OSM NATIONAL LIBRARY

September 10, 2012

Current Journal Contents

U.S. Office of Surface Mining/DOI
1999 Broadway, Suite 3320
Denver, CO 80202-3050

This is the current compilation of the table-of-contents pages for journals received during the month of August in the Library. Individuals may have copies of specific articles by notifying the librarian either by phone, e-mail, or regular mail service. **(If you have more than one or two articles you want, please send a written or e-mail request.)**

Deborah K. McGinnis, Librarian **Tel: (303) 293-5073**
dmcginnis@osmre.gov **FAX (303) 293-5017**

Search the OSM Library Catalog HERE

NOTICE OF WARNING CONCERNING COPYRIGHT RESTRICTIONS

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted material.

Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specific conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

This institution reserves the right to refuse to accept a copying order if, in its judgment, fulfillment of the order would involve violation of copyright law.

Agronomy Journal July–August 2012 Volume 104, No. 4

Table of Contents

Review & Interpretation

A Review on the Challenges for Increased Production of Castor
Liv S. Severino, Dick L. Auld, Marco Baldanzi, Magno J. D. Cândido, Grace Chen, William Crosby, Tan D., Xiaohua He, P. Lakshmamma, C. Lavanya, Olga L. T. Machado, Thomas Mielke, Máira Milani, Travis D. Miller, J. B. Morris, Stephen. A. Morse, Alejandro A. Navas, Dartanhã J. Soares, Valdinei Sofiatti, Ming L. Wang, Mauricio D. Zanotto, and Helge Zieler 853

Agronomy, Soils & Environmental Quality

Rye–Corn Silage Double-Cropping Reduces Corn Yield but Improves Environmental Impacts
Erik S. Krueger, Tyson E. Ochsner, John M. Baker, Paul M. Porter, and Don C. Reicosky 888

Spring Nitrogen Fertilization of Ryegrass–Bermudagrass for Phytoremediation of Phosphorus-Enriched Soils
John J. Read 908

Modeling Sustainable Agricultural Residue Removal at the Subfield Scale
D. J. Muth, Jr., D. S. McCorkle, J. B. Koch, and K. M. Bryden . . 970

Interference of Tifton Burclover Residues with Growth of Burclover and Wheat Seedlings
Gatua wa Mhũgwa, James M. Krall, and David E. Legg 982

Soil Microbiology in Glyphosate-Resistant Corn Cropping Systems
Newton Z. Lupwayi and Robert E. Blackshaw 1041

Sunflower–Soybean Intercrop Productivity under Different Water Conditions and Sowing Managements
José F. Andrade, Aníbal Cerrudo, Roberto H. Rizzalli, and Juan P. Monzon 1049

Near Infrared Reflectance-Based Tools for Predicting Soil Chemical Properties of Oklahoma Grazinglands
Brian K. Northup and John A. Daniel 1122

Intensification of Field Pea Production: Impact on Soil Microbiology
Newton Z. Lupwayi, Guy P. Lafond, William E. May, Chris B. Holzapfel, and Reynald L. Lemke 1189

Biofuels

Response of Continuous Maize with Stover Removal to Living Mulches
Dustin R. Wiggans, Jeremy W. Singer, Kenneth J. Moore, and Kendall R. Lamkey 917

Forage and Energy Sorghum Responses to Nitrogen Fertilization in Central and Southern Illinois
Matt Maughan, Thomas Voigt, Allen Parrish, Germán Bollero, William Rooney, and D. K. Lee 1032

Biometry, Modeling & Statistics

Use of Surface Soil Moisture to Estimate Profile Water Storage by Polynomial Regression and Artificial Neural Networks
Alfredo Bono and Roberto Alvarez 934

Crop Ecology & Physiology

Diamond Zoysiagrass Golf Green Response to Reduced Light Environments with the Use of Trinexapac-Ethyl
Jeffrey L. Atkinson, Lambert B. McCarty, Haibo Liu, Jim Faust, and Joe E. Toler 847

Spatial Interrelationships between Wheat Phenology, Thermal Time, and Terrain Attributes
Gregory S. McMaster, Timothy R. Green, Robert H. Erskine, Debora A. Edmunds, and James C. Ascough II 1110

Crop Economics, Production & Management

Maize Evapotranspiration and Water-Use Efficiency in Response to Row Spacing
P. Barbieri, L. Echarte, A. Della Maggiora, V. O. Sadras, H. Echeverria, and F. H. Andrade 939

Lack of Hybrid, Seeding, and Nitrogen Rate Interactions for Corn Growth and Yield
William J. Cox and J. H. Cherney 945

Planting Soybean with a Grain Drill Inconsistently Increases Yield and Profit
John Orlowski, William J. Cox, Antonio Ditommaso, and Wayne Knoblauch 1065

An Innovative Crop–Forage Intercrop System: Early Cycle Soybean Cultivars and Palisadegrass
C.A.C. Crusciol, G.P. Mateus, A.S. Nascente, P.O. Martins, E. Borghi, and C.M. Pariz 1085

The Effects of Seeding Rate on Older Stands of Glyphosate-Tolerant Alfalfa
M. H. Hall, J. M Dillon, H. J. Stambaugh, N. S. Hebrock, J. L. Caddel, V. N. Owens, R. M. Sulc, D. J. Undersander, and R. E. Whitesides 1096

The Impact of Drainage Water Management Technology on Corn Yields
Benoit A. Delbecq, Jason P. Brown, Raymond J. G. M. Florax, Eileen J. Kladivko, Adela P. Nistor, and Jess M. Lowenberg-DeBoer 1100

Cover: Corn (*Zea mays* L.) and soybean [*Glycine max* (L.) Merr.] crops are shown at the end of the growing season in a corn–soybean rotation study evaluating no-till and strip-till tillage systems with broadcast and subsurface-band phosphorus and potassium placement. Two articles from the same study (one on soybean, one on corn) are published in this issue. See the articles: "No-Till and Strip-Till Corn Production with Broadcast and Subsurface-Band Phosphorus and Potassium," by F.G. Fernández and C. White, pages 996–1005; and "Soybean Seed Composition, Aboveground Growth, and Nutrient Accumulation with Phosphorus and Potassium Fertilization in No-Till and Strip-Till," by B.S. Farmaha, F.G. Fernández, and E.D. Nafziger, pages 1006–1015. Photo credit: Fabián G. Fernández.

Variable Environment and Market Affect Optimal Nitrogen Management in Wheat and Cattle Production Systems
X. C. (John) Zhang, C. T. MacKown, J. D. Garbrecht, H. Zhang, and J. T. Edwards 1136

Lightweight Rolling Effects on Anthracnose of Annual Bluegrass Putting Greens
Joseph A. Roberts, James A. Murphy, and Bruce B. Clarke . . 1176

Simulating the Production Potential of Dryland Spring Canola in the Central Great Plains
D. C. Nielsen, S. A. Saseendran, L. Ma, and L. R. Ahuja . . . 1182

Organic Agriculture & Agroecology

Yield and Weed Abundance in Early- and Late-Sown Field Pea and Lentil
Adria L. Fernandez, Craig C. Sheaffer, Donald L. Wyse, and Thomas E. Michaels 1056

Soil Fertility & Crop Nutrition

Nitrogen Dynamics in Irrigated Forage Systems Fertilized with Liquid Dairy Manure
Daniel Geisseler, Patricia A. Lazicki, G. Stuart Pettygrove, Bernard Ludwig, Philip A. M. Bachand, and William R. Horwath 897

Using Active Canopy Sensing to Adjust Nitrogen Application Rate in Corn
D. W. Barker and J. E. Sawyer 926

Alfalfa Nitrogen Credit to First-Year Corn: Potassium, Regrowth, and Tillage Timing Effects
Matt A. Yost, Jeffrey A. Coulter, Michael P. Russelle, Craig C. Sheaffer, and Daniel E. Kaiser 953

No-Till and Strip-Till Corn Production with Broadcast and Subsurface-Band Phosphorus and Potassium
Fabián G. Fernández and Catherine White 996

Soybean Seed Composition, Aboveground Growth, and Nutrient Accumulation with Phosphorus and Potassium Fertilization in No-Till and Strip-Till
Bhupinder S. Farmaha, Fabián G. Fernández, and Emerson D. Nafziger 1006

Yield and Potassium Balance in a Wheat–Maize Cropping System of the North China Plain
Chun-e He, Zhu Ouyang, Zhen-rong Tian, and Harwood D. Schaffer. 1016

The Effects of Chloride and Potassium Nutrition on Seed Yield of Annual Canarygrass
William E. May, Sukhdev S. Malhi, Christopher B. Holzapfel, Bryan X. Nybo, Jeff J. Schoenau, and Guy P. Lafond 1023

Effects of Polymer-Coated Urea Application Ratios and Dates on Wheat and Subsequent Double-Crop Soybean
P. R. Nash, K. A. Nelson, P. P. Motavalli, and C. G. Meinhardt. . 1074

Does Handling Physically Alter the Coating Integrity of ESN Urea Fertilizer?
Brian L. Beres, Ross H. McKenzie, Ray E. Dowbenko, Cosmin V. Badea, and Dean M. Spaner 1149

Soil Tillage, Conservation & Management

Cotton Production as Affected by Irrigation Level and Transitioning Tillage Systems
P. B. DeLaune, J. W. Sij, S. C. Park, and L. J. Krutz 991

Can a Labile Carbon Test be Used to Predict Crop Responses to Improve Soil Organic Matter Management?
S. T. Lucas and R. R. Weil 1160

Rainfall as a Limiting Factor for Wheat Grain Yield in Permanent Raised-Beds
Agustin Limon-Ortega and Ken Sayre 1171

Urban Agriculture

Species Selection, Pre-Plant Cultivation, and Traffic Affect Overseeding Establishment in Bermudagrass Turf
Jon M. Trappe, Michael D. Richardson, and Aaron J. Patton. . 1130

Notes & Unique Phenomena

Estimating Factor Contributions to Soybean Yield from Farm Field Data
Maria B. Villamil, Vince M. Davis, and Emerson D. Nafziger . . 881

Effects of Zinc Fertilization on Zinc Dynamics in Potentially Zinc-Deficient Calcareous Soil
Xinchun Lu, Juan Cui, Xiaohong Tian, Jumoke E. Ogunniyi, William J. Gale, and Aiqing Zhao 963

Other Items

ASA Statement of Ethics iv
Errata 1197

AGRONOMY JOURNAL
Vol. 104, no. 4 (July/August 2012)
Page 2 of 2

JULY 2012 | VOL. 117 | NO. 7

Coal Age

FEATURE ARTICLES

24 China Ship Congestion—How So Many Capesize Ships Got Locked Out of China's Ports

30 MINExpo 2012 Preview
Las Vegas hosts the largest exposition for mining and mineral processing

48 Engineering the New Wild Boar Prep Plant
The design integrates safety and maintenance consideration with simplified circuits

54 Public Relations vs. Public Affairs
Knowing the difference, companies can communicate better

56 *Coal Age* Buyers Guide 2012

68 An Observation About Exporting Coal to China

71 Fiber Optics Report Pendant Line Conditions

COAL IN THE NEWS

4 Senate rejects the Stop UMACT Rule

4 Patriot Coal files for Chapter 11 reorganization to improve the company's long-term prospects

5 Rhino temporarily idles CAPP production

6 EPA targets Essar Group for CWA violations

8 Hallador seeks permit for Allerton

10 Kentucky bans habitual offenders from mining

10 UBB is permanently sealed

12 Kentucky coal operator ordered to reinstate miner to job

14 CONSOL Energy idles Fola, extends summer vacation for some longwall miners

16 Arch Coal responds to market downturn

18 MSHA turns its attention to ribs again

20 Cloud Peak acquires CONSOL Energy's PRB assets

22 Iron ore miners need coal-fired power

WORLD NEWS

5 Rio Tinto makes first coal shipment from Mozambique

BHP approves Appin Area 9 project in Australia

China's major ports face coal oversupply

6 Anglo American gets consent for Grovenor project in Australia

Colombian coal exports drop in May

8 Prospects for Donkin revival doubtful

India to decide on coal block de-allocation

NEWS/4

MINEXPO PREVIEW/30

PREP PLANT DESIGN/48

BUYERS GUIDE/56

THIS ISSUE

This month, Coal Age offers readers an inside look at what they will see at MINExpo INTERNATIONAL 2012. More than 1,800 companies will participate in the world's largest mining exposition. On the cover, the view from the Joy-Global stand at MINExpo 2008. (Photo: Lee Buchsbaum)

DEPARTMENTS

2 Editorial

4 Coal in the News

5 World News

12 People

14 Dateline Washington

16 Calendar

18 Awards

20 Letters to the Editor

68 Market Watch

71 Operating Ideas

72 Suppliers News

74 Product News

77 Classified

80 Legally Speaking

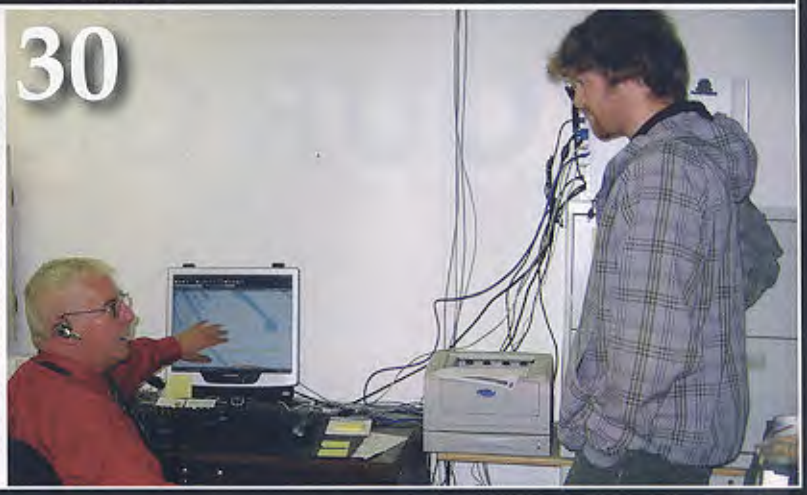
EARTH

SEPTEMBER 2012
vol. 57 ■ no. 9
www.earthmagazine.org

FEATURE

SEISMIC CITIZENS:
Volunteers host home-based seismometers to help assess earthquake threat

30



Driven by a desire to help scientists prepare for the next big earthquake and by an interest in science and technology, residents in the Pacific Northwest are installing seismometers in their houses through the NetQuakes program.

Timothy Oleson

FEATURE

DO-IT-YOURSELF LAVA FLOWS:
Science, Art and Education in the Syracuse University Lava Project

38

It's not every day that lava flows through a parking lot of a college campus, but it is common at Syracuse University, thanks to the Syracuse University Lava Project, a unique mix of science, art and education that was developed to investigate the physical properties, aesthetics and educational opportunities of creating basaltic lava.

Jeffrey A. Karson and Robert J. Wysocki

FEATURE

TRAVELS IN GEOLOGY:
South Africa: On Safari for the Geological Big Five

46

Whether talking about South Africa's charismatic megafauna, its marine ecosystem, the unique fynbos plant community, or the extraordinary rock record, the country has something for everyone.

Callan Bentley

ON THE COVER: The Syracuse University Lava Project involves melting basalt in a large crucible and then pouring it onto various surfaces to test properties of lava. Photos courtesy of Jeffrey A. Karson. Background image ©Shutterstock.com/RZ design.

NEWS

12 SUPERVOLCANOES' SURPRISINGLY SHORT FUSES

13 EARLY GRANITES MAY HOLD KEY TO MULTICELLULAR EVOLUTION

14 ANTARCTIC TREES SURPRISE SCIENTISTS

15 PHYSICISTS FINGERPRINT PLUTONIUM

16 SAN ANDREAS OBSERVATORY REVEALS WEAK FAULT

16 IRELAND BOULDER MYSTERY SOLVED

17 LOWER MANTLE HIDEOUT FOR MISSING SILICON REVEALED

18 PETM WEATHERING GOT PHYSICAL

19 DETAILED GROUNDWATER MAPS OF AFRICA PRODUCED

19 ON MARS, SAND SALTATES

20 MODELS AND MAPPING OF "GROUNDING LINE" MODIFY ANTARCTIC FORECAST

21 SUPERWINDS BLOW STAR STUFF INTO SPACE

22 NEW DATES PLACE SPANISH CAVE ART AS OLDEST IN EUROPE

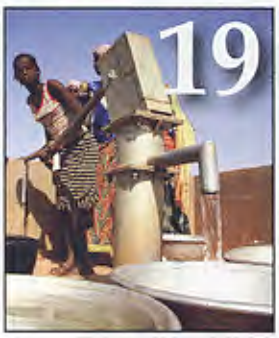
23 BRINGING DINOSAUR BIOLOGY INTO THE 21ST CENTURY

24 LIFT-OFF FOR AMERICA'S COMMERCIAL SPACEFLIGHT INDUSTRY

25 THE MALDIVES TO BECOME WORLD'S LARGEST MARINE RESERVE

25 SOS: AMERICA'S ICEBREAKERS

26 BALANCING THE TERRESTRIAL CONTRIBUTION TO SEA LEVEL



28 COMMERCIAL SHIPS COULD BOOST TSUNAMI-WARNING NETWORK

29 SPEEDY COELACANTHS ONCE SWAM THE SEAS

29 AT EARTH ONLINE ...

VIEWS

8 A COMMENT
RIDING THE DRAGON: COMMERCIAL SPACE EXPLORATION
In May, when the SpaceX Dragon spaceship docked with the International Space Station, it heralded a revolution in space exploration: We have entered the era of private spaceflight, and just in time.
Ryan Anderson

72 GEOLOGIC COLUMN
THE BIG THAW
Permafrost, spread across the Arctic and chock full of carbon, is thawing and releasing methane. Thawing permafrost might well be that proverbial horse that gets out of the barn before we can rein it in.
Fred Schwab

DEPARTMENTS

4 FROM THE EDITOR

6 LETTERS: PERSPECTIVES FROM READERS

10 EARTH EXPOSURES: HOG ISLAND BAY, VIRGINIA
Michael Collier

53 GEOMEDIA
On the Web: Sky Watching via Cyberspace
TV: Physics, Genetics, Resurrection and More Are Explored in "Through the Wormhole"

55 CROSS-SECTION: A PUZZLE

56 WHERE ON EARTH?

57 MINERAL RESOURCE OF THE MONTH

58 BENCHMARKS
September 23, 1933: The U.S. Oil Industry Arrives in Saudi Arabia

61 DOWN TO EARTH WITH
UNIVERSITY PRESIDENT AND OILMAN BRUCE BENSON

64 EARTH PRODUCT SPOTLIGHT

66 GEOMARKETPLACE

67 CLASSIFIEDS: CAREER OPPORTUNITIES

AUGUST 2012 • VOL 213 • NUMBER 8

E&MJ ENGINEERING AND MINING JOURNAL®

FEATURES

MINExpo 2012 Preview
Las Vegas hosts the world's largest exposition for mining and mineral processing 30

The Drivers of Autonomy
Both underground and on surface, autonomous mining machines are becoming increasingly attractive 52

MTU Rolls Out New Engines to Meet Tier 4 Final Standards
The diesel builder uses its popular, large-displacement Tier 2 models as a launching pad to integrate new technology for improved performance in the Tier 4 era 58

Gearbox Builders Ratchet Up Resources
New mines, customers and technologies require speedy support, broader distribution networks and higher education 62

China Ship Congestion—How So Many Capesize Ships Got Locked Out of China's Ports 66

A Predictive Approach to Haul-road Dust Control
An Australian company provides information that allows its customers to determine the best way to manage possible mining-related dust-impact events, in advance 70

Special Report: Mining in Brazil
Big, bountiful but bewilderingly bureaucratic 73

The Growing Popularity of Sustainable Mine Reclamation
Companies may reap potential rewards by considering the Triple Bottom Line business model, which bolsters sustainability through financial prosperity, environmental stewardship and social responsibility 104

ICMM Represents Mining at Rio+20
The mining industry demonstrates its commitment to sustainability 108

LEADING DEVELOPMENTS

Vale Obtains Environmental License for S11D, Moves Closer to Construction 4
Iron Ore Miners Producing Record Rates at Mid-year 4
Gold Discoveries not Keeping Pace with Mine Production 5
Turquoise Hill is Ivanhoe's New Name 6
Mining Companies' Share Performance Falling Short of Operating Results: PwC 6

AROUND THE WORLD

U.S. & Canada: *New Gold Starts Production at New Afton* 8
Latin America: *PanTerra Reprocessing Historic Pueblo Viejo Tailings* 16
Australia/Oceania: *Nyrstar Considering Redevelopment of Port Pirie Smelter* 18
Africa: *Tiger Resources Begins Exporting Kipoi Concentrate* 20
Asia: *OceanaGold Signs Didipio Concentrate Offtake Agreement* 22
Exploration Roundup: *North American Palladium Reports Positive Exploration Results at Lac des Iles* 24

This month, E&MJ offers readers an inside look at the equipment and services they can expect to see at MINExpo INTERNATIONAL 2012—the world's largest mining exposition. The U.S. National Mining Association hosts the event every four years in Las Vegas. On the cover, delegates inspect haul trucks at MINExpo 2008. (Photographer: Lee Buchsbaum/ www.lmbphotographgy.com)

DEPARTMENTS

Calendar 28
Classified Advertisements 126
Equipment Gallery 124
From the Editor 2
Markets 128
Operating Strategies 116
People 14
Processing Solutions 122
Suppliers Report 118
This Month in Coal 26

ENR - ENGINEERING NEWS RECORD

August 13, 2012

Contents

Volume 269 • Number 5

COVER STORY

Hudson River Cleanup

42 GE's $1-billion, 10- to 11-year project to reduce PCB levels in the Hudson River is under way. But does it go far enough?

50 The persistent PCB problem

Cover photo and photo right courtesy of General Electric

Work starts on California treatment plant. Page 53

SPECIAL REPORT

The Top 200 Environmental Firms

53 Firms look to resurging private-sector work, particularly in new global locations and in rebounding energy markets, to boost this year's revenue total by 5%

UPCOMING ISSUES

Aug. 20	Web News and Updates
Aug. 27	Top International Contractors
Sept. 3	Top 10 Water Projects
Sept. 10	Q3 Technology Focus

NEWS

Buildings

10 **Data Centers:** Patented system designed to slash data-center water, power and cooling costs

Power & Industrial

12 **Power:** India blackout highlights power gap, opportunities

Transportation

14 **Mass Transit:** Dallas ramps up innovation on expanding rail network

14 **Bridges:** Recycled plastic gaining interest

20 **Infrastructure:** Team members left hanging on bid for Tappan Zee Bridge

Business Management

16 **Research:** CII sees room to improve industrial project performance

19 **Public Works:** Ethics issues kill contract

Legal

18 **Workforce:** Judges overturn same-sex sexual harassment verdict

enr.com
ADDITIONAL CONTENT ONLINE

DEPARTMENTS

4 Calendar
6 Construction Week
9 Washington Observer
22 Information Technology
23 Equipment Tracks & Trends
24 People
39 Construction Economics
74 Products/Manufacturers' Information
76 Pulse
80 Editorials

Please Recycle This Magazine

For subscriber services call:
(877) 876-8208 or (515) 237-3681

GO TO MY.ENR.COM FOR PASSWORD-PROTECTED ONLINE ACCESS.

Not getting ENR Insider and News Alerts? Please call (877) 876-8208

Engineering News-Record
The McGraw-Hill Companies
SERVING THE INDUSTRY SINCE 1874

ENR (Engineering News-Record), (ISSN 0891-9526). Published weekly 3 issues a month; 36 weeks a year by The McGraw-Hill Companies, 1221 Ave. of the Americas, New York, N.Y. 10020. **Founder:** James H. McGraw (1860-1948). **Executive, editorial, circulation, advertising offices:** Two Penn Plaza, New York, N.Y. 10121-2298. Phone (212) 512-2000. **Postmaster:** Please send address changes to ENR/Engineering News-Record, Attention: Fulfillment Manager, P.O. Box 5730, Harlan, IA 51593. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post Publication Mail Agreement No.40012501. Registered for GST as The McGraw-Hill Companies. GST #R123075673. RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: DHL Global Mail, 355 Admiral Blvd-Unit 4, Mississauga, ON L5T 2N1. Email: enrcustserv@cdsfulfillment.com.

Copyright, printing and reprinting: Titles Engineering News-Record (ENR) and CONSTRUCTION WEEK reg. ® in U.S. Patent Office. Copyright © 2012 by The McGraw-Hill Companies. All rights reserved.
Officers of The McGraw-Hill Companies, Inc.: Harold W. McGraw III, Chairman, President, and Chief Executive Officer; Jack F. Callahan Jr., Executive Vice President and Chief Financial Officer; Kenneth M. Vittor, Executive Vice President and General Counsel. McGraw-Hill Construction: Keith Fox, President; John Murphy, Director, Finance.
Where necessary, permission is granted by copyright owner for those registered with Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, Mass. 01923, www.copyright.com, to photocopy any article herein for personal or internal reference use only for the flat fee of $1.20 per copy for each article. Send payment to CCC. ISSN 0891-9526/92. Copying for other than personal or internal reference use without express permission of The McGraw-Hill Companies is prohibited. Write the editor to request such permission.
Printed in the USA. Subscription rates for individuals in the field of the publication: U.S. and possessions, $82 per year (single copies $9.95 in U.S.); Canada and Mexico, $89 per year; outside North America, $195 per year. Please allow four to six weeks for shipment. **Subscriber service and single copies:** (877) 876-8208 or (515) 237-3681. Send all correspondence, notices and subscription orders to Fulfillment Manager, ENR, P.O. Box 5730, Harlan, IA 51593. If possible, attach address label from a recent issue. **Please contact customer service to change your name or address.** If the postal authorities alert us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within two years. Please allow a month for change of address to take effect. Classified advertising: Send ads to ENR, Classified Advertising, Two Penn Plaza, 9th Floor, New York, NY 10121. Phone (212) 904-2815.

PHOTO COURTESY OF PCL

ENR - ENGINEERING NEWS RECORD

August 27, 2012

Contents

Volume 269 • Number 6

COVER STORY

Brazil

40 The president of South America's biggest country is pressed to build infrastructure needed for the 2014 World Cup and 2016 Olympics—and for after the Games have ended.

Cover photo and right courtesy of Brazil Ministry of Sports

FEATURE

Top International Contractors

49 Significant global opportunities mean international contractors' revenues rise after a three-year lull, despite concern about Europe's financial health

Hochtief expands Salzburg's rail station. Page 49

NEWS

Transportation

8 **Infrastructure:** London's huge Crossrail tunnel project survives austerity cuts

UPCOMING ISSUES

Sept. 3	Top 10 Water Projects
Sept. 10	Q3 Technology Focus
Sept. 17	Top 400 Sourcebook
Sept. 24	Q3 Cost Report

12 **Finance:** States gear up to compete for expanded DOT loan program

17 **Bridges:** Feds and designers speed up schedule for elevated scheme

Business & Management

11 **Labor:** Caterpillar strike didn't stall production at hydraulics plant

39 **Obituary:** Frank A. Lee, 88, fought take-over of Foster Wheeler Corp.

Legal

14 **Safety:** Table-saw safety bill advances in California over objections of power-tool industry

Power & Industrial

16 **Technology:** Sewage treatment innovation promises big net-energy gain

Crossrail pushes forward with construction. Page 8

DEPARTMENTS

4 Update
6 Washington Observer
7 Construction Week
18 Information Technology
39 People
79 Products
82 Equipment Tracks & Trends
83 Construction Economics
89 Pulse
96 Viewpoint

Please Recycle This Magazine

For subscriber services call:
(877) 876-8208 or (515) 237-3681

GO TO MY.ENR.COM FOR PASSWORD-PROTECTED ONLINE ACCESS.

Not getting ENR Insider and News Alerts? Please call (877) 876-8208

enr.com
ADDITIONAL CONTENT ONLINE

Engineering News-Record
The McGraw-Hill Companies
SERVING THE INDUSTRY SINCE 1874

ENR (Engineering News-Record), (ISSN 0891-9526). Published weekly 3 issues a month; 36 weeks a year by The McGraw-Hill Companies, 1221 Ave. of the Americas, New York, N.Y. 10020. **Founder:** James H. McGraw (1860-1948). **Executive, editorial, circulation, advertising offices:** Two Penn Plaza, New York, N.Y. 10121-2298. Phone (212) 512-2000. **Postmaster:** Please send address changes to ENR/Engineering News-Record, Attention: Fulfillment Manager, P.O. Box 5730, Harlan, IA 51593. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post Publication Mail Agreement No.40012501. Registered for GST as The McGraw-Hill Companies. GST #R123075673. RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: DHL Global Mail, 355 Admiral Blvd-Unit 4, Mississauga, ON L5T 2N1. Email: enrcustserv@cdsfulfillment.com. **Copyright, printing and reprinting:** Titles Engineering News-Record (ENR) and CONSTRUCTION WEEK reg. ® in U.S. Patent Office. Copyright © 2012 by The McGraw-Hill Companies. All rights reserved. **Officers of The McGraw-Hill Companies, Inc.:** Harold W. McGraw III, Chairman, President, and Chief Executive Officer; Jack F. Callahan Jr., Executive Vice President and Chief Financial Officer; Kenneth M. Vittor, Executive Vice President and General Counsel. McGraw-Hill Construction: Keith Fox, President; John Murphy, Director, Finance. Where necessary, permission is granted by copyright owner for those registered with Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, Mass. 01923, www.copyright.com, to photocopy any article herein for personal or internal reference use only for the flat fee of $1.20 per copy for each article. Send payment to CCC. ISSN 0891-9526/92. Copying for other than personal or internal reference use without express permission of The McGraw-Hill Companies is prohibited. Write the editor to request such permission. **Printed in the USA. Subscription rates for individuals in the field of the publication:** U.S. and possessions, $82 per year (single copies $9.95 in U.S.); Canada and Mexico, $89 per year; outside North America, $195 per year. Please allow four to six weeks for shipment. **Subscriber service and single copies:** (877) 876-8208 or (515) 237-3681. Send all correspondence, notices and subscription orders to Fulfillment Manager, ENR, P.O. Box 5730, Harlan, IA 51593. If possible, attach address label from a recent issue. **Please contact customer service to change your name or address.** If the postal authorities alert us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within two years. Please allow a month for change of address to take effect. Classified advertising: Send ads to ENR, Classified Advertising, Two Penn Plaza, 9th Floor, New York, NY 10121. Phone (212) 904-2815.

PHOTO LEFT COURTESY OF HOCHTIEF AG, RIGHT COURTESY OF BKF-JOINT VENTURE

THE GEOLOGICAL SOCIETY OF AMERICA®

BULLETIN

VOL. 124 • NO. 9/10 • P. 1409–1664 SEPTEMBER/OCTOBER 2012

The Geological Society of America Bulletin *is a leading international journal for major scholarly research in all branches of the earth sciences. Published continuously since 1890.*

TABLE OF CONTENTS

PALEOCLIMATOLOGY

1411 **New constraints on using paleosols to reconstruct atmospheric pCO_2**
Jennifer M. Cotton and Nathan D. Sheldon

PALEOCEANOGRAPHY

1424 **Evidence for a diachronous Late Permian marine crisis from the Canadian Arctic region**
Thomas Algeo, Charles M. Henderson, Brooks Ellwood, Harry Rowe, Erika Elswick, Steven Bates, Timothy Lyons, James C. Hower, Christina Smith, Barry Maynard, Lindsay E. Hays, Roger E. Summons, James Fulton, and Katherine H. Freeman

GEOCHRONOLOGY

1449 **Coupled U-Pb dating and Hf isotopic analysis of detrital zircon of modern river sand from the Yalu River (Yarlung Tsangpo) drainage system in southern Tibet: Constraints on the transport processes and evolution of Himalayan rivers**
J.Y. Zhang, A. Yin, W.C. Liu, F.Y. Wu, Ding Lin, and M. Grove

NEOTECTONICS

1474 **An exceptionally long paleoseismic record of a slow-moving fault: The Alhama de Murcia fault (Eastern Betic shear zone, Spain)**
María Ortuño, Eulalia Masana, Eduardo García-Meléndez, José Martínez-Díaz, Petra Štěpančíková, Pedro P. Cunha, Reza Sohbati, Carolina Canora, Jan-Pieter Buylaert, and Andrew S. Murray

DEFORMATION

1495 **Contribution of crystallographic preferred orientation to seismic anisotropy across a surface analog of the continental Moho at Cabo Ortegal, Spain**
Sergio Llana-Fúnez and Dennis Brown

TECTONICS

1514 **Paleogeographic reconstruction of a late Paleozoic arc collision zone, southern Mongolia**
Matthew J. Heumann, Cari L. Johnson, Laura E. Webb, Joshua P. Taylor, Undarya Jalbaa, and Chuluun Minjin

1607 **Permian–Carboniferous arc magmatism and basin evolution along the western margin of Pangea: Geochemical and geochronological evidence from the eastern Acatlán Complex, southern Mexico**
Moritz Kirsch, J. Duncan Keppie, J. Brendan Murphy, and Luigi A. Solari

TECTONOPHYSICS

1535 **Anatomy and tectono-sedimentary evolution of a rift-related detachment system: The example of the Err detachment (central Alps, SE Switzerland)**
Emmanuel Masini, Gianreto Manatschal, Geoffroy Mohn, and Patrick Unternehr

QUATERNARY GEOLOGY/GEOMORPHOLOGY

1552 **Geochronology of the Bolson sand sheet, New Mexico and Texas, and its archaeological significance: Discussion**
H. Curtis Monger, Brenda J. Buck, John W. Hawley, and David M. Rachal

1557 **Geochronology and stratigraphy of the Bolson sand sheet: Reply**
Stephen A. Hall, Myles R. Miller, and Ronald J. Goble

1629 **Growth of fissure ridge travertines from geothermal springs of Denizli Basin, western Turkey**
Luigi De Filippis, Claudio Faccenna, Andrea Billi, Erlisiana Anzalone, Mauro Brilli, Mehmet Özkul, Michele Soligo, Paola Tuccimei, and Igor M. Villa

VOLCANOLOGY

1562 **Caldera structure, amount of collapse, and erupted volumes: The case of Bolsena caldera, Italy**
V. Acocella, D.M. Palladino, R. Cioni, P. Russo, and S. Simei

PALEOBOTANY

1577 **Eocene vegetation and ecosystem fluctuations inferred from a high-resolution phytolith record**
Lauren A. Miller, Selena Y. Smith, Nathan D. Sheldon, and Caroline A.E. Strömberg

GEOCHEMISTRY

1646 **The Toarcian oceanic anoxic event in the Western Saharan Atlas, Algeria (North African paleomargin): Role of anoxia and productivity**
Matías Reolid, Francisco J. Rodríguez-Tovar, Abbas Marok, and Abbes Sebane

PALEONTOLOGY

1590 **Chronology of the Eocene continental deposits of Africa: Magnetostratigraphy and biostratigraphy of the El Kohol and Glib Zegdou Formations, Algeria**
Pauline Coster, Mouloud Benammi, Mohammed Mahboubi, Rodolphe Tabuce, Mohammed Adaci, Laurent Marivaux, Mustapha Bensalah, Salamet Mahboubi, Abdessamed Mahboubi, Fateh Mebrouk, Cheikh Maameri, and Jean-Jacques Jaeger

ADDENDUM

1448 **Evidence for a diachronous Late Permian marine crisis from the Canadian Arctic region**
Thomas Algeo, Charles M. Henderson, Brooks Ellwood, Harry Rowe, Erika Elswick, Steven Bates, Timothy Lyons, James C. Hower, Christina Smith, Barry Maynard, Lindsay E. Hays, Roger E. Summons, James Fulton, and Katherine H. Freeman

VOL. 25, NO. 11

GOVERNING

08.2012

FEATURES

24 OVER-THE-COUNTER CULTURE
Thanks to tighter state controls, medical marijuana is more mainstream than ever before.
By Dylan Scott

32 SQUEEZED
Hit harder by the economic downturn than either cities or states, counties are feeling pressure from all sides, leading many to reexamine county functions altogether. Are counties an outdated concept—or are they the future?
By Alan Greenblatt

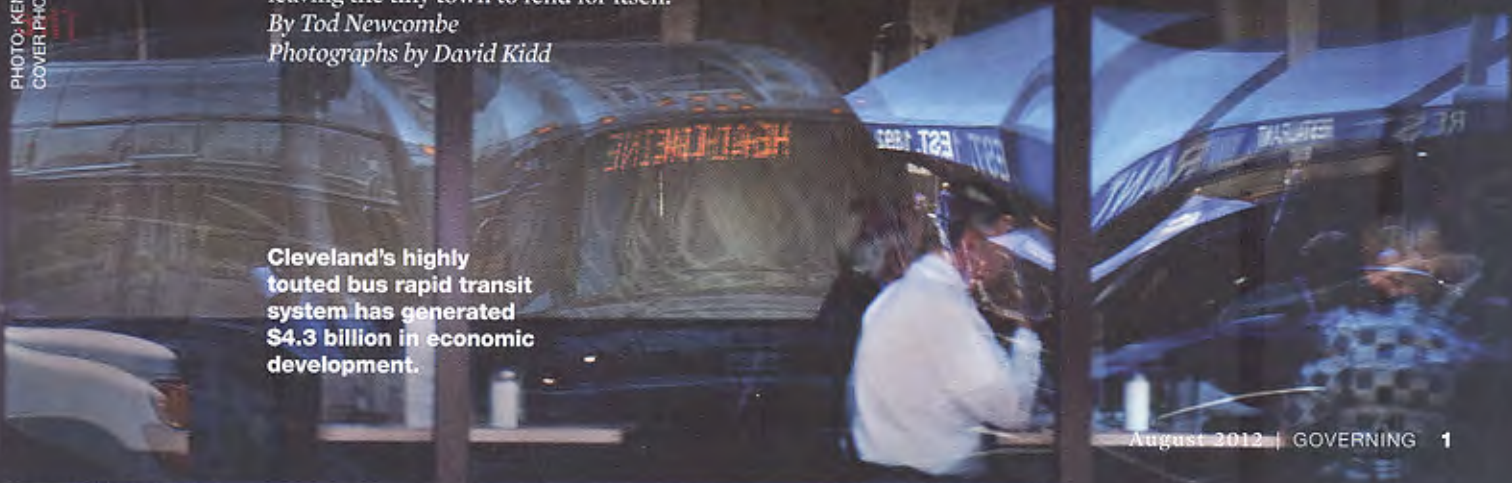
36 HYBRID PENSIONS
Unable to continue making payments on traditional retirement benefits, officials are trading in the old model and looking for a more efficient option.
By Carol Anderson

40 HOLDING THE SAFETY NET
Four people worth watching in human services.
By Jonathan Walters

46 GET ON THE BUS
Several localities are embracing bus rapid transit, even if not everyone in the transportation community is sold on the idea.
By Ryan Holeywell

52 A COMPANY TOWN WITHOUT A COMPANY
In 1971, the Olin chemical company pulled out of Saltville,Va., leaving the tiny town to fend for itself.
By Tod Newcombe
Photographs by David Kidd

PHOTO: KEN BLAZE
COVER PHOTO: BARRY STAVER



Cleveland's highly touted bus rapid transit system has generated $4.3 billion in economic development.

GOVERNING MAGAZINE
Vol. 25, no. 11 (August 2012)
Page 2 of 2

DEPARTMENTS

4 Publisher's Desk

6 Letters

OBSERVER

9 Forgiving Overdoses
New laws give legal immunity to people who report ODs.

10 Call It the Low Line
Architects want to develop the tunnels under Washington, D.C.'s Dupont Circle.

12 The Story on Agenda 21
Is the anti-planning rhetoric for real?

POLITICS + POLICY

14 Dispatch
The odd fit between public finance and social media.

16 Potomac Chronicle
Once-forgotten diseases return, raising troubling questions.

17 FedWatch
The federal government is testing talking cars.

18 Health
Louisiana has slashed the rate of uninsured kids.

20 Green Government
With green jobs comes the need for a green education.

22 Economic Engines
The next challenge for bikers is legal protection from drivers.

23 Urban Notebook
A new and uncertain era in news coverage has begun.

PROBLEM SOLVER

60 Starting Early
To combat dropout rates, some states require high schoolers to pick majors.

62 Smart Management
Gainsharing can save money, but the concept has fallen on hard times.

63 Idea Center
New York will become the first state to make pro bono work mandatory for admittance to the state bar.

64 Tech Talk
What one city's "Footloose" moment can teach others.

66 Public Money
The recession hit private workers hard. Will states and localities have to rescue them?

68 Last Look
A new library in the District of Columbia adds style to its neighborhood.

APIMAGES.COM

16

SHUTTERSTOCK.COM

22

SHUTTERSTOCK.COM

20

Government Executive

Contents 08/15/2012

Vol.44, no. 9

STOCKTREK/GETTY IMAGES

FEATURES

10 **The Next War**
Today's budget battles will determine what U.S. troops carry into real battles for years to come. By Sydney J. Freedberg Jr.

20 **Course Correction**
F-35 program manager Vice Adm. David Venlet seeks to return to acquisition fundamentals. By Dan Taylor

28 **Keeping the Faith**
Military compensation reform is in its infancy, but it's already causing full-blown anxiety. By Kellie Lunney

36 **Truth & Consequences**
Two analysts explore the potential fallout if Congress fails to avert defense cuts. By Marion C. Blakey and Winslow T. Wheeler

COVER PHOTOGRAPH BY ED DARACK/CORBIS

4 **Editor's Notebook**
Pentagon leaders face an unprecedented combination of challenges.

ADVICE AND COMMENT

41 **The Hacker Wars**
Collateral damage and a dearth of cyberwarriors are among the Pentagon's biggest hurdles.

44 **In the Line of Fire**
Defense employees hunker down for the potential barrage of budget and workforce cuts.

46 **Looking Ahead**
Former Marine Bob Brewin looks at the Army's battlefield network.

JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION

Vol. 48, No. 4

AMERICAN WATER RESOURCES ASSOCIATION

August 2012

Table of Contents

Technical Papers

Generation of Ensemble Streamflow Forecasts Using an Enhanced Version of the Snowmelt Runoff Model
– *Brian J. Harshburger, Von P. Walden, Karen S. Humes, Brandon C. Moore, Troy R. Blandford, and Albert Rango* 643

Karst Hydrological Processes and Grey System Model
– *Yonghong Hao, Jiaojuan Zhao, Huamin Li, Bibo Cao, Zhongtang Li, and Tian-Chyi J. Yeh* 656

Snowmelt Runoff and Water Yield Along Elevation and Temperature Gradients in California's Southern Sierra Nevada
– *Carolyn T. Hunsaker, Thomas W. Whitaker, and Roger C. Bales* 667

Urban Impacts on Streams are Scale-Dependent with Nonlinear Influences on Their Physical and Biotic Recovery in Vermont, United States
– *Evan P. Fitzgerald, William B. Bowden, Samuel P. Parker, and Michael L. Kline* 679

Calibration Catchment Selection for Flood Regionalization Modeling
– *Wan Zurina Wan Jaafar and Dawei Han* 698

Observations and Modeling of Stream Plunging in an Urban Lake
– *Emmet M. Owens, Steven W. Effler, Anthony R. Prestigiacomo, David A. Matthews, and Susan M. O'Donnell* 707

Channel Evolution Model of Semiarid Stream Response to Urban-Induced Hydromodification
– *Robert J. Hawley, Brian P. Bledsoe, Eric D. Stein, and Brian E. Haines* 722

Estimating Potential *E. coli* Sources in a Watershed Using Spatially Explicit Modeling Techniques
– *K. J. Riebschleager, R. Karthikeyan, R. Srinivasan, and K. McKee* 745

Morphology Characteristics of Southern Appalachian Wilderness Streams
– *Jason M. Zink, Gregory D. Jennings, and G. Alexander Price* 762

Application of Rosgen's BANCS Model for NE Kansas and the Development of Predictive Streambank Erosion Curves
– *Christopher K. Sass and Tim D. Keane* 774

Framework and Tool for Rapid Assessment of Stream Susceptibility to Hydromodification
– *Brian P. Bledsoe, Eric D. Stein, Robert J. Hawley, and Derek Booth* 788

A Side-by-Side Comparison of Pervious Concrete and Porous Asphalt
– *Andrea L. Welker, James D. Barbis, and Patrick A. Jeffers* 809

America's Rivers and the American Experiment
– *Martin W. Doyle* 820

A Question of Boundaries: The Importance of "Revenuesheds" for Watershed Protection
– *Lauren A. Patterson, Jeffrey Hughes, Glenn Barnes, and Stacey I. Berahzer* 838

Reconstructions of Soil Moisture for the Upper Colorado River Basin Using Tree-Ring Chronologies
– *SallyRose Anderson, Glenn Tootle, and Henri Grissino-Mayer* 849

ERRATUM 859

JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION
Vol. 48, no. 4 (August 2012)
Page 2 of 2

AMERICAN WATER RESOURCES ASSOCIATION
Community, Conversation, Connections

Many Disciplines, One Community:
Protecting Water Resources

We invite you to join our unique & progressive community.

The management of water resources has never been more critical.

For more information regarding special half-year rates and lasting benefits, please visit www.awra.org or call us at AWRA at (540) 687-8390.

Please Submit All Manuscripts Through http://www.awra.org/jawra/instructionsforauthors.html.
All inquiries should be made to: Phone (540) 687-8390, Fax (540) 687-8395, or Email jawra@awra.org
For AWRA membership information . . . info@awra.org

Cover photo: Dory on Lower Salmon River Idaho. Photo by Tom Ring.

THE JOURNAL OF
WILDLIFE MANAGEMENT

Vol. 76, Issue 6, August 2012

Table of Contents

EDITOR'S MESSAGE

1107 Student Involvement
Bill Block

COMMENTARY

1108 Harvest and Dynamics of Duck Populations
James S. Sedinger and Mark P. Herzog

RESEARCH ARTICLES

POPULATION ECOLOGY

1117 Estimating Breeding Season Abundance of Golden-Cheeked Warblers in Texas, USA
Heather A. Mathewson, Julie E. Groce, Tiffany M. McFarland, Michael L. Morrison, J. Cal Newnam, R. Todd Snelgrove, Bret A. Collier, and R. Neal Wilkins

1129 Survival, Fidelity, and Recovery Rates of White-Winged Doves in Texas
Bret A. Collier, Shelly R. Kremer, Corey D. Mason, Markus J. Peterson, and Kirby W. Calhoun

1135 Comparative Survival and Recovery of Ross's and Lesser Snow Geese from Canada's Central Arctic
Joshua J. Traylor, Ray T. Alisauskas, Stuart M. Slattery, and Kiel L. Drake

1145 Site Occupancy Dynamics of Northern Spotted Owls in Managed Interior Douglas Fir Forests, California, USA, 1995–2009
Stuart L. Farber and Andrew J. Kroll

1153 Estimating Size and Trend of the North Interlake Woodland Caribou Population Using Fecal-DNA and Capture–Recapture Models
Peter N. Hettinga, Arni Neil Arnason, Micheline Manseau, Dale Cross, Kent Whaley, and Paul J. Wilson

1165 Composite Analysis of Black Duck Breeding Population Surveys in Eastern North America
Guthrie S. Zimmerman, John R. Sauer, William A. Link, and Mark Otto

1177 Evaluating the Ability of Regional Models to Predict Local Avian Abundance
Jaymi J. Lebrun, Wayne E. Thogmartin, and James R. Miller

MANAGEMENT AND CONSERVATION

1188 Effects of Salvage Logging of Beetle-Killed Forests on Avian Species and Foraging Guild Abundance
Andrew J. Kroll, Jack Giovanini, Jay E. Jones, Edward B. Arnett, and Bob Altman

1197 Implications of Goat Eradication on the Survivorship of the Galapagos Hawk
Jose L. Rivera-Parra, Kenneth M. Levenstein, James C. Bednarz, F. Hernan Vargas, Victor Carrion, and Patricia G. Parker

1205 Bird Assemblages of Intensively Established Pine Plantations in Coastal Plain Mississippi
Brice B. Hanberry, Phillip Hanberry, Samuel K. Riffell, Stephen Demarais, and Jeanne C. Jones

1215 Integrated Risk Factors for Vertebrate Roadkill in Southern Ontario
Robert G. Farmer and Ron J. Brooks

1225 Influence of Forest Structure on Density and Nest Success of Mature Forest Birds in Managed Landscapes
Marja H. Bakermans, Amanda D. Rodewald, and Andrew C. Vitz

1235 Reproduction in a Population of Wild Pigs (*Sus scrofa*) Subjected to Lethal Control
Stephen S. Ditchkoff, D. Buck Jolley, Bill D. Sparklin, Laura B. Hanson, Michael S. Mitchell, and James B. Grand

1241 Resource Partitioning Among Cape Foxes, Bat-Eared Foxes, and Black-Backed Jackals in South Africa
Jan F. Kamler, Ute Stenkewitz, Unn Klare, Nicolas F. Jacobsen, and David W. MacDonald

1254 Identification and Management of a Single Large Population of Wild Dromedary Camels
Peter B. S. Spencer, Danielle Giustiniano, Jordan O. Hampton, Phil Gee, Neil Burrows, Ken Rose, Gary R. Martin, and Andrew P. Woolnough

1264 Genetic Structure of Red Deer Population in Northeastern Poland in Relation to the History of Human Interventions
Magdalena Niedziałkowska, Bogumiła Jędrzejewska, Jan M. Wójcik, and Simon J. Goodman

1277 Using Bayesian Stable Isotope Mixing Models to Estimate Wolf Diet in a Multi-Prey Ecosystem
Jonathan J. Derbridge, Paul R. Krausman, and Chris T. Darimont

1290 A Comparison of Methods for Estimating Raccoon Abundance: Implications for Disease Vaccination Programs
James C. Beasley, William S. Beatty, Todd C. Atwood, Shylo R. Johnson, and Olin E. Rhodes, Jr.

HABITAT RELATIONS

1298 Using Bayesian Networks to Incorporate Uncertainty in Habitat Suitability Index Models
George F. Wilhere

1310 Temporal Dynamics of Roost Snags of Long-Legged Myotis in the Pacific Northwest, USA
Michael J. Lacki, Michael D. Baker, and Joseph S. Johnson

HUMAN DIMENSIONS

1317 Policy Learning and Deer Co-Management in New York State: Insights From Newspaper Coverage
Heather A. Triezenberg, T. Bruce Lauber, and Barbara A. Knuth

INFORMATION ACCESS

1326 Books and Literature
Carla G. Heister

1330 Erratum

JOURNAL OF WILDLIFE MANAGEMENT
Vol. 76, no. 6 (August 2012)
Page 2 of 2

You can now read Land and Water Magazine online, visit www.landandwater.com

Land and Water
THE MAGAZINE OF NATURAL RESOURCE MANAGEMENT AND RESTORATION

Volume 56, Number 4 July/August 2012

DEPARTMENTS

6 Tell It Like It Is
53 Equip-Board
54 Advertiser's Index

ABOUT THE COVER

Native landscaping principles used at Lincolnshire North Park (Lincolnshire, IL) unite nature, recreation, and sustainability. Visitors enjoy nature trails, wildlife, and a functioning system that manages stormwater and erosion while also contributing to the aesthetic beauty of the park. Photo Credit: Matt Kocourek, Applied Ecological Services See story page 46.

FEATURES

SLOPE STABILIZATION

8 **HydroMulching Stabilizes NC Landslide**
The combination of a burst water pipe at the top of Buck Mountain, N.C., and higher than normal rainfall caused a three-story wall of mud and rocks to cascade down the mountain.
by Jim Wahl

CONSTRUCTED WETLANDS

13 **Wetlands Return to Ranarium Farm**
A once 55-acre Ranarium Farm is turned into a multi-faceted restoration site.
by Brian Bartell

GEOSYNTHETICS

18 **Geosynthetics Play Key Role in 62-acre Rockwood Landfill Closure**
A bold commitment was made to close a 62-acre landfill during a single summer, using a combination of a geomembrane layer, a geocomposite layer for drainage, and 30 inches of vegetative cover.
by Erin Riccardi, Christina Pearce & Chris Eichelberger

SOIL STABILIZATION

22 **Sky Harbor Airport Soil Stabilization**
Design specifications from the City of Phoenix prompted the use of lime and co-polymers as dust control on a soil stabilization project at the Sky Harbor Airport in Arizona.
by Steven J. Brezzo

URBAN STREAM REHABILITATION

25 **Watts Branch Stream Restoration**
A watershed grant got the ball rolling on a much needed stream restoration project which involved stabilizing land and stream bank erosion, enhancing fish habitat, expanding riparian forest buffer, and increasing canopy cover.
by Peter Hill & Josh Burch

LAKES & PONDS

31 **Ponds as Part of Landscaping**
Bob Lusk tells us how he turned a "snoky-looking mess" surrounding his home, into a pristine lawn, patio, shoreline area, swimming hole and, of course, fishing pond.
by Bob Lusk

SEDIMENT CONTROL

36 **Lake Belle View Restored with Help of Geogrid**
After 30 years of planning, the restoration of Lake Belle View meant a separation berm, using a geogrid, must be constructed to stop sediment from a local river from entering and further destroying the lake.
by Jim Howley

AQUATIC WEED CONTROL

41 **The Creepy Pond – Getting to the Root of the Problem**
Lake management experts donned this pond with the name "The Creepy Pond" after several attempts were made to control the aquatic weeds plaguing the pond before finding the perfect balance of algaecide and maintenance.
by Shannon Junior

LANDSCAPING

46 **Problem Solving with Native Restoration Landscaping**
Native restoration landscaping isn't the traditional approach these days, despite it's ability to offer a versatile, sustainable, and economical alternative to landscaping.
by Elizabeth Tiller

HABITAT RESTORATION

50 **Bringing Back the Salmon – New Fish Hatchery is Key Element in Elwha River Restoration**
In an effort to restore the fish population, two dams along the Elwha River are being removed, along with the construction of a fish hatchery.
by Frank Boulton

STAFF

Kenneth M. Rasch
President

Jane Rasch
Vice President

Amy Dencklau
Publisher
landandwater@frontiernet.net

Shanna Egli
Assistant Editor/Sales
lweditor@frontiernet.net

Martha Steinkamp
Circulation Manager
lwsub@frontiernet.net

Emily Jones
News & Marketing Manager
lwmarketing@frontiernet.net

Angela Dougall
Accounting
lwacct@frontiernet.net

SALES

Gail Henry
Account Executive
gail@landandwater.com
phone: 515-227-5042 or 515-576-3191

Shanna Egli
Assistant Editor/Sales
lweditor@frontiernet.net
515-576-3191

Land and Water (ISSN 0192-9453) is published bimonthly by Land and Water, Inc., 320 A Street, Fort Dodge, IA 50501-9225. Telephone (515)576-3191, Fax (515)576-2606. Land and Water is edited for contractors, engineers, architects, government officials and those working in the field of natural resource management and restoration from idea stage through project completion and maintenance. Subscription rates for printed copies: One year – $20.00; Two years – $35.00; Three years – $50.00. Foreign – add $12.00 per year. All non-paid subscriptions are mailed on a rotating basis to receive occasional copies at Fort Dodge, Iowa and at additional mailing offices. No charge for digital version of the magazine. No part of this publication may be reproduced without the written consent of the publisher. **Land and Water** assumes no responsibility for statements expressed by contributors. Jeremiah 29:11

Mining engineering

OFFICIAL PUBLICATION OF SME
www.miningengineeringmagazine.com

AUGUST 2012
VOL. 64 NO. 8

MINExpo

16 **MINExpo by the numbers**
Emily Wortman-Wunder

26 **National Mining Hall of Fame ceremony to be held during MINExpo**

Feature Articles

80 **History of Newmont's gold treatment facilities at Carlin operations**
B. Arthur and R. Dunne

85 **New water treatment processes balance challenges in Latin America**
Andrew Hall

Technical Papers (peer-reviewed and approved)

87 **Comparing EIA and ESHIA for evaluating mining projects**
R.E. Mitchell

93 **Mine reclamation costs in the Alberta oil sands**
U. Thorley

Copyright 2012 by the Society for Mining, Metallurgy and Exploration, Inc. All rights reserved.
MINING ENGINEERING (ISSN 0026-5187) is published monthly by the Society for Mining, Metallurgy, and Exploration, Inc., at 12999 E. Adam Aircraft Circle, Englewood, CO, 80112 USA. Phone +1-800-763-3132 or +1-303-973-9550. Fax: +1-303-973-3845 or e-mail: sme@smenet.org. Website: www.smenet.org. Periodicals postage paid at Englewood, CO USA and additional mailing offices. Canadian post: publications mail agreement number 0689688.
POSTMASTER: Send changes of address to MINING ENGINEERING, 12999 E. Adam Aircraft Circle, Englewood, CO, 80112 USA.
Printed by Cummings Printing Co.

NATIVE PLANTS JOURNAL

vol. 13 | no. 2 | summer 2012

REFEREED RESEARCH

Outplanting but not seeding establishes native desert perennials 81
Scott R Abella, Donovan J Craig, and Alexis A Suazo

GERMPLASM RELEASE

Notice of release of Bounty Germplasm big bluestem: a selected class of natural germplasm 91
Wayne Markegard, Wayne Duckwitz, Nancy Jensen, and Dwight Tober

Seed-feeding insects impacting globemallow seed production 95
Robert Hammon and Melissa Franklin

Restoring the rare Kentucky lady's slipper orchid to the Kisatchie National Forest 98
James P Barnett, Kevin Allen, and David Moore

Some insects affecting *Penstemon* seed production 107
Robert Hammon and Melissa Franklin

NATIVE PLANT MATERIALS DIRECTORY

Alphabetical listings 112

Location index 174

Rangeland Ecology & Management

A Journal of the Society for Range Management

VOLUME 65 NUMBER 4 JULY 2012

Table of Contents

Invited Synthesis

319 Functional Resource Heterogeneity Increases Livestock and Rangeland Productivity
Richard W. S. Fynn

Forums

330 Using Very-Large-Scale Aerial Imagery for Rangeland Monitoring and Assessment: Some Statistical Considerations
Jason W. Karl, Michael C. Duniway, Sarah M. Nusser, Jean D. Opsomer, and Robert S. Unnasch

340 Profitability of Carbon Sequestration in Western Rangelands of the United States
John P. Ritten, Christopher T. Bastian, and Benjamin S. Rashford

Research Articles

351 Sagebrush Control: At What Canopy Cover Is It Economically Justified?
Christopher T. Bastian, Dannele E. Peck, Michael A. Smith, and James J. Jacobs

362 Using Unmanned Helicopters to Assess Vegetation Cover in Sagebrush Steppe Ecosystems
Robert P. Breckenridge, Maxine Dakins, Stephen Bunting, Jerry L. Harbour, and Randy D. Lee

371 Grazing Distribution and Diet Quality of Angus, Brangus, and Brahman Cows in the Chihuahuan Desert
Morgan L. Russell, Derek W. Bailey, Milt G. Thomas, and Barbara K. Witmore

382 Forage Allowance as a Target of Grazing Management: Implications on Grazing Time and Forage Searching
Júlio K. Da Trindade, Cassiano E. Pinto, Fabio P. Neves, Jean C. Mezzalira, Carolina Bremm, Teresa C. M. Genro, Marcelo R. Tischler, Carlos Nabinger, Horacio L. Gonda, and Paulo C. F. Carvalho

394 Biomass Production and Net Ecosystem Exchange Following Defoliation in a Wet Sedge Community
Chad S. Boyd and Tony J. Svejcar

401 Physical Characteristics, Shade Distribution, and Tall Fescue Effects on Cow Temporal/Spatial Distribution in Midwestern Pastures
Douglas A. Bear, James R. Russell, and Daniel G. Morrical

409 Grass Seedling Demography and Sagebrush Steppe Restoration
J. J. James, M. J. Rinella, and T. Svejcar

418 Preemergent Control of Medusahead on California Annual Rangelands With Aminopyralid
Guy B. Kyser, Vanelle F. Peterson, Josh S. Davy, and Joseph M. DiTomaso

426 Arbuscular Mycorrhizal Fungi Can Accelerate the Restoration of Degraded Spring Grassland in Central Asia
Tao Zhang, Yu Sun, Zhaoyong Shi, and Gu Feng

Front Cover Photograph: Zebra on the Mababe grasslands, Botswana, a key wet season range in their migration. Photo by Amanda Stronza.

SOIL SCIENCE

An Interdisciplinary Approach to Soils Research

AUGUST 2012 | CONTENTS | Vol. 177 No. 8

Estimating Mass Fractal Dimension of Soil Using Artificial Neural Networks for Improved Prediction of Water Retention Curve 471
Behzad Ghanbarian-Alavijeh, Ruhollah Taghizadeh-Mehrjardi, and Guanhua Huang

Noncomposted Municipal Solid Waste Byproduct Influences Soil and Plant Nutrients 5 Years After Soil Reclamation 480
Dexter B. Watts, Francisco J. Arriaga, H. Allen Torbert, Ryan R. Busby, and Dick L. Gebhart

In Situ Subsoil Stress-Strain Behavior in Relation to Soil Precompression Stress 490
Thomas Keller, Johan Arvidsson, Per Schjønning, Mathieu Lamandé, Matthias Stettler, and Peter Weisskopf

An Application of Principal Component Analyses and Correlation Graphs to Assess Multivariate Soil Health Properties 498
Carel N. Bezuidenhout, Rianto van Antwerpen, and Shaun D. Berry

Analysis of Three-dimensional Geometrical Pore Parameters From Rock Weathering 506
Ranjith P. Udawatta, Clark J. Gantzer, Stephen H. Anderson, Ann M. Rossi, Robert C. Graham, and Richard A. Ketcham

Investigating the Role of Raindrop Impact on Hydrodynamic Mechanism of Soil Erosion Under Simulated Rainfall Conditions 517
Juan An, Fenli Zheng, Jia Lu, and Guifang Li