

Preliminary Air Monitoring Results for Clyde, Ohio

Paul Koval

Ohio EPA

Division of Air Pollution Control

(614) 644-2270

OhioEPA

Division of Air Pollution Control



Ohio EPA Air Monitoring Study

- Ambient air measurements follow study objectives:
 - Screening
 - Risk Management
 - Public Safety



Air Monitoring in Ohio

- More than 230 monitors currently operating in Ohio
- Monitoring focused on:
 - Compliance with ambient air quality standards
 - Real-time monitoring for air pollution episodes
 - Data for trend analysis, e.g., Urban Air Toxic Studies
 - Complaint Investigation
 - Data for risk assessment/risk management
 - Superfund/indoor air



Air Toxics Monitoring Air Monitor Types

- Heavy Metals
 - Examples: arsenic, cadmium, chromium
- Volatile Organic Compounds (VOCs)
 - Examples: benzene, carbon tetrachloride, toluene
- Semi-Volatile Organic Compounds (SVOCs)
 - Examples: PCBs, dioxins, Polycyclic Aromatic Hydrocarbons (PAHs)

Sampling Method VOCs



Sampling Method TSP and PM



Sampling Method TSP





Results Interpretation (Exposure Assumptions)

- ◆ Health assessment is calculated for “worst-case scenario” [maximum possible exposure]
- ◆ Evaluate “maximum risk”
- ◆ Actual risk is always lower
- ◆ Year(s) of data required to predict chronic exposure/risk

Air Sample Analysis

- ◆ Detected compounds are compared against a risk-based standard
 - ◆ Published in U.S. EPA database
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- *Cancer compounds-*
Unit Risk Factors (URF)
 - *Non-Cancer Compounds-*
Reference Concentrations (RfC)

Risk Range

No Action Necessary	Ample Margin of Safety consideration of technical feasibility and other factors (e.g. background and national exposure levels)	Action Level risk further evaluated weighing other factors (e.g., likelihood of exposure, duration of exposure, etc)
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(1 in 1,000,000) 10^{-6}

(1 in 10,000) 10^{-4}

← RISK LEVEL →

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Clyde Sampling Site Locations

- One central location and several community locations
- Six samples collected at central site and three samples at four community sites
- Site locations not disclosed to prevent tampering and preserve quality of data
- Sample timing also not disclosed

Sampling Site locations - 2

- For regional air monitoring in general, one or two sites in a county depict air quality in the area.
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- For this study, 7 sites have been selected to ensure broad coverage of study area (1 central, plus 6 community sites).

Clyde Average Concentrations

January 2009-March 2009

	Site 1	Site 2	Site 3	Site 5	Site 7	Ohio
			units - $\mu\text{g}/\text{m}^3$			
Acetone	10.10	13.14	13.70	11.24	11.24	22.60
Acetonitrile	ND	ND	0.28	ND	ND	0.30
Acrylonitrile	ND	0.43	0.48	ND	ND	0.67
Benzene	0.72	0.71	0.70	0.77	0.81	1.39
n-Butane	2.75	3.36	2.37	3.45	3.39	4.15
2-Butanone	1.15	2.77	3.24	1.94	1.26	2.29
Chlorodifluoromethane	1.15	1.11	1.14	1.12	1.13	1.04
Chloromethane	2.11	1.58	1.68	2.07	2.18	1.13
Dichlorodifluoromethane	3.78	3.66	3.78	3.81	3.84	2.58
Hexane	ND	ND	ND	0.85	ND	0.68
Methylene chloride	0.82	0.63	0.49	1.05	1.07	0.50
n-Pentane	1.20	1.70	1.87	1.56	1.29	2.08
Propylene	ND	ND	1.20	ND	ND	1.27
Toluene	0.47	1.25	ND	0.59	0.51	2.02
Trichlorofluoromethane	2.16	1.48	1.99	1.60	1.65	5.08
Vinyl acetate	0.79	0.60	ND	0.62	1.20	1.43

Clyde Metal Concentrations

	units = $\mu\text{g}/\text{m}^3$		
Compounds	31-Jan-09	11-Feb-09	Ohio
arsenic	0.000	0.000	0.0010
beryllium	ND	ND	0.0000
cadmium	0.000	0.000	0.0010
chromium	0.001	0.001	0.0041
lead	0.004	0.003	0.0750
nickel	0.000	0.001	0.0168
barium	0.006	0.004	NA
manganese	0.017	0.006	0.1840
zinc	0.000	0.020	0.4950

Summary

No unusual concentrations for Clyde area have been detected thus far.

- ◆ **The preliminary results do not indicate cause for concern at this time.**
- ◆ **Air monitoring will continue.**

Drinking Water Quality Sampling to Support ODH Childhood Cancer Investigation, Clyde Ohio



Division of Drinking and Ground Waters

April 20, 2009



Significant Findings

- All water sources are safe to consume!
- All compounds detected in samples meet primary health standards.
- Some naturally occurring compounds (non-carcinogenic) were found above recommended secondary standards or health advisory levels.
- Detailed information and results are summarized in a report.

Where Did We Sample?

- City of Clyde (3 Samples)
- Northern Ohio Rural Water (4 Samples)
- Domestic Water Wells (4 Samples)



What is in Water?

- There is no such thing as naturally pure water.
- What we find in water depends on where it comes
 - Surface Water
 - Ground Water



Drinking Water Health Standards

- **Primary Health Standards**

- Carcinogenic or Non-Carcinogenic Health Concerns
- Examples: Atrazine, Gross alpha, Nitrate, Trihalomethanes

- **Secondary Health Standards**

- Set for Cosmetic or Aesthetic Effects like taste, color, odor
- Examples: Iron, Sulfate, Total Dissolved Solids

- **Health Advisory Levels**

- Used to Evaluate Potential Health Risk (Non-cancer) where no Primary Standard is available
- Examples: Strontium, Sodium, Diethylphthalate

What Did We Test For?

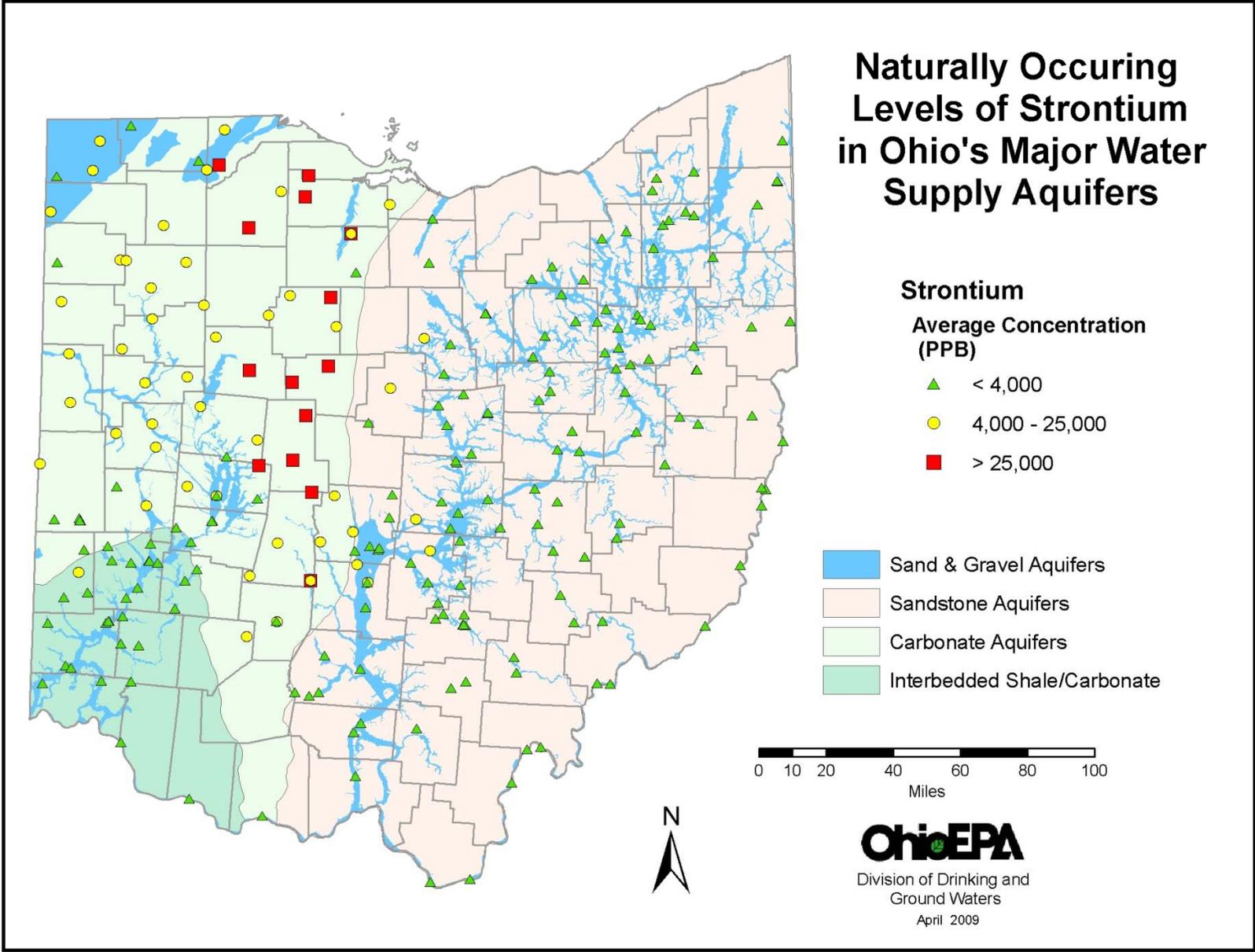
- **Inorganic Compounds (34)**
 - Examples: lead, calcium, nitrate
- **Organic Compounds (183)**
 - Examples: solvents, petroleum products, pesticides
- **Radiological Substances (7)**
 - Examples: alpha, beta, gamma, radium, uranium
- **Organic Compound Scan**
 - Tentatively Identified Compounds (160,000 possible)



What Did We Find? Inorganic Compounds

- Primary Health Standards
 - **All samples met primary health standards**
- Secondary Standards
 - Domestic wells higher than standards for Iron, Sulfate and Total Dissolved Solids
- Health Advisory Levels
 - Sodium higher than recommended in two well samples and one NORW sample.
 - Strontium higher than recommended in the domestic water wells (naturally occurring & non-carcinogenic)

Naturally Occuring Levels of Strontium in Ohio's Major Water Supply Aquifers



What Did We Find? Organic Compounds

- Primary Health Standards & Health Advisory levels
 - **All samples meet these standards**
- Only 11 of the 183 Organic Compounds were detected. (98% non-detect for 2000 analyses)
- All 11 found are at low levels and meet standards
- Results are similar to Public Water Supply monitoring across Ohio.

What Did We Find? Radiological Substances

- All detections of radiological substances meet primary health standards.
- Probable source of radioactivity is the decay of naturally occurring radon.
- Results are consistent with monitoring throughout Ohio



Conclusions

- All water sources are safe to consume!
- All compounds detected in samples meet primary health standards.
- Some naturally occurring compounds (non-carcinogenic) were found above recommended secondary standards or health advisory levels.
- Detailed information and results are summarized in a report.

Additional Information

- Ohio EPA and Ohio Dept. Of Agriculture will conduct more pesticide sampling.
- Summary and Detailed Report with all results will be posted on the Ohio EPA web site.

- Contact Information

Michael Eggert or Dr. Chris Kenah

Ohio EPA Division of Drinking and Ground Waters

(614) 644-2752



Acknowledgements

- Water Well Owners
- City of Clyde PWS, NORW PWS
- Sandusky County Health Department
- Ohio EPA Environmental Services Laboratory
- Ohio Department of Health Laboratory
- OSU Extension – Sandusky County
- Ohio Department of Agriculture
- USDA Research Program Office

Biological Stream Monitoring

Sandusky Bay Tributaries

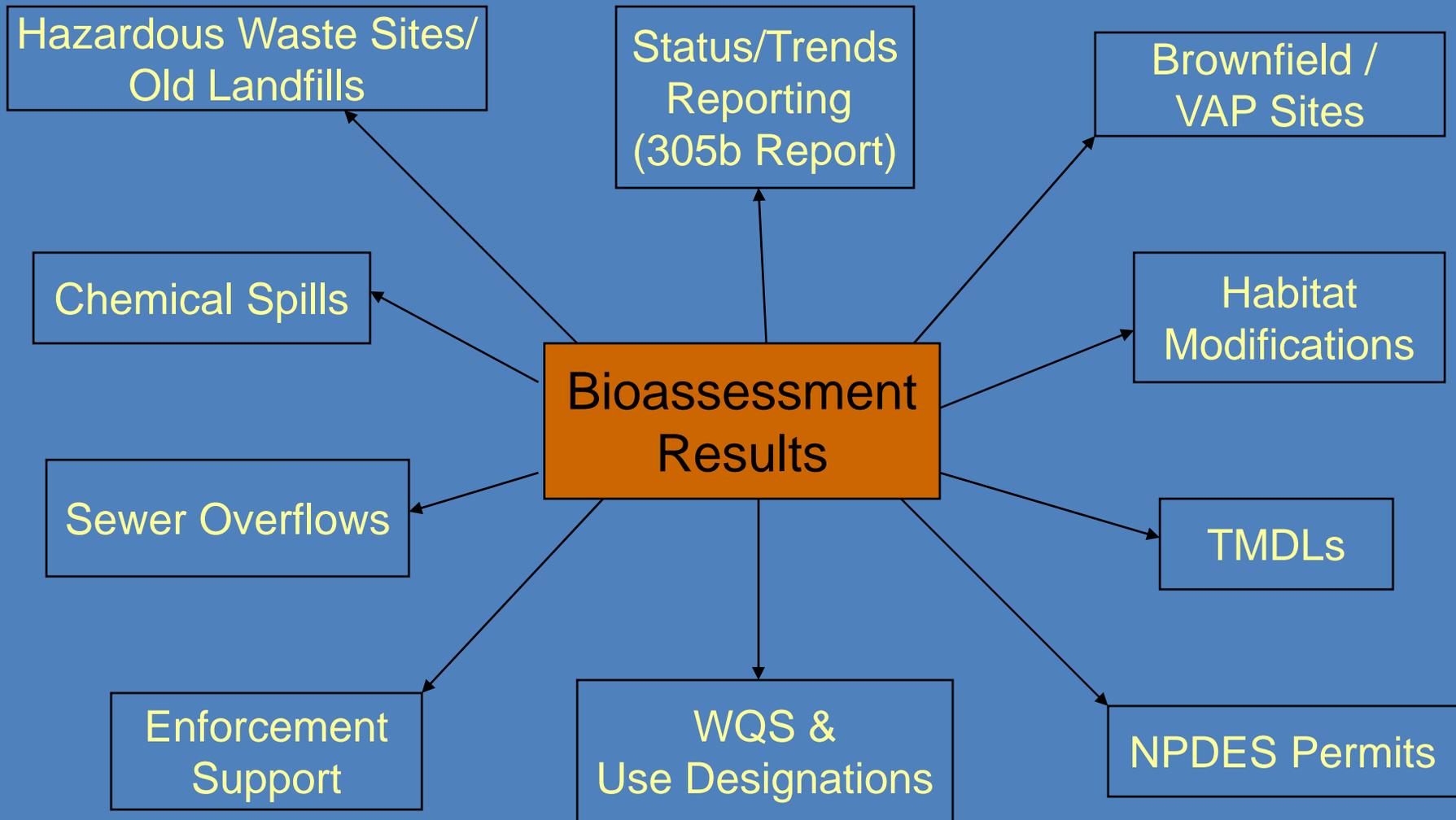
(Including Clyde and surrounding areas)

Holly Tucker

April 16, 2009



Ohio Bioassessments - Applications



What is a TMDL?

- A study that results in a written, quantitative assessment of water quality problems and contributing sources of pollution
- Established under Section 303(d) of the Clean Water Act
- Focuses on identifying and restoring polluted rivers, streams and lakes
- Takes a simple, problem-solving approach to restoring water quality

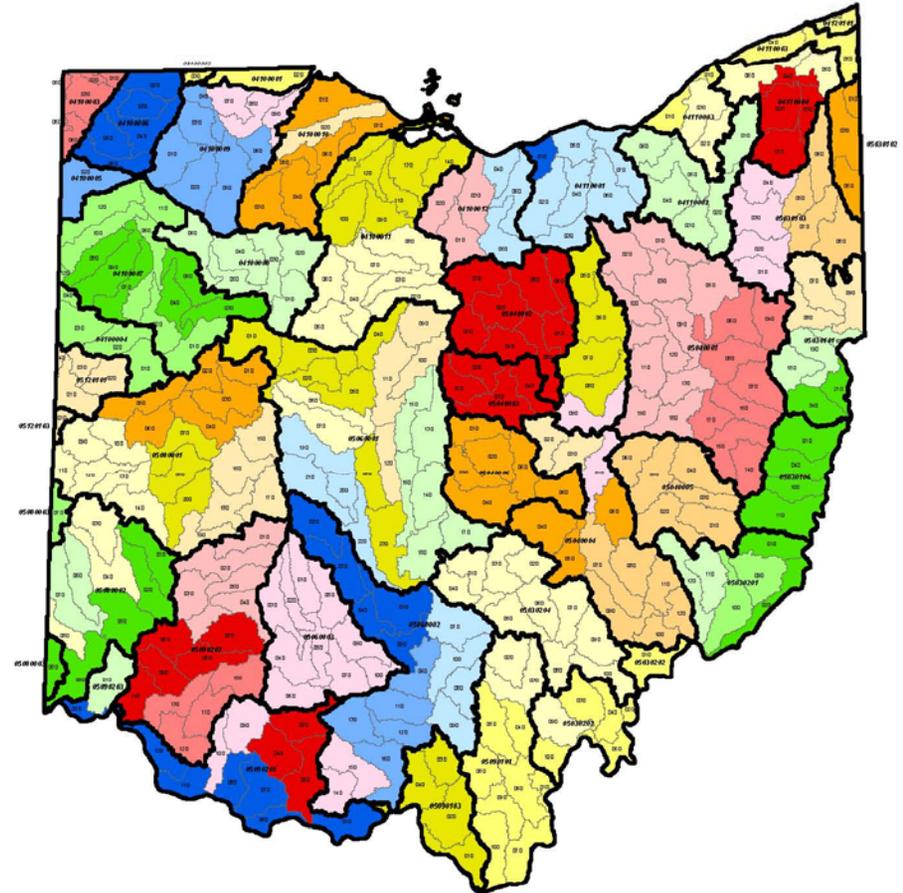
TMDL Monitoring Schedule

Survey watersheds in
rotating basin
approach

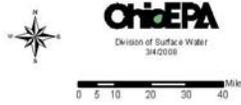
Sample watersheds
every 10-15 years

Sampled Raccoon
Creek in mid-1980's
and mid-1990's.

Ohio 2008 Integrated Report Long-Term Monitoring Schedule

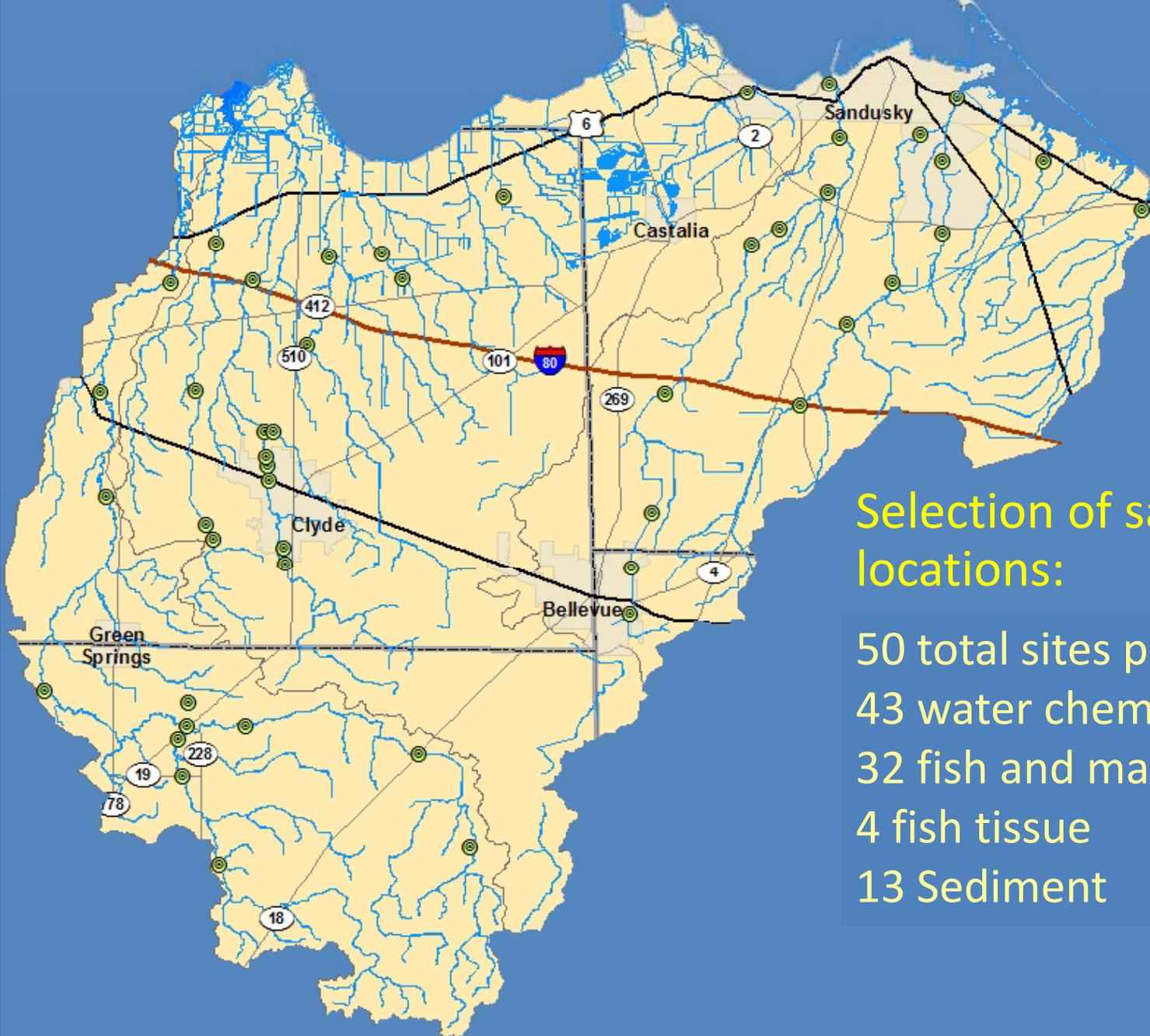


8-digit Hydrologic Unit Boundary
11-digit Hydrologic Unit Boundary



Monitoring Schedule			
2007	2012	2017	2022
2008	2013	2018	
2009	2014	2019	
2010	2015	2020	
2011	2016	2021	

Sandusky Bay Tributaries Study Area



Selection of sampling locations:

- 50 total sites proposed
- 43 water chemistry
- 32 fish and macroinvertebrate
- 4 fish tissue
- 13 Sediment

Proposed sampling near Clyde

Raccoon Creek Reservoir

Beaver Creek Reservoir

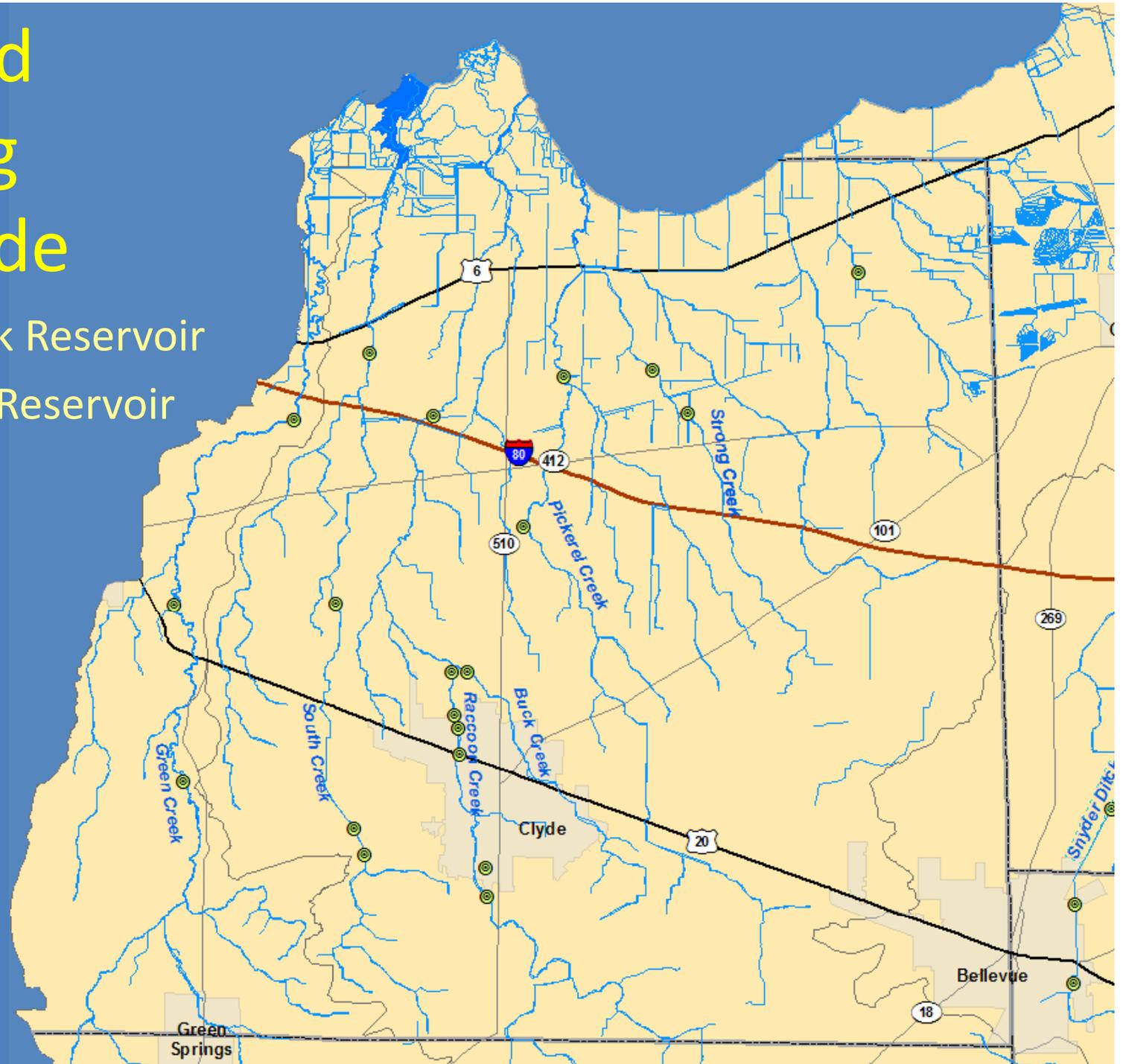
Buck Creek

South Creek

Green Creek

Pickerel Creek

Strong Creek



Biosurvey Components

Rivers and Streams

- Fish community: abundance and variety
- Macroinvertebrate community: abundance and variety
- Physical habitat of the stream channel
- Chemical water quality samples and sediment samples collected by district offices.

Fish Methods

- Pulsed DC electrofishing
- Sampling based on distance
- Mid-June to October collection period
- Weight (> 20 square miles)
- Anomalies (abnormalities)





Macroinvertebrate Methods



- Artificial substrates (HDs) & qualitative dip-net/ handpick
- HDs set for six week period
- Taxonomy to genus or species

Macroinvertebrate collection and analysis





Contact Information:

Holly Tucker

holly.tucker@epa.state.oh.us

(614) 836-8777