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Autodesk AI in water management: rising to meet new challenges

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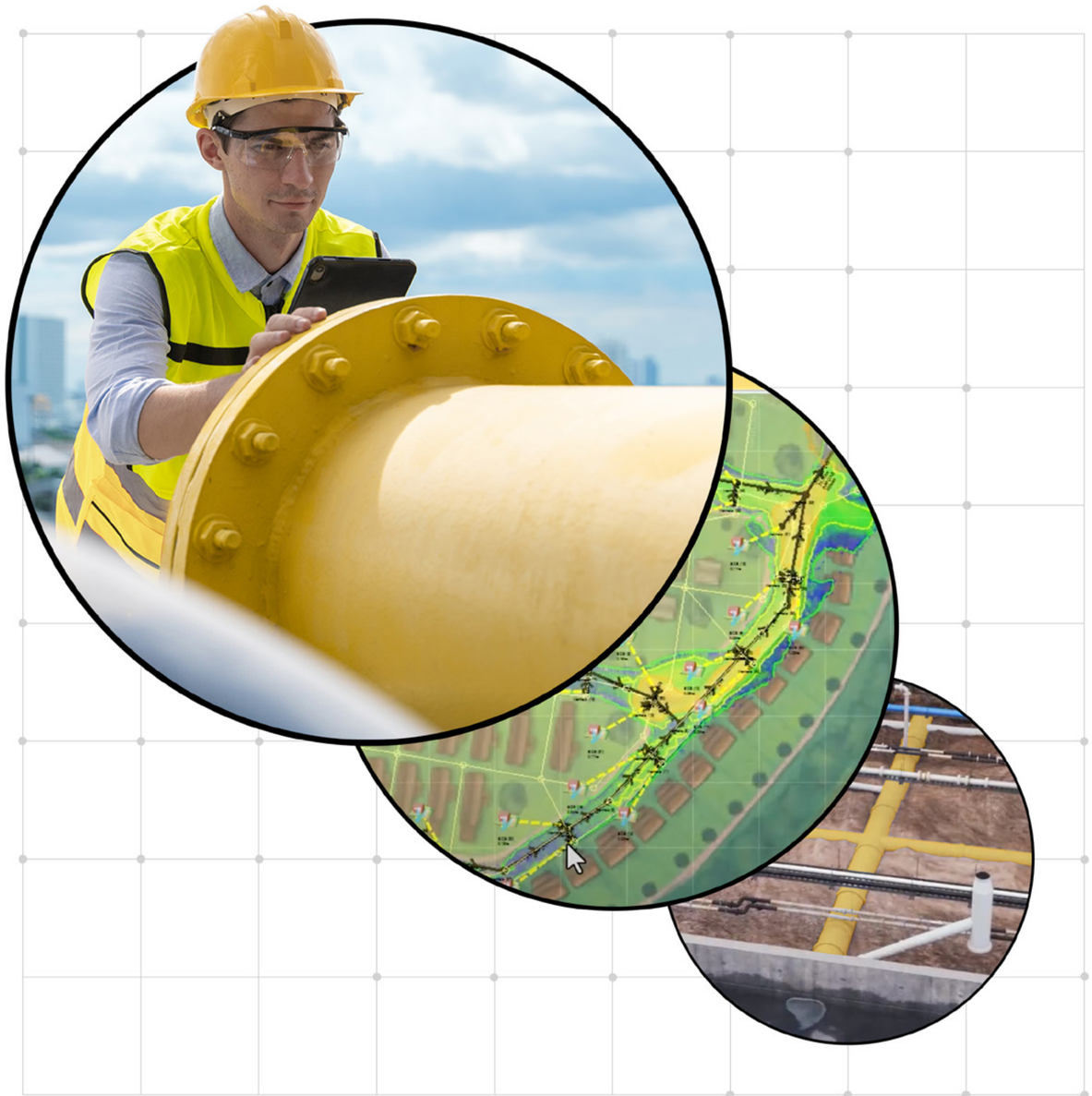
01 Navigating new challenges in water

The world of water is changing.

Population growth and urbanization is causing demand to outstrip supply. Experts are predicting a 40% shortfall in freshwater resources by 2030,[1] compounded by aging infrastructure that can lose up to half of treated water to leaks before it even reaches customers.[2] And the cost of running drinking water systems is higher than ever, with as much as 40% of the operating costs going towards energy.[3]

To top it all off, climate change is causing a sharp spike in global flooding through heavier rainfall and rising sea levels; the number of recorded floods per year has more than doubled since the year 2000.[4]

The skills and resourcefulness of water professionals are needed by their communities now more than ever. And artificial intelligence (AI) is set to play a crucial supporting role, amplifying those skills, helping experts to secure clean water and protect vital ecosystems while saving on costs.



AI is changing how we manage water, for good

In the face of surging demand for water and severe flood risks, water professionals have their work cut out for them. Teams must strive for more efficient freshwater delivery and wastewater disposal, as well as better flood protection with lower risks. All while under pressure to work faster and more precisely.

That's where AI comes in. An invaluable support for human skill and ingenuity, AI can help water agencies achieve better outcomes in their projects, with fewer errors, at speed; which means more sustainable systems and safer, cleaner water for communities around the world.

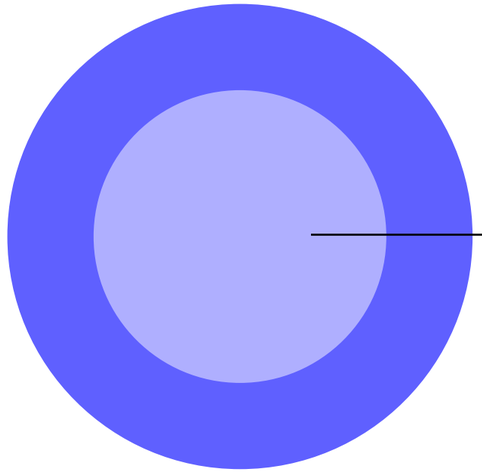
Plus, working with AI isn't a pipe dream—it's already making an impact. 66% of design leaders agree AI will be essential for their business within two to three years,[5] from automating repetitive tasks to optimizing predictive maintenance. And 35% are using AI to enhance workplace safety and risk analysis.[6]

With Autodesk water infrastructure software, we're putting water professionals at the forefront of AI advancements, with two new AI-powered tools that unlock powerful automation and analysis capabilities:

- The **Machine Learning (ML) Deluge tool** within our InfoDrainage software lets users predict flood maps quickly and accurately, enabling more informed design decisions.

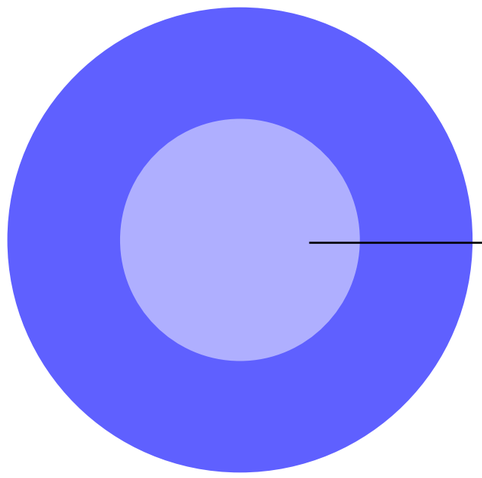
- And our new integration of asset management solution Info360Asset with **VAPAR.Solutions**, which uses AI to automatically scan pipe footage for issues, freeing up hours of valuable time for asset managers and their teams to reduce operational spend with better risk analysis and pipe rehabilitation plans.

Let's do a deep dive into the power of AI in water management and explore how you can use it to help your projects flow smoothly to success.



66%

of leaders agree AI will be essential within three years



35%

of leaders already use AI for risk analysis

02 Ride the AI wave with Autodesk

We make the software firms need to efficiently plan, design, operate, and maintain streamlined water systems that stand the test of time.

Digital, cloud-based capabilities let teams from anywhere in the world collaborate around a central data hub, allowing users to access and edit the most up-to-date model versions and avoid conflicts. Cloud simulations, from basic 1D to complex 2D, let users analyze and optimize their stormwater and wastewater designs and models. Real-time cloud-based analytics provide insights to improve operational efficiency of treatment plants, like daily reports for tracking energy usage and spotting opportunities to reduce costs.

And just as cloud capabilities let users run large simulations and analytics at high speed, our AI advancements use the power of machine learning to speed up simulations and make designs more responsive.

We do it all through a combination of our own in-house built innovations, like the AI-powered Machine Learning Deluge tool; and through strategic partnerships that unlock combined innovation and expertise, like our team-up with VAPAR.Solutions.

Helping you secure:

- Better water management
- More resilient flood management
- More efficient drainage design
- Lower-risk, highly efficient treatment operations
- Cost-effective operations and predictive maintenance

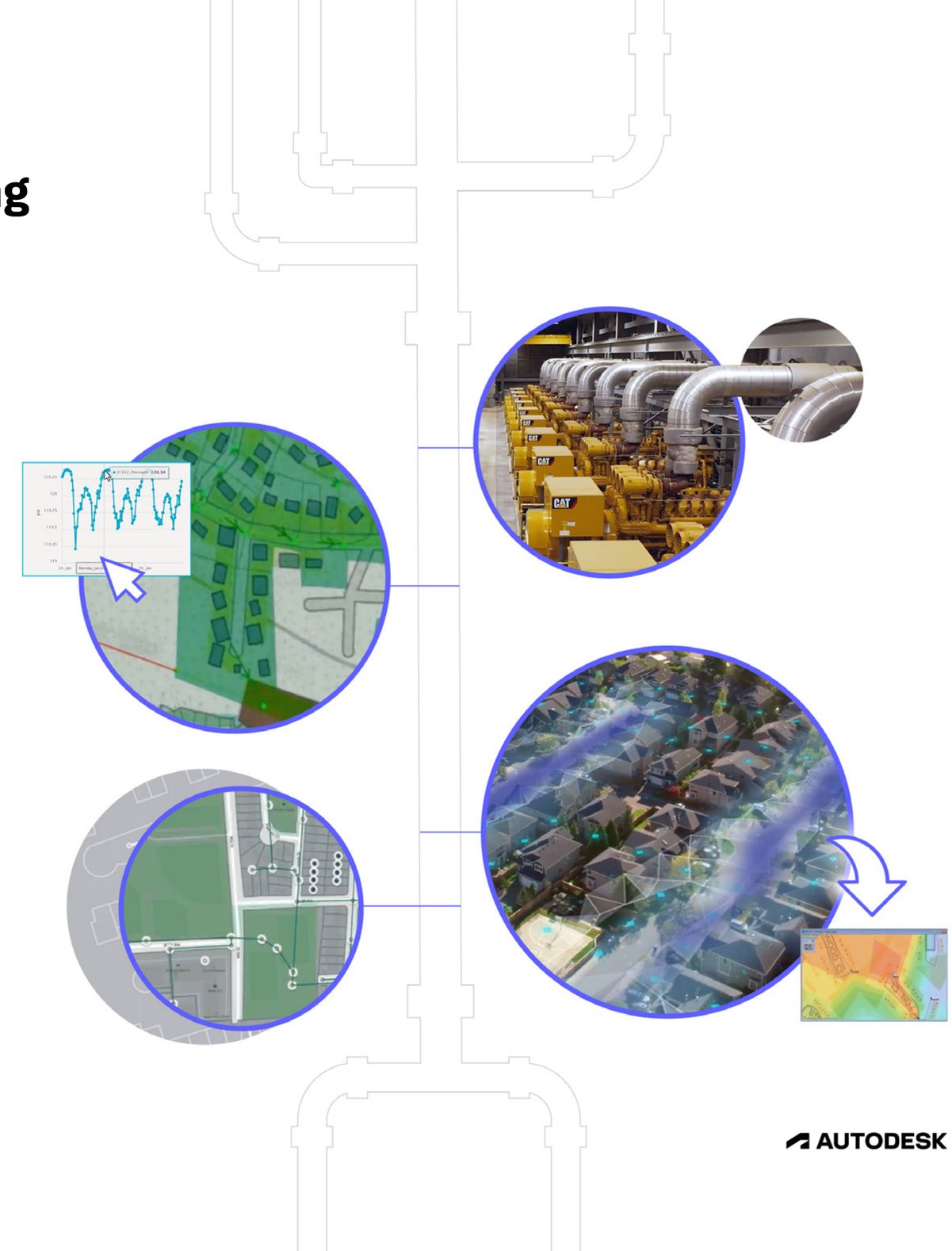
The bottom line? Greater customer satisfaction. Better emergency preparedness. And a sustainable, efficient future of water for all.

03 InfoDrainage Machine Learning Deluge tool: the future of flood mapping

Drainage planning sits at the heart of any water management project. It's the part that really gets put to the test during decisive moments like storms and floods; and can often fail that test, due to insufficient scenario testing and increasingly extreme weather.

The InfoDrainage Machine Learning Deluge tool helps designers build resilient drainage plans that can not only weather today's storms, but also handle future challenges brought by climate change. It lets users instantly pinpoint areas on a site with the highest risk of flooding, while also highlighting the best spots for stormwater controls like ponds and swales.

With learning algorithms trained on over 10,000 flood mapping simulations, the Machine Learning Deluge tool responds to the real-world conditions of each site and project—unlocking more streamlined, precise design workflows. It enables engineers to speed through the flood mapping stage, without sacrificing accuracy; so they can focus on impactful work, and drive outcomes much faster.



04 Machine Learning Deluge tool in action

Imagine that your firm needs to build a school for a coastal town, on a tight timeframe. You need to find and mitigate the greatest flood risks, but don't have weeks to spend poring over the data.

With the Machine Learning Deluge tool, your team could use its AI capabilities to analyze weeks' worth of site data in seconds, providing them with native data to help predict channeling and ponding. Plus, they could scale the flood maps to ensure the school's drainage plan fits the town's water management system, iterating the design based on feedback from the tool.

Your models would be more responsive to real-world conditions, so you'd know exactly where to place every stormwater filter and check dam, and what spots to avoid building on—accelerating the project's timeline, minimizing remedial works, and giving the client confidence in their flood-resistant facility.

25X
Faster simulation vs traditional deluge calculation

10,000+
Trained on simulations for model accuracy

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05 Info360 Asset + VAPAR.Solutions*: getting CCTV reviews done in minutes

Pipe inspection is a slow and costly process. Usually only a fraction of your footprint can be covered in a given year, with the data gathered varying based on who is performing the review. It makes getting a true picture of your network nearly impossible, hampering your ability to perform proactive maintenance and make capital planning decisions effectively.

That's why we invested in VAPAR.Solutions—to let you carry out thorough, AI-powered inspections on pipeline footage that identify faults fast and remove the inconsistent manual review bottleneck from your workflows for good.

Used side by side with our asset management platform, Info360 Asset, you can manage all your pipe data in the cloud, use it to create airtight asset management plans, and make defensible capital management decisions in a fraction of the time.

**VAPAR.Solutions subscription required and sold separately to Info360 Asset.*

TRILITY | Surveying 52k meters of pipeline 3x faster

See the success story

City of Ryde | Saving 400+ hours of manual footage reviews

See the success story

06 Looking ahead: a fully intelligent water management ecosystem

The future of water management is bright. Yes, there are plenty of challenges to overcome—but with all-new capabilities unlocked by digital transformation, the industry is better equipped than ever to tackle them.

With over thirty years of development, our industry-leading tools consistently deliver positive outcomes across the water cycle. And we're building that work into the bigger picture: cloud-connected and enhanced with AI, the future of water will integrate with architecture, engineering, construction, and operations through the Autodesk Design & Make Platform.

Think efficiency and sustainability, easily achieved at every stage of the water asset lifecycle. Proactive risk management, built into every process. Enhanced decision making that leads to more resilient infrastructure. We're closer than ever to that vision of the industry, with innovations made to address the water challenges of the future.

Expect more innovations very soon, made to help you:

- Design more sustainable water infrastructure, with simulation tools to help you prepare for every possibility
- Save more time in every project, with faster AI-assisted processing and automations
- Win clients over and secure more work, through clear modeling and visualization
- And much more on the horizon

All in the name of moving the industry forward on its digital transformation journey and securing access to safe, clean water for all.

07 Get involved

Step into the future of water management.

Explore Autodesk's software for end-to-end water asset management

Digital tools made to help you build the most resilient, sustainable water infrastructure, and drive success in your projects.

View the website

Discover the InfoDrainage Machine Learning Deluge tool

Detect flood risks during the design phase, and adapt your infrastructure to suit—no matter the scale of your project. Now available with InfoDrainage by Autodesk.

View capabilities

Learn more about Info360 Asset

Equip your team to manage inspections, calculate risk, and build rehabilitation plans from the cloud.

View capabilities

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1 Earth.org. 2023. “World Faces 40% Shortfall in Freshwater Supply by 2030, Experts Warn Ahead of UN Water Conference.” https://earth.org/freshwater-supply-shortage/

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4 Carlos Andrés Macías Ávila and others. 2021. “Leakage Management and Pipe System Efficiency. Its Influence in the Improvement of the Efficiency Indexes.” Water. Abstract. https://www.mdpi.com/2073-4441/13/14/1909

5 Autodesk, Inc. 2023. “2023 State of Design and Make.” https://www.autodesk.co.uk/insights/research/state-of-design-and-make

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