



Ministry of
Environment and
Climate Change Strategy

Stormwater

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What is Stormwater?

What may be in Stormwater?

What are Implications of Unmanaged Stormwater?

How can Stormwater be managed?

What is Stormwater?

- Stormwater consists of rainwater and water from other sources that runs off impervious surfaces.
- Stormwater is typically channeled into ditches, storm sewers and into watercourses.

What is Stormwater?

- Stormwater can carry pollutants causing an adverse effect downstream.
- Stormwater is considered a "non-point source" or NPS, which is one of the reasons it is difficult to manage.
- Studies in Puget Sound have found that NPS is the greatest source of impact to watercourses.

What may be in Stormwater?

Stormwater Contaminant	Source
Suspended solids/sediments	Construction sites, roads, winter sanding
Nutrients (P & N)	Fertilizers, pet waste, yard waste
Metals	Automobiles
Organics and microplastics	Automobiles
Petroleum products (oil, grease, PAHs)	Automobiles, leaks, spills, crumbling asphalt
Bacteria	Pet waste, domestic livestock, wildlife
Pesticides and herbicides	Park, yard and garden care
Heat (increased temperature)	Hot pavement
POPs (persistent organic pollutants)	Atmospheric deposition
CECs (contaminants of emerging concern)	6PPD-Q, PBDEs, etc.

What are Implications of Unmanaged Stormwater?



Scientists who showed how copper damages salmon's sense of smell receive prestigious award

APRIL 14, 2016 BY JUSTIN COX

It's always beautiful when scientific discovery leads directly to concrete changes in environmental policy.

Such was the case with a team of scientists who will be honored by the SeaDoc Society on Friday for having demonstrated how copper damages salmon's sense of smell. Their work led to legislation that removed copper from car brake pads in Washington State.



Photo by Ingrid Taylor

The team, led by NOAA scientists Drs. Jenifer McIntyre, David Baldwin, and Nathaniel Schell helped pave the way for the legislation, which will benefit salmon recovery by reducing the load of toxic metals to the Salish Sea by hundreds of thousands of pounds each year.

The award will be presented at the [Salish Sea Ecosystem Conference](#), which starts April 13 Vancouver, B.C. Close to 1,000 scientists and conservationists from both sides of the U.S....

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Testers find tire toxin lethal to salmon in coho-bearing Saanich stream

Peninsula Streams Society is involved in a deeper look at the impacts of 6PPD-Q across the Island



Christine van Reeuwijk
Jan 19, 2024 2:30 PM



1 / 2 Peninsula Streams Society volunteer streamkeepers on Colquitz River monitor restoration projects near a on Gabo. (Courtesy Peninsula Streams Society)

Waterway stewards hope the discovery of lethal levels of tire toxins in a salmon-bearing

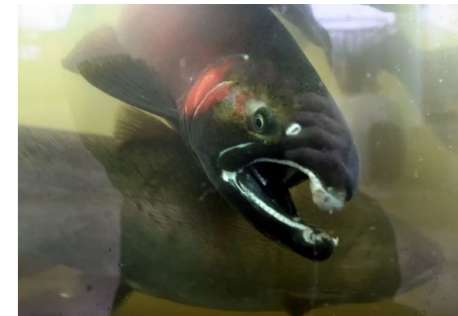
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Fishing groups sue tire-makers over toxic chemical that kills salmon

Nov. 8, 2023 at 8:40 am | Updated Nov. 8, 2023 at 5:10 pm



A 3-year-old adult coho makes its way through the Isapaugh Salmon Hatchery. (Mike Siegel / The Seattle Times, 2023)

By Isabella Broda
Seattle Times staff reporter



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What are Implications of Unmanaged Stormwater?

- Toxicity to aquatic life (e.g., 6PPD – Q)
- Deterioration of habitat for aquatic species
- Bioaccumulation in sediments
- Potential for contamination to wild foods
- Decreased immune and endocrine functioning in long-lived mammals (e.g., Orcas)

How can Stormwater be managed?

Some of the guiding principles of an **integrated stormwater management strategy** include:

- Rain from frequent small events should be allowed to infiltrate the ground.
- Runoff from heavy events should be retained and slowly released.
- Runoff from extreme storms should be managed to prevent flooding.

How can Stormwater be managed?

Know where to target –
“70% of this pollution could be addressed by treating only 1.35% of the land area”

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Review



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One contribution of 17 to a theme issue ‘Integrative research perspectives on marine conservation’.

Subject Areas:
environmental science

Keywords:
stormwater, scale, operational objectives, killer whale, salmon

Impacts of stormwater on coastal ecosystems: the need to match the scales of management objectives and solutions

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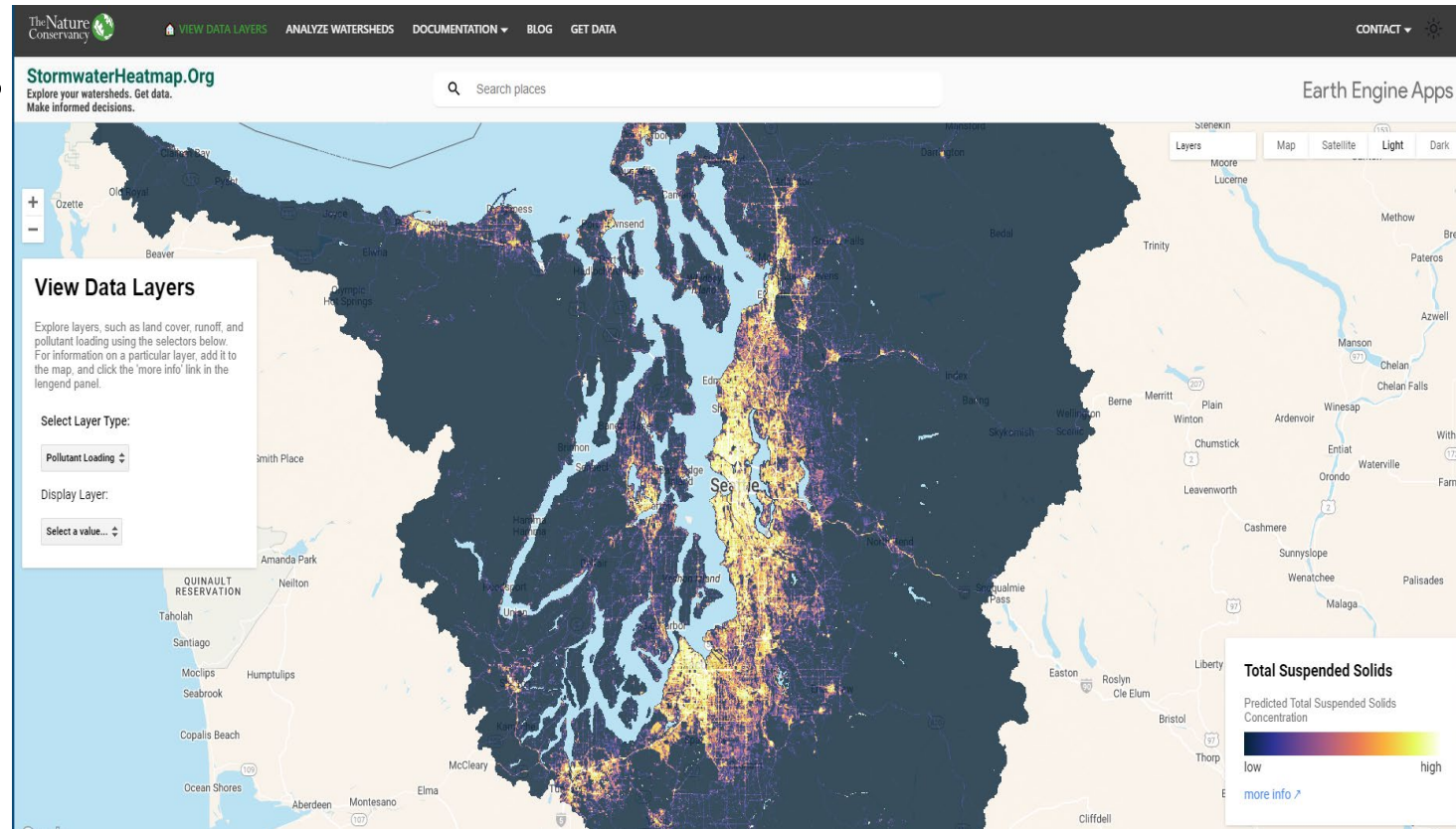
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Despite their limited area relative to the global ocean, coastal zones—the regions where land meets the sea—play a disproportionately important role in generating ecosystem services. However, coastal ecosystems are under increasing pressure from human populations. In particular, urban stormwater is an increasingly important threat to the integrity of coastal systems. Urban catchments exhibit altered flow regimes that impact ecosystem processes and coastal foodwebs. In addition, urban stormwater contains complex and unpredictable mixtures of chemicals that result in a multitude of lethal and sublethal impacts on species in coastal systems. Along the western coast of the United States, we estimate that hundreds of billions of kilograms of suspended solids flow off land surfaces and enter the Northern California Current each year. However, 70% of this pollution could be addressed by treating only 1.35% of the land area. Determining how to prioritize treatment of stormwater in this region requires a clear articulation of objectives—spatial distribution of appropriate management actions is dependent on the life histories of species, and management schemes optimized for one species may not achieve desired objectives for other species. In particular, we highlight that the scale of stormwater interventions must match the ecological scale relevant to species targeted by management. In many cases, management and policy will require mechanisms in order to ensure that local actions scale-up to efficiently and effectively achieve man-

How can Stormwater be managed?

The Nature Conservancy developed a stormwater

“heat map”.



How can Stormwater be managed?



Ottawa

City looks to stem run-off by expanding rain retrofit program

Pilot program aims to make Ottawa's urban areas spongier to soak up stormwater



Arthur White-Crummey · CBC News · Posted: Apr 09, 2024 1:00 AM PDT | Last Updated: April 9



Local News

Mayor says Montreal is stepping up its 'sponge city' investments

The city will unveil a pilot project next week to unveil its first "sponge street."

Jason Magder · Montreal Gazette

Published Oct 03, 2023 · Last updated Oct 03, 2023 · 3 minute read

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How can Stormwater be managed?

Working together with a multi-faceted approach.



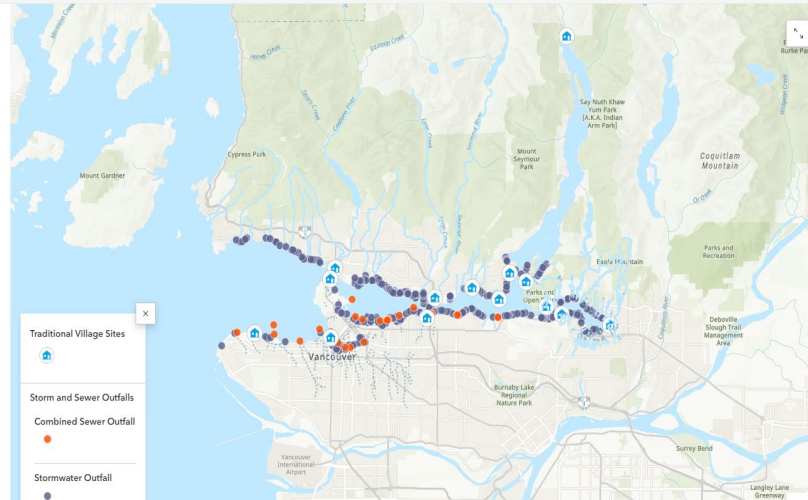
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Urban Runoff

Urban and industrial development has hardened the land and removed natural vegetation. Rainwater is directed into pipes, ending at 400 stormwater outfalls and 28 combined sewer overflow outfalls that carry untreated stormwater, sewage, and toxins directly into the Inlet.



- <https://twnation.ca/restoring-a-healthy-inlet/>

- **Thank you!**
- **Any Questions?**