



# K R Æ K E N

Increasing the resilience of our cities  
to climate change with the first BIM  
flow simulation tool



# KRÆKEN'S HISTORY





Kræken is the new 3D hydraulic modeling software.

It is made for civil and environmental engineers



## BIRTH

Made and marketed by [ÆGIR](#) since 2018. [Kræken](#) models hydraulic phenomena in 3D with **90% accuracy**.

Result of **15 years** of laboratory research. Proven and validated by the leaders of the construction market.



## ADDED VALUE

[Kræken](#) automatically detects anomalies in **all phases** of the project.

It is essential **to optimize** the design of your constructions, **guarantee** their efficiency and **secure** your investments.



## WHAT IT IS

[Kræken](#) is a SaaS cloud-based software based on **Smooth Particules Hydrodynamics (SPH)** technology.

His powerful **calculation engine** represents all the hydraulic phenomena faced by the constructions.




A high-speed photograph of a water splash, creating a complex, sculptural shape with various peaks and valleys. The water is a deep blue, and the background is a lighter, uniform blue. The word 'BENEFITS' is centered in white, bold, sans-serif capital letters. In the bottom left corner, there is a stylized logo consisting of several overlapping, semi-transparent rectangular blocks in shades of blue and white, arranged to form a larger, abstract shape.

# BENEFITS






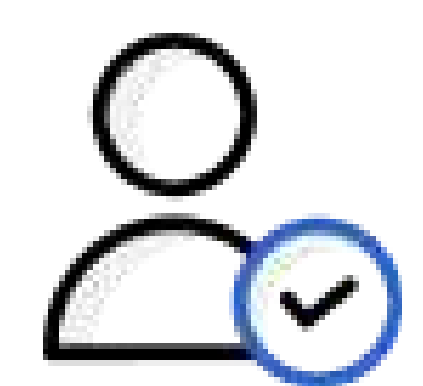
Free up your  
hydraulic experts'  
time



View your  
anomalies in  
video



Automatically scan  
the most complex  
structures



## USER-FRIENDLY

No need to be an engineer to run simulations with [Kræken](#).

The simulations are **predictive models** that do not require any specific parameterization.



## CINEMATIC

[Kræken](#) splits the fluid into particles and gives their precise positions in space at each physical time step.

You can see in **video** how your constructions are functioning.



## DYNAMIC

[Kræken](#) easily handles complex structures with moving parts or downstream influences.

Quickly understand the behavior of **complex structures** in their hydraulic environment.



A high-speed photograph of a water splash, creating a complex, organic shape with many small droplets and ripples. The water is a deep blue, and the background is a lighter, solid blue. The word 'TECHNOLOGY' is centered in white, bold, sans-serif capital letters. In the bottom left corner, there is a stylized, semi-transparent logo consisting of several overlapping geometric shapes, including a large 'K' and some vertical bars, in a light blue or grey color.

TECHNOLOGY





## ACCURATE

Kræken includes a Lagrangian SPH solver that solves the Navier-Stokes equations **6400 times** per second of modeling.

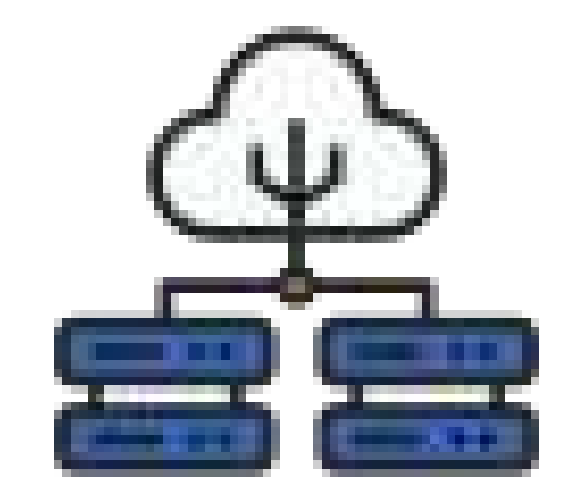
+ Only 5% of uncertainty



## FAST

Kræken is coded under **CUDA** and computes on GPU. It brings the results, on average,

+ 25x faster than competitors' software



## CLOUD BASED

Kræken calculates and records the generated data in the **cloud**.

+ Nos investment in computers



## SECURED

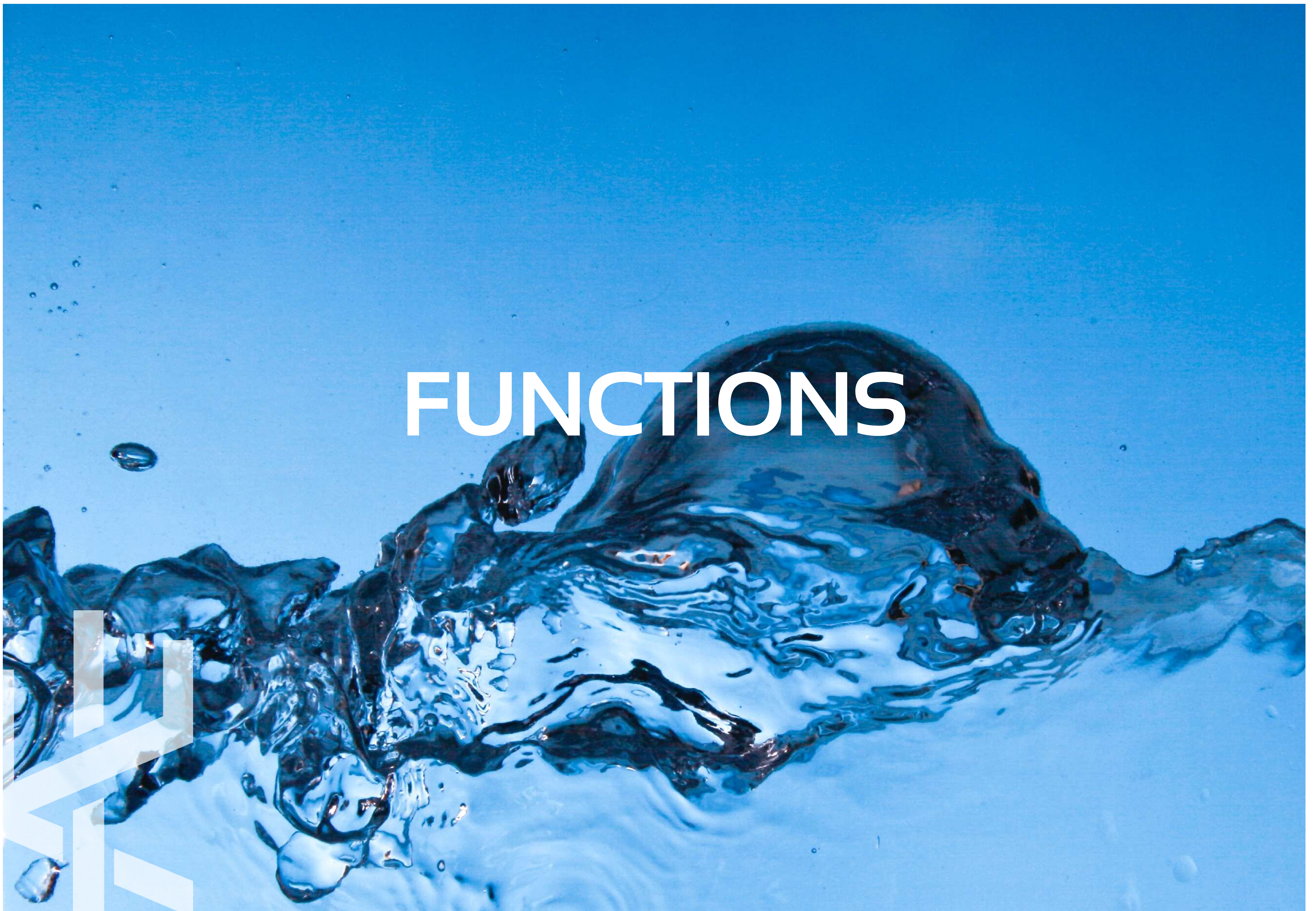
Kræken uses the **blockchain** to secure the project's data sharing.

+ 100% privacy

Kræken  
digitalize the hydraulic engineer



# FUNCTIONS

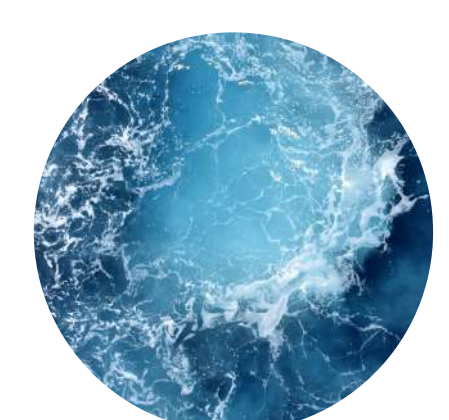






## EASY SET UP

Only define the project type, flow rates and particle resolution.



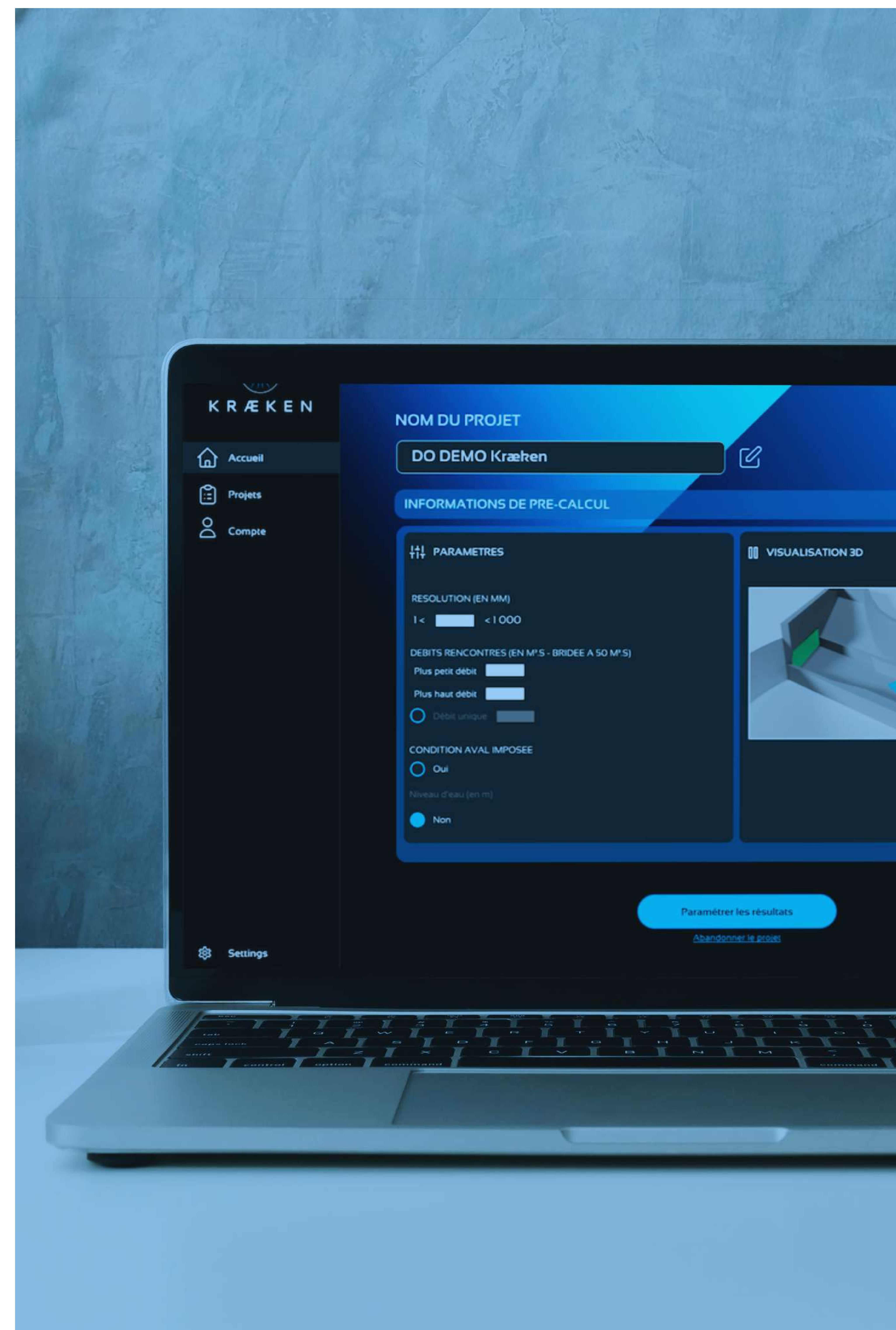
## AUTOMATED DATA ANALYSIS

Smart selection of relevant data to answer your question.



## ANALYSIS OF ALL THE PHYSICAL PHENOMENA

The expert report is automatically fitted to user need for information regardless of the stage of the structure's life.







## **BIM COMPATIBLE**

Confirm the hydraulic behaviour of your structures designed in BIM.



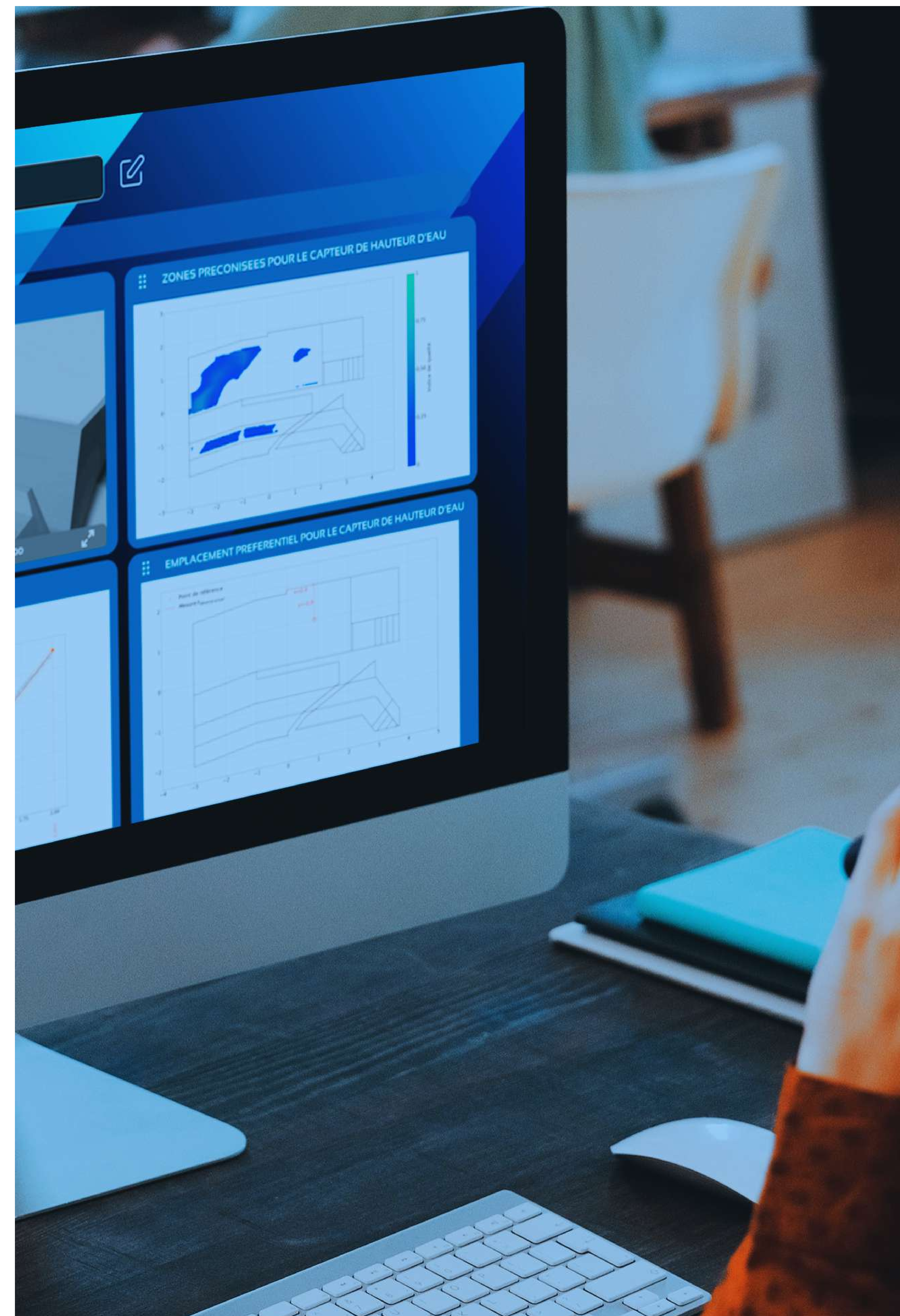
## **AUTOMATIC ANOMALY DETECTION**

Identify malfunctions to improve the design of your works.



## **GLOBAL RISK VISIBILITY**

Detect deficiencies early on and secure your investments.

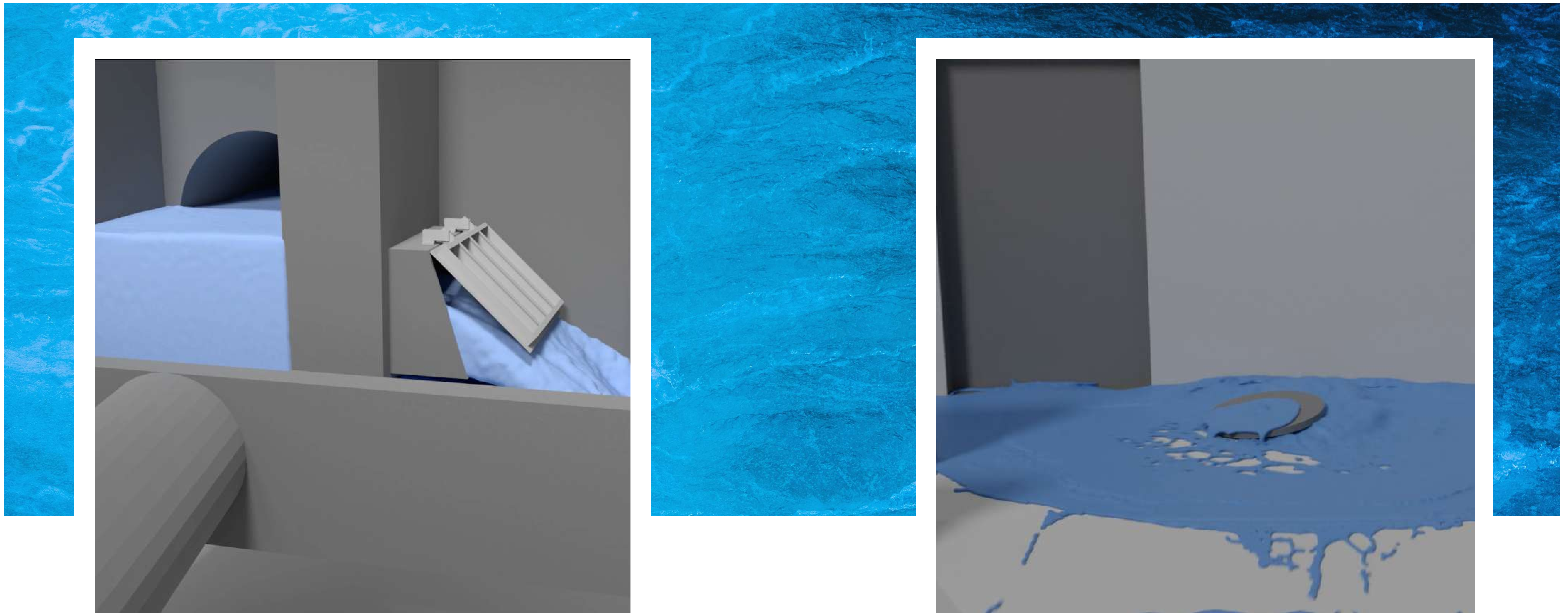




# USE CASES



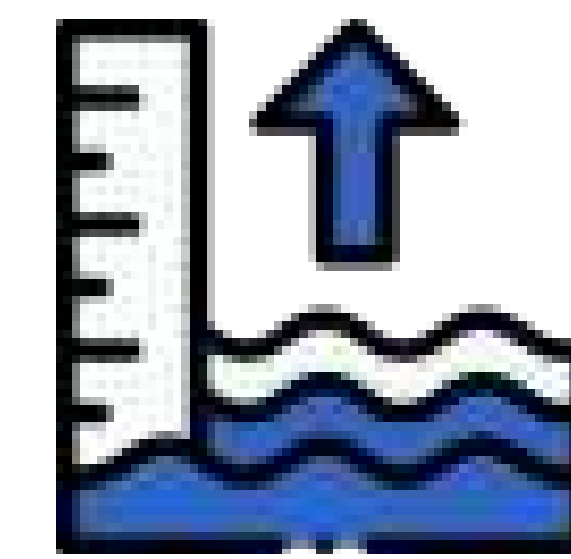




## URBAN HYDRAULICS

- Metrology
- Natural environment influence
- **Safety** of operating staff
- Instrumented and moving valves
- Assistance in the design of **storage tanks**

Since 2018, we use Kræken to respond in the best possible way to our customers' issues.

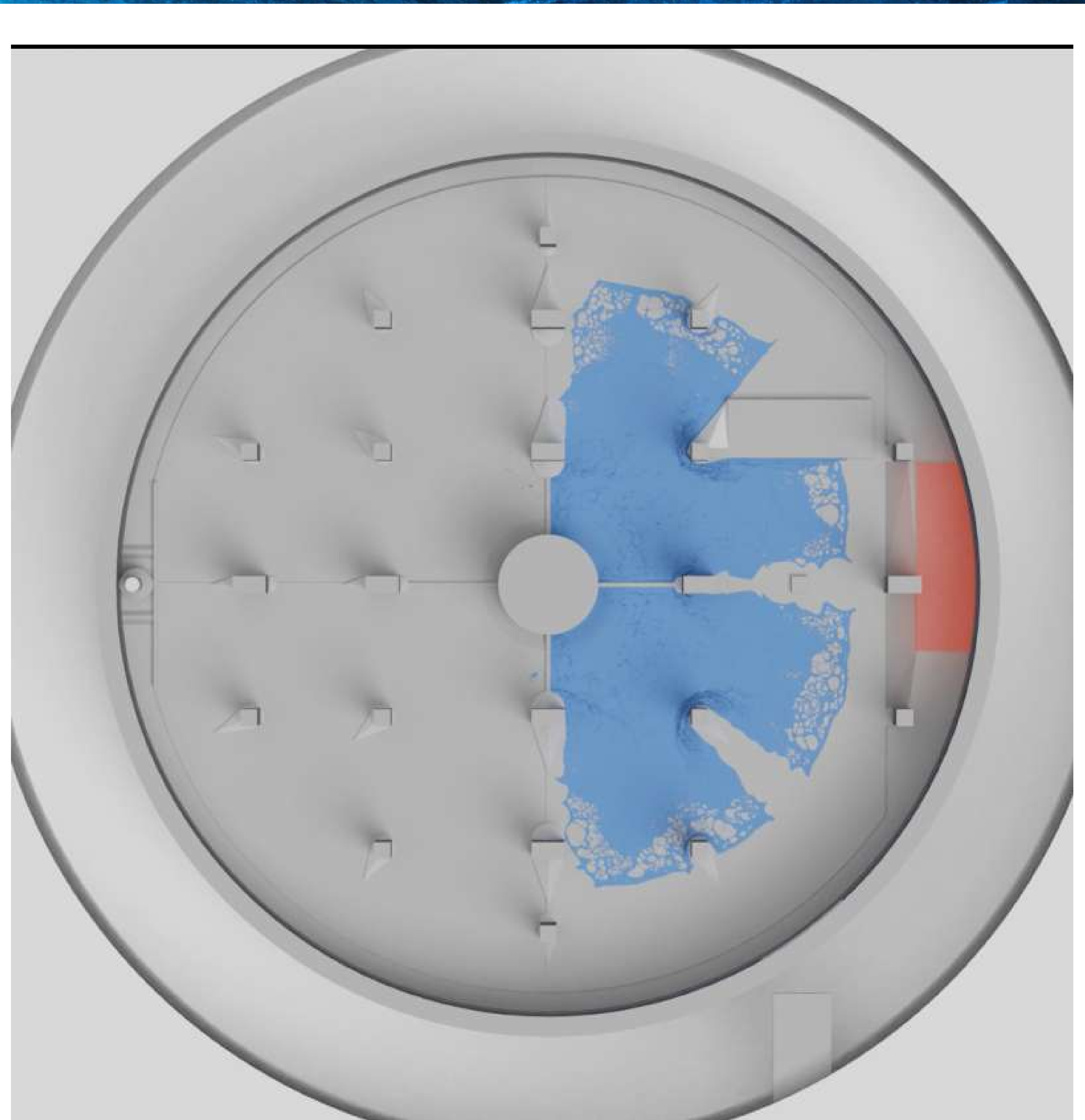
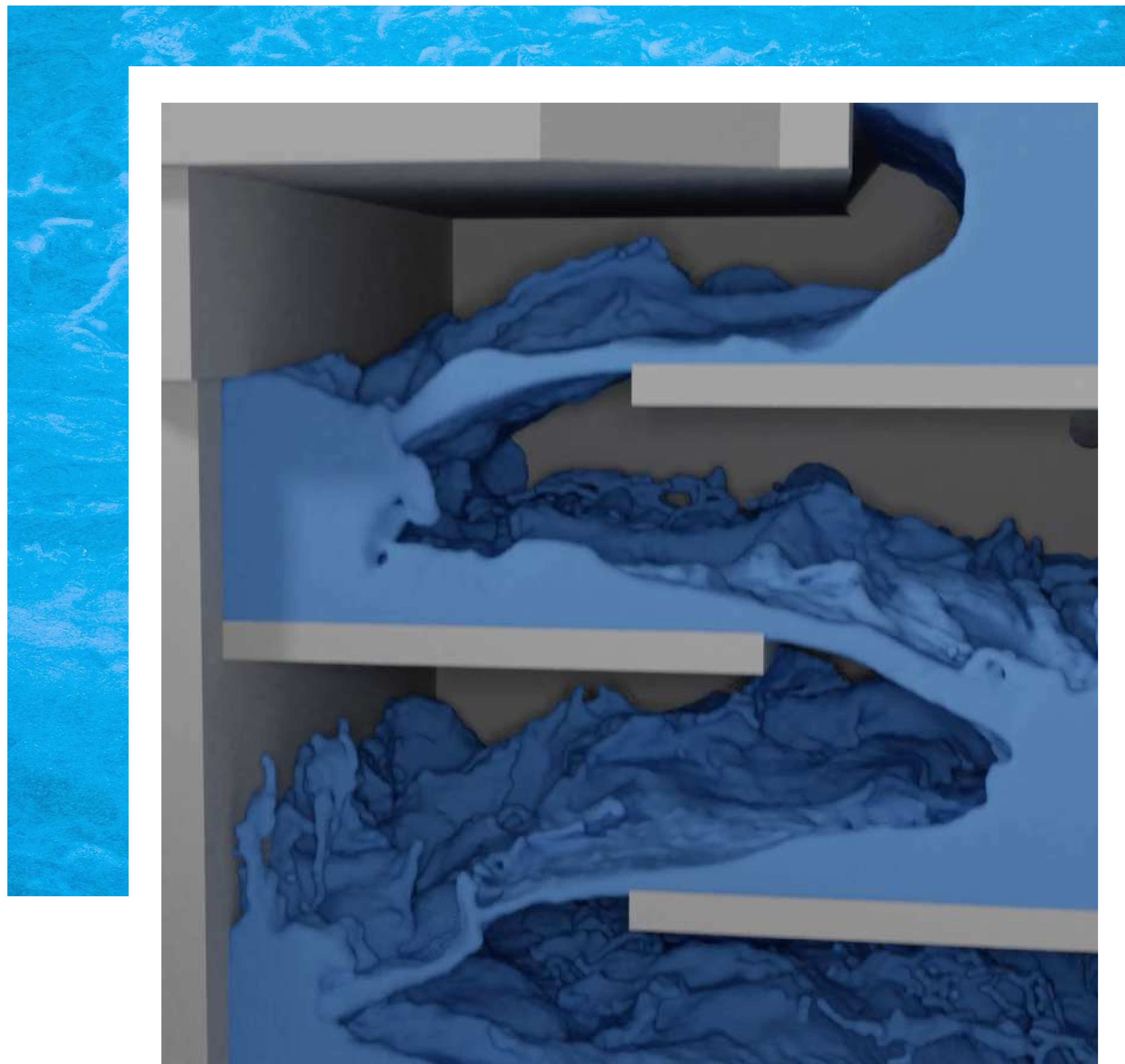


## FLOODING IMPACT

- Analysis of **logjam** dynamics
- **Heat map** of pressure on structures
- Dynamic mapping of **risks to people**
- **Pollution** risk detection

The Kræken engine simulates the impact of floods at the scale of an infrastructure or an industrial site.





## INDUSTRIES

- ROI at 9 months
- Analysis of complex systems **instrumentation**
- **IoT** simplification
- **Safety** analysis of maintenance staff

Kræken is the decision support tool for building infrastructures that respect environmental standards.



## CONSTRUCTION

- Improve **water-related processes** (washing, cooling, treatment)
- Enhance continuous **sampling** and **measurement**
- **Certify** the resilience of a construction to hydraulic stress.

Kræken adds hydraulic expertise to BIM software for weather-resistant construction.



# THE TEAM





# PRISCILLE BEGUIN

CEO, Co-founder, Strategy

Engineer from INSA Lyon



# ADRIEN MOMPLOT

COO, Co-founder, Production

PhD and engineer from INSA Lyon





# TANGUY POUZOL

CSO, Kræken development

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# REFERENCES











# K R Æ K E N

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