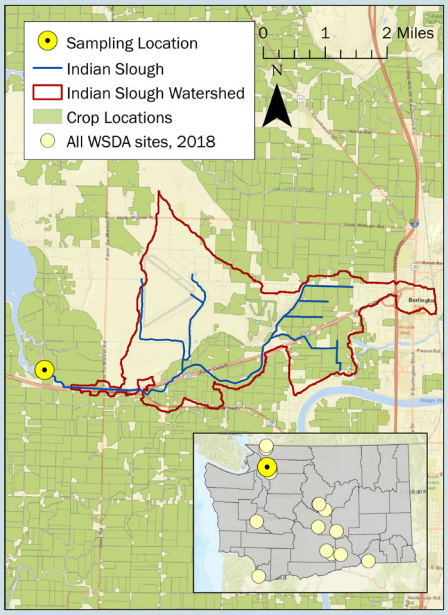
Indian Slough

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 Skagit County.

Washington State Department of Agriculture

Natural Resources Assessment Section

Watershed and site information

Sampling history: 2006 - present

Watershed area: 5,000 acres (~7.8 square miles)

Area in agricultural use: 1,800 acres (~36% of total watershed acreage)

Main crops: Potatoes, grass hay, field corn, blueberries, and cucumber

Fish habitat: Chinook and coho salmon (SalmonScape: apps.wdfw.wa.gov/salmonscape/)

Sampling dates: 11 sampling visits, March 19 – Sept. 24

Water testing:

- WSDA tested for 144 current and legacy chemicals (50 insecticides, 54 herbicides, 20 fungicides, 15 pesticide degradates, 2 synergists, 1 antimicrobial, 1 insect repellent, and 1 wood preservative).
- 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:

- Indian Slough water releases directly into Puget Sound and is tidally influenced.
- The Skagit Valley (including the Indian Slough watershed) is also a major pit stop for migratory waterfowl, including trumpeter swans, tundra swans, snow geese, and other birds.
- New Zealand mud snails, an invasive aquatic species, were observed in the slough upstream from the tide gate.

Results and Conclusions

- There were 232 total pesticide detections in Indian Slough from 5 different use categories: 21 types of herbicides, 8 fungicides, 9 insecticides, 8 degradates, and 3 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, 20 were above WSDA's assessment criteria.
- The POCs chlorpyrifos, clothianidin, diuron, fipronil, imidacloprid, metolachlor, pentachlorophenol, pyriproxyfen, and thiamethoxam were detected.
- Every detection of imidacloprid at this site was higher than WSDA's assessment criteria.
- Imidacloprid has also been detected 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 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. The "–" signifies a sample or measurement that was not collected or could not be analyzed.

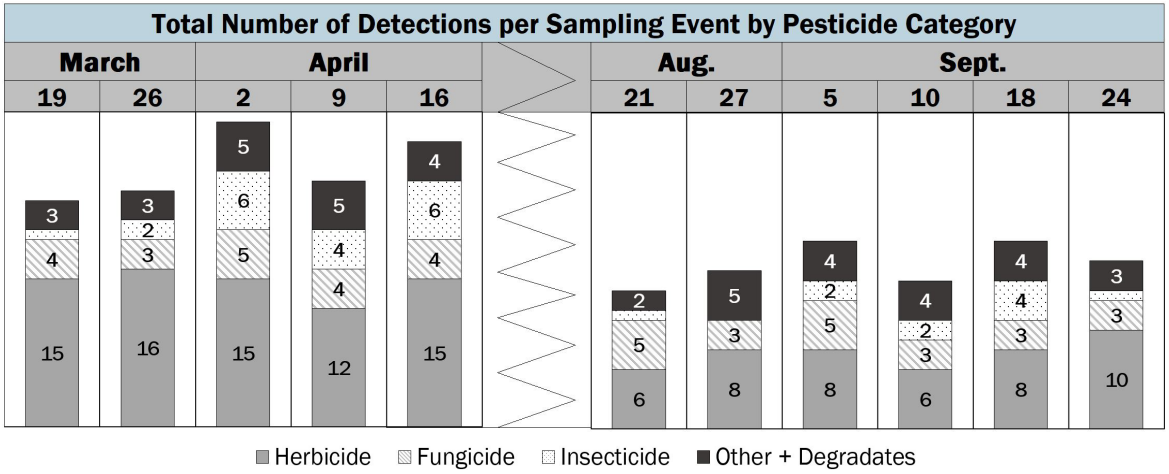
Washington State's Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations

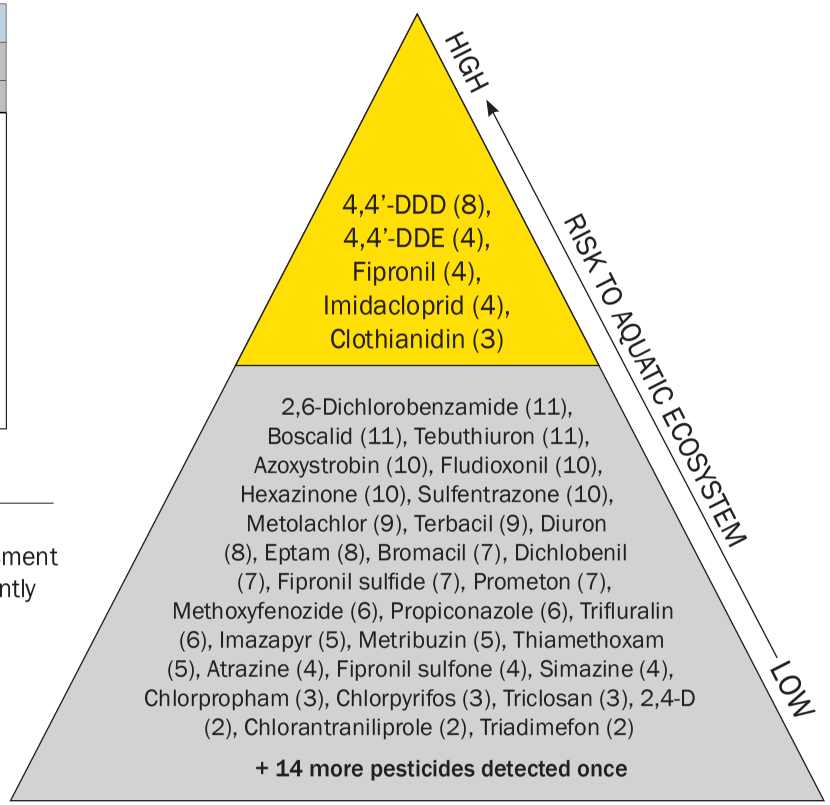
Month		March		April			Aug.		Sept.			
Day of the Month	**Use***	**19**	**26**	**2**	**9**	**16**	**21**	**27**	**5**	**10**	**18**	**24**
Chlorpyrifos	I									0.003	0.002	0.002
Clothianidin	I			0.013	0.029	0.023						
Diuron	H	0.009	0.011	0.014	0.017	0.016	0.004	0.003				0.004
Fipronil	I			0.009	0.009	0.007					0.005	
Imidacloprid	I			0.010	0.018	0.026					0.009	
Metolachlor	H	0.018	0.010	0.016	0.051	0.046			0.002	0.002	0.003	0.003
Pentachlorophenol	WP				0.012							
Pyriproxyfen	I								0.004			
Thiamethoxam	I	0.010	0.014	0.021	0.031	0.039						
Total suspended solids (mg/L)		–	–	–	–	9.0	4.0	3.0	4.0	8.0	5.0	12.0
Streamflow (cubic ft/sec)		31.74	50.19	63.14	60.17	–	4.05	5.86	3.71	4.73	6.78	6.81
Precipitation (total in/week)		0.39	1.00	1.16	1.58	1.49	0	0.02	0	0.33	0.59	0.20

Exceeds Assessment Criteria Below Assessment Criteria

(H: Herbicide, I: Insecticide, WP: Wood Preservative)*

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. Bars without data labels represent one detection for that sampling visit and pesticide category.





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.