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# Glen Helen and Little Miami River Water Quality Fall 2015

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# Glen Helen and Little Miami River Water Quality Fall 2015

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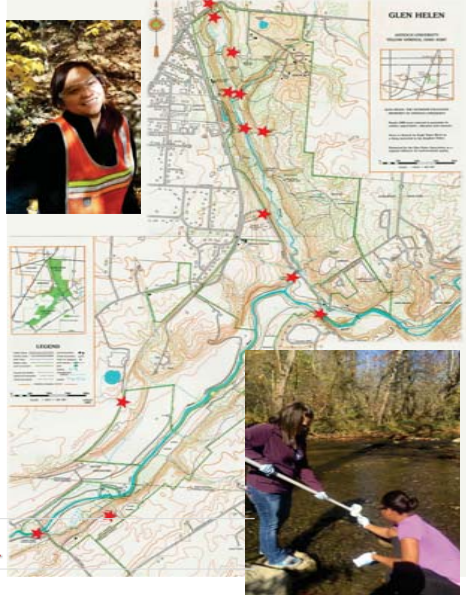


## CHM 4020/6020 Environmental Chemistry SRVI

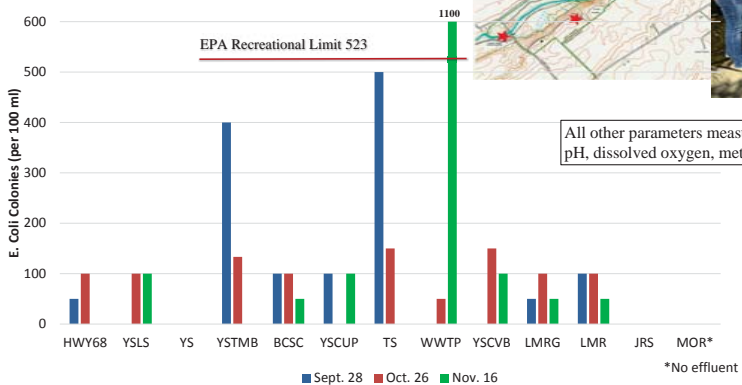
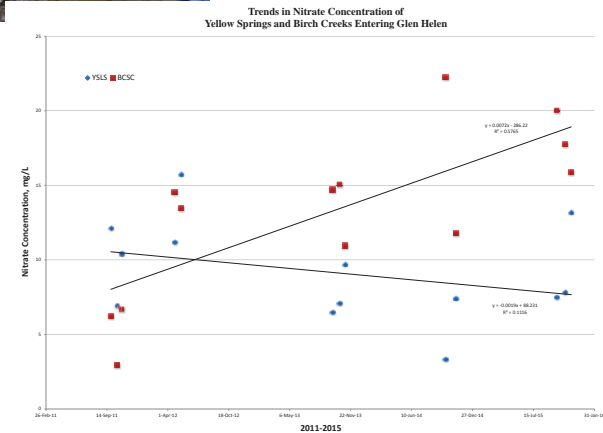
Service Learning Intensive (SVI) - a teaching and learning pedagogy that engages faculty, students, and community members in a partnership to achieve academic learning objectives, meet community needs, promote civic responsibility, and reflect on the learning experience.

More specifically, the objectives for this course are for students to:

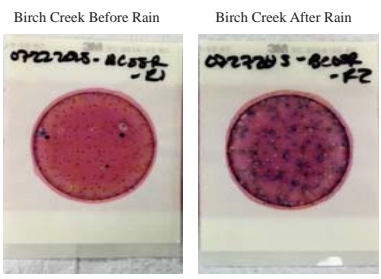
- Apply environmental chemistry concepts learned in the classroom to the interpretation environmental analysis results
- Use Good Laboratory Practice (GLP) through the use of Standard Operating Procedures (SOPs) and EPA methods for the analysis of metals, anions, dissolved oxygen, pH, temperature, conductivity, ammonia, and turbidity
- Follow up on previous years' results showing elevated *E. coli* and nitrates at some sites
- Present results to key stakeholders in the Village of Yellow Springs and Greene County
- Perform residential well sampling
- Complete periodic written reflections to tie classroom, laboratory, field, and community service experiences together



★	HWY68	Yellow Springs Creek north entry into Glen Helen
★	YSLS	Yellow Springs Creek at Yellow Springs Lift Station
★	YS	The Yellow Spring
★	YSTMB	Yellow Springs Creek at Glen Helen Trailside Museum
★	BCSC	Birch Creek Stone Crossing
★	YSCUP	Yellow Springs Creek after Birch Creek input before TS input
★	TS	Traveler's Spring
★	WWTP	Yellow Springs Wastewater Treatment plant effluent
★	YSCVB	Yellow Springs Creek at Covered Bridge, prior to input from BCSC, TS, and WWTP
★	LMRG	Little Miami River at Grinnell Road Bridge, prior to input from Yellow Springs Creek
★	MOR	Morris Bean Inc. effluent (dry, no flow)
★	JRS	Jacoby Rd Spring near Birch Manor House
★	LMR	Little Miami River at Jacoby Rd Canoe Access, includes inputs from YSCVB, LMRG, MOR, and JRS



All other parameters measured were within normal levels; pH, dissolved oxygen, metals, turbidity, conductivity, etc.



Blue dots represent *E. coli* colonies

## Escherichia Coli (*E. coli*)

The water in Glen Helen is of high quality for the parameters tested, except for *E. coli*.

*E. coli* is normally found in feces from animals and humans. Most strains are not harmful but some can cause illness if consumed.

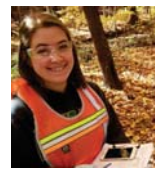
Although not required by OEPA, the Village of Yellow Springs should consider adding year-round treatment of Wastewater Treatment Plant (WWTP) effluent for bacteria because of the high potential of human and animal contact with Yellow Springs Creek.

The WWTP effluent could be treated with UV light in winter to kill bacteria.

*E. coli* enters Glen Helen in extremely high amounts in runoff from precipitation.

People and pets could become sick by drinking water from the creeks, especially after rain.

SPECIAL THANKS TO:  
 Mr. Nick Boutis, Executive Director, Glen Helen Ecology Institute  
 Glen Helen Staff: Mr. Shahkar Strolger, Mr. George Bieri, Mr. Ben Silliman, Ms. Ann Simonson  
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 Dino's Cappuccinos for helping keep the samples cold and the students warm!  
 Mr. Garrett VanNess, laboratory assistance  
 Wright State University Department of Chemistry  
 Sture Fredrik Anliot Fund



## Nitrate

Nitrate levels in Birch Creek where it enters Glen Helen have increased since September 2011 whereas, nitrate levels in Yellow Springs Creek (by Highway 68) where it enters Glen Helen have decreased slightly since September 2011.

Nitrate-Nitrogen was found in levels that exceed the EPA Drinking Water Limit of 10 mg/L in private wells south of the Little Miami River and East of Highway 68 (North Xenia Township). Citizens who live in that area may have wells that are contaminated and should have their wells tested. Infants below the age of six months who drink water containing nitrate in excess of 10 mg/l could become seriously ill. Please contact Dr. McGowin for more information, audrey.mcgowin@wright.edu.

No nitrate was detected in the Yellow Spring or in the Yellow Springs Municipal Well.

## Wastewater Sinkhole

Since 2011, each environmental chemistry class has documented the fact that the effluent from the Morris Bean, Inc. wastewater pond does not flow from the Morris Bean property into Glen Helen according to their Permit to Discharge (11N00095001). Previously, it was confirmed by the Ohio EPA that their wastewater effluent was, in fact, flowing down a sinkhole.

Since the Yellow Spring Municipal Wells are downstream, the village should consider setting timelimes with OEPA and Morris Bean to permanently correct the situation by requiring a different method of wastewater management



Site of Morris Bean effluent, or lack thereof, into Glen Helen