

Frequently Asked Questions

REMOTE WATER QUALITY MONITORING NETWORK

OVERVIEW

What is SRBC's Remote Water Quality Monitoring Network (RWQMN)?

The RWQMN is a system of continuous monitoring stations designed to remotely track water quality conditions in the Susquehanna Basin. The network provides data for water management agencies to determine whether man-made activities are impacting water quality in the Susquehanna River Basin.

Why did SRBC start the network?

Increasing demands for water, particularly for natural gas drilling, coupled with the increasing potential for wastewater spills require advanced technology to monitor rapid changes in water quality conditions. The stations cover areas where smaller streams have not historically been monitored. The data help agency officials track existing water quality conditions and any changes in them on an ongoing, real-time basis.

When did SRBC start the network?

SRBC initiated the network in late 2009 with station installation beginning in 2010. SRBC previously operated and maintained such a system only on the mainstem of the Susquehanna River for the purpose of monitoring drinking water sources.

Where are the stations located?

The stations are located throughout the Susquehanna River Basin. Currently, there are 62 water quality monitoring stations.

How is SRBC selecting station locations?

SRBC selects monitoring sites based on various criteria, including: (1) human activities within the watershed; (2) watersheds that match criteria such as stream size, streamflows, etc.; and (3) based on interest from government agencies, nonprofits, and the general public. SRBC also selects some locations specifically for their pristine qualities such as those designated as High Quality or Exceptional Value Streams, or streams critical to drinking water supplies.

What types of monitoring are conducted?

Monitoring stations are equipped with sensors that can detect subtle changes in water temperature, pH, dissolved oxygen, conductivity (ability to conduct electricity), and turbidity (water clarity).

Does SRBC collect additional data during station visits?

Yes. At select stations, SRBC also collects:

- streamflow measurements;
- fish collection;
- macroinvertebrate (bugs) and habitat data; and
- about four times a year: Acidity/Alkalinity, Aluminum, Chloride, Barium, Total Dissolved Solids, Sulfate, Total Organic Carbon, Calcium, Magnesium, Sodium, Potassium, Nitrate, Bromide, Strontium, Total Phosphorus, Iron, Manganese, and Gross Alpha and Beta.

How does the network operate?

The monitoring network provides constant data measurement with instruments sensitive enough to detect subtle changes in water quality on a frequency that will allow background conditions and any changes to them to be documented throughout the year. SRBC receives the data from the stations and makes that real-time information available to resource agencies and the public via its website at <http://mdw.srbc.net/remotewaterquality/>.

What does a RWQMN station look like?

Each station consists of a: (1) data sonde that is inserted into a protective PVC pipe and placed in the stream to measure data on the five parameters; and (2) solar-powered data platform that transmits the real-time information to SRBC.

UNDERSTANDING MONITORING PARAMETERS

What do the monitoring parameters measure and why are they important?

Temperature – measures how warm or cold a stream runs over time. Temperature can affect the general health of aquatic organisms and the ability of water to hold oxygen as well as the ability of organisms to resist certain pollutants.

pH – measures the stream's acidity or alkalinity, with normal ranges between 6 and 9. Pollution can change the pH of water, which in turn can harm animals and plants living in the water.

Conductance – measures the ability of the water to conduct electricity, which typically reflects the amount of dissolved solids or chlorides in the water. High specific conductance indicates high dissolved-solids concentration; dissolved solids can affect the suitability of water for domestic, industrial, and agricultural uses. The primary parameter of interest in areas of natural gas drilling will be conductivity, since this is the parameter most likely to rise if natural gas development activities impact local streams.

Dissolved oxygen – measures the amount of oxygen in the water available to aquatic life, with levels best above 4-5 milligrams per liter. The oxygen dissolved in streams is crucial for the organisms and creatures living in it. As the amount of dissolved oxygen drops below normal levels in water bodies, the water quality is harmed and creatures begin to die off.

Turbidity – measures water clarity, or the amount of particulate matter in the water column. Turbidity is measured by shining a light through the water and is reported in nephelometric turbidity units (NTU). During periods of low flow (base flow), turbidities are low, usually

less than 10 NTU. Higher turbidity readings, typical during storm events or resulting from pollution, can make the water cloudy or opaque and can block sunlight needed by aquatic organisms. Streams with persistently high turbidities can degrade aquatic habitat and pose difficulties for the treatment of drinking water.

At what interval are the data measured?

The water quality parameters are measured at 15-minute intervals and the data are transmitted to the SRBC office in Harrisburg every 2-4 hours. During the winter season, data transmission schedules to the website may be reduced for select stations to conserve power since the stations are powered by solar panels, which can be affected by snow/ice conditions and shorter daylight hours. In addition, water quality observations may be affected at times by ice build-up and/or blockages.

ACCESS / USE OF DATA

Does SRBC monitor the water quality data coming into the office?

Yes, SRBC staff members monitor the continuous monitoring data. In addition, alarms are set for each parameter at each station to alert SRBC staff of any deviations from normal levels.

How are the data used?

The network provides early warnings to help environmental protection officials respond more rapidly and better pinpoint causes if water quality conditions change. Additionally, many organizations and the public use the data to simply monitor the quality of streams. The data are also being used by local universities working on watershed research.

COST

How much does each monitoring station cost?

It costs about \$20,000 to purchase and install the equipment, and about \$8,000 annually to maintain each station. This annual maintenance cost includes labor, equipment servicing, and data management.

How is the network funded?

Funding for this initiative was provided by East Resources, Inc., the New York State Energy and Research Development Authority, and the Headwaters RC&D Council Sinnemahoning Stakeholders Committee. Additional funding was provided by the Pennsylvania Department of Conservation and Natural Resources for stations installed in 2011 on state forest land. SRBC is covering the continuous operation and maintenance costs for the entire network.