



King County Streams Monitoring Update for April 2019



A King County field scientist samples Cottage Lake Creek under the Tolt Pipeline Trail. In 2018, Puget Sound Energy replaced the old creosote-treated wood bridge with the new bridge shown above.

Thank you for your interest in the Streams Monitor, a monthly update from King County's [Routine Stream and River Monitoring Program](#), which samples water quality at 75 sites on streams each month. This month's article highlights a day in the life of one of our field staff out sampling the county's streams.



A Day in the Life – A Streams Sampling Run



Stephanie Hess collects water quality samples from Little Bear Creek as part of the King County streams routine monitoring program.

“I’m really into bugs right now,” Stephanie Hess says as she changes lanes on the freeway. She believes that one of the greatest threats to our region’s waters are chemicals and flow conditions that kill or displace the benthic invertebrates (“bugs”) found in streams. She expressed concern over the pharmaceuticals and pesticides that disrupt these crucial critters that provide sustenance to fish and birds.

Hess has worked for the King County Environmental Laboratory since 1999, and for nearly all of her 20 years at the County, she has been on the team collecting water quality samples from the County’s lakes and streams. Hess is now the lead field scientist for the [Routine Stream and River Monitoring Program](#), for which she coordinates the sampling schedule, adjusts sampling locations, and summarizes field observations. I had the pleasure of joining Hess for a sampling run in the Lake Washington and Sammamish River watersheds.

We started our morning at [Cochran Springs](#) at the southern edge of Kirkland. Cochran Springs flows into [Yarrow Creek](#) and then into Lake Washington’s Yarrow Bay. The vehicle



was filled with iced coolers, empty bottles, a water quality sonde, a pair of binoculars, and some snacks. Over the course of the day, the bottles and coolers were filled and the snacks dwindled.

Hess told me one of her most memorable moments of the past 20 years. While driving through the forest to one of the sampling sites, she spotted a cougar in the middle of the road. “That was the only time I ever saw a cougar, and the rest of the day I was practicing swinging my [water quality] sonde around in case that cougar came back.”

Hess, like many of her fellow field scientists, is an avid birder. She will whip out her binoculars at the sound of a wren’s song, a warbler’s warble, or a woodpecker’s peck. The field science team maintains an annual bird log to account for all the different bird species they’ve spotted over the past year. In 2018, they spotted 159 and so far, they’ve seen 127 in 2019. Hess’s favorite bird that she’s spotted is the [Swallow-tailed Gull](#), which is rarely seen north of the equator.



Stephanie Hess scans for uncommon and just plain delightful birds while sampling Yarrow Creek.

Hess appreciates the opportunity to talk about environmental wonders with the people she meets while out sampling. As we sampled the [Sammamish Slough](#) at the NE 145th St. bridge, a resident walking along the Sammamish River Trail stopped to ask us about a curiosity he saw downstream. A hundred, maybe two hundred, fish “yea big” – he showed a length



between his hands of about a foot – were amassed and darting about beneath the NE 175th St. bridge. Based on his description, Hess inferred that the fish were spawning peamouth minnows. Hess had only seen this phenomenon once before. Peamouth minnows spend most of their lives in Lake Washington and travel to streams or the shoreline in the spring to spawn. [Check out this video](#) produced by the City of Bellevue about peamouth minnows spawning in Kelsey Creek.

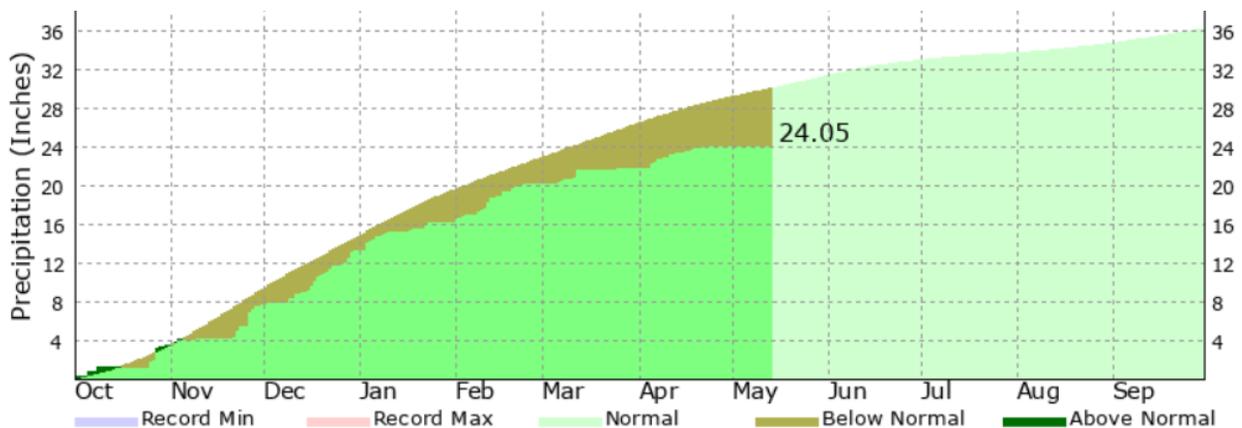
“Another stinkin’ robin,” Hess laments as she snips Himalayan blackberry bushes encroaching onto the access path to our final site of the day, [Kelsey Creek](#). Kelsey Creek (also called Mercer Slough at its lower reach) is visited at the end of the day because it is home to invasive [New Zealand mudsnails](#), and it is important that we don’t risk contaminating our gear with mudsnails and spreading them to other streams.

In all we visited 13 streams over the course of the day. We ducked under bridges, cut through brambles, marveled at [violet green swallows](#), and collected water quality data that provide insight into how well the region is maintaining its aquatic resources and how to best restore and protect them in the future.



Summary of April 2019 Observations for King County Monitored Streams

- **Sampling dates**
 - Apr. 9. – North Lake Washington and Lake Sammamish streams ([Water Resources Inventory Area \[WRIA\] 8](#)).
 - Apr. 10 – South Lake Washington, Pipers Creek ([WRIA 8](#)), Green River and Vashon-Maury Island streams ([WRIA 9](#)), Boise Creek ([WRIA 10](#)).
 - Apr. 15 – Streams of Snoqualmie and Skykomish rivers ([WRIA 7](#)).
- **Rainfall, snowmelt, and flow**
 - Before sampling on Apr. 9, there was between 0.15 and 0.6 inches of rain in the 12 hours just prior to sampling. In the 48 hours prior to that, about 0.25 inches fell. Rain fell heavily throughout sampling.
 - For the Apr. 10 sampling, there was approximately 0.2 to 0.6 inches of rain in the 24 hours prior to sampling with another 0.1 to 0.5 inches in the 48 hours prior to that. Rain fell heavily throughout sampling.
 - Prior to sampling WRIA 7 streams on Apr. 15, there was approximately 0.5 inches of rain in the preceding 48 hours. No rain fell during sampling.



Rainfall during the 2019 water year has been about 6 inches below normal. When the streams were sampled in mid-April 2019, the region experience more typical rainfall. Since mid-to-late-April, very little rain has fallen.



A description of the water quality standards may be found at the end of this email.

- **Water quality**

- ***E. coli***

- Seven sites (accounting for six streams) had **high E. coli levels** above the state peak criteria:
 - **Springbrook Creek** draining to the Duwamish River;
 - **Newaukum Creek** draining to the middle Green River (Newaukum had the greatest *E. coli* concentration at 6,200 colonies per 100 mL);
 - **Lower and Middle Green River**;
 - **Issaquah and Idylwood** creeks draining to Lake Sammamish;
 - Nine sites (accounting for 9 streams) have had **ongoing E. coli levels** that are above the state geometric mean criteria:
 - **McAleer and Thornton** creeks draining to Lake Washington;
 - **Longfellow and Springbrook** creeks draining to the Duwamish River;
 - **Newaukum Creek** draining to the middle Green River;
 - **Idylwood and Zachuse** creeks draining to Lake Sammamish; and
 - **Bear and North** creeks draining into the Sammamish River.

- ***Dissolved oxygen, Temperature, and pH***

- **Kelsey Creek (Mercer Slough) and Upper Evans Creek (WRIA 8) and Springbrook and Rock** creeks (WRIA 9) were below the state criteria for **dissolved oxygen**.
 - No stream appeared to have temperatures above the state criteria.

- ***Nutrients***

- Stream nutrient (phosphorus and nitrogen) levels at nearly all sites were similar to the typical historic values for the time of the year. Nitrate levels were generally on the low side.

[Click Here to Explore King County Stream Water Quality Data](#)



Purpose of Updates

As part of its routine stream monitoring program, King County monitors water quality at 74 sites within streams in WRIAs 7, 8, 9, and one stream, Boise Creek, in WRIA 10. Typically these updates will be completed one month after the streams are sampled once all laboratory analysis and quality assurance procedures are completed.

These updates serve several purposes:

1. To alert interested parties when the most recent King County routine stream monitoring data is uploaded and publicly available on the [Streams Water Quality Monitoring Data webpage](#).
2. To provide initial quality assurance and control of the routine data by identifying outliers and anomalies with regards to *historic stream conditions* and *regional observations*.
3. To provide a cursory, snapshot narrative of regional stream conditions based on the observed stream quality measurements, stream gage data, and meteorological data. This analysis is **not** comprehensive and is meant to serve as a starting point.

To provide context and a relative scale, water quality data may be compared to Washington State Water Quality Standards. These comparisons should **not** be used to determine impairment and are for interpretive purposes only.

Brief Background of Washington State Water Quality Standards

- The Washington State legislature has established **water quality standards** ([WAC 173-201A](#)) for the **protection of human health** and **aquatic life**.
- For the protection of aquatic life, standards are established for temperature, dissolved oxygen, pH, total dissolved gas, turbidity, and toxic chemicals (e.g., metals, polychlorinated biphenyls or PCBs, and pesticides).
- The routine water quality data collected by King County allow for the comparison of **temperature, dissolved oxygen, pH, and un-ionized ammonia**. The standards for each of these are dependent on the **designated aquatic life use** (e.g., salmon spawning and core summer habitat).

E. coli are used as indicators of pathogens associated with fecal material from warm-blooded animals. The *E. coli* criteria include both a geometric mean criterion and a statistical threshold value (or peak). The geometric mean is defined as the n^{th} root of the product of n numbers. The statistical threshold is defined as a value that not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained within an averaging period