



CDC Private Water Systems Grant Project

Midwest Conference 2014

*Residential Water and Sewage Program
Bureau of Environmental Health
Ohio Department of Health*

CDC Private Water Systems Grant

Improving Ohio's state and local capacity to assess and manage risks associated with private water systems by using the EHS-Net and other data tools.



Private Water Systems

- In Ohio, approximately 1 million homes are served by private water systems in rural and suburban areas.
- Most private water systems are water wells using ground water that can be subject to contamination from land use activities such as farming, land application of sewage and animal wastes, resource extraction, and industrial activities.



Public Health Data and Drinking Water Illness

- According to the Centers for Disease Control and Prevention (CDC), 36 waterborne disease outbreaks from drinking water were reported in the US between 2007 and 2008, the latest years for which data are published.
- More than half were a result of untreated or undertreated groundwater sources, usually private wells.
- These 36 outbreaks caused illness in more than 4,000 people and resulted in three deaths.



Private water systems and disease

- Ohio does has improved standards for the construction and sampling of private water systems, however
- Permit data related to these systems is largely stored at the local health districts and is inaccessible for evaluation of emerging public health issues or trends for these water sources.
- Certain disease data is reported to ODH, however
- No effort to link disease data with water well quality information, land use or geologic data



CDC Grant Offering

- CDC – National Center for Environmental Health grant opportunity to build state private water systems capacity offered in Spring 2013 –
- Grant application submitted in May, 2013
- Project award received in late fall of 2013
- Project completion by August 31, 2015.



Project Goals

Outcome 1:

Identify existing and historical private water systems metadata to assess incorporation into a central web based application and EHSNIS.

Outcome 2:

Create a sustainable system to capture and analyze private water systems data through the EH DSI private water module, integrate with other state agency datasets, and record using EHSNIS



Project Goals

Outcome 3:

Develop and use geographical information system (GIS) and other tools to compare key land use, hydrogeology, water quality and reportable disease/symptom data to identify and describe existing exposures, risks, regional patterns, and potential health impacts on private well users.



Project Goals

Outcome 4: Develop and implement targeted interventions for specific regions in the state where ground water quality impairments from contaminants (E.coli, nitrates, arsenic, methane, bacteria) are identified or can be linked to disease or symptoms.



Project Goals

Outcome 5: Identify and develop an evaluation process using the EH DSI functionality, the ability to access and integrate with other ODH and state datasets using GIS, and using the resources of EHSNIS to measure and evaluate the public health outcomes of the interventions.



Project Goals

Outcome 6: Disseminate project results, educational materials, and curricula statewide and in targeted areas as identified through coordination with local health districts, state agencies, and the state



Data Inventory and Entry

- Inventory of private water systems data stored at ODH and local health districts
- Data entry of paper files - data entry operator
- Integration with other state water quality data for water wells – ODNR/Ohio EPA
- Import of digital files in HDIS or other applications - contract funding



Build Program Capacity

- Support development of water module for EH DSI application
 - Permitting and inspection functionality
 - Water quality data
 - Contractor registration and inspection
 - Linkage with well log database at ODNR
 - Interface with ArcMap and GIS tools
- Provide data to the EHS-Net and use the resources of EHSNIS to assist with data analysis.



Environmental Health Services (EHS)

EHS

Environmental Health Specialists Network (EHS-Net)

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Environmental Health Specialists Network (EHS-Net)

EHS-Net (pronounced S-Net) is a [collaborative forum](#) of environmental health specialists whose mission is to improve environmental health practices. These specialists collaborate with epidemiologists and laboratorians to identify and prevent environmental factors contributing to foodborne and waterborne illness outbreaks.

Did you know that half of all foodborne illness outbreaks in the United States are associated with restaurants? EHS-Net did, and since 2002, EHS-Net has conducted 15 studies on restaurant food safety. Read [EHS-Net's Immersive Restaurant Food Safety One Study at a Time](#).  (PDF - 166 KB)

Read about how EHS-Net's [environmental public health practice work supports CDC's Winable Battle on Food Safety](#).  (PDF - 960 KB)



Program Activities

About EHS-Net

How EHS-Net helps health departments improve the practice of EH service programs

EHS-Net Information System

How you can use EHS-Net to support your next data collection activity

Food-safety Projects

EHS-Net food safety study descriptions

Partners

EHS-Net local, state, and federal partners

Study Tools

Protocols and data collection instruments for EHS-Net food research multi-site studies

Study Findings in Plain Language

EHS-Net food-safety study findings and recommendations in plain language

Resources

Completed food-safety projects, EHS-Net, NVEAIS, and more

Publications

EHS-Net publications on food-safety and water-safety studies



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File Formats Help:

 How do I view different file formats (PDF, DOC, PPT, MPEG) on this site?

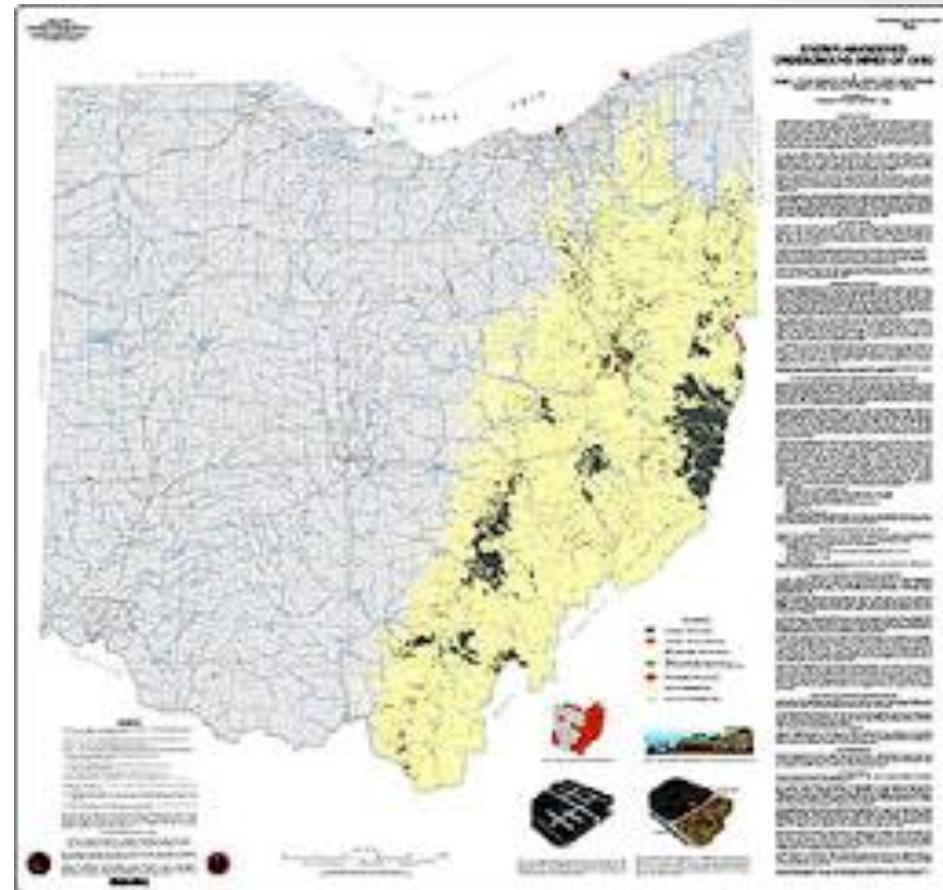
EHS-Net

- EHS-Net (pronounced S-Net) is a collaborative forum of environmental health specialists whose mission is to improve environmental health practice. These specialists collaborate with epidemiologists and laboratorians to identify and prevent environmental factors contributing to foodborne and waterborne illness outbreaks.
- EHS-Net work is based on system theory. EHS-Net assists state health departments in their efforts to improve the practice of environmental health service programs. EHS-Net conducts environmental assessments to determine why an agent was present in the environment in such a way that the host could be exposed.
- EHS-Net works to
 - Identify environmental antecedents (underlying factors) to illness and disease outbreaks.
 - Translate findings into improved prevention efforts using a systems-based approach.
 - Offer training opportunities to current and future environmental health specialists.
 - Strengthen collaboration among epidemiology, laboratory, and environmental health programs.



Project Area

- Abandoned underground mines impacting 32 of 88 counties in Ohio
- Many drift and room/pillar mines have shafts that extend to the ground surface also serving as open conduits for the entry of surface water into aquifers
- Many wells in these areas are open borehole to mine shafts that are both saturated and unsaturated



Disease and Health Data

- Evaluate data and prepare data coverages from the Ohio Disease Reporting System
 - Reportable diseases by law
 - Identify those related to waterborne diseases
 - Data available since 2000
 - Can access location data
- Syndromic surveillance data
 - National Retail Monitoring database – sales of products such as anti-diarrheal medicine
 - Symptom reporting database from emergency rooms and urgent care facilities
 - Both de-identified by zip code
 - About 75% of areas of state is reporting



Other Relevant Datasets

- Geologic data – karst boundaries and related geologic formations/stratigraphy
- Hydrogeologic data- aquifer types, water table and potentiometric surfaces, ground water flow direction and velocities, recharge areas
- Precipitation data – identified periods of high and low precipitation and/or seasonal trends
- Streamflow data – sustained periods of high flow (runoff events) and low flow (base flow)
- Ground water quality data – various sources
- Well log data



Technical Advisory Group

- CDC National Center for Environmental Health staff
- OSU College of Public Health
- ODNR – Divisions of Geological Survey and Soil and Water Resources
- US Geological Survey
- Ohio EPA – Division of Drinking and Ground Waters
- ODH Waterborne Disease Epidemiologist



Analysis

- Use ArcMap tools such as spatial analyst and time tracking to identify correlations between specific disease or symptom occurrences, precipitation events, water quality within the target karst and underground mine areas
- Consideration of time lag after precipitation for recharge to occur, time lag for symptom occurrence after ingestion, and subsequent symptom reporting



Analysis

- Identify other sensitive or specialized hydrogeologic settings (such as factors influencing the presence of arsenic, hydrogen sulfide, manganese) to evaluate against private well quality data and disease and/or syndromic surveillance data.



Analysis and Interventions

- Identify correlations and results
- Identify protective recommendations for well owners in these areas
- Work with OSU Extension to develop targeted educational materials
- Disseminate educational materials through different forums based on the nature of the information - Know Your Well Water site, OSU Extension agent local training/workshop events, direct mailings, webcasts



Evaluation

- Use of independent evaluator for review of the outcomes, strategies and activities of the project through the entire project period, with the provision of a final report by the evaluator.
- Develop and conduct a follow-up evaluation with internal and external stakeholders on the use of the EH DSI application to identify successes, challenges, barriers for use, and potential improvement/changes to the application and/or training needs



Evaluation

- Evaluate the success and applicability of using GIS and other tools to analyze resource extraction data, water quality data and disease/syndromic surveillance data to identify water quality or related health impacts.



Long Term Outcomes

1. Maintain data on potential exposures and risks to populations using private water systems through the continued use and support of the EH DSI private water module.
2. Use the EH DSI's integration and analysis with other ODH, state and federal datasets to facilitate a timely response to emerging health issues and develop appropriate interventions.
3. Improve public health by evaluating water quality and related private water systems data to determine necessary changes to existing state private water system standards.
4. Provide easily accessible, real-time information and resources through the EH DSI system for private water systems data.



Questions??

