EPA Office of Water
Recent Water Research
July - December 2014 No. 2014-2

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

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International Scientists' Priorities for Research on Pharmaceutical and Personal Care Products in the Environment. Rudd, M. A., **Ankley, G. T.**, et al., 2014. *Integrated Environmental Assessment and Management,* 10, 576-587.

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Your Garden Hose: A Potential Health Risk Due to *Legionella* spp. Growth Facilitated by Free-Living Amoebae. Thomas, J., T. Thomas, R. Stuetz, and **N. Ashbolt**, 2014. *Environmental Science & Technology,* 48(17), 10456-10464.

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USGS – Chemical and Biological Quality of Water in Grand Lake St. Marys, Ohio, 2011-12, with Emphasis on Cyanobacteria. Dumouchelle, Denise H., and Erin A. Stelzer, 2014. USGS Scientific Investigations Report 2014-5210. Identifies relationship between microcystin concentrations and *Planktothrix* and *Microcystis* genotypes (toxic versus non-toxic).

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Human Exposure to Emerging Contaminants: Monitoring and Modeling. Krauss, Martin, and Natalie von Götz, 2014. *SETAC Globe,* 15(7), 17 July 2014. Paper topics: more comprehensive assessment of human exposure to chemicals; non-target screening approaches to monitor compounds in human tissue; integration of experimental and modeling approaches.

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WERF – Fate of Engineered Nanomaterials in Wastewater Biosolids, Land Application and Incineration. Water Environment Research Foundation, 2014. Project U1R10. Tools to quantify how engineered nanomaterials undergo wastewater treatment, and how they accumulate in biosolids and the environment.

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Occurrence and Consequences of Increased Bromide in Drinking Water Sources. McTigue, Nancy E., et al., 2014. *Journal American Water Works Association,* 106(11), E492-E508.

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Are Interactive Effects of Harmful Algal Blooms and Copper Pollution a Concern for Water Quality Management? Hochmuth, J. D., et al., 2014. *Water Research,* 60, 41-53.

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Surface Water Quality and Cropping Systems Sustainability under a Changing Climate in the Upper Mississippi River Basin. Panagopoulos, Y., et al., 2014. *Journal of Soil and Water Conservation,* 69(6), 483-494.

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Applicability of Universal Bacteroidales Genetic Marker for Microbial Monitoring of Drinking Water Sources in Comparison to Conventional Indicators. Shahryari, A., et al., 2014. *Environmental Monitoring and Assessment,* 186(11), 7055-7062.

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Drinking Water Quality Concerns from Chloramine-Induced Degradation of Elastomeric Compounds. Nagisetty, Raja M., et al., 2014. *Journal American Water Works Association,* 106(9), E402-E407.

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Biotransformation of the Flame Retardant Tetrabromobisphenol-A (TBBPA) by Freshwater Microalgae. Peng, Fu-Qiang et al., 2014. *Environmental Toxicology and Chemistry,* 33(8), 1705-1711.

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Biomass Production and Nutrient Removal by *Chlorella* sp. as Affected by Sludge Liquor Concentration. Akerstrom, A. M., et al., 2014. *Journal of Environmental Management,* 144, 118-124.

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Pesticides in U.S. Streams and Rivers: Occurrence and Trends during 1992-2011. Stone, W.W., et al., 2014. *Environmental Science & Technology,* 48(19), 11025-11030.

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Nitrate Removal in Shallow, Open-Water Treatment Wetlands. Jasper, J. T., et al., 2014. *Environmental Science & Technology,* 48(19), 11512-11520.

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Recent and Upcoming Meetings

RECENT:

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

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

Go to Meeting Page or gwpc.org

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

Go to Meeting Page or www.amwa.net

AWRA 2014 Annual Water Resources Conference. November 3-6, 2014 in Tysons Corner, VA.

Go to Meeting Page or www.awra.org

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

Go to Meeting Page or www.setac.org

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

Go to Meeting Page or www.watereuse.org

2015 GWPC UIC Annual Conference. February 9-11, 2015 in Austin, TX.

Go to Meeting Page or gwpc.org

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

Go to Meeting Page or www.toxicology.org

UPCOMING:

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

Go to Meeting Page or www.awwa.org

Water and Energy 2015: Opportunities for Energy and Resource Recovery in the Changing World. June 8-10, 2015 in Washington, DC.

Go to Meeting Page or news.wef.org

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

Go to Meeting Page or www.watereuse.org

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

Go to Meeting Page or waterprocommunity.org

2015 NAWC Water Summit. October 4, 2015 in Scottsdale, AZ.

Go to Meeting Page or www.nawc.org

ASDWA 2015 Annual Conference. October 20-23, 2015 in Fort Worth, TX.

Go to Meeting Page or www.asdwa.org

APHA Annual Meeting and Exposition. October 31 - November 4, 2015 in Chicago, IL.

Go to Meeting Page or www.apha.org

SETAC North America 36th 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

The Verification of a Method for Detecting and Quantifying Diethylene Glycol, Triethylene Glycol, Tetraethylene Glycol, 2-Butoxyethanol and 2-Methoxyethanol in Ground and Surface Waters. Schumacher, Brian A. and Lawrence Zintek, 2014. EPA 600-R-14- 008. Detection of glycols indicates possible presence of hydraulic fracturing fluid.

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Cost-Effectiveness of Nitrogen Mitigation by Alternative Household Wastewater Management Technologies. Wood, A., T. Hawkins, X. **Xue, N. Ashbolt, J. Garland, and M. Blackhurst**, 2014. *Journal of Environmental Management,* 150(3), 344-354.

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Optimizing the Structure and Scale of Urban Water Infrastructure: Integrating Distributed Systems. The Johnson Foundation, 2014. Examines potential to integrate/substitute traditional infrastructure with distributed water infrastructure systems.

Go to Report or www.johnsonfdn.org

WEF and WateReuse – Desalination Engineering: Operation and Maintenance. Water Environment Federation and WateReuse Association, 2014. State-of-the-art methods for reverse osmosis brackish and seawater desalination plants.

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Simultaneous Removal of Pesticides from Water by Rice Husk Ash: Batch and Column Studies. Saha, Ajoy, et al., 2014. *Water Environment Research,* 86(11), 2271-2278.

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Effect of UV Irradiation (253.7 nm) on Free *Legionella* and *Legionella* Associated with its Amoebae Hosts. Ceruero-Arago, S., et al., 2014. *Water Research,* 67, 299-309.

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A Fully-Automated Analyzer for Determining Haloacetic Acid Concentrations in Drinking Water. Henson, C. M., et al., 2014. *Chemosphere,* 117, 586-595.

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Reduction of *Legionella* spp in Water and in Soil by a Citrus Plant Extract Vapor. Laird, K., et al., 2014. *Applied and Environmental Microbiology,* 80(19), 6031-6036.

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Assessment of Biomass in Drinking Water Biofilters by Adenosine Triphosphate. Pharand, Lizanne, et al., 2014. *Journal American Water Works Association,* 106(10), E433-E444.

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Using SWAT-VSA to Predict Diffuse Phosphorus Pollution in an Agricultural Catchment with Several Aquifers. Pezet, F., et al., 2014. *Journal of Hydrologic Engineering,* 19(7), 1462-1470.

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Assessing Microbiological Water Quality in Drinking Water Distribution Systems with Disinfectant Residual Using Flow Cytometry. Gillespie, S., et al., 2014. *Water Research,* 65, 224-234.

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Mimicking Filtration and Transport of Rotavirus and Adenovirus in Sand Media Using DNA-Labeled, Protein-Coated Silica Nanoparticles. Pang, L. P., et al., 2014. *Water Research,* 62, 167-179.

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Hospital Wastewater Treatment by Fungal Bioreactor: Removal Efficiency for Pharmaceuticals and Endocrine Disruptor Compounds. Cruz-Morato, C., et al., 2014. *Science of the Total Environment,* 493, 365-376.

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Water Treatment by Fabric Capillary Action: New Technique with Ancient Origins. Fadel, Hatem A., 2014. *Journal American Water Works Association,* 106(12), 44-50.

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Inferring Nitrogen Removal in Large Rivers from High-Resolution Longitudinal Profiling. Hensley, R. T., et al., 2014. *Limnology and Oceanography,* 59(4), 1152-1170.

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Multimedia Model for Polycyclic Aromatic Hydrocarbons (PAHs) and Nitro-PAHs in Lake Michigan. Huang, L., and S. A. Batterman, 2014. *Environmental Science & Technology,* 48(23), 13817-13825.

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Removal of Pharmaceuticals and Endocrine Disruptor Compounds from Natural Waters by Clarification Associated with Powdered Activated Carbon. Lima, D. R. S., et al., 2014. *Water Air and Soil Pollution,* 225, 2170.

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Evaluation of *Clostridium perfringens* as a Tracer of Sewage Contamination in Sediments by Two Enumeration Methods. Vijayavel, K., and D. R. Kashian, 2014. *Environmental Monitoring and Assessment,* 186(9), 5617-5624.

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Photocatalytic Phenol Degradation by Immobilized Nano ZnO. Malayeri, H. Zamankhan, et al., 2014. *Water Environment Research,* 86(9), 771-778.

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Porous Ceramic Tablet Embedded with Silver Nanopatches for Low-Cost Point-of-Use Water Purification. Ehdaie, B., et al., 2014. *Environmental Science & Technology,* 48(23), 13901-13908.

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Inactivation of *Microcystis aeruginosa* by Electron Beam Irradiation. Liu, S. Y., et al., 2014. *Water Air and Soil Pollution,* 225(9), 2093.

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A Graphical Procedure for Sensor-Placement Guidance for Small Utilities. Schal, Stacey, et al., 2014. *Journal American Water Works Association,* 106(10), E459-E469.

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A Web-Based Application for Optimization of Single Reservoir Operation. Jahanpour, Mohammadamin, et al., 2014. *Journal American Water Works Association,* 106(11), E509-E517.

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Self-Powered Wastewater Treatment for the Enhanced Operation of a Facultative Lagoon. Ewing, Timothy, et al., 2014. *Journal of Power Sources,* 269, 284-292.

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Microfluidic Quantitative PCR for Simultaneous Quantification of Multiple Viruses in Environmental Water Samples. Ishii, S., et al., 2014. *Applied and Environmental Microbiology,* 80(24), 7505-7511.

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Using LiDAR and Geographic Information System Data to Identify Optimal Sites in Southern Minnesota for Constructed Wetlands to Intercept Nonpoint Source Nitrogen. Wan, H. B., et al., 2014. *Journal of Soil and Water Conservation,* 69(4), 115A-120A.

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Estimation of Cyanobacteria Biovolume in Water Reservoirs by MERIS Sensor. Medina-Cobo, M., et al., 2014. *Water Research,* 63, 10-20.

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A Facile and Cost-Effective Method for Separation of Oil-Water Mixtures Using Polymer-Coated Iron Oxide Nanoparticles. Palchoudhury, S., and J.R. Lead, 2014. *Environmental Science & Technology,* 48(24), 14558-14563.

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Rapid Chromatographic Separation of Dissoluble Ag(I) and Silver-Containing Nanoparticles of 1-100 Nanometer in Antibacterial Products and Environmental Waters. Zhou, X. X., et al., 2014. *Environmental Science & Technology,* 48(24), 14516-14524.

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A Comparative Study on the Pulsed UV and the Low-Pressure UV Inactivation of a Range of Microbial Species in Water. Garvey, Mary, et al., 2014. *Water Environment Research,* 86 (12), 2317-2324.

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Real Time Observation System for Monitoring Environmental Impact on Marine Ecosystems from Oil Drilling Operations. Godo, O. R., et al., 2014. *Marine Pollution Bulletin,* 84(1-2), 236-250.

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Mathematical Model of Dynamic Behavior of Microbial Desalination Cells for Simultaneous Wastewater Treatment and Water Desalination. Ping, Q. Y., et al., 2014. *Environmental Science & Technology,* 48(21), 13010-13019.

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Removal of Pharmaceuticals from MWTP Effluent by Nanofiltration and Solar Photo-Fenton using Two Different Iron Complexes at Neutral pH. Miralles-Cuevas, S., et al., 2014. *Water Research,* 64, 23-31.

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Internal Porosity of Mineral Coating Supports Microbial Activity in Rapid Sand Filters for Groundwater Treatment. Gulay, A., et al., 2014. *Applied and Environmental Microbiology,* 80(22), 7010-7020.

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Rapid On-Site Separation of As(III) and As(V) in Waters Using a Disposable Thiol-Modified Sand Cartridge. Du, Jingjing et al., 2014. *Environmental Toxicology and Chemistry,* 33(8), 1692-1696.

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An Urban Storm-Inundation Simulation Method Based on GIS. Zhang, S. H., and B. Z. Pan, 2014. *Journal of Hydrology,* 517, 260-268.

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Ultraviolet-Visible Light-Sensitive High Surface Area Phosphorous-Fluorine-Co-Doped TiO_2 Nanoparticles for the Degradation of Atrazine in Water. Khan, J. A., et al., 2014. *Environmental Engineering Science,* 31(7), 435-446.

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Recent and Upcoming Meetings

RECENT:

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

Training: Climate Adaptation & Infrastructure Engineering. February 11-12, 2015 in Washington, DC.

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UPCOMING:

WEFTEC 2015. September 26-30, 2015 in Chicago, IL.

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NWRA Annual Conference. November 4-6, 2015 in Denver, CO.

Go to Meeting Page or www.nwra.org

Water Quality Technology Conference® & Exposition. November 15-19, 2015 in Salt Lake City, UT.

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

From EPA

NOW AVAILABLE:

THE FINAL REPORT CONNECTIVITY OF STREAMS AND WETLANDS TO DOWNSTREAM WATERS.
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Great Lakes Restoration Initiative Action Plan II. Great Lakes Interagency Task Force, 2014. Environmental threats and steps for managing those risks, including climate resiliency.

Go to Report or greatlakesrestoration.us

Managing Microcystin: Identifying National-scale Thresholds for Total Nitrogen and Chlorophyll a. Yuan, L. L., Pollard, A. I., Pather, S., Oliver, J. L., and D'Anglada, L., 2014. *Freshwater Biology,* 59(9), 1970-1981.

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Climate Change Indicators in the United States, 2014. EPA 430-R-14-004. 30 indicators of observed long-term trends related to climate change; includes the significance and consequences of these trends.

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From Collaborators

NGWA – Aquifer Storage and Recovery. National Ground Water Association, 2014. Catalog #BSP26. Best suggested practices (BSPs) for aquifer storage and recovery projects.

Go to Report or ngwa.org

GWPC – State Oil & Gas Regulations Designed to Protect Water Resources: 2014 Edition. Groundwater Protection Council, 2014. Overview of 2013 groundwater protection rules in 27 states.

Go to Report or www.gwpc.org

Great Lakes Ice and Climate Research and Forecast. Wang, J., et al., 2014. *Proceedings of the 22nd IAHR International Symposium on Ice 2014, Singapore, August 11-15, 2014. International Association of Hydro-Environment Engineering and Research,* 48-55. Ice-circulation models simulate lake ice variations on the synoptic, seasonal, interannual, and decadal time scales.

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The Economic Benefits of Cleaning up the Chesapeake; A Valuation of the Natural Benefits Gained by Implementing the Chesapeake Clean Water Blueprint. Chesapeake Bay Foundation, 2014. Analysis finds benefits of $130 billion annually when the Blueprint is fully implemented.

Go to Report or cbf.org

Progress Toward Restoring the Everglades: The Fifth Biennial Review, 2014. National Research Council and collaborators, 2014. Recommendations for restoration activities, project management strategies, management of invasive nonnative species, and high-priority research needs.

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USGS – Basin-Scale Simulation of Current and Potential Climate Changed Hydrologic Conditions in the Lake Michigan Basin, United States. Christiansen, D.E., et al., 2014. USGS Scientific Investigations Report 2014-5175. Calibrated Precipitation-Runoff Modeling System used to evaluate potential responses to climate change.

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Fish Model Species in Environmental Toxicology. Legradi, Jessica, and Charles Tyler, 2014. *SETAC Globe,* 15(7), 17 July 2014. Topics included: chemical testing and focused mechanistic studies; population-level impacts; differences in potencies depending on varying environments.

Go to Report or globe.setac.org

The Green Infrastructure Guide for Water Management: Ecosystem-Based Management Approaches for Water-Related Infrastructure Projects. United Nations Environment Programme, 2014. ISBN: 978-92-807-3404-1. Job Number: DEP/1827/NA. Green infrastructure solutions offer viable alternatives to grey water infrastructure and support goals across multiple policy areas.

Go to Report or www.unepdhi.org

USGS – Baseline and Projected Future Carbon Storage and Greenhouse-Gas Fluxes in Ecosystems of the Eastern United States. Zhu, Zhiliang and Reed, Bradley C., editors, 2014. USGS Professional Paper 1804, 204 p. National assessment of storage and flux of carbon and other greenhouse gases in the Eastern U.S.

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From Journals

Keeping Tabs on HABs: New Tools for Detecting, Monitoring, and Preventing Harmful Algal Blooms. Seltenrich, Nate, 2014. *Environmental Health Perspectives,* 122(8), A206-A213.

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RECENT:

WEF 2014 Stormwater Congress. September 27 - October 1, 2014 in New Orleans, LA.

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2014 NGWA Groundwater Expo and Annual Meeting. December 9-12, 2014 in Las Vegas, NV.

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

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

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

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Upcoming:

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

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NGWA Groundwater Expo 2015. December 15-17, 2015 in Las Vegas, NV.

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