Low Cost Water Quality Monitoring Survey

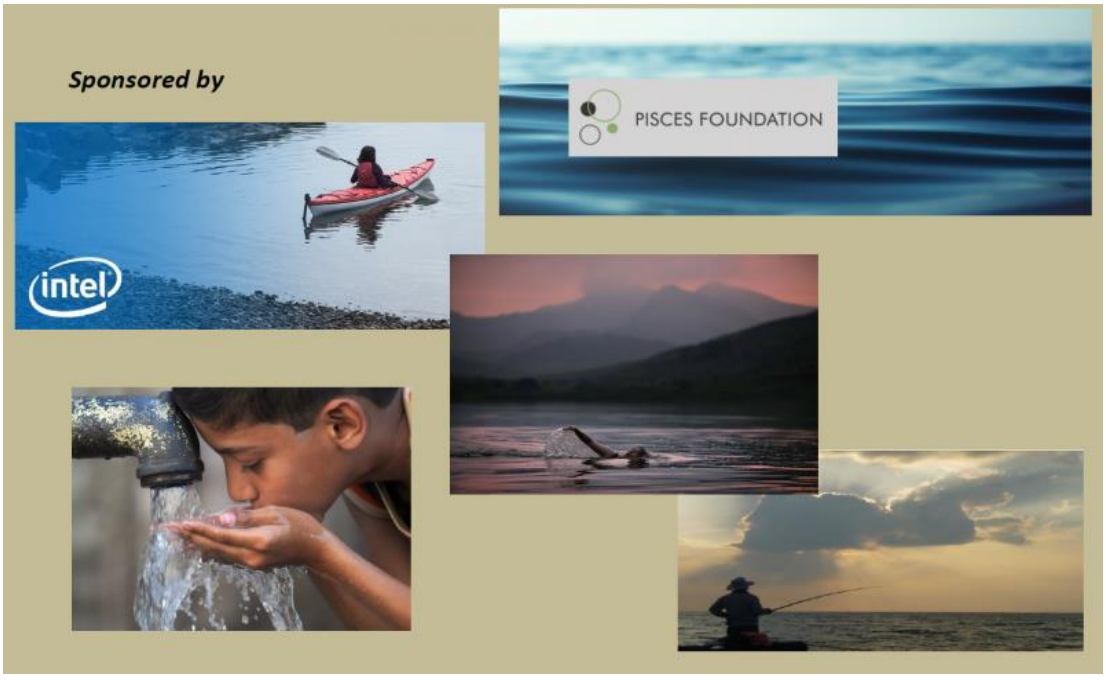
Thank you for your interest in participating in a survey sponsored by the Pisces Foundation and Intel Corporation to help empower citizens to protect their water through information gained with the use of low – cost monitoring equipment.

The specific outcome of this survey is to gather information about the groups that are using “low cost” equipment to collect and distribute water quality monitoring information. A potential second phase of the project, focused on technology development and/or deployment, will be informed by the results of the survey.

Survey directions:

The time required to complete this survey will vary (15-50 minutes) depending upon the familiarity the survey respondent has with their organization's monitoring program. You will be asked to provide general information about your program and more specific details about topics such as: the parameters being monitored, perceived needs and preferences regarding your monitoring practices, data collection methods, and some open ended questions about your monitoring experiences. It may be helpful for you to review the survey before you proceed. A separate link to the survey has been provided to you in your transmittal email.

This survey was developed by a team from Intel Corporation working with Burke Environmental Associates. If you have questions on the survey please contact Paula Hose at paulahose@verizon.net.



Please enter your contact information below.

Name _____
Email _____
Your organization or group _____
City _____
Postal code _____

Select the role that best fits your situation:

- ❍ Monitoring program coordinator/lead
- ❍ Monitoring program staff
- ❍ Monitoring program volunteer
- ❍ Person with strong monitoring program knowledge
- ❍ Person with some monitoring program knowledge
- ❍ Other (please specify) _____

In which country do you currently monitor?

- ❍ USA
- ❍ Canada
- ❍ other _____

In which state(s) do you currently monitor? (check all that apply)

- ❑ Alabama
- ❑ Alaska
- ❑ Arizona
- ❑ Arkansas
- ❑ California
- ❑ Colorado
- ❑ Connecticut
- ❑ Delaware
- ❑ District of Columbia
- ❑ Florida
- ❑ Georgia
- ❑ Hawaii
- ❑ Idaho
- ❑ Illinois
- ❑ Indiana
- ❑ Iowa
- ❑ Kansas
- ❑ Kentucky
- ❑ Louisiana
- ❑ Maine
- ❑ Maryland
- ❑ Massachusetts
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- ❑ Nevada
- ❑ New Hampshire
- ❑ New Jersey
- ❑ New Mexico
- ❑ New York
- ❑ North Carolina
- ❑ North Dakota
- ❑ Ohio
- ❑ Oklahoma
- ❑ Oregon
- ❑ Pennsylvania
- ❑ Puerto Rico
- ❑ Rhode Island
- ❑ South Carolina
- ❑ South Dakota
- ❑ Tennessee
- ❑ Texas
- ❑ Utah
- ❑ Vermont
- ❑ Virginia
- ❑ Washington
- ❑ West Virginia
- ❑ Wisconsin
- ❑ Wyoming

In which province do you currently monitor?

- ❍ Ontario
- ❍ Quebec
- ❍ Nova Scotia
- ❍ New Brunswick
- ❍ Manitoba
- ❍ British Columbia
- ❍ Prince Edward Island
- ❍ Saskatchewan
- ❍ Newfoundland and Labrador

In which tribal land/territory do you monitor? _____

What type of organization do you support?

- ❍ Non-profit
- ❍ Government
- ❍ Quasi-government
- ❍ Business
- ❍ University
- ❍ Extension
- ❍ Other _____

What geographic area(s) does your organization typically serve? (check all that apply)

- ❑ watershed
- ❑ county
- ❑ state or province
- ❑ region
- ❑ river basin
- ❑ other _____

What is the mission or focus area of the organization you support? (check all that apply)

- ❑ water monitoring or assessment
- ❑ watershed protection or restoration
- ❑ public education
- ❑ school programs
- ❑ advocacy
- ❑ clean water act implementation or enforcement
- ❑ wildlife conservation
- ❑ protecting human health
- ❑ water conservation or efficiency
- ❑ protecting water supply
- ❑ other _____

What is the staffing strength of the organization you support?

Number of paid staff employed: _____

Number of volunteers: _____

Monitoring Program

Does your organization have a water quality monitoring program?

- ❍ Yes
- ❍ No
- ❍ Not Sure

If your organization does not have a water quality monitoring program, you will not be asked the following questions about your program in this section.

What are your monitoring program objectives? (check all that apply)

- ❑ education
- ❑ target problem areas
- ❑ affect regulatory or legislative policy
- ❑ watershed planning
- ❑ best management practice (BMP) assessment
- ❑ restoration assessment
- ❑ create long-term data sets
- ❑ consistency in methods
- ❑ supplement other data sets
- ❑ sharing
- ❑ report pollution incidents
- ❑ change community behavior
- ❑ take other action
- ❑ compliance or enforcement
- ❑ other _____

What water bodies do you monitor? (check all that apply)

- ❑ rivers or streams
- ❑ lakes or ponds
- ❑ water wells
- ❑ beaches
- ❑ wetlands
- ❑ estuarine
- ❑ marine
- ❑ harbors
- ❑ storm or waste water discharge areas
- ❑ groundwater
- ❑ drinking water supplies (home, schools, etc.)
- ❑ other _____

Do you have water volume (quantity) monitoring?

- ❍ Yes
- ❍ No
- ❍ Not Sure

What are your key monitoring program barriers? (check all that apply)

- ❑ funding stability
- ❑ funding amount
- ❑ staff time
- ❑ supporting volunteers
- ❑ volunteer turnover
- ❑ data analysis or sharing
- ❑ equipment
- ❑ other _____

How would you characterize your monitoring program approach? (check all that apply)

- ❑ Tier 1: Volunteers conduct basic monitoring tasks using simple methods, equipment and quality assurance procedures. Results are mainly used for screening problems, outreach and education purposes.
- ❑ Tier 2: Volunteers and/or staff are trained more intensively in QAQC protocols and use advanced monitoring methods and equipment to support local decision-making and water quality analyses.
- ❑ Tier 3: Experienced volunteers and/or staff are well trained in QAQC procedures, may be certified, and use expert monitoring methods (of "known and acceptable quality") and equipment and perform high level tasks. Results may be used to support policy, regulatory or scientific findings.

What methods do you use to *collect* data? (check all that apply)

- ❑ grab samples and lab analysis
- ❑ prepared samples and lab analysis
- ❑ field test kits
- ❑ lab test kits
- ❑ single parameter electronic meters or sensors
- ❑ multi-parameter meters or sensors
- ❑ custom assembled sensors
- ❑ unattended monitoring stations without telemetry
- ❑ unattended monitoring stations with telemetry
- ❑ long term fixed stations with flow controls without telemetry
- ❑ long term fixed stations with flow controls with telemetry
- ❑ cell phone reporting
- ❑ other _____

How do you normally share your data? (Check all that apply)

- ❑ annual or periodic reports
- ❑ online database
- ❑ online map with results
- ❑ data submission apps
- ❑ community outreach
- ❑ blogs
- ❑ use of smart phones
- ❑ social media
- ❑ other _____

What alternative water monitoring and/or information sharing technologies are used by your organization to enhance your effectiveness? (Check all that apply)

- ❑ phone apps
- ❑ satellite remote sensing
- ❑ GIS mapping
- ❑ data visualization software
- ❑ other _____

With whom do you share your data? _____

What Parameters Are Monitored by Your Organization? Please list the most needed physical, chemical, biological and/or other parameters (up to 10 parameters) that your organization monitors. If you have less than 10, leave the remaining parameter sections blank. For each parameter monitored by your organization we would like to understand your current approaches, preferred practices and level of precision needs. Respective datasheets may be needed to provide detailed information for each item checked.

Water Quality Parameters.csv

Select up to 10 parameters from this list:

If the parameter you want is not listed as an option, please enter it below. _____

For each parameter you select you will be asked to provide the following information.

Select Parameter #01 from the list above.

What is the **current** and **preferred** data collection approach for monitoring this parameter?

	not sure	manual methods (e.g. test kit, grab sample)	semi-automatic methods (e.g. meter, sensor)	fully automatic (continuous recording sensor)	other (please specify)
current collection approach	❍	❍	❍	❍	❍
preferred collection approach	❍	❍	❍	❍	❍

Please specify the **current** data collection approach?

Please specify the **preferred** data collection approach?

What is the **current** and **preferred** level of precision for monitoring this parameter?

	not sure	basic	advanced	expert
current level of precision	❍	❍	❍	❍
preferred level of precision	❍	❍	❍	❍

Briefly describe the methods and equipment your organization uses to collect data for monitoring this parameter. Please reference the actual method, if there is one (e.g. EPA Method 320.01, etc.) and, if applicable, related accuracy requirements.

Why do you monitor this parameter? _____

Would you like to enter information for another parameter?

- ❍ Yes
- ❍ No

What parameters would be most useful to measure that you can't today?

Equipment

Do you know of new or promising low-cost monitoring *equipment* that could benefit your program?

- ❍ No
- ❍ Yes

Please explain the new or promising low-cost monitoring equipment (add link if possible). _____

What are your perceived needs for low-cost water quality monitoring equipment? (check all that apply)

- ❑ use as a screening tool for advanced/expert level monitoring/investigation
- ❑ as a part of monitoring and verification protocols for nutrient trading programs, BMPs, restoration projects, etc.
- ❑ use by recreational water users (e.g. boaters, swimmers, fishermen) to determine water safety
- ❑ safe drinking water in homes or business or schools
- ❑ compliance or enforcement
- ❑ target problem areas
- ❑ supplement other data sets
- ❑ report pollution incidents
- ❑ other _____

What features would you most like to see in new equipment? (Check all that apply)

- ❑ remote-sensing and data loggers
- ❑ flow-triggered sampling
- ❑ automatic metadata capture
- ❑ in-field data entry
- ❑ equipment durability
- ❑ open source equipment
- ❑ other _____

What parameters should be the focus of low-cost monitoring *equipment*?

What price range would you consider to be "low cost" for *monitoring equipment*?

low end of price range _____
high end of price range _____

Do you think widespread availability of low-cost *monitoring equipment* could affect major improvements in water quality?

- ❍ No
- ❍ Yes

Please explain**.**_____

Do you participate in an equipment borrowing program?

- ❍ No
- ❍ Yes
- ❍ Please explain _____

Access and Sharing

Do you know of new or promising low-cost data *access and sharing* technologies that could benefit your program?

- ❍ No
- ❍ Yes

Please explain the new or promising low-cost *access and sharing* technology (add link if possible).

What are your greatest perceived needs for low cost *access and sharing* technologies? (check all that apply)

- ❍ crowd sourcing and sharing of water quality data
- ❍ sharing of water quality information with environmental advocates
- ❍ sharing of water quality information with local government officials
- ❍ quality and reliability of the data
- ❍ low unit cost of the data
- ❍ compliance or enforcement
- ❍ reporting pollution incidents
- ❍ other _____

What price range would you consider to be "low cost" for *access and sharing* technologies?

low end of price range _____

high end of price range _____

Water Quality Monitory Story

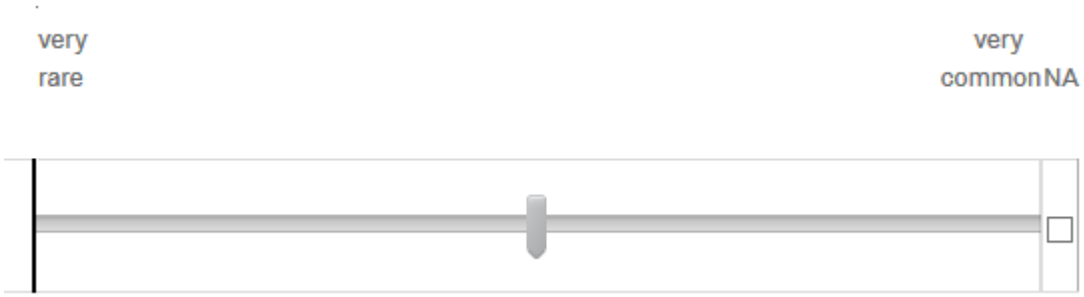
Share a short story about a *specific* experience or event based on one of the following questions (chose one).

- ❍ Describe a specific experience where efforts to effectively monitor water quality was a challenge
- ❍ Describe a time when you had to use a workaround in order to effectively monitor water quality
- ❍ Share a moment where something was working well to help monitor water quality

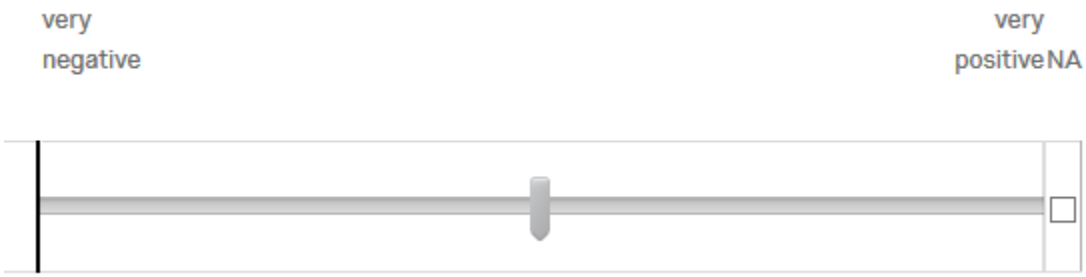
Enter your response below with enough detail to make it easy for others to understand.

Position the sliders for where you feel it best describes your story. Check the Not Applicable (NA) box if the question does not fit or apply to your story or if you have no idea how to answer.

How common is this situation?



What was the overall effect on water quality monitoring of the events shared in your story?



What were the *main challenges* in your story about?

Based on the experience shared above, rate how *easy* or *difficult* the following activities were by positioning the marker. Check Not Applicable (NA) if it does not fit or apply to your story or if you have no idea how to answer.

Thank you very much for taking your valuable time to participate in this survey. We will post a copy of the final report and provide you with information on the activity that may be taken to implement its findings. Additionally, information will occasionally be posted on the Pisces Foundation Blog.