

**42nd Engineering Geology and
Geotechnical Engineering Symposium &
14th Intermountain Conference on the
Environment**

**Geotechnics, Environment, Energy, and
Economics (GE) – The Links for
Sustainability**

**Pocatello, Idaho, USA
5-6 November 2009**

ISBN: 978-1-62276-250-7

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© (2009) by Engineering Geology and Geotechnical Engineering Symposium (EGGES)
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact
Engineering Geology and Geotechnical Engineering Symposium (EGGES)
at the address below.

Engineering Geology and Geotechnical Engineering Symposium (EGGES)
c/o Paul Link Department of Geosciences
MS 8072 Idaho State University
Pocatello Idaho 83209

Phone: (208) 282-3365

Fax: (208) 282-4414

linkpaul@isu.edu

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

Underground Nuclear Parks for Next Generation Reactors	1
<i>Kellen M. Giraud, Jay F. Kunze, James M. Mahar, Carl W. Myers</i>	
Laboratory Investigation of the Effect of Low Values of Macroporosity on the Engineering Properties of Rock-like Materials	16
<i>Krista Hanson, Mary MacLaughlin, Nick Hudyma</i>	
Predicting the Unconfined Compressive Strength of Vesicular Basalt as a Function of the Specific Gravity of the Basalt	20
<i>Brian Kuhn, Mary MacLaughlin, Nick Hudyma</i>	
The Thorium Nuclear Power Cycle - Cleaner and Less Expensive	26
<i>Darryl Siemer, Jay F. Kunze</i>	
Microbial Community Analysis of a Microbial Fuel Cell Utilizing Potato Waste	46
<i>Zhen Li, Eugene Sato, Chikashi Sato, Malcolm Shields</i>	
2D Numerical Investigation of the Influence of Macropore Alignment on Strength of Cubic Specimens	55
<i>Mary MacLaughlin, Colleen Jespersen, Nick Hudyma</i>	
Building Damage from Thawing of Frozen Soil	63
<i>Gennaro G. Marino, James W. Mahar, Mohamed G. Abdel-Maksound</i>	
Methods for Attaching Fiber Optic Strain Sensors to Rock in Situ Underground	78
<i>Mary MacLaughlin, Herb Wang</i>	
Calvert Mine Pit Lake	86
<i>Barbara L. Pape, Christopher H. Gammons</i>	
Reliability Based Underseepage Analysis in Levees using Monte Carlo Simulation	94
<i>Lourdes Polanco, John Rice</i>	
Geophysical Investigation of the Mouat Superfund Site, Columbus, MT	114
<i>Jared M. Quilty, Curtis A. Link, Richard L. McNearney</i>	
The Effect of Flat Circular Pore Orientation on Engineering Properties of Rock-like Materials with Large Voids	135
<i>Alan Roos, Mary MacLaughlin, Nick Hudyma</i>	
Modal Testing: An Innovative Approach to Dynamic Rock Specimen Characterization	147
<i>Ariel Sarno, Nick Hudyma, Dennis Hiltunen, Mary MacLaughlin</i>	
Air-Cathode Single-chamber Microbial Fuel Cell: Generation of Electricity from Potato-Residue Extract	161
<i>Chikashi Sato, Larissa Quintana Sanchez, Malcolm S. Shields, Marco P. Schoen, Alba Perez-Gracia</i>	
Single-chamber Microbial Fuel Cells: Effect of Electrode Surface Area on Electricity Generation	175
<i>Rishika Sharma Lamichhane, Chikashi Sato, Malcolm Shields</i>	
“Nuclear Ammonia” – A Solution to the World’s Impending Transportation Fuel Crisis	189
<i>Darryl Siemer</i>	
Distinct Regimes: The Hydrology and Geomorphology of Twelve Tributaries to the Salmon River, Idaho	202
<i>Christopher J. Tennant, Benjamin T. Crosby</i>	
Spatial Analysis of Hillslope Failures Using High-Resolution Topographic Datasets, Southern California	219
<i>Kelly M. Whitehead, Benjamin T. Crosby, James Mahar</i>	
Prediction of Drained Lateral Extension Behavior from Traditional Drained Axial Compression Triaxial Test	228
<i>Horng-Jyh Yang, Sherif Elfass, Gary Norris</i>	
Geo-sustainable Stabilization of Collapsible Loess Soil Deposits	241
<i>M. Zoghi, J. Mahar, A. Ebrahimpour, M. Y. Araya, P. Katamaneni</i>	
Sustainable Pavement Maintenance Via Chip Sealing Application	250
<i>Manoochehr Zoghi, Arya Ebrahimpour, Vishwanath Pothukutchi</i>	
Digital Image Processing and Analysis of Macroporous Rock Surfaces	259
<i>Aaron Zosel, Mary MacLaughlin, Tom Moon, Nick Hudyma</i>	
Microbial Fuel Cells and Their Benefits to Wastewater Treatment	266
<i>Beltus Abeh, Chikashi Sato, Solomon Leung</i>	
Metal Characterization in Mining Impacted Sediments Along the Coeur d’Alene River Near Kellogg Idaho	267
<i>Debra Bruhn, Neal Yancey</i>	

Rapid Bioremediation of Soil Contaminated with Petroleum Hydrocarbons and Polychlorinated Dibenzofurans	268
<i>Ted L. Carpenter, Paul H. Kelly, David L. Dressler</i>	
Detection, Quantification, and Sequencing of stx1 and stx2 Genes in Southeastern Idaho Wastewater Treatment Facilities	269
<i>Heather Fitzpatrick, Chikashi Sato, Malcolm Shields</i>	
The Center for Advanced Energy Studies: Report to the Idaho Research Community	270
<i>Ray Grosshans, Oren Hester</i>	
Investigation of Public Discourse Methods in Energy Policy Decision-making	271
<i>Jeffrey C. Joe, Steve J. Piet, John C. Freemuth, Michael C. Lewis, Carole D. Nemnich, Ann Oakes, Patrick Wilson, Troy Hall</i>	
Seismic Surface-wave Dispersion Curves for Long, to 750-m, Linear Arrays	272
<i>Andrew Karasa, Helena Murvosh, Barbara Luke</i>	
Electricity Supply Environmental Issues for the Intermountain Area	273
<i>Jay F. Kunze</i>	
Rapid Response Sensor for Water Quality Measurements at Trace Level	274
<i>Solomon W. Leung, Yuanhong Wang, James C.K. Lai</i>	
Addition of Low-Temperature Heating to In Situ Reductive Treatment of Chlorinated Solvent DNAPLs	275
<i>Tamzen W. Macbeth, Michael J. Truex, Mandy Michalsen, Emile Petri, Greg Sandberg, Tom Powell, Kent S. Sorenson</i>	
Sagebrush Steppe Regional Land Trust - Conservation Planning in Southeastern Idaho	276
<i>Joselin Matkins, Heidi Albano</i>	
LiDAR Canopy Height and Shape Measurements in a Sagebrush-steppe Ecosystem	277
<i>J. J. Mitchell, N. F. Glenn</i>	
A Case Study on Construction Dewatering-Induced Settlement Damage: Could This Have Been Avoided?	278
<i>Robert L. Mokwa, Leonard P. Mokwa, Timothy P. Mokwa</i>	
Water Disinfection with In-Series Ultrasound-Ultraviolet Light Reactor	279
<i>Verona Nicolae, Chikashi Sato, Malcolm Shields</i>	
Influences of Topography on Spring Runoff	280
<i>Neil F. Olson, Benjamin T. Crosby</i>	
Public Information on Environmental Impact: Corporate Social Responsibility Reporting and G3	281
<i>Priscilla R. Reis</i>	
Pocatello's Environmental Education Programs: Changing Public Behavior to Improve Stormwater	282
<i>Hannah Sanger, John Sigler</i>	
Relationships of Post-fire Aeolian Transport to Soil and Atmospheric Conditions	283
<i>Joel Sankey, Nancy Glenn, Matt Germino</i>	
Numerical Modeling of Upstream Fish Passage	284
<i>Bruce Savage</i>	
Numerical Modeling of the Madison Canyon Rockslide	285
<i>Christopher Sherman, Mary MacLaughlin, Nick Sitar</i>	
Effects of Polluted Water Intakes on Elemental Distributions in Vital Organs	286
<i>Shilpa Siddhanti, James C.K. Lai, Solomon W. Leung</i>	
Pocatello Storm Water Management Practices: One Piece of the Story – Sacajawea Park	287
<i>John W. Sigler, Hannah Sanger</i>	
Stormwater Management Requirements for New Construction in the Pocatello Urbanized Area	288
<i>Martin Sorenson</i>	
Geotechnical Investigations on the Mechanism of Prehistoric Liquefaction Flow Movements at the Farmington Siding Landslide Complex, Utah	289
<i>Aurelian C. Trandafir, Zahra A. Amini, Ichael D. Hylland</i>	
A Risk Assessment Model for Ground Water Septic Contamination	290
<i>John Welhan, Carol Moore</i>	
Pacific Ocean and Snake River Coupling System and New Concepts for Water Conservation	291
<i>Di Wu, Jing Wang</i>	
Author Index	