



ILLINOIS GROUNDWATER ASSOCIATION
Advancing Groundwater Knowledge Since 1983
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2011 Fall Meeting

Starved Rock Lodge, Utica, IL

October 26, 2011

Agenda and Abstracts

AGENDA

ILLINOIS GROUNDWATER ASSOCIATION 2011 FALL MEETING OCTOBER 26, 2011

STARVED ROCK LODGE, UTICA, IL

- 8:45 - 9:15 Registration
- 9:15 - 9:30 Opening Remarks, **Danielle Wallin, IGA Chair**
- 9:30 - 10:00 **Randi Liescheidt, Illinois State University**, Using the O and H Stable Isotopes to Track Sources of Water in Constructed Wetlands
- 10:00 - 10:30 **Cassandra McKinney, McHenry County Resources Manager, County of McHenry - Department of Planning and Development**, Groundwater Protection: Sustainability in the Face of Development
- 10:30 - 11:00 Break
- 11:00 - 11:30 **Todd Drefcinski, Environmental Health Unit, Kendall County Health Department**, Kendall County Health Department's Private Well Education
- 11:30 - 12:00 **Colin Booth and Melissa Lenczewski, Northern Illinois University**, Environmental Geosciences Program at NIU: A 10-Year Perspective
- 12:00 - 1:00 Lunch & IGA Executive Committee Meeting
- 1:00 - 1:15 Open for Comments & Announcements, **Danielle Wallin, IGA Chair**
- 1:15 - 1:45 **Alan G. Stone, CES Group of Illinois**, A Brief Introduction to Monitored Natural Attenuation
- 1:45 - 2:15 **Bill Dixon, Practical Environmental Consultants**, Status of Geologist Licensing in the US and Illinois
- 2:15 - 2:30 Break
- 2:30 - 4:00 Professional Geologist Licensure – Panel of Discussion
- 4:00 Closing Remarks, Adjourn

ABSTRACTS

(In order of presentation)

Using the O and H Stable Isotopes to Track Sources of Water in Constructed Wetlands

Randi Liescheidt, M.S. Candidate
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This study attempts to investigate the potential of O and H isotopes to track sources of water contributing to constructed wetland cells for five different constructed wetlands (agricultural tile fed wetlands and a wetland that receives treated effluent) in McLean County, IL. Tile/effluent and groundwater should have different isotopic compositions since tile water should reflect season variations in the isotopic composition of precipitation, while groundwater is expected to be a weighted annual average of precipitation. Therefore, a mixing equation could be used to determine the proportion that each end member (groundwater and tile/effluent water) contributes to the wetland water. To complete this study, tile water, shallow groundwater wells, and wetland surface water were sampled approximately bi-monthly, from July 2010-June 2011 and analyzed for $^{18}\text{O}/^{16}\text{O}$, $^2\text{H}/^1\text{H}$, common anions and NH_4^+ . Plotted $\delta^{18}\text{O}$ vs. $\delta^2\text{H}$ results indicate that end member calculations cannot be used for most of the sampling periods, since the groundwater and tile water have very similar isotopic compositions, many of the wells experience seasonal variations in compositions, and the wetland cells can undergo evaporation in the dry, warmer months. Results also indicate that groundwater inflow into one of the tile fed wetlands had more effect during the winter months, and comparing the waters between wetlands and overtime can be used to estimate how the hydrology of the wetlands changes temporally and spatially.

Groundwater Protection: Sustainability in the Face of Development

Cassandra McKinney, Water Resource Manager
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Over the past two decades, McHenry County, Illinois has been one of the fastest growing counties in the State. From 2000 to 2030, McHenry County's population (current population 308,000) is expected to grow by 180,000. In addition, the County is solely dependent on groundwater, with no other options available. Studies suggest that areas in Northeastern Illinois and McHenry County may experience water supply shortages as early as 2030. In the year 2000, water use in the county amounted to an annual average of 34.6 million gallons per day (mgd). By 2030, average annual water use is estimated to almost double to 67.5 mgd. In an effort to plan for the future and guard against supply shortages, McHenry County has engaged in a comprehensive effort to study its only potable water source - Groundwater.

This presentation will highlight the importance of cooperative planning and the significance of building a strong base of scientific knowledge to protect and preserve water resources. A brief overview of the County's Water Resources Action Plan (WRAP) will be provided as well as information on the four scientific projects that are currently underway, including: 3-D Hydrogeological Modeling (ISGS), Groundwater Flow Modeling (ISWS), Installation of and Real-time of 41 Observation Wells, Stream Gauges, and Precipitation Gauges (USACE, USGS, and ISGS), and Water Quality Sampling (USGS).

Kendall County Health Department Private Well Education & Mapping Project

Todd Drefcinski, Licensed Environmental Health Practitioner

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Kendall County Health Department (KCHD) created the Private Well Education & Mapping Project (PWE&MP) in 2007 in an effort to educate the public about water wells and groundwater protection. The project has three objectives. 1) Provide educational materials to residents. 2) Collect global positioning system (G.P.S.) locations of wells throughout the county. 3) Require and/or recommend corrective action for well code violations (if found during site visits).

KCHD designed a web page containing information on well maintenance, water sampling and water conservation. A postcard was then created that outlines the project and includes a link to the web page. The postcard is mailed to pre-selected areas. Within a few weeks KCHD conducts site visits. At that time KCHD collects well locations using a handheld G.P.S. receiver. The visible portions of the well are inspected. If code violations exist they are tracked through a complaint process.

Kendall County is almost entirely served by groundwater. The county population is 114,000+, yet only 75 private well water samples have been processed through KCHD in the last few years. Many residents moved to Kendall County from areas served by public water and may not have an understanding of wells or groundwater.

The initial pilot project in 2008 revealed that ~20% of water wells did not meet code requirements for construction. From 2008-2011 this figure fluctuates between 2 – 20%. Based on our findings in the field it appears that more must be done to educate residents about groundwater resources and groundwater protection. This project is one tool KCHD utilizes to provide that education.

The Environmental Geosciences Program at NIU: A Ten-Year Perspective

Colin J. Booth and Melissa E. Lenczewski

Department of Geology and Environmental Geosciences

Northern Illinois University

In 2001, the Department of Geology at Northern Illinois University expanded its undergraduate B.S. major into three Emphases: Geology (traditional and focused), Environmental Geosciences (more diverse and flexible) and Earth Science Education (with teacher certification at the secondary level). Since this restructuring, the department's undergraduate enrollment has risen from about 30 in 2001, 55 in 2004, 86 in 2008 and about 100 today – a very large geology program among NIU's peer institutions. Currently, about 50% of majors are in the Geology emphasis and about 30% are in Environmental Geosciences, though switching between emphases is quite easy especially through junior year. All emphases have a common core requirement of 20 semester hours of basic geology including 16 hours at upper division. However, the Geology Emphasis then focuses in depth on upper-division electives in geology and a capstone traditional field geology camp, whereas Environmental Geosciences (EG) requires upper-division electives in both geology and a broader range of cross-disciplinary environmental sciences, and a capstone residential environmental field methods camp held jointly at NIU and ISU. Substantial early difficulties with the initial program structure were resolved by a significant systematic restructuring about 4 years into the program, which also ensured that the program satisfies the Illinois P.G. requirements for geology course hours. The EG program was intended especially to accommodate students who wanted to focus on broader careers in environmental sciences rather than the traditional petroleum geology and extraction industry careers. However, we have found that students from both emphases continue successfully into a wide range of geological careers such as in environmental consulting companies and government agencies and surveys. This diverse and flexible structure is particularly useful in accommodating the periodic swings in employment and growth between the environmental and extraction areas of geoscience.

A Brief Introduction to Monitored Natural Attenuation

Alan G. Stone

CES Group of Illinois

Fall 2011 IGA Presentation

Monitored Natural Attenuation (MNA) has been an accepted remedial alternative for quite some time, and is applicable under different conditions. It has been used as a stand-alone remedial alternative and/or combined with other remedial alternatives (pump and treat, soil excavation, SVE, chemox, etc.). MNA is not a do nothing approach! It requires long-term monitoring for contaminants of concern (COCs) and geochemical parameters. MNA should also include data screening, and contaminant fate and transport modeling (BIOSCREEN, BIOPLUME III, spreadsheet models).

Remediation timeframe may be longer than conventional alternatives since long-term monitoring is required to determine its effectiveness. Long-term monitoring, data analysis, and modeling may be expensive, but should be economical when compared with other remedial alternatives. Restrictions such as engineered barriers and/or groundwater use restrictions may still be necessary.

Status of Geologist Licensing in the US and Illinois

William Dixon

Practical Environmental Consultants

ABSTRACT

Licensing of geologists in the US is controlled by state boards.

There are three basic types of boards: stand alone, independent boards in fourteen states AL, AR, FL, IN, KY, MS, MO, NE, NC, OR, PR, SC, WA, WY; departmentally controlled boards in seven states DE, GA, ID, IL, TN, UT, VA; and multi-disciplinary boards in nine states AZ, CA, KS, ME, MN, NH, PA, TX, WI.

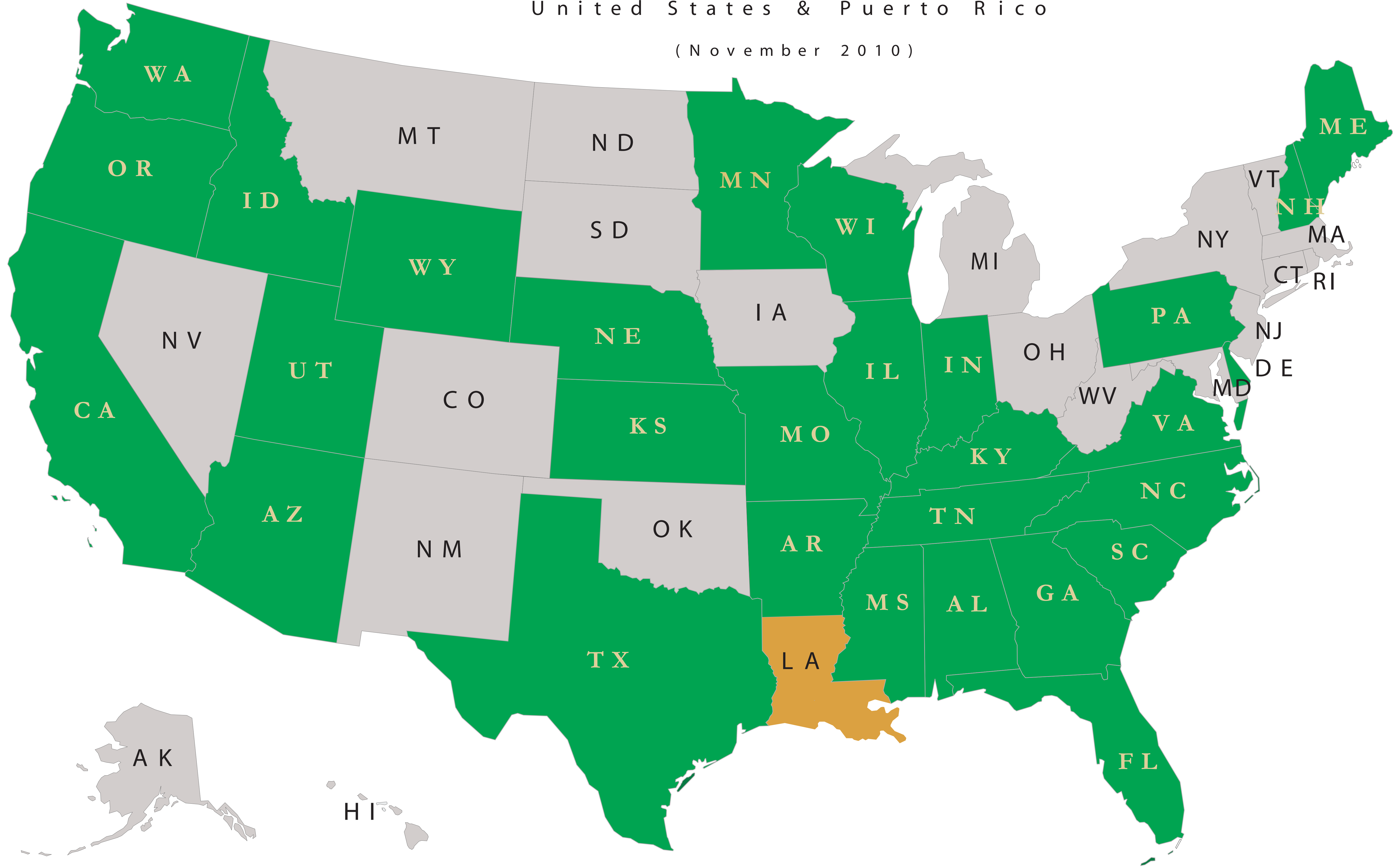
All boards use the National Association of State Boards of Geology (ASBOG[®]) exams; all boards but AZ require 30 hours of geology; most boards require 5 years of experience, and after that the requirements, authority, and exemptions for geologist licensure are a patchwork of diversity.

The LA board is in the process of writing regulations; geologists in NY are trying for the 15th consecutive year to pass a licensing bill through their legislature; and in IL, regulations are under review by the Illinois Pollution Control Board (IPCB) to control the use of clean construction and demolition debris (CCDD) to fill abandoned mines, and Joint Committee on administrative Rules (JCAR) is reviewing the regulations to implement the Geologist Intern program.

A wealth of information about licensing, including the Map of ASBOG[®] states and the Matrix of Geology Registration Standards, can be accessed on the ASBOG[®] web site www.asbog.org .

United States & Puerto Rico

(November 2010)



-  - ASBOG Member Board Regulatory State (MBR) (30)
-  - Visitor State Regulatory (VSR) (1)
-  - Visitor State Non-Regulatory (VSNR) (20)

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Professional Geologist Licensure – Panel of Discussion

Moderator:

Mr. Erik Spande, Hydrogeologist CH2M HILL

Panelists:

Ms. Joyce Day is an Illinois licensed professional geologist with PDC Technical Services, Inc. in Peoria, Illinois. She received her B.S. in Geology/Environment & Natural Resources from the University of Wyoming (2003). She then went to work for an environmental consulting firm as a compliance officer and later as a field geologist in the groundwater department, serving coal bed methane operators in the Powder River Basin, Wyoming. In 2006 she returned to Illinois, completing her M.S. in Hydrogeology at Illinois State University (2008).

Ms. Danielle Wallin is an Illinois licensed professional geologist with Farnsworth Group, Inc. in Shorewood, Illinois with over 10 years of experience. Danielle received a B.S. degree in geology from Eastern Illinois University and a M.S. degree in geology from Northern Arizona University. She specializes in water supply planning and resource evaluation, groundwater well design, Phase I and Phase II environmental site assessments, soil and groundwater characterization and remediation, permitting and project management. Danielle has served on the IGA Executive Committee for the past 7 years holding positions as Secretary, Director, Vice-Chair and Chair. Danielle is also a board member of the American Institute of Professional Geologists.

Mr. William Dixon is the Secretary of the ASBOG Foundation. He currently works part-time for Practical Environmental Consultants, Inc. on underground storage tank sites. He is a licensed geologist in IL, IN, and WI. He was active in getting the Illinois licensing act passed, and served several years as Chairperson of the Board of Licensing. He is a long-time member of the Association of Environmental and Engineering Geologists (AEG) and the American Institute of Professional Geologists (AIPG). He has been active in ASBOG® since 1997 and served as President in 2007.