

# Ambient Ground Water Quality Characterization Monitoring Program What, How & Changes

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OWRC - Workgroup  
Water Resource Monitoring Meeting  
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# AGWQMP - What

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- 200 active wells;
- Continuous data since 1970s;
- Analyze raw (untreated) water
  - 30 inorganic and 61 organic parameters;
- Most wells are public water system wells;  
Focus is characterization of source water for GW based PWSs.
- Well aquifer types:
  - Sand & Gravel 60%;
  - Sandstone 17%;
  - Carbonate 23%.



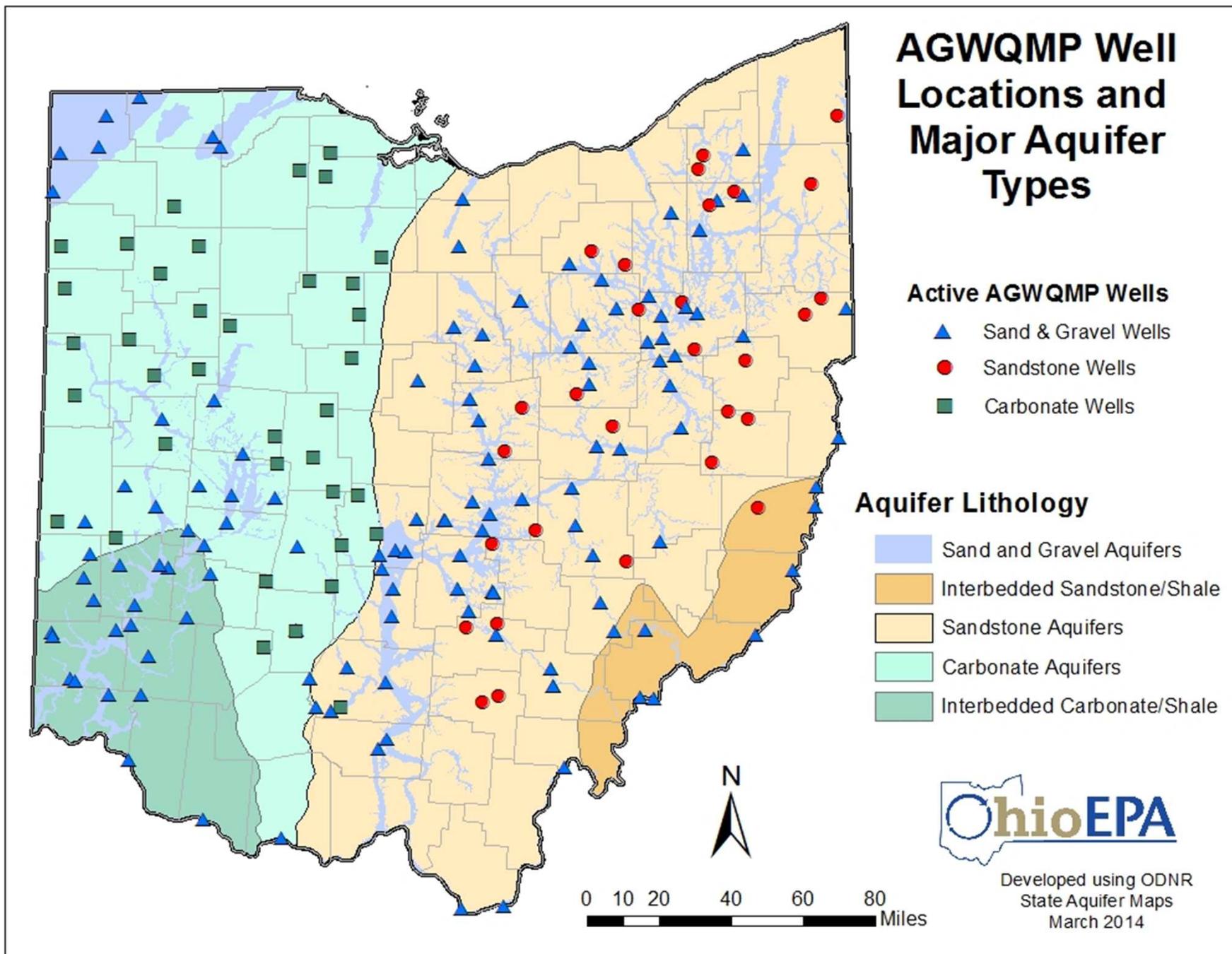
# AGWQMP Well Locations and Major Aquifer Types

## Active AGWQMP Wells

- ▲ Sand & Gravel Wells
- Sandstone Wells
- Carbonate Wells

## Aquifer Lithology

- Sand and Gravel Aquifers
- Interbedded Sandstone/Shale
- Sandstone Aquifers
- Carbonate Aquifers
- Interbedded Carbonate/Shale



# AGWQMP - How

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- District geologist collect samples
  - 6 month or 18 month frequency
- Samples analyzed by Ohio EPA Lab
- CO imports and approves electronic data
  - GWQCP database
  - QA/QC in End-of-Round Report
  - Data summarized for Web
  - Data available on Web



# AGWQMP – Changes Expansion

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- Adding bedrock wells
- Extending sampling interval
  - shift wells to 18 and 36 month interval
  - maintain similar budget
- Add 20 new wells in 2015
  - Background data in SE Ohio
  - Fill holes

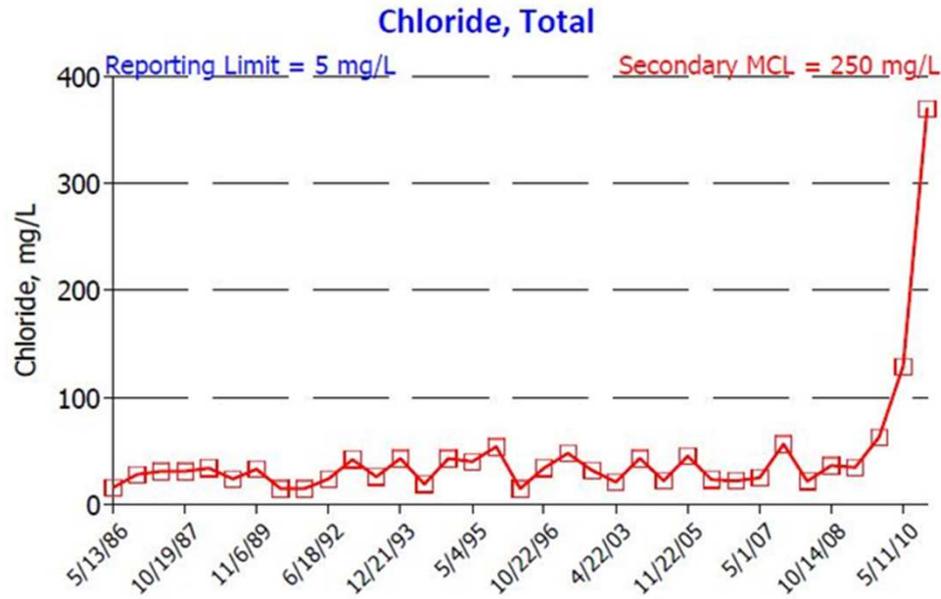


# AGWQMP – Changes Data Utilization

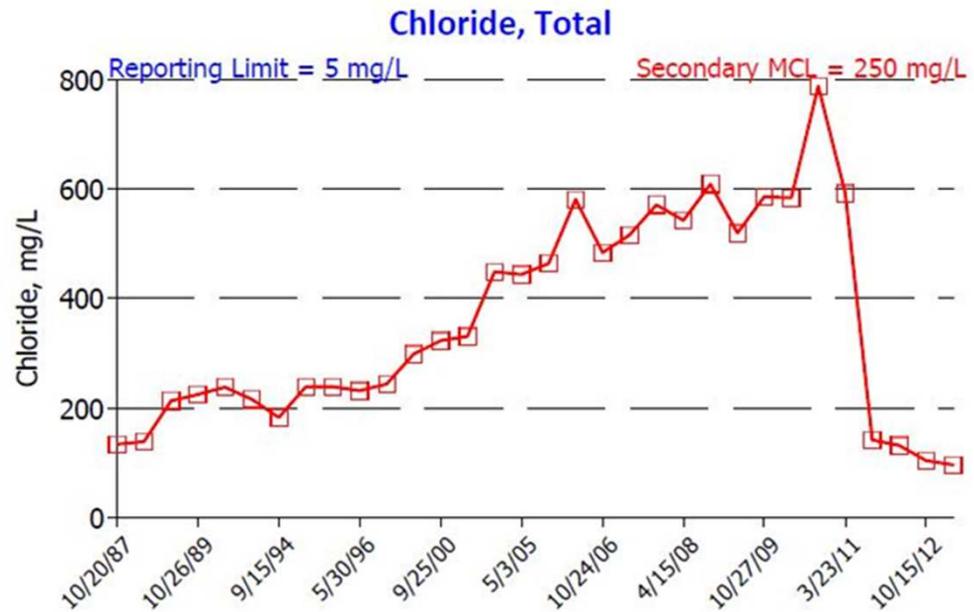
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- Characterize Ohio's ground water;
  - Use the times series to identify long term water quality trends
  - Develop Fact Sheets and Technical Reports for specific parameters
  - Use nitrate data to ID GW-SW study area





Camden PWS, SW Ohio  
 Sand & Gravel well  
 41' deep; 28' casing



Cygnet PWS, NW Ohio  
 Carbonate well  
 209' deep; 40' casing

# Fact Sheets and Technical Reports

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- Value of data is documented by its use;
  - Fluoride;
  - Aquifer and Ground Water Quality;
  - Oxidation–Reduction;
  - Strontium out for comment
    - Strong Carbonate association
    - Potential GW-SW use



# Strontium Distribution AGWQMP GW Data

## Strontium Concentrations ug/L

- ▲ < 2,000
- ▲ 2,000-4,000
- ▲ 4,000 - 11,000
- ◆ 11,000 - 18,000
- ◆ 18,000 - 25,000
- 25,000 - 35,000
- >35,000

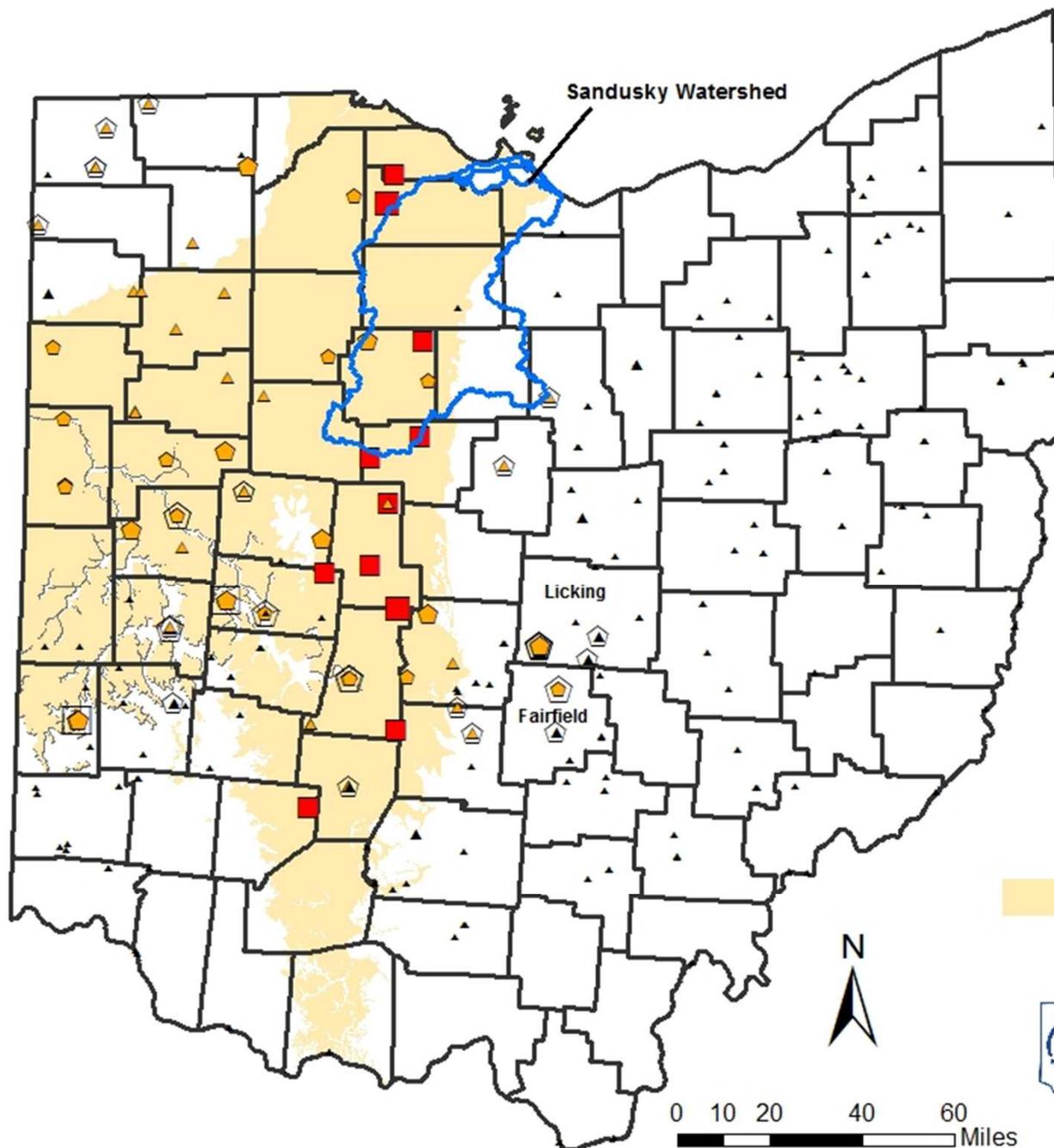
## Sand & Gravel Aquifers Strontium >3000 ug/L

- ◇ 3,000 - 10,000
- ◇ 10,000 - 20,000
- > 20,000

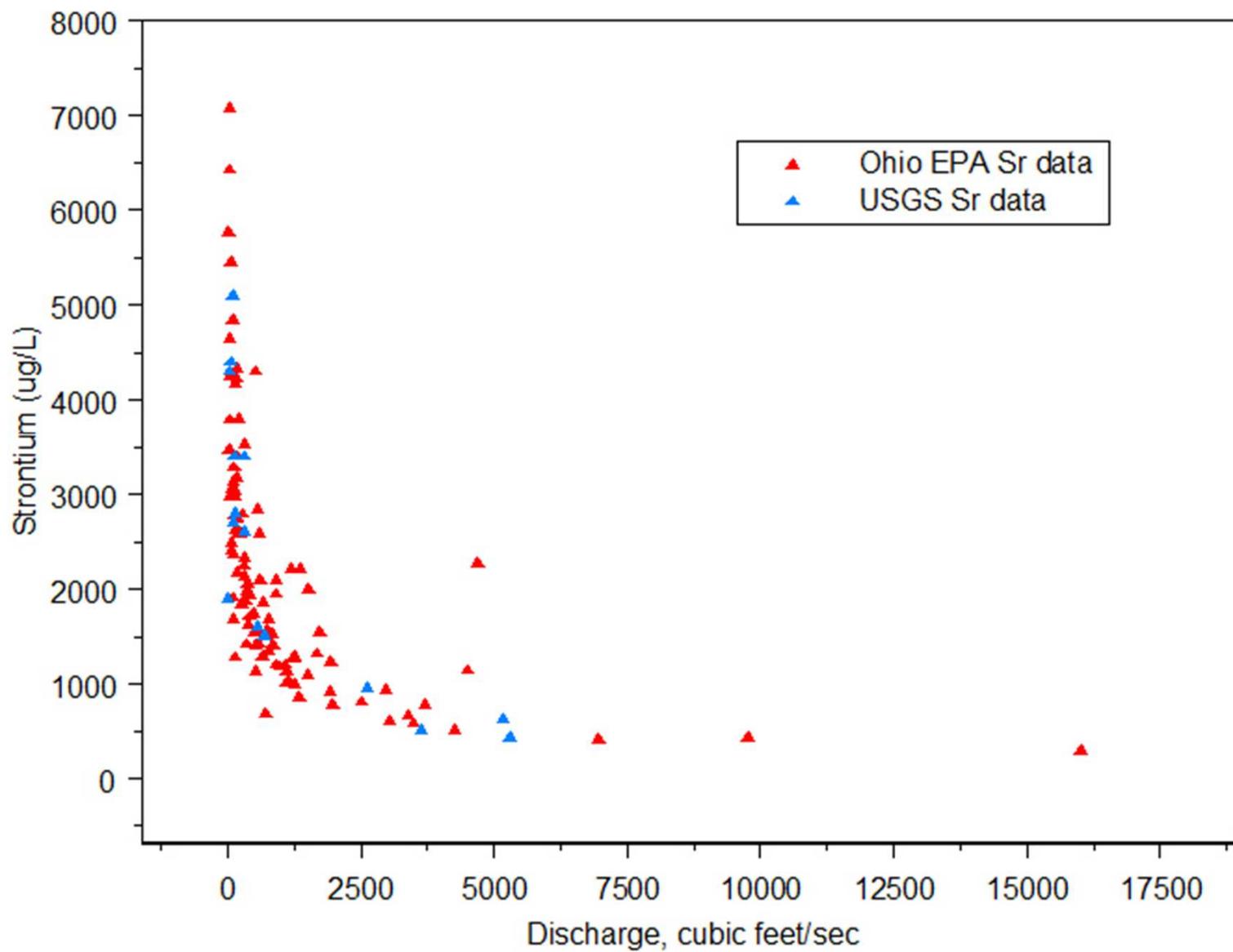
■ Silurian and Devonian  
Carbonates



Developed using ODNR State Aquifer  
Maps and AGWQMP Data - June 2014



## Strontium vs Discharge at Fremont Ohio



# Data and Acknowledgements

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Ohio EPA, DDAGW

GW Quality Characterization Program Web Page

<http://www.epa.state.oh.us/ddagw/gwqcp.aspx>

- PWS Operators
- Ohio EPA district staff and DES staff
- ODNR Map Products

