Frequently Asked Questions

Village Blue: Real-time water quality monitoring in the Baltimore Harbor

ABOUT VILLAGE BLUE

1. **What is Village Blue?**
   Village Blue is a water quality monitoring project providing real-time water quality data to the Baltimore community. EPA and the U.S. Geological Survey (USGS) initiated the project to increase public awareness about local water quality, help close water quality information gaps, and give citizens and professional scientists more data to inform communities, policies, and environmental restoration efforts. The project complements work already being done toward the Waterfront Partnership of Baltimore's goal of making Baltimore Harbor swimmable and fishable by 2020.

2. **What kinds of data are being collected for Village Blue and how?**
   Water quality data are being collected in real-time by water sensors located on the Jones Falls River where it meets Baltimore Harbor. Multiple water sensors are connected to probes that record measurements of selected water quality parameters every five minutes to monitor the Jones Falls and Inner Harbor water quality. The monitoring site is helping to test, evaluate, and develop new low-cost water sensors that collect real-time water quality data.

   The following data are being collected:

   - Precipitation
   - Gage Height
   - Stream Velocity
   - Turbidity
   - Salinity
   - Dissolved Oxygen
   - Nitrate
   - Temperature
   - pH

SENSORS AND DATA

3. **What are "real-time sensors"?**
   Monitoring of water bodies is traditionally accomplished by collecting individual, time-specific measurements of water quality parameters in the field. "Real-time" sensors allow for measurement of specific water quality parameters over a time period less than one hour, which helps scientists observe natural patterns and trends in rapidly changing systems.

4. **What are the benefits of using "real-time sensors?"**
   In recent years, water quality monitoring systems have trended toward including continuous data collection that can be accessed through on-site downloading or remotely. This has the advantage of constant surveillance that can be carried out to rapidly detect changes and trends in critical water quality indicators, and can provide early warning information to decision-makers so they can respond appropriately.

5. **How accurate is data from the Village Blue sensors?**
   All Village Blue data are provisional and subject to revision until they have been thoroughly reviewed and received final approval by the U.S. Geological Survey (USGS). Approved data is defined as completely analyzed time-series data, including examination for errors and proper interpretation. Data shown as approved on the USGS National Water Information System (NWIS) web site are considered "published."

   Provisional data can be inaccurate due to instrument malfunctions or physical changes at the measurement site. Real-time data relayed by telemetry are automatically screened to not display improbable values until they can be verified. Subsequent review based on field inspections and measurements may result in significant revisions to the data.

   USGS has adopted a Continuous Data Review Policy, which states that data should be reviewed and finalized several times per year for most parameters. Some data streams require longer periods to finalize due to the complexity of the parameter and the necessary laboratory results for analyses.

   Data users should carefully consider the provisional nature of Village Blue data before using it for decisions that concern personal or public safety or conducting business that involves substantial monetary or operational consequences. Information on the accuracy and appropriate uses of these data or concerning other hydrologic data may be obtained from USGS.

6. **Does Village Blue track bacteria contamination with its real-time sensors?**
   Village Blue does not currently have a sensor to detect microbial contaminants in the water. EPA will, however, collect culture data and use quantitative polymerase chain reaction (qPCR) for fecal indicator bacteria (E. coli or enterococci) and source tracking markers using standard batch water collection methods. This data, sensor water quality data, and weather data will be used to develop microbiological water quality forecast models using EPA's Virtual Beach software.

   Since the data is still being collected, it is too early to know how the results will be presented. There may be opportunities to display results via the Village Blue application or through publication of the results. Source tracking information will also be analyzed using the Virtual Beach software for potential forecasting for target levels. Densities of the source tracking markers will also be assessed to understand what conditions most influence marker densities.

7. **Are the Village Blue water sensor data available for download?**
   The sensor data are available from EPA's Village Blue application and the USGS National Water Information System (NWIS).

8. **Is this project measuring rainfall?**
   Rainfall is measured by the National Oceanic and Atmospheric Administration (NOAA) outside the Maryland Science Center in the Baltimore Inner Harbor. Rain may impact other areas of the Jones Falls River Watershed before it reaches the Science Center.
   View a radar image of precipitation in Baltimore from NOAA.

   NOTE: Time on the NOAA site is shown in Coordinated Universal Time (UTC), while time on the Village Blue site is shown in Eastern Standard Time (EST). Please take that into account when comparing data from the two sites. (For example, if looking for precipitation measurements for 1pm EST, look at 6pm UTC on the NOAA site, since UTC is 5 hours ahead of EST.)

APPLICATION

9. **Can I view the application on my mobile phone or tablet?**
   Yes, the website and application can be viewed on iOS and Android operating systems.

10. **Why are the most recent observation showing "---" or data missing from the plots?**
    Water sensor data are not displayed if they have a USGS Data Qualifier. Typical data qualifiers for the Jones Falls sensors are Equipment Malfunction (Eqp) and Maintenance in progress (Mnt).

11. **The Village Blue application only displays 7, 14, or 30 days' worth of data in the figures. Can a longer time period be displayed?**
    Village Blue can only present the data in 7, 14 or 30 day increments, but the USGS National Water Information System (NWIS) can provide graphs of Village Blue data based on a beginning and end date, from February 2017 onward.

PROJECT DETAILS

12. Is Village Blue being conducted on Gwen Falls or any other watershed's main basin?
The Village Blue is focused solely on the Jones Falls River.

13. Are public education and outreach opportunities being developed as part of the Village Blue project?
EPA is partnering with local organizations to implement the Village Blue project and raise public awareness about the importance of monitoring and protecting local waters. Village Blue community partners include Blue Water Baltimore, National Aquarium, City of Baltimore, Waterfront Partnership of Baltimore, and Maryland Science Center.

14. How will Village Blue be funded in the future?
EPA will fund Village Blue through the end of September 2018. The project team is currently investigating funding options for Village Blue after that time.

WATER QUALITY MONITORING

15. Where can I find more information about the health of the Baltimore Harbor watershed?
Each spring, the Baltimore Waterfront Partnership publishes a Healthy Harbor Report Card. The report card summarizes major restoration activities that took place over the prior year and provides information on the health of the Jones and Gwynns Falls streams, the Baltimore Harbor, and the Tidal Patapsco River.

16. How can I get involved with Baltimore water quality monitoring efforts?
Please see the City of Baltimore's Department of Public Work's website for more information.

17. What other water monitoring is being conducted in Baltimore?
View a map of the other water sampling sensor locations.