# Chemical Contaminant Concentrations in Maryland Farm Well Drinking Water

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## Introduction

- National Primary Drinking Water Regulations protect public water systems from several inorganic chemical contaminants.[1]
- These regulations do not apply to private drinking water wells, and private well users are responsible for ensuring the safety of their drinking water.[2]
- Study objective: evaluate select inorganic chemical contaminant concentrations and factors which may impact concentrations in Maryland farm well drinking water.

## Methods

- We collected private well drinking water samples from farms in 19 counties and had them tested for NPDWR chemical contaminants (arsenic, barium, cadmium, chromium, copper, lead, nitrate, selenium, and uranium) and sodium.
- We evaluated the impact of several factors including region, well characteristics, and use of water treatment devices on chemical concentrations (above/below MCL or HA) using Fisher's exact tests.

## Results

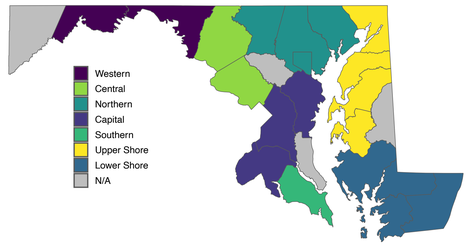
- 6% (4/65) of water samples exceeded the arsenic maximum contaminant limit (MCL) and 6% (4/64) exceeded the nitrate MCL.
- For sodium, 31% (20/65) of water samples exceeded the EPA recommended limit to avoid effects on taste (30-60 mg/L) and 46% (30/65) exceeded the EPA health advisory (HA) level (20 mg/L) for consumers on restricted sodium diets (500 mg/day).
- Arsenic ($p<0.001$) and sodium ($p=0.003$) concentrations varied by region.

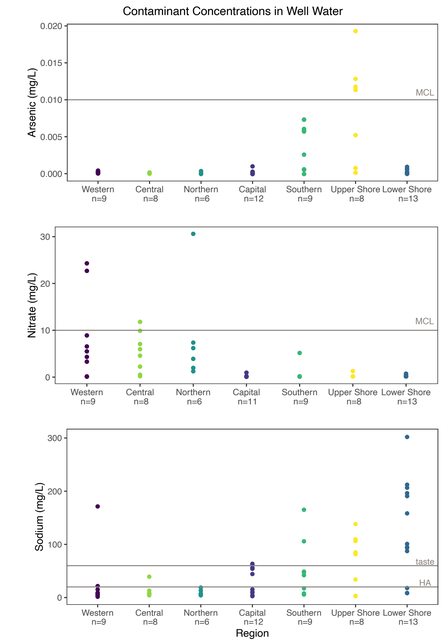
**References**

1. US EPA. (2023). *Drinking Water Regulations*. https://www.epa.gov/dwreginfo/drinking-water-regulations
2. US EPA. (2023). *Private Drinking Water Wells*. https://www.epa.gov/privatewells

# Inorganic chemical contaminants in groundwater vary based on regional geological characteristics and local land uses.

# Private well users should understand these factors and test their drinking water for relevant contaminants.




## Public Health Significance

- Our findings highlight the importance of regular inorganic chemical testing of farm well drinking water and implementing appropriate treatments for identified contaminants.

**Acknowledgements**

- This project was supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number ONE21-397.
- RP was supported by NRT-INFEWS: UMD Global STEWARDS (STEM Training at the Nexus of Energy, WAter Reuse and FooD Systems) awarded to the University of Maryland School of Public Health by the National Science Foundation National Research Traineeship Program, Grant number 1828910.

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