

# Using Live Modeling Solutions to Reduce Sewer Overflows

Don't run the risk of consent decree enforcement

## Prevent Raw Sewage and Contaminated Stormwater from Entering Your Waters



There are two types of sewer overflows: Sanitary Sewer Overflow (SSO) and Combined Sewer Overflow (CSO).

Neither is desirable, and both can land water companies with sizeable fines from the EPA due to their detrimental effect on the environment and public health.

When Sanitary Sewers overflow they release raw sewage that can contaminate waterways, causing water quality problems and threatening public health.

The EPA estimates that there are at least 23,000 – 75,000 SSOs in the U.S. every year. That figure is for spills into waterways or on to roads, it doesn't include sewage backup into buildings.

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“EPA has taken actions at 97 % of large combined sewer systems, 92 % of large sanitary sewer systems and 79 % of Phase 1 municipal separate stormwater systems.” - USEPA

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A Combined Sewer Systems (CSSs) collects rainwater runoff into the same pipe as domestic sewage and industrial wastewater.

Normally, it transports all the wastewater to a sewage treatment plant. But the problem is heavy rainfall events or snowmelt can lead to that the volume of wastewater exceeding the capacity, resulting in a Combined Sewer Overflow (CSO) into nearby water bodies. CSOs can contain untreated or partially treated human and industrial waste, toxic materials, and debris as well as stormwater.

So, how many are being affected? And how can wastewater managers take control?

Around 860 municipalities across the U.S. have CSSs, that means a population of around 40 million people live with a potential pollution concern from CSOs.

## Who's at risk from CSOs?

CSSs are characteristic of aging water infrastructures, built when it was cheaper to have a single pipe to transport sanitary and stormwater to a treatment plant. CSOs are mainly found in the Northeast and Great Lakes regions, particularly in Illinois, Indiana, Maine, Michigan, New York, Ohio, Pennsylvania, and West Virginia. While some large cities like New York, Philadelphia, and Atlanta have CSSs, most communities with CSO problems have fewer than 10,000 people.

## What's being done about them?

The EPA's CSO control policy is a national framework for controlling CSOs through the National Pollutant Discharge Elimination System permitting program. The EPA has the authority to fine municipalities and companies for violating the Clean Water Act, through a Consent Decree: a federal mandate to reduce sewer overflows into local streams and rivers.

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"33% of utility respondents have fully implemented CSO/SSO plans in place, with an additional 20% with implementation in progress."

- AWWA 2018 State of the Water Industry Report

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## How can you control overflows?

While rainfall and snowmelt are inevitable and beyond the control of municipalities and water companies, there are ways to reduce SSO and CSO events using water infrastructure technology solutions. [Here are five ways live modeling technology can help you prevent raw sewage and contaminated stormwater from entering your waters.](#)

### 1: Use live modeling to incorporate field and weather forecast data

Connect SCADA data, field telemetry instrumentation, and weather forecasts with existing GIS data for real-time insights that can predict overflow events. When you know what's about to happen, your operators are prepared to pre-empt spills. As a tool in their day-to-day work, ICMLive helps operators plan their system response to heavy rainfall.

### 2: Apply live alerts from your model to guide field operations

Live models built with ICMLive connect SCADA databases, telemetry devices installed at outfalls, and radar data with hydraulic models to predict the likelihood of CSO events. You can set alerts based on logical variables – such as submerged weirs, flow level, velocity, etc. – to inform system managers and operators when the likelihood of overflow is predicted to be high.

### 3: Control events in real-time

Incorporating Real-Time Control (RTC) logic into your model allows you to directly program control structures, like regulators, bendable weirs, and telemetry-controlled pumps, to respond during weather events.

You can investigate analysis of storage, pump operation, flood gates, and other control structure performance. RTC enables you to explore a wide variety of options to improve operations, giving you invaluable insight into which actions, taken at which time, will have the biggest impact on reducing overflow volume and frequency.

#### 4: Simulate wet weather conditions to identify overflow risk

A hydraulic and hydrologic (H&H) model enables you to track CSOs and SSOs and evaluate potential solutions to comply with regulated standards. It will help you carry out comparative analysis between CSO or manhole spill locations. You can understand the impact of your solutions based on evidence rather than gut feel and identify any potential knock on impact on other parts of your network.

#### 5: Find blockages or sources of infiltration and inflows (I&I)

A hydraulic model provides a holistic view of your complete network, so you can drill down into specific areas to identify problem areas. InfoSWMM, InfoSewer, and InfoWorks ICM SE help you to gain a deeper understanding of what causes I&I and blockages in your networks.

## It's up to you to act now.

Don't let SSOs and CSOs pollute your waterways, or your reputation.

Make use of the information you already have in your organization to build a model that gives you clear, coherent insight into what's happening in your network, and how to mitigate the risk of sewage spills in real-time.



If you're struggling to  
reduce overflows,  
we can help.

Let's Do This

## About Innovyze

Innovyze empowers water professionals around the world to create, manage, and maintain water services. We are the global leader in water infrastructure data analytics software, providing enduring support for customer success.

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