

**DORIA L. KUTRUBES, M.Sc., P.G.  
PRESIDENT AND SR. GEOPHYSICIST**

**EDUCATION**

Colorado School of Mines  
M.Sc., Geophysical Engineering, 1986

Bates College  
B.S., Magna Cum Laude, Geology, 1983

**EXPERIENCE**

**General Qualifications**

Ms. Kutrubes uses her 30+ years of experience in ground penetrating radar (GPR), electrical resistivity, electromagnetic, gravity, and seismic refraction and reflection methods for solving environmental, infrastructure, geotechnical, and hydrogeologic problems. She has been on hundreds of assignments across the world, ranging from detection of lost cities, native and pre-19th Century artifacts, and burials, to locating buried USTs, hazardous waste, utilities, and areas of deteriorating concrete and asphalt, and voids beneath pavements, dams, and granite-block bridge abutments.

Ms Kutrubes works cooperatively with leaders in the geophysical industry to help develop and implement advanced geophysical methods and processing and imaging techniques. In the 1989, Ms. Kutrubes wrote the Standard Operating Procedures for GPR for the Massachusetts Department of Environmental Protection (Then the MA Department of Environmental Quality), and she helped write the SOPs for Magnetometry, EM, and Electrical Resistivity methods.

From 1993 to 1997, Ms. Kutrubes worked as a subcontractor with the world's leading radar manufacturer, GSSI, Inc., to beta-test their radar processing software for accuracy and efficiency, RADAN<sup>®</sup> and write their software manuals for it. She was one of the first geophysicist in New England to integrate GPS-guidance with GPR and EM instrumentation, and her company was the first commercial company in the U.S. to image GPR results in 3D and time-depth slice formats. Ms. Kutrubes has trained new GPR users all over the world, including for the Korean Ministry of Construction, and taught several short courses in principles and operation of GPR, including one for the Environmental and Engineering Geophysical Society (EEGS) at their March 2001 symposium. In 2003 she also taught a GPR/remote sensing course with Dr. Kent Schneider, formerly of the U.S. Forestry Service, and Dr. Dean Goodman of the Geophysical Archaeometry Laboratory, training representatives from the Jenna Choctaw and other Native American Tribes in GPR theory and the use of GPR with GPS.

Most recently, Ms. Kutrubes completed assignments serving on two Federal Highway Administration/Transportation Research Board (TRB), Strategic Highway Research Plan (SHRP II) committees, one for concrete deterioration, the other for utility detection. The purpose of the government-sponsored project is to have the committee assess and implement in the form of a tool-box approach the best non-destructive and geophysical methods to map concrete deterioration and utilities.

**Utility Detection for Construction, Engineering, and Environmental Support Services**

- Project Manager/SR. Geophysicist- in support of intrusive work at numerous New York City Remedial Sites including:
  - Meeker Avenue Plume Trackdown Monitoring Well/ Boring Clearance performed for URS Corporation and the NYDEC, 2008 to present
  - Utility and UST detection at hundreds of NY City sites for URS Corporation and the NYC Department of Design and Construction - multiple Contracts since 1999, with current award through June 2016.
- Utility Detection with a Joint Venture with Infrasense, Inc. at two National Grid LNG facilities in Massachusetts, 2014
- Utility Detection at Multiple National Grid Electrical Substations and along a 1,000+ foot alignment, Massachusetts and Connecticut Facilities, 2014 to Present
- Utility Detection at Numerous Massachusetts Universities and Schools including: Mass Maritime Academy, Boston College, Northeastern University, Westfield State University, Springfield College, Babson University, Bridgewater State University, Dedham Country Day School, and Fenns School.
- Utility and Leak Detection at a DCAM Facility, Lancaster, MA for FST, 2011-2012.
- Utility Detection at Numerous Massachusetts-based and UXO Clearance on over 50 acres at the former Fort Devens, Devens, Massachusetts for Skanska USA and Parsons, Inc. for the Bristol Myers Squibb construction project.

**Environmental (SUPERFUND, Chapter 21E, and Brownfield )Sites:**

- Project Manager and GPR Specialist - Weston and Sampson/USEPA, Sanford, ME Using GPR (400 MHz, 200 MHz, and 60 MHz antennas), Gravity, and Seismic Refraction to help map a DNAPL Plume and help determine Bedrock Topography.
- Project Manager/Sr. Geophysicist - Metcalf & Eddy (AECOM)/USEPA at the Durham Meadows Superfund Site, where GPR, EM-61, Magnetometry, and EM induction were used to help detect utilities and potential sources of contamination.
- Project Geophysicist - Numerous Superfund Sites, including Toms River, NJ Londonderry, VT, Coventry, RI, and Woburn, MA using GPR, magnetometry, and EM terrain conductivity to locate over 100,000 buried drums, sludge material, and help determine landfill boundaries and continuity of a clay aquitard or aquiclude.

## **Representative Infrastructure and Geotechnical Experience**

- GPR Specialist - 1997 to Present: Mapping Concrete Pavement and Bridge Deterioration and Delamination with Infrasense, Inc. for numerous state, federal, and International (European/S. Korean) clientel using WINDECAR<sup>®</sup> software developed by Infrasense, Inc.
- Project Manager/GPR Specialist - Void Survey of a Concrete Column, Dana Farber Cancer Institute, Boston, MA using GPR Depth-Slice imaging and a 1.5 GHz antenna to survey a support column within the X-ray room for potential voids to create a 3D representation of the voids within the support column.
- Project Manager/GPR Specialist - Void and Structural Assessment Surveys of and beneath Concrete Slabs at New Balance and other Manufacturing Facilities using GPR and Impact Echo. Fill thickness and location of voids helped assess loading capabilities of the structural slab for the addition of new, heavier equipment.
- Project Manager/GPR Specialist Mapping 1,000+ Proposed Core and Trench Areas, Determining Location and Depth of Post Tension Cables.
- Project Manager/GPR Specialist - Concrete Deterioration and Delamination Study, Rumford, Maine using GPR to evaluate deterioration and delamination of the concrete holding tank used to hold corrosive pulp-mill product for the Mead Paper Company.
- Project Manager/Sr. Geophysicist - Bedrock Topography Survey using Gravity and GPR at two Maximum Security Prison Facilities, Danemore and Stormville, NY to help determine the optimal route for new utility corridors
- Project Manager/GPR Specialist -Fracture Survey, Saint James, Barbados using GPR depth-slice imaging to accurately locate voids and fractures beneath the proposed footprint of the \$250 million dollar complex.
- Project Geophysicist - Bedrock Profiling, Weymouth Combined Sewer Outfall Project, MA conducting seismic refraction and tomography in a complex tidal environment, where organics, changing saturation conditions, and velocity inversions were prevalent to produce an accurate image of the subsurface.
- Project Manager/GPR Specialist - Multiple Granite-Block Bridge Abutments and Dams for Multiple DOTs and Engineering Firms, Massachusetts and New Hampshire where GPR was used to assess abutment stability and loading capabilities of numerous bridges for their reuse in bridge renovation. More recent studies include the use of Sonic Echo/ Impulse Response and Parallel Seismic for assessment of structure foundation depth and geometry.

- Project Manager, Sr. Geophysicist - Bedrock Water Supply Study, Holbrook, MA using a combination of Electromagnetic Terrain Conductivity (EM-34) with 20 and 40 Meter spacing and GPR with a 60 MHz antenna to find a network of intersecting fractures. The first two recommended well locations produced yields of 50 and 30 GPM, above our client's needs and expectations.
- Project Manager, Sr. Geophysicist - Water Supply Study, Long Lake, NY where a combination of seismic refraction/tomography, gravity, GPR and VLF were used to identify a fault-contact between two different rock lithologies as a potential location for a bedrock water supply well. Additional areas of deep overburden were identified with GPR, which helped our client develop a higher-yielding, less expensive municipal water supply.

### **Representative Archaeological/ Forensic Experience**

- Project Manager/ SR. Geophysicist - Valley Forge National Park, PA, and Victory Woods, Saratoga National Park, NY where GPR, Magnetic, Electrical Resistivity, and EM terrain conductivity surveys for the National Park Service to help locate Revolutionary War earthworks, barracks, and other artifacts.
- Project Geophysicist/GPR Specialist - 1996, 1998, and 2002 Surveys for The Helike Project, Aigion Area, Greece for the Smithsonian Institute and American Museum of Classical Greek Studies in Athens using GPR and magnetometry to augment archeology investigations to help locate the lost City of Helike.
- Project Geophysicist - Historic Cane Juice Plantation, Puerto Rico where GPR and magnetic data were used to locate the former plantation's chimney and Jamaica Train, a brick-line structure used to transport the cane juice sluice from one end of the plantation to another.
- Project Manager/GPR Specialist - Gore Mansion, Waltham, Massachusetts conducting GPR and magnetic surveys at the Colonial-era home of Massachusetts' first Governor, Christopher Gore, to locate the mansion's original foundation and entryways, brick-line air ducts and conduits supplying fresh air to the chimneys, and locate more recent era cisterns.
- Project Manager/GPR Specialist - Repatriation Surveys at multiple NY, MA, RI sites for the Mohegan, Narragansett, and Wampanoag Nations using GPR survey to locate unmarked burials help find locations appropriate for repatriation for those individuals whose remains were previously unearthed.

- Project Manager/GPR Specialist - White Sands Missile Range, NM for the USDOD, Department of the Army where a highly-detailed GPR survey was used to an 11<sup>th</sup> Century, El-Paso Era Native American adobe floor slab in efforts of preserving this and other significant sites.
- GPR Specialist for the Characterization and Detection of Numerous Colonial-Era Artifacts for the Historic Fort George/Fort Monroe, Norfolk, VA, Warren Tavern, Charlestown, MA, as well as several other Boston, MA area locations.
- Invited Instructor/GPR Specialist - Yarmony, Colorado to provide GPR and magnetometry training to CSM students to characterize a pit-house is the oldest known Native American structure in North America, dating back over 6,000 B.C.
- GPR Specialist - The Jena Choctaw Tribe teaching with Kent Schneider, Ph.D. (formerly U.S. Forestry Service) and Dean Goodman, Ph.D. of the Geoarchaeometry Laboratory to train BIA, Jena Choctaw, and other Native-American Archaeologists on radar theory, acquisition, and processing techniques of GPR to help locate unmarked burials from an 18<sup>th</sup> Century cemetery.

#### **Background:**

- Former Principal and Senior Geophysicist - Hager GeoScience, Inc., Waltham, MA
- Geophysicist - Geophysical Applications, Inc., Bellingham, Massachusetts
- Staff Geophysicist - Weston Geophysical Corp., Westboro, Massachusetts
- Geophysicist/hydrogeologist - Ground Water Associates, Sterling, Massachusetts
- Assistant Research Geophysicist - US Geological Survey, Geophysics Branch, Golden, CO
- Geophysical Contractor to Maine Geological Survey - Augusta, Maine

#### **PROFESSIONAL AFFILIATIONS**

- Co-Founder of the GPR Service Providers Coalition for Action
- Environmental and Engineering Geophysical Society Member
- EEGS SAGEEP Technical Session Chair, multiple years including SAGEEP 2014 Boston
- Society of Exploration Geophysicists
- Near Surface Geological Society

#### **PROFESSIONAL DEVELOPMENT AND AWARDS**

- Licensed Professional Geologist, State of New Hampshire (Lic.# 614)
- 2005 Recipient of the Molly Bish Foundation Grant, for Pro-bono work with MA State Police
- Reflection Seismology, Massachusetts Institute of Technology, 1993
- Short Course on Electrical Properties of Rock, Olhoeft, G.R., 1986
- 40 Hours OSHA Health & Safety Training, 1989, 8 Hour OSHA Refresher Course, 1990-2003
- Phi Beta Kappa
- Milt Lindholm Scholar Athlete Award, Bates College, 1983
- DAR Good Citizen's Award, 1979

## **PUBLICATIONS**

- Kutrubes, D., Ziter, A. K., Cote, G., 2014, LNAPL Migration Study using GPR and EM-61, Southeastern Massachusetts Site, presented at Symposium for the Application of Geophysics for Environmental and Engineering Applications, Boston, MA, March 2014.
- Goodman, D., Novo, A., Astier, G., Morelli, G., Piro, S., Kutrubes, D., Lorenzo, H., Advances in GPR Imaging with Multi-Chanel Radar Systems from Engineering to Archaeology, presented at Symposium for the Application of Geophysics for Environmental and Engineering Applications, Charlestown, SC, April 2011.
- Kutrubes, D.L., Kick, J.F., 2011, Prospecting for a Municipal Water Supply using Multiple Geophysical Methods, Long Lake, NY, presented at Symposium for the Application of Geophysics for Environmental and Engineering Applications, Charlestown, SC, April 2011.
- Kick, J.F., Kutrubes, D.L., Denham, M., Dowty, K., 2007, Gravity and GPR Investigations for the Hydrogeologic Determination of Aquifer Properties: presented at Symposium for the Application of Geophysics for Environmental and Engineering Applications, Denver, CO., April 2007.
- Kutrubes, D.L., Andrews, M.A., Andrews, M., Denham, M., 2006, Time-Depth Imaging to Locate Bedrock Fractures and Voids, Saint James, Barbados: presented at Symposium for the Application of Geophysics for Environmental and Engineering Applications, Seattle, Washington, April 2006.
- Kutrubes, D.L., 2006, Effects of Material Dielectric Properties in Subsurface Imaging with GPR, presented at Transportation Research Board (TRB), January, 2006, Washington D.C.
- Heinz-Vallribera, A., Kutrubes, D.L., Olson, S.M., Lewis, L., Baker, J., Kick, J.F., 2004, Uncovering the mysteries of Gore Place: a GPR case history: Presented at Symposium for the Application of Geophysics for Environmental and Engineering Applications, Colorado Springs, CO., February 23-26.
- Kutrubes, D.L., Soter, S., Katsonopoulou, D., Heinz Vallribera, A., 2003, Ground Penetrating Radar in the Search for Ancient Helike, Symposium for the Applications of Geophysics to Environmental and Engineering Problems, April 6-10, San Antonio, TX.
- Kutrubes, D.L., 2003, Ground Penetrating Radar, Public Safety, and the FCC, Symposium for the Applications of Geophysics to Environmental and Engineering Problems, April 6-10, San Antonio, TX.
- Kutrubes, D.L., 2003, Dielectric permittivity measurements of soils, rocks, and earth materials, presented at Transportation Research Board (TRB), January, 2003, Washington D.C.
- Sussmann, T.R., Maser, K.R., Kutrubes, D.L., Heyns, F., Selig, E., 2001, Development of ground penetrating radar infrastructure condition detection: Symposium for the Applications of Geophysics to Environmental and Engineering Problems, 5-8 March, 2001, Denver, CO.
- Kutrubes, D.L., 2000, Use of a ground-coupled monostatic antenna for determining deterioration of concrete structures: Symposium for the Applications of Geophysics to Environmental and Engineering Problems, 21-24 February 2000, Washington, D.C., pp. 851-5.
- Kutrubes, D.L., Maser, K., 1998, Use of GPR in 2D and 3D imaging of bridge footings and scour studies: Symposium for the Applications of Geophysics to Environmental and Engineering Problems, March 1998, Chicago, IL., pp. 893-902.



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Kutrubes, D.L., Soter, S., and Katsonopoulou, D., 1997, The search for ancient Helike: a GPR case study: Symposium for the Applications of Geophysics to Environmental and Engineering Problems, April 1997, Reno, NV., pp. 973-982.

Kutrubes, D.L., Zhang, J., and Hager, J., 1996, Conventional processing techniques and nonlinear refraction travelttime tomography for imaging bedrock at an eastern Massachusetts coastal site: Symposium for the Applications of Geophysics to Environmental and Engineering Problems, April 1996, Keystone, CO., pp. 215-220.

Zhang, J., Kutrubes, D.L., and Toksoz, M.N., 1996, High-resolution shallow seismic structure imaging using grid-based nonlinear refraction travelttime tomography: Symposium for the Applications of Geophysics to Environmental and Engineering Problems, April 1996, Keystone, CO., pp. 209-214.

Morey, R.M., and Kutrubes, D.L., 1996, Hydrogeologic characterization of the groundwater remediation field laboratory, Dover AFB, Delaware, using GPR and CPT: Hydrology and Hydrogeology of Urban and Urbanizing Areas Conference, American Institute of Hydrogeology, June 1996, Boston, MA, pp. ccg1-ccg11.

Kutrubes, D.L., and Olhoeft, G.R., (unpublished), Dielectric permittivity measurements of soils saturated with fluids - predictions and applications to GPR, 22p.

Kutrubes, D.L., Blackey, M., Jenkins, T., 1994, Preservation of a historic landmark: White Marble Dam, North Adams, Massachusetts: 5th International GPR Conference, 12-16 June, 1994, Kitchner Ontario, Canada, pp. 559-568.

Kutrubes, D.L., and Zhang, J., 1994, Predictive deconvolution of GPR data using ProMAX: IEEE Dual Use Technologies and Applications Conference, 23-26, May 1994, SUNY Institute of Technology, Utica/Rome, New York, pp. 439-446.

Kutrubes, D.L., DuBois, K., and Fenner, T., 1992, GPR at a Superfund site, Vermont: 4th International Conference on GPR, 8-11 June, Rovaniemi, Finland, 6p.

Bedingfield, L., and Kutrubes, D.L., 1991, Delineation of voids beneath highways in Massachusetts: Pipeline Crossing Proceedings, ASCE Conference, 25-27 March, 1991, Denver, CO., pp. 149-160.

Bedingfield, L., and Kutrubes, D.L., 1990, GPR applications for bridges and highways in Massachusetts: Abstract, Third International Conference on GPR, 14-18 May, Denver, CO.

Kutrubes, D.L., 1988, use of GPR for detecting hazardous fluids in soils - predictions and applications: Abstract, American Geophysical Union Transactions, V. 69, no. 44, p. 1190.

Kutrubes, D.L., and Olhoeft, G.R., 1987, Dielectric permittivity measurements - applications to GPR: presented at the AGU fall meeting, 7-12 Dec., American Geophysical Union Transactions, V. 68, no. 44, pp. 1282-1283.

Kutrubes, D.L., 1986, Dielectric Permittivity Measurements of Soils Saturated with Hazardous Fluids: M.Sc., Thesis, Colorado School of Mines, 300p.

