MARIN WATER

Water Loss Control Program

February 27, 2024

Overview

- Current Leak Detection Practices
- Water Loss Reporting
- Performance Indicators in California
- Evaluating Technologies to Reduce Water Loss

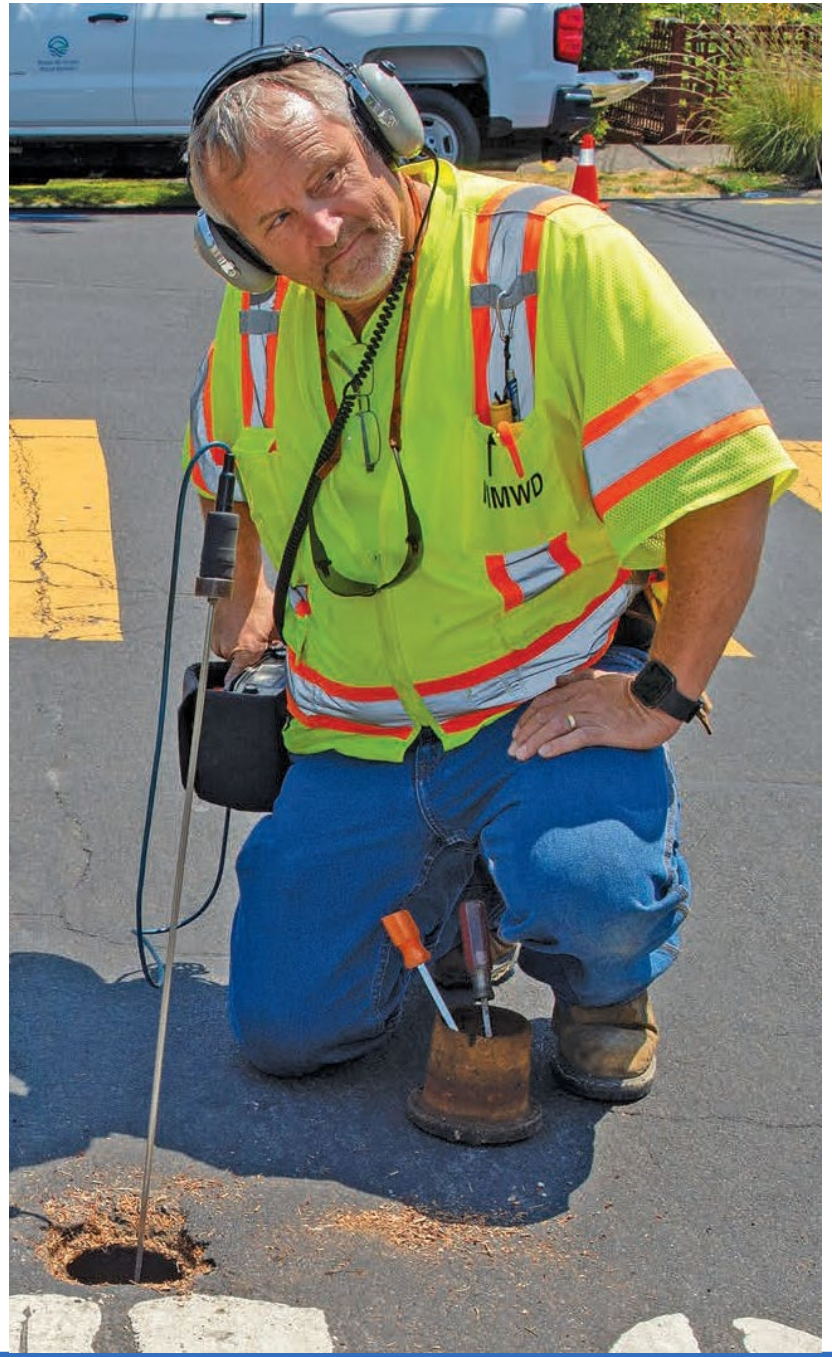
Current Leak Detection Practices

Proactive Leak Detection Program

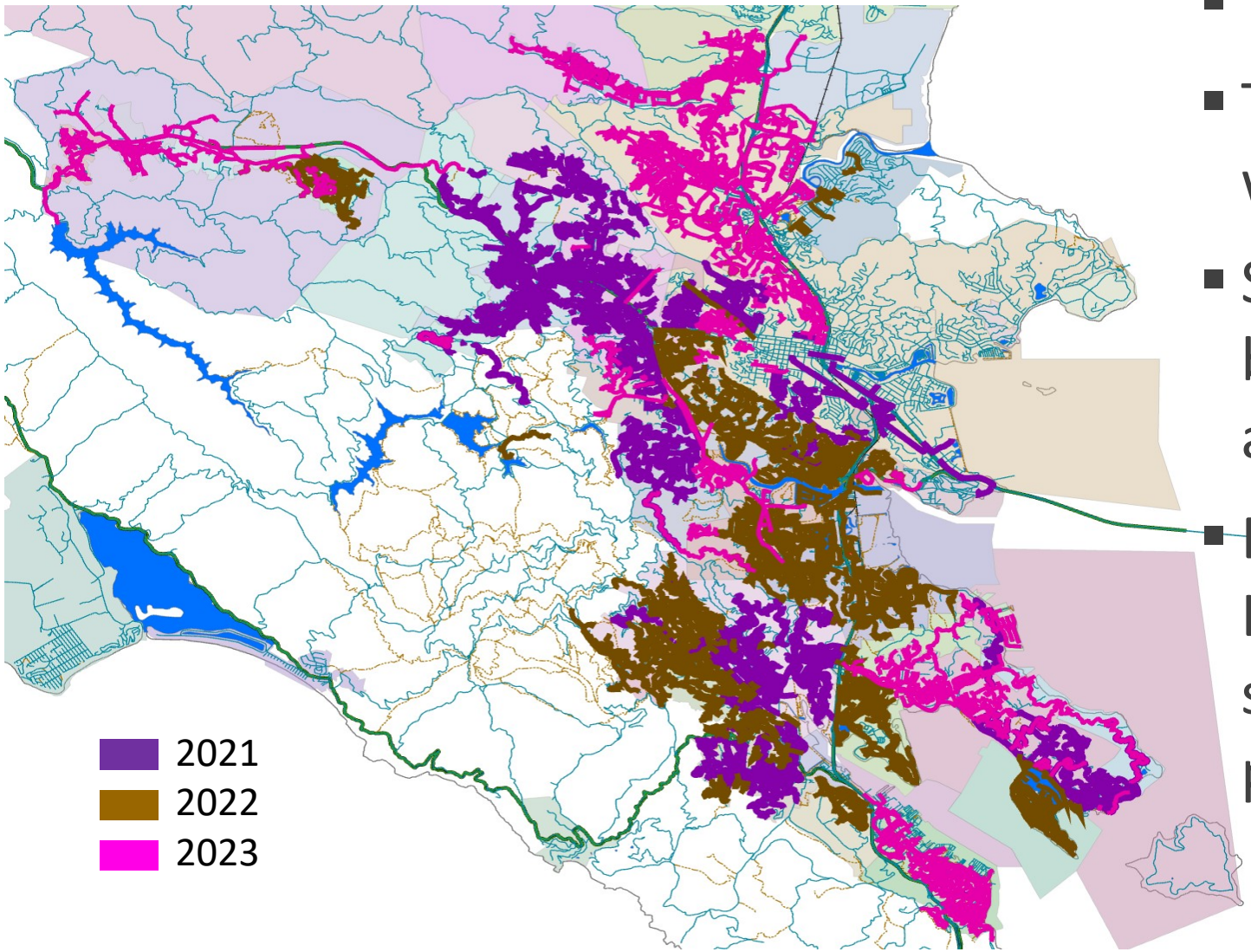
- 873 miles of potable pipelines, 24 miles of recycled pipelines
- ~200 miles surveyed annually (~25% of system)
- Utilize GIS to plan and log results
- Technology: Manual Acoustic Leak Survey
  - Oldest and most reliable methods of leak detection

Process for Leak Survey

- Pre-planned, block-by-block, walking survey
- Staff uses acoustic technology to discover leaks from/ between meters, valves, and fire hydrants
- Any 'noise' is noted and followed up via workorder
- Workorder tracks the path for any necessary follow-up investigations

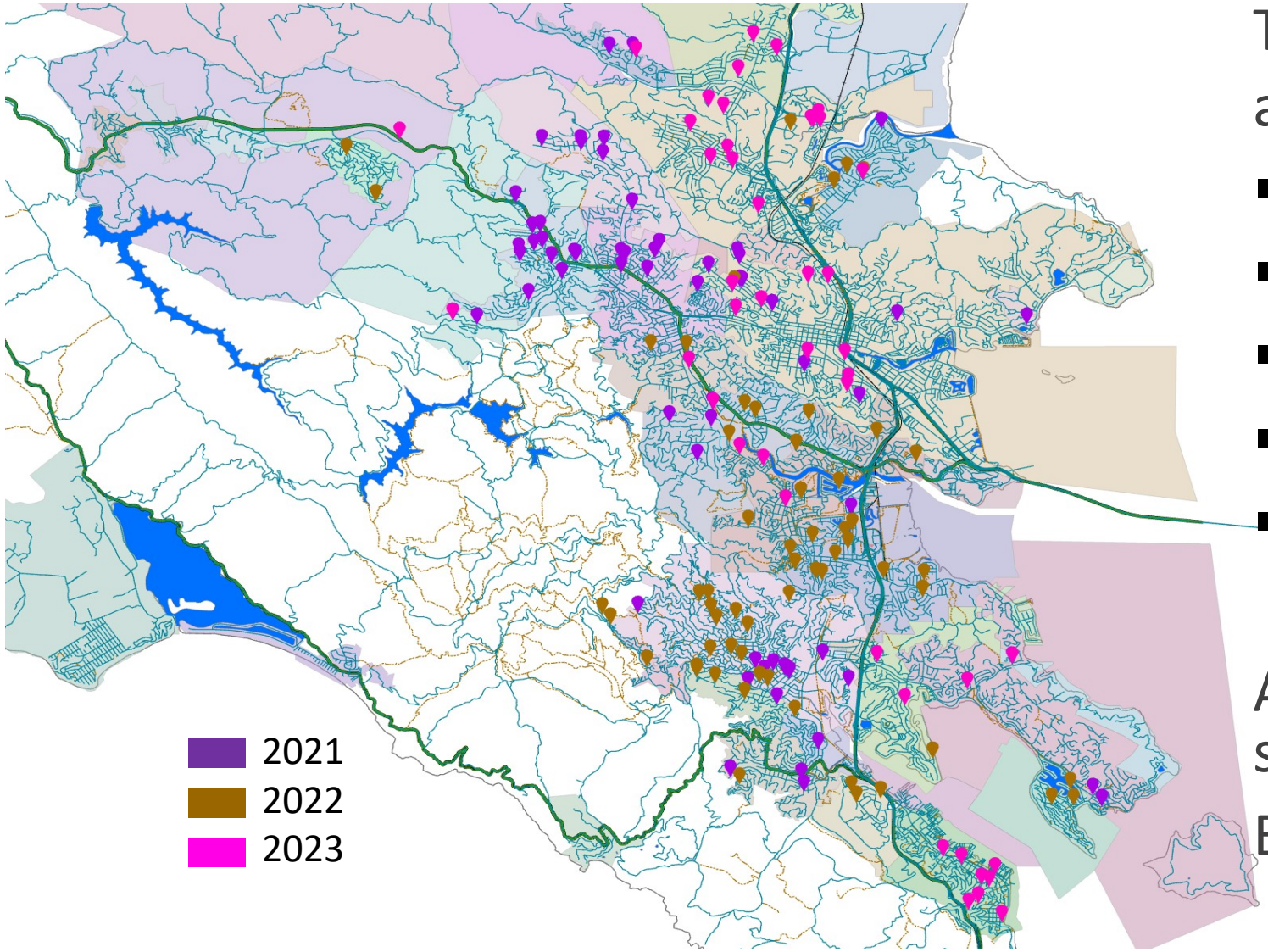


Survey Map 2021 - 2023



- Two staff complete surveys
- Team goal is 200 miles of water main each year
- Survey route prioritized by time of last survey and paving projects
- Between 2021 to 2023, the Leak Detection Team surveyed 619 miles of pipeline

Confirmed Leaks 2021 - 2023



Total of 122 leaks discovered and repaired:

- 2 hydrant leaks
- 8 curb cock leaks
- 25 meter leaks
- 21 District main leaks
- 66 District service leaks

A leak rate is estimated by staff observation.

Estimated savings: 38 acft/yr

Tracking Systemwide Leaks (2021-2023)

- Class I - access to drinking water is impacted (a mainline must be shut off)
- Class II - service is not impacted due to the leak, will be managed based on available resources.
- Class III - the leak is very minor and water loss is estimated to be low, the leak will be repaired within 2-3 weeks depending on other priorities.

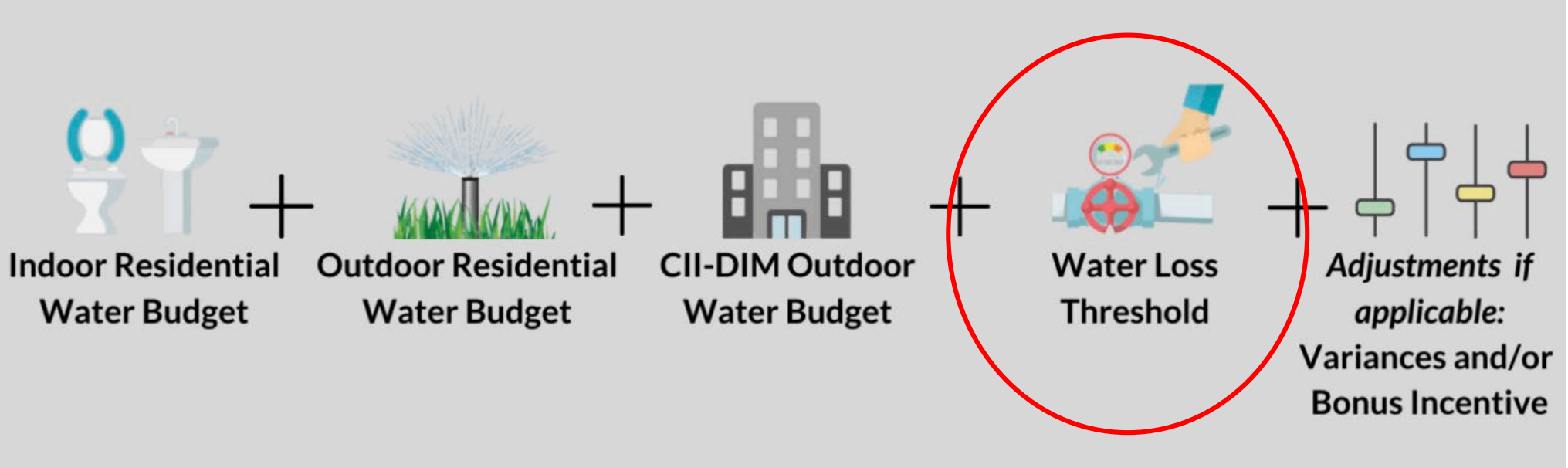
	Class 1	Class 2	Class 3	Total
2021	145	26	217	388
2022	190	36	236	462
2023	164	30	151	345

- Proactive leak detection program discovered 10% of the 1,195 leaks that were not observable and would not have been discovered/repaired.

Water Loss Reporting 2016 to 2022

Water Loss Regulation

- State Water Use Objectives include water loss
- SB 555: Established a ‘water loss standard’ for each water utility in the State
  - Real Losses: 28.5 gallons/connection/day



AWWA Free Water Audit Software: Water Balance

WAS v5.0

Water Audit Report for:	Marin Municipal Water District (CA2110002)	
Reporting Year:	2021	1/2021 - 12/2021
Data Validity Score:	63	

Own Sources (Adjusted for known errors)
14,050.222

Water Imported
7,482.831

Water Exported
0.000

Water Supplied
21,533.053

Authorized Consumption
19,775.893

Billed Authorized Consumption
19,684.123

- Billed Water Exported
- Billed Metered Consumption (water exported is removed) *19,684.123*
- Billed Unmetered Consumption *0.000*

Unbilled Authorized Consumption
91.770

- Unbilled Metered Consumption *2.766*
- Unbilled Unmetered Consumption *89.004*

Water Losses
1,757.160

Apparent Losses
711.916

- Unauthorized Consumption *53.833*
- Customer Metering Inaccuracies *608.873*
- Systematic Data Handling Errors *49.210*

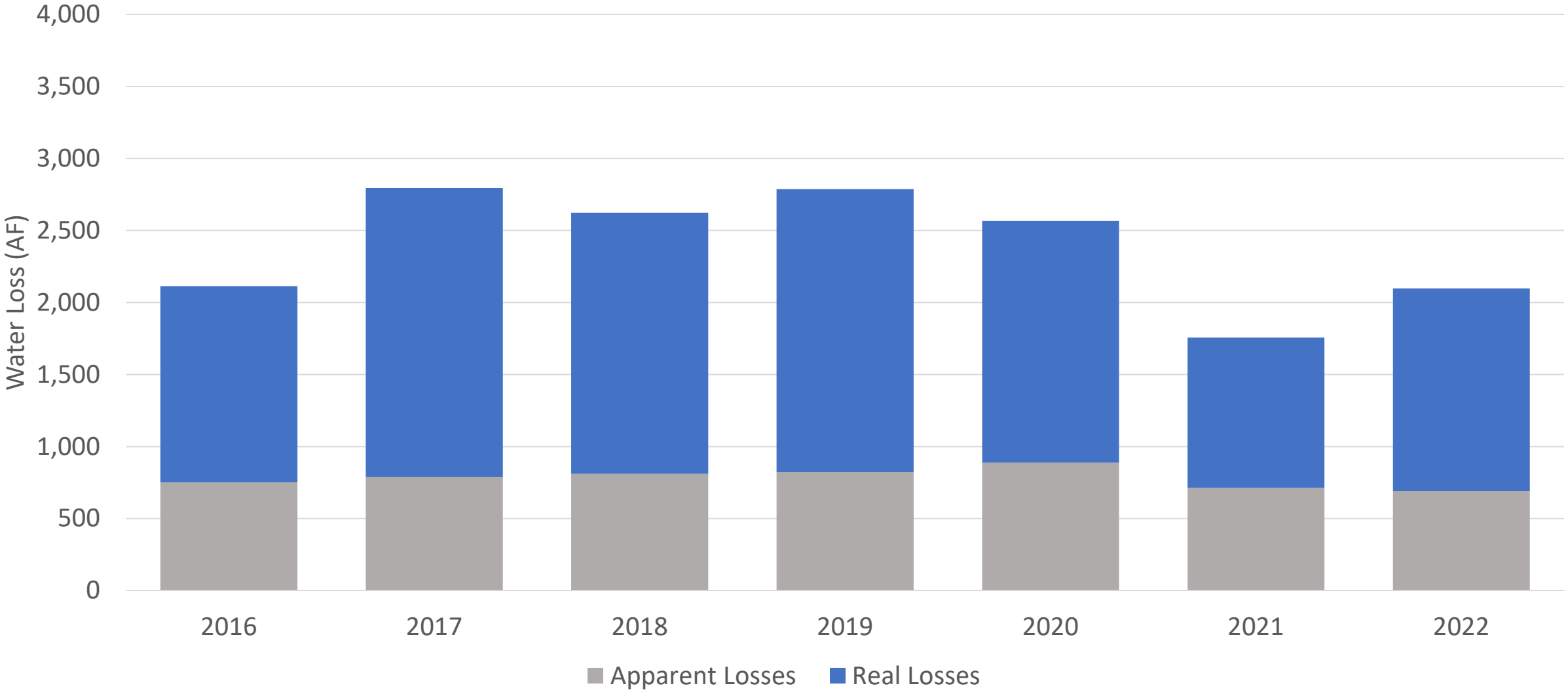
Real Losses
1,045.244

- Leakage on Transmission and/or Distribution Mains *Not broken down*
- Leakage and Overflows at Utility's Storage Tanks *Not broken down*
- Leakage on Service Connections *Not broken down*

Revenue Water
19,684.123

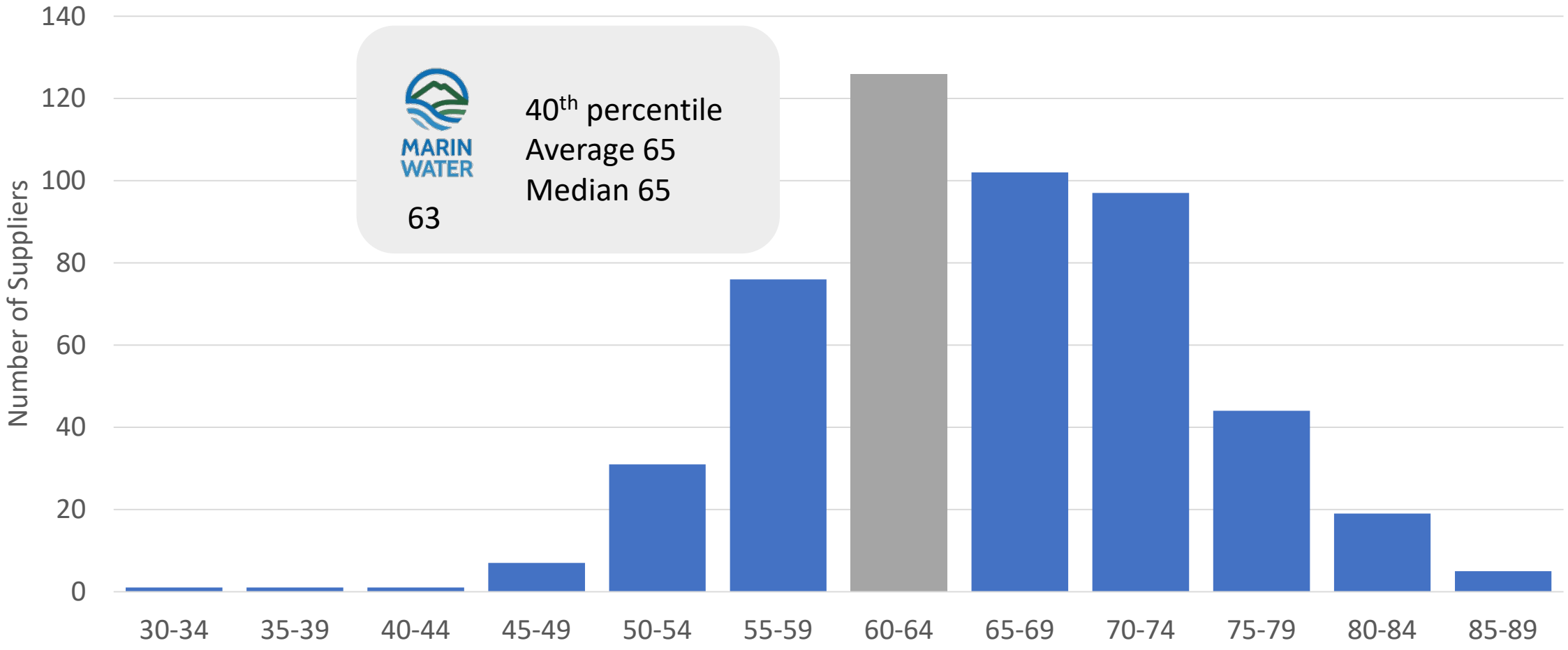
Non-Revenue Water (NRW)
1,848.930

Water Loss Volume

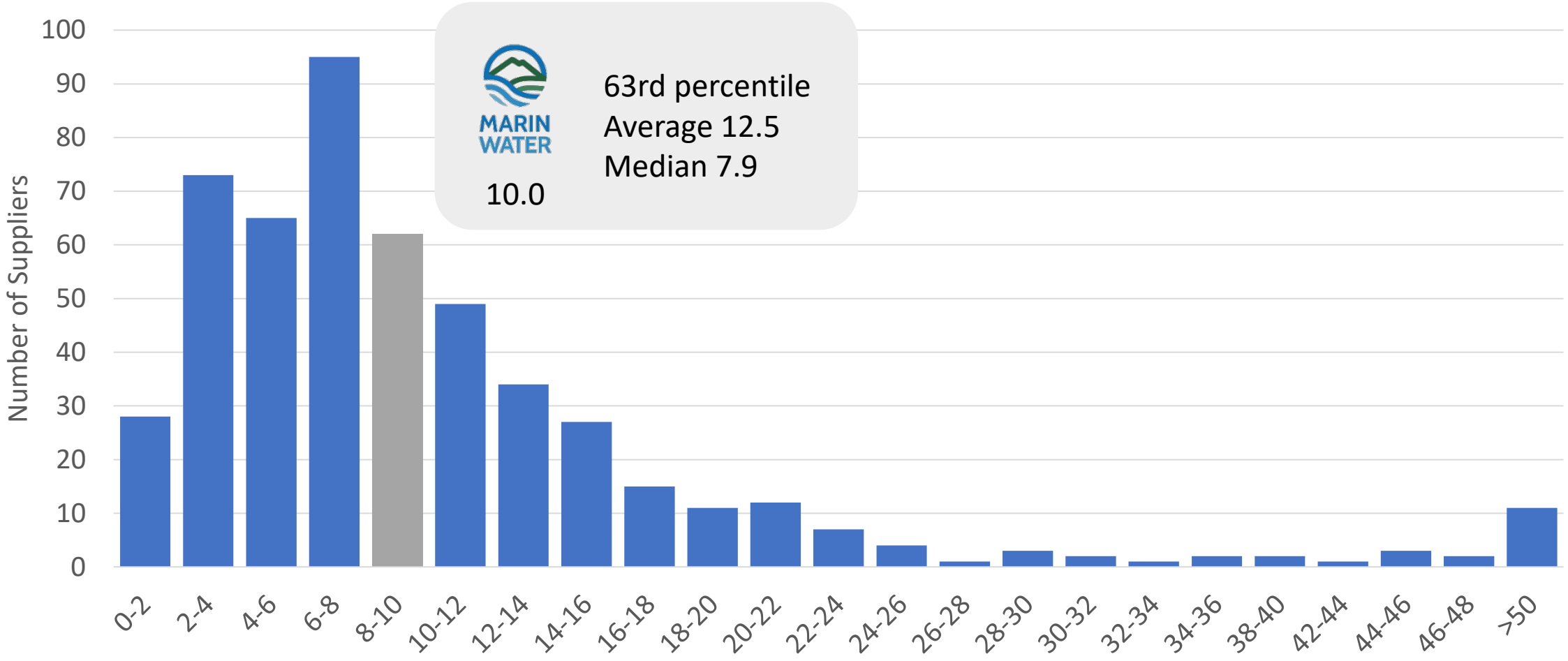


Performance Indicators
All Water Suppliers

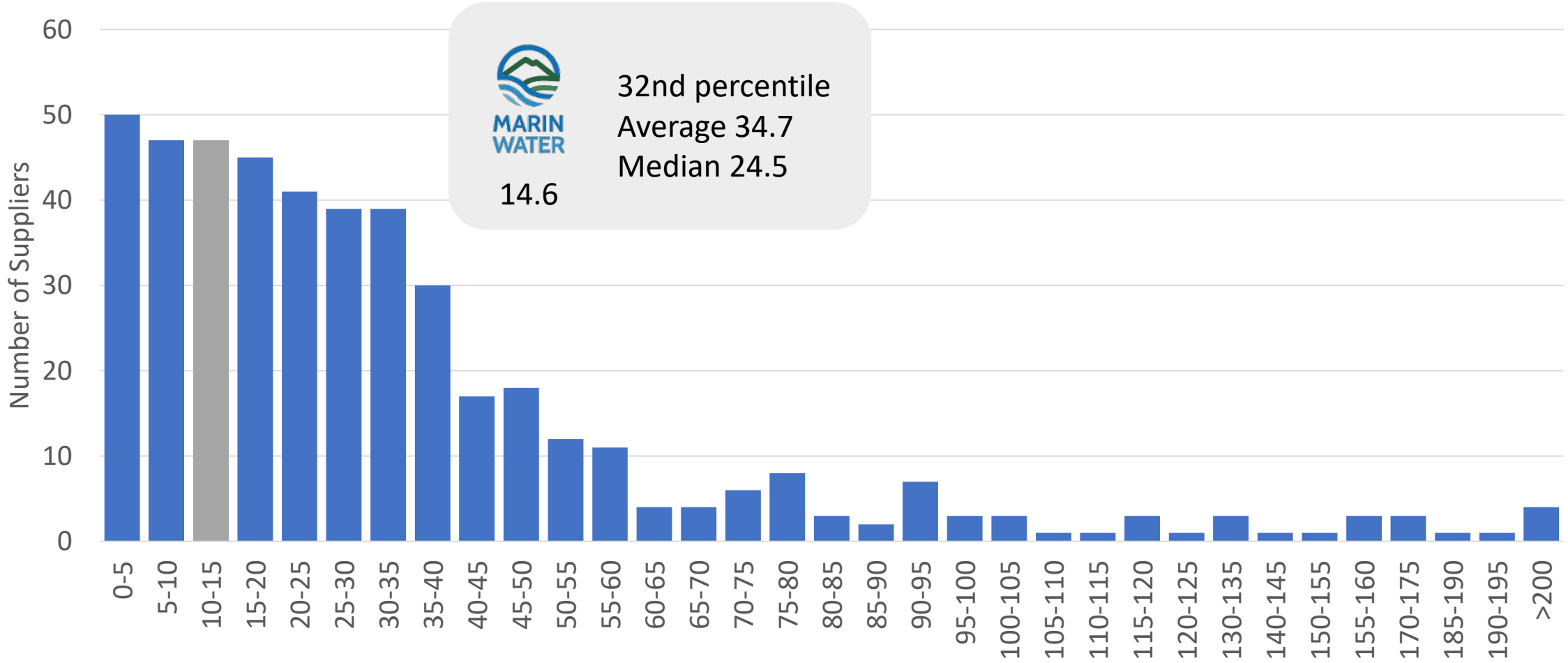
Data Validity Score



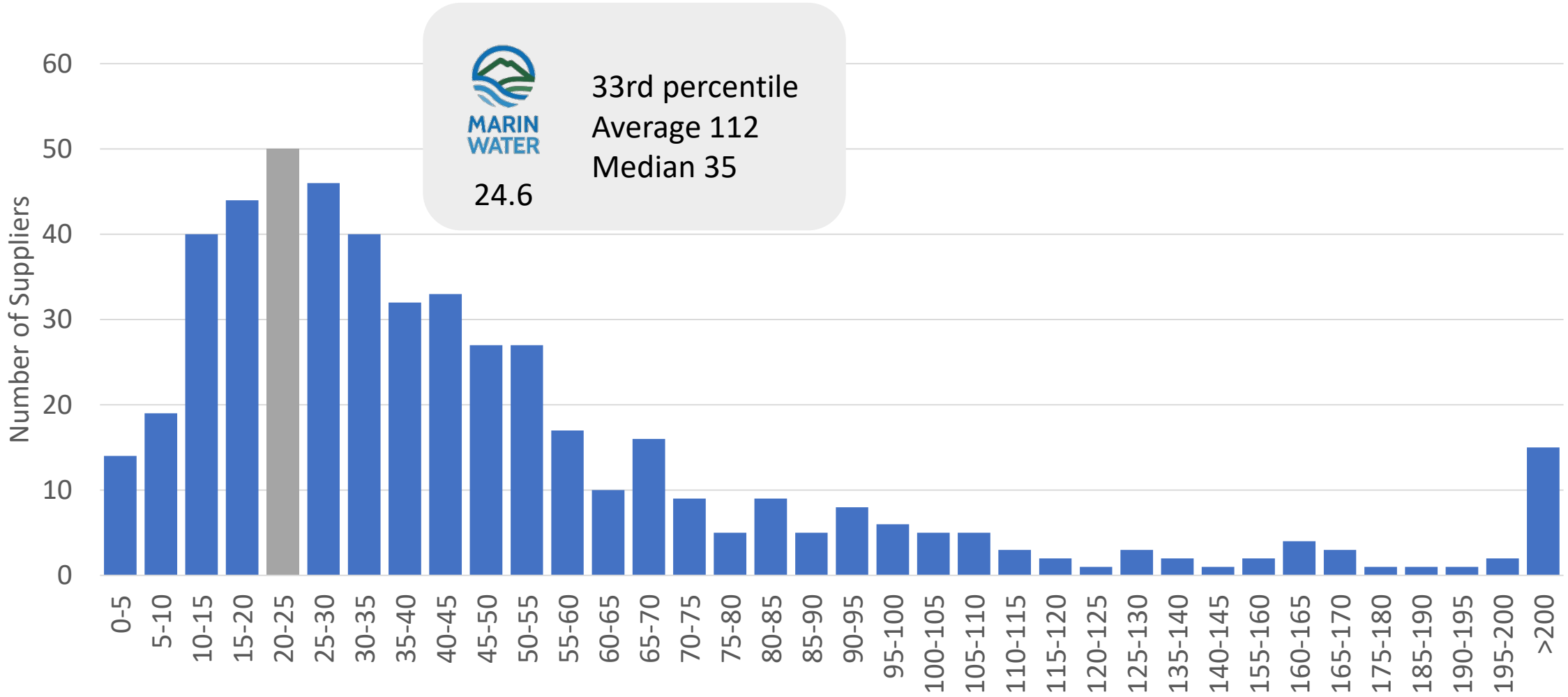
Apparent Loss Gallons Per Connection



Real Loss Gallons Per Connection



Total Loss Gallons Per Connection



Evaluating Technology to Reduce Real Losses

Technology Enabled Leak Management Strategies

- Increase staff awareness of available technologies
- Evaluate technologies that may provide benefit and supplement current efforts
- Analyze and forecast outcomes using pilots to predict full system deployment
- Select appropriate technologies for implementation recognizing they will likely be multi-faceted

Ex: Satellite Based Leak Detection - ASTERRA

SENSOR

Synthetic Aperture Radar

Uses L band for up to 10’ penetration

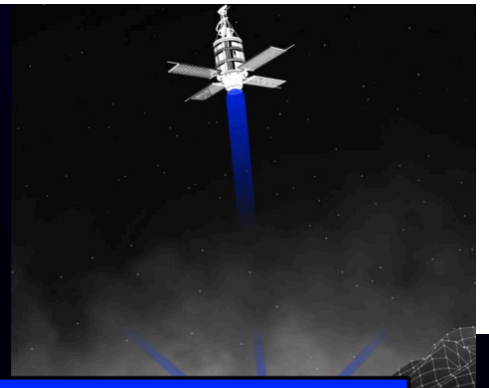
Pierces forest, pavement, asphalt, concrete, etc.

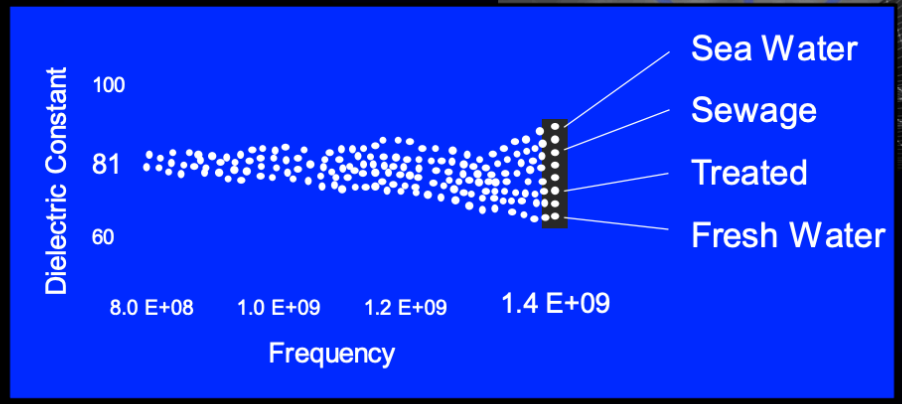
All weather conditions

Day and night operation

Dielectric sensitivity

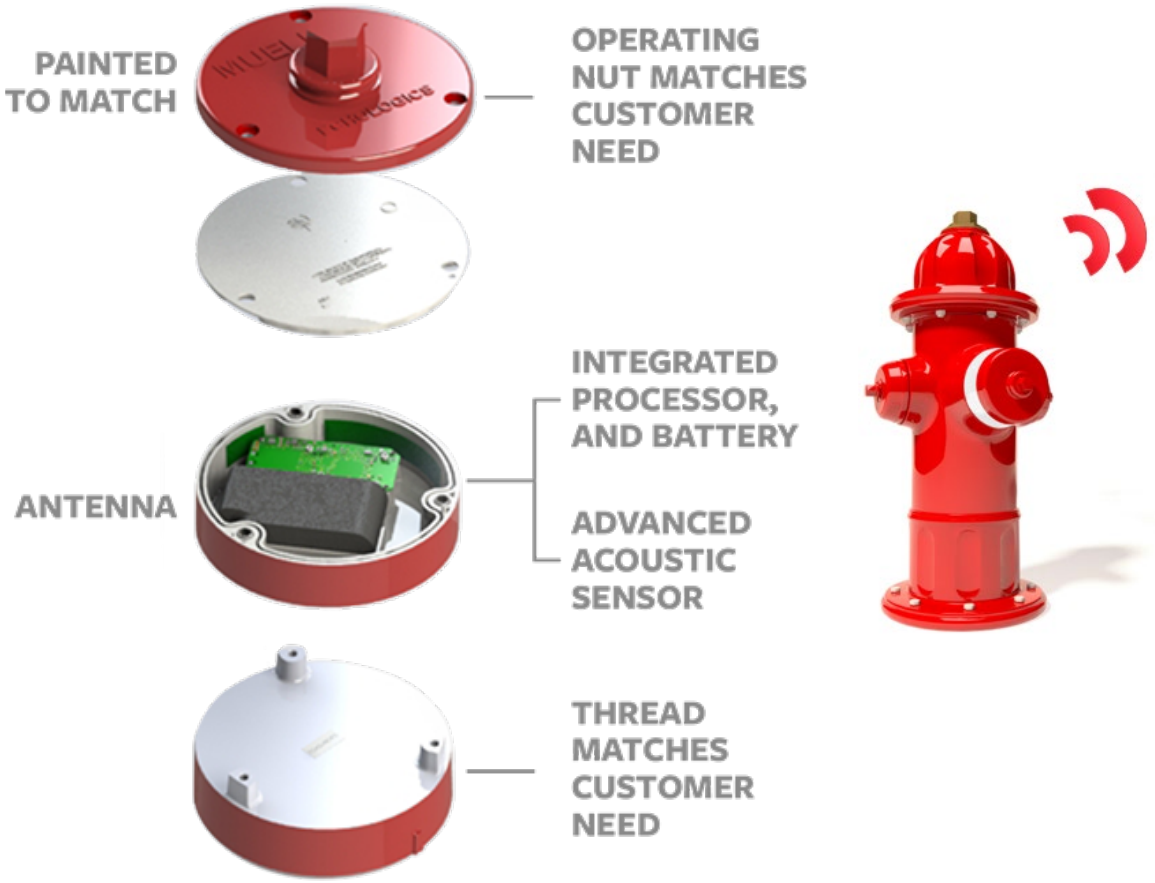
Sees the actual soil moisture





- Provides a 300’ radius target area for further evaluation

Ex: Acoustic Loggers on Hydrants - Mueller



Echoshore-DX

- Permanent installation
- Minimum detection of 5gpm
- Communicates over cellular network
- Customizable for any fire hydrant manufacturer
- Works on metallic or concrete mains up to 16“ diameter

Next Steps

- Complete annual State reporting and performance tracking to meet or exceed regulatory requirements
- Continue to evaluate new technologies
  - Build upon current leak detection program informed by water loss studies
- Develop pilot projects to collect data for determining feasibility and District benefits
- Provide periodic updates to the Board on the Water Loss Control Program and findings from pilot projects