EPA Office of Water
Recent Water Research
January – June 2014 No. 2014-1

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Protecting Aquatic Life and Human Health from Chemicals and Microbes in Water

From EPA

Updated National Recommended Water Quality Criteria - Human Health. Updates for 94 chemical pollutants, including updated exposure and risk factor assumptions.

Go to Report or www.epa.gov

A Visual Insight into the Degradation of Metals Used in Drinking Water Distribution Systems Using AFM. Daniels, S., and D. **Lytle**, 2014. Evaluation of corrosion and passivation of the copper pipes.

Go to Report or www.epa.gov

Evaluating Potential Exposures to Ecological Receptors Due to Transport of Hydrophobic Organic Contaminants in Subsurface Systems (Final Report). EPA 600-R-10-015. Use of HOC exposure information to estimate risks to ecological receptors.

Go to Report or www.epa.gov

From Collaborators

GAO – Freshwater Supply Concerns Continue, and Uncertainties Complicate Planning. GAO-14-430. Impacts of climate change and extreme weather events, as well as the effect of energy sector on water quantity, quality, economic growth, and land use complicate water planning.

Go to Report or www.gao.gov

Water Quality Impacts of Extreme Weather-Related Events. Stanford, B., 2014. *Water Environment Research Foundation,* Project CC4C10. Tools for utilities to assess vulnerabilities, develop adaptation strategies.

Go to Tool or www.werf.org

Wildfires Affect Water Quality, Quantity. Sham, Chi Ho, and K. Ozekin, 2014. *Opflow,* 40(5): 10-13. Drastic effects of wildfires on source water quality and associated treatment needs.

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Identifying Meaningful Opportunities for Drinking Water Health Risk Reduction in the United States. Seidel, C., et al., 2014. Water Research Foundation, Project 4310. Compares methodologies for risk assessment; a Relative Health Indicator (RHI) tool available on project page.

Go to Report or www.waterrf.org

NRC – Review of Environmental Protection Agency's State-of-the-Science Evaluation of Nonmonotonic Dose-Response Relationships as they Apply to Endocrine Disrupters. Recommendations made to improve EPA's processes and strengthen evaluation.

Go to Report or www.nap.edu

Recent Water Research

SETAC Technical Issue Paper: What is an Endocrine Disrupter? Pensacola (FL): SETAC. 5 pp. Aims to provide scientific discussion of EDs: definition, exposure routes, risks, research needs.

Go to Report or www.setac.org

USGS – Analysis of Pharmaceutical and Other Organic Wastewater Compounds in Filtered and Unfiltered Water Samples by Gas Chromatography/Mass Spectrometry. Zaugg, S.D., et al., 2014. Open-File Report 2013–1297. Describes performance for filtered and unfiltered methods.

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NRC – Review of EPA's Integrated Risk Information System (IRIS) Process. Review of IRIS Process finds improvements have been made; recommendations should be seen as building on progress already made.

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NRC – Critical Aspects of EPA's IRIS Assessment of Inorganic Arsenic. Evaluates critical issues in assessing cancer and noncancer effects of oral exposure to inorganic arsenic; recommendations on how to address.

Go to Report or www.nap.edu

NRC – Review of the Styrene Assessment in the National Toxicology Program 12th Report on Carcinogens. Concurs with NTP determination of limited, credible evidence that exposure in some occupational settings associated with increase in lymphohematopoietic cancers.

Go to Report or www.nap.edu

Deepwater Horizon Crude Oil Impacts the Developing Hearts of Large Predatory Pelagic Fish. Incardona, J.P., et al., 2014. *Proceedings of the National Academy of Sciences,* 111 (15): E1510-E1518. Impacts of oil on rapidly developing embryos of warm-water predators; bluefin and yellowfin tunas, amberjack.

Go to Report or www.noaa.gov

USGS – Nutrient Load Summaries for Major Lakes and Estuaries of the Eastern United States, 2002. Moorman, M.C, et al., 2014. Data Series 820. Nutrients to 255 lakes and 64 estuaries in Eastern U.S. estimated using SPARROW.

Go to Report or www.pubs.usgs.gov

From Journals

Chemical Contaminants in Drinking Water: Where do we go from here? Barrett, J., 2014. *Environmental Health Perspectives,* 122(3): A80. Roadmap to help future studies identify and elucidate risks presented by specific contaminants.

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Assessing Exposure and Health Consequences of Chemicals in Drinking Water: Current State of Knowledge and Research Needs. Villanueva, C., et al., 2014. *Environmental Health Perspectives,* 122(3): 213-212.

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Radionuclides in Fracking Wastewater: Managing a Toxic Blend. Brown, V.J., 2014. *Environmental Health Perspectives,* 122(2): A51-A55. Fracking is making naturally occurring radioactive material more available for human exposure through anthropogenic means.

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Reconnaissance of Pharmaceuticals and Wastewater Indicators in Streambed Sediments of the Lower Columbia River Basin, Oregon and Washington. Nilsen, E., et al., 2014. *Journal of the American Water Resources Association,* 50(2): 291-301.

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Estrogen and Androgen Receptor Activities of Hydraulic Fracturing Chemicals and Surface and Ground Water in a Drilling-Dense Region. Kassotis, C.D., et al., 2014. *Endocrinology,* 155(3): 897-907.

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Organic Substances in Produced and Formation Water from Unconventional Natural Gas Extraction in Coal and Shale. Orem, W.H., et al., 2014. *International Journal of Coal Geology,* 126: 20-31.

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Factors Affecting Temporal Variability of Arsenic in Groundwater Used for Drinking Water Supply in the United States. Ayotte, J.D., et al., 2014. *Science of The Total Environment,* Online March 2014.

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Land Use and Climate Variability Amplify Carbon, Nutrient, and Contaminant Pulses: a Review with Management Implications. Kaushal, Sujay S., et al., 2014. *Journal of the American Water Resources Association,* 50(3): 585-614.

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Oxidative Stress Responses of Gulf Killifish Exposed to Hydrocarbons from the Deepwater Horizon Oil Spill: Potential Implications for Aquatic Food Resources. Crowe, Kristi M., et al., 2014. *Environmental Toxicology and Chemistry,* 33: 370-374.

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Synthetic Estrogen Directly Affects Fish Biomass and may Indirectly Disrupt Aquatic Food Webs. Hallgren, Per, et al., 2014. *Environmental Toxicology and Chemistry,* 33: 930-936.

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Concentrations of Prioritized Pharmaceuticals in Effluents from 50 Large Wastewater Treatment Plants in the US and Implications for Risk Estimation. Kostich, M.S., et al., 2014. *Environmental Pollution,* 184: 354-359.

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Drinking Water as a Proportion of Total Human Exposure to Volatile N-Nitrosamines. Hrudey, S.E., et al., 2014. *Risk Analysis,* 34(3): 598-598.

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Glyphosate and its Degradation Product AMPA Occur Frequently and Widely in U.S. Soils, Surface Water, Groundwater, and Precipitation. Battaglin, W.A., 2014. *Journal of the American Water Resources Association,* 50(2): 275-290.

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Spatial and Temporal Patterns of Endocrine Active Chemicals in Small Streams Indicate Differential Exposure to Aquatic Organisms. Lee, K.E., 2014. *Journal of the American Water Resources Association,* 50(2): 401-419.

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Fathead Minnow (Pimephales Promelas Rafinesque) Exposure to Three Novel Brominated Flame Retardants in Outdoor Mesocosms: Bioaccumulation and Biotransformation. de Jourdan, Benjamin P., 2014. *Environmental Toxicology and Chemistry,* 33: 1148-1155.

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Assessment of Relative Potential for Legionella Species or Surrogates Inhalation Exposure from Common Water Uses. Hines, S. A., Chappie, D. J., Lordo, R. A., Miller, B. D., **Janke**, R. J., **Lindquist**, H. A., **Fox**, K.R., **Ernst**, H.S., and, S.C. Taft, 2014. *Water Research,* 56: 203-213.

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Assessment of Wastewater and Recycled Water Quality: a Comparison of Lines of Evidence from in Vitro, in Vivo and Chemical Analyses. Leusch, F.D.L., et al., 2014. *Water Research,* 50: 420-431.

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Characterization of Soluble Microbial Products as Precursors of Disinfection Byproducts in Drinking Water Supply. Liu, J.L., et al., 2014. *Science of the Total Environment,* 472: 818-824.

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Estimating the Risk of Cyanobacterial Occurrence Using an Index Integrating Meteorological Factors: Application to Drinking Water Production. Ndong, M., et al., 2014. *Water Research,* 56: 98-108.

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Suitability of Organic Matter Surrogates to Predict Trihalomethane Formation in Drinking Water Sources. Pifer, A.D., and J.L. Fairey, 2014. *Environmental Engineering Science,* 31(3): 117-126.

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The Accumulation of Radioactive Contaminants in Drinking Water Distribution Systems. Lytle, D. A., **Sorg**, T., **Wang**, L. L., and, A. Chen, 2014. *Water Research,* 50: 396-407.

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Year-Long Evaluation on the Occurrence and Fate of Pharmaceuticals, Personal Care Products, and Endocrine Disrupting Chemicals in an Urban Drinking Water Treatment Plant. Padhye, L.P., et al., 2014. *Water Research,* 51: 266-276.

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Exposure to Brominated Trihalomethanes in Water during Pregnancy and Micronuclei Frequency in Maternal and Cord Blood Lymphocytes. Stayner, L.T., et al., 2014. *Environmental Health Perspectives,* 122(1): 100-106.

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The Occurrence and Fate of Chemicals of Emerging Concern in Coastal Urban Rivers Receiving Discharge of Treated Municipal Wastewater Effluent. Sengupta, Ashmita, et al., 2014. *Environmental Toxicology and Chemistry,* 33: 350-358.

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Worldwide Estimation of River Concentrations of Any Chemical Originating from Sewage-Treatment Plants Using Dilution Factors. Keller, Virginie D.J., 2014. *Environmental Toxicology and Chemistry,* 33: 447-452.

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Acute Toxicity of Sodium Bicarbonate, a Major Component of Coal Bed Natural Gas Produced Waters, to 13 Aquatic Species as Defined in the Laboratory. Harper, David D., et al., 2014. *Environmental Toxicology and Chemistry,* 33: 525-531.

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The Chronic Toxicity of Sodium Bicarbonate, a Major Component of Coal Bed Natural Gas Produced Waters. Farag, Aïda M., and D.D. Harper, 2014. *Environmental Toxicology and Chemistry,* 33: 532-540.

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Effects of Triclocarban, N, N-Diethyl-Meta-Toluamide, and a Mixture of Pharmaceuticals and Personal Care Products on Fathead Minnows (Pimephales Promelas). Zenobio, Jenny E., et al., 2014. *Environmental Toxicology and Chemistry,* 33: 910-919.

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The Naturally Occurring Carcinogen Ptaquiloside is Present in Groundwater Below Bracken Vegetation. Clauson-Kaas, Frederik, et al., 2014. *Environmental Toxicology and Chemistry,* 33: 1030-1034.

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Influence of Carbon and Metal Oxide Nanomaterials on Aqueous Concentrations of the Munition Constituents Cyclotrimethylenetrinitramine (RDX) and Tungsten. Brame, Jonathon A., et al., 2014. *Environmental Toxicology and Chemistry,* 33: 1035-1042.

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Predicted No Effect Concentration Derivation as a Significant Source of Variability in Environmental Hazard Assessments of Chemicals in Aquatic Systems: an International Analysis. Hahn, Thorsten, et al., 2014. *Integrated Environmental Assessment and Management,* 10: 30-36.

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Pesticides in Mississippi Air and Rain: a Comparison Between 1995 and 2007. Majewski, Michael S., et al., 2014. *Environmental Toxicology and Chemistry,* 33: 1283-1293.

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Maximizing the Accuracy of Field-Derived Numeric Nutrient Criteria in Water Quality Regulations. McLaughlin, Douglas B., 2014. *Integrated Environmental Assessment and Management,* 10: 133-137.

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A Coupled Classification-Evolutionary Optimization Model for Contamination Event Detection in Water Distribution Systems. Oliker, N., and A. Ostfeld, 2014. *Water Research,* 51: 234-245.

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A Year-Long Study of the Spatial Occurrence and Relative Distribution of Pharmaceutical Residues in Sewage Effluent, Receiving Marine Waters and Marine Bivalves. McEneff, G., et al., 2014. *Science of the Total Environment,* 476: 317-326.

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Behaviour and Fate of Perfluoroalkyl and Polyfluoroalkyl Substances (PFASs) in Drinking Water Treatment: a Review. Rahman, M.F., et al., 2014. *Water Research,* 50: 318-340.

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Changes in *Escherichia coli* to *Cryptosporidium* Ratios for Various Fecal Pollution Sources and Drinking Water Intakes. Lalancette, C., et al., 2014. *Water Research,* 55: 150-161.

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Constraints on Upward Migration of Hydraulic Fracturing Fluid and Brine. Flewelling, S.A., and M. Sharma , 2014. *Groundwater,* 52(1): 9-19.

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Designating Restricted Areas Around Drinking Water Sources Through an Index-Based Spatial Approach. Gul, A., et al., 2014. *Journal of Hydrologic Engineering,* 19(5): 931-942.

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Detection of Vancomycin-Resistant *Enterococci* (VRE) at Four US Wastewater Treatment Plants That Provide Effluent for Reuse. Goldstein, R.E.R., et al., 2014. *Science of the Total Environment,* 466: 404-411.

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Discharges of Produced Waters from Oil and Gas Extraction via Wastewater Treatment Plants are Sources of Disinfection By-Products to Receiving Streams. Hladik, M.L., et al., 2014. *Science of the Total Environment,* 466: 1085-1093.

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Distribution of Enteric Pathogens in Wastewater Secondary Effluent and Safety Analysis for Urban Water Reuse. Zhang, C.M., and X.C. Wang, 2014. *Human and Ecological Risk Assessment,* 20(3): 797-806.

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Environmental Monitoring of Selected Pesticides and Organic Chemicals in Urban Stormwater Recycling Systems Using Passive Sampling Techniques. Page, D., et al., 2014. *Journal of Contaminant Hydrology,* 158: 65-77.

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Formation of Brominated Disinfection Byproducts During Chloramination of Drinking Water: New Polar Species and Overall Kinetics. Zhai, H.Y., et al., 2014. *Environmental Science & Technology,* 48(5): 2579-2588.

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Influence of Water Quality on the Embodied Energy of Drinking Water Treatment. Santana, M.V.E., et al., 2014. *Environmental Science & Technology,* 48(5): 3084-3091.

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Life Cycle Water Consumption and Wastewater Generation Impacts of a Marcellus Shale Gas Well. Jiang, M., et al., 2014. *Environmental Science & Technology,* 48(3): 1911-1920.

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Molecular Analysis of Point-of-Use Municipal Drinking Water Microbiology. Holinger, E.P., et al., 2014. *Water Research,* 49: 225-235.

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Occurrence and Ecotoxicological Risk Assessment of 14 Cytostatic Drugs in Wastewater. Martin, J., et al., 2014. *Water Air and Soil Pollution,* 225(3).

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Occurrence of Carboxylic Acids in Different Steps of Two Drinking-Water Treatment Plants Using Different Disinfectants. Jurado-Sanchez, B., et al., 2014. *Water Research,* 51: 186-197.

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Occurrence of Human Enteric Viruses at Freshwater Beaches during Swimming Season and Its Link to Water Inflow. Lee, C.S., et al., 2014. *Science of the Total Environment,* 472: 757-766.

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Variability of Tap Water Residual Chlorine and Microbial Counts at Spatially Resolved Points of Use. Pieri, P., et al., 2014. *Environmental Engineering Science,* 31(4): 193-201.

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Time-Dependent Health Risk from Contaminated Groundwater Including Use of Reliability, Resilience, and Vulnerability as Measures. Rodak, Carolyn, et al., 2014. *Journal of the American Water Resources Association,* 50(1): 14-28.

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Comparing Contaminant Removal Costs for Aquifer Recharge with Wastewater with Water Supply Benefits. Bloetscher, Frederick, et al., 2014. *Journal of the American Water Resources Association,* 50(2): 324-333.

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Cyanobacterium *Microcystis aeruginosa* Response to Pentachlorophenol and Comparison with that of the Microalga *Chloyella vulgaris*. de Morais, P., et al., 2014. *Water Research,* 52: 63-72.

Go to Article

Widespread Molecular Detection of *Legionella pneumophila* Serogroup 1 in Cold Water Taps Across the United States. Donohue, M. J., **O'Connell**, K., **Vesper**, S. J., **Mistry**, J. H., **King**, D., **Kostich**, M., and, S. **Pfaller**, 2014. *Environmental Science & Technology,* 48(6): 3145-3152.

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Recent and Upcoming Meetings

RECENT:

GWPC 2014 UIC Conference. January 21-23, 2014 in New Orleans, LA.

Go to Meeting Page or www.gwpc.org

Groundwater and Salt Town Hall: Restoring the Equilibrium after Severe Weather Events (#801). February 19, 2014 - webinar.

Go to Meeting Page or www.ngwa.org

2014 WateReuse California Annual Conference. March 16-18, 2014 in Newport Beach, CA.

Go to Meeting Page or www.watereuse.org

29th Annual WateReuse Symposium. September 7-10, 2014 in Dallas, TX.

Go to Meeting Page or www.watereuse.org

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2014 NAWC Water Summit. October 5-8, 2014, in Fort Lauderdale, FL.

Go to Meeting Page or www.nawc.org

GWPC 2014 Annual Forum. October 6-8, 2014 in Seattle, WA.

Go to Meeting Page or www.gwpc.org

AMWA 2014 Annual Meeting. October 19-22, 2014, in Newport Beach, CA.

Go to Meeting Page or www.amwa.net

ASDWA 2014 Annual Conference. October 20-23, 2014, in Albuquerque, NM.

Go to Meeting Page or www.asdwa.org

SETAC North America 35th Annual Meeting. November 9-13, 2014 in Vancouver, BC, Canada.

Go to Meeting Page or www.setac.org

UPCOMING:

2015 Industrial and Commercial Water Reuse Conference. February 1-3, 2015, in Austin, TX.

Go to Meeting Page or www.waterreuse.org

54th SOT Annual Meeting & ToxExpo. March 22-26, 2015, in San Diego, CA.

Go to Meeting Page or www.toxicology.org

ACE15 – Uniting the World of Water. June 7-10, 2015, in Anaheim, CA.

Go to Meeting Page or www.awwa.org

30th Annual WateReuse Symposium. September 13-16, 2015, in Seattle, WA.

Go to Meeting Page or www.waterresuse.org

WaterPro Conference. September 28-30, 2015, in Oklahoma City, OK.

Go to Meeting Page or www.waterpro.org

SETAC North America 36 Annual Meeting. November 1-5, 2015 in Salt Lake City, UT.

Go to Meeting Page or www.setac.org

Innovative and Affordable Tools and Technologies for Sustainable Public Health Protection

From EPA

Promoting Technology Innovation for Clean and Safe Water: Water Technology Innovation Blueprint−Version 2. EPA 820-R-14-006. Identifies market opportunities for solving water challenges; outlines how EPA can promote innovation.

Go to Report or www.epa.gov

From Collaborators

Pilot Testing of Membrane Zero Liquid Discharge for Drinking Water Systems. Brandhuber, P., 2014. *Water Environment Research Foundation,* Project WERF5T10. Assessments of zero discharge desalination technology, cost estimates for full-scale implementation.

Go to Report or www.werf.org

The New Ice Age: Pigging Effectively Cleans Water and Wastewater Pipelines. Ervin, Kirt et al., 2014. *Opflow,* 40(4): 14-16, 18. Three states highlight benefits and effectiveness of ice pigging for cleaning pipelines.

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Investigation of Desalination Membrane Biofouling. Jiang, S., and N. Voutchkov, 2014. WRRF-08-19. Identified: biological foulants; factors leading to biofouling; and control strategies. Recommendations made for prevention.

Go to Report or www.watereuse.org

Enhanced Disinfection of Adenoviruses with UV Irradiation. Linden, K., and J. Thurston, 2014. WRRF-06-011. Confirms polychromatic medium-pressure UV lamps more effective than low-pressure lamps; doses required for inactivation lower than EPA regulations.

Go to Report or www.watereuse.org

Approaches to Maintaining Consistently High Quality Recycled Water in Storage and Distribution Systems. Thomure, T.M., 2014. WRRF-08-04. Findings: quality deteriorated with residence time; pathogens found beyond point of compliance; pathogens regrow following disinfection; fecal indicators rarely found.

Go to Report or www.watereuse.org/catalog/foundation-research-reports

Membrane Integrity for Virus Removal: Pulsed-Marker Membrane Integrity Monitoring System. Frenkel, V.S., and Y. Cohen, 2014. WRRF-09-06b. PM-MIMo approach for detecting membrane breaches demonstrated by comparing intact and damaged membranes.

Go to Report or www.watereuse.org

Evaluation of the Efficiency of Biogas Treatment for the Removal of Siloxanes. de Arespacochaga, N., 2014. *Water Environment Research Foundation,* Project OWSO10C10. Demonstrates silica gel media as less costly option to granular activated carbon; information on analytical and sampling methods.

Go to Report or www.werf.org

NSF − An Integrated Computer Modeling System for Water Resource Management. Comprehensive system allows more accurate predictions of water shortages; flood/storm management.

Go to News Release or www.nsf.gov

DOE − The Water-Energy Nexus: Challenges and Opportunities. Water scarcity, variability, and uncertainty becoming more prominent; collaboration with DOE's current and potential partners is crucial.

Go to Report or www.energy.gov

Recent Water Research

The Impingement Mortality and Entrainment (IM&E) Reduction Guidance Document for Existing Seawater Intakes. Hogan, T.W., 2014. Guidance on intake technologies and modifications for mitigating IM&E of marine organisms.

Go to Report or www.watereuse.org

Minimizing Concentrate Using Advanced Oxidation, Biofiltration, and Ion-Exchange Pretreatment for Electrodialysis Reversal. *Water Reuse Association,* WRRF-12-01. Cost-effective approach to minimize brine and maximize water recovery from high-salinity reclaimed water.

Go to Report or www.desalination.biz

Fit for Purpose Water: the Cost of Overtreating Reclaimed Water. *Water Reuse Association,* WRRF-10-01. Framework to ensure selection of appropriate treatment without expending unnecessary funds, energy, and greenhouse gas emissions.

Go to Report or www.desalination.biz

Demonstration and Evaluation of Innovative Wastewater Main Rehabilitation Technologies. Matthews, J.C., 2014. *Water Environment Research Foundation,* Project INFR4R11. Review of ultraviolet cured-in-place pipe (CIPP) and reinforced WC-CIPP for large-diameter pipes.

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From Journals

Radium and Barium Removal Through Blending Hydraulic Fracturing Fluids with Acid Mine Drainage. Kondash, A.J., et al., 2014. *Environmental Science & Technology,* 48(2): 1334-1342.

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The Impact of Stormwater Treatment Areas and Agricultural Best Management Practices on Water Quality in the Everglades Protection Area. Entry, J.A., and A. Gottlieb, 2014. *Environmental Monitoring and Assessment,* 186(2): 1023-1037.

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Viruses as Groundwater Tracers: Using Ecohydrology to Characterize Short Travel Times in Aquifers. Hunt, R.J., et al., 2014. Groundwater, 52(2): 187-193.

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Bioregeneration of Spent Anion Exchange Resin for Treatment of Nitrate in Water. Meng, X.Y., et al., 2014. *Environmental Science & Technology,* 48(3): 1541-1548.

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Forward Osmosis: Novel Desalination of Produced Water and Fracturing Flowback. Coday, B.D., and T.Y. Cath, 2014. *Journal American Water Works Association,* 106(2): 37-38.

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On-Site Vapor-Phase Analysis as a Novel Approach for Monitoring Groundwater Wells. Adamson, D.T., et al., 2014. Groundwater Monitoring and Remediation, 34(2): 43-60.

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Removal of Pharmaceuticals and Personal Care Products During Water Recycling: Microbial Community Structure and Effects of Substrate Concentration. Onesios-Barry, K.M., et al., 2014. *Applied and Environmental Microbiology,* 80(8): 2440-2450.

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Reducing Monitoring Costs in Industrially Contaminated Rivers: Cluster and Regression Analysis Approach. Ruman, M., et al., 2014. *Journal of Environmental Quality,* 43(2): 753-762.

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Submersible Optical Sensors Exposed to Chemically Dispersed Crude Oil: Wave Tank Simulations for Improved Oil Spill Monitoring. Conmy, R.N., et al., 2014. *Environmental Science & Technology,* 48(3): 1803-1810.

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Using in Situ Ultraviolet-Visual Spectroscopy to Measure Nitrogen, Carbon, Phosphorus, and Suspended Solids Concentrations at a High Frequency in a Brackish Tidal Marsh. Etheridge, R., et al., 2014. *Limnology and Oceanography: Methods,* 12: 10-22.

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1DTempPro: Analyzing Temperature Profiles for Groundwater/Surface-Water Exchange. Voytek, E.B., et al., 2014. *Groundwater,* 52(2): 298-302.

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Understanding the Impacts of Allocation Approaches During Process-Based Life Cycle Assessment of Water Treatment Chemicals (Pages 87-94). Alvarez-Gaitan, Juan P., et al., 2014. *Integrated Environmental Assessment and Management,* 10: 87-94.

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Advanced Treatment Process for Pharmaceuticals, Endocrine Disruptors, and Flame Retardants Removal. Sundaram, Vijay, et al., 2014. *Water Environment Research,* 86(2): 111-122.

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Nutrients Removal from Urban Stormwater by Different Filter Materials. Reddy, K.R., et al., 2014. Water Air and Soil Pollution, 225(1). Materials in this study are potentially effective for treatment of nutrients and heavy metals.

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Bacteria and Virus Removal Effectiveness of Ceramic Pot Filters with Different Silver Applications in a Long Term Experiment. van der Laan, H., et al., 2014. *Water Research,* 51: 47-54.

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Characterization of Unknown Brominated Disinfection Byproducts During Chlorination Using Ultrahigh Resolution Mass Spectrometry. Zhang, H.F., et al., 2014. Environmental Science & Technology, 48(6): 3112-3119.

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Comparison of Five Integrative Samplers in Laboratory for the Monitoring of Indicator and Dioxin-Like Polychlorinated Biphenyls in Water. Jacquet, R., et al., 2014. *Chemosphere,* 98: 18-27.

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Direct Comparison of Ozonation and Adsorption Onto Powdered Activated Carbon for Micropollutant Removal in Advanced Wastewater Treatment. Altmann, J., et al., 2014. Water Research, 55: 185-193.

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Effective Removal of Microcystis Aeruginosa and Microcystin-LR Using Nanosilicate Platelets. Chang, S.C., et al., 2014. *Chemosphere,* 99: 49-55.

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Overview of Technologies for Removal of Methyl Tert-Butyl Ether (MTBE) from Water. Levchuk, I., et al., 2014. *Science of the Total Environment,* 476: 415-433.

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Removal of Triclocarban and Triclosan During Municipal Biosolid Production. Ogunyoku, T.A., and T.M. Young, 2014. Water Environment Research, 86(3): 197-203.

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Removal Processes of Disinfection Byproducts in Subsurface-Flow Constructed Wetlands Treating Secondary Effluent. Chen, Y., et al., 2014. *Water Research,* 51: 163-171.

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The Simultaneous Determination of Six Flame Retardants in Water Samples Using SPE Pre-Concentration and UHPLC-UV Method. Kowalski, B., and M. Mazur, 2014. Water Air and Soil Pollution, 225(3).

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UV Light Inactivation of Human and Plant Pathogens in Unfiltered Surface Irrigation Water. Jones, L.A., et al., 2014. *Applied and Environmental Microbiology,* 80(3): 849-854.

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Evaluation of Pesticide Monitoring Strategies in Agricultural Streams Based on the Toxic-Unit Concept-Experiences from Long-Term Measurements. Bundschuh, M., et al., 2014. *Science of the Total Environment,* 484: 84-91.

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Recent and Upcoming Meetings

RECENT:

9th Annual WERF Research Forum: Implementing the Next Generation Water Resource Recovery Facility. January 28-29, 2014 in New Orleans, LA.

Go to Meeting Page or www.werf.org

14th National Conference Disasters and Environment - Science, Preparedness, and Resilience. January 28-30, 2014 in Washington, DC.

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WEF Midyear Meeting. January 29-February 1, 2014 in New Orleans, LA.

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AWWA/AMTA Membrane Technology Conference & Exposition. March 10-13, 2014 in Las Vegas, NV.

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Water Environment Federation Technical Exhibition and Conference (WEFTEC) 2014. September 27-October 1, 2014, in New Orleans, LA.

Go to Meeting Page or www.werf.org

WaterPro Conference. October 6-8, 2014 in Seattle, WA.

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NWRA Annual Conference. November 12-14, 2014 in Coronado, CA.

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2014 DWR/NWRI Drought Response Workshop. November 13-14, 2014, Orange County, CA.

Go to Meeting Page or www.nwri-usa.org

Water Quality Technology Conference® & Exposition. November 16-20, 2014, in New Orleans, LA.

Go to Meeting Page or www.awwa.org

Ecological Systems Approach to Protect and Restore Sustainable Water Quality and Water Quantity on a Watershed Basis

From EPA

2013 Highlights of Progress: Responses to Climate Change by the EPA National Water Program. EPA 850-R-14-002. Summary of NWP and regional program accomplishments; major ORD research projects.

Go to Report or www.epa.gov

From Collaborators

Coastal Blue Carbon Opportunity Assessment for Snohomish Estuary: the Climate Benefits of Estuary Restoration. Crooks, S., et al., 2014. Climate mitigation benefits of restoring tidal wetland habitat; provides approach for assessing carbon fluxes.

Go to Report or www.estuaries.org

Algal Bloom-Associated Disease Outbreaks Among Users of Freshwater Lakes − United States, 2009-2010. Hilborn, Elizabeth D., et al., 2014. *Morbidity and Mortality Weekly Report,* 63(01): 11-15. Summary from CDC's Waterborne Disease and Outbreak Surveillance System.

Go to News Release or www.cdc.gov/mmwr

NOAA − Mapping Climate Change in the Oceans. 41702. New web portal maps climate change effects in oceans; assesses vulnerability of fish stocks to climate change.

Go to Tool or www.noaa.gov/newsarchive.html

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Recent and Upcoming Meetings

RECENT:

NGWA Conference on Hydrology and Water Scarcity in the Rio Grande Basin (#5034). February 25-26, 2014 in Albuquerque, NM.

Go to Meeting Page or www.ngwa.org

Water, Climate, Food, and Energy Conference. March 3-7, 2014 in Chapel Hill, NC.

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87th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC 2014). September 27 - October 1, 2014, in New Orleans, LA.

Go to Meeting Page or www.weftec.org

UPCOMING:

Climate Leadership Conference. February 23-25, 2015, in Washington, D.C.

Go to Meeting Page or www.climateleadershipconference.org

Sustainable Water Management Conference. March 15-18, 2015, in Portland, OR.

Go to Meeting Page or www.awwa.org

NGWA Groundwater Summit. March 16-18, 2015, in San Antonio, TX.

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2nd International Ocean Colour Science (IOCS) Meeting. June 16-18, 2015, San Francisco, CA.

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