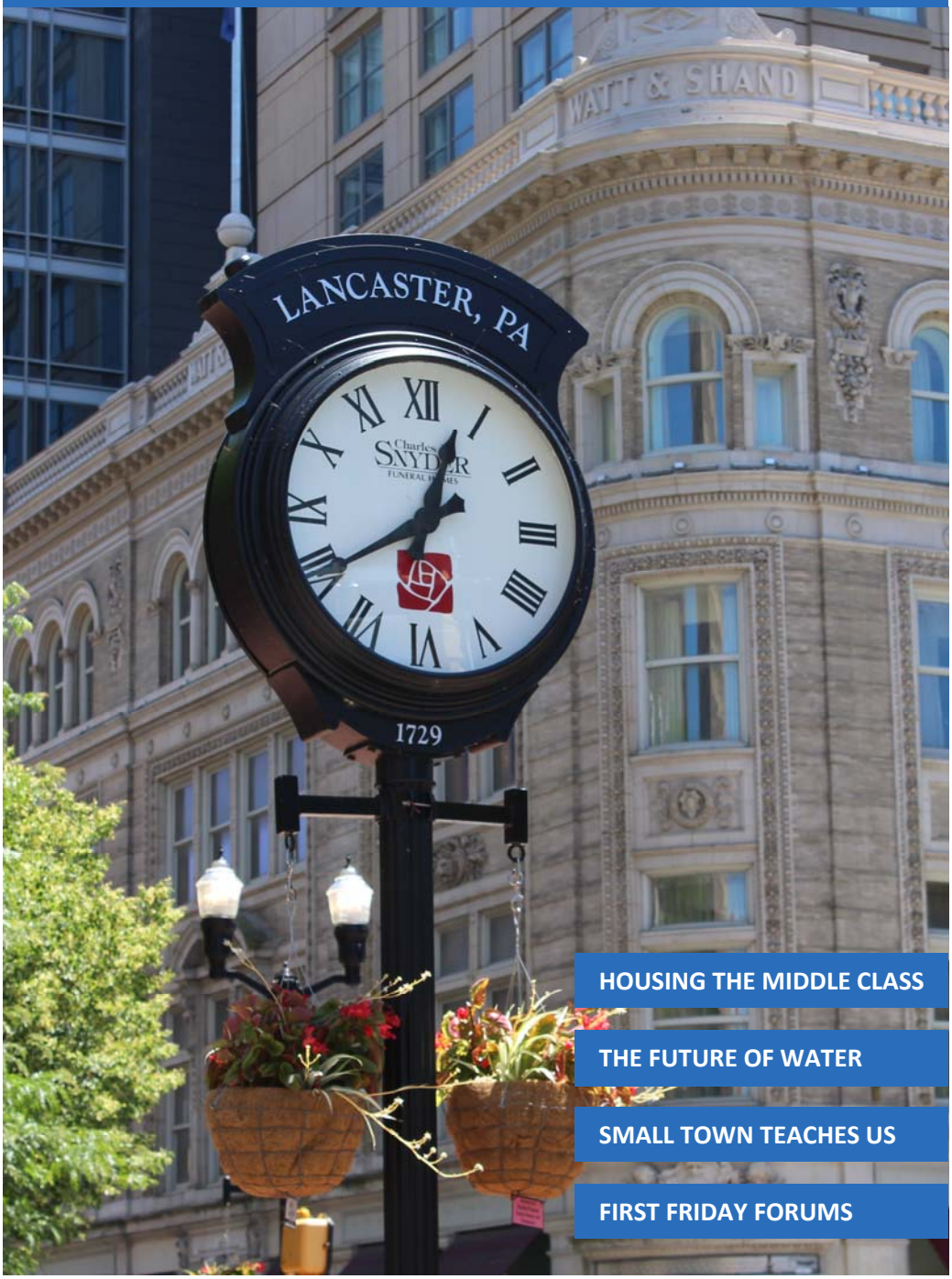
Summer 2019

Hourglass Quarterly



HOUSING THE MIDDLE CLASS

THE FUTURE OF WATER

SMALL TOWN TEACHES US

FIRST FRIDAY FORUMS

THE FUTURE OF WATER

Clean Water Can Not be Taken for Granted

Climatic changes threaten the availability of fresh water and create new risks to our health, the food supply, and the environment.

The last 100 years have been described as the golden age of water. Now this golden age of plentiful, free, reliably safe, and mostly taken-for-granted water is being replaced by the need for careful stewardship of our water resources. From 1900 to 1940, life expectancy in the U.S. increased from 47 years to 63 years. Much of that success is attributed to progress in making clean water available to more people.

Today, as water supplies tighten and droughts and floods worsen, many cities are embracing a more holistic approach to the planning and management of water supply, wastewater, and stormwater. We must employ new technologies and devote as much effort to recharging aquifers as we do pumping from them while also managing groundwater and surface water as an integrated system. Our aging drinking water systems are not ready for future climate change and the undue burden imposed by inadequate pollution regulations.

Our nation's continued reluctance to invest in water systems allows them to deteriorate until they fail. Water systems in cities across the country are seriously in need of replacement or upgrading and local water systems are dropping fluoride despite its health benefits.

Because of the deteriorating systems, residents in many communities believe that their tap water is no longer safe to drink. The availability of an adequate, safe water supply is no longer taken for granted.

The use of old water-filtration and disinfection plants and simply banning difficult-to-treat chemicals like PFAS, are not adequate. In Toledo, Ohio, where the continued release of nutrients from farms, wastewater treatment plants, and city streets, coupled with warmer temperatures in the Great Lakes, resulted in blooms of toxic algae that made tap water unsafe for several days in 2014. Most experts suspect that nutrients that are legally released from farms and cities are the main cause.

In eastern Virginia, the local utility is treating wastewater with advanced technologies before using it to recharge the local drinking water aquifer, eliminating the discharge of nutrient-rich wastewater to the ecologically sensitive Chesapeake Bay. And these actions counteract the vulnerability of the land to flooding. The problem isn't limited to a

few cities or regions, it is being felt just about everywhere. It may take a few high-profile drinking water contamination incidents to force action.

Using the water self-sufficiency movement as a starting point, it may be possible to rapidly adapt existing infrastructure. For example, the reverse osmosis technology used to make municipal wastewater effluent and seawater safe to drink by forcing water through a membrane that captures salts, microbes, and chemicals could be repurposed to remove PFAS and algal toxins from water supplies. Emerging technologies, such as energy-efficient LED water disinfectant lamps and treatment systems that use electricity instead of difficult-to-manage chemicals to decontaminate water, could help solve water quality problems. While advanced treatment technologies will not eliminate all problems related to decaying water pipes, aging dams, and inadequate treatment plants, they may create the means to move away from our historic reliance on massive infrastructure projects that have become too expensive to properly maintain.

For example, point-of-entry water filters that purify only the water that comes into the kitchen, and building scale water recycling systems that clean up any contaminants that enter the water within the underground pipe network, could reduce cost by allowing water used outdoors for cleaning and irrigation to be treated less stringently than drinking water. Additional savings could be realized by investments in underutilized technologies that prevent treated water from escaping from aging water pipes between the treatment plant and the user.

Protection and conservation of groundwater is an important component of ensuring the quality and availability of our water supply. Actions to replace scarce surface water by pumping groundwater from aquifers at a rate beyond natural replacement can not only reduce water supply, it can change land use, and lead to the disappearance of ecologically important wetlands. And, it can degrade the quality of the groundwater. Managed aquifer recharge diverts alternative sources of water – surface water, stormwater, and treated urban wastewater – onto land where the water can be infiltrated in ponds or injected into wells.

Elected officials and community leaders must recognize their important role in reforming the institutions, regulations, and financial policies that impede systemic change. Our history of crisis and response will likely continue, but the more we can anticipate and plan, the better the chance that we'll have the safe water we all need in a less forgiving future.

Edited from the Spring 2019 Trend publication, "The Future of Water", from the Pew Charitable Trusts.