



Catchment Planning and Stormwater Solutions

End-to-End Water Management Series – Part 1

Water Infrastructure - APAC



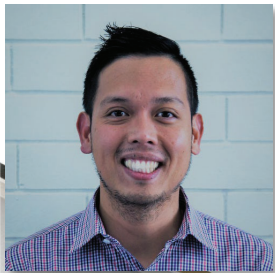


Presenters



Matthew Piggott

Technical Specialist,
Water Infrastructure



Eland Afuang

Senior Technical Specialist,
Water Infrastructure

Agenda

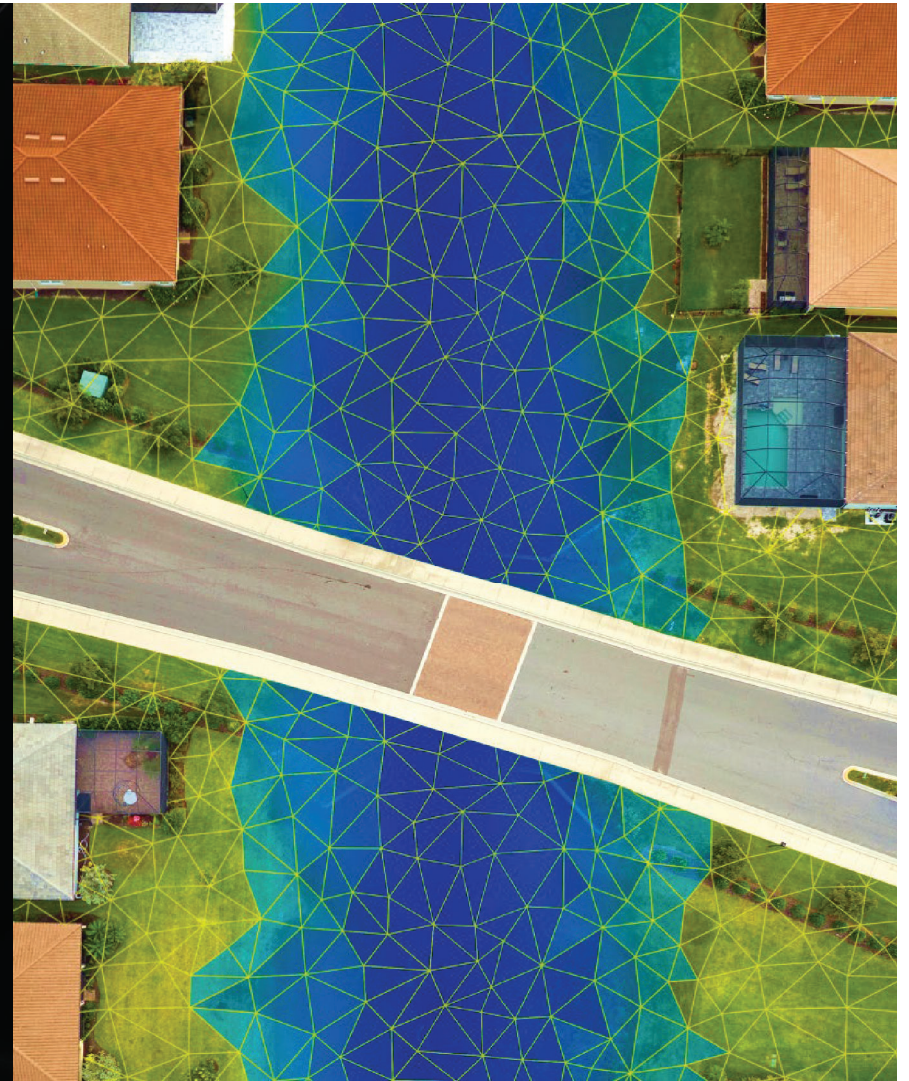
1 Water industry context

2 Autodesk History and Solutions

3 Integrated Catchment Modelling

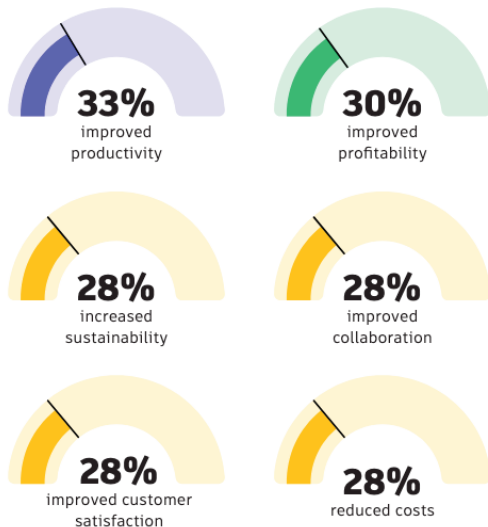
4 Case Studies

5 Questions

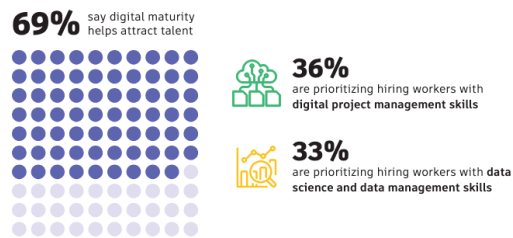


Digital transformation is no longer optional

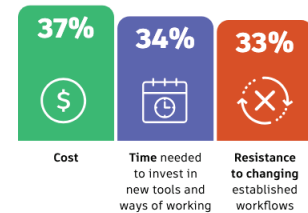
Productivity tops the list of digital transformation benefits



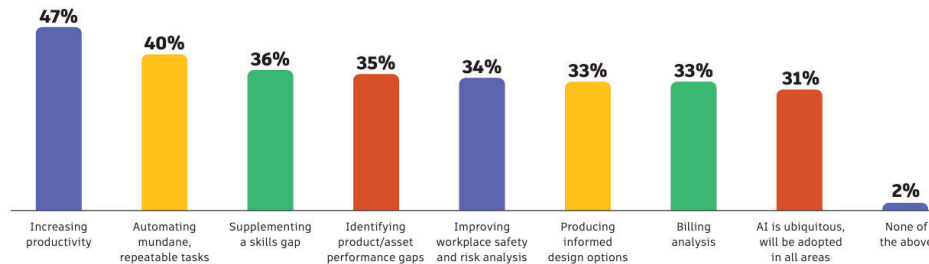
Technology and talent



Cost is the top barrier to digital transformation



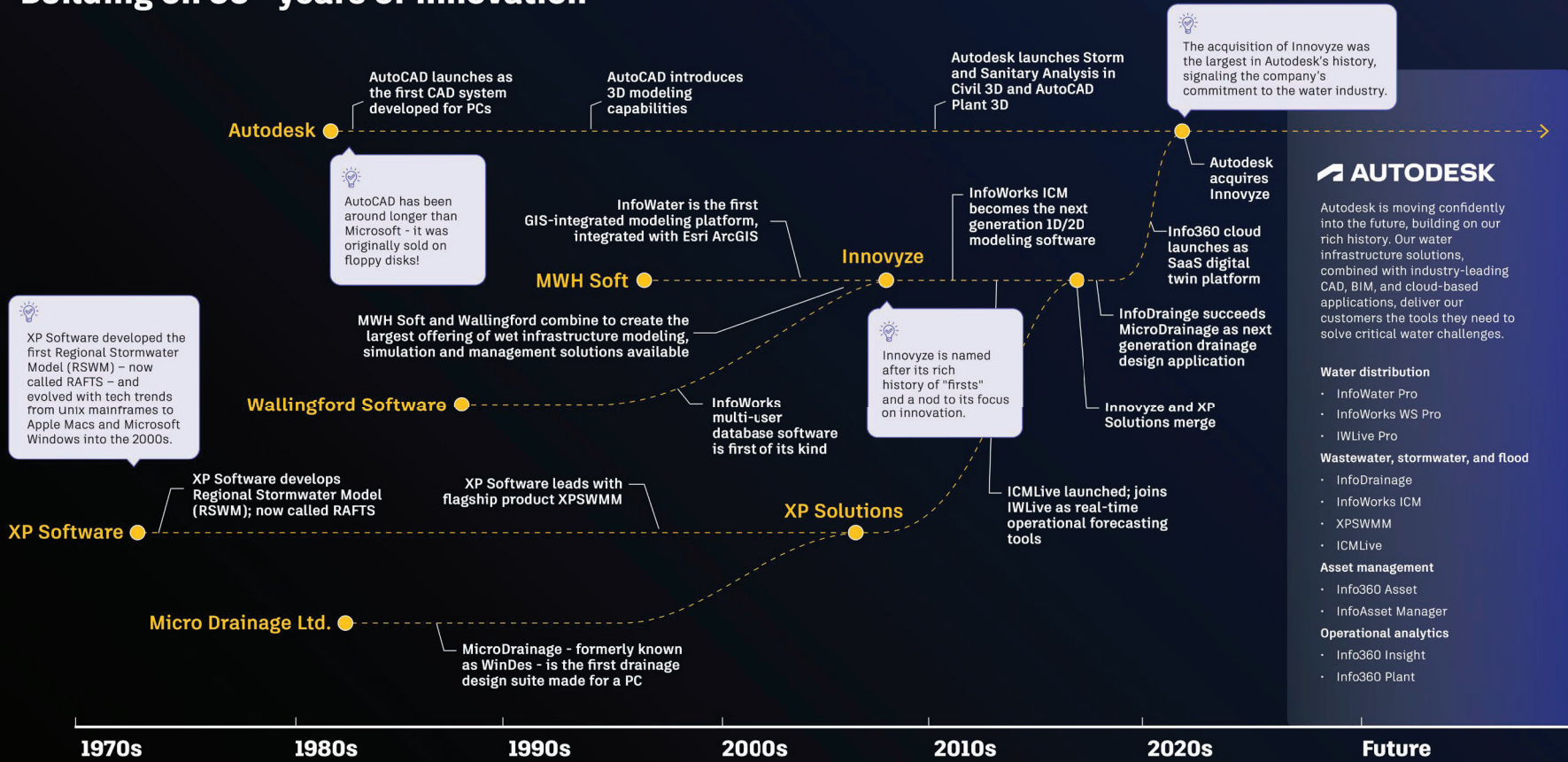
AI use cases across the water industry



Sources:
 2024 State of Design & Make Report
 2024 Spotlight on Data and Digitalization in the Water Industry

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Building on 50+ years of innovation



Autodesk is moving confidently into the future, building on our rich history. Our water infrastructure solutions, combined with industry-leading CAD, BIM, and cloud-based applications, deliver our customers the tools they need to solve critical water challenges.

- Water distribution**
 - InfoWater Pro
 - InfoWorks WS Pro
 - IWLIVE Pro
- Wastewater, stormwater, and flood**
 - InfoDrainage
 - InfoWorks ICM
 - XPSWMM
 - ICMLive
- Asset management**
 - Info360 Asset
 - InfoAsset Manager
- Operational analytics**
 - Info360 Insight
 - Info360 Plant

Our vision: End-to-end water asset management

Enable the water industry with the solutions needed to make the best decisions possible at every stage of a water asset's lifecycle

DIGITAL TWIN

PLAN

DESIGN

BUILD

OPERATE & MAINTAIN

CAPITAL PLANNING

HYDRAULIC MODELING
(ANALYSIS & SIMULATION)

DETAIL DESIGN
DOCUMENTATION

COORDINATION, PROJECT MANAGEMENT

ASSET
MANAGEMENT

OPERATIONAL
ANALYTICS

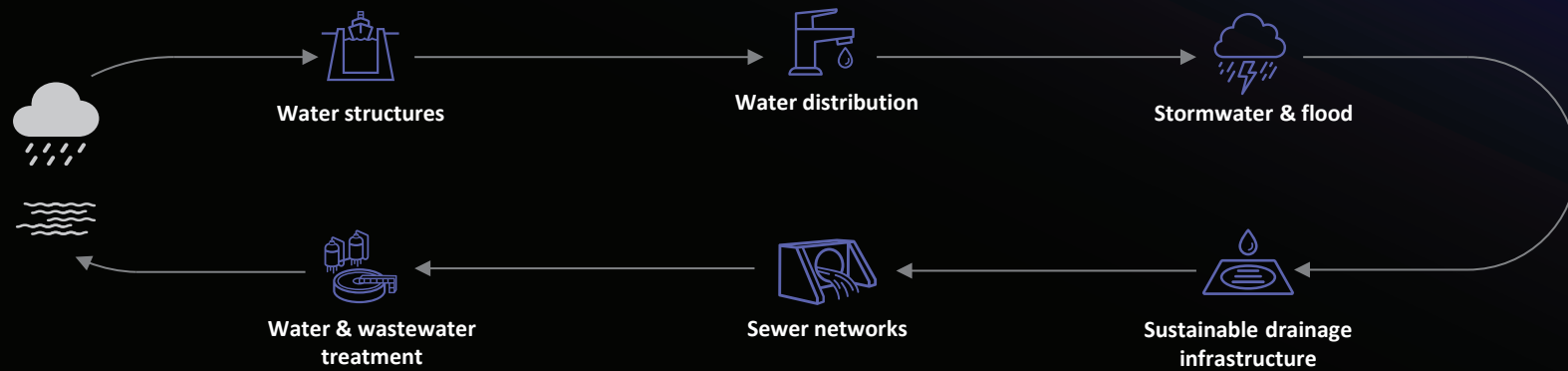
OPERATIONAL
MODELING

DIGITIZING CONTENT MANAGEMENT, COLLABORATION, PROJECT CONTROL & COMPLIANCE

DATA CAPTURE

VISUALIZATION, ANALYSIS & OPTIMIZATION

Driving digital transformation from cloud to sea



DIGITAL TWIN

PLAN

DESIGN

BUILD

OPERATE & MAINTAIN

Purpose-built solutions for sustainable water management



Drainage

Design optimization of networks to mitigate flooding and meet regulatory requirements

I InfoDrainage



Storm/Sewer/Flood

Modeling and simulation of flood and stormwater drainage systems and sewer collection systems

I InfoWorks ICM

I ICMLive

X XPSWMM



Water Distribution

Modeling of water distribution systems to ensure meeting service levels and delivering clean potable water

I InfoWorks WS Pro

I InfoWater Pro

I IWLIVE Pro



W/WW Treatment

Industry-specific toolset for plant design including automated P&ID, 3D models, piping ortho and isometric drawings

A AutoCAD Plant 3D



Asset Management

Analytical risk-based management for water and sewer networks to reduce operational risks and capital costs

I Info360 Asset

I InfoAsset Manager



Operational Analytics

Real-time and actionable insights to reduce operational costs and enhance service reliability

I Info360 Insight

Sustainability outcomes



Total carbon management

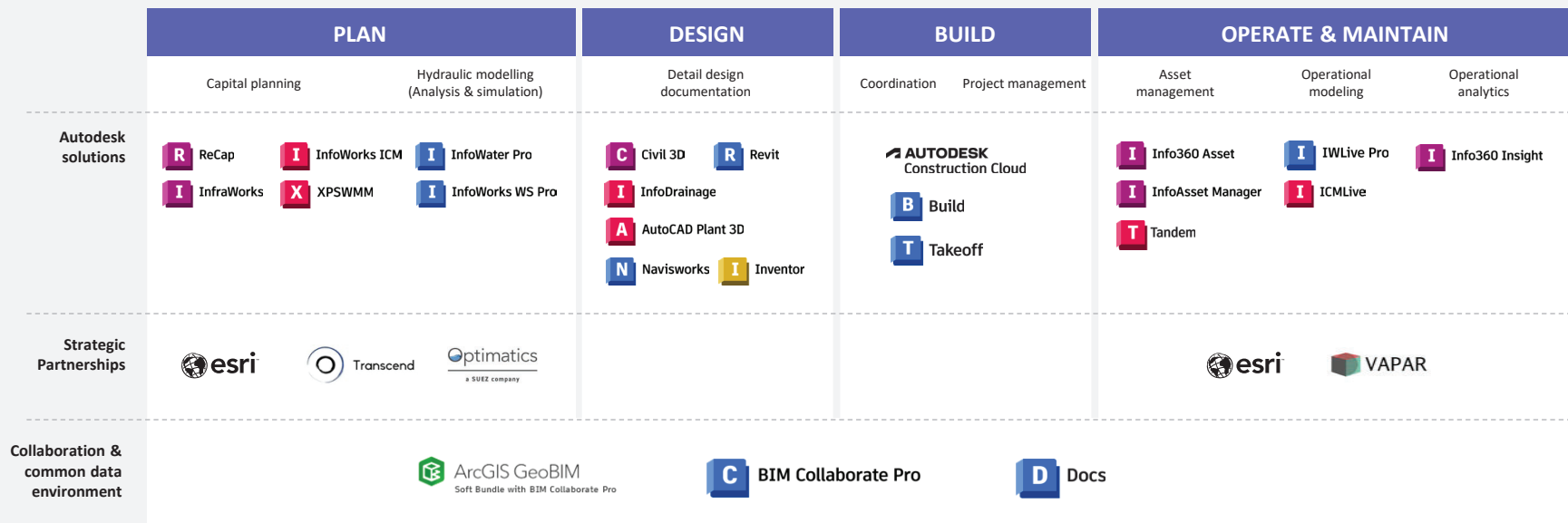


Resource efficiency

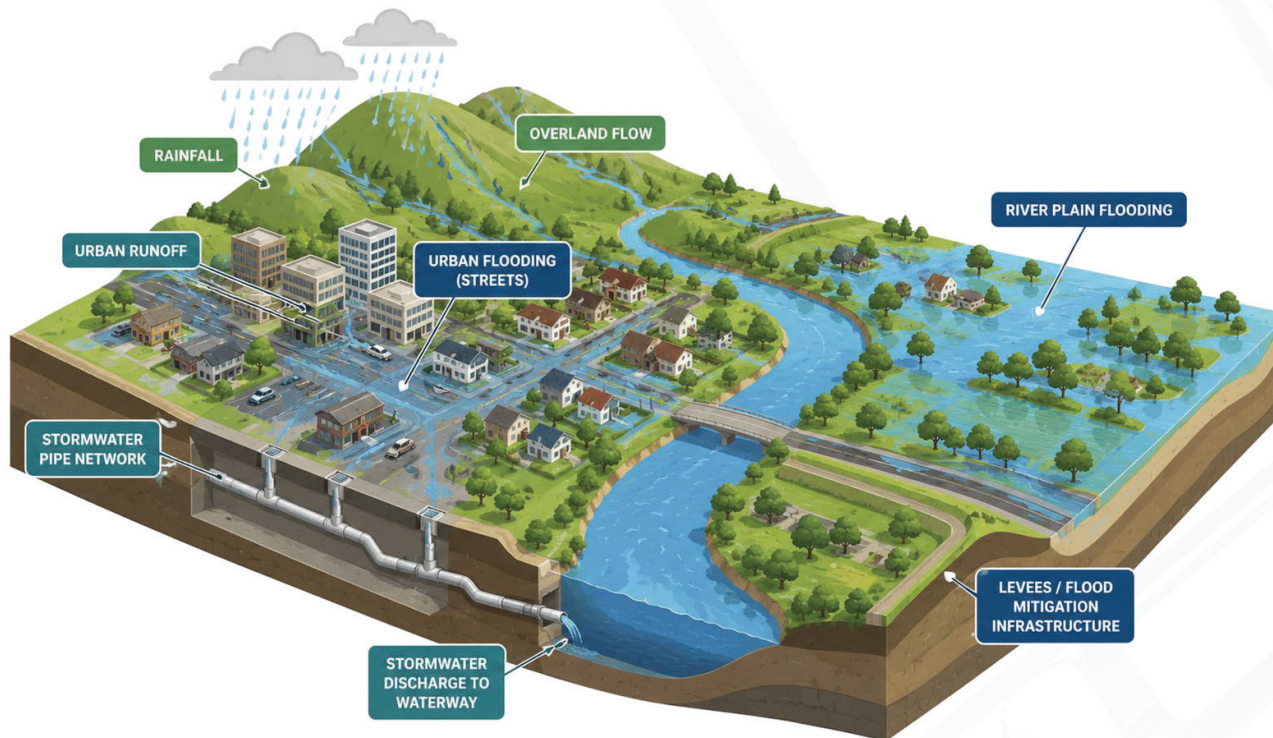


Climate resiliency

Our full ecosystem of solutions for water infrastructure



Integrated Catchment Modelling



High-resolution modeling approach to understand interactions between subsurface and overland flow, including hydrologic and hydrodynamic processes...

Model all sources of flooding & SW impact



Localised flooding (Pluvial)

- Flash flooding events

Regional flooding (Fluvial)

- River and stream overtopping
- Reservoir, dam, canal

Coastal flooding

- Storm surges and storm tides

Combined systems

- Stormwater and sewer overflows

Water quality

- Wash off pollutants

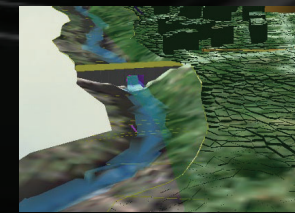
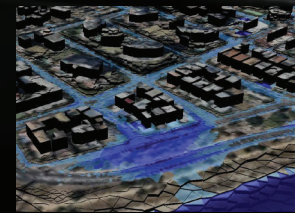
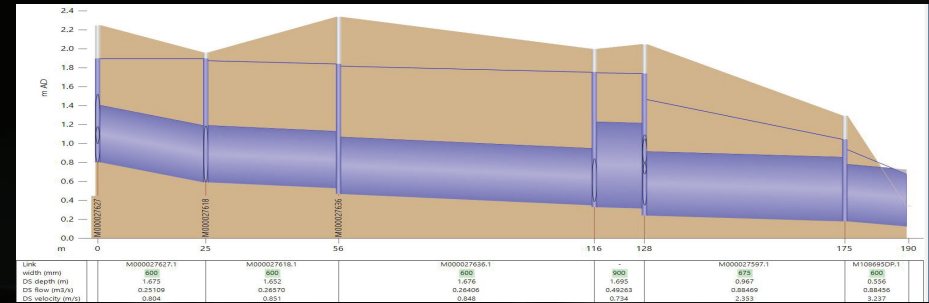
The background image is a composite of several elements. At the top, a basketball hoop with a blue backboard and white net is visible. Below it, a white-framed window is set into a dark brown wall. In the foreground, there are green leaves and branches of a tree or bush. On the left side, a speed limit sign is visible, with the text 'SPEED LIMIT 20' clearly legible. The entire scene is overlaid with a dark, semi-transparent filter.

I.C.M. Challenges



InfoWorks ICM

Powerful integrated catchment modelling software that helps plan for emergency scenarios such as flood and wastewater spill risks, system expansions, and capacity improvements.



Confidently face evolving water challenges



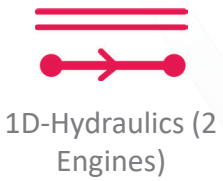
Plan, model, and forecast systems to prepare communities for extreme weather



Minimize project downtime with speedy and accurate simulations, locally or in the cloud



Enhance collaboration between stakeholders within a single workspace



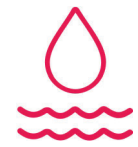
InfoWorks ICM



Cloud storage &
simulation



External Models:
HEC-RAS, XPRafts,
XPSWMM/XPStorm,
Civil3D (BIM) etc.



Water Quality &
Sediment Transport



Autodesk AI



Pipe Network
Design Logic



TSDB/ SCADA/ Rain
gauges/ Radar



Autodesk cloud capabilities – H&H modelling

Store

Single and multi-user storage in the cloud removes capacity limitations and IT burdens of on-premise servers.

Manage

Streamlined database management in a web environment with automatic backups ensure model data is safe and accessible.

Simulate

Cloud-distributed simulations with on-demand computation power achieves in-depth analyses faster than ever.



Local vs. Cloud

InfoWorks ICM Simulation Speed Test

2D Simulation Speed Tests

1. Lenovo ThinkPad vs Info360 Cloud (AWI)

Model

- Version 2026.1
- 2D only – Direct rainfall approach (calculation intensive)
- 3.13 km² area (313 ha)

GPU

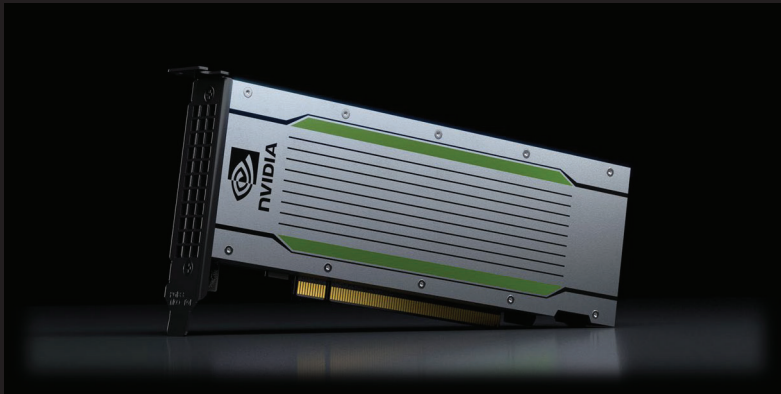
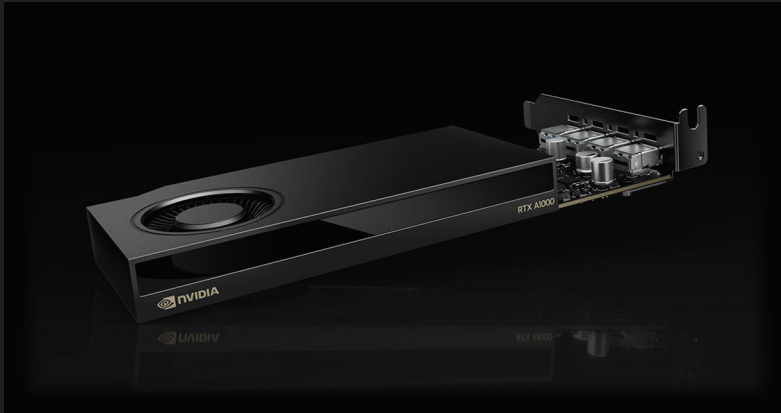
Local = NVIDIA RTX A1000

Cloud = Tesla T4

Test A: Same model set-up – different storm durations

Test B: Same storm duration – different mesh resolution

Test C: Small 1D/2D urban model – multiple simulations



Test A: Different storm durations

- 3.13 km² area (313 ha)
- Avg. mesh element = 6.4 m²
- No. of elements = 488,090

Duration	Local	Cloud
1 hr	9 min	4 min
12 hr	45 min	19 min
24 hr (1 day)	1 hr 21 min	34 min
48 hr (2 day)	2 hr	1 hr 5min
168 hr (7 day)	8 hr 22 min	3 hr 27 min

x2.25

speed increase using cloud over pc for each sim on average



Test B: Different mesh resolution

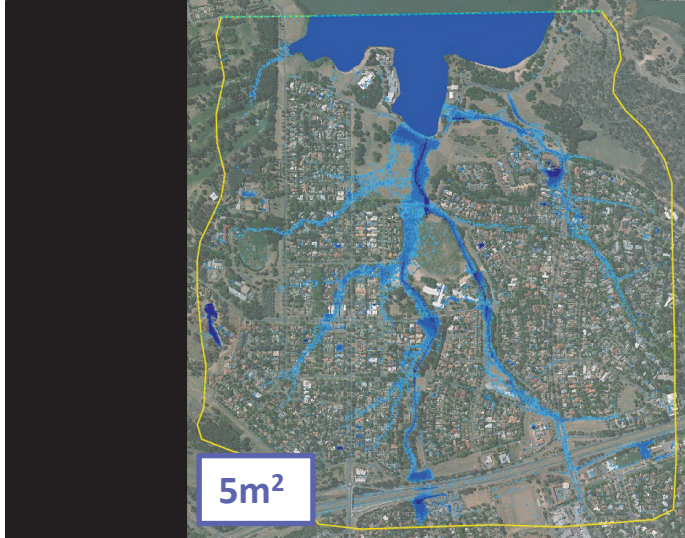
- 3.13 km² area (313 ha)
- 48 hr (2 day) storm duration - 60 hr run time

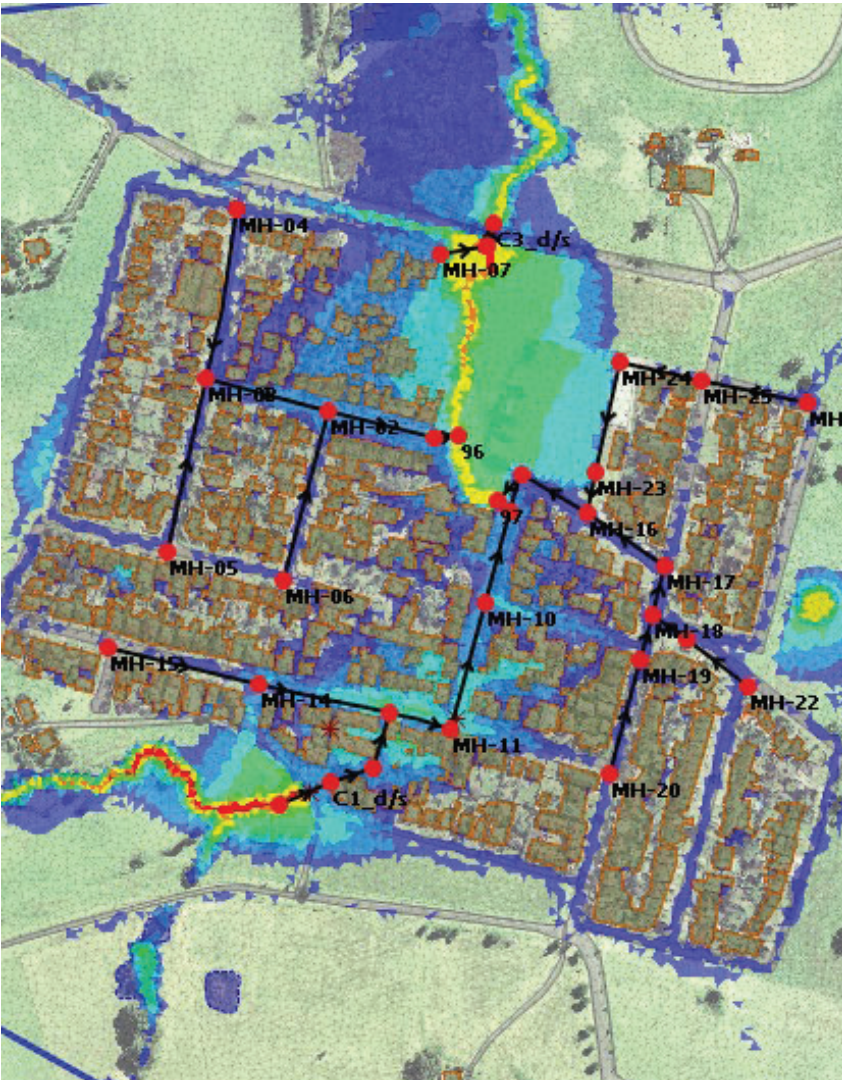
Resolution	Local	Cloud
1 m ²	12 hr 35 min	5 hr 34 min
5 m ²	1 hr 7 min	29 min
10 m ²	28 min	11 min
50 m ²	2.5 min	1 min
100 m ²	1.5 min	0.5 min
500 m ²	50 s	9s
1000 m ²	36 s	8 s

7 hours

time saving over high-resolution flood mapping







Test C: Multiple simulations

- Small 1D/2D (Urban) model
- Subcatchment Inflow + Direct Rainfall + Boundary Inflow Hydrograph
- 84.4 ha or 0.84 km²
- 29 1D links & 28,301 mesh elements (30 m² avg.)
- 40 storm scenarios tested

Local (4 sims simultaneous – 5 threads each [max = 20])

```

Memory used by simulation engine = 188.6MB
Threads = 5
Elapsed clock time = 59s
Total CPU time = 59.8s
Last continuation results file # = 0
EXITING
  
```

Run time = 10 mins

Cloud (40 storms simultaneous – 16 threads each)

```


Memory used by simulation engine = 299.8MB
Threads = 16
Elapsed clock time = 9s
Total CPU time = 128.3s
Last continuation results file # = 2
EXITING
  
```

Run time = 10 sec



Case studies

Real world examples



Aurecon – Sydney, Australia

Understanding Environmental Risk with Integrated Catchment Modelling

“Knowledge of the pollutants is vital. An integrated catchment model is a key tool in implementing a wet weather strategy that considers risk of impact to the receiving environment”

— Technical Director - Water, Aurecon

<https://www.autodesk.com/autodesk-university/class/Unleashing-the-Power-of-ICM-to-Understand-Risk-of-Environmental-Impact-2023>

Challenge

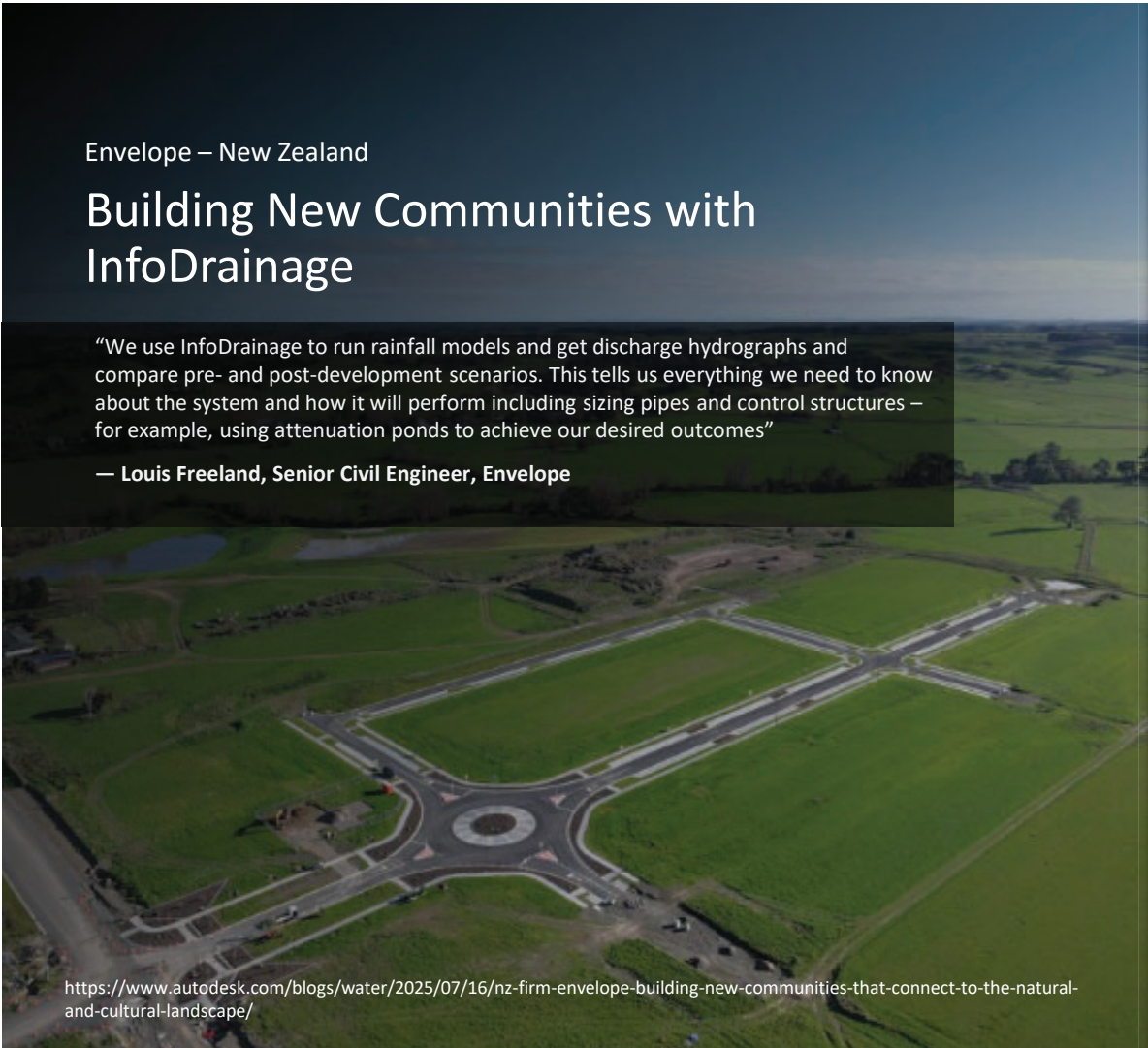
Overflows in wet weather are difficult to assess because volume and frequency alone do not show the true environmental risk. The real challenge is understanding how pollutants move through connected sewer, stormwater and receiving-water systems, and whether they affect sensitive ecological or recreational areas.

Solution

A fully integrated catchment model was developed in **InfoWorks ICM**, combining 1D sewer, 1D stormwater and 2D receiving-water systems in a single calibrated model. Long-term simulations compared stormwater-plus-wastewater scenarios with stormwater-only scenarios to isolate where overflows made a meaningful contribution to water-quality impacts.

Impact

The model provided a clearer, risk-based view of where overflow impacts were chronic, acute or unlikely. This supports better prioritisation of capital investment by focusing effort where it can deliver the greatest benefit to waterways, ecosystems and community users.



Envelope – New Zealand

Building New Communities with InfoDrainage

“We use InfoDrainage to run rainfall models and get discharge hydrographs and compare pre- and post-development scenarios. This tells us everything we need to know about the system and how it will perform including sizing pipes and control structures – for example, using attenuation ponds to achieve our desired outcomes”

— Louis Freeland, Senior Civil Engineer, Envelope

<https://www.autodesk.com/blogs/water/2025/07/16/nz-firm-envelope-building-new-communities-that-connect-to-the-natural-and-cultural-landscape/>

Challenge

Delivering Awa Park meant balancing technical innovation with a deep understanding of place. The requirement from the outset, was a drainage and flood resilience strategy that could unlock the site’s potential without compromising its natural waterways.

Solution

Envelope developed a seamless workflow from site design to full 1D/2D hydraulic analysis using **Civil 3D**, **InfoDrainage** and **InfoWorks ICM**.

By utilizing **InfoDrainage** in combination with **InfoWorks ICM**, Envelope can confidently ensure that their designs are robust and compliant with local regulations. The ability to model different rainfall events and assess their impacts allows the team to fine-tune their designs and avoid potential flooding issues

Impact

The success of Awa Park highlights the potential of Autodesk’s suite of solutions in taking sites from initial development and visualization to finalized stormwater and drainage plans, ready for development. As firms like Envelope continue to embrace digital transformation and holistic design and analysis solutions, they’re delivering smarter, faster, and more responsible development outcomes.

Resources

- **Technical Hubs**

- [InfoWorks ICM](#)

- **Autodesk Viewer licences**

- <https://www.autodesk.com/viewers>

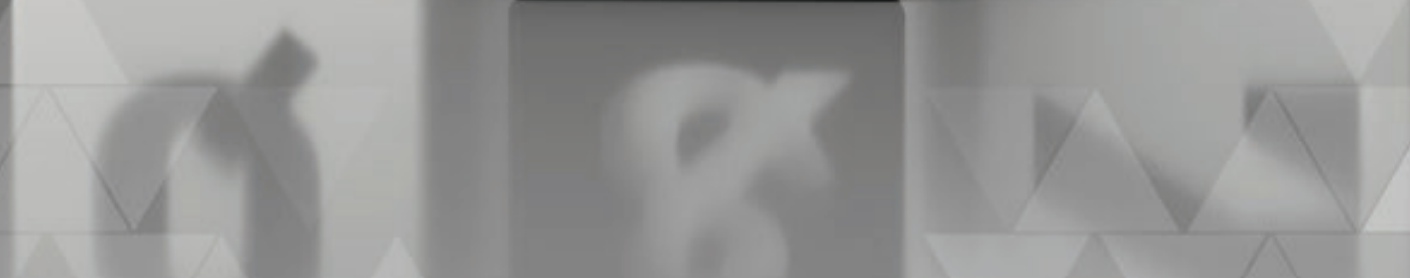
- **Educational licences**

- [Autodesk Education Community](#)

- **Trail downloads**

- [InfoDrainage Free Trial](#)







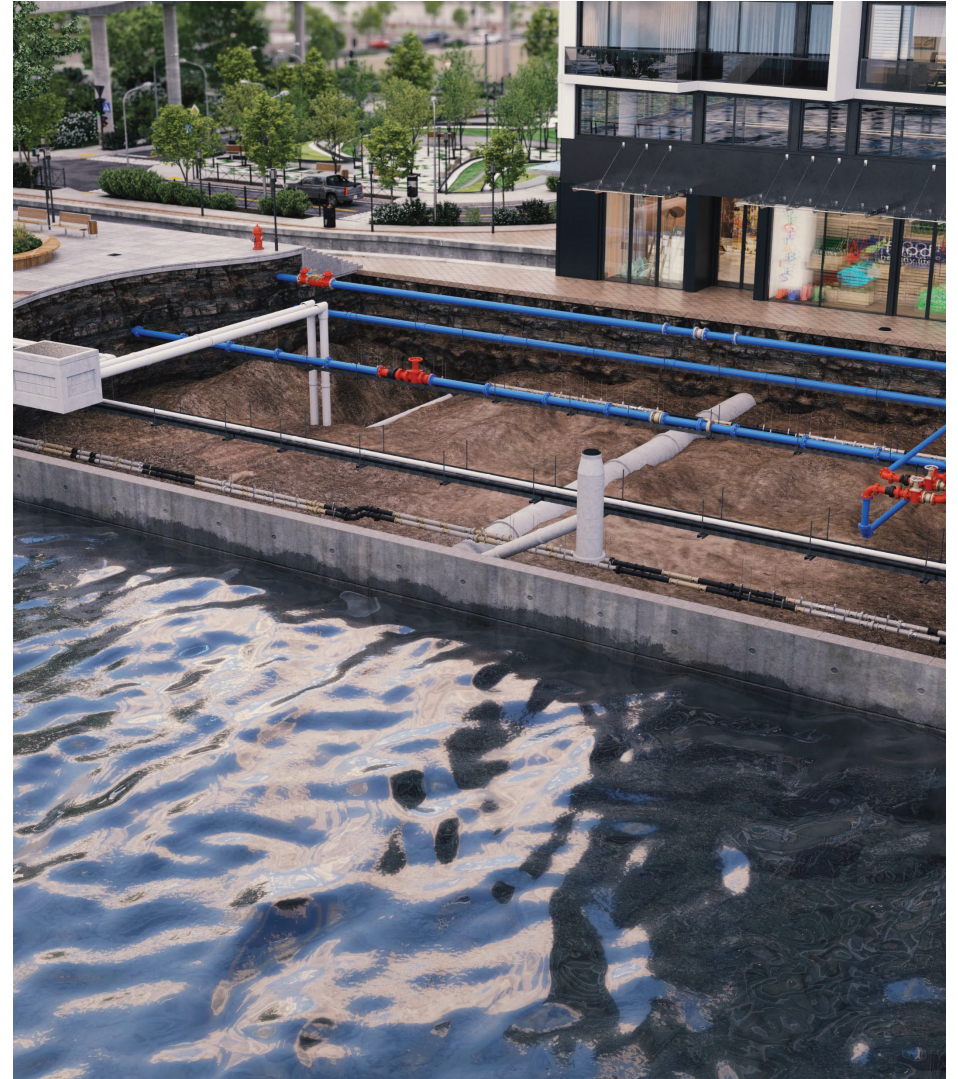
Connect with us



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