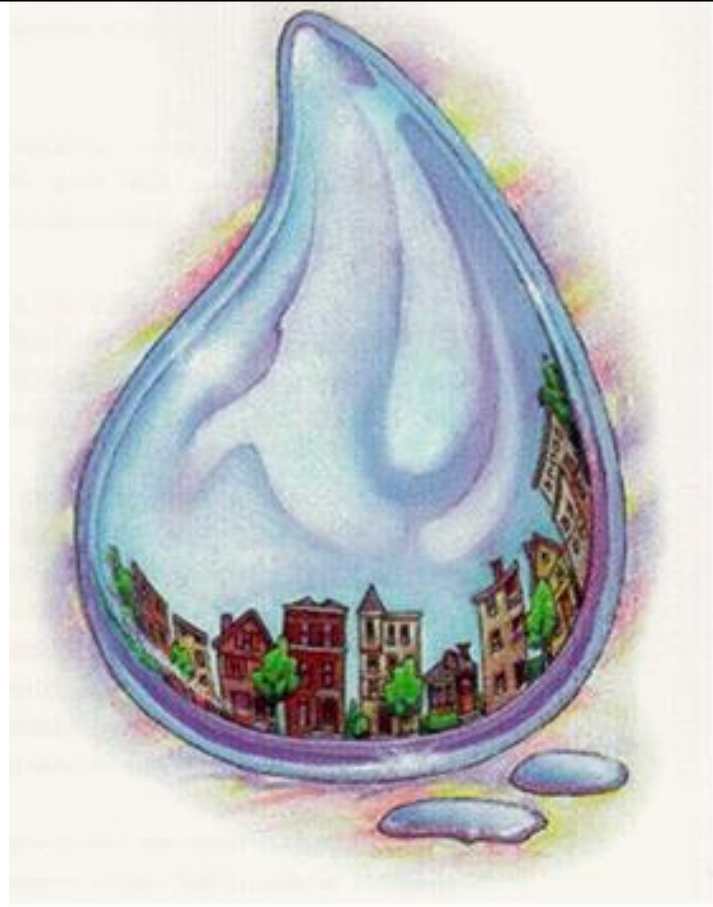


# Community Water Fluoridation: A Plan for Missouri



Office of Dental Health, Department of  
Health & Senior Services

1/3/2024

## Contents

<b>Introduction</b> .....	2
<b>What is Community Water Fluoridation?</b> .....	3
<b>Historical Timeline</b> .....	4
<b>The Role of Fluoride and Water Fluoridation</b> .....	6
<b>Capacity to Meet Healthy People 2030 Objectives</b> .....	8
<b>Missouri Fluoridation Overview</b> .....	9
<b>Laws &amp; Regulations</b> .....	11
<b>Program Management</b> .....	12
<b>Quality Control</b> .....	16
<b>Education and Training</b> .....	17
<b>Goals – Objectives – Action Plan</b> .....	20
<b>Conclusion/Closing</b> .....	23
<b>References</b> .....	24
<b>Frequently Used Abbreviations and Terms</b> .....	25
<b>Appendices</b> .....	26
<b>Missouri’s Fluoridation Statistics 2022</b> .....	27
<b>Missouri’s Optimal Fluoridation Statistics 2022</b> .....	28
<b>Healthy People 2030 Oral Health Conditions</b> .....	29
<b>Missouri’s Fluoridated Communities Map 2023</b> .....	33
<b>Missouri’s Naturally Fluoridated Communities 2023</b> .....	34
<b>Missouri’s Consecutive Fluoridated Communities Systems Map 2023</b> .....	35

## Introduction

Oral health is an important component of ensuring good overall health. In Missouri, as in most of the United States, tooth decay (cavities) remains the most prevalent chronic disease in both children and adults, even though it is largely preventable.

Poor oral health affects not only the ability to eat and speak, but are also interconnected with serious health issues like diabetes, heart disease, stroke, osteoporosis, and pre-term births. This impacts a person's life physically by negatively impacting other chronic health conditions and mentally by diminishing a person's self-esteem or hindering the ability to obtain employment. Additionally, there are known health disparities in our communities, based on race, socio-economics status, age, geography and access to care. These disparities put specific communities of people at higher risk for tooth decay (cavities).

Missouri's Fluoridation Plan serves two purposes, (1) to educate Missourians about the benefits of community water fluoridation (CWF) and Missouri's CWF statistics and (2) to act as a guideline to promote and advance optimal fluoridation in the state to provide an equitable public health program that will ultimately improve oral health and overall health for all Missourians.

## What is Community Water Fluoridation?

Fluoride is a mineral that exists naturally in rivers, lakes, streams, oceans and groundwater. The natural level of fluoride varies based on geographic location and the make-up of the surrounding topography. Usually, the natural fluoride level does not reach the recommended optimal level needed to help reduce and prevent tooth decay (cavities).

Community water fluoridation (CWF) is the controlled adjustment of the natural fluoride concentration in community water supplies to the concentration recommended (0.7 mg/L) for preventing tooth decay (cavities). CWF is the single most effective and efficient public health intervention to help reduce and prevent tooth decay (cavities) in children and adults. Because of this, CWF has been recognized by the Centers for Disease Control and Prevention (CDC) as one of “10 great public health achievements” of the 20<sup>th</sup> century.

Additionally, the “halo” effect of fluoridated water proves to be an additional effective and efficient public health intervention irrespective of geography, race, age, education level or socioeconomic status. The diffusion of fluoride assists in reducing the prevalence of tooth decay (cavities) in both fluoridated and non-fluoridated communities. This is accomplished through beverages and food that are processed in fluoridated areas but consumed in non-fluoridated areas. These items provide the benefits of fluoridated water to non-fluoridated communities lessening the effects of tooth decay (cavities) among communities, therefore assisting with the reduction of oral health disparities.

CWF began in Grand Rapids, Michigan in 1945 and since the discovery of the benefits of fluoride in 1901 by Dr. Frederick S. McKay (U.S.), there have been overwhelming scientific studies, evidence and data to support the effectiveness and safety of this continued public health intervention. In Missouri the first system to implement CWF was St Louis in 1953 and it still continues to fluoridate today.

## Historical Timeline

The implementation of CWF is an example of a community-based public health intervention. In 1901, dentists in the United States and Italy separately observed lower rates of dental decay (cavities) in populations with distinctly stained teeth. Dr. Frederick S. McKay moved to Colorado Springs, Colorado to begin his practice in 1901. He noted that many residents had what locals called “Colorado brown stain” and devoted his career to investigating the phenomenon he labeled “mottled enamel”.

Dr. McKay enlisted the assistance of Dr. G.V. Black, the Dean of Northwestern University Dental School, to study and uncover the cause of the mottling. They realized it had to be an agent in the water and began their search for the answer, which led them to other areas of the country affected by “mottled enamel”. In 1931, Dr. McKay confirmed their hypothesis through laboratory chemical analysis of the water from several water systems. This testing showed a high concentration of fluoride in the public water systems, up to 14 milligrams per liter (mg/L), otherwise known as parts per million (ppm), as a logical cause of the stain.

During this timeframe, there were other changes occurring in the realm of public health. In 1912, the former Marine Hospital Service was renamed to the US Public Health Service (USPHS) and continued to be responsible for improving the health of the general population. In 1914, US drinking water standards were enacted and many state regulators adopted them as well. In 1930, the National Health Institute was formed and in 1931, the first dentist, Dr. H.T. Dean began to expand observations regarding the inverse relationship between fluoride and tooth decay (cavities). During the 1930s and 1940s experiments and studies were completed in twenty-one (21) cities and confirmed that populations receiving fluoridated water experienced lower tooth decay (cavity) rates than populations in cities without fluoridated water.

Continued studies showed the optimal level of fluoride needed in drinking water to reduce tooth decay (cavities) with no detrimental effects to teeth was 1.0 to 1.2 mg/L. Subsequently in 1962, the USPHS set the fluoride level optimal range of 0.7 – 1.2 mg/L depending on the ambient temperature of a community. This range was based on the premise that people in hotter climates drink more water.

In January 2011, the U.S. Department of Health and Human Services (HHS) and the U.S. Environmental Protection Agency (EPA) announced important steps to ensure the standards and guidelines on fluoride in drinking water continue to provide the maximum protection to the American people to support good oral health. Based on this, a review was completed and in 2015, HHS proposed a new recommendation of 0.7 mg/L of fluoride in water. This recommendation was accepted and set the optimal level of fluoride in water at 0.7 mg/L which replaced the prior recommended range.

Fluoridated water systems strive to meet the recommended fluoridation level of 0.7 parts per million (ppm) for their customers. They test the water daily to ensure the fluoride is at the proper level.

## The Role of Fluoride and Water Fluoridation.

Tooth enamel is the material on the outside of your teeth, right on top of the softer layer called dentin. Tooth enamel is made up of small segments called enamel rods. Enamel is similar to the skin on your body. Just as the skin on your body helps protect your internal organs, enamel helps protect the interior part of your teeth from tooth decay (cavities).

Enamel rods are tiny keyhole or fish-shaped prisms that make up the enamel. Because of their shape, enamel rods are able to be packed together tightly without any gaps. This is to help keep the enamel from splitting and ensures the surface of the tooth is smooth. Because of this tooth enamel is the hardest substance in a person's body. Even though the tooth enamel is hard, it can still be broken down or wear down both over time and with continued acid attacks from food and drinks that individuals consume. Enamel and enamel rods are not living tissue like bones and skin cells. A person only receives one set of permanent teeth, which erupt after all primary (baby) teeth have been lost in a lifetime, as new enamel cannot be formed. So it is important to try to protect both the primary and permanent teeth as much as possible.

There are several ways to do this:

- Visit the dentist twice a year for regular cleanings.
- Floss daily and brush with fluoridated toothpaste twice a day.
- Eat a healthy diet and avoid acidic foods, sugary drinks, and things like eating ice.
- Wear mouth protection while playing sports.
- And finally, drink fluoridated water!

Fluoride helps prevent tooth decay by slowing down the breakdown of enamel and speeding up the re-mineralization process. Fluoride enters the enamel rods in the teeth to treat broken-down enamel by re-mineralizing it. The new re-mineralized enamel rods that form are harder, larger, and more resistant to acid. Fluoride increases the rate of re-mineralization and protects against demineralization. Community water fluoridation provides the right amount of fluoride in the drinking water, which gives a person 25% more prevention against tooth decay (cavities) than what they are already receiving from fluoridated toothpaste and mouth rinses.

Community water fluoridation provides this benefit to everyone equally in two ways, topically and systemically. When there is fluoride in drinking water, fluoride is absorbed through the body's natural processes to produce a preventive effect in three main ways:

- Topically which means the tooth absorbs the fluoride from the outside of the tooth first through continual bathing of the tooth's enamel in fluoridated water.
  - Fluoride from the water is first absorbed by the biofilm in the mouth which has bacteria that causes tooth decay (cavities).

- Fluoride is incorporated into the plaque on the teeth and creates a fluoride reservoir between the plaque and the tooth.
- Fluoridated water helps reduce the amount of acid produced by the decay-causing bacteria and thus reduces decay.
- The weakened enamel rods more readily absorb fluoride where decay has started and promotes the repair of tooth enamel in areas with early stages of tooth decay (cavities).
- Systemically which means fluoride is first absorbed into the digested system and then is dispersed to the inside of the tooth by drinking fluoridated water or eating foods prepared with fluoridated water.
  - For children age eight (8) and younger; fluoride from the water is absorbed through ingestion and deposited in teeth and bones to make both stronger.
  - As the fluoride is absorbed, it makes the primary and permanent teeth forming under the gum stronger and less susceptible to decay by chemically strengthening the enamel rods and making the enamel denser.
- A combination of systemically and topically.
  - For all ages; fluoride is absorbed systemically, then released into the saliva.
  - The saliva, which is continually produced in the mouth, will provide a topical re-application of fluoride, which continually bathes the teeth.
  - This helps strengthen the enamel of the tooth, helps neutralize acid in the mouth, and provides benefits for those who suffer from xerostomia (dry mouth) or have orthodontics (braces), crowns, bridges, or partial dentures.

Fluoridated water offers another method of prevention to help fight tooth decay. The use of fluoridated toothpaste, mouth rinses, or fluoride varnish applied by a dental professional does not replace the need for drinking fluoridated water. Consider seat belts and air bags in cars; both are considered necessary to help prevent injury or even death from a car accident. The same is true for the use of fluoridated water and other fluoridated products such as fluoride toothpaste, mouth rinses, and fluoride varnish applied in a dental facility. One does not replace the other in the fight to prevent tooth decay (cavities).



## Capacity to Meet Healthy People 2030 Objectives

The *Healthy People* initiative is designed to guide national health promotion and disease prevention efforts to improve the health of the nation. Released by the U.S. Department of Health and Human Services (HHS) every decade since 1980, *Healthy People* identifies science-based objectives with targets to monitor progress and motivate focused action. *Healthy People 2030* is the fifth iteration of the initiative and continues in this tradition with nearly 350 core objectives to be tracked over this decade.

*Healthy People 2030* recognizes the importance of oral health to overall health and has set an oral health objective to reduce tooth decay (cavities), specifically untreated tooth decay (cavities) for children and adults across their lifetime. This is accomplished by providing a more equitable oral health landscape by increasing access to care and preventive services. *Healthy People 2030* also recognizes that one of the most important public health measures that assists in the reduction of tooth decay (cavities), is community water fluoridation.

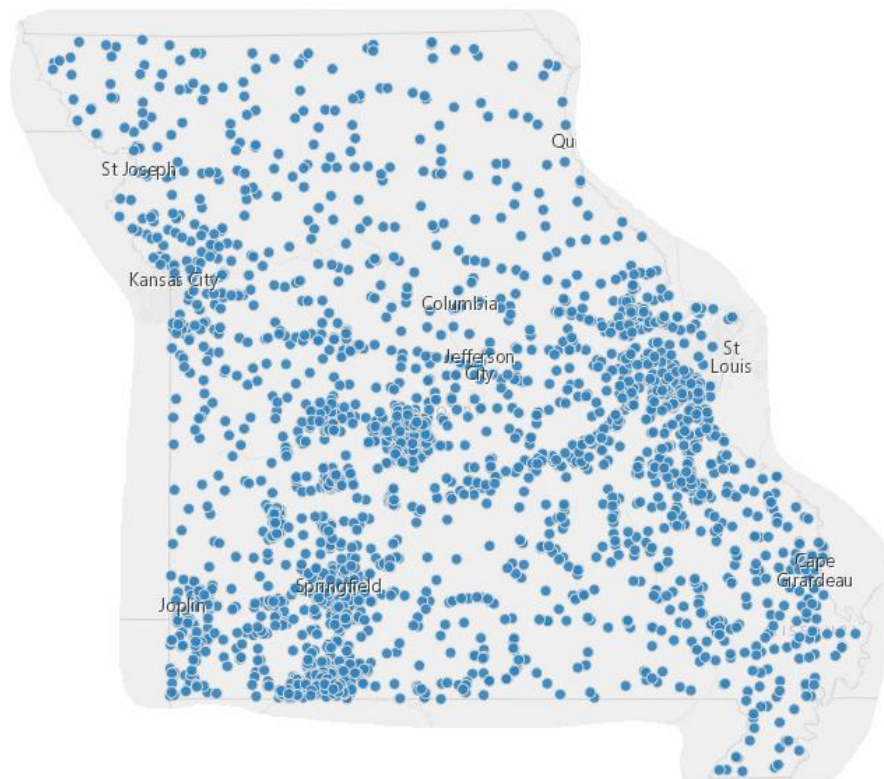
### **1. Healthy People 2030 objective (OH-11):**

- Increase the proportion of persons served by community water systems with optimally fluoridated water systems with a target of 77.1 percent.
- The most recent data (2016) shows a baseline of 72.8 percent of persons served by community water systems with optimally fluoridated water.

## Missouri Fluoridation Overview

Missouri has over 2,700 regulated public water systems (PWS) that serve just over 5.2 million people. Approximately 1,428 are community water systems (CWS), which are defined as systems that serve at least 15 service connections and is operated on a year-round basis or regularly serves at least 25 residents on a year-round basis.

Missouri's community water systems receive most of their drinking water via one of two methods: groundwater sources (aquifers) accessed through wells or surface water sources (lakes, rivers and reservoirs). Approximately 74 percent or 1,047 of Missouri's primary CWS' are groundwater source systems.



The Safe Drinking Water Information System (SDWIS) is maintained by the Missouri Department of Natural Resources – Drinking Water Section (DNR). This data is used to populate the Water Fluoridation Reporting System (WFRS) maintained by the CDC. Currently WFRS shows Missouri has 97 primary systems (produce drinking water for their community and sell water to other communities) which have a CWF program, 130 primary water systems have natural fluoride levels at 0.7 mg/L or higher and 163 consecutive systems (those that purchase water from a CWF or naturally fluoridated system) receive fluoridated water to their communities (2023). These 390 community water systems provide fluoridated water to just over 76 percent or approximately 4 million people in Missouri. However only 65 percent, just over 3.4 million people, have access to optimally fluoridated water, which means the fluoride level is within the

recommended operating range of 0.6-1.0 ppm. This statistic ranks Missouri 30<sup>th</sup> in the U.S. for fluoridation.

Adjusted systems at 0.7 mg/L (ppm)	
Number of water systems reporting*	136
Number of people served by these water systems*	2,953,482
Recommendation: No action needed	
Natural systems at 0.7 mg/L (ppm)	
Number of water systems reporting*	120
Number of people served by these water systems*	300,078
Recommendation: No action needed	
Adjusted systems less than 0.6 mg/L (ppm)	
Number of water systems reporting*	125
Number of people served by these water systems*	767,634
Recommendation: Increase amount of naturally occurring fluoride to <u>adjusted</u> , optimal levels	
Non-adjusted systems less than 0.6 mg/L (ppm)	
Number of systems reporting*	1,065
Number of people served by these water systems*	1,255,075
Recommendation: Increase amount of naturally occurring fluoride to optimal levels	
Natural systems greater or equal to 2.0 mg/L (ppm)	
Number of water systems reporting*	12
Number of people served by these water systems*	23,765
Recommendation: Decrease amount of naturally occurring fluoride to optimal levels	

\*This data was extracted from the Water Fluoridation Reporting System (WFRS) on 6/14/2023 for the CY 2022.

\*\*Data is available on the fluoride levels of individual, privately owned wells.

## Laws & Regulations

Missouri does not have a state law or mandate guaranteeing its residents access to optimally fluoridated water, which would help prevent tooth decay (cavities). Instead, Missouri allows local municipalities to determine their community water fluoridation status.

### Federal

- The Safe Drinking Water Act (SDWA), enacted in 1974, was originally passed by Congress to protect public health by regulating the nation's public drinking water supply. After amending the law twice (1986, 1996), more requirements were put in place to protect drinking water and its sources – rivers, lakes, reservoirs, springs and ground water. Additionally, the SDWA authorizes the Environmental Protection Agency (EPA) to set national health-based standards for drinking water to protect against both naturally-occurring and man-made contaminants that may be found in drinking water and these rules apply to every public water system in the United States.

### State

- The Missouri Department of Natural Resources (DNR) was created on July 1, 1974 under the Omnibus State Reorganization Act of 1974 and the Missouri Revised Statutes, section 640.010, RSMo. The Missouri Clean Water Law (Chapter 640, RSMo and Chapter 644, RSMo) was enacted in 1973 and revised in 1996. This law ensures the state's water quality meets federal standards.
- In 1992 the Safe Drinking Water Commission was established to administer the Missouri Safe Drinking Water law. The Environmental Quality Division, Water Protection Program advances the goal of safe drinking water in various ways, including but not limited to inspections of water treatment and wastewater treatment plants, testing and monitoring for contaminants and issuance of permits for construction and operation of public drinking water systems.
- Missouri has a fluoridation notification statute (RSMo 640.136) that went into effect in August 2016. This statute requires any public water system or public water supply district which intends to make modifications to fluoridation of its water supply to notify DNR, the Missouri Department of Health & Senior Services (DHSS) Office of Dental Health and their customers at least 90 days prior to any vote on the matter.

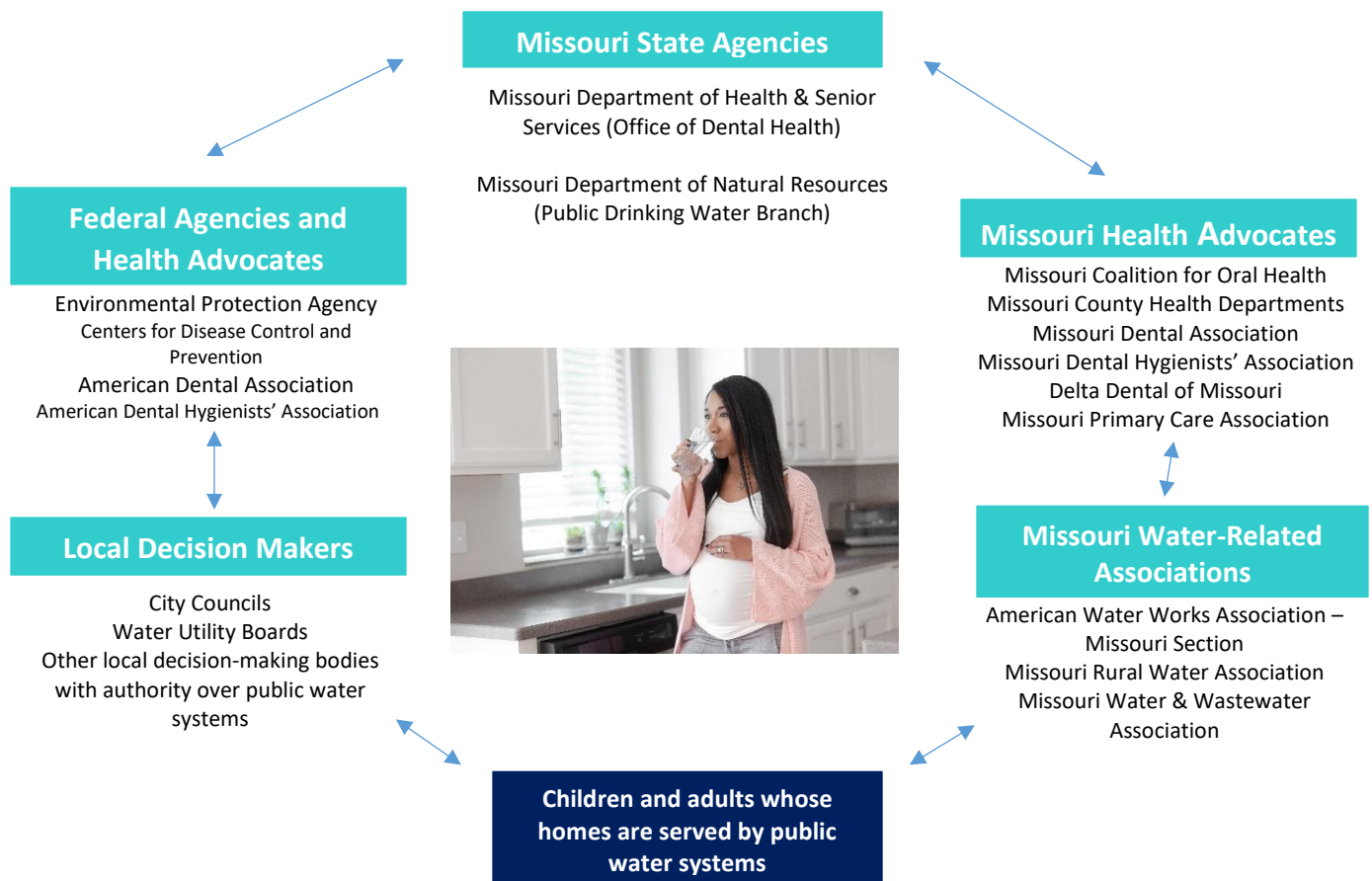
### Local

- Local municipalities, including water boards, city councils and other governing entities set the rule for fluoridation at the local level. Some municipalities have included it in their city charters and statutes. All local decisions are presented before the local decision-making body.

# Program Management

## A. Strong Partnerships

In 2020, the [Missouri Oral Health Plan 2020-2025](#) was released, emphasizing the guiding principles of “responsibility, collaboration, inclusiveness, flexibility, and accountability” to promote and increase better oral health for all Missourians. By forging strong partnerships the oral health goals for Missourians are able to be met through a shared vision that fosters improvement and achievement. Together, partners can continue existing efforts, expand new opportunities, and engage community-driven grassroots efforts to promote CWF. The following diagram explains the entities and roles that significant partners play in ensuring access to CWF.



### Missouri State Agencies

#### Missouri Department of Health & Senior Services (Office of Dental Health)

- Collects, analyzes, and disseminates oral health data to stakeholders, policy, and decision-makers, showing the prevalence and impact of dental disease.
- Promotes oral health through facilitated partnerships, educational materials, and outreach activities.

- Works with local, state, and national partners to educate and engage people living in Missouri, raising awareness of CWF and other forms of preventive oral health measures.
- Works with the CDC to update the WFRS database using data from the local water systems monthly operating reports and DNR's quarterly fluoride testing results.

#### **Missouri Department of Natural Resources (Drinking Water Section)**

- Requires community and non-community, non-transient systems to have a certified water operator.
- Enforces the DNR rules that set the maximum contaminant level (MCL) of 4.0 mg/L and a secondary maximum contaminant level (SCML) of 2.0 mg/L and enforces facility and design standards of fluoridation for facilities adding fluoride.
- Grants approval of water systems, including compliance activities, regular surveys of water systems, and enforcement activities.
- Oversees reporting requirements and other rules that apply if or when a local water system violates drinking water standards.
- Maintains the State Drinking Water Information System (SDWIS) for Missouri, which is a database that contains information on all Missouri permitted public water systems.

#### **Federal Agencies**

##### **U.S. Environmental Protection Agency (EPA)**

- Oversees the federal Safe Drinking Water Act.
- Sets limits on fluoride and other compounds in drinking water.

##### **U.S. Centers for Disease Control and Prevention (CDC)**

- Sets the scientifically recommended level for optimal fluoridation of drinking water.
- Provides support and guidance, but no regulation, to states for the addition of fluoride to drinking water for oral health benefits.
- Conducts biennial state-by-state surveillance programs on populations with access to fluoridated water.

#### **Local Decision-Makers**

##### **City councils, Board of Aldermen, local water boards, entities that own their water systems**

- When appropriate, oversee administrators who manage applicable water systems.
- Keep apprised of state and federal rules that apply to local water systems.
- Provide capital budgeting support to properly maintain water treatment (plant) equipment and provides effective public health protection.
- Support resource and development needs for water management staff.

#### **Missouri Water-Related Associations**

**Missouri Section of American Water Works Association, Missouri Rural Water Association, Missouri Water and Wastewater Association**

- Serve as a broker of information and updates about fluoride additives and monitoring of fluoride levels.
- Sponsor and/or promotes training sessions that strengthen water operators' ability to effectively manage CWF specifically and water systems generally.
- Offer a collegial environment through which water operators and engineers can share information and insights that help strengthen the management of water systems.

**Missouri Health Advocates**

**Local public health departments**

- Educate local decision-makers and community members by answering questions and sharing reports, data, educational materials, fact sheets, etc.

**Health Organizations**

- Urge communities to start and continue engaging in CWF, including direct communications with local decision-makers.

**Missouri Coalition for Oral Health (MCOH)**

- Seek to improve oral health for Missourians by uniting stakeholders to advance advocacy, policy, education, and innovative approaches.
- Is comprised of representation from oral health professions, colleges, universities, funding organizations, managed care, professional associations, and state government agencies.
- Is a supporter of community water fluoridation and other proven preventive oral health measures and other health strategies.

**Missouri Dental Association (MDA)**

- MDA is a non-profit, professional organization with more than 2,000 members statewide, representing all areas of dentistry.
- MDA is a state constituent of a tripartite association where members belong to the American Dental Association (ADA) and its [local component societies](#).
- Organized in 1865, the MDA is a unified organization of individual members committed to the highest quality of care for the public and a resource for advocacy, education, communication, information, and fellowship.

**Missouri Dental Hygienists' Association (MDHA)**

- MDHA is a membership organization that seeks to promote the highest standards of dental hygiene education, licensure, practice, and research while representing and promoting the interests of dental hygienists.
- MDHA is affiliated with the American Dental Hygienists' Association (ADHA).

**Local residents**

- Begin the grassroots efforts to initiate or continue a local water fluoridation program.
- Communicate with local decision-makers.
- Act as the liaison between the state and local health departments, other stakeholders and the decision-making body for the local community.

## **B. Community Engagement**

State level agencies and organizations can serve as important resources for a community, however, the key to successful community engagement is diverse partnerships that are at local and state levels. Like-minded individuals should work together to develop strategies that promote the effectiveness and safety of CWF to different audiences. It is essential to involve multiple types of individuals including dental and medical professionals, state and community partners. These individuals will form the community champions' workgroup that will be able to identify the needs of individual communities and prioritize the best strategies to meet those needs.

Here are a few examples of where community champions can be found:

- School nurses
- School principals
- Children's advocates
- Local public health departments
- Community leaders
- Local decision-makers
- Faith community leaders
- Youth leaders
- School-age and young adult leaders

## **C. Effective Communication**

When highlighting the benefits of optimal water fluoridation, it is crucial to understand that different audiences have different informational needs.

- Community members need to understand that CWF is effective and safe.
- Decision-makers need to understand that CWF benefits the entire community and provides a positive return on investment.
- Water treatment professionals need to understand the importance and effectiveness and safety of CWF so they can explain it to others.

CWF promotion should use effective, evidence-based communication strategies to share information to strengthen their community's health.



## Quality Control

### **Oversight Roles**

Each state that receives Centers for Disease Control and Prevention (CDC) funding to promote CWF has a person who is designated as the coordinator managing the state's fluoridation program and serves as a liaison with other states and federal agencies. For Missouri, this staff person is based within the ODH. The Water Fluoridation Coordinator receives assistance from the DHSS Professional Engineer and the Missouri Coalition for Oral Health (MCOH).

Staff within the DNR Drinking Water Branch and the ODH each have roles to monitor and/or promote CWF, as well as to communicate all aspects of water fluoridation in Missouri with each other. The goals, objectives, and action steps (See Section 12) include an action item designed to strengthen this collaboration.

### **CWF Facility Designs**

Proposals to install new CWF programs are required to be developed and evaluated in conjunction with the existing DNR water supply permitting process. A permittee must complete a system-specific construction permit, a system-specific operating permit, and obtain a professional engineer's report outlining said construction and operation guidelines. The chemical-feed facilities need to be designed, constructed, and approved in accordance with applicable DNR design standards. Chemical safety handling measures and personal protective equipment are associated with operational requirements.

One of the following fluoride additives, with proper certification, may be utilized for CWF: sodium fluoride, sodium fluorosilicate, or fluorosilicic acid.

### **Monitoring and Reporting**

Public water systems that engage in CWF are required to check their fluoride level daily, although some systems could take multiple readings each day via in-line, continuous analyzers, meaning the system can record its fluoride range and average its fluoride level. The monitoring requirements for the systems are in the DNR Safe Drinking Water regulations. Additionally, each public water system is required to conduct routine fluoride monitoring at each entry point to the distribution system and perform quarterly certified state lab tests to ensure fluoride levels remain below the SMCL.

DNR utilizes the data and provides an annual [Consumer Confidence Report](#) for each water system that engages in CWF from the data provided by the water systems and from the quarterly certified state lab test results. Because Missouri is among the states that received oral health infrastructure grants from the CDC, the state is required to share information showing which water systems are fluoridated and their fluoride levels through the CDC's WFRS database.

## Education and Training

### Training Requirements for Water Operators

Water operators are required by the State of Missouri to obtain a [Drinking Water Treatment Certificate](#). There are four levels of certification, with a Class A being the highest and a Class D being the lowest. In order to treat water for water fluoridation, a water operator must obtain a Class D Drinking Water Treatment Certificate, which is issued for a 3-year term.

#### The requirements for this level of certification include:

- Six (6) months of water treatment facility operating experience or the equivalent which can be any of the following:
- Either a high school diploma, General equivalency diploma (GED), successful completion of a special department-approved training course, or an additional six (6) months of hands-on experience.
  - Graduation from an approved one (1) year certificate program in water/wastewater technology.
  - College level courses with a grade of “C” or higher in a related field (chemical/biological/environmental science or public health). Each 3-hour course is assigned one (1) month of experience up to six (6) months in total.
  - Two-year (2) associates degree in related field (chemical/biological/environmental science or public health). This is equivalent to 1.5 years of experience.
  - Four-year (4) degree or higher in related field (chemical/biological/environmental science or public health or civil, mechanical, electrical or related engineering degree). This is equivalent to two (2) years of experience.
  - Department-approved water treatment course of at least forty-five (45) contact hours (4.5 CEUs). This is equivalent to six (6) months per course up to 1.5 years in total. (For multi-day courses, attendance of at least eighty percent (80%) is required to receive credit).
  - Department-approved water distribution system-training course of at least thirty-five (35) contact hours (3.5 CEUs). This is equivalent to six (6) months of distribution system experience per course up to 1.5 years in total. (For multi-day courses, attendance of at least eighty percent (80%) is required to receive credit).
  - Department-approved correspondence (virtual) course of at least forty-five (45) contact hours (4.5 CEUs). This is equivalent to six (6) months experience towards the appropriate type of certificate up to 1.5 years in total.
- Submit a certification application and a \$50 test fee to DNR.
- Take a department-approved (DNR) training course and pass the exam with a score of 70% or higher.

Upon attainment of the appropriate level of certification, Missouri water operators are required to:

- Maintain a minimum number of department-approved continuing education training hours:
  - Class A = 30 hours
  - Class B = 30 hours

- Class C = 30 hours
- Class D = 20 hours
- Complete and submit a renewal application.
- Pay a \$60 renewal fee.

### **Education and Continued Training for Water Operators**

A variety of organizations have developed, sponsored or promoted educational and training resources for water operators in the state. These resources are summarized below.

- The DNR maintains the [operator certification web page](#). This webpage has information on operator certification training, exams, the training voucher program, forms and publications, operator certification database, and employment opportunities for certified operators.
- The Missouri Rural Water Association (MRWA) has a [web page](#) that provides a schedule of training courses for operators and another [web page](#) for water conferences for renewal hours that count towards continuing education hours.
- The Missouri Section of the AWWA has a [web page](#) that provides local training events and workshops along with conferences available for water operators.
- The CDC created the free [Fluoridation Learning Online](#) (FLO) training program. FLO has four (4) modules and includes technical information for water system personnel on fluoride additives and operations. ODH worked with DNR to obtain approval for eight (8) continuing education hours for water operators towards their drinking water licenses for this training.
- ODH in conjunction with the Missouri Water Resources Research Center (MOWRRC) developed a free [online training](#) for water operators and administrators. This training has been approved for one (1) hour of continuing education credit towards drinking water certification.

### **Education and Training for Health Professionals and Health Educators**

Many Missourians were born and raised after their community had adopted a local fluoridation program. To raise the public's understanding of CWF, some organizations have developed, sponsored or promoted training about CWF for health professionals, health educators, decision-makers and others who want to learn about public health issues.

- The Missouri Coalition for Oral Health (MCOH) has sponsored multiple virtual webinars on how to educate their communities about CWF. These MCOH webinars have qualified for continuing education credits for water operators, dentists and dental hygienists.
- [FLO](#) was developed to provide water operators with a better understanding of CWF, but also offers insight for health professionals, decision-makers and the general public about CWF and the benefits provided.
- The Campaign for Dental Health, a project of the American Academy of Pediatrics (AAP), provides many online educational resources about CWF and oral health. The campaign's website "[I Like My Teeth](#)" offers many downloadable or printable materials for health professionals and parents.
- The American Dental Association provides evidenced-based resources regarding CWF and overall oral health. These resources can be found here: [Health professionals resources](#) and [Fluoridation Facts](#).
- The ODH offers an [Information for Professionals](#) web page that consolidates evidenced-based information and educational resources on water fluoridation in one place.

### **Other Educational and Promotional Resources**

- The CDC offers a web page that allows people to learn about their community's drinking water fluoridation level. [My Water's Fluoride](#)
- American Dental Association provides evidenced-based resources regarding CWF and overall oral health. [Fluoridation Facts](#) and [Mouth Healthy.org](#)
- The American Fluoridation Society ([AFS](#)) provides science-based education on CWF and support for communities across the United States.
- The National Institutes of Health provide [Fluoride Fact Sheets](#) to help people better understand the benefits of water fluoridation.
- Fluoride Legislative User Information Database ([FLUID](#)) provides an electronic search engine for case law, legislation and journal articles related to fluoridation laws and regulations.
- The ODH offers a [water fluoridation](#) web page for anyone to visit to find educational materials, answers to common questions and resources to help people learn more about water fluoridation.

## Goals – Objectives – Action Plan

The 2020-2025 Missouri State Oral Health Plan recognizes the importance of community water fluoridation and has strategies in place to continue to educate, promote and assess data to improve community water fluoridation in Missouri. Missouri has a specific goal of increasing the amount of the population from 65% to 75% who are receiving optimally fluoridated water.

Goals	Objectives	Activities
Goal 1: Missouri will maintain a strong network of stakeholders across the state who promote community water fluoridation.	Objective 1-1: By 2025 the Fluoride-Sealant Workgroup will maintain or increase participating membership involvement to no more than twenty (20) members.	<ul style="list-style-type: none"> <li>Identify diverse populations and communities who can help make progress on increasing the number of communities with optimal fluoridation.</li> <li>Create and disseminate stakeholder recruitment materials.</li> </ul>
	Objective 1-2: By 2025, in collaboration with other CWF stakeholders, the Missouri Office of Dental Health will increase the number of letters of support for CWF received to 30%.	<ul style="list-style-type: none"> <li>Identify influential organizations and individuals.</li> <li>Create and disseminate a letter of support template.</li> <li>Determine where to share the letters of support.</li> </ul>
	Objective 1-3: By 2025, the Fluoride-Sealant Workgroup will identify three (3) communities with non-optimal fluoride levels that have community support to adopt CWF.	<ul style="list-style-type: none"> <li>Identify communities with non-optimal fluoride levels in their public water systems.</li> <li>Create an assessment tool for identifying communities well positioned for adjusting community water systems to optimal levels.</li> <li>Work with selected communities to determine the steps</li> </ul>

		needed to achieve optimal fluoridation.
Goal 2: Provide Missourians with understandable messages and education and community water fluoridation.	Objective 2-1: By 2024, distribute evidenced-based messages on the importance of safe and optimally fluoridated drinking water.	<ul style="list-style-type: none"> <li>• Create a public awareness plan.</li> <li>• Identify and develop messages.</li> <li>• Local stakeholders launch campaign in three (3) communities.</li> </ul>
	Objective 2-2: By 2025, create three educational opportunities for key stakeholders to learn more about CWF.	<ul style="list-style-type: none"> <li>• Identify specific groups to target (dental, medical, water operator, policymakers, etc.)</li> <li>• Design specific content for each targeted group.</li> <li>• Determine a schedule to present educational programs.</li> <li>• Complete CEU process for water operators and dental/medical professionals.</li> </ul>
Goal 3: Ensure communities in Missouri have access to data-informed tools and resources they need to promote CWF.	Objective 3-1: By 2025, Fluoride-Sealant Workgroup will identify tools and resources needed to support communities and partners with CWF implementation and expansion.	<ul style="list-style-type: none"> <li>• Identify needed support.</li> <li>• Locate or create support.</li> <li>• Compile support into a toolkit.</li> <li>• Promote and disseminate the toolkit.</li> </ul>
	Objective 3-2: By 2025, the ODH will collaborate with the Missouri Department of Natural Resources on a private well water data collection and educational program.	<ul style="list-style-type: none"> <li>• Determine how to modify any current well water testing protocols to include fluoride.</li> <li>• Design messages for well water users about the benefits of optimal fluoride levels.</li> </ul>

		<ul style="list-style-type: none"> <li>• Create a dissemination or action plan for messages.</li> </ul>
	<p>Objective 3-3: By 2025, create a Missouri-specific CWF website with data and educational resources.</p>	<ul style="list-style-type: none"> <li>• Determine Missouri specific data to include.</li> <li>• Create a site map.</li> <li>• Design web page and database.</li> </ul>

## Conclusion/Closing

The promotion of CWF in drinking water is ongoing for the ODH and the ODH's partners and stakeholders. Widespread CWF has resulted in a remarkable decline in the prevalence and severity of tooth decay (cavities), saving money for both families and the health care system, as well as keeping consumers healthier.

A community's participation in a local fluoridation program is unique because fluoride is added to the water supply solely to help reduce tooth decay (cavities). By reducing tooth decay (cavities), overall health is improved. Participating in CWF is an ideal public health measure that helps reduce health disparities regardless of race, socio-economics status, age, geography or access to care. If you are able to turn on the tap and drink water, you receive the benefit.

It is recommended that all public water systems in Missouri be fluoridated to the recommended, optimal level for the best oral and overall health, working towards a statewide mandate or better education to increase local fluoridation programs. The goal of the Missouri Fluoridation Plan is to improve the oral health status of Missouri, thus improving the overall health for Missourians. ODH supports CWF and recognizes the practice as effective, safe, cost-effective, and beneficial to all who drink and use the water.



## References

(Dental Caries (Tooth Decay), 2023)

(Timeline for Community Water Fluoridation, 2023)

(The Story of Fluoridation, 2023)

(Our History: Commissioned Corps of the U.S. Public Health Service, 2023)

(Water Fluoridation Basics, 2023)

(Community Water Fluoridation, 2023)

(Water Fluoridation, 2023)

(Fluoridation FAQs, 2023)

(National Fluoridation Advisory Committee, 2021)

(Fluoride in the Water, 2023)

(Benefits of Fluoride in Drinking Water, 2023)

(Healthy People 2030, 2023)

(Health People 2030: Oral Health Objectives, 2023)

(My Water's Fluoride, 2023)

(Summary of the Safe Drinking Water Act of 1974, 2023)

(Citizen's Guide to Water Rules and Regulations, 2023)

(Missouri's State Oral Health Plan, 2023)

(Missouri Rural Water Association, 2023)

(Missouri Section of the American Water Works Association, 2023)

(Missouri Coalition for Oral Health, 2023)

(Missouri Dental Association, 2023)

(Missouri Dental Hygienists' Association, 2023)

(Delta Dental of Missouri, 2023)

(Operator Certification, 2023)

(Continuing Education for Medical-Dental Providers in Missouri, 2023)

## Frequently Used Abbreviations and Terms

ADA (American Dental Association)  
Adjusted  
ASTDD (Association of State and Territorial Dental Directors)  
AWWA (American Water Works Association)  
CDC (Centers for Disease Control and Prevention)  
Consecutive System  
CCR (Consumer Confidence Report)  
CWF (Community Water Fluoridation)  
CWS (Community Water System)  
Delta Dental of Missouri  
DHSS/MDHSS (Missouri Department of Health & Senior Services)  
DNR (Missouri Department of Natural Resources)  
EARFW (Engineering and Administrative Recommendation for Water Fluoridation)  
EPA (Environmental Protection Agency)  
FLUID (Fluoride Legislative User Information Database)  
HP 2030 (Healthy People 2030)  
MCL (Maximum Contaminant Level)  
MCLG (Maximum Contaminant Level Goal)  
Mg/L (Milligrams per Liter)  
Missouri AWWA (The American Water Works Association, Missouri Section)  
MCOH (Missouri Coalition for Oral Health)  
MDA (Missouri Dental Association)  
MDHA (Missouri Dental Hygienists' Association)  
MRWA (Missouri Rural Water Association)  
MWWC (Missouri Water and Wastewater Association)  
MWF (My Water's Fluoride)  
Natural  
Natural/Non-Fluoridated  
NSF/ANSI (National Sanitation Foundation and International/American National Standards Institute)  
OCR (Operational Control Range)  
ODH (Missouri's Office of Dental Health under Missouri Department of Health and Senior Services)  
Primary System  
PWS (Public Water System)  
SMCL (Secondary Maximum Contaminant Level)  
SMCLG (Secondary Maximum Contaminant Level Goal)  
WFRS (Water Fluoridation Reporting System)  
Wholesale Water System

## Appendices

Missouri's Fluoridation Statistics 2022

Missouri's Optimal Fluoridation Statistics 2022

Healthy People 2030 Oral Health Conditions

Missouri's Fluoridated Communities Map 2023

Missouri's Naturally Fluoridated Communities Map 2023

Missouri's Consecutive Fluoridated Communities Map 2023

## Missouri's Fluoridation Statistics 2022

	Systems	Population	% of Fluoridated Systems	% of Fluoridated Population	% of Total Systems	% of Total Population
All Water Systems	1453	5276635	--	--	100.00%	100.00%
<b>Fluoridated</b>	0	0			0.00%	0.00%
Adjusted	90	3030782	23.20%	75.31%	6.19%	57.44%
Natural	127	304095	32.73%	7.56%	8.74%	5.76%
Variable/Other	0	0	0.00%	0.00%	0.00%	0.00%
Defluoridated	0	0	0.00%	0.00%	0.00%	0.00%
Consecutive	163	539789	42.01%	13.41%	11.22%	10.23%
Multi-source	8	149706	2.06%	3.72%	55.00%	2.84%
<b>Total</b>	<b>388</b>	<b>4024372</b>	<b>100.00%</b>	<b>100.00%</b>	<b>26.70%</b>	<b>76.27%</b>
<b>Non-Fluoridated</b>	0	0			0.00%	0.00%
Non-Adjusted	922	1022385	--	--	63.45%	19.38%
Variable/Other	0	0	--	--	0.00%	0.00%
Defluoridated	0	0	--	--	0.00%	0.00%
Consecutive	140	211133	--	--	9.64%	4.00%
Multi-source	3	18744	--	--	2.10%	36.00%
<b>Total</b>	<b>1065</b>	<b>1252263</b>	<b>--</b>	<b>--</b>	<b>73.30%</b>	<b>23.74%</b>

## Missouri's Optimal Fluoridation Statistics 2022

	Systems	Population	% of Fluoridated Systems	% of Fluoridated Population	% of Total Systems	% of Total Population
Non-optimally Fluoridated	0	0			0	0
Non-Fluoridated	0	0			0	0
Total	1,065	1,252,263	--	--	73.30%	23.73%
Fluoridated - not optimal	-	-			0	0
Adjusted	17	361,870	4.38%	8.99%	1.17%	6.86%
Consecutive	64	39,963	16.49%	0.99%	4.40%	0.76%
Multi-source	8	149,706	2.06%	3.72%	0.55%	2.84%
Total	89	551,539	22.93%	13.70%	6.12%	10.46%
Optimally Fluoridated - Partial	-	-			0	0
Adjusted	18	188,247	4.64%	4.68%	1.24%	3.57%
Consecutive	18	30,498	4.64%	0.76%	1.24%	0.58%
Multi-source	-	-	0	0	0	0
Total	36	218,746	9.28%	5.44%	2.48%	4.15%
<b>Optimally Fluoridated</b>	-	-			0	0
Adjusted	55	2,480,665	14.18%	61.64%	3.79%	47.01%
Natural	120	303,603	30.93%	7.54%	8.26%	5.75%
Defluoridated	-	-	0	0	0	0
Consecutive	81	469,327	20.88%	11.66%	5.57%	8.89%
Multi-source	-	-	0	0	0	0
<b>Total</b>	256	3,253,596	65.99%	80.84%	17.62%	<b>61.65%</b>

## Healthy People 2030 Oral Health Conditions

**Goal: Improve oral health by increasing access to oral health care, including preventive services.**



Tooth decay is the most common chronic disease in children and adults in the United States.<sup>1,2</sup> Healthy People 2030 focuses on reducing tooth decay and other oral health conditions and helping people get oral health care services.<sup>3</sup>

Regular preventive dental care can catch problems early, when they're usually easier to treat.<sup>4</sup> But many people don't get the care they need, often because they can't afford it. Untreated oral health problems can cause pain and disability and are linked to other diseases.

Strategies to help people access dental services can help prevent problems like tooth decay, gum disease, and tooth loss. Individual-level interventions like topical fluorides and community-level interventions like community water fluoridation can also help improve oral health. In addition, teaching people how to take care of their teeth and gums can help prevent oral health problems.

### Objective Status

- **2** Target met or exceeded
- **1** Improving
- **1** Little or no detectable change
- **1** Getting worse
- **9** Baseline only
- **1** Developmental

- 0 Research

[Learn more about objective types](#)

## Related Objectives

The following is a sample of objectives related to this topic. Some objectives may include population data.

Oral Conditions — General

[Reduce the proportion of adults with active or untreated tooth decay — OH-03](#)

Baseline only

[Increase the proportion of oral and pharyngeal cancers detected at the earliest stage — OH-07](#)

Baseline only

[Increase use of the oral health care system — OH-08](#)

Target met or exceeded

Adolescents

[Reduce the proportion of children and adolescents with lifetime tooth decay — OH-01](#)

Baseline only

[Reduce the proportion of children and adolescents with active and untreated tooth decay — OH-02](#)

Baseline only

Health Care Access and Quality

[Reduce the proportion of people who can't get the dental care they need when they need it — AHS-05](#)

Target met or exceeded

[Increase the proportion of people with dental insurance — AHS-02](#)

## Improving

### Health Policy

Increase the proportion of people whose water systems have the recommended amount of fluoride — OH-11

## Baseline only

### Nutrition and Healthy Eating

Reduce consumption of added sugars by people aged 2 years and over — NWS-10

## Little or no detectable change

### Older Adults

Reduce the proportion of older adults with untreated root surface decay — OH-04

## Baseline only

Reduce the proportion of adults aged 45 years and over who have lost all their teeth — OH-05

## Baseline only

Reduce the proportion of adults aged 45 years and over with moderate and severe periodontitis — OH-06

## Baseline only

### Preventive Care

Increase the proportion of low-income youth who have a preventive dental visit — OH-09

## Getting worse

Increase the proportion of children and adolescents who have dental sealants on 1 or more molars — OH-10

## Baseline only



Public Health Infrastructure

[Increase the number of states and DC that have an oral and craniofacial health surveillance system — OH-D01](#)

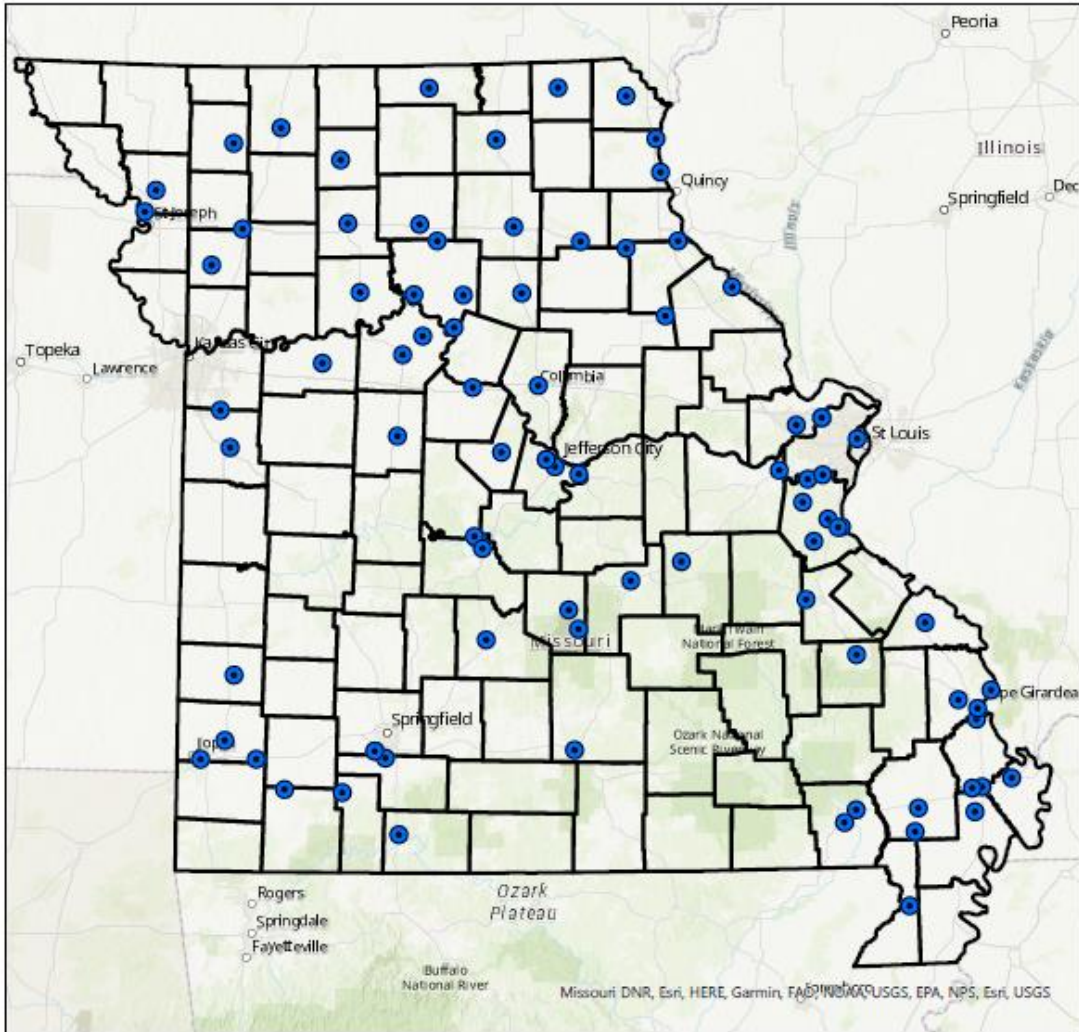
Developmental

**Other topics you may be interested in**

- [Adolescents](#)
- [Health Care Access and Quality](#)
- [Nutrition and Healthy Eating](#)

# Missouri's Fluoridated Communities Map 2023

## CWF Fluoride Levels for Public Water Wells



### Water Wells

### Fluoride Conc

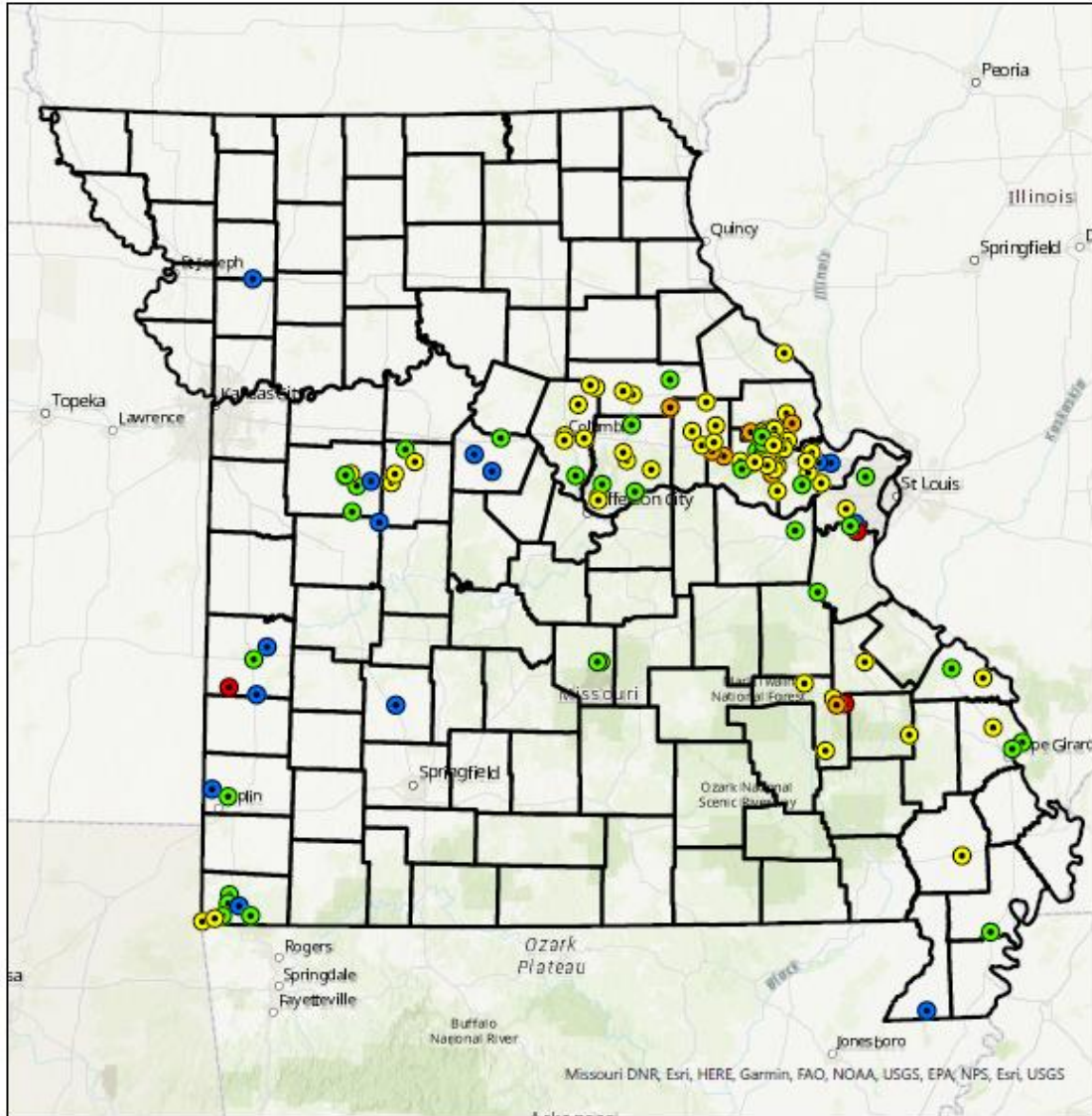
- 0.70
- County

Although the data in this data set have been compiled by the Missouri Department of Health and Senior Services, no warranty, expressed or implied, is made by the Department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the Department in the use of these data or related materials.



# Missouri's Naturally Fluoridated Communities 2023

## Natural Fluoride Levels for Public Water Wells



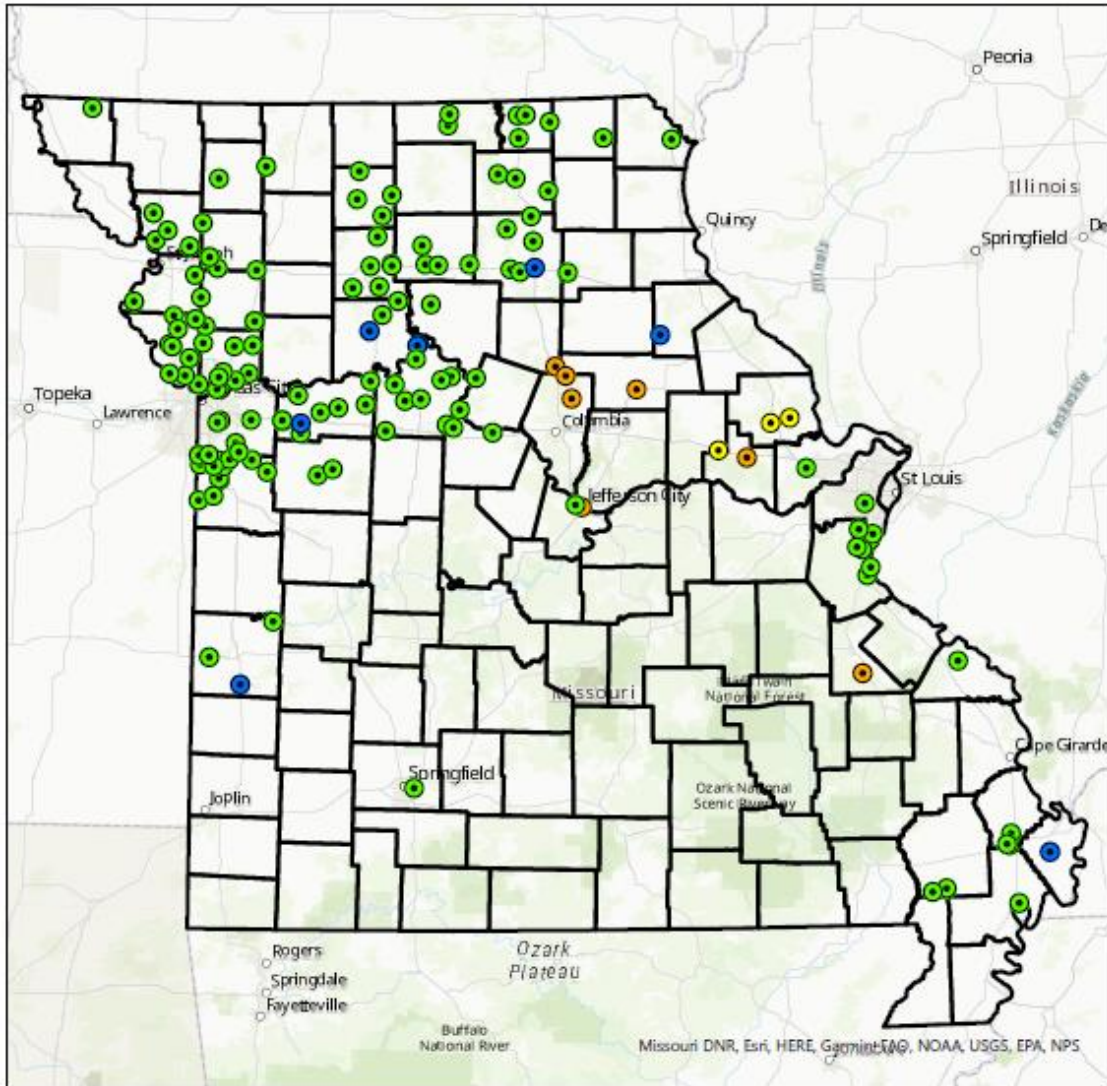
- Water Wells**  
**Natural Fluoride Concentrations**
- 0.00 - 0.64
  - 0.65 - 1.00
  - 1.01 - 2.00
  - 2.01 - 3.00
  - 3.01 - 3.81

Although the data in this data set have been compiled by the Missouri Department of Health and Senior Services, no warranty, expressed or implied, is made by the Department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the Department in the use of these data or related materials.



# Missouri's Consecutive Fluoridated Communities Systems Map 2023

## Consecutive Fluoride Levels for Public Water Wells



- Water Wells**  
**Consecutive Fluoride Concentration**
- 0.00 - 0.64
  - 0.65 - 1.00
  - 1.01 - 2.00
  - 2.01 - 3.00

Although the data in this data set have been compiled by the Missouri Department of Health and Senior Services, no warranty, expressed or implied, is made by the Department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the Department in the use of these data or related materials.

