

# Association of Environmental & Engineering Geologists

## NORTH CENTRAL SECTION

"Serving Professionals in Engineering, Environmental and Groundwater Geology Since 1957"

## New World in Geophysics

### About the Course

Sponsored by the North Central Section of the Association of Environmental and Engineering Geologists, the short course is designed for practicing Civil Engineers, Geologists, Engineering Geologists, Archaeologists, Law Enforcement Investigators, Consultants, Owners, Managers, and others responsible for development or evaluation of site characterization studies that might benefit from the application of modern geophysical methods. Many of us were exposed to geophysics during our undergraduate or graduate studies, which may have been completed many years ago now. There has been much progress in geophysics since your undergraduate studies. This course will bring you up-to-date with the latest developments in geophysical methods for land, water, and subsurface characterization. In addition to providing the student with a working knowledge of each of the available geophysical tools, pitfalls in subcontracting geophysical services will be presented. After you complete this course, you will be an informed consumer of geophysical services and be capable of scoping and applying the correct geophysical methods to solve your particular problem. Course participants will earn 2.0 hours of Continuing Education Credit.

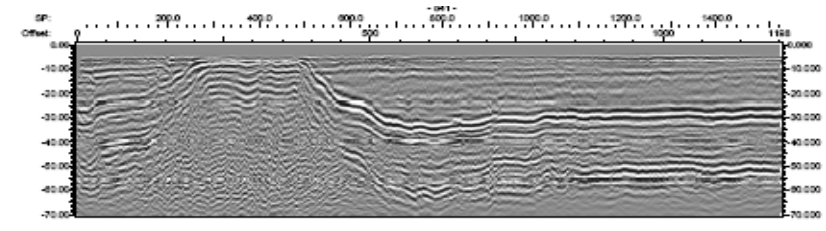
### The Course Schedule

#### Day 1 - Methods Discussion

Morning session: Introduction (overview of topics)

- Seismic refraction
- Seismic reflection
- Seismic surface waves (MASW)
- Resistivity
- SP, IP
- EM, VLF
- GPR
- Gravity
- Magnetics
- Borehole
- Water-borne
- Airborne

Afternoon session: Outdoor Stations with Field Demonstrations



#### Day 2 - Applications and Limitations

Morning Session:

Exploration approach (scope of work - phased and sequential surveys, need multiple methods)

Client / contractor / geophysicist interaction

Limitations and pitfalls (noise sources, geometry, tomographic artifacts, smoothing)

Specific Applications -

- Karst (resistivity, refraction tomography, MASW, GPR, gravity?)

- Buried fracture mapping

- Depth to bedrock (refraction and reflection, MASW)

- Groundwater contaminant plume mapping

- Buried tanks, utilities, UXO

- Site characterization / brownfields

- Archaeology and forensics

- Downhole characterization (fractures, voids, glacial sediments, shear-wave surveys, water flow)

- Structures (existing infrastructure characterization - rebar, drain tiles)

- Water-borne geophysics

- Landfills

- Underground mines and voids / subsidence risk

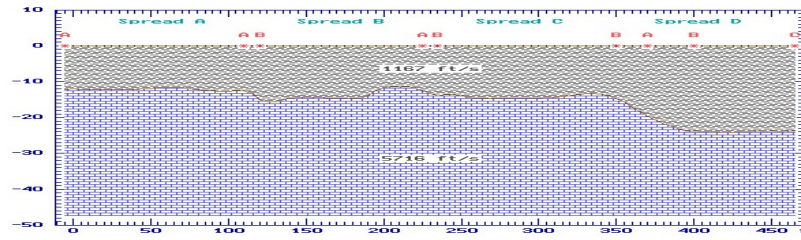
- Wetlands

- Alternative energy

- Carbon-dioxide sequestration

- Ore bodies and mines, industrial minerals

Afternoon session: Stations with Data Interpretation/Data Reduction Demonstrations



### About the Course Instructors-

The course is taught by geophysics experts who are experienced with daily application of a wide range of geophysical tools for a variety of purposes.

**Dr. Philip Carpenter-** Dr. Carpenter is Professor of Environmental Geophysics, Engineering Geology, and Seismology at Northern Illinois University in DeKalb, Illinois. He received a PhD in Geoscience from New Mexico Institute of Mining and Technology in 1984. He has worked in oil/gas exploration at Chevron USA, Inc. and Mobil Oil. This was followed by employment in the seismology group at Los Alamos National Laboratory in New Mexico, where he did research on methods of detecting underground nuclear tests. He then joined NIU where he has been employed for over 20 years. Dr. Carpenter's research interests include: (1) Environmental geophysics: noninvasive detection of pollution from landfills and hazardous waste sites, both in the U.S. and China; (2) geophysical surveys over karst areas; (3) earthquakes and ambient ground vibrations in the Midwestern U.S.

**Dr. Timothy Larson-** Dr. Larson is Senior Geophysicist with the Illinois State Geological Survey (ISGS) under the administration of the University of Illinois at Urbana-Champaign. He received a PhD in geology from that university in 1990. Since 1980 he has worked for the ISGS as a geologist and geophysicist. His major research interests include: hydrogeophysical research and case studies; research and case studies using primarily resistivity and seismic refraction techniques but also EM, GPR, and gravity; seismicity of Illinois and neotectonics

of the Central U.S.; shallow seismic reflection studies; studies of shallow heat and moisture flow; and crustal studies of McMurdo Sound, Antarctica.

**Dr. Ahmed Ismail-** Dr. Ismail is a Geophysicist with the Illinois State Geological Survey (ISGS) under the administration of the University of Illinois at Urbana-Champaign. He received a PhD in applied geophysics from the University of Missouri-Rolla in 2003. Dr. Ismail worked as a researcher with the National Research Institute of Astronomy and Geophysics, Cairo, Egypt, from late 2003-early 2005; as a post-doctoral research assistant at the University of Missouri-Rolla from 2005-early 2006; and in his present position with ISGS since 2006. Publications he has co-authored include: *Misleading Interpretation of Shallow Seismic Methods, Three Case Studies from MASW, P-Wave Reflection and SH-Wave Reflection Surveys* (Symposium on the Application of Geophysics to Engineering and Environmental Problems, 2009); *Near Surface Characterization of a Geotechnical Site, North East Missouri, Using Shear Wave Velocity Measurements* (Near Surface Geophysics Journal, European Association of Geoscientists & Engineers, 2007); *Ground-Penetrating Radar: A Tool for Monitoring Bridge Scour* (Environmental and Engineering Geosciences, 2007); *Imaging glacial sediments and underlying bedrock in Illinois using surface wave data acquired by a land streamer* (Highway Geophysics - NDE Conference, St. Louis, Missouri, December, 2006).





### About the Morton Arboretum-

The Morton Arboretum is an outdoor museum of trees and other plants from around the world. The 16 miles of hiking trails have been carefully planned to enhance your experiences on the grounds. These trails lead you through plant collections, natural areas, and other scenic landscapes. Several trails are paved, but most are wood-chipped.

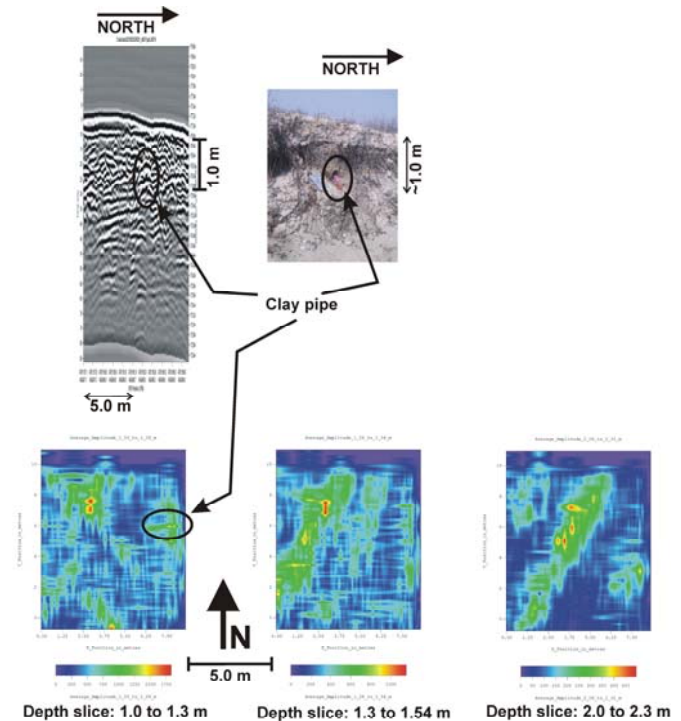
Have you ever seen a majestic tree reflected in a clear pond? Have you listened carefully to the vibrato of frogs coming from silent lakes and marshes? Water is an integral part of the Arboretum—not only because it nourishes the trees and grassy areas around it, but because it nourishes people, too. Sit quietly beside Lake Marmo, Meadow Lake, or Sterling Pond. Reflect on the natural beauty you see there. The lakes, ponds, marshes, and rivers throughout the Arboretum attract birds, animals, wildflowers, and nature lovers.

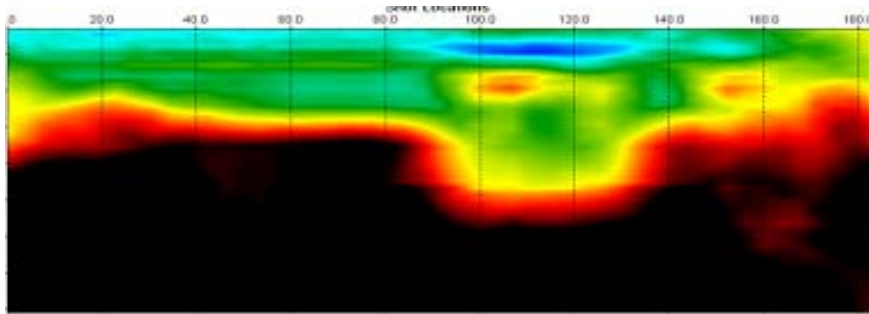
Schulenberg Prairie is one of the oldest planted prairies in the Midwest. It's lush with flowering plants from April through October, resplendent with asters and

grasses in September and October and alive with migrating birds in November and December. Schulenberg Prairie is home to at least 500 different plant species. Be sure to stop at the Prairie Visitor Station.

### About the Meeting Space-

The short course will be held in the Founder's Room at the Thornhill Education Center on the Arboretum grounds. The Founder's Room, with its ornate bookcases, marble fireplace, intimate alcove, and stained glass windows, is a visual step back into the early 20th century.





### Marriott Hickory Ridge Conference Center

1195 Summerhill Drive, Lisle, IL 60532

Phone: 630-971-5000

Fax: 630-971-6956

From the Arboretum, drive south on Route 53 for about three miles and turn right on Summerhill Drive. The hotel provides complimentary transportation within a five-mile radius, which includes The Morton Arboretum and the Lisle Metra Train Station. Transportation must be pre-arranged.

### Where to Stay-

[www.stayinlisle.com](http://www.stayinlisle.com)

Visitor information about Lisle, Illinois and the surrounding area.

### Hilton Lisle/Naperville

3003 Corporate West Drive, Lisle, IL 60532

Phone: 630-505-0900

Fax: 630-505-8948

From the Arboretum, take Route 53 to Warrenville Road and turn right. Go 1.5 miles west. The hotel is on the left.

### Hyatt Lisle

1400 Corporate Drive, Lisle, IL 60532

Phone: 630-852-1234

Fax: 630-852-1260

From the Arboretum, drive south on Route 53 just past Warrenville Road and turn right.

### Wyndham Lisle-Chicago Hotel

3000 Warrenville Road, Lisle, IL 60532

Phone: 630-505-1000

From the Arboretum, take Route 53 to Warrenville Road and turn right. Go about 1.5 miles, and the hotel is on the right.

### Taxi Services in Lisle

It is about a five-minute cab ride between the train station in Lisle and the Arboretum. A few local taxi services are:

- American Taxi at 630-920-9480
- A M Regional Taxi at 630-971-8888
- My Chauffeur Limo Service at 847-376-6169
- DuPage Limo Service at 630-941-3080 or 800-426-9890

### Accessibility

All buildings and paved garden paths and trails are accessible to strollers and wheelchairs.

## Registration Form

Please make checks payable to "AEG North Central Section". If you sign up for Continuing Education Credits you will be mailed a certificate after completion of the course and will earn 2.0 CEU credits. If you are not registering online, you may mail the form and a check to:

AEG North Central Section (c/o Dr. Kevin Richards)  
1530 Willow St.  
Lake Forest, IL 60045

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Registration Form  
AEG North Central Section Short Course  
New World in Geophysics  
May 18-19, 2010

1. Tuition Fees/Donations:

- \$\_\_\_\_\_ Corporate Sponsor\*\* (Platinum Level \$1000, Gold Level \$500)  
\$\_\_\_\_\_ AEG Members (\$350)  
\$\_\_\_\_\_ Professional (Early Registration\* \$350, Other \$450)  
\$\_\_\_\_\_ Student (Early Registration\* \$100, Other \$125)  
\$\_\_\_\_\_ Continuing Education Credit Certificate (2.0 hours - \$5)  
\$\_\_\_\_\_ New AEG Member (\$75 for new member dues plus \$275 for Tuition = \$350 total)  
\$\_\_\_\_\_ Total

\*\*Corporate Sponsorships are also available. Sponsor contributions will be used to cover the costs of the course and for activities for Geo-science Students in the North Central Section area. Your sponsorship will be recognized in future course advertisements, the AEG Newsletter, at an AEG Section Meeting, and on course materials. In appreciation of your donation, tuition fees are waived for Corporate Sponsors under the following schedule; Platinum Sponsors - up to 4 short course attendees, Gold Sponsors up to 2 short course attendees.

\*We have extended the due date for Early Registration. Please mail your registration forms by January 31, 2010 to receive the discounted early registration fee.

2. Please complete for each registrant:

Name: \_\_\_\_\_

Position: \_\_\_\_\_

Company/Firm: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Email Address: \_\_\_\_\_



\_\_\_\_\_ I need special accommodations. Please contact me.

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For further information on the benefits of AEG Membership, please go to <http://www.aegweb.org>