





Citizen Science Quality Assurance Toolkit

5 STEPS TO IMPROVE CITIZEN SCIENCE DATA QUALITY

Citizen science, or community science, provides an opportunity for everyone to explore environmental protection and public health questions to support community change. Quality data are the key to answering these questions. One of the best ways to produce quality data is for citizen science groups and governmental agencies to work together. This fact sheet outlines the quality assurance steps likely used by citizen scientists  when conducting field analyses or by governmental laboratories  when a sample is analyzed at the lab.

THE IMPACT OF A QUALITY PROCESS: DATA THAT COUNTS

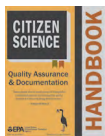
These steps provide a neutral, consistent way to produce quality data. With proper documentation, anyone can trace the life of each sample. Sample results can then be used for what they were intended: to educate the community, answer a research question or support a policy change.



1 PREPARE A PROJECT PLAN

Develop a project plan to integrate quality assurance into your project through a sampling plan, data quality objectives, etc. Use the US Environmental Protection Agency (EPA)'s QA Handbook to help develop your project plan.

Develop procedures to track, validate, verify and distribute your data.



Plan Quality Assurance Into Your Citizen Science Project

The EPA created the *Quality Assurance Handbook and Guidance Documents for Citizen Science Projects* (EPA QA Handbook) to help citizen science groups develop a Quality Assurance Project Plan (also known as a QAPP or Project Plan) to plan and document their project.

2 SAMPLE COLLECTION

Collection, Storage and Transport

Use quality control measures like equipment blanks and duplicate samples to ensure samples are collected without contamination.

Add appropriate labels and preservatives to the containers prior to sample collection.

Store your samples if they not shipped or tested right away.

Document the environment in which samples are stored and/or shipped.

Indicate on labels if sample preservation is maintained throughout storage and/or shipping.

Document the sample owner each time it changes hands to maintain chain-of-custody.



Choose your storage and transport locations carefully.

Environmental factors such as sunlight and temperature might influence results!

2 SAMPLE COLLECTION, CONTINUED

Verification

Reject samples that do not meet quality requirements (e.g., transport temperature is not met, transport time exceeded).
Verify sample identities when entering information into the lab information management system. A second verification may be necessary.

3 SAMPLE ANALYSIS

Prepare samples for analysis.
Analyze samples according to EPA-approved methods, if such methods exist. If not, use validated industry methods.

4 DATA MANAGEMENT

Data Documentation

Input data into the data management system using proper procedures. A second verification may be necessary.

Data Verification & Validation

Technical Manager: Review and validate data and test results.
QA Officer: Verify that all analyses fulfill proper quality assurance/quality control (QA/QC) acceptance criteria, precision, accuracy, and instrument performance measures.
Conduct a second QA/QC review.
Check for less common errors, such as improper instrument calibration or calculation errors.



Why weren't my data used?

Data may not be used because:

- The analysis did not start or the sample was not prepared within the method time frame.
- An incorrect analytical method was used.
- The instrument did not perform correctly or was broken.
- Samples were contaminated by outside source(s).
- Insufficient QA/QC measures were used.
- Data reports were incomplete.

5 DATA REPORTING

Review all sample results before performing a final validation.
Document all data that did not meet analytical method validation requirements.

MAKE YOUR DATA COUNT!

Learn more about maximizing your Citizen Science project (and find links to the documents referenced here) at:
epa.gov/citizen-science or aphl.org/citsci



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