Asian Development Bank

Smart Water Solutions for a Resilient Water Future

ROBIN WONG, DIRECTOR, ADVANCED INFRASTRUCTURE ANALYTICS

MARTIN SHAW, NRW SOLUTIONS ARCHITECT

ALEX EVARISTO, GENERAL MANAGER XYLEM PHILIPPINES

Let’s talk about Smart Water

At Xylem, we’re leading the water industry’s migration to smart infrastructure…

Through strategic acquisitions and innovations centered on energy management and process optimization, Xylem has established itself as a leading provider of smart water solutions that address the industry’s most persistent challenges.

…and we’re committed to guiding water managers through this transition.

Xylem’s latest contribution to the global water dialogue is ‘**The Smarter Water Manager - Smart Water Solutions for a Resilient Water Future’** – a tool to educate and support water managers in the transition to smart water.

Identify your challenges in your water and wastewater businesses

Global mega-trends

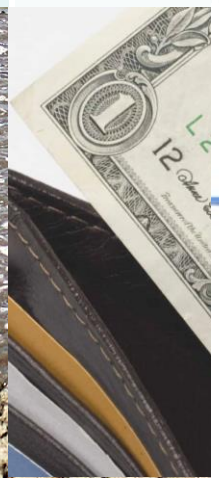
- Climate change and resource scarcity
- Demographic and social changes
- Rapid urbanization
- Environmental protection

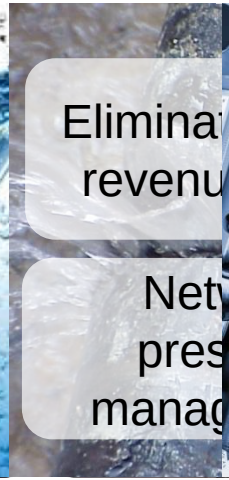
Water challenges

- High energy costs
- Droughts and floods
- Water scarcity
- Capital constraints
- Aging workforce

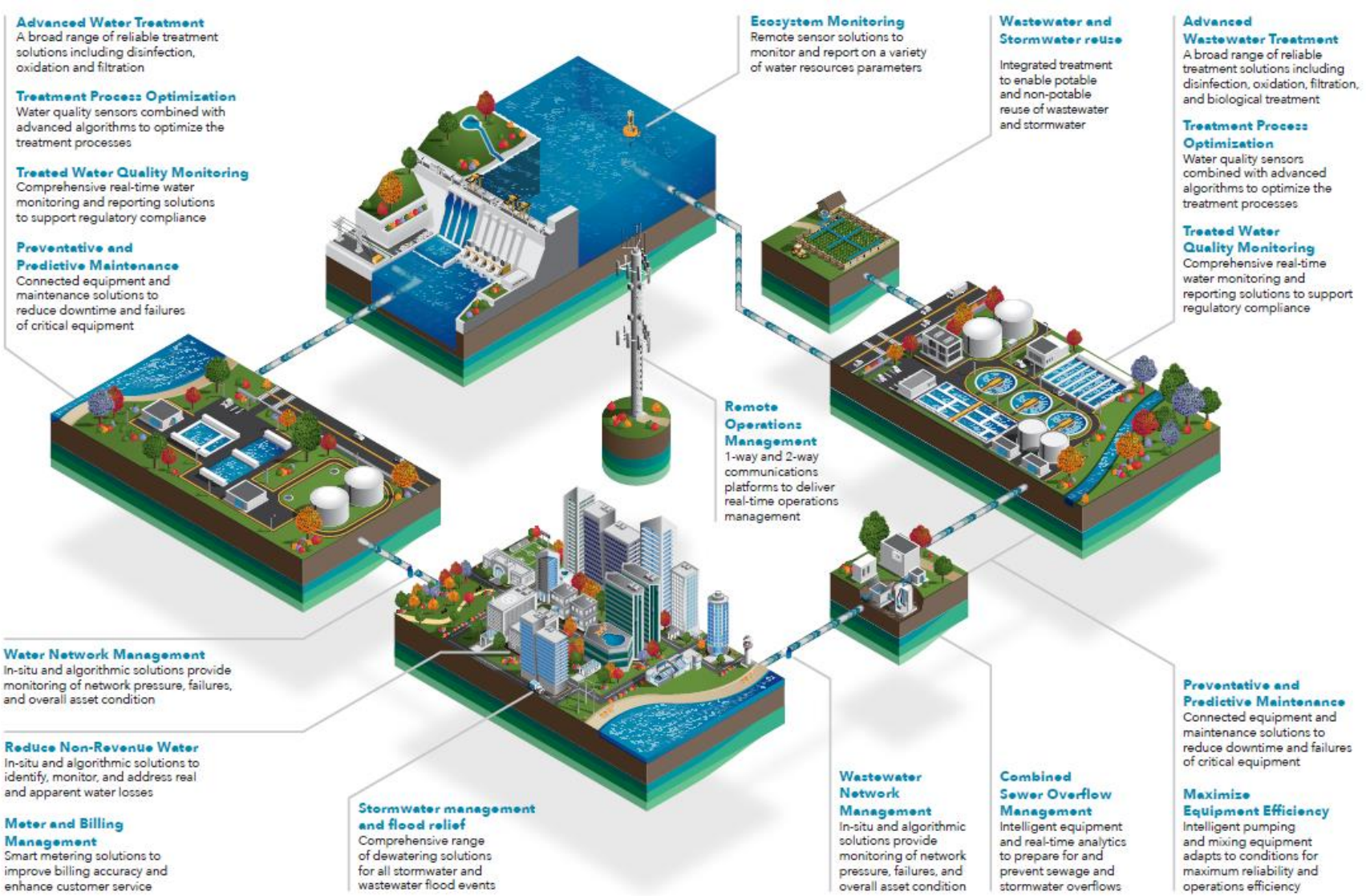
Daily activities of a water manager



xylem


Advanced Water Treatment
A broad range of reliable treatment solutions including disinfection, oxidation and filtration
Treatment Process Optimization
Water quality sensors combined with advanced algorithms to optimize the treatment processes
Treated Water Quality Monitoring
Comprehensive real-time water monitoring and reporting solutions to support regulatory compliance
Preventative and Predictive Maintenance
Connected equipment and maintenance solutions to reduce downtime and failures of critical equipment
Ecosystem Monitoring
Remote sensor solutions to monitor and report on a variety of water resources parameters
Wastewater and Stormwater reuse
Integrated treatment to enable potable and non-potable reuse of wastewater and stormwater
Advanced Wastewater Treatment
A broad range of reliable treatment solutions including disinfection, oxidation, filtration, and biological treatment
Treatment Process Optimization
Water quality sensors combined with advanced algorithms to optimize the treatment processes
Treated Water Quality Monitoring
Comprehensive real-time water monitoring and reporting solutions to support regulatory compliance
Remote Operations Management
1-way and 2-way communications platforms to deliver real-time operations management
Water Network Management
In-situ and algorithmic solutions provide monitoring of network pressure, failures, and overall asset condition
Reduce Non-Revenue Water
In-situ and algorithmic solutions to identify, monitor, and address real and apparent water losses
Meter and Billing Management
Smart metering solutions to improve billing accuracy and enhance customer service
Stormwater management and flood relief
Comprehensive range of dewatering solutions for all stormwater and wastewater flood events
Wastewater Network Management
In-situ and algorithmic solutions provide monitoring of network pressure, failures, and overall asset condition
Combined Sewer Overflow Management
Intelligent equipment and real-time analytics to prepare for and prevent sewage and stormwater overflows
Preventative and Predictive Maintenance
Connected equipment and maintenance solutions to reduce downtime and failures of critical equipment
Maximize Equipment Efficiency
Intelligent pumping and mixing equipment adapts to conditions for maximum reliability and operations efficiency

Learn about smart water solutions

A better understanding of Smart Water solutions gives **rapid rewards** from **Small, incremental changes**.
The transition to smart water solutions does not necessarily involve complex systems.

Intelligent equipment

Definition
Equipment, system and solution capable of self-optimization in-situ for enhanced performance – incl. Including pumps, mixers, treatment and sensors

Value for water managers:
Reduces time and effort needed to monitor and maintain critical technologies

Smart networks

Definition
Network collecting information across a number of equipment to provide exhaustive real-time status information of an overall system

Value for water managers:
Enables remote and continuous monitoring of operations and real-time reactive management and maintenance

Digital solutions

Definition
Solution combining historical and current data with algorithmic decision support to provide data-driven forecast of the status of an overall system

Value for water managers:
Enables preventive adjustments to operations and proactive management of the system based on data-driven decisions

... And define “Smart Water Migration”

Intelligent Equipment

Smart Networks

Digital Solutions

Discover

Qualitative and quantitative analysis with your expert partner

Design

Co-creation of solution in collaborative space

Deliver

Minimum viable product with basic necessities

Followed by Continuous delivery

xylem

Discover Xylem smart water and wastewater solution map to solve your challenges

Intelligent Equipment

Smart Network

Digital Solution

Water manager daily challenges	Xylem's solution	Monitor	Treat	Transport	Decide
		EXAMPLE XYLEM BRANDS			
Ecosystem monitoring	Remote sensor solutions to monitor and report on a variety of water resources parameters				
Remote operations management	1-way and 2-way communications platforms to deliver real-time operations management				
Preventative and predictive maintenance	Connected equipment and maintenance solutions to reduce downtime and failures of critical equipment				
Treatment process optimization	Water quality sensors combined with advanced algorithms to optimize the treatment processes				
Treated water and wastewater quality monitoring	Comprehensive real-time water monitoring and reporting solutions to support regulatory compliance				
Advanced water and wastewater treatment	A broad range of reliable treatment solutions including disinfection, oxidation, filtration, and biological treatment				
Wastewater and stormwater reuse	Integrated treatment to enable potable and non-potable reuse of wastewater and stormwater				
Maximize equipment efficiency	Intelligent pumping and mixing equipment adapts to conditions for maximum reliability and operations efficiency				
Stormwater management and flood relief	Comprehensive range of dewatering solutions for all stormwater and wastewater flood events				
Combined sewer overflow management	Intelligent equipment and real-time analytics to prepare for and prevent sewage and stormwater overflows				
Reduce non-revenue water	In-situ and algorithmic solutions to identify, monitor, and address real and apparent water losses				
Water and wastewater network management	In-situ and algorithmic solutions provide monitoring of network pressure, failures, and overall asset condition				
Meter and billing management	Smart metering solutions to improve billing accuracy and enhance customer service				

Partner with Xylem to implement smart water solution with the adapted return

Thames Water **smart network** reduces water consumption by **13%**
United Kingdom

Smart network saves **$260 000** of water losses to Borough of Monaco, PA
United States

Digital solution fulfills wastewater collection needs across 2**500 pump stations**, Netherlands

Digital solution at Milan municipality finds and fixes previously **undetected leaks**, Italy

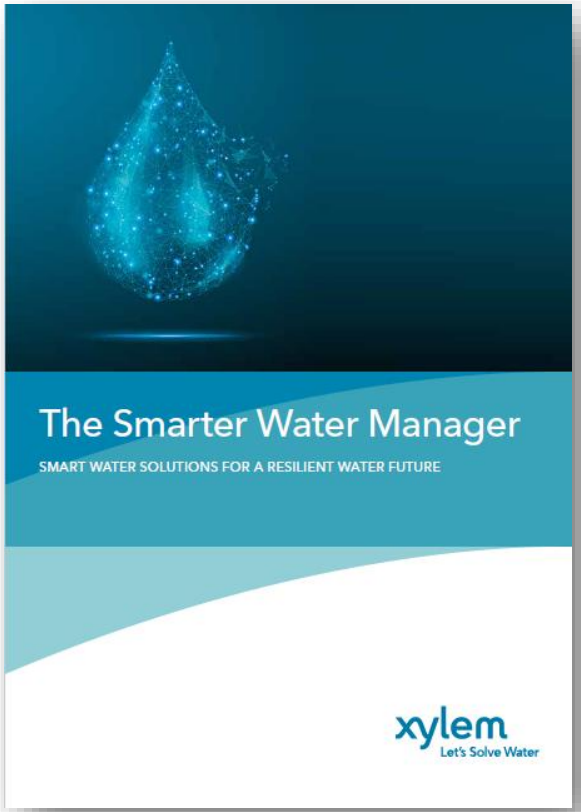
Get our full Smart Water Manager paper today

Download it on:

http://info.xyleminc.com/Smart-Water-Solutions.html

or contact us at:

smartwater@xyleminc.com



xylem

xylem

Let's Solve Water

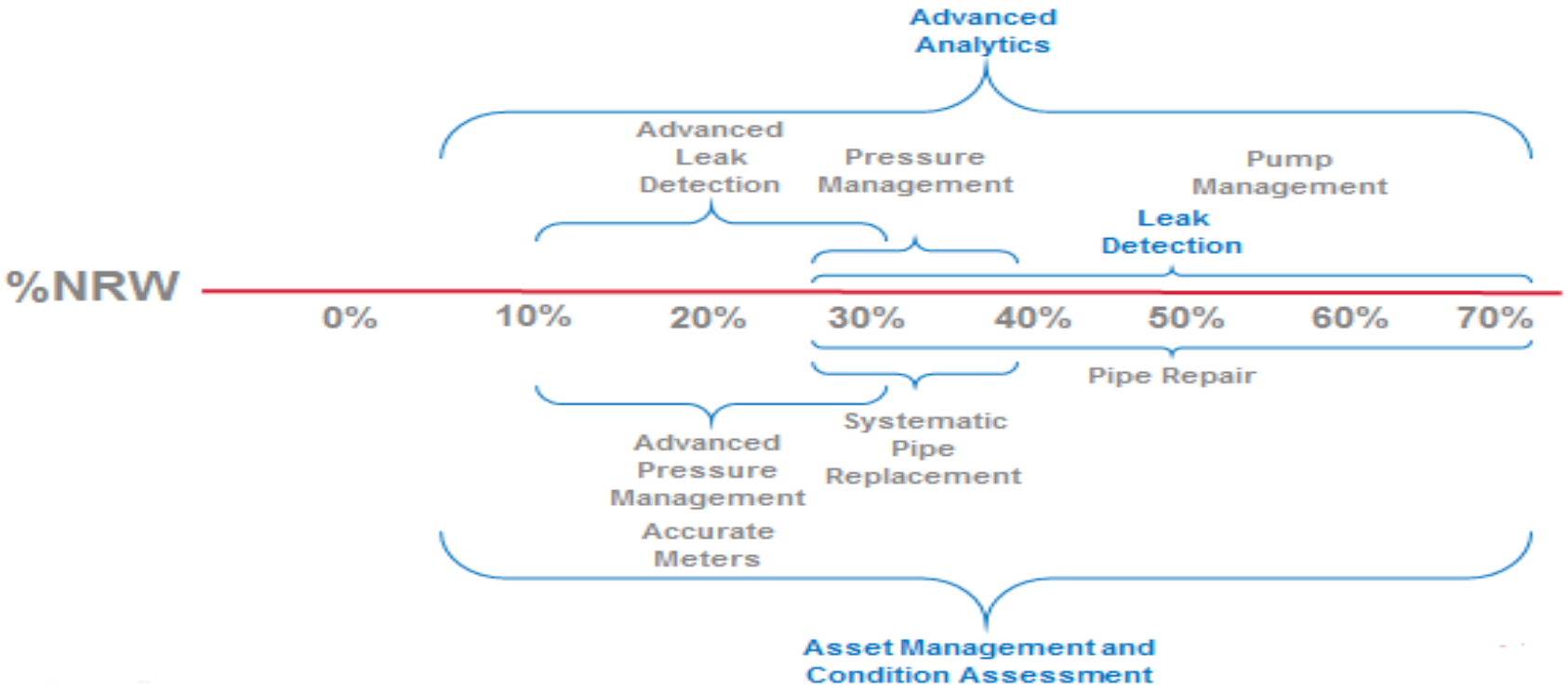
29th August 2018

Application of Advanced Analytics in NRW Management

Operational Efficiencies Achieved Through NRW Management

- Increased Availability of Water
- Reduced Treatment and Pumping Costs
- Social Factors
  - Reduced Risk of Water Contamination
  - Reduced Inconvenience from Unplanned Shut Downs
- Environmental Factors
  - Reduced Abstraction Volumes
- Improved Planning of Utility Resources
- Increased Revenue

No Single Solution

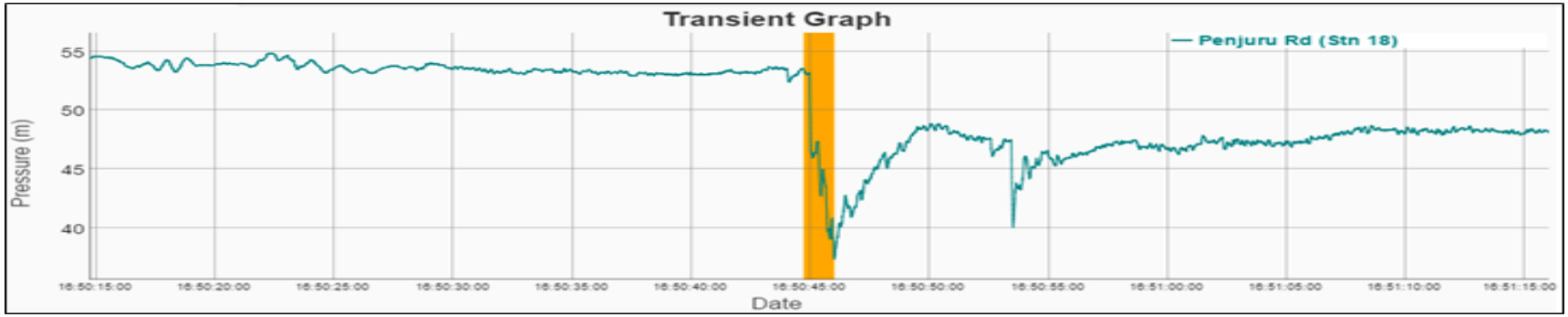


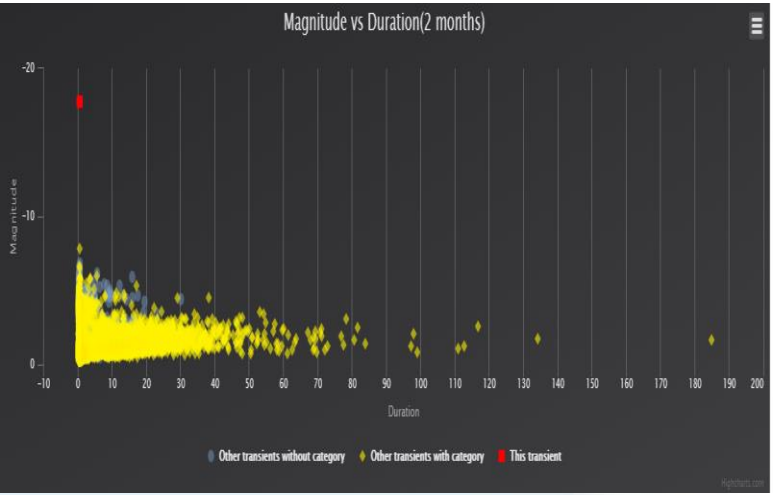
Advanced Analytics

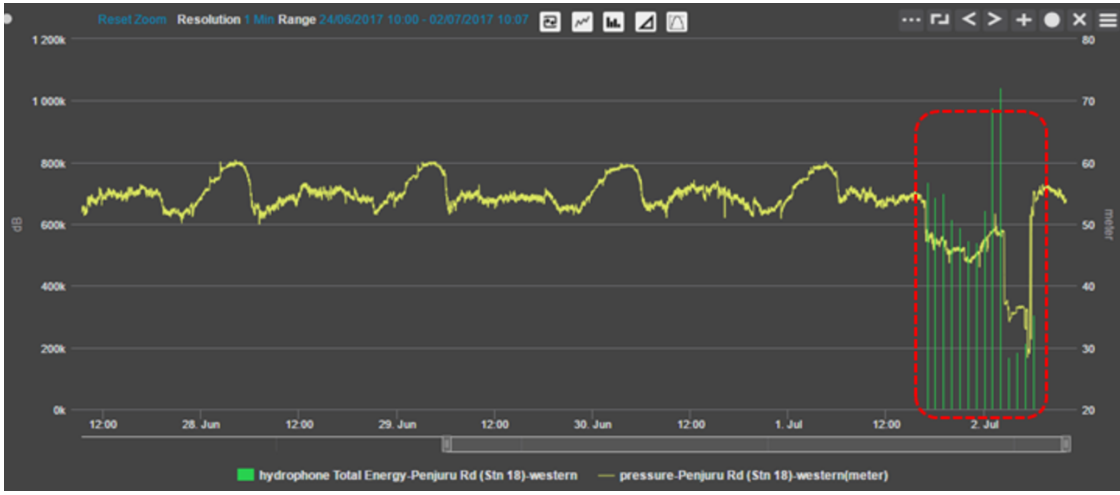
1. Real Time Network Monitoring and Alarms
2. High Resolution Data Recording
3. Machine Learning
4. Acoustic Leak Detection
5. Integrated Data Platforms
6. Pipe Risk Prioritisation
7. Pipe Condition Assessment
8. Revenue Meter Performance Assessment

Traditional Analytics

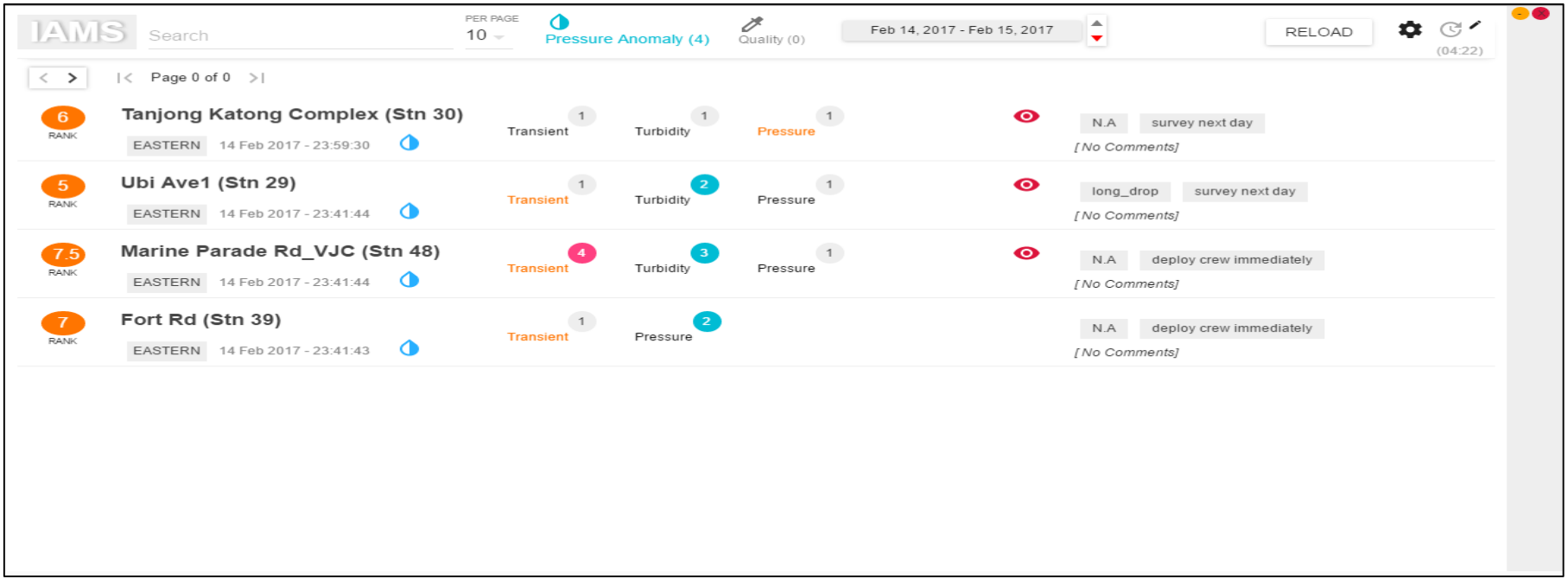
1. Real Time Network Monitoring and Alarms



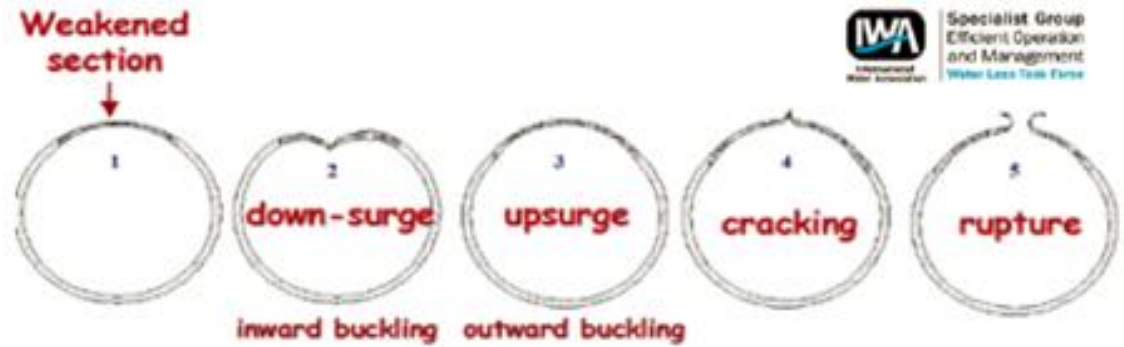


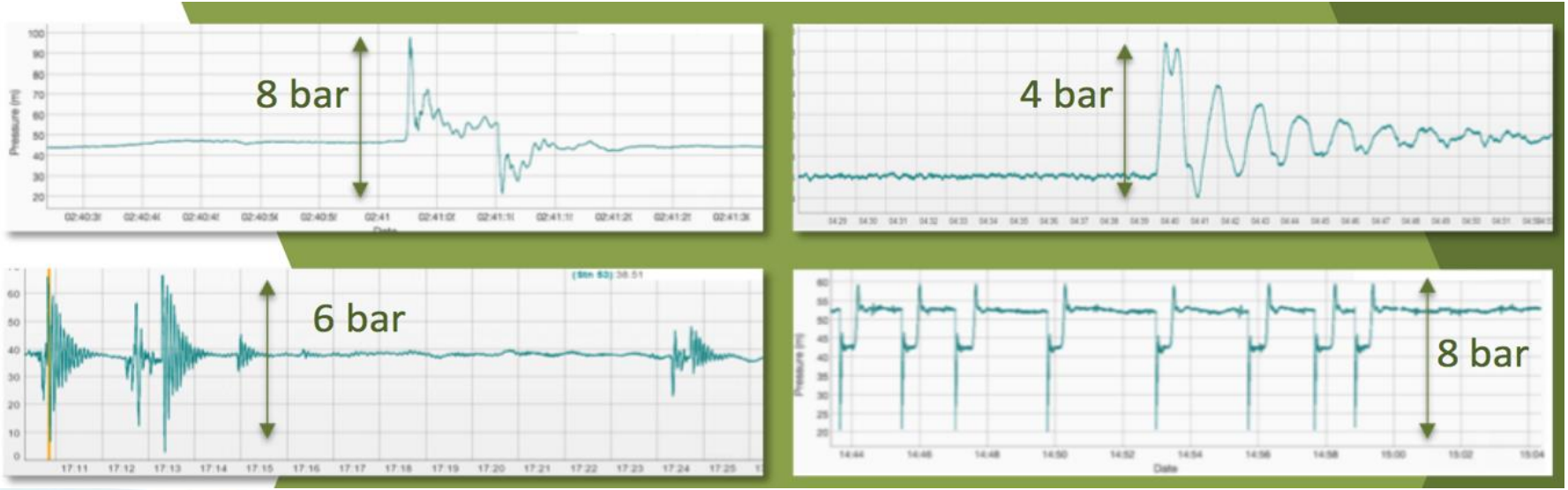


1. Real Time Network Monitoring and Alarms

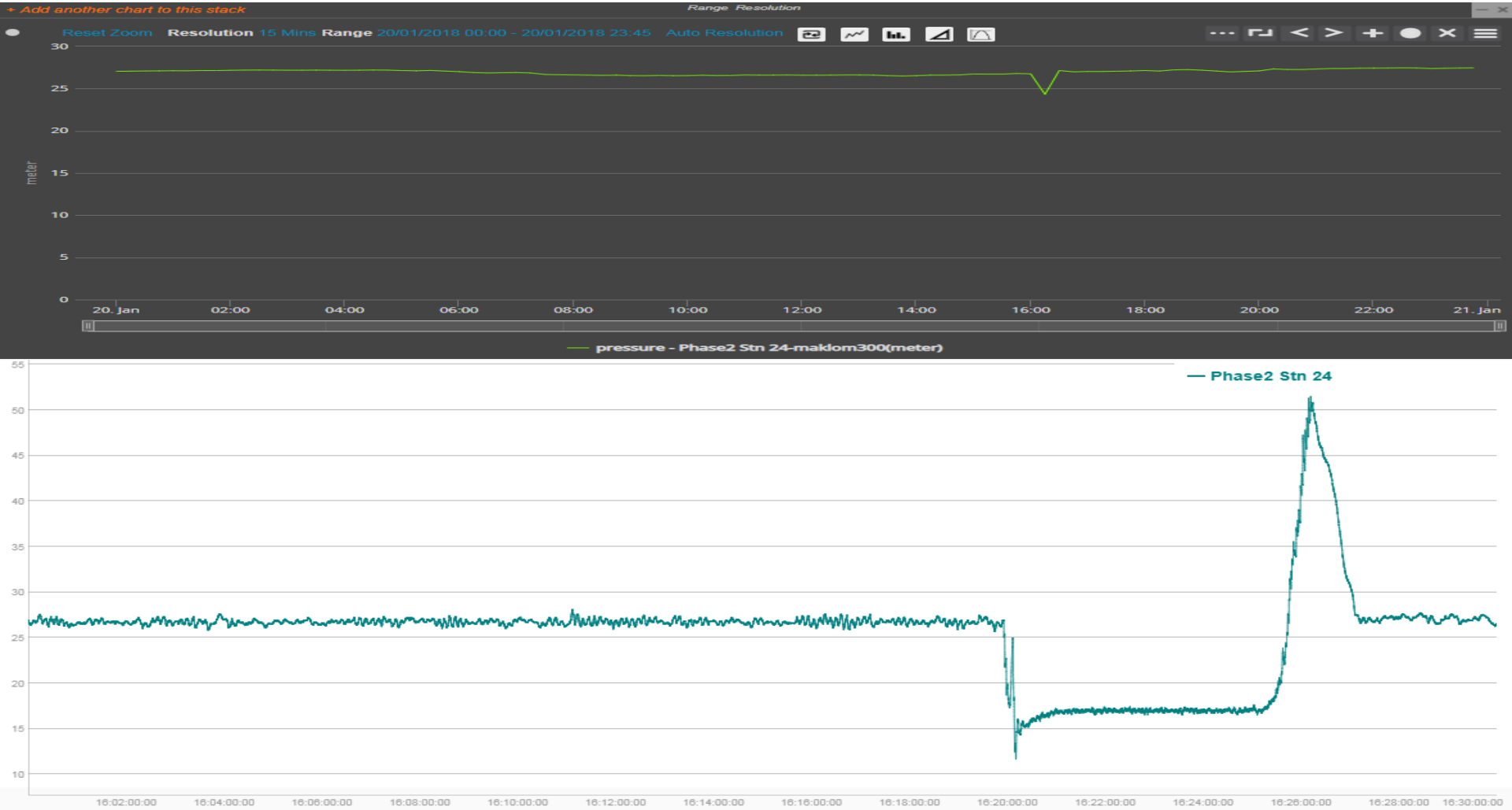


2. High Resolution Data Recording

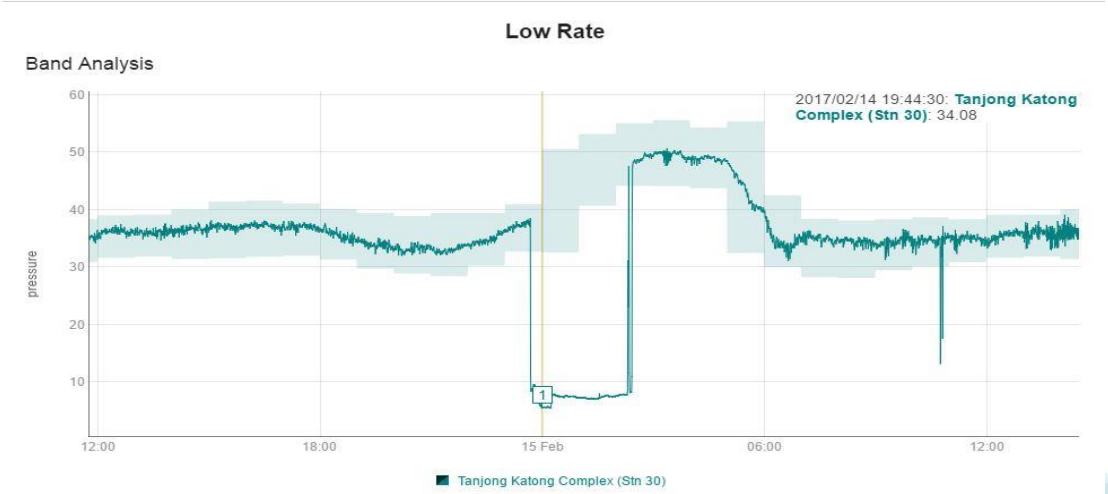




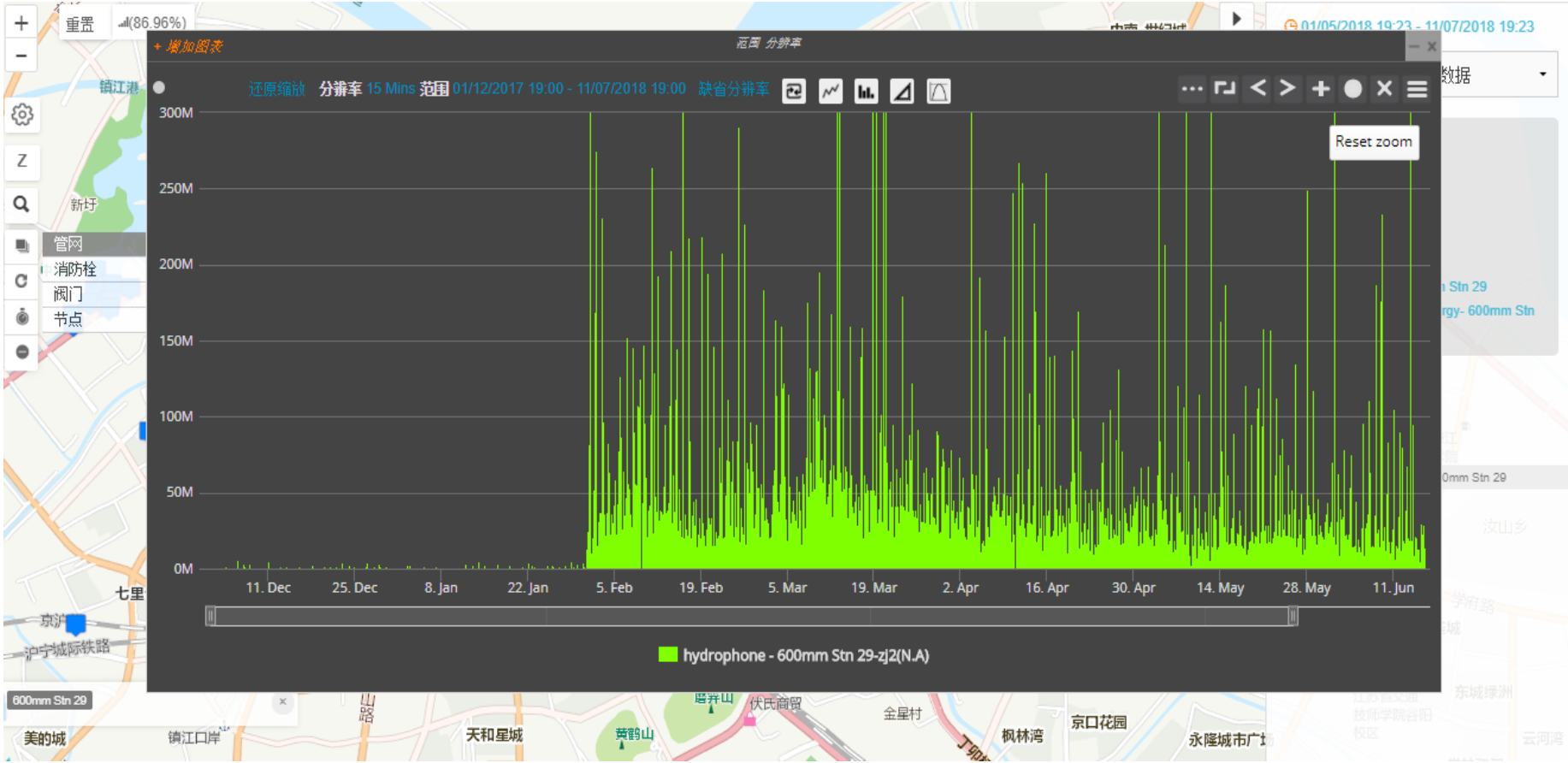
2. High Resolution Data Recording



3. Machine Learning

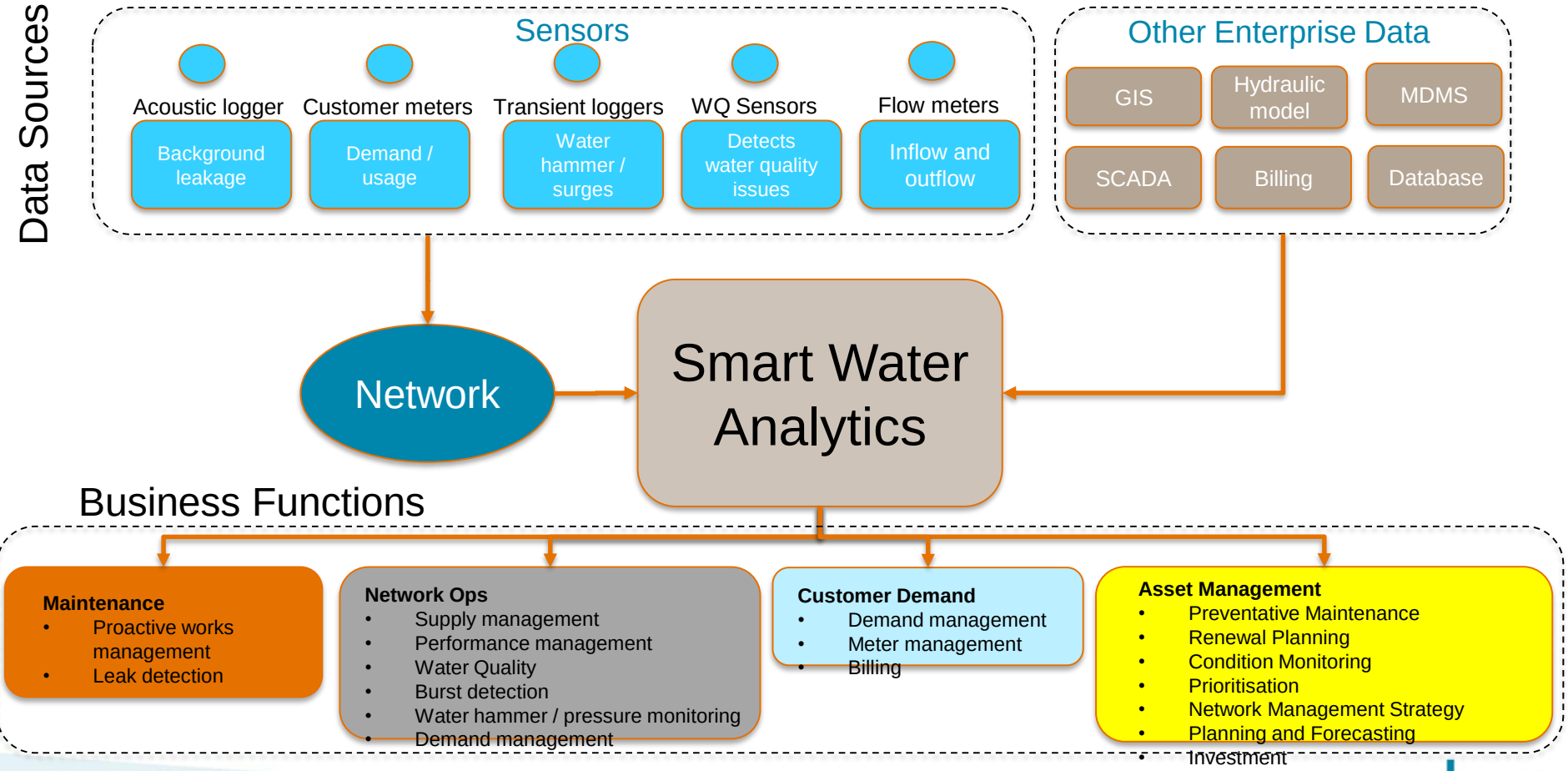


4. Acoustic Leak Detection

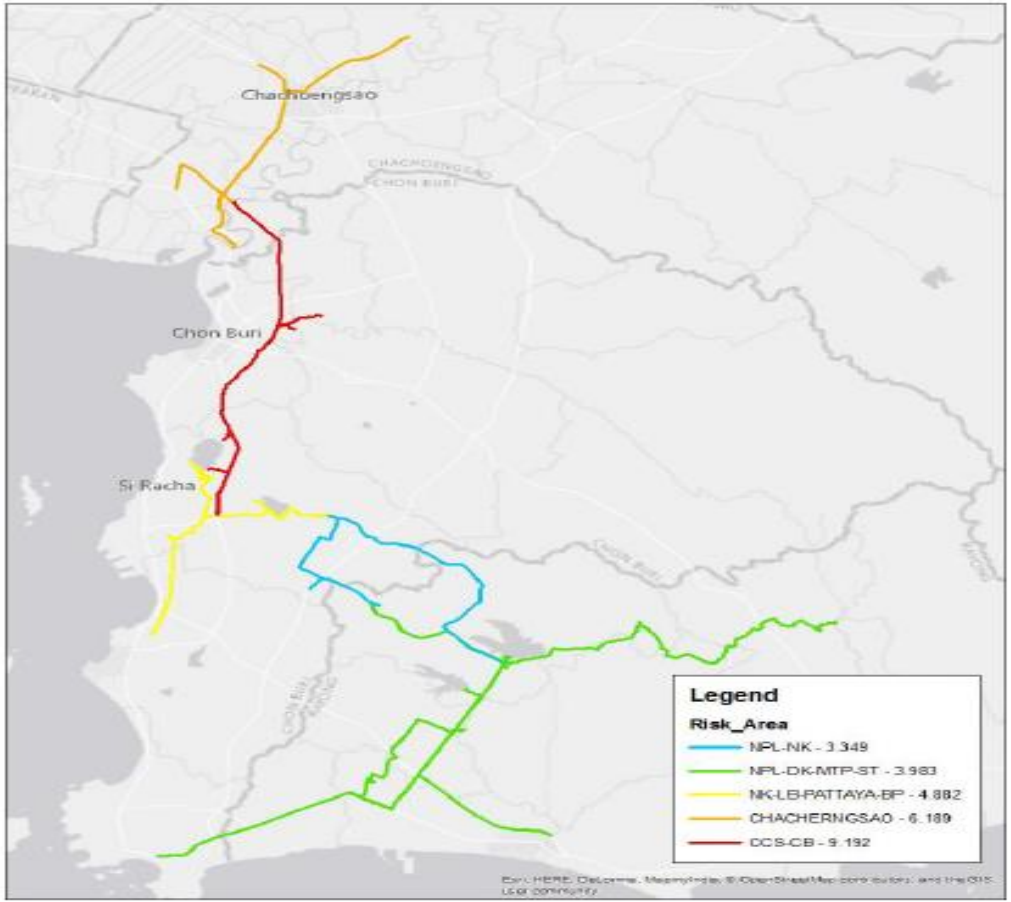


4. Acoustic Leak Detection

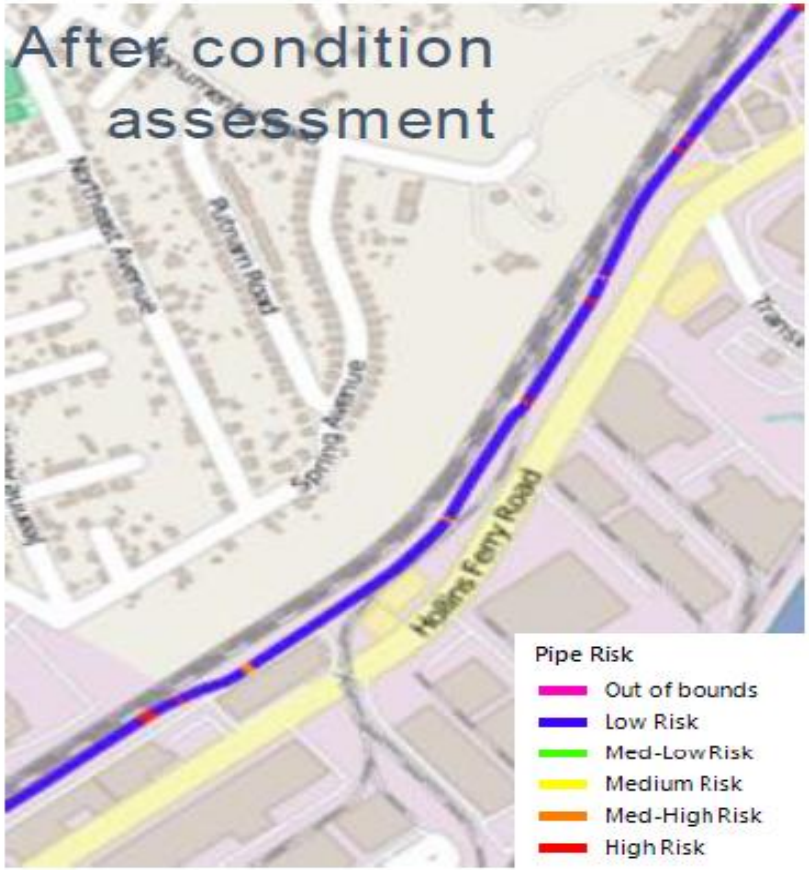
5. Integrated Data Platforms



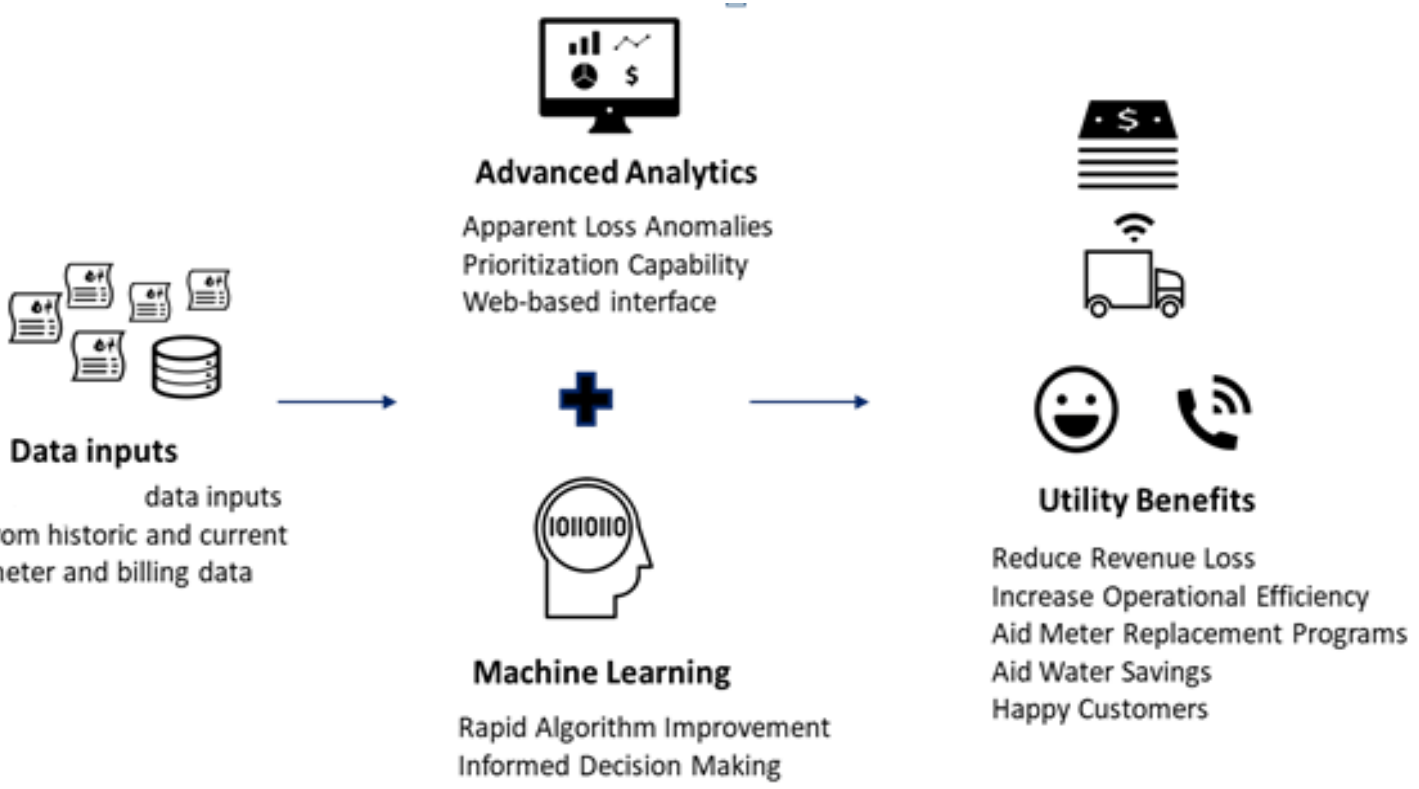
6. Pipe Risk Prioritisation



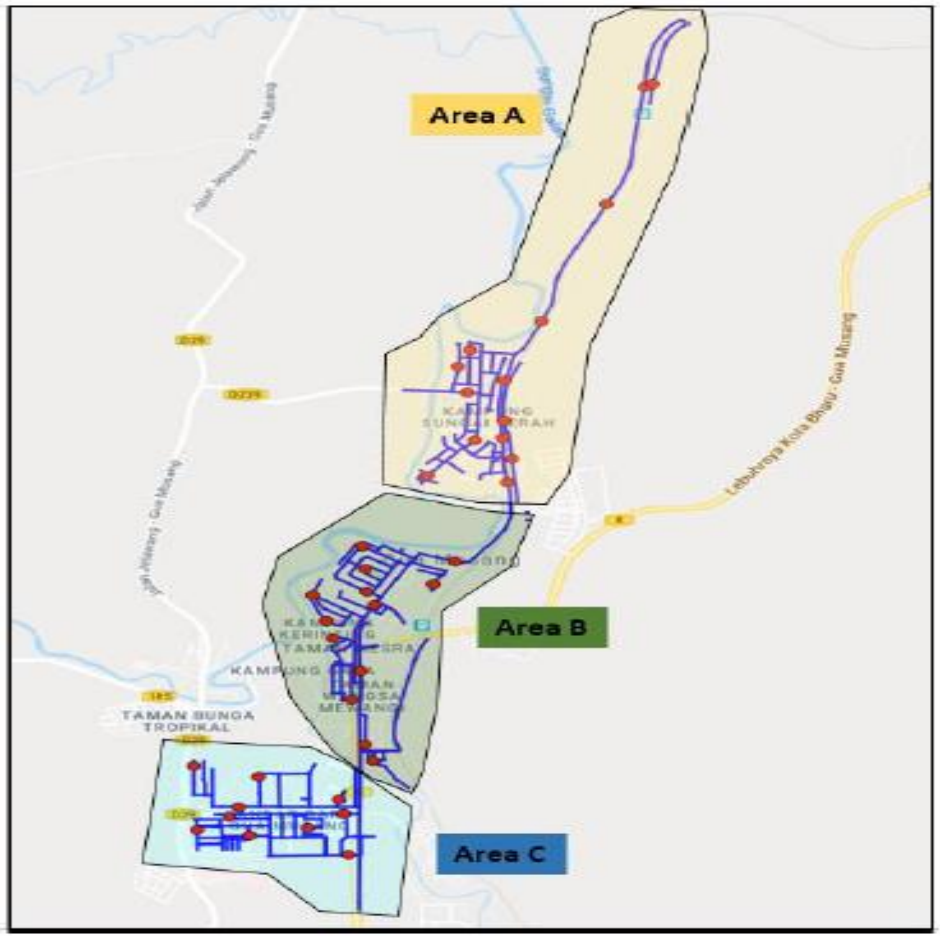
7. Pipe Condition Assessment



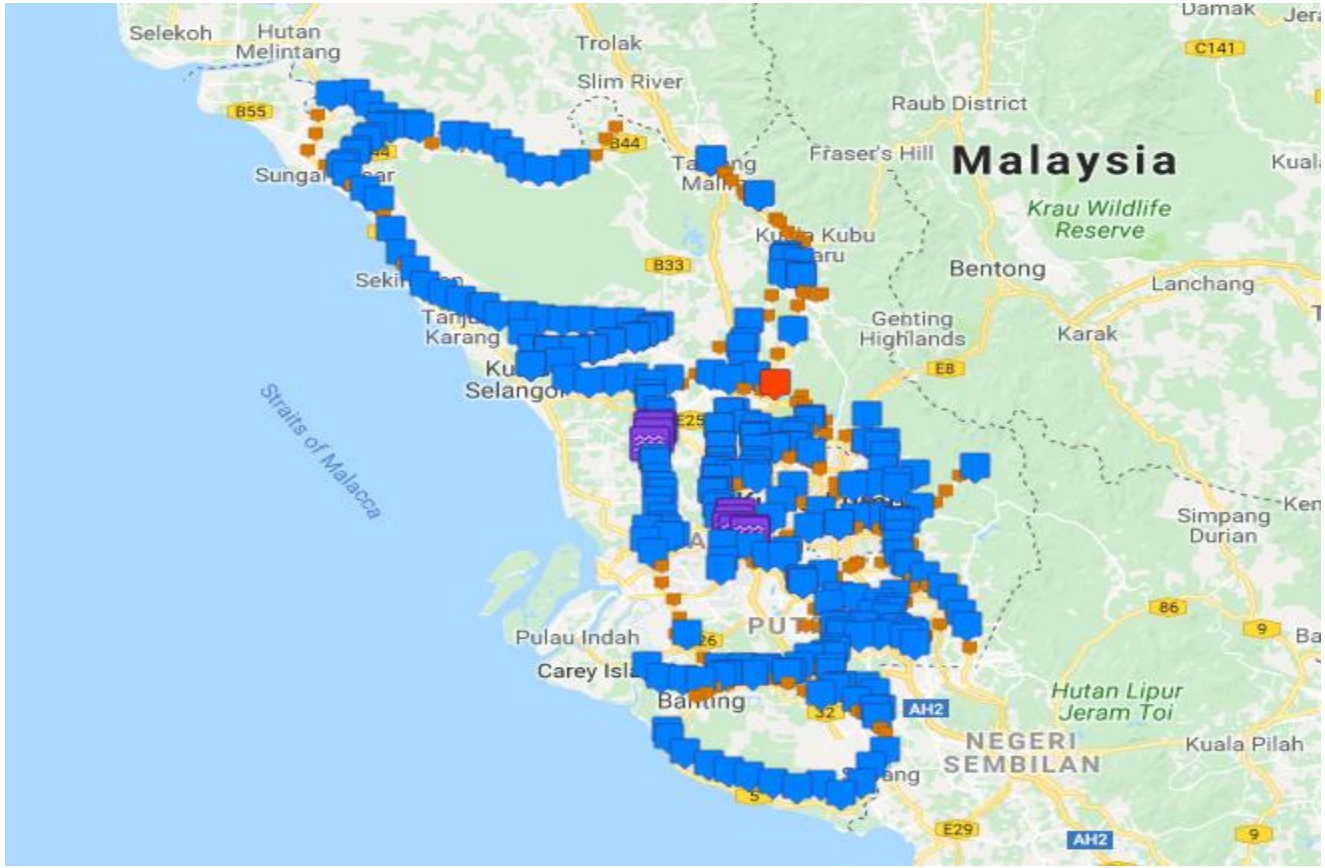
8. Revenue Meter Performance Assessment



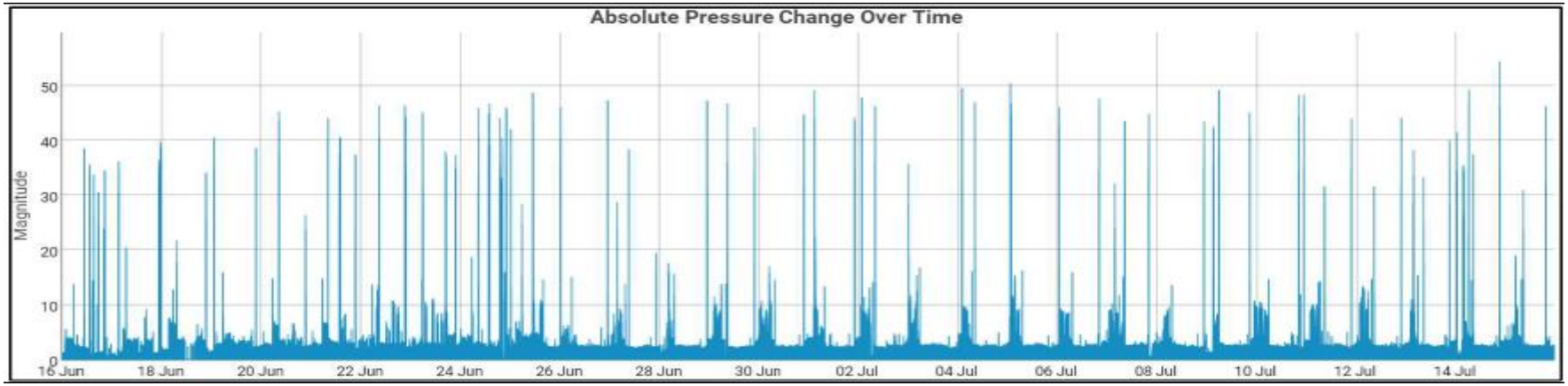
Case Study 1 – NRW 50%



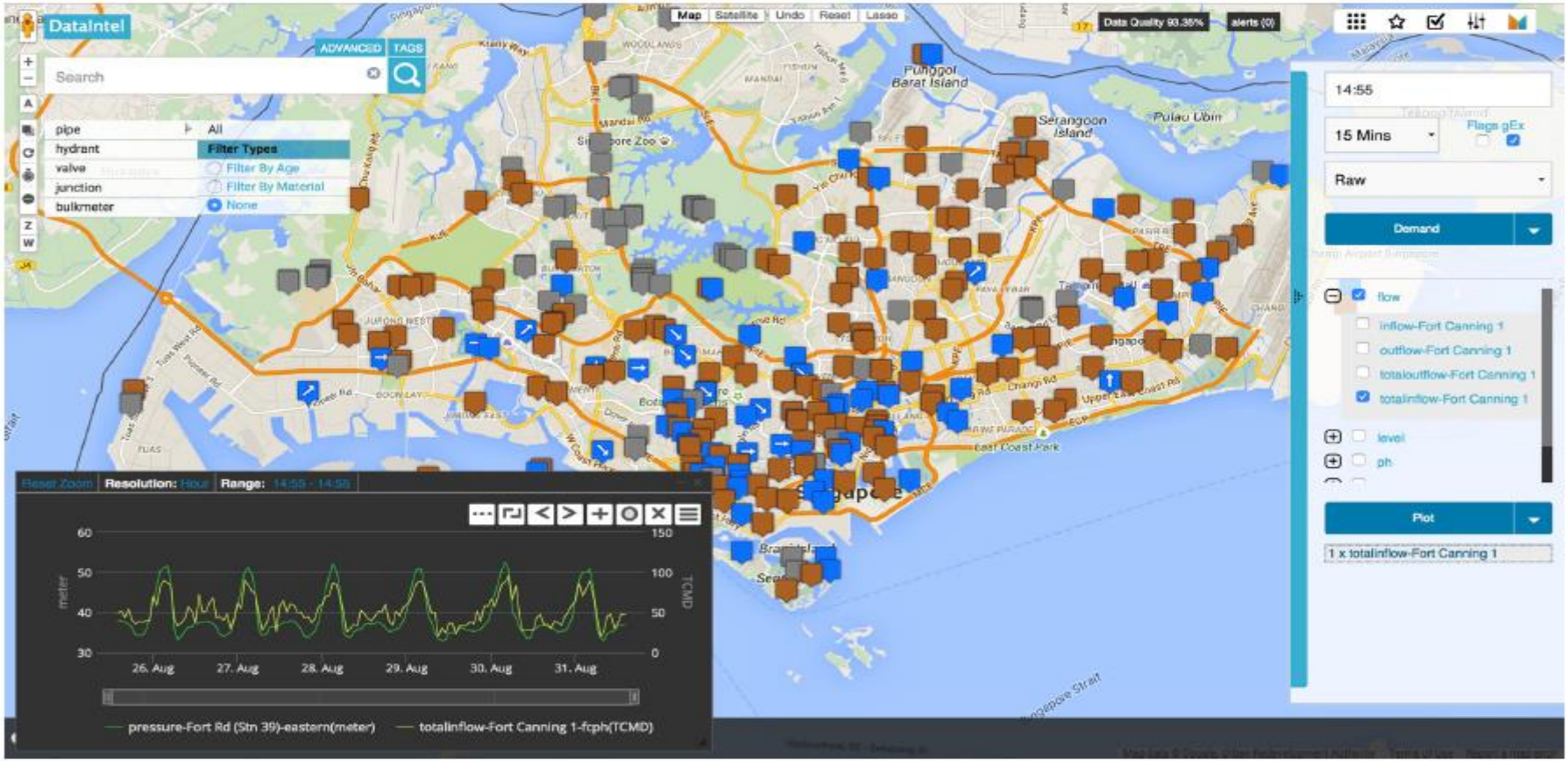
Case Study 2 – NRW 30%



Case Study 2 – NRW 30%

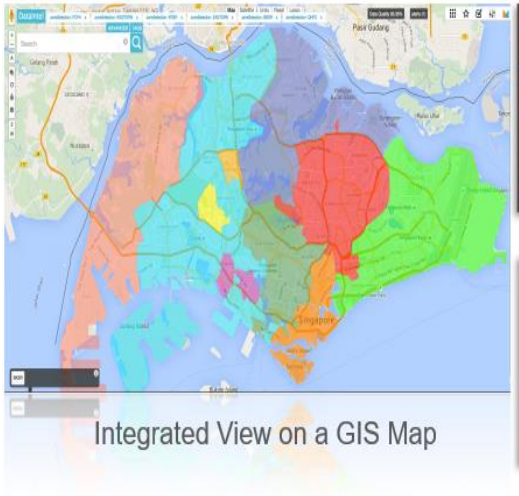


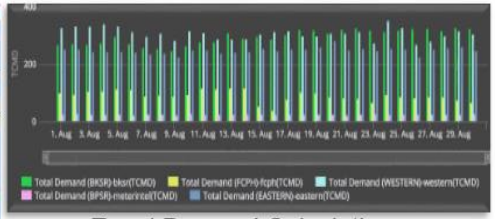
Case Study 3 – NRW 5%

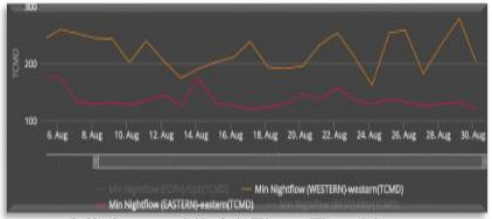


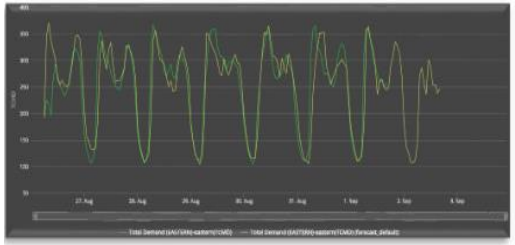
Case Study 3 – NRW 5%

- Smart Water Grid System
  - Island-wide Sensor Deployment
  - Water Demand Prediction
  - Water Quality Monitoring & Analysis
  - Automated Metering Analytics
  - Sensor Health Management System
  - Hydraulic Modeling and Simulation
  - Water Quality Sub-zoning Tool
  - Load Dispatch
  - Water Main Break Detection and Localization


Integrated View on a GIS Map


Zonal Demand Calculations


Minimum Night Flow Tracking


Zonal Demand Forecast


Demand Correlation with Weather

Summary

- There is no one solution for a NRW management strategy – different utilities face different challenges

- Use of advanced analytics can achieve major operational efficiencies through sustainable water loss management strategies.


xylem
Let's Solve Water

Q and A