GEORGIA

Adopt-A-Stream

Department of Natural Resources
Environmental Protection Division
Winter 2017

TRAIN THE TRAINER MANUAL

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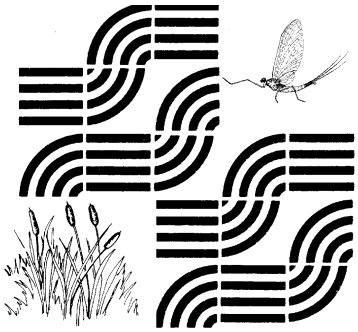

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General Trainer Information

Trainer's Roles and Responsibilities

1. POINT OF CONTACT

In most cases, you will be the point of contact for the program with volunteers. We will train you in methodology, but hope to give you enough background about the program philosophy, too.

2. ACCURATE INFORMATION

We need to ensure that we thoroughly understand all procedures so that we can convey accurate information to volunteers. How do we conduct tests? What do the numbers mean?

3. SAFETY

This is extremely important. Is your training site safe? Talk to your volunteers about field hazards and access points. Also, discuss water quality and chemical and bacterial monitoring hazards.

4. COMMUNICATE WITH GEORGIA ADOPT-A-STREAM

Stay in touch! Please place your workshop on the AAS website calendar and let us know if you need any materials or assistance with your workshop.

5. QUALITY ASSURANCE/QUALITY CONTROL

There are several ways volunteers' efforts can protect streams (cleanups, calling in problems, stabilizing streambanks, etc). The QA/QC process has to maintain the best standards possible. As a trainer, you are the front line for deciding whether the volunteers will turn in accurate and quality data. When testing volunteers, not everyone has to pass. We have to have confidence in the numbers we ultimately compile from volunteer monitors, or all of the data collection efforts will be discounted.

Georgia Adopt-A-Stream
Community Coordinator Participation Agreement

Georgia Adopt-A-Stream is only as strong as its network of coordinators, trainers and partners. Thank you for your continued participation and support of the program. As a Community Coordinator, you fulfill these responsibilities:

- Actively participate in guiding / improving the AAS program through feedback and ideas
- Attend at least one Community Coordinator meeting per year
- Provide accurate information and guidance to AAS volunteers
- Receive in-region referrals of volunteer requests from AAS State office

Community Coordinators provide additional support depending on their level of participation. **Please check *only one* of the following levels of participation:**

☐ **ADOPT-A-STREAM PUBLIC TRAINER**

- Receive AAS Trainer certification and annual recertification
- Conduct at least two QAQC workshops per year as a certified AAS trainer
- Contact information is publicly listed on the AAS website Coordinator page
- Serve as point of contact on volunteer profiles in support region
- Receive and review automatic email notifications from the AAS database when data are entered by volunteers in support area
- Receive in-region referrals of volunteer workshops from AAS State office
- Post public workshops on the calendar of events at AdoptAStream.Georgia.gov

☐ **ADOPT-A-STREAM NON-PUBLIC TRAINER**

- Receive AAS Trainer certification and annual recertification
- Conduct at least two QAQC workshops per year as a certified AAS trainer
- Contact information is NOT publicly listed on the AAS website Coordinator page
- Receive in-region referrals of volunteer workshops from AAS State office
- Post public workshops on the calendar of events at AdoptAStream.Georgia.gov

☐ **ADOPT-A-STREAM PUBLIC PARTNER**

- Contact information is publicly listed on the AAS website Coordinator page
- Serve as point of contact on volunteer profiles in support region
- Receive and review automatic email notifications from the AAS database when data are entered by volunteers in support area

By signing below, I agree to fulfill the responsibilities of my chosen level of participation with the Adopt-A-Stream program and to identify my support region to Adopt-A-Stream staff.

Name: _____ Date: _____

Signature: _____ Organization: _____

Service Area(s) (City, County, Watershed): _____

_____

Preferred public contact: Email: _____ Phone: _____

Georgia EPD Staff Name & Signature: _____

Quality Assurance Plan Summary

1. Volunteers complete an annual certification test for macroinvertebrate, chemical, and bacterial monitoring.

   In the Field:

   Chemical monitoring: the volunteers' chemistry results must fall within the duplicate precision range for each parameter of those obtained by trainer.

   Macroinvertebrate monitoring: collection and identification skills (90% accuracy on not less than 20 samples) must be demonstrated.

   Bacterial monitoring: Volunteer should demonstrate proficiency in collecting water sample and plating, and be able to identify with 90% accuracy the *E.coli* counts and calculate *E.coli* levels of test plates.

   Written Test:

   For all monitoring written tests, trainee should get a score of 80% or better.

2. Volunteer's chemical test kits are checked annually at recertification workshop to ensure reagents are current and not expired.

3. Only an individual can be a certified QA/QC volunteer.

4. Volunteers can only be QA/QC certified by a certified Adopt-A-Stream Trainer.

5. Trainers must be trained through the state Georgia Adopt-A-Stream office.

6. Trainers and volunteers must be recertified annually to maintain certification.

7. Local Coordinators will work with volunteers to review water quality data and update the online database.

8. Local Coordinators will also help volunteers interpret results, identify trends and isolate information that may warrant follow-up.

Train the Trainer Criteria

Trainer Certification

Georgia Adopt-A-Stream has a trainer program for our chemical, macroinvertebrate, and bacterial monitoring programs.

Criteria for new trainers:

- Have **1- year of AAS QA/QC certification and monitoring experience** in the Train-The-Trainer workshop of interest, or obtain approval from the AAS State Coordinators.
- **Attend a macroinvertebrate (6-hours), chemical (5-hours), or bacterial (4-hours) Train-The-Trainer (TTT) workshop** and pass field and written tests. To attend a TTT workshop, one must have already attended a QA/QC workshop and have working knowledge of biology, chemistry, microbiology or a related field; and commit to conducting two workshops within a year. Train-The-Trainer workshops cover what it means to be a trainer, how to conduct a workshop, and how to work with volunteers.
- After attending the TTT workshop, a new trainer must do **two co-trainings** with another trainer who has been approved by the State Office. These co-trainings count towards the two workshops that a trainer commits to do within a year.

Trainer Recertification

A Trainer must attend a TTT refresher course once a year for the macroinvertebrate, chemical or bacterial programs (if they will be doing workshops for any of the three). These courses review the field portion and require a written test.

Georgia Adopt-A-Stream Training Workshops

Getting Started with Georgia Adopt-A-Stream/Visual Stream Survey
Watershed Survey, Map Assessment and Visual Stream Survey
4 hours

This workshop is based on the manual Getting To Know Your Watershed. Volunteers learn about the process of registering the stream, wetland or lake that they will monitor. Then volunteers learn how to use maps to delineate and assess their watershed. Land use and impervious surface is discussed as it pertains to the watershed survey data forms. The second half of the workshop is spent at a stream conducting the visual stream survey and learning how to do a stream cross-section and calculate flow.

Chemical Monitoring Workshop for Quality Assurance
(Stream, Coastal or Lake monitoring)
4 hours

The Chemical Monitoring workshop is designed to teach volunteers about basic stream water chemistry and how to conduct the chemical tests using hand-held field equipment. The basic set of tests that volunteers are asked to conduct includes dissolved oxygen, conductivity, pH, and temperature. Additional tests include alkalinity, phosphate and nitrate-nitrogen. Volunteers are given a field test and written test to assess their ability to collect accurate and precise data. Volunteers who collect data within the duplicate precision rules and pass the written test with a score of 80% or better will be considered a QA/QC volunteer for one year.

Macroinvertebrate Monitoring Workshop for Quality Assurance
5 hours

Learn how to sample the biological diversity of a stream! The macroinvertebrates (insects, mollusks & crustaceans) found in a stream are excellent indicators of the condition of both water quality and habitat. This workshop will focus on collection techniques for either rocky or muddy bottom streams as well as macroinvertebrate identification. A quality assurance test is available at the end of the workshop for those who wish to test their skills. Volunteers who identify the macroinvertebrates with 90% accuracy and pass the written test with a score of 80% or better will be considered a QA/QC volunteer for one year.

Bacterial Monitoring Workshop for Quality Assurance
3 hours

The Bacterial Monitoring Workshop will teach volunteers how to monitor *Escherichia coli* levels in their adopted waterway. *E. coli* is an indicator organism that is often used to assess water quality. Monitoring levels of *E. coli* can help identify possible sources of pollution. This workshop will focus on proper collection of a water sample; transfer of sample onto plates that will be incubated and proper interpretation of results. Volunteers who successfully perform the bacterial monitoring, identify colonies and calculate *E. coli* levels of test plates

with 90% accuracy and pass the written test with a score of 80% or better will be considered a QA/QC volunteer for one year.

Amphibian Monitoring Workshop
3 hours

Learn how to monitor for amphibians (frogs and salamanders), through passive methods. Amphibians are found in a variety of upland and aquatic habitats including streams, wetlands, and lakes. This workshop will focus on the instruction of monitoring techniques including treefrog refugia, cover boards, and frog calls. Volunteers will also be instructed on general life history, site setup, safe handling procedures of amphibians and the need to gather life history information critical for conservation planning. Volunteers who attend will be considered an amphibian monitoring volunteer.

Wetland Monitoring Workshop
3 hours

Adopt-A-Stream's Wetland Monitoring Program immerses participants into the amazing world of wetlands. During this workshop, participants will learn about Georgia's wetland types and how to classify wetlands based on their soils, hydrology and vegetation. The workshop will also introduce them to challenges facing wetlands and provide the tools necessary to participate in their protection. Volunteers who attend will be considered a freshwater wetland monitoring volunteer.

Educator's Guide Workshop
5 hours

Adopt-A-Stream Educator's Guide is designed to introduce the Adopt-A-Stream monitoring program to students across Georgia. These activities will bring water quality education to your classroom and spark your students' interest in protecting our precious water resources. During this workshop, educators will participate in several of these activities and learn how to use them in the classroom. Teachers will then be asked to submit a detailed report on how they use the Adopt-A-Stream Educator's Guide as an educational tool. This workshop is suitable for formal and non-formal teachers.

Most AAS workshops combine Getting Started with a monitoring workshop. The introduction is then shortened to 1.5 hour.

One PLU credit is available to teachers that total 10 hours participation in any of the above workshops. Check with your local school administrators to verify requirements as these can vary by district.

Levels of Involvement

Georgia Adopt-A-Stream offers a variety of monitoring programs which allow volunteers and groups the ability to design a monitoring plan that best fits their interests, time, and resources. Opportunities include conducting a watershed survey, performing visual surveys of their adopted stream, and conducting a cleanup and an outreach activity. Other options include participation in quality assurance workshops covering macroinvertebrate, chemical, and bacterial monitoring. Additional activities can include amphibian and wetland monitoring, river cleanups and habitat enhancement projects. The time commitments of each program are the following:

• Watershed Survey	Once a year
• Visual Monitoring	4 times a year (quarterly)
• Macroinvertebrate Monitoring	4 times a year (quarterly)
• Chemical Monitoring	12 times a year (monthly)
• Bacterial Monitoring	12 times a year (monthly)
• Amphibian Monitoring	4 times a year (quarterly)
• Wetland Monitoring	Once a year
• Habitat Enhancement	One time project
• Rivers Alive Cleanup	All year

Adopt-A-Stream Certifications and Monitoring Programs
For Freshwater and Coastal Waterways

Watershed Assessments (Y)	Visual Monitoring (Q)
Macroinvertebrate Monitoring (Q)*	Amphibian Monitoring (bi-monthly)
Chemical Monitoring (M)*	Bacterial Monitoring (M)*
Freshwater Wetland Monitoring (Q)	Rivers Alive (year round)
Trainer Certification*	

*=QA/QC programs M=Monthly Sampling Q=Quarterly Sampling Y=Yearly Sampling

It is important that volunteers understand that each monitoring program is a part of a larger picture of their stream and watershed. For example, chemical monitoring alone is not going to provide a full picture of their stream conditions. Currently, Adopt-A-Stream has thousands of active volunteers who monitor over 700 sites and our quarterly newsletter has over 11,000 subscribers. We invite you to join us to help protect Georgia's water resources.

General Workshop Information

Adopt-A-Stream Workshop Trainer Guidance

Georgia Adopt-A-Stream understands that local programs, trainers, and volunteers have varying interests, resources, and goals. However, to maintain consistency in presenting accurate information, here are some essential items to discuss in each workshop.

- ✓ Emphasize the goals of the program (A.D.O.P.T.), available options and resources provided by Adopt-A-Stream, and the importance of designing a monitoring plan.
- ✓ Define: watershed, point and non-point source pollution.
- ✓ Describe how to choose a safe, legally accessible and representative stream segment.
- ✓ Have volunteers look over the data forms (if you have time, review the watershed and visual survey forms).
- ✓ Teach the information that is on the QA/QC test! Test answers are shown in bold in the powerpoint presentations as a reminder to emphasize these points. Print copies of the presentation in handout style for your volunteers so that they can follow along and take notes while you are speaking.
- ✓ Explain how to interpret data and how to follow up on results that are outside of expected ranges (Who to Call list). Discuss the uses of volunteer data (baseline information, screening for problems, designing watershed management plans, education).
- ✓ Make sure the volunteer knows what equipment is needed and how to take care of that equipment.
- ✓ Demonstrate the Adopt-A-Stream online database so that volunteers know how to register their group and site(s) and how to enter and view their data.

Before your Workshop

1. Let the Georgia Adopt-A-Stream state office know if you need manuals, brochures, photocopies, supplies or equipment.

2. Send the workshop to the State office to be placed on the AdoptAStream.Georgia.gov calendar. This helps others find your workshop and the State office know what is going on around the state!
    a. Gather all of the details for the workshop. Be sure to include the following:
        - Workshop title including location and type of workshop. Ex: *Macon Chemical Monitoring Workshop*
        - Date(s) and time(s) of the workshop
        - Location, address, and any needed directions
        - Description of the workshop (you can use the example workshop descriptions from page 10), whether it will include new certifications as well as recertifications, and anything else that would be helpful for the volunteer to know in advance (any costs, to bring boots or lunch, etc.)
        - Instructions on how to RSVP and contact information
    b. Send all workshop details by email to AAS@gaepd.org.

3. Check your location to make sure it is available and is an effective place to conduct your workshop.
    a. If you will be showing a DVD, using internet or using PowerPoint, make sure a computer and projector are available as well as connected to the internet.
    b. Is there a stream nearby? Don't demonstrate anything in the classroom that you can do outside. It is important to allow ample time at the stream to demonstrate the monitoring techniques.

4. Review the ***Getting To Know Your Watershed*** and ***Visual Stream Survey*** manuals as well as the manual corresponding to your workshop, so that you can explain to others where they can find the information. Also, get on AdoptAStream.Georgia.gov and click through the basic pages and the database so you will have good examples to show your volunteers.

5. Gather materials needed to conduct the workshop. Materials lists are provided in each section.

After your Workshop

1. Enter workshop data at AdoptAStream.Georgia.gov.
   a. Sign in using your username and password.
   b. Using your sign in sheet, first look up your workshop participants to see if they are already in the AAS database. If not, click "New Contact" and input their contact information and newsletter preference indicated on the sign in sheet and hit "Save". *Note: If the volunteer is under 18, DO NOT enter a home address, only an e-mail address.*
   c. Hover over "Data Entry" and then click "Enter Workshop Data".
   d. Record the names of all the trainers that helped with your workshop and choose the type, location and date of your workshop. If needed, adjust the length of your workshop to reflect the time spent.
   e. Click save!

2. Follow up with the participants by email and notify them if they have passed or need to try again. Include where they can view their certificate. A follow up email template is available on the Trainer Resources page of the AAS website.

3. Once you have sent the post-workshop email, hover over "Data Entry" and click on "Certificates and Letters." Find and click your workshop in the workshop list. Click on the "Certificates" button. If participants would like printed certificates you can print them from this page or email the State Office with your request.

* To enter workshops with multiple certifications but the same participants and trainers:
   1. Enter all the information for the first certification. (For example, Chemical QA/QC.)
   2. Click **Save**.
   3. Select the other certification type. (For example, Macroinvertebrate QA/QC.) Update 'Passed' column for individuals, if necessary.
   4. Click **Save**.

*If there are edits that need to be made to your submitted workshop information, please contact the State Office.

Answers to Common Trainer Concerns and Questions

I want to teach a workshop, but no one has requested one…

The best way to have people attend your workshop is to proactively recruit new volunteers: set a date, reserve a location and, publicize the workshop. Whether you have 5 or 25 participants, you are fulfilling one of the Adopt-A-Stream goals of increasing public awareness. You can post your event on the AdoptAStream.Georgia.gov website Calendar of Events and additionally the State office will help you publicize your event in the Adopt-A-Stream newsletter. We can also assist you in setting up a workshop through lending equipment and workshop materials.

How do I get through all of this information in the time allotted?

- Outline, Outline, Outline. Stick to your outline.
- Use the AAS PowerPoint Presentations: They can all be found on the Trainer Resources Section of AdoptAStream.Georgia.gov
- Use the "It All Begins with You" video. The AAS Introduction will say in nine minutes what would take you 30 minutes to say. A link to this video is on the Trainer Resources page.
- You can't teach them everything. Remind yourself and them that this is just the beginning of a long learning process.
- To better acclimate potential volunteers and not overwhelm them, you may want to offer a "Getting Started" or introductory presentation and a monitoring specific workshop on different days.

There is so much information to teach! How do I remember it all?

Start with the basics (see outlines in this manual and provided overhead presentations). **Create a detailed outline and stick to it**. Make photocopies of handouts to be given to the more "curious" participants. Use props such as the video, presentations, the manuals, maps and written directions for the chemical monitoring tests.

I know the science, but don't feel comfortable leading a whole workshop. What can I do?

Some trainers are good speakers, but don't feel comfortable with the science. Let us know and we'll try to team you up with someone. Again, use props and vary your teaching methods. A good goal is to convey the information with the least amount of talking. Handouts, small group activities, and hands-on activities all work well. If you work with someone who is not trained as a trainer, but understands the program, let him or her do the introductory information and you can teach the chemistry.

How do I keep it interesting and fun for the entire workshop?

The more props, hands-on activities, and variety in speaking voices (more than one trainer, or you can just act like two or three different people – that should make it interesting) that you can provide, the better the workshop will be. Do you have the AAS Educator's Guide? There

are some great ideas in there. Try to get out to the stream quickly. **Anything you can demonstrate at the stream, don't demonstrate in the classroom!**

Answers to Common Volunteer Concerns and Questions

How am I protecting my stream when I Adopt-A-Stream?

Several ways:

- Immediately, by picking up litter and knowing who to call if you notice a problem.
- Long term, by gathering visual, chemical or biological data, which can help determine the condition and trends of your stream.
- Also, by setting an example that you care for the environment and by creating awareness for water quality issues.

Who uses my data?

It depends.

1. You, first of all, have a better understanding of what is influencing your stream.
2. Second, local water departments, planners, and city councils, environmental consulting agencies, universities and colleges may be interested in summaries of the information you collect. Some groups work in partnership with local agencies to collect information on specific streams. Local agencies often don't have time and/or crews to send out.
3. Third, Georgia Adopt-A-Stream's database and website allows all entered data to be viewed by any group who wishes to use it.

I'm not sure I know enough.

We are all learning. The most important thing is to get out there and start looking at maps, at land use, and at the streambanks and streambed. Go as soon as you can after this workshop, while the information is still fresh. Read your manual; there is lots of good information in there. Reach out to your Local Coordinator and other monitoring groups for help. Feel free to call us!

Chemical Workshop

Chemical QA/QC Certification Requirements

(From Georgia Adopt-A-Stream Quality Assurance Project Plan)

The chemical monitoring workshop highlights each of the core sampling parameters and volunteers learn why the chemical parameters are important to aquatic life, as well as the significant levels and how these levels can be affected. Trainers will lead the volunteers through field techniques and check techniques in collecting the sample and using the kits properly. Volunteer monitors will be trained to take duplicate samples for dissolved oxygen and pH and how to evaluate and check measurements, equipment and reagents. Volunteers will be certified when they achieve results within the acceptable duplicate precision range of those obtained by the trainers and achieve 80% accuracy on a written test. To maintain QA/QC status volunteers shall replace reagents when they expire and must be recertified annually. The re-certification workshop includes a field based test in addition to a written test.

Chemical Monitoring Workshop Materials List

Materials Needed for All Workshops:

- Copies of:
  - the sign-in sheet/waiver form
  - the appropriate manuals (optional)
  - the PowerPoint Presentation (optional)
  - extra copies of the data forms
  - the appropriate tests (and a key)
  - the 'Who to Call List'
- Pens/pencils
- AAS Introduction Video, *It all begins with you.* This is on the website and can be found with a search on YouTube.com (optional)
- Clear container or whirl-pak to teach the visual observations (can use dissolved oxygen sample bottles)
- Projector, computer, screen, power cords, PowerPoint on flash drive (if needed)
- Dry erase board (optional)
- Clip boards (if available)
- Drinking water for volunteers (in hot conditions)

Chemical Specific Materials:

- Chemical Kits (usually 2 volunteers per kit)
- Waste Jugs
- Latex Gloves & Goggles
- Conductivity Meters & Calibration Solution (Stream and Lake workshops)
- Refractometers & Calibration Solution/Distilled Water (Coastal workshop)
- Secchi Disks (Lake and Coastal workshops)

Adopt-A-Stream Chemical Workshop Outline (example)

Get Acquainted (Sign-in/ waiver) 10:00 - 10:10

I. Introduction & Classroom Discussion 10:10 - 12:00
(Use the PowerPoint and test as guides for what to cover)

AAS Video: *It All Begins with You*
Georgia Adopt-A-Stream, what is it?
Goals of Program
Importance of Quality Assurance
Watershed & Water Quality Impacts
Chemical Parameters
Trend Monitoring
Review data forms and the online database (registration and data entry)

II. Lunch 12:00 - 12:30

III. Field 12:30 – 2:00

Review and fill out observations on data form at stream site
Conduct chemical sampling tests

IV. Review and take QA/QC Test 2:00 - 2:30

During the Chemical Workshop

Get Acquainted (sign-in/waiver)
This lets people relax and know this will be a fun event. Bring some snacks and drinks if you can. Make sure people fill in the sign-in form. The sign-in form also acts as the liability and photo waiver.

I. Introduction & Classroom Discussion
Have people introduce themselves and explain their background and interest in adopting a stream. Introduce yourself.

Adopt-A-Stream Video: *It All Begins with You*
This is a great way to start the workshop. It gives people an overview of the program and it can reduce the amount of information you have to say. Remember, the video can say in 9 minutes what it may take you 30 minutes to say.

Georgia Adopt-A-Stream, what is it?
Don't assume that people have been to an AAS workshop. GA AAS is a program that gives people the tools to evaluate and protect their local streams. We produce a newsletter, which they can receive. All Adopt-A-Stream resources, including manuals, newsletters, and current updates, can be found at our website at AdoptAStream.Georgia.gov. We have an annual volunteer conference, *Confluence*, and we help coordinate the annual waterway cleanup event called Rivers Alive. We have more than 350 individual programs and 50 community programs statewide, with thousands of volunteers participating. AAS Coordinators perform many of the same functions as the State office; recruiting volunteers, promoting AAS, conducting workshops and serving as local contacts for individual programs.

Goals of Program
Review the goals of Adopt-A-Stream. Have volunteers repeat them out loud!

Importance of Quality Assurance and Quality Control
Georgia Adopt-A-Stream has a Quality Assurance Project Plan (QAPP) that is approved by US EPA. A summary of this plan is near the beginning of the Train-The-Trainer manual. Anyone who looks at this plan can see what Georgia Adopt-A-Stream requires in order to ensure the quality of our data. Examples include annual certification workshops and tests, checking test kits annually, and following duplicate precision rules. It is up to the trainers and the volunteers to uphold the integrity of all of the data.

Watershed & Water Quality Impacts
Emphasize that water quality is better than it was 30 years ago because of improved control over **point source pollution**. Today, **nonpoint source pollution** (NPSP) is **the number one** cause of water quality problems in Georgia. Sediment, runoff from roads and parking lots, fertilizers and pesticides from lawns and fields – all negatively impact the structure and water quality in a stream. We need clean water for drinking, agriculture and industry. NPSP is related to the way in which the land surrounding a stream is treated. If the earth is exposed

because of construction or farming, the soil can easily wash into the nearest stream when it rains. If too much fertilizer is applied to a lawn or field, the excess can wash into a creek. In urban areas, storm drains receive runoff from parking lots and streets. Rarely do storm drains flow to treatment plants; most often the stormdrain collects water that has mixed with oil, gasoline, brake dust, debris and other pollutants and then pipes it directly into our waterways. Other types of NPSP include spills and illegal dumping. Most people value clean water for aesthetic and recreational value. We enjoy fishing, we observe wildlife that need clean water for habitat, we canoe and we enjoy clean parks along river corridors. We all need to do our part to protect our streams, wetlands, rivers and lakes. Remember to include any local information and **the watershed the workshop is being held in** (this is on the test!).

Safety

Please stress field safety considerations in all workshops. Refer to powerpoint for field safety guidelines. Also, you may want to share your field experiences and any local site information (sunburn, insects, poison ivy, briars, ticks, etc.)

Chemical Parameters

The best option is to use the power point presentation created by the State office. This is your best guide for covering all the important information that is required for QA/QC certification. Discuss relevant parameters to your workshop (stream, lake, coastal). *Remember to emphasize all the information that will be on the test*. Test answers are shown in bold in the powerpoint presentations.

Trend Monitoring

The idea behind gathering chemical data is to document the “vital signs” of your stream over time. Conducting chemical monitoring once a month is the minimum amount, as conditions are constantly changing. Over the course of the year, volunteers will notice normal fluctuations. If a result outside of the expected range is found, re-test. If the results continue to be the same, contact your local AAS coordinator, your water authority and/or local health agency. Monitoring chemical conditions of a stream allows volunteers to compare their stream with other streams, with other segments of the same stream and with itself over time.

Review data forms and the online database (registration and data entry)

This is a good time to go over the data form as well as introduce the online database and our website (if you have internet access). Our website is the best place to find more information about all of our programs. It’s also the starting point for registering new groups, sites, and submitting and accessing water quality data. Volunteers should be aware of resources they can find at **AdoptAStream.Georgia.gov**. Not all volunteers are comfortable accessing information on a website. Some volunteers may require help navigating the forms on the website, especially data entry forms. If possible, familiarize your volunteers with our online database. If you can show the online database, go through how to setup your password/login information, how to register your group/site, how to find your group/site, how to submit data and options for viewing data. The best way for data to flow is from a volunteer to the online database. The AAS online database should be the final repository for all volunteer data. Volunteers should be encouraged to send copies to their local government and to anyone

else that may use their data. Only data from a site that has been registered with the State database will be accepted.

II. Lunch

III. Field

Review and fill out observations on data form at stream site
It is helpful to go over the data forms while out in the field, mimicking a volunteer's monitoring event. Explain each of the observations and that it is important to note these fields as soon as you reach your monitoring site. Some parameters, such as smell, may become less obvious as you acclimate to the area.

Conduct Chemical Tests
Lead the volunteers through the tests step by step, providing hints for better sampling along the way. Check everyone's technique to be sure they are collecting the samples and using the kits correctly. If they did not get results within the duplicate precision range, have them do the test again. **Remind them that DO and pH tests should be run in duplicate.** Chemical waste should be placed in a bottle and disposed of by flushing down the drain: do not flush waste down a drain that is on the septic system. Emphasize how consistency in collection is important – *it is the only way to compare sampling on one stream over time and between streams.*

IV. QA/QC Test

Review using the 'Just the Facts' slide in the powerpoint presentation and answer any questions. Pass out the test found on the Trainer Resources page of the website. We try to grade the tests in class, usually letting the volunteers check their own. Make sure the sign-up sheet is filled out and that you have indicated who passed. Volunteers' results must fall within the duplicate precision range of the trainer's results for each parameter and 80% or higher on the written test.

Precision, Accuracy and Measurement Range for Chemical Monitoring

(From Georgia Adopt-A-Stream Quality Assurance Project Plan)

The table below illustrates the precision, accuracy and measurement ranges for the core parameters measured by AAS volunteers. The table also features methods used, sensitivity of the test instrument and calibration requirements.

PARAMETER	METHOD/ RANGE	UNITS	DUPLICATE PRECISION	ACCURACY (allowable range comparing monitor value to QA value)	SENSITIVITY	CALIBRATION
Temperature	Thermometer -5.0 - 50.0	Degrees Celsius (°C)	N/A	+/- 1.0 °C	0.5 °C	Ice bath
pH	Color Comparator 3.0 - 10.5	Standard pH units (su)	+/- 0.25 su	+/- 0.25 su	0.5 su	Use of current and non-contaminated reagents
Dissolved Oxygen	Micro Winkler Titration	ppm or mg/L	+/- 0.6 ppm or mg/L	+/- 0.1 ppm or mg/L	0.1 ppm or mg/L	Winkler Titration Standard Methods
Conductivity	Meter 0-1999 μS/cm	μS/cm	N/A	+/- 1% of Full Scale	10 μS	Standard of 250μS
Salinity	Refractometer 0-100 ppt	Parts per thousand (ppt)	+/- 1.0 ppt	+/- 1.0 ppt	1.0 ppt	Distilled water
Clarity	Secchi Disk	Meters (m)	+/- 0.1 m	+/- 0.2 m	0.01 m	NA

Bacterial Workshop

Bacterial QA/QC Certification Requirements

(From Georgia Adopt-A-Stream Quality Assurance Project Plan)

The objectives of the bacterial program are to provide citizens involved in *Escherichia coli (E. coli)* monitoring with the scientific background and tools necessary to develop an understanding of the role of bacteria in stream water quality. The Adopt-A-Stream methods were designed to allow volunteers to quickly assess health risks due to bacterial contamination of surface waters. This workshop focuses on sample collection, plating samples onto 3M Petrifilm™ plates to culture *E. coli* and enumerating the *E. coli* colonies. Bacterial protocols require collecting one field blank and one stream sample and preparing a control plate and three sample plates from each site to ensure accurate results.

To become certified in bacterial monitoring, volunteers must achieve 80% or better on the written test, achieve 90% accuracy in sample enumeration and demonstrate the ability to collect, plate and read the 3M Petrifilm™ plates. To maintain certification, volunteers are encouraged to collect monthly samples throughout the year and must attend a recertification workshop annually. The re-certification workshop includes a field based test in addition to a written test.

Bacterial Monitoring Workshop Materials List

Materials Needed for All Workshops:

- Copies of:
  - the sign-in sheet/waiver form
  - the appropriate manuals (optional)
  - the PowerPoint Presentation (optional)
  - extra copies of the data forms
  - the appropriate tests (and a key)
  - the 'Who to Call List'
- Pens/pencils
- AAS Introduction Video, *It all begins with you.* This is on the website and can be found with a search on YouTube.com (optional)
- Clear container or whirl-pak to teach the visual observations
- Projector, computer, screen, power cords, PowerPoint on flash drive (if needed)
- Dry erase board (optional)
- Clip boards (if available)
- Drinking water for volunteers (in hot conditions)

Bacterial Specific Materials:

- Whirl-pak® bags and permanent marker for labeling
- Distilled water to demonstrate a blank
- Gloves
- Cooler with ice
- 3M Petrifilm™ plates for practicing plating
- Pipettors and sterile pipette tips
- Plastic cups or other sample holders
- Incubator with digital thermometer
- Disinfectant for before and after plating
- Calculators

Adopt-A-Stream Bacterial Workshop Outline (example)

Get Acquainted (sign-in/waiver) 10:00 - 10:10

I. Introduction & Classroom Discussion 10:10 - 11:10
(Use the PowerPoint and test as guides for what to cover)

AAS Video: *It All Begins with You*
Georgia Adopt-A-Stream, what is it?
Goals of Program
Importance of Quality Assurance
Watershed & Water Quality Impacts
Discuss Bacterial Monitoring, Methods and Standards
Trend Monitoring
Review data forms and the online database (registration and data entry)

III. Field 11:10-12:30

Review how to take a Whirl-Pak sample
Demonstrate sample plating and processing

IV. Lunch 12:30-1:00

V. Review and take QA/QC Test 1:00-1:30

During the Bacterial Workshop

Get Acquainted (sign-in/waiver)
This lets people relax and know this will be a fun event. Bring some snacks and drinks if you can. Make sure people fill in the sign-in form. The sign-in form also acts as the liability and photo waiver.

I. Introduction & Classroom Discussion
Have people introduce themselves and explain their background and interest in adopting a stream. Introduce yourself.

Adopt-A-Stream Video: *It All Begins with You*
This is a great way to start the workshop. It gives people an overview of the program and it can reduce the amount of information you have to say. Remember, the video can say in 9 minutes what it may take you 30 minutes to say.

Georgia Adopt-A-Stream, what is it?
Don't assume that people have been to an AAS workshop. GA AAS is a program that gives people the tools to evaluate and protect their local streams. We produce a newsletter, which they can receive. All Adopt-A-Stream resources, including manuals, newsletters, and current updates, can be found at our website at AdoptAStream.Georgia.gov. We have an annual volunteer conference, *Confluence*, and we help coordinate the annual waterway cleanup event called Rivers Alive. We have more than 350 individual programs and 50 community programs statewide, with thousands of volunteers participating. Our Local Coordinators perform many of the same functions as the State office; recruiting volunteers, promoting AAS, conducting workshops and serving as local contacts for individual programs.

Goals of Program
Review the goals of Adopt-A-Stream. Have volunteers repeat them out loud!

Importance of Quality Assurance and Quality Control
Georgia Adopt-A-Stream has a Quality Assurance Project Plan (QAPP) that is approved by US EPA. A summary of this plan is near the beginning of the Train-The-Trainer manual. Anyone who looks at this plan can see what Georgia Adopt-A-Stream requires in order to ensure the quality of our data. Examples include annual certification workshops and tests, checking test kits annually, and following duplicate precision rules. It is up to the trainers and the volunteers to uphold the integrity of all of the data.

Watershed & Water Quality Impacts
Emphasize that water quality is better than it was 30 years ago because of improved control over **point source pollution**. Today, **nonpoint source pollution** (NPSP) is **the number one** cause of water quality problems in Georgia. Sediment, runoff from roads and parking lots, fertilizers and pesticides from lawns and fields – all negatively impact the structure and water quality in a stream. We need clean water for drinking, agriculture and industry. NPSP is related to the way in which the land surrounding a stream is treated. If the earth is exposed

because of construction or farming, the soil can easily wash into the nearest stream when it rains. If too much fertilizer is applied to a lawn or field, the excess can wash into a creek. In urban areas, storm drains receive runoff from parking lots and streets. Rarely do storm drains flow to treatment plants; most often the storm drain collects water that has mixed with oil, gasoline, brake dust, debris, and other pollutants and then pipes it directly into our waterways. Other types of NPSP include spills and illegal dumping. Most people value clean water for aesthetic and recreational value. We enjoy fishing, we observe wildlife that need clean water for habitat, we canoe and we enjoy clean parks along river corridors. We all need to do our part to protect our streams, wetlands, rivers and lakes. Remember to include any local information and **the watershed the workshop is being held in** (this is on the test!).

Safety

Please stress field safety considerations in all workshops. Refer to powerpoint for field safety guidelines. Also, you may want to share your field experiences and any local site information (sunburn, insects, poison ivy, briars, ticks, etc.)

Discuss Bacterial Monitoring, Methods and Standards

Go over the purpose of bacterial monitoring and why it is important. Discuss significant levels and how levels can be changed. The best option is to use the powerpoint presentation created by the State office. This is your best guide for covering all the important information that is required for QA/QC certification. *Remember to emphasize all the information that will be on the test*. Test answers are shown in bold in the powerpoint presentations.

Trend Monitoring

The idea behind gathering chemical data is to document the “vital signs” of your stream over time. Conducting chemical monitoring once a month is the minimum amount, as conditions are constantly changing. Over the course of the year, volunteers will notice normal fluctuations. If a result outside of the expected range is found, re-test. If the results continue to be the same, contact your local AAS coordinator, your local health agency and/or water authority. Monitoring bacterial conditions of a stream allows volunteers to compare their stream with other streams, with other segments of the same stream, and with itself over time.

Review data forms and the online database (registration and data entry)

This is a good time to go over the data form as well as introduce the online database and our website (if you have internet access). Our website is the perfect place to find more information about all of our programs. It’s also the starting point for registering new groups, sites, and submitting and accessing water quality data. Volunteers should be aware of resources they can find at **AdoptAStream.Georgia.gov**. Not all volunteers are comfortable accessing information on a website. Some volunteers may require help navigating the forms on the website, especially data entry forms. If possible, familiarize your volunteers with our online database. If you can show the online database, go through how to setup your password/login information, how to register your group/site, how to find your group/site, how to submit data and options for viewing data. The best way for data to flow is from a volunteer to the online database. The AAS online database should be the final repository for all volunteer data. Volunteers should be encouraged to send copies to their local government

and to anyone else that may use their data. Only data from a site that has been registered with the State database will be accepted.

III. Lunch

IV. Field

Review how to take a Whirl-Pak sample
It is ideal to take participants out in the field to take a sample, however this aspect of the workshop can also be taught indoors (i.e. from a baby pool or large bucket). Be sure to emphasize that samples are collected without touching the inside of the Whirl-Pak bags to avoid introducing contamination, and that they are sealed tight using the twist ties so no leaking occurs. Make sure volunteers know to immediately place samples on ice away from sunlight until ready for sample processing. It is also helpful to demonstrate creating a blank and remind volunteers of its importance.

Demonstrate sample processing
Lead the volunteers through the processing step by step, providing hints for better handling of samples along the way. Check everyone's technique and be sure they are comfortable with pipetting the correct volume of each sample correctly onto the Petrifilm™ with no air bubbles. **Remind them that all samples should be run in triplicate with one blank.** Pipetting and petrifilm waste should be disposed of properly. Pipette tips can be put in the trash, and Petrifilm™, once counted, should be sprayed with a disinfectant, put into a re-sealable bag and then can be put in the trash. Emphasize how consistency in collection is important – *it is the only way to compare sampling on one stream over time and between streams.*

V. QA/QC Test

Review using the 'Just the Facts' slide in the powerpoint presentation and answer any questions. Pass out the test found on the Trainer Resources page of the website. We try to grade the tests in class, usually letting the volunteers check their own. Make sure the sign-up sheet is filled out and that you have indicated who passed. Volunteers must identify *E.coli* counts with 90% accuracy, calculate levels of test plates and achieve 80% or higher on the written test.

Macroinvertebrate Workshop

Macroinvertebrate QA/QC Certification Requirements

(From Georgia Adopt-A-Stream Quality Assurance Project Plan)

In the macroinvertebrate monitoring workshop, volunteers will learn to identify macroinvertebrates and will demonstrate the ability to collect a sample from a stream. The in-class identification will typically include identifying a collection of macroinvertebrates. This session is very important because sometimes very few macroinvertebrates will be found during the field collection. Sample collection methods and habitat types are reviewed and the rocky bottom and muddy bottom methods for collection sampling are demonstrated. The workshop participants will process the collection, complete the AAS data form and tally the macroinvertebrate water quality index value to determine the health of the stream.

Volunteers will be tested on their ability to identify macroinvertebrates and interpret the results. The trainer may use reference collections or live specimens to assess the volunteer's knowledge of macroinvertebrates. Those certified will achieve 90% accuracy in identifying at least twenty macroinvertebrate samples, correctly calculating the macroinvertebrate water quality index value and achieve 80% accuracy on a written test. Volunteers are encouraged to sample quarterly for one year and they must be recertified annually to maintain certification. The re-certification workshop includes a field based test in addition to a written test.

Macroinvertebrate Monitoring Workshop Materials List

Materials Needed for All Workshops:

- Copies of:
  - the sign-in sheet/waiver form
  - the appropriate manuals (optional)
  - the PowerPoint Presentation (optional)
  - extra copies of the dataforms **needed for Macro Test!**
  - the appropriate tests (and a key)
  - the 'Who to Call List'
- Pens/pencils
- AAS Introduction Video, *It all begins with you.* This is on the website and can be found with a search on YouTube.com (optional)
- Clear container or whirl-pak to teach the visual observations
- Projector, computer, screen, power cords, powerpoint on flash drive (if needed)
- Dry erase board (optional)
- Clip boards (if available)
- Drinking water for volunteers (in hot conditions)

Macro Specific Materials:

- Aquatic Macroinvertebrate Field Guide for Georgia's Streams (these are on the AAS website and laminated copies are available from the State office for active monitors)
- D-Frame and Kick Seine Nets for field demo and practice
- Set of macros for identification practice
- Test macros for identification section (20)
- Spoons, forceps, hand lenses, petri dishes, sorting pans, ice trays, bucket(s), small pieces of screening
- Pitcher or Jug for rinsing out macros from nets into sorting pans

Adopt-A-Stream Macroinvertebrate Workshop Outline (example)

Get Acquainted (sign-in/ waiver) 10:00 - 10:10

I. Introduction 10:10 - 10:40
(use the powerpoint and test as guides for what to cover)

AAS Video: *It All Begins with You*
Georgia Adopt-A-Stream, what is it?
Goals of Program
Importance of Quality Assurance
Watershed & Water Quality Impacts

II. Macroinvertebrate Monitoring 10:40 - 11:40

What are Macroinvertebrates?
Macros as Indicators of Water Quality
Stream Habitats
Review data forms and the online database (registration and data entry)

III. Identification in the Classroom 11:40 - 12:30

Aquatic Macroinvertebrate Field Guide for Georgia Streams
Samples of specimens
Key characteristics

IV. Lunch 12:30 - 1:00

V. Field 1:00 - 3:00

Review and fill out observations on data form at stream site
Stream habitats and sampling protocol
Identification
Complete Data Form
(Optional): Briefly introduce the Stream Habitat Survey

VI. Review and take QA/QC Test 3:00 - 3:30

During the Macroinvertebrate Workshop

Get Acquainted (sign-in/waiver)
This lets people relax and know this will be a fun event. Bring some snacks and drinks if you can. Make sure people fill in the sign-in form. The sign-in form also acts as the liability and photo waiver.

I. Introduction
Have people introduce themselves and explain their background and interest in adopting a stream. Introduce yourself.

Adopt-A-Stream Video: *It All Begins with You*
This is a great way to start the workshop. It gives people an overview of the program and it can reduce the amount of information you have to say. Remember, the video can say in 9 minutes what it may take you 30 minutes to say.

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Watershed & Water Quality Impacts
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because of construction or farming, the soil can easily wash into the nearest stream when it rains. If too much fertilizer is applied to a lawn or field, the excess can wash into a creek. In urban areas, storm drains receive runoff from parking lots and streets. Rarely do storm drains flow to treatment plants; most often the storm drain collects water that has mixed with oil, gasoline, brake dust, debris, and other pollutants and then pipes it directly into our waterways. Other types of NPSP include spills and illegal dumping. Most people value clean water for aesthetic and recreational value. We enjoy fishing, we observe wildlife that need clean water for habitat, we canoe and we enjoy clean parks along river corridors. We all need to do our part to protect our streams, wetlands, rivers and lakes. Remember to include any local information and **the watershed the workshop is being held in** (this is on the test!).

Safety

Please stress field safety considerations in all workshops. Refer to powerpoint for field safety guidelines. Also, you may want to share your field experiences and any local site information (sunburn, insects, poison ivy, briars, ticks, etc.)

II. Macroinvertebrate Monitoring

What are Macroinvertebrates?

The best option is to use the power point presentation created by the State office. This is your best guide for covering all the important information that is required for QA/QC certification. *Remember to emphasize all the information that will be on the test*. Test answers are shown in bold in the powerpoint presentations.

Macros as Indicators of Water Quality

Make sure you discuss the importance of dissolved oxygen for aquatic insects. True aquatic insects derive their oxygen from the water, through their gills, as opposed to breathing from the surface. Review sources of dissolved oxygen in the water.

Stream Habitats

There are many places where macroinvertebrates live in a stream (riffles, leaf packs, roots hanging in the water). We use 2 or 3 habitats in our sampling methods. Different kinds of macros live in different places; macros typically found in riffles need lots of oxygen and may filter food from the water, graze on aquatic vegetation, or prey on other organisms. Others may live in packs of leaves and need less oxygen. Different macros occupy different ecological niches within the aquatic environment, so diversity of species generally means a healthy, balanced ecosystem. Usually it's easier to cover habitats while at the streamside.

Review data forms and the online database (registration and data entry)

This is a good time to go over the data form as well as introduce the online database and our website (if you have internet access). Our website is the best place to find more information about all of our programs. It's also the starting point for registering new groups, sites, and submitting and accessing water quality data. Volunteers should be aware of resources they can find at **AdoptAStream.Georgia.gov**. Not all volunteers are comfortable accessing information on a website. Some volunteers may require help navigating the forms on the website, especially data entry forms. If possible, familiarize your volunteers with our online

database. If you can show the online database, go through how to setup your password/login information, how to register your group/site, how to find your group/site, how to submit data and options for viewing data. The best way for data to flow is from a volunteer to the online database. The AAS online database should be the final repository for all volunteer data. Volunteers should be encouraged to send copies to their local government and to anyone else that may use their data. Only data from a site that has been registered with the State database will be accepted.

III. Identification in the Classroom

Aquatic Macroinvertebrate Field Guide

Go over the Macro field guide. Emphasize that this key only identifies bugs to the order level. There are hundreds of different species of stoneflies, mayflies, etc. Point out the relative size differences between orders.

Samples

Most volunteers need all the practice they can get to hone their identification skills. Use a set of preserved macroinvertebrates as examples of as many different macros as possible. Usually it's better to let the volunteers learn at their own rate while you walk around the room answering questions. This in-class identification session is very important, as sometimes you will find very few macros during the field collection period.

Key Characteristics

After volunteers have spent time familiarizing themselves with the bugs, review the key characteristics. Point out that the colors in the preserved specimens are not representative of what they may find in the field. Now is a good time to review subtle differences between orders: Are gills present? Where are the gills located? What is the number of lateral tail-like appendages? Is the gilled snail opening on the right or left? Another option is to groups macroinvertebrates by similar characteristics and discuss commonly misidentified taxa.

IV. Lunch

V. Field

Sample / Collection Protocol

Go to the selected stream. Review the Rocky and Muddy Bottom methods. Usually there is only time to collect and identify macros for one method, but it is a good idea to discuss which conditions you would use for each method. Refer volunteers to the manual for further descriptions of habitats. Point out the different types of habitats you will sample for the selected method, and then demonstrate by example. For sandy or muddy substrate sampling, it is a good idea to demonstrate the elutriation method for separating bugs. Working in groups, instruct volunteers to practice sampling methods and observe for correct technique. Emphasize how consistency in collection is important – *it is the only way to compare sampling on one stream over time and between streams.*

Identification
Have volunteers process any samples they have, either by washing or picking through the sample. All macros should be placed in a clean container of water for easy identification. If you have the time, or feel it is necessary, have volunteers separate bugs into groups that look alike – all without tails into one group, all with tails into another. Then try to separate mayflies from stoneflies, craneflies from aquatic worms, etc. Finish identifying macros. You may want to encourage volunteers to keep a reference collection.

Complete Data Form
After you have practiced identification, be sure to complete the Adopt-A-Stream data form. Ask everyone as a group if each order was found during the sampling; "Did we find a hellgrammite? Did we have a scud?" This allows a chance to clarify any misidentifications and reinforce I.D. skills. The water quality index score places emphasis on diversity of orders over total number or organisms. Finally, have the group tally the water quality rating as an indication of the stream's health. The calculations are simple but can be easily confused.

Optional: Briefly introduce the Stream Habitat Survey
Use the AAS Stream Habitat Survey as an example of how to evaluate the physical habitats of a stream and its riparian zone.

IV. QA/QC Test

Review using the 'Just the Facts' slide in the powerpoint presentation and answer any questions. Pass out the test found on the Trainer Resources page of the website. We try to grade the tests in class, usually letting the volunteers check their own. If there's not time to grade the full test, try to at least grade the I.D. portion (using a key) as this is difficult to repeat later or discuss over the phone or email if the volunteer misidentifies many of the samples. Make sure the sign-up sheet is filled out and that you have indicated who passed. Volunteers must identify at least 20 macroinvertebrates with 90% accuracy and achieve 80% or higher on the written test.

Helpful Hints:
- Make sure you schedule plenty of time to review macros in the classroom – they may not find them when they sample in the field.
- Discussions of habitats and sampling techniques are usually easier and more interesting in the field. Explain each sampling technique and habitat type thoroughly.
- Send attendees the 'Rays Bugs' link on the AAS website ahead of the workshop to help volunteers get experience with identification. If an attendee can identify at least five bugs before the workshop, they're likely to do fine in the workshop!
- When introducing volunteers to the Aquatic Macroinvertebrate Field Guide for Georgia's Streams and the Macroinvertebrate Count Form, emphasize that macroinvertebrates are divided into three levels based on an organism's sensitivity to oxygen levels.

In the field:
- Anchor kick seine to the bottom of the stream and check for gaps.

- Rub all rocks only within the 2x2 area and directly in front of the net.
- Emphasize using the appropriate sampling method and correct number of samples to take from each habitat.