Water Equipment & Policy
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Anaerobic biotechnology to convert industrial and agricultural waste to renewable energy

Dr. Dan Zitomer
Marquette University

At Marquette University Professor Dan Zitomer specializes in wastewater treatment and anaerobic biotechnology. He is the Director of Marquette's Water Quality Center and has more than 16 years of experience consulting with entities such as Packaging Corporation of America, United Water Services, CH2M Hill, Xylem Corporation and others. Dr. Zitomer's research focuses on the relationship between microbial community structure and the function of engineered bioprocesses for wastewater purification. Results have been implemented in full scale such as his anaerobic digestion work with the Milwaukee Metropolitan Sewerage District. He has helped to increase biomethane and renewable energy production at wastewater reclamation facilities, and his work in microbial community optimization has resulted in six provision patents and patent applications. He received the 2008 Gordon Maskew Fair Distinguished Engineering Educator Medal from the Water Environment Federation for outstanding service in engineering education.

Dr. Zitomer's Biotechnology Research Team

In 2012 Marquette University opened its state-of-the-art Water Quality and Hydraulic Laboratories where Dr. Zitomer's lab group works to improve biotechnology for waste treatment and renewable energy. Much of the team's research involves anaerobic digestion in which specific microorganisms convert wastes and other feedstocks to biogas that contains methane. The methane can be used as a renewable fuel. Dr. Zitomer's group collaborates with Drs. Jim Maki and Krassi Hristova (environmental microbiology/ecology, Biological Sciences) at Marquette and others. They use molecular tools (PCR, qPCR, DGGE, clone libraries, etc.), bioinformatics and other statistical tools (principal component analysis, etc.) to quantify and compare various microbial community structures and relate these to engineering and environmental parameters (rate of COD removal, process stability) to improve engineered bioprocesses.

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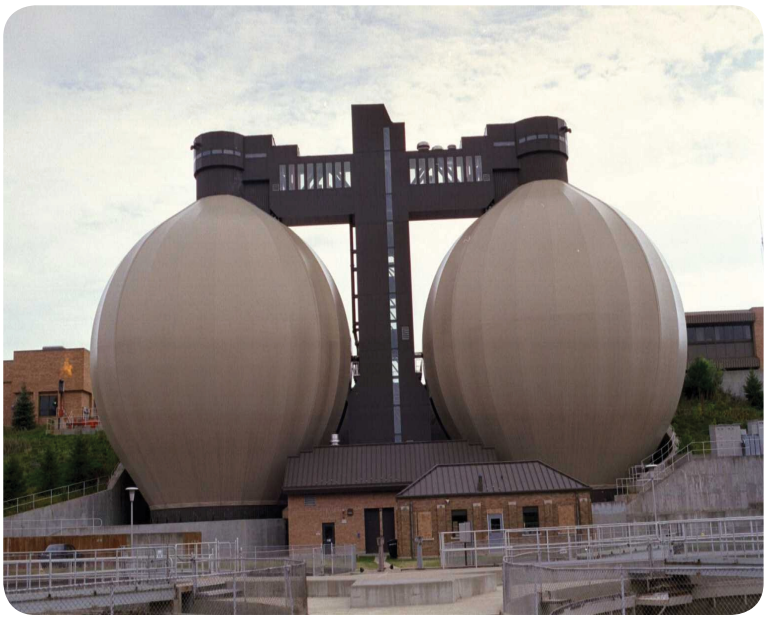

Dr. Zitomer's research focuses on anaerobic biotechnology to convert industrial and agricultural waste to renewable energy.

Representative journal publications:

1. (2011) Tale, V. P., Maki, J. S., Struble, C. A., and Zitomer, D. H., "Methanogen Community Structure-Activity Relationship and Bioaugmentation of Overloaded Anaerobic Digesters," Wat. Res. 45(16), pp. 5249-5256.
2. (2011) Navaneethan, N., Topczewski, P., Royer, S., and Zitomer, D. "Blending Anaerobic Co-Digestates: Synergism and Economics," Wat. Sci. Tech. 63(12), pp2916-2922.
3. (2010) Morris, R. L., Schauer-Gimenez, A. E., Struble, C., Zitomer, D. H., and Maki ,J. S., "Application of Restriction Fragment Length Polymorphism Analysis of mcrA for Determining Methanogen Diversity Journal of Applied Microbiolog (under review).
4. (2010) Schauer-Gimenez, A. E., Zitomer, D. H., Maki, J. S., and Struble, C. A., "Bioaugmentation for Improved Recovery of Anaerobic Digesters After Toxicant Exposure," Wat. Res. 44, pp. 3555-3564.
5. (2008) Borg, J.P. and Zitomer, D. H., "Dual-Team Model for International Service-Learning in Engineering: Remote Solar Water Pumping in Guatemala," Journal of Professional Issues in Engineering Education and Practice ASCE, 134(2), pp. 178-185.

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