

An Analysis of Digital Transformation in Water Governance

Session 1: Modernizing Water Management Through Digital Innovation

October 25, 2023

IWA's Digital Water Programme

- The Digital Water Programme aims to act as a catalyst for innovation, knowledge, and best practices around digitalisation for the water industry, provide a platform to share experiences and promote leadership in transitioning to digital water solutions, and consolidate lessons to guide the natural evolution from the 'business as usual' to achieving a digital water utility.
- The Programme is driven by end users (e.g., utilities, regulators) as well as solution providers (e.g., technology companies, software companies, researchers, academia) at the forefront of emerging technologies to solve urgent and costly operational problems to deliver water services.
- The overall goal of the Programme is to facilitate utility's access to knowledge that enhances the rate of success of their digital initiatives and prowess. The objectives of the Programme ensure this goal can be achieved.

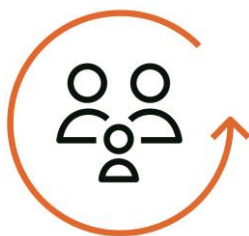


IWA's DWP Committee

- The Steering Committee guides the Programme, ensuring the goal and objectives are consistently achieved.
- The 2023 – 2025 Steering Committee was recently announced, with 55% being female, and 50% representing low- and middle-income countries.
- The Steering Committee is led by Oliver Grievson.



Intro: challenges the water industry is facing



Population increases



Aging assets



Shifting consumption practices driving water demand



Emerging contaminants



High customer expectations



Undervalued by society



Climate change

Sustainability Frameworks: UN Sustainable Development Goals (SDG's)



How we manage water resources impacts multiple SDGs



It is all about answering business questions and empower people with better situational awareness

- **When** to turn on **pumps** and line them up?
- **How** much **DO** to be supplied?
- How much **coagulant** to be added?
- **When** do I send **crews** to clean manholes?
- When should I contact **customers**?
- How many customers will be affected by a potential water main **break or a backup**?
- How to **maintain calm water** networks?
- How much **capacity** will we have next week?
- When should be make an asset offline while maintaining **operational stability**?
- **Can** we continue to **meet permits** next week?
- How many pipes do we need to replace?
- **When and where** to send the crews?

As the **COST** of {digital} technologies, solutions, and services are getting

AFFORDABLE and

deployment **TIMES** are getting

SHORTER ■ ■ ■

■ ■ ■ **answering these questions using data and analytics** are better now than before



Application of Digital Technologies and Solutions



Increase situational awareness through effective use of digital technologies and solutions across the water cycle



Management Insight



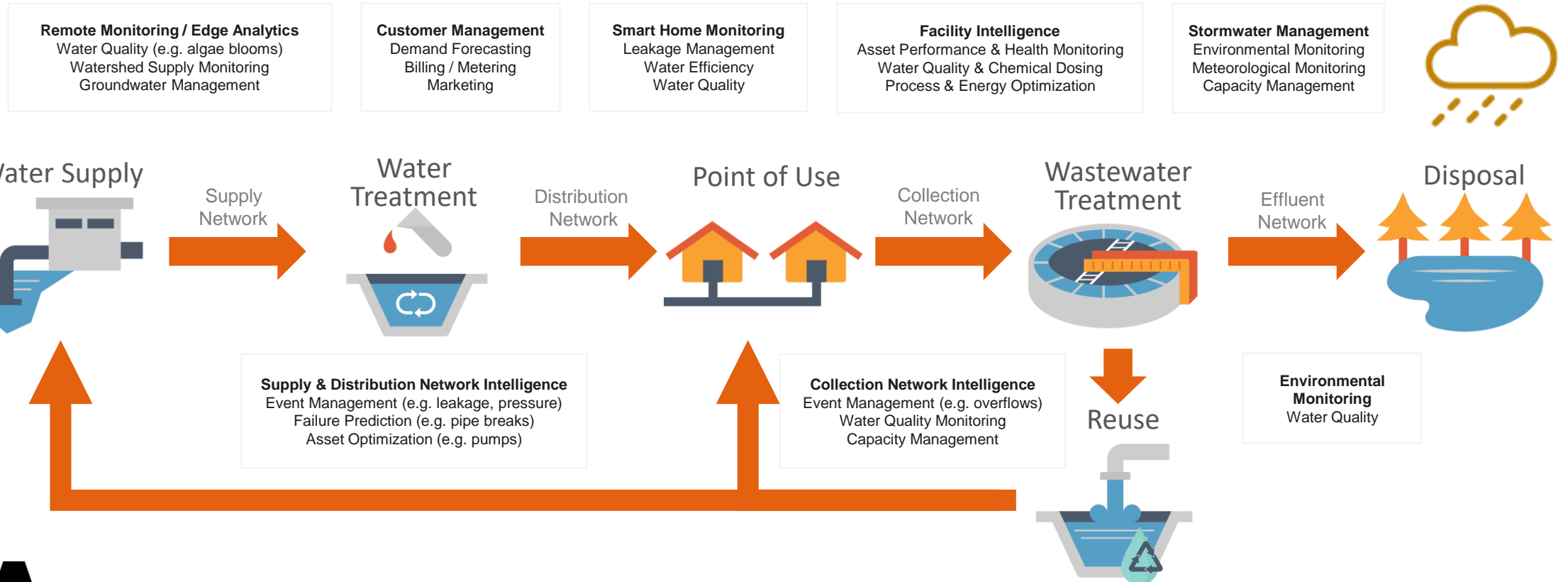
Digital Planning



Smart Capital



Intelligent Ops



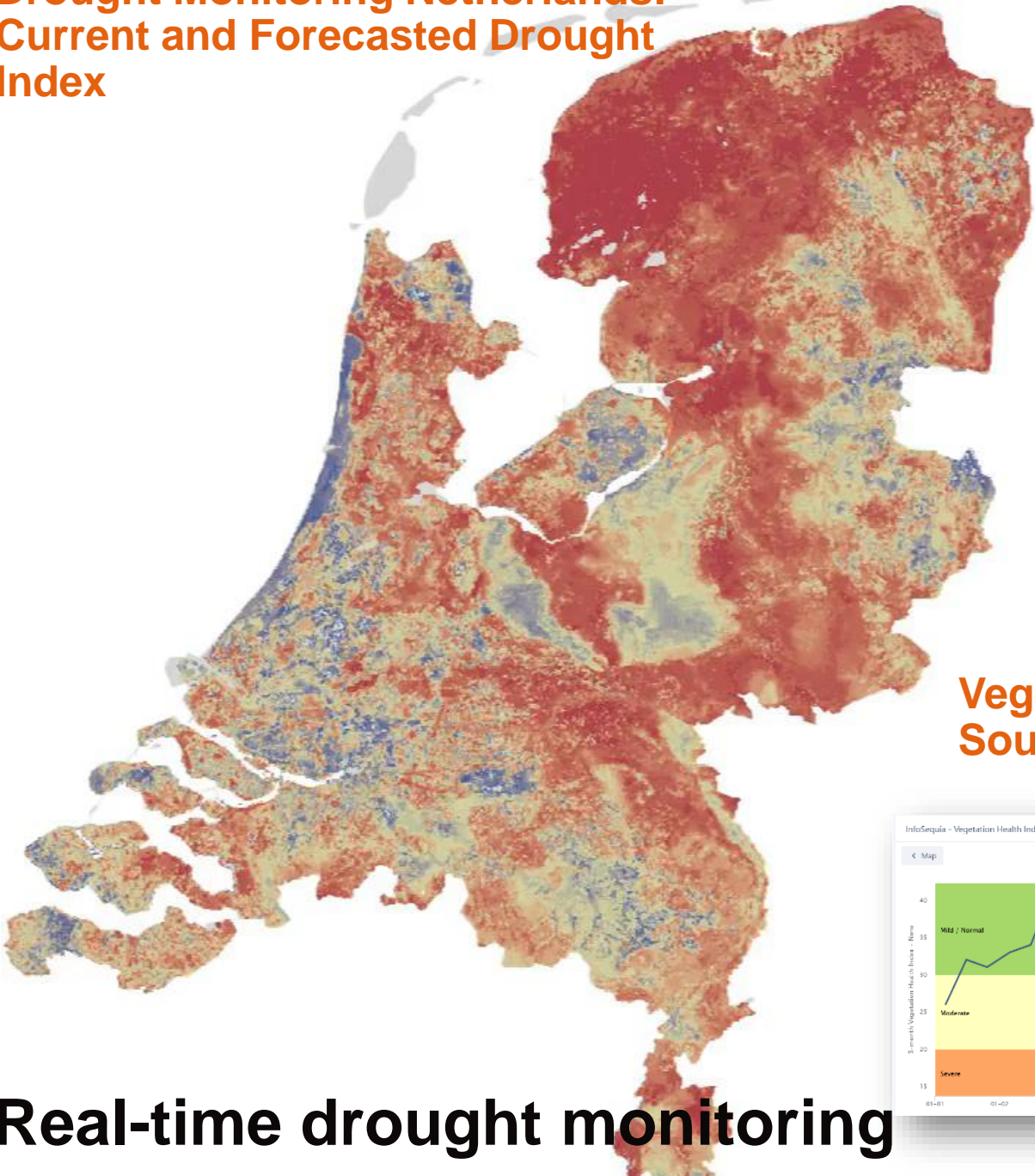
Let's look at few examples...

HydroNET

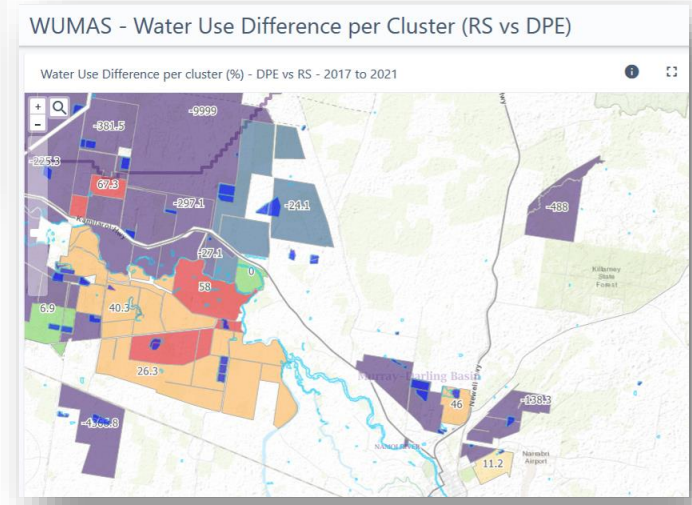
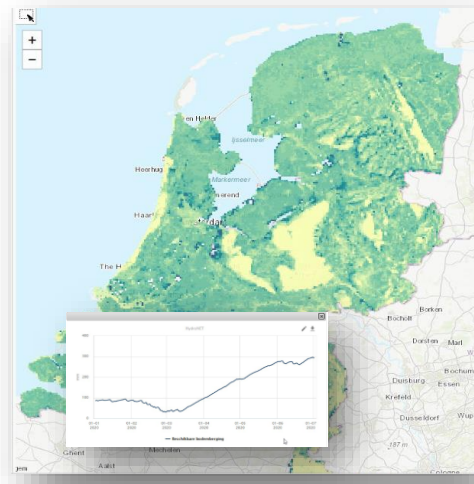
Data Management & Analysis



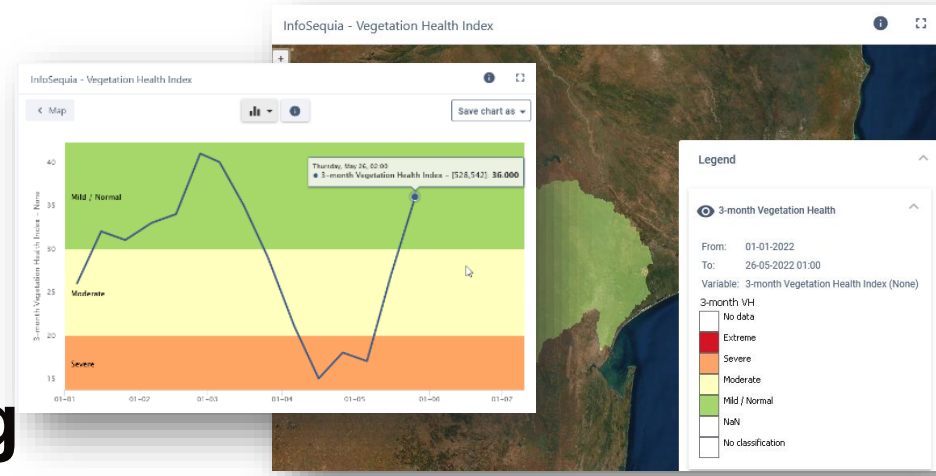
Drought Monitoring Netherlands: Current and Forecasted Drought Index



Water availability monitoring Netherlands



Vegetation health monitoring South Africa



Irrigated water use monitoring Murray- Darling Basin Australia

Real-time drought monitoring

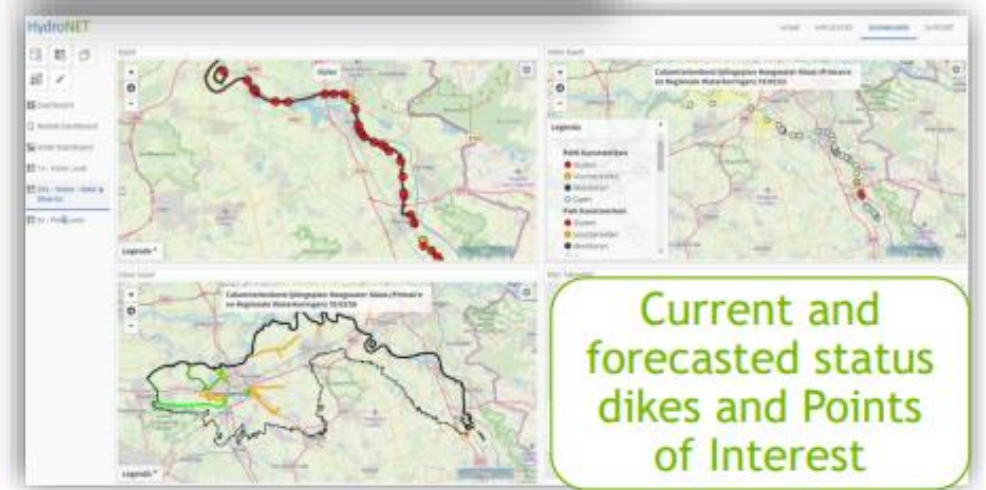
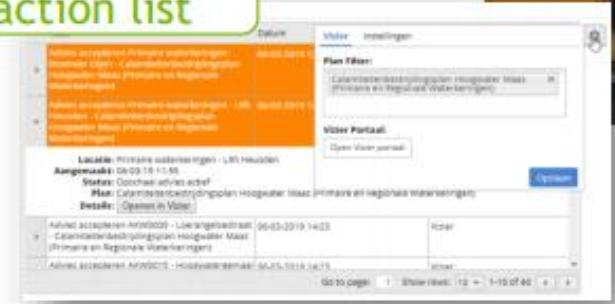
Flood Risk and Emergency Management – Netherlands (VIZIER)



Personalised tasks and action list



Tailored Warnings



Current and forecasted status dikes and Points of Interest

Reduce impact & save lives

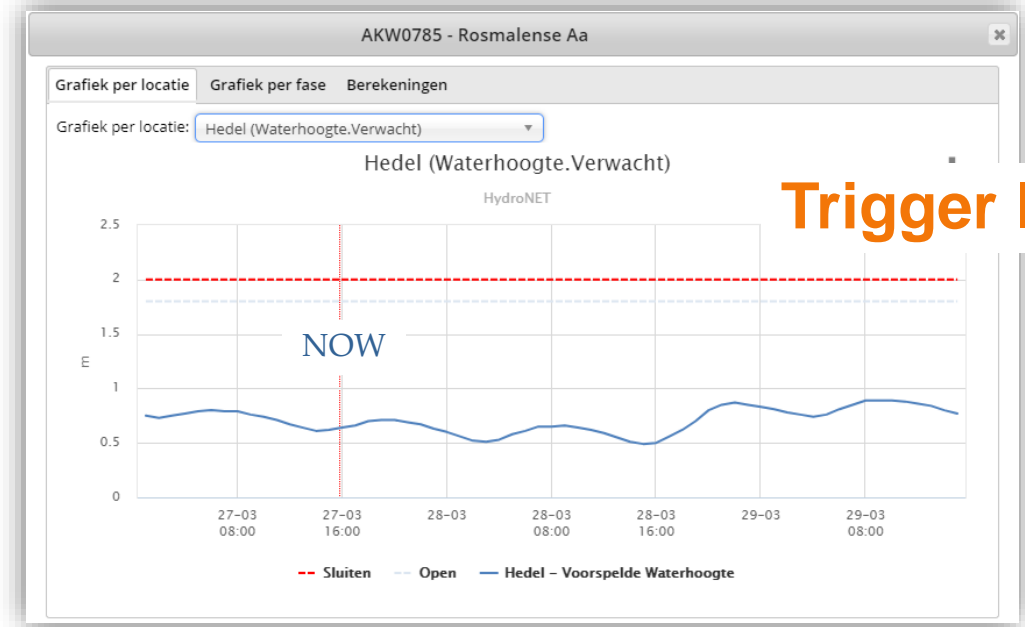
Emergency Management Control Room for the main Dutch rivers



Live status of your water system

The screenshot shows the HydroNET dashboard interface. It features a top navigation bar with 'HOME', 'APPLICATIES', 'DASHBOARD', and 'SUPPORT'. The main area is divided into two map sections and a task list. The top-left map shows a route with red and yellow markers. The top-right map shows a larger area with various colored zones. The bottom-left map shows a detailed view of a specific area. The bottom-right section is a 'Mijn Takenlijst' (My Task List) table.

Taak	Datum	Type
Advies accepteren Primaire waterkeringen - Lith Heusden - Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen)	06-03-2019 15:45	Vizier
Advies accepteren AKW0042 - Beugense Maastraat - Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen)	06-03-2019 15:48	Vizier
Advies accepteren AKW0061 - Hazewinkel - Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen)	06-03-2019 15:48	Vizier



Trigger level

Status



Trigger e.g open emergency response system

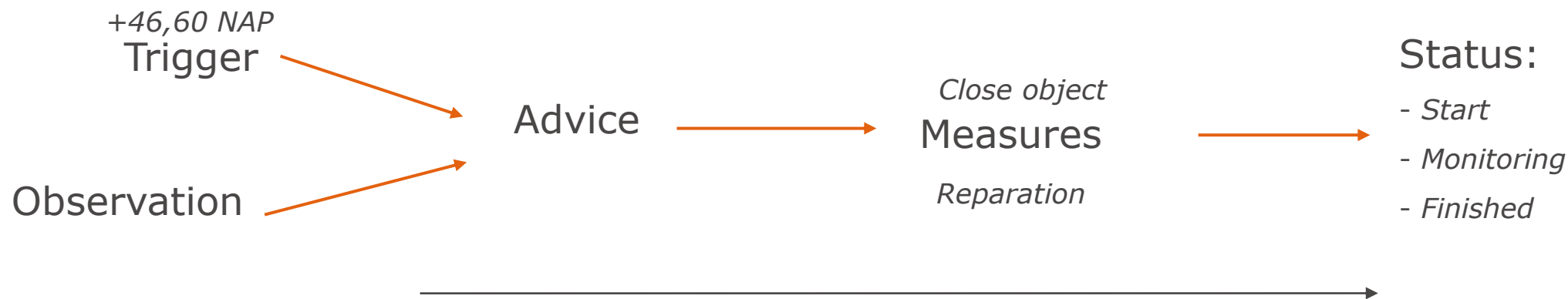
The screenshot shows the VIZIER application interface. It has a sidebar with navigation options like 'ALGEMEEN', 'MAATREGELEN', 'GEBEURTENISSEN', 'OVERZICHTEN', and 'INSTELLINGEN'. The main content area displays details for a specific measure: 'u uitvoeren controle kunstwerk voor sluiting'. It includes fields for 'Algemeen' (General), 'Gehoopt Aan' (Expected), and 'Data'. At the bottom, there are buttons for 'Start uitvoering', 'Maatregel afbreken', and 'Maatregel afsluiten'.

Status overview of of all actions and measures

The screenshot displays the HydroNET dashboard with three main components:

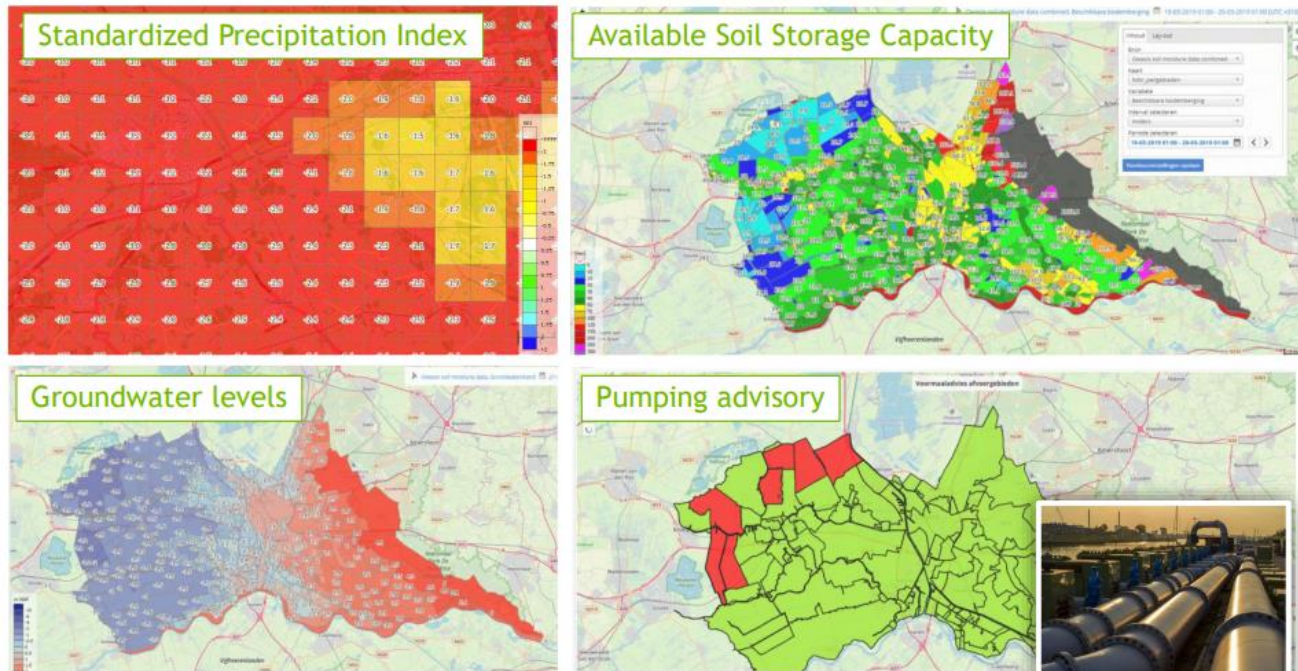
- Top Left Map:** A map titled 'Vizier' showing a route of red dots along a road.
- Top Right Map:** A map titled 'Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen) 15:03:53' with a legend for 'RWK Kunstwerken' (Sluiten, Voorbereiden, Monitoren, Open) and 'Pwk Kunstwerken' (Sluiten, Voorbereiden, Monitoren).
- Bottom Left Map:** A map titled 'Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen) 15:03:55' showing a large area with various colored zones.
- Bottom Right Table:** A 'Mijn Takenlijst' (My Task List) table with columns for 'Taak', 'Datum', and 'Type'.

Taak	Datum	Type
Advies accepteren Primaire waterkeringen - Lith Heusden - Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen)	06-03-2019 15:45	Vizier
Advies accepteren AKW0042 - Beugense Maasstraat - Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen)	06-03-2019 15:48	Vizier
Advies accepteren AKW0061 - Hazewinkel - Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen)	06-03-2019 15:48	Vizier
Locatie: AKW0046 - Hagelkruisstraat		
Aangemaakt: 06-03-19 14:48		
Status: Opschakel advies actief		
Plan: Calamiteitenbestrijdingsplan Hoogwater Maas (Primaire en Regionale Waterkeringen)		
Details: Openen in Vizier		
Advies accepteren AKW0079 - Oefftsebeek -	06-03-2019 15:48	Vizier

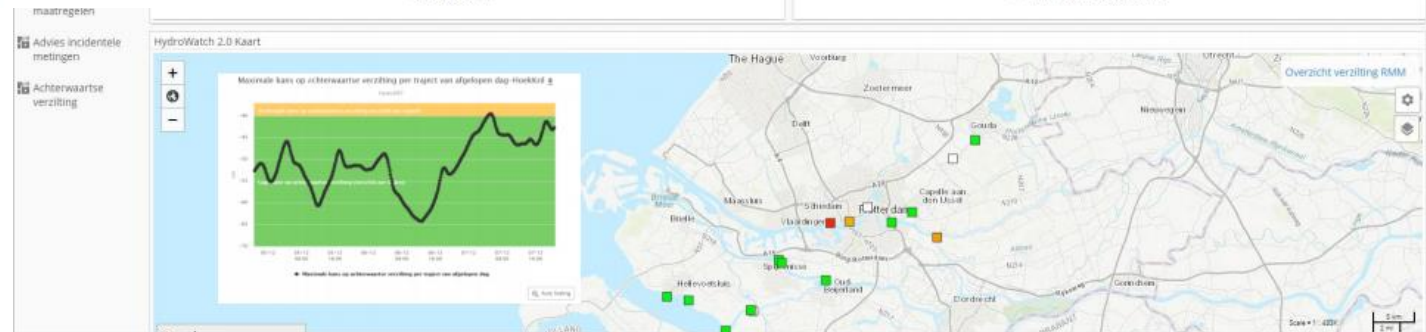
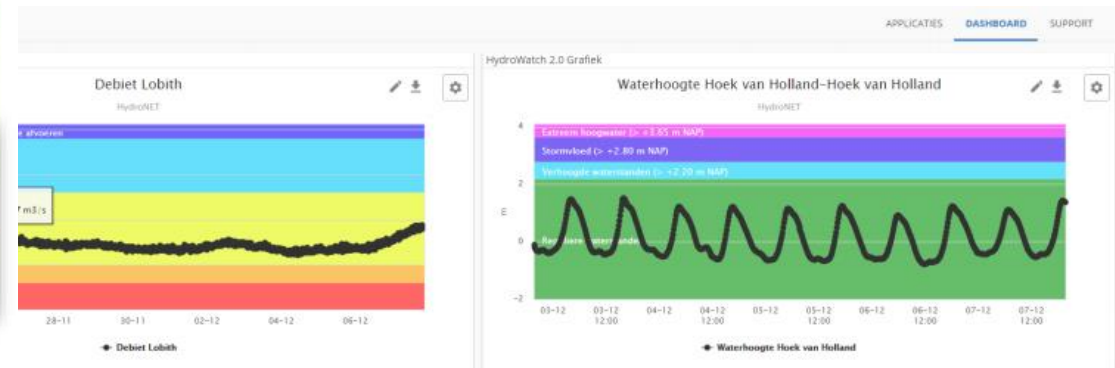


Personal tasklist and dashboards

Operational Control Dashboards - Netherlands

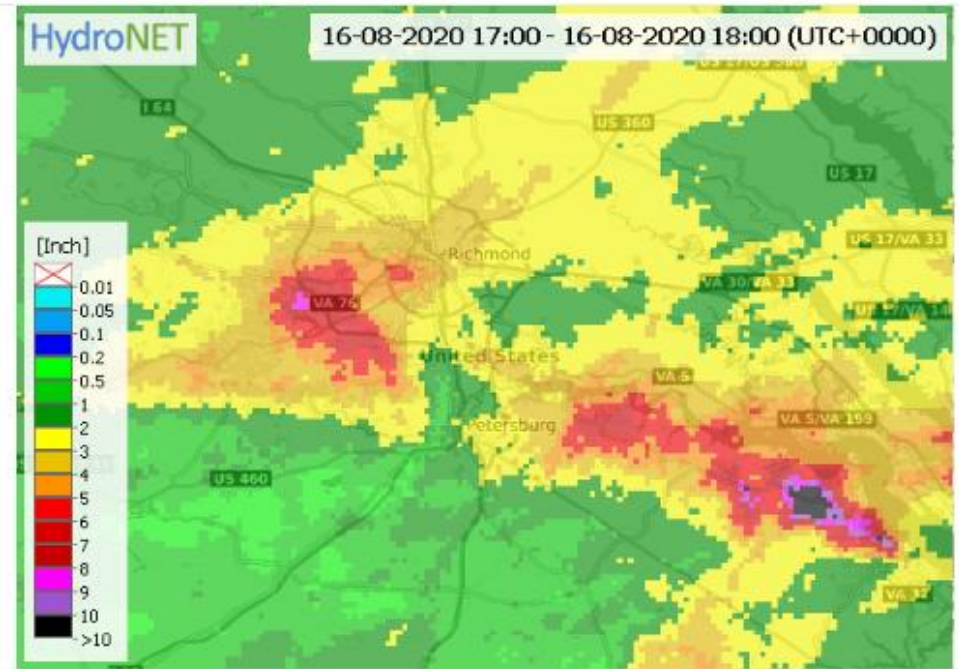


Drought Control Room for the operational manager.....

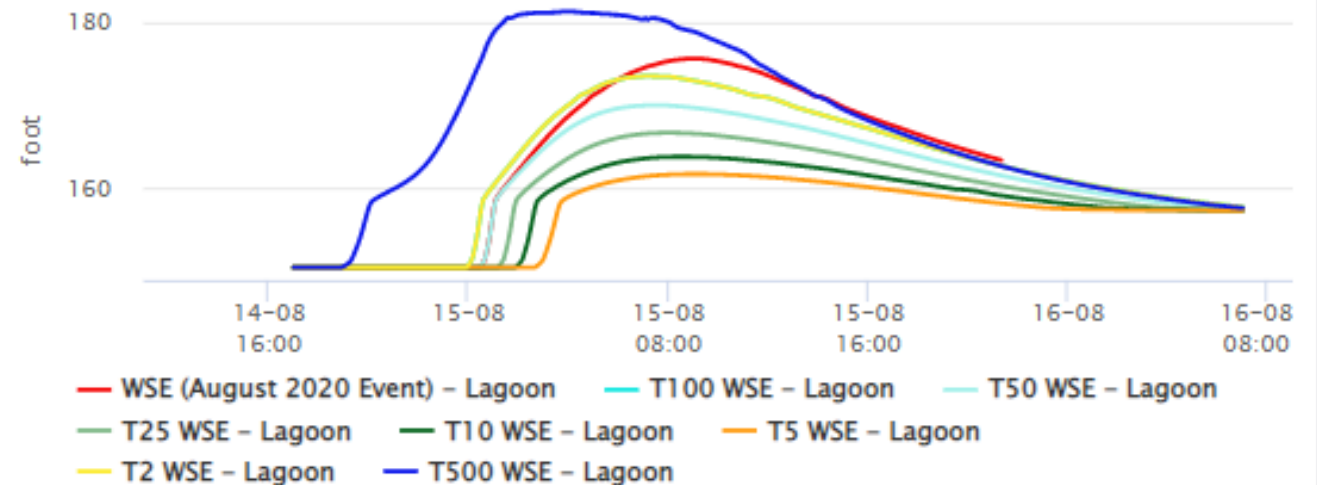


Salinity Risk Control Room for Port of Rotterdam

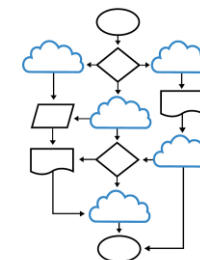
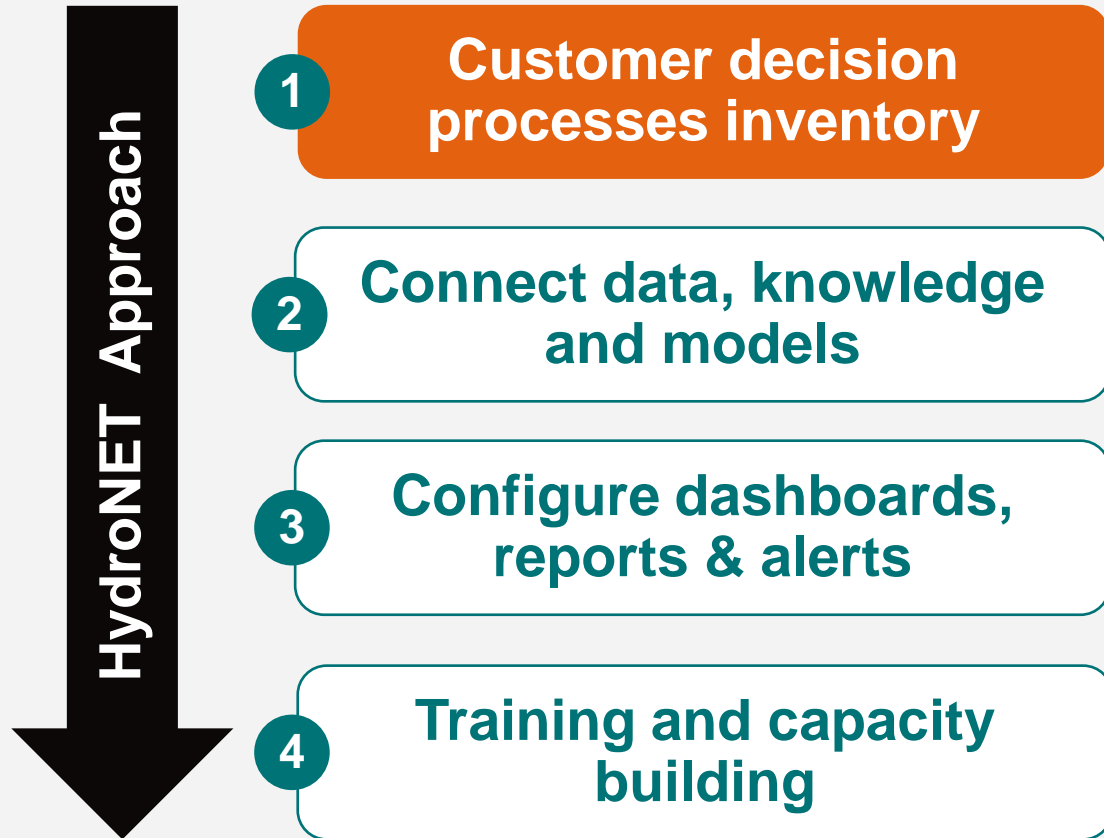
What is the approach to deliver digital solutions?



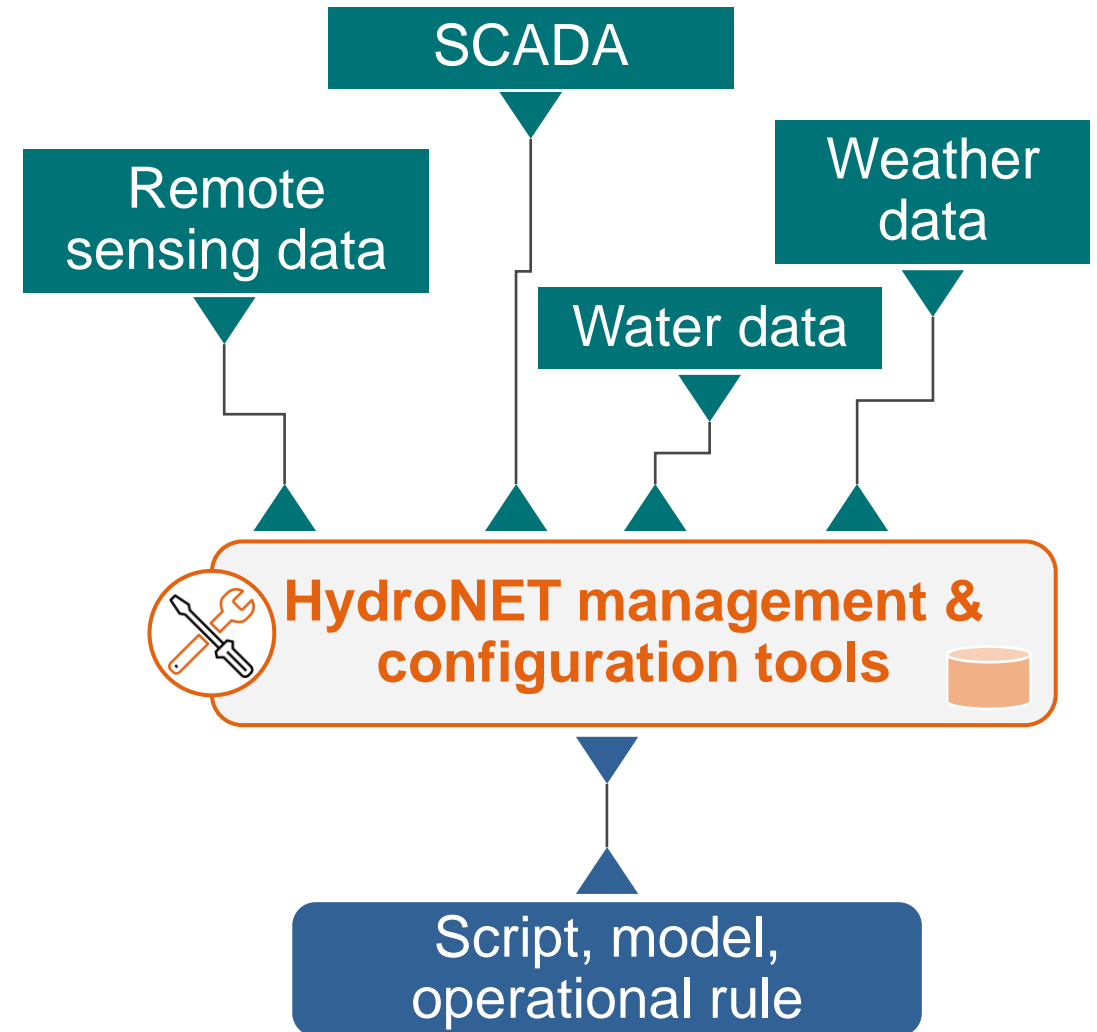
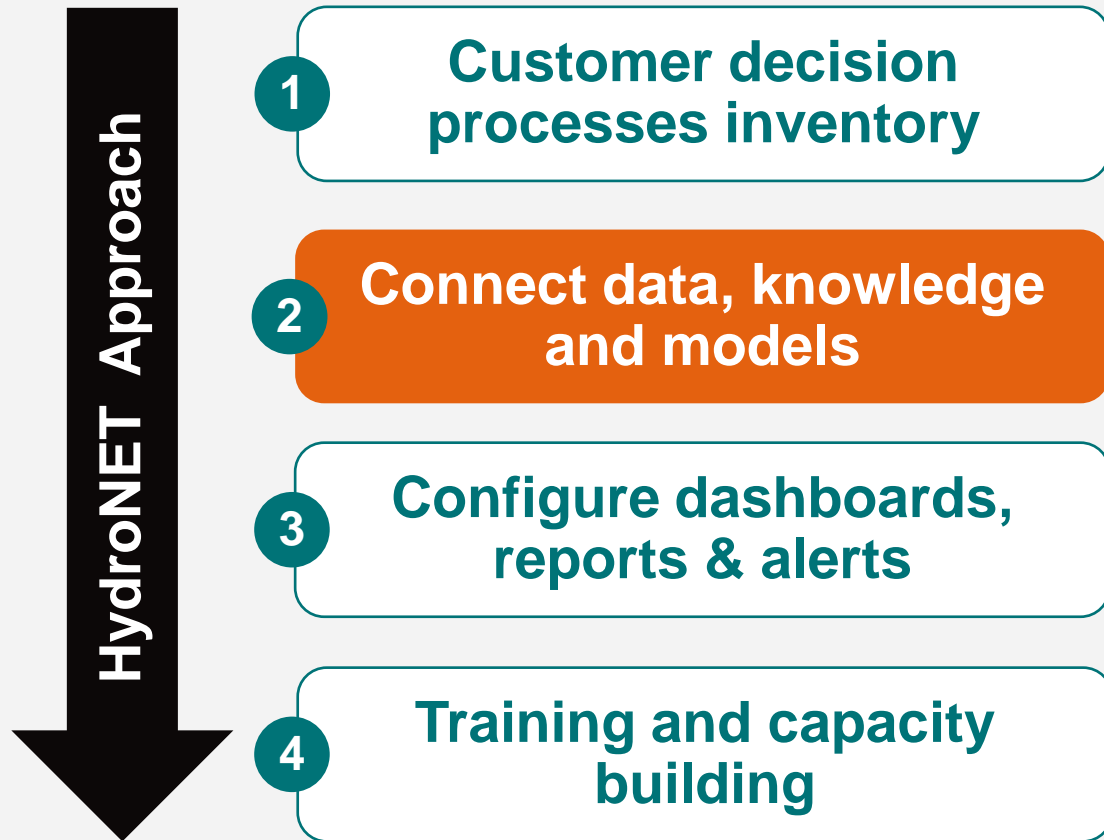
Water Surface Elevation - Lagoon



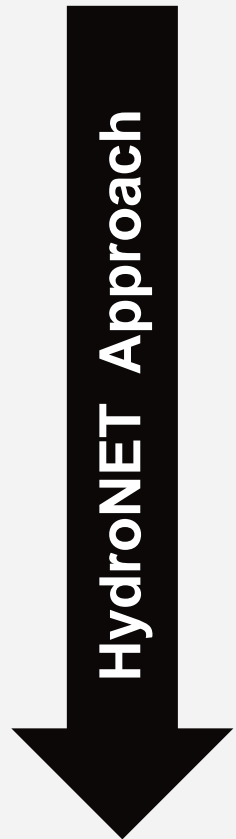
HydroNET implementation approach



HydroNET implementation approach



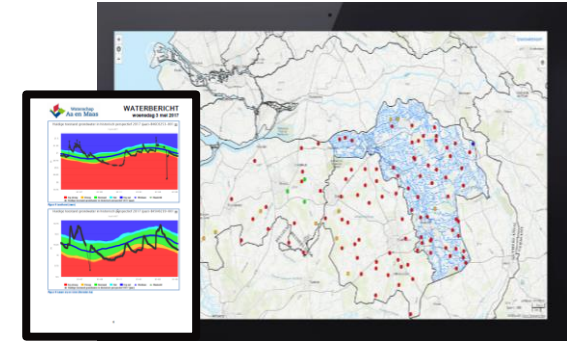
HydroNET implementation approach



- 1 Customer decision processes inventory
- 2 Connect data, knowledge and models
- 3 Configure dashboards, reports & alerts
- 4 Training and capacity building



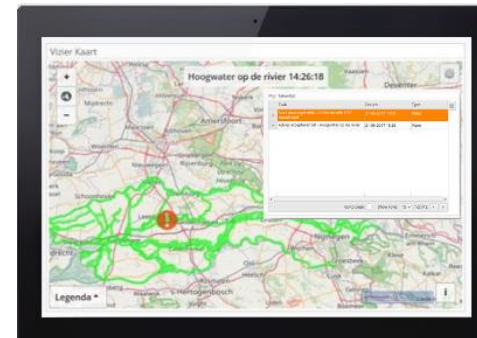
Maps and charts



Reports and embeds



HydroNET Portal tools

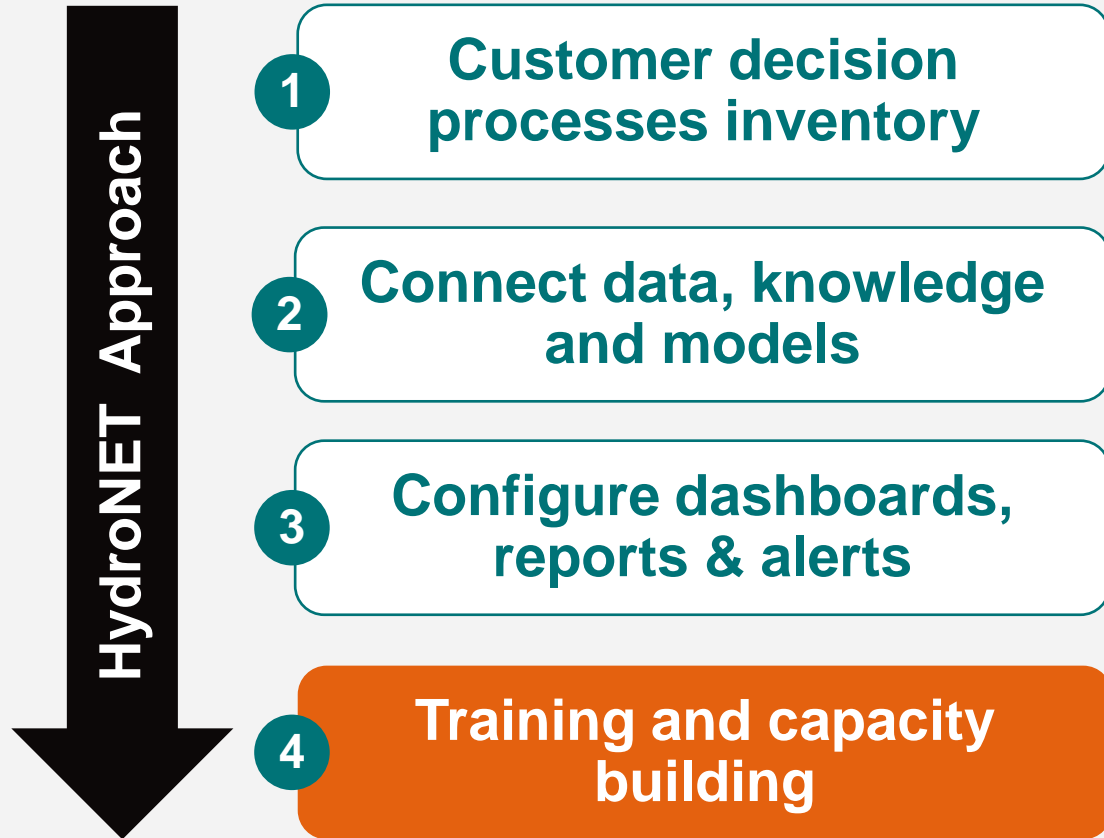


Notifications



Situational dashboards

HydroNET implementation approach



A NEW ERA

The Age of AI has begun

Artificial intelligence is as revolutionary as mobile phones and the Internet.

By: Bill Gates | March 21, 2023 • 14 minute read



"Human-AI partnership can help solve society's challenges."

Satya Nadella
CEO, Microsoft

FEB. 27 / MARCH 6, 2023

TIME

T Hi ChatGPT

G Hello! How can I assist you today?

T What do you think of a TIME cover story with the title, "The AI Arms Race Is Changing Everything?"

G As an AI language model, I don't have personal opinions or beliefs, but I can provide some context and information on the subject.

"The AI Arms Race is Changing Everything" could be an interesting and thought-provoking story on AI. A cover story in a publication like TIME could raise public awareness about the challenges and benefits of this technology and discussions on how to develop and deploy it in a safe and ethical manner.

It's important to note that...

SUBSCRIBE BROWSE SEARCH NEWS

Learning the language of molecules to predict their properties

This AI system only needs a small amount of data to predict molecular properties, which could speed up drug discovery and material development.

Adam Zewe | MIT News Office
July 7, 2023

PRESS INQUIRIES



Researchers from MIT and the MIT-IBM Watson AI Lab have developed a unified framework that uses machine learning to simultaneously predict molecular properties and generate new molecules using only a small amount of data for training.
Image: Jose Luis Olivares/MIT



AI is probably the most important thing humanity has ever worked on.

Sundar Pichai
CEO of Google



Your next phone will be able to run generative AI tools (even in Airplane Mode)

At Build 2023, Qualcomm is partnering with Microsoft to expand its on-device AI capabilities. Here's how.



Written by June Wan, Reviews Editor on May 23, 2023

in f t



GO BEYOND THE CUTTING EDGE WITH TE 2245 PORTFOLIO SOLUTIONS

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TE Connectivity

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60 MINUTES

DRAMATIC ADVANCES IN ARTIFICIAL INTELLIGENCE

"60 MINUTES" VIEWS GOOGLE'S NEVER-BEFORE-SEEN TEXT-TO-VIDEO AI TOOL

intel. AMD NVIDIA

Water Research Foundation (WRF) Project 5189

Quantifying the Impact of Artificial Intelligence/Machine Learning-Based Approaches on Utility Performance



Water Research Foundation

Ashwin Dhanasekar + PAC

Principal Investigator:

Prabhu Chandrasekaran¹, PE

Co-Principal Investigators:

Katya Bilyk², PE

Dr. Sunil Sinha³

Project Team:

Arcadis¹, Hazen and Sawyer², Virginia Tech SWIM Center³, Bluefield Research. Other technical advisors include Jim Cooper, Esteban Azagra, Dax Blake, Ben Stanford, Christopher Miller, Jose Porro and Oliver Grievson.

Partnering Utilities:



Partnering Vendors:

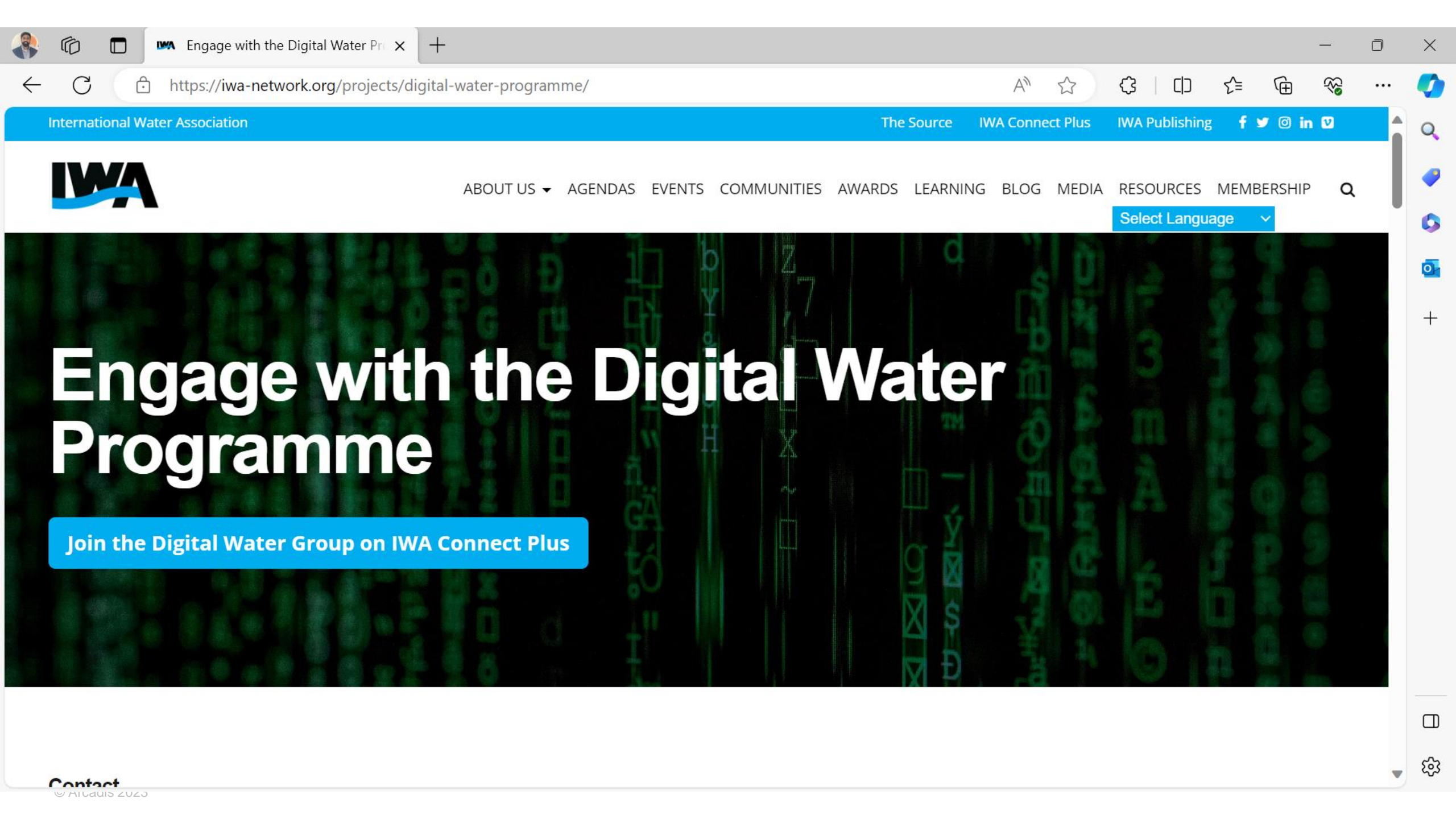
Aquasuite
Blue Conduit
Cobaltwater
Confluency
DHI
Dynamita
Fontus Blue
HydroDigital
Hyfi
Kando
Maia
Neer
Optimatics
SewerAI
Trinnex

THE Team

¹ Arcadis

² Hazen and Sawyer

³ VA Tech SWIM Center



Engage with the Digital Water Programme

Join the Digital Water Group on IWA Connect Plus

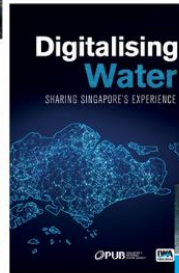
IWA's DWP Outputs

4
Subgroups

11
Publications

13
Webinars &
Events

40+
Online media



Digital Water Summit 2023

A snapshot of the first IWA Digital Water Summit:

- 300+ digital water professionals joined and contributed to the numerous discussions
- 20 exhibitors showcasing innovative & futuristic technologies
- Multi-faceted programme challenged attendees on What is digital water? What is the difference between digital water and digitalisation? How can we make the water industry more digitally aware?
- Featuring keynote presentations, technical sessions, 'Innohub' pitches, and out-the-box interactive sessions.



IWA the international water association

IWA Digital Water Summit
BILBAO SPAIN | 14 - 16 Nov 2023

Join the digital water transformation journey!

KEYNOTE SPEAKERS
INNOHUB INNOVATION PITCHES
LIVE DEMOS
NETWORKING ACTIVITIES
& A FANTASTIC SOCIAL PROGRAMME

www.digitalwatersummit.org

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#DigitalWaterSummit

Thank you!

Prabhu Chandrasekeran, PE
Intelligent Water National Practice Lead
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