

WATER SNAPSHOT 2012

An Upper Delaware Snapshot



Drawing by Kayla Campbell – Hancock Central School

Upper Delaware Scenic & Recreational River

Compilation of results collected by students of Wayne Highlands School District's Damascus Elementary School, Lakeside Elementary and Preston Area School as well as Sullivan West Central School, the Hancock Central School and Roscoe Central School in conjunction with National Park Service Ranger Jamie Myers, Seasonal Rangers Susie Kaspar and Brandon Diefenbach, and Rich Egan, National Park Service V.I.P.

The Tale of John Polout

This is the story of John Polout.

Once there was a boy named John Polout and he was the worst polluter of all. One day his family and he went on a camping trip. But all the garbage was dumped in the river by John Polout. He then got the nick name John Pollute.

Suddenly one day out of the blue a trout appeared. He said "John, you should not pollute the water, it is important." John didn't believe him and kept on polluting the water. One day he went to the river and got terribly sick from drinking the water.

John had learned his lesson and never polluted the water again. He even became a **steward**. Eventually the pollution went away. The trout came back and said "John, you should have listened." John said "I know!"

By: Alisha Trautschold & Kyra Breihof
Roscoe Central School

Nice cool fresh breeze
A fish, a rainbow trout
Turtles sun bathe on a rock
Under a tree is a patch of clover
Red as a ruby, a Cardinal sings
Eggs of fish are hidden here

By: Isabella Watson
Lakeside Elementary School

Overview

Who: Fifth Grade classes from Wayne-Highlands School District's Damascus Elementary School, and Preston Area School in Pennsylvania, Hancock Central School and Sullivan County West in New York. Fourth grade students from Lakeside Elementary School in Pennsylvania and Roscoe Central School in New York also participated.

What: Water Snapshot is a basin-wide water quality sampling event that takes a "snapshot" of the health of the entire Delaware River Basin, starting from the confluence of its headwaters and ending in the Delaware River Estuary that empties into the Atlantic Ocean.

It is an opportunity for people of all ages and experience levels, and especially students to visit a portion of the Delaware River watershed. Whether it is a tributary or the Delaware River itself, students have an opportunity to observe their surroundings and collect water quality information.

Why: In order to create an awareness of local watersheds and the valuable role they play in all of our lives. Students will gain an appreciation of the health and high quality of water in their own backyards, or next to their own schools.

When: April 2 through May 4, 2012

Where: Students in the Upper Delaware River Valley were able to collect water samples from three different aquatic settings. This year four different tributaries of the Upper Delaware were sampled along with the main stem Delaware River and the East Branch Delaware River. Because each of these areas is unique from each other, a comparison of results between each aquatic setting is encouraged.

A Delaware River Haiku

Deer drink out of me
Fish jump in me every day
I'm the Delaware

By: Jared Bochnovich
Lakeside Elementary School

WATER SNAPSHOT WATER QUALITY TERMINOLOGY

Nitrate and Phosphate - Nitrate and phosphate are necessary for aquatic plant growth, which supports the rest of the aquatic food chain. Both of these nutrients are derived from a variety of natural and artificial sources, including decomposition of plant and animal materials, man-made fertilizers, and sewage. Rainfall also can be a significant source of nitrates. While excessive nutrients might cause undesirable plant growth with their deleterious impacts on water quality, an appropriate level of nutrients is one of the driving forces of the aquatic ecosystem.

Natural nitrate concentrations rarely exceed 10 milligrams per liter (mg/l). Most are less than 1 mg/l, especially during periods of high plant production. Concentrations greater than 20 mg/l may pose a health hazard to small mammals, causing a problem where the blood's hemoglobin cannot transport oxygen.

In natural unpolluted water, phosphate levels are generally very low. Phosphorus, which combines with oxygen to form phosphate, is most often the limiting factor for plant production in streams.

Oxygen - Dissolved - Dissolved oxygen (DO, pronounced dee-oh) is oxygen that is dissolved in water. It gets there by diffusion from the surrounding air; aeration of water that has tumbled over falls and rapids; and as a product of photosynthesis. The amount of dissolved oxygen present is affected by temperature. Cold water generally contains more DO than warm water. If water is too warm, there may not be enough oxygen in it. When there are too many bacteria or aquatic animals in the area, they may overpopulate, using DO in great amounts.

Oxygen levels also can be reduced through over fertilization of water plants by run-off from farm fields containing phosphates and nitrates (the ingredients in fertilizers). Under these conditions, the numbers and size of water plants increase a great deal. Then, if the weather becomes cloudy for several days, respiring plants will use much of the available DO. When these plants die, they become food for bacteria, which in turn multiply and use large amounts of oxygen.

How much DO an aquatic organism needs depends upon its species, its physical state, water temperature, pollutants present, and other factors. For example, at 5 °C (41 °F), trout use about 50-60 milligrams (mg) of oxygen per hour; at 25 °C (77 °F), they may need five or six times that amount. Numerous scientific studies suggest that 4-5 parts per million (ppm) of DO is the minimum amount that will support a large, diverse fish population. The DO level in good fishing waters generally averages about 9.0 parts per million (ppm).

pH - pH is a measure of the acid/alkaline relationship in a water body. pH values range on a scale of zero to 14, with 7 being neutral.

A pH of about 6 to 9 is generally favored by aquatic life, especially fish. Algae and rooted plants in a stream modify pH levels through the photosynthesis and respiration processes. If plants are active, wide swings in pH levels can be observed over a 24-hour period, with low values experienced at night and high values experienced at midday. In-stream pH levels can also be impacted by acid and alkaline chemicals from industry, mining, acid rain, and other man-made sources, as well as by natural sources such as limestone deposits (bedrock) and tannic acid (produced by certain vegetation).

Turbidity - The American Public Health Association (APHA) defines turbidity as "the optical property of a water sample that causes light to be scattered and absorbed rather than transmitted in straight lines through the sample. In simple terms, turbidity answers the question, "How cloudy is the water?"

Light's ability to pass through water depends on how much suspended material is present. Turbidity may be caused when light is blocked by large amounts of silt, microorganisms, plant fibers, sawdust, wood ashes, chemicals, and coal dust. Any substance that makes water cloudy will cause turbidity. The most frequent causes of turbidity in lakes and rivers are plankton and soil erosion from storm water runoff.

Water Temperature - Water temperature is an important environmental factor for fish and other aquatic life, with many species needing specific temperature ranges to thrive. Temperature affects the concentrations of dissolved oxygen in water, with higher concentrations occurring with colder temperatures.

Damascus Elementary School – Damascus, PA

Results of sample testing performed by students of Mrs. Hazen's class.

WEATHER CONDITIONS

Air Temp: 14°C

Description: SUNNY

Was there precipitation within the past 48 hours? NO

SAMPLING LOCATION – Delaware River & Beaverdam Creek

SAMPLING DATE – April 30, 2012

Delaware River	Water Temp. (°C)	pH	Dissolved Oxygen (ppm)	Nitrate (ppm)	Phosphate (ppm)
Maggie, Lillian, Cody, Jacob	16	8	4	<5	<1
Joey, Sydney, Garrett, Emma	16	7	4	<5	<1
Jake, Abby, Matthew, Marissa, Katrina	22	7	4	<5	<1
Class Averages	18	7.3	4	<5	<1
Beaverdam Creek					
Justin, Brandon, Nina, Lexy	14	7	4-8	<5	<1
Thor, Brooke, David, Johnathan	14	7	4	<5	<1
Tyler, Kaitlin, Emily, Savannah	14	7	8	<5	<1
Class Averages	14	7	6	<5	<1



Roscoe Central School – Roscoe, NY

Results of sample testing performed by students of Mrs. Clifford's class.

WEATHER CONDITIONS

Air Temp: 22°C

Description: OVERCAST

Was there precipitation within the past 48 hours? YES

SAMPLING LOCATION – Willowemoc Creek

SAMPLING DATE – May 1, 2012

Willowemoc Creek	Water Temp. (°C)	pH	Dissolved Oxygen (ppm)	Nitrate (ppm)	Phosphate (ppm)
Kyra, Carly, Kyle, Willi	14	7	4	<5	<1
Kiara, Breanna, Isabella, Damien, Austyn	14	8	4-8	<5	1
Edgar, Stephen, Amber, Alisha	14	7	6	<5	<1
Kia, Stephanie, Trevor, Chad, John, Michael	18	7	4	<5	<1
Class Averages	15	7.3	5	<5	<1



Lakeside Elementary School – Honesdale, PA.

Results of sample testing performed by students of Mrs. Israel's, Mr. Theobold's, and Mrs. Hutchinson's classes.

WEATHER CONDITIONS

Air Temp: 20°C

Description: SUNNY

Was there precipitation within the past 48 hours? YES

SAMPLING LOCATION – Delaware River at Darbytown Access

SAMPLING DATE – May 3, 2012

Delaware River	Water Temp. (°C)	pH	Dissolved Oxygen (ppm)	Nitrate (ppm)	Phosphate (ppm)
Nia, Anthony, Rebecca, Tariel, Alexis	18	8	4	<5	1
Cindy, Chloe, Hailey, Joseph, David	20	8	4	<5	<1
William, Ethan, Sevion	14	7	8	<5	<1
Maya, Giana, Ethan, John	20	7	4	<5	1
Nick, Ethan, Tyler, Jasmin, Emily	14	8	8	<5	<1
Anna, Robbie, Cole, Jelena, Mary	14	8	4	<5	<1
Hannah, Chloe, Jason, AJ, Alyssa	14	8	4	<5	<1
Eddie, Reillie, Jackie, Morgan, Ethan	18	8	8	<5	<1
April, Taylor, Jordan, Caleb, Jonathan	14	8	8	<5	1
Chris, Matthew, William		8	4	<5	<1
Class Averages	16.2	7.8	5.6	<5	<1



Lakeside Elementary School – Honesdale, PA.

Results of sample testing performed by students of Mrs. Pender's, Ms. Jeffers', and Mrs. McAndrew's classes.

WEATHER CONDITIONS

Air Temp: 21°C

Description: PARTLY CLOUDY

Was there precipitation within the past 48 hours? YES

SAMPLING LOCATION – Delaware River at Darbytown Access

SAMPLING DATE – May 4, 2012

Delaware River	Water Temp. (°C)	pH	Dissolved Oxygen (ppm)	Nitrate (ppm)	Phosphate (ppm)
Bella, Molly, Angelica, Sarah	18	7	8	<5	<1
Kyler, Joey, Price, Ethan, Zach	24	7	4	<5	4
Morganne, Jada, Jack, Rashad, Madison	14			<5	<1
Kaitlyn, Emelia, Rachel, Justin, Dustin	16	8	8	<5	<1
Jack, Aidan, Josh, Vincent	16	7	8	<5	<1
Dominic, William, Daniel, Nichloes	14	7	4	<5	<1
Alyssa, Thea, Kiera, Thomas, Amanda	16	8	4	<5	<1
Trent, Adam, Aaron, Carson, Noah	14	8	4	<5	<1
Natalee, Gracie, Sophie, Bella, Britney	16	8	4	<5	<1
Grady, Jimmy, Dacota, Damon, Tyler	16	8	8	<5	<1
Class Averages	16.4	7.6	5.8	<5	<1.3



Lakeside Elementary School – Honesdale, PA.

Results of sample testing performed by students of Mrs. Keen's, Mrs. Friese's, and Mrs. Hutchinson's classes.

WEATHER CONDITIONS

Air Temp: 23°C

Description: PARTLY CLOUDY

Was there precipitation within the past 48 hours? YES

SAMPLING LOCATION – Delaware River at Darbytown Access

SAMPLING DATE – May 4, 2012

Delaware River	Water Temp. (°C)	pH	Dissolved Oxygen (ppm)	Nitrate (ppm)	Phosphate (ppm)
Sam, Cody, Chelsy, Alexis	14	8	4	<5	<1
Kaylee, Kayleigh, Victoria, Alex	16	7	4	<5	<1
Hunter, Andrew, Matt, Zachary, David	22	8	4	<5	2
Rachel, Danielle, Logan, Gavin, Daniel	20	7	4	<5	<1
Miranda, Marissa, Sophia, Skyler, Hayly,	12	7	4	<5	<1
Katie, Kiersten, Shawnee, Thomas, Jason	14	7	4	<5	<1
Megan, Julia, Ian, Peter, Caleb	14	8	4	<5	<1
Alyssa, Julian, Daniel, Cassie	14	8	4	<5	2
Luke, Joey, Sean, Jarod, Alex	14	7	4	<5	<1
Lydia, Kelly, Hannah, Dana, Lilah	14	8	4	<5	2
Libby, Maggie, Katie, Leigha, Morgan	16	8	8	<5	<1
Class Averages	15.5	7.5	4.4	<5	1



Preston Area School – Lakewood, PA

Results of sample testing performed by students of Mrs. Galloway's class.

WEATHER CONDITIONS

Air Temp: 4.5°C

Description: PARTLY CLOUDY

Was there precipitation within the past 48 hours? YES (SNOW!)

SAMPLING LOCATION – Shehawken Creek

SAMPLING DATE – April 2, 2012

Shehawken Creek	Water Temp. (°C)	pH	Dissolved Oxygen (ppm)	Nitrate (ppm)	Phosphate (ppm)
Autumn, Caroline, Devin	<14	7	8	<5	<1
Preston, Jacob, David	<14	7	4	<5	<1
Charlie, Austin, Gabby, Chase	<14	8	4	<5	<1
Damian, Matthew, Danyel	<14	8	4	<5	<1
Class Averages	<14	7.5	5	<5	<1



Hancock Central School – Hancock, NY

Results of sample testing performed by students of Ms. Charles' and Mrs. White's classes.

WEATHER CONDITIONS

Air Temp: 13°C

Description: OVERCAST

Was there precipitation within the past 48 hours? YES

SAMPLING LOCATION – East Branch Delaware River

SAMPLING DATE – May 3, 2012

East Branch Delaware River	Water Temp (°C)	pH	Dissolved Oxygen (ppm)	Nitrate (ppm)	Phosphate (ppm)
Eric, Owen, Cole, Kyle, Thomas	14	7	4	<5	<1
Camryn, Mariah, Riley, Tommy, Josiah, Spencer	14	7	4	<5	<1
Patrick, Lucas, Mason, Cameron, Garrett	15	7	4	<5	<1
Kayla, Parker, Trinity, Katie, Cullen, Danny	14	7	4	<5	<1
Class Averages	14.25	7	4	<5	<1



Sullivan West School – Jeffersonville, NY

Results of sample testing performed by students of Mrs. Mullally's and Mrs. Erlwein's classes.

WEATHER CONDITIONS

Air Temp: 14°C

Description: RAIN

Was there precipitation within the past 48 hours? YES

SAMPLING LOCATION – Sullivan West Creek

SAMPLING DATE – April 23, 2012

Sullivan West Creek	Water Temp (°C)	pH	Dissolved Oxygen (ppm)	Nitrate (ppm)	Phosphate (ppm)
Bennett, John, Katerina, Victoria, Kris	16	7	4	<5	<1
Jared, Hailee, Kristen, Greta, Molly, Brianna	16	7	4	<5	<1
Brett, Tanner, Jordan, Allyson, Sydney, Jenna	16	7	4	<5	<1
Michael, Aden, Cameren, Jason, Joly	16	7	4	<5	<1
Larry, Luke, Miranda, Marris	16	8	4	<5	1
Hannah, Gillian, Marris, Jordan, Darian	16	7	4	<5	<1
Caitlin, Victoria, Nile, Joe, Izzy	14	7	4	<5	<1
Corinna, Brittany, Andrew, Karlee, Kira, Domic	14	7	4	<5	<2
Allison, Paulina, Samantha, Alec, Emilly	14	7	4	<5	<1
Ben, Havyn, Elizabeth, Krystalin, Jacob	14	7	4	<5	<1
Camille, Madison, Treven, Ryan, Max	14	7	4	<5	<1
Josephine, James, Dylan, William	14	7	4	<5	<1
Renee, Victoria, Will, Eric, Anthony	14	7	4	<5	<1
Cameron, Andrew, Keirsten, Emma, Abby, Chanlyn	16	7	4	<5	<1
Victoria, Kayla, Faith, Bailey, Trevor	16	7	8	<5	<1
Kyle, Madison, Jake, Edwin	16	7	4	<5	<1
Kyle, Cadence, Grace, Geri, Daimien, Sebastian	14	7	4	<5	<1
Class Averages	15	7	4	<5	<1



Stewardship is important.

Try to be a good steward.

Everyone should be a good steward.

Water should stay clean so the fish aren't harmed.

Always clean up your trash.

Remember, the animals' homes that you could be ruining.

Don't pollute.

Stay safe when you are outdoors.

Help keep the environment clean.

Indoors and outdoors, be good to the earth.

Protect the environment.



By: Emily Gaebel
Sullivan West School