Invisible water: is your lawn sucking California dry?

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As the state of California enters the fourth year of what is turning out to be the most severe drought in recorded history, Governor Brown recently issued a first of its kind executive order mandating state-wide water reductions to the tune of 25%. "Today we are standing on dry grass where there should be five feet of snow. This historic drought demands unprecedented action" he said. Current urban landscapes, especially lawns, emerge as the biggest water loser as the executive order demands for replacement of lawns and prohibition of irrigation of urban landscapes using potable water.[1]

[1] http://tinyurl.com/saveourwaterweb

How much water does my urban landscape use?

It has been estimated that outdoor water use in California can be as high as half of all residential water demand. The choice of plants that dominate our urban landscapes is likely one of the biggest factors that determines California's urban water footprint. Historically, Californians have preferred growing thirsty plants adapted to humid climates over drought tolerant native plants resilient to our local climate. [2]

[2] http://www.ppic.org/content/pubs/cep/ep_706ehep.pdf

The water used to irrigate our thirsty urban landscapes remains largely invisible as most irrigation in these systems occurs at night time. This invisible water use combined with an equally invisible inefficiency of irrigation strategies employed by our urban landscapes amounts to an astonishing amount of water wasted every night! Indeed, many of us have seen sights similar to those shown in figure 1 and figure 2 and failed to ask ourselves why exactly do curbs need water? Unsurprisingly, they don't! The curb water needs to be curbed!

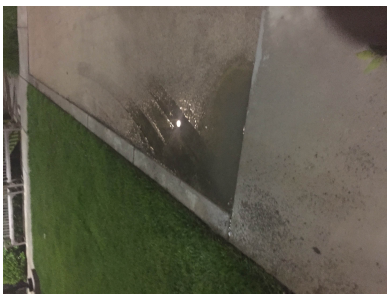

Figure 1: Invisible water: water collecting at the edge of the curb. Semi-permeable material to allow recharge of ground water.

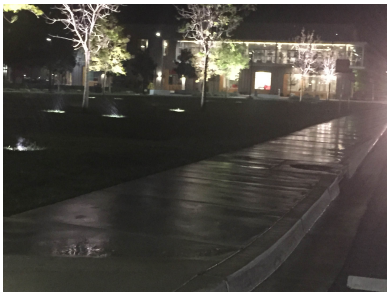

Figure 2: Invisible water: inefficient sprinklers leading to excessive water use

Can I save outdoor water and still have a beautiful landscape?

Don't plants need water?

Yes and yes! Water is a precursor to the photosynthetic reaction. As a first step in photosynthesis, plants harvest "packets of energy" provided by the sun to break water molecules to hydrogen, oxygen (that we breathe!), and electrons. However, not all plants need the same amount of water to maintain their sustenance. Some plant species are adept at using water more efficiently than others depending on their

evolutionary history. A lot of California native plants for example have adapatations to help them survive and fluorish in their drought prone native environment. If we are to take water conservation in our urban systems seriously then the vegetation in these landscapes needs to be dominated by locally adapted plants that are at balance with our climate.[3]

[3] http://www.ppic.org/content/pubs/cep/ep_706ehep.pdf

What else can I do to save outdoor water? How can I curb "curb-water"?

In addition to paying close attention to the plant species present in the landscape, one needs to manage irrigation efficiently and reduce evaporative losses from the surface. As a starting point, you might consider (1) watering deeply but less frequently, (2) mulching around trees and plants whenever possible, (3) using a broom to clean passages, and (4) switching to drip-irrigation or at least optimizing your sprinkler system to minimize water wastage.[4] If you are unsure what plant species to you use, you might want to consider the University of California, Master Gardener program website as a starting point for inquiries. [5]

[4] http://saveourwater.com/what-you-can-do/tips/

[5] http://mg.ucanr.edu/

References

[1] Advice to grow by ... ask us! - uc master gardener program. http://mg.ucanr.edu/. Accessed: 2015-04-13.

[2] Governor brown directs first ever statewide mandatory water reductions - save our water. http://saveourwater.com/blog-posts/governor-brown-directs-first-ever-statewide-mandatory-water-reductions/. Accessed: 2015-04-13.

[3] Tips - save our wateradvice to grow by ... ask us! - uc master gardener program. http://saveourwater.com/what-you-can-do/tips/. Accessed: 2015-04-13.

[4] Ellen Hanak and Matthew Davis. Lawns and water demand in california. *PPIC Research Reports*, 2006.