

The following item was proposed for the back cover of the 2nd Edition of “The 3-D Global Spatial Data Model” but the publisher chose different material. Instead, see the CRC Press web site for ordering the book and/or the flyer (containing supportive reviews) that CRC Press prepared for describing the book. Both web sites can be access from www.globalcogo.com - Earl F. Burkholder, PS, PE, F.ASCE - June, 2017.

Simplicity and integrity are deciding factors when selecting an appropriate model for spatial data computations. The best model is the simplest one that is adequate for the intended application. Flat-Earth rectangular 2-D or 3-D equations are used extensively in many disciplines – often without detrimental consequences. But the Earth is not flat and more complex models are needed when curvature of the Earth makes a difference. Geometrical integrity is preserved (at the expense of simplicity) by performing geodetic computations on the mathematical ellipsoid. Alternatively, cartographers invented map projections to recover some of the simplicity for the end user without sacrificing integrity. Both models are legitimate and used extensively. But both models assume separate origins for horizontal and vertical (3-D data) and both models require measurements of spatial data to be reduced to a computational surface – the mathematical ellipsoid for geodetic computations and to a projection surface for mapping.

The 3-D global spatial data model (GSDM) is an improvement over traditional models in that spatial data computations are performed in 3-D space. The GSDM embodies a single origin (center of mass of the Earth) for both horizontal and vertical data and the GSDM eliminates the need for many “reductions.”

Among others, advantages of the GSDM include:

- 1. The model does not distort spatial data components.*
- 2. The simplicity of “flat-Earth” uses is fully supported.*
- 3. Backward compatibility supports derivative uses of traditional 2-D and 1-D models.*
- 4. Global perspective and uses are supported with no loss of geometrical integrity.*
- 5. The same equations are applicable worldwide for all spatial data disciplines.*
- 6. Computations are less complicated and data storage is more efficient.*
- 7. Spatial data accuracy is well defined for both global and local perspectives.*