# Stormwater as a Resource

Visitors often seem to believe that we have the same rainfall as the rest of the soggy Pacific Northwest, and that there's water in abundance. With all our trees it would certainly seem so. Yet we fall in the rainshadow of Vancouver Island, and our rainfall is typically half that of the mainland to our east.

There's even a large variation in rainfall across the islands themselves, parts of Lopez and San Juan Island being particularly dry. We struggle with other issues too:

- Steep, rocky slopes
- Thin soils with bedrock close to the surface
- Large areas of open grassland with few trees (like the western side of Speiden Island.
- Few year-round creeks and streams
- Loss of wetlands (which act like sponges to absorb excess water)

Even if we didn't have any development here we would still have stormwater runoff into the nearshore waters, on some of our islands. But as we have developed the islands we have made the situation much worse. Every time we pave over more ground with impervious surfaces (such as houses, tarmac or even compacted gravel) we decrease the amount of water that will soak down into our aquifers and recharge our drinking supplies. The water that flows across these surfaces often collects contaminants and is then concentrated into a smaller area where its increased speed causes soil erosion.

Until about ten years ago most utilities considered stormwater a waste product that was to be disposed of as efficiently (which meant quickly and cheaply) as possible. In Portland, Oregon, most of the city was served by Combined Sewer Overflows (CSOs). In major storms the excess stormwater flowed into the sewer system and combined relatively clean rainwater with blackwater (raw sewage). The sewage treatment plants could not cope with the volume and the excess would flow into the local rivers. That is not healthy!

In Friday Harbor you may have noticed that the street drains (along the curb) drain into a pipe that empties into the harbor near the ferry dock. Stand in the waiting area on a rainy day and watch the water gush out. This thankfully is not sewage, but as the water drains off the streets it picks up trash, brake dust, oil, and dog poop. In some places there are mechanical traps which collect the trash (such as paper products) and can skim off floating oil-based products. These are typically only 80% efficient at removing pollution from the stormwater.

So here we are speeding up the departure of valuable clean rainwater - now mixed in with debris and pollutants - into our nearshore waters. Yet elsewhere in the islands we have chronic shortages of potable water.

Consider Lopez Island for example: many wells over there have experienced saltwater intrusion, many to the point that they are unusable. Imagine in an aquifer that the fresh water (which is less dense than salt water) is floating on top of the saltwater that is intruding in from the ocean. This layer of freshwater is the water we want in our well. But if we pump too much fresh water out the salt water level will rise to replace it, and the well will become more and more saline. (This is a very simplified explanation.)

We need to change our frame of how we view stormwater. It's not a waste product to be disposed of, but a valuable resource that can easily be captured, filtered and used to recharge our aquifers. Our aquifer recharge rates here are frighteningly low:

- Lopez 2.49" per annum
- San Juan 1.99" per annum
- Orcas 1.46" per annum
- Shaw 1.44" per annum.

Aquifer recharge rates on the mainland vary widely according to rainfall and geology but in some areas of Whatcom county they vary between 7" and 50" per annum.

So what can we do to catch and retain this water? The Puget Sound Action Team (PSAT) and Washington State University wrote the book on this a few years back - it's called "LID Technical Guidance Manual' and it covers many different techniques for using Low Impact Development to manage stormwater more effectively, and at lower cost. You can download this from our web site:

http://www.sanjuanislandscd.org/

Then click the 'Programs' menu item, then the Building menu. (It's a 5MB download.)

I studied a project named the Seattle Street Edge Alternative (SEA) that uses many of these techniques. This project was designed to provide drainage that more closely mimics the natural landscape prior to development rather than traditional piped systems.

To accomplish this, Seattle Public Utilities reduced impervious surfaces to 11% less than a traditional street, provided surface detention in swales, and added over 100 evergreen trees and 1100 shrubs. This was all carried out after extensive involvement with the property owners

Two years of monitoring have shown that SEA Street has reduced the total volume of stormwater leaving the street by 98% for a 2-year storm event. In addition the landscaping has dramatically improved the neighborhood, and the wavy edges along the roads that contain many of the plantings have also reduced traffic speed in these quiet neighborhoods. The project also cost about 30% less than the original pipe-based replacement.

Now instead of flowing down into the ocean and being 'wasted' the water naturally recharges local aquifers.

This article was written by Steve Hussey, a Natural Resources Planner with the San Juan Islands Conservation District.