

# ON THE LEVEL



Water Monitoring News and Updates

**Solinst**<sup>®</sup>

High Quality  
Groundwater  
and Surface Water  
Monitoring  
Instrumentation

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October 22 - 23, 2009

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SPECIAL EDITION  
FALL 2009

## Solinst Symposium a Great Success! Recent Advances in Watershed & High Resolution Monitoring



On October 22nd and 23rd Solinst held a unique symposium on “Recent Advances in Watershed and High Resolution Monitoring”.

The event was held at our office in Georgetown, Ontario and featured speakers from the University of Waterloo, AMEC Geomatrix, Boart Longyear, the University of Nebraska-Lincoln, the Ontario Ministry of the Environment and the Kansas Geological Survey at the University of Kansas.

Attendees gained insight on the importance of protecting our water resources at a watershed and ecosystem scale and the need for high-resolution data to achieve this. The presentations introduced new methodologies and technologies that show promise in realizing these goals.

Thank you to all of the speakers, attendees and our staff for making it such a beneficial event for everyone!

For more information from the event, visit: [www.solinst.com/Symposium/](http://www.solinst.com/Symposium/)





## Advances in Environmental Drilling Technologies



Day One ended with a guest speaker from **Boart Longyear**. **Brennan McMahon** focused on the use of sonic drilling technology for environmental applications, involving soil samples and groundwater monitoring.

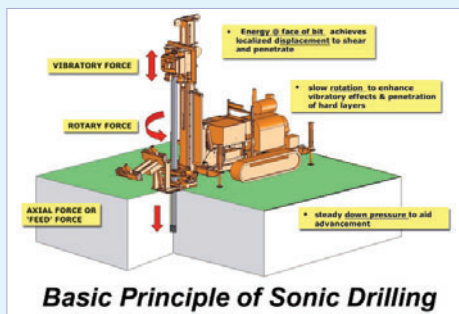
Brennan discussed the advantages gained through sonic drilling, talked about the costs involved and showed that this technology is quick and effective in a wide variety of applications, including site investigations and remediation efforts.

### Why Use Sonic Drilling?

- Speed (2-4 times faster than conventional drilling)
- Superior information (continuous core samples, provide clear view of lithology, geochemistry, and hydrogeology)
- Waste minimization (“dry” drill uses less water, less waste to dispose of)
- Sample virtually anywhere!  
- Sand, gravel, boulders, bed rock, delicate formations, etc.

### Applications

- Contaminated soil and groundwater investigations
- Plume delineation  
- Vertical Aquifer Profiling
- Well installations
- Air sparge installations
- Remedial injections
- Landfill investigations/expansion
- MGP site characterizations (Manufactured Gas Plant)



### ABOUT THE SPEAKER - Brennan McMahon, Boart Longyear

Mr. McMahon has been with Boart Longyear for 3 years. He has over 15 years drilling experience in a variety of geological formations in local and international locations. He is the key personnel for start-ups and strategic planning and development.

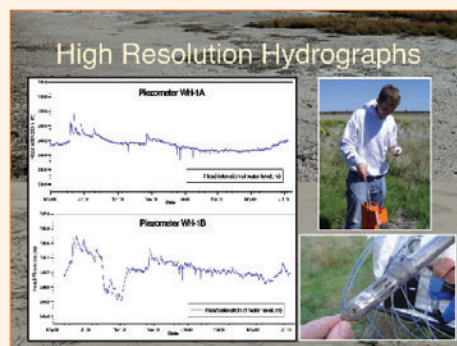
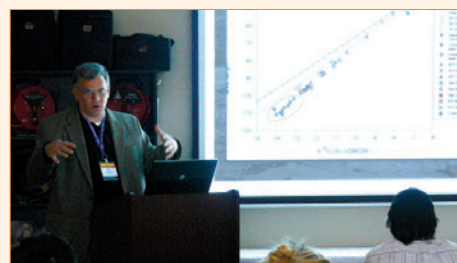
## Of Salt and Sand – The story of Two of Nebraska’s Most Unique Groundwater Dependent Ecosystems

Day Two began with a very interesting presentation by **Ed Harvey with the University of Nebraska-Lincoln**. Ed presented ongoing research from two of Nebraska’s most unique groundwater dependent ecosystems – Eastern Saline Wetlands and Sandhills Fens. Due to the unique composition of the groundwater that feeds these two ecosystems, the species found in these environments are not native to these regions of Nebraska.

Eastern Saline Wetlands are sustained by highly saline water up-welling from deep formations. These wetlands support plant life more commonly found in coastal wetlands. Sandhills wetlands have very low total dissolved solid and nutrient loads. Induced by evapotranspiration in this very arid region, up-flowing groundwater sustains plant communities found more commonly in boreal regions of the northern United States and Canada. Rare and fragile plant and insect species rely on these “island ecosystems” for their survival, creating a unique relationship.

### Monitoring Ecosystem Processes and Responses

Research clearly shows that responses to changes in hydrological and chemical conditions in these ecosystems occurs very quickly and, therefore, requires high resolution data in order to capture the smaller timescales at which these changes take place. By using Levelloggers at these sites, researchers have been able to capture the frequent data sets desired, over the long term. Continuous, automated monitoring of water levels, temperature and conductivity has allowed researchers to track the changes more easily.



### ABOUT THE SPEAKER - F. Edwin Harvey, Ph.D., PG, University of Nebraska-Lincoln

Dr. Harvey is Associate Director, and Professor at the University of Nebraska-Lincoln School of Natural Resources. His research interests include groundwater dependent ecosystems, groundwater-surface water interaction, and regional groundwater flow.

## Designing Provincial-Scale Water Monitoring Networks to Meet Future Needs

The symposium continued on Day Two with a presentation from the **Ontario Ministry of the Environment**. The presentation focused on the province-wide stream water and groundwater monitoring networks that are currently being overseen by the Ministry of the Environment in partnership with Conservation Authorities and participating municipalities. These networks monitor ambient (baseline) stream water quality conditions at about 400 sites and groundwater levels and chemistry conditions at about 470 sites.

They discussed how the networks currently support numerous activities including: source water protection planning, water allocation, setting water quality standards, recognition of emerging issues, trends, and correlations, understanding relationships between precipitation and groundwater levels, etc. – all leading to informed resource management decisions. They also touched on an assessment of the two networks for their ability to act as tools in recognizing climate change signals on the water resources and to assist in adaptation.



### ABOUT THE SPEAKERS -

**Deborah Conrod, M.Sc., P.Geo.** is the Supervisor for the Provincial Stream Water and Groundwater Monitoring Networks at the Ontario Ministry of the Environment.

**Pradeep Kumar Goel, Ph.D.** is a Senior Surface Water Scientist with the Ontario Ministry of the Environment, involved in nutrient management research.

**Dajana Grgic, B.Sc.** is the Coordinator for the Provincial Groundwater Monitoring Network Program at the Ontario Ministry of the Environment

**Scott MacRitchie, M.Sc., P.Geo.** is a Senior Hydrogeologist in the Provincial Groundwater Monitoring Network Program at the Ontario Ministry of the Environment.

## New Approaches for Exploiting Water-Level Responses to Fluctuations in Barometric Pressure



**Jim Butler from the Kansas Geological Survey at the University of Kansas** provided a great presentation to close the symposium. Jim discussed work being done by the Kansas Geological Survey at monitoring wells that have been set up to collect continuous records of water level and barometric pressure. Although not the initial focus of their studies, they started looking at information that can be obtained from a more intensive look at the relationship between barometric pressure and the water level in a well.

Jim discussed how barometric efficiency has long been utilized to characterize short-term response of a well to changes in barometric pressure, and further, how the barometric response function can be an effective means to characterize longer-term response. “[BRF] characterizes the water-level response over time to a step change in barometric pressure”.

Using well data collected by the Kansas Geological Survey, Jim showed that a program of passive monitoring of water levels and barometric pressure is a promising approach to gaining valuable insights into site hydrostratigraphy, and for the development of important insights for a broad range of hydrogeologic applications.

**ABOUT THE SPEAKER - James J. Butler, Jr., Ph.D, Kansas Geological Survey, University of Kansas** Dr. Butler is a Senior Scientist and the Chief of the Geohydrology Section of the Kansas Geological Survey at the University of Kansas. He was the 2009 recipient of the Pioneers in Groundwater Award of the Environmental and Water Resources Institute of the American Society of Civil Engineers.

## Attendees Learn About Solinst Instrumentation

Throughout the two days of the symposium, attendees were provided with the opportunity to discuss environmental applications and monitoring methodologies with Solinst technical staff. The attendees were able to view hands-on demonstrations of Solinst instrumentation, including Solinst STS Telemetry Systems, Leveloggers®, Integra™ Bladder Pumps, and Multilevel Groundwater Monitoring Systems. Solinst staff were there to answer any questions about the equipment and any related hydrogeological and hydrological applications.



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