

# Testing the Waters with Friends of Temescal Creek

**W**ater is essential for all living organisms. Where waterways are healthy we find abundant plant and animal species. We can gauge the health of our creeks and rivers by looking at their basic chemical properties. The balance of these natural chemical components helps determine which aquatic organisms survive.

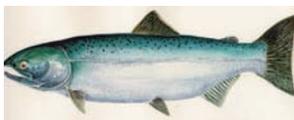


RYAN JONES

For the past three years, Friends of Temescal Creek has been taking water samples at various points along Temescal Creek, including the inlet of Lake Temescal and a site along Thornhill Road, as part of a water quality monitoring program.

## Temperature and Oxygen

Just as humans and other animals need oxygen to survive on land, fish and aquatic organisms depend on dissolved oxygen (DO) for their existence underwater. Because oxygen dissolves more easily in cold water, cold water contains more oxygen than warm water. Water with higher levels of DO supports a greater diversity of aquatic species. Without enough DO in the water, fish die.



RYAN JONES

Many fish and aquatic organisms need a specific temperature range for each part of their life cycle. Steelhead, for example, need colder water for migration, spawning and incuba-

tion (optimum range 46-50 degrees F), and slightly warmer water for rearing (55-60 degrees F). The highest temperature reading at Thornhill was 60.8 degrees. At Temescal Inlet it was 59 degrees.

As for dissolved oxygen, salmon and trout need higher levels of this element than carp or catfish. Aquatic insects, such as caddisflies, need higher levels than snails. The general standards for DO for Salmonid spawning is >11.0 mg/L. At Lake Temescal, DO was mostly above 9.0. At Thornhill there was greater variability with a low of 7.9 and a high of 12.0.



VALERIE KELLS

## Where Does Dissolved Oxygen Come from?

Water takes oxygen from the air as the creek travels over rocks. Obstructed or sluggish creeks contain less oxygen. Another source of dissolved oxygen comes from aquatic plants as they photosynthesize underwater during the day.

## What Affects Temperature and Dissolved Oxygen?

Sewage and runoff from chemical fertilizers used in gardens and on farms can add nutrients—such as nitrogen and

phosphorus—to water. Bacteria, like all living organisms, feed on nutrients. The increase in nutrients encourages the growth of more bacteria. As the bacteria respire, they consume dissolved oxygen, leaving less DO for fish and other organisms. Essentially, the bacteria ‘steal’ DO from the fish. By using chemical fertilizers in our gardens, we decrease the levels of dissolved oxygen necessary for fish to survive as these chemicals leach into creeks.

The primary determinant—along with climate—of water temperature is vegetative cover. Trees and shrubs shading the creek help keep water temperatures cooler.

## pH

The pH of water is used to gauge the level of its acidity. Water with a high pH is acidic. A balanced pH is neutral or 7. Most aquatic organisms cannot survive in water with a pH that is too low or too high.

The pH of water in a stream is influenced by soil geology and biological processes. Pollution from chemical spills and sewage can also have a negative impact on the pH of water.

Both Thornhill and Temescal were at the high end of the normally safe 6.5 to 8.5 range.

## Nitrate and Phosphate

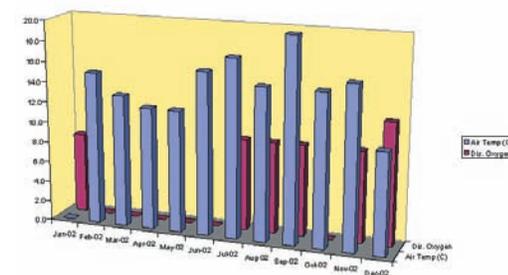
Nitrogen and phosphorus are both essential to plants and animals and occur naturally in water. Too much of these nutrients, in the form of nitrate or phosphate, however, can lead to excess plant and algae growth which decreases the level of dissolved oxygen in the water.



Excess nitrates can come from decaying plants and animals, human sewage and animal wastes, runoff from chemical fertilizers used on farms and residential land, as well as septic tanks.

The natural reading for nitrogen in water is 0.0 to 0.08 ppm. Readings for both sites were variable and may indicate potential pollution.

The natural reading for phosphate in water is 0.0 to 0.65 ppm. Readings for both sites were within the natural range.



TEMPERATURE VS. DISSOLVED OXYGEN AT THORNHILL SITE, 2002

For details of how you can volunteer with Friends of Temescal Creek, email [temcrk@mountaincurrent.net](mailto:temcrk@mountaincurrent.net).