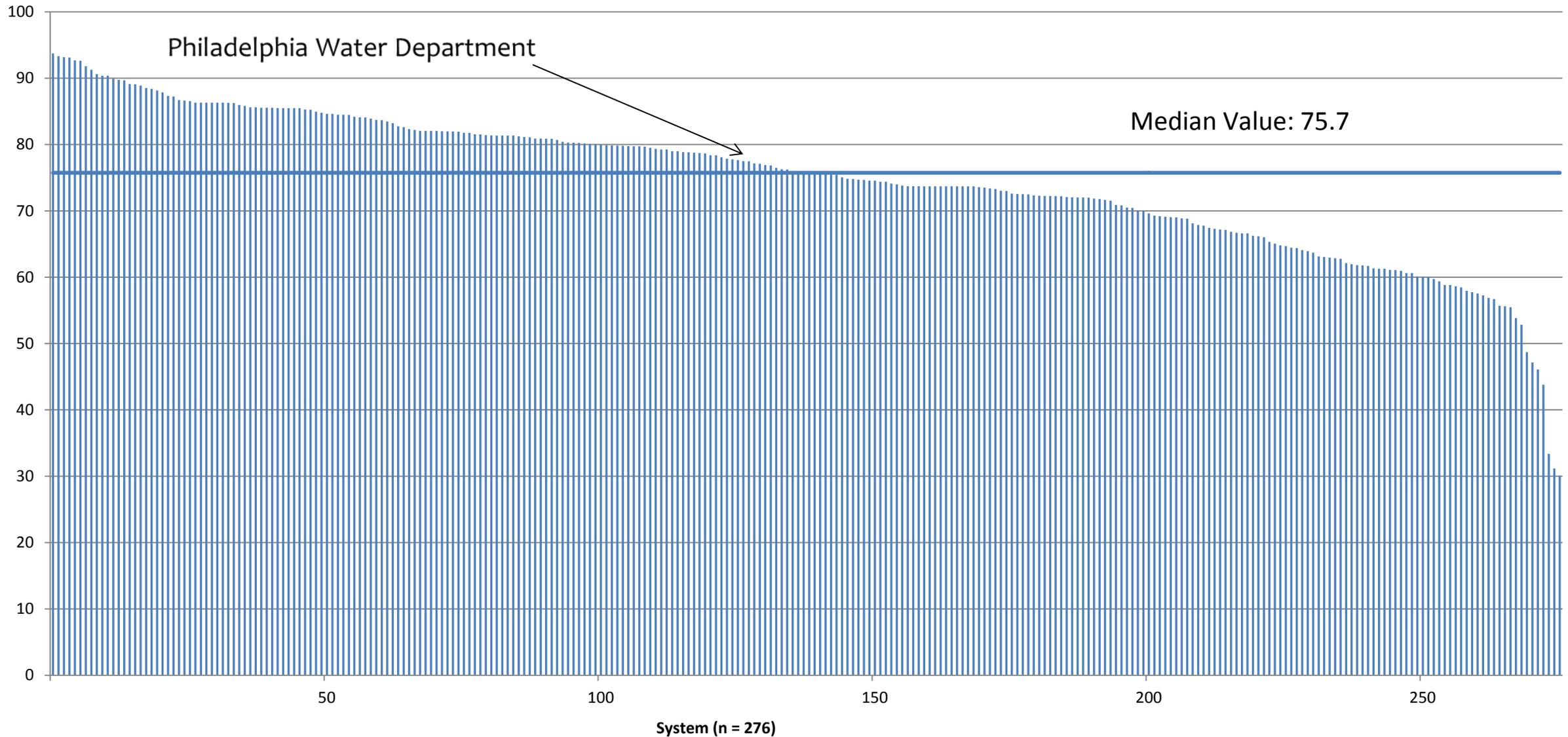


Water Supplied in CY2014 – DRB (MGD)



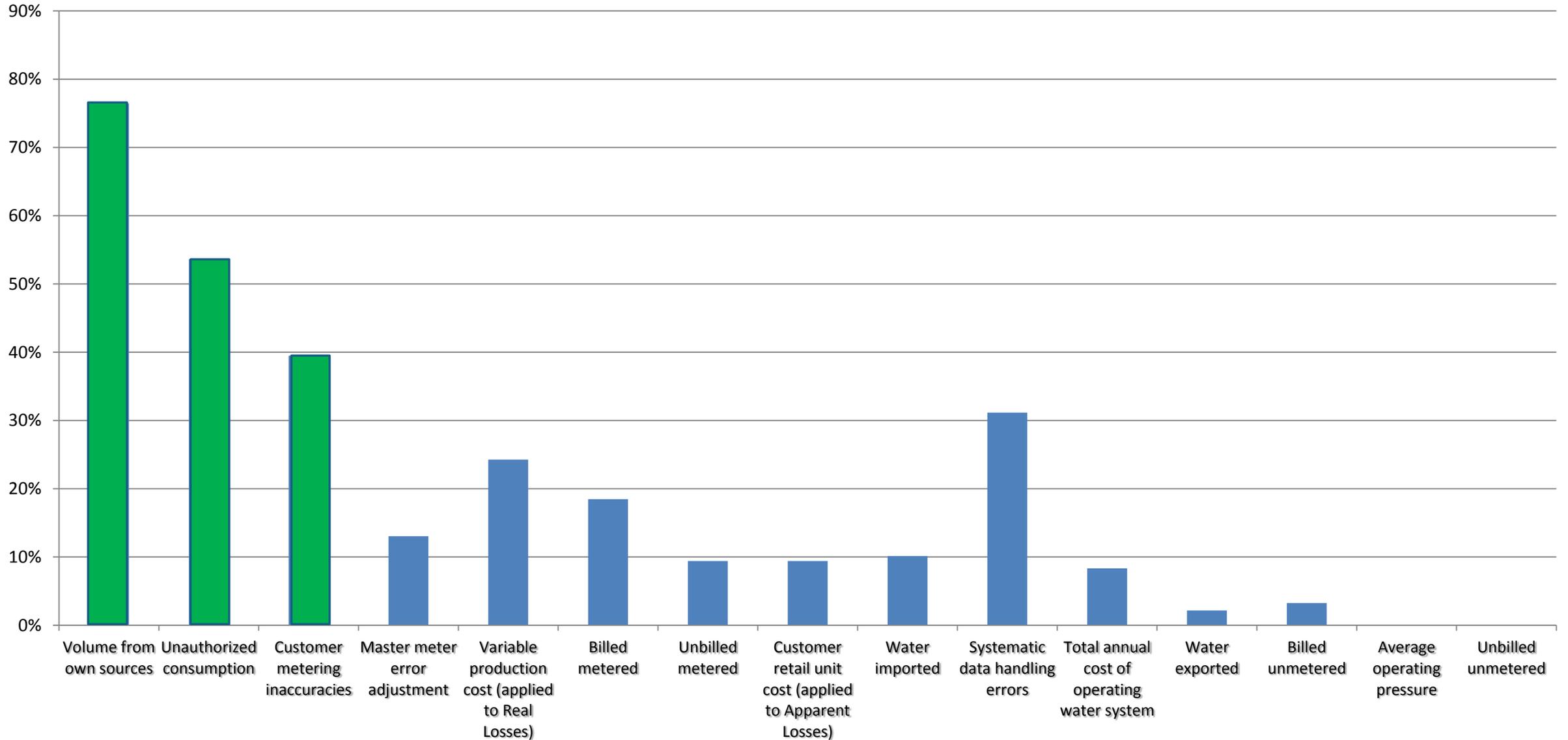


Water Audit Data Validity Score CY2014 - DRB



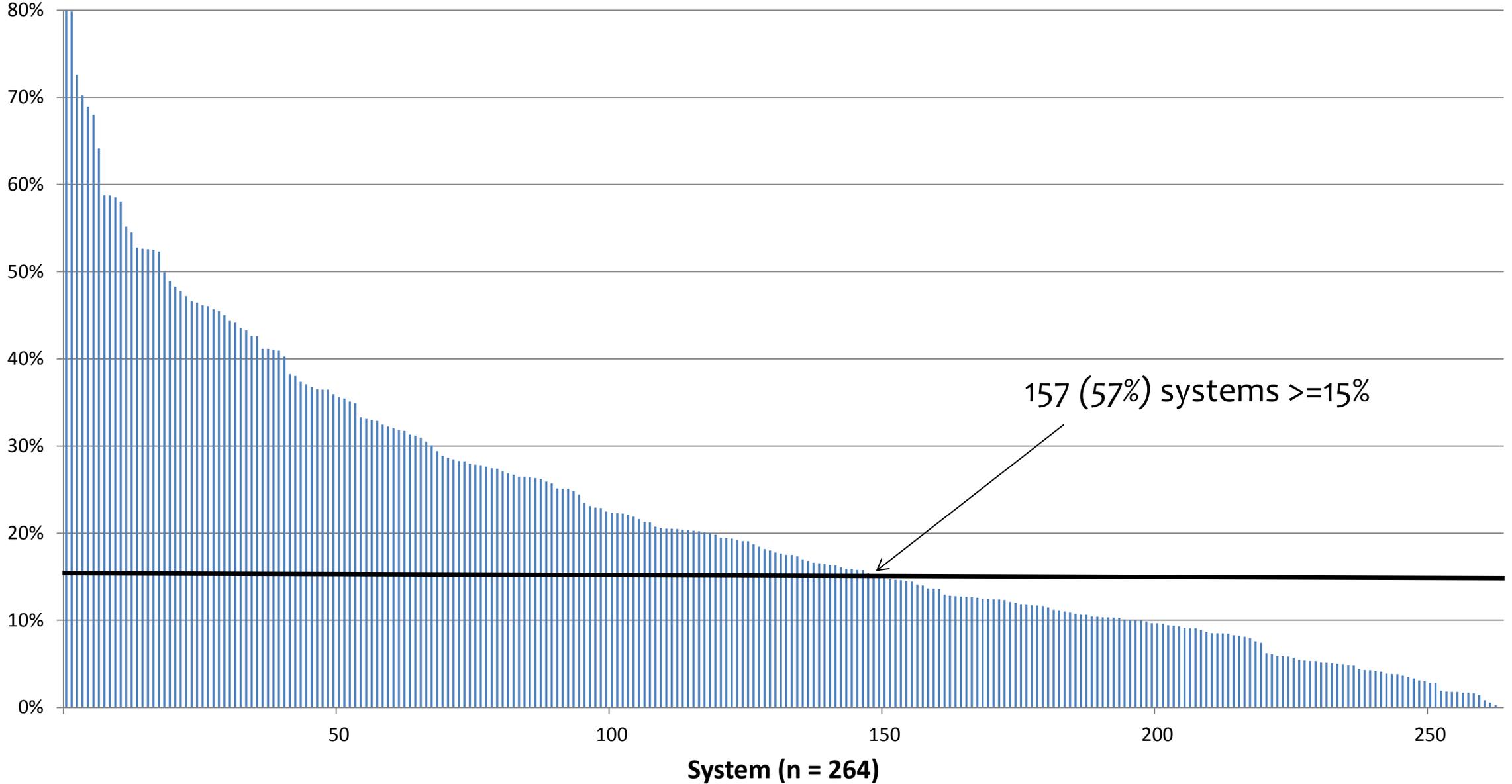


Priority Areas to Improve Grading Score CY2014 - DRB



Non-Revenue Water as % of Water Supplied

CY2014 - DRB



DRBC water audit program summary (CY2014)



Conclusions / Next Steps

- Water Use Trends: basin export trends relatively flat while consumptive use trends vary for the 3 major sectors
- Water Audit:
 - Raising awareness of best practice
 - Continuing trends in conservation
 - Asset Management Tool
 - DRBC leadership in Water Auditing: Training / Support / Validation Program (funding?)

Thank You!



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Delaware River Basin Commission

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One Process One Permit

- DRBC Compact and Rules allow for and encourage the use of administrative agreements with states and state agencies to:
 - ✓ Promote inter-agency collaboration and cooperation on shared mission objectives.
 - ✓ Promote regulatory program efficiencies.
 - ✓ Avoid unnecessary duplication of effort.
 - ✓ Recognizes the Authority, standards, rules of each agency



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Summary

- Who we are:

- Watershed based interstate agency
- Engineers, Scientists, Planners

- What we do:

- **Plan:** Watershed based, Comprehensive water resource, Topic Driven, WQ Assessments
- **Policies:** Regulations, Standards, Rules of Practice
- **Projects:** Supported by DRBC (e.g., Blue Marsh and Beltzville Reservoirs) and supported by others to meet Basin needs.





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www.drbc.net



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*Managing Our Shared Water
Resources since 1961*