

Table 1. Community Water Monitoring Tiered Data Quality Framework



In general, the amount of time, money, and expertise required increases with the tiers.

	TIER 1 <i>Educational</i>	TIER 2 <i>Targeting</i>	TIER 3 <i>Regulatory</i>
Data Uses	<ul style="list-style-type: none"> Community education Municipal engagement 	Includes Tier 1 uses, plus: <ul style="list-style-type: none"> Project-specific monitoring Water quality report cards BMP effectiveness monitoring Targeting installation of BMPs Targeting advanced monitoring NJDEP Comprehensive Regional Assessments 	Includes Tier 2 uses, plus: <ul style="list-style-type: none"> Regulatory assessments of water quality standard attainment
General Requirements	<i>Suggested:</i> At a minimum, a Study Design available for review by potential data users, with: <ul style="list-style-type: none"> Documentation of methods, locations, and timeframe 	QAPP¹ approved at Tier 2 by NJDEP BEARS ² or NJ Watershed Watch Network with: <ul style="list-style-type: none"> Use of standard operating procedures with defined levels of accuracy and precision 	QAPP¹ approved at Tier 3 by NJDEP Office of Quality Assurance, with: <ul style="list-style-type: none"> Use of NJDEP-Certified field and/or laboratory methods for chemical and microbiological analyses Use of EPA Rapid Bioassessment Protocol for habitat assessments Use of a defined NJ Watershed Watch Network method for macroinvertebrates (see Table 2)

¹QAPP = Quality Assurance Project Plan, a technical document that describes exactly how your data is being collected, analyzed, and stored for future potential data users to review. NJ Watershed Watch Network (NJ WWN) will help you to prepare according to the guidelines set forth by NJDEP Office of Quality Assurance and the EPA Citizen Science Handbook.

²NJDEP Bureau of Environmental Assessment, Restoration and Standards (BEARS)

Table 2. Overview of Volunteer and Financial Commitments by Tier

	MACRO TIER 3.1 <i>Good</i>	MACRO TIER 3.2 <i>Better</i>	MACRO TIER 3.3 <i>Best</i>
Training and Testing Required	<ul style="list-style-type: none"> • Two-day training • Field accreditation every 3 years • Streamside ID testing every 3 years 	<ul style="list-style-type: none"> • Three-day training • Field accreditation every 3 years • Lab ID testing every 3 years 	<ul style="list-style-type: none"> • Half-day training • Field accreditation every 3 years
Volunteer Time Commitment	<ul style="list-style-type: none"> • Field work: approximately 3 hours per sample 	<ul style="list-style-type: none"> • Field work: approximately 1-2 hours per sample • Lab work: approximately 3-4 hours per sample 	<ul style="list-style-type: none"> • Field work: approximately 1-2 hours per sample
Financial Resources Required	<ul style="list-style-type: none"> • Up-front costs include sampling materials like waders, nets, trays, buckets, sieves, rinse bottles, and utensils 	<ul style="list-style-type: none"> • Up-front costs include sampling materials (see 3.1) and preservation jars plus laboratory materials like dissecting microscopes, desk lamps, gridded sorting trays, 12-sided die, petri dishes, forceps, and vials • Alcohol for preservation 	<ul style="list-style-type: none"> • Up-front costs include sampling materials (see 3.1) and preservation jars • Alcohol for preservation • Lab identification – approximately \$150-250 per sample, plus shipping

Table 3: Summary of Habitat and Macroinvertebrate Assessment Requirements

	MACRO TIER 3.1 <i>Good</i>	MACRO TIER 3.2 <i>Better</i>	MACRO TIER 3.3 <i>Best</i>
Macroinvertebrate Sampling	<ul style="list-style-type: none"> • Sample collection with D-frame net using multi-habitat technique 		
Macroinvertebrate Preservation	<ul style="list-style-type: none"> • No preservation required, organisms are returned to stream 	<ul style="list-style-type: none"> • Sample preservation in the field 	
Habitat Assessment	<ul style="list-style-type: none"> • At a minimum, the assessment should include the 10 questions from the EPA Rapid Bioassessment Protocols • NJ Watershed Watch Network data sheet is available but not required 		
Quality Assurance in the Field	<ul style="list-style-type: none"> • Field accreditation of sampling technique before first sample and every 3 years thereafter • Duplicative samples at 10% of sites every year • Field audit of 5% of sites every year 		
Macroinvertebrate Identification	<ul style="list-style-type: none"> • Performed streamside by volunteers • Mix of Class, Order, and Family, limited to 22 target organisms 	<ul style="list-style-type: none"> • Sample sorting, subsampling, and identification performed by volunteers with microscope • Family (except Annelids at Class level) 	<ul style="list-style-type: none"> • Sample sent to NJDEP-approved laboratory for sorting, subsampling, and identification • Lowest practicable taxonomic level (Genus or Species)
Quality Assurance for Macroinvertebrate Identification	<ul style="list-style-type: none"> • 50-organism proficiency test administered by NJ-WWN before first sample and every 3 years thereafter 	<ul style="list-style-type: none"> • 50-organism Family-level proficiency test administered by NJ-WWN OR SFS Taxonomic Certification Exam¹ before first sample and every 3 years thereafter • 10% of group samples re-identified annually by approved lab 	<ul style="list-style-type: none"> • All identifications performed by approved lab
Macroinvertebrate Assessment Indices	<ul style="list-style-type: none"> • Volunteer HGMI • Volunteer CPMI • Volunteer PMI 	<ul style="list-style-type: none"> • HGMI – family (high gradient only) 	<ul style="list-style-type: none"> • HGMI - genus • CPMI • PMI

¹Society for Freshwater Science Taxonomic Certification Exam administered by Stroud Water Research Center (<https://stroudcenter.org/sfstcp>)