

Riparian Ecosystems IV: Advancing Science, Economics, and Policy 2012

Held at AWRA Summer Specialty Conference 2012

**Denver, Colorado, USA
27-29 June 2012**

Editors:

Kenneth J. Lanfear N. Earl Spangenberg

ISBN: 978-1-62276-328-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2012) by the American Water Resources Association
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the American Water Resources Association
at the address below.

American Water Resources Association
PO Box 1626
Middleburg, VA 20118

Phone: (540) 687-8390
Fax: (540) 687-8395

awrahq@aol.com

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

COUPLED BIO-GEOCHEMICAL CYCLES

Coupled Biogeochemical Cycles in Restored Urban Streams	1
<i>S. McMillan, G. Jennings, A. Tuttle, A. Gardner (Abstract)</i>	
Approaches to Characterizing Biogeochemistry Effects of Groundwater and Surface Water Interaction at the Riparian Interface	2
<i>P. Mayer, C. Cooper, K. Forshay, S. Kaushal, M. Langland, D. Low, D. Merritts, G. Sivirichi, R. Walter (Abstract)</i>	
Woody Debris: Denitrification Hotspots and N₂O Production in Fluvial Systems.....	3
<i>J. Hyman, A. Gold, K. Addy, P. Mayer, K. Forshay, P. Groffman (Paper)</i>	
Hotspots of Nitrogen Removal in Intermittent Streams in Forested Watersheds of Southern New England.....	11
<i>K. Addy, A. Gold, M. Welsh, S. Cox, E. Elmstrom (Abstract)</i>	

RIPARIAN RESTORATION

Giant Cane's Biogeochemical Role in Riparian Buffers.....	12
<i>A. Nelson, J. Schoonover, K. Williard (Abstract)</i>	
Town of Minturn Eagle River Restoration Project.....	13
<i>D. Blauch, T. Thompson (Abstract)</i>	
Choosing the Correct Willows for Riparian Restoration in Colorado	14
<i>R. Mandel (Abstract)</i>	
Riparian Restoration Strategies for Cottonwood Forests in Colorado's Frontrange	15
<i>V. Sortman, C. Browne (Abstract)</i>	

RIPARIAN VEGETATION MANAGEMENT I

Efficacy of Aquatic-Use Registered Herbicides Used for Preemergence (PRE) and Postemergence (POST) Control of Microstegium Vimineum on Stream and Riparian Restoration Sites.....	16
<i>K. Hall, R. Richardson, S. Hoyle, J. Spooner, D. Frederick (Abstract)</i>	
Gains and Losses of Urban Riparian Greenspaces in the Portland-Vancouver Metropolitan Area Over an 18 Year Period of Growth	17
<i>A. Yeakley, C. Ozawa, D. Fisher de Leon, C. Armstrong (Paper)</i>	
Modeling and Classifying Riparian Ecotones via GIS Utilizing Geophysical and Vegetative Inputs: A New Approach	22
<i>S. Abood, A. Maclean (Paper)</i>	
Soil and Groundwater Salinity Management for Irrigated Riparian Restoration Areas	28
<i>M. Grabau, M. A. Milczarek, M. Banerjee, A. Rudolph (Abstract)</i>	

ALPINE AND MOUNTAIN ECOSYSTEMS

Downstream Effects of Diversion dams on Riparian Vegetation Communities in the Routt National Forest, Colorado	29
<i>S. Caskey, E. Wohl, K. Dwire, D. Merritt, L. Schnackenberg (Abstract)</i>	
Carbon Pools Along Headwater Streams with Differing Valley Geometry in Rocky Mountain National Park, Colorado	30
<i>K. Dwire, E. E. Wohl, N. A. Sutfin, R. A. Bazan, L. E. Polvi-Pilgrim (Abstract)</i>	
Using Beaver to Reconnect Floodplains and Restore Riparian Habitat in an Incised Stream.....	31
<i>M. Pollock, N. Weber, J. Wheaton, N. Bouwes, C. Jordan (Paper)</i>	
Mapping Riparian Zones Using a Multi-Scale Process-Based Approach	37
<i>J. Salo, D. Theobald (Abstract)</i>	

RIPARIAN ECOSYSTEMS SERVICES

Using Ecosystem Service Valuation to Support Markets for Riparian Areas: Eugene Water and Electric Board Case Study	38
<i>R. Schmidt, D. Batker, J. Harrison-Cox (Abstract)</i>	

Use of Payments for Ecosystem Services to Protect Drinking Water in the McKenzie Watershed, Oregon	39
<i>K. Morgenstern (Abstract)</i>	
Science-Based, Vegetative Designs Presented Using Engineering Specifications	40
<i>J. Patterson, G. W. Annandale, R. H. Mandel (Paper)</i>	

RIPARIAN ECOSYSTEMS AND STORM WATER ATTENUATION

Sustainable Riparian Restoration – “String of Pearls” On The Rio Grande	48
<i>M. Landis (Paper)</i>	
Sustaining Watershed Health in the Face of Urban Development	55
<i>M. Wolfe, C. Murdock (Abstract)</i>	
Quantifying Ecologic and Flood Risk Benefits of Floodplain Reconnection on the Lower San Joaquin River	56
<i>K. Jagt, M. Matella (Abstract)</i>	

REGIONAL RESTORATION ASSESSMENTS

Restoration of Riparian Buffer Function in Reclaimed Surface Mine Soils in Southern Illinois	57
<i>N. Rahe, K. Williard, J. Schoonover (Abstract)</i>	
Historical Riparian Functions as the Basis for a Watershed Approach to Low Impact Development (LID) and Watershed Management	58
<i>J. Beagle, R. Grossinger, K. Cayce (Abstract)</i>	
Sensitivity of Floodplain Connectivity to Variations in Stream Flow at Congaree National Park	59
<i>J. Kupfer, K. M. Meitzen (Abstract)</i>	
Developing a Strategy for Reducing Ravine, Bluff and Streambank Sediment in the Minnesota River Basin	60
<i>C. Lenhart, D. Smith, A. Lewandowski (Abstract)</i>	

BIOGEOCHEMICAL PROCESSES

Landscape Controls on Multiple Contaminant Dynamics in Riparian Zones	61
<i>P. Vidon, P. Jacinthe, M. Baker, X. Liu, K. Fisher, M. Panunto (Abstract)</i>	
Hydrogeomorphic Controls of Nitrous Oxide Fluxes in Riparian Buffers of Central Indiana	62
<i>P. Jacinthe, P. Vidon, M. Baker, K. Fisher, X. Liu, M. Panunto (Abstract)</i>	
Hydrogeomorphic Classification of Riparian Ecosystems in Central Indiana	63
<i>M. Panunto, M. Baker, P. Jacinthe, P. Vidon, K. Fisher, X. Liu (Abstract)</i>	
Nutrient and Carbon Retention in Riparian and Hillslope Forests after Mountain Pine Beetle Infestation and Timber Harvesting in Colorado	64
<i>C. Rhoades, C. Chambers, K. Elder, D. Pierson, B. Starr (Abstract)</i>	

IMPACTS OF INVASIVE SPECIES ON RIPARIAN COMMUNITY STRUCTURE

Hydrologic Source Characterization of Black Ash Wetlands: Implications for EAB Response	65
<i>C. Lenhart, M. Davidson, K. Brooks, R. Slesak, T. D'Amato (Paper)</i>	
Impacts of an Invasive Insect Pest, Emerald Ash Borer, on Riparian Forest Structure and Function in Agricultural Watersheds	71
<i>D. Kreutzweiser, S. Capell, D. Nisbet, P. Sibley, T. Scarr (Abstract)</i>	
Impacts of Autumn Olive (<i>Elaeagnus Umbellata Thunb.</i>) on Stream Nitrogen Levels in Headwater Watersheds in Southern Illinois	73
<i>N. Montano, K. Williard, A. Somor, D. Evans, C. Goldstein, J. Groninger, J. Schoonover (Abstract)</i>	

RIPARIAN POLICY PROBLEMS AND SOLUTIONS

Restoring a Desert Spring Riparian Zone in a High Use Recreation Area	74
<i>B. Poff, A. Savage (Abstract)</i>	
Landscaping the Long-Term: Water System and Irrigation Re-Visions for Sustainability	75
<i>J. Wiener, G. F. Sassenrath (Paper)</i>	
Recommendations and Implementation Plan for Strengthening Policies and Programs for the Protection of Natural and Beneficial Floodplain Functions in Montana	81
<i>L. Saul (Abstract)</i>	

TIDAL RIPARIAN ECOSYSTEMS AND THEIR UNIQUE VULNERABILITIES

Water Quality Characterization and Coastal Watershed Planning in Double Bayou – Communicating the Importance of Riparian Resources in Water Quality Management.....	82
<i>Stephanie Glenn, L. Gonzalez, L. Shead, M. Lee</i>	

RIPARIAN VEGETATION MANAGEMENT II

Assessing Biomass Production in Giant Cane with Respect to Soil Properties.....	83
<i>M. Goble, J. E. Schoonover, K. W.J. Williard, J. J. Zaczek (Abstract)</i>	
Effectiveness of Riparian Best Management Practices during Forest Fertilization in the South.....	84
<i>E. Schilling, G. Ice, M. Cohen, M. McBroom (Abstract)</i>	

WATER QUANTITY AND QUALITY IN WATERSHEDS

Colorado Statewide Watershed Project Knowledge Base	85
<i>M. Herzog, M. Blazewicz, J. Crane, J. Labadie (Paper)</i>	
Connecting the Dots: Linking Riparian Areas, Land Management and Source Water Protection.....	91
<i>S. Hymel (Paper)</i>	
Effects of Seasonal Stream Expansion on Spatially-Explicit Riparian Metrics in the Calapooia River Watershed, OR.....	97
<i>J. Christensen, P.J. Wigington Jr. (Abstract)</i>	
Current and Expected Changes in Hydrologic Connectivity San Pedro River, Arizona.....	98
<i>T. Meixner, C. Soto-Lopez, H. Ajami, D. Turner, H. Richter, J. Stromberg, F. Dominguez (Abstract)</i>	

RIPARIAN CORRIDOR MANAGEMENT FOR AGRICULTURAL LAND

Concentrated Flow Paths in Riparian Buffer Zones in Agricultural Watersheds	99
<i>J. Schoonover, K. W.J. Williard, R. C. Pankau (Abstract)</i>	
Variable Width Riparian Buffers for Concentrated Flow Paths in Agricultural Watersheds.....	100
<i>K. Williard, J. E. Schoonover, E. Holzmueller (Abstract)</i>	
Modeling the Aggregate Effects of Riparian Buffers in the Chesapeake Bay Watershed	101
<i>D. Weller, M. E. Baker (Abstract)</i>	
Estimation of Surface Runoff Area Affected by Riparian Buffers in the Illinois River Watershed	102
<i>G. Levesque, B. Farris (Paper)</i>	

RIPARIAN VEGETATION MANAGEMENT III

Riparian Restoration Activities in the New York City Reservoir Watershed: Using Native Vegetation to Restore Stream Stability and Enhance Water Quality.....	106
<i>C. P. Tran, A. C. Doan, J. M. Grieser, C. H. Skalda, L. Weyeneth, M. Maglio (Paper)</i>	
Assessing the Effect of Thinning on Riparian Forest Structure Important to ESA-Listed and Other Species in Decline.....	112
<i>M. Pollock, T. Beechie (Paper)</i>	
Representing Riparian Vegetation in a Numerical Model	116
<i>L. Fotherby, E. Gordon, B. Greimann, J. Huang, D. Dombroski, Y. Lai, P. Makar (Abstract)</i>	
Toward Improvement in Boundless Biogeochemical Cycles in Terrestrial-Aquatic Ecosystems	117
<i>T. Nakayama (Abstract)</i>	

RIPARIAN RESOURCES FOR TMDL ATTAINMENT

Targeting Riparian Forest Buffer Locations to Meet Water Virginia Water Quality Goals	118
<i>J. Okay (Abstract)</i>	
Role of Riparian Forest Buffers in the Chesapeake Bay TMDL	119
<i>S. Claggett (Abstract)</i>	
Use of Riparian Forest Buffers in the Maryland Chesapeake Bay TMDL	120
<i>A. Hairston-Strang (Abstract)</i>	
Indexes for Targeting Buffer Placement to Improve Water Quality.....	121
<i>M. Dosskey, Z. Qiu (Abstract)</i>	

RIPARIAN CORRIDOR WIDTH AND HABITAT

A Comprehensive Approach to Evaluating CREP Planting Success in Virginia	122
<i>J. A. Okay, T. Groh, J. Starr (Abstract)</i>	
Planting Success of Riparian Shrubs and Trees on an Urban Stream Restoration in Utah	123
<i>E. McCulley, T. Harrison (Abstract)</i>	
Incorporating Riparian Habitat Functions into the Environmental Analysis and Monitoring of Chatfield Reservoir Reallocation.....	124
<i>M. Powell, R. D. Beane (Abstract)</i>	

MODELING RIPARIAN ECOSYSTEMS

Modeling Interactions of Flow and Vegetation for Improved Riverine System Management	125
<i>D. Domroski, B. Greimann, Y. Lai, V. Huang, L. Fotherby, M. Stone, L. Chen (Abstract)</i>	
Modeling Environmental Flow Needs for Riparian Vegetation.....	126
<i>R. T. Milhous, I. G. Jowett, T. R. Payne, J. M. D. Hernandez (Paper)</i>	

WATER QUALITY COMPONENTS AND PROCESSING IN THE RIPARIAN ZONE

Re-Saturating Riparian Buffers in Tile Drained Landscapes	132
<i>T. Isenhart, D. Jaynes (Abstract)</i>	
Implications of Regional Hydrologic Settings and Local Hydrology on Riparian-Forest-Buffer Functions	133
<i>G. Speiran, D. L. Nelms, W. E. Sanford (Abstract)</i>	
Applications of the Riparian Ecosystem Management Model (REMM).....	134
<i>R. Lowrance, C. Williams, A. Tilak, M. Burchell, R. Williams (Abstract)</i>	
Multi-Scale Hydrologic Controls on River Network Connectivity and Riparian Function	135
<i>J. P. Wigington, S.G. Leibowitz (Abstract)</i>	

ANTHROPOGENIC DISTURBANCES IN THE RIPARIAN CORRIDOR

Riparian Vegetation Establishment Associated With Stream Restoration Projects in Semi-Arid Southwest Colorado.....	136
<i>V. Sortman (Abstract)</i>	
Are Abandoned Floodplains Novel Ecosystems? Plant Community and Edaphic Traits of Abandoned Floodplains Compared to Adjacent Habitat along a Regulated River	137
<i>L. Reynolds, P. B. Shafroth (Abstract)</i>	
Public Attitudes about Riparian Preservation and Restoration on the Carson River, Nevada	138
<i>S. Donaldson, S. Lewis (Paper)</i>	

RESOURCE EXTRACTION

Degradation and Risk of Damages from Utilizing Multiple Ecosystem Services in a River Basin	143
<i>T. Warziniack (Paper)</i>	
The Impact of Forest-Based Biofuel Practices on Riparian Buffers and Water Resources	149
<i>J. Nettles, D. Amatya, J. Cacho, G. Chescheir, J. Grace, Z. Leggett, M. Youssef (Abstract)</i>	
Biofuel Feedstock from Riparian Buffers: A Win-Win for Climate and Water Quality?	150
<i>M. Dosskey (Abstract)</i>	
Using Abandoned Gravel Mining Pits for Riparian Restoration in Northern Colorado.....	151
<i>M. Lighthiser (Abstract)</i>	

POSTER PRESENTATIONS

Hydrologic Controls on Methylmercury Availability in Coastal Plain Rivers	152
<i>P. Bradley, C. Journey (Abstract)</i>	
Structure and Composition of Riparian Boreal Forest in Quebec	153
<i>A. Comtois, M. Darveau, M. Poulin, D. Pothier (Abstract)</i>	
Establishment of Riparian Strips by Spontaneous Recolonization and Plant Succession in Agricultural Areas	154
<i>N. D'Amour, M. Poulin, A. Vanasse, R. Andersen (Abstract)</i>	
Comparative Water Use by Riparian Forest, Grass, and Crops in the Great Plains.....	155
<i>M. Dosskey, D. Pedersen, D. Eisenhauer (Abstract)</i>	

Direct Seeding and Seedling Production to Enhance Riparian Restoration.....	156
<i>M. Grabau, M. A. Milczarek, B. De Vor, R. Thurman, F. Zamora (Abstract)</i>	
Environmental Impact Evaluation of Exploiting the Subsurface Water Resource near the Rivers in West-Central Taiwan	157
<i>S. Huang, K. Lin, C. Hsu, M. Yeh, J. Wen, K. Chang (Abstract)</i>	
Process and Significance of Snow Redistribution in the Central Colorado Subalpine Zone.....	158
<i>C. Leaf (Paper)</i>	
An Ecohydrological Assessment of Dryland Riparian Ecosystems in the Southwestern United States	164
<i>J. Murray, L.R. Levick, B. Bledsoe, R. Lyon, S. Hammer, P. Guertin, D. Goodrich, M. Laituri (Abstract)</i>	
Effects of Valley Segment Sequencing on Floodplain Hydroperiods.....	165
<i>M. Panunto, M. Baker, P. Vidon, P. Jacinthe (Abstract)</i>	

MODELING RIPARIAN ECOSYSTEMS

Measures of Human Modification of Upland, Lateral, and Longitudinal Ecological Processes in Freshwater Systems: A Colorado Example	166
<i>David Theobald, J. Salo, T. Brown, D. Harrison-Atlas, D. Mueller, S. E. Reed, D. Merritt</i>	
Modeling Water-Related Ecosystem Services in the Yallahs and Hope Watersheds in Jamaica.....	167
<i>Driss Ennaanay, E. Steele</i>	
Author Index	