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# Stemilt Creek

## Summary of 2016 Surface Water Monitoring Program Results

Washington State Department of Agriculture  
Natural Resources Assessment Section  
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### Introduction

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 through September). In 2016, 12 sites were monitored across Washington, 4 of which were in Chelan County. State and federal agencies use this data to evaluate water quality and make exposure assessments for pesticides registered for use in Washington State.

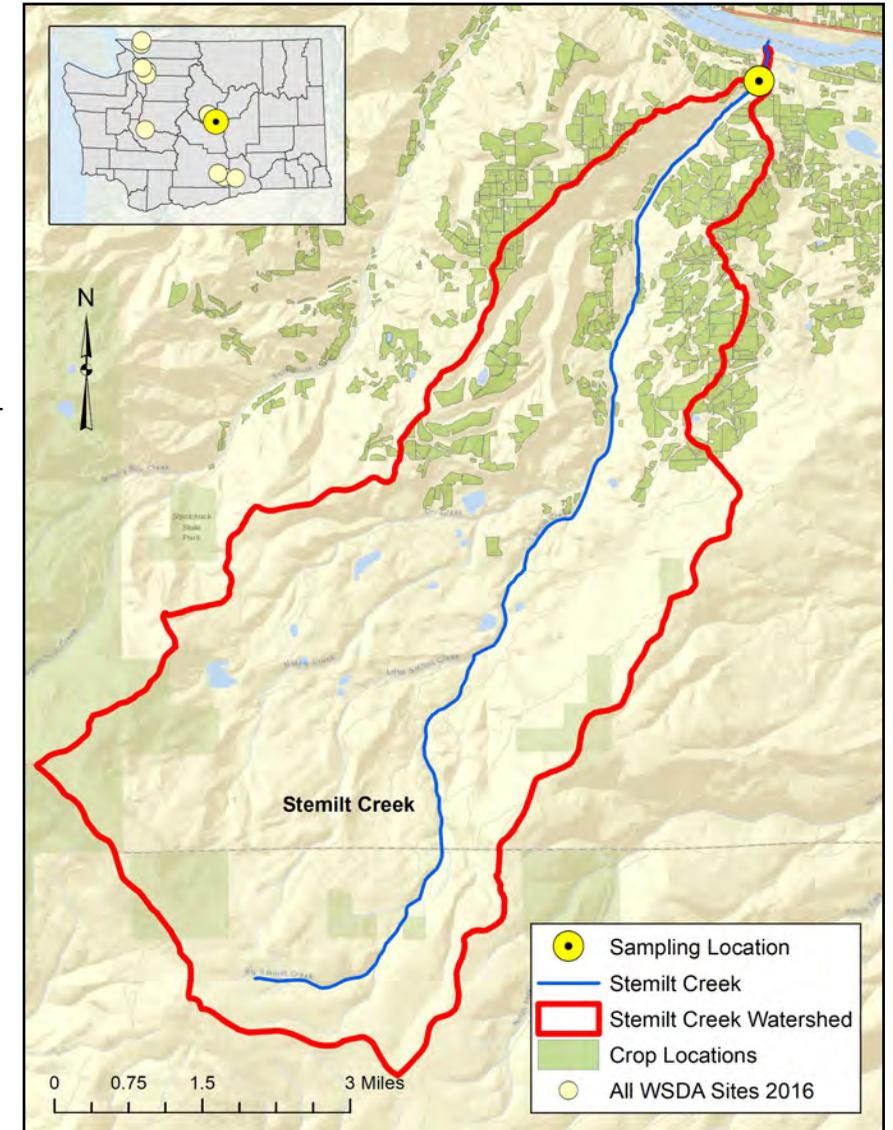
### Study Area

Water has been tested from Stemilt Creek from 2013 through 2016. The watershed drains approximately 21,200 total acres and about 9% (1,900 acres) of the acres is used for agriculture. The main crops are cherries, apples, and pears. The very lower reach of Stemilt Creek provides habitat for spring Chinook and summer steelhead salmon\*.

\* Washington State Department of Fish and Wildlife SalmonScape (<http://apps.wdfw.wa.gov/salmonscape/>)

### Sampling Details

- Samples were collected for 18 weeks, from March 29 through August 3.
- Water samples were tested for 152 chemicals: current and legacy insecticides, herbicides, fungicides, rodenticides, wood preservatives, and pesticide breakdown products.
- Sample analysis was conducted at Manchester Environmental Laboratory in Port Orchard, Washington.
- Streamflow and total suspended solids were measured at every sampling event.
- Air and water temperature (measured every 30 minutes) were monitored for the entire sampling season.
- Fish believed to be juvenile salmonids were frequently observed during site visits.



The table below shows the sample dates and their corresponding detected pesticide concentrations. The detections have been color coded according to assessment criteria, if any, that were surpassed. Assessment criteria for this program are derived by applying a 0.5 safety factor to state and federal water quality criteria. This safety factor is applied to ensure that assessment criteria are protective of aquatic life. Potential water quality issues can be identified early on by using the pesticide data. Watersheds in which detections above assessment criteria occur are a priority for continued monitoring and educational outreach. Please see <http://agr.wa.gov/PestFert/natresources/SWM> for more information.

Assessment Criteria	Month	Mar					Apr					May				Jun				Jul				Aug
		Day of the Month	29	5	12	19	27	3	10	18	25	1	14	21	28	6	12	19	26	3				
May affect fish survival at sensitive life stages	2,4-D																		0.147					
	2,6-Dichlorobenzamide											0.048		0.033	0.027	0.026	0.030	0.046	0.041					
Additional level of protection for endangered species	Boscalid											0.129	0.016	0.054	0.040	0.043	0.046	0.041	0.040					
	Chlorpyrifos	0.035																						
May affect invertebrate survival	Chlorsulfuron													0.024					0.059					
	Dacthal (DCPA)								0.023															
Nearing a pesticide state water quality standard	Diuron		0.003																					
	Imidacloprid												0.008											
May affect fish growth or reproduction with prolonged exposure	Malathion										0.098													
	Myclobutanil																0.004							
May affect invertebrate growth or reproduction with prolonged exposure	Pentachlorophenol	0.027	0.023	0.120	0.025	0.015																		
	Sulfentrazone																		0.027					
May affect aquatic plant growth	Triclopyr acid																		0.046	0.071				
	Precipitation	0.01	0.00	0.00	0.55	0.00	0.01	0.18	0.10	0.55	0.00	0.02	0.39	0.02	0.00	0.26	0.40	0.08	0.00					
Below all identified criteria	Streamflow	14.88	19.56	33.39	29.50	41.23	37.93	49.49	15.00	7.90	1.45	0.08	4.08	0.15	1.76	2.49	2.21	0.07	0.20					
	Total Suspended Solids	5	9	32	14	33	22	26	18	21	13	15	23	9	20	22	32	4	4					

Units for pesticide detections are in (µg/L), precipitation measurements in (week total inches), streamflow measurements in (cfs), and total suspended solids in (mg/L).

**Results Summary**

- There were 32 pesticide detections in Stemilt Creek. Of these, 2 detections were above assessment criteria.
- WSDA identifies some pesticides as Pesticides of Concern because they have been found somewhere in the state above WSDA’s assessment criteria. Chlorpyrifos, dacthal, diuron, malathion, and pentachlorophenol are all Pesticides of Concern that were detected in Stemilt Creek.
- Only chlorpyrifos and malathion were higher than WSDA’s assessment criteria at this site. In past years, chlorpyrifos and malathion have been detected in Stemilt Creek at concentrations known to negatively affect aquatic life.
- Common products containing chlorpyrifos (an insecticide) are Lorsban and Pilot, and common products containing malathion (also an insecticide) include Drexel Malathion, Fyfanon, and Malathion 57 EC.
- The most frequently detected pesticide was boscalid (a fungicide) occurring 44% of the time (8 out of 18 sample weeks).
- When multiple pesticides are detected simultaneously the effects can combine; multiple pesticides were detected 9 out of 18 sample weeks at Stemilt Creek (50% of the time). As many as 5 pesticides were detected at the same time.

**Recommendations**

- Read and follow label directions to protect water quality.
- Choose less-toxic pesticides whenever possible.
- Calibrate, maintain, and inspect application equipment often.
- Check the weather before application to reduce drift or runoff.
- Exhibit care when applying pesticides (e.g. chlorpyrifos), especially in spring before vegetation along streams is leafed out.
- Use best management practices: buffers, filter strips, sediment basins, ground cover, and setbacks.
- Properly dispose of all unneeded pesticides. Apply here to participate in a WSDA waste pesticide collection event: [www.agr.wa.gov/wastepesticide](http://www.agr.wa.gov/wastepesticide)