

Getting Past the “Yuck” Factor: Recycled Water in Florida and Other States

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With record-setting droughts plaguing the western United States and growing populations increasing the demand for water across the country, many communities have been seeking out new sources of water. One strategy that has been gaining popularity is water reuse, which involves using treated wastewater for industrial production, the augmentation of drinking water supplies, irrigation, and other purposes.

Further adoption of water reuse would not be just another drop in the bucket. A recent report by the National Research Council (2012) estimates that reusing all of the municipal wastewater that is discharged into oceans or estuaries could supply 6 percent of total US water use and 27 percent

on the “yuck” factor as a potential barrier to further adoption. Indeed, survey-based studies have shown that public support for water reuse initiatives generally wanes as the likelihood of individual contact with reused water increases.

As a result, many questions remain regarding the future of water reuse. What could more widespread adoption of water reuse look like? What types of communities are more likely to adopt water reuse? What economic sectors would use recycled water?

A Pioneering Approach in Florida

We are able to start answering some of these questions by turning to Florida, which, together with California, has been a pioneer

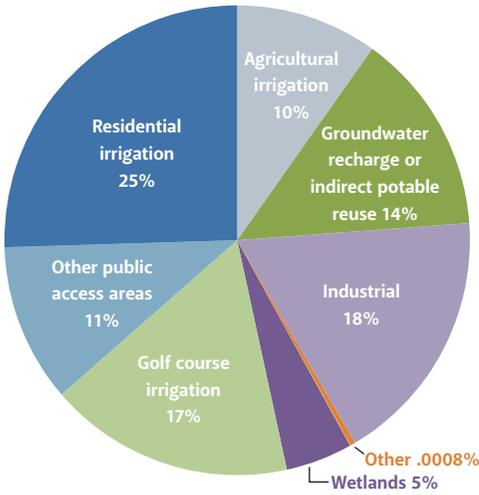
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of all residential, commercial, and industrial uses—those that can be supplied most readily with treated wastewater. Water reuse also offers the benefit of reducing the volume of wastewater discharged into surface water, which may lead to improved ambient water quality outcomes.

However, most communities have yet to adopt reuse as a water management strategy. Issues surrounding water reuse, particularly related to the conversion of wastewater for potable purposes, have been increasingly covered by the popular press with a focus

in the adoption of water reuse practices. According to the Florida Department of Environmental Protection, the state’s capacity to recycle water nearly tripled between 1992 and 2012. If Florida were to reuse all of the wastewater it could, that volume would represent 67 percent of the state’s wastewater treatment capacity. In 2012, 486 reuse facilities were operating in the state, with a total reuse capacity of 1,711 million gallons per day. Of this capacity, on average, about 725 million gallons were actually being used per day.

Figure 1. Uses of Recycled Water in Florida in 2013



Source: Florida Department of Environmental Protection 2014.

Figure 1 illustrates how recycled water was used in Florida in 2013. Recycled water was used to irrigate 321,340 residential yards, 548 golf courses, 961 parks, and the grounds at 328 schools. In addition, recycled water was used for irrigation on 14,056 acres of agricultural land for edible crops—primarily oranges, grapefruits, and tangerines—and 24,752 acres of other crops. Significant amounts were also used for industrial purposes and the recharging of aquifers. Less than 1 percent was used for toilet flushing, decorative fountains, commercial laundry, cleaning of roads and sidewalks, vehicle washing, and the making of concrete.

Some may be concerned that the 14 percent of recycled water in Florida designated as “groundwater recharge or indirect potable reuse” (IPR), could eventually be used to supply drinking water. IPR involves releasing recycled water post-treatment into natural surface water or groundwater sources as a means of augmenting freshwater supply. It differs from direct potable reuse (DPR), in which recycled water is introduced directly into a potable water distribution system. Both DPR and IPR require advanced

treatment processes, such as membrane filtration and reverse osmosis, but by discharging treated water into surface water or groundwater prior to reuse, IPR uses environmental buffers such as rivers, lakes, and aquifers to naturally purify the water.

Despite these rigorous treatment processes, research reinforcing the safety of reuse technology, and assurances of water quality by authorities at local levels, the yuck factor associated with public perception of potable water reuse is real. Although people often favor water reuse as a general concept, attitudes change when potable reuse projects become more tangible and are proposed in specific communities. However, these public perception hurdles are not immovable.

Research has shown that public acceptance of water reuse is higher when information about the protection of water quality and public health is effectively communicated, when communities have a high level of confidence in public authorities, and when people are aware of ongoing water supply problems.

In the case of Florida, public policy played an important role in encouraging the adoption of water reuse. State policymakers have established the promotion and encouragement of water reuse as a formal objective. Elements of the Florida Administrative Code and Florida statutes that address water reuse focus on coordination and educational activities, and five water management districts develop rules to implement water reuse programs authorized by the state. Florida has further promoted water reuse within areas known as “water resource caution areas,” which have current or projected water supply problems as determined by the Florida Department of Environmental Protection. Within the water resource caution areas, reuse of reclaimed water is required. The water management districts may limit the quantity of freshwater



that the municipalities and utilities can withdraw or, more directly, require implementation of specific types of reuse activities.

The Economics of Recycled Water

One interesting characteristic of recycled water is that it generates different levels of socioeconomic benefits depending on its end use. End uses, in turn, are associated with different required levels of treatment and thus different costs. For example, people are generally willing to pay much less for water used to flush toilets or irrigate parks than for drinking water. But it generally costs less to treat wastewater to irrigation standards than to potable quality.

Because the costs and benefits of recycled water are a function of its end use, the expansion of recycled water as an alternative to freshwater poses an unfamiliar challenge to regulators and researchers. Historically, water resource economists have studied the optimal allocation of freshwater

of uniform quality, recommending that it be directed toward its highest-value use. However, when water is available in differing levels of quality, it may make sense to avoid high-value uses, such as augmenting drinking water supplies, given the potentially high cost of recycling technology. Instead, it may be best to treat the recycled water for use in a sector with less stringent standards for quality—agricultural irrigation, for example—even if the societal value of a unit of water in this sector may be lower. ●

FURTHER READING

- Dupont, Diane P. 2013. Water Use Restrictions or Wastewater Recycling? A Canadian Willingness to Pay Study for Reclaimed Wastewater. *Water Resources and Economics* 1: 61–74.
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