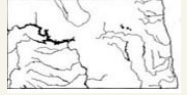


# 5<sup>th</sup> Annual ND WRI Distinguished Water Seminar



## Dr. Paul Westerhoff

*Senior Advisor to the Provost for Engineering & Science*

*Professor of Environmental Engineering*

*Arizona State University*

## Water Information Technology: Modeling DeFacto Wastewater Reuse Across the USA

**Date & Time:** February 18 (Thursday), 2016, 1:00-2:00 PM (Refreshments will be served at 12:45 PM)

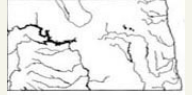
**Place:** Badlands, Memorial Union

**Sponsor:** North Dakota Water Resources Research Institute

**Co-Sponsors:** Civil Engineering, Agricultural and Biological Engineering, Geosciences, Environmental and Conservation Sciences, and School of Natural Resources Sciences

**Abstract:** The National Research Council 2011 report lists quantifying the extent of de facto (or unplanned) potable reuse in the U.S. as the top research need associated with assessing the potential for expanding the nation's water supply through reuse of municipal wastewater. Efforts to identify the significance and potential health impacts of de facto water reuse are impeded by outdated information regarding the contribution of municipal wastewater effluent to potable water supplies. The presentation will provide an overview on the topic and research needs, and focus on a national perspective. De facto wastewater reuse occurs when treated wastewater is discharges in surface waters upstream of potable water treatment plants. Wastewater treatment plant (WWTP) discharges threaten water quality at the downstream drinking water treatment plant (DWTP). However, it is also a reliable water supply source! De facto reuse occurrence has been reported in regional studies, but a national assessment hadn't been completed in over 30 years. Overall, 50% of the DWTP intakes were potentially impacted by upstream treated WWTP discharges. Contrary to the high frequency of occurrence, the magnitude of de facto reuse was relatively low with 50% of the impacted intakes containing less than 1% treated municipal wastewater under average flow conditions. The 25 highest ranked DWTP intakes ranged from 11 to 31%. Under average flow conditions 15 different municipalities spread across the U.S, serving roughly 4 million have an intake that has greater than 20% treated wastewater. The magnitude of de facto reuse increases under low flow conditions, where 15 of the 37 sites potentially contained greater than 90% treated wastewater. Knowledge regarding the contribution of municipal wastewater to potable water supply, and efforts for identifying the significance and potential health impacts of de facto reuse are needed. Such research can contribute to the judicious use of "wastewater for drinking" in the US and across the globe.

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### Speaker: Dr. Paul Westerhoff

The Distinguished Water Seminar Series brings eminent professionals to NDSU to give presentations with focus on emerging issues, challenges, and new research directions in waters. The speaker for the 5th seminar series is Dr. Paul Westerhoff is a professor in the School of Sustainable Engineering and the Built Environment at Arizona State University and the Senior Advisor to the ASU Provost on Science and Engineering. I served as Department Chair of Civil and Environmental Engineering, founding Director for the School of Sustainable Engineering and the Built Environment, Associate Dean for Research in the School of Engineering, and ASU Vice Provost for Academic Research Programming. He obtained his Ph.D. from the University of Colorado at Boulder, MS from University of Massachusetts and BS from Lehigh University. He joined ASU in August 1995 and was promoted to professor as a University Exemplar in 2007. Dr. Westerhoff has over 185 journal publications on his research related to fate of nanomaterials in water, using nanomaterial-based technologies for water and reuse treatment, reactions and fate of oxo-anions, plus characterization, treatment and oxidation of NOM and micropollutants. He is the recipient of several awards including the ASU Outstanding Doctoral Mentor for 2015, 2013 ARCADIS/AEESP Frontier in Research Award, and 2006 Paul L. Busch Research Award from Water Environment Research Foundation Endowment for Innovation in Applied Water Quality Research. Currently, he directs a 9-university EPA network on the lifecycle of nanomaterials and Deputy Director of a newly awarded NSF/ERC on Nano-enabled water treatment technologies. He has served as the lead in research funded by AWWARF, USEPA, NSF, and DOD.



All interested faculty and students are welcome to attend the seminar and participate in discussions/meetings with Paul before/after his seminar. For additional information, please contact Dr. Eakalak Khan ([eakalak.khan@ndsu.edu](mailto:eakalak.khan@ndsu.edu), 1-7043), Dr. Achintya Bezbaruah ([a.bezbaruah@ndsu.edu](mailto:a.bezbaruah@ndsu.edu), 1-7461), or Dr. Xuefeng Chu ([xuefeng.chu@ndsu.edu](mailto:xuefeng.chu@ndsu.edu), 1-9758).