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

### *From EPA*

**EPA Releases Final Health Assessment for TCE.**

Added to IRIS; characterizes trichloroethylene as carcinogenic to humans and a health hazard.

Go to [Report](#) or [www.epa.gov/iris](http://www.epa.gov/iris)

**NCEE – Do Regulators Overestimate the Costs of Regulation?** Simpson, R.D., 2011. National Center for Environmental Economics.

Go to [Report](#) or [www.epa.gov/ncee](http://www.epa.gov/ncee)

**EPA Strengthens Key Scientific Database to Protect Public Health.** Plans to improving the Integrated Risk Information System (IRIS), database for human health assessments.

Go to [Report](#) or [www.epa.gov/iris](http://www.epa.gov/iris)

**NCEA – Exposure Factors Handbook 2011 Edition.** EPA/600/R-09/052F. Refining the assumptions used in exposure assessments and reducing uncertainty.

Go to [Report](#) or [www.epa.gov/ncea](http://www.epa.gov/ncea)

**New Standard Evaluation Procedures Provide Guidance for Review of EDSP Tier 1 Assays.** Support consistency, efficiency, and transparency in the process.

Go to [Report](#) or [www.epa.gov/scipoly/ospendo](http://www.epa.gov/scipoly/ospendo)

**Supporting Decisions by the Pie Slice: EPA Researcher Serves Up Data.** An EPA statistician is developing innovative ways to translate vast quantities of toxicological data into an accessible, visual format.

Go to [Article](#) or [www.epa.gov/ncct/ToxPi](http://www.epa.gov/ncct/ToxPi)

**A Beta Version of the Dietary Exposure Evaluation Model-Food Commodity Intake Database (DEEM-FCID) Is Available for Testing.** System for chronic and acute exposure assessments.

Go to [Report](#) or [www.epa.gov/pesticides/science](http://www.epa.gov/pesticides/science)

**The Future of Toxicity Testing is Here.** EPA’s CompTox has partnered with the NIEHS’s National Toxicology Program, the NIH’s Chemical Genomics Center, and the FDA in a collaboration known as Tox21.

Go to [Report](#) or [www.epa.gov/ncct/Tox21](http://www.epa.gov/ncct/Tox21)

### *From Collaborators*

**Fungal Diseases: An Emerging Threat To Human, Animal, and Plant Health – Workshop Summary.** Institute of Medicine of the National Academies. Exploring the scientific and policy dimensions.

Go to [Report](#) or [www.iom.edu/reports](http://www.iom.edu/reports)

## **Surveillance for Waterborne Disease Outbreaks and Other Health Events Associated with Recreational Water – United States, 2007-2008.**

Hlavsa, M.C., V.A. Roberts, A.R. Anderson, V.R. Hill, A.M. Kahler, M. Orr, L.E. Garrison, L.A. Hicks, A. Newton, E.D. Hilborn, T.J. Wade, M.J. Beach, and J.S. Yoder, 2011. *Morbidity and Mortality Weekly Report*, 60(ss12), 1-32.

Go to [Article](#) or [www.cdc.gov](http://www.cdc.gov)

**Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water – United States, 2007-2008.** Brunkard, J.M., E. Ailes, V.A. Roberts, V. Hill, E.D. Hilborn, G.F. Craun, A. Rajasingham, A. Kahler, L. Garrison, L. Hicks, J. Carpenter, T.J. Wade, M.J. Beach, and J.S. Yoder, 2011. *Morbidity and Mortality Weekly Report*, 60(ss12), 38-68.

Go to [Article](#) or [www.cdc.gov](http://www.cdc.gov)

**WaterRF – State of the Science of Hexavalent Chromium in Drinking Water.** McNeill, L., et al., 2011. #4404. Occurrence, sources, analytical methods, treatment options, health effects, and regulations.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**WaterRF – Adaptation of the Minimum Anticipated Biological Effect Level (MABEL) Approach to Emerging Compounds of Interest.** #4214. Developed health-protective Acceptable Daily Intakes.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**WaterRF – Formation of Halonitromethanes and Iodo-Trihalomethanes in Drinking Water.** #4063. Investigated precursors and occurrence as well as the influence of parameters on the formation.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**Trace-Elements and Radon in Groundwater across the United States, 1992-2003.** Ayotte, J.D., et al., 2011. Nearly 20% of wells exceeded benchmark for at least one trace element. Radon exceeded benchmark in >65% of samples.

Go to [Report](#) or [www.usgs.gov](http://www.usgs.gov)

**AWWA – Monitoring Indicates Crypto Threat Lower than Thought.** EPA's preliminary data suggests that *Cryptosporidium* is less prevalent in drinking water supplies than previously believed.

Go to [Article](#) or [www.awwa.org](http://www.awwa.org)

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## ***From the Journals***

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**Effect of Water Disinfection Type on Adverse Fetal Outcomes.** Wright, J.M. and Rivera-Núñez, Z., 2011. *Journal of the American Water Works Association*, 103(10).

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**Nitrosamines from Pipeline Materials in Drinking Water Distribution Systems.** Morran, J., et al., 2011. *Journal of the American Water Works Association*, 103(10).

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**Occurrence and Concentrations of Pharmaceutical Compounds in Groundwater Used for Public Drinking-Water Supply in California.** Fram, M.S. and K. Belitz, 2011. *Science of the Total Environment*, 409(18), 3409-3417.

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**Predicting the Migration Rate of Dialkyl Organotins from PVC Pipe into Water.** Adams, W.A., Y. Xu, J.C. Little, A.F. Fristachi, G.E. Rice, C.A. Impellitteri, 2011. *Environmental Science & Technology*, 45(16), 6902-6907.

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**Evidence Suggesting that Di-n-Butyl Phthalate Has Antiandrogenic Effects in Fish.** Aoki, K.A.A., et al., 2011. *Environmental Toxicology and Chemistry*, 30(6), 1338-1345.

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**Social Disparities in Nitrate-Contaminated Drinking Water in California's San Joaquin Valley.** Balazs, C., et al., 2011. *Environmental Health Perspectives*, 119(12), 1272-1278.

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# Water Research Update

**Detection of *Aeromonas hydrophila* in Water Using PCR.** Gulab, P., et al., 2011. *Journal of the American Water Works Association*, 103(11).

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**Health Effects of Naturally Radioactive Water Ingestion: The Need for Enhanced Studies.** Canu, I.G., et al., 2011. *Environmental Health Perspectives*, 119(12), 1676-1680.

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**Estimating Water Supply Arsenic Levels in the New England Bladder Cancer Study.** Nuckols, J.R., et al., 2011. *Environmental Health Perspectives*, 119(9), 1279-1285.

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**An Estimate of the Cost of Acute Health Effects From Food- and Water-Borne Marine Pathogens and Toxins in the USA.** Ralston, E.P., et al., 2011. *Journal of Water and Health*, 9(4), 680-694.

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**Effects of the Antihistamine Diphenhydramine on Selected Aquatic Organisms.** Berninger, J.P., et al., 2011. *Environmental Toxicology and Chemistry*, 30(9), 2065-2072.

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**Prioritizing Contaminants of Emerging Concern for Ecological Screening Assessments.** Diamond, J.M., et al., 2011. *Environmental Toxicology and Chemistry*, 30(11), 2385-2394.

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**Demasculinization of Male Fish by Wastewater Treatment Plant Effluent.** Vajda, A.M., et al., 2011. *Aquatic Toxicology*, 103(3-4), 213-221.

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**USEPA to Review Additional Drinking Water Regulations.** Holmes, T. and J.A. Roberson, 2011. *Journal American Water Works Association*, 103(11), 14-15.

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**Perchlorate, Bromate, and Chlorate in Hypochlorite Solutions: Guidelines for Utilities.** Stanford, B.D., et al., 2011. *Journal American Water Works Association*, 103(6).

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**Age-Associated Variation in Sensory Perception of Iron in Drinking Water and the Potential for Overexposure in the Human Population.** Mirlohi, S., et al., 2011. *Environmental Science & Technology*, 45(15), 6575-6583.

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**Identifying New Persistent and Bioaccumulative Organics Among Chemicals in Commerce II: Pharmaceuticals.** Howard, P.H. and D.C.G. Muir, 2011. *Environmental Science & Technology*, 45(16), 6938-6946.

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**Three Common Metal Contaminants of Urban Runoff (Zn, Cu & Pb) Accumulate in Freshwater Biofilm and Modify Embedded Bacterial Communities.** Ancion, P.Y., et al., 2010. *Environmental Pollution*, 158(8), 2738-2745.

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**Spatial Patterns and Temporal Trends in Mercury Concentrations, Precipitation Depths, and Mercury Wet Deposition in the North American Great Lakes Region, 2002-2008.** Risch, M.R., et al., 2011. *Environmental Pollution*, 161, 261-271.

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**Uptake of 17  $\beta$ -Estradiol and Biomarker Responses in Brown Trout (*Salmo trutta*) Exposed to Pulses.** Knudsen, J.J.G., et al., 2011. *Environmental Pollution*, 159(12), 3374-3380.

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**Stability, Preservation, and Quantification of Hormones and Estrogenic and Androgenic Activities in Surface Water Runoff.** Havens, S.M., et al., 2010. *Environmental Toxicology and Chemistry*, 29(11), 2481-2490.

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**Iron-Rich Oklahoma Clays as a Natural Source of Chromium in Monitoring Wells.** Scott, D., et al., 2011. *Journal of Environmental Monitoring*, 13(12), 3380-3385.

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**Effects of Subchronic Exposure of Early Life Stages of White Sturgeon (*Acipenser transmontanus*) to Copper, Cadmium, and Zinc.** Vardy, D.W., et al., 2011. *Environmental Toxicology and Chemistry*, 30(11), 2497-2505.

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**Could the Health Decline of Prehistoric California Indians be Related to Exposure to Polycyclic Aromatic Hydrocarbons (PAHs) from Natural Bitumen?** Wärmländer, S.K.T.S., et al., 2011. *Environmental Health Perspectives*, 119(9), 1203-1207.

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**Polychlorinated Biphenyl Elimination Rates and Changes in Chemical Activity in Hibernating Amphibians.** Angell, R.A. and G.D. Haffner, 2010. *Environmental Toxicology and Chemistry*, 29(3), 700-707.

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**Development of Biotic Ligand Models for Chronic Manganese Toxicity to Fish, Invertebrates, and Algae.** Peters, A., et al., 2011. *Environmental Toxicology and Chemistry*, 30(11), 2407-2415.

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**Waterfowl Abundance Does Not Predict the Dominant Avian Source of Beach *Escherichia coli*.** Hansen, D.L., et al., 2011. *Journal of Environmental Quality*, 40(6), 1924-1931.

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**Influence of Dissolved Organic Carbon on Toxicity of Copper to a Unionid Mussel (*Villosa iris*) and a Cladoceran (*Ceriodaphnia dubia*) in Acute and Chronic Water Exposures.** Wang, N., et al., 2011. *Environmental Toxicology and Chemistry*, 30(9), 2115-2125.

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**A Tale of Two Pesticides: How Common Insecticides Affect Aquatic Communities.** Groner, M.L. and R.A. Relyea, 2011. *Freshwater Biology*, 56(11), 2391-2404.

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**A Survey on the Temporal and Spatial Distribution of Perchlorate in the Potomac River.** Impellitteri, C.A., et al., 2011. *Journal of Environmental Monitoring*, 13(8), 2277-2283.

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**A Kinetic study of Accumulation and Elimination of Mycrocystin-LR in Yellow Perch (*Perca flavescens*) Tissue and Implications for Human Fish Consumption.** Dyble, J., et al., 2011. *Marine Drugs*, 9(12), 2553-2571.

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**An Assessment of Bone Fluoride and Osteosarcoma.** Kim, F.M., et al., 2011. *Journal of Dental Research*, 90(10), 1171-1176.

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## Upcoming Meetings

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**Emerging Issues in Groundwater Conference.** February 27-28, 2012 in San Antonio, TX. National Ground Water Association – Ground Water Summit.

Go to [Meeting Page](#) or [www.ngwa.org](http://www.ngwa.org)

**The Hot Topics in UIC.** January 23-25, 2012 in Houston, TX. Regulatory and technical considerations for hydraulic fracturing and groundwater protection.

Go to [Meeting Page](#) or [www.gwpc.org](http://www.gwpc.org)

**Building for Better Decisions: Multi-Scale Integration of Human Health and Environmental Data.** May 8-11, 2012 in Research Triangle Park, NC. SOT and SETAC Workshop.

Go to [Meeting Page](#) or [www.setac.org/meetings](http://www.setac.org/meetings)

## Innovative and Affordable Tools and Technologies for Sustainable Public Health Protection

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### ***From EPA***

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**Harnessing Water, Waste and Energy Systems for Sustainability.** Strategies of water decentralization, recovery, and reuse matched with energy conservation.

Go to [Article](#) or [www.epa.gov/nrmrl](http://www.epa.gov/nrmrl)

**EPA Examines Ways to Treat Biotoxins in Drinking Water.** Agency researchers advance science to help protect the nation's drinking water.

Go to [Article](#) or [www.epa.gov/sciencematters](http://www.epa.gov/sciencematters)

**Comparison of Ultrafiltration Techniques for Recovering Biothreat Agents in Water.** EPA/600/R-11/103. Laboratory-based UF method established by CDC was compared to a field-portable UF method developed by EPA.

Go to [Report](#) or [www.epa.gov/nhsrsc](http://www.epa.gov/nhsrsc)

**Formulation of Chlorine and Decontamination Booster Station Optimization Problem.** Haxton, T., R. Murray, et al., 2011. In the 13th Annual Water Distribution Systems Analysis Symposium Proceedings. Optimally locating stations to decontaminate following an incident.

Go to [Article](#) or [www.asce.org](http://www.asce.org)

**USEPA's Climate Ready Water Utilities Initiative.** Ampleman, M., C. Baranowski, A. Posner, J. Whitler, 2011. *Journal American Water Works Association*, 103(9), 28-31.

Go to [Article](#) or [www.awwa.org/publications](http://www.awwa.org/publications)

**Screening Methods for Metal-Containing Nanoparticles in Water.** EPA/600/R-11/096. Capability of single particle-inductively coupled plasma mass spectrometry (SP-ICPMS) for transformations of silver nanoparticles in surface water.

Go to [Report](#) or [www.epa.gov/nerl](http://www.epa.gov/nerl)

**Researchers Develop Innovative Tools in Drinking Water Treatment Studies.** Providing a library of shelf-stable, drinking-water-relevant NOM samples from representative sources around the U.S.

Go to [Article](#) or [www.epa.gov/nrmrl](http://www.epa.gov/nrmrl)

**Post Amerithrax: Advancing the Science and Engineering of Decontamination.** EPA scientists are developing and evaluating decontamination technologies to inactivate lethal bacteria such as anthrax.

Go to [Article](#) or [www.epa.gov/nhsrsc](http://www.epa.gov/nhsrsc)

**Costs of Arsenic Removal Technologies for Small Water Systems: U.S. EPA Arsenic Removal Technology Demonstration Program.** Wang, L., and A.S.C. Chen, 2011. EPA/600/R-11/090. Analysis of costs for 50 demonstrations across 26 states.

Go to [Report](#) or [www.epa.gov/nrmrl](http://www.epa.gov/nrmrl)

**Game On: Can Serious Games Help Inform Serious Environmental Challenges?** EPA researchers partner with IBM to provide data and science for CityOne, a serious game with real-world potential.

Go to [Article](#) or [www.epa.gov/ord](http://www.epa.gov/ord)

**Sustainable Chesapeake: A Community-Based Approach to Stormwater Management Using Green Infrastructure.** Science to Achieve Results (STAR) program. Funding research to engage lay persons and experts in solutions to stormwater problems.

Go to [Article](#) or [www.epa.gov/ncsr](http://www.epa.gov/ncsr)

**Persistence and Decontamination Testing of *Brucella suis*.** EPA/600/R-11/111. Helping plan for responses to natural occurrences or intentional releases of biological agents.

Go to [Report](#) or [www.epa.gov/nhsrsc](http://www.epa.gov/nhsrsc)

**EPA's Water Security Modeling and Simulation Research.** EPA/600/S-11/007. Summarizes advance computing products for water security.

Go to [Article](#) or [www.epa.gov/nhsrc](http://www.epa.gov/nhsrc)

**EPA Announces Final Study Plan to Assess Hydraulic Fracturing.** Investigating potential impacts on drinking water resources and the responsible use of this source of natural gas.

Go to [Article](#) or [www.epa.gov/hydraulicfracturing](http://www.epa.gov/hydraulicfracturing)

**Aging Water Infrastructure Research: Science and Engineering for a Sustainable Future.** EPA/600/F-11/010. Brochure.

Go to [Article](#) or [water.epa.gov/infrastructure](http://water.epa.gov/infrastructure)

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## *From Collaborators*

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**Sustainability and the U.S. EPA.** National Research Council. Better assess social, environmental, and economic impacts of options in EPA decision making.

Go to [Report](#) or [www.nationalacademies.org](http://www.nationalacademies.org)

**WaterRF – Engineered Biofiltration for Enhanced Hydraulic and Water Treatment Performance.** #4215. Operational modifications to the ozone/biofiltration process to attain water treatment objectives.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**Novel Membrane Helps Remove Perchlorate from Drinking Water.** Electrodialysis and an electrochemical reaction in one system reduces low-levels of perchlorate to non-toxic chloride.

Go to [Article](#) or [www.udel.edu/udaily](http://www.udel.edu/udaily)

**WERF – Technology Roadmap for Sustainable Wastewater Treatment Plants in a Carbon-Constrained World.** #OWSO4R07d. Research needs and options for optimizing carbon and nutrient management.

Go to [Report](#) or [www.werf.org](http://www.werf.org)

**WaterRF – Enhancing Removal of Viruses in Water Treatment Plants Using Zero-Valent Iron.** #4140. Assesses the effectiveness of zero-valent iron (ZVI) to remove the pathogenic viruses.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**WaterRF – Hydraulic Fracturing Issues and Research Needs.** Wright, B.A., et al., 2011. #4301. Identifies environmental and water quality issues related to drilling in oil shale formations.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**WaterRF – Energy Efficiency Best Practices for North American Drinking Water Utilities.** #4223. Includes best practices in the energy efficient design and operation of water industry assets.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**Green Gov Success Stories.** Examples of projects that will drive long-term savings, improve efficiency, reduce pollution, and eliminate waste.

Go to [Report](#) or [www.whitehouse.gov/greengov](http://www.whitehouse.gov/greengov)

**WaterRF – Accuracy of In-Service Water Meters at Low and High Flow Rates.** #4028. Quantified flow measurement accuracy with exposure to particles in the system and other degradation factors.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**WaterRF – Copper Pitting and Brass Dezincification: Chemical and Physical Effects.** #4289. Establishes whether chemical constituents inhibit or accelerate copper pitting corrosion.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**Final Report: Anaerobic Pre-Treatment for an Algae-Based Wastewater Treatment System.** Horst, G., 2011. SBIR Program. Sequesters nitrogen and phosphorus into the biomass of algae that can be converted into useful products.

Go to [Report](#) or [www.epa.gov/ncer](http://www.epa.gov/ncer)

**WaterRF – Membrane Treatment of Impaired Irrigation Return and Other Flows: Creating New Sources of High-Quality Water.** #4069. Producing potable water from winter irrigation return flows.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

**WaterRF – Comparing Conventional and Pelletized Lime Softening Concentrate Chemical Stabilization.** #4283. Demonstrates the efficiencies of a technology to improve reverse osmosis recovery.

Go to [Report](#) or [www.waterrf.org](http://www.waterrf.org)

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## From the Journals

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**Optimizing Alert Occurrence in the Cincinnati Contamination Warning System.** Allgeier, S.C., et al., 2011. *Journal of the American Water Works Association*, 103(10).

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**Removal of Selected Endocrine Disrupting Chemicals and Personal Care Products in Surface Waters and Secondary Wastewater by Ozonation.** Tay, K., et al., 2011. *Water Environment Research*, 83(8), 684-691.

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**Science Policy Considerations for Responsible Nanotechnology Decisions.** Morris, J., J. Willis, et al., 2011. *Nature Nanotechnology*, 6, 73-77.

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**Dynamics of Steroid Estrogen Daily Concentrations in Hospital Effluent and Connected Waste Water Treatment Plant.** Avberšek, M., et al., 2011. *Journal of Environmental Monitoring*, 13(8), 2221-2226.

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**Theoretical Modeling and Experimental Validation of Leakage in Drinking Water Networks.** Bennis, S., et al., 2011. *Journal American Water Works Association*, 103(12).

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**Removal and Formation of Chlorinated Triclosan Derivatives in Wastewater Treatment Plants Using Chlorine and UV Disinfection.** Buth, J.M., et al., 2011. *Chemosphere*, 84(9), 1238-1243.

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**A Tale of Two Technologies: Hydraulic Fracturing and Geologic Carbon Sequestration.** Dammel, J.A., et al., 2011. *Environmental Science & Technology*, 45(12), 5075-5076.

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**Modeling Techniques of Best Management Practices: Rain Barrels and Rain Gardens Using EPA SWMM-5.** Aad, M.P.A., M.T. Suidan, and W.D. Shuster, 2010. *Journal of Hydrologic Engineering*, 15(6), 434-443.

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**Real-time In-network Distribution System Monitoring to Improve Operational Efficiency.** Allen, M., et al., 2011. *Journal American Water Works Association*, 103(7).

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**Tertiary-Treated Municipal Wastewater is a Significant Point Source of Antibiotic Resistance Genes into Duluth-Superior Harbor.** LaPara, T.M., et al., 2011. *Environmental Science & Technology*, 45(22), 9543-9549.

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**Measurement of Organic Nitrogen and Phosphorus Fractions at Very Low Concentrations in Wastewater Effluents.** Sattayatewa, C., et al., 2011. *Water Environment Research*, 83(8), 675-683.

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**Persistence of Non-Native Spore Forming Bacteria in Drinking Water Biofilm and Evaluation of Decontamination Methods.** Shane, W.T., J.G. Szabo, and P.L. Bishop, 2011. *Environmental Technology*, 32(8), 847-855.

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**Application of WWTP Biosolids and Resulting Perfluorinated Compound Contamination of Surface and Well Water in Decatur, Alabama, USA.** Lindstrom, A.B., M. Strynar, A. Delinsky, S.F. Nakayama, L. McMillan, E. Laurence Libelo, M. Neill, L. Thomas, 2011. *Environmental Science and Technology*, 45(19), 8015–8021.

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**Treatment of Wastewaters Containing Bisphenol A: State of the Science Review.** Melcer, H. and G. Klečka, 2011. *Water Environment Research*, 83(7), 650-666.

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**Domestic Wastewater Treatment as a Net Energy Producer-Can This be Achieved?** McCarty, P.L., et al., 2011. *Environmental Science & Technology*, 45(17), 7100-7106.

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**A Bench-Scale Constructed Wetland as a Model to Characterize Benzene Biodegradation Processes in Freshwater Wetlands.** Rakoczy, J., et al., 2011. *Environmental Science & Technology*, 45(23), 10036-10044.

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**A Minimum Data Set of Water Quality Parameters to Assess and Compare Treatment Efficiency of Stormwater Facilities.** Ingvertsen, S.T., et al., 2011. *Journal of Environmental Quality*, 40(5), 1488-1502.

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**Fighting Water With Water: Behavioral Change versus Climate Change.** Strassberg, V. and B. Lancaster, 2011. *Journal American Water Works Association*, 103(6).

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**Transformation of Dissolved Organic Matter in a Novel Groundwater Recharge System with Reclaimed Water.** Linlin, W., et al., 2011. *Water Environment Research*, 83(12), 2140-2146.

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**Algal Turf Scrubbing: Cleaning Surface Waters with Solar Energy while Producing a Biofuel.** Adey, W.H., et al., 2011. *Bioscience*, 61(6), 434-441.

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**Field Application of a Renewable Constructed Wetland Substrate for Phosphorus Removal.** Rosenquist, S.E., et al., 2011. *Journal of the American Water Resources Association*, 47(4), 800-812.

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**Snake in a Lake-An Innovative Pipeline Design.** Grandelli, P. and J. Holland, 2011. *Journal American Water Works Association*, 103(7), 36-40.

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**Hot Water Treatment (Chronic Upper Lethal Temperature) Mitigates Biofouling by the Invasive Asian Mussel *Limnoperna fortunei* in Industrial Installations.** Perepelizin, P.V. and D. Boltovskoy, 2011. *Environmental Science & Technology*, 45(18), 7868-7873.

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## Upcoming Meetings

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**16th Annual Water Reuse & Desalination Research Conference.** June 4-5, 2012 in San Diego, CA.

Go to [Meeting Page](#) or [www.watereuse.org/foundation](http://www.watereuse.org/foundation)

**The Utility Management Conference.** January 30-February 2, 2012 in Miami, FL. Hosted by the American Water Works Association and Water Environment Federation.

Go to [www.wef.org/UtilityManagement](http://www.wef.org/UtilityManagement)

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

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### *From EPA*

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**An Assessment of Decision-Making Processes: Evaluation of Where Land Protection Planning Can Incorporate Climate Change Information.** EPA/600/R-09/142F.

Go to [Report](#) or [www.epa.gov/ncea](http://www.epa.gov/ncea)

**A Primer on Using Biological Assessment to Support Water Quality Management.** Reports on condition of aquatic biota, developing biological criteria, and assesses results of management actions.

Go to [Report](#) or [water.epa.gov/scitech](http://water.epa.gov/scitech)

**EPA Announces the Healthy Watersheds Initiative National Framework and Action Plan.** Intended to protect the nation's watersheds, prevent impairment, and accelerate restoration.

Go to [Report](#) or [water.epa.gov/type/watersheds](http://water.epa.gov/type/watersheds)

**Efficacy of Ballast Water Treatment Systems: A Report by the EPA Science Advisory Board.** EPA/SAB/11/009. Recommended a risk-based approach to address invasive species in vessel ballast water discharge.

Go to [Report](#) or [www.epa.gov/sab](http://www.epa.gov/sab)

**New and Improved EPA Website on Nitrogen & Phosphorus Pollution.** Information about this type of pollution (sources, impacts, helpful actions) and states' numeric water quality criteria for nutrients.

Go to [www.epa.gov/nutrientpollution](http://www.epa.gov/nutrientpollution)

**Improving EPA Review of Appalachian Surface Coal Mining Operations under the Clean Water Act, National Environmental Policy Act, and the Environmental Justice Executive Order.** The guidance to work with stakeholders towards a balanced approach that protects communities from harmful pollution associated with coal mining.

Go to [Report](#) or [water.epa.gov](http://water.epa.gov)

**Reactive Nitrogen in the United States: an Analysis of Inputs, Flows, Consequences, and Management Options.** EPA/SAB/11/013. Analyzed sources and fate of reactive nitrogen; recommended research and control strategies.

Go to [Report](#) or [www.epa.gov/sab](http://www.epa.gov/sab)

**Gulf of Mexico Regional Ecosystem Restoration Strategy.** Released by the Gulf Coast Ecosystem Restoration Task Force after extensive feedback from citizens throughout the region.

Go to [Report](#) or [www.epa.gov/gulfcoasttaskforce](http://www.epa.gov/gulfcoasttaskforce)

**Down the Drain: Wetlands as Sinks for Absorbing Reactive Nitrogen.** First continental-scale analysis to estimate how much nitrogen is removed by wetland ecosystems.

Go to [Article](#) or [water.epa.gov/type/wetlands](http://water.epa.gov/type/wetlands)

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### *From Collaborators*

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**USDA – Economic Research Service Report: Nitrogen in Agricultural Systems: Implications for Conservation Policy.** Two-thirds of U.S. cropland not meeting criteria for nitrogen management.

Go to [Report](#) or [water.epa.gov/type/watersheds](http://water.epa.gov/type/watersheds)

**New USEPA Water Quality Criteria by 2012: GOMA Concerns and Recommendations.** Gooch-Moore, J., et al., 2011. *Journal of Water and Health*, 9(4), 718-733.

Go to [Article](#) or [www.gulfofmexicoalliance.org](http://www.gulfofmexicoalliance.org)

**USGS – Sources, Fate, and Transport of Nitrogen and Phosphorus in the Chesapeake Bay Watershed: An Empirical Model.** Ator, S.W., et al., 2011. #2011-5167. SPARROW model. Significant contributions from agricultural and urban activities as well as natural sources.

Go to [Report](#) or [www.usgs.gov](http://www.usgs.gov)

# Water Research Update

**USGS – Regional SPARROW Model Assessments of Streams and Rivers.** Access to six regional models describing how rivers receive and transport nutrients. Articles based on this program in the October issue of the *Journal of the American Water Resources* - 47(5).

Go to [Tool](#), [Journal](#), or [water.usgs.gov/nawqa](http://water.usgs.gov/nawqa)

**Global Change and Extreme Hydrology: Testing Conventional Wisdom.** Committee on Hydrologic Science, National Research Council. Examines if floods and droughts are increasing, changes at the regional scale, and the influence of the global climate.

Go to [Report](#) or [www.nap.edu](http://www.nap.edu)

**USGS – Hydrography of and Biogeochemical Inputs to Liberty Bay, a Small Urban Embayment in Puget Sound, Washington.**

Takesue, R.K. (ed.). #2011-5152. Effects of contaminant inputs from an urban watershed and modifications of the shoreline to nearshore habitats.

Go to [Report](#) or [www.usgs.gov](http://www.usgs.gov)

**USGS – Organic Contaminants, Trace and Major Elements, and Nutrients in Water and Sediment Samples in Response to the Deepwater Horizon Oil Spill.** Nowell, L.H., et al., 2011. #2011-1271.

Differences in contaminant concentrations before and after landfall of oil.

Go to [Report](#) or [www.usgs.gov](http://www.usgs.gov)

**USGS – Trends in Suspended-Sediment Loads and Concentrations in the Mississippi River Basin, 1950-2009.** Heimann, D.C., et al., 2011. #2011-5200. Declines in sediment loads and concentrations; generally explained by corresponding decreases in stream flows.

Go to [Report](#) or [www.usgs.gov](http://www.usgs.gov)

**WERF – A Strategic Risk Communications Process for Outreach and Dialogue on Biosolids Land Application.** Eggers, S., et al., 2011.

#SRSK2R08. Includes methods, tools, and materials to enable effective outreach.

Go to [Report](#) or [www.werf.org](http://www.werf.org)

**Approaches for Ecosystem Services Valuation for the Gulf of Mexico after the Deepwater Horizon Oil Spill.** National Research Council. Options to include the analysis of ecosystem services to help address the spill.

Go to [Report](#) or [www.nap.edu](http://www.nap.edu)

**USGS – Columbia River Estuary Ecosystem Classification: Concept and Application.** Simenstad, C.A., et al., 2011. #2011-1228. Characterize large flood plain rivers influenced by riverine and estuarine hydrology.

Go to [Report](#) or [www.usgs.gov](http://www.usgs.gov)

**Nutrient Use Geographic Information System (NuGIS).** International Plant Nutrition Institute. Predicts partial nutrient balance and nutrient removal to use ratios at county, state, and watershed scales.

Go to [Tool](#) or [www.ipni.net](http://www.ipni.net)

**Factors that Influence the Hydrologic Recovery of Wetlands in the Northern Tampa Bay Area, Florida.** Metz, P.A. #2011-5127. Investigates why water levels for some wetlands have not increased after reduction in groundwater withdrawals.

Go to [Report](#) or [www.usgs.gov](http://www.usgs.gov)

**NOAA Website Provides Real-Time Information from Chesapeake Bay Interpretive Buoy Systems.** Meteorological, oceanographic, and water quality data.

Go to [Article](#) or [www.wef.org](http://www.wef.org)

**USGS – Sediment Load from Major Rivers into Puget Sound and Its Adjacent Waters.** #2011-3083. Each year, 6.5 million tons is transported to Puget Sound; 70% from rivers (mostly during floods) and 30% from shoreline erosion.

Go to [Article](#) or [www.usgs.gov](http://www.usgs.gov)

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## *From the Journals*

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**An Environmental Assessment of United States Drinking Water Watersheds.** Wickham, J.D., T.G. Wade, K.H. Rütters. *Landscape Ecology*, 7(1), 605-616.

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## **Community Structures of Fecal Bacteria in Cattle from Different Animal Feeding Operations.**

Shanks, O.C., et al., 2011. *Applied and Environmental Microbiology*, 77(9), 2992-3001.

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## **Connecting the Dots: Responses of Coastal Ecosystems to Changing Nutrient Concentrations.**

Carstensen, J., et al., 2011. *Environmental Science and Technology*, 45(21), 9122-9132.

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## **Nitrate in the Mississippi River and Its Tributaries, 1980 to 2008: Are We Making Progress?**

Sprague, L.A., et al., 2011. *Environmental Science and Technology*, 45(17), 7209-7216.

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## **Nutrient Loadings to Streams of the Continental United States from Municipal and Industrial Effluent.**

Maupin, M.A., and T. Ivahnenko, 2011. *Journal of the American Water Resources Association*, 47(5), 950-964.

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## **Threats to Riparian Ecosystems in Western North America: An Analysis of Existing Literature.**

Poff, B., et al., 2011. *Journal of the American Water Resources Association*, 47(6), 1241-1254.

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## **Mobilization of Endocrine-Disrupting Chemicals and Estrogenic Activity in Simulated Rainfall Runoff from Land-Applied Biosolids.**

Giudice, B. and T. Young, 2011. *Environmental Toxicology and Chemistry*, 30(10), 2220-2228.

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## **Nutrients in Precipitation and the Phytoplankton Responses to Enrichment in Surface Waters of the Albemarle Peninsula, NC, USA after the Establishment of a Large-Scale Chicken Egg Farm.**

Rosignol, K.L., et al., 2011. *Hydrobiologia*, 671(1), 181-191.

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## **Factors Affecting Stream Nutrient Loads: A Synthesis of Regional SPARROW Model Results for the Continental United States.**

Preston, S.D., et al., 2011. *Journal of the American Water Resources Association*, 47(5), 891-915.

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## **Acid Mine Drainage Affects the Development and Function of Epilithic Biofilms in Streams.**

Smucker, N.J. and M.L. Vis, 2011. *Journal of the North American Benthological Society*, 30(3), 728-738.

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## **Evaluating Performance of Stormwater Sampling Approaches Using a Dynamic Watershed Model.**

Ackerman, D., et al., 2011. *Environmental Monitoring and Assessment*, 180(1-4), 283-302.

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## **Land Application of Hydrofracturing Fluids Damages a Deciduous Forest Stand in West Virginia.**

Adams, M.B., 2011. *Journal of Environmental Quality*, 40(4), 1340-1344.

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## **River Restoration: The Fuzzy Logic of Repairing Reaches to Reverse Catchment Scale Degradation.**

Bernhardt, E.S. and M.A. Palmer, 2011. *Ecological Applications*, 21(6), 1926-1931.

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## **A Watershed Approach to Improve Water Quality: Case Study of Clean Water Services' Tualatin River Program.**

Cochran, B. and C. Logue, 2011. *Journal of the American Water Resources Association*, 47(1), 29-38.

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## **Development, Validation, and Application of a Macroinvertebrate-Based Index of Biotic Integrity for Nonwadeable Rivers of Wisconsin.**

Weigel, B.M. and J.J. Dimick, 2011. *Journal of the North American Benthological Society*, 30(3), 665-679.

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**Forecasts Aid HABs Response.** Freeman, K.S., 2011. *Environmental Health Perspectives*, 119, a510-a510.

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**Evaluating Agricultural Best Management Practices in Tile-Drained Subwatersheds of the Mackinaw River, Illinois.** Lemke, A.M., et al., 2011. *Journal of Environmental Quality*, 40(4), 1215-1228.

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**Centennial-Scale Changes to the Aquatic Vegetation Structure of a Shallow Eutrophic Lake and Implications for Restoration.** Madgwick, G., et al., 2011. *Freshwater Biology*, 56(12), 2620-2636.

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**TMDL Implementation in Agricultural Landscapes: A Communicative and Systemic Approach.** Jordan, N.R., et al., 2011. *Environmental Management*, 48(1), 1-12.

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**Impacts of Land-Cover Change on Suspended Sediment Transport in Two Agricultural Watersheds.** Schilling, K.E., et al., 2011. *Journal of the American Water Resources Association*, 47(4), 672-686.

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**Use of Fish Functional Traits to Associate In-Stream Suspended Sediment Transport Metrics with Biological Impairment.** Schwartz, J.S., et al., 2011. *Environmental Monitoring and Assessment*, 179(1-4), 347-369.

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**Change Point Analysis of Phosphorus Trends in the Illinois River (Oklahoma) Demonstrates the Effects of Watershed Management.** Scott, J.T., et al., 2011. *Journal of Environmental Quality*, 40(4), 1249-1256.

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**A Coherent Signature of Anthropogenic Nitrogen Deposition to Remote Watersheds of the Northern Hemisphere.** Holtgrieve, G.W., et al., 2011. *Science*, 334(6062), 1545-1548.

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**PCB-Induced Changes of a Benthic Community and Expected Ecosystem Recovery Following in situ Sorbent Amendment.** Janssen, E.M., et al., 2011. *Environmental Toxicology and Chemistry*, 30(8), 1819-1826.

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**Multicriteria Evaluation of Water Resources Sustainability in the Context of Watershed Management.** Kang, M., and G. Lee, 2011. *Journal of the American Water Resources Association*, 47(4), 813-827.

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**Nutrient Fluxes and the Recent Collapse of Coastal California Salmon Populations.** Moore, J.W., et al., 2011. *Canadian Journal of Fisheries and Aquatic Sciences*, 68(7), 1161-1170.

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**Environmental Risk Assessment of Fluctuating Diazinon Concentrations in an Urban and Agricultural Catchment Using Toxicokinetic-Toxicodynamic Modeling.** Ashauer, R., et al., 2011. *Environmental Science & Technology*, 45(22), 9783-9792.

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**Zooplankton as Indicators in Lakes: A Scientific-Based Plea for Including Zooplankton in the Ecological Quality Assessment of Lakes According to the European Water Framework Directive (WFD).** Jeppesen, E., et al., 2011. *Hydrobiologia*, 676(1), 279-297.

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**Pragmatic Approaches for Water Management under Climate Change Uncertainty.** Stakhiv, E.Z., 2011. *Journal of the American Water Resources Association*, 47(6), 1183-1196.

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**Sources and Delivery of Nutrients to the Northwestern Gulf of Mexico from Streams in the South-Central United States.** Rebich, R.A., et al., 2011. *Journal of the American Water Resources Association*, 47(5), 1061-1086.

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**Effects of Riparian Buffers on Nitrate Concentrations in Watershed Discharges: New Models and Management Implications.** Weller, D.E., et al., 2011. *Ecological Applications*, 21(5), 1679-1695.

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**Impact of Different Land Uses on Polycyclic Aromatic Hydrocarbon Contamination in Coastal Stream Sediments.** Zheng, W.D., et al., 2011. *Chemosphere*, 84(4), 376-382.

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**Flow Regime, Temperature, and Biotic Interactions Drive Differential Declines of Trout Species under Climate Change.** Wenger, S.J., et al., 2011. *Proceedings of the National Academy of Sciences*, 108(34), 14175-14180.

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**Reducing Nitrogen and Phosphorus Pollution and Protecting Drinking Water Sources.** Bergman, R., 2011. *Journal American Water Works Association*, 103(8), 28-31.

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**Risks and Benefits of Consumption of Great Lakes Fish.** Turyk, M.E., et al., 2011. *Environmental Health Perspectives*, 120, 11-18.

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**Acidification of Subsurface Coastal Waters Enhanced by Eutrophication.** Cai, W., et al., 2011. *Nature Geoscience*, 4, 766-770.

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**Subsurface Transport of Orthophosphate in Five Agricultural Watersheds, USA.** Domagalski, J.L., and H.M. Johnson, 2011. *Journal of Hydrology*, 409(1-2), 157-171.

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**Water Quality Model Uncertainty Analysis of a Point-Point Source Phosphorus Trading Program.** Kardos, J.S., and C.C. Obropta, 2011. *Journal of the American Water Resources Association*, 47(6), 1317-1337.

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**Significant Efflux of Carbon Dioxide from Streams and Rivers in the United States.** Butman, D., and P.A. Raymond, 2011. *Nature Geoscience*, 4, 839-842.

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**A Regional Modeling Framework of Phosphorus Sources and Transport in Streams of the Southwestern United States.** García, A.M., et al., 2011. *Journal of the American Water Resources Association*, 47(5), 991-1010.

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**The Effect of Rain and Runoff When Assessing Timing of Manure Application and Dissolved Phosphorus Loss in Runoff.** Vadas, P.A., et al., 2011. *Journal of the American Water Resources Association*, 47(4), 877-886.

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**The Feasibility of Using Mosquitofish (*Gambusia affinis*) for Detecting Endocrine-Disrupting Chemicals in the Freshwater Environment.** Kamata, R., et al., 2011. *Environmental Toxicology and Chemistry*, 30(12), 2778-2785.

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**Has the Magnitude of Floods across the USA Changed with Global CO<sub>2</sub> Levels.** Hirsch, R.M. and K.R. Ryberg, 2011. *Hydrological Sciences Journal*, 57(1), 1-9.

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**Functional Impacts of Ocean Acidification in an Ecologically Critical Foundation Species.** Gaylord, B. et al., 2011. *Journal of Experimental Biology*, 214, 2586-2594.

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**Environmental Concentrations of Agricultural-Use Pesticide Mixtures Evoke Primary and Secondary Stress Responses in Rainbow Trout.** Tierney, K.B., et al., 2011. *Environmental Toxicology and Chemistry*, 30(11), 2602-2607.

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# Water Research Update

**Economic Incentives and Regulatory Framework for Shale Gas Well Site Reclamation in Pennsylvania.** Mitchell, A.L. and E.A. Casman, 2011. *Environmental Science & Technology*, 45(22), 9506-9514.

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**Mountaintop Removal Mining: Digging into Community Health Concerns.** Holzman, D.C., 2011. *Environmental Health Perspectives*, 119, a476-a483.

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**Climate Change, Agricultural Insecticide Exposure, and Risk for Freshwater Communities.** Kattwinkel, M., et al., 2011. *Ecological Applications*, 21(6), 2068-2081.

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**The Use of Large Water and Sediment Diversions in the Lower Mississippi River (Louisiana) for Coastal Restoration.** Allison, M.A. and E.A. Meselhe, 2010. *Journal of Hydrology*, 387(3-4), 346-360.

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**The Impact of Agricultural Best Management Practices on Water Quality in a North German Lowland Catchment.** Lam, Q.D., et al., 2011. *Environmental Monitoring and Assessment*, 183(1-4), 351-379.

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**The Impacts of Modern Warfare on Freshwater Ecosystems.** Francis, R.A., 2011. *Environmental Management*, 48(5), 985-999.

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## Upcoming Meetings

**8th National Water Quality Monitoring Conference – Water: One Resource - Shared Effort - Common Future.** April 30-May 4, 2012 in Portland, OR.

Go to [Meeting Page](#) or [www.acwi.gov](http://www.acwi.gov)

**AWRA's 2012 Summer Specialty Conference.** June 25-29, 2012 in Denver, CO. June 25-27: Contaminant of Emerging Concern; June 27-29: Riparian Ecosystems.

Go to [Meeting Page](#) or [www.awra.org](http://www.awra.org)

**AWWA 2012 Sustainable Water Management Conference & Exposition.** March 18-21, 2012 in Portland, OR.

Go to [Meeting Page](#) or [www.awwa.org](http://www.awwa.org)

**Global Conference on Oceans, Climate and Security (GCOCS).** May 21-23, 2012 in Boston, MA.

Go to [www.gcocs.org](http://www.gcocs.org)

**Stormwater Symposium 2012.** July 18-20, 2012 in Baltimore, MD. Water Environment Federation and the Chesapeake Water Environment Association.

Go to [www.wef.org/Stormwater2012](http://www.wef.org/Stormwater2012)

**River Network's River Rally.** May 4-7, 2012 in Portland, OR. An international gathering of the watershed conservation community.

Go to [Meeting Page](#) or [www.rivernetwork.org](http://www.rivernetwork.org)

## A Note from the Editors

Welcome to our new publication schedule. As we announced in the last issue, the "Quarterly" is now a semi-annual publication. With the new schedule comes a new name: "Water Research Update." We have a new name and a new schedule but we've kept the same number of titles for your perusal, covering six months instead of three months of titles, meetings and announcements. We expect you will find it helpful, as usual, and of course, we also ask for your feedback. Keep your comments and suggestions coming.

Regards, Luis, Mary, Vera, and the Cadmus Group.