

Annual Report 2017



Dickinson

Our mission

The Alliance for Aquatic Resource Monitoring (ALLARM) is a community-based science organization housed in Dickinson College.

ALLARM educates communities to use science as a tool to investigate the health of their streams and to use the data they generate for aquatic protection and restoration efforts.

Cover: Volunteers in Bethel Township, Pennsylvania (Berks County) collect macroinvertebrates to assess stream health.

This page: The LeTort Spring Run in Carlisle, Pennsylvania.

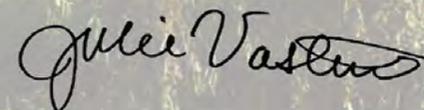
Dickinson

Letter from the director

Wow, ALLARM is 31! Water quality questions have changed, but some things remain as true as in 1986. We have always been fortunate to work with dedicated volunteers and our student staff continue to amaze me by turning classroom skills into diverse community-based projects.

Thanks to committed, engaged communities collecting scientific data on their streams, as a larger community, we have a better understanding of watershed health in Pennsylvania and New York. Again and again, we see the power of volunteer monitors assessing water quality and using their data for change in their communities.

We have a lot to be thankful for in our 31 years; our volunteer collaborators, team, community partners, colleagues, funders, and especially Dickinson College. We look forward to what the future has in store for us.



Julie Vastine, Director

Volunteer monitoring and technical assistance

Watershed Coordinator
Juliet Risko '19 (center)
trains volunteers how to
measure dissolved oxygen.



"ALLARM has always assisted us when in need and provided our watersheds hope to be safeguarded."

Bill Kibler, Brokenstraw Watershed Council

We supported 26 organizations across PA and NY.

We supported community partners that monitor a variety of water quality parameters in order to obtain baseline data that can be used to protect and restore their local waterways.

We ensured the quality of volunteer data.

Student lab coordinators verified that volunteers are collecting credible data of known quality. Our Volunteer Monitoring Quality Control Program analyzed 266 water samples from 218 volunteers, using 20 different testing methods for a total of 2,837 values.

We conducted our first Chesapeake Monitoring Cooperative (CMC) workshop.

The CMC is the first multi-state project to integrate volunteer-collected water quality data into a federal analysis of a multi-state watershed. We conducted our first CMC workshop for 24 Otsego County Conservation Association volunteers in New York.

We helped volunteers understand their data.

ALLARM helped 17 monitors in 5 counties who monitored 32 sites analyze the relationship between their conductivity data, land use, and geology. Through personalized letters, we were able to emphasize the importance of volunteers' contributions to baseline water quality data in Pennsylvania.

Carlisle and campus engagement

Watershed Coordinators Allison Curley '19 (right) and Xinyi Wu '19 (center) mark storm drains with a community member during the Stormwater Spectacular.

"The Adopt a Storm Drain campaign...ensures stormwater can flow into storm drains [as quickly] as possible to reduce pollution and street flooding."

Carlisle Gazette

We presented in 16 Dickinson College classes.

15 student Watershed Coordinators presented to 375 students. Our students have the opportunity to build skills in the classroom, apply those skills through their community work at ALLARM, and bring those skills and experiences back to the classroom.

We engaged volunteers in the Carlisle community.

In collaboration with multiple community partners, we worked with over 30 volunteers to assess the health of our local watershed through the Conodoguinet Creek Watershed Snapshot. Volunteers collected data throughout the watershed and brought samples to ALLARM's lab, where they learned how to test three water quality parameters.

We spread awareness of stormwater and local water quality issues.

ALLARM continues to partner with the Borough of Carlisle to raise awareness about the impact of stormwater runoff on the LeTort Spring Run. This year ALLARM hosted six community educational events for 100 residents.

We contributed to Bosler Memorial Library's Institute for Lifelong Learning.

Full-time staff and 3 student Watershed Coordinators taught 5 courses about a variety of issues affecting Pennsylvania water quality. Over 20 community members attended the courses to learn and apply water quality assessment techniques.

Contributions to the field

Volunteers collect macroinvertebrates and water samples.

"[The] webinar was very informative and, overall, one of the most useful webinars I've ever attended. Thank you."

Therese Beaudoin, Watershed Coordinator, DEP Bureau of Water Resources (Massachusetts)

We led 3 national webinars.

We led 2 National Water Quality Monitoring Conference webinars, "Volunteer Monitoring: Building Credibility" and "Exploring the Worlds of Citizen Science and Volunteer Monitoring." We also led a Citizen Science Association webinar, "Exploring Tools for Volunteer Recruitment and Engagement."

We attended 4 conferences and presented 6 times.

We attended the Pennsylvania Statewide Conference for Watershed Organizations in State College and presented 3 times. Along with one of our OCCA partners, we presented at the Upper Susquehanna Watershed Forum about our CMC collaboration. We also attended a Citizen Science Association conference in Minneapolis and the Mid-Atlantic Regional Air Management Association Monitoring Training Workshop in Philadelphia, where we discussed operational models of community science.

We represented the national volunteer monitoring community.

ALLARM serves on the National Water Quality Monitoring Council, comprised of 30 federal, state, tribal agencies, and stakeholders to collaborate on the assessment of U.S. waters. ALLARM chairs the Volunteer Monitoring Work Group.

Our publications reached a wide audience.

We contributed an article to the National Water Quality Monitoring Council's Spring 2017 newsletter about our research published in the journal *Citizen Science: Theory and Practice*. Our publications on Dickinson Scholar were downloaded 3,241 times by 357 institutions in 92 countries.

ALLARM student experiences



Watershed Coordinator Tom O'Donnell '19 (left) discusses water quality parameters with Institute for Lifelong Learning attendees.

"[ALLARM students] did a wonderful job communicating the science and community action that make ALLARM so important to environmental protection."

Kirk Doran, community member

Our students continued to build their communication and collaboration skills through a number of events that helped them connect their work at ALLARM to the greater community.

"Until I [did a workshop] I had no idea how much time some folks invest in monitoring [...] Seeing the time and effort it takes to monitor and monitor for years, I am impressed and proud to serve communities like theirs." - Cheyenne Moore '18

"The Conodoguinet Snapshot events certainly connected me to ALLARM's mission. It was refreshing to interact with such a high number of conservation-conscious community members. To see them excited about their data was special." - Nick Long '19

"[Multiple community events] have allowed me to feel more connected to the communities which make up ALLARM. I was able to educate community members [about] water chemistry and stormwater concepts, engage them through hands on activities, and empower them to conduct their own tests." - Meredith Jones '20

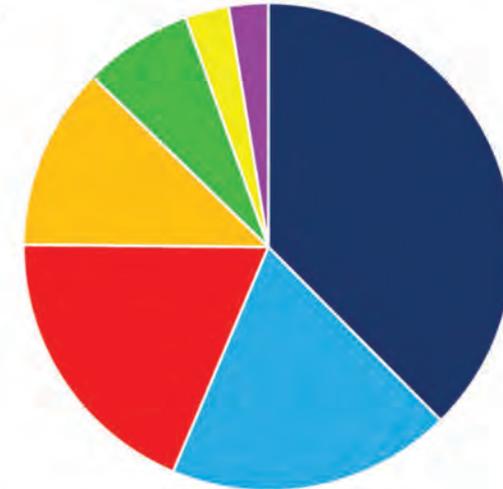


A look ahead

As we enter our 32nd year supporting community-based research, we look towards new projects and continued partnerships. We look forward to new opportunities for communities to engage in scientific research across Pennsylvania and New York, and thank all of our volunteers for bringing their research questions, passion, and interests to our work. Thank you also to our partner organizations for your resources, expertise, and support!

Funding Sources

- \$130K Dickinson College
- \$65K Consortium for Scientific Assistar to Watersheds
- \$65K Chesapeake Monitoring Cooperative
- \$42K Individual Contributions
- \$25K Foundation for Pennsylvania Watersheds
- \$10K General Contracts
- \$9K Colcom Foundation



ALLARM gratefully acknowledges support from Dickinson alumni, family, and friends, including John '60 and Ann '63 Curley, Mark '81 and Lisa Burgess, Rick '81 and Mary Shangraw, Jessica Howard '01, and Katie Mattern '16.

ALLARM also appreciates support from the Charles Merrill Kurtz Fund, established in memory of Charles M. Kurtz, class of 1907.

ALLARM's year by the numbers

- 4 Youth education events
- 7 Open-access publications and community resources
- 26 Groups supported in Pennsylvania and New York
- 30 Rain barrels distributed to Carlisle community members
- 35 Community events
- 52 Carlisle storm drains routinely cleared by volunteers
- 300 Volunteers reached
- 432 Dickinson students reached through collaborations and events
- 450 Carlisle area K-12 students reached
- 459 Water samples analyzed
- 460 Trees cared for at the stream restoration (buffer) site
- 4,350 Total water sample tests
- 5,168 Shale gas observations uploaded to ALLARMwater.org