

A GIS-Based Methodology for the Delineation of Undeveloped Sewershed Boundaries

by

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Abstract

A major challenge facing water agencies is the accurate projection of future wastewater flows in undeveloped areas. A critical element in this analysis is the development of well-defined sewer shed areas, which clearly delineate the directionality of future wastewater flows. Advances in GIS technology, coupled with the increased availability of GIS data, have created powerful new tools in attacking this crucial problem.

A GIS-based approach was recently adopted to redelineate sewer sheds in undeveloped portions of the Vallecitos Water District (VWD). Beginning with a USGS digital elevation model (DEM) grid, a set of topographic contours were extrapolated. Portions of these were supplemented with more accurate contours available from several different GIS databases. A triangulated irregular network (TIN) was then created, which formed the basis of a relief map. Utilizing this map, distinct sewer shed boundaries were delineated, which when overlaid with orthophotography, clearly indicate the directionality of future wastewater flows for each sewer shed.

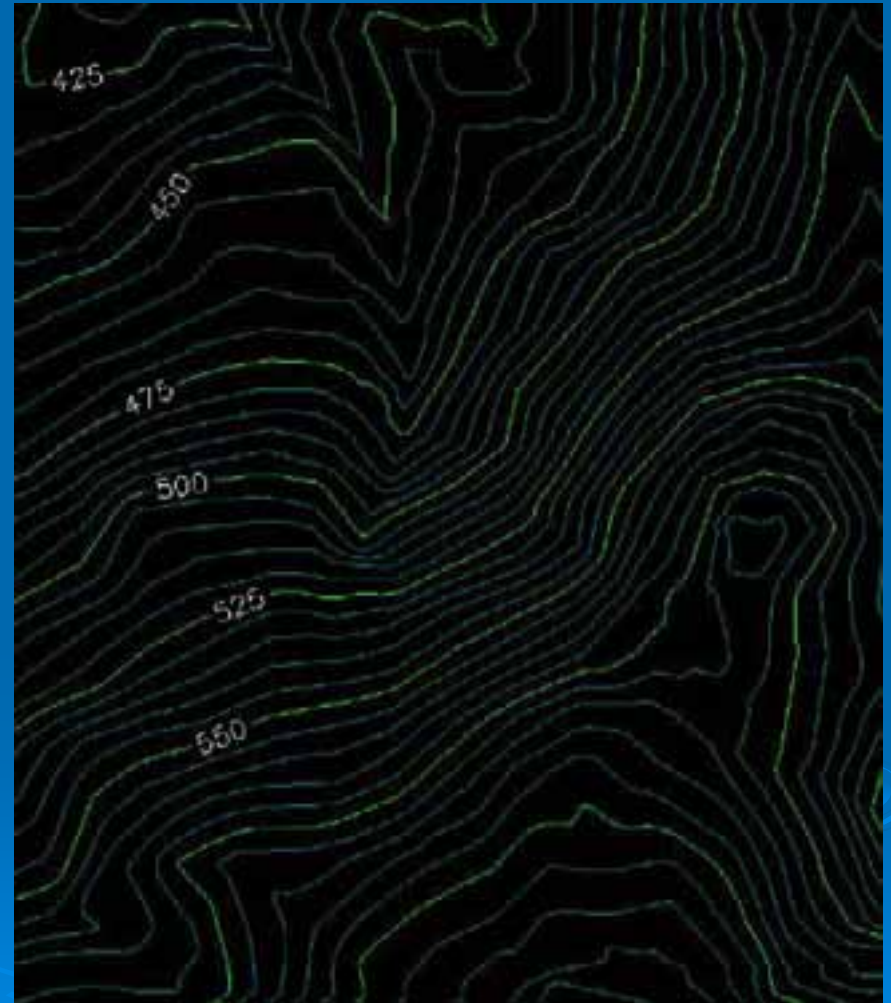


Project Description

- Vallecitos Water District, San Marcos, CA
- New development in primarily undeveloped area
- Previous basin delineations were based upon “old method”
- Needed accurate basin delineation to determine ultimate service area and designate flow characteristics



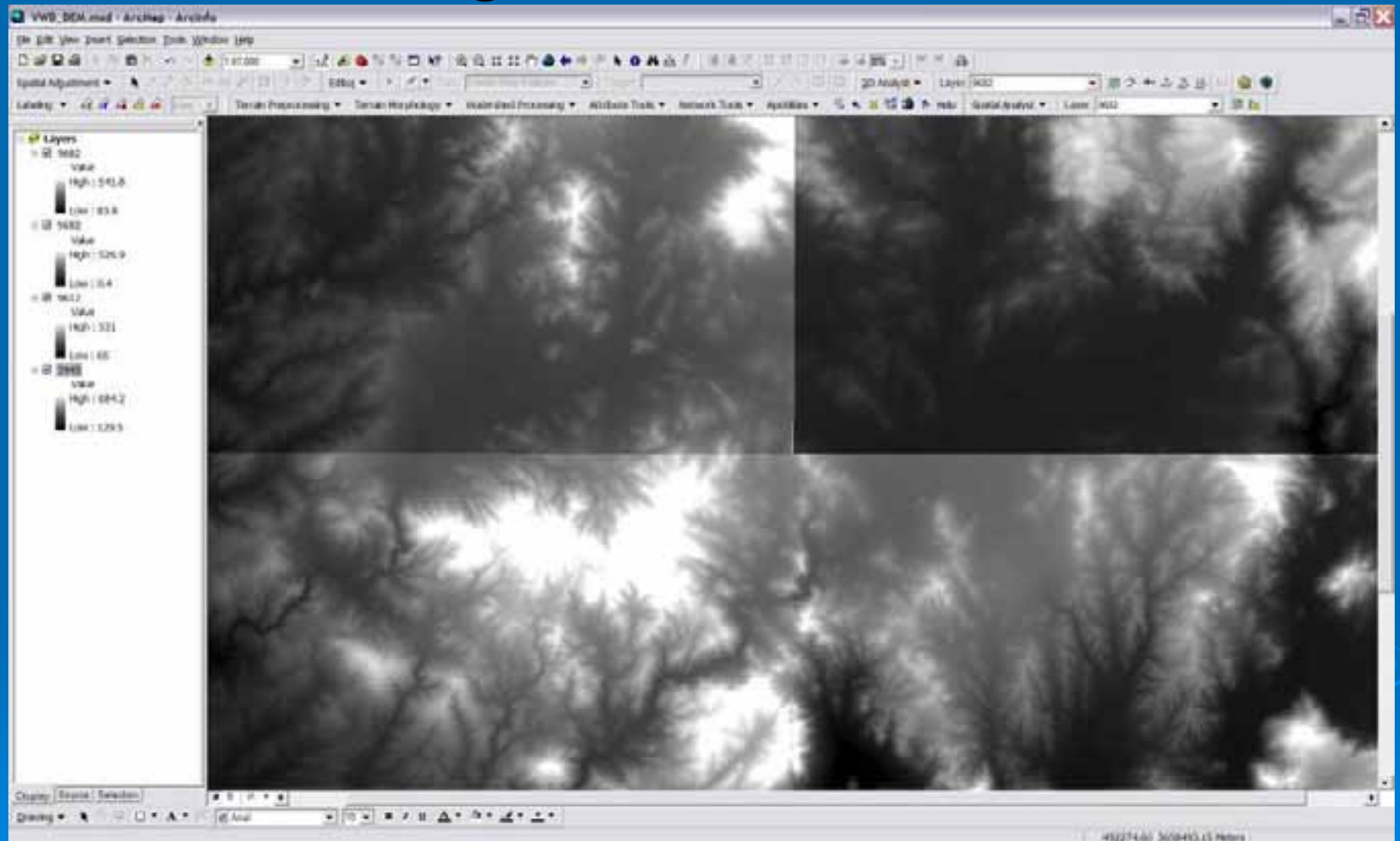
Old Method



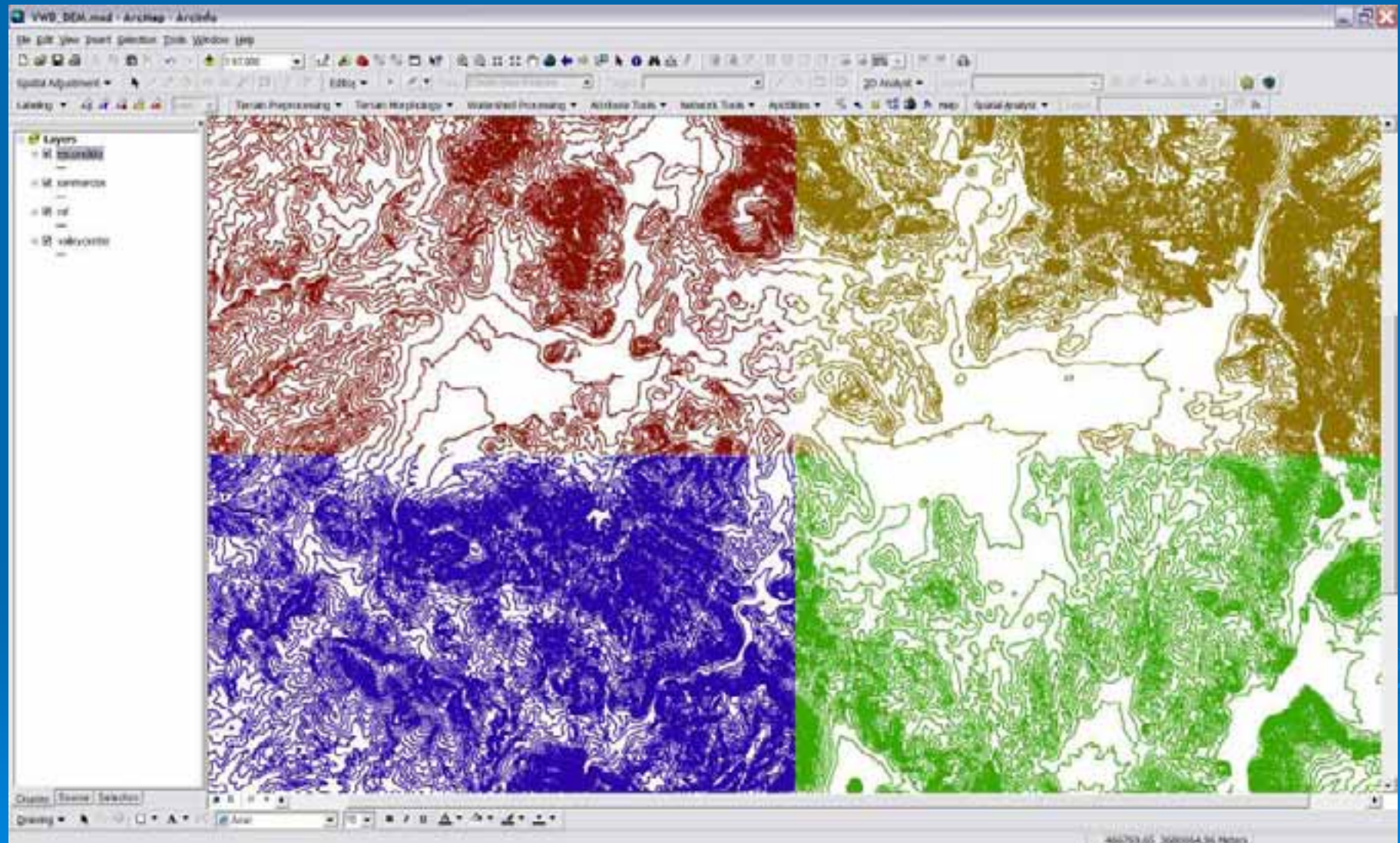
Old Method



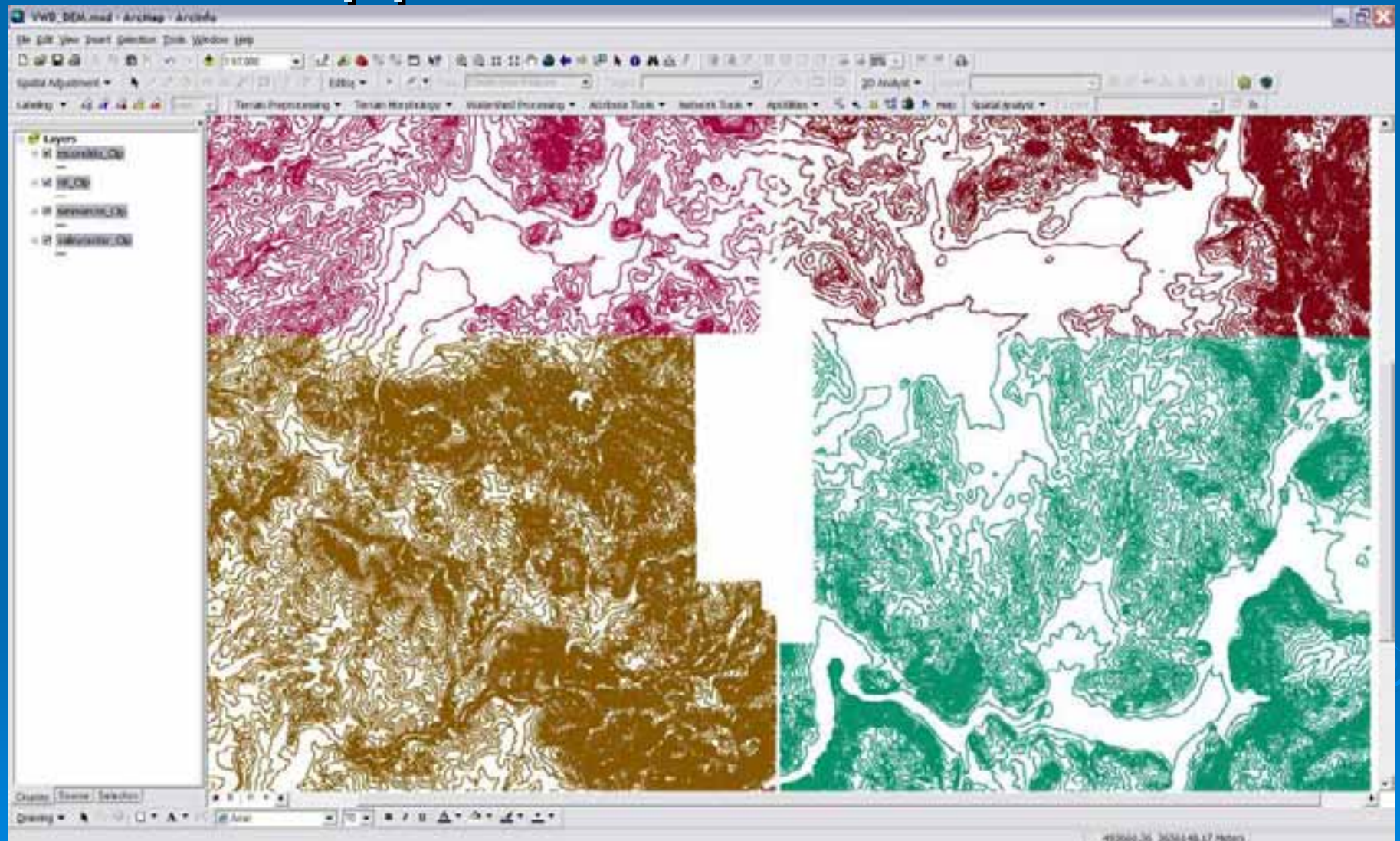
USGS Digital Elevation Models



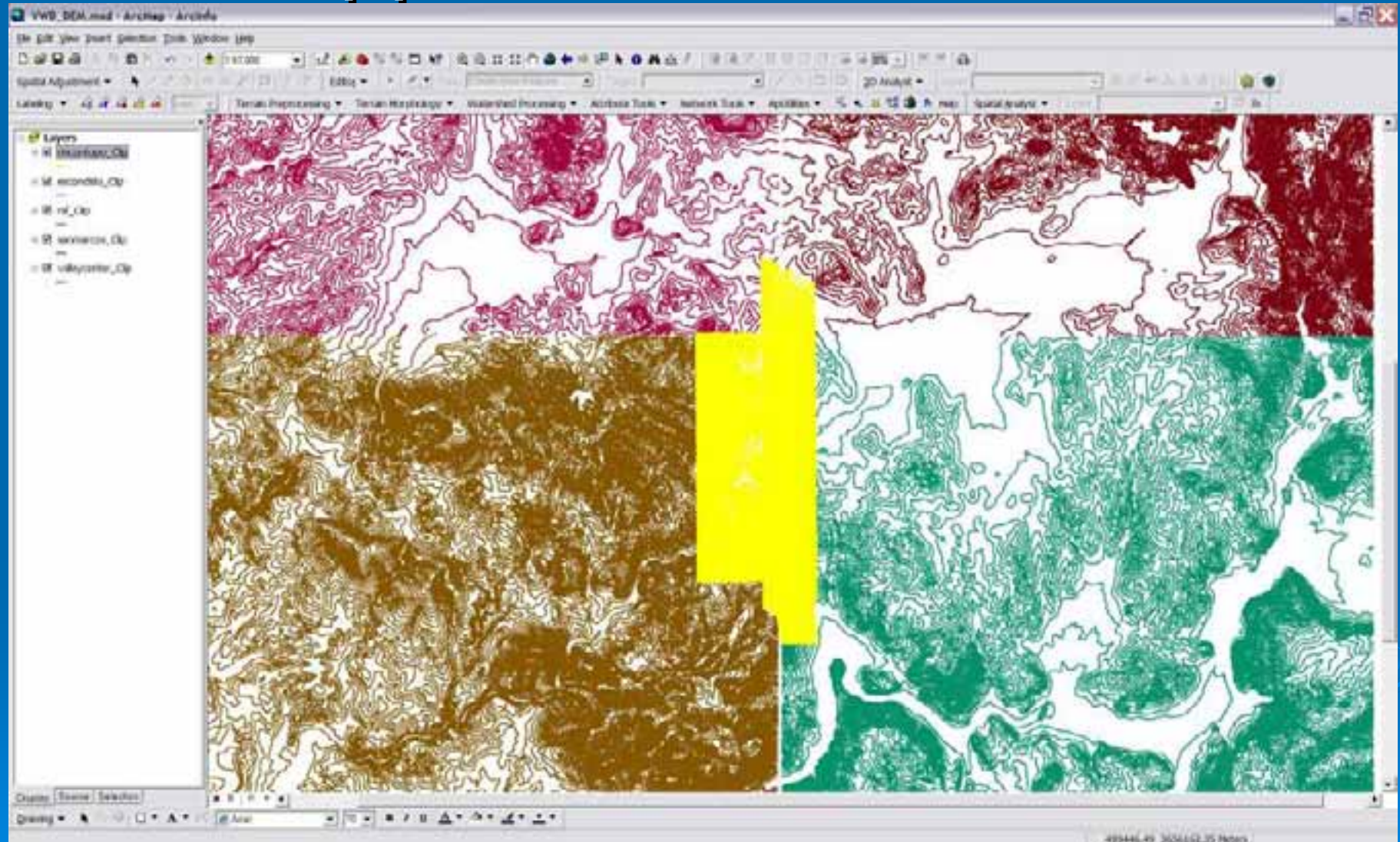
Create Contours



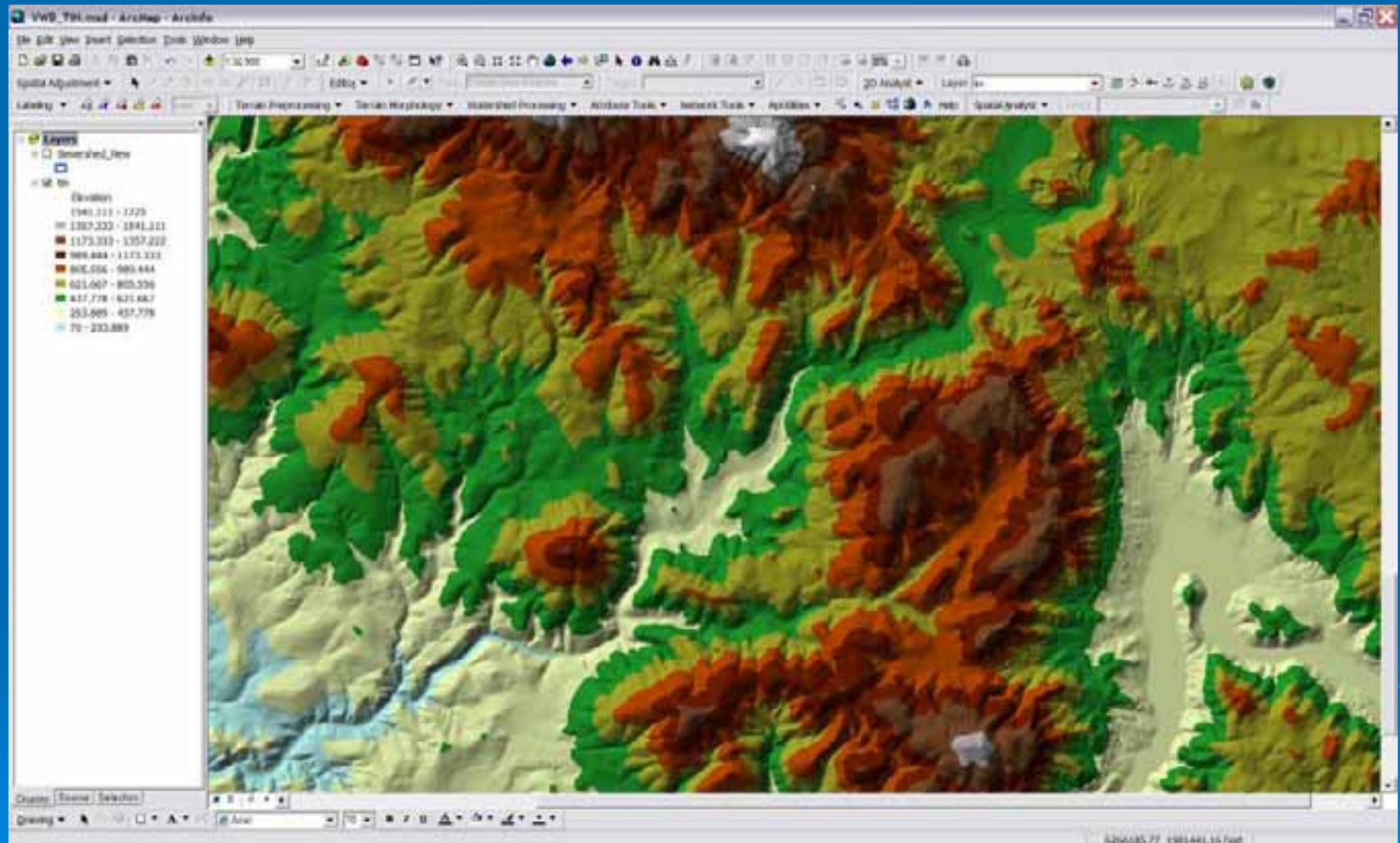
Supplemental Contours



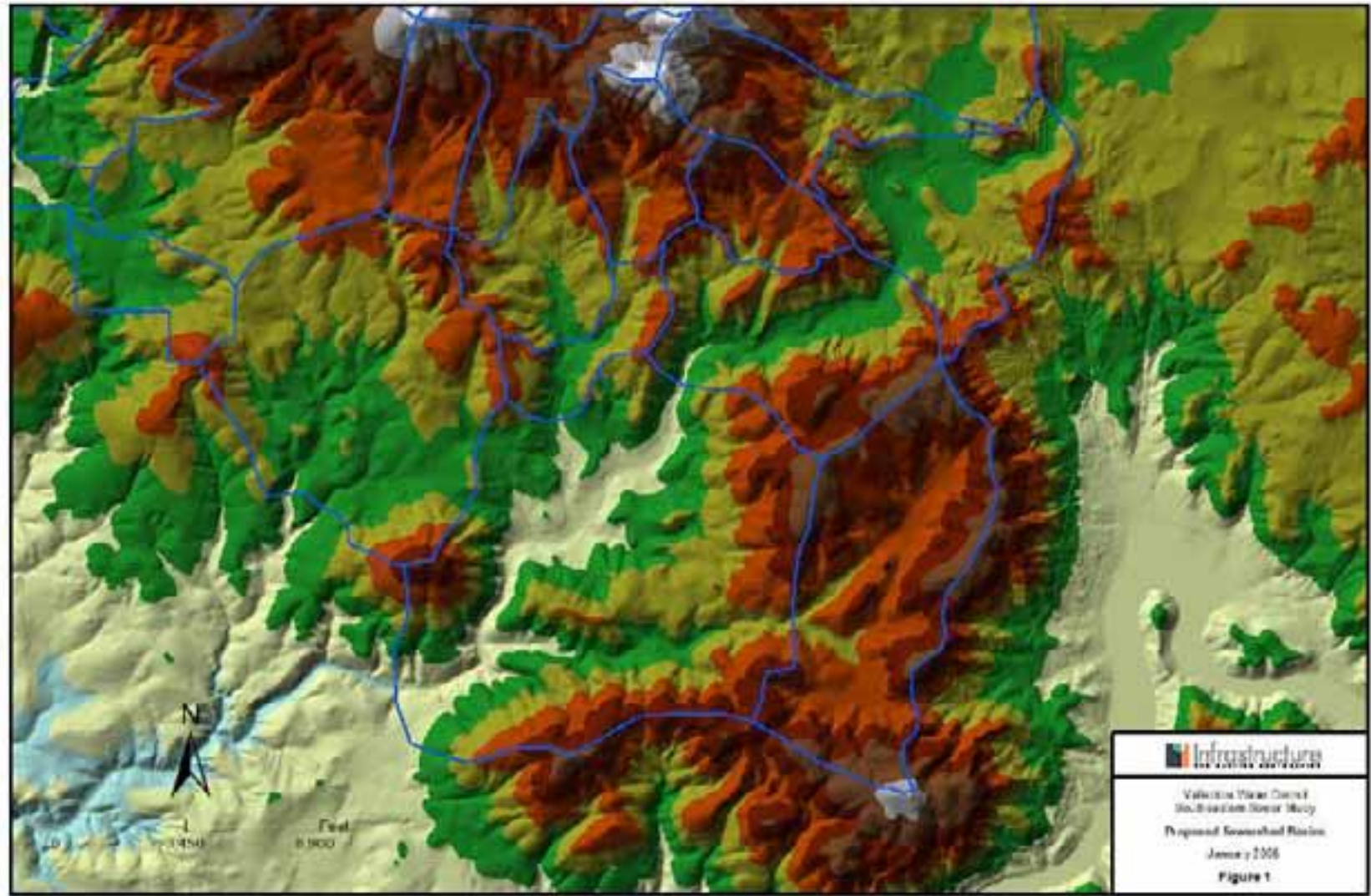
Supplemental Contours



Create TIN



Digitize Sewershed Boundaries

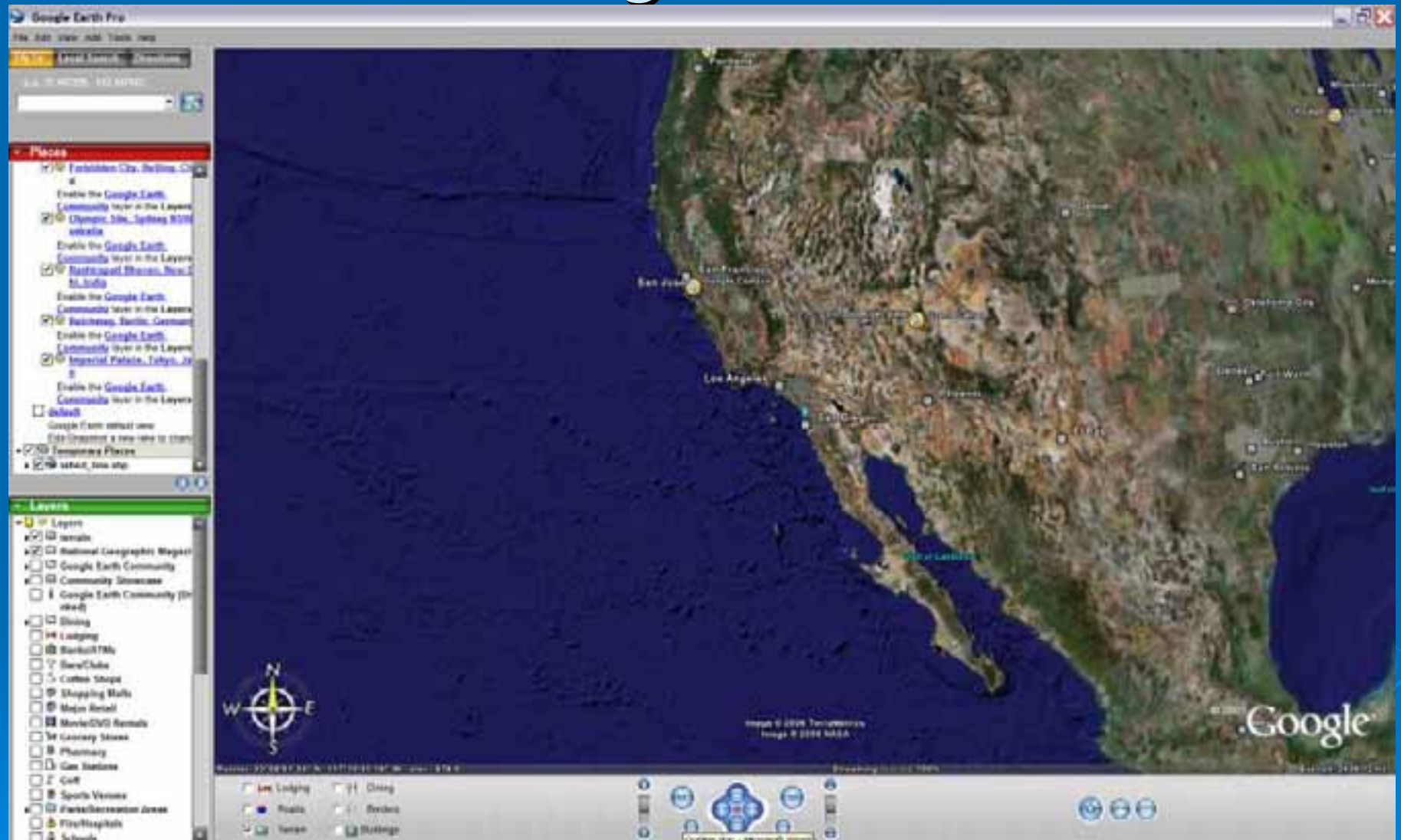


“Visual” Applications

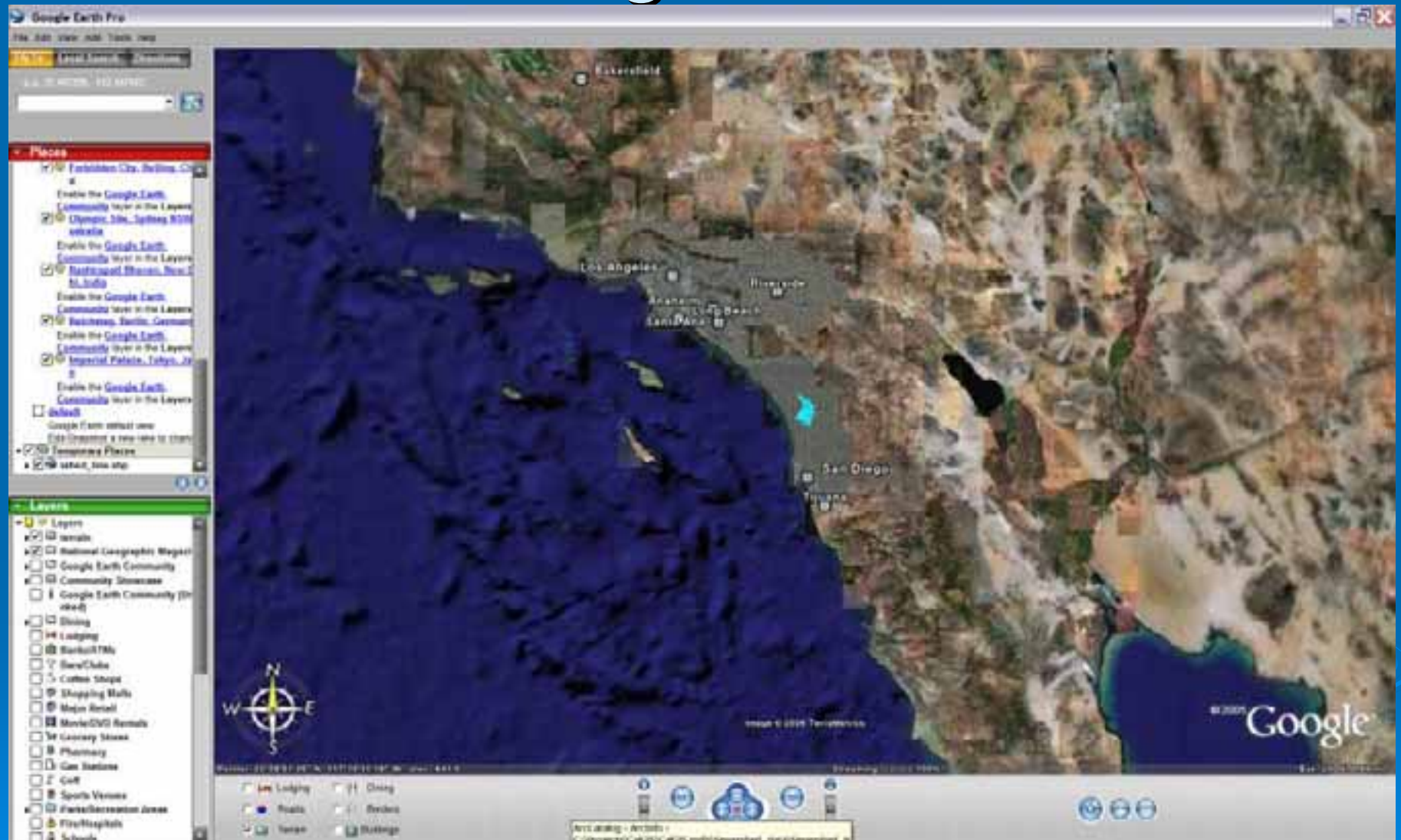
- Google Earth
- 3D Animation



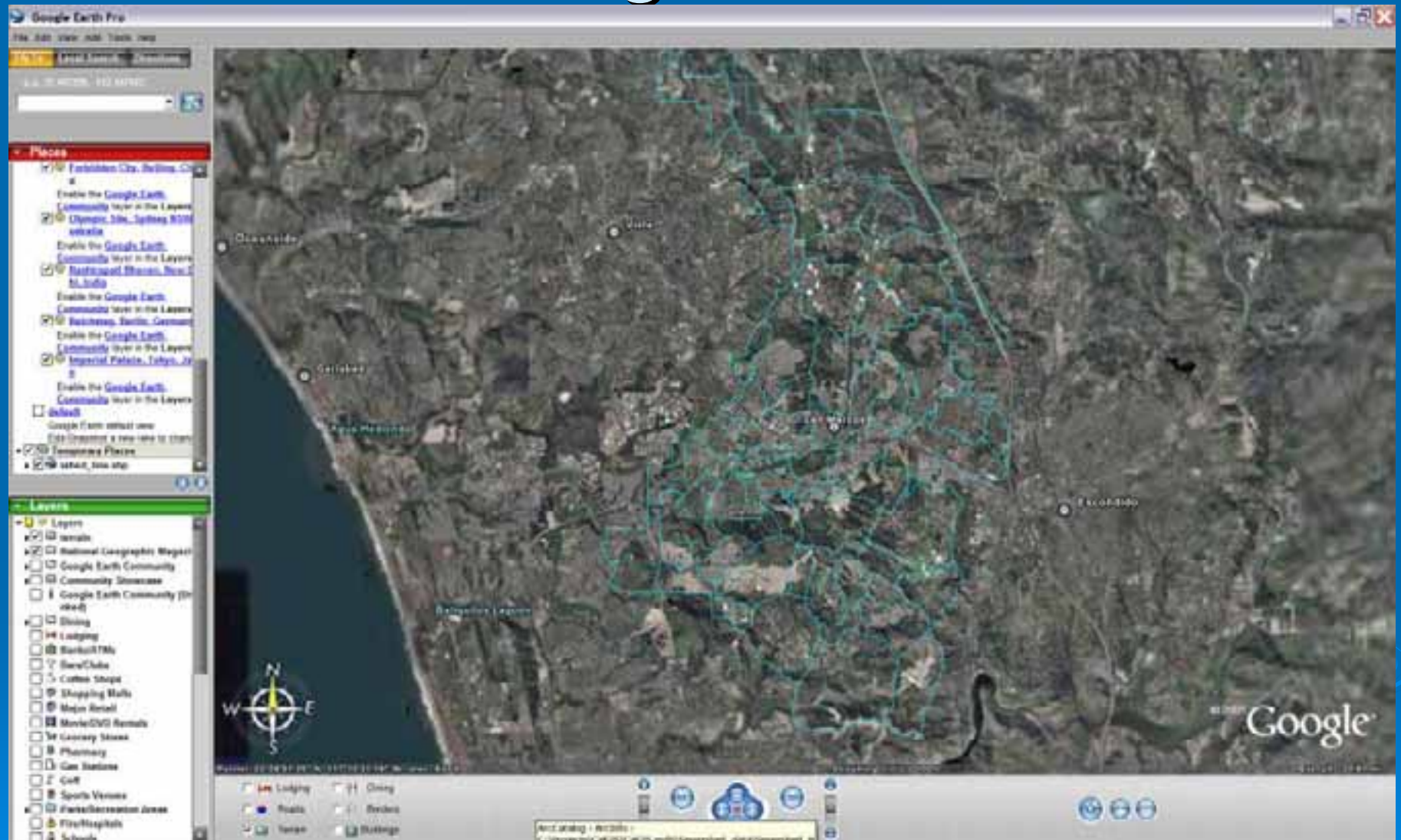
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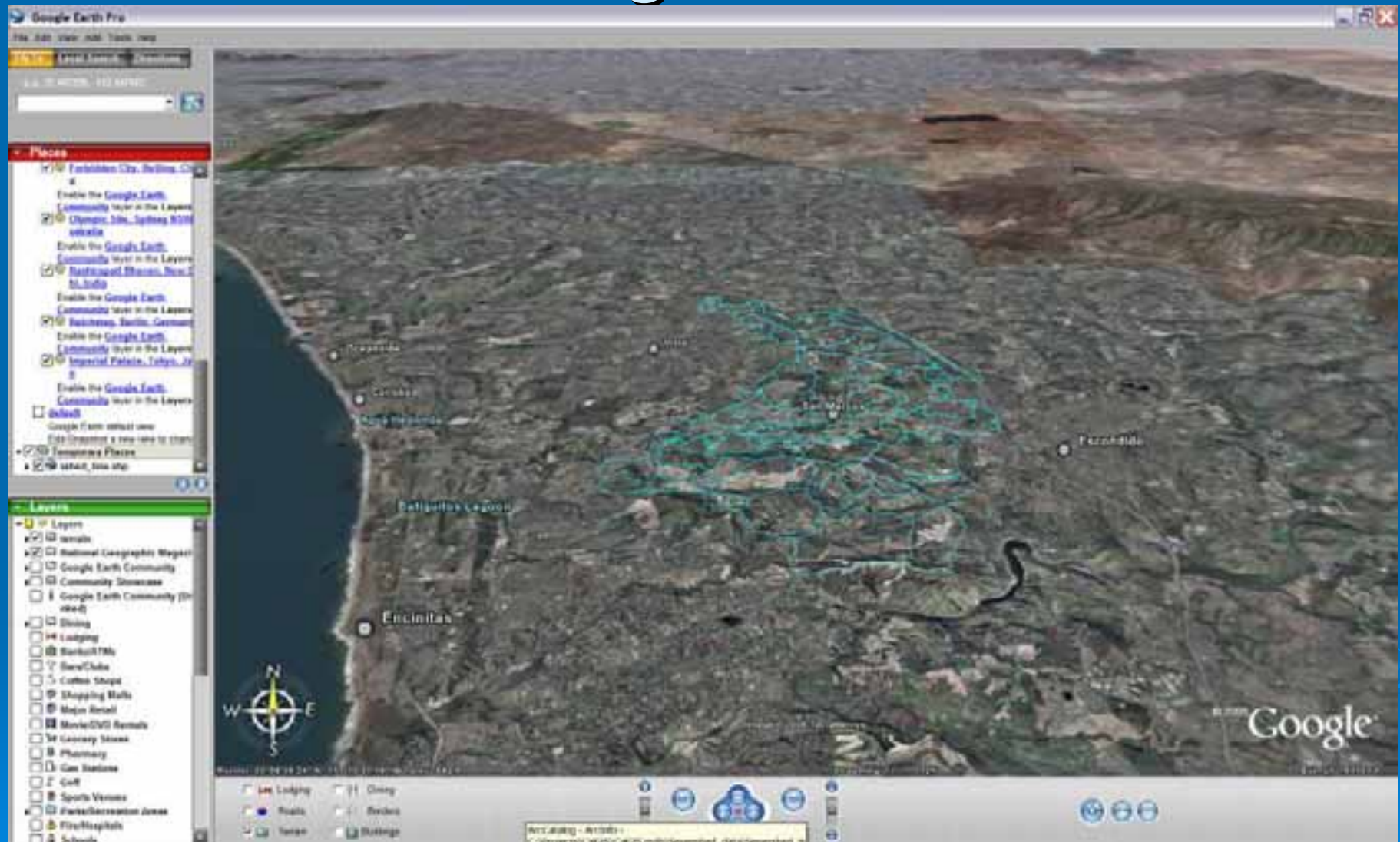
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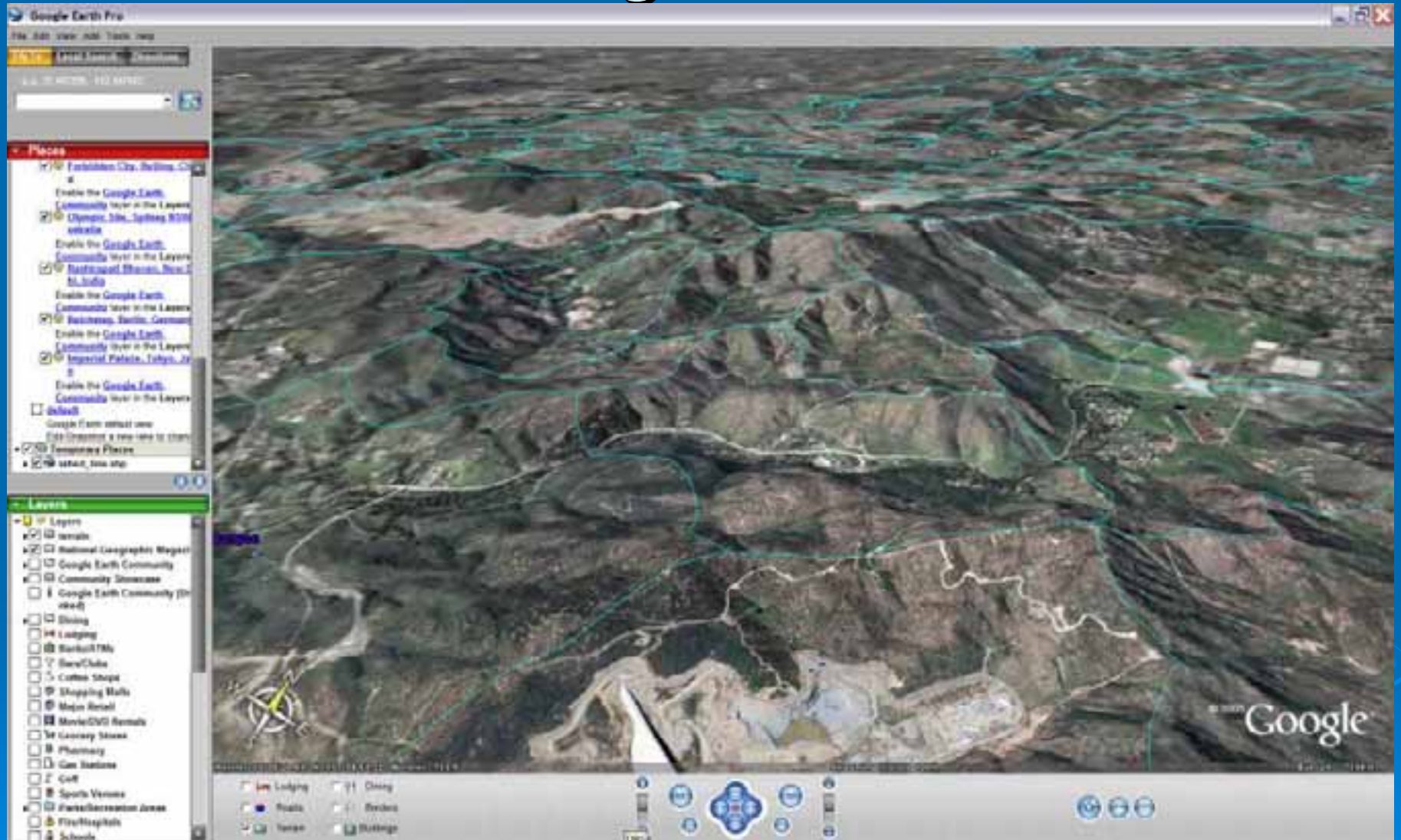
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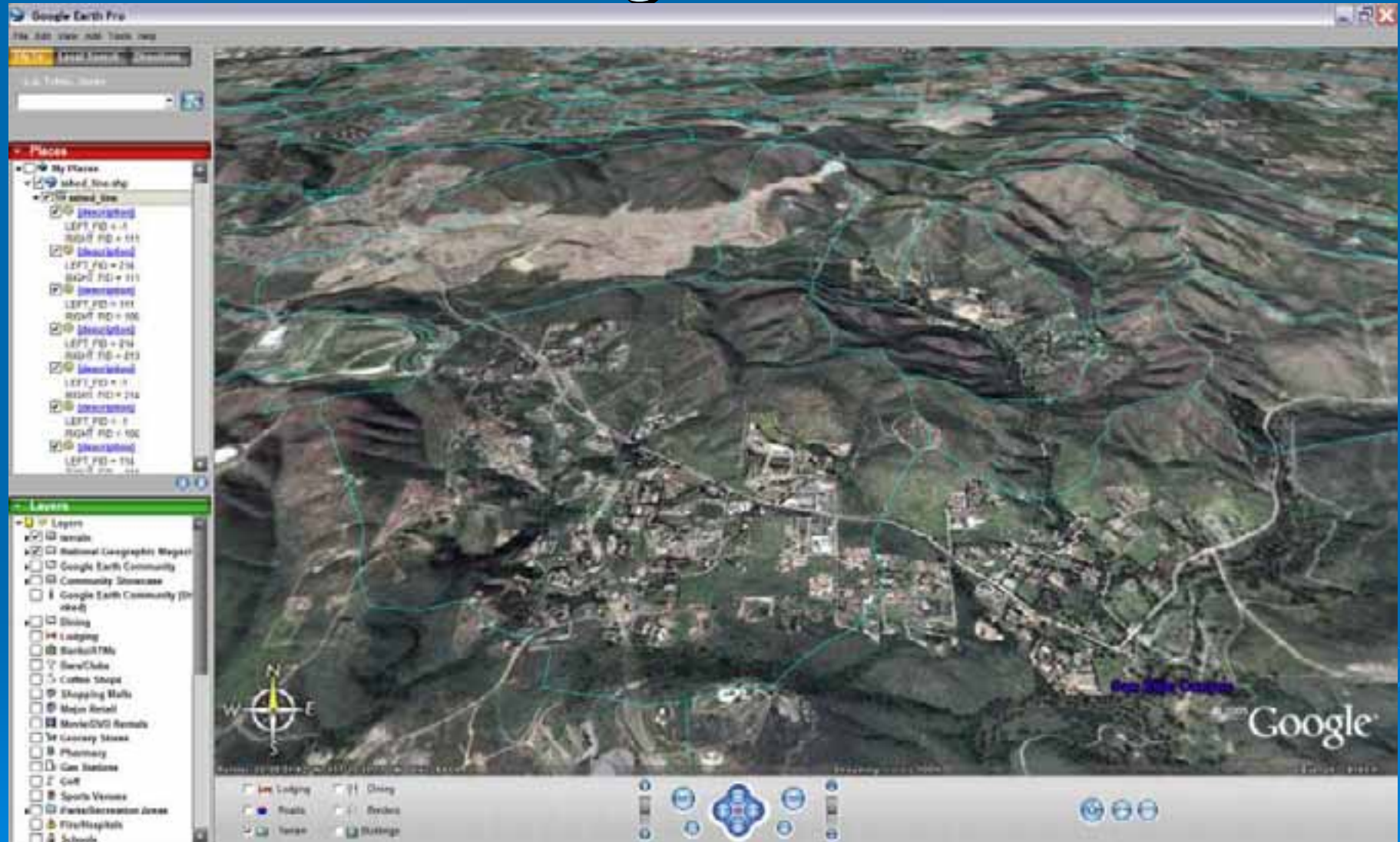
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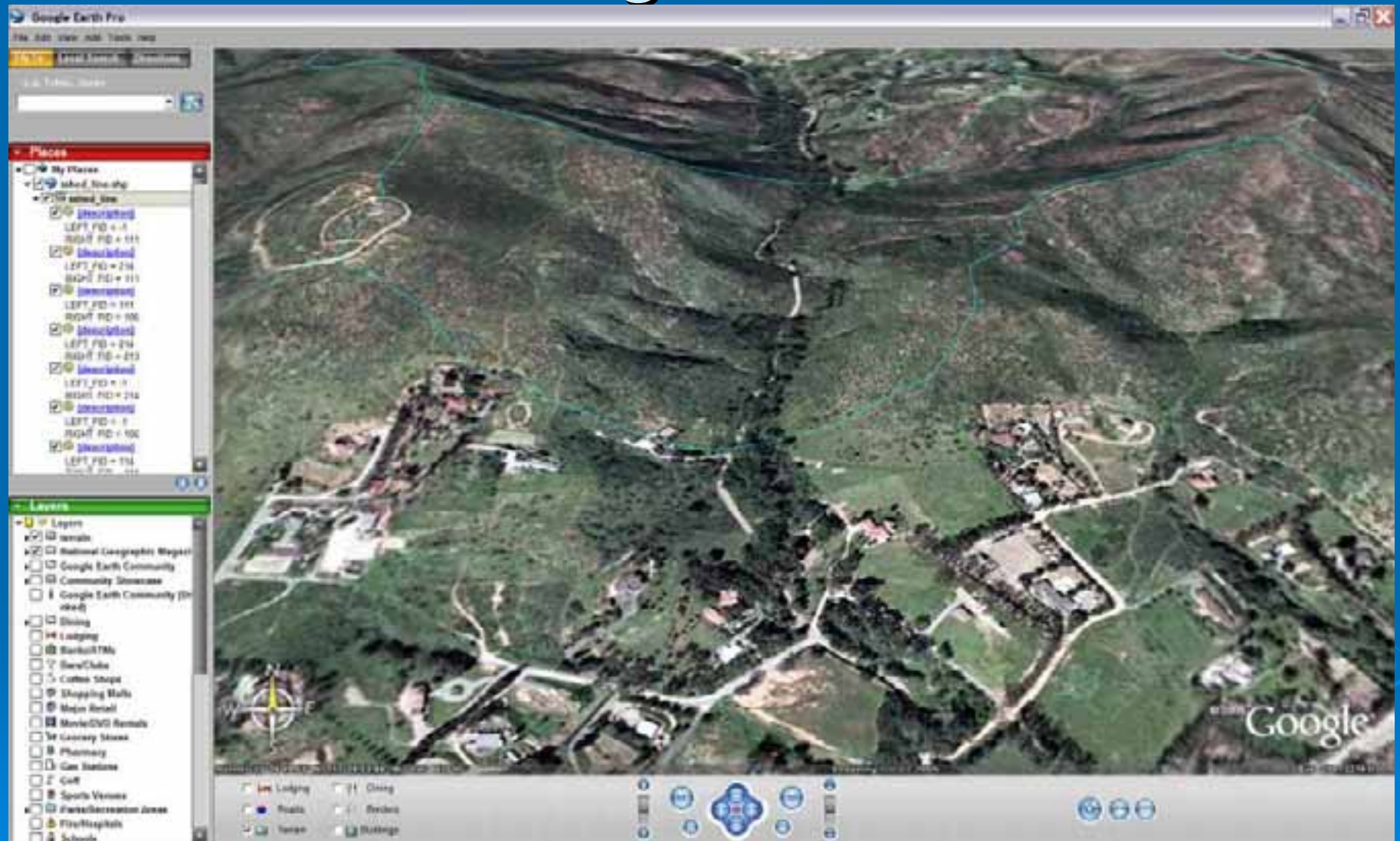
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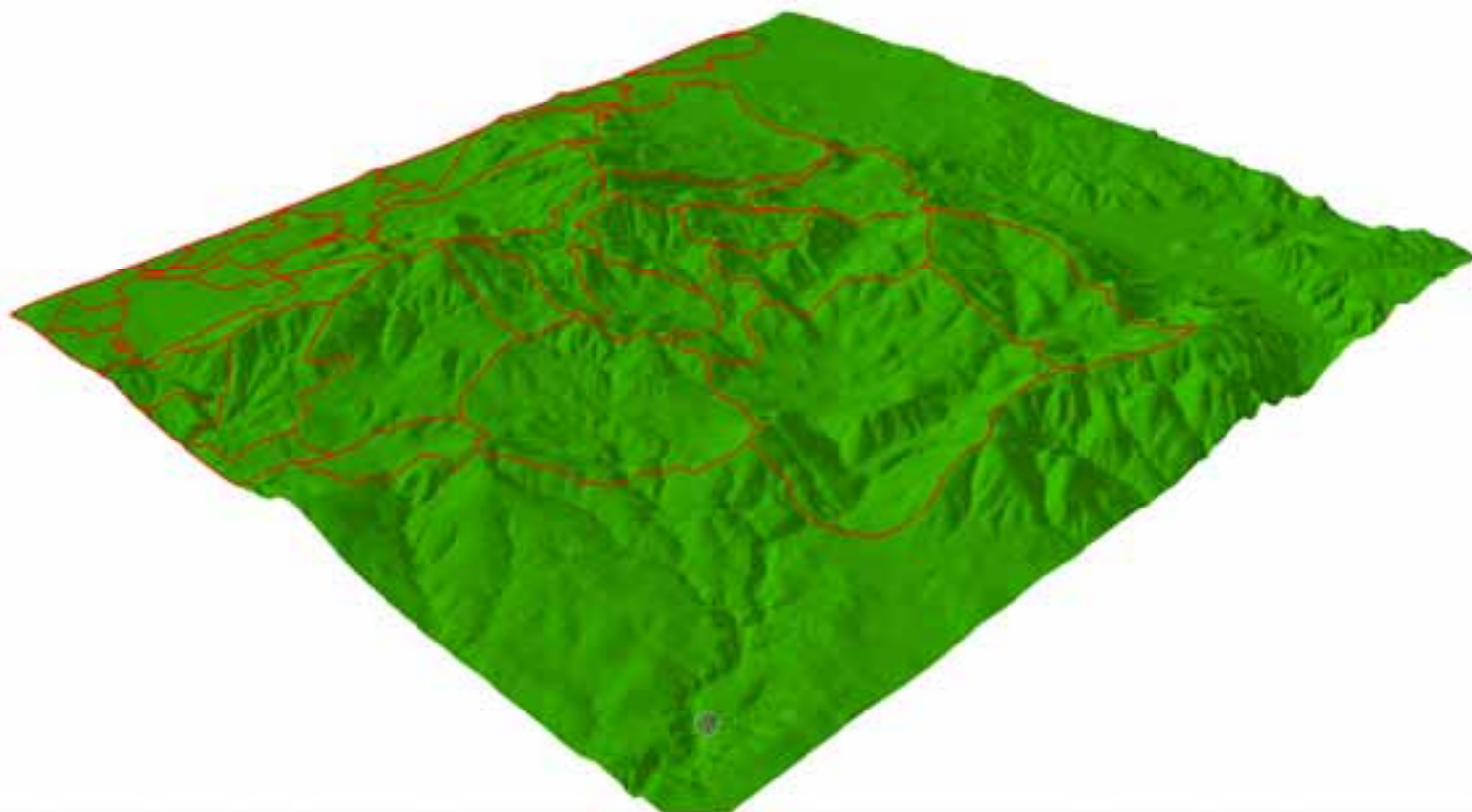


GoogleEarth



GoogleEarth





Conclusions

- More accurate method using best available data
- More efficient/cost effective
- Client/public can “visualize”
- Easily updated



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