

# Water Water Everywhere....



**... and 10 ways for restaurants  
to stem the flow**

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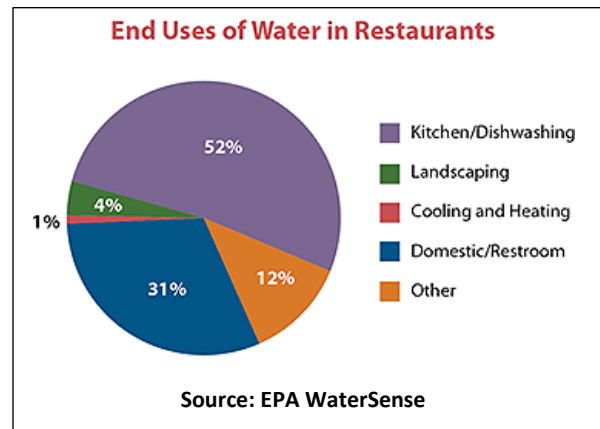
## Water, Water, Everywhere.....

### ..... and 10 ways for restaurants to stem the flow

Water is used for virtually everything in a restaurant – cooking, dishwashing, cleaning, you name it. There is a huge variation in the amount of water that different restaurants use - not to mention huge differences in estimates generated by research reports of exactly how much that is. Costs vary even further than usage, since water rates can vary by huge amounts across the country. But, every restaurant manager will tell you that they use a lot of water – in fact too much.

While there are [studies](#) that suggest restaurant water usage of as much as 25,000 gallons daily, the more common estimate is that a typical sit-down restaurant uses 3,000 to 7,000 gallons per day, with an average of about 5,800. (Another number that pops up in studies is 24 gallons per seat per day). Quick serve restaurants use about a third the total on average, although the usage per seat tends to be much higher.

5,800 gallons per day translates into over 2 million gallons of water per year. That's thousands of dollars per year, literally going down the drain. (At a not uncommon rate of .4 cents per gallon, this level of usage translates into more than \$8,000 per year, but for many restaurants the cost is significantly higher).



There are factors other than size -that can have a significant impact on water usage and costs. For example, as will be discussed below, the type of equipment in a restaurant can dramatically change the water equation.

And, that doesn't take into account the impact of leaks – in faucets, toilets, dish machines, irrigation systems or elsewhere. A running toilet, for example, will use over 200 gallons per day, increasing the bill for an average QSR by more than 10%! Irrigation system leaks can use thousands of gallons per day.

The general consensus is that water is routinely wasted in large quantities in almost every food service operation, from the smallest café to the largest institution. The good news is that something can easily be done about it. Savings on the order of 25% - 30% are readily available through modest changes in practice and the replacement of some equipment. In many cases, the potential savings can be even higher. In the many areas of the country seeing drought conditions, water savings have an even greater benefit.

Here are 10 ways for restaurants to increase profits - by better managing their use of water (with thanks to the various sources used to compile these suggestions).

## The Basics: In and Around the Kitchen

### 1. Do The Easy Stuff

The easiest ways to save water - and money - are a set of no cost changes to some basic practices. For example:

- Presoak utensils and dishes in basins of water, rather than in running water. No need to keep that water running all the time.
- Don't use running water to melt ice in bar sink strainers. Put the ice in earlier to allow it to melt on its own.
- Turn off the continuous flow used to wash the drain trays of coffee/milk/soda beverage islands.
- Reduce the flow to dipper wells for ice cream and butter scoops and other frequently used utensils. Often, dipper wells will run all day; if they are in use 16 hours per day, they will consume 2,000 gallons per year, if not more. If the dipper is using hot water, you will be paying even more for the associated energy. Turn the valve off when not in use, turn the flow down, or install in-line restrictors that reduce flow by as much as 40% (to .3gpm).
- Don't allow water to flow unnecessarily. Consider using automatic shut-off faucets at bar sinks, for example.
- Teach kitchen staff how to replace a washer when there is a leak! It's easy. ([youtube.com/watch?v=9gxQ3BAUJZE](https://www.youtube.com/watch?v=9gxQ3BAUJZE)). Have a washer kit and tools on hand. If a sink is leaking at the end of the night, it should be considered the same as if the employee didn't clean and sanitize it.
- Don't serve water unless asked. For every glass of water you serve, it takes 2 glasses of water to clean the glass. 1 glass of water = 3 glasses. If you give a clean glass for every refill as some restaurants do, you're leaving money on the table....literally.



### 2. Deploy Simple Faucet and Valve Replacements

Here are some inexpensive options that yield big paybacks.

- Pre-rinse spray valves use as much as 4 -5 gallons of water per minute. Replace them with low-volume spray valves using 2.0 gallons per minute or less. If these are used 8 hours per day, the annual savings can reach 10,000 gallons per year per valve – and the new valves can pay for themselves in a matter of months.
- Use automatic shut-off spray nozzles on cleaning and other hoses



1.6 gpm pre-rinse spray valve

- Install low flow aerators on all hand washing faucets - the best ones use less than 1.5 gpm. These aerators are very inexpensive and typically pay for themselves in a few months.
- Fit kitchen faucets with fingertip control valves that switch between aerated flow for washing hands or vegetables, and full flow for filling pots
- Install foot controls for frequently used faucets to make them much easier to turn off

### 3. Use Dishwashers as Efficiently as Possible

Restaurants use about 2 gallons of water for dishwashing for every meal served. Therefore, if you serve 400 meals per day, you can expect to use about 800 gallons per day, or almost 300,000 gallons per year.

We discussed low flow pre-rinse valves above. These are extremely cost-effective, but the simplest way to save on dishwashing is to make sure to wash only full loads. In the above example, going from 2/3 full loads to totally full loads would save about 100,000 gallons per year, or several hundred dollars.



Proper operations and maintenance can be very important. For example, here are some suggestions from [Fisher-Nicke](#) and others:

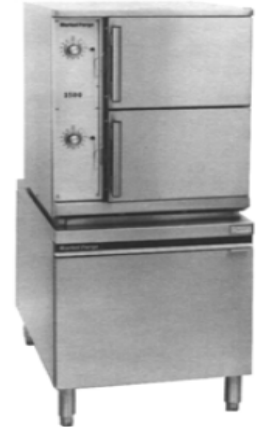
- Check regularly to ensure that the manual fill valve completely closes after the wash tank is filled.
- Set the rinse cycle time and rinse pressure to the manufacturer's recommended settings and verify them periodically.
- Make sure that the rinse bypass drain on conveyor type machines is adjusted properly so that the wash tank water is adequately re-filled during operation.
- In high volume operations, it may be cost-effective to install a recycle loop that reuses final rinse water for pre-wash cycles.
- You may also want to consider a pressure regulator to reduce the water volume.

When considering a new dishwasher, look for one that uses less than 1.2 gallons per rack for fill and dump machines, and .9 gallons for all other types. Also, be aware that *high temp* machines that do not require sanitizing chemicals use more water – typically around 70% more - because of high pressure sprays. They also use significantly more electricity, in large part because of the need to heat the water to 180 degrees. Generally, the additional cost of water and energy will exceed the cost savings from eliminating chemicals.

## Equipment Upgrades That Provide a Big Bang for the Buck

### 4. Switch to More Efficient Steamers - or use Them More Efficiently

If you currently use boiler-type steamers, you should be aware of newer models, alternatively known as “connectionless”, boilerless” or “pressureless”, that have no water or discharge sewer lines. With these units, steam is generated in a reservoir at the bottom of the cooking compartment and water is added and drained manually. Condensed steam returns to the reservoir, instead of draining outside. Since there is no continuous flow, these steamers do not require condensate cooling water. (Note: these models may not be appropriate for very large restaurants). According to [Fisher-Nickel](#), 6 pan boiler-type steamers can use as much as 175,000 gallons per year, while the alternative models use as little as 5% of that amount. This represents a potential savings of hundreds of dollars per year.



Even with the boiler type units there are savings opportunities. Most models offer a standby setting and will automatically switch to standby at the end of a timed cooking period. The condensate cooling water is shut off while the steamer is in standby so the steamer uses a minimal amount of water during these periods.

Combination ovens, which offer dry heat, moist heat, and steam modes, also come in boiler and boilerless models. Boilerless combi units require less water than the boiler-based models, and while the savings are not as great as they are for stand-alone steamers, they may still exceed 100,000 gallons per year.

### 5. Replace Water Cooled Ice Machines, Refrigeration, and HVAC Units— as Soon as Possible

If you have a once-through water cooled ice maker (a technology also commonly used for soft serve equipment), or a water cooled refrigerator or HVAC unit (not as common but still in use in many locations), you have an enormous opportunity to cost-effectively lower your water bill. Water-cooled units generate less heat, but utilize a continuous stream of cold water that is then simply sent down the drain. An 800 pound ice machine uses about 1,300 gallons of water per day – or over 460,000 gallons per year – costing well over \$1,000 per year in most areas.



The Massachusetts Water Resources Authority published a [case study](#) of a restaurant in the Boston area that had a water cooled ice machine as well as two water-cooled condensers

for a walk-in cooler and walk-in freezer. Replacing these units with air-cooled units was estimated to cost about \$7,000 and result in annual water savings of just over 1.04 million gallons of water, valued at \$5,820 based on local rates. The additional electrical cost of air cooled units was estimated at \$375 per year, for a resulting payback of 1.3 years.

If replacing an ice machine, consider a flake or nugget machine rather than a cube machine; these are both more water efficient and more energy efficient.

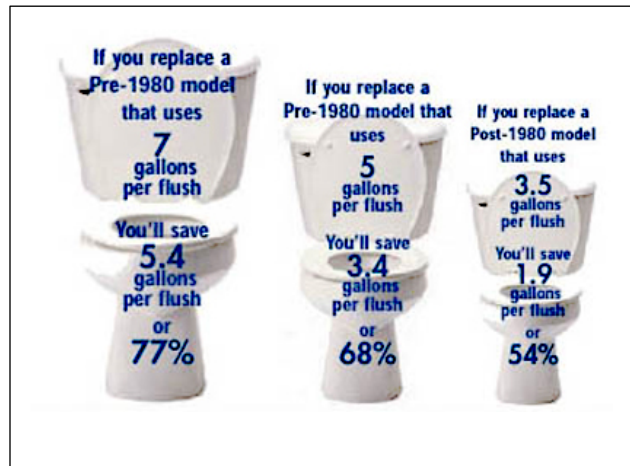
Ice makers provide other potential savings opportunities, particularly when it comes to energy. One approach favored in some areas is to simply turn the ice maker off at night. In areas with time-of-use rates or demand-response programs, the opposite may make sense; buy a sufficient sized unit to make all the ice that is needed at night and in other off-peak hours, then shut the unit down during the peak rate times.

## Going Beyond the Kitchen

### 6. Upgrade the Restrooms

Toilets in a busy restaurant may be flushed as many as 50 times a day. If these toilets are more than 25 years old, they may consume as much as 70,000 gallons per year, costing several hundred dollars. Newer low flow toilets consume 1.6 gallons or less and can reduce water usage by 50% or more, paying for themselves in just a few years. As discussed later, in many areas, utilities will provide incentives for replacing older toilets. Under all circumstances, check for running toilets on a regular basis.

Also consider waterless urinals for men's rooms. Waterless urinals can save a significant amount of water and provide better hygiene. They do require proper maintenance, and have been shown to result in negative payback where improper maintenance caused urinals to fail; so make sure to have the right maintenance procedures in place if you choose this option. Alternatively, ultra-low flush urinals will consume 1 gallon or less per flush compared with 2 to 5 gallons for standard urinals.



If you are charged less for non-potable water and local codes allow it, use non-potable water for all toilets.

Finally, install low cost, low flow aerators in toilet sinks as well.

## 7. Irrigate Responsibly

Overall, irrigation accounts for less than 5% of restaurant water usage. Many restaurants do not have to worry about irrigation at all, but if you do use irrigation you know it can be expensive.



If you have the luxury, start by installing plantings that require the least amount of irrigation. In any case, minimize the frequency of irrigation; in most areas of the country using the sprinklers 2-3 times per week should be sufficient. Use mulch to minimize weeds and weed regularly, since weeds (and unhealthy plants) absorb water that could otherwise be used by the other plants. Avoid runoff and make sure sprinklers cover just the lawn or garden, not sidewalks, driveways, or gutters. Always use sprinklers in the early morning to minimize evaporation.

Irrigation system upgrades can save water and improve landscapes by avoiding over-watering. Check with your water utility to see if rebates are available for evapotranspiration controllers, soil moisture sensors, rain sensors, weather-based automated scheduling and other water-conservation irrigation equipment.

## 8. Conserve Water as you Clean and Dispose

Lots of water is used to clean restaurants – both inside and out in many cases. There are things you can do to minimize the use of water for this purpose.



At a minimum, cleaning hoses should have an auto-shut off valve. Better still; replace hoses with *Water Brooms* for cleaning floors, parking areas and sidewalks. Water brooms use half the energy of hoses – and possible even less - saving in the range of at least 200 gallons per day if used for 1 hour, or over 70,000 gallons per year, and hundreds of dollars. They also result in much faster drying without runoff

Alternatively, if you have not replaced your steamers with boilerless models, water from steam tables is stored in a reservoir to be dumped out later. Instead of dumping this clean water down the drain, use it for cleaning the floors.

You can control the flow of water to the garbage disposer with a solenoid valve that shuts the water off when the unit is not operating.

You can also use the rinse water from the dishwasher as flush water for garbage disposer.

Finally, consider the option of installing a *pulper* to compact your garbage. Not only do they compact, but they use less recycled water; typically only 2 gallons per minute compared to the 8 gallons a typical commercial garbage disposal uses.

## Other Resources

### 9. Leverage Available Rebates – and WaterSense Equipment

In several places in this document there have been references to utility rebates. Water utilities throughout the US offer rebates for water efficient toilets, clothes washers, dishwashers, irrigations systems, and more. These can make replacing equipment very cost-effective. Check your utility website for details. (Be aware that there are likely to be even more rebates available for energy efficient equipment from your electric or gas utility).



Most people are now aware of the **EnergyStar**® label that has been appearing on products for years, indicating that they meet certain energy efficiency standards.

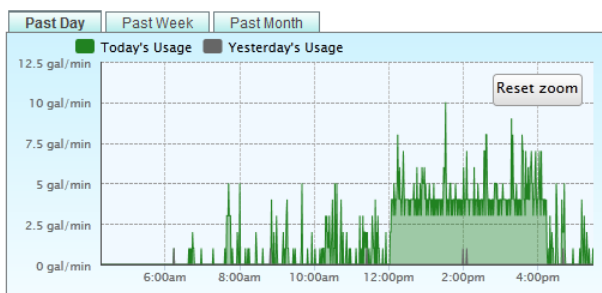
The EPA, which sponsors EnergyStar, more recently introduced **WaterSense**® to bring the same concept of labeling to water efficient products. To obtain the WaterSense label, products must be at least 20% more water efficient than the average product in the category. Look for the WaterSense label when replacing equipment - and check the WaterSense [website](#) for additional ideas on reducing water usage

### 10. Monitor Water Use on an Ongoing Basis

Managing water use is made all the harder by the fact that most water utilities bill only every 2 or 3 months, meaning it can be a long time before you are even aware of a problem. For example, if there is a leak in your irrigation system – a not infrequent occurrence – it could be 3 months and thousands of dollars before you have reason to even suspect it.

If you are lucky enough to have a utility that has installed smart water meters, you may be able to monitor your water use on your utility website, so you can see if there is a sudden change in usage.

Without a smart meter you can still do a better job of monitoring your water use by simply reading the water meter regularly, ideally as often as weekly. Write the readings down so that you can track usage and see if any problems seem to have developed.



Better still, there are companies that offer water monitoring systems that keep track of water use in real time. These systems will also usually send out



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alerts if the data suggests that there might be a leak or other problem, and will typically pay for themselves the first time they do report a leak.

Whatever you do, at the first sign of a leak, find it and fix it! Talk about money literally going down the drain.

## **Conclusion**

Water may not cost a restaurant as much as energy does, but it still represents a sizeable expense that too often is considered uncontrollable. But, you can control it and save thousands of dollars in the process, while making your restaurant greener and doing your part for communities where water is becoming a scarcer commodity. The best time to start is now.