

2017 Citizen and Non-Agency Monitoring Activity Report

**Virginia Department of Environmental Quality
Water Monitoring and Assessment Program**

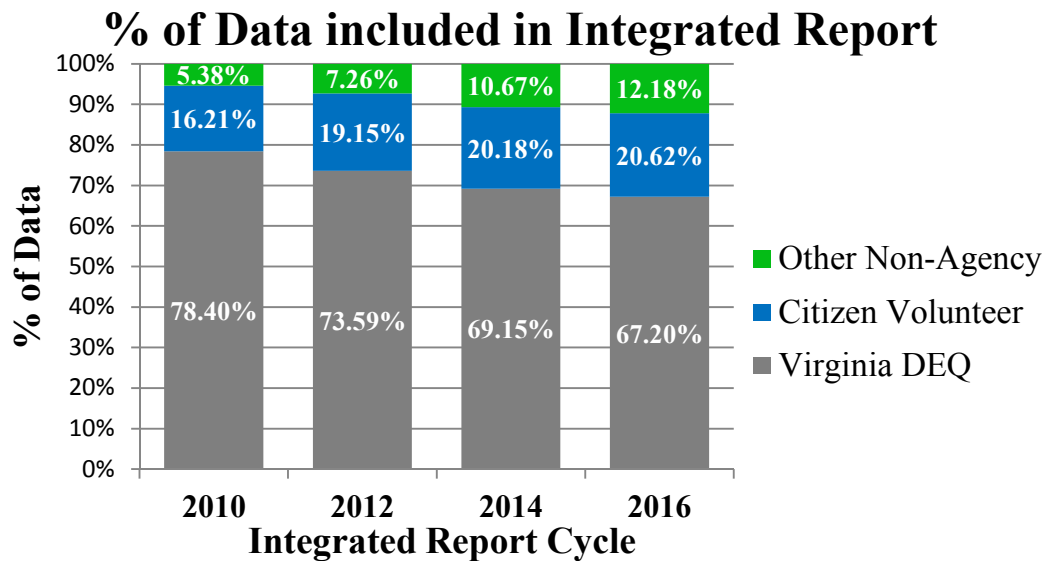
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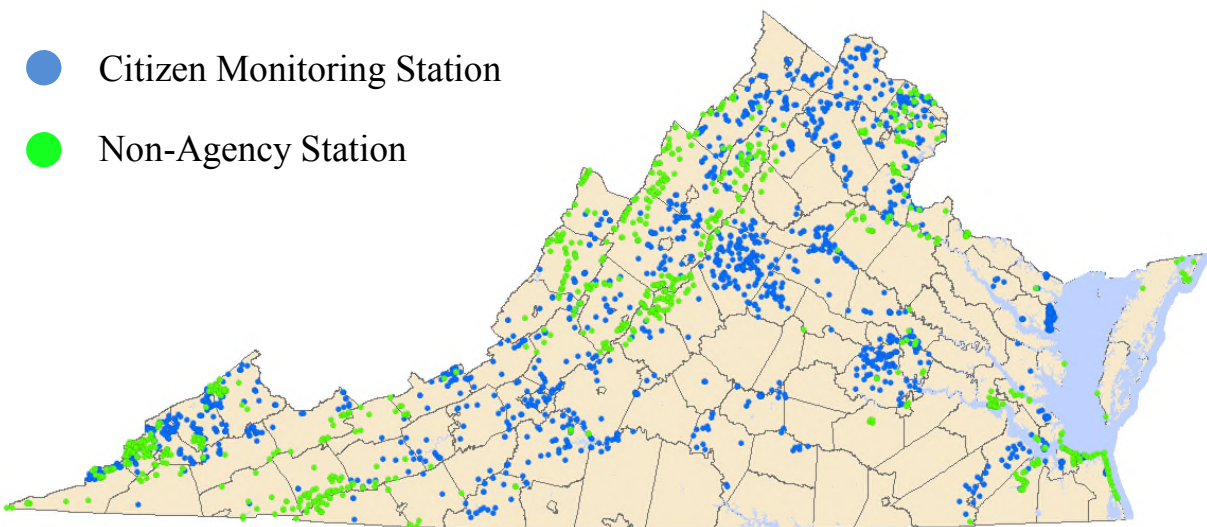
2017 Citizen and Non-Agency Monitoring Activity Report

The Virginia Department of Environmental Quality (DEQ) began assessing water quality data from citizen and other non-agency monitoring organizations in 2004. Much of the data the agency receives is included in the biennial Integrated Water Quality Assessment Report (Integrated Report). This Integrated Report is submitted to the U.S. Environmental Protection Agency (EPA) under sections 305(b) and 303(d) of the Clean Water Act. This report summarizes how DEQ interacted with monitoring organizations during 2016.

In the latest 305(b)/303(d) report, DEQ utilized data from over 2,500 stations sampled by citizen and other non-DEQ monitoring organizations. This represents nearly a full third (32.80%) of all stations included in the report that originated from monitoring done by citizen volunteers (20.62%) and other non-agency monitoring (12.18%) organizations.



This submitted information has resulted in increased monitoring coverage in significant portions of Virginia. These areas include large clusters in the Shenandoah Valley, southwest Virginia, northern Virginia, and the Charlottesville, Richmond, Roanoke, and Tidewater metropolitan areas.



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Citizen Monitoring Activities:

Citizen and other monitoring data submitted to DEQ fall into one of three categories. The highest level is known as Level III. Level III data is used the same way as if the water samples were collected by agency staff. This includes assessing waterbody health and help list and delist impaired waters. Monitoring groups must meet three conditions to have their data classified as Level III:

1. Pass a DEQ field or (when applicable) laboratory audit
2. Possess a DEQ approved Quality Assurance Project Plan (QAPP) and field or laboratory Standard Operating Procedures (SOP).
3. Provide necessary calibration log and related quality control information to DEQ.

In 2004 when DEQ began classifying citizen data as being capable of meeting Level III, less than 50 stations met this standard. For the 2016 Integrated Report, 1069 sites met this status as outlined in **Table 1**.

Table 1- Level III Citizen Volunteer Organizations and Academic Institutions:

Organization	Member Groups	Level III Sites*	Level III Parameters
Alliance for the Chesapeake Bay	8	81	Dissolved Oxygen (DO), pH, temperature (temp)
Clean Virginia Waterways	1	21	E. coli
Coast Guard Auxiliary Flotilla 33	1	7	DO, pH, temp
Dividing Creek Association	1	50	DO, pH, temp
Friends of Norfolk Environment	1	11	Enterococcus
Friends of the North Fork Shenandoah River	1	6	DO, E. coli, pH, temp
Friends of the Shenandoah River	7	145	Ammonia, DO, E. coli, pH, temp
Goose Creek Association	1	34	Temp
Historic Green Springs Inc.	1	7	DO, nutrients, temp
Isle of Wight Ruritan Club	1	13	DO, temp
Lake Anna Civic Association	1	45	Chlorophyll a, DO, E. coli, nutrients, pH, temp
Lake Monticello Owners Association	1	15	DO, E. coli, nutrients, pH, temp
Leesville Lake Association	1	11	DO, E. coli, pH, temp
Lewis Ginter Botanical Garden	1	4	DO, pH, temp
McClure River Restoration Project	1	24	E. coli
Nansemond River Preservation Alliance	1	9	DO, temp
New River Conservancy	1	35	DO, temp
Peninsula Chapter Virginia Master Naturalists	1	4	Temp
Phi Theta Kappa Blue Ridge Community College	1	2	pH, temp
Poquoson Citizens for the Environment	1	26	pH, temp
Rivanna Conservation Alliance	1	121	Macroinvertebrates
Roanoke Valley Chapter Trout Unlimited	1	10	Temp
Smith Mountain Lake Association	3	162	Chlorophyll a, DO, E. coli, nutrients, pH, temp
Southern Appalachian Mountain Stewards	1	226	Selenium (5 sites), temp
Virginia Aquarium and Marine Science Center	1	7	DO, pH, temp
Total	40	1,069	

* Stations with accurate site coordinates and located away from permitted discharges



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DEQ also receives and uses data from Level II monitoring groups. Level II is data from organizations that have a DEQ approved QAPP or SOP. However, field or laboratory methods may deviate from those recognized by DEQ. For example, a group identifies benthic macroinvertebrates to Order instead of Family or Genus level as used by DEQ. However, such differences will likely produce a similar result when compared to a Level III method. Level II data helps DEQ to identify waters for future agency monitoring and track water quality restoration progress between DEQ or Level III sampling events. For the 2016 Integrated Report, 734 sites met Level II status and is outlined in **Table 2**.

Table 2- Level II Citizen Volunteer Organizations and Academic Institutions:

Organization	Member Groups	Level II Sites*	Level II Parameters
Blackwater/Nottoway Riverkeeper	1	12	DO, E. coli, pH, temp
Chesapeake Beach Civic League	1	14	DO, E. coli, pH, temp
Chesterfield RiverTrends	1	57	DO, E. coli, pH, temp
Chickahominy Swamp Rats	1	22	E. coli
Cowpasture River Preservation Association	1	20	DO, E. coli, pH, temp
Cubitt Creek Monitors	1	10	E. coli
Fairview Beach Monitors	1	69	E. coli
Four Creeks Monitors	1	16	DO, E. coli, pH, temp
Friends of Russell Fork	1	19	E. coli, temp
George Mason High School	1	4	E. coli
Hoffler Creek Wildlife Foundation	1	1	DO, pH, temp
James River Association	1	10	E. coli
John Marshall Soil and Water Conservation District (SWCD)	1	35	DO, E. coli, pH, temp
Lake Gaston Association	1	2	E. coli
Loudoun Watershed Watch	1	13	E. coli
Northern Neck SWCD	1	4	E. coli
Pebble Creek Property Owners Association	1	4	E. coli, temp
Prince William SWCD	1	17	E. coli
Randolph Macon College	1	10	E. coli
RappFLOW	1	12	E. coli
Rippon Middle School	1	6	E. coli
Riverine Chapter Virginia Master Naturalists	1	6	DO, E. coli, pH, temp
Southeast CARE Coalition	1	15	E. coli, temp
Southside SWCD	1	21	E. coli
Thomas Jefferson SWCD	1	26	E. coli
Tri-County/City SWCD	1	8	E. coli
Upper Tennessee River Roundtable	1	4	E. coli
Virginia Save Our Streams	74	297	Benthic macroinvertebrate
Total	101	734	

* Stations with accurate site coordinates and located away from permitted discharges

Citizen Monitoring Grants:

DEQ routinely offers funds to support volunteer-based water quality monitoring. Grant applications are generally accepted during the summer of each year with awards distributed at the end of the year. Funds are used by the grant recipients for the following year with a report due shortly thereafter.



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In 2017, the agency received \$120,783.17 in grant requests with \$88,000 available for awards. Of the 27 applications received, 21 received an award. The grant awards supported citizen volunteer related activities for the 2018 calendar year. Grant recipients will provide a final report with associated monitoring data due by February of 2019. [Appendix 1](#) contains more information about the FY2018 Citizen Monitoring Grant recipients.

Citizen Monitored Stream Miles:

Since 2008, DEQ has tracked the number of miles monitored by citizen and other organizations. Mileage is calculated based on if the station was included in the most recent 305(b)/303(d) Integrated Report. For the 2016 305(b)/303(d) report, citizen groups continued to provide increasing amounts of data. This is reflected by the general increase in the number of stations monitored and sample data points collected.

For the 2016 report, 3,766.89 stream miles were covered along with 89.31 square miles of estuaries and 15,477.64 acres of lakes and reservoirs. **Table 3** lists the amount of coverage citizen groups have provided to the agency since 2008.

Table 3- Citizen Mileage Summary

Integrated Report	Monitoring Year	Stations Submitted	Sample Events	Stream Miles	Estuary Mi ²	Lake Acres
2008	2001-2006	1,002	15,605	2,371.61	73.74	9,726.15
2010	2003-2008	1,485	23,420	3,499.45	37.48	30,052.98
2012	2005-2010	1,774	30,829	4,124.44	40.15	27,975.46
2014	2007-2012	1,494	31,871	3,559.96	34.48	24,860.47
2016	2009-2014	1,902	32,859	3,766.89	89.31	15,477.64

Other Non-Agency Monitored Miles:

Along with tracking the monitoring coverage of citizen volunteer groups, the agency also tracks the monitoring coverage by other non-DEQ organizations. These “non-agency” organizations consist of other government agencies, private businesses, and others who voluntarily provide data to DEQ.

For the 2016 report, 2,808.5 stream miles, 64.86 square miles of estuaries, and 9,284.80 acres of lakes were monitored by non-agency organizations. **Table 4** lists the amount of coverage non-agency groups have provided to DEQ since 2008.

Table 4- Non-Agency Mileage Summary

Integrated Report	Monitoring Year	Stations Submitted	Sample Events	Stream Miles	Estuary Mi ²	Lake Acres
2008	2001-2006	446	19,844	1,262.98	266.09	5,412.23
2010	2003-2008	368	12,284	638.90	28.86	10,685.04
2012	2005-2010	506	11,881	1,433.44	87.82	8,334.23
2014	2007-2012	857	26,328	1,366.56	480.21	12,868.83
2016	2009-2014	1,055	15,827	2,808.5	64.86	9,284.80

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Citizen Nominations:

Each year, DEQ invites the public to nominate waterbodies for sampling by the agency. In 2017, the agency received nominations to monitor four waterbodies. The agency will be able to perform follow up monitoring on two waterbodies for the 2018 sampling year. **Table 5** lists the nominated waters that are to be monitored by DEQ.

Table 5: Nominated Waterbodies Prioritized for DEQ Monitoring

Stream Name	County	Parameter	Group
Dog Branch	Loudoun	Macroinvertebrate	Loudoun Watershed Watch
Milltown Creek	Loudoun	Macroinvertebrate	Loudoun Watershed Watch

Public Outreach:

DEQ actively engages the public in its citizen monitoring program through supporting community events. Agency staff will frequently speak at meetings and attend events to promote environmental stewardship and education. In 2017, staff participated in 23 events as outlined in [Appendix 2](#).

Volunteer Monitoring Training:

DEQ takes an active role in training and assisting citizen monitoring organizations to help train new volunteers. In addition, the agency routinely performs field and laboratory audits to ensure data received meets Level II and III requirements. In 2017, DEQ staff participated in 16 training and technical assistance events with various citizen monitoring groups. [Appendix 3](#) provides additional details of these events.

Citizen/Non-Agency Monitoring Database:

Due to an upgrade in the agency's Oracle data management system, the Citizen/Non-agency database went offline in March 2017. This was due to a program incompatibility of the database to the new version of Oracle. The data stored on the database was retained. A new database is being considered for development. For the interim, groups can submit data directly to DEQ by Excel or Access files.

Groups active in the Shenandoah, Potomac, Rappahannock, York, or James River watersheds can participate in a [database](#) developed by the [Chesapeake Monitoring Cooperative](#). Data uploaded to this site will be shared with DEQ, EPA, and the general public. For more information about the CMC program, please contact [Liz Chudoba](#) at the Alliance for the Chesapeake Bay.

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Appendix 1: List of FY2018 Citizen Monitoring Grant Awardees

Grant Type	Organization	Project Details	Parameters	Locality or Region	Award
Coordination	Alliance for the Chesapeake Bay	Continue Level III the Alliance RiverTrends program monitoring at over 80 stations	DO, E. coli, pH, temp, turbidity	Virginia portion of the Chesapeake Bay watershed	\$10,000
Coordination	Friends of the Shenandoah River	Continue Level III Shenandoah River watershed monitoring network of over 280 sites	DO, E. coli, nutrients, pH, temp	Shenandoah River watershed	\$10,000
Coordination	Smith Mountain Lake Association	Continue Level III Smith Mountain Lake monitoring network of over 160 sites.	Chlorophyll a, DO, E. coli, nutrients, pH, temp	Bedford, Campbell, Franklin	\$10,000
Mini	Boy Scouts Troop 50	Establish a bacteria monitoring project	E. coli	Lynchburg	\$780
Mini	Friends of the North Fork Shenandoah River	Monitor filamentous green algae in the Shenandoah River watershed.	Algae distribution and density	Frederick, Rockingham, Shenandoah	\$1,000
Mini	Goose Creek Association	Continue and expand water monitoring in the Goose Creek watershed	Benthic macroinvertebrates, E. coli.	Fauquier, Loudoun	\$1,000
Mini	Lake Jackson Citizens Association Inc.	Expand volunteer monitoring activities on Lake Jackson	Conductivity, DO, pH, temp	Prince William	\$1,000
Mini	Trantwood Lake Association	Establish volunteer monitoring on Lake Trant	DO, nutrients pH, temp, turbidity	Virginia Beach	\$1,000
Regular	Chesterfield County Department of Environmental Engineering	Continue Chesterfield RiverTrends volunteer monitoring activates	DO, E. coli, pH, temp, turbidity	Chesterfield	\$4,700
Regular	Chincoteague Bay Field Station	Continue and expand volunteer monitoring in Accomack	DO, E. coli, pH, temp, turbidity	Accomack	\$2,000
Regular	Friends of Claytor Lake	Support water monitoring which began in 1993 on Claytor Lake and tributary streams	Chlorophyll a, DO, E. coli, nutrients, pH, temp	Pulaski	\$4,000
Regular	G2 Associates Inc.	Perform water monitoring along Antipoision and Indian Creeks	Chlorophyll a, nutrients	Lancaster	\$4,000
Regular	Henricopolis SWCD	Expand water quality monitoring parameters and coverage in Henrico County	Benthic macroinvertebrate, E. coli, fluoride, nutrients, turbidity	Henrico	\$3,630
Regular	James River Association	Continue James River Watch bacteria monitoring program	E. coli, temperature, turbidity	James River watershed	\$4,490
Regular	Lake Anna Civic Association	Continue Level III ambient monitoring in and around Lake Anna	Chlorophyll a, DO, E. coli, nutrients, pH, temp	Louisa, Orange, Spotsylvania	\$4,500
Regular	Lonesome Pine SWCD	Continue Level III bacteria monitoring program	DO, E. coli, pH, temp.	Buchanan, Dickenson	\$4,000
Regular	Longwood University	Continue Level III bacteria monitoring in the Appomattox River watershed	Chlorophyll a, DO, E. coli, nutrients, pH, temp.	Amelia, Cumberland, Prince Edward, Westmoreland	\$4,500
Regular	New River Conservancy	Continue Level II/III volunteer monitoring along the New River watershed	DO, pH, E. coli, temp, turbidity	Bland, Carroll, Floyd, Giles, Grayson, Pulaski, Wythe	\$3,900
Regular	Northern Virginia SWCD	Continue volunteer monitoring activities	Benthic macroinvertebrate, DO, E. coli, pH, temp.	Arlington, Falls Church, Fairfax	\$5,000
Regular	Rivanna Conservation Alliance	Continue and expand Level III monitoring in the Rivanna River watershed	Benthic macroinvertebrates, E. coli, temp	Albemarle, Charlottesville, Fluvanna, Greene	\$4,000
Regular	Virginia Water Monitoring Council	Provide water quality information and World Water Monitoring Challenge kits	DO, pH, temp, turbidity	Statewide	\$4,500
Total					\$88,000



Appendix 2: 2017 DEQ Public Outreach Events

Envirothon Judging: DEQ staff participated as judges in several Envirothon competitions hosted by local Soil and Water Conservation Districts (SWCD). Staff evaluated high school student presentations and administered tests to gauge their knowledge in water quality and other environmental topics. Below is a list of Envirothon events which had DEQ participation.

1. **March 23: Holston River SWCD Envirothon in Abingdon, VA.**
2. **March 24: Holston River SWCD Envirothon in Clintwood, VA.**
3. **March 27: Henricopolis SWCD Envirothon in Henrico, VA.**
4. **April 5: Area IV regional Envirothon competition in Wytheville, VA**
5. **April 26: Area I regional Envirothon competition in Mt. Solon, VA**
6. **May 22: Statewide Envirothon competition Petersburg, VA**

7. **April 1-2: Daffodil Festival, Gloucester, VA-** Tidewater Regional Office staff participated in the event through an educational booth describing various DEQ programs.
8. **April 4: Science fair competition at North River Elementary School, Mt. Solon, VA-** DEQ participated by helping to judge student science projects.
9. **April 4-6: Environment Virginia, Lexington, VA-** Staff presented on several topics including the development of a new filamentous algae monitoring protocol.
10. **April 8: Blacks Run Stream Cleanup Day, Harrisonburg, VA-** Valley Regional Office staff manned an exhibit to show the public the importance of benthic macroinvertebrates.
11. **April 13: Abingdon High School Career Fair, Abingdon, VA-** Southwest Regional Office staff talked with students about careers and opportunities in the environmental field.
12. **April 21: Wilson Elementary School Earth Day Event, Fishersville, VA-** Valley Regional Office staff wrote and implemented an Standards of Learning (SOL) approved Earth Day activity for kindergarten classes.
13. **April 22: Staunton Earth Day, Staunton, VA-** Valley Regional Office staff manned a display discussing the water quality in Lewis Creek.
14. **April 27: Earth Day Event, Fort AP Hill, VA-** Staff demonstrated water quality sampling techniques to students ranging from 4th to 8th grades.
15. **April 27: Hurricane Creek Earth Day Event, Russell, VA-** Southwest Regional Office staff talked with the public about local environmental issues.
16. **April 28: Smyth County Watershed Field Day, Chilhowie, VA-** Southwest Regional Office staff talked with Chilhowie High School students about water quality and environmental topics.
17. **May 17: Virginia Junior Academy of Science Richmond, VA-** Staff participated as judges at the annual VJAS Research Symposium. The staff judged papers concerning environmental issues.

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18. **June 10: Back to the Bay, Lorton VA-** Staff manned several DEQ displays including the Augmented Reality sandbox to show the various types of waterbodies in Virginia.
19. **June 23: Honaker Elementary and Middle School Summer Program, Honaker, VA-** Southwest Regional Office staff talked with students about environmental topics.
20. **July 24: VCU Discovery Camp, Richmond, VA-** Central Office staff demonstrated water quality monitoring techniques.
21. **July 28: Kids in the Creek Summer Program, Dickenson, VA-** Southwest Regional Office staff showed benthic macroinvertebrates and demonstrated water sampling techniques.
22. **July 29: Dragon Boat Festival, Richmond, VA-** Staff talked with the public about water quality.
23. **September 29- October 8, Doswell, VA-** Staff manned an educational display discussing several DEQ programs along with the Augmented Reality Sandbox.

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Appendix 3: 2017 DEQ Volunteer Monitoring Training and Support

1. **February 17: Lake Anna Civic Association-** Staff provided training on using the InSitu SmarTROLL multiprobe.
2. **February 22: Lake Monticello Homeowners Association-** Provided training on using the InSitu TROLL 9500 multiprobe.
3. **March 6: Alliance for the Chesapeake Bay-** Reviewed the Alliance RiverTrends monitoring protocols
4. **April 3: Lake Anna Civic Association-** Inspected accuracy of field monitoring equipment and reviewed field sampling procedures.
5. **April 14: Lewis Ginter Botanical Garden-** Trained volunteers on monitoring protocols.
6. **April 24: Pocahontas State Park-** Inspected and verified accuracy of field monitoring equipment used to sample several state lakes in Culpeper and Prince Edward Counties.
7. **April 27: McClure River Restoration Project-** Inspected and verified accuracy of equipment and audited Colilert laboratory procedures.
8. **May 27: Southeast CARE Coalition-** Trained volunteers on using Coliscan Easygel and field sampling procedures.
9. **June 16-17: Rivanna Conservation Alliance-** Trained volunteers on use of the Colilert and Coliscan Easygel protocols.
10. **June 24: Southeast CARE Coalition-** Trained additional volunteers on use of Coliscan Easygel and field sampling procedures.
11. **July 7: Smith Mountain Lake Association-** Inspected and verified accuracy of equipment and audited laboratory procedures.
12. **July 24: Rivanna Conservation Alliance-** Administered a technician proficiency study on Colilert laboratory protocols.
13. **August 24: Rivanna Conservation Alliance-** Audited the benthic macroinvertebrate field collection and Colilert sampling and analysis protocols.
14. **September 20: Lake Monticello Homeowners Association-** Audited field sampling protocols.
15. **November 18: Alliance for the Chesapeake Bay-** Reviewed RiverTrends training procedures in use at a recertification training event.
16. **December 17: Rivanna Conservation Alliance-** Validated stream monitoring thermometers.

