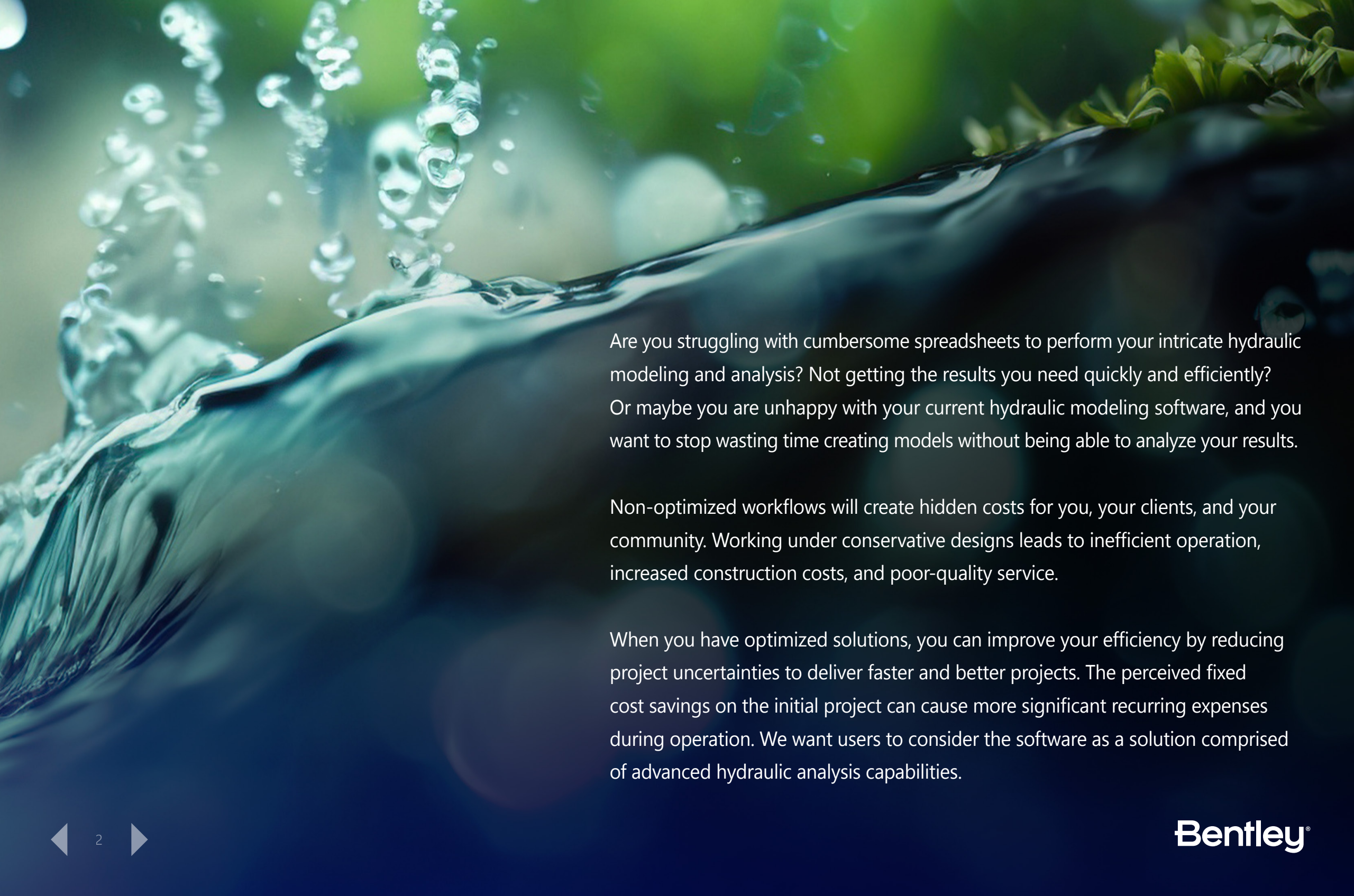Bentley®

Let Your **Savings** Flow with

OpenFlows™

Are you struggling with cumbersome spreadsheets to perform your intricate hydraulic modeling and analysis? Not getting the results you need quickly and efficiently? Or maybe you are unhappy with your current hydraulic modeling software, and you want to stop wasting time creating models without being able to analyze your results.

Non-optimized workflows will create hidden costs for you, your clients, and your community. Working under conservative designs leads to inefficient operation, increased construction costs, and poor-quality service.

When you have optimized solutions, you can improve your efficiency by reducing project uncertainties to deliver faster and better projects. The perceived fixed cost savings on the initial project can cause more significant recurring expenses during operation. We want users to consider the software as a solution comprised of advanced hydraulic analysis capabilities.

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The Value of a Good Analysis Solution

When using advanced hydraulic analysis software like Bentley's OpenFlows™ WaterGEMS®, OpenFlows SewerGEMS®, and OpenFlows HAMMER®, cost savings will be realized instantly during the entire infrastructure lifecycle— from planning, analysis, and design to optimization of operations and maintenance. You receive the benefit of intuitive and automated workflows that can significantly reduce overall costs and work efficiently under tight deadlines and margins.

The faster that you learn the software, the faster that you deliver projects. Eventually, you will spend more time prospecting or working on newer projects. A small investment in highly efficient software like Bentley's OpenFlows WaterGEMS can deliver a very quick return on investment, providing:

- **Automated model building**
- **Power of analysis**
- **Big savings from small tweaks to system operations**

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Dive into the Details

OpenFlows products are user-friendly and have superior interoperability. You can choose your preferred platform and increase the hydraulic model capabilities with more power to perform georeferenced analysis and/or drawing, saving time and avoiding the hassle of switching between different platforms. With their ease of use, you and your new hires will be up and running quickly to get the job done.

Learn more about OpenFlows solutions:

OpenFlows™ WaterGEMS®

OpenFlows™ SewerGEMS®

OpenFlows™ HAMMER®

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OpenFlows™ WaterGEMS®

OpenFlows WaterGEMS provides an easy-to-use environment to confidently analyze, design, and optimize your water distribution and pressure systems. It also provides advanced interoperability, geospatial model building, optimization, and asset management capabilities.

OpenFlows WaterGEMS supports your engineering workflows with:

- Model building
- Interoperability
- Fire flow and water quality analyses
- Advanced calibration methods
- Advanced automatized design methods
- Advanced operation optimization methods

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OpenFlows™ SewerGEMS®

OpenFlows SewerGEMS is an easy-to-use advanced engineering software for you to analyze, design, and operate sanitary and combined sewer systems. You can decrease decision risks by ensuring that the model uses the best available data, built-in hydraulic and hydrology capabilities, and a variety of wet-weather calibration methods.

OpenFlows SewerGEMS provides:

- The ability to work in multiple platforms
- 1D/2D hydraulic analysis
- Model building and management
- Advanced analysis
- What-if scenario performance
- Five hydraulic solvers for simulations considering static, extended period, dynamic, and 2D simulations
- Automatized gravity pipes design

> We have bundled OpenFlows WaterGEMS and OpenFlows SewerGEMS in our Water WorkSuite for a discounted price. The bundle is now offered in three pipe sizes: 1,000, 5,000, and unlimited pipes at a 40% discount.

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OpenFlows™ HAMMER®

A transient analysis and water hammer application, OpenFlows HAMMER is the most cost-effective way to control transients. If left unchecked in a water or sewer system, transient pressures can cause catastrophic damage to pipes and equipment, risk the safety of operators, allow the intrusion of dangerous contaminants into the system, and interrupt service to customers. Used successfully on high-profile projects around the world, OpenFlows HAMMER can identify critical points in the system that need protection and facilitate sound system design.

OpenFlows HAMMER provides:

- Computing results with a proven algorithm
- Superior interoperability
- Model building and management
- What-if scenario performance to test different protection devices or configurations
- Data analysis

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Analysis to Save Time and Money

Discover the streamlining benefits of OpenFlows software that allow you to solve your water and wastewater challenges.

- **Scenario management:** OpenFlows applications can efficiently evaluate several designs, compare the results, and analyze operations of an existing or planned system under numerous extreme and typical conditions. Engineers, designers, and operators can test what-if conditions to better foresee and predict the impact of change in the system and even small operational actions.

- **Easy model building:** Jumpstart the model-building process and use your model to make the best engineering decisions. You can leverage and import many well-known external data formats, which maximizes the return on investment for geospatial and engineering data and automates input data generation. It also allows access to and comparison with record drawings and live GIS asset and background data. The software enables you

to leverage numerous data sources and avoid manual tasks that will make it harder and longer, as well as increase of typing mistakes.

- **Great visualization:** You can use capabilities—such as color coding, annotation, profiling, and graphs—to create a better visualization experience in your modeling application. The ability to easily implement background images, such as Bing Maps, helps you create and present information in an interesting way.

Analysis to Save Time and Money

From fire flow and water quality simulations to criticality and energy cost analysis, water software, such as OpenFlows WaterGEMS and OpenFlows HAMMER, have everything you need. The following capabilities will help you identify and mitigate risks.

- **Criticality analysis:** OpenFlows WaterGEMS helps you find the weak areas or links in water distribution systems and assess the adequacy of isolation valves. The software enables you to evaluate the ability to isolate portions of the system, generate network segments, and serve customers using different valve locations.

- **Fire flow analysis:** Access and identify inadequacies in fire protection and design improvements to meet fire flow and protection requirements. You can modify the sizing and location of pipes, pumps, and tanks. Use the software to automate fire flow analysis capabilities so that you do not need to manually create scenarios and iterations to evaluate every hydrant location.

- **Pump Optimization:** Model pumps accurately using hydraulic modeling, including complex pump combinations and variable speed pumps, to understand the impact that different pump operational strategies have on energy usage.

You can minimize energy related to pumping costs while maximizing system performance. OpenFlows WaterGEMS has several features that enable this analysis, including generating a quick comparison of a pump's operation to its intended design and efficiency.

- **Assess Water Quality:** Easily carry out an analysis using simulations to help solve water quality problems. You can create water quality simulations for chlorine decay, water age, source tracing, and multispecies analysis (MSX). Enable a comprehensive thematic display of the results, both within and apart from GIS platforms, to get a clear understanding of how and where problem areas develop in your system.

- **Flushing Analysis:** Optimize flushing programs with multiple conventional and unidirectional flushing events in a single run. Increasing velocity in mains can flush out solids and stale water, with the primary indicator of success being the maximum velocity achieved in any pipe during the flushing operation. OpenFlows WaterGEMS includes automated capabilities for flushing analysis, including printing a sequenced report for field use.

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Examples of the capabilities of OpenFlows WaterGEMS include:

Automated Design: Automatically find maximum benefit or minimum-cost designs and rehabilitation strategies, based on available budget, construction cost, and pressure and velocity constraints. You can also analyze energy consumption to identify the most energy-efficient pump scheduling strategy.

Optimize:

- Operations of fixed- and variable-speed pumps

- Tank storage to minimize energy usage or energy cost, based on pressure, velocity, pump start, and tank level constraints

- Energy costs to be aggregated across pumping stations, factoring in complex tariffs, as well as non-model-related energy costs, to perform net present value analysis of operating scenarios

Automated Model Calibration: Evaluates millions of possible solutions to quickly find a calibration hypothesis that best matches measured flows, pressures, and on/off status, empowering users to make reliable decisions based on accurate hydraulic simulations of the real world.

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Time is Money

Due to a workforce shortage, utilities, contractors, and other industry entities are often reactively replacing assets that fail. Hydraulic modeling could aid as a proactive strategy that is far more cost-effective in the long term. Finding the solution that will help optimize your designs, increase profits, save time, and keep your consumers happy is only the first step.

Successful integration through consistent and reliable support, including access to water and wastewater industry experts, ensures that you will accelerate your productivity.

All new users receive a **New User Learning Resources Guide** to ensure that you get up and running quickly. In addition, our hydraulic and hydrology experts have in-depth content, such as webinars, blogs, and tutorials.

You can use:

- **On-demand Training:** Courses and learning paths database

  VIRTUAL CLASSROOM >>

- **Formal Expert Training:** On-demand and live training are included with SELECT/ELS licenses

  BENTLEY LEARNSERVER >>

- **Keys:** Every Virtuoso subscription to OpenFlows software includes complimentary keys that can be redeemed for customized training with experts

  SOFTWARE KEYS >>

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OpenFlows™

Get Your **Savings** Flowing Today

We often encounter growing utility companies and consultants that initially relied on conservative and outdated methods for design and operation or even basic hydraulic analysis software. These professionals were content with these methods until they realized what they were missing out on daily opportunities to properly identify and leverage modern hydraulic models to find hidden savings.

No matter the size of your business, investing in innovative and efficient technology solutions today can help you reap greater profitability for all your tomorrows. Learn more about OpenFlows. If you are ready to save today, chat with an expert.

To learn about all of the OpenFlows applications,

Click Here →

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"We applied OpenFlows WaterCAD software in a water loss control and reduction project in the Passo Fundo region, which suffers from severe drought. The existing water distribution system had a loss of approximately 60%. The goal was to reduce that loss to 40%, which we achieved."

– Matheus Viegas, Owner
Tecnologia em Saneamento Ambiental (TSA)
Brazil