Xin (Cissy) Ma, Research Environmental Engineer in EPA's National Risk Management Research Laboratory

Water Systems Division
Mailing Address

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Areas of Expertise:

- New sustainability metrics for the holistic management of various water systems
- One Water concept from source to tap and back to the source, and potential transformative treatment alternatives to address a suite of issues facing water systems coupled with improved whole system efficiency.
- System-based tools to quantitatively evaluate the tradeoffs among processes employing the concept of fit-for-purpose water treatment and resource-recovery.
- Multiple metrics for regional sustainable environmental management and commercial product systems.
- Biological transformation and fate and transport of hazardous substances.
- Colloids and interface science.

Select Publications:

B. Morelli, S. Cashman, **Xin (Cissy) Ma**, J. Garland, Jason Turgeon, Lauren Fillmore, Diana Bless and Michael Nye. Effect of Nutrient Removal and Resource Recovery on Life Cycle Cost and Environmental Impacts of a Small Scale Water Resource Recovery Facility. *Sustainability*. Special issue: Sustainable Wastewater Treatment Systems 10, 3546, 2018.

S. Arden, **Xin (Cissy) Ma**, M. Brown. Emergy Analysis of Constructed Wetland for Greywater Recycle and Reuse. *Science of the Total Environment* 630. 587-599, 2018.

S. Cashman, **Xin (Cissy) Ma**, J. Mosley, J. Garland, B. Crone, X. Xue. Energy and greenhouse gas life cycle assessment and cost analysis of aerobic and anaerobic membrane bioreactor systems: Influence of scale, population density, climate, and methane recovery. *Bioresource Technology* 254, 56-66, 2018.

Gonzalez, **Xin (Cissy) Ma**. The Emergy Perspective of Sustainable Trends in Puerto Rico from 1960 to 2013. *Ecological Economics* 133, 11-22, 2017.

S. Cashman, J. Mosley, **Xin (Cissy) Ma**, J. Garland, J. Cashdollar and D. Bless. Life Cycle Assessment and Cost Analysis of Water and Wastewater Treatment Options for Sustainability: Influence of Scale on Membrane Bioreactor Systems. US EPA, Washington, D.C. EPA/600/R-16/243, 2016.

Xiaobo Xue, Mary Schoen, **Xin (Cissy) Ma**, Troy R. Hawkins, and Nicholas Ashbolt. Critical Insights to the Sustainability Framework for Engineering the Next-Generation of US Municipal Water Services: Metrics and Approaches. *Water Research* 77, 155-169, 2015.

View more research publications by Xin (Cissy) Ma.

Education:

- Ph.D., University of Minnesota, Minneapolis, MN; Civil Engineering, 2004
- M.S., University of Wisconsin, Green Bay, WI; Environmental Science and Policy, 1999
- B.S., Tongji University, Shanghai, China; Environmental Engineering, 1992

Professional Experience:

Project and Workgroup Leads

- Task Lead under Safe and Sustainable Water Resources (SSWR) National Research Program.
- Water Reuse: Developing non-potable water reuse guidance and working with communities such as San Francisco Public Utilities Commission to develop the risk-based log reduction targets related to fit-for-purpose water use. Conducting integrated assessment of life cycle costs, environmental impacts and human health impacts assessment of various alternative onsite non-potable water systems.
- Resource Recovery: As part of an effort to explore system-based approaches for assessment of transformative fit-for-purpose and resource recovery-based water systems, we are exploring energy recovery from wastewater in municipal utilities via modeling of various treatment plants.
- Nutrient Recovery: Developing models to simulate the fertilizer production process, potential revenue, crop yields, uptake efficiency, and use in comparison with traditional commercial fertilizer (diammonium phosphate, DAP) for assessing the feasibility of phosphorous recovery and use.

Memberships and Committees

- Water Environment Federation
- American Water Works Association
- Registered Professional Engineer (PE) in the State of Minnesota

Awards and Honors

- US EPA Peer Ovation Notable Innovation Award for Pre-recorded Public Webinar Series, 2012
- US EPA Scientific and Technological Achievement Awards (STAA) Honorable Mention, 2012
- US EPA Scientific and Technological Achievement Awards (STAA) Level III, 2011