



U.S. EPA: Supporting Sustainable Solutions with Green Infrastructure Technologies

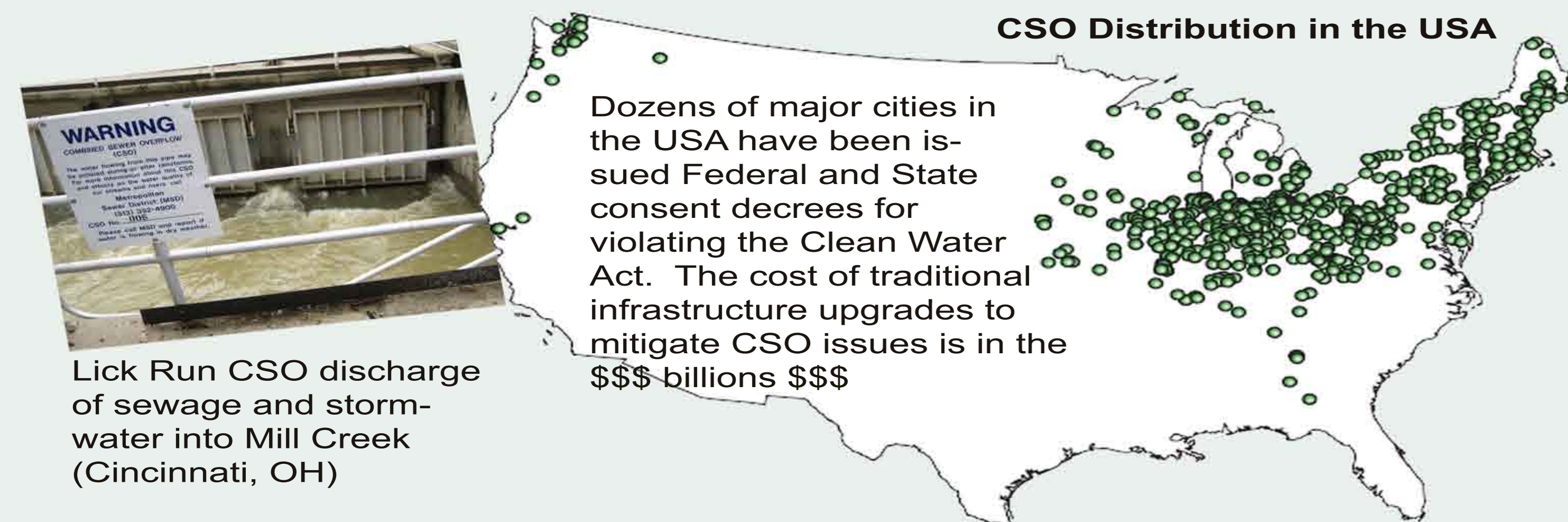
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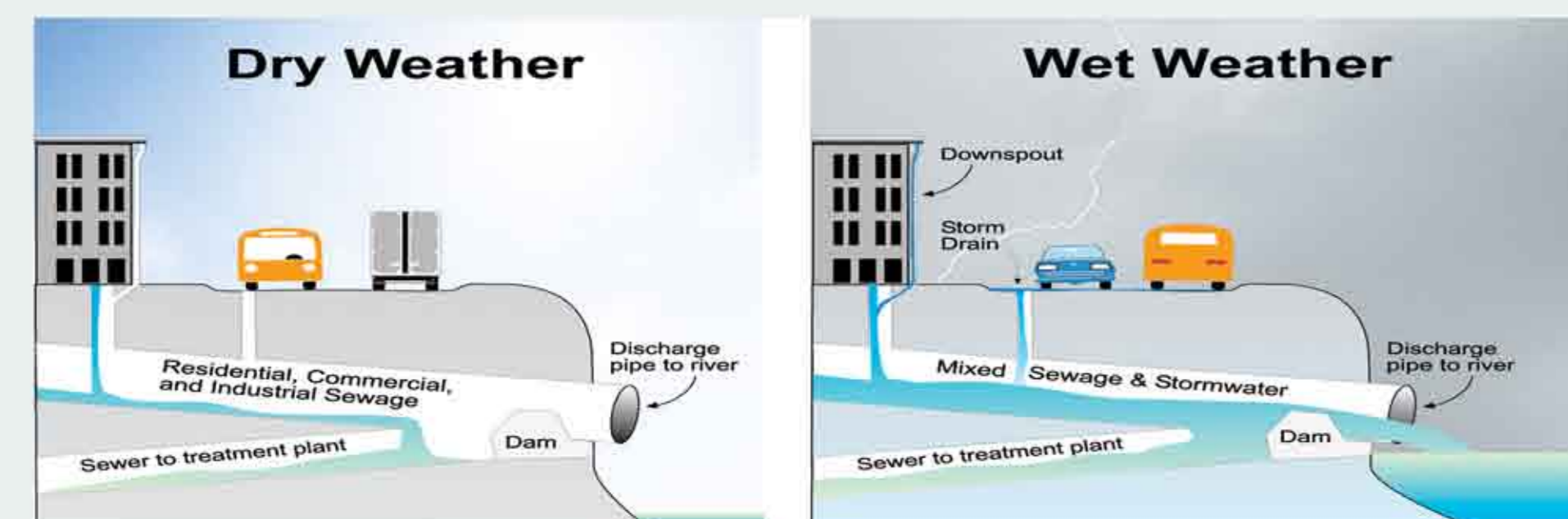


Grey and Green Infrastructure

Combined sewer overflows (CSOs) pose environmental and public health risks in many U.S. cities. It is common that the aging water infrastructure includes combined sewers - sewers that handle both stormwater and sewage.



When storms hit urban areas, the expanse of roofs and paved streets and parking lots results in much more stormwater runoff than in less developed areas where natural landscapes have been maintained.



Typical CSO Structure. During heavy rains, the combined flow of sewage and stormwater is typically more than wastewater treatment plants can handle, and CSO pipes discharge the excess sewage and stormwater into streams. Such discharges create polluted waterways that expose humans and wildlife to pathogens and toxins.

CSOs can result in Clean Water Act violations that cause cities to incur heavy costs in penalties and expansion of infrastructure to achieve compliance. Traditionally, cities have addressed this problem with increased piping, storage tunnels, and high-rate treatment - "grey infrastructure." Through negotiated agreements with the U.S. EPA, many cities are also considering a way to reduce CSOs that also uses scarce financial resources to invest in long-term sustainable solutions - "green infrastructure."



Typical installation or repair of grey infrastructure often interrupts street traffic flow

Green Infrastructure: a Sustainable Solution



Administrator Lisa Jackson has described EPA's increased focus on sustainability as "the difference between treating disease and pursuing wellness". Across the country EPA is partnering with other organizations on projects that promote sustainability.

Sustainability

Sustainability is both the goal and process of *attaining a society and environment that can meet its current needs while preserving the ability of future generations to meet their needs*. Traditional stormwater policies have relied on grey infrastructure for management of water volumes; however, green infrastructure provides opportunities to introduce more sustainable approaches with environmental, economic, and social benefits.



What is Green Infrastructure ?

Techniques that use natural or engineered systems (that mimic natural processes), to direct stormwater to areas where it can be stored, infiltrated, evaporated, transpired (released from plant leaves), or re-used.



Green infrastructure technologies, such as rain gardens, rain harvesting, riparian zone restoration, green roofs, and permeable pavements, reduce stormwater runoff and increase water quality, and have economic and social benefits for communities

Green Infrastructure Successes

GI projects to deal with CSOs in cities such as Kansas City, Portland, and Philadelphia have been good for the environment, economy, and society. In Philadelphia, urban development incorporating GI reduced CSO inputs by 250 million gallons and saved an estimated \$170,000,000 in infrastructure costs as well as maintenance and upkeep costs.

Benefits of Green Infrastructure Technologies in CSO Communities

Environment	Society	Economics
Water quality	Urban renewal	Green jobs
Natural flow regime	Sewage backups	Cost effective
Habitat	Green space	Stormwater credits
Groundwater Recharge	Water recreation	Property values
Habitat	Aesthetics	
	Pathogen and toxin exposure	

