BUILDING A CLIMATE-RESILIENT WORKFORCE: ADDRESSING EDUCATION AND TRAINING NEEDS FOR OHIO'S GREAT LAKES COMMUNITIES

Jason Cervenec, Traci Lepicki, and Lorrayne Miralha

Ohio ACTE Conference

July 21, 2026

ATTENDEE CHECK-IN CODE

4 2 Z R

Attendees scan this, or open **events.ohioacte.org/my-pass**, find their pass, tap *Check in to this session*, and enter **42ZR**.

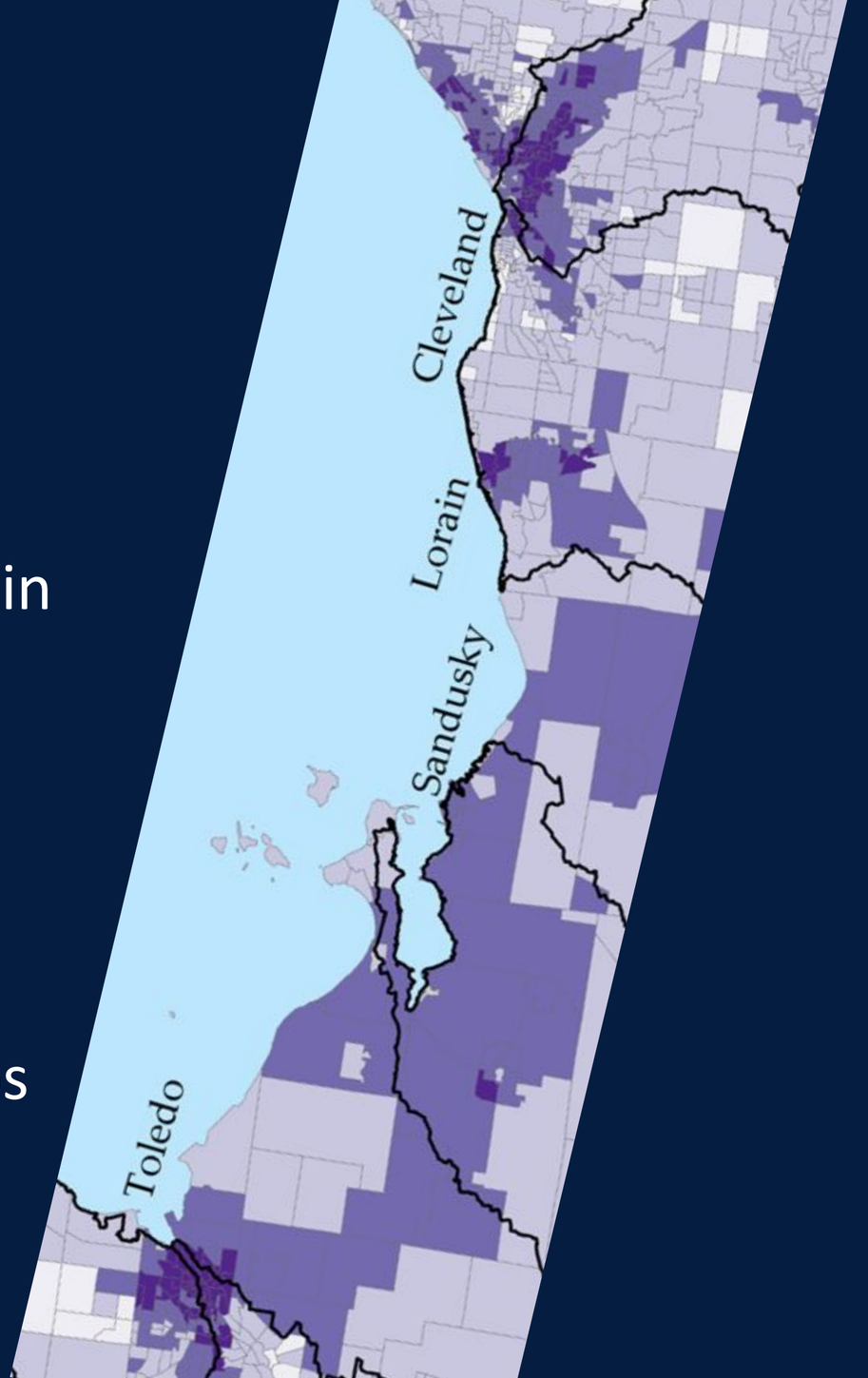
Project Overview

Goal

- Train at least 100 climate-ready workers, including technicians, scientists, and engineers, to fulfill the specialized workforce needs of the water industry in the Great Lakes by 2028

Timeline – Program and Recruitment

- Design Phase: CETE, ESD, microcredentials, and recruitment
- Implementation Phase: Hands-on training and jobs



Program we are building

Workshop training

1. Water quality monitoring
2. Mapping water systems with GIS
3. Sustainable Land and Water Systems
4. Stormwater Management

Micro-credentials

1. Humanitarian engineering
2. Risk Assessment of water systems
3. Stormwater systems inspection and maintenance

2-year Degree Community College

1. Data analytics in water resources in partnership with LCCC

4-year Degree University (undergraduate level courses)

1. Engineering for sustainable development
2. Ecological engineering
3. Design of Urban Stormwater Control Measures

Graduate Degree University

1. MS and PhD in Food, Agricultural, and Biological Engineering (focus watershed modeling and data analytics)
2. MS and PhD in Civil, Environmental, and Geodetic Engineering (focus infrastructure risk and stormwater management)

Water Quality Management

Sensor Technology

And More!

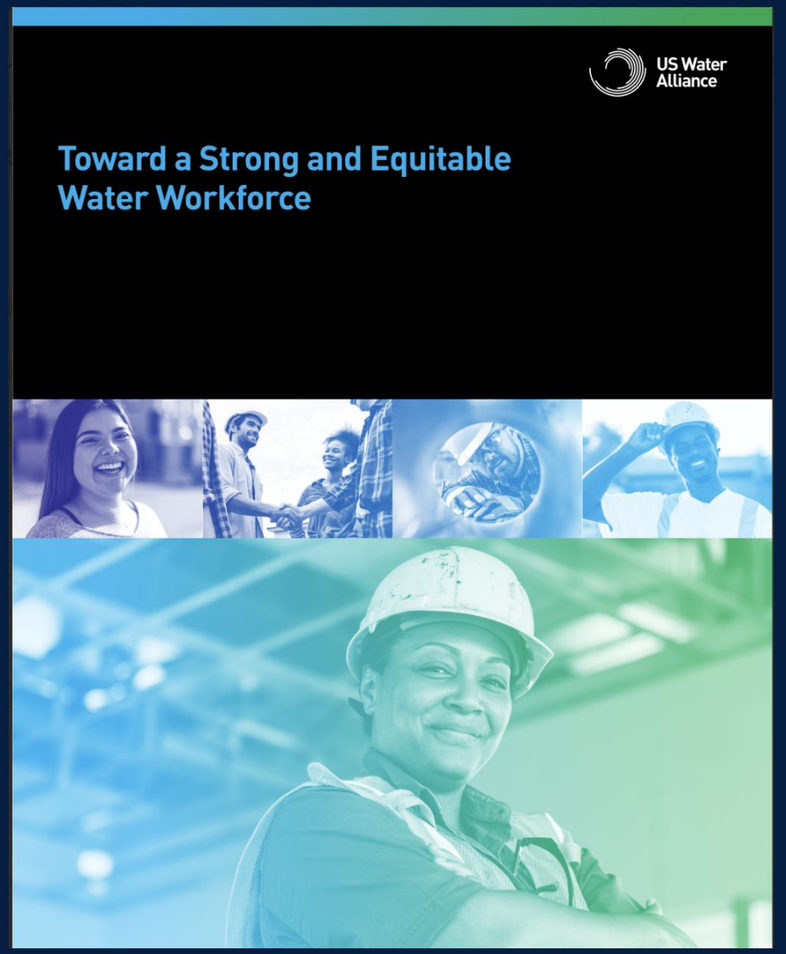
Wetland Delineation

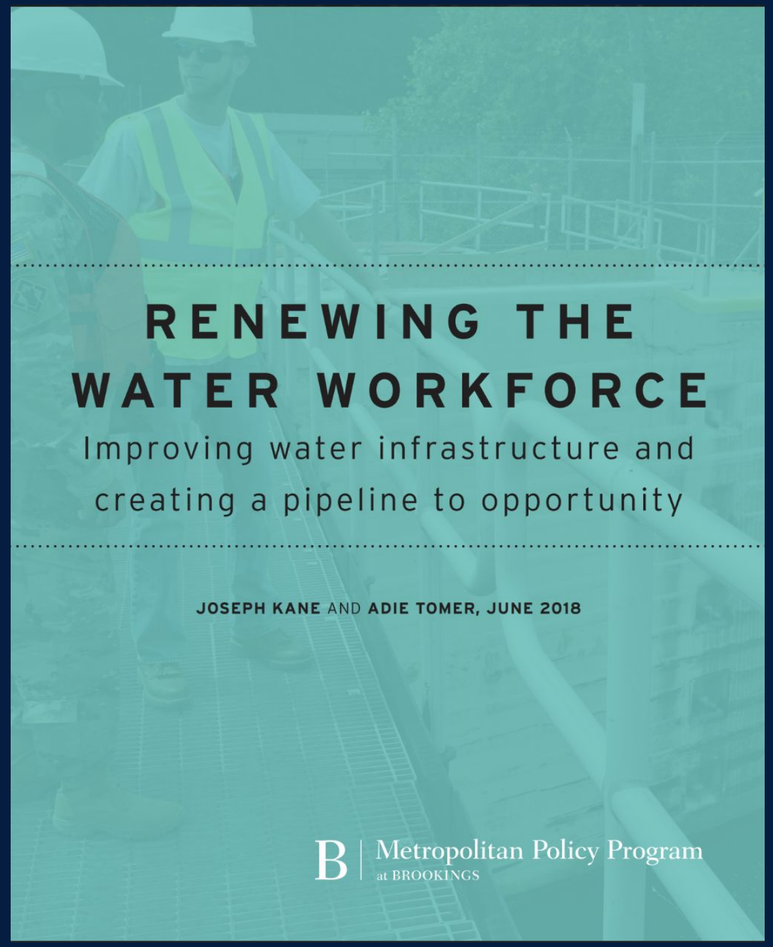
Stormwater Control Measures

Preliminary Information to Guide the Project

Report assembled by state government ~10 years prior indicated unfilled demand in career sector

Anecdotal reports of shortage of applicants to fill current positions and "silver tsunami" of employees eligible to retire





Defining the "Water Resources" Career Sector

- Some members of the project team envisioned the water resources sector focused on employees in water and wastewater treatment plants as well as installation of infrastructure, such a building facilities and laying pipe.
- Other members of the project team envisioned water resources sector focused on site assessments, wetlands restoration, and installation of green infrastructure.
- The team adopted an inclusive definition, with the former being established careers that still needed employees and the later being emerging careers seeing continued growth.

Employer Needs Assessment Survey

Goal

- Gather information to better understand local workforce needs
- Identify training needs associated with those workforce needs
- Assist with identifying opportunities for occupational analysis and input for supporting curriculum development

Survey Results

Current and Projected Workforce Need

- Environmental Manager, Environmental Sampling and Analysis Scientist, and Environmental Sampling and Analysis Technician

Identified Skill Gaps

- Basic knowledge in watershed issues
- Basic taxonomy
- Data analysis programs such as R
- General computer classes
- Identification of macroinvertebrates and fish species
- Interpreting topographic maps and construction plans
- Wetland identification/delineation
- More hands-on experiences

DACUM Functional Analysis Workshops

- Data Collection and Analysis
- Erosion and Sediment Control

DACUM Results:

Data Collection and Analysis

DACUM Research Chart for Data Collection and Analysis Function

March 10 & 11, 2025

DUTIES	TASKS								
A. Perform Project* Planning	A.1 Determine project objectives (e.g., goals, hypothesis, outcomes)	A.2 Obtain management approval	A.3 Assemble project coordination team	A.4 Coordinate with project partners and stakeholders	A.5 Obtain project funding (e.g., grant funds, budget, milestones)	A.6 Review historical data (e.g., reports, as-builts, video footage)	A.7 Obtain work permits/property permissions	A.8 Determine project methodologies (e.g., sampling, assessment, testing)	A.9 Identify data collection sites
	A.10 Establish data collection schedule	A.11 Create data management plans (e.g., study plan, retrieval, storage)	A.12 Create QA/QC plan	A.13 Develop data analysis plan	A.14 Create project assets (e.g., templates, forms)	A.15 Determine project resource requirements (e.g., tools, tech, staff)	A.16 Identify project-specific training and development needs	A.17 Delegate project tasks	A.18 Develop project evaluation plan (e.g., deliverables, model confirmation, timeline)
	A.19 Determine safety								
	B.2 Maintain spare part and supply inventory	B.3 Test technical equipment (e.g., instruments, meters, motors)	B.4 Troubleshoot technical equipment		B.5 Repair malfunctioning tools and equipment	B.6 Perform equipment preventative maintenance (e.g., clean, batteries, fuses)	B.7 Maintain equipment records	B.8 Assemble technical equipment	B.9 Update equipment firmware and software
	C.2 Confirm field work permissions	C.3 Determine site access locations	C.4 Gather field work supplies and equipment (e.g., bottles, paperwork, preservatives)		C.5 Verify equipment calibration	C.6 Provide field work information to public	C.7 Gather site information from public	C.8 Install monitoring equipment	C.9 Collect in situ measurements
	C.11 Conduct environmental field assessment (e.g., biological, habitat, plant/animal)	C.12 Collect field samples	C.13 Coordinate sample processing with lab (e.g., chain of custody, schedule, hold times)		C.14 Restore work area to original condition	C.15 Verify industrial self-monitoring reports	C.16 Report nuisance conditions	C.17 Document field data (e.g., scan, transcribe, upload)	
	D.2 Subdivide field samples	D.3 Store field samples	D.4 Prepare sample per intended analysis		D.5 Prepare test reagents and standards	D.6 Analyze biological samples (e.g., identify, quantify, specify)	D.7 Conduct chemical analysis (e.g., instrumental, wet chemistry)	D.8 Verify quality control checks (e.g., standards, blanks)	D.9 Maintain lab environment (e.g., temperature, humidity, cleanliness)
	D.11 Re-analyze anomalous results	D.12 Ship samples for commercial analysis	D.13 Input data into secure information management system						
	E.2 Create data optimization resources (e.g., scripts/macros, programs, templates)	E.3 Prepare data for analysis (e.g., clean, sort, filter)	E.4 Perform data exploration (e.g., compute summary statistics, initial visual representation, data gaps)		E.5 Conduct statistical analysis (e.g., test hypothesis, identify trends and relationships)	E.6 Develop predictive models (e.g., test, validate, calibrate)	E.7 Perform data interpretation (e.g., standards, models, targets)	E.8 Perform data visualization (e.g., figures, tables, maps)	E.9 Create draft report
	E.11 Obtain stakeholder feedback (e.g., peer review, public comment)	E.12 Address stakeholder feedback	E.13 Finalize project report						

DACUM Results:
Erosion and Sediment Contro

DACUM Research Chart for Erosion and Sediment Control Function

Produced for

NOAA — National Oceanic and Atmospheric Administration — U.S. Department of Commerce

DACUM Observers - OSU
Jason Cervenec
Joey Smith
Cherish Vance

DACUM Facilitators - OSU
Kate Fergus
Tricia Hughes-Fitzgerald

7 duties & 127 tasks

Produced by

The Ohio State University
CENTER ON EDUCATION AND TRAINING FOR EMPLOYMENT

DACUM International Training Center
Columbus, Ohio

June 16 & 17, 2026

DACUM Panel

Elli Alexander
Owner/Project Engineer
Follow the River Environmental
McConnelsville, Ohio

Paul Demuth
President
Ohio Land Improvement Contractors Assn.
Vermilion, Ohio

Hans Gucker
Construction Hydraulic Engineer
Ohio Department of Transportation
Columbus, Ohio

Aaron Habig
Urban Technician II
Hamilton County Conservation District
Cincinnati, Ohio

Jon Prier
Hydraulic Environmental Engineer
Ohio Department of Transportation
Columbus, Ohio

Justin Reinhart
Stormwater Engineer
Ohio EPA
Columbus, Ohio

Samantha Robbins
President
BREMA Resources
Columbus, Ohio

Ian Simpson
Associate Director
Chagrin River Watershed Partners
Willoughby, Ohio

Eric Stottlemyer
Manager
At Grade
Marysville, Ohio

Additional DACUM Analysis

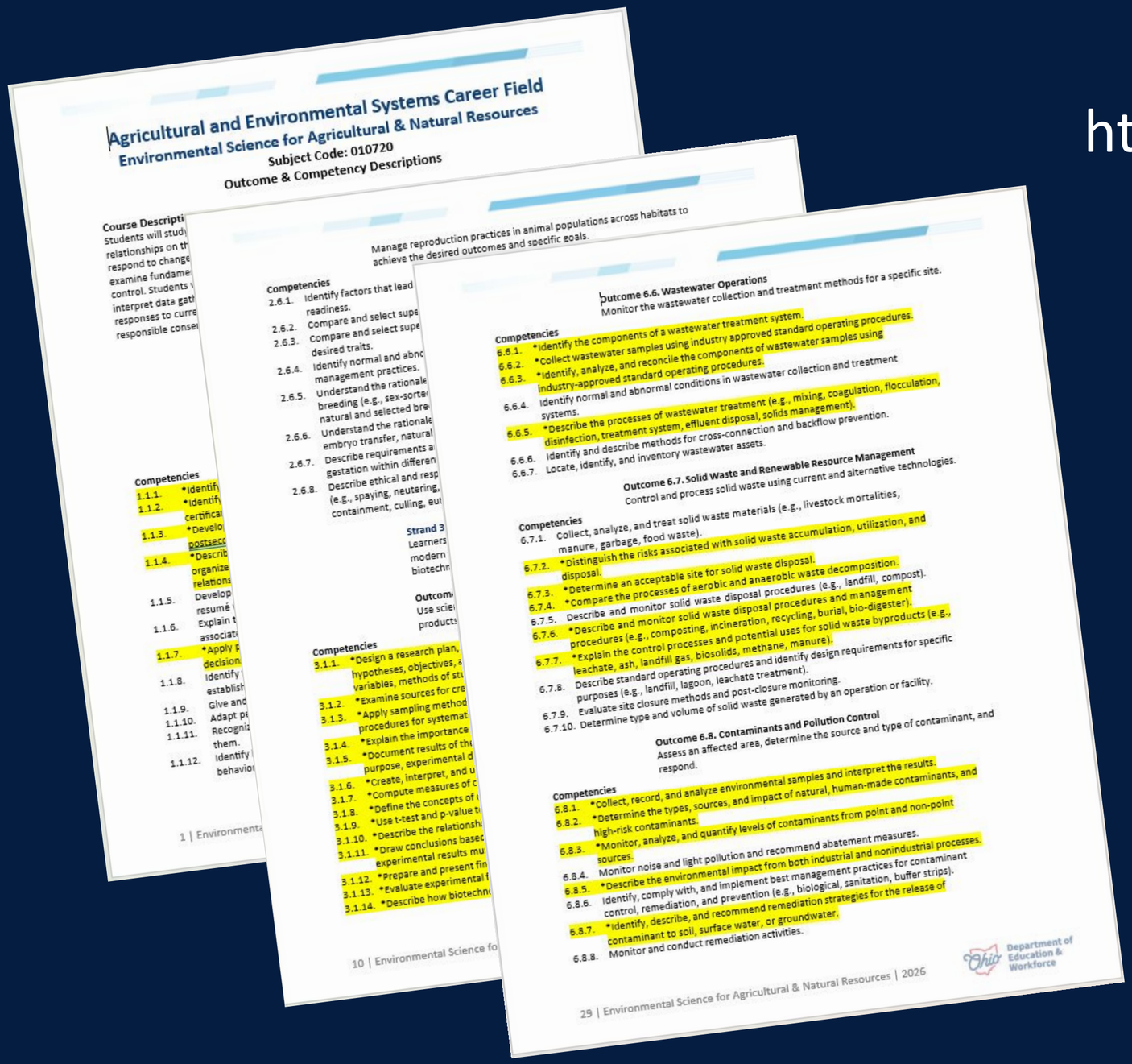
Charts Developed in Collaboration with Ohio EPA

- Class I Wastewater Collection System Operator
- Class II Wastewater Treatment Operator
- Wastewater Treatment Operator Class III
- Class IV Wastewater Treatment Plant Operator
- Class I Water Operator
- Class IV Water Supply Operator
- Collection System 2 Operator
- Environmental Specialist II-CDO
- Water Chemistry Data Collector

Content Standards Alignment

- Department of Labor Competency Model Clearinghouse
  - Reviewed the Water and Wastewater Competency Model

- Ohio's Career Field Technical Content Standards
  - Reviewed Construction Technologies
    - Mapped at strand level to six course outlines
    - Competency mapping in process
  - Reviewed Agricultural and Environmental Systems
    - Mapped at competency level to nine course outlines



https://go.osu.edu/ohioacte2026

ATTENDEE CHECK-IN CODE

4 2 Z R

Attendees scan this, or open **events.ohioacte.org/my-pass**, find their pass, tap *Check in to this session*, and enter **42ZR**.

Questions and Feedback

1. How does our work align with demand you are seeing from employers? Interests you are seeing from students?
2. Does the process seem well-aligned with assessing demand/future demand and aligning the skill set?
3. Any feedback, guidance, recommendations?
4. Are you interested in collaborating with the team if there are opportunities? If so, please add your name, school, and e-mail address to our contact list.

Climate-Ready Workforce Project Website

https://go.osu.edu/crw

- Needs assessment report
- DACUM charts
- Links to trainings and project partners

Thank you!

Jason Cervenec
cervenec.1@osu.edu

Traci Lepicki
lepicki.1@osu.edu

Dr. Lorrayne Miralha
miralha.1@osu.edu

THE OHIO STATE UNIVERSITY