



Dynamic Measurement Webinar #001

Thursday, 23 March 2017, 10:00 AM or repeated at 3:00 PM Central Time

Lead Presenter: **H. Roice Nelson, Jr.**, geophysicist, B.S. Geophysics University of Utah 1974, founder Landmark Graphics, with 45+ years of experience in oil, gas, and mineral exploration

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Topic: **Lightning Analysis: creating geo-frameworks cheaper, faster, and safer**

Abstract

This introduction to Dynamic Measurement's work with lightning databases shows how Dynamic's new patent, "Method for determining surface and subsurface resistivity," enables creation of geo-frameworks anyplace, for a variety of exploration and infrastructure applications. It is easy to get the idea it's all over when we see a base map covered with well-spots and a lot of dry holes or closed-down mines. Lightning analysis, and the resulting resistivity volumes, provide insights necessary to revisit old properties and trends and locate opportunities worth re-evaluating.

Geophysicists have used gravity, magnetic, magneto-telluric, electrical, and seismic data to understand the subsurface of the earth for decades. Dynamic Measurement has expanded on these capabilities, developing and patenting ways to data mine electrical information in existing lightning-strike databases. Workstation ready products enhance your data set by creating geo-frameworks of subsurface geology anyplace onshore and on the shelf.

This presentation reviews Dynamic's lightning technologies, explaining horizontal resolution (typically 164 foot map-pixel and volume-trace spacing in both longitude and latitude), depth calculations (depth of interaction with telluric currents tied to strike-source-height derived from the Peak Current of lightning strikes), vertical sampling (typically less than 10 samples per trace, with 100+ samples interpolated from surrounding bins to create traces), and calibration. Small areas may benefit from SPOTSM cylindrical analysis (the lightning equivalent of a check-shot survey, allowing quick & inexpensive ties to outcrop, well, seismic, or other control). Pipeline cathodic protection needs and powerline leakage can be evaluated with LINESM, maps and volumes derived along critical infrastructure.

The presentation includes examples from lightning analysis projects in Texas, Louisiana, Michigan, and Arizona. Presentation focus is on how this new geophysical data type enables creation of geo-frameworks. There will also be an introduction of how lightning resistivity maps and volumes can be used to locate areas of pipeline corrosion and powerline leakage associated with the geomagnetic hot zones (GHZ), which GHZs control lightning strike clusters.

Dynamic Measurement's lightning-based technology quickly adds another layer of information and value to exploration prospects. Covering very large trend areas allows linkage of isolated data into a framework for workstation analysis. For small areas, like the pimple-mound-prospects in Illinois, infill-drilling of old fields, lightning may provide insights into the surrounding productive and non-productive areas.

Lightning analysis enables explorers to build geologic frameworks faster (a couple of months), less expensively (\$5,850 for a 1 mile radius 3 square mile SPOTSM analysis or \$73,060 for a 100 square mile D.NSEMSM project with 164 foot trace and line spacing), and safer (no boots on the ground) than any other available geophysical data type.

