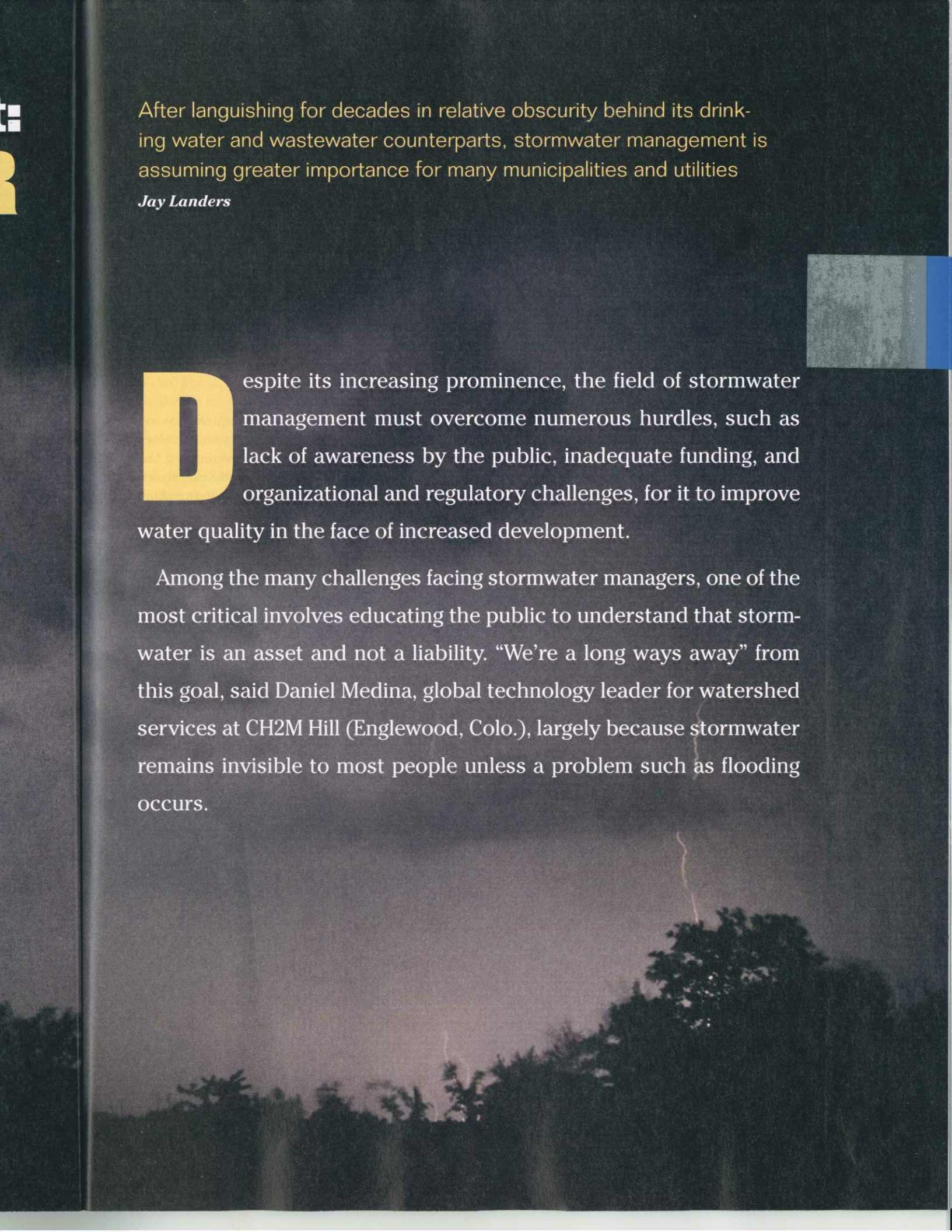


Stormwater Management: **THE NEXT FRONTIER**





After languishing for decades in relative obscurity behind its drinking water and wastewater counterparts, stormwater management is assuming greater importance for many municipalities and utilities

Jay Landers

Despite its increasing prominence, the field of stormwater management must overcome numerous hurdles, such as lack of awareness by the public, inadequate funding, and organizational and regulatory challenges, for it to improve water quality in the face of increased development.

Among the many challenges facing stormwater managers, one of the most critical involves educating the public to understand that stormwater is an asset and not a liability. “We’re a long ways away” from this goal, said Daniel Medina, global technology leader for watershed services at CH2M Hill (Englewood, Colo.), largely because stormwater remains invisible to most people unless a problem such as flooding occurs.

Such events, while unfortunate, can be used to help people understand the need for better stormwater management. Often, "it takes a crisis," such as flooding or drought, before the public begins to view stormwater as an asset worth managing, said James Scholl, director of water resources at Malcolm Pirnie Inc. (White Plains, N.Y.). For example, some communities in Florida that rely on surface water have seen these supplies significantly curtailed as a result of drought conditions during the past several years, he said. As a result, such communities have begun to evaluate the use of stormwater to recharge aquifers for later use, along with storing runoff in canals and ponds for use in irrigation. Compared to other, more expensive sources of water, such as desalination, stormwater begins to appear as a "very viable element" for municipalities looking to ensure more reliable water supplies, Scholl said.

Addressing the Funding Challenge

Yet as long as stormwater remains relatively

invisible to the public, stormwater management programs will continue to suffer from inadequate funding, experts say. "The single biggest challenge" facing stormwater management today is funding, said Jeff Henson, director of water resources at Black & Veatch (Kansas City, Mo.).

"It's hard to get people to vote for funding just for stormwater management," Henson said. To overcome these challenges and help generate public support, stormwater management programs can be incorporated within broader multipurpose projects that provide additional benefits, such as recreation or habitat restoration, that may be touted as a means of improving a community's quality of life, he said.

Organizational Obstacles

Another key challenge facing entities responsible for stormwater management involves avoiding or, more commonly, overcoming the problem of institutional "silos," said Kevin Shafer, executive director of the Milwaukee Metropolitan Sewerage District. Such silos arise as respon-



sibility for managing different water resources is assigned to different groups within the same agency or to different agencies.

"We talk about stormwater separately from how we talk about wastewater treatment or drinking water," Shafer said. "Yet when you look at the overall picture, it's all integrated on a watershed." As a result, such functions as financing and research also often are conducted independently for stormwater, wastewater, and drinking water. "I think one of the biggest challenges is [that] we've broken all the pieces apart of this puzzle," Shafer said, "and it really needs to be brought back together."

From a regulatory perspective, the Clean Water Act (CWA) contributes to some of the challenges inherent in stormwater management. Under CWA, there has been a "historic tendency" to address water quality problems by capturing and treating water, said Brooks Smith, a partner on the environmental team of the law firm Hunton and Williams (Richmond, Va.). Although such an approach works for wastewater and will work "to some degree" for stormwater, capturing and treating stormwater "cannot be the solution," he said, given its highly variable, ubiquitous nature.

Meanwhile, flow is not considered a pollutant under CWA. However, many current regulatory approaches seek to control stormwater flows, for example, by mandating that runoff from a site following construction equal what it was before development. "There's an inherent regulatory obstacle to dealing with flow as the pollutant of issue," Smith said.

A recent report on stormwater management by the U.S. National Research Council notes that stormwater regulation is "hampered" by CWA's focus on pollutants, rather than flow volumes. Released in October by the council's Committee on Reducing Stormwater Discharge Contributions to Water Pollution, the report — *Urban Stormwater Management in the United States* — recommends that stormwater flows and related parameters, such as impervious cover, be considered for use as proxies for pollutant loadings in stormwater. This recommendation is one of several contained in the report, which advocates "radical changes" to the current regulatory structure for stormwater.

On Climate Change and Farm Runoff

Climate change and its potential effects on weather patterns and precipitation loom as key question marks for future efforts to manage stormwater effectively. With more intense storms

likely to occur as a result of climate change, designers of stormwater systems likely should be taking a more conservative approach to ensure that controls are adequate for future conditions, Henson said.

Others prefer to wait until a clearer picture emerges of how stormwater management should respond to climate change before making major modifications. "There isn't sufficient data thus far to reliably predict the future," said Richard Lanyon, executive director of the Metropolitan Water Reclamation District of Greater Chicago. "We cannot base funding decisions and capital expenditures on imprecise predictions of the future."

Meanwhile, if the nation is to make inroads in addressing nonpoint source pollution, runoff from agriculture will require more attention. Although farm practices contribute to water pollution, "very limited political will" exists to regulate such sources, Scholl said, aside from confined-animal-feeding operations. However, agricultural runoff cannot be ignored forever, he said, especially because such sources are "going to become very visible and recognized."

More TMDLs To Come?

Stormwater professionals can expect to see more total maximum daily loads (TMDLs) in the future, Smith said. "There's an increased emphasis on getting TMDLs out the door for waters identified as impaired," he said, mainly by those states that must comply with previous agreements entered into with the U.S. Environmental Protection Agency. At the same time, the universe of parties required to reduce pollutant loadings as part of TMDLs is likely to increase. "There's going to be a broadening of the landscape of those who are subject to reduction requirements," Smith said.

While not perfect, the TMDL program offers a framework in which water quality trading could be employed by affected parties to implement the most cost-effective means of compliance, Smith said. Because the creation of a TMDL involves identifying all sources causing or contributing to a water quality problem, "you have opportunities to build markets," he said.

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