



Mark and Focus

---

MARK AND FOCUS MAGAZINE

---

VOL 01/02 OCT 2018

---

INEQUALITY OF  
CLIMATE CHANGE

NATURAL WATER  
POLICY IN  
NEW ZEALAND

INDUSTRIAL  
WATERSHED

BUDAPEST WATERWORKS:  
FUTURE WATER UTILITY



# INDUSTRIAL WATERSHED

---

By Jim Lauria

---

Over the past five decades, the ecology mega-trend has led us to recognize the many complex relationships in the watersheds that surround us—and positioned industry as the enemy of those same watersheds. Now, progressive business leaders see that they are the heart of not just the natural watershed in which they operate, but of industrial watersheds where their decisions have implications on the source, use and re-use of valuable water resources within their businesses.

The glory of industrial watersheds is much like the wonder of natural ones—the elegant interconnectedness among water supplies, the economy of use and reuse, the continuum from source to sink and back again. Comprehending industrial watersheds is leading businesspeople to better appreciate, and better manage their water supplies.

Of course, the first lesson from watersheds is the fact that every drop of water is constantly being reused. Just as the name implies, the hydrological cycle isn't a pipe, it's a circle,

with water transforming from precipitation to surface water to groundwater, bubbling back to the surface, then evaporating, then condensing to form precipitation again. When power plant operators began reusing cooling water, the environmental impact was dramatic. According to a 2008 report by the Union of Concerned Scientists, freshwater withdrawal intensity among power plants in Virginia, North Carolina, Michigan, and Missouri—where once-through cooling systems are the norm—were 41 to 55 times greater than in Utah, Nevada, and California, which boast more recirculating systems.

## **Careful accounting**

Just as in studying a natural ecosystem, every drop of water that gets pumped into the industrial watershed, falls from the sky, or released must be accounted for. It must be analyzed, treated, wisely utilized, appraised, and then have its future uses assessed on that appraised value and the efficiency of various treatment options.

# INDUSTRIAL WATERSHED

The overlaps among ingredient water, service water and process water in an industrial watershed can allow for highly effective re-use either with or without treatment, which in turn improves both energy efficiency and water efficiency. That's where analysis is especially important. Analyzing the contents and condition of water throughout its cycle through an industrial facility can help pinpoint how much treatment is necessary before it is piped to its next task or to discharge into the environment. After all, cooling water for a boiler does not need to be purified nearly as much as would a supply of ingredient water that will be packaged with the food inside. Later in the cycle, water being prepared for discharge must be brought to a high standard, and investments and efforts have to be scaled accordingly.

The importance of the dissolved oxygen (DO) content of water also rises in an industrial watershed model. Managing DO—in the sense of increasing it—is vital in water that will be discharged to the environment. But DO management—in the sense of lowering it—is also important in many industrial applications, because dissolved oxygen can accelerate the corrosion of equipment in facilities like power plants. Fortunately, re-aerating deoxygenated water can be a simple task. It just requires some planning and the commitment to understanding the contents of water, how it will be used, and how we can manage it.

Stormwater is the wild card in an industrial watershed. It can be a plus when rain delivers new supplies of vital water, but can also pose a threat of flushing contaminants off-site. Stormwater can force the issue for water managers, connecting the natural and industrial watersheds in ways that are not always desired...or controlled.

## **Business sense**

An industrial watershed mindset dovetails with efforts to maintain resiliency. On a business level, we're learning from Mother Nature how to flow with disruptions and weather unexpected events without crippling the business model. On an ecological level, we're finding how challenges to the system can be absorbed or diverted through its interconnected water channels.

As a result, thinking in terms of industrial watersheds isn't some sort of hippie consciousness raising. It's good business. In fact, it's critical to survival in today's business climate.

Increasingly, watershed thinking is growing more vital every day. Increasingly, industries operate at the pleasure of the communities that surround them—and there have been cases around the world in which companies have struggled to establish facilities in the face of opposition to their possible impacts on water quality or scarce water supplies. In a 2013 poll of industry leaders, the Pacific Institute and VOX Global found that 80 percent of the respondents expected water supply to impact where they will locate a facility in the following five years. Fifty-seven percent said water issues affected their bottom line, and an equal number predicted water issues would affect their growth. In addition, 79 percent of the company leaders reported facing current water challenges and 86 percent expected to face them within five years—which is now.

Today, society evaluates businesses not just on their revenues and returns, but on their environmental footprint. Reducing water consumption, energy use and carbon emissions have become new indicators of a company's values and its business approach. As a result, the efficiencies of a watershed mindset can flow straight to the bottom line and to the corporate social responsibility report.

## **Powerful tools**

Aiding the industrial watershed perspective is a host of new tools that help managers understand, evaluate and treat water throughout its circulation in the system. In many ways, these high-tech tools mirror an ancient way of thinking about watersheds. Five centuries ago, Leonardo da Vinci envisioned water flowing through arteries in cities that breathed and excreted—descriptions of urban watersheds that drawn in terms of pure, elegant anatomy. Today, we can build on that model with sensor eyes and ears, wire (or wireless) neural networks, SCADA brains, and state-of-the-art filtration and treatment systems that act as kidneys and livers. Our technology hasn't quite evolved to the magnificence of the human body yet, but it provides remarkable flexibility and fluidity in managing water with a systems approach and a constant loop that provides feedback and adjustment.

When we combine an industrial water management approach with the vision of two of life's most impressive systems—the human body and the hydrological cycle—we can begin to see how water can play a wide range of functions, be treated to more than one degree or level, and vary in its value and function. We can look beyond the concept of water as a monolithic commodity and consider how to optimize the use of potable water, brackish water, process water, gray water, and wastewater. Then we can use those many waters again, and ultimately cycle, recycle and efficiently manage the resources that buoy our industries.

Overall, understanding industrial water within a watershed model helps managers steward water more effectively and manage it with greater cost- and energy-efficiency.

\*Jim Lauria is Vice President of Sales & Marketing for Mazzei Injector Company, LLC, a fluid design company that manufactures mixing and contacting systems. He has over twenty years of global water treatment experience in the agricultural, municipal, industrial and commercial markets. Since graduating with a Bachelor of Chemical Engineering degree from Manhattan College, he has traveled the world benchmarking the best water management practices. Jim can be contacted at [jlauria@mazzei.net](mailto:jlauria@mazzei.net)

**Photo credit**

<https://pixabay.com/en/industry-power-energy-industrial-1827886/>