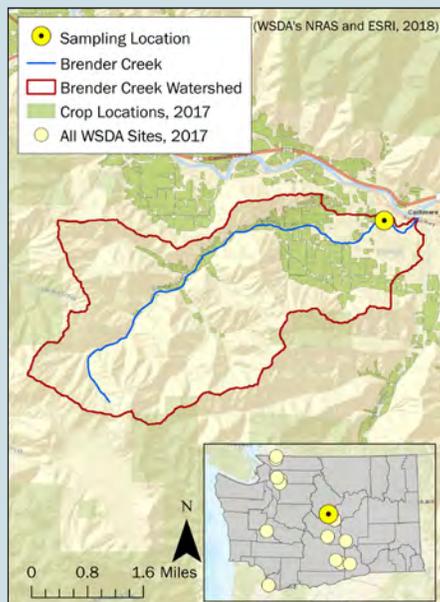


Upper Brender Creek

Summary of 2017 Surface Water Monitoring Program Results | November 2018



The Washington State Department of Agriculture (WSDA) has monitored pesticide concentrations in surface water throughout the state since 2003. WSDA staff take surface water samples during the typical pesticide use season (March - September). In 2017, WSDA monitored 16 sites in Washington, 4 of which were in the Wenatchee River watershed. State and federal agencies use this data to evaluate water quality and make exposure assessments for pesticides registered for use in Washington State.



Natural Resources Assessment Section

Watershed and site information

Sampling history: 2007 - present

Watershed area: 6,900 acres (~11 square miles)

Area in agricultural use: 900 acres (~13% of total watershed acreage)

Main crops: Pears, apples, pasture, and cherries

Fish habitat: Spring Chinook salmon and summer steelhead (Washington State Department of Fish and Wildlife SalmonScape: apps.wdfw.wa.gov/salmonscape/)

Sampling dates: 19 sampling events, April 4th - August 8th

Water testing:

- 130 chemicals (current and legacy insecticides, herbicides, fungicides, rodenticides, pesticide degradates, and other pesticide products)
- Streamflow and total suspended solids
- Air and water temperature measured every 30 minutes
- Sample analysis at Manchester Environmental Lab, Port Orchard, Washington

Notes:

- DDT was widely used in orchard production until it was banned in the U.S. in 1972. It is still detected in the Brender Creek watershed due to the chemical's strong soil binding abilities, combined with soil erosion into the adjacent stream.
- See WSDA's study in collaboration with the Cascadia Conservation District on DDT retention in wetlands: agr.wa.gov/FP/Pubs/docs/676BrenderUpperLowerDDT2016.pdf.

Results and Conclusions

- There were 69 pesticide detections in Upper Brender Creek. Of these, 9 were current-use pesticides detected above WSDA's assessment criteria and 24 were DDT and its breakdown products (4,4'-DDD and 4,4'-DDE).
- Out of all the chemicals tested for, there were 7 types of insecticides, 4 herbicides, 1 fungicide, 3 degradates, and 1 other pesticide-related chemical detected.
- WSDA identifies a pesticide as a Pesticide of Concern (POC) when it has been found somewhere in the state above WSDA's assessment criteria in recent years. Chlorpyrifos, diuron, imidacloprid, malathion, and pyridaben are POCs that were detected in Upper Brender Creek.
- All detections of imidacloprid, malathion, and pyridaben at this site were higher than WSDA's assessment criteria.
- Malathion was only detected during the first 2 weeks of monitoring.
- Chlorpyrifos and imidacloprid have also been detected in Upper Brender Creek in previous years at concentrations known to negatively affect aquatic life.

Recommendations

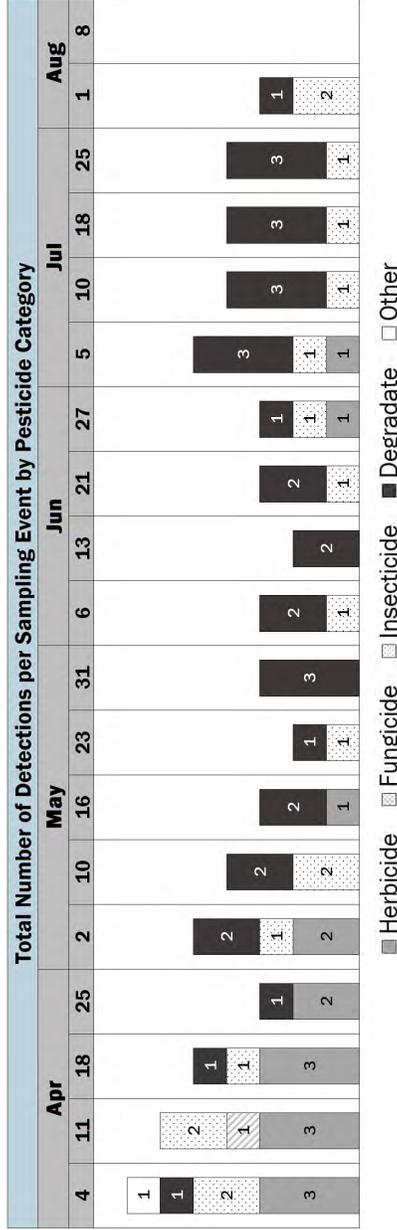
- **Make use of natural protections**
 - Use buffers, filter strips, sediment basins, ground cover, and setbacks.
- **Be informed**
 - Read and follow pesticide label directions, and be familiar with active ingredients.
 - Plan applications using the weather forecast to reduce the chances of drift or 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 Pesticide of Concern detected. This calendar does not include all the pesticides WSDA found during the growing season. The colors correspond to the risk each pesticide's detected concentration represents to an aquatic ecosystem. Detected concentrations that exceed WSDA's assessment criteria have a higher potential to cause harm to aquatic ecosystems. These assessment criteria are specific to each individual pesticide and are determined by applying a safety factor to state and federal water quality standards and criteria.

The graph below shows the total number of detections per sampling event in each pesticide category. The category 'other' includes wood preservatives, an insect repellent, synergists, and antimicrobials.

Washington State's Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations																				
Day of the Month	Use*	Apr				May				Jun				Jul				Aug		
		4	11	18	25	2	10	16	23	31	6	13	21	27	5	10	18	25	1	8
Chlorpyrifos	I-OP	0.248	0.108	0.052	0.034	0.022	0.034				0.013			0.010	0.009					
Diuron	H													0.058	0.021					
Imidacloprid	HN																			
Malathion	I-OP	0.209	0.080																0.028	
Pyridaben	I											0.038								
Total Suspended Solids (mg/L)		372.0	1050.0	1310.0	800.0	340.0	264.0	203.0	205.0	155.0	68.0	28.0	46.0	38.0	84.0	91.0	73.0	122.0	72.0	35.0
Streamflow (cubic ft./sec.)		6.0	6.9	7.6	5.8	4.5	7.3	7.2	6.6	3.8	1.7	2.6	2.6	2.6	5.2	4.4	4.5	3.0	4.1	2.8
Precipitation (total in./week)		0.19	0.57	0.74	0.24	0	0.26	0.37	0.03	0.17	0.19	0.16	0.01	0	0	0	0	0	0	0

■ Exceeds Assessment Criteria
 ■ Below Assessment Criteria
 (* H: Herbicide, I: Insecticide, OP: Organophosphate, N: Neonicotinoid)



The triangle to the right shows what pesticides were detected in Upper Brender Creek in 2017. Pesticides were categorized based on the highest detected concentration. The total number of detections for each pesticide is in parentheses next to the pesticide name. Detections have been color sorted according to WSDA risk assessment criteria that were surpassed. The risk each pesticide represents to an aquatic ecosystem is based on assessment criteria specific to each individual pesticide, not only on the concentration detected. WSDA's assessment criteria are derived by applying a safety factor to state and federal water quality standards and criteria in order to be proactively protective of aquatic life. Please see agr.wa.gov/PestFert/natresources/SWM for more information.

