

# Environmental Insight



## Impacts of Stormwater runoff on Southern Resident Killer Whales

Stormwater runoff from industrial and municipal areas can carry pollutants to surface water, like the Puget Sound, that are harmful to killer whales. The Southern Resident killer whale (SRWK) resides in the Puget Sound and are a listed Endangered Species. These whales are protected by the Endangered Species Act and the Marine Mammal Protection Act, and have a Recovery Plan established by the National Marine Fisheries Service.

Impacts to SRKW from stormwater can result from biomagnification and bioaccumulation of pollutants. Persistent Organic Pollutants, called POPs, are synthetic man-made chemicals that are particularly concerning in bioaccumulation and biomagnification. To better understand bioaccumulation, it is important to look at the start of the food web. Smaller organisms absorb POPs over time and the POPs accumulate within the organism's tissue. As larger organisms consume the smaller ones, the concentration of POPs increases in each organism as it moves up the trophic food levels from zooplankton to fish to apex predators. This is called biomagnification.

Since SRKWs are an apex predator at the top of the food chain, they are heavily impacted by these two processes. Research has identified high levels of PCBs in the blubber of orcas and evidence of mothers passing contaminants to their young through the mother's milk. PCBs can impair reproduction, and the endocrine and immune systems, making SRKWs more susceptible to disease or infection from injuries (Desforges et al., 2018; NMFS 2016).

By following MSGP and MS4 permit requirements and properly maintaining stormwater BMPs we can work together to help protect these beautiful whales.

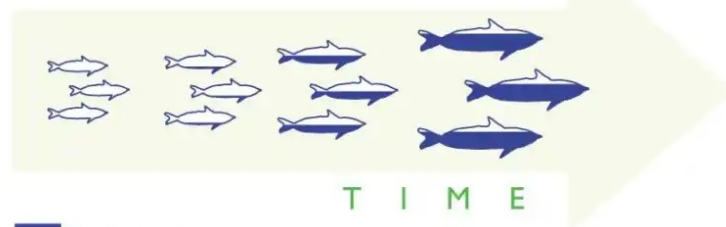
### References

Desforges, J.P., A. Hall, B. McConnell, A. Rosing-Asvid, J.L. Barber, A. Brownlow, S. De Guise, I. Eulaers, P.I.D. Jepson, R.J. Letcher, R.J. Letcher, M. Levin, P.S. Ross, F. Samarra, G. Vikingson, C. Sonne, and R. Dietz. 2018. Predicting global killer whale population collapse from PCB pollution. *Science*. 361, 6409.1373-1376.

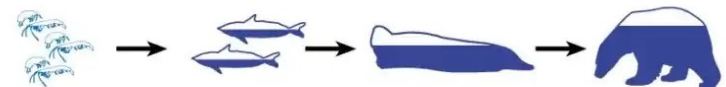
National Marine Fisheries Service. 2016. Exposure to a Mixture of Toxic Chemicals: Implications for the Health of Endangered Southern Resident Killer Whales. NOAA Technical Memorandum NMFS-NWFSC-135. 118 pp.

<https://cimioutdoored.org/bioaccumulation-and-biomagnification-increasingly-concentrated-problems/>

### Bioaccumulation



Contaminant levels



Contaminant levels

### Biomagnification

Photo credit and reference: <https://cimioutdoored.org/bioaccumulation-and-biomagnification-increasingly-concentrated-problems/>

**NSE Environmental Staff**  
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Program	Phone
Spills	(425) 304-3465
Natural Resources	(425) 304-3464
Stormwater, Wastewater, & UST/AST	(425) 304-3277
Air & Drinking Water	(425) 304-3466
Recycling	(425) 304-3071
Hazardous Waste	(425) 304-5987

**Great Job Ben!**

Thank you to Ben Pena from Facilities for replacing the trench drain filter on Pier B and the South wharf. Having a removable filter greatly aids in the clean out of the trench drain and helps prevent trash from reaching the outfall.



Filter collecting trash



Trench drain after filter, all clean!

**MS4 Education Materials**

A large part of our MS4 Stormwater Permit is public outreach and education. As we move into nicer weather, you will notice some outdoor stormwater signage and indoor postings around the base which is meant to educate and remind base personnel of the Navy's commitment to stormwater compliance. The intent is to provide positive reinforcement as well as provide our contact information for reporting spills. Our program has both the pictured magnets available for posting on refrigerators in your command. I plan on passing them out to EWCCs, but if a command representative would like to come by and pick some up, please let me know so I can arrange a time to meet you. Please help us keep these magnets attached to refrigerators and postings posted. EWCCs are our conduit to the tenant commands on base, and your support of our environmental programs goes a long way in ensuring your command's understanding and compliance. If you need additional magnets or replacements, please let us know.

**Prevent Water Pollution**

Pouring, leaking or discarding any substance other than rainwater into stormwater system **degrades** our water resources.

Pollutants dumped onto our streets or in our storm drains do not go to a sewage treatment plant to be cleaned. Instead, these pollutants are discharged directly into the storm system which flows into our natural waterways.

If you witness a potential spill or an illegal dumping into a storm drain, the street, a ditch, or a water body, **REPORT IT!**

Naval Station Everett  
To report spills call  
(425)210-8391

**ONLY RAIN DOWN THE DRAIN!**



# STORMWATER

## What is Stormwater Pollution?

When rain hits concrete and asphalt, it cannot absorb and filter through the ecosystem as nature intended. Instead, it runs along these impervious surfaces and flows into drains and creeks, picking up any contaminants along the way. This pollutes waterways, damages vegetation and wildlife, and even contaminate drinking water.

Naval Station Everett areas are subject to the Clean Water Act. Together, we can help keep the Puget Sound Clean.



A Washington State University study showed that salmon die within hours of exposure to stormwater pollution. This is the cause for up to a third of salmon deaths in the Puget Sound.

## What causes it?



**SPILLAGE OF OIL, FUEL, AND ANTIFREEZE.** Perform vehicle maintenance in a garage or under cover, and always use a drip pan. Pick up any spills with absorbent material like rags or kitty litter. Every drop counts.



**CIGARETTE BUTTS AND TRASH.** Rain picks up harmful bacteria and toxic metals from trash. Especially harmful to the environment are cigarette butts, which contain metals toxic to aquatic organisms.



**PET WASTE.** Poop left outside takes a very long time to decompose. It spreads parasites and bacteria that are not only harmful to the ecosystem, but also to humans and other pets. Always pick up after your dog.



**PESTICIDES AND FERTILIZERS.** Apply these chemicals sparingly, and in the proper method. Excess fertilizer and pesticides create runoff into waterways and can even leach into soil and groundwater.



**SEDIMENT AND EROSION.** Excess sediment harms aquatic organisms and reduces oxygen levels in the water. Cover dirt piles with a tarp. Never hose off any impervious surfaces without permission from Public Works.



The local orca pods thrive off salmon as their primary food source. If salmon populations do not improve, the Puget Sound orcas will go extinct.



Please do not wash your cars in your driveway! Take your car to a commercial carwash. This way the sediment, oil, and metals on your vehicle wash into a filtered recycled system.



**NO DUMPING**  
  
**DRAINS TO SOUND**

## Drinking Water Testing for PER-and Polyfluoroalkyl Substances

The 2020 Assistant Secretary of Defense policy requires the Navy to monitor for the potential presence of Per- and Polyfluoroalkyl substances (PFAS) within each installation's drinking water system where DoD is not the water purveyor. This is due to the fact that two specific PFAS compounds, Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA), have been assigned a Lifetime Health Advisory (LHA) limit of 70 parts per trillion (ppt) by the EPA.

Between 2014 and 2016, the Navy and/or the water suppliers conducted PFOS and PFOA sampling in drinking water serving the NRNW facilities and results were below detection limits (non-detectable). Due to the amount of time that has passed since that sampling occurred, changes in lab protocols, and lack of more recent data from water suppliers, the Navy is currently conducting additional sampling. For Naval Station Everett, the sampling was completed in 2021 and the results are posted here (URL below).

<https://www.cnic.navy.mil/content/dam/cnic/cnrnw/pdfs/NSE%20News/NSE%20PFAS%20Table.pdf>

[https://www.cnic.navy.mil/regions/cnrnw/installations/ns\\_everett/om/naval-station-everett-environmental-policy/DrinkingWaterTesting.html](https://www.cnic.navy.mil/regions/cnrnw/installations/ns_everett/om/naval-station-everett-environmental-policy/DrinkingWaterTesting.html)

A few other recent links to learn more about PFAS (forever chemicals) are listed below.

<https://www.cnet.com/home/security/what-are-pfas-the-risks-of-forever-chemicals-in-your-home-and-what-you-can-do/>

[Toxic firefighting foam: Newly obtained emails show military knew about the risk for years | KHGI \(nebraska.tv\)](#)

If you have any questions, please contact the Drinking Water Program Manager.