

# Water at home

For more information visit [www.sustainableliving.org.nz](http://www.sustainableliving.org.nz)

## Valuable Water

Water is essential to life on Earth. Seemingly plentiful, it covers 71% of the earth's surface. However, less than 3.5% of this is fresh, salt-free water and much of it is frozen in glaciers and ice-caps, leaving only 1% as potential drinking water in streams, lakes and in underground reserves. Much of this 'fresh' water is inaccessible to people or has become too polluted for use without treatment. The freshwater store in underground aquifers is in many areas being extracted for human use faster than nature recharges those aquifers, creating a problem for future years. It's a precious resource that we cannot take for granted.

People cannot live without water. We value water for many reasons - drinking, cooking, washing, to support livestock and agriculture, for recreation and aesthetic reasons. Natural water systems provide key services so the planet can function - moving energy, spreading nutrients, dispersing pollutants and clearing rain-floods. Flowing, fresh water supports plant life, fish and provides home to many creatures and it disperses plant seeds and animal young.

Flowing water is highly valued by the Maori, the first people of Aotearoa (*Tangata Whenua*) for its life force (*mauri* – a spiritual concept meaning essence of being or the power that makes it what it is).

## The water cycle

Drinking-quality water is a scarce resource globally, but nature steadily renews the supply through rainfall.



This illustration (from Greater Wellington Council) shows evaporation from the sea, forming clouds, air rising to cross mountains, cooled air releasing rain, rain falling across the land, feeding streams. This supplies human needs, with treated discharges going back to rivers and hence the sea.

## Water Supply

In NZ, about two thirds of our community piped water supplies are taken from lakes and rivers, and a third from groundwater 'aquifers'.

Both surface and underground waters can easily be polluted by human activity. Pollution sources include:

- ▶ pastoral and crop farm nitrogen fertilisers,
- ▶ herbicide sprays and animal manures,

- ▶ soil erosion into rivers,
- ▶ waste water discharges from abattoirs and dairy factories,
- ▶ household chemicals such as moss-killers, herbicides, detergents, oil and paints; wood preservative chemicals,
- ▶ mine drainage and spoil heaps,
- ▶ other industrial activities
- ▶ in populated areas, oily and metal-polluted run-off in the 'storm water', gathered from roads and urban hard surfaces after rain.

## What happens upstream will affect downstream, inevitably

Rain falling on healthy soils is absorbed and usually remains clean as it flows downhill. Sediments are trapped or filtered out by natural wetlands. Few wetlands have survived near urban areas so we have to be aware of where our liquid waste materials flow, as they can easily pollute water catchments.

- ▶ If dissolved O<sub>2</sub> in a stream falls below 60% of saturation, fish will die. Below 40% most everything else. Decaying materials (sewage, soil and plant debris), will use up O<sub>2</sub> fastest.
- ▶ Phosphate levels, from detergents and sewage, can reach ten times above natural levels in urban streams, feeding algae growth which uses up O<sub>2</sub>, (eutrophication), killing animal life.
- ▶ Nitrogen compounds from fertiliser run-off, sewage and decaying organic matter, at 100 times higher than in nature in some urban streams, also feed algae and can be toxic to stream animals.
- ▶ Low flow and un-shaded streams can more easily overheat, killing aquatic life, starting with the native fish and invertebrates.
- ▶ Sediment reduces water clarity, reducing plant efficiency and clogging the gills of fish.
- ▶ Oil films and paints are visible by colour sheens when they enter streams but the invisible pollutants are often the most deadly: eg dissolved metals (Zn, Cu), acids, detergents, herbicides and pesticides.
- ▶ If you see a pollution incident, or abandoned chemical containers in water, contact the regional council – check your phone book for a 24hr 'pollution hotline'.

## Waste water

Waste water from toilets is known as 'black water', or 'foul water'. It contains bacteria naturally found in all people's digestive systems, but capable of multiplying to become a health hazard. It needs to be treated, to make it less hazardous, before the water is released whether to land, river or sea.

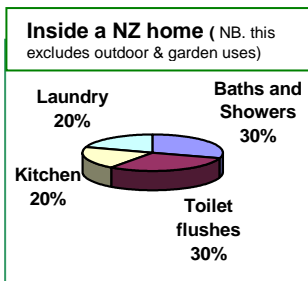
Waste water from baths, showers and laundry contains some bacteria, plus water softeners and detergents, but is less hazardous than sewage and is known as 'grey water'. Grey water should not be stored, or the bacteria in it will multiply.

### Current practice

Piped water supplies and sewerage systems, have contributed to greatly improved public health by controlling water-borne diseases. In 1999, only 59% of the New Zealand population had connections to safe drinking water supply systems, and 15% were not connected to a community supply – using their own well, rainwater from roof collection or a tanker supply. Despite improvements in water treatment, by 2003 there were still over a million New Zealanders whose drinking water supplies did not meet national health standards. For information on water grading where you live, see the *Register of Community Drinking Water Supplies in New Zealand*, available at your library, or ask at the local Council offices.

and the water-hungry appliances like washing machines and spa pools. In NZ we use 180 - 250 litres of water per person each day, *plus* the water that is used outside the house. Summer garden water use can raise total average demand to **800 litres per person per day** in summer. Contrast this to parts of India, where people are limited to about 25 litres/day, i.e. what they can carry!

What water use do our home appliances and activities require? <i>Water efficient</i>		<i>...compared to water inefficient</i>
Front-loading clothes washer 60 litres/load		Top-loading washer 170 litres/load
Half-flush on toilet cistern 6 litres		Full flush 11+ litres
A low-flow shower 35 to 55 litre		A bath 180 litres, full-flow shower 130 litres
10 litre bucket to wash car or house windows		Hose running at 15 litres per minute
Cleaning teeth using mug of water for brush		Tap running at 15 litres per min.
Modern dishwasher 30 litres per load		Old dishwasher 50 litres



### Water Consumption

In developed countries annual water use per person has increased hugely in the past century, due to garden and farm irrigation, high livestock numbers, industrial processes, water-borne sanitation (flushing toilets)

### Options for improvement

Some local authorities have introduced a charge for water by metered flow instead of the common flat rate related to house value. In these areas, annual water demand has dropped between 15% and 35%.

We can make a difference in our homes, by conserving the water we use and making sure that what we tip down the drain isn't going to harm the natural water environment.

## ———— Saving Water and Reducing Pollution at Home ————

### 10 Water Saving Actions at no/little cash cost

1. Ration the garden - water early morning or late evening; water every 3 – 5 days and only if required; don't cut grass too short; use mulch to reduce evaporation; use a timer on any sprinklers use a hardy grass type.
2. Wash the car and house windows from a bucket, not a hose. (To reduce pollution, wash cars when parked on grass, or use a commercial carwash)
3. Use less water when flushing the toilet by displacing water in the cistern with a container of water or brick.
4. Don't use the loo as a waste bin.
5. Check for leaks (e.g. toilet cistern, tap washers) and get them fixed. Check outside taps too.
6. Turn taps off – don't run continuously when washing veges, or cleaning teeth.
7. Share baths or have a shower. Reduce water flow from an existing shower fitting a flow reducer behind the shower head at very low cost.
8. Use the fridge to chill water and defrost frozen food in the fridge rather than by running water over it.
9. Drains are only for rain – protect streams from water-borne pollutants.
10. Do you have a free water saving tip? – if you do, share it with others.

### Low Cost Actions to Save Water

1. Buy a device to reduce the amount of water a toilet uses in a single flush.
2. Switch to an aerator or low flow shower head – this will save energy as well as water.
3. To water the garden, use a hose with a dripper system or a soak hose, ideally with a timer.
4. Divert "grey water" for garden use.
5. If you have a waste disposal unit in your sink considering removing it and establishing a composting system instead.
6. Insulate hot water pipes to reduce the amount of water you have to run off before the warm water reaches the tap.
7. Sweep paths clean rather than hosing down or using a water blaster.

### Further Actions – making longer term water efficiency investments

1. Collect rainwater from the roof for garden use.
2. Make some beds of your garden 'no-watering' areas. Replace "thirsty" plants with more drought tolerant species.
3. Think about water efficiency (as well as energy efficiency) when choosing a new dishwasher or a clothes washing machine. Look for water-conservation rating of AAA or higher.

For more detailed information refer to the website [www.sustainableliving.org.nz](http://www.sustainableliving.org.nz)