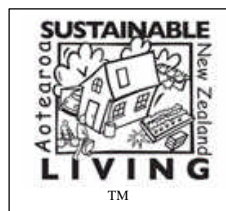


# Sustainable Living Programme NZ 2009 Edition

## Water Actions – Saving water and reducing pollution at home



As in the Energy information materials, we have grouped suggested actions according to their likely cost to the household. Free actions come first, followed by ones that will cost a little (but where water supply is charged by volume, and for those that involve water heating, they'd pay for themselves over time). Finally we cover the water-saving impact of larger expenditure choices, such as 'whiteware' appliance purchases, or factors to consider when choosing your home to buy or rent.

We encourage wider awareness of the global scarcity of fresh water, so that water conservation becomes 'the right thing to do', whether or not it is locally rationed by price. You know how expensive bottled mineral water is – similar to petrol, per litre, at present – so be conscious of how lucky we are to have valuable tap water that's cheap, safe and not rationed. We rely on it, so don't take it for granted. Read our background information sheet (Issues page of resources website) on why water is so valuable to us.

### 10 water saving actions, at little or no cash-cost

1. **Ration the garden.** If you have a 'thirsty' lawn and flower-beds, make your watering effort much more efficient, by:

- (a) When you water, applying it in early morning or later evening, outside the heat and winds of the day, to cut evaporation losses.



Using a hand-held hose with a trigger, to control which plants will get water. Aim for soil not leaves, especially if using tap-water that has chlorine added. Avoid watering leaves in the hottest part of day. (Photo: Angela McLroy, Papanui HS, 2002)  
A lower-volume alternative to spraying is a seeper or 'leaky' hose - pictured below



- (b) Water no more often than once every three to five days that pass without rain. Photo above shows handy equipment to get water direct to plant roots: a dripper

system, or a porous rubber 'leaky' hose, which can be buried, or a trigger controlled hand-held hose - instead of scattering over 800 litres per hour into the air from a sprinkler.

- (c) Some lawn grass mixtures, in areas not given hard wear under foot, can be allowed to dry and go yellow in the dry summer months. They will recover and 'green' in the autumn. Avoid cutting them short before withholding water. If you set the mower cutting height above 40mm in the drier months your lawn will need less watering to stay green, too. Allowing the grass to grow longer leaves will produce deeper roots to reach soil water.

- (d) Around trees, on flower and vegetable garden beds (not seed beds), add a surface layer of mulch up to 100mm deep. Wheat or pea-straw, gravel, composted bark or grass clippings can be used to reduce summer evaporation losses from the soil. Avoid mulching very close to living plant stems, to protect against rot. Gradual decay of the mulch will feed the soil, too. Beware slugs!

- (e) If you still use a sprinkler, time it when in use (or use a clockwork timer near the tap, see photo on later page), and also put out a tin or jar to collect a sample of the actual water depth that has fallen. Approximately 2.5cm water depth per week, in the combined total of

rainfall and watering, is sufficient for lush green lawns. Don't try to put this on all at one soaking or you will waste much of it! Remember that



Total household water use in drier parts of the country, such as Christchurch, can be greatly influenced by garden use in a dry summer. The chart above shows 'typical' annual use of 25% on the garden, but statistically that average calculation includes the households with no garden. If you've a garden, it could be your largest water user.

clay soils absorb water more slowly than sandy soils, and that water soaks in less on slopes, so excess water will simply puddle or run off.

Watering the lawn and garden for one hour can use as much water as a full day's worth of other household activities for a family of four.

We look next at another common household use of the outside tap!

2. **Wash the car and the house windows from a bucket.** It requires only a few buckets of 10 litres each instead of a hose sending out 15 to 20 litres a minute, running for up to half an hour! A rubber squeegee, a soft sponge and newspaper (for cleaning glass) will do the job as well as a hose fitted with glove or brush, for a fraction of the water volume. A little white vinegar added to the water improves window cleaning.

To reduce pollution of local streams with detergents, oils and toxic metals, don't wash and rinse the car when it is on the road seal or concrete driveway, but when parked on a permeable surface such as gravel or lawn. The grass and soil will trap these pollutants and are themselves less vulnerable to such pollution than stream life. If you have no grass surface on which to wash a vehicle, use a commercial car wash (such as BP) where water should be recycled and pollutants will be trapped. Ask, to check this.

Also, don't tip garden chemicals, paint, thinners or waste oil down the storm water drain – they can be safely recycled at local authority facilities. For this, store and present in labelled screw-top containers.



Wash the car on the lawn rather than the drive or roadway. Soil filtering protects streams, but the road storm-water gratings would drain detergents into streams or sea.

3. **If a toilet is the fixed single-flush type, reduce the water consumption** for each flush by

displacing water. To do this put a water-filled, sealed, 1 to 1.5 litre plastic bottle (or a plastic container such as the 'Hippo' bag) inside the toilet cistern, which reduces the volume of water available to flush away each time. Watch the mechanism working while the lid is off the cistern to make sure that nothing snags on moving parts. If you prefer to buy and fit a 'flush saver' weight (that will allow you to regulate the length of time of the flush by how long you hold down the flush button) see the low cost ideas list on page 6.



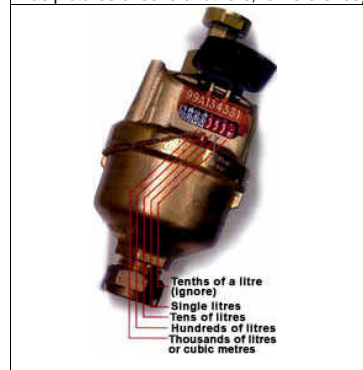
If you have dual-flush already fitted in the cistern, use the half-flush (3 litres) whenever appropriate. It saves many litres a week.

4. **Don't use the loo as a waste bin.** Used pocket tissues and sanitary products can safely go out with solid refuse, so you could have a small, lidded, waste-bin handy alongside the toilet. To avoid wasting water, restrict toilet flushing just to human waste, that needs watery transport to safe treatment in the septic tank or at the sewage works. (As an aside, some male gardeners also add urine onto a lemon tree or the compost heap, as a nitrogen-rich 'activator' that helps it to work. The hormones present in women's urine make it less suitable in this role.)
5. **Check for leaks.** Turn off taps and all water-using equipment, wait for toilet cistern and header tank to

refill, and then look at the **water meter** outside to see if the two numbers at the far right (litres and tenths of a litre) are still turning. Check this reading again after an hour or so, provided you have not run any water. No more movement in that hour means no leaks.



Can't find the water meter? Look for a round or rectangular box lid in metal or black plastic, near the road entrance to your house or flat, labelled 'meter' in raised lettering. Lever it open with a screwdriver. (Meter types vary - study group facilitator has pictures of several others, for reference)



If you have a different 'Kent' water meter with dials, for help reading it see [http://www.taurangawater.govt.nz/water-supply/learn-about-it/tabid/657/qid/1562/tctl/1455\\_ViewQuestion/Default.aspx](http://www.taurangawater.govt.nz/water-supply/learn-about-it/tabid/657/qid/1562/tctl/1455_ViewQuestion/Default.aspx)

**Sometimes toilet cisterns leak into the pan.** A good way to check

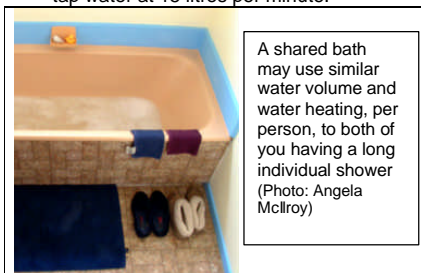
for this is to add a few drops of food colouring to the water in the cistern, then see if any of this colour appears in the pan before you next flush. A leaking cistern, if it was running constantly, could waste up to 2.5 million litres of clean water a year (equivalent to 35,000 bathtubs!). Even a silent leak that you'd only detect with the food dye test could waste over 200 litres a day.

**Dripping taps with broken washers** can also waste large amounts of water, from 4 litres a day in small drips to a steady dribble that wastes up to a litre a minute. Dripping taps are also very costly if it is your hot water tap that's leaking, as you will be heating cold water replacing it in the tank. New tap washers are much cheaper than a larger annual power bill, and quick to fit! Don't forget to turn off the water supply valve before you dismantle any taps, however. For a guide to fixing taps and toilet cisterns, see [http://www.taurangawater.govt.nz/water-supply/learn-about-it/tabid/657/qid/1629/tctl/1455\\_ViewQuestion/Default.aspx](http://www.taurangawater.govt.nz/water-supply/learn-about-it/tabid/657/qid/1629/tctl/1455_ViewQuestion/Default.aspx) <http://www.mitre10.co.nz/how-to-guides/fix-it/fixing-a-leaky-cistern.cfm>

**Check outside taps** and garden hose installations too, especially after frosty weather, when bursts are possible. If you live in a cold region, wrap insulation on the outside tap and pipes to protect them from frost.

6. **Turn off the tap once you have collected enough for the task** in a bowl (or in a sink with the plug fitted). This might be to wash your hands, or to rinse plates or clean vegetables or to run enough into a clean mug for tooth-brushing or for shaving. There is no need to leave the tap running. About 6 to 10 litres

will fill a bowl, after which you save tap water at 15 litres per minute.



A shared bath may use similar water volume and water heating, per person, to both of you having a long individual shower (Photo: Angela McIlroy)

7. **Share baths, or use shower more often than taking baths.** Stay clean while using up to 50 litres less water per person each time. Time yourself in the shower too – see if you can limit showers to five minutes or less. Showers use 7 to 24 litres a minute depending on the system pressure and the shower head design. You'll save money on hot water bills too! Reduce water flow from an existing shower 20%, 35% or 50% by fitting a flow reducer behind the shower head (choice of 3 simple plastic washers with holes in them; just a few dollars from Plumbers' merchants).

As you wait for the shower to warm up you can collect water in a bucket, to use in the garden later.

8. **Use the fridge to cool water and as the place to thaw frozen foods.** Is there someone in your house who on a summer's day regularly runs the tap for half a minute to get their half-litre of cold water, wasting 6 litres in the process? Beat this by keeping a jug or bottle of water ready-chilled in the fridge. Another waster is running tap water over frozen food packages to thaw them – just a little planning ahead can put frozen foods on a plate in the fridge (which is at about 4°C) to thaw.

Their initial frost also helps to keep the fridge cool, which is energy efficient.

9. A reminder, **to protect living streams** by not washing paints, solvents, oil, detergents or chemicals down storm drains. Water from these drains does not reach the sewage treatment plant it goes into the same waterways that we fish in and swim in. **Drains are only for rain!**



Road drains get debris washed off the road surface when it rains. Don't add a chemical cocktail to the litter.

Do you have a free water-saving tip to share with the group? Make a note of it here to remind you for the next group discussion.

In **Auckland**, *Metrowater* offer a free *Water Conservation Advisory Service* visit to your home, to help you economise on water. Find the telephone

number on your bill or in the phone book or email: [backflow@metrowater.co.nz](mailto:backflow@metrowater.co.nz)

In **Wellington City** call the *Waterwise* line on 04 801 3695 Information also at <http://www.bethedifference.gw.govt.nz>

In **Christchurch** call *Waterwise* on 03 941 8748 or visit [http://www.ccc.govt.nz/waterwise/story2\\_497.cfm?](http://www.ccc.govt.nz/waterwise/story2_497.cfm?)

**Waitakere City Council** 'Sustainable Home Guidelines' include a water section, available in print, or on website <http://www.waitakere.govt.nz/AbtCit/ec/bldsus/water.asp> In that city, *Water Wise Up* is run by EcoMatters Environment Trust 09 826 4276



A similar water advisory service runs in **Tauranga**. Ask for Allan Dale Ph: 5777 000.




**Low cost actions to save water: (some good investments)**

1. If you have a pre-1990s single-flush **toilet cistern** and are not already using other methods, **buy a flush saver device or gizmo to ration water use**. Devices available to cut water use by about 2 litres per flush, and costing only a few dollars, include:
- *Water Stop* flush control weight (made by Tiller Holdings of Auckland)
  - *Selecta Flush* (made by BB Water Saver Systems of New South Wales)
  - a strong plastic bag design called *Hippo* (UK import to NZ, for info: phone 03 546 9962 or email: [hippo.nz@xtra.co.nz](mailto:hippo.nz@xtra.co.nz))

Some local Councils already distribute such devices, free or inexpensively. However, one of these bags or gizmos is not required if you already have a modern dual-flush (two button) toilet cistern or have already reduced some of the flush volume within the cistern by inserting a water-filled and sealed container, such as a code 2 plastic.

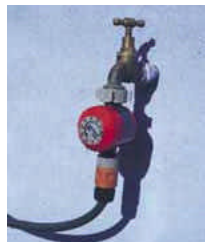
2. **Switch to an aerator or low-flow shower head.** Does your existing shower head supply over 12 litres of water per minute? (*To find out, collect full flow into a bucket for a timed 15 seconds, find out how much water fell using a kitchen measuring jug, then multiply by four to calculate the flow in one minute*). It could be as high as 24 litres a minute! If so, you could save significant amounts of water and money on heating by using a low flow shower head that supplies about 7 to 9 litres/minute. The new one must match the screw-thread of the shower head you take off, and be suitable for the water pressure available in your house. (You could save over 20,000 litres per person per year if by habit you currently

take a seven minute shower, daily). A similar approach applied to the sink mixer taps can save water there. These devices are also valuable for their money-saving on hot water: they pay for themselves in power-bill savings over two years, so you'll read about them in our energy efficiency information too!

	
<p>When choosing an aerator shower head, and mixers or flow regulators, ask about their <b>water efficiency rating</b>. This Australian system codes AAA or higher as water efficient. Many bathroom-construction firms in NZ do not yet offer water-efficient showers as standard, so you may have to ask at a plumber's merchant. New Zealand makers of adjustable flow shower-heads include Methven and Felton. Imported brands include Aqualoc, Brewers, Caroma, Con-Serv, Flexispray, Niagara and Rye. An example available by mail order from Negawatt Resources of Petone is shown below. <a href="http://www.nrl.co.nz/">http://www.nrl.co.nz/</a></p>	
	BW032CH original watersaver

3. **Buy a garden hose with drippers or a seeper hose** and use branching garden-plumbing connectors, ideally fed by a timer that will allow you to set a limit to how long water can flow. A managed irrigation system can guide water to the areas that most need it and deliver the right amount they need. Checking if soil is dry (10cm underneath mulch) each time

before watering, saves unnecessary water use in the first week after rain. It's easy to over-water when piped irrigation is installed! Those with \$200 to spare could get automatic water moisture and rain detectors and a micro-chip controlled watering system with 'zones' that you can program – the technology exists.



Above: Clockwork water cut-off timers for hoses (makers include Gardena and Darlac) are a nice gift idea for someone who tends to turn on the sprinkler or other garden irrigation and then forgets that it's on!  
Below: Example of dripper, on 19mm pipe.



The seeper or 'leaky' hose, made from recycled rubber (pictured on page 1), works best at low pressures, so if you have a high mains pressure, add a pressure regulator, set at 8psi (60 kpa) at the inlet, to prolong hose life.

4. **Divert 'grey water' for garden use**, via a valve from the back of washing machine or shower tray outlet. Use a wide-diameter un-branched hose and a filter is

essential (this must be easily-removed and regularly cleaned). This soap-containing water from showers, baths or final spin only of machine clothes washing, but not kitchen sinks, can be used on soil but only around mature trees or perennial flower beds. It can be useful there in times of drought. However, this 'grey water' will be alkaline, typically contains traces of phosphates and borax and inevitably some bacteria, making the grey water hazardous for direct application onto leaves of vegetables or soft fruit. As it is alkaline, keep it off acid-loving plants such as rhododendrons and azaleas.

It requires natural treatment by the soil and is best not stored in a tank before use, as the bacteria would quickly multiply there in the nutrients from the detergent residues. (The filter will also harbour these bacteria: so use rubber gloves when handling it). Add a top dressing of compost or mulch to any garden areas frequently receiving grey water, to help in the control of flies and odour, and do rotate grey water with freshwater irrigation.

Beware over-watering, especially in the winter when plants take up less water, or on clay soils, which tend to accumulate chemical residues faster. Do not run grey water down dripper or seeper hoses as it blocks the small holes. Phosphate levels can be reduced if you only use detergents without phosphorus-based water softeners; and avoid all bleaches: see also the *Shopping* information in this series.

For those who are keen, there's information on grey-water systems at: [www.oasisdesign.net/greywater/misinfo/index.htm](http://www.oasisdesign.net/greywater/misinfo/index.htm) and [www.greywater.com](http://www.greywater.com)

Oasis Design, from California, publishes a *Builder's Greywater Guide*, by Art Ludwig, 1999 (which is stocked in NZ by Pathfinder Bookshop 0800 554455). Closer to home the following companies sell grey water systems for use in your home [www.ecoplus.co.nz](http://www.ecoplus.co.nz), [www.newwater.co.nz](http://www.newwater.co.nz) With these systems you can save up to 70% of your water. **Similar systems are already permitted by many councils but you would have to check with your District or City Council on NZ building code and Resource Management Act compliance.** The waste-water section of Waitakere City *Sustainable Home Guidelines* also has useful brief notes on grey water (reference on page 6 above). In low rainfall areas we advise caution in garden use of grey water as chemical salts can build up in soil. They are less suited to clay soils.

5. **If you have a waste disposal 'insinkerator' or 'guzzler' installed below the kitchen sink, consider taking it out** and using instead a compost bin, EM Bokashi or worm-composting for the kitchen organic wastes (see *Waste* and *Gardening* notes in this series). The advantages of compost-making include producing useful free fertiliser for your plants and saving 20 to 30 litres of clean water each day, plus a small electric power saving, and less damaged cutlery!

The chopped organic matter from a waste disposal unit added to the sewage flow speeds up the filling rate of your septic tank or increases the oxygen demand at the municipal treatment works. Also those useful nutrients which should be destined for the land, as feed, are washed out and lost to the river or sea.

6. **Don't hose down or 'water-blast' the yard or paths** - buy a strong-bristle yard broom to sweep them



Water blasting strips off tar and accumulated surface chemicals as well as algae and lichens, and all are likely to wash into streams via storm drains. What's wrong with growing some grey lichens on a drive, anyway? We may already admire them on old trees and churchyard memorial stones! (Photo: Rhys Taylor)

instead. This helps to keep you fit, saves water and is far more energy-efficient than using a petrol-powered or electrical motor (and it's quieter for your neighbours than an air blower or water-blaster too).

7. **Insulate the hot water pipes, starting from the top of the hot water tank** and moving towards the taps – this will reduce the length of time to get warm water flowing at the tap, which reduces the water wastage, as well as saving money on water heating. If there is a very long distance from the hot water tank to one particular hand-basin

hot tap, consider installing a small 'instant' electric water heater under that basin. This would be plumbed into the cold supply, and you could then close off and drain the supply pipe branch from the central hot tank. This could be a cost-effective investment after a few years.



Hot pipe insulation- keeps water warmer for longer, so you don't need to run taps for as long before you get useable hot water.

**Further action: Making longer-term water- efficiency investments**

1. **Collect rainwater from the roof for garden use** by intercepting the down-pipe (spouting) flows and storing in a tank, preferably filtered first. If a ground-supported outdoor water tank has capacity over 25,000 litres you will need to use a registered plumber and get a Building Consent, and similarly if the base is more than 2 metres above the ground and it exceeds 2,000 litres capacity. If it is over 2.5 metres in height and over 5,000 litres capacity it will be noticeable by neighbours and you might also need a Resource Consent – if in doubt ask the local authority, as rules vary around the country. A rainwater tank(s) total capacity of 4,550 litres (1000 gallons) could be sufficient for urban gardening and toilet flushing use, unless you live in a very dry region. Mains water trickle-top up is an option, but a backflow prevention valve is essential.

Many Councils are encouraging environmentally-friendly ways of using rainwater around the home and garden. For more information ask your local authority. (See what North Shore City is doing at: <http://www.northshorecity.govt.nz/Water/StormWater/f-test.htm> or download a pamphlet from Waitakere City's website [http://www.waitakere.govt.nz/AbtCnl/to/eco\\_wtrbrochures.asp](http://www.waitakere.govt.nz/AbtCnl/to/eco_wtrbrochures.asp))

replacing old gutters and spouting. If plastic mesh is used ensure it is UV-light stable or you will be generating plastic waste within a few years.

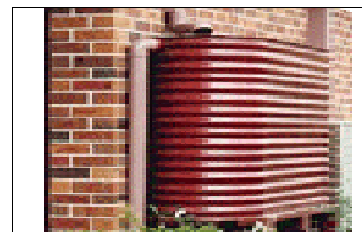
The rainwater tank needs a lid, for peoples' safety and to keep out the light, preventing green algae growth. Locate it in the shade. There are a variety of devices available that trap or divert the first 'flush' of water when it starts to rain (carrying wind-blown soot pollution, paint debris and bird-droppings from the roof) after which you can collect in the tank somewhat cleaner water. The first-flush diverter may need to be an adjustable design as how much you should divert depends on the likely pollution levels and rainfall frequency.

Makers of rain diverters include three Australian firms: SmartFlo <http://www.smartflo.com.au/> Rain Harvest

<http://www.rainharvesting.com.au/> and Safe Rain <http://www.saferain.com.au/>. Firms in New Zealand include Marley (for *leafslide*) 0800 627 539, <http://www.marley.co.nz>

You also need a metal mesh strainer to keep mosquitoes out of the pipes. Overflow, when the tank is full, should be anticipated, and go to storm drains. Some households use stored rainwater for toilet flushing as well as garden watering, but to do this you'd need extra plumbing professionally installed in parallel to (and not connected to) the original 'mains' cold water system and get Minor Works Building Consent permission from the local authority.

The Government has guidelines on this topic to protect your health. Read *Household Water Supplies* (Updated 1997, Booklet Code 4602 Ministry of Health) and the leaflet *Water Collection Tanks and safe household water* (code 10148, August 1999).



2000L rainwater holding tank on house wall.



NZ-made rain-water storage barrels by RainSaver Systems of Nelson 03 548 7044 [www.rainsaver.co.nz](http://www.rainsaver.co.nz) are fed by the spouting. In the best systems a 'first-flush diverter' sends the initial rush of dirty water away from the tank, after which it collects until the tank is full, then overflows additional rain to storm drains.

Special guttering designs and inserts are available that filter out leaves and debris if you are building new or

For firms that supply complete rainwater harvesting systems see New Water [www.newwater.co.nz](http://www.newwater.co.nz) who import systems from Australia.

We have not tested these devices or systems and are thus not able to specifically endorse them. (Suggest you ask for test reports or to speak to satisfied independent NZ users.)

2. **Make some beds of your garden or yard 'no-watering' areas** by moving out the most thirsty plants and adding drought tolerant types, such as the scented Mediterranean herbs (e.g. lavender, sage), pinks, geraniums, cacti, succulents and some drought-tolerant NZ native plants (e.g. kowhai, akeake, lancewood). A surface cover of light-coloured stones, gravel, bark or mulch may help to shade their roots and reduce water evaporation. Do not use black plastic sheet as it overheats the roots and restricts air movement. Beware drought-tolerant weeds that will also get established in mulch if you don't remove them early: e.g. oxalis and thistles.

3. **Think about water efficiency (as well as energy efficiency) when choosing a new dishwasher or a clothes washing machine.** The information to help you do this is supplied by manufacturers as a 'Water Conservation Rating'. Look for a rating of AAA or higher. Front-loading **clothes washers** use less water and less detergent than top-loading machines, and also, as they have no agitator, wash more gently but slowly, which helps clothes and bedding to last longer. Front-loaders can spin faster (to 1000 rpm), which extracts more water than a top-loader and speeds up line drying, especially in the winter: so you'd not need an electric dryer.



Use the labels to guide your choice. Seek AAA (or better) water efficiency which means a front-loader or one of very few top loaders: NZ made Fisher and Paykel's *smart-drive* top-loader washing machines are worth a look. Seek energy rating higher than 3.5 stars; e.g. look at Robert Bosch, Asko, Simpson and Whirlpool machines. (Photo: Angela McIlroy)

Modern **dishwasher** machines should use no more water than hand washing for a full load and about half that of 1980s models. With the re-design, their power consumption has reduced from about 2.5 kWh per load to 1.5 kWh.

For comparative independent reviews of **dishwashers** by manufacturers such as AEG, Asko, Westinghouse, Bosch, and Fisher & Paykel see *NZ Consumer* magazines and similarly for **clothes washers**, including some made by these firms.

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Additional reading and websites:

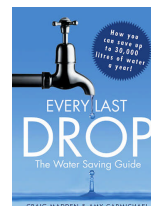
You may be interested in taking your understanding of water issues, both local and global further. Below are a range of resources - great for sharing with your family and friends.

Te Puni Kokiri, 2004, *Māori cultural values and the national importance of water bodies*. Wellington.

Allan Windust, 2003, *Waterwise House and Garden*. Victoria: Landlinks Press

Ian Cooke, 2008 *Waterwise Gardening*. Auckland, New Holland Press, Northcote

Wendy van Dok, *The Water efficient garden: a guide to sustainable landscaping in Australia*. (good for principles, but many plants differ)



Craig Madden & Amy Carmichael (2007) *Every Last Drop: The Water Saving Guide*

The issue of bottled water is profiled here:

<http://www.foodandwaterwatch.org/water/bottled> and <http://www.bethechange.org.nz/pledge/drink-tap-water>

To help you think about gathering rainwater, see an American site: <http://www.rainwaterharvesting.org> and search the web-pages of Auckland Regional Council, Waitakere City or North Shore City.

This booklet 'Water: A household guide to improving water quality and managing water use in Hamilton' (Dec 2006) from Hamilton City Council is also very informative about water quality, wastewater and storm water treatment.

NZ Ministry for the Environment: chapter three of their booklet *Gentle Footprints* is available as pdf at <http://www.mfe.govt.nz/publications/ser/gentle-footprints-may06/index.html>

To understand more about the national standards for drinking water see: <http://www.mfe.govt.nz/laws/standards/drinking-water-source-standard.html>

Global Education Centre has resources on many issues and dedicated 3 resources to a discussion of water issues. The resources can be downloaded from:

<http://www.globaled.org.nz/globalissues/index.php?pubsPage=2>

The NZ Hydrological Society produced a very detailed teachers' kit about water for schools. There is a great deal of interesting and useful information within that kit. Access it here:

<http://www.h2know.org.nz/posters.html>

For background information on the possible impact that climate change may have on NZ, pick up pamphlets from, or visit the websites of:

- ◆ Ministry for the Environment: <http://www.mfe.govt.nz/issues/climate/>
- ◆ NIWA Climate Change Centre <http://www.niwa.cri.nz/ncc/clivar/ipcc> and also read the IPCC Fourth Assessment Report, Summary for Policymakers, 2007.