

Modern Surveying, 3-D, and the Global Spatial Data Model (GSDM)

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While boundary determination and leveling remain at the heart of the surveying profession, the digital revolution has made an enormous impact on the tools that surveyors use for making measurements and the way in which surveyors manipulate their data. The proliferation of measurement tools and coordinate computation software also enables many in other disciplines to do marvelous things with 3-D digital spatial data. In order to compete, survive, and thrive in the current economy, surveyors need to become aware of (and even proficient in using) modern tools, models, and software.

Although many/most surveyors enjoy their work and do a good job for their clients, the challenge facing many is to understand the characteristics of spatial data more fully and to compete more successfully with others who might have a different perspective on coordinate systems, projections, datums, and models. The purpose of this workshop is to look at fundamental concepts, to discuss the characteristics of spatial data, and to organize our thought processes in such a manner that spatial data users in other disciplines will recognize the contributions that surveyors can make in the efficient use of spatial data.

The global spatial data model (GSDM) was defined based on the assumption of a single origin for 3-D geospatial data. The proven rules of solid geometry are used in the context of the Earth-centered Earth-fixed (ECEF) coordinate system (invented by the DoD for GPS) to describe a model (the GSDM) in which geometrical integrity is preserved on a global scale while providing local users the opportunity to use “flat-earth” plane surveying methods on most projects. The GSDM accommodates rigorous high-level geodesy operations but, for local applications, the GSDM avoids the use of map projections, zone constants, scale factors, and geoid modeling. For additional information see www.globalcogo.com.

Recognizing the impossibility of “learning it all at once,” after the workshop, attendees will be encouraged to work on a series of on-line exercises posted on the Global COGO web site. The exercises will be designed to reinforce the concepts and to provide an opportunity to learn by doing. Each “module” will include a worked example, equations, comments that identify the “new” material to be learned. Subsequent questions sent via email will be addressed in a timely manner.