The Chicago River system has improved dramatically over the last 35 years with cleaner water, more wildlife, and all kinds of new ways to enjoy the river. Yet our awareness and hard work are needed more than ever to protect the people, plants, and animals that rely on our waterways. That is why Friends developed the Overflow Action Days initiative. Our information packet and awareness campaign are designed to reach your communities in dynamic ways and arm citizens with the information they need to help prevent sewage and stormwater runoff from polluting the river, as well as the unintended negative consequences of residential water use, which contributes to the problem. This document introduces this new initiative and outlines why it is necessary take action on multiple levels.

Overflow Action Days

Friends of the Chicago River and our partners will declare an Overflow Action Days on any day leading up to, during, or after a rain event that has the potential to overwhelm our sewers and flush harmful waste into the Chicago River system. Friends developed the Overflow Action Days initiative to engage the public’s help in reducing stormwater pollution, sewage overflows, and flooding. Friends and its partners will declare Overflow Action Days through social media, e-alerts, and sending press alerts, signaling the need for additional water conservation.

This “call to action” asks people to reduce water during this critical time and make changes in the way they use and treat water in and around their homes. The “Simple Guide to Water Conservation” (included in this packet) provides easy tips on how we can minimize water usage before, during, and after rain events and hopefully reduce sewage overflows into the river system. Beyond the actual rain event, an Overflow Action Days will remind citizens to also support the systemic efforts and investments that are necessary to reduce sewage overflows, flooding and other stormwater related pollution.

Understanding the Overflow Problem

The Chicago River system receives harmful pollution from a number of sources, especially during heavy rainfalls. This is when the river system is most at-risk because both sewage overflows and stormwater bypass treatment plants and make their way directly into our freshwater systems. This problem is complex but not insurmountable if we understand how to help.

Overflow pollution comes from three critical sources.

- **Combined sewer systems make “clean” water polluted, treating rainwater like garbage to be thrown away.** When rain falls in areas with combined systems, drains divert fresh stormwater along the same route as sewage. It goes through a sewage treatment plant before being released into the river system again.

- **Heavy rainfalls easily overwhelm our combined systems already treating waste.** Because stormwater and sewage converge and share routes to the treatment plants, additional rainwater can cause an overflow of raw sewage combined with polluted stormwater.

- **Separated systems still move toxic stormwater directly to waterways.** Pavement covers much of our once-natural landscape, and stormwater runoff picks up toxins like motor oil, salt, and fertilizers on its way to the river. This toxic “first flush” is recognized as the leading cause of water pollution by the U.S. EPA.

Friends of the Chicago River
The Containment Solution in Progress
In 1975, the MWRD started TARP, nicknamed Deep Tunnel, to address combined sewer overflows and flooding. TARP's 109 miles of underground tunnels and three reservoirs are designed to capture rain water, in addition to our regular amount of sewage and industrial waste during rainstorms. The tunnels and reservoirs store the excess water until MWRD sewage treatment plants have the capacity to treat it. Once the wastewater is treated, it is released into the river.

The first tunnels began operation in 1985, and an estimated 85% of CSO pollution has been eliminated. Water quality has improved as a result. The number of fish species has skyrocketed from seven to 70. More natural, open space has been preserved for public enjoyment. Commercial and residential developments have blossomed along a river system that was once ignored.

As of 2015, all 109 miles of tunnel are complete; two of three reservoirs are operating. The last and largest McCook Reservoir is scheduled for completion in 2029. But storms of greater volume and intensity and climate change exacerbate the problem of evoking rain patterns. TARP was not designed for these extremes, causing an increase in local sewer overflows and flooding. For the Chicago River system to continue its improvement, we must take action.

Finding Fixes Now
Overflow solutions take a variety of forms:

- **We can incentivize and encourage onsite management of stormwater.** Local governments and regional agencies must develop a coordinated plan that rewards and requires developers and major landowners to develop stormwater controls, keeping it away from the river system, including green infrastructure.

- **Citizens must think about what and how much they put down their drains.** If everyone across the Chicago metropolitan area conserves water, the Chicago River will become one of the world’s greatest metropolitan rivers.

- **Homeowners can play a strong role by managing their property.** To reduce water to our sewers through disconnecting downspouts, using permeable pavers over impervious pavement, and incorporating more native flowers and grasses in your yard instead of turf grass.

Sign the Overflow Action Day Pledge
We cannot wait for the large infrastructure solutions to be completed. We must act now and conserve water at home and work. If we act collectively and individuals across the metro area pledge to reduce personal water use by at least 10 gallons a day, we will keep almost one billion gallons of water from being treated at a wastewater treatment plant. Take the Overflow Action Day pledge today and share your promise to encourage widespread adoption of water conservation efforts that make a big impact on our local environment. [www.chicagoriver.org/overflowpledge](http://www.chicagoriver.org/overflowpledge).

Key Abbreviations and Terms:

**Friends**: Friends of the Chicago River

**CSO**: A combined sewer overflow happens when a rain event overwets the sewer system and MWDRD releases the excess water into Chicago River and sometimes into the lake.

**First Flush**: First flush is the initial surface runoff of a rain event. During this phase, water pollution entering storm drains in areas with high proportions of impervious surfaces is typically more concentrated compared to the remainder of the storm.

**U.S. EPA**: The U.S. Environmental Protection Agency is charged to protect human health and the environment.

**MWDRD**: Metropolitan Water Reclamation District

**TARP**: Tunnel and Reservoir Plan

**CSS**: A combined sewer system is one that is designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe.

**SSS**: A separated sewer system receives rainwater separately from homes and industrial wastewater. A separated sewer system can reduce or eliminate sanitary discharges into receiving waters, such as the Chicago River.

Overflow Action Days is an initiative of Friends of the Chicago River. [www.chicagoriver.org/overflowaction](http://www.chicagoriver.org/overflowaction)
Overflow Action Days

Background Information and Key Facts and Figures
Stormwater and CSOs negatively impact the Chicago River system throughout the year. On occasion, sewage is released through the locks into Lake Michigan. The current patterns and projections for climate change make the Overflow Action Days initiative even more urgent. We cannot solve flooding and CSOs without individuals playing a role and simply conserving water at home.

Currently, TARP can store 10.55 billion gallons of stormwater in its 109 miles of tunnels and two functioning reservoirs. Unfortunately, available data shows that extreme rain events are steadily increasing throughout the Midwest. Scientists agree that climate change is the culprit.

What About Climate Change?
Climate change is making it harder to manage stormwater and prevent CSOs in the Chicago metropolitan area. Heavy isolated rains and 100-year storms now occur every couple of years and can overwhelm the system.

- A number of Chicago metropolitan area precipitation records have been broken in the last three years, leading to widespread flooding, property damage, massive amounts of CSOs, and even a state of emergency:
  - June 2015: Early June saw record breaking precipitation and, on June 15, a Chicago weather station recorded 2.56 inches of rain. This massive multi-day rain event caused flash flooding and sewage overflows at nearly every point on the Chicago River.
  - April 18, 2013: Government officials declared a state of emergency after the second-rainiest April day in Illinois history, 3.53 inches. The two-day total of 5.53 inches of rainfall is about the amount that typically falls over a two month period.
  - Climatologists label rain events based on their probability:
    - A 100-year rain event has a probability of occurring once every 100 years – or 1% chance of occurring in a year. Similarly, a ten-year rain event has a probability of occurring once every ten years – or a 10% chance of occurring in a year.
    - From 2009-2015, the city had four ten-year rain events.
    - Weather data shows that the number of 100-year rain events has nearly doubled over the past century due to a rapidly changing climate. The increase in 100-year rain events necessitates that we increase capacity in our sewer system, demanding both water conservation and water storage (TARP and on site storage).

The Chicago metropolitan area cannot rely solely on MWRD’s tunnel and reservoir system to solve flooding and sewer overflows. Climate change forces us to act collectively and to support multi-pronged approaches to reduce the environmental and economic damages of these extreme rain events. Urban areas need to include innovations like green stormwater infrastructure as well as initiatives like Overflow Action Days, asking citizens to conserve water at home through simple actions like taking a shorter shower. For more ideas on how to conserve water at home, refer to Friends’ “Citizen Guide to Water Conservation.”

Key Abbreviations and Terms:

TARP: Tunnel and Reservoir Plan

CSO: A combined sewer overflow happens when a rain event overwhelms the sewer system and excess water and waste are released into the Chicago River and sometimes into the lake.

Stormwater: Stormwater is water that originates during precipitation events and snow/ice melt. Stormwater can soak into the soil (infiltrate), be held on the surface and evaporate, or runoff and end up in nearby streams, rivers, or other water bodies (surface water).

Green infrastructure: Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. The City of Chicago put forth a green stormwater infrastructure vision that prioritizes permeable pavement and green roofs, adding 85 million gallons of annual stormwater capacity.

Overflow Action Days is an initiative of Friends of the Chicago River.

www.chicagoriver.org/overflowaction
Overflow Action Days

Background Information and Key Facts and Figures
Stormwater and CSOs negatively impact the Chicago River system throughout the year. On occasion, sewage is released through the locks into Lake Michigan. The following facts and figures describe the river system and highlight significant historical milestones for our waterways.

Where is the Chicago River System?
- The Chicago River system is 156 miles long and includes the North Branch and its three tributary streams, the North Shore Channel, the Main Stem, the South Branch, the South Fork of the South Branch (Bubbly Creek), the Chicago Sanitary & Ship Canal, the Cal-Sag (Calumet-Saganashkee) Channel, the Little Calumet River, and the Calumet River. Its northernmost point is approximately seven miles from the Wisconsin border.
  - In 1900, engineers completed the Chicago Sanitary and Ship Canal, reversing the Chicago River to protect Lake Michigan, Chicago’s source of drinking water, from pollution.
  - The Chicago Sanitary and Ship Canal flows into the Des Plaines River at Lockport, which drains into the Illinois River, then the Mississippi River, and eventually the Gulf of Mexico.
  - The canal permanently connects the Chicago River with the Des Plaines River and provides a direct link between Lake Michigan and the Mississippi River.
  - The North Shore Channel was completed in 1910 to drain the area and to increase water flow and volume to the North Branch, which was often stagnant with septic water.
  - The Calumet-Sag Channel reversed the Calumet system in 1922. It now also flows away from the lake into the Chicago Sanitary and Ship Canal upstream of Lemont.
  - Since TARP tunnels went online in 1985, water quality in our river system has improved greatly. For example, in 1970 officials counted only seven species of fish in the Chicago River system. Today, there are 70 along with dozens of species of birds and other wildlife, including turtles, beavers, muskrat, mink, and the occasional river otter.
  - In 2011, the U.S. Environmental Protection Agency mandated higher water quality standards for the Chicago River system that included protections for swimming in many of its reaches, including the North and South Branches, the North Shore Channel, the Calumet-Sag Channel, and the Little Calumet River.

Key Abbreviations and Terms:
CSO: A combined sewer overflow happens when a rain event overwhelms the sewer system and MWBR releases the excess water into Chicago River and sometimes into the lake.

Overflow Action Days is an initiative of Friends of the Chicago River. www.chicagoriver.org/overflowaction
Overflow Action Days

Background Information and Key Facts and Figures
Stormwater and CSOs negatively impact the Chicago River system throughout the year. On occasion, sewage is released through the locks into Lake Michigan. The following facts and figures highlight how the MWRD treats and manages water, how our sewer system works as well as associated stormwater issues.

Where Does the Water Go?
Metropolitan Water Reclamation District of Greater Chicago (MWRD)

- The MWRD is a special-purpose taxing district chartered by the State of Illinois in 1889 to operate in Cook County. The MWRD is managed by an elected board of nine county-wide commissioners.

- The MWRD’s purpose is the reclamation of wastewater and stormwater management in Cook County to protect the health and safety of citizens, Lake Michigan, and area waterways.

- The MWRD has an 883 square mile service area, including Chicago and 125 surrounding suburbs.

- The MWRD treats an average of 1.4 billion gallons of wastewater per day, and its capacity is over 2 billion gallons per day.

- There are four sewage treatment plants that discharge to the Chicago River system: the Terrance J. O’Brien Water Reclamation Plant, the Calumet Water Reclamation Plant, the Stickney Water Reclamation Plant, and Lemont Water Reclamation Plant.

- By spring 2016, the MWRD will seasonally disinfect sewage effluent at the Calumet River Water Reclamation Plant and the O’Brien Wastewater Treatment Plant.

- The Stickney Water Reclamation Plant is the largest in the world serving 2.38 million people across 260 square miles in Chicago and 46 surrounding suburbs. It has the capacity to treat 1.2 billion gallons of water per day.

Key Abbreviations and Terms:

TARP: Tunnel and Reservoir Plan

CSO: Combined Sewer Overflows. A combined sewer overflow happens when a rain event overwets the sewer system and MWRD releases the excess water into Chicago River and sometimes into the lake.

Stormwater: Stormwater is water that originates during precipitation events and snow/ice melt. Stormwater can seep into the soil (infiltrate), be held on the surface and evaporate, or runoff and end up in nearby streams, rivers, or other water bodies (surface water).

CSS: A combined sewer system

SSS: A separated sewer system

MWRD: Metropolitan Water Reclamation District

Runoff Pollution: runoff pollution, includes but is not limited to any pipe, ditch, channel, tunnel, or conduit from which pollutants may be discharged. Rainwater carries runoff pollution such as fertilizers, oil, grease, and sediment directly into the sewer system as well as the river.

Outfall: the place where a river, drain, or sewer empties into the sea, a river, or a lake.

Effluent: wastewater - treated or untreated - that flows out of a treatment plant, sewer, or industrial outfall
Tunnel and Reservoir Plan (TARP, or Deep Tunnel)
- The MWRD adopted TARP in 1972 to protect Lake Michigan from raw sewage pollution, improve water quality of rivers and streams, and provide an outlet for floodwaters to reduce street and basement sewage backup flooding. Construction began in 1975.

  - TARP is composed of 109.4 miles of tunnels. The tunnels were completed in 2016 and can hold approximately 2.3 billion gallons of water.

  - TARP includes three reservoirs for storing stormwater. TARP reservoir capacities are:
    - The Gloria Alitto Majewski Reservoir, completed in 1998, can contain 350 million gallons.
    - The Thornton Reservoir, completed in 2015, can contain 7.9 billion gallons.
    - The McCook Reservoir (under construction) will contain 10 billion gallons. Phase 1 is scheduled to be complete in 2017 and Phase 2 in 2029.

  - Currently, the MWRD estimates that TARP has eliminated 85% of all CSO pollution. Before TARP, officials estimated that sewage reached the river once every three days.

How does the system work when it's wet?

Stormwater
- From 1985 to spring 2015, the MWRD opened the locks to allow the river to flow into Lake Michigan 27 times—releasing an estimated 44 billion gallons of sewage into the lake due to excessive stormwater and CSOs to the river system.

  - The City of Chicago notes that a rain event of as little as 0.67 inches in a 24-hour period can trigger a CSO in the Chicago River system.

  - Just as weather in the Chicago metropolitan area can be localized so can CSOs. The MWRD data confirms that most CSOs only impact a portion of the river system.

  - In 2004, the Illinois General Assembly granted the MWRD the authority to regulate stormwater for Cook County, which led to the MWRD passing the Watershed Management Ordinance in 2013.

  - The Watershed Management Ordinance for Cook County was passed with the purpose of preventing additional stormwater impacts from stormwater runoff (flooding, erosion, and water quality impairments). The landmark ordinance recognizes the importance of open space and native plant areas, and it requires new developments to retain stormwater on site.
Combined Sewer Systems

- In the 19th century before treatment existed, the combined sewer system was constructed to carry stormwater, sanitary sewage and industrial waste in the same set of pipes and delivered to the river.

- In the early 20th century the MWRD built wastewater treatment plants, connected them to the existing combined sewer system, and redirected wastewater to the treatment plants to be cleaned.

- In combined sewer areas, heavy rains can overwhelm TARP and cause CSOs that release harmful sewage and stormwater pollution into nearby bodies of water, like the Chicago River, Little Calumet, and Lake Michigan.

- Rapid urbanization left much of the Chicago metropolitan area without natural features to absorb stormwater. Instead, stormwater enters pipes that direct it to sewage treatment plants. This treated effluent is released into our waterways.

- Some pollutants picked up by stormwater, like salt, fertilizers, cleaning products, and motor oil, are not removed by sewage treatment technology.

- Chicago and many of the older suburbs have combined sewer systems (CSS). There are 772 cities in the United States with CSS.

- MWRD monitors a total of 305 CSO outfalls, 185 in Chicago, 76 in the suburbs and 39 on MWRD property, but there are untold numbers of stormwater pipes directed to the river system.

How does the system work when it's dry?

Separated Sewer Systems

- A separated sewer system collects stormwater separately from home and industrial wastewater. A separated sewer system eliminates CSOs.

- Communities with more recently built systems have separated sewers.

- Close to 60 percent of Chicago's land area is paved, built upon, or otherwise covered in a way that prevents rainwater from infiltrating the ground. Instead, rainwater runs off into pipes, picking up harmful pollutants along the way. This is known as the "first flush" and can be as harmful to the waterway as sewage.

- In Cook County's combined sewer system, TARP often captures and treats part of the first flush. In the separated sewer area, there is nothing in between the roads and the river but a pipe.
Best Practices Across North America

All across the country, our municipalities and government agencies diligently work to reduce flooding and clean up our river systems. Working collectively, we can learn from each other by observing the most successful programs of other cities. Reducing individual household’s water consumption is key, but we must implement large scale municipal projects that alleviate stormwater flooding and pollution. This document provides examples of the best practices across North America that complements the Overflow Action Days Initiative by demonstrating that municipalities can and must act in tandem with individuals.

To this day, municipalities throughout the United States operate combined sewer systems that flush sewage into nearby waterways. Each municipality has a unique solution for their stormwater problem. The City of Chicago is nationally known for its own $50 million commitment to green infrastructure and stormwater research. Here are some other examples:

**Kansas City, Missouri:**

Kansas City set a goal of installing 10,000 rain gardens to beautify underused spaces and capture stormwater before it flows into nearby waterways. The simple outreach program demonstrated the reliability of rain gardens and engaged landowners throughout the city to green their own land. The city itself allocated $79 million for green infrastructure projects and recently outfitted a 100-acre residential development with enough green infrastructure to offset local sewer overflows.

**Portland, Oregon:**

A city known for embracing its natural resources, Portland adopted a variety of policies to protect the Willamette River, from an advanced stormwater fee to developer stormwater incentives to a “green streets” plan. Most municipalities struggle with funding for green infrastructure and stormwater strategies, but Portland’s stormwater fee, capital investment structures, and incentives have paid for 920 “green street components” and more than 80,000 new trees on public and private land.
Best Practices Across North America

Stormwater fees can be a powerful tool for watershed-level stormwater management, and at an average of $30 a month per household, Portland’s are among the highest in the country (estimates show the average rising to nearly $70 in the next two years due to available greenspace and changing weather patterns). New developments incur a one-time stormwater payment that they can offset by incorporating green infrastructure into the plans. Furthermore, property owners can eliminate stormwater fees by decreasing the amount of impervious surfaces on site. These fees and incentives have helped fund Portland’s ambitious green roofs project, another great opportunity for stormwater mitigation.

Washington, DC:

The District Department of Environment runs the RiverSmart Homes program, a robust rebate aimed at greening individual properties throughout the Potomac River watershed. Homeowners can receive up to $1,200 in rebates to install rain barrels, native plants and trees, permeable pavement, and rain-ready landscaping. Homeowners that want to go above and beyond the rebate program can participate in a stormwater credit trading program that allows the sale of mitigation credits in order for certain sites to meet retention requirements.

DC was also one of the first cities to enact a bag tax for stores that sell either food or alcohol. The five cent tax funds cleanup, education, and revitalization initiatives as part of the Anacostia River Cleanup and Protection Fund.

Toronto:

Toronto leads the way on disconnecting downspouts and managing wet weather. A Great Lakes community much like Chicago with a dense city center and overwhelming sprawl, Toronto established a voluntary downspout disconnection program in 1998 that became a requirement for all residents in 2011. Disconnected downspouts divert rainwater from the sewers by directing it to nearby greenspace for absorption. Toronto’s master plan includes containing stormwater and designing infrastructure to handle bursts of heavy rain and buildup of debris. The legislated targets allow for flexibility in achievement, a major plus for any urban environment.

Lessons learned from these and other similar policy initiatives—such as managing stormwater at the watershed level and prioritizing native plants—inform policies that protect the Chicago River. The Overflow Action Days Initiative takes us the next step further by asking people to pledge to conserve water at home and in turn foster support for large scale municipal policy reform.
Overflow Action Days

Who is Friends of the Chicago River?
Friends’ mission is to improve and protect the Chicago River system for people, plants, animals.

Friends achieves its mission through education and outreach, public policy and planning, and on-the-ground projects that physically improve the river and make it more accessible.

Friends was founded in 1979 after an article in Chicago magazine questioned why the Chicago River was friendless. Spurred to take action, people began calling the author of the article, Robert Cassidy. Eventually, a critical mass was reached and Friends of the Chicago River was formed. Friends of the Chicago River has been at the forefront of the river’s recovery and renaissance for over 35 years. With over 7,500 members, volunteers, and online advocates, Friends works to make the river cleaner and more accessible, while building awareness of the benefits that an improved, healthy river can bring to communities across the Chicago metropolitan area.

Friends of the Chicago River is working to make the Chicago River one of the world’s great metropolitan rivers. For more information on Friends of the Chicago River, please visit www.chicagoriver.org. Or to explore all 156 miles of the Chicago River system virtually, visit www.explorecicagoriver.org and learn more about the river, discover attractions and activities, and see what is happening along the river.

Background Information and Key Facts and Figures
Stormwater and CSOs negatively impact the Chicago River system throughout the year. On occasion, sewage is released through the locks into Lake Michigan. Friends’ Overflow Action Days initiative seeks to fill a gap in how the Chicago metropolitan area addresses flooding and sewer overflows by asking its citizens to take an Overflow Action Days pledge and keep water out of the treatment process.

Key Abbreviations and Terms:
CSO: A combined sewer overflow happens when a rain event overwhelms the sewer system and MWRD releases the excess water into Chicago River and sometimes into the lake.
References


Friends of the Chicago River
References


