

Liquid Assets

by [Alisa Smith](#) on Mar 11, 2004 at 12:00 am

Vancouverites enjoy some of North America's cheapest, cleanest water--and pour it down the drain with abandon. Metering could change our wasteful ways.

What happens if there isn't enough rain in the rain forest?

It's hard to think of water shortages when you're leaping puddles at every crosswalk. But this is precisely the time to plan: better now than in the midst of a drought like last summer's, when a rising chorus began to call out "Raise the dams!" It's like each of us has a little Wacky Bennett sitting on our shoulders, whispering "Build me another megaproject, won't you, friend, and everything will be all right." Vancouver's psychology of water waste is deeply ingrained, and effective conservation measures take years to put in place. The time to start is today.

It's amazing how quickly the crunch can come. Victoria, which is historically more prone than Vancouver to summer droughts, never developed a water-conservation plan; in late 2002, it finished the Sooke Reservoir Expansion Project, at a cost of \$23 million. "By the time they talked about [expanding] the dam, in 1996, I had to agree that they had no choice," says Oliver Brandes, a research associate at the POLIS Project on Ecological Governance at the University of Victoria, who recently co-authored a report on urban water use across Canada. "But they should have been doing something about it back in 1992, or even earlier," Brandes explains in a phone interview. "Then they could have avoided having to do it [build a larger dam]." The salmon in the Sooke River would have appreciated sticking with the older, smaller version; to maintain the fish population left high and dry by the dam, Victoria had to spend \$1.5 million to pipe water into the river from another reservoir.

Chronic water shortages in Santa Monica, California, called for drastic measures to avoid the expense of expanding reservoirs or building new dams, and in 1989 city officials decided it would be cheaper to pay for households to switch to low-water toilets. Soon, flummoxed bureaucrats ended up with about 40,000 old toilets that they had to get rid of. They planned to dump them in the bay as "fish habitat", but public outcry nixed that peculiar plan and the city recycled the toilets into asphalt instead.

In 1977, when increasing demands on the water system seemed to necessitate a new US\$500-million dam, Boston found it was cheaper to install water meters and charge to encourage conservation. This change also let officials detect leaks in the city's pipes; water use has held at 25 percent less than before metering, and Boston won't need a new dam for the foreseeable future.

Look at other cities in North America and Europe and you'll be surprised--and probably embarrassed--by how little we do to conserve water in Vancouver. Water-system innovators are shocked to discover that we don't even meter residential use, when the basic tenet of

utilities experts is: "You must measure it to manage it."

"We're not Arizona" is the countering mantra here, which is true enough. Vancouverites don't need to go to the conservation extremes that a desert climate demands. But our water supply isn't limitless, as last summer's drought proved. Plus, the Lower Mainland's population is growing rapidly: in 2002 it stood at just over two million, up from 1.6 million a decade earlier. Between 1965 and 2002, per capita daily water use increased by 40 litres to 578, according to the Greater Vancouver Water District. (The good news: that's markedly lower than 1985, when it spiked to 743 litres.)

During that same period, total water use more than doubled, from 461 million litres per day to 1.168 billion. On the horizon to keep us liquid: new infrastructure to pump more water from Coquitlam Lake (price tag \$342 million, according to the Vancouver Sun), and a bigger dam and reservoir at the Seymour watershed (\$444 million). As usual, ecological costs--such as lost fish habitat downstream and decreased water quality from silt stirred up by new construction--don't make it onto the balance sheet.

The call to account came last summer, and it jolted the rain-forest dwellers. "We went into [emergency] response level 2, level 3, level 4--we had to make up level 5," says Johnny Carline, water-district commissioner and chief administrator of the Greater Vancouver Regional District. He's sitting in his Burnaby office overlooking the mountains surrounding Coquitlam Lake, one of the region's three major water sources and the site of one of six GVRD dams.

Although Vancouverites have a reputation for being environmentally minded, the regional district fielded a steady flow of calls last summer from residents demanding more water, no matter what. "I was surprised by the number of people who felt that way," says Andrew Marr, a senior engineer in the Demand Side Management division of the GVRD's policy and planning department, in a phone interview. "We could build a water system that would let you waste as much as you wanted, but why promote that? It's analogous to traffic. We could build a 20-lane highway between here and Abbotsford, but the cost of that--economically, environmentally--well, for most people, that just won't do."

THE CASE FOR METERING

For now, the response of the man overseeing our water supply is to assure us that 2003 was a freak occurrence. "Snow pack was way down, and we had 15 percent of the water supply off-line for repairs. There may be dry summers again, but nothing like that," Carline says. "However, we have decided to revisit our [crisis] response plan."

Crisis management is entirely different from conservation. In the United Kingdom, officials are doing long-term water planning based on the effects of global warming. In the last 13 years, they've gone from metering one percent of the country's households to 22 percent. The principle is basic: charge people for water and they'll use less of it.

But Britain is learning that lifestyle aspirations can have a powerful pull the other way: despite metering, overall water use has remained about the same. "We're picking up bad habits from the Americans," says David Howarth on the phone from Worthing, England, where he heads the U.K. Environment Agency's National Water Demand Management Centre. "People never used to have power washers for their cars and sidewalks until a few years ago. And 'power showers' are becoming popular too." On the other hand, at least the new status-seeking water wasters aren't driving consumption upward.

As a general rule, metering does save water. Look at Seattle: same climate as Vancouver, same eco-attitude, same type of water supply (mountain watersheds), but a different consumption pattern. With metering in place since--get ready for it--1891, Seattle residents use 19 percent less water per person than we do.

Meanwhile, the City of Vancouver charges a flat annual rate of \$271 per single-family dwelling, about the same as other Lower Mainland municipalities. Conservation advocates consider this a regressive form of pricing. Still, it's an improvement on the "decreasing block rate" structure, where the more you use, the less you get charged per unit of water. Greater Vancouver municipalities only phased that out in the past 10 years. (Industrial, institutional, and large commercial users have long been metered in the GVRD.)

New York City began a program of universal residential metering in the late 1980s; so far, it has installed some 600,000 meters, at a cost of US\$350 million. With help from another city-funded program to install 1.3 million low-water toilets, water use has decreased by 15 percent over the past decade. The economic benefits have been substantial: New York avoided having to find new water sources and has put off building a waste-treatment and water-pumping station on the Hudson River. Even with the costs of the conservation program, the city has saved about \$230 million.

In semi-arid Denver, Colorado, where they achieved universal metering in 1993, average water use has increased by only five percent since 1979, while the customer base jumped by 20 percent, to 1.2 million in 2003. Denver's goal is to hold close to this line until 2050, when the city's service area runs out of room to build at an estimated 1.6 million people. Although metering cost the city \$38 million, most of the funds came from surcharges on taps in new developments. "Our philosophy is that growth must pay its own way," says Liz Gardener, conservation manager for Denver Water, on the line from her office.

Having meters also let Denver spot points in the system that were hemorrhaging water. The water utility noticed that the city zoo was its single largest customer. The problem wasn't thirsty elephants; it was leaky pipes. By fixing them and making a few other changes, the zoo cut its consumption by 50 percent. In comparison, Greater Vancouver officials have no way of keeping track. Amy Vickers, an internationally recognized water consultant in Amherst, Massachusetts, estimates that unmonitored systems lose between 15 to 30 percent of their water to leaks.

Denver also suffered during last summer's drought ("the worst in 300 years," Gardener says), but it responded with a 20-percent price hike. Despite having only 18 centimetres of rain in 2003, the city made it through by getting tough. Penalties for ignoring watering restrictions ran as high as \$1,000; compare this to Vancouver's measly \$100 third-time-offender fines, which were barely enforced despite the large number of suspiciously lush lawns on the West Side.

Not only that: Denver actually reduced the water supply to the homes of stubborn transgressors. "We have a metal device that looks like a LifeSaver that we can put in the pipes, which reduces the diameter to about the size of a pencil," Gardener says. "It would take about half an hour for a toilet to refill!"

There's likely no need for Vancouver ever to get this serious, you say. But cities must set firm goals to see results. In Copenhagen, Denmark, metering combined with price incentives plus a sense of personal responsibility has seen domestic water use decrease from 160 litres per person per day in 1989 to the current level of about 130, with a goal of 110 litres by 2011. It

really is that simple.

WHERE THE MONEY WENT

"The GVRD talks a lot about conservation, but they fail to take any aggressive actions," Hans Schreier, a professor of agroecology in UBC's faculty of agricultural sciences who specializes in watershed systems, says by phone from his office.

Well, no one can say they aren't studying the question. In the near future, the GVRD is slated to release a comprehensive drinking-water management plan; the economics of metering will be a major component.

"The time for universal metering is here," says GVRD administrator Carline. He pauses. "Or at least it is very close." He argues that people in Vancouver are reaching a state of epiphany where they will collectively endorse it, just like what happened with recycling. "There wasn't that great an economic argument for it [recycling]. But we have diverted 50 percent of all garbage from landfills now. It was the right thing to do."

The "economic argument" for metering is even less convincing, Carline says, because the GVRD has some of the continent's cheapest water rates. This makes the expense of metering harder to balance against future savings.

Without a public debate on water priorities, the money available for future projects is draining in questionable directions, local water activists argue. Think metering sounds expensive? GVRD politicians recently committed \$600 million to build the Seymour-Capilano Filtration Plant, which will rid the Seymour and Capilano water supplies of sediment caused by seasonal rainstorm runoff. By 2007, when the project is complete, annual household water rates will have jumped 25 percent to pay for its construction.

Proponents point to new Health Canada guidelines stating that drinking water should only have one NTU (nephelometric turbidity unit) of sediment, where the old number was five NTUs (which the Capilano reservoir, in particular, reaches occasionally, such as after a landslide during a storm).

However, there is a compelling argument that the filtration plant is unnecessary, or at least not adequately considered. Paul Hundal, a director of Vancouver's Society Promoting Environmental Conservation and a watershed watchdog, explains it over lunch at a restaurant near his Burnaby law office. Vancouver's water starts out clean, coming as it does from rain and snowmelt coursing through rivers in uninhabited mountain areas. Most other Canadian cities draw their water from lakes or rivers that have already had sewage and pollution dumped into them, he points out.

Hundal says Vancouver should have argued for an exemption from the new Health Canada sediment standards, which don't take these unique local conditions into account. Our sediment is just dirt, he argues, not the toxic ooze found in other cities' watersheds.

Several U.S. cities have successfully fought blanket standards for water treatment. In 1989, the federal Environmental Protection Agency decreed that all surface water used for drinking had to be filtered. Among a host of other requirements--such as minuscule or nonexistent levels of cryptosporidium, lead, PCBs, and arsenic--sediment could measure no more than five NTUs, a figure tightened to one NTU in 2002.

New York, for one, fought for a waiver and won the right not to filter the water from its Catskill/Delaware watershed, for as long as it can prove the process isn't necessary. Despite the fact that New York's drinking water partly comes from inhabited areas, city officials succeeded in avoiding filtration. In 1997, they committed \$1.4 billion over a decade to ensure the source area remains adequately clean and safe; for instance, they have reduced agricultural chemical runoff by educating farmers and creating buffer landscapes between farms and streams. Although the conditions in New York's watershed are clearly different than in Vancouver's, the point is that water safety hinges on a constellation of factors that need to be assessed on a case-by-case basis.

For \$600 million, Vancouver will have the best drinking water in North America, Carline says. Is it worth it? "It will be the champagne of tap water," he claims. "It's too bad that only about two percent of it will be used for drinking. The standard people have here for drinking water is very high indeed. If a few hundred people a year get stomach upsets, that's too much."

The end result: we'll be filling our toilets and washing our cars with the best water \$600 million can buy. "That's a huge expense," acknowledges Burnaby mayor Derek Corrigan, chair of the GVRD water committee and a supporter of the plan. "Any other expense, like metering, is going to have to queue behind that. So it'll be at least another five or 10 years."

THE WATER BRIGADE

Not everyone is waiting around. Back in the mists of time--the 1970s--Langley City began installing meters in every residence, for a total of 4,125 today. People there are among the GVRD's stingiest users of water: 484 litres a day per capita in 2002. (The City of Vancouver stood at 632 litres daily.) Yet the GVRD continues to study the issue rather than act. "We are releasing our report, but to be honest we will continue to do studies on universal metering for some time to come," says Stan Woods, a senior engineer and project manager for the GVRD drinking-water plan.

Of the other municipalities, Surrey is the most aggressive, no doubt due to its rapid growth and the hope that it won't need to buy more water from the GVRD. (The GVRD administers the system and charges taxpayers, then sells water in bulk to each municipality.) Since 1998, all new residential construction in Surrey must include meters, and the city pays for any meters people volunteer to have installed, for a total of about 6,000 households so far; the program will be reviewed in 2005, and city council will consider universal metering after that.

West Vancouver now permits people to put in meters and pay by use, but each household must cover the approximately \$600 installation cost. SPEC's Paul Hundal lives in West Van, and he bought a meter as soon as he heard they were available. "I have made that money back already in savings in the two years since," he says.

Hundal notes, however, that he doesn't have the typical Kentucky-bluegrass lawn. Between June 1 to September 30, lawns use 40 percent of all water in Vancouver, even when commercial and industrial uses are included. That's where much of our \$600 million "champagne of tap water" will end up. This seems excessive, to say the least.

There are alternatives. "Why have a California garden, or an English garden?" asks Sharon Slack, head gardener of the Vancouver group City Farmer. "Why not have a British Columbia garden?" Native plants are already tolerant of the climate here, need very little extra watering, and can be very beautiful, even if locals overlook that sometimes. "The British explorers took many of our plants back to use in their gardens," Slack says by phone. "What we call skunk

cabbage, and wrinkle our noses at, the English call swamp lantern and plant at the edges of their ponds."

Professional gardener Eva Antonijevic specialized in lawn removal before she got a job in North Vancouver restoring the native plants of Mahon Park. "I did two or three of those [removals] a year," she says in a phone interview. "It's quite easy. You lay newspaper over the lawn, dress it with soil, and then landscape it. I would put in shrubs, patios, and brick paths," Antonijevic continues. "That's what I've done with my yard. It's really easy to take care of. Hardly anything needs extra watering."

The SPEC demonstration garden at Maple Street and West 6th Avenue illustrates these principles, as well as the use of rain barrels. "Even in August [2003] we hadn't run out of water," Hundal says. The City of Vancouver sells the 341-litre recycled-plastic containers--topped with mosquito screens--at a discount rate of \$60. (They cost \$135 to make.) It began the program in 1996, hoping to reduce summer water use, and it now moves about 500 barrels a year. But if the barrels are great for gardens, they won't do much for thirsty Kentucky bluegrass.

Coquitlam city councillor Diane Thorne, a member of the GVRD water committee, expresses frustration that grey-water recycling, where water from the bath, say, gets reused on lawns or to flush the toilet, is not allowed under provincial law. Rapidly growing Coquitlam is looking at adding 25,000 people in the Burke Mountain development alone over the next 20 years. It makes sense to build in environmental measures from the ground up, so developers can pay for them. "Believe me, they're [developers] not fighting it. They just want to move forward and build communities," Thorne says when contacted by phone.

Provincial officials will probably change the grey-water regulations fairly soon, according to the GVRD's Carline. Also in the pipeline: a sustainability report that will likely contain recommendations that all new developments be equipped with low-water toilets and fixtures, which will then go into public review over the next year. But it's like chipping away at an iceberg with a chisel. Hundal calls these measures "chump change" compared to metering and conservation pricing.

DESPERATION LEADS TO INNOVATION

Winnipeg could soon be Canada's leading light in progressive taxation. Its problem: a shrinking population combined with an aging water and sewer system that will cost \$1.2 billion to replace. The old-school solution was to raise property taxes further, but this is a vicious circle that can drive more people and businesses out of the city. Instead, Winnipeg council recently commissioned a study from Victoria's Centre for Integral Economics on "tax shifting", which would actually decrease property taxes and make services reflect their true cost, encouraging environmentally responsible behaviour in the process. One result: metered water with an affordable base rate and a steep curve for higher use.

Tax shifting was laid out in the 1990s by Seattle-based NGO Northwest Environment Watch as a way to help calculate the value of services performed by Mother Nature and shift costs so that people and businesses save money when they do positive things like conserving water.

"As it stands, Vancouver does not pay the true cost of its water system," says Zane Parker, the Vancouver-based research director of Victoria's Centre for Integral Economics, a nonprofit think tank. Our water is cheap partly because it is piped by gravity from the mountains, rather than being electrically pumped. Also, the fact that our water is unpolluted to begin with, and

need not be purified, gives Vancouver some of North America's cheapest water.

Tax shifters place a value--comparable to what it would cost people and machines to perform the same function--on these natural services and charge for them, so consumers don't squander an inherently valuable resource. It sounds simple, and maybe it is: unfortunately, under the present system it's apparently easier to move water through mountains (the Seymour-Capilano Filtration Plant calls for 7.2-kilometre twin tunnels into Grouse Mountain and Mount Fromme) than to move politicians in a new direction.

After the Winnipeg experiment, tax shifting may become part of more cities' futures. Sometimes, though, great ideas come from the past. In Istanbul, one of the most impressive monuments is the 1,600-year old Roman cistern, a vast underground water-storage facility supported by graceful columns and archways. It's cool and quiet down there while the city bustles above. If Vancouver has so much rainwater, why not store some underground for a non-rainy day--or summer?

An ambitious dream, perhaps, but not far off from what innovative people are doing in the real world. "Our group is restoring Roman cisterns in Palestine, where there is a severe water shortage, and we're building new ones as well," says Peter Gubser, president of Washington, D.C.--based American Near East Refugee Aid. These cisterns are considerably smaller than Istanbul's and are typically aboveground, built halfway into a hillside, and fed either by a natural spring or by water collected off roofs during the rainy season. They can supply between 500 and 15,000 people; one cistern that cost about US\$20,000 will serve 1,000. "But this is not a profligate use of water, I assure you," Gubser says in a phone interview. In his opinion, it wouldn't be adequate for North American demands.

Which is, of course, the point. According to the World Health Organization, the minimum amount of water that should be available to each person every day is 20 litres; all too often, this need isn't met. Meanwhile, Vancouverites continue to throw money at megaprojects for the privilege of washing their cars (estimated water use: 400 litres) in the middle of a drought, with some of the world's cleanest and cheapest water. We don't need to live like Saharan nomads, but a little moderation is our global due.

Source URL: <http://www.straight.com/liquid-assets>