

# Storm Water

The Red River is more than just a recreational asset in our community. It is also the source of drinking water produced by the Cities of Fargo and Moorhead. That's why it's especially important to protect this waterway.

Anything dumped down or washed into the drain on your street will enter the Red River untreated. While drinking water from the Red River is treated to meet national standards, the 'raw' water from the Red is encountered by people who swim, fish, canoe and boat in it.

## What is stormwater runoff?

Stormwater runoff starts as rainfall or snowmelt. It flows over the ground or impervious surfaces (i.e. buildings, sidewalks, and driveways) and drains into either natural or man-made drainage ways or directly into a waterbody (river, lake, stream, or wetland). In contrast, rainwater that falls directly on porous ground is filtered through layers of soil and rock and then into ground water aquifers or into a waterbody.

## Why is stormwater runoff a problem?

Since stormwater flows primarily on the surface, it collects a wide assortment of debris, chemicals, dirt, and other pollutants. Stormwater is not treated before entering a waterbody. We may use that waterbody for swimming, fishing, and drinking water. Small amounts of these materials are not generally considered harmful. But when these small amounts are multiplied by thousands or tens of thousands they can cause serious water quality problems.

## Amount of pollutants carried into waterways

The type and amount of pollutants that drain into waterbodies depends upon location and storm severity. About 90% of pollutants found in stormwater runoff come from the first inch of precipitation, referred to as the 'first flush'. A second factor is the amount of time between "flushes". The longer this time frame, the greater the accumulation of pollutants. Winter usually has the longest time between flushes in North Dakota and Minnesota. About 65% of the annual stormwater pollution in this area is a result of the first large spring snow melt.

A third factor is the area covered by impervious surfaces. When pavement and rooftops replace grass and trees, the amount of precipitation that infiltrates the ground can be reduced by as much as 85%. This increases stormwater pollution and also contributes to extreme water level fluctuations.

## Types of pollutants found in stormwater runoff

There are many kinds of pollutants contained in stormwater. Some are primarily a human problem, but others can damage the entire ecosystem. Some of the pollutants include:

Pollutant	Source in Nature	Role in Nature	Source in Developed Areas	Consequences of Pollutants
Sediment	Riverbanks and shorelines	Store nutrients, maintain stream profile	Construction sites, lack of vegetation	Block sunlight, release excess nutrients, affect aquatic habitat
Nutrients/Organic Compounds	Decomposing organic matter, natural runoff rates	support vegetation growth	Pesticides, fertilizers, sewage, yard waste, food and pet waste	algae blooms, oxygen deprivation, fish die-offs
Trace Metals	Mineral weathering	Nourishment for plants and animals	Motor vehicle wear, power plants, chemicals, construction materials	Alters human and wildlife development, increase toxicity levels
Salts/Chlorides	Mineral weathering	Support ecosystems	water softening and de-icing salts	Sterilize soil, reduce biotic growth
Oil & Grease	Decomposing organic matter	store nutrients	Pavement, motorized vehicles, industry	Reduce oxygen of water, increases nutrient load, wildlife hazard
Bacteria	Native animals, soil	Decomposition and nutrient cycling	Improper wastewater management, pets, cattle, pigs, etc.	Increase risk of disease
Thermal Changes	Sun exposure, shallow water, seasonal changes	Offer variety of natural habitats	Impervious areas, tree removal, shallow ponds	Stresses/kills fish and wildlife, changes habitats
Trash	Not found	Not found	Spillage, floods, improper disposal or material storage	Suppresses foliage, stresses/kills fish and wildlife, eyesore
Toxic and Synthetic Chemicals	Not found	Not found	Pesticides, motorized vehicles, improper disposal, air deposition	Changes natural systems, degrades ecosystem health

## Point and nonpoint source pollution

Point source pollution is where pollution enters the water from a specific source such as a factory or wastewater treatment plant. All other types of water pollution are called "nonpoint source pollution" or "polluted runoff." These pollutants fall from the sky and wash from the land during rain storm. Some even get dumped into storm drains or directly into the water by local residents. The United State Environmental Protection Agency considers nonpoint source pollution the number one threat to water quality in the United States.



A ditch that drains to the Red River in Moorhead is filled with garbage.



One of about 40 storm drain outfalls in Fargo-Moorhead. Notice this one is plugged with garbage from the streets.



# Storm Water

## Clean Waterways: Starting in your home and yard

Through everyday activities, we can cause water pollution. Making simple changes can help reduce some types of pollution. For example:

### Auto care

Washing your car at home can send detergents and other contaminants through the storm sewer system.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.
- Repair leaks.
- Dispose of used auto fluids and batteries at recycling locations.
- Shake and wash floor mats over your lawn, not hard surfaces.

### Pet waste

Animal waste problems are not unique to agriculture. Pets, waterfowl and other urban wildlife waste can cause significant water pollution. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into the Red River.

- Pick up after your pet.
- Dispose of kitty litter properly. Cat waste may be scooped out and flushed down the toilet, and the used litter should be bagged, sealed and placed in the trash.
- Don't feed waterfowl or deer. Feeding causes them to concentrate in numbers higher than can be supported by the natural food supplies. Large flocks of birds and herds of deer create large quantities of waste and serious water pollution problems.



A ditch that drains to the Red River in Moorhead is filled with garbage.

Wayne Goeken

### Commercial

Sand, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter the Red River.

- Sweep up litter and debris from sidewalks, driveways and parking lots.
- Keep dumpsters covered and repair leaks.
- Report chemical and oil spills.

### Construction

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install and maintain silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion control devices.
- Store fuel and chemicals properly.
- Prevent soil erosion by minimizing disturbed areas during construction projects. Seed and mulch bare areas as soon as possible.
- Clean up any sediment that is tracked onto the streets.

### Lawn Care/Landscaping

Home and business lawns and landscaping have environmental impacts beyond the immediate area. Runoff, containing pollutants, can enter waterbodies. Simple changes can have an impact on water quality.

- Don't over water your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly and in recommended amounts. Explore alternatives to chemical use.
- Compost or mulch yard waste. Don't place it in the street. If you want it removed, use city services.
- Use sand and salt on winter ice sparingly. Both pollute water and are harmful to grass and flowers.
- Cover bare soil. Seed or mulch to prevent soil erosion. Consider using native species with multiple season interest.
- Before using pesticides check the product label to be sure both the plant and pest are listed. Read the entire label carefully and, follow the directions exactly. Remember that the label is the law, literally, for pesticide application. Using higher application rates wastes money and may contaminate the environment without eliminating any more of the pests. Use the fewest number of applications possible. Use only when necessary. When possible, use insecticidal soap or horticultural oil instead of a longer residual synthetic insecticide. Time pesticide applications so that natural enemy populations will not be harmed. Use reduced rates when possible and treat only infested plants, not entire areas.
- Clean gutters regularly. Put leaves in compost piles or bag for collection with other yard trimmings.
- Direct water from downspouts away from buildings and paved surfaces and onto a lawn.
- Remove debris from storm drains after every rain
- Lawns in Fargo-Moorhead contain ample amounts of phosphorus and in most cases applying additional phosphorus in lawn fertilizer is unnecessary. Find out what your lawn needs by obtaining a soil test. Use phosphorus-free fertilizer. Minnesota's Phosphorus Lawn Fertilizer Law went into effect on January 1, 2005. The law states that Minnesotans cannot use fertilizer containing phosphorus for general lawn care.
- Don't apply lawn care products to frozen ground—wait until the grass starts growing.
- Sweep up and reuse any lawn care products that fall on streets, sidewalks and driveways.
- Do not dump grass, leaves or other organic debris along streambanks, drainage channels, detention ponds, lakes, wetlands.

- Mulching your grass reduces the need for fertilizer because as the grass clippings break down, nutrients are released into your lawn.
- Compost your grass clippings.
- Don't cut your grass lower than three inches in the summer. Slightly longer grass will stay greener, reducing the need for watering. And, less watering means less runoff!
- Mulch or compost your leaves as soon as they fall and as often as possible.
- Do not wash paint brushes in the driveway or street.
- Remove non-native and invasive plants.
- Landscape with native plants. Native plants are adapted to our climate and are tolerant to both drought and tough winters. They are also adapted to our soils and thus don't need fertilizers or pesticides. Native plants have deeper root systems which accommodates water infiltration reducing runoff.
- Traditional concrete and asphalt don't allow water to soak into the ground. Instead try permeable pavement that allows rain and snowmelt to soak through, decreasing stormwater runoff.
- Collect rainwater from rooftops in rain barrels. Later the water can be used on lawn or garden areas. Rainwater is oxygenated, unchlorinated, and warmer than tap water, qualities that actually make it a better source for plants and safer for the environment. Make sure the barrel is childproof by having a secure lid.
- Plant rain gardens, specially designed areas planted with native plants, to provide natural places for rainwater to collect and soak into the ground.



Grass clippings in street that could go down the storm drain when it rains or with a little help from the wind.

River Keepers

### Agriculture

Lack of vegetation on stream banks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterbodies with bacteria.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Plant filter strips, areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways, streets, yards and fields.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

### Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

## You are connected to a river

- > Your rooftop is connected to your gutter
- > Your gutter is connected to your downspout
- > Your downspout is connected to your yard
- > Your yard is connected to your driveway
- > Your driveway is connected to your street
- > Your street is connected to your storm drain
- > Your storm drain is connected to a river
- > And, the river supplies your drinking water