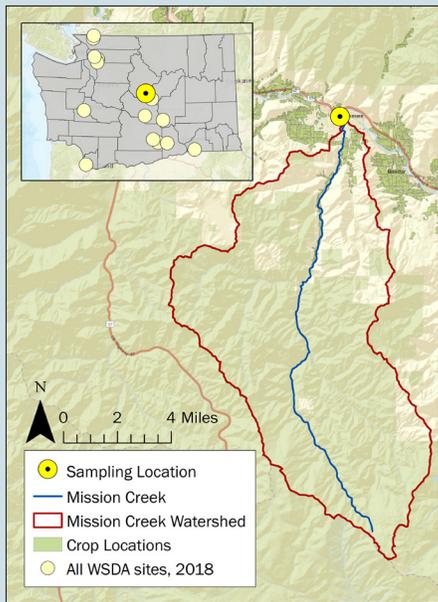
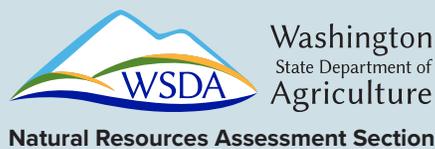


Mission Creek

Summary of 2018 Surface Water Monitoring Program Results | November 2019



The Washington State Department of Agriculture (WSDA) routinely monitors surface water throughout the state for the presence of pesticides. The monitoring is done between March and September, the typical season for pesticide use, and includes checking general water quality conditions and streamflow. State and federal agencies use this data to evaluate water quality and make exposure assessments for pesticides registered for use in Washington State. In 2018, WSDA monitored 16 sites in Washington, three of them in Chelan County.



Watershed and site information

Sampling history: 2007 - present

Watershed area: 52,400 acres (~82 square miles)

Area in agricultural use: 700 acres (~1% of total watershed acreage)

Main crops: Pears, cherries, apples, and fallow fields

Fish habitat: Summer steelhead (SalmonScape: apps.wdfw.wa.gov/salmonscape/)

Sampling dates: 8 sampling visits, March 13 – May 1

Water testing:

- WSDA tested for 90 current and legacy chemicals (35 insecticides, 35 herbicides, 9 fungicides, 7 pesticide degradates, 1 antimicrobial, 1 insect repellent, and 2 synergists).
- Samples were analyzed at Manchester Environmental Lab, Port Orchard, Washington.
- WSDA compares detected pesticide concentrations to WSDA assessment criteria, which are half of state and federal water quality criteria. Each pesticide has its own assessment criteria, based on its toxicity to aquatic animals, insects, and plants.
- WSDA identifies Pesticides of Concern (POCs) as current-use pesticides that have been found somewhere in the state above WSDA's assessment criteria in recent years.

Notes:

- Mission Creek has dense riparian vegetation on its banks for most of the reach, which helps prevent pesticide contamination.
- Juvenile fish of an unknown species were frequently observed at the site.

Results and Conclusions

- There were 40 total pesticide detections in Mission Creek from 5 different use categories: 5 types of herbicides, 1 fungicide, 3 insecticides, 3 degradates, and 2 other pesticide-related chemicals. This substantial increase from 2017 is largely due to new equipment at the lab and does not necessarily reflect an increase in pesticide use.
- Of the total pesticide detections, 13 were above WSDA's assessment criteria.
- The POCs chlorpyrifos, malathion, and pyridaben were detected.
- All detections of pyridaben at this site were higher than WSDA's assessment criteria.
- DDT was banned in the U.S. in 1972, but DDT and its breakdown products are very persistent in the environment and bind strongly to soil. Two of these breakdown products, 4,4'-DDD and 4,4'-DDE, were detected at concentrations known to negatively affect aquatic ecosystems.

Recommendations

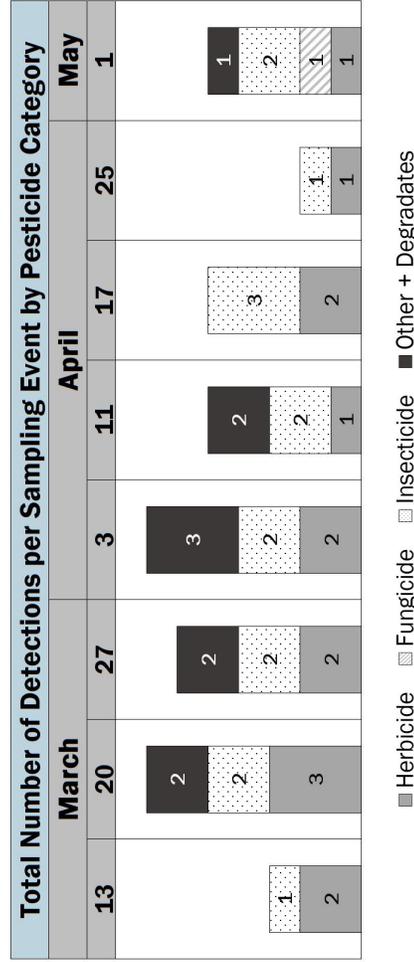
- **Make use of natural protections**
 - Use buffers, filter strips, sediment basins, ground cover, and setbacks.
 - Maintain vegetation along the creek and take care during spring applications before vegetation along streams leafs out.
- **Be informed**
 - Read and follow pesticide label directions, and be familiar with active ingredients.
 - Plan applications using the weather forecast to reduce the chances of drift or runoff.
 - Review WSDA's POCs and choose less-toxic pesticides when possible.
- **Care for your equipment and products**
 - Calibrate, maintain, and inspect application equipment regularly.
 - Properly dispose of all unneeded pesticides. Visit agr.wa.gov/wastepesticide to learn about waste pesticide collection events.

The calendar to the right shows the concentration in µg/L and date sampled of each WSDA POC. This calendar does not include all the pesticides WSDA found during the growing season. Detected concentrations that exceed WSDA's assessment criteria have a higher potential to cause harm to aquatic ecosystems.

Washington State's Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations												
Month	Use*	March			April			May				
Day of the Month		13	20	27	3	11	17	25	1			
Chlorpyrifos	I		0.070	0.615	0.055	0.019	0.014	0.005	0.006			
Malathion	I	0.013	0.019	0.242	0.030		0.008		0.002			
Pyridaben	I				0.048	0.029						
Total suspended solids (mg/L)		4.0	5.0	7.0	5.0	35.0	27.0	11.0	48.0			
Streamflow (cubic ft./sec)		24.3	34.1	36.2	39.1	89.9	74.4	51.0	62.9			
Precipitation (total in./week)		0.07	0.12	0.44	0	0.65	0.72	0	0.22			

Exceeds Assessment Criteria
 Below Assessment Criteria
 (*): Insecticide

The graph below shows the total number of detections per sampling visit in each pesticide category. The category 'other' includes degradates and additional pesticide-related chemicals. Note that the number of detections between categories cannot be directly compared due to the different number of chemicals in each category and variability in analysis methods used.



In the triangle to the right, pesticides in the top section have one or more detections above WSDA assessment criteria. The total number of detections for each pesticide is in parentheses after the name, with more frequently detected pesticides listed first in each section.

Please see agr.wa.gov/AgScience for more information.

