Our Water's Health in the Rockford Region

Regional Water Quality Overview

Acknowledgements

Overview written for Region 1 Planning Council

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Intention and Purpose

This document serves as a high-level overview on the status of water quality in the Rockford region for residents and decision-makers alike.

This overview is paired with a technical document that provides more detail, which can be accessed using the QR code and link below.

Our goal is to streamline complex water data available in our region to inform the community's efforts towards improving surface, ground, and drinking water quality.

Executive Summary

This Regional Water Quality Overview discusses known information about the Rockford Region's surface water, groundwater, and drinking water. Its purpose is to help decision-makers and the public understand where our water comes from and what affects its quality. It can be used to inform those who plan how we can work together to protect water. This document addresses both natural and human-induced elements of water quality. It briefly summarizes water quality information and recommendations from local sources throughout the Rockford Region, which extends throughout Winnebago, Ogle, and Boone counties, as shown in Figure 2.

Our Water Cycle

Water is an integrated system that cycles surface water, groundwater, and drinking water between the atmosphere, Earth's surface and underground, as seen in Figure 1. Human activity reshapes the natural water cycle. We pump and treat groundwater for drinking, block natural underground pathways, and send wastewater and stormwater into streams and lakes. Because of this, less rain soaks into the ground to recharge our aquifers. In cities and suburbs, stormwater systems quickly move rain from roads, rooftops, and parking lots into surface waterways instead of letting it naturally absorb into the soil. The effects of this can be seen in Figure 13.

Land Use Effects on Water Quality

The history of the Rockford Region, which is detailed in Figure 4, is based on manufacturing and agricultural production. Currently, the Rockford Region's landscape, approximately 434,665 acres in size, is made up of 49% cropland, 24% developed areas, 13% pasture and other grassed areas, and 14% natural areas. This breakdown is shown geographically in Figure 7 and graphically in Figure 10.

Urban and suburban living create high percentages of impervious surfaces, which route precipitation into nearby water bodies rather than letting it soak into the ground or be filtered by vegetation and soil. Therefore, urban land uses are significantly more polluting to our surface waterways, taxing on our groundwater/drinking water supplies, and problematic for flooding, when comparing land use types of the same size (e.g. acre per acre), followed by suburban and then agricultural lands.

Pollutants

The quality of our water is affected by pollution from both direct and indirect sources. Contaminants can be carried into our surface waters and groundwater by various methods, such as through stormwater, agricultural runoff, or directly from an outlet or pipe. This overview discusses water pollutants of major public concern, including lead, microplastics, PFAS, coliform, bacteria, sediments, nutrients, and pesticides.

Executive Summary - Continued

Aquifers for Drinking Water

Our region sits above productive aquifer systems that have provided clean drinking water for more than a century. These aquifers occur in three main layers—deep sandstone, shallow bedrock, and shallow sand and gravel. Their long-term sustainability depends on how well they can recharge, which varies by local geology and land use, and extends beyond the Rockford area into southern Wisconsin. Figure 14 and Figure 15 show how these aquifers are layered and where they are located.

Drawdown of Aquifers

Drawdown occurs when water is not replenished into an aquifer as quickly as it is taken up to be used. Figure 22 depicts differences in drawdown across the northern part of Illinois; our region represents stable water levels compared to other areas of Illinois. In contrast, Joliet is in the costly and complex process of switching their drinking water supply from groundwater to Lake Michigan. This trend puts the long-term future of deep sandstone aquifers at risk across northern Illinois. Improved practices by the region's communities have changed and slowed the outcome.

High Quality and Impaired Streams

The river system in the Rockford Region includes both impaired stream segments and streams of high biological integrity and diversity. There are 26 impaired segments of stream within the watersheds of the region. Most impairments are to primary contact and fish consumption, and the most identified issues were fecal coliform, mercury, and polychlorinated biphenyl (PCB). Figure 17 provides a map of the impairments throughout the region. Lower Beaver Creek was designated as the highest quality stream in our region as Biologically Significant, which supports the life of rare and endangered species with high biological integrity and diversity. Reaches of the Kishwaukee River in the region shared this designation in the early 1990s, but their ratings declined due to water quality degradation. Of 25 streams given biological quality ratings, 18 were rated exceptional to moderate/fair (A-C) for diversity, and 23 were rated A-C for integrity. Figure 18 and Figure 19 provide stream locations and biological ratings.

Executive Summary - Continued

Drinking Water Consumer Choices

Our regional water systems consistently meet federal and state safety standards. People choose their drinking water based on what they feel is safest, best-tasting, most affordable, and most trustworthy. Options include tap water, bottled water, or tap water with home treatment systems. These choices often reflect larger social and economic trends, and some rural Latino and high-poverty communities experience more frequent water-quality violations as shown in Figure 23. No matter the source, it's important to base decisions on reliable information, Consumer Confidence Reports, rather than marketing or misconceptions.

Looking Forward

Our region's shared goal is ensuring access to safe, clean water for drinking, recreation, and economic viability. Local water agencies and citizens are committed to monitoring, treating, communicating about, and investing in our water quality.

Multiple agencies have produced plans like TMDL studies and watershed-based plans that recommend best management practices on farmlands and green infrastructure in urban and suburban areas. Studies are in process, such as aquifer mapping. Together, we can learn from these studies and implement these plans to ensure sustainability of our waters.

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Our Shared Resource

Can you picture a single hour that goes by where you don't rely on water?

From the moment we brush our teeth in the morning to the last load of laundry at night, water flows through every hour of every day. It brews our coffee, grows our food, cleans our homes, and keeps our bodies healthy. Underpinning every tap, public and personal, is an intricate and delicate system, crucial for maintaining a clean, safe, and continuous water supply for current and future generations.

In Rockford, water is more than a utility— it's a lifeline that connects Rockford residents together.

Our deep reliance on local waterways is non-discriminate; we all need water.

Region 1 recognizes how interconnected our communities naturally operate– just like our water. We aim not only to address the issues concerning our waterways, but to develop a unified water overview to sustainably tackle the region's water needs.

An Integrated Approach

The Region 1 Planning Council (Region 1) has adopted a One Water approach to water management, an integrated water outlook that considers all water, whether from the tap, a stream, or a storm, as a single, valuable resource.

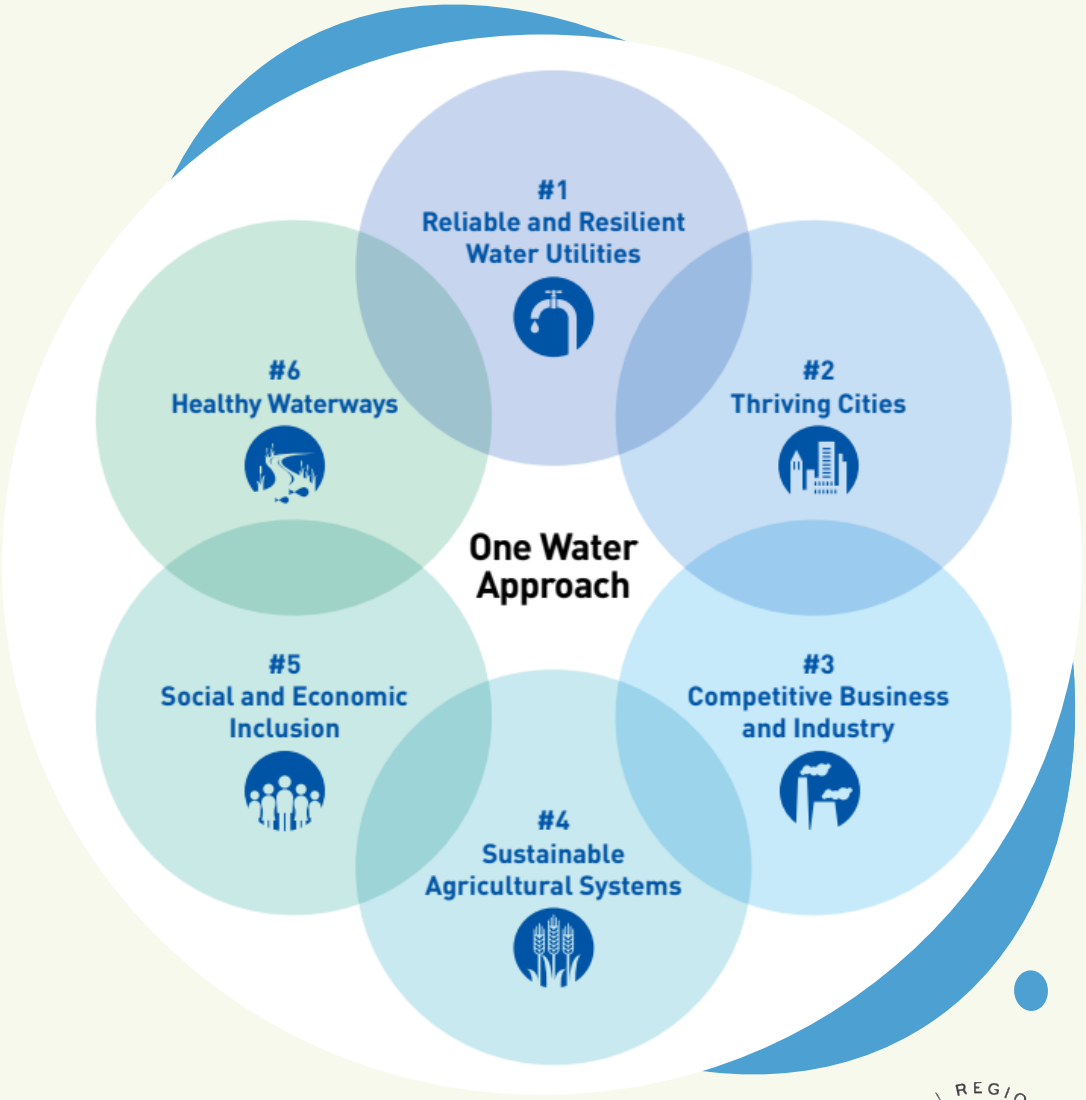


Image Source: US Water Alliance

The Interconnectedness of Water

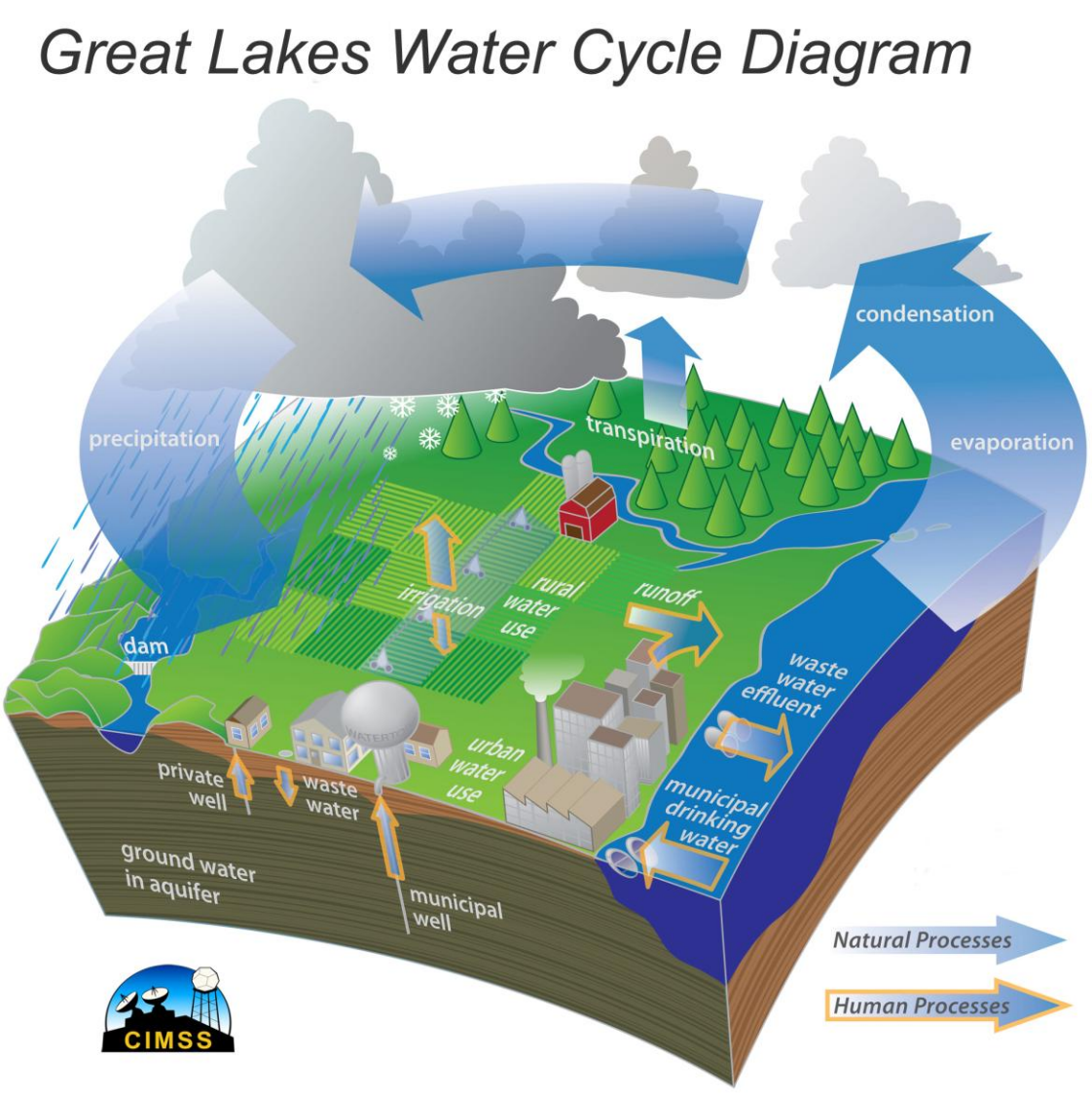


Figure 1: The Water Cycle

Source: Cooperative Institute for Meteorological Satellite Studies-University of Wisconsin-Madison

Water is always moving through a continuous cycle that connects the sky, land, and underground. It evaporates from oceans and lakes, condenses into clouds, and falls back to Earth as rain or snow. Some of that water runs off into rivers and streams, while some soaks into the ground to replenish groundwater and support plants.

Each part of the cycle is linked—what happens on the surface affects what happens below. Healthy soils, wetlands, and vegetation help keep the cycle balanced, protecting clean water for people, wildlife, and ecosystems alike.

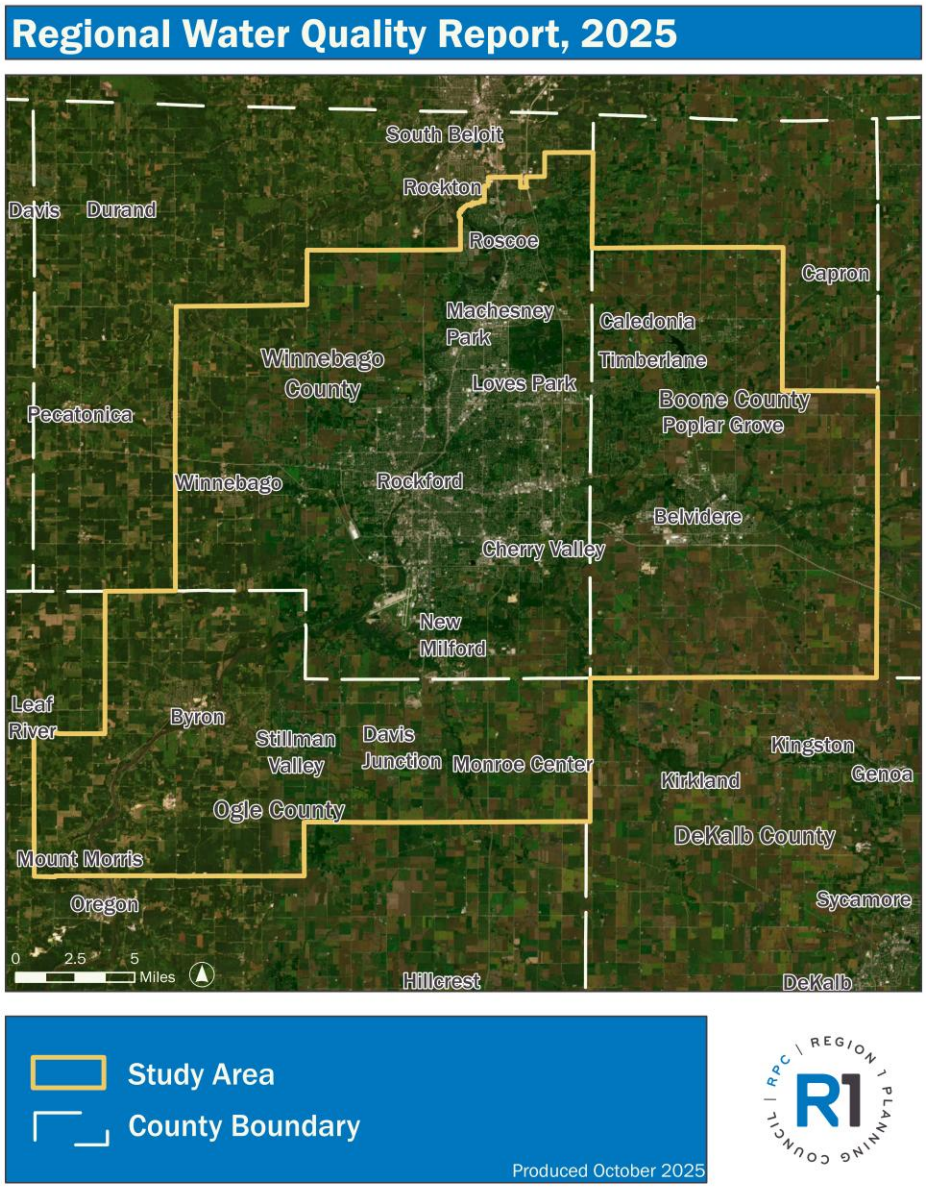


Figure 2: The Rockford MPA

The Rockford Metropolitan Planning Area

Region 1 Planning Council's service area spreads across three counties and three watersheds.

The Lower Rock, Kishwaukee, and Pecatonica rivers and their watersheds cover the planning area.

The metropolitan area serves a population of 300,000+ throughout Boone, Winnebago, and Ogle counties.

What makes our region unique?

The tri-county region has a balance of small cities, farmland, and natural open space all connected by a network of rivers and streams.

These vast waterways support recreation, public health, and economic vitality.

Wetlands and forest on preserves and private land dotted throughout the region help filter runoff and support wildlife.

This mix allows for more water to soak into the ground, replenishing Rockford's precious aquifers and reducing pollution in rivers and streams.

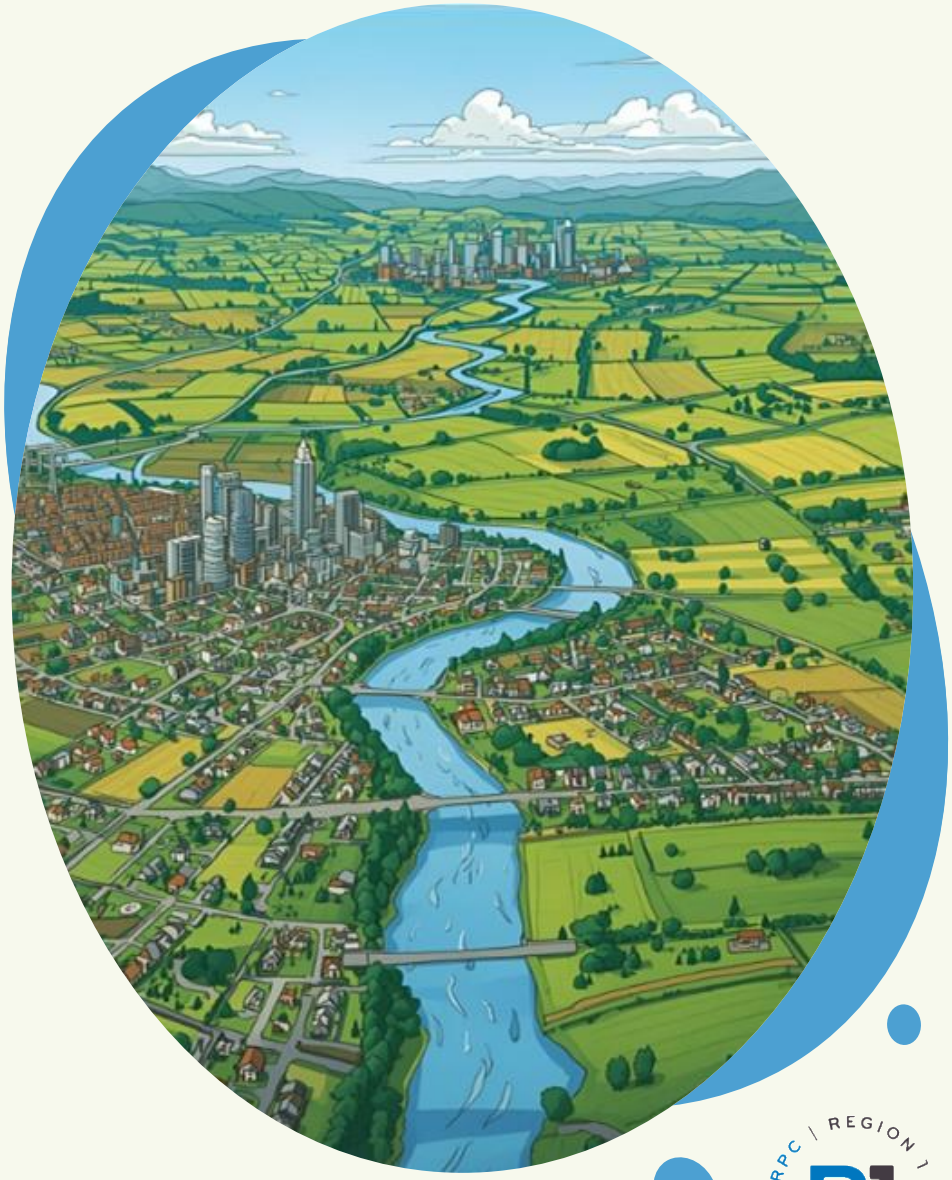


Image Source: AI-generated

Groundwater to Drinking Water

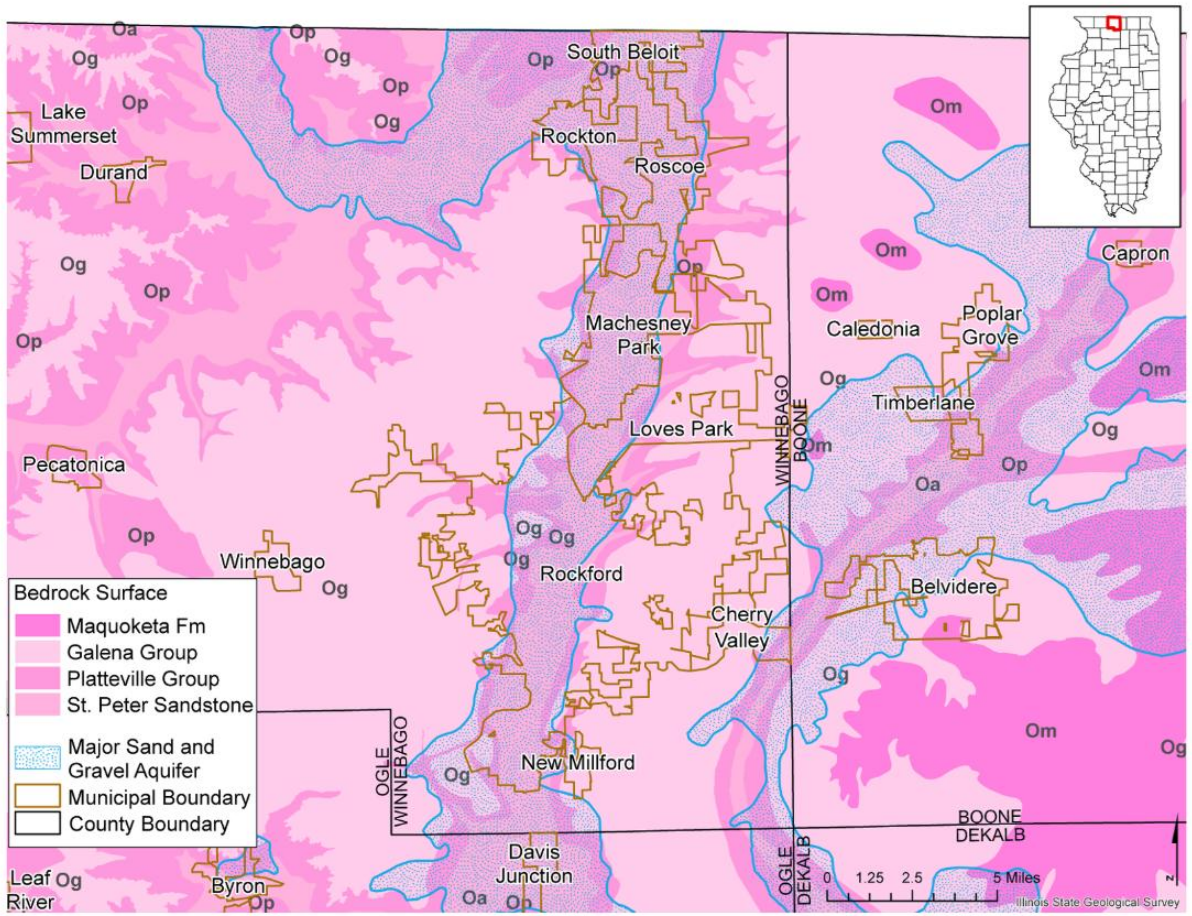


Figure 3: Bedrock Formations In Our Region

Source: Illinois State Water Survey

The Rockford Region depends on groundwater for its drinking water.

Below the ground lie the St. Peter and Ironton-Galesville formations. These bedrock formations are crucial to the storage and movement of groundwater to shallow aquifers.

Aquifers provide clean drinking water to cities, towns, and rural areas across the region.

The Rockford area provides several miles of riverfront recreational opportunities.

Taking the Rock River Recreation Path, wakeboarding at West Rock Wake Park, paddleboarding on Pierce Lake, or observing wildlife at Kishwaukee Gorge North Forest Preserve are just a few of the many water centered activities residents and visitors take advantage of year-round.

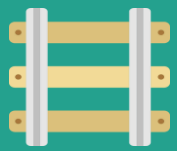
Surface Water & Recreation

How did we get here?

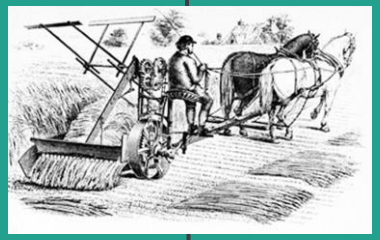
Figure 4: Historical Timeline of Rockford Region

1834 – Rockford made its roots as an agricultural hub called “Midway”

1852 – Arrival of the railroad connected Rockford & Chicago, boosting trade routes



1855 – Invention of the reaper– significant agricultural boom



Late 1800’s – Industrial growth helped in part by robust waterpower from Rock River; first deep wells drilled

1899 – Rivers & Harbors Act – national protections of water navigation, water pollution becoming a major issue

Early 1900’s – Military training base, manufacturing hotspot… increasing prosperity

The Editors of Encyclopedia Britannica, n.d.; Go Rockford, n.d.; U.S. Bureau of Labor Statistics, n.d.
Image Sources: Public Domain

Figure 4.5: Historical Timeline of Rockford Region

1948 – Federal Water Pollution Control Act (FWPCA) – first comprehensive approach to addressing water pollution

Late 1900's – Rockford facing economic shifts and infrastructure challenges

1969 – Several environmental crises – fish kills, contaminated drinking water, Cuyahoga River fire (not the first one!)

1972 – In response to public demand for action, amendments to FWPCA became known as the Clean Water Act (CWA)

1990's – Efforts in redevelopment and diversification of economy helped Rockford start to grow once again

The Editors of Encyclopedia Britannica, n.d.; Go Rockford, n.d.; U.S. Bureau of Labor Statistics, n.d.
Image Sources: Public Domain

Evolution of Drinking Water

Early settlers of Rockford sourced water from private wells, rivers, or cisterns that collected rainwater.

Soon, they developed community water systems to keep up with demand from population growth.

When the first wells were drilled into deep sandstone, water pressure was so high that many wells flowed at the surface without pumping, which is referred to as an **artesian well**.

This initial abundance allowed extensive development, but decades of pumping have reduced these pressures, and most drilled wells are no longer artesian.

In 1885, Rockford's first major well was drilled to a depth of 1,520 ft, and it produced 1.2 million gallons per day.


Image Source: J.F. Brown

Powers, 2005

Determinants of Water Quality

The state of our water is dependent on each part of the water cycle.

Addressing water quality requires an insight to the broader picture of how water moves, and what moves with it.

To get a better picture of the state of our waterways, we must understand the movement of pollutants that are altering our water systems.

Depending on their point of origin and mechanism of travel within the water cycle, pollutants enter our surface, ground and drinking water sources, both directly and indirectly.

Image Source: Public Domain

Surface Water

Surface water is water we see on the ground, like in rivers, lakes, and ponds. It comes from rain, melting snow, water running off the land, and water surfacing from underground. Pollution can enter surface water directly and indirectly.

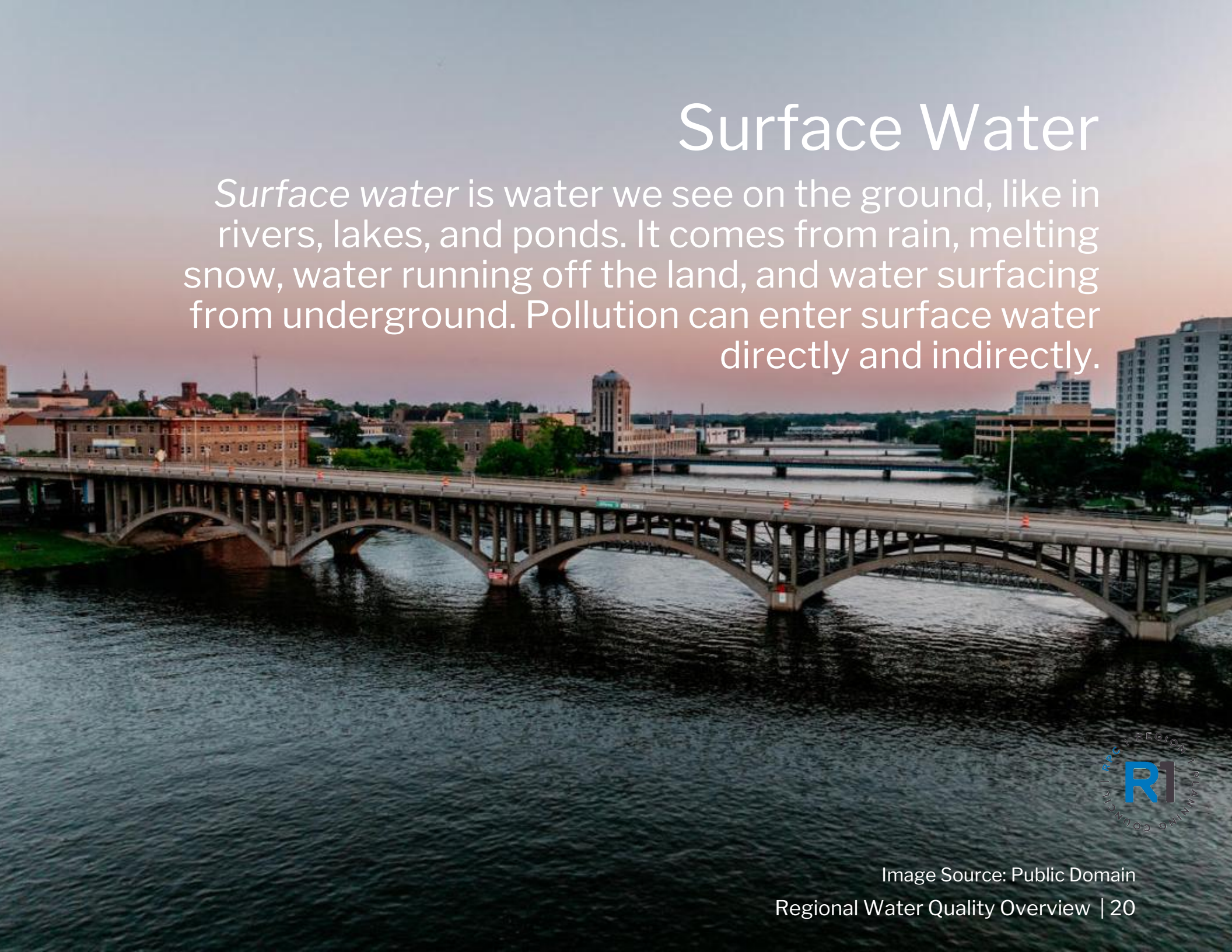


Image Source: Public Domain

Ground Water

Groundwater is water found underground in spaces between rocks and soil.

When water gets trapped between less permeable rock, it collects and creates aquifers, which is where we dig wells to extract drinking water.

Shallow aquifers are the most susceptible to human-caused contamination.

Groundwater can get polluted via leakage or water soaking into the ground and carrying pollutants with it.

It can also be affected by contaminants that occur naturally underground, such as radium and arsenic.

The type of contaminant and depth of soil between the contaminant and aquifer determine how easily contaminants can reach the groundwater.

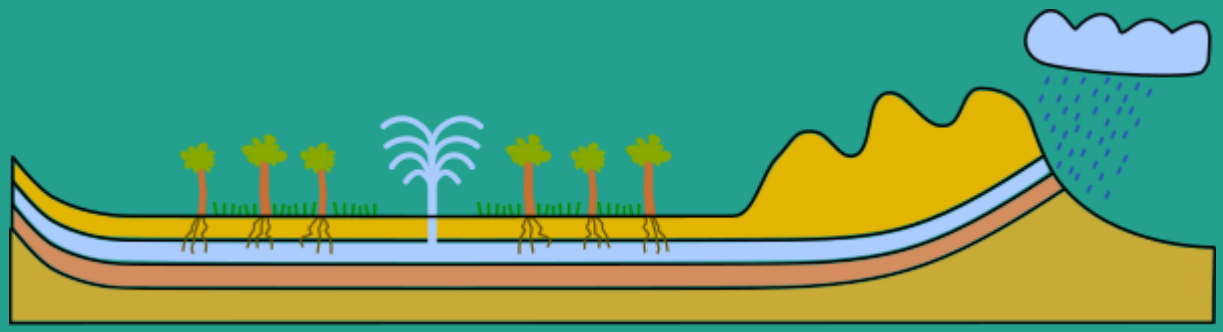


Image Source: Wikipedia Commons

Drinking Water

Drinking water is the water we clean and treat to make it safe to drink.

In our region, 100% of it comes from groundwater. Though there can be contaminants in source water, each local water utility treats the water so that all contaminant concentrations are below statewide standards.

The region is consistently monitored for meeting the health standards of the Illinois Environmental Protection Agency.

Private wells are often sourced from shallow aquifers, making them more susceptible to contaminants. They depend on individual action and monitoring.

Image Source: Public Domain

Pollution Within the Water Cycle

The Environmental Protection Agency has identified major pollutants of concern in the nation's waterways and has set standards for safe amounts of each.

In almost all cases, when found in surface water, these pollutants degrade ecosystem and aquatic life health, decreasing aesthetic and economic value of the surrounding land.

Often, they also have implications for human health whether they are found in surface water, groundwater, or drinking water.

Image Source: Public Domain

Where does pollution come from?

Pollution can enter our water directly or indirectly.

Indirect sources, or ***non-point sources,*** of pollution are of greater concern due to their difficulty to trace and regulate.

They do not originate from a single discrete source but instead accumulate from multiple, widespread sources.

They are carried by stormwater runoff from various sources of urban, suburban, and rural land uses.

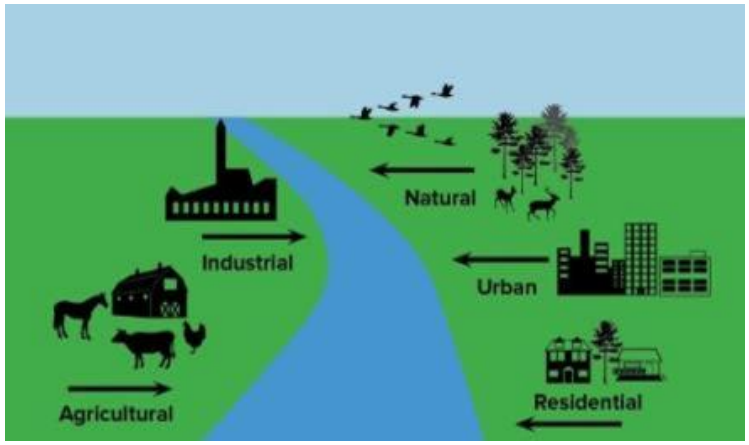


Image Source: NY Department of Environmental Conservation

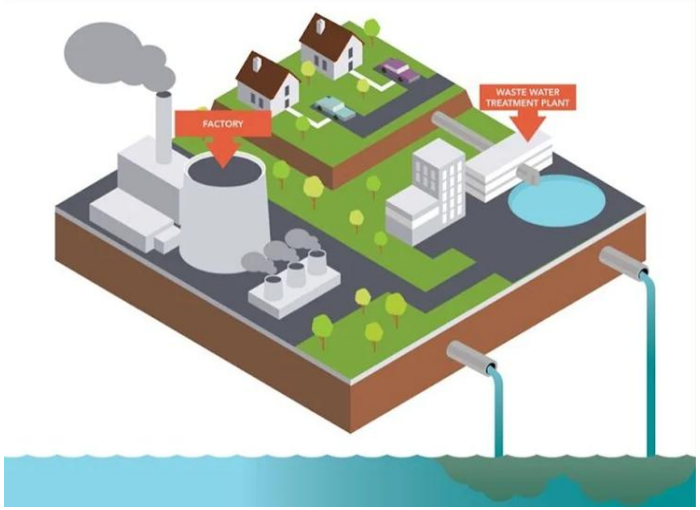


Image Source: algae.com

Direct sources, or ***point sources***, of pollution are often regulated by permits (Clean Water Act) and traceable.

They enter our water by direct discharge of wastewater from industrial facilities and sewage treatment.

Some urban areas and large-scale feed lots are also considered to be point sources.

Table 1. Types of Water Pollutants

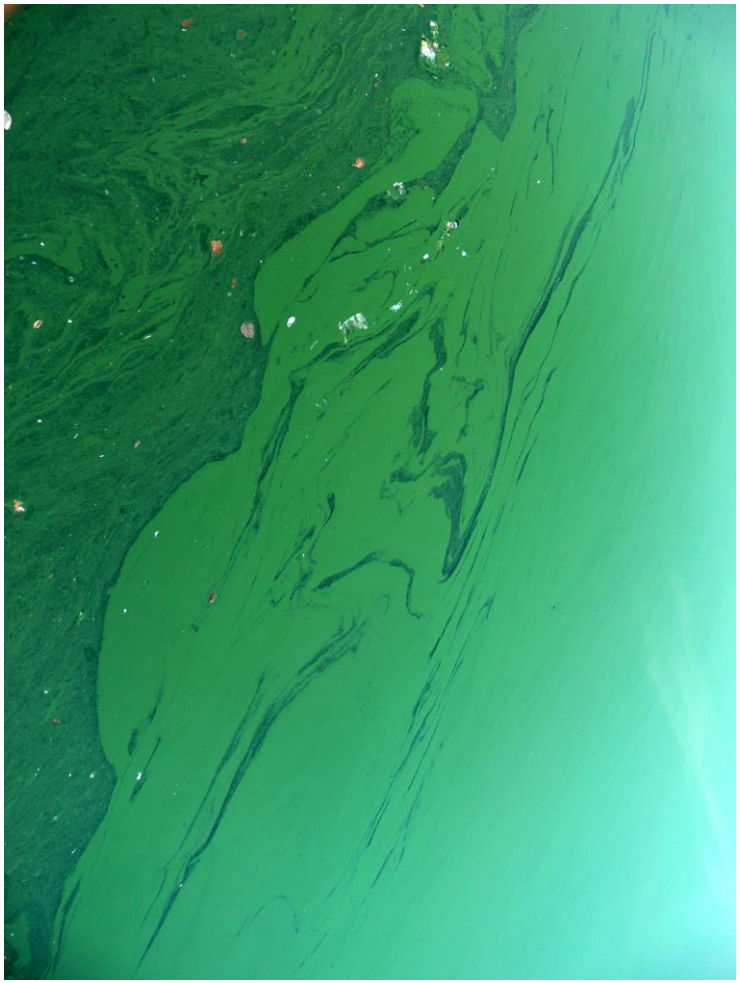
Types of Water Pollutants	Definition	Source	Impacts	Effects
Oxygen-Demanding Waste	Wastewater or sewage	Facilities that produce biodegradable organic compounds: food processing industries, breweries, slaughterhouses, etc.	As they break down within a water body, they consume dissolved oxygen, which is vital for supporting aquatic life	Fish kills, dead zones, habitat degradation, etc.
Synthetic Organic Compounds	Human-made, carbon-based chemicals including pesticides, solvents, plastics, detergents, polychlorinated biphenyls (PCBs), etc.	Production, transportation, and use of the compounds	They are persistent in the environment (they are slow to break down) and often toxic	Harm to human and aquatic life health over time
Organic Oils	Petroleum or petroleum-based substances created by natural processes	Industrial discharges, transportation, oil spills, pipe leaks, wastewater, natural seeps	They sit on the surface of water and reduce dissolved oxygen and light transmission into the water	Harm to aquatic life via poor ecosystem health and smothering of plants and animals
Pathogens	Disease-causing microorganisms like E.coli, Salmonella, etc.	Wastewater, sewage, animal waste - they are usually removed during drinking water treatment	They contaminate water and make it unsafe for humans and animals	Waterborne diseases like cholera, dysentery, hepatitis, and gastrointestinal illness
Nutrients	Nitrogen and Phosphorus compounds	Agricultural runoff of fertilizers and animal waste, wastewater treatment plants, septic systems, urban stormwater	In excess, nutrients stimulate the growth of aquatic algae and weeds which can reduce dissolved oxygen in the waterbody	Eutrophication, fish kills, blue-green algae growth - toxic to humans and animals, degraded aesthetic value

Illinois Environmental Protection Agency, n.d.; Denchak, 2023

Types of Water Pollutants	Definition	Source	Impacts	Effects
Suspended Solids and Sediments	Comprised of silt, sand, and minerals	Erosion, urban runoff, agricultural runoff	Reduce storage capacity of reservoirs, increases turbidity which blocks sunlight transmission, impairs aquatic life	Poor water quality, anaerobic conditions, loss of biodiversity, impairment to natural processes, flooding
Inorganic	Heavy metals, mineral acids, inorganic salts, cyanides, sulphates, etc.	Sewage, industrial waste, outdated infrastructure of water treatment and management, road salts, natural processes	They persist in the environment and accumulate in waterbodies and aquatic life, alter water chemistry, and are harmful to human life when found in drinking water	Degraded ecosystem health, poisonous to aquatic life and humans (in drinking water and in fish that humans eat
Thermal	Any disruption of a water body's natural temperature	Discharge of hot water from power plants and industries using water as coolant	Reduces dissolved oxygen, alters water chemistry	Degraded ecosystem health and water quality
Radioactive	Materials that emit ionizing radiation like uranium, radium, etc.	Nuclear power plants, medical/industrial waste, mining, and some natural sources - they are usually removed during drinking water treatment	Invisible and difficult to detect without testing, can be absorbed by aquatic organisms and transferred to humans when consumed, can end up in drinking water if not treated properly	Long term health risks like cell damage, genetic mutations, cancer, and other chronic illnesses
Emerging contaminants	Chemicals or materials recently detected that may pose risks to human health or ecosystems but are not yet fully regulated or understood (e.g. microplastics, hormones, PFAS, etc.)	Wastewater, urban and agricultural runoff, improper disposal	They persist in the environment and are usually difficult to remove, their effects on humans and the environment are not yet fully understood	Regulation is difficult without enough research, they accumulate in aquatic life and humans and have been linked to cancer and immune system issues

Table 1. Types of Water Pollutants
Illinois Environmental Protection Agency, n.d.; Denchak, 2023

How Do the Seasons Affect Water Pollution?



The seasonal cycle means that pollution levels fluctuate throughout the year — often peaking during **spring (runoff)** and **summer (biological impacts)**.

Managing water quality effectively requires anticipating these seasonal variations (e.g., timing fertilizer application or controlling stormwater).

“Hot Topic” Pollutants

There’s no doubt you’ve heard of them in the news.

Whether national or local, pollutants of emerging interest are making headlines.

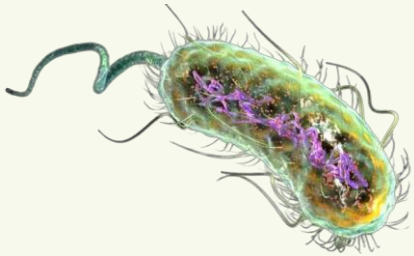
Current data has brought these to the forefront of our public water concerns.

Pesticides

Microplastics

Lead

Coliform Bacteria



Sediments & Nutrients

PFAS

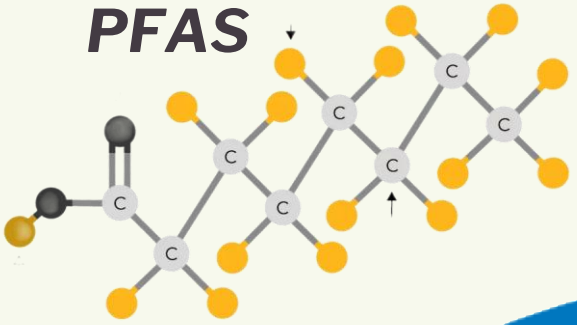


Illustration Sources: FoodSafetyNews, ANSYS Blog, Public Domain

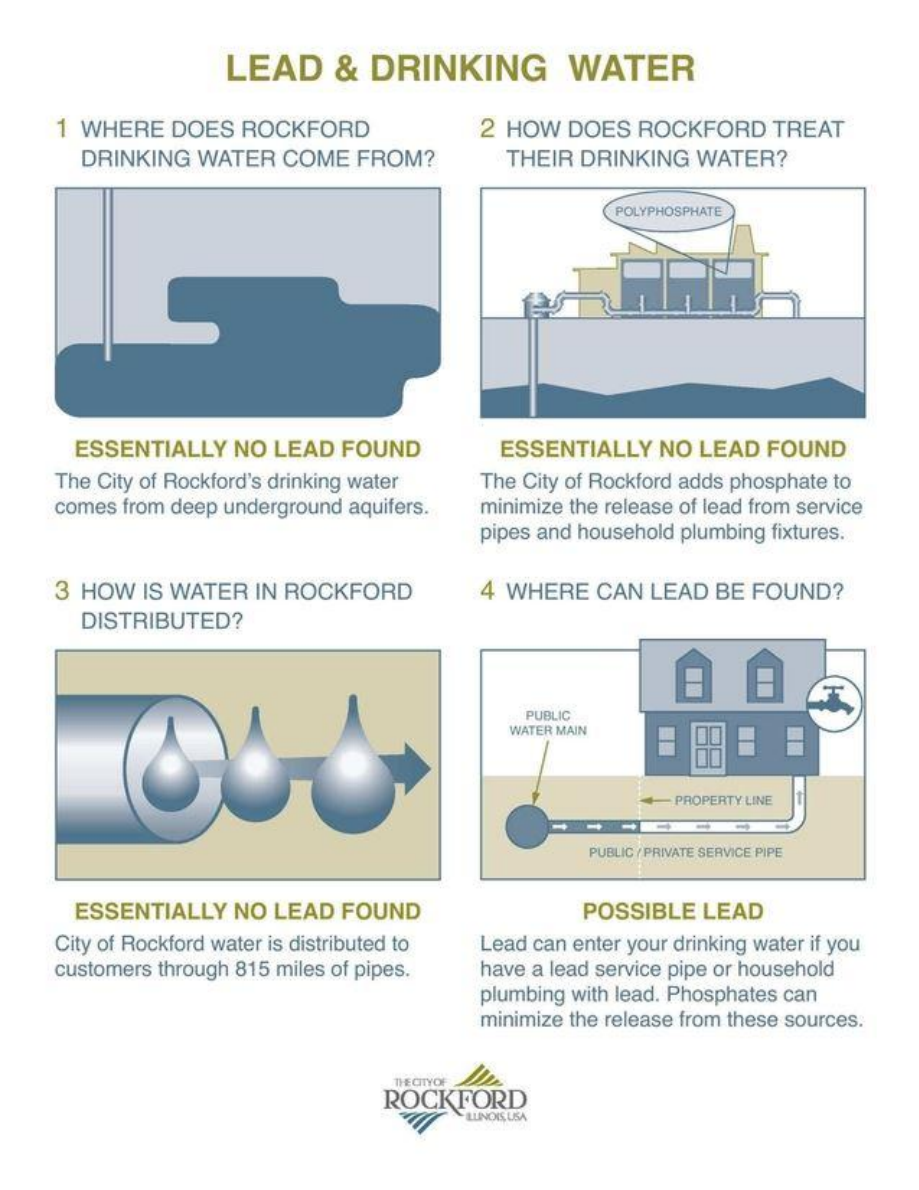
Lead

Lead is a heavy metal that disrupts bodily functions by mimicking essential minerals such as calcium and zinc. No level of lead is considered safe for any age group.

Lead enters our drinking water through the corrosion of lead plumbing or service lines. Homes and buildings constructed prior to 1986 are more at risk due to the previous widespread use of lead and the longevity of the material.

Rockford has thousands of homes that still have lead service pipes. The city has been replacing hundreds of these each year, but there are still many more to go: over 14,000 lead pipes, plus galvanized lines that may also lead to lead contamination.

Image Source: City of Rockford, Illinois



Haas, 2024
U.S. Environmental Protection Agency, 2025

Do Your Pipes Contain Lead?

The City of Rockford Water Division has compiled historic data on public lead service lines.

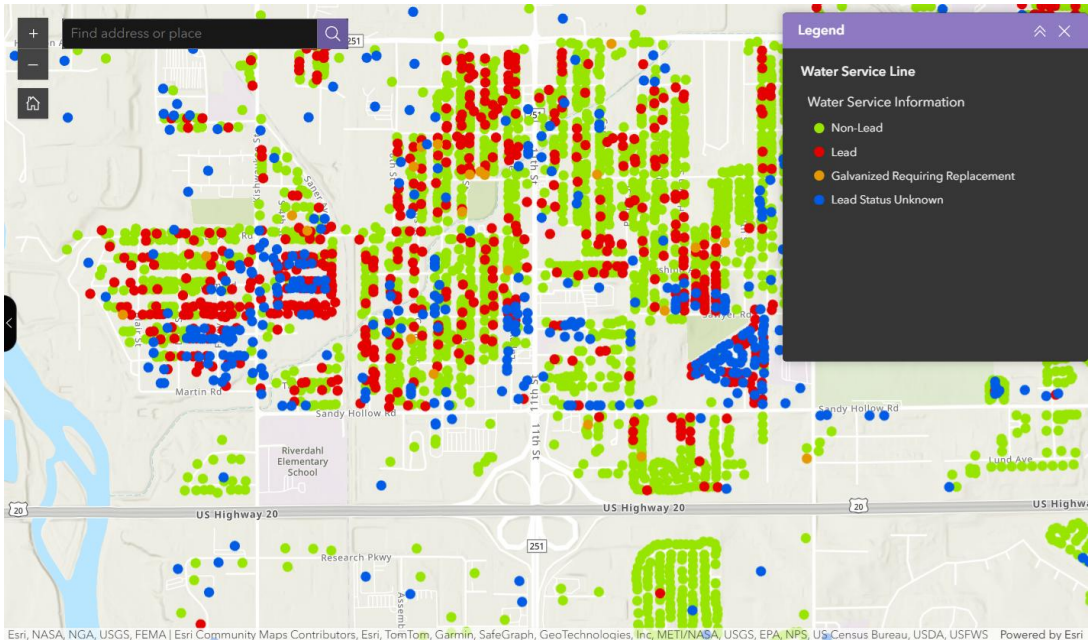


Figure 5: Historic Lead Service Lines Map

Find out if your home pipes may be made with lead by using their interactive map.

Still unsure if your service line contains lead?

All you need is a refrigerator magnet, a coin, and your water meter.

Find out more on NPR's website or contact the City of Rockford Water Quality at 779-348-7151 to obtain a lead testing kit.

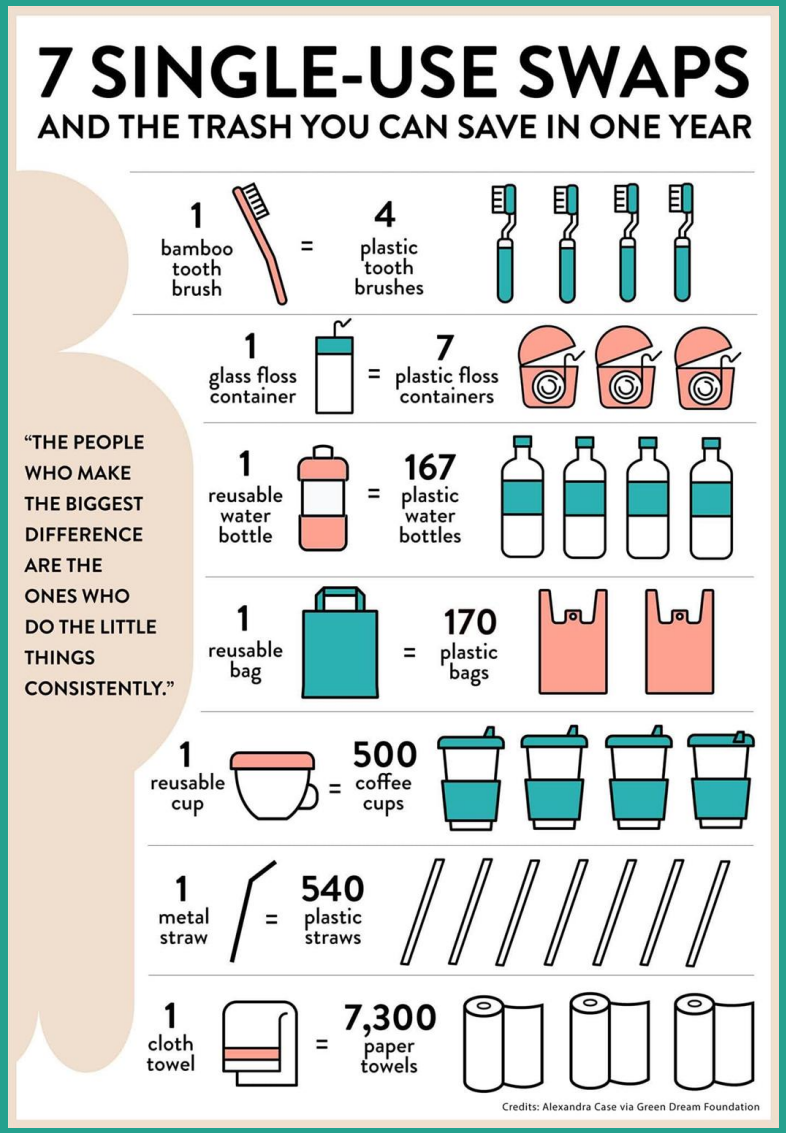
Microplastics

Out of all emerging water pollutants of concern, the topic of microplastics continues to be the most pervasive and multifaceted.

Microplastics are defined as plastic particles between 1 nanometer (nm) and 5 million nm (or 5 millimeters [mm]) in size. The smallest of these particles are typically not detectable to the naked human eye.

Microplastics enter waterways through the continuous breakdown of plastic materials into lakes, rivers, and oceans. Plastic pieces from litter, synthetic fabrics, tire wear down, and products designed with microplastics are washed into drains or transported into surface water. Microplastics have been found in drinking water, surface water, and groundwater.

Are Microplastics Really Everywhere?



Infographic Source: Alexandra Case via Green Dream Foundation

Microplastic particles persist all around us.

Their variety in size and shape allows these pieces to stay suspended in the water, settle to sediments, or continue to pass through water systems. Plastic surfaces act as carriers for contaminants like heavy metals.

There are many key uncertainties surrounding microplastics, and research to treat and combat microplastic levels in drinking water and our environment is still ongoing.

Reducing the use of both single and reuse plastic products, as well as products designed with microplastics, will help reduce the spread in our waterways.

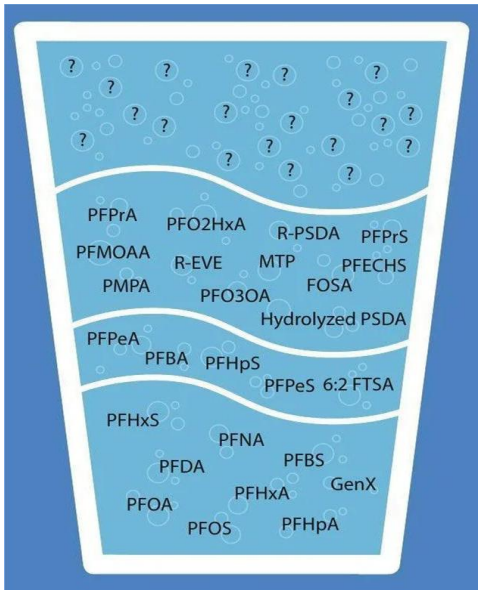
Image Source: Illinois Environmental Protection Agency

PFAS

PFAS, or Per- and Polyfluoroalkyl substances, are a group of chemicals used since the 1940s in products such as non-stick pans, water-resistant clothing, food packaging, and firefighting foam.

PFAS have characterized in popular media as “forever chemicals” due to their strong carbon-fluorine bonds that make them highly resistant to breaking down, meaning they can build up in our bodies over time.

Nearly everyone tested has traces in their blood. Being exposed to high levels of PFAS for a prolonged period may raise the risk of health problems like high cholesterol, thyroid issues, or certain cancers. Research concerning PFAS and human health Is ongoing.



PFAS Monitoring in the Rockford Region

Rockford, Belvidere, Loves Park, and the North Park Water District and others monitor PFAS and associated substances. Individual water utilities have specific information on their PFAS testing and their approach to managing this emerging contaminant.

While public water complies with current EPA standards, multiple small community water systems in southeast Rockford have been found to exceed safe limits for human consumption.

In 2024, the EPA finalized a National Primary Drinking Water Regulation (NPDWR) establishing legally enforceable levels, called Maximum Contaminant Levels (MCLs), for six PFAS in drinking water. If monitoring results in public water systems show PFAS levels above the legal limit, systems have until 2029 to take steps to lower those levels.

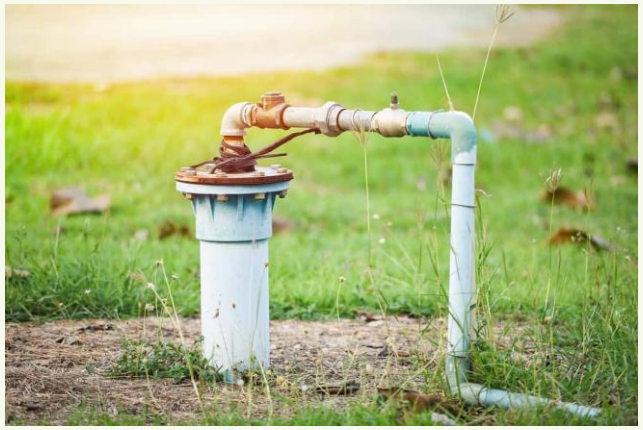


Image Source: Public Domain
U.S. Environmental Protection Agency, n.d.

Coliform Bacteria

Coliform bacteria are a broad group of bacteria commonly found in the environment — including soil, vegetation, and the intestines of warm-blooded animals (humans, livestock, wildlife).

They aren't necessarily harmful themselves, but they are used as indicator organisms to test water quality and sanitation safety. Their presence suggests that pathogenic (disease-causing) microorganisms might also be present. Testing for every possible pathogen (viruses, protozoa, bacteria) is expensive and complex.

Image Source: David Fankhauser

Coliforms, on the other hand, are easy to detect, common where pathogens are present, and sensitive to water treatment processes.

While most coliforms don't cause illness, their presence signals possible contamination with fecal matter. A positive *E. coli* result, for example, almost always indicates that human or animal fecal waste is entering the water supply.

Ingesting contaminated water can lead to diarrhea, stomach cramps, nausea and vomiting, and fever.

How Does Coliform Enter Our Waterways?

These bacteria can enter through sewage leaks or overflows, failing septic systems, animal manure runoff, surface water infiltration, improperly constructed or maintained wells, and stormwater runoff carrying fecal material.

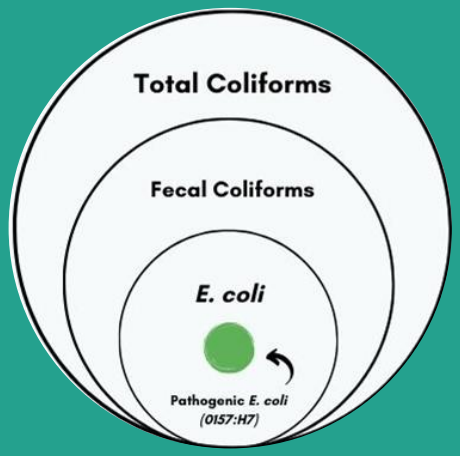


Image Source:
Alabama Cooperative Extension System

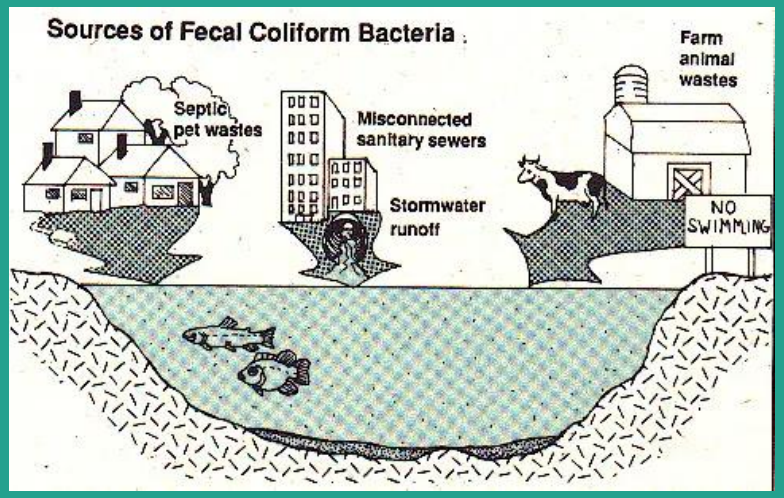


Image Source: “Chapter 2 - Lakes." Fecal Coliform Bacteria Concentrations. Web. 27 May 2015.

Due to the proximity to agricultural land and septic systems, private wells are more at risk of contamination. The EPA recommends testing for coliform bacteria annually; residents can contact the City of Rockford Environmental Laboratory, which offers a testing kit for $19. Learn more about water testing services here.

Sediment

Sediment pollution refers to the excessive presence of soil particles (silt, sand, clay, and organic matter) in water bodies due to **erosion** or **human activity.**

While a small amount of sediment is natural, too much suspended or deposited sediment can severely degrade water quality, aquatic habitats, and ecosystem balance.

Major sources include:

Agricultural runoff: Tilling, overgrazing, and bare soil expose land to erosion. Rain washes soil and attached nutrients into rivers and lakes.

Construction sites: Disturbed soil without vegetation easily washes away during storms.

Deforestation and logging: Removing vegetation removes root structures that stabilize soil.

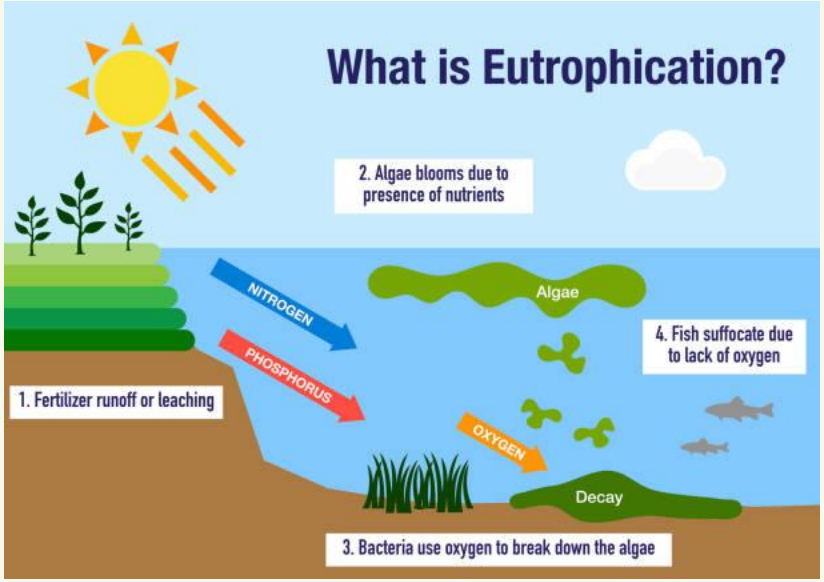
Urban stormwater runoff: Eroded soil, dust, and particles from streets and construction areas are carried into drains and streams.

Streambank and shoreline erosion: Altered water flow or loss of vegetation increases bank collapse.

Image Source: Public Domain
City of Rockford, n.d.

Nutrients

Sediment doesn't just cloud the water; it often carries **nutrients** (especially **phosphorus** and sometimes **nitrogen**) attached to soil particles or dissolved in water.



Phosphorus strongly binds to soil particles. When sediment enters water, it brings particulate phosphorus.

Nitrogen can attach to organic matter in sediment or be released later through chemical processes. It can also be carried through the soil to groundwater.

This combination of sediment and nutrients can greatly accelerate eutrophication, where water bodies become overly enriched with nutrients.

Image Source: Public Domain
Ikeda et al., 2009

Pesticides

Pesticides are used to kill and control pests and include herbicides, fungicides, and insecticides.

Pesticides such as glyphosate, triclopyr, and atrazine are widely used in commercial agriculture, landscaping, and other settings to control pests, including weeds. Pesticides enter waterways through runoff from fields/lawns, infiltration from soil to shallow aquifers, atmospheric deposition, or via stormwater and drainage.

Due to the Rockford Region's agricultural history and dominant rural land use, pesticides are an ongoing concern for environmental health.

In the Overview covering the Rock River basin, various wells were analyzed for synthetic organic pesticides. Monitoring data did not indicate quantifiable concentrations of organic pesticides.

Testing is recommended for rural/private wells that have been found running adjacent to crop field irrigation.

Image Source: Wikipedia Commons – Stefan Thiesen

Water Quality Issues in the News

Water quality is an ongoing issue, locally, nationally, and globally

This image taken by Justin Stumberg depicts a controlled oil burn in the Gulf of Mexico after an oil spill in April of 2010.

Flash Flooding

The Rockford Region is no stranger to sensational water stories, especially flooding.

Intense rainfall events have repeatedly caused flash flooding in neighborhoods. One example: homes near Keith Creek have experienced flooding so severe that people's basements have been submerged, doors have blown off, and residents had to evacuate. Businesses along Charles Street were heavily damaged in July 2024 floods. Over 200 properties were affected.

Image source: mystateline

Building on floodplains in the Rockford Region has been restricted since the late 1970s. Before then, floodplains were regularly constructed on due to their accessibility to water and flat land.

Find out if your home or surrounding area is near or on a floodplain at FEMA's flood map service center.

Langley, 2024
Federal Emergency Management Agency Regional, 2025

Southeast Rockford Superfund Site- 1989

In the 1980s, tests found that private and municipal wells in the southeast area of Rockford were contaminated with industrial solvents (volatile organic compounds, or VOCs).

The site was added to the federal Superfund list in 1989.

Cleanup actions included connecting hundreds of homes to the city water supply (to replace private wells), installing filtration on public wells, and ongoing groundwater monitoring.

In 2020, part of the site (Source Area 4) was declared cleaned up enough to be removed from the Superfund list, and a portion was restored with native prairie.

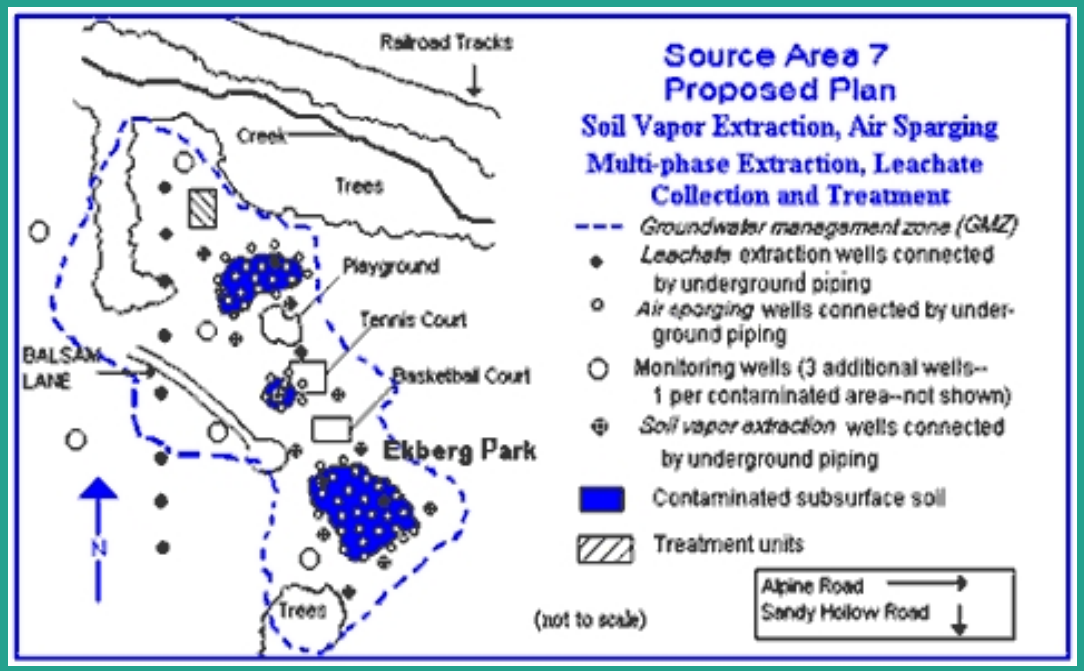


Figure 6. Source Area 7 Proposed Plan- Southeast Rockford Groundwater Contamination Superfund Project

Source: IEPA Fact Sheet 10b: Source Area 7 feasibility study and proposed plan

Chemtool Chemical Fire- 2021

On June 14, 2021, a major fire and explosions occurred at the Chemtool grease and lubricant manufacturing plant in Rockton, Illinois (near the Rock River).

The fire prompted a mandatory evacuation of all homes and businesses within a one-mile radius and health advisories for residents within three miles.

The fire was started by a maintenance accident: a scissor-lift struck a piping valve, allowing hot mineral oil to spill and ignite.

Because of concerns about chemicals, runoff, and smoke, fire crews allowed parts of the blaze to burn out rather than using large water streams, which might have spread chemical contamination. After the event, investigations looked for air, water and soil contamination (including testing for PFAS) around the plant and nearby Rock River.

Haas, 2021

Land Use and the Environment

Water moves through and across our landscape. The way we use our land will affect the state of our water.

Land use is typically categorized into **agricultural**, **urban**, **suburban**, and **natural** land use types.

Each have their own necessary benefits to supporting our community. They all also have different impacts on our water system.

Image Source: Public Domain

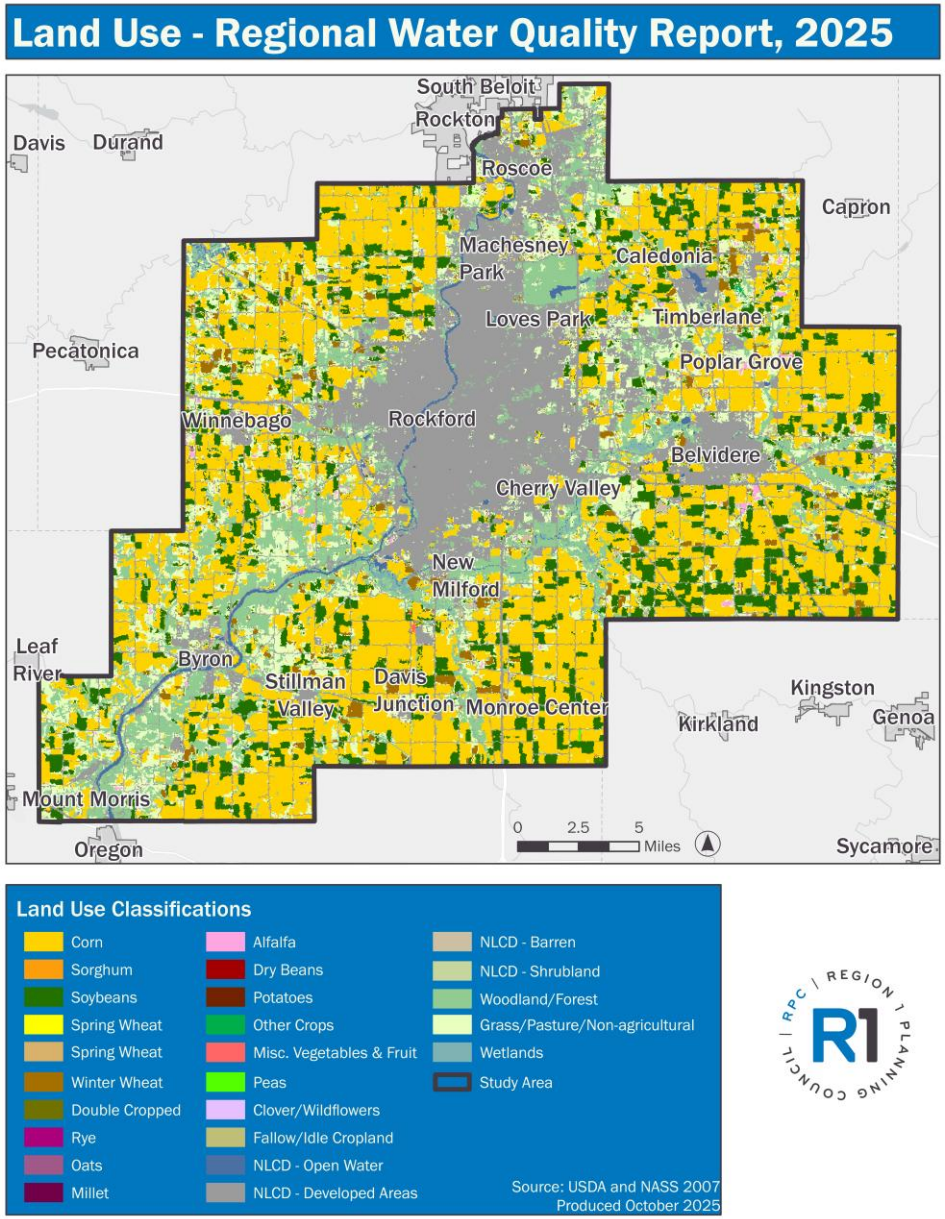


Figure 7. Land Use Types in the Rockford Region

Land Uses in the Rockford Region

Land use breakdown is the greatest determinant for the type of runoff we see in an area – how much/how little runoff accumulates and the type/number of pollutants that accumulate within it.

It is different land use types that contribute to non-point source pollution.

Regional Point Sources of Pollution

There are also land use types that contribute to point source pollution.

National Pollutant Discharge Elimination System (NPDES) is a program established by the Clean Water Act that requires any entity that discharges pollutants from a **point source** (like a pipe, ditch, or drain) into U.S. surface waters to obtain an NPDES permit.

The permit sets limits on pollutant concentrations, flow rates, and monitoring requirements to minimize the impact on receiving waters, but the impact is not zero.

This map shows the NPDES outfall locations in our region, mostly concentrated around the big cities.

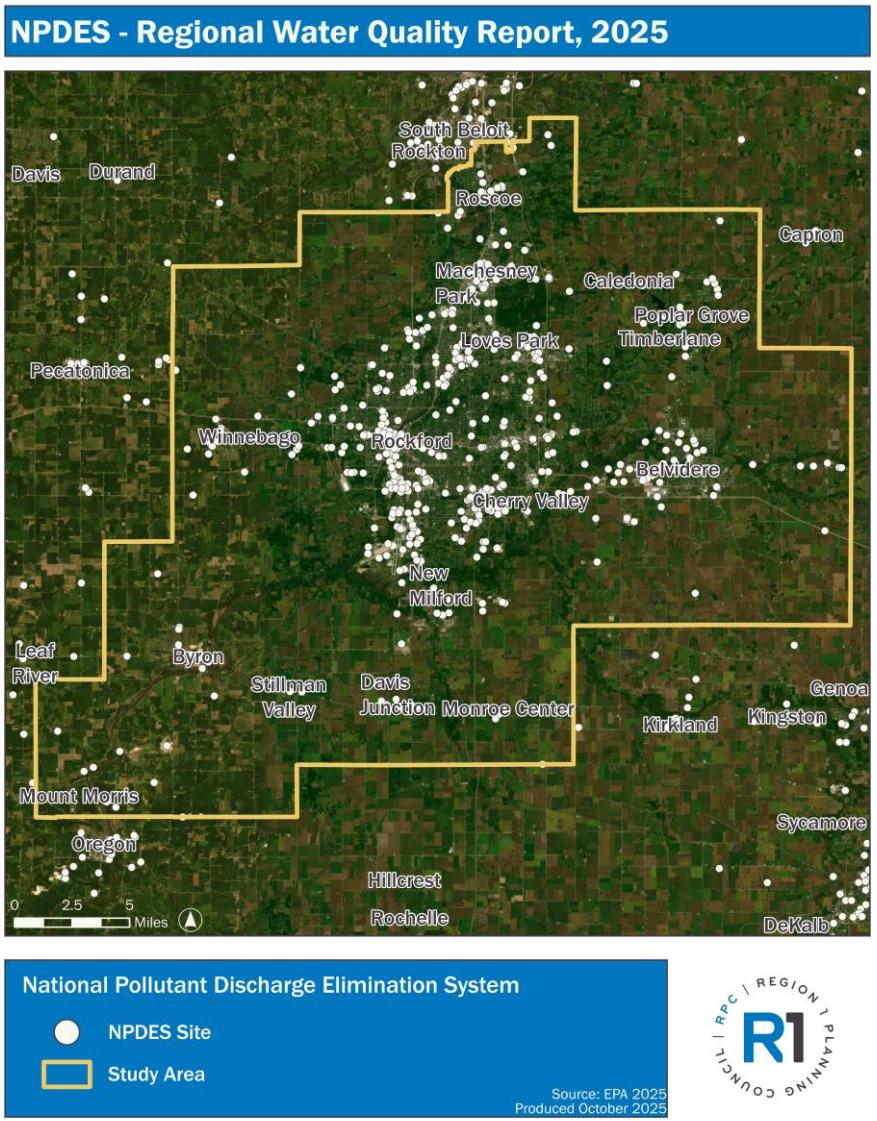
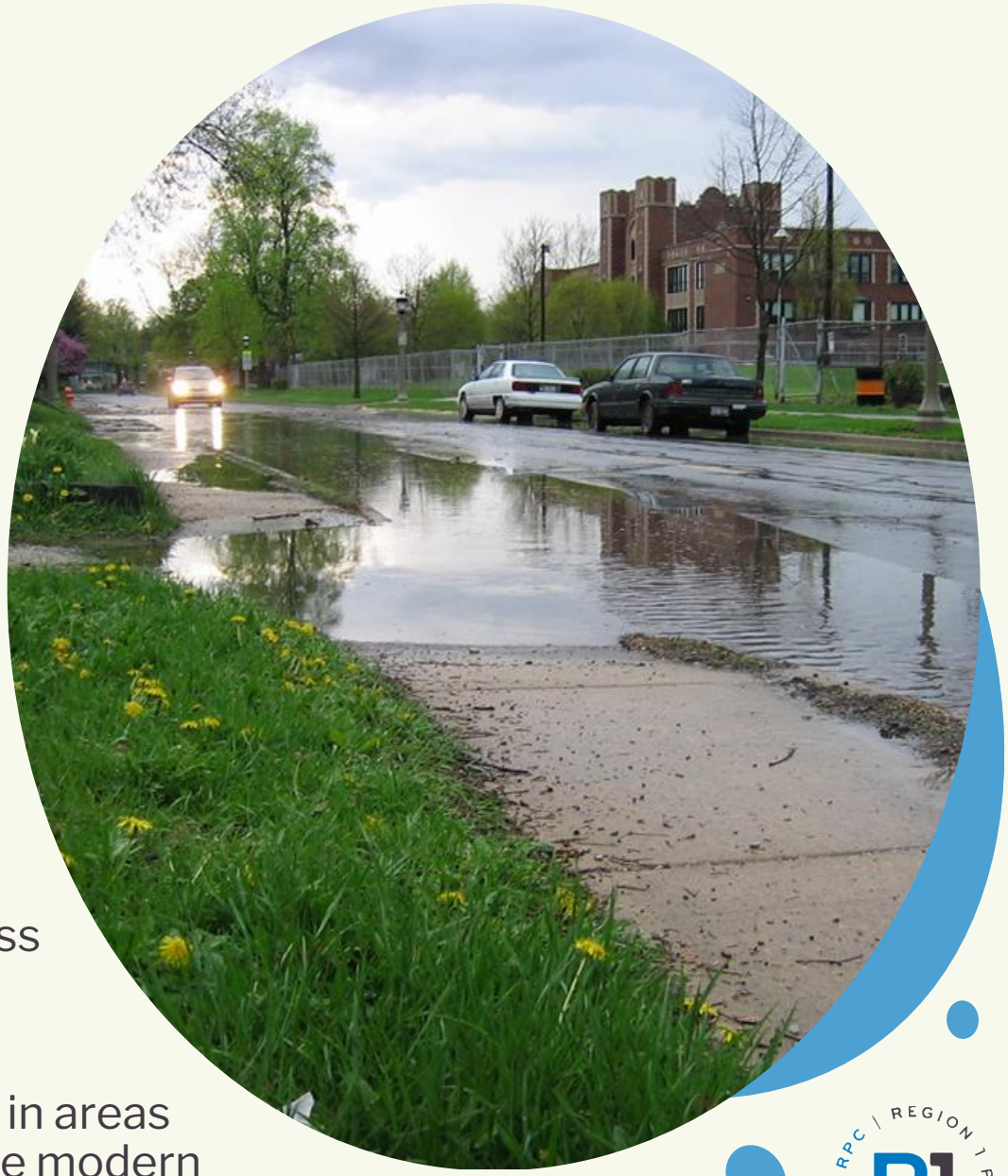


Figure 8. Regional Point Sources of Pollution

Illinois Environmental Protection Agency, n.d.

Impervious surfaces

Man-made materials or structures prevent water from infiltrating into the ground.



Impervious surfaces are a key factor influencing water quality and hydrology.

Examples include roads, parking lots, rooftops, sidewalks, and buildings.

Without space for stormwater to infiltrate into the ground, it flows across the landscape, carrying pollutants and entering our streams and rivers.

It also increases flood risk - especially in areas where older infrastructure can't handle modern storm volumes – and reduces groundwater recharge.

Impacts of Impervious Surfaces- “Flashiness”

What would have become groundwater becomes urban surface water directed into roadside swales, streams, rivers, and lakes.

The excess surface water often overruns these bodies of water, especially those which lack a natural floodplain, making streams and rivers “flashier,” creating flash flood events and severe erosion of streambanks.

This allows for the mass transportation of pollutants and sediments into the water systems causing a myriad of environmental integrity and health concerns.

Johnson, 2023
Image source: Public domain

Urban Canal

Natural Stream

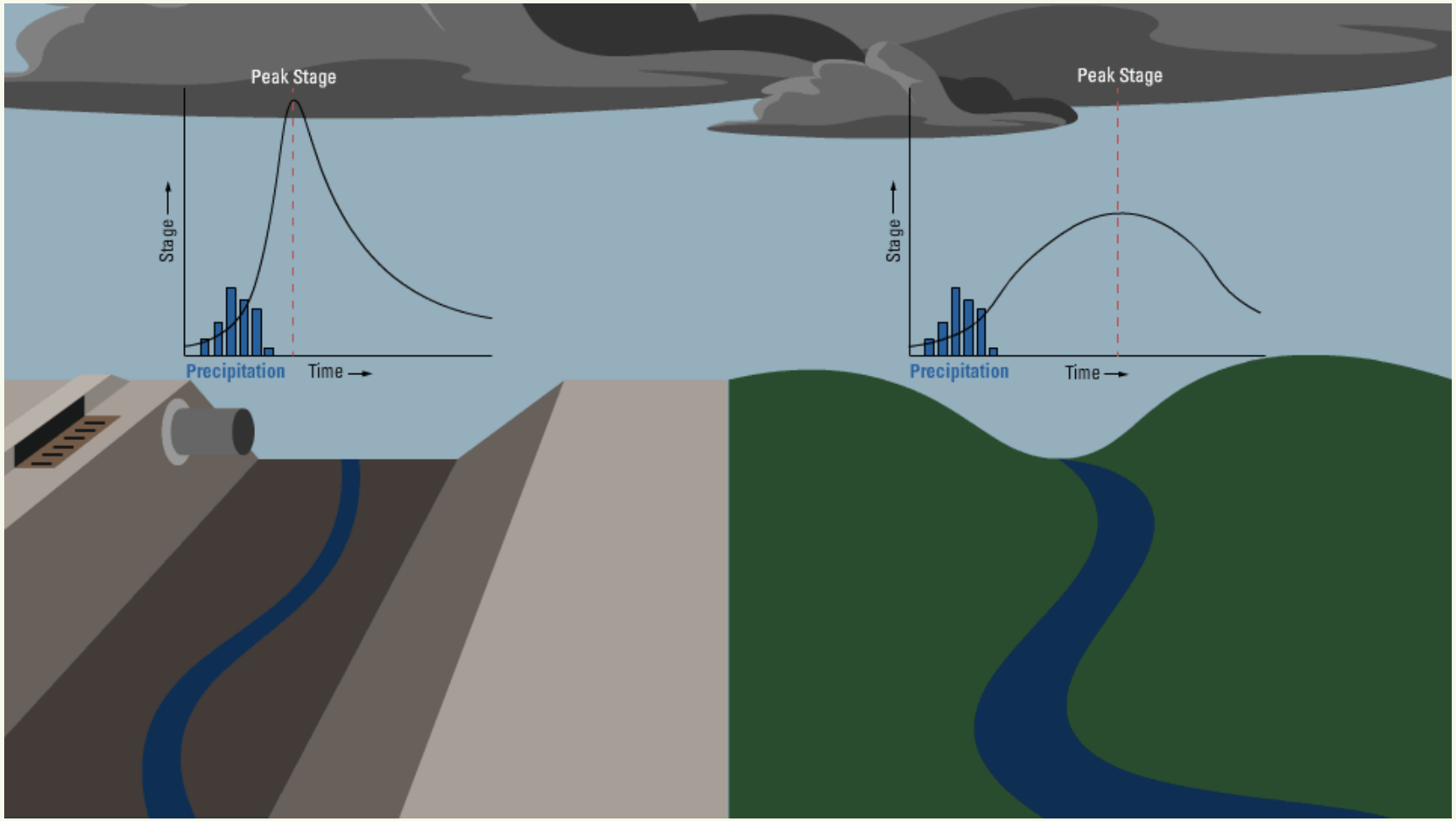


Figure 9. Flashiness of an urban canal versus natural stream

The figure depicts the difference in flashiness between a flashy, urban canal (left) and a less flashy, natural stream (right) as seen by the rate at which water levels peak after a rain event and fall after the peak.

Graphic source: Virginia and West Virginia Water Science Center, U.S. Geological Survey

Land Use Breakdown by Area

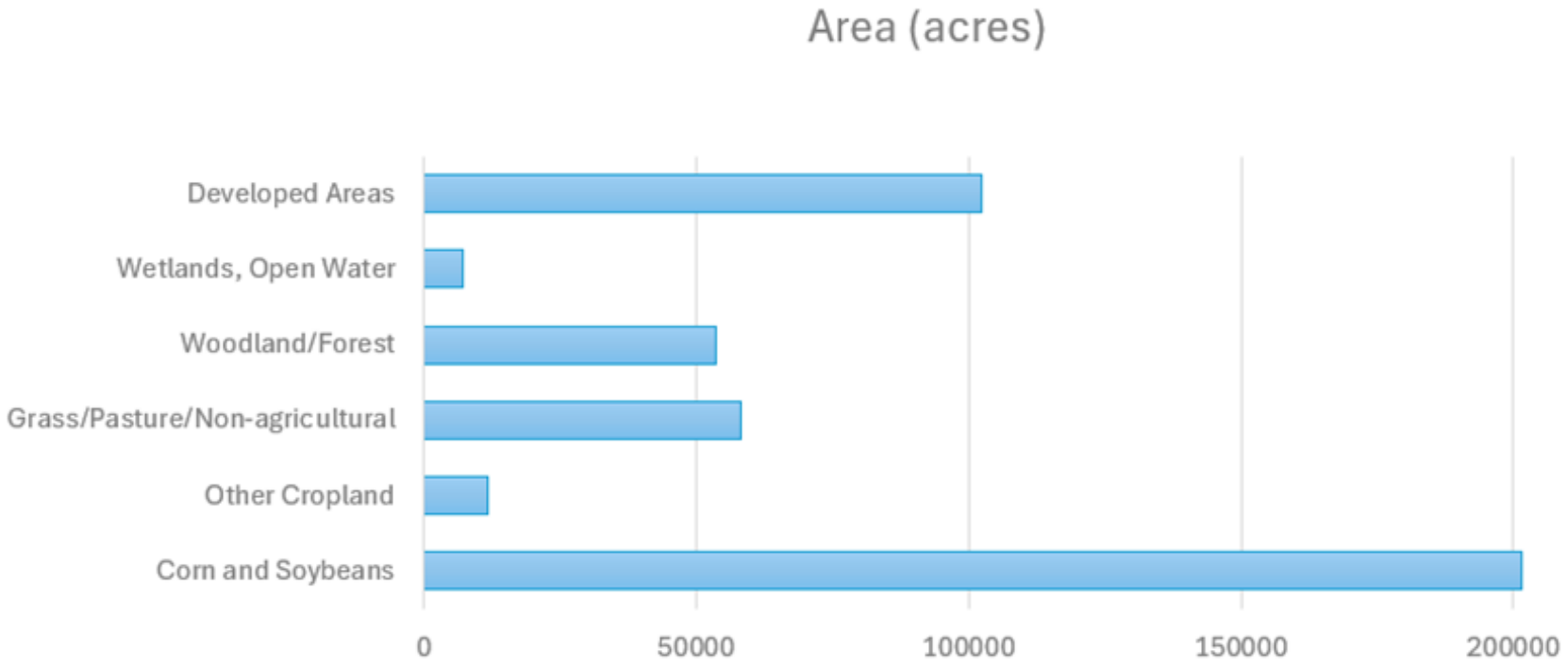


Figure 10. Land Use Breakdown by Area in the Rockford Region

Currently, the Rockford Region's landscape, approximately 434,665 acres in size, is dominated by 49% cropland (213,222 acres), 24% developed areas (102,363 acres), 13% pasture and other grassed areas (58,216 acres), and 14% natural areas (60,864 acres).

Urban Land Use

is characterized by high residential and commercial volume and public services.

In the core of Rockford, land use is primarily composed of dense development, including roads, rooftops, parking lots, and commercial/industrial properties – all **impervious surfaces**.

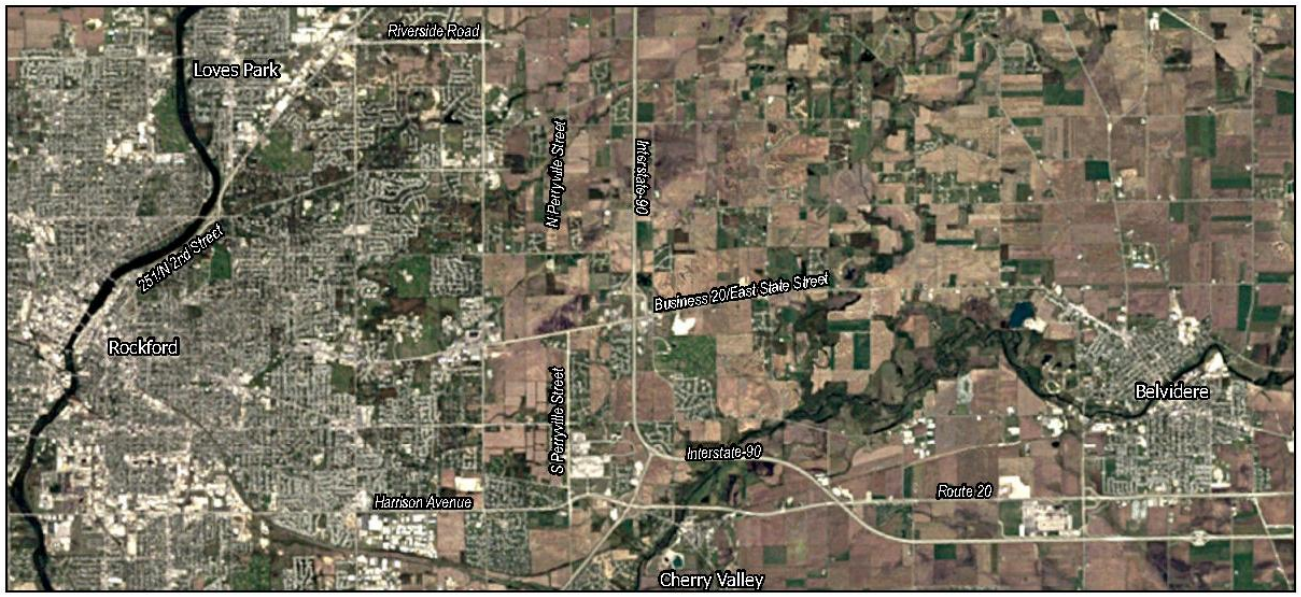
Lower proportions of green spaces to impervious surfaces has made urban land use the highest contributor per acre of pollution to our waterways, especially when urban stormwater and environmentally harmful byproduct are not managed strategically.

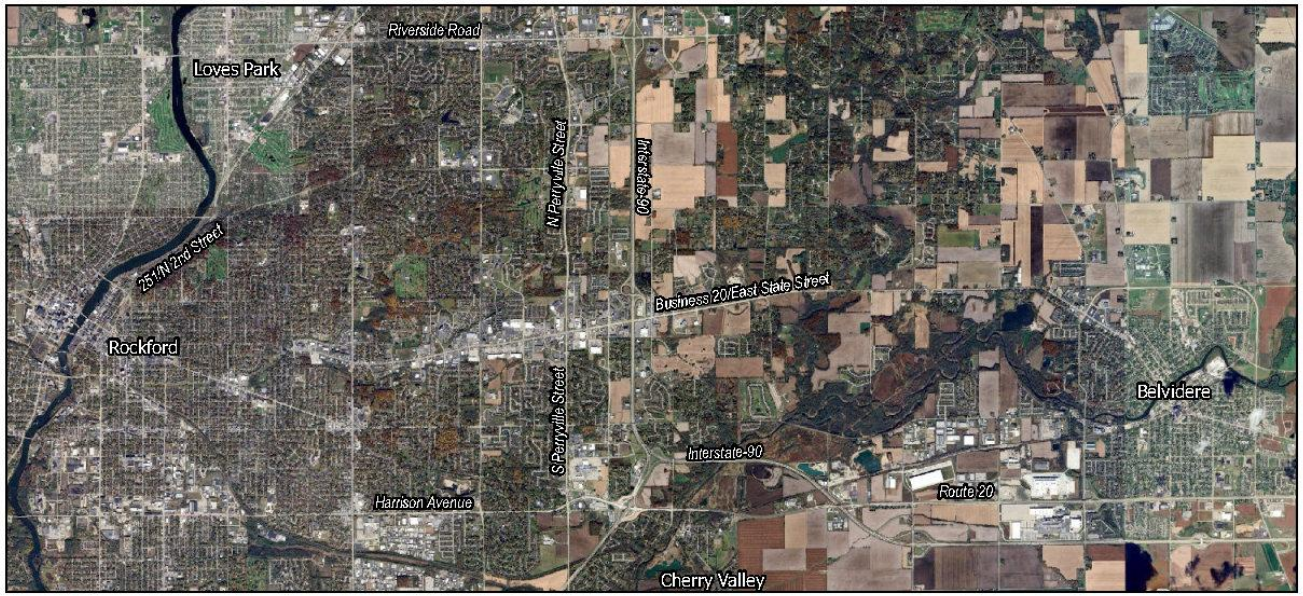
Urban areas contribute an array of non-point source pollutants that flow directly into waterways like the Rock River or Kent Creek.

- Pesticides and fertilizers used in landscaping
- Particulates and heavy metals from transportation, pavements, and de-icing
- Wastewater and greywater

Point sources include Municipal Wastewater Treatment Plants, Combined Sewer Overflows, industrial discharges, and Urban Stormwater Outfalls.

Urban land use has seen substantial growth in the region in the last 30 years.





Urban Sprawl

These aerial photographs from 1985 and 2025 show how the region has experienced urban sprawl between Rockford and Belvidere.

Figure 11. Land Use in 1985

Figure 12. Land Use in 2025

This increase in urban land use has implications on the local water cycle and water quality.

Natural Land Use vs. Urban Land Use

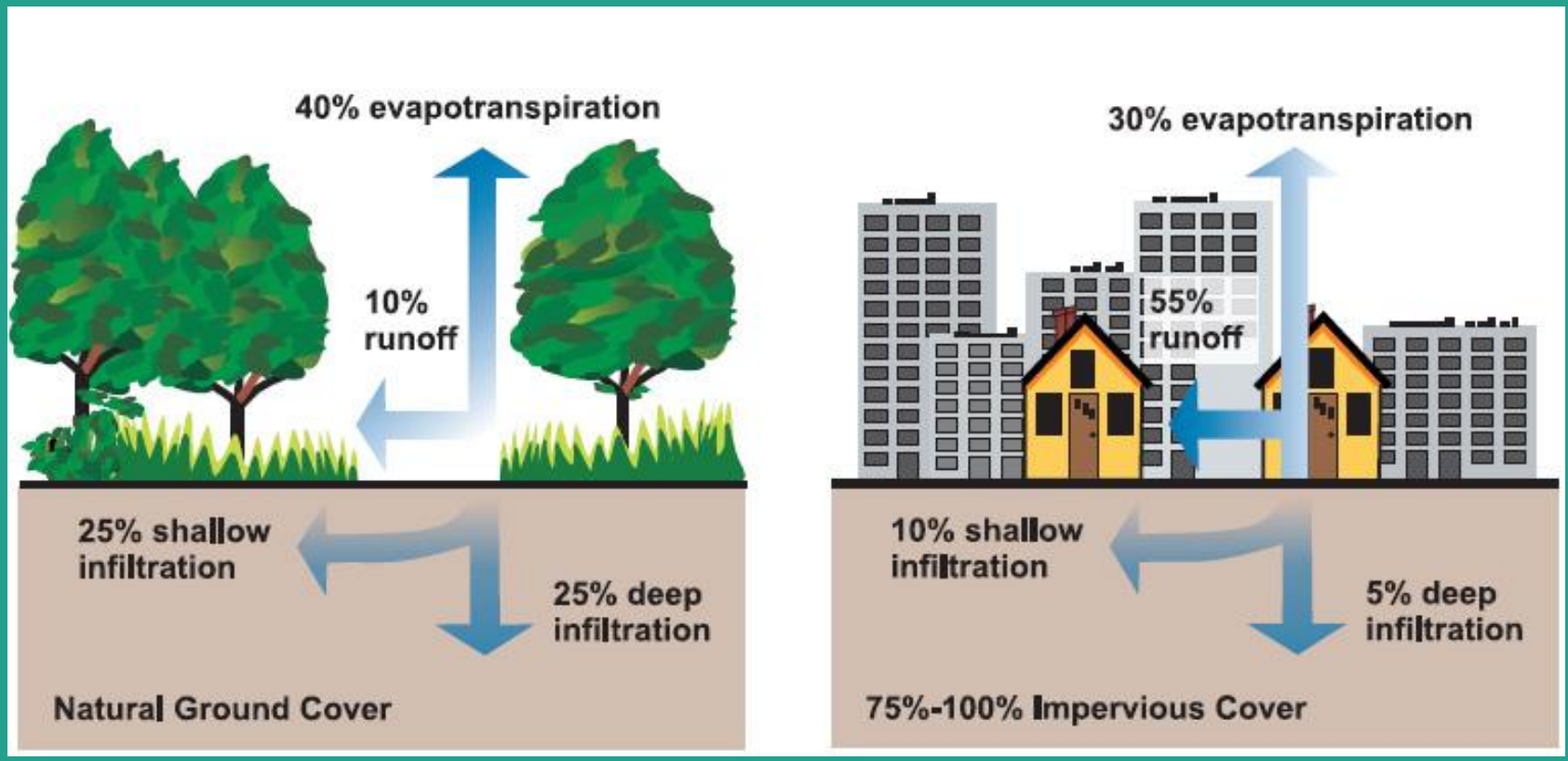


Figure 13. Natural Land Use Versus Suburban Land Use
Source: U.S. Environmental Protection Agency

Suburban Land Use

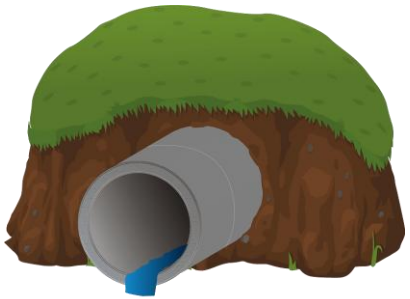
A mix of residential, commercial and green spaces located between urban centers and rural regions

Their impact on water quality is like that of urban land use but mitigated by higher proportions of green space that reduce runoff and allow for infiltration.

They give off the same types of pollutants as urban, but in lower concentrations and with more defense.

There are often more **stormwater management** features which help mitigate some of the runoff and filter pollutants before they reach waterways.

Image Source: Public Domain



Stormwater management

Strategic stormwater management is the most efficient and cost-effective way to mitigate the impacts of impervious surfaces.

Stormwater management is the series of curbs, gutters, sewers, etc. that are meant to direct stormwater off the landscape and into our waterways to mitigate flooding.

Not all stormwater management is created equally... it is not always sufficient to handle modern-day flood events, and it is not always outfitted to filter out pollutants at the same time.

Green infrastructure and **Best Management Practices (BMPs)** are ways to manage stormwater to reduce flooding while simultaneously creating spaces for filtering of pollutants and infiltration of runoff into the ground.

Brown & Bobrow, n.d.

A Local Example: Floating Wetlands at Levings Lake

This was done as part of a water quality improvement plan by the Rockford Park District and various partners.

It consists of floating beds of vegetation whose roots extend into the water column, removing excess nutrients from the lake.

Floating wetlands have the capacity for 63-98% reductions in some settings.

It was done alongside vegetated filter strips, native plantings, and a constructed stormwater wetland.

Olson Ecological Solutions, n.d.

Other Examples of Sustainable Stormwater Management

Bioswales: roadside swales with native vegetation to filter stormwater

Rain Gardens: Usually part of landscape design, native plantings downstream from gutters

Green Roofs: reduce runoff from roofs with vegetation to intercept it

Porous Pavement: decreases amount of impervious surface without sacrificing utility

Filter Strips: native vegetation planted along waterways to intercept runoff

Constructed Wetlands: to promote stormwater storage, filtration, and groundwater recharge

Rain Barrels: to catch stormwater from roofs to be used for lawn maintenance, reduces amount of stormwater in times of heavy flow

Image Source: Self-Sourced
Brown & Bobrow, n.d.

Agricultural Land

Crop fields, pasture, and feedlots

"I think of regenerative agriculture as a mindset—which can be summarized as 'doing the best you can, using all the tools in the toolbox, to leave the soil in better condition than when you found it."

- Ross Bricklemyer, *Ecosystem Services Modeling Strategy Lead*, Bayer

The highest proportion of land use in the Rockford Region is agricultural land, specifically corn and soybean fields.

These landscapes can significantly affect water quality by contributing excess nutrients from fertilizers, livestock, and sediment from erosion of exposed fields.

Practices like tile drainage (underground pipes that remove excess water from fields) increases water movement and pollutants into waterways disrupting natural infiltration of water into the soil.

Despite these challenges, rural areas generally have more pervious (absorbent) surfaces, which allows for more efficient infiltration and groundwater recharge.

Image Source: Public Domain

Sustainable Farming

Because agriculture covers the most ground in the region, its effect on water quality is one of the greatest.

There is movement towards farming practices that reduce its negative effect on the environment:

- Planting cover crops
- No-till farming
- Nutrient management
- Crop rotation
- Field buffers

There are many federal and local farming programs that support producers who incorporate sustainable practices. The Illinois Sustainable Ag Partnership, Winnebago County's Land & Water Conservation Dept., National Resources Conservation Service, farmer led watershed groups, and many more.

Image Source: Public Domain; Self-sourced

Natural Lands

Prairies, woodlands, forests, wetlands

Natural lands are our best defense against water pollution – they create space for the slow infiltration of surface water to our groundwater stores, filtering out contaminants and using excess pollutants as fuel for healthy growth.

Luckily, there is natural land dispersed throughout the Rockford Region, breaking up impervious surfaces, intercepting pollutants, providing habitat for wildlife, and enhancing the quality of life for those in nearby communities.

Not all natural land provides equal ecosystem benefits...

Wetlands, when populated by native species are some of the most important landscape features for water quality.

Woodlands that are dominated by invasive shrubs might contribute to sediment loading due to a lack of herbaceous species, as a dense shrub layer reduces sunlight exposure to the forest floor, impeding the growth of important soil stabilizing plants.

Image Source: Self-sourced

Geology of our region

Geologic layers, their transmissivity, and the history of water supply are crucial for understanding both current water supply reliability and future challenges in the Rockford metropolitan area.

Our region has three primary sources of groundwater, found in layers beneath the surface, each with distinct characteristics that affect water supply and quality.

- Shallow sand and gravel aquifers
- Shallow bedrock Aquifers
- Deep sandstone aquifers

Image Source: Public Domain

Three Main Water-Bearing Layers

This graphic by the Illinois State Water Survey for the Chicago region illustrates the same layers that our found in our region.

1) ***Shallow sand and gravel aquifers***

2) ***Shallow bedrock aquifers***

3) ***Deep sandstone aquifers (Cambrian-Ordovician)***

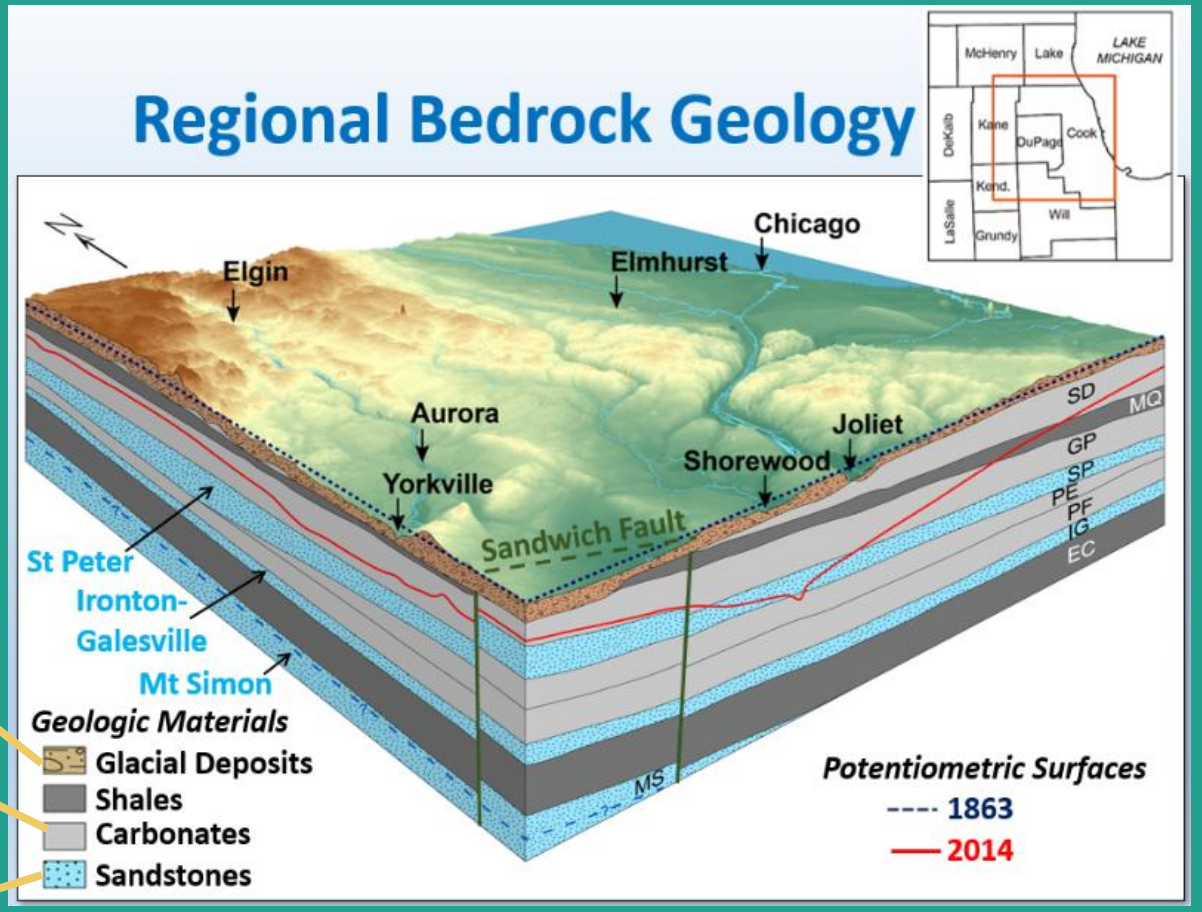


Figure 14. Regional Bedrock Geology

How does each layer supply our water?

1. Shallow Sand and Gravel Aquifers

These aquifers are made up of loose materials like sand and gravel that were left behind by glaciers and rivers. They are found close to the surface and are shown as “Glacial Deposits” on the Regional Bedrock Geology map. In areas such as Boone and Winnebago Counties, these shallow aquifers are associated with outwash valleys, and can provide water for small households, farms, and some irrigation.

Image Source: Public Domain

2. Shallow Bedrock Aquifers

These aquifers form in layers of limestone and dolomite, such as the Galena-Platteville system, which lie a few hundred feet below the surface. On the geology map, they are labeled as “Carbonate” formations. Water flow in these aquifers depends on how much the rock is cracked or fractured. In some areas, they can produce a steady supply of water, while in others, the flow may be limited. These aquifers are the source of private wells in upland areas.

3. Deep Sandstone Aquifers (Cambrian-Ordovician System)

These deep sandstone layers—shown as “Sandstones” on the geology map—are the main source of water for municipal sources in the region. The St. Peter and Ironton-Galesville Sandstones are especially important because their sand grains are well-rounded and have open spaces that allow water to move and be stored efficiently. Most cities in the area, including Rockford, rely heavily on these deep sandstone aquifers for their public water supplies.

Our Region's Aquifers

Almost our entire region sits above aquifers that supply drinking water.

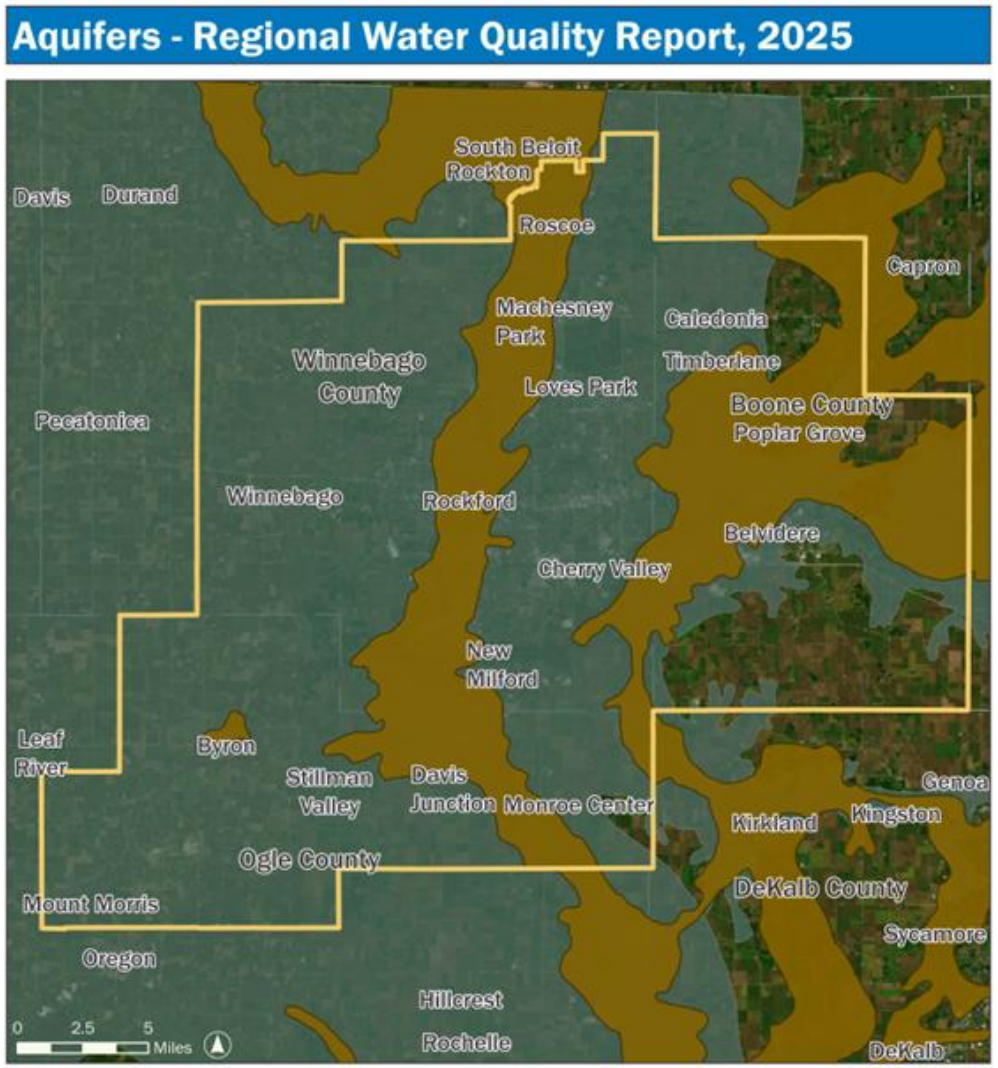


Figure 15. Our Region's Aquifers

Transmissivity of Ground Layers

Transmissivity is a measure of how easily water can move through rock and soil; higher transmissivity means better supply of water.

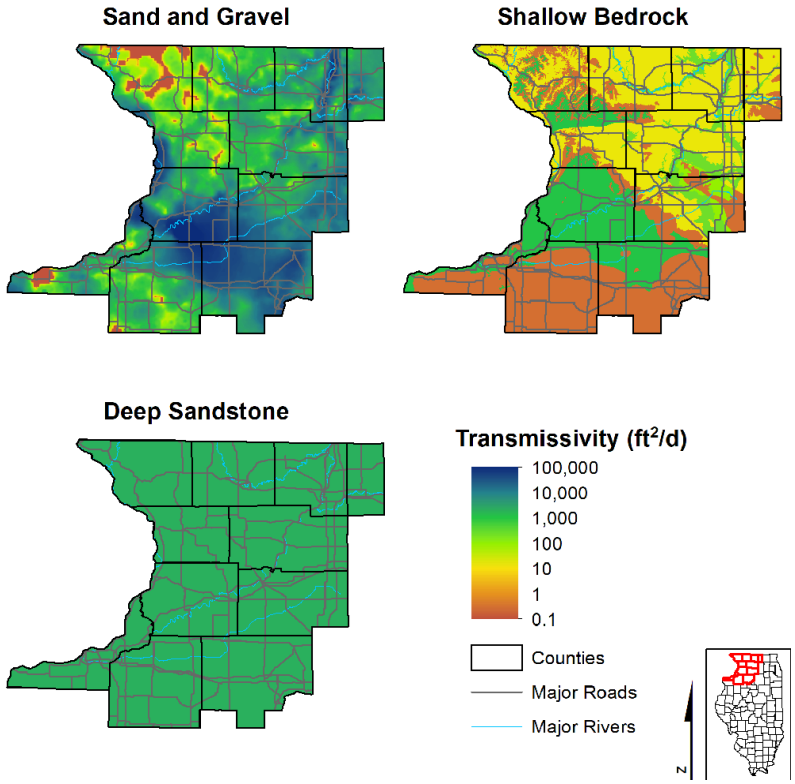


Figure 16. Transmissivity of Ground Layers
Source: Illinois State Water Survey, 2023

The deep sandstone aquifers have steady, moderate transmissivity. That means they're reliable water sources.

Shallow sand and gravel can have high transmissivity, but not everywhere.

Clay-rich areas don't let water move well, so they have low transmissivity.

Shallow bedrock aquifers have the lowest transmissivity of all.

Local Water Quality

Surface, ground, and drinking water is monitored federally and locally.

Most surface water is monitored and regulated per provisions laid out in the Clean Water Act, but there are other local programs as well.

Groundwater is monitored to collect information for studies and environmental sites. Landfills and known contamination sites are actively monitored, but most groundwater is not continuously monitored and tested.

Municipal drinking water is closely monitored by local water utilities and small community water systems. The testing includes up to 80 different contaminants that are regulated by the IEPA.

Private well owners are encouraged to test their water regularly.

Image Source: Public Domain; Illinois EPA

Surface Water Quality

Surface water quality in the region was analyzed by examining a compilation of federal water quality data from the **Illinois EPA** and **Illinois DNR**.

Both agencies have ways of giving ratings to **navigable waters** based on their use attainments and biological integrity and diversity.

They extract data from local resources and programs that they often support financially such as the Ambient Water Quality Monitoring Network, volunteer and partner data, NPDES compliance data, and special studies like Total Maximum Daily Load (TMDL) Overviews and watershed plans.

Gaps in the data:

Because only **navigable** waters are federally regulated, other streams are often ignored.

Not every **navigable** water is monitored every year; often, IEPA and IDNR data can be outdated.

Not all watersheds in the region have a **TMDL** or **watershed plan**.

Image Source: Public Domain

Impaired Streams

An **impaired stream** refers to a river or stream that is too polluted or degraded to support its **designated uses** as determined by the IEPA via CWA Section 303(d) List.

Image Source: Public Domain

A **designated use** is what a water body should be able to support if it were protected and restored to its highest attainable condition.

These uses include protection of aquatic life, primary contact recreation, aesthetic quality, drinking water supply, and fish consumption.

We want to focus on areas that require our most immediate attention, which starts with identifying which of our local water bodies are degraded or ***impaired***.

Our Region's Impaired Streams

The map shows the 26 impaired stream segments, adding up to 269 miles, from the IEPA's most recent Overview in 2024. They have all been listed for at least the last 6 years.

Rock River, Kishwaukee, and Elkhorn Creek segments have more than one impaired designated use.

Most impairments are to primary contact and fish consumption.

Fecal coliform, Mercury, and PCBs were the most common identified issues.

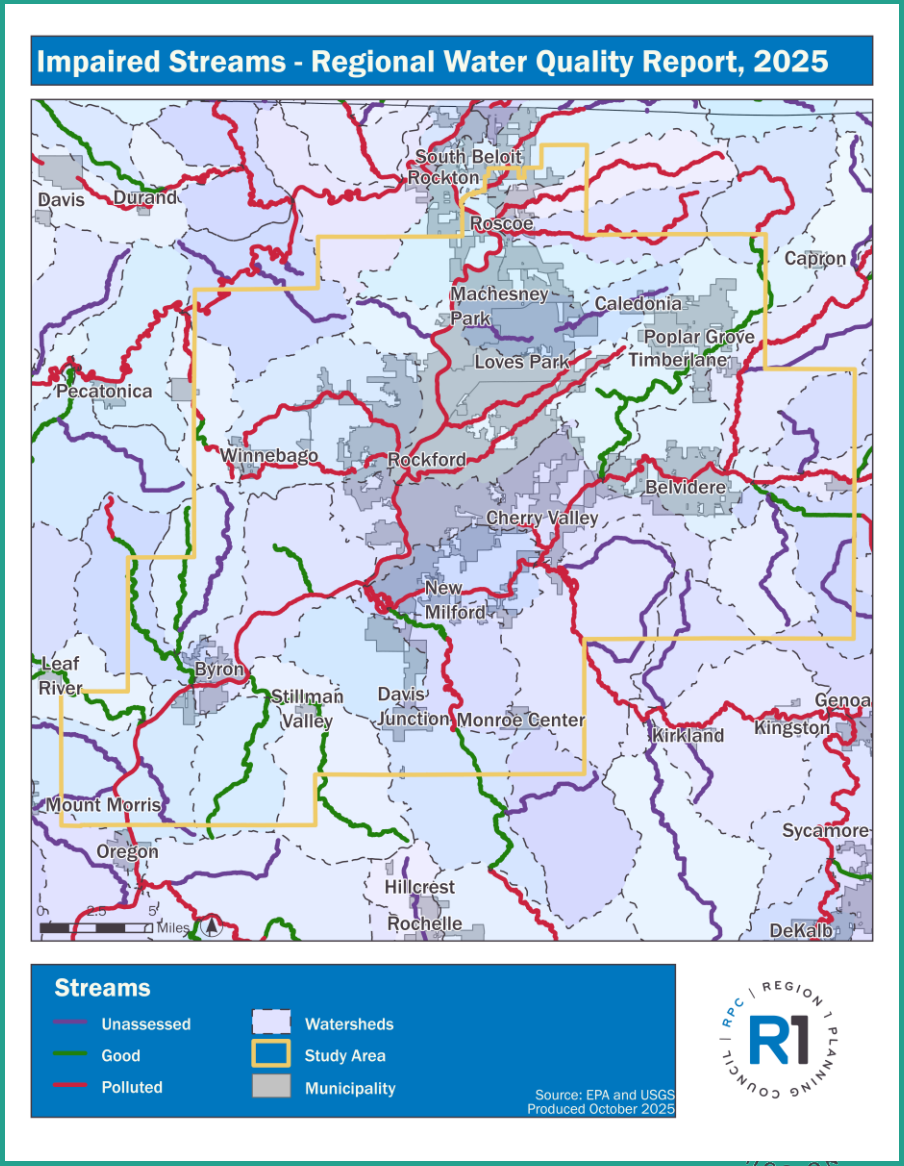


Figure 17. Impaired Streams

Stream Ratings

The Illinois Department of Natural Resources produces an inventory of classifications that categorize local streams on **biological integrity** and **biological diversity**.

Image source: Self-sourced; Illinois Department of Natural Resources

Data is typically taken from fish communities, macroinvertebrates, and mussels.

Streams are rated on an alphabetical scale of A-E, A being “exceptional”, E being “restricted”

25 streams were given ratings.

- One was designated as Biologically Significant – Lower Beaver Creek
- 18 of these streams were given a rating of A-C for Diversity
- 23 of these streams were given a rating of A-C for Integrity

Biological Integrity Ratings

Biological integrity refers to the measure of intactness of a stream community.

It is important to note that there is one **biologically significant stream** – Beaver Creek – a stream that supports the life of rare and endangered species with high biological integrity and diversity.

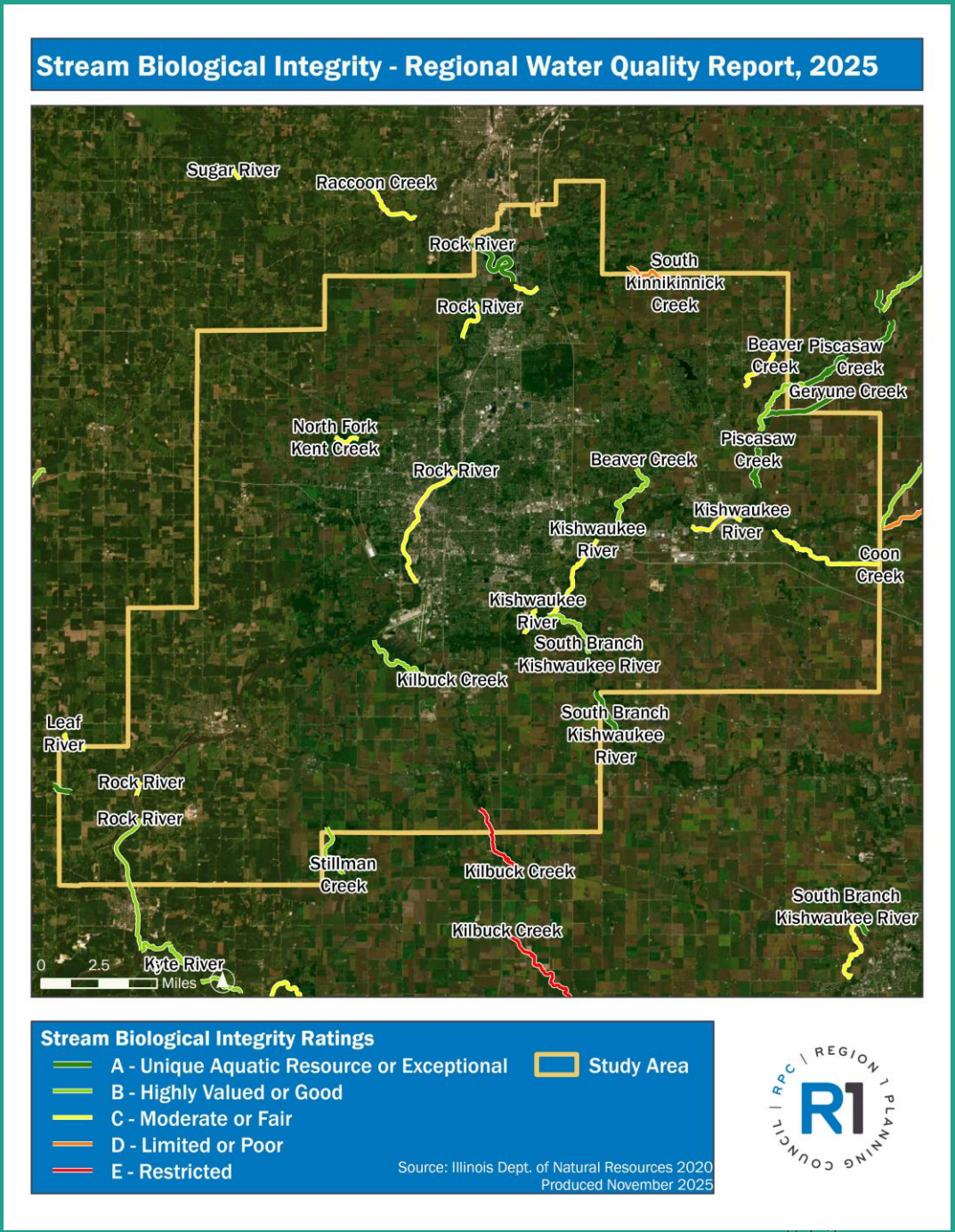


Figure 18. IDNR Biological Integrity Ratings

Biological Diversity Ratings

Biological diversity refers to the measure of the variety of species in a stream.

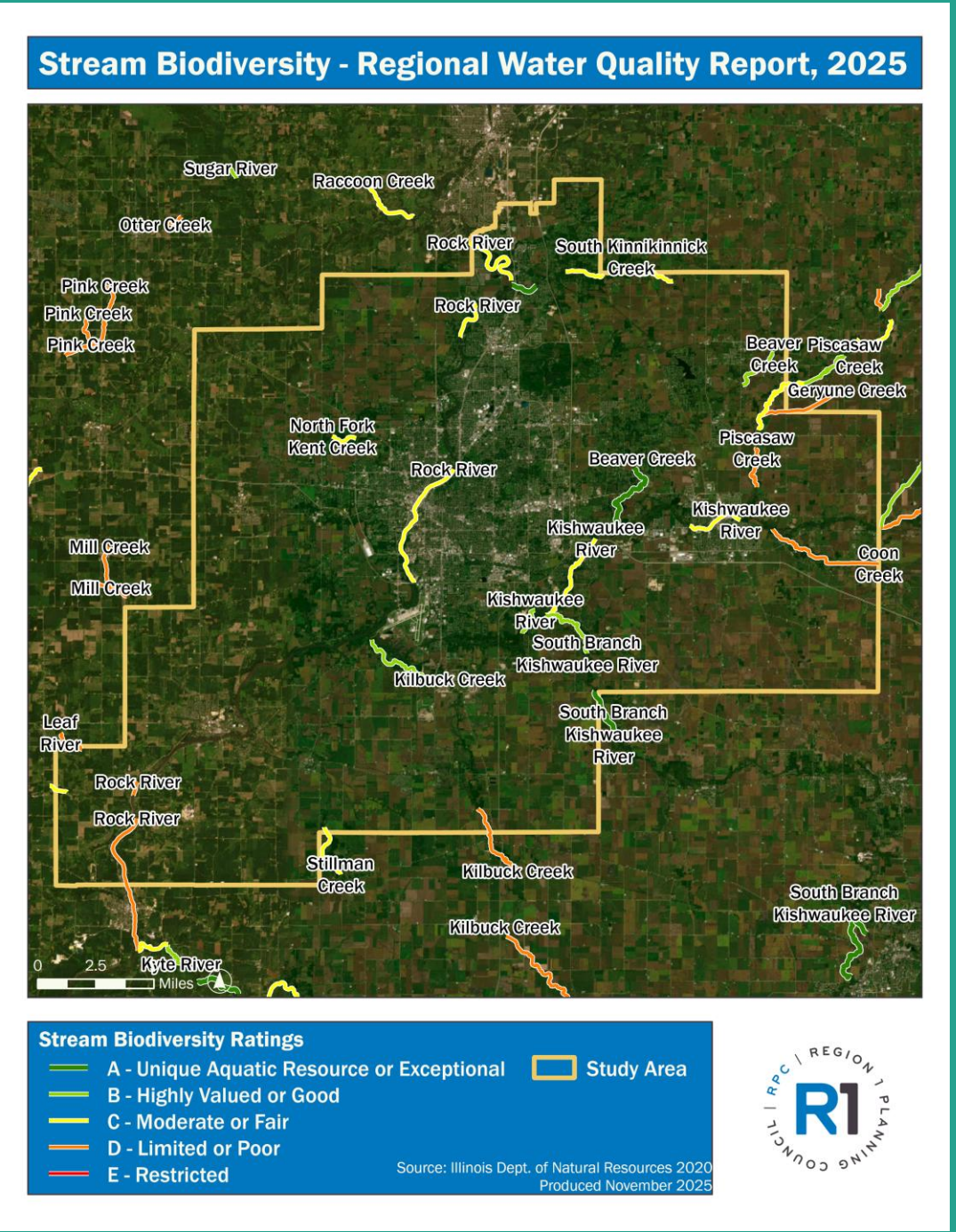


Figure 19. IDNR Biological Diversity Ratings

Total Maximum Daily Loads & Watershed Plans

Total Maximum Daily Load (TMDL) reports and **watershed plans** are local, usually grant funded projects that examine a local watershed to analyze pollutants, ecosystem health, and recommendations for improvements.

A TMDL determines the maximum amount of a given pollutant that a water body can receive without violating water quality standards and designated uses. It considers both point-source and non-point sources of pollution, as well as inputs from all land use types.

Watershed plans provide specific recommendations for water quality improvement backed by in-depth research and data.

The map shows the areas in our region that have either a TMDL study or a watershed plan.

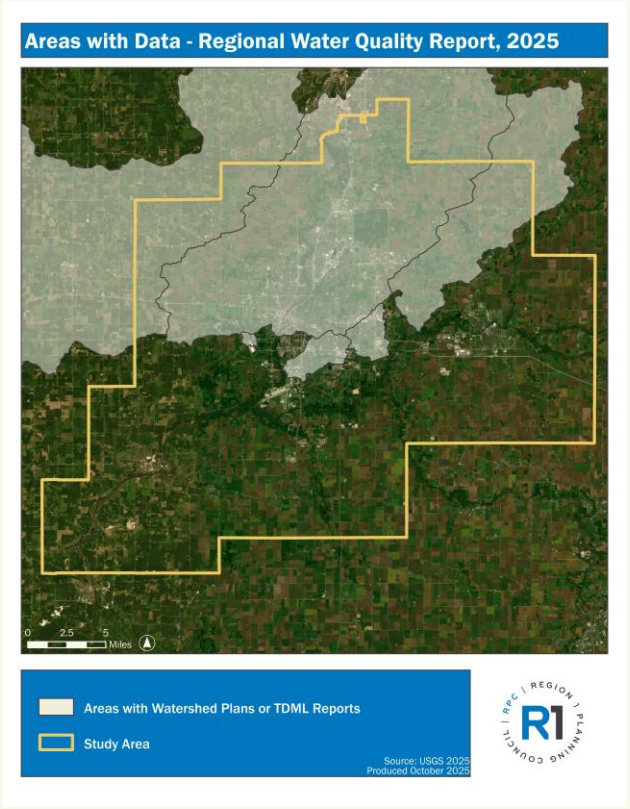


Figure 20. Total Maximum Daily Loads and Watershed Plans

Gaps in Surface Water Data

The surface water data we do have is informative, but gaps remain…

Six of the impairments did not have an identified issue.

Not each designated use is always assessed.

None of the streams had a probable source of pollutants identified.

Not all streams have been assessed – only navigable waters are assessed federally.

Some of the data can be outdated, for both impaired streams and biological stream ratings.

There remains areas not yet researched by TMDLs and watershed plans – only 9 of the impaired stream segments had plans associated with them.

Groundwater Quality

Our region's drinking water sources consistently meet Maximum Contaminant Levels established by the Illinois EPA, with detected levels typically well below regulatory limits.

This regulatory compliance, combined with transparent public Overviewing through annual Consumer Confidence Overviews, demonstrates how regional water providers prioritize both water safety and public trust.

Having a clean source for drinking water is the first step towards safe water quality, but it does not ensure an abundance of clean water into perpetuity.

Between the ground and the tap as well as the present and the future, care must be taken to protect groundwater from contaminants and scarcity.

Water Quantity: Tracking Drawdown

Our region enjoys groundwater resources, but it is critical to track the sustainability of the supply.

Drawdown, the reduction in aquifer level over time, is being monitored across the state.

Recent analysis shows that most of our region has little to no drawdown, while other areas have shown some decline in water levels.

The decline of our region's groundwater is less severe than the issues that parts of the Chicago and Joliet regions are experiencing, but all these areas are connected.

Well records from two areas of Rockford illustrate how geology impacts drawdown.

Geology Impacts on Drawdown

Wells in the Rock River Valley (#1 and #6):

A shallow alluvial (river-deposited) aquifer sits directly above the deeper Cambrian-Ordovician sandstone, creating the most reliable water sources.

Precipitation infiltrates easily into the shallow aquifer and then leaks down to recharge the deeper sandstone.

Wells in this system have shown minimal drawdown (less than 50 feet) over more than 70 years.

Wells Outside the Valley (#30):

The Galena-Platteville limestone system overlies the deeper sandstone and acts as a barrier, restricting recharge to the sandstone below.

These wells experienced much greater drawdown (more than 100 feet) in less than 45 years.

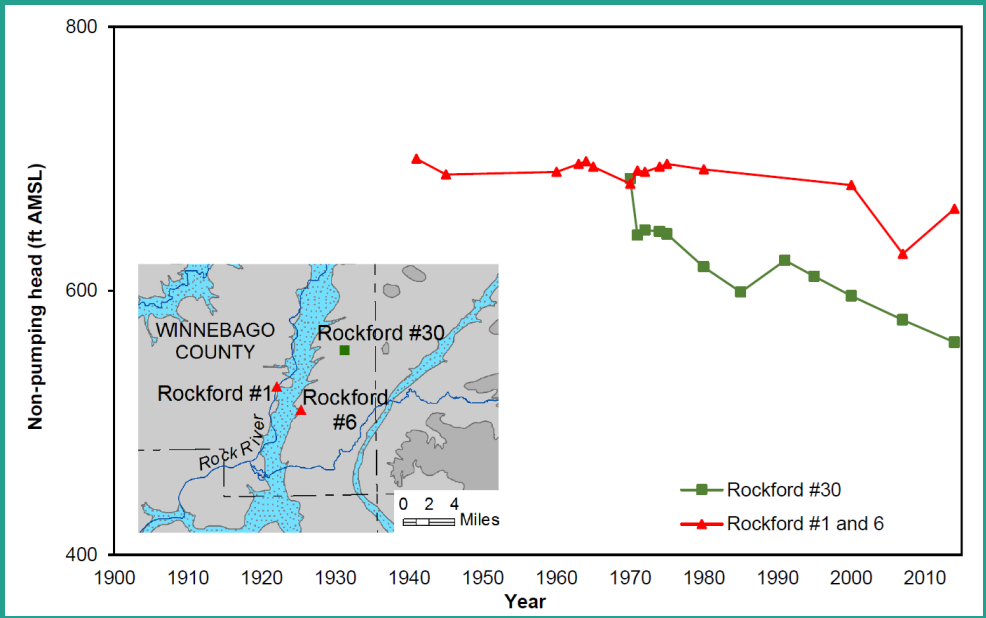


Figure 21. Geological Impacts on Drawdown

Comparing Drawdown Across the State

The Rockford region currently represents some of the most sustainable groundwater in the state- but our neighbors illustrate that those resources are *finite* and require careful usage.

Communities in the dark red are now in the costly and complex process of switching their water supply source from groundwater to Lake Michigan.

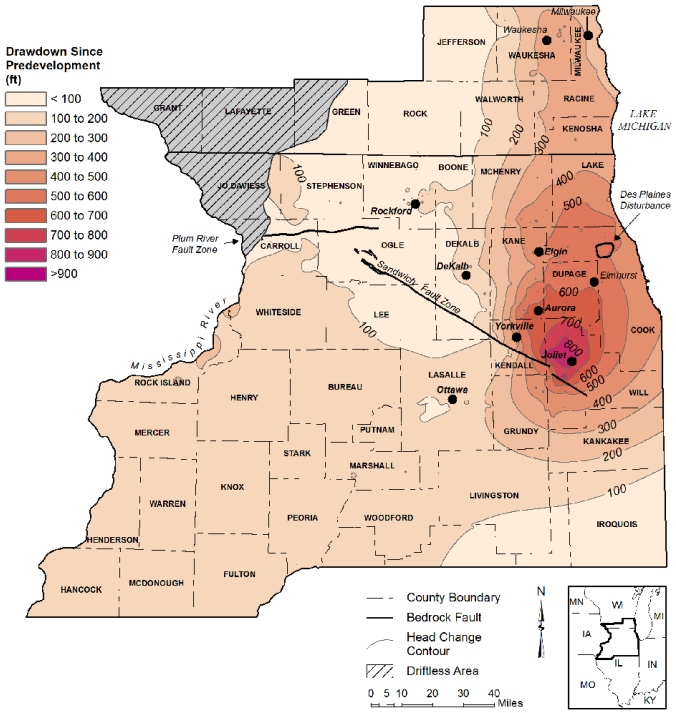


Figure 22. Comparing Drawdown

Source: Illinois State Water Survey, 2023

Analysis of 23 Rockford wells showed that 5 had increasing water levels, 8 were stable, 7 were decreasing, and 3 showed no clear trend.

The City of Rockford's total water pumping has steadily declined from 32 million gallons per day in 1979 to 16 million gallons per day in 2019.

This reduction, combined with the geological advantages in certain areas, has helped keep water levels stable.

Abram et al, 2023; Powers, 2005

Gaps in the Groundwater Data

There is also a need for more extensive groundwater data, especially considering sensitive recharge areas.

The information we currently have about our water supply is basic – limited to only a few studies in the area and are usually based on low-resolution data.

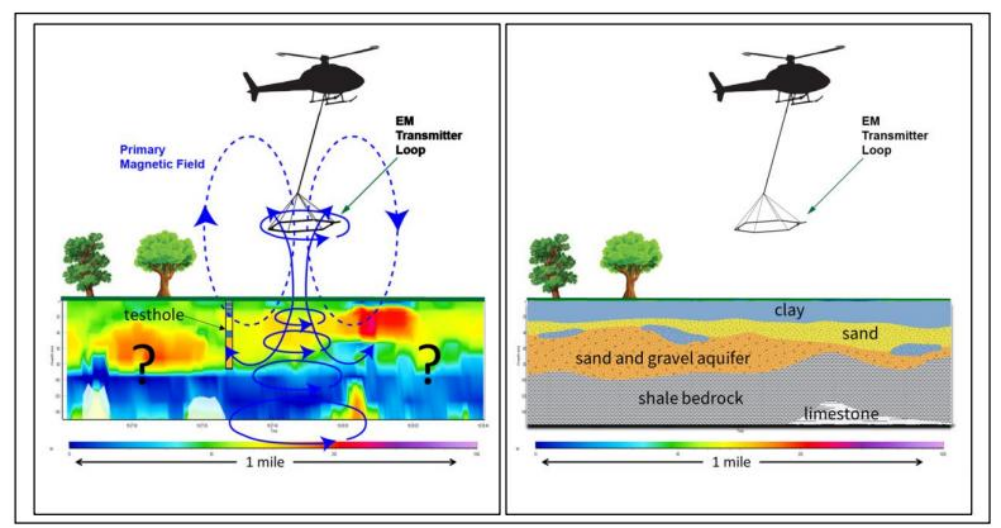


Figure 23. Boone County Geologic Mapping Project Depiction
Planned HTEM Geophysics as provided by Jason Thomason with the Illinois State Geological Survey

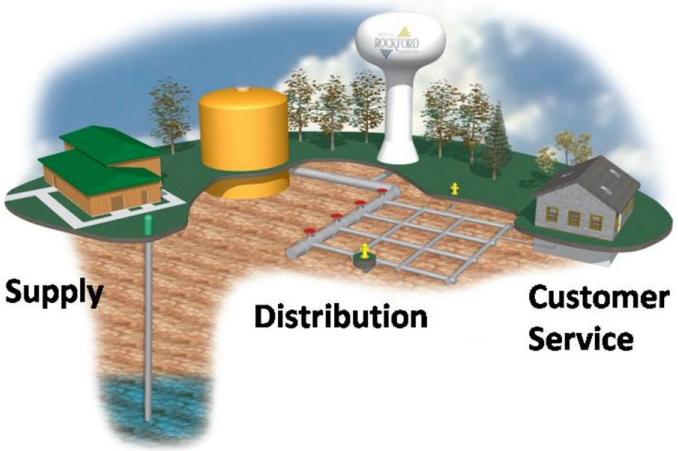
Boone County is currently planning a geologic mapping project to better understand how our geology interacts with our water supply, such as where sensitive recharge areas are located.

Using electromagnetic signals, recharge areas will be estimated by looking at the location of shallow sandstone aquifers, where the underlying ground is porous. This will give a much clearer understanding of our local geology to inform protection and improvement measures.

Our Drinking Water

Our regional water systems consistently meet federal and state safety standards.

Municipal water providers test for over 80 different contaminants throughout the year and detected levels remain well below regulatory limits.



That doesn't mean our water is 100% free of contaminants, just that they are present at levels below EPA regulatory limits.

We rely heavily on regular testing and current regulations that protect drinking water sources from excessive contamination.

Continued investments in research, treatment, and monitoring are pivotal to keeping our drinking water as clean as it should be.

Transparent Overviewing through annual Consumer Confidence Overviews keep the public informed.

Image Source: City of Rockford

Drinking Water and Environmental Injustice

Environmental Injustice is the unfair distribution of environmental burdens that disproportionately harm marginalized communities, such as low-income neighborhoods and communities of color.

Research shows that violations of drinking water standards occur more frequently in lower income communities.

Communities that have experienced water contamination incidents or general government neglect have developed understandable skepticism toward public water systems.

Accordingly, lower income populations consume bottled water at higher rates than the rest of the population, even if local water quality is safe.

The map displays areas in the region that disproportionately experience environmental burdens present in our community.

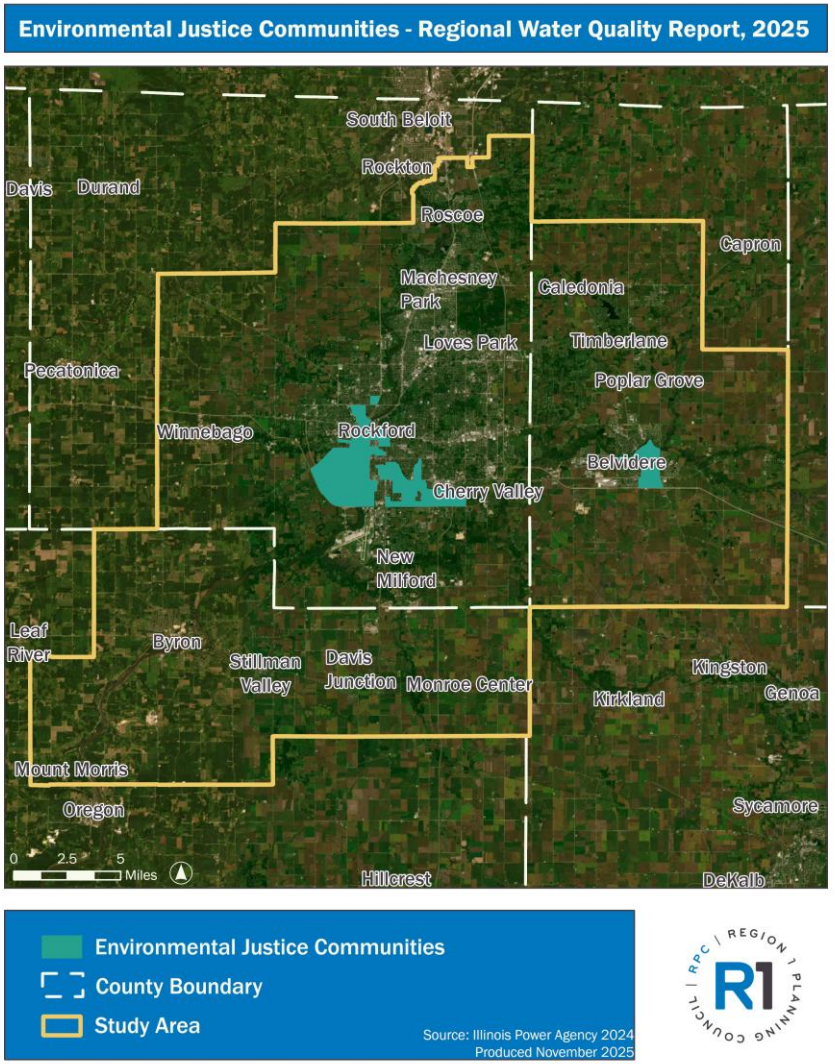


Figure 24. Environmental Justice Communities



Drinking Water Choices

Tap Water

- Regulated by the EPA requiring comprehensive testing and public Overviewing
- Can contain detectable levels of various contaminants, mostly below health standard limits
- Not all tap water is the same - stay informed on yours through public Overviews and home testing

Typically costs less than $0.01/ gallon and consistently meets all regulatory standards

Bottled Water

- Regulated by the Food & Drug Administration and state administrations
- Can contain many of the same substances found in tap water
- Up to ⅔ of U.S. sold bottled water is repackaged tap water with additional filtration
- Presents unique concerns including potential bacterial contamination during storage and higher microplastic concentrations and chemical leaching from plastic packaging
- Testing in independent studies indicates that bottled water generally has lower levels of contaminants than tap water

Costs range from $1-$10/ gallon

Home Filtration

- Further reduce specific contaminants in tap water
- Contaminant reduction comparable to bottled water
- Avoids the unique risks associated with plastic
- Cost can be more or less than bottled water depending on filtration system and bottle brand

Abraham et al., 2024; Bear et al., 2024; Gambino, 2022

Image Source: Public Domain

Looking Forward

Water quality management is an ongoing process...

As scientific understanding advances and new substances enter the environment, monitoring and treatment must evolve with them.

Our region benefits from well maintained groundwater resources and generally favorable geology.

The main challenges ahead involve managing treatment costs and upgrading infrastructure to address emerging contaminants like PFAS while maintaining affordable water for all residents.

Our shared goal is ensuring every resident has access to safe, reliable, and affordable drinking water; clean and plentiful ground water supplies; as well as clean, beautiful streams and rivers for enjoying our wonderful landscape.

Local water agencies remain committed to delivering on this goal through effective monitoring and treatment, transparent communication about water quality, and continued investment in the infrastructure that serves our communities.

Image Source: Public Domain

Recommendations

We have a clearer picture of what the water in our region looks like. What now?

Information can be overwhelming– especially when it involves the health of our bodies, our communities, and our environment, but taking the steps to improve and maintain clean waterways doesn't have to be overwhelming.

Even the smallest actions can make a significant impact.

The Rock River Watershed Group provides 10 recommendations on how we can protect our watershed.

Image Source: Self-Sourced

10 ways we can protect our watershed

Action	Why It Matters	Tip
1. Collect Rainwater	Capturing rain from your roof instead of sending it rushing into storm drains, reduces polluted runoff and provides free water for your garden.	Choose a rain barrel sized for your roof area, place it conveniently, and direct overflow into a lawn or garden—not a storm drain.
2. Minimize Use of Fertilizers	Excess fertilizer washes off into waterways, fueling algae growth and harming aquatic life.	Test your soil before fertilizing; use slow-release or organic types and sweep granules off hard surfaces.
3. Use Commercial Car Washes	Soap, oil, and grime from driveway washing flow into storm drains. Commercial car washes treat or reuse their water.	If washing at home, use biodegradable soap and wash on grass or gravel.
4. Scoop the Poop	Pet waste left on lawns or sidewalks is washed into waterways, adding bacteria and nutrients.	Carry waste bags, set up a “pet waste station,” and encourage neighbors to do the same.
5. Properly Dispose of Hazardous Waste	Storm drains often lead straight to rivers, so dumped chemicals directly pollute water.	Check with your local hazardous waste program for drop-off sites; keep a small spill kit in your garage.

Source: The Rock River Watershed Group

Table 2. 10 Ways We Can Protect Our Watersheds

Image Source: Public Domain

10 ways we can protect our watershed

Action	Why It Matters	Tip
6. Plant a Stream or River Buffer	Native vegetation filters runoff, stabilizes soil, and shades water, improving habitat and water quality.	Use native Illinois plants; stop mowing at least 15 feet near the water's edge; leave natural debris to protect soil.
7. Be Water Conscious	Saving water reduces stress on treatment systems, conserves aquifers, and minimizes runoff from over-watering.	Fix leaks, install low-flow fixtures, and water lawns only when needed (early morning).
8. Participate in Local Cleanup	Picking up litter prevents it from clogging drains and polluting waterways.	Join local cleanups (e.g., Rock River Watershed Group); bring gloves, bags, and water.
9. Use Porous (Permeable) Surfaces	Hard surfaces increase runoff and erosion; permeable materials let rain soak into the ground.	Choose pavers, gravel, or permeable concrete; direct downspouts to lawns or gardens.
10. Use Alternate Forms of Transportation	Reduces oil, brake dust, and exhaust pollutants that wash into waterways.	Try one "car-free" day per week or carpool with neighbors.

Source: The Rock River Watershed Group

Table 2. 10 Ways We Can Protect Our Watersheds

Image Source: Public Domain

Farming Recommendations

In the Rockford region, our rural lands mean a lot to us— so what can (and are) farmers doing to support our soils and waterways?

Due to a flatter landscape, Illinois soils and Midwest agriculture face challenges of high rainfall events with more intense storms and increasing impervious cover near farms (urbanizing fringes), so practices that slow and absorb runoff matter more than ever.

Sediment, phosphorus, nitrogen and other pollutants from agriculture and runoff degrade streams, lakes and affect rare aquatic species that require high-water-quality (for example cold-water fish, aquatic insects); reducing agricultural and stormwater pollutants helps protect those species.

Soil health is directly tied to water quality; healthy soils hold more water and nutrients rather than letting them run off.

In Illinois, the regenerative agriculture movement emphasizes this link.

Image Source: Public Domain

Soil Health	**Cover Crops & Continuous Living Cover**	Keeps soil protected year-round, reduces erosion and runoff, builds organic matter, retains nutrients.
	Reduced / No-Till (Minimal Disturbance)	Preserves soil structure, boosts infiltration, reduces erosion and nutrient loss.
	Diverse Crop Rotations	Breaks pest/weed cycles, enhances soil biology, improves resilience and nutrient efficiency.
Nutrient Management	**Right Source, Rate, Time, Place**	Ensures nutrients used efficiently—minimizes runoff and water pollution.
	Livestock Integration / Grazing Cover Crops	Recycles nutrients, builds soil carbon, reduces external fertilizer needs.
	Manure & Organic Waste Management	Digesters and proper timing prevent nutrient leakage; keeps phosphorus out of waterways.
Water Protection	**Riparian & Field Buffers**	Filters runoff, traps sediment, stabilizes streambanks, improves water quality.
	Terraces & Contour Farming	Slows water flow on slopes, reduces erosion and sediment-bound phosphorus.
	Wetland & Floodplain Restoration	Acts as natural nutrient/sediment sinks; buffers floods and protects ecosystems.
Stormwater & Landscape Practices	**Infiltration Practices / Green Infrastructure**	Rain gardens, bioretention, and swales enhance infiltration and reduce runoff.
	Edge-of-Field Monitoring & Runoff Control	Tracks nutrient losses and supports adaptive management.
	Urban Coordination / Infiltration Ponds	Treats stormwater before it reaches farmland streams; supports regional water quality.

Here are some of the sustainable farming practices local and national farmers are utilizing to support soil health.

Table 3. Sustainable Farming Practices
Dane County Planning & Development, 2022; Image Source: Public Domain

Together, We Shape Our Water Future

Water connects us across neighborhoods, counties, and generations.

Just as water knows no boundaries, neither should our efforts to protect it.

With shared knowledge and unified action, Region 1 has sought to instill confidence within consumers, businesses, stakeholders, and communities when it comes to our water by providing information needed for decision-making.

Our region's waterways are resilient, and so are we.

Together, we can leave behind not just a cleaner watershed, but a legacy of stewardship that future generations can depend on.

Image Source: Public Domain

Want more information?

Residents, businesses, stakeholders, and other interested parties can find links and helpful resources to various topics on the following slides.

Resources include recommended water quality material, consumer confidence Overviews, and city/village specific water department contacts.

A QR code to our more detailed technical Overview can be found to the right.

Image Source: Public Domain

Illinois EPA Water Quality Resources

The IEPA website is full of in-depth information about water quality topics.

Drinking Water

Surface Water

Ground Water Quality Protection

Private Well Users

Microplastics

PFAS

Harmful Algal Blooms

Water Quality Standards

Impaired Waters/303d List

Lead Service Line Information

Request Your Local Consumer Confidence Overview

[City of Belvidere]

[Village of Durand]

[Village of Poplar Grove]

[City of Rockford]

[Village of Winnebago]

Groundwater Resources/Recommended Reading:

1. Rock River Region: Water Supply Planning

2. Changing Groundwater Levels in the Sandstone Aquifers of Northern Illinois and Southern Wisconsin: Impacts on Available Water Supply

3. Water Supply Planning: Assessment of Water Resources for Water Supply in the Rock River Region

4. Winnebago County Small Community Water Security Assessment Overview

5. Unequal Trust: Bottled Water Consumption, Distrust in Tap Water, and Racial Inequality in the United States

Contact your municipal water department with specific questions:

Boone County

For private wells: The Boone County Health Department manages potable water and well services, including permits and inspections.

https://www.boonecountyil.gov/government/departments/health_department/potable_water_wells.php

For other water resources: The Boone County Planning Department has a water resources section on its website.

https://www.boonecountyil.gov/government/departments/planning_department/water_resources.php

Municipal water departments/public water supply contacts:

Belvidere, Illinois (City) – Public Works Department / Water & Sewer
https://www.belvidereil.gov/public-works/

Poplar Grove, Illinois (Village) – Water Quality Information https://www.poplargrove-il.gov/water-sewer

Cherry Valley, Illinois (Village) – Water Quality Information
https://www.cherryvalley.org/public_works_water/index.php

Municipal Water Department Contacts

Winnebago County

***For private wells*:** The Winnebago County Soil & Water District provides information on soil and water-related resources.

The Winnebago County Health Department – "Wells & Septic Program" page gives details on private wells and septic systems in the county.

For wastewater treatment: The Four Rivers Sanitation Authority handles wastewater treatment for certain areas of the county.

Municipal water department/public water supply contacts: The Village of Winnebago Water Department and City of Rockford Water Division manage their own municipal water services.

Rockford, Illinois (City) – Water Division
Contact: 425 E State Street, Rockford, IL 61104
Phone: 779-348-7300

Village of Winnebago, Illinois – Utilities / Public Works
Phone: 815-335-2020
After hours water/utility emergencies: (815) 985-8311 or (815) 985-8635

Municipal Water Department Contacts

Ogle County

***For private wells*:** The Ogle County Health Department provides services for safe well water supplies and groundwater protection, including permits for new wells.

For city water services: Contact your specific city's water department, such as the Village of Byron, which is served by a public water supply.

Village of Byron *City of Rochelle* *City of Oregon* *City of Polo*

Consider home water testing if you want information specific to your household plumbing:

Rockford Environmental Laboratory

Sample Collection Form

Winnebago County Private Water Testing

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