xylem

Let's Solve Water

31.03 2022

MAGNE STOKKA, BUSINESS DEVELOPMENT MANAGER

What does Xylem mean?

Xylem |'zīləm|

Xylem is a tissue in plants that ensures water transport from the roots upwards. So the name suits us very well. We also transport, treat and measure water. We do it with...

Respect

Responsibility

Integrity

Creativity

Global leader in water technology

- 2020 sales $ 4,88B
- Employees ~ 17.000
- Countries ~ 150
- Continents 7

RESPECT RESPONSIBILITY INTEGRITY CREATIVITY

Xylem Norway

70 MEUR Revenue 2021

160 Employees

9 Locations

- Sales engineers
- Project engineers
- M&C Automation engineers
- Application engineers
- Project management
- Service technicians
- Local service work shops

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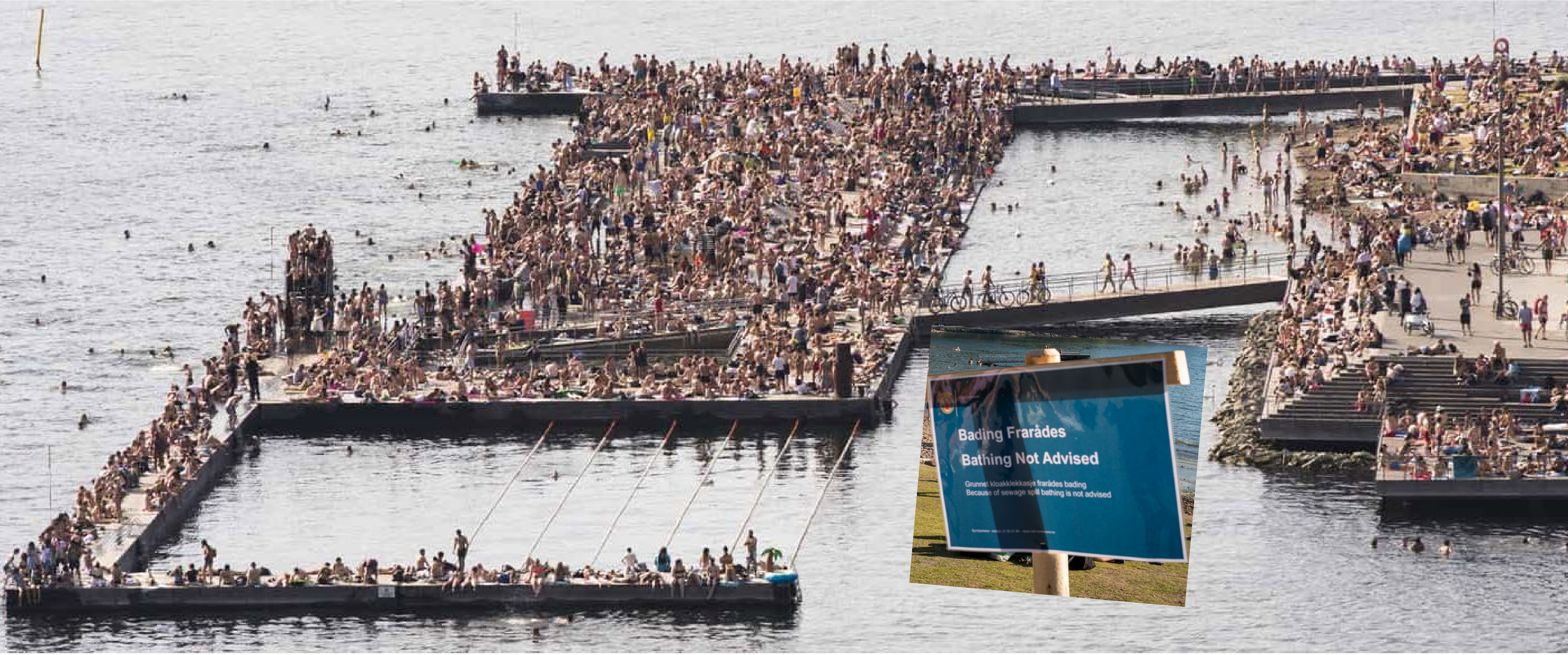
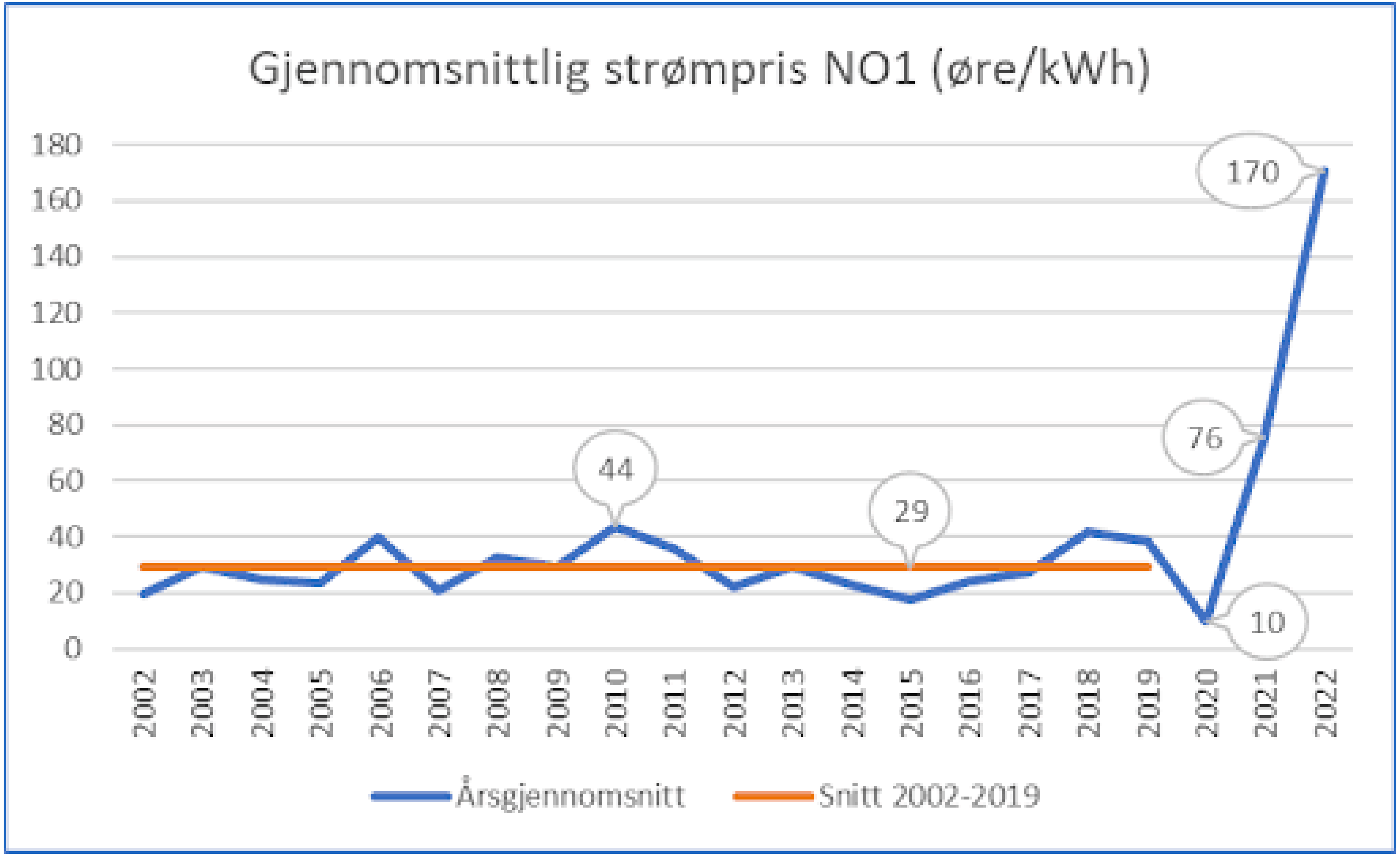
xylem vue

powered by go-aigua

xylem

KICK-OFF 2023


Bading Frarådes
Bathing Not Advised
Grunnet kloakklekkasje frarådes bading
Because of sewage spill bathing is not advised



Kilde: Nord Pool

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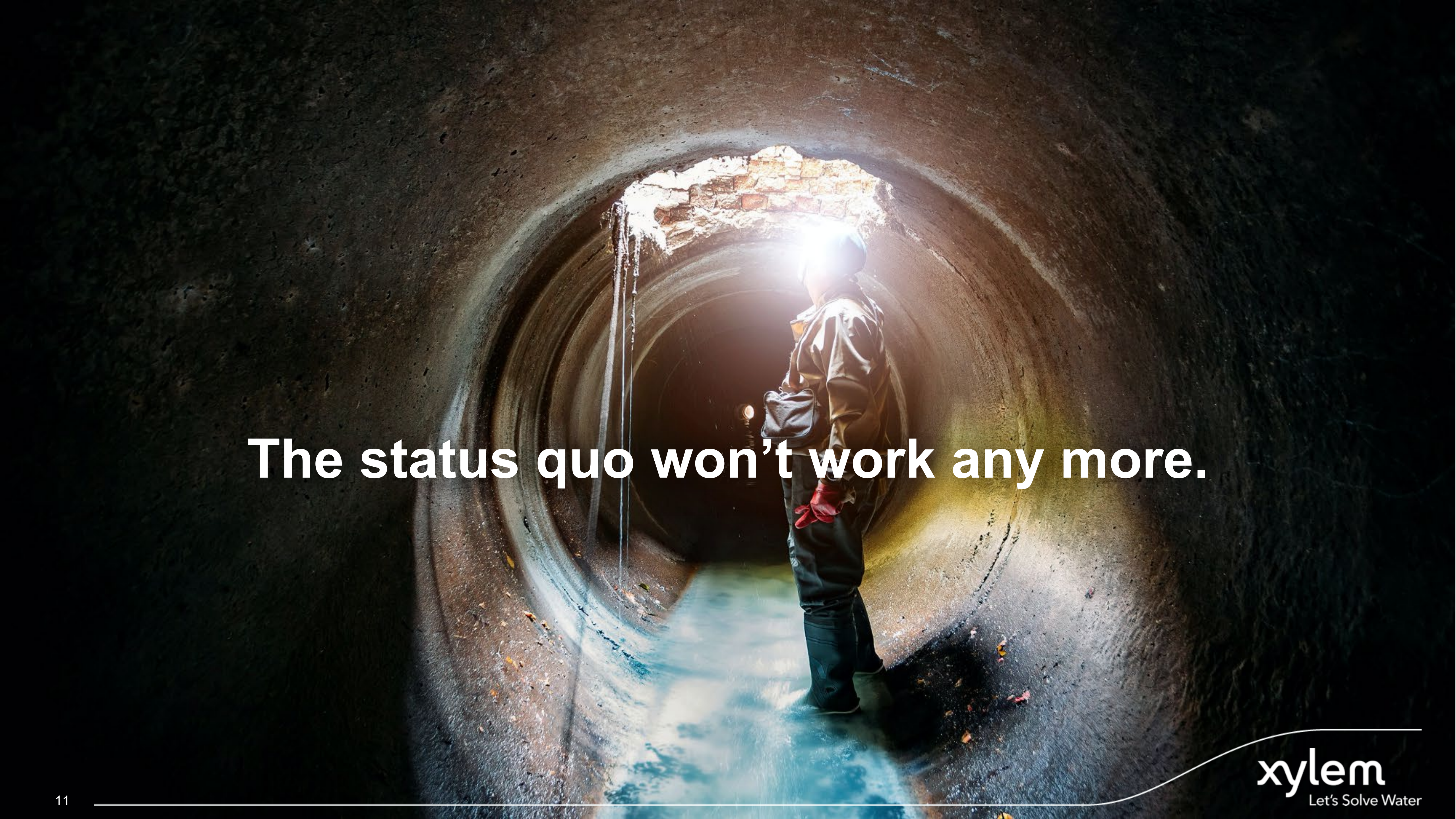


The status quo won’t work any more.

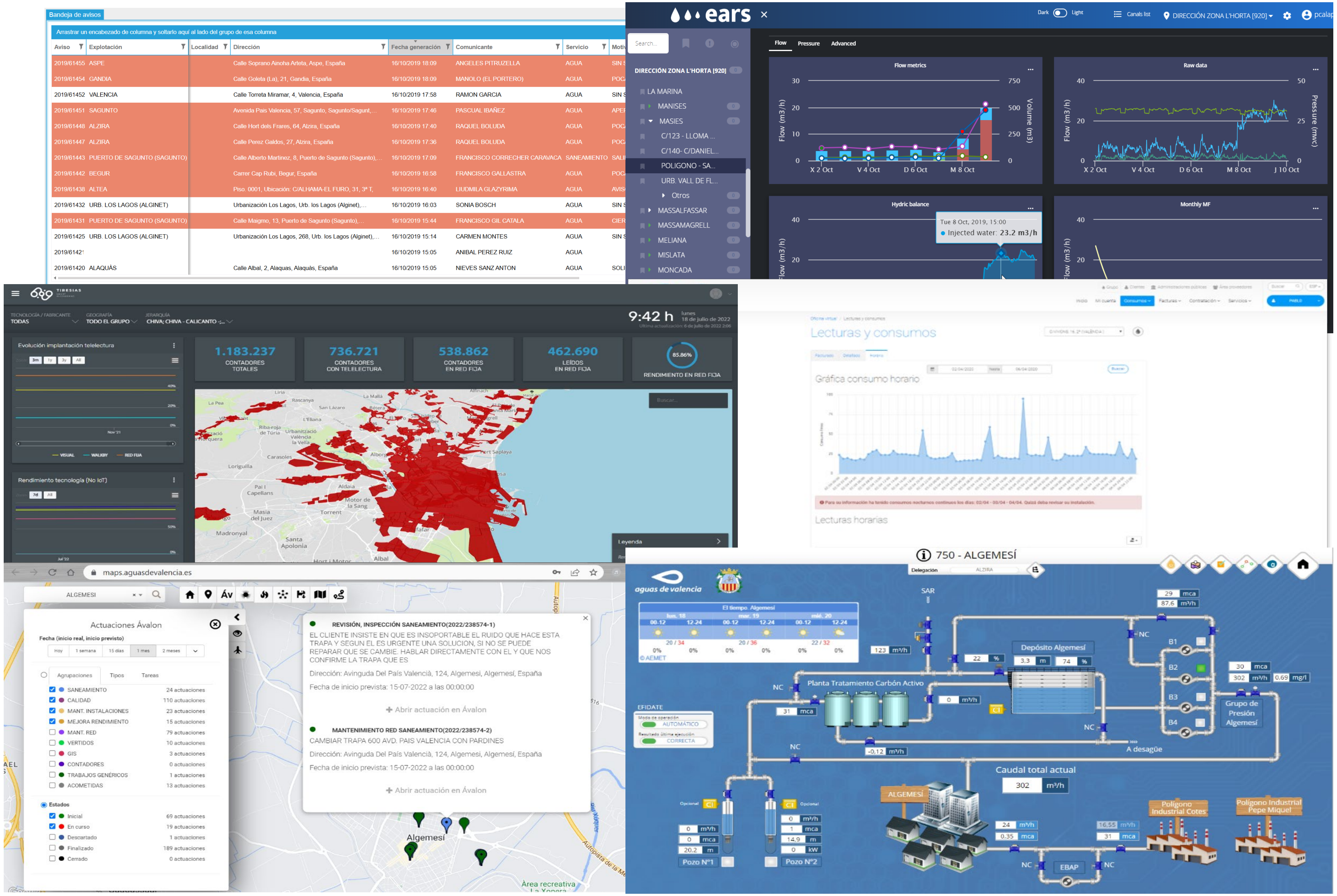
There is no shortage of data – unlocking it is the challenge

Lack of system-wide visibility and siloed systems makes it hard to deploy resources accurately

True partnerships are rare

Solutions are often reactive

Many digital solutions are one-size-fits-all

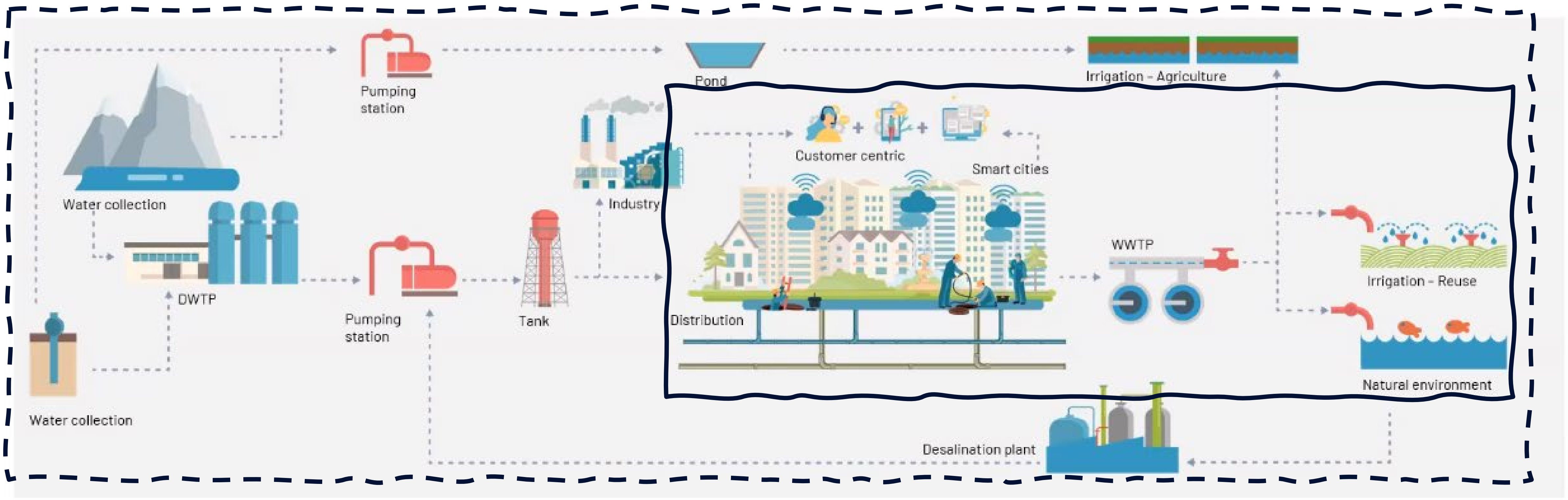


Bandeja de avisos
Arrastrar un encabezado de columna y soltarlo aquí al lado del grupo de esa columna
Aviso
Explotación
Localidad
Dirección
Fecha generación
Comunicante
Servicio
ears
DIRECCIÓN ZONA L'HORTA [920]
Flow
Pressure
Advanced
Flow metrics
Raw data
Hydric balance
Monthly MF
LA MARINA
MANISES
MASIES
MASSALFASSAR
MASSAMAGRELL
MELIANA
MISLATA
MONCADA
Tue 8 Oct, 2019, 15:00
Injected water: 23.2 m3/h
9:42 h
1.183.237
CONTADORES TOTALES
736.721
CONTADORES CON TELELECTURA
538.862
CONTADORES EN RED FIJA
462.690
LEÍDOS EN RED FIJA
85.86%
RENDIMIENTO EN RED FIJA
Evolución implantación telelectura
Rendimiento tecnología (No IoT)
Leyenda
Lecturas y consumos
Gráfica consumo horario
Lecturas horarias
maps.aguasdevalencia.es
ALGEMESI
Actuaciones Ávalon
Fecha (inicio real, inicio previsto)
Agrupaciones
Tipos
Tareas
SANEAMIENTO
CALIDAD
MANT. INSTALACIONES
MEJORA RENDIMIENTO
MANT. RED
VERTIDOS
GIS
CONTADORES
TRABAJOS GENÉRICOS
ACOMETIDAS
Estados
Inicial
En curso
Descartado
Finalizado
Cerrado
REVISIÓN, INSPECCIÓN SANEAMIENTO(2022/238574-1)
EL CLIENTE INSISTE EN QUE ES INSOPORTABLE EL RUIDO QUE HACE ESTA TRAPA Y SEGUN EL ES URGENTE UNA SOLUCION, SI NO SE PUEDE REPARAR QUE SE CAMBIE. HABLAR DIRECTAMENTE CON EL Y QUE NOS CONFIRME LA TRAPA QUE ES
Dirección: Avinguda Del País Valencià, 124, Algemesí, Algemesí, España
Fecha de inicio prevista: 15-07-2022 a las 00:00:00
Abrir actuación en Ávalon
MANTENIMIENTO RED SANEAMIENTO(2022/238574-2)
CAMBIAR TRAPA 600 AVD. PAIS VALENCIA CON PARDINES
Algemesí
750 - ALGEMESÍ
aguas de valencia
El tiempo Algemesí
Depósito Algemesí
Planta Tratamiento Carbón Activo
Grupo de Presión Algemesí
A desagüe
Caudal total actual
302 m³/h
ALGEMESÍ
Polígono Industrial Cotes
Polígono Industrial Pepe Miquel
EBAP
Pozo Nº1
Pozo Nº2

IT chaos

Holistic Data Management and Analytics Platform

Data integration for an End to End Water Cycle Monitoring and Optimisation



Translate your strategic goals into higher performance with Xylem Vue

5 Data fusion and analysis
transforming system data into reliable forecasts through machine learning for real-time decision support

4 Data management
bringing data together from multiple sources into on-site or cloud-based management systems, providing data cleaning and organization for unlimited access to relevant insights

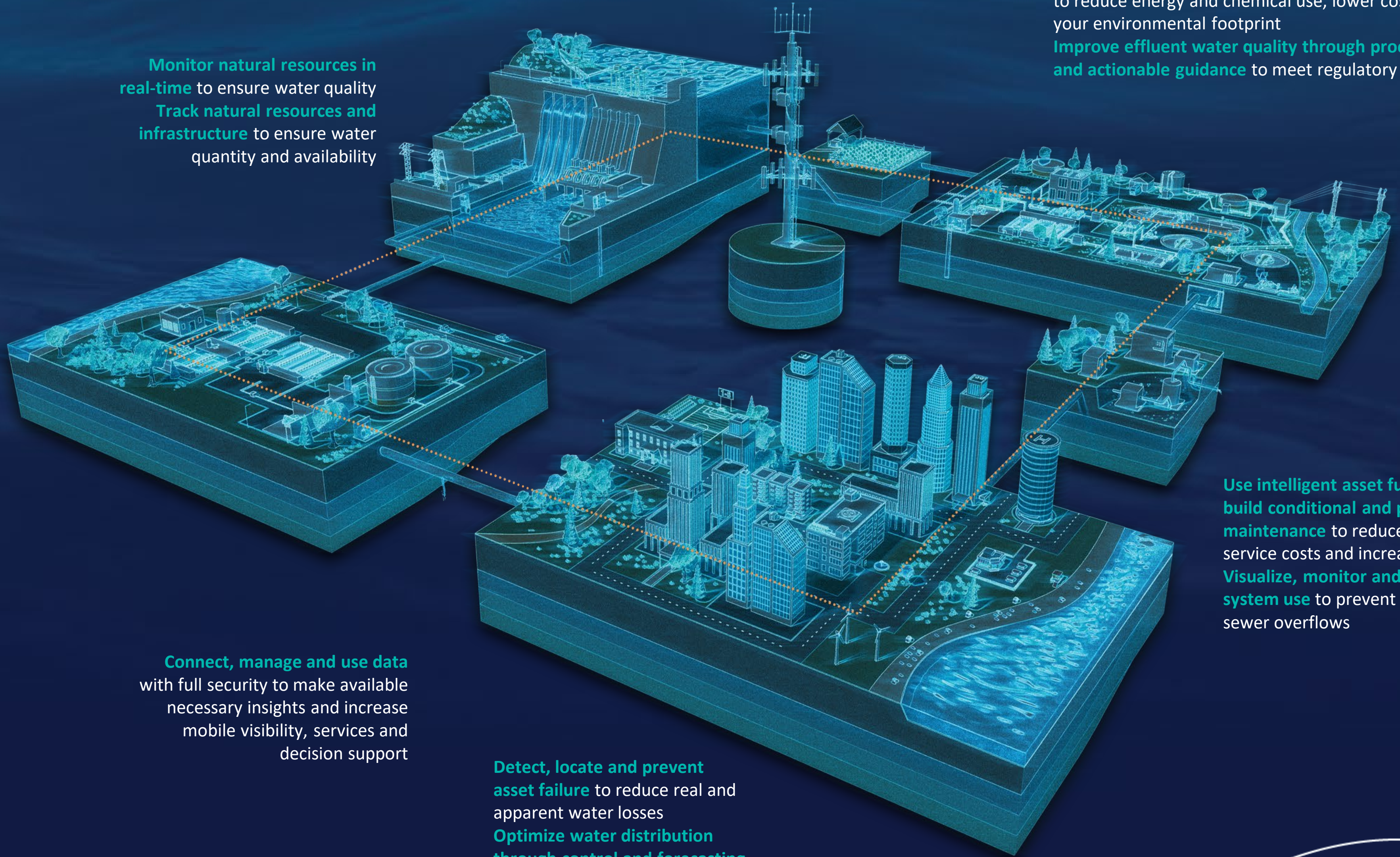
3 Data collection and communication
discrete data point collection, transmission and storage; instructing sensors and actuators about what data to collect and actions to execute

2 Sensing and control
interfaces between the physical layer and network data systems

1 Physical assets
equipment that performs mechanical, hydraulic or analytic functions

Monitor natural resources in real-time to ensure water quality
Track natural resources and infrastructure to ensure water quantity and availability

Simulate wastewater processes and enhance control to reduce energy and chemical use, lower costs, and minimize your environmental footprint
Improve effluent water quality through process forecasts and actionable guidance to meet regulatory compliance



Use intelligent asset functionality to build conditional and predictive asset maintenance to reduce callouts, mitigate service costs and increase asset life
Visualize, monitor and optimize system use to prevent flooding and sewer overflows

Connect, manage and use data with full security to make available necessary insights and increase mobile visibility, services and decision support

Detect, locate and prevent asset failure to reduce real and apparent water losses
Optimize water distribution through control and forecasting to ensure quantity and quality at the lowest cost

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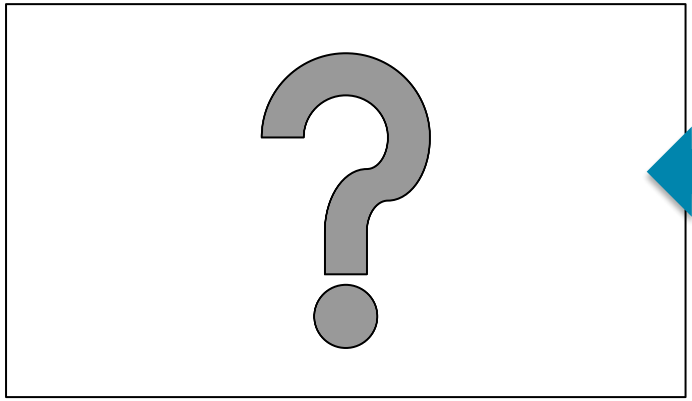
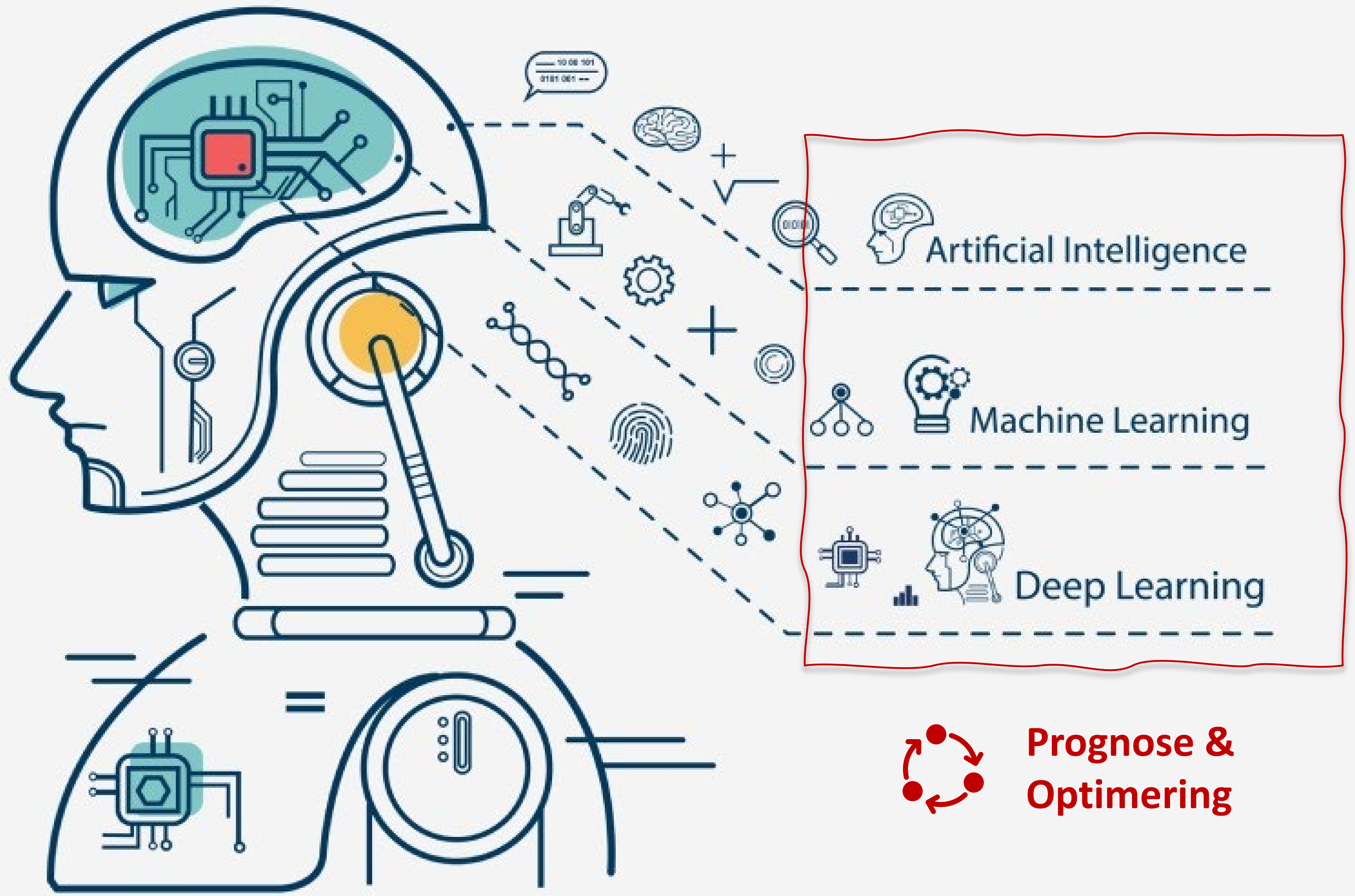
ETAP
go-aigua
M1 M2 M3 M4
Operación
Dashboard
Caudal de entrada
1.750 l/s
Nivel CJT
2,23 m
Depósitos de salida
Caudales de salida
Valencia 2.018 l/s
Horta Sud 205 l/s
Albal 197 l/s
Picassent 67 l/s
Alcalans 41 l/s
Total 2.528 l/s
Captación
Turbidez 0,8 NTU
COT 2,3 mg/l
Calidad del agua bruta
Apta
Decantación
Turbidez 0,55 NTU
40% Reducción
COT 1,85 mg/l
20% Reducción
Dosis policloruro
25 ppm
16 ppm Recomendado
Filtración
Turbidez 0,09 NTU
40% Reducción
COT 1,5 mg/l
20% Reducción
Partículas 10 part/ml
Lavado de filtros 9/18
Desinfección
Ozono 0,6 ppm
CLR
Decantada 0,8 ppm
Filtrada 1,3 ppm
1,2 ppm
Leaks / Port de Sagunt / Dashboard
go-aigua
Dashboard
Water balance
Service connections
Flow metrics
Pressure
Alarms
Sensors
O-Leaks
30 Alarms
Type of connection
Hydraulic efficiency
Floods / Calpe / Map
go-aigua WASTEWATER
English
Floods
Time until event: 7 hour(s)
2022/02/09
15:00
Map
Alerts
Forecast
Historic
Simulation
Sensor on 559
No incoming events
Current rainfall: 0.0 mm/h
Current sensor level 144.01 mm
Current sensor flow 264.45 m3/h
Simulated sensor level 138.88 mm
Simulated sensor flow 459.28 m3/h
Telelectura / Dashboard
go-aigua
Telelectura
Dashboard
Rendimiento de lectura
Contadores
60
Red fija
61%
Monitorización
36%
36%
Alarmas
15
Rendimiento tecnología
My operation/SARS Analytics
go-aigua WASTE WATER
My operation
Dashboard
Work Orders
Laboratory
Alarms
15°C
Muestras - estado general
53
Muestras analizadas
32
Muestras en curso
21
Muestras pendientes
Puntos de muestreo
85
Puntos totales
53
Puntos activos
Costos asociados
Personal
Logística
Material
Otros
Planificación
Vista mensual
20/05/2020
Mon Tue Wed Thu Fri Sat Sun
Muestras analizadas
Muestras pendientes
I&I / Dashboard
go-aigua
I&I
Dashboard
Work orders
Wastewater balance
Average per km of network in the last 15 days
Q total
1,208.24 m3/day
Q non revenue (5.86%)
70.84 m3/day
Q revenue (94.14%)
1,137.40 m3/day
Non-revenue flow evolution
Reset zoom

What is possible today and what is the future?



Artificial Intelligence, Machine/ Deep Learning

Defintions and terminologies



https://www.readspeaker.ai/blog/deep-learning-vs-machine-learning/

Artificial intelligence

- The theory and development of computer systems to perform tasks that normally require human intelligence.

Machine learning

- Allows the computer/algorithm to learn without being explicitly programmed to do so

Deep learning

- Machine learning algorithms with a structure of algorithms (similar to the brain) called artificial neural networks

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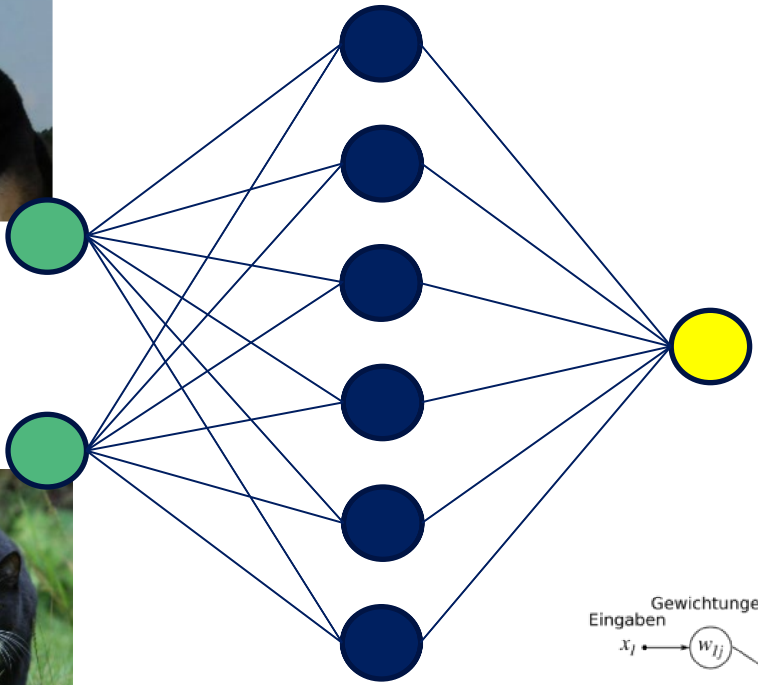
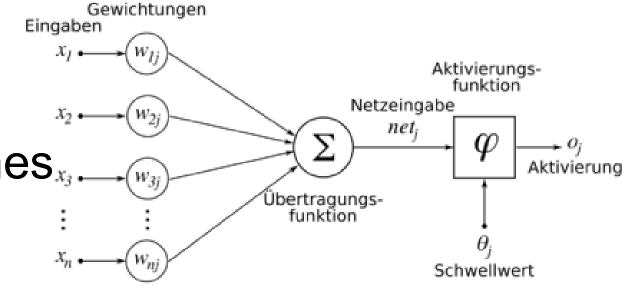
Artificial Intelligence, Machine/ Deep Learning

Prinziples of artificial neural networks



Artificial Neurones



Input

Output

Artificial intelligence

- The theory and development of computer systems to perform tasks that normally require human intelligence.

Machine learning

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- Machine learning algorithms with a structure of algorithms (similar to the brain) called artificial neural networks

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Artificial Intelligence, Machine/ Deep Learning.

Examples: These people do not exist

https://this-person-does-not-exist.com/en

Artificial intelligence

- The theory and development of computer systems to perform tasks that normally require human intelligence.

Machine learning

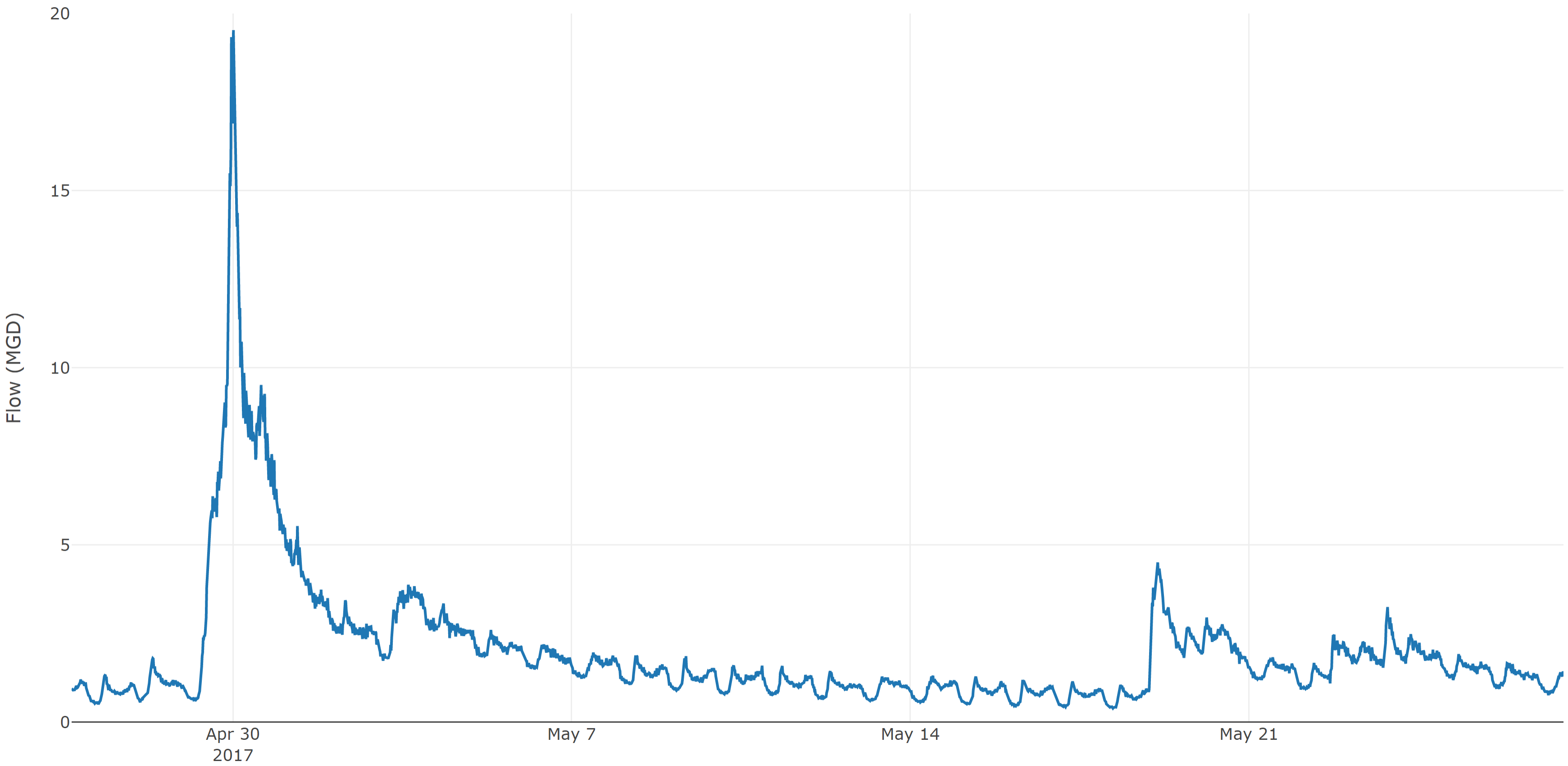
- Allows the computer/algorithm to learn without being explicitly programmed to do so

Deep learning

- Machine learning algorithms with a structure of algorithms (similar to the brain) called artificial neural networks

Kansas City, Missouri, USA

Measured Flow



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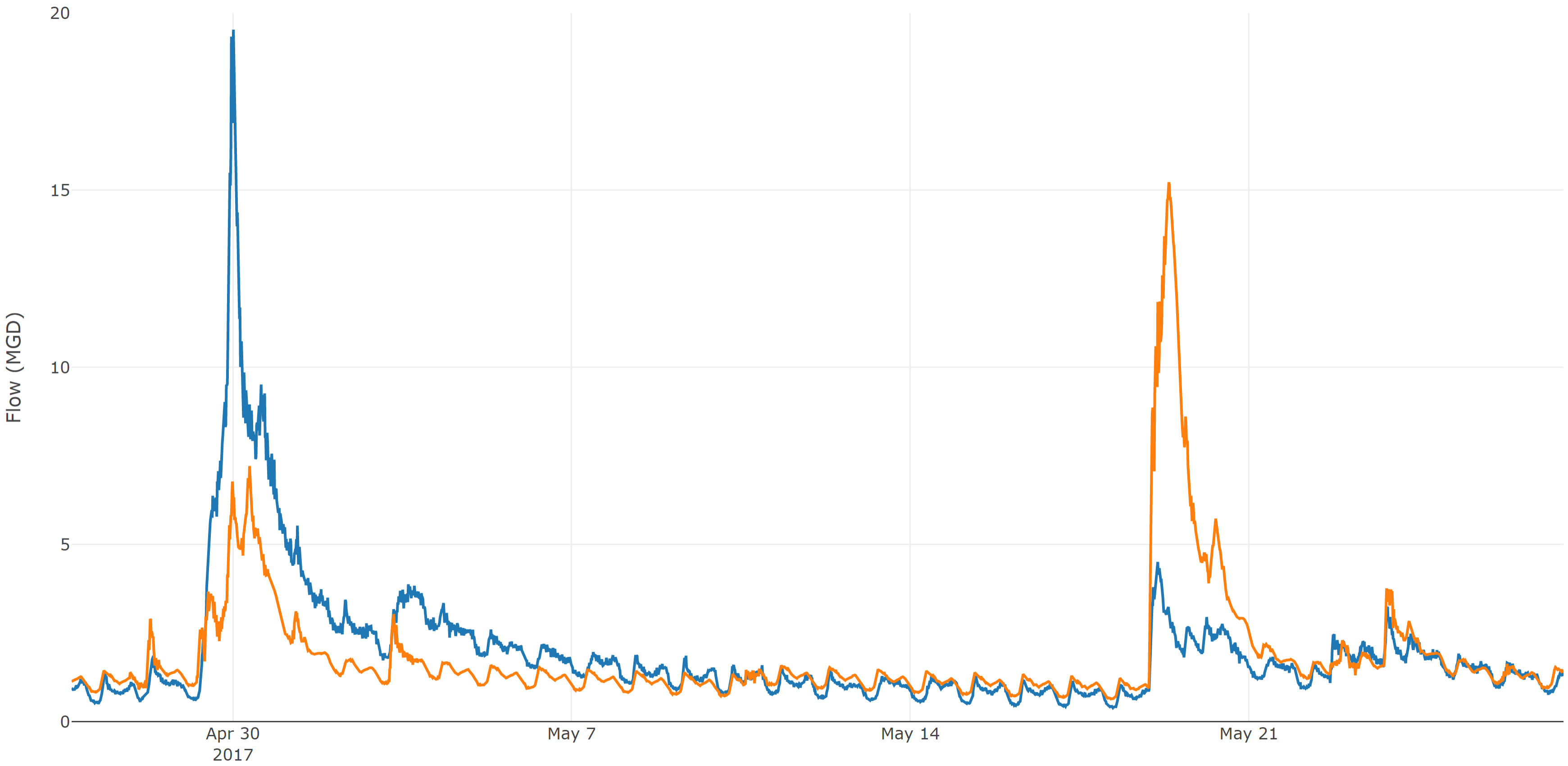
Kansas City, Missouri, USA

CHRS: 5 weeks training (10 events)



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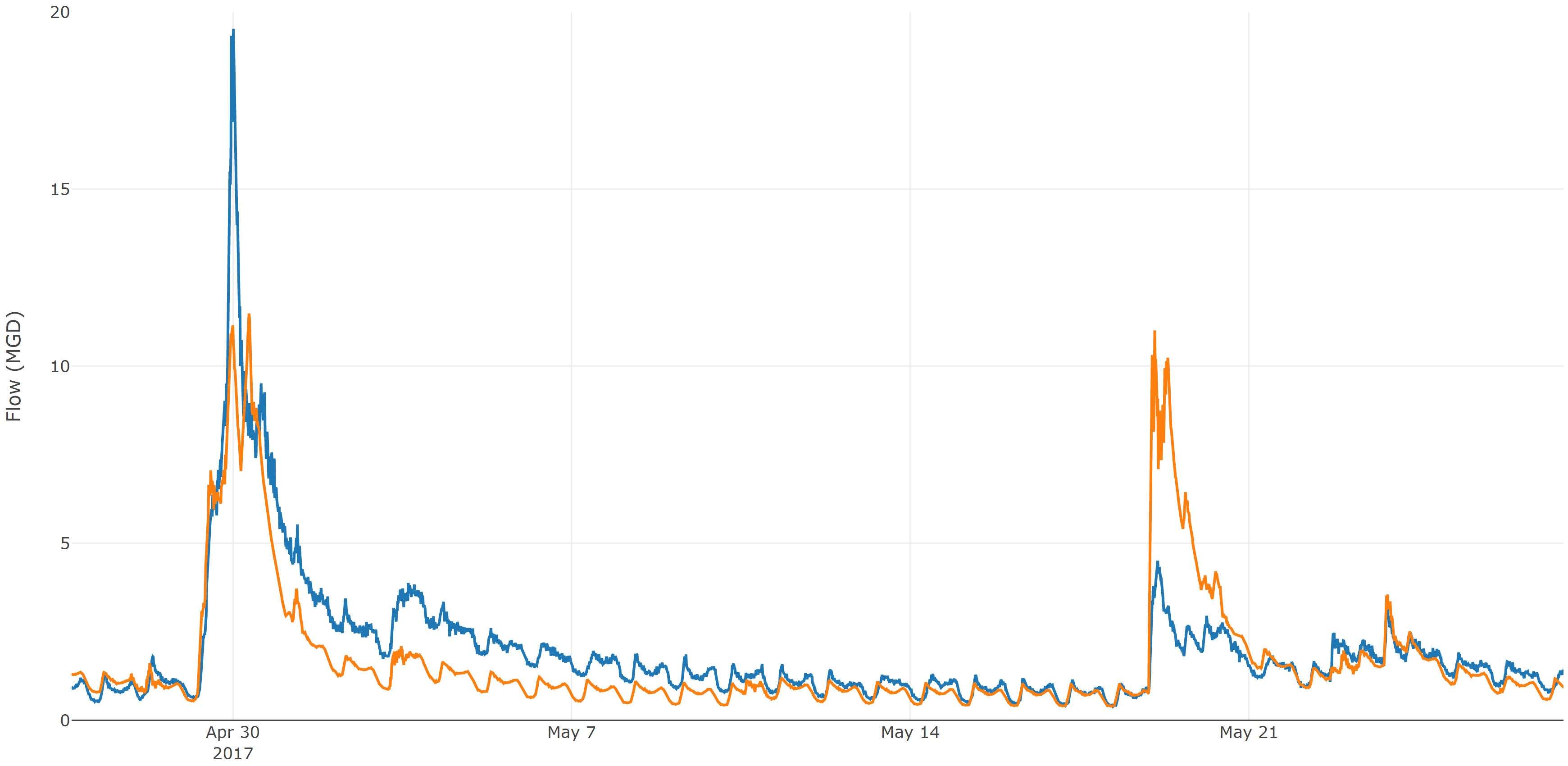
Kansas City, Missouri, USA

CHRS: 7 weeks training (12 events)



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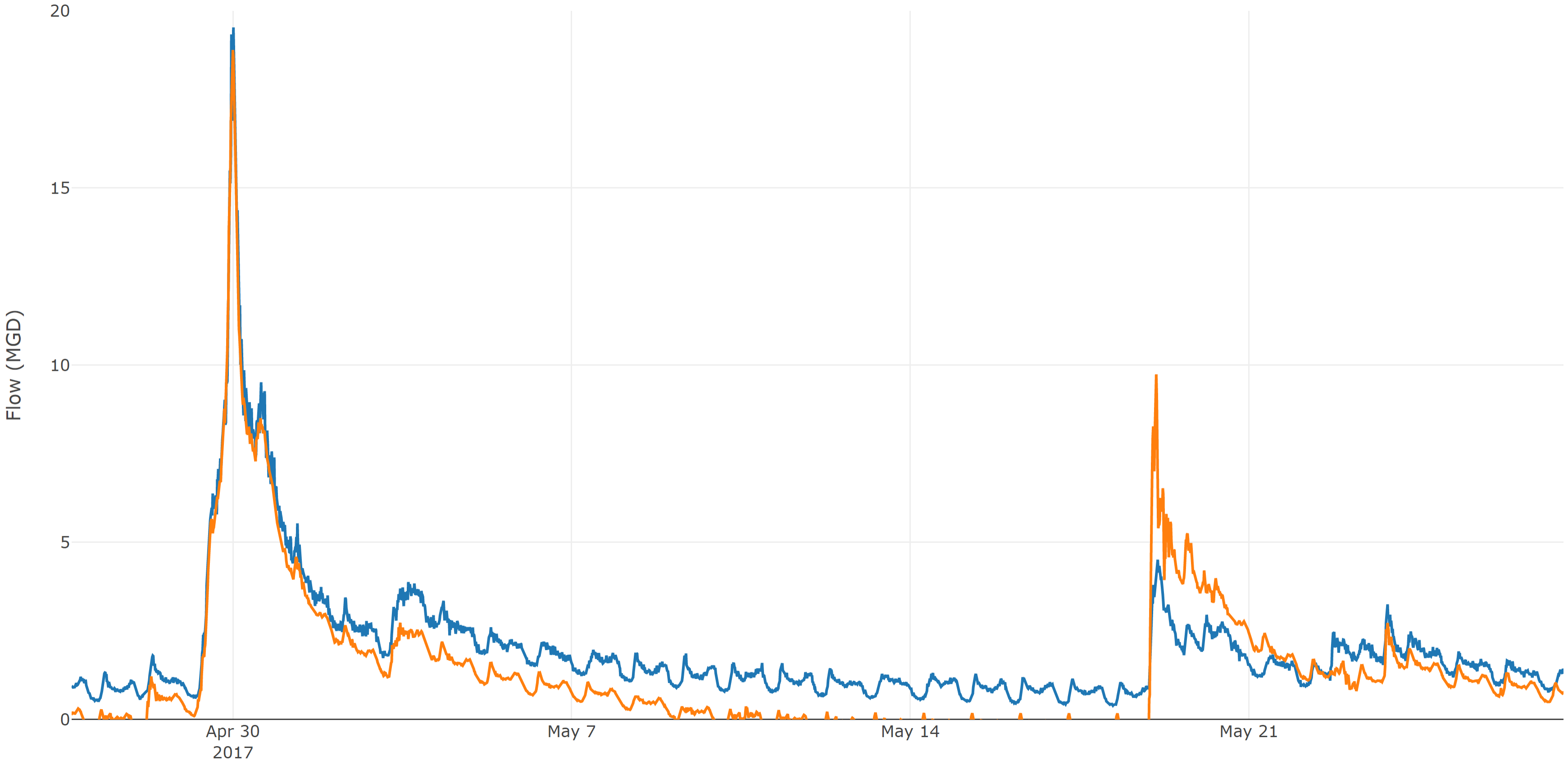
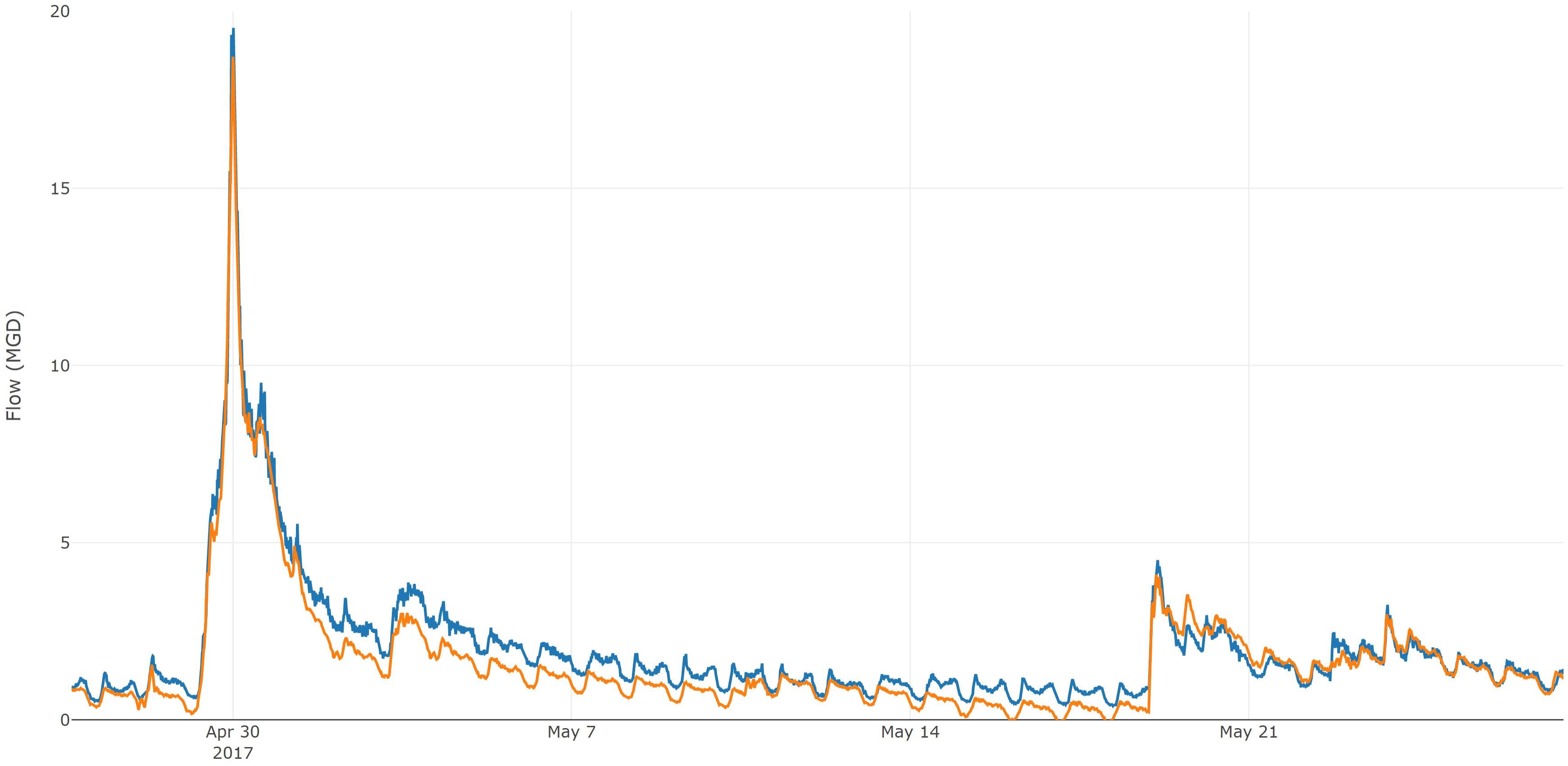
Kansas City, Missouri, USA

CHRS: 10 weeks training (19 events)



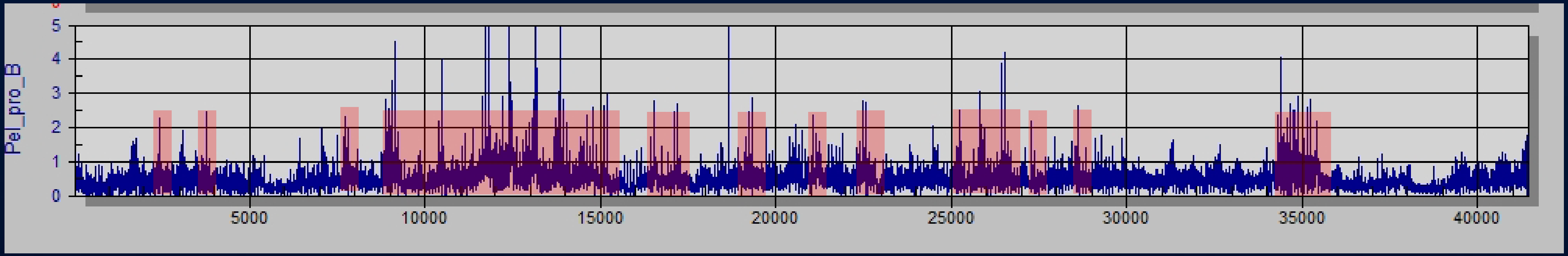
Kansas City, Missouri, USA

CHRS: 15 weeks training (31 events)

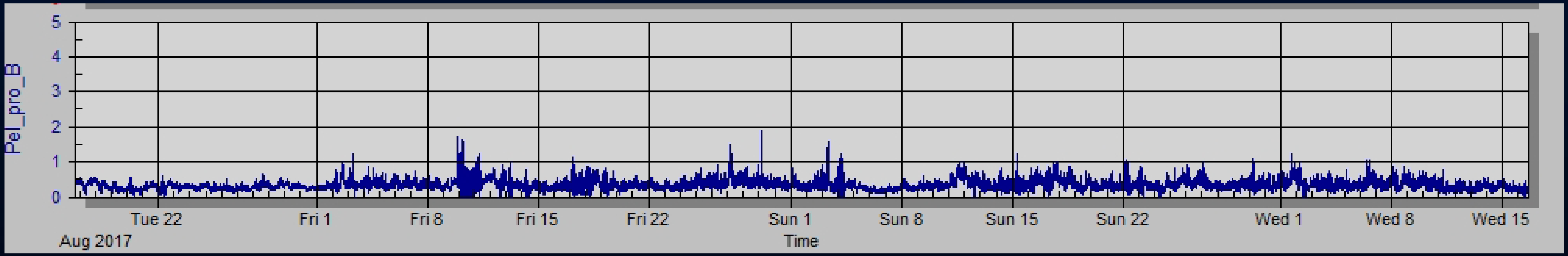


Energiforbruk (kWh/kg)

Før optimimalisering



Etter optimimalisering



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EWE WASSER GmbH

Cuxhaven, Germany

30%
reduction in aeration energy usage

1.2 MILLION
kWh saved annually

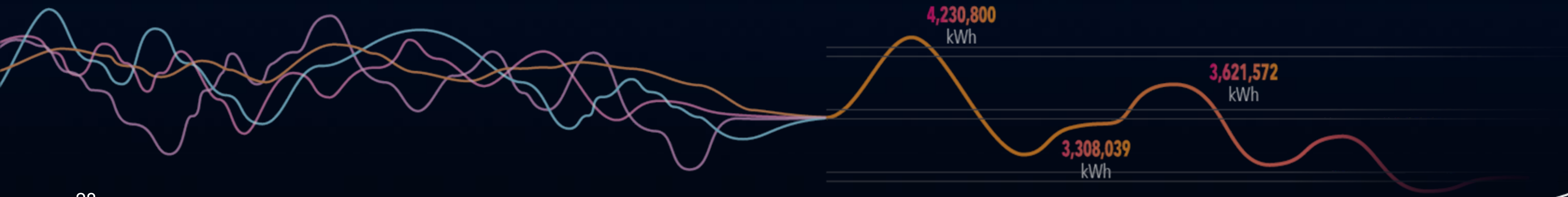
By optimizing operations, the utility saw a drastic reduction in unnecessary plant fluctuations and prevented situational peak energy consumption – saving enough energy to power 64 homes for one year.

CHALLENGE

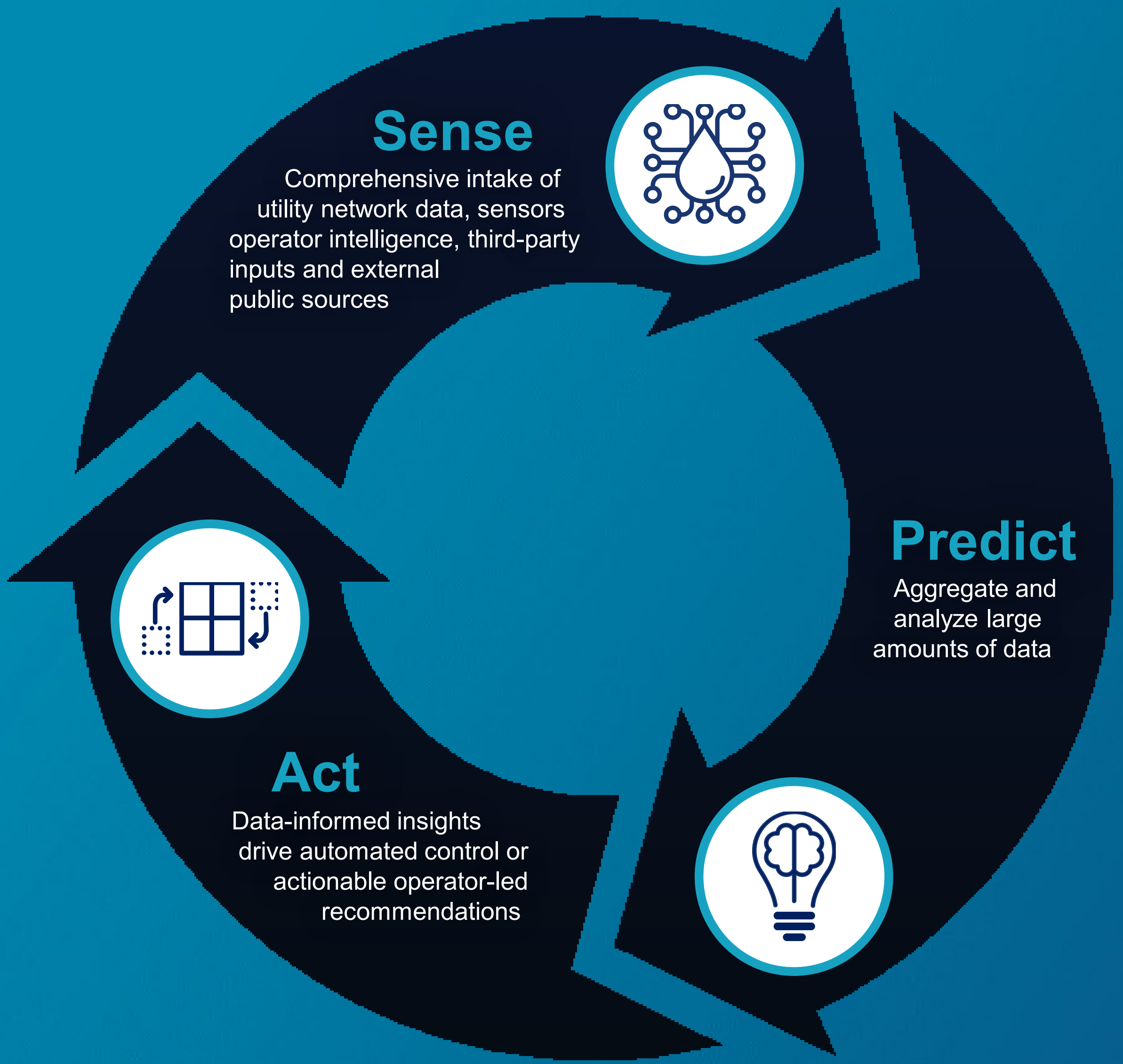
EWE proactively aimed to optimize energy consumption and improve safety with better system control of chemical usage at the Cuxhaven treatment plant.

SOLUTION

Treatment System Optimization, a real-time digital monitoring and modeling solution that marries real-time input data and plant models to provide analysis, insight and control so plant managers can visualize, optimize and manage their treatment plant operations safer and at reduced cost.

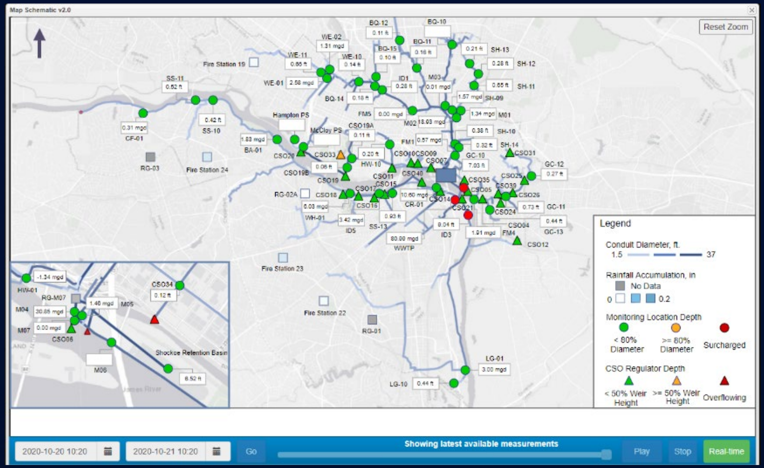


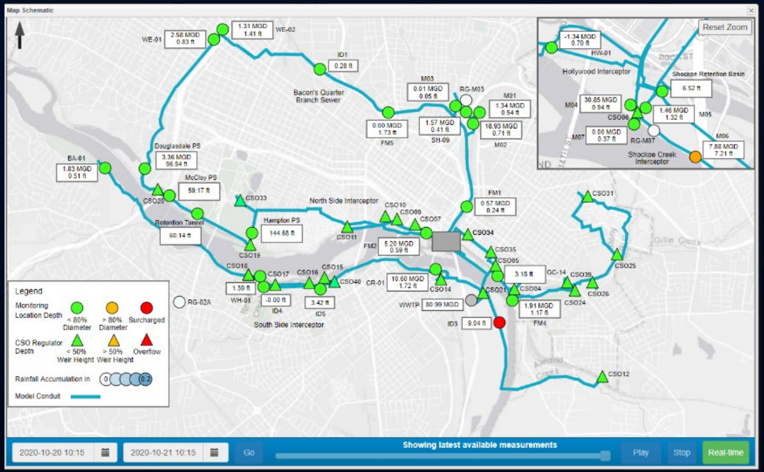
Continuous system improvement drives transformational outcomes

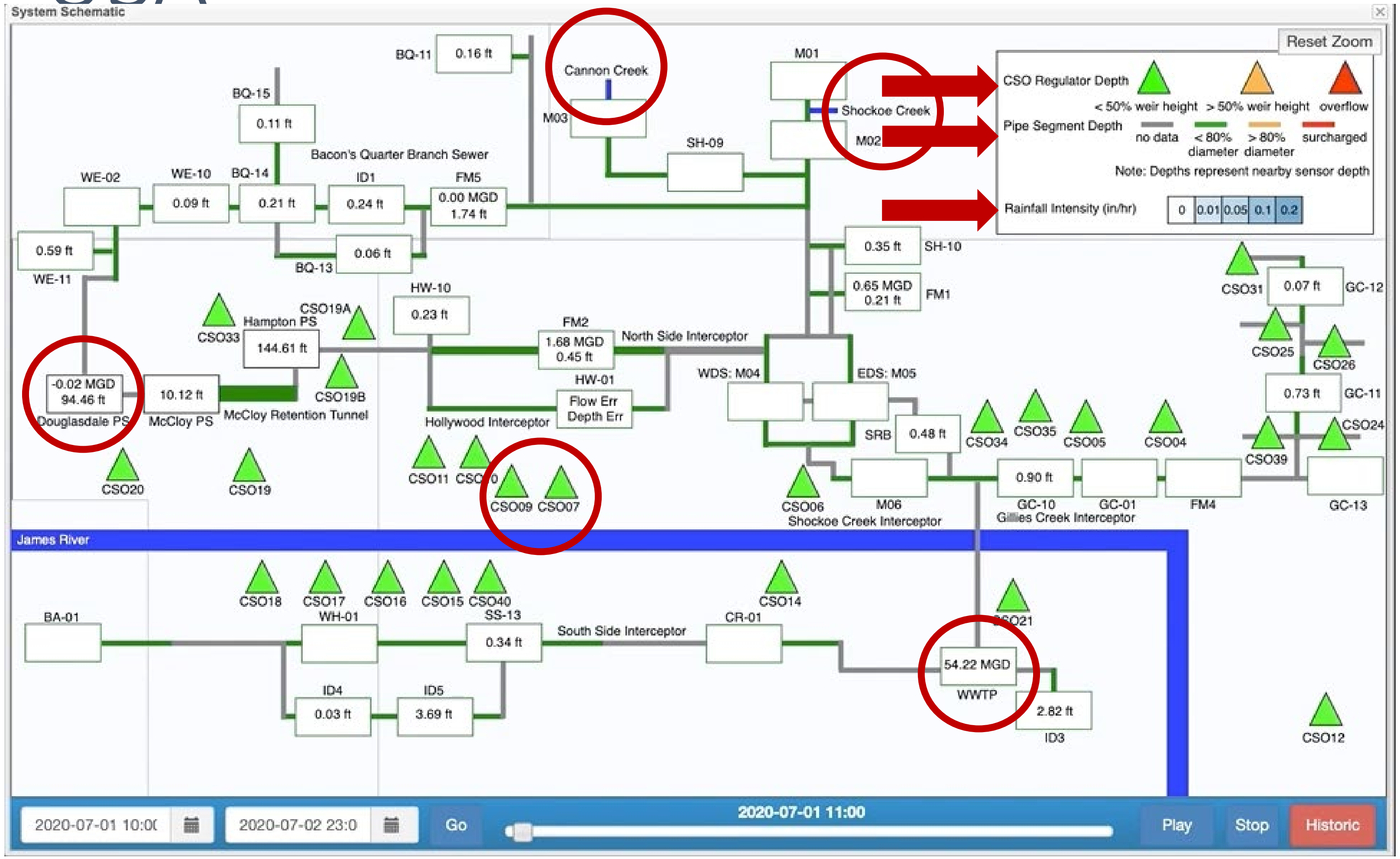


SENSE Turn on the Lights!

Example interface Richmond, USA







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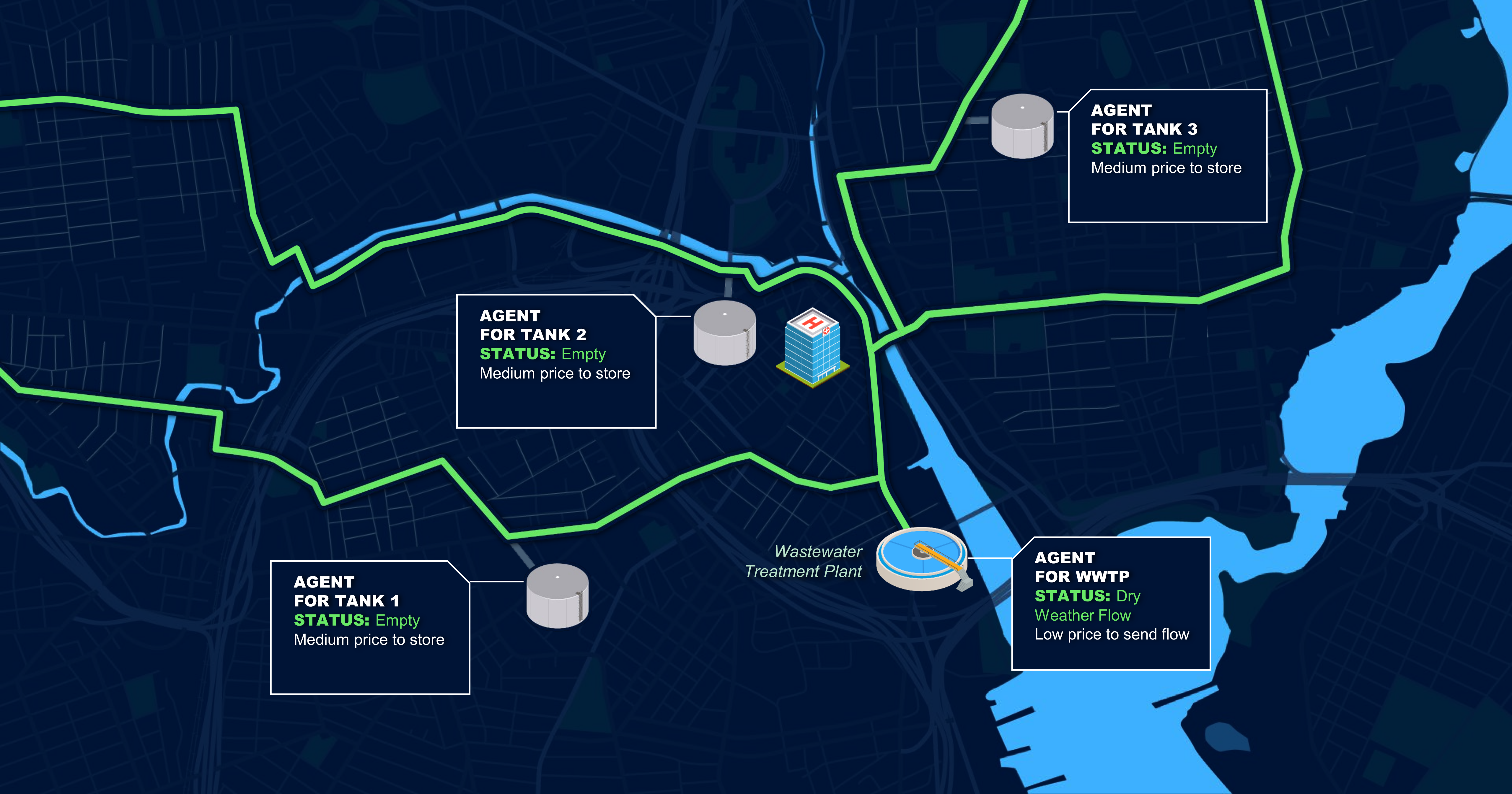
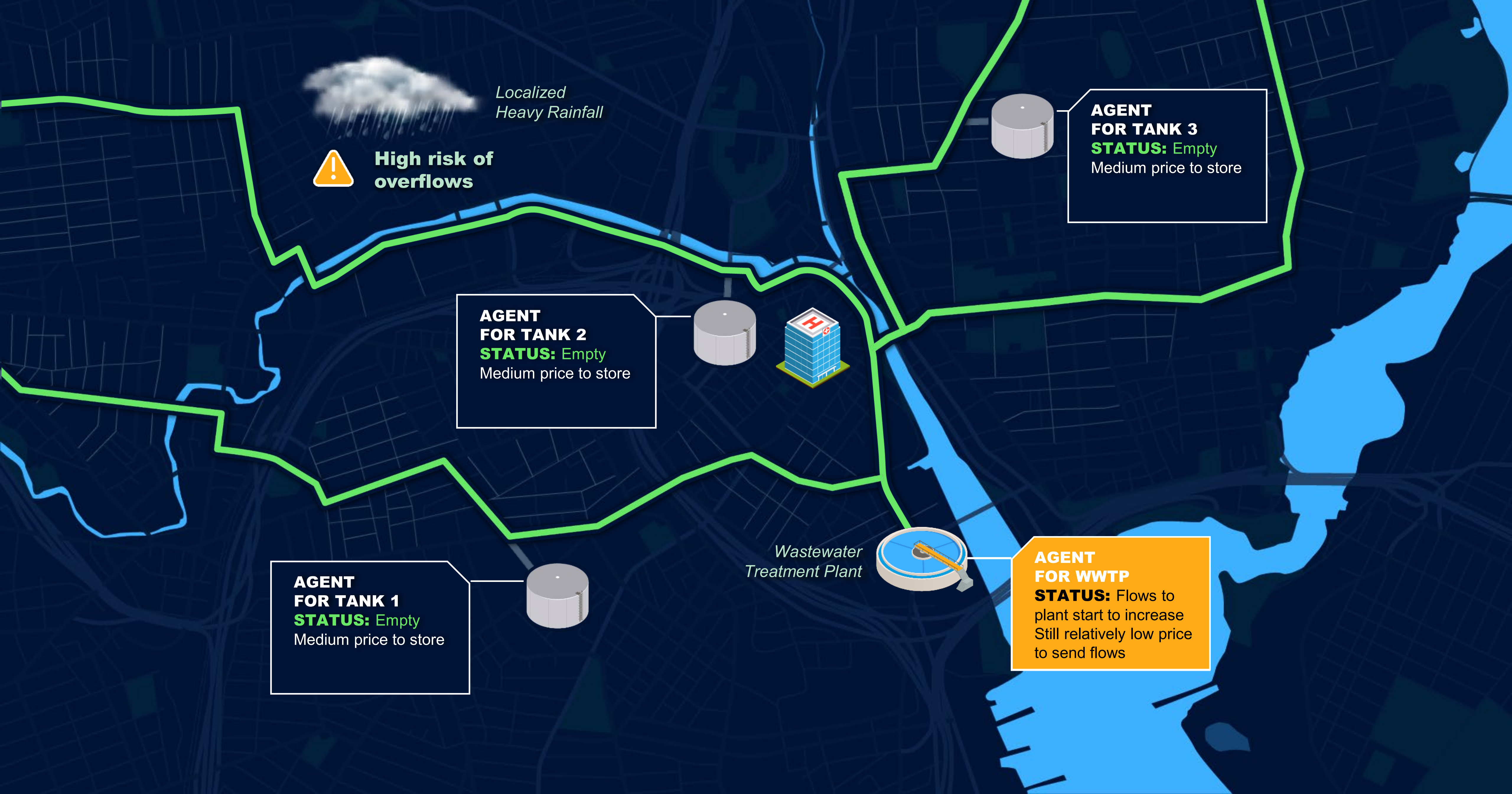
Market Based Optimization (MBO)



Rainfall is coming, increasing risk in the network…



WWNO commands assets in balanced way

Rainfall decreases…

Network returns to dry weather conditions and strategy

The Path to Optimized Performance Across the Water Cycle

Leveraging technology to support clients in Water and Wastewater

Physical Assets

Sensing

Platform & Data Integration

Smart Water Engine

Analytics, Optimization and Real-Time Decision Support

Unified System Management

Event Detection

Distribution Network Real-time Decision Support

Water Loss Management

Wastewater Quality

Collection Network Real-time Decision Support

Smart Metering

Asset Management

Plant Real-time Decision Support

Operational Intelligence

Service Operations Center

Xylem Vue powered by GoAigua Architectuur

Real-time monitoring and actions on key indicators

Service Operations Center | BI Connectors | Dashboards & Reporting

→ Operational intelligence

Analytics, Optimization and Real-Time Decision Support

- Unified Network Management
- Unified Plant Management
- Leak Detection & Localization
- Meter Data Analytics
- Real-time What-If Scenarios
- Network Real-time Decision Support
- Biological Monitoring
- Clog Monitoring
- Flood (SSO) / CSO Prediction & Prevention
- Plant Real-Time Decision Support

→ Modulair data applications / modules

IoT Core | **Domain Master Data** | **Data Science Framework** | **GIS Framework**

→ Integrated Smart Water Engine

AMI/AMR | Sensors | SCADA, PLCs & IoT Sensors | Distributed Databases | GIS, CMMS

→ Vendor agnostic, integrates with any technology

Over 120 protocols/systems supported

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City of Grand Rapids

Grand Rapids, Michigan, United States

€835M

reduction in estimated costs to achieve regulatory compliance

The City demonstrated that, by focusing on a few critical areas needing improvement, its infiltration and inflow problem could be solved for EUR 25-45 million as opposed to the original EUR 880 million estimate.

CHALLENGE

For compliance purposes, the City needed analytic data to certify infiltration and inflow performance, and how their system behaved during a variety of wet and dry weather conditions.

SOLUTION

Wastewater Network Optimization, a real-time digital monitoring and modeling solution that leverages sensor data, hydraulic monitoring and machine learning to help utilities visualize, predict and control their wastewater networks more efficiently.

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Buffalo Sewer Authority

Buffalo, New York, United States

11 MILLION+ M3 reduction in CSOs

€127M+ reduction in CapEx spending

"Our real-time control program, led by the team at Xylem, has delivered more than four times the expected performance. It is hands down the most cost-effective program in our long-term control plan."

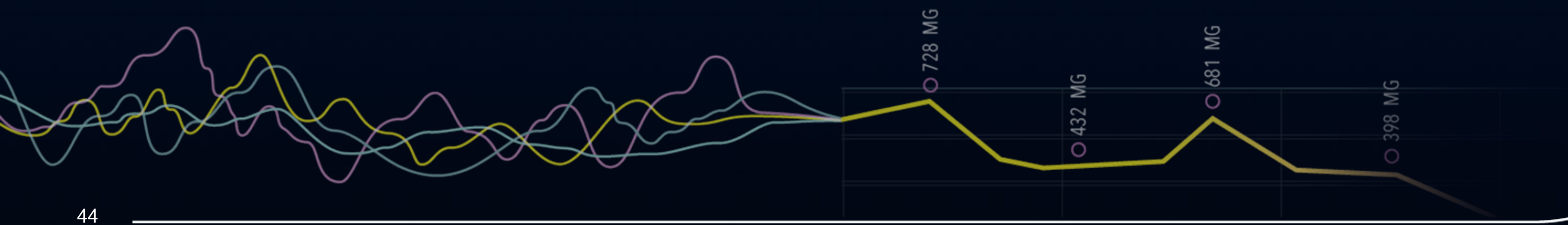
– OJ McFoy, General Manager

CHALLENGE

The City faced a EUR 335 million Long-Term Control Plan as a result of nearly 7,5 billion liters of combined sewer overflow annually into receiving waterways.

SOLUTION

Wastewater Network Optimization, a real-time digital monitoring and modeling solution that leverages sensor data, hydraulic monitoring and machine learning to help utilities visualize, predict and control their wastewater networks more efficiently.



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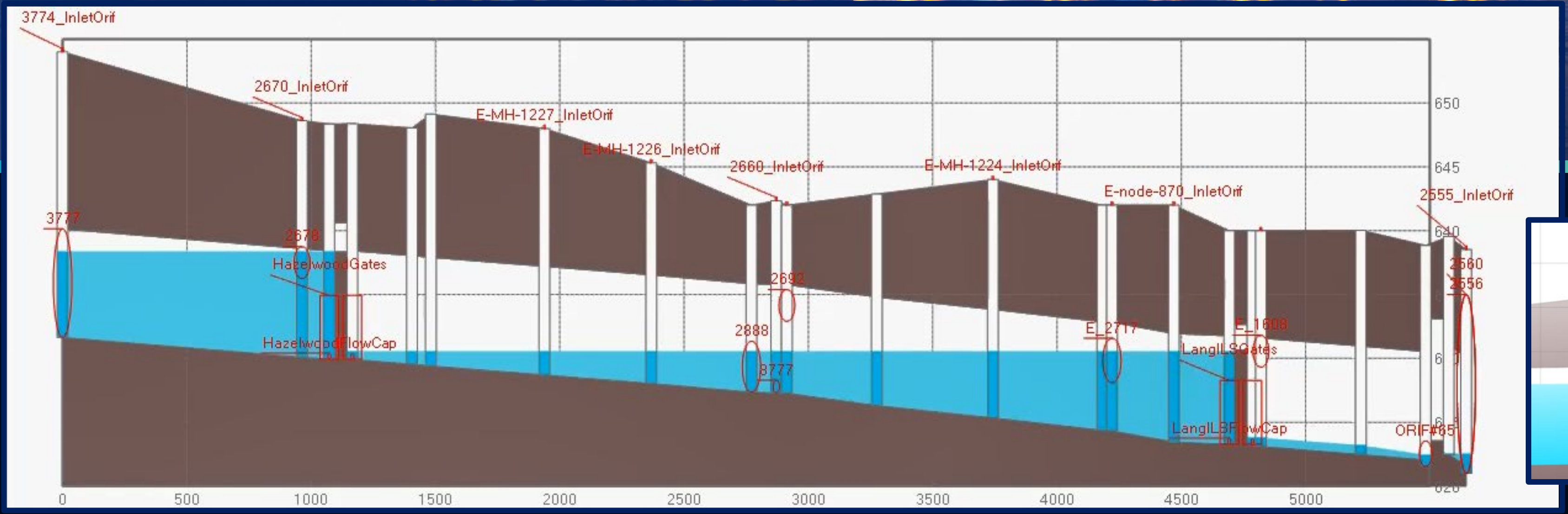
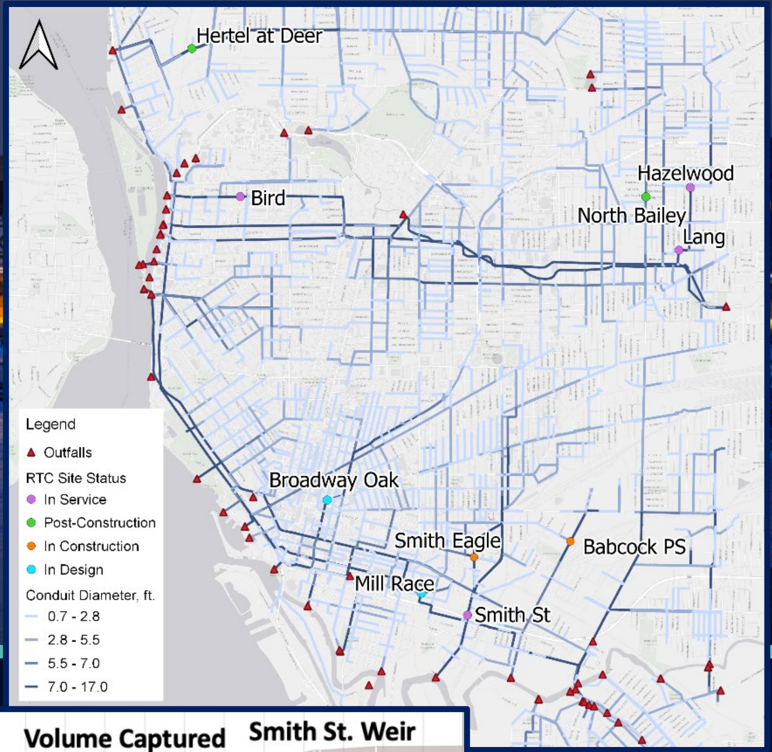
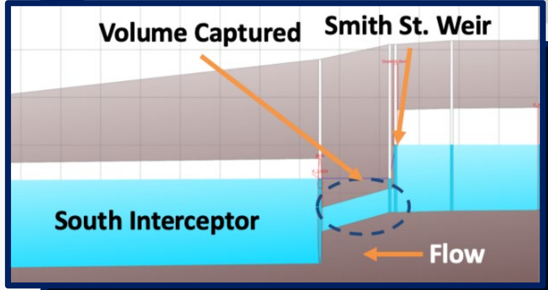
Buffalo, New York, United States

Buffalo Sewer Authority

- **Real Time Control Strategies:**
- **Coordinated inline storage**
- **Pump station optimization/storage**
- **Recapturing overflow volume**
- **Dynamic underflow**







Hazelwood

Lang Ave

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City of South Bend

South Bend, Indiana, United States

- Population: 100,000
- Median Household Income: EUR 30.000
- Consent Decree: EUR 750 million
- 3,8 Billion Liters Annual CSO Volume

3,8 MILLION+
M3 annual reduction in CSOs

€ 440M+
estimated CapEx savings

" We spent 440 million EUROS less than originally estimated, achieving the same environmental benefit and level of service, just by optimizing the existing system in the ground."

– Eric Horvath, Director of Public Works

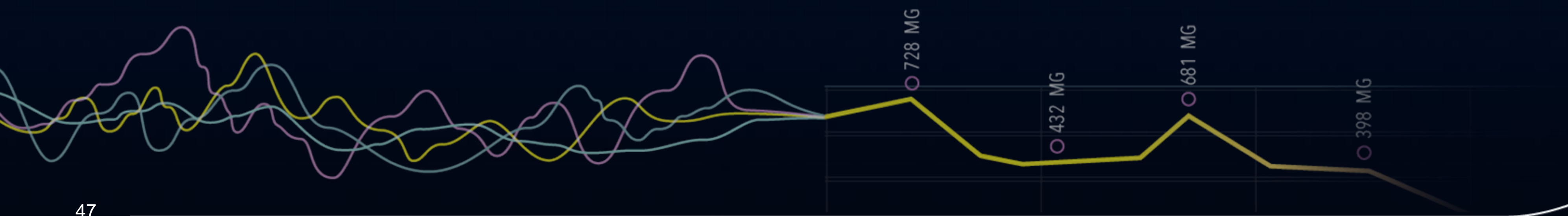
CHALLENGE

Average of 3,5 – 7,5 billion liters of combined sewer overflow annually into the Saint Joseph River.

The City faced a Long-Term Control Plan of more than EUR 750M.

SOLUTION

Wastewater Network Optimization, a real-time digital monitoring and modeling solution that leverages sensor data, hydraulic monitoring and machine learning to help utilities visualize, predict and control their wastewater networks more efficiently.



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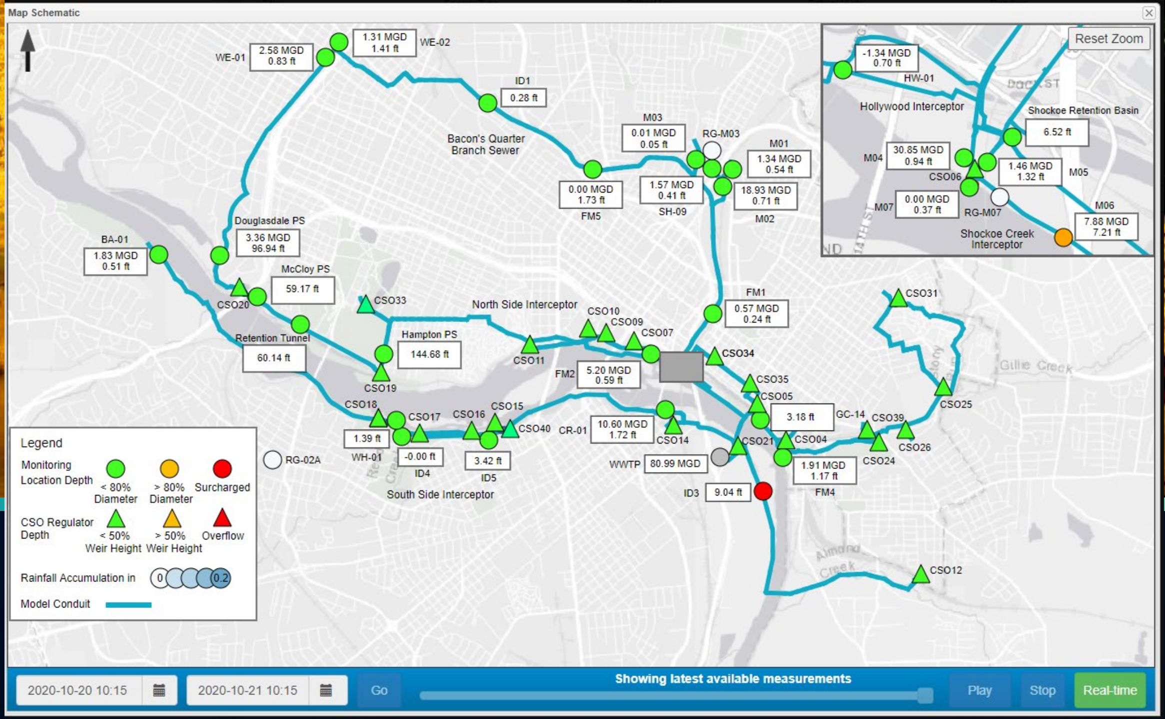
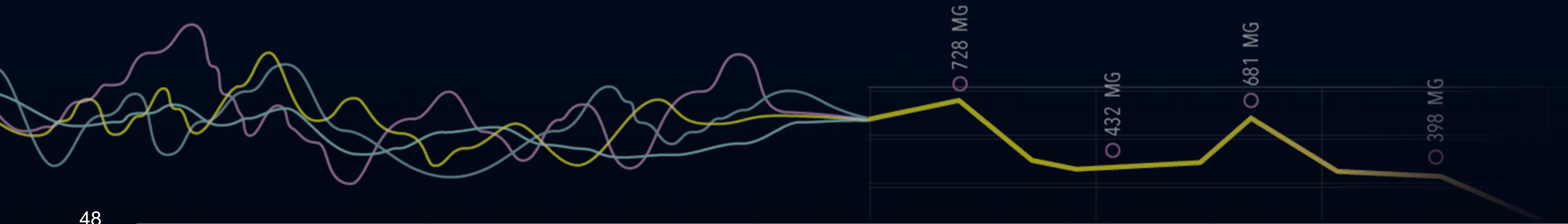
City of Richmond

Richmond, Virginia, United States



SOLUTION

Wastewater Network Optimization, a real-time digital monitoring and modeling solution that leverages sensor data, hydraulic monitoring and machine learning to help utilities visualize, predict and control their wastewater networks more efficiently.



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