



David Striffling
is photographed in
his Marquette Law
School office.

EVEN THE KITCHEN SINK

Marquette's Water Law and Policy Initiative Pursues an Ambitious Agenda of Teaching, Research, and Convening Public Events

As mundane as whether it's better to put food waste down your sink's garbage disposal or to throw it out. As sophisticated as the use of nanotechnology in drinking-water treatment.

On every level, Marquette Law School's Water Law and Policy Initiative, as part of Marquette University more generally, has been addressing a wide range of policies and practices involving that key to life—water.

That includes offering courses in water law and related environmental subjects and providing curricular internships for law students in water-related projects. It embraces convening noteworthy conferences and events that have affected the course of water policy in the Law School's city and the region. And it goes beyond these approaches to include other work on some of the current big issues in water policy.

With a key role in a new cross-campus, interdisciplinary \$3.8 million federal grant, the Water Law and Policy Initiative is adding another important aspect to its work with multiple partners.

Consider this a "state of the water initiative" report, starting with a conference in 2009 that focused on the role of water in the economic future of southeastern Wisconsin and proceeding to the diverse aspects of the effort today.

Launching the Initiative

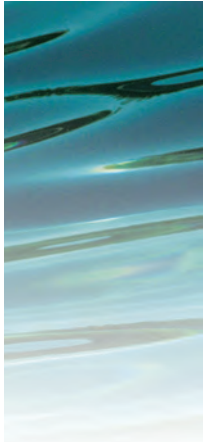
The Law School's 2009 conference, convened by Mike Gousha early in his long tenure as distinguished fellow in law and public policy, brought together an array of leaders, including Wisconsin's then-governor, Jim Doyle, and key players in higher education and the private sector.

The focus was the vision in which the Milwaukee area would become a world-class center for water enterprises, focusing on environmental policy work, water technology, and economic development. While the region's initial hopes may have been somewhat more optimistic than what has been achieved so far, there certainly has been positive development of the public and private water sectors. And Marquette Law School has been part of the action.

By the time of that 2009 gathering, the Law School had begun to offer courses intended to introduce students to the subject of water and the law. Then, in 2014, new Marquette University President Michael R. Lovell challenged all parts of the university to become more deeply engaged in studying and solving the world's water problems. This was a formidable task for the Law School, lying outside the school's traditional areas of expertise.

The Law School's response centered on the appointment of Professor David A. Striffling as director of a newly denominated Water Law and Policy Initiative. Striffling, who also holds a master's degree from Harvard Law School, is a Marquette engineer and a Marquette





lawyer. Strifling created ambitious goals around establishing the Law School as a regional center for study, exploration, discussion, and education concerning issues of water law and policy.

Today, using an interdisciplinary and collaborative approach, the initiative seeks to assess the legal and regulatory aspects of water policy, to pursue opportunities for information exchange and collaboration within and outside the university, and to provide the means for the public to become better informed on legal and policy aspects of critical water-related issues.

The benefits generated by this work have spread far beyond the walls of Eckstein Hall, with dozens of public presentations, media appearances, and academic publications. Many programs have been held in conjunction with the Law School's Lubar Center for Public Policy Research and Civic Education, and the Marquette Law School Poll has frequently surveyed public opinion on water issues. During the COVID shutdown, the initiative convened several online programs, including, this past semester, a continuing legal education seminar that attracted some 300 people.

An earlier highlight was the initiative's 2016 conference, "Public Policy and American Drinking Water," which prompted Milwaukee's then-mayor, Tom Barrett, a conference participant, to change and accelerate the city's response to its lead-lateral-pipes crisis. A host of other water-related events have examined a range of topics, including water policy in the Chicago Megacity, the evolution of the Great Lakes Compact, and water-fueled economic development in the region.

The Law School's central purpose—educating people to become lawyers—has been very much part of the water initiative. In fact, the curricular program has grown, reflecting both the institutional commitment to the subject and student interest.

In recent years, Strifling has taught courses in environmental law, water law, natural resources, and water technology and policy, reaching many students. Graduates who have taken the courses have gone on to hold related positions in the legal departments at government agencies, law firms, and corporations.

In addition, 35 students have worked with Strifling as research assistants on various projects and grants. Most were law students, but some have been Marquette University undergraduate and graduate students from other disciplines such as engineering. The research assistant positions generally have been funded by grants to the Water

Law and Policy Initiative.

Strifling also has engaged a broad set of external partners in event sponsorship and planning, research work, and general outreach. These partners include The Water Council, Chicago Current, the Milwaukee Metropolitan Sewerage District, the Wisconsin Department of Natural Resources, and the *Milwaukee Journal Sentinel*, among many other organizations. And the initiative also has collaborated with water researchers in other disciplines at Marquette, including environmental engineering, biological sciences, hydrology, chemistry, education, and the social sciences.

Jeanne Hossenlopp, professor of chemistry and Marquette University's vice president for research and innovation, said, "Because of the global issues around water sustainability and access to clean water, the water initiative is only going to continue to grow here at Marquette. One of the really important things about our water initiative is that it engages people from a wide array of disciplines."

"All of these issues don't get solved just technically," Hossenlopp said. "There are always policy questions. That's where the Law School comes in." The involvement of the Law School broadens the focus of scientific work to include law, regulatory action, and engagement with the public.

Daniel Zitomer, professor in Marquette University's Opus College of Engineering, said the National Science Foundation has provided funding for 70 cooperative water research centers around the country, each with a specific focus. "Ours in Milwaukee is in water equipment and policy," he said. "Out of all of the 70 centers, ours is the only one that includes a thrust area in water policy. It's unique."

The involvement of Strifling and the Law School is important to that policy work, Zitomer said. "In terms of research, teaching, and service, we feel fortunate to have Dave with us here at Marquette."

Since 2015, the initiative has secured a series of grant awards supporting significant research projects. Many of these projects have had a technical bent, reflecting Strifling's own background in both law and engineering. They have included analysis of the legal and policy aspects of chloride transport to waterways that is caused by winter deicing and water softening; integrated water resources management; the food-energy-water nexus; real-time control of stormwater infrastructure; and the use of nanotechnology in drinking water treatment applications.

These projects also served as the starting point

for a variety of conversations that became the foundation for interdisciplinary partnerships with researchers in other university departments. Law student researchers often have been paired with undergraduate and graduate researchers from other disciplines. This has provided students with an opportunity for interdisciplinary team-based research that is rarely found in the law school curriculum but can be invaluable in preparation for practice, where lawyers are frequently engaging or collaborating with experts in other fields. The substantive results of the research projects have been widely disseminated in academic journals and regional stakeholder communities.

Marquette water researchers' collaborative and interdisciplinary efforts have yielded a variety of benefits. So far, the biggest of these came this past winter, in December 2021, when Marquette University announced its largest-ever federal award for water research: a \$3.8 million award from the U.S. Army Corps of Engineers to fund an interdisciplinary research program titled "Novel Technologies to Mitigate Water Contamination for Resilient Infrastructure."

The Law School's role in this major new project involves exploring and evaluating legal and policy strategies to prevent or mitigate "nonpoint source pollution." Nonpoint source pollution results from diffuse sources such as precipitation runoff and carries impurities such as agricultural fertilizers or oil and grease from city streets. It is much more difficult to measure and manage than traditional "end of pipe" sources such as factories and wastewater treatment facilities. The Law School's project team will particularly focus on legal strategies to prevent or mitigate the formation of harmful algal blooms like the ones in Green Bay, Lake Erie, and many other parts of the Great Lakes and the country, which are largely caused by nonpoint source pollution.

Growing the Research

What follows is a brief glimpse into some of the initiative's projects leading up to its role in the major new grant.

The Trouble with Salt

Greater environmental protections and increased public safety are often believed to be synonymous, or at least to go hand-in-hand. Sometimes, however, those two goals are in tension—for example, when the excess application of salt for winter deicing, in

combination with other chloride sources, causes elevated chloride concentrations in waterways.

Sodium chloride, commonly known as salt, has often played a critical role in human culture, trade, religion, economics, public safety, and even warfare. It is naturally found in both fresh and salt water, and at modest concentrations is essential to biotic life. But it has a complicated legacy that includes potentially serious consequences for human health and the environment, including deteriorated water quality, toxicity to aquatic and benthic organisms, adverse effects on vegetation, and impacts on drinking water supplies.

Moreover, environmental chloride concentrations are on the rise, having approximately doubled over the past two decades. Hundreds of scientific studies have examined potential risks to human health and the environment associated with excess chlorides in the environment, especially those sourced from deicing operations. Yet little, if any, of that work had been directed toward developing legal and policy strategies to address the chloride issue.

In the initiative's first major grant-supported project, which was awarded in 2015 and had work extending into 2018, Strifling and several law students examined the underlying causes of unsustainable chloride pollution from a scientific and engineering perspective, and they then proposed a menu of responsive legal and policy options. These options include incentivized self-governance at the community or individual levels; informational strategies to encourage optimal chloride use levels for deicing and in water softening applications; direct legal and regulatory mechanisms or mandated best practices issued pursuant to the Clean Water Act, state regulations, or municipal ordinances; use of chloride alternatives such as green infrastructure and substitute deicing substances; integrated watershed management; and direct economic measures.

In keeping with the Water Law and Policy Initiative's identity as a nonpartisan and disinterested observer, the results of the project did not suggest that all these options are appropriate in every context, nor did it rank them from most to least useful. Those decisions, Strifling believed, are best left to affected stakeholders. In that spirit, the resulting publication examined the technical and legal contours of each option, and linked the legal and policy dimensions to the scientific underpinnings. This science-based approach increases the likelihood that ultimate



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policy decisions can be both legally defensible and scientifically sound.

The extent of local and regional interest in the subject became apparent after the initiative's research was published. Strifling was invited to present the research in numerous settings, and he also accepted an invitation from the Southeastern Wisconsin Regional Planning Commission to serve on its Technical Advisory Committee studying chloride problems in the region.

Integrated Water Resources Management

Recent efforts to study and optimize water resources management have largely endorsed an integrated approach that is implemented at the watershed level and necessarily crosses traditional geopolitical and agency boundaries. Known as Integrated Water Resources Management (IWRM), this methodology generally aims to coordinate development and management of diverse water and water-related resources to maximize economic and social welfare without compromising environmental sustainability. Although its precise scope and content remain unclear, policy makers attempting to implement IWRM must adopt innovative and cooperative governance mechanisms.

Starting from an analysis of existing programs and interviews with involved regulators, the Water Law and Policy Initiative's researchers drew on recent literature in a variety of fields to inform and evaluate legal and policy strategies for integrated watershed management. Applying integrated management strategies and fostering intergovernmental cooperation could lead to important environmental and technological advances while conserving socially valuable resources.

Although progress toward implementing integrated solutions has generally been slow, the initiative's researchers distilled three important lessons learned from earlier integrated water resources management projects. These involved the need to create an enabling regulatory environment, ensure the availability of adequate resources, and build management capacity. Incorporating those lessons learned could significantly further similar efforts in the future.

The Food-Energy-Water Nexus

Another of the initiative's grants led not to an academic publication but to a conference of regional leaders on a subject of great long-term importance: the food-energy-water nexus. It

attracted professionals and academic figures from across Wisconsin and the country who work in these tightly related fields. The daylong session, organized by Strifling and an advising committee, had a broad theme of how leaders and researchers in these crucial fields could work together and stretch their vision to serve the best and broadest sense of the public good.

Speakers at the event covered a variety of topics, including energy recovery at wastewater treatment facilities, the importance of groundwater, ethical aspects of decisions about natural resources, and the deep links between agriculture, water, and energy. Yet for the handful of people in the audience who were less technical in their background, the most practical piece of wisdom may well have been a bit of advice on how to use a garbage disposal.

In the question-and-answer session at the end of a panel discussion on environmental issues, an attendee asked if it was better for the environment to put food waste into one's garbage disposal, sending it to a wastewater treatment facility, or into one's garbage, sending it to a landfill. The questioner related that her garbage disposal sometimes got clogged, causing flooding in her basement, so she had stopped using it.

One of the panelists was Michael Keleman, manager of environmental engineering for InSinkErator, a leader in the garbage disposal field. The company is headquartered in Sturtevant, Wisconsin, in Racine County. Not surprisingly, Keleman is partial to garbage disposal units and putting most food waste down the sink. Yet he explained his answer. Keleman said food waste is 70 to 90 percent water. "Why are we handling this as a solid waste?" he asked. "It's not really solid any more if you're using the disposer right." Its density is about the same as water, and it will be successfully transported to a treatment facility that can recover resources—including clean water and energy—from it, and simultaneously avoid land use problems.

Real-time Control of Stormwater Infrastructure

When it rains or snows, the resulting runoff can collect pollutants, including salts, fertilizers, chemicals, oils, and sediment. These contaminants have the potential to impair surface water and groundwater that receive the runoff. Communities in the United States face growing challenges to effective stormwater management as a result of aging infrastructure, increasing urbanization, changing climate, and shrinking budgets, among

other factors. These changes have increasingly stressed existing “static” stormwater management systems, such as pipe networks and ponds, which are intended simply to convey storm flows to nearby receiving waters without regard to overall system conditions.

Dealing with these stressors requires innovative and resilient solutions such as real-time control (RTC) or “dynamic” stormwater management systems. RTC systems are typically automated or semiautomated and involve the use of sophisticated models to operate stormwater controls in real time, such as modifying set points to open and close valves or routing stormwater differently under particular system conditions. The goal of an RTC system is to continuously regulate the flow in the various branches of a network based on real-time information related to system capacity and weather conditions. This reduces the magnitude of outflows during storms and relieves other stresses on the system.

An interdisciplinary team of Marquette law faculty, engineering faculty, and students from both disciplines studied dozens of examples involving RTC implementation in the United States and abroad. The team also examined the literature detailing institutional barriers to RTC innovation. And it reviewed numerous legal decisions related to municipal liability for stormwater management (or mismanagement). The resulting publications suggested a variety of strategies to combat these institutional and legal barriers to smooth the transition to RTC systems.

As an initial matter, the research team found that RTC systems have not been widely adopted. Some analysts have blamed historical resistance to innovation, especially among governmental system operators responsible for protecting public health and safety. Other factors inhibiting innovation include the risk-averse nature of water managers, the long life expectancy and significant complexity of most water systems, geographic and functional fragmentation, water-pricing practices, absence of incentivizing regulations, and insufficient access to venture capital.

From this foundation, the team distilled several institutional and legal barriers that prevent municipalities from embracing innovative stormwater management systems. Key institutional barriers include regulatory fragmentation, workforce readiness, resistance to innovation, data management, cybersecurity, and cost. Municipalities considering RTC innovations must be ready to address those challenges.

On the legal side, the team found, two considerations should concern a stormwater management system operator considering RTC: first, that by actively making decisions to control and route the flow of stormwater in its system, it increases the likelihood of liability for negligence or nuisance claims; and second, that the sheer amount of data collected by RTC networks effectively puts the municipality on notice of problems within its system, increasing the likelihood of legal liability connected with future claims.

Some of the lessons learned in overcoming these barriers may be applicable to analogous situations involving other innovative technologies capable of improving public health and the environment.

Nanotechnology and Drinking-Water Treatment

Then there are engineered nanomaterials (ENMs)—products designed and manufactured at an extremely small scale, measuring between 1 and 100 nanometers in at least one dimension. ENMs have a very high surface-to-volume ratio and sometimes exhibit unique chemical and physical properties. They have shown promise in a variety of applications, including for treatment of drinking water. Specifically, ENMs have proved effective at contaminant removal and disinfection, as well as contaminant detection and corrosion control. However, despite their great promise, many uncertainties remain about utilizing ENMs in products for treating drinking water; these points of doubt include possible pathways of release to the environment, the fate and transport of ENMs once in the environment, and unclear governance via voluntary and mandatory regulatory frameworks.

As nanotechnology advances and is incorporated in more products, questions have arisen surrounding the appropriate balance between protecting public health and the environment, on the one hand, and incentivizing ENM-driven innovation and economic development, on the other. Although some authorities have begun to monitor and regulate the use of ENMs, these efforts have been fragmented and largely unsuccessful. The resulting regulatory uncertainty negatively affects the ability of the regulated community to develop and use ENMs.

The Water Law and Policy Initiative developed a project to address and resolve some of this uncertainty, in order to help streamline the implementation of ENMs in applications for drinking-water treatment. First, the research team



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“ITS LOCATION ON THE GREAT LAKES AND ITS IMPRESSIVE COHORT OF WATER RESEARCHERS MAKE MARQUETTE AN IDEAL PLACE FOR IMMERSION IN THE STUDY OF WATER LAW AND POLICY.”

David Strifling
Director, Water Law
and Policy Initiative

examined existing literature related to the uses of ENMs in treating drinking water and their ultimate fate and transport in the environment. This identified key knowledge gaps for future investigation. It then evaluated existing regulatory frameworks, especially in jurisdictions farther along in regulating ENMs. Finally, it proposed a menu of policy options to help mitigate regulatory uncertainty related to utilization of ENMs in the drinking-water context. These policy options include both difficult-to-enact “hard” policy instruments, such as statutes and regulations, and self-enabling but potentially less effective “soft” instruments. The latter can involve industry or organizational codes of conduct, best practices, aspirational guidelines, voluntary reporting or risk management standards, nonbinding standards, and licensing or certification programs.

This series of successful grant-funded projects has well prepared the initiative’s team to tackle its role in the university’s major new project underwritten by the grant from the U.S. Army Corps of Engineers.

And it reflects just how far the Law School has advanced in its efforts to help fulfill President Lovell’s challenge to Marquette University, first issued in 2014, to help study and solve the world’s water problems. “Its location on the Great Lakes and its impressive cohort of water researchers make Marquette an ideal place for immersion in the study of water law and policy,” Strifling said. “I look forward to the initiative’s continued growth.”

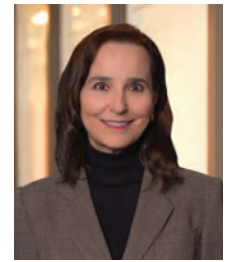
As is true of so many rivers, the Law School’s water efforts started out modestly. The stream has grown, fed by sources such as the new federal grant, and it is flowing toward broader and deeper work on environmental policy. ■



Kent A. Tess-Mattner



Kathy L. Nusslock



Christina M. Lucchesi

71 Mary L. Staudenmaier of Stephenson National Bank & Trust, in Marinette, Wis., was inducted into the Wisconsin Banking Association’s Leaders in Banking Excellence.

72 James R. Beer retired after serving as a judge of the Green County Circuit Court, Wis., for 25 years. He previously served as the district attorney, the family court commissioner, and a county board supervisor and now has been appointed a reserve judge.

73 Robert D. Donohoo received the Wisconsin District Attorneys Association’s Lifetime Achievement Award for 2021.

77 Patricia J. Gorence received the Faithful Servant Award from the St. Thomas More Lawyers Society of Wisconsin.

80 Kent A. Tess-Mattner, who retired from the active practice of law at the end of 2020, has been installed as moderator of the Presbytery of Milwaukee. The Presbytery of Milwaukee includes more than 40 Presbyterian Church (USA) congregations and serves more than 7,000 members living in 11 counties in southeastern Wisconsin.

81 Mark D. McGarvie published his fourth book, *The Pragmatic Ideal: Mary Field Parton and the Pursuit of a Progressive Society* (Cornell University Press 2022). He is a visiting scholar at the American Bar Foundation in Chicago.

85 Andy N. Herbach has written more than 50 travel guides to Europe. Because of travel restrictions during the pandemic, he has released three guides to Southern California.

Kathy L. Nusslock has formed Concurrence ADR, a dispute resolution and appellate consulting practice. Joining Nusslock in this new venture are Paul Reilly and Jeff Davis, former judges of the Wisconsin Court of Appeals.

89 Leslie M. Van Buskirk, Wisconsin securities administrator and board member of the North American Securities Administrators Association, was elected vice chair of the Securities and Exchange Commission’s Investor Advisory Committee.

90 Christina M. Lucchesi is now in practice in the Milwaukee office of von Briesen & Roper. She represents government entities, nonprofits, and for-profit corporations in taxable and tax-exempt bond issuances.