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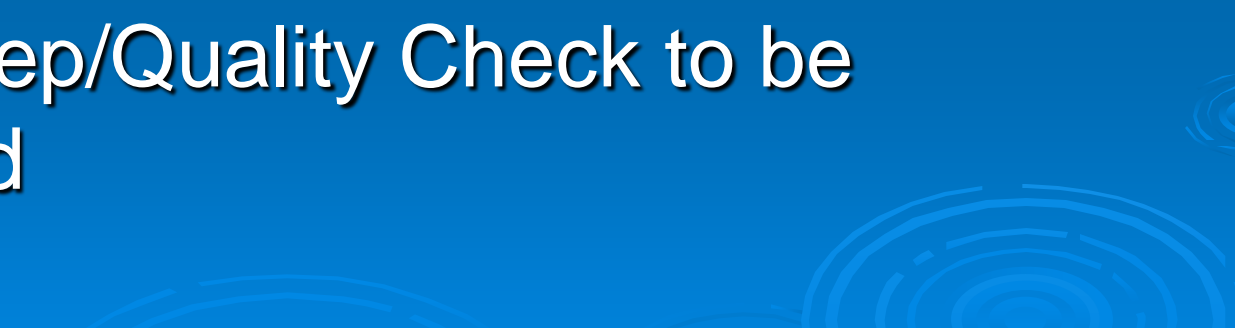
Georgia Water Loss and Auditing Reports – Results and Analysis

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Las Vegas, Nevada
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The background of the slide is a solid blue color. In the bottom right corner, there are several concentric white circles of varying sizes, resembling ripples in water. These ripples are arranged in a way that suggests a point of impact, with the largest ripple being the most prominent.

Presentation Outline

- Background and Regulatory Drivers
 - Specific Requirements for Water Suppliers
 - Preliminary Audit Results from the Large Systems
 - Observations from Large Systems Audits
 - Validity Step/Quality Check to be Conducted
 - Summary
- 
- The background of the slide is a solid blue color. In the bottom right corner, there are several faint, concentric white circles that resemble ripples on water, adding a decorative touch to the presentation.

Extreme Drought

U.S. Drought Monitor

August 21, 2012

Valid 7 a.m. EST

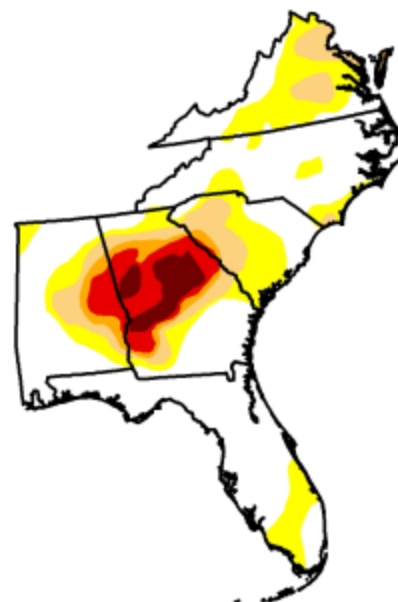
Southeast

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	55.73	44.27	22.76	12.60	9.41	3.48
Last Week (08/14/2012 map)	52.96	47.04	22.34	12.76	9.41	3.48
3 Months Ago (05/22/2012 map)	22.91	77.09	52.42	40.01	29.68	8.93
Start of Calendar Year (12/27/2011 map)	40.38	59.62	43.05	28.62	18.71	0.00
Start of Water Year (09/27/2011 map)	42.24	57.76	41.82	31.77	23.48	0.00
One Year Ago (08/16/2011 map)	24.64	75.36	53.03	34.23	12.78	0.00

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu>



Released Thursday, August 23, 2012
Michael Brewer, National Climatic Data Center, NOAA

History of Lake Lanier Rulings

- 2009: Fed Court Ruling
 - Water supply was not originally authorized purpose of Lanier
 - Current supply use exceeds Army Corps authority
 - Restricts future water use (2012 deadline)
- June 2011: Court of Appeals
 - Reversed 2009 Ruling
 - Vacated the 2012 deadline
 - Dismissed requirement for Congressional approval
- June/July 2012
 - US Supreme Court declines to hear appeal.
 - Army Corps must determine how it will operate Lanier to meet water supply and the other authorized purposes.

Water Stewardship Act of 2010

- WSA was enacted by 2010 General Assembly
- Recognizes imminent needs:
 - to create a culture of water conservation in the State of Georgia
 - to plan for water supply enhancement during future extreme drought conditions and water emergencies
- Six key provisions ...

WSA - Key Provisions

- Requires state agencies to review and enhance conservation programs
- Revises standards for plumbing fixtures and devices
 - High efficiency plumbing fixtures (toilets, showerheads and urinals)
 - Sub-metering for multi-unit buildings (after July '12)
 - High efficiency cooling towers for commercial and industrial (after July '12)

WSA - Key Provisions

- 3) Mandates public water systems to conduct annual water audits and follow leak abatement best practices
- 4) Modifies authorities to restrict outdoor water use and establishes a schedule for outdoor irrigation
- 5) Calls for amendments to permitting system for farm water use
- 6) Created a Water Supply Study Commission to study and analyze the state's reservoir system and strategic needs for additional water supply

WSA – Water Loss Provision

- Amends O.C.G.A. §12-5-4
- DNR Board: adopt rules for minimum standards and best practices
- Public water systems must improve water system efficiency:
 - 1.) Conduct annual water system audits
 - 2.) Implement water loss detection program

WSA – Water Audits

- Annual water system audits (calendar year)
- Phased approach based on size of service area:
 - Water systems serving >10,000 individuals initial audit by 2012
 - Water systems serving 3,300 to 10,000 individuals by 2013
 - Infrastructure leakage index (ILI)
 - In accordance with the International Water Association (IWA) method/standard
- Submitted audits to EPD to be posted online

Guidance and Assistance for Water Suppliers

- EPD provided guidance for water systems conducting audits
 - Georgia Water System Audits and Loss Control Manual (2011)
 - Full-day Workshops (5 in Fall 2011, 6 in Spring 2012)
 - Technical Assistance for Audits and Leak Detection Grant Program (Small Water Systems) Starting June 2012
 - Technical assistance for small systems based on lessons learned from the large systems audit submissions
 - Expected future workshops statewide

What will EPD do with the Audits?

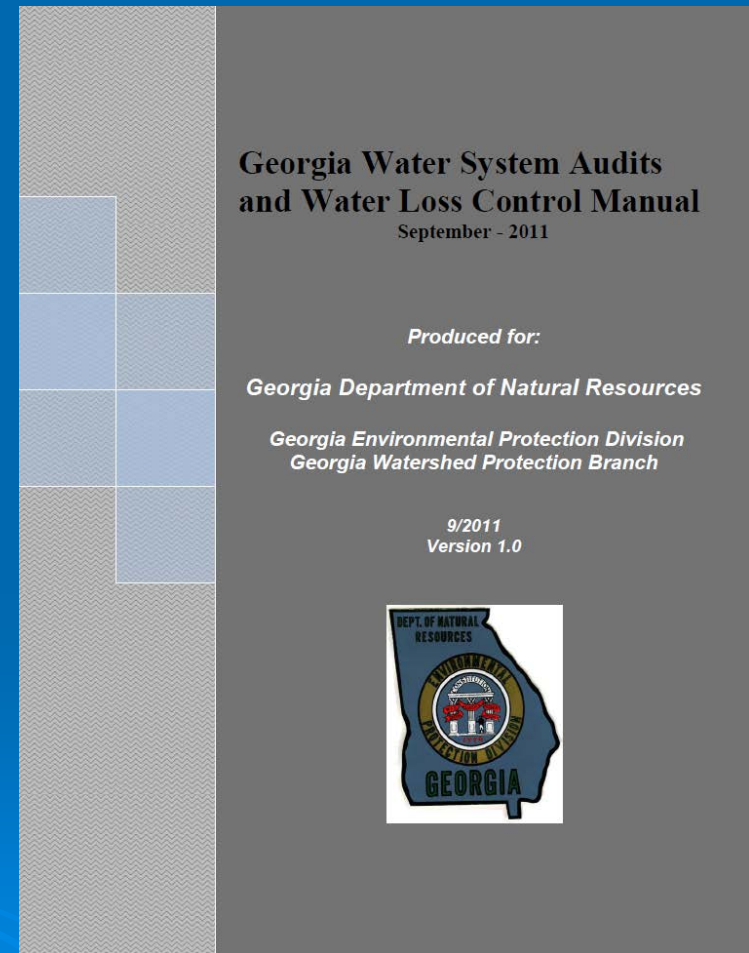
- Increase adoption of IWA/AWWA methodology and AWWA Free Water Audit Software ©
- Post results to website
- Create guidance and technical assistance for systems to improve validity over time
- Track water loss control statewide through annual water system audits

GA Water Loss Control Manual

- EPD contracted with Georgia Association of Water Professionals (GAWP) to assist in developing best practices and training
- Convened 12 in- and out-of-state experts
- Stakeholder input collected
 - Informational sessions
 - Email communication
- Best practices captured in new *GA Water System Audits and Water Loss Control Manual*

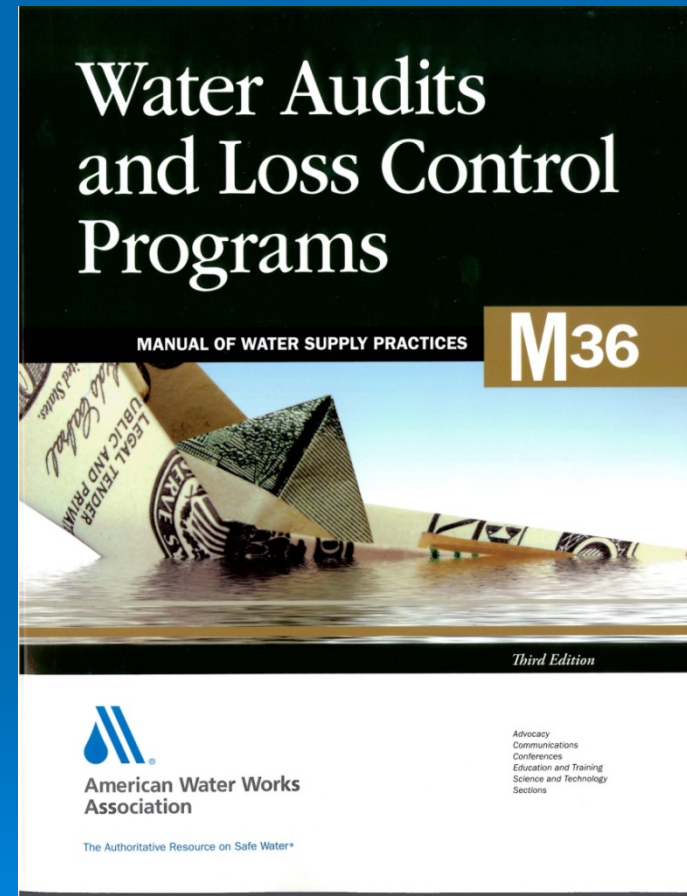
GA Water Loss Control Manual

- Utilized existing resources
 - AWWA M36 Manual and Software
 - Metropolitan North Georgia Water Planning District

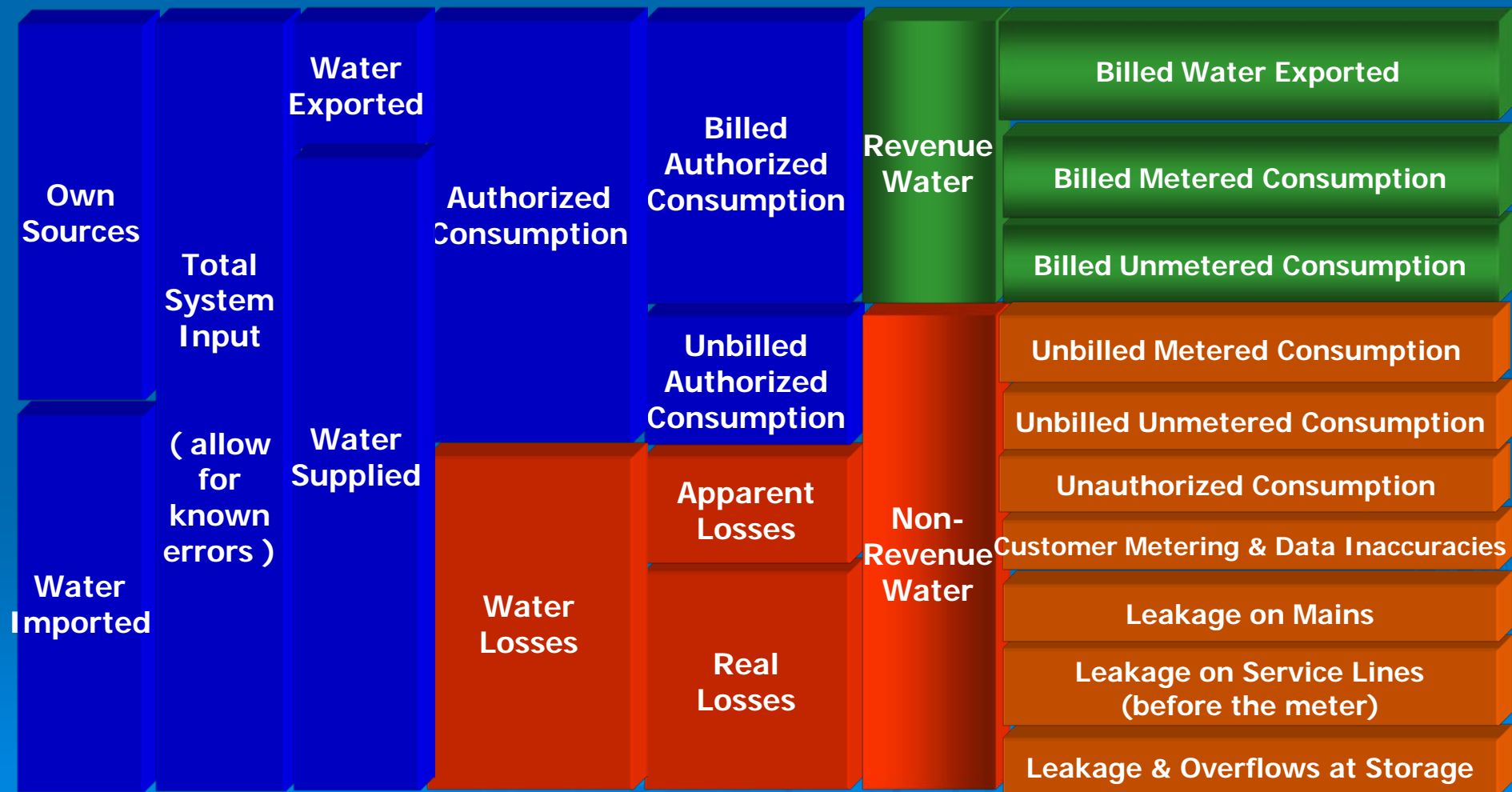


GA Water Loss Control Manual

- Reporting period covers 12 month calendar year
- Establishes IWA/AWWA Methodology as standard
- Requires use of AWWA Free Water Audit Software ©
- Refers heavily to M36 Manual (3rd Ed.)



IWA/AWWA Standard Water Balance



Transition away from “Unaccounted-for Water Percentage”

- No consistent definitions for the components
- Percentage indicators have been found to be suspect in measuring technical performance
- Percentage indicators translate nothing about water volumes and costs
- Water systems now translating UAW components into IWA/AWWA standard water balance about water volumes and costs

Water Audits Current Status

- For public water systems serving populations:
 - Greater than 10,000 - Initial list of 113 systems, 6 fell below 10,000. 106 out 107 audits submitted to date
 - Greater than 3,300 to 10,000 – Initial list 124, now up to 127
 - WSA requires water audit reports submitted to EPD by March 1, 2013 (small systems)
 - Reporting period covers 12 month calendar year

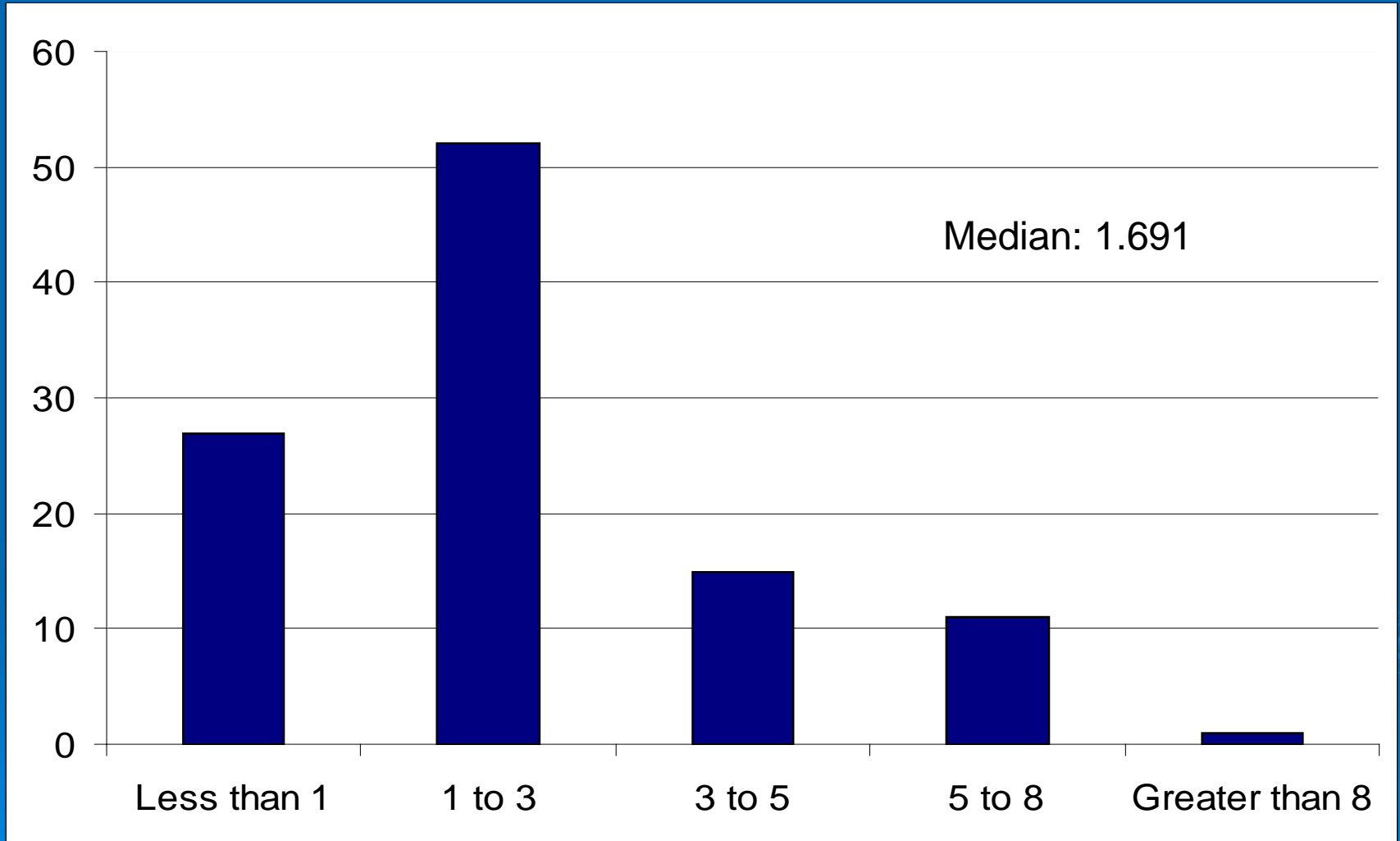
Preliminary Audit Results from Large Systems

- Water audit results will be posted on EPD website as required by law (after quality review)
- Key Performance Indicators
 - Financial and Operational
 - Infrastructure Leakage Index (ILI)
 - dimensionless
 - CARL/UARL
 - VALIDITY!
 - Top 3 Priority Areas to improve

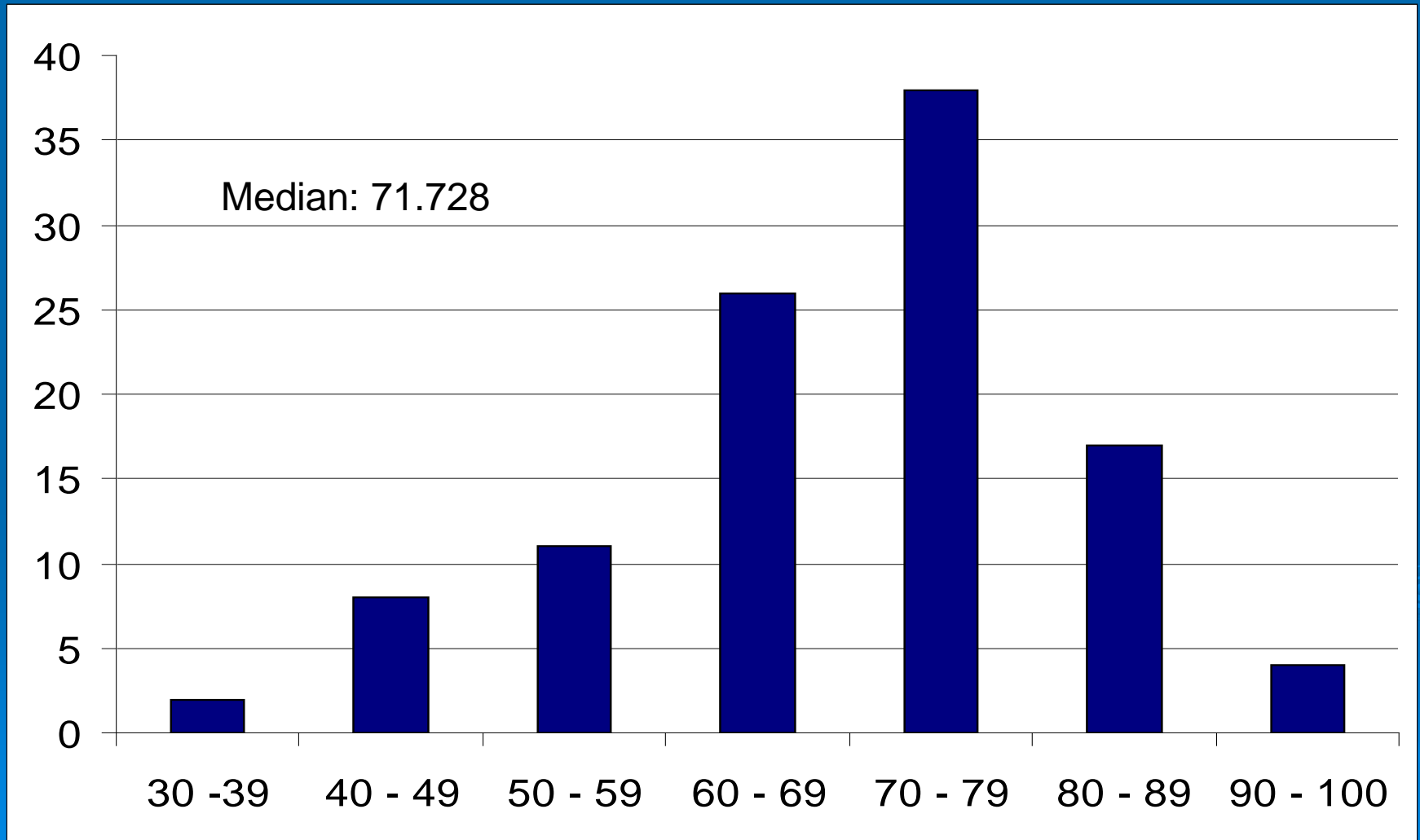
Bottom 3 bullets
to be posted on
website

*Random number generator used to shield water systems until quality check is completed

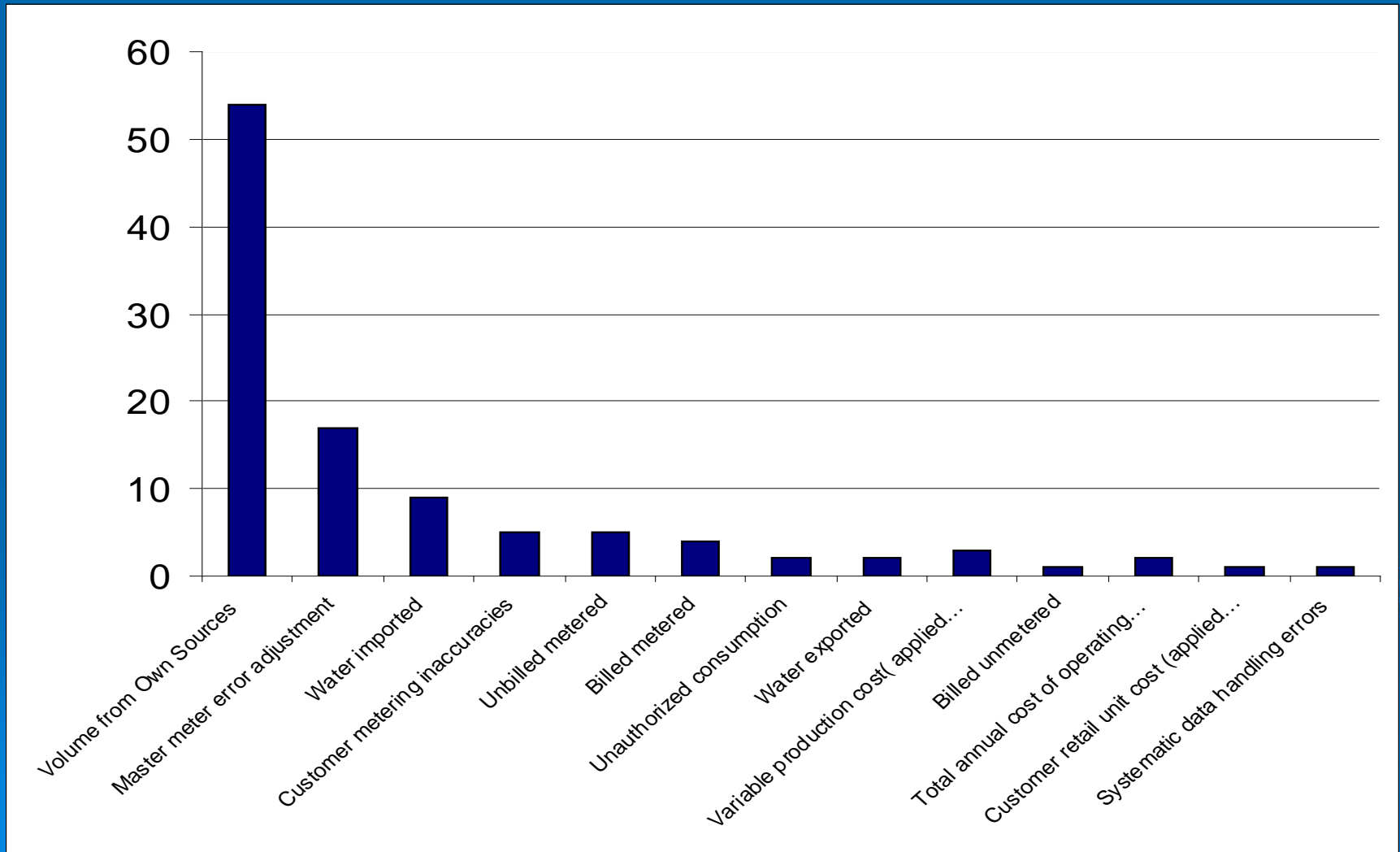
Preliminary Data for ILI Scores



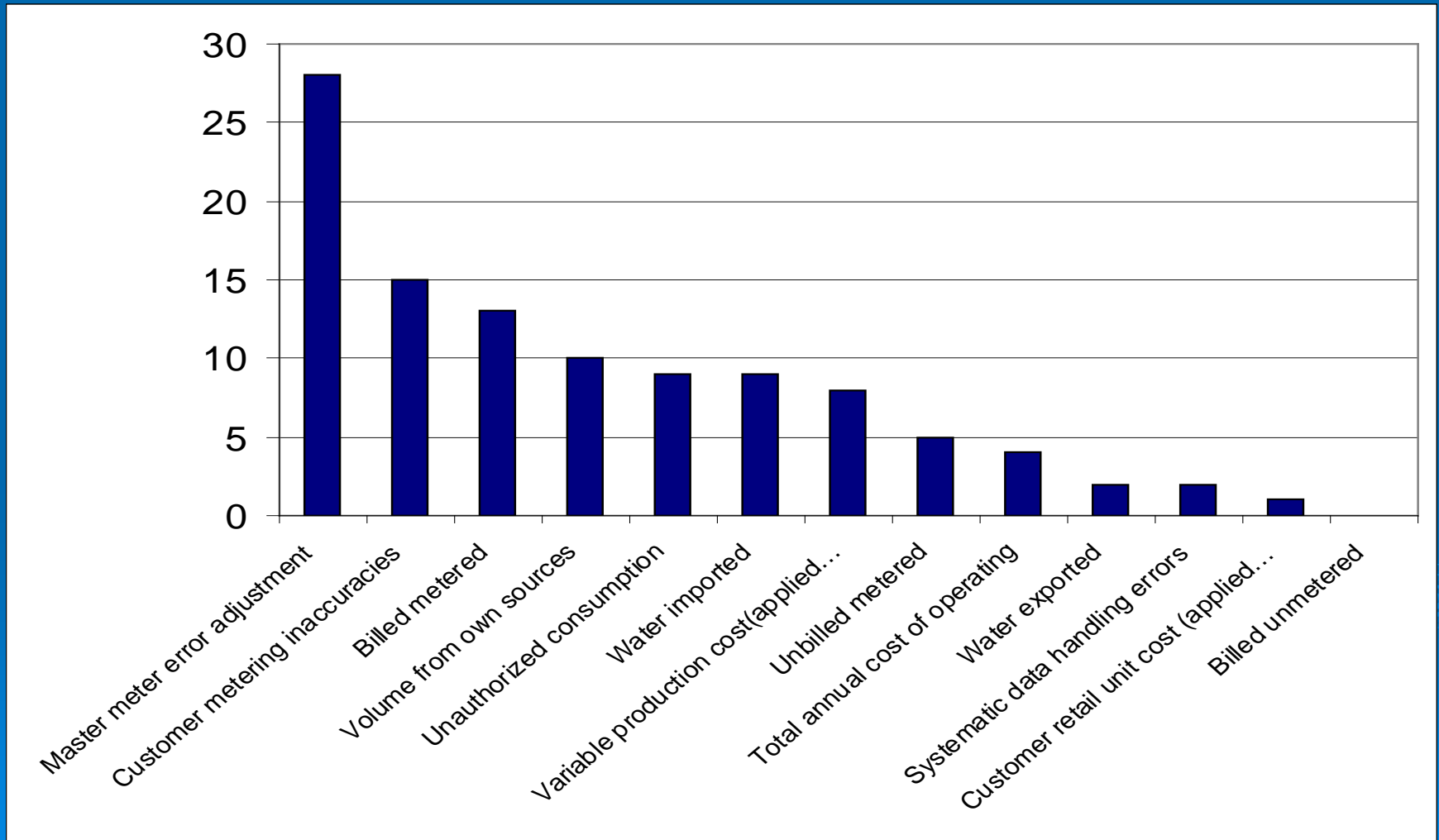
Preliminary Data for Validity Scores



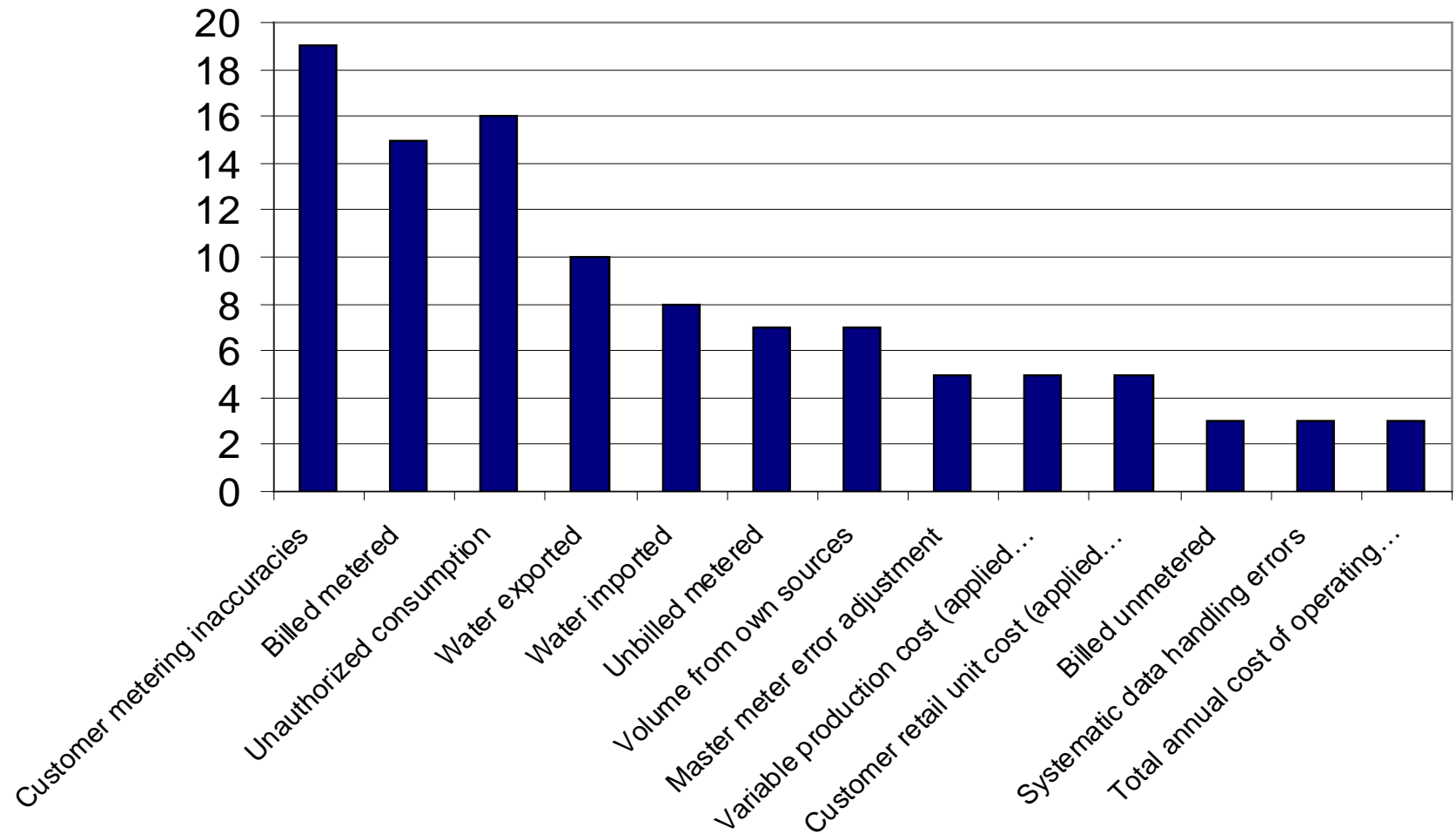
Priority 1 to Improve Audit Accuracy



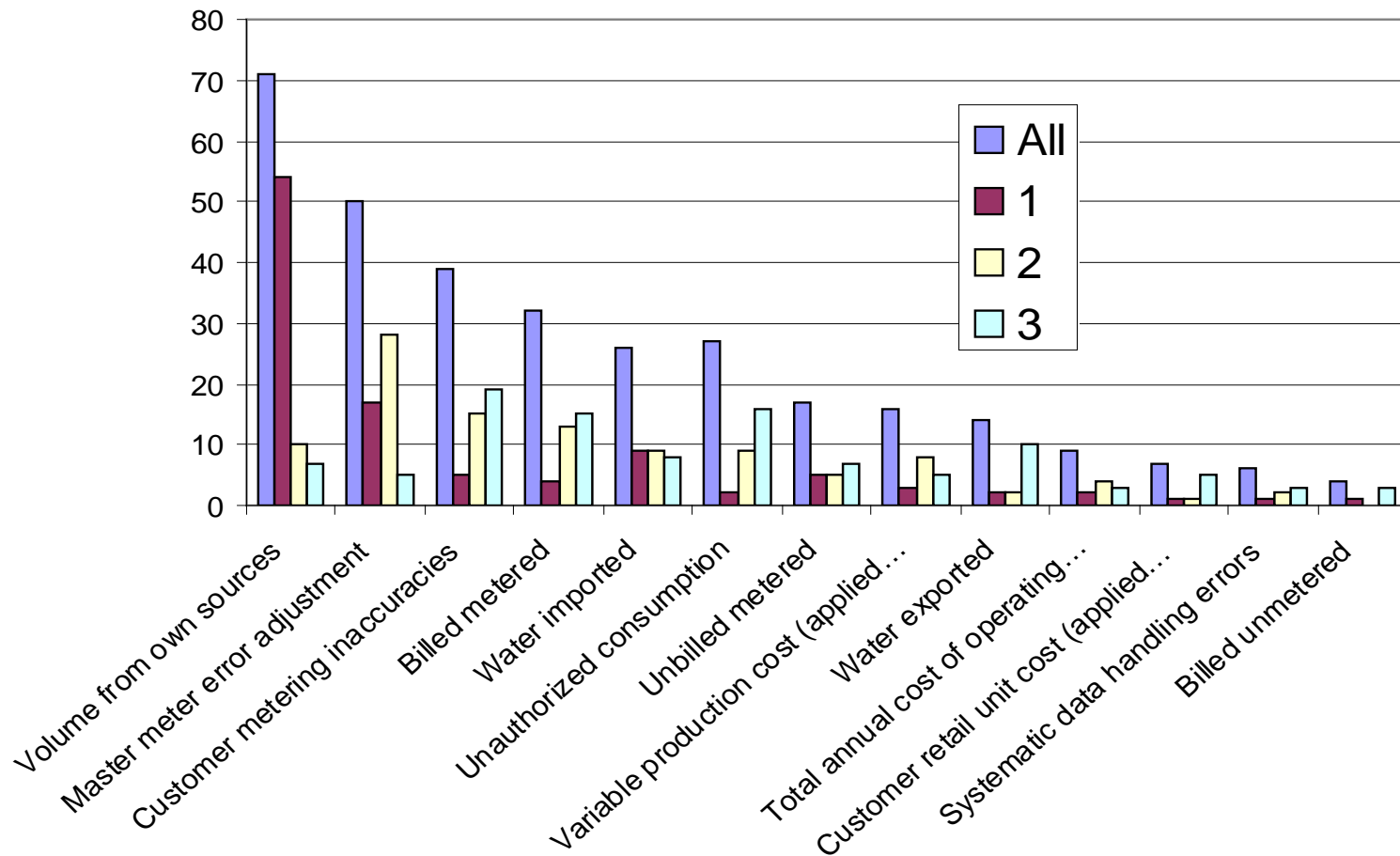
Priority 2 to Improve Audit Accuracy



Priority 3 to Improve Audit Accuracy



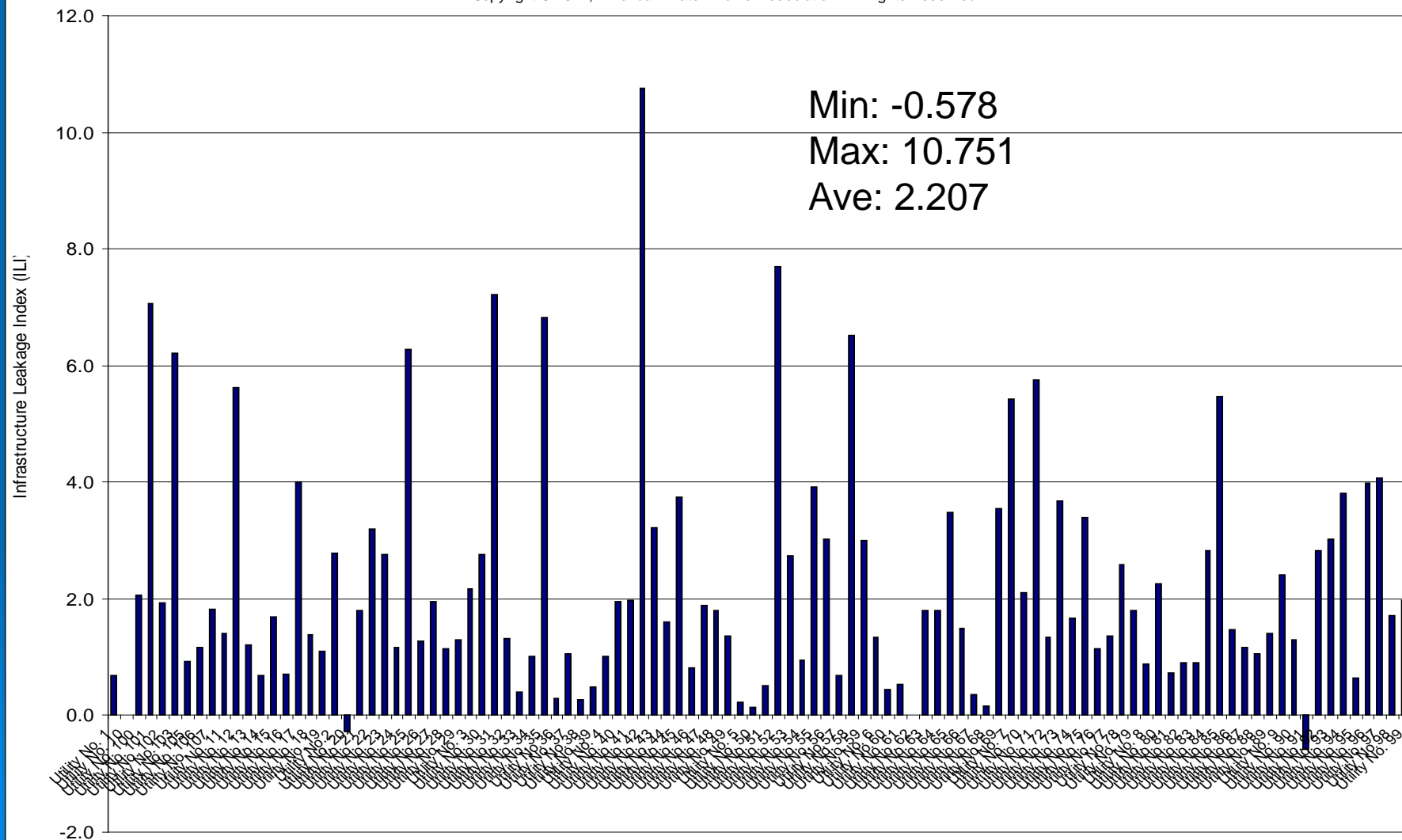
All Areas for Improvement



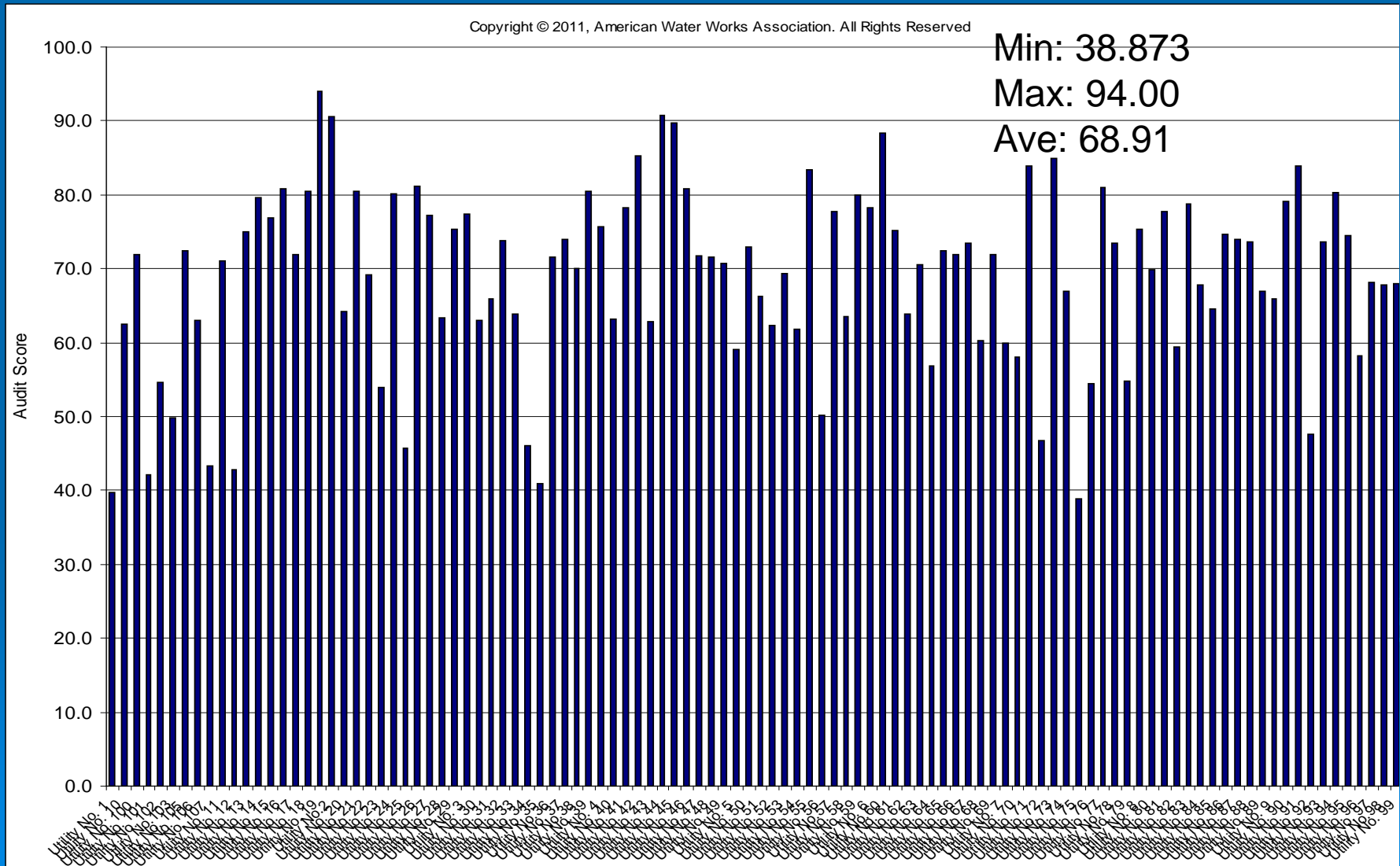
Observations from Large System Audits

- Reconcile period of water supplied with water authorized consumption
 - Billing period may be offset
 - Caution of negative ILI's (more water consumed than supplied)
- Average cost of real losses is greater than cost of apparent losses!!! (units \$/1,000 gal for apparent losses, \$/Million gallons for real losses)
- Order of magnitude of losses are questionable
- Submit actual and verified data (careful review)
- Explain any problems or discrepancies in comment box
- Submit/attach a basis of the audit (grading appears high)

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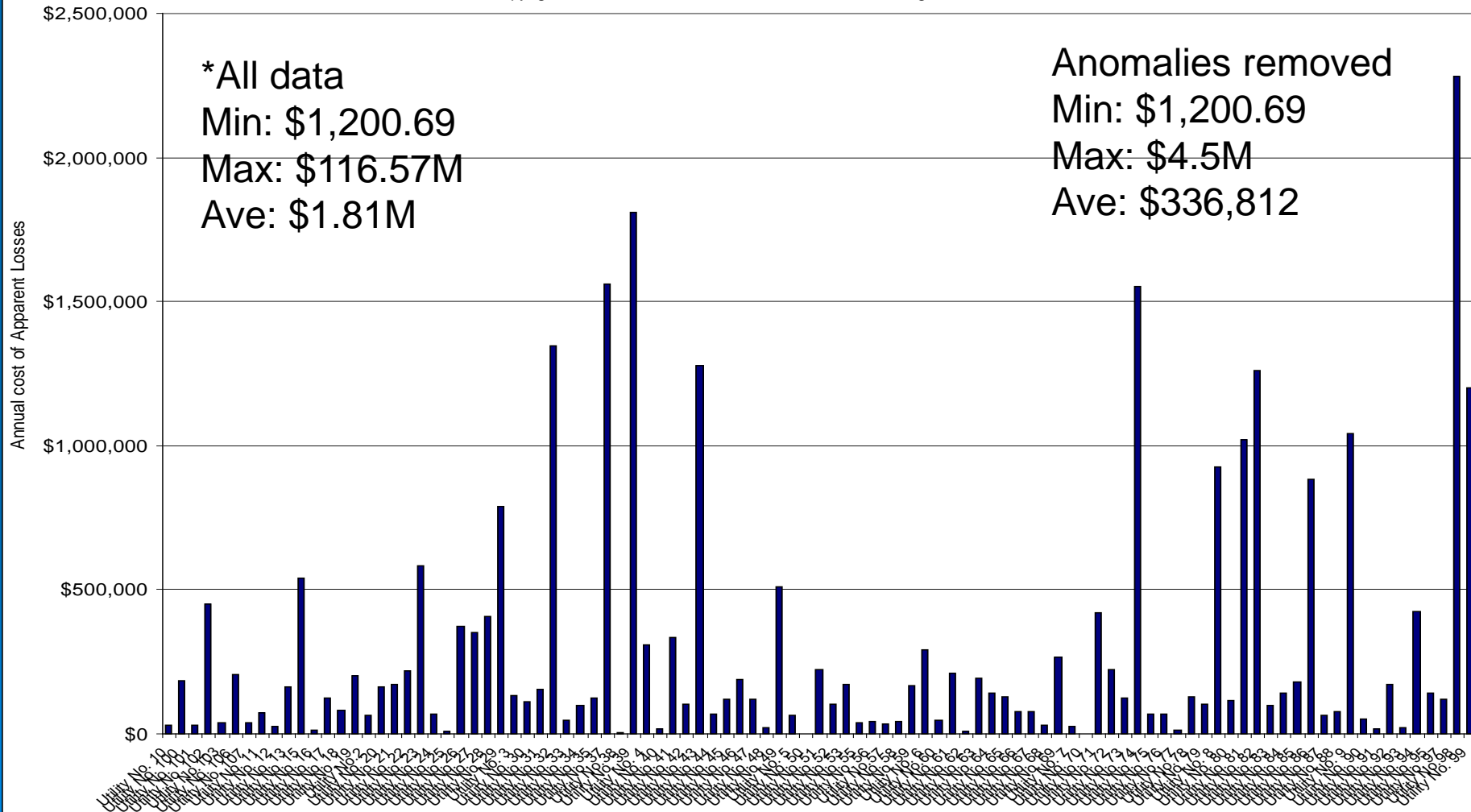


Validity Scores for 106 Large Systems



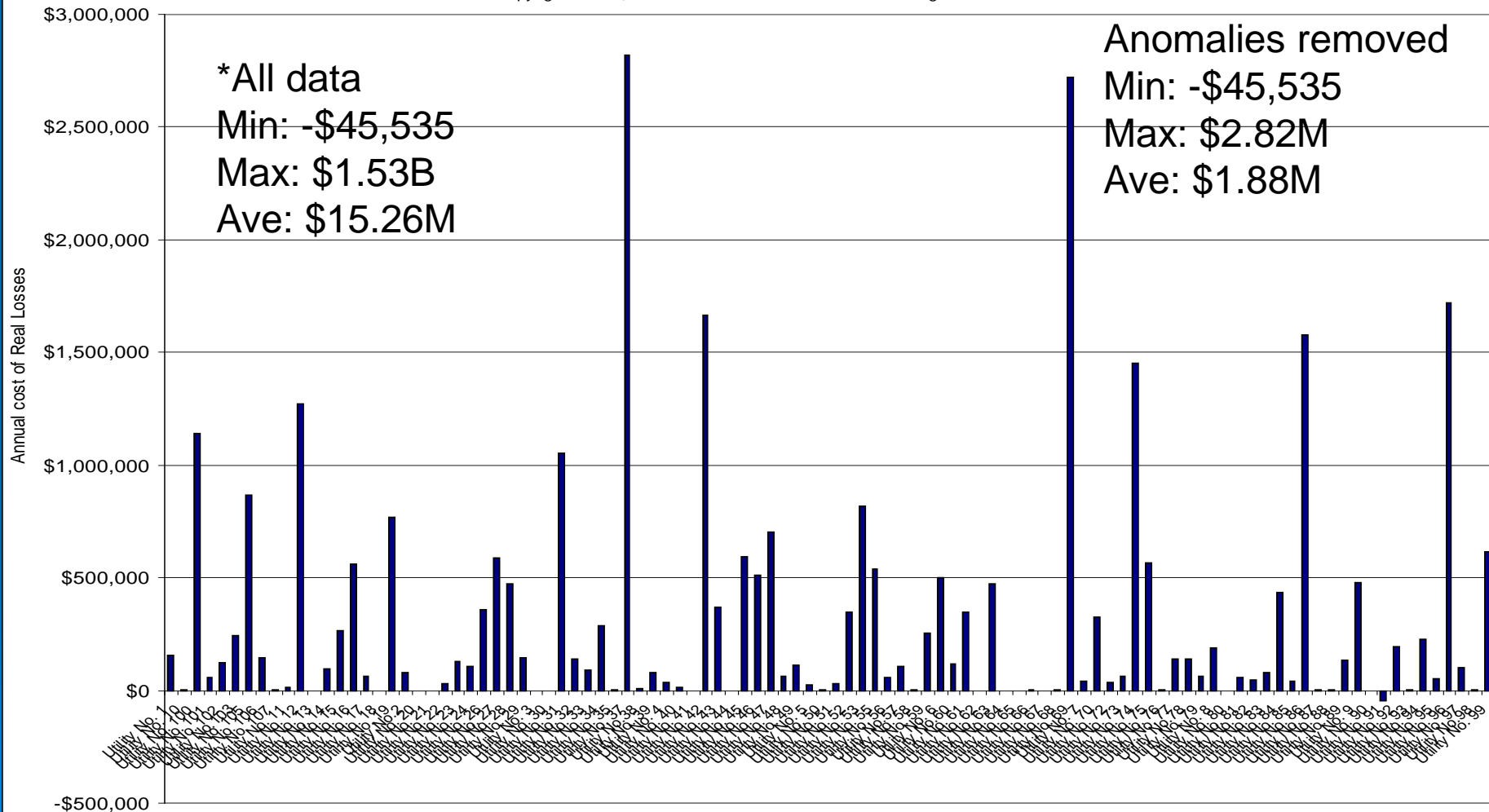
Annual cost of Apparent Loss w/ Anomalies removed

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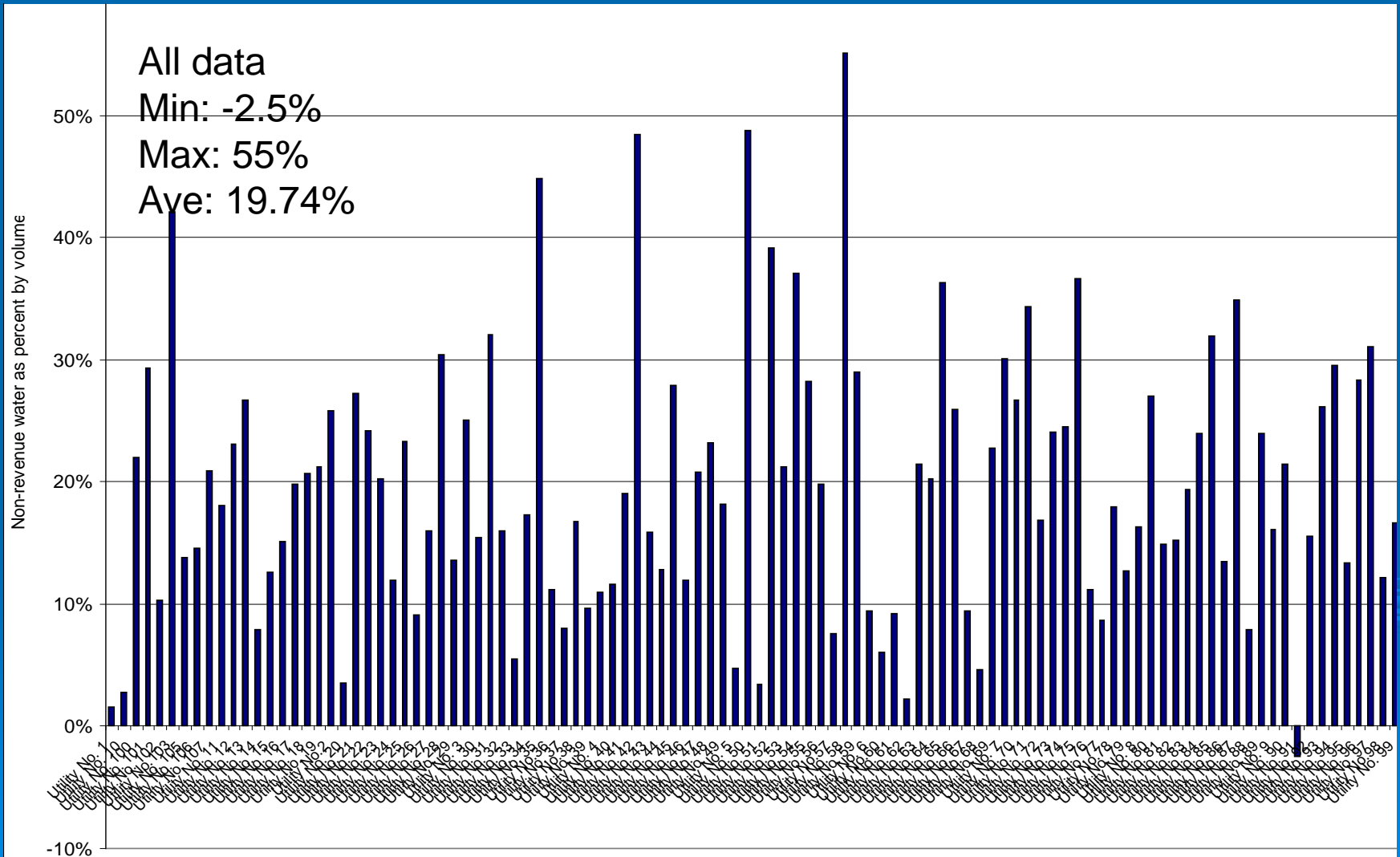


Annual Cost of Real Losses w/ anomalies removed

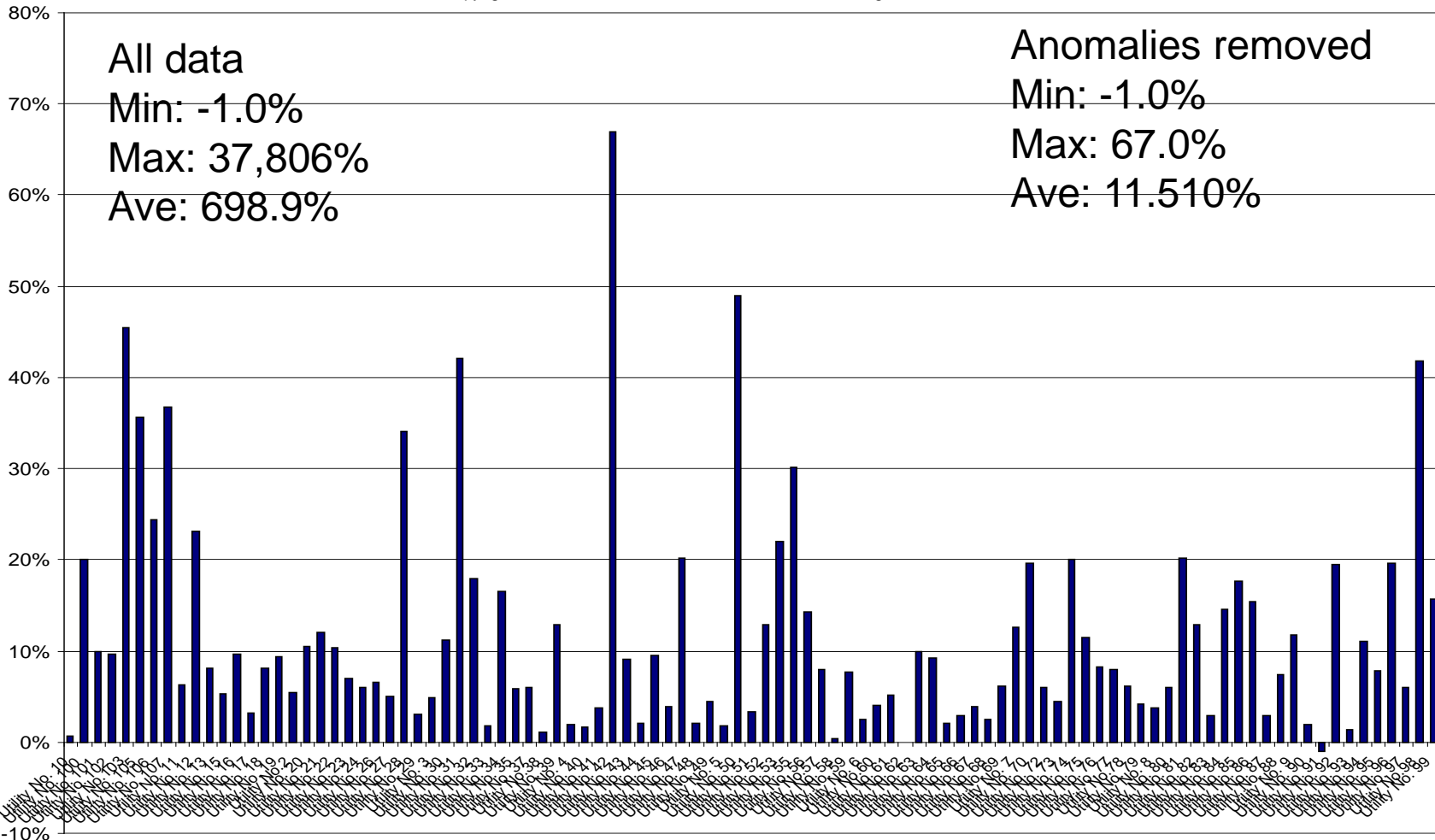
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Non-revenue Water as % by Volume

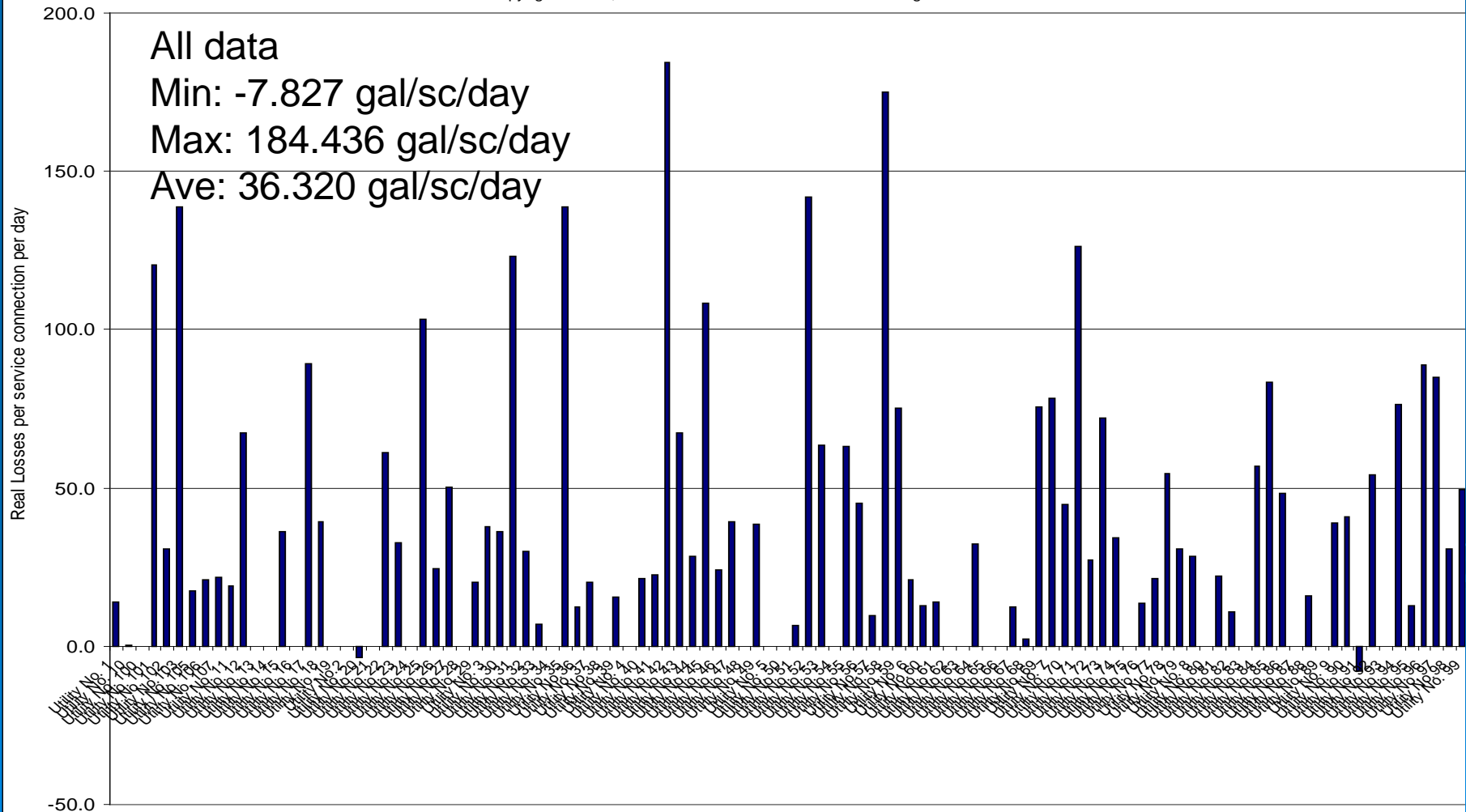


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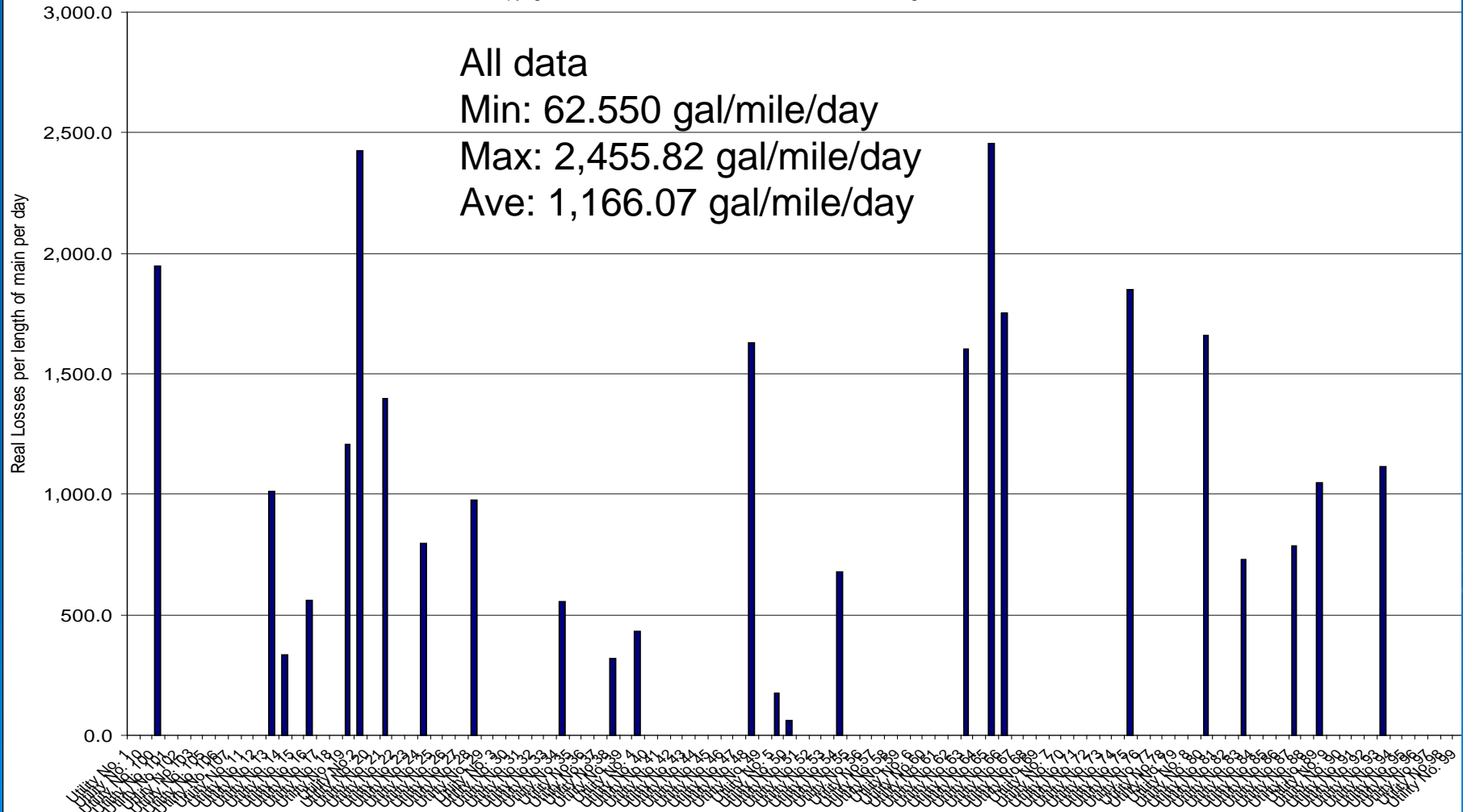
Real Losses per Service Connection per Day

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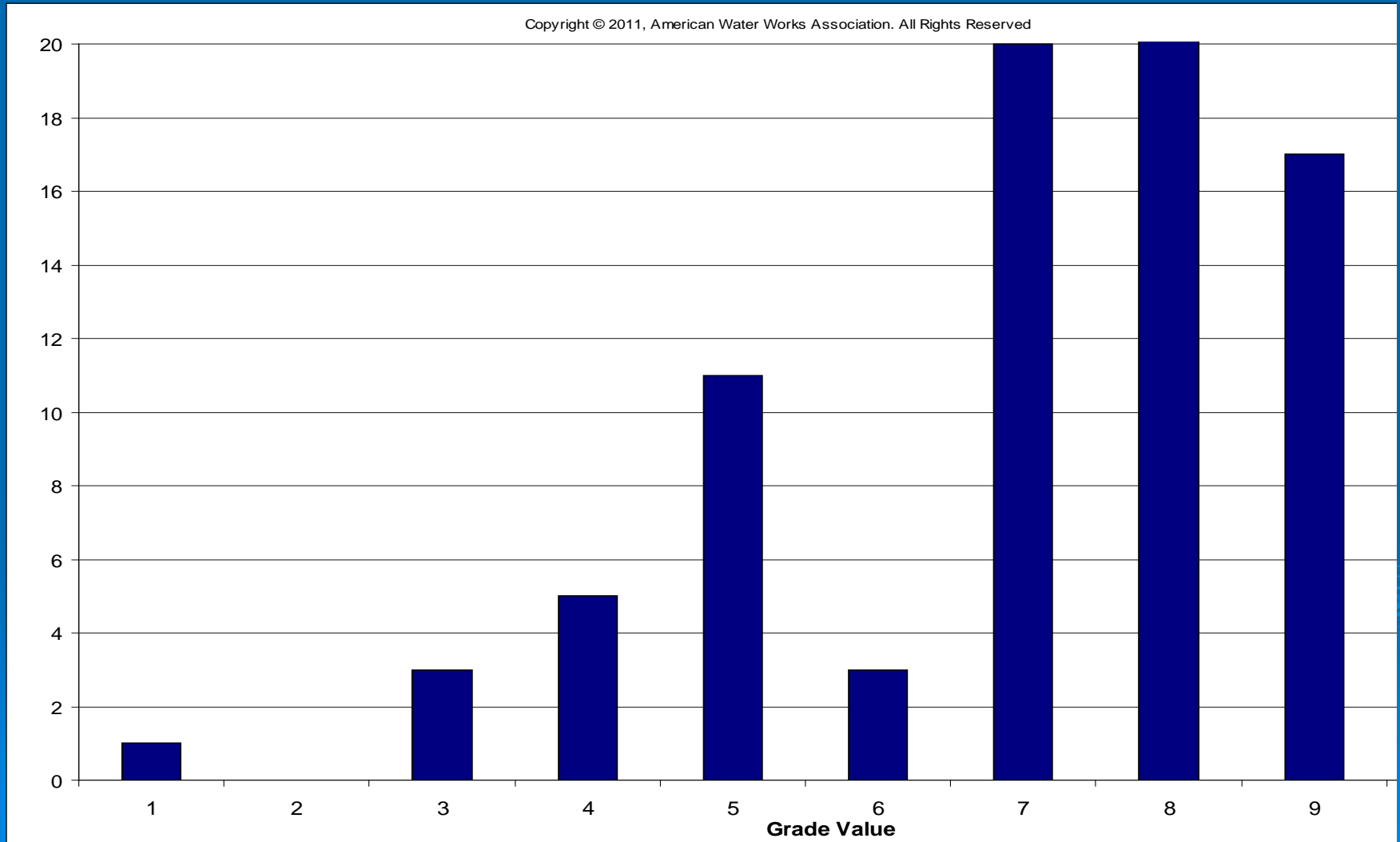


Real Losses per Length of Main per Day

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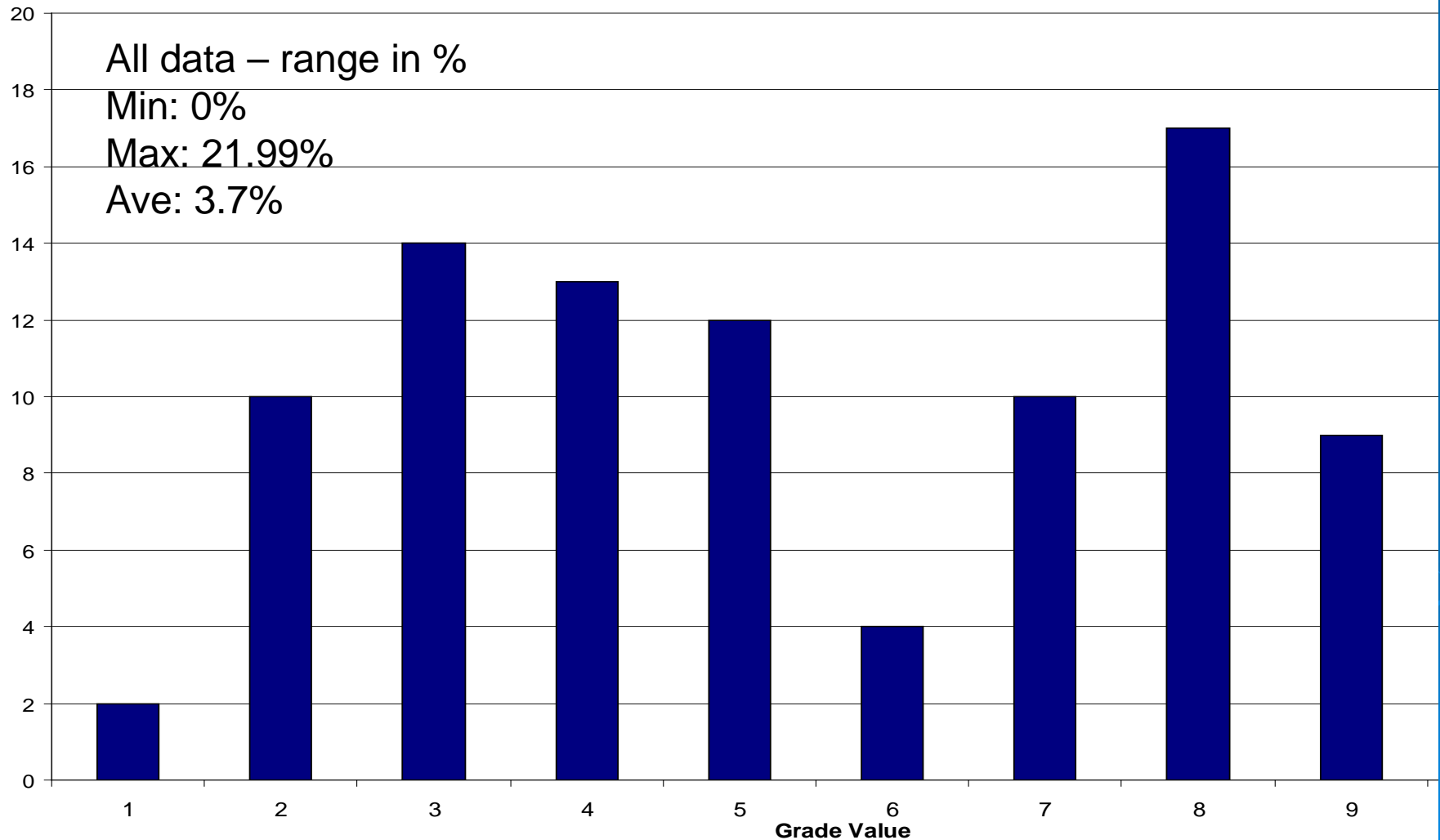


Data Grade - Volume from Own Sources



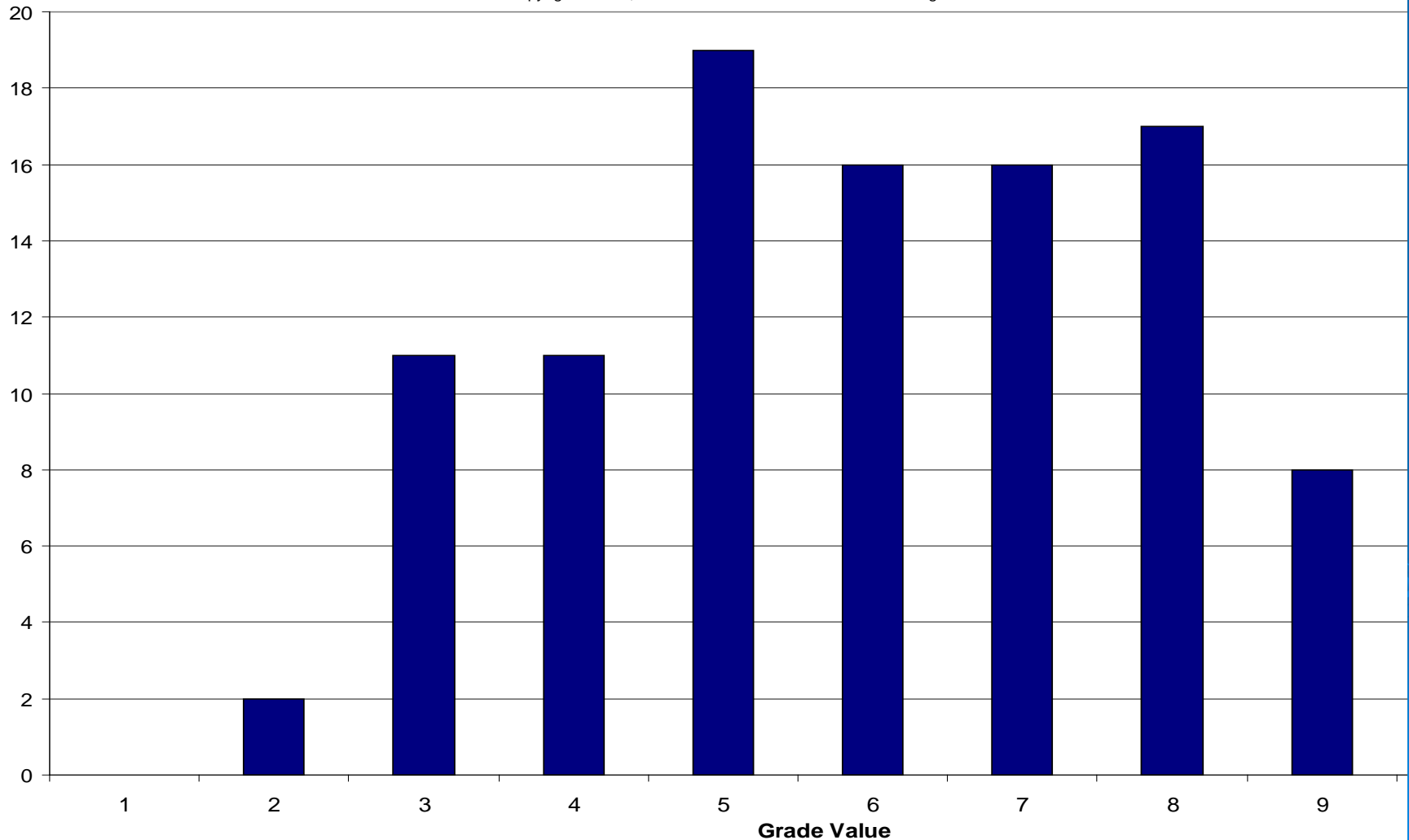
Data Grade - Master Meter Error Adjustment

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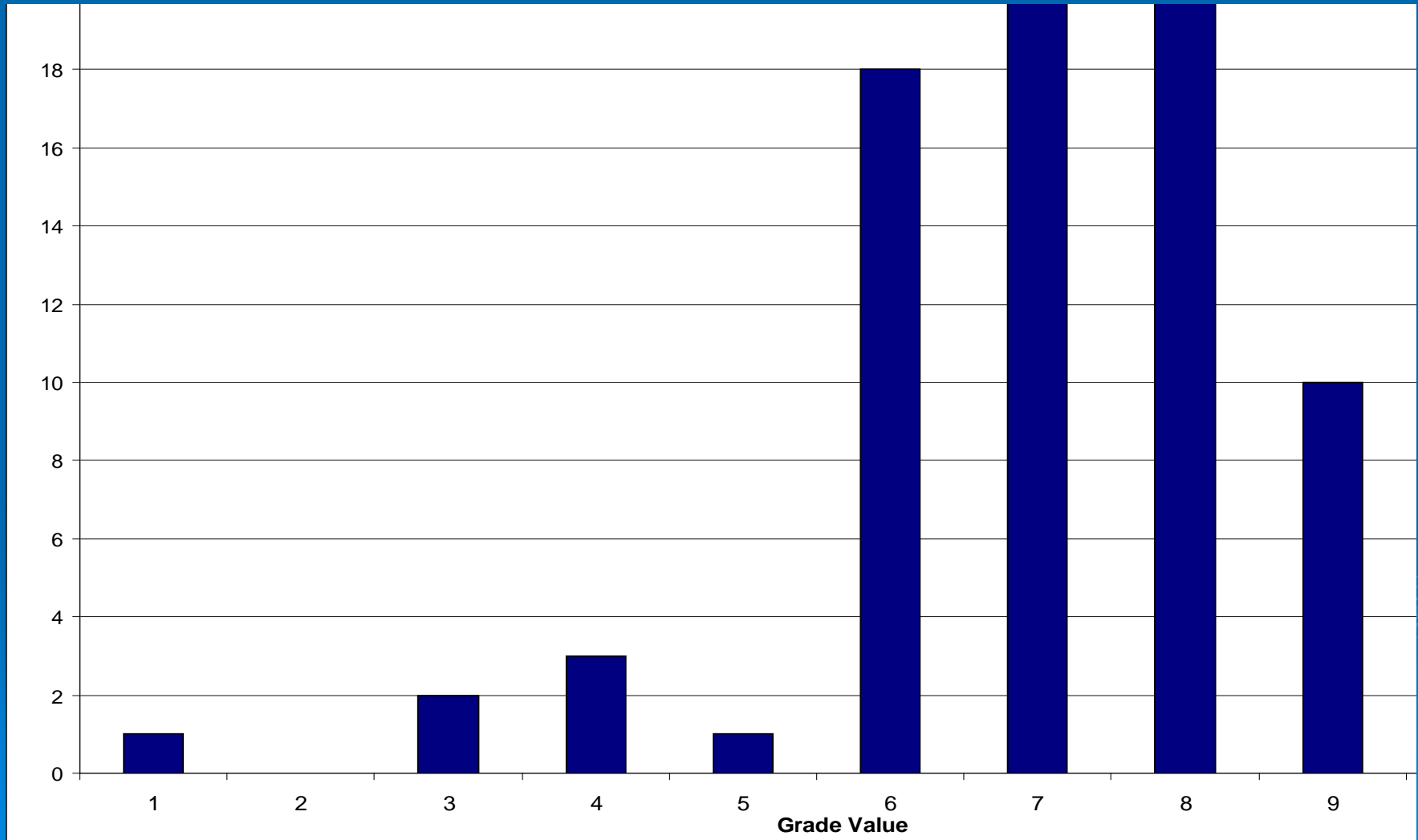


Data Grade - Customer Metering Inaccuracies

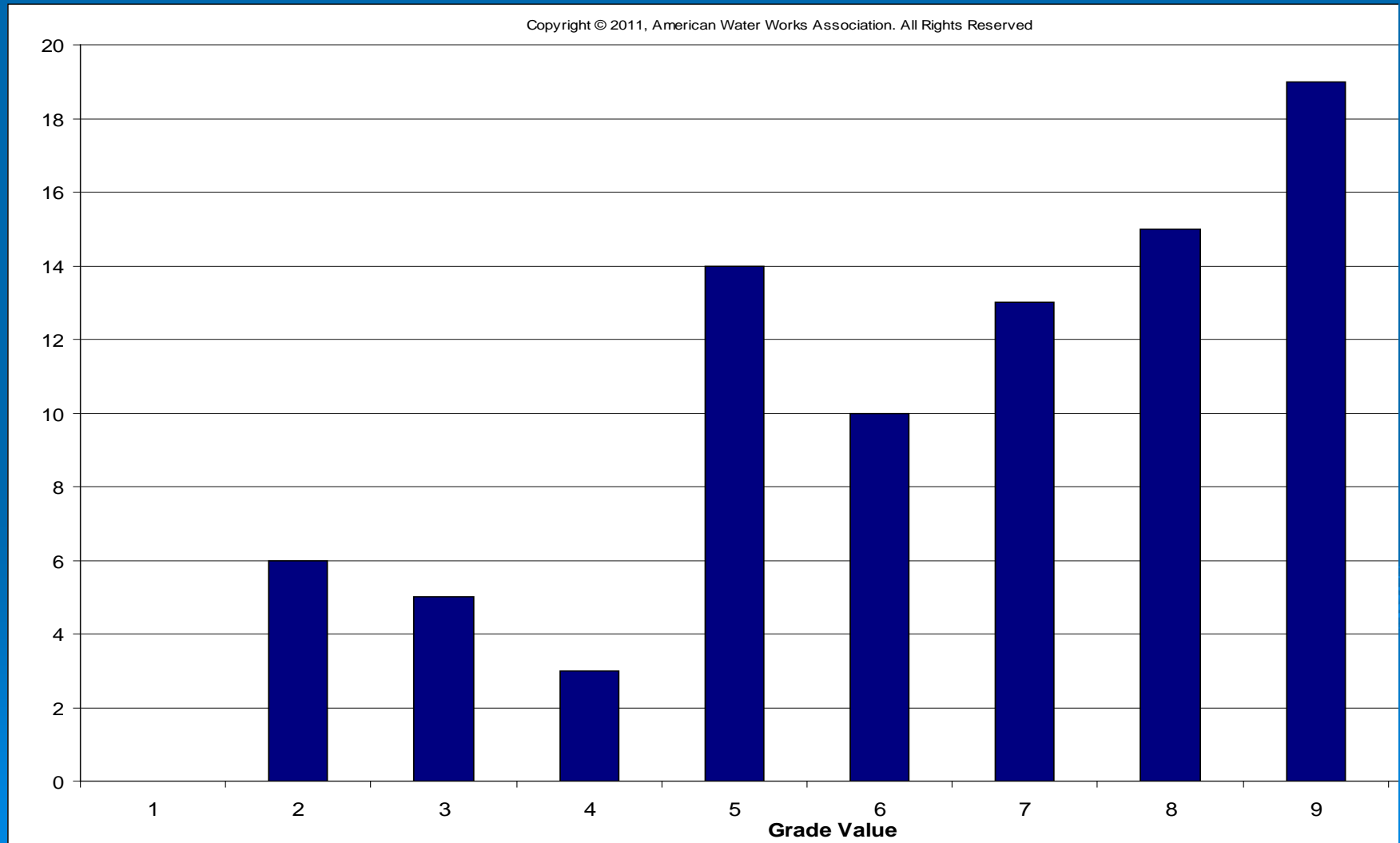
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Data Grade - Customer Retail Unit Cost (applied to apparent losses)



Data Grade - Variable Production Costs (applied to real losses)



Validity Step/Quality Check to be Conducted

- Contractor is being hired to conduct validation step based on an established AWWA Water Audit Subcommittee Validation Checklist – using phone interviews
 - Objectively rank the quality of data sources to assist water utilities resolve anomalies in their data
 - Utilities will begin the task of resolving anomalies in their data, where identified
 - Water systems will revise their water audits accordingly to establish more realistic and accurate benchmarks
 - More accurate benchmarking of initial audits by the water systems – allows for meaningful improvements over time
 - Revised audit results will be consolidated with the new and/or improved data – final results will be posted on EPD web site
 - Track pre- and post- Validity scores and other KPIs

SUMMARY

- 100 out 107 audits submitted to date from the large systems – preliminary results
- Contractor is being hired to conduct validation step based on an established AWWA Water Audit Subcommittee Validation Checklist
- Water Systems may need to reconcile period of water supplied with water authorized consumption – offset billing periods
- Initial average cost of real losses is greater than cost of apparent losses, even with anomalies removed!!!

SUMMARY

- All water systems are being encouraged to translate UAW components into IWA/AWWA standard water balance
- Check for potential errors in audit results - low initial ILI's and high validity scores
- ILI, Validity Score, and Top Three Priority Areas will be posted with disclaimer on EPD web site (September)
- Validity is the critical emphasis!!!

Questions

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