A Word from the Watershed: The Nehalem River and Lethal Heat

By Corrie Aiuto

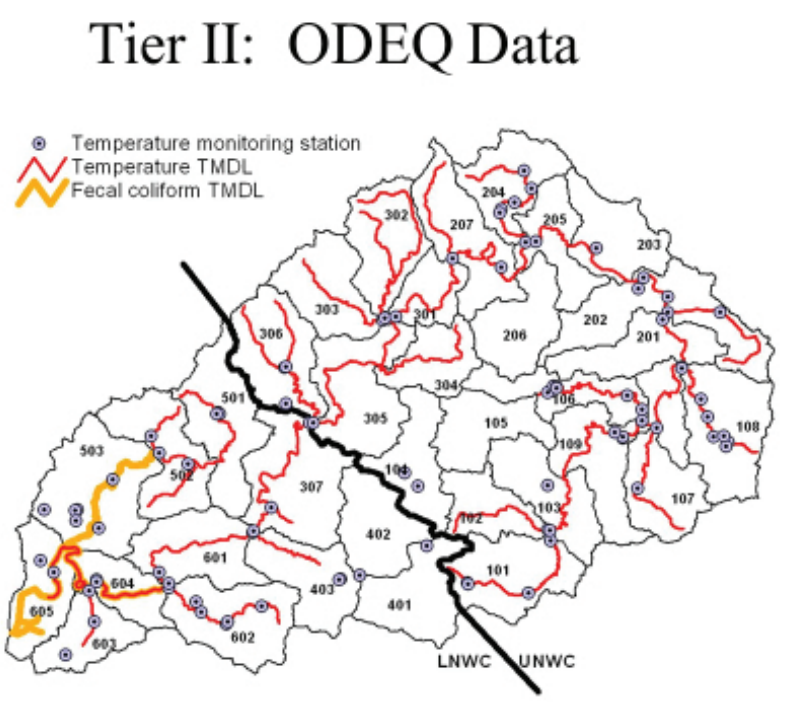
For years, summer temperatures in the Nehalem River have been too high, negatively impacting salmon strength and vitality. The Upper Nehalem Watershed Council (UNWC) needs your help to address the human-made causes.

Recently, on a hot weekend afternoon, my family and I sought out the cool relief of Rock Creek. As I waded out towards the middle of the stream, with my pants rolled up around my calves and my feet delighted, I began thinking about the complexity of life in the water. Sunlight and oxygen, plants and fish, living organisms and decaying matter, all must strike a Goldilocks balance to sustain the aquatic systems we know. Deficiencies in one ingredient or excess of another can bring the whole system out of balance and begin a series of reactions, impacting creatures all along the food chain.

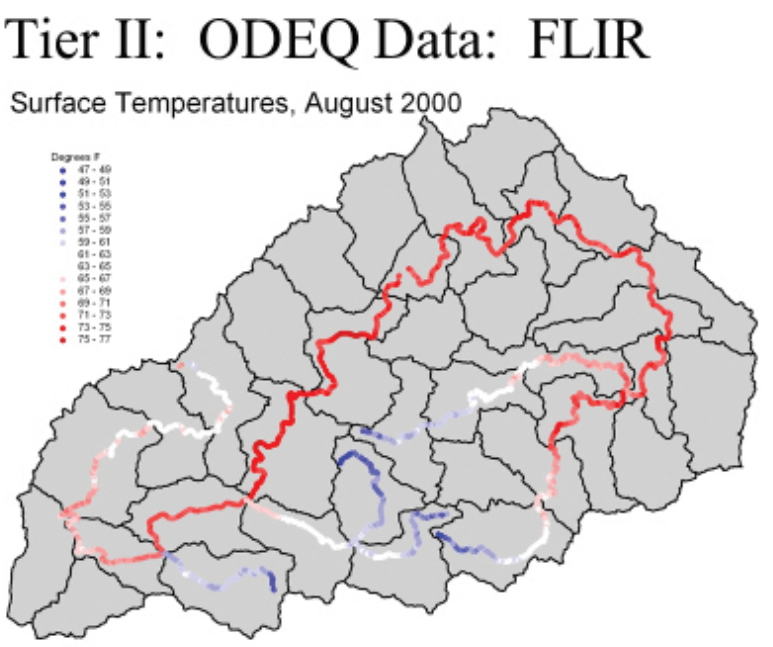
One excessive ingredient in our waters is sunlight, or more scientifically, solar radiation. We might not think of sunlight as a source of pollution, but when enough solar radiation heats a water body beyond what the creatures inside can endure, that's exactly what it is: sunlight pollution. To maintain water quality, environmental agencies look at what we traditional think of as pollutants, such as oil spills, chemicals, and wastewater, and also things like excess bacteria and sunlight.

In 1972, the Clean Water Act expanded water quality standards for U.S. waterways set in place by the earlier Federal Water Pollution Control Act of 1948. As part of this expansion, each state is required to establish a list of polluted water bodies and add them to what is known as the 303(d) list. Total Maximum Daily Limits, or TMDLs, were created, which set the total amount of a pollutant, including solar radiation, that can exist in the water without lowering water quality. In the case of stream temperatures, TMDLs focus on preserving water quality for salmon spawning, rearing, and migration. As early as 1998, the Oregon Department of Environmental Quality (DEQ) included the main stem of the Nehalem on the 303(d) list as temperature impaired, and by 2003 the TMDL report added many of the tributaries for the same problem. The Nehalem River, even 21 years ago, was too hot for some species of salmon.

Stream temperature data is taken and recorded in a number of ways and one common method uses a device called a thermograph. The small, battery-powered, cylindrical device is about six inches long and is left in the water for months at a time, taking temperature readings and storing them internally to be downloaded and analyzed later. TMDLs use seven day averages of such temperature data. The UNWC uses thermographs following DEQ protocol to ensure accuracy and places them in streams in the spring or early summer to record peak temperatures. The height of summer heat usually occurs at the end of July through August with temperatures dropping by late September.



In the summer of 2000, the DEQ took temperature data from over 40 in-stream sites in the Upper Nehalem and over 20 sites in the Lower Nehalem. They also conducted an infrared flyover, taking surface temperature data from an aerial view. Unsurprisingly, the data showed that much of the Nehalem was warmer than the maximum temperature threshold for salmon migration and rearing, reaching lethal limits in the main stem.



Some stream temperature increases, or heat loading, are part of natural seasonal fluctuations, but most are the result of human activity. Logging, agriculture, roadways, and wastewater treatment are a few of the ways we contribute to heat loading. Removing trees from riparian areas reduces shade cover, and runoff from developed land, roads, and water treatment facilities adds warm water to the stream.

The well documented increase in temperatures impacts the watershed in many ways. Most notably, salmon struggle to survive in warm water. For most species, anything over 55° F is too warm for spawning and over 65° F is too warm for rearing. This puts strain not only on salmon populations, but also on creatures that feed on live and decomposing salmon. The list of creatures depending on the redistribution of nutrients from the salmon life cycle is long, spans the length of the Pacific Northwest food chain, and includes us.

Another result of warmer waters is a reduction in dissolved oxygen. As the temperature rises, water chemistry changes, making less oxygen available. This has consequences for both animals and plants and gives advantage to some warm-loving invasive species.

Wading in Rock Creek provided a cool break from the summer heat for this warm-blooded homo sapiens. But the cold-blooded creatures who swim and squirm and crawl through the waters of the Upper Nehalem Watershed are feeling the heat. Those of us who live beside them must work harder to ensure their habitat not only exists, but also provides a necessary cool refuge in our warming planet.

You may be wondering how you can help. One key step is understanding the importance of diversely forested riparian areas along the entire length of the river, and particularly at the headwaters of a river or tributary. The Oregon Forest Practice Act does not require riparian buffers to be retained along non-fish bearing streams with an average annual flow of less than 2 cubic feet per second. This means that areas around headwaters can be clear cut if there are no fish and the flows are low enough. In order for streams to contribute cold water to the main stem, they must be allowed shade cover from the source all the way to the bay. Small landowners can help by not clearing trees and vegetation that are close to shore. Planting trees and contacting your state representatives about expanding riparian buffers are a couple other steps you can take.

Another helpful step is embracing the concept of natural valley storage. This refers to the land's capacity to store water in the winter and release it in the summer. Increased storage can help moderate stream temperatures and keep water cooler, longer. Beaver are particularly good at increasing natural valley storage by creating dams, pools, and wetland areas. Support beaver. If you are a landowner who encounters beaver, consider tolerating them for the benefits they bring the land, or relocation rather than extermination.

Finally, support your local watershed council. Donate. The UNWC operates almost entirely on grant funding, which is time consuming and competitive. If you have the resources to financially support your watershed council, do so. Volunteer your time. The UNWC needs board members first and foremost, but they also need folks to tend the native plant nursery, and help in the office with administrative tasks. Stay tuned and join us for volunteer tree planting events this coming fall and winter. Together we can help restore cooler waters to the Nehalem River.

The next Upper Nehalem Watershed Council Board Meeting is scheduled for Thursday, August 22, 5:30-7:30 pm at the UNWC office, 1201 Texas Avenue.