



April 2006 Monthly Newsletter

Velocity Surveys in GOM³

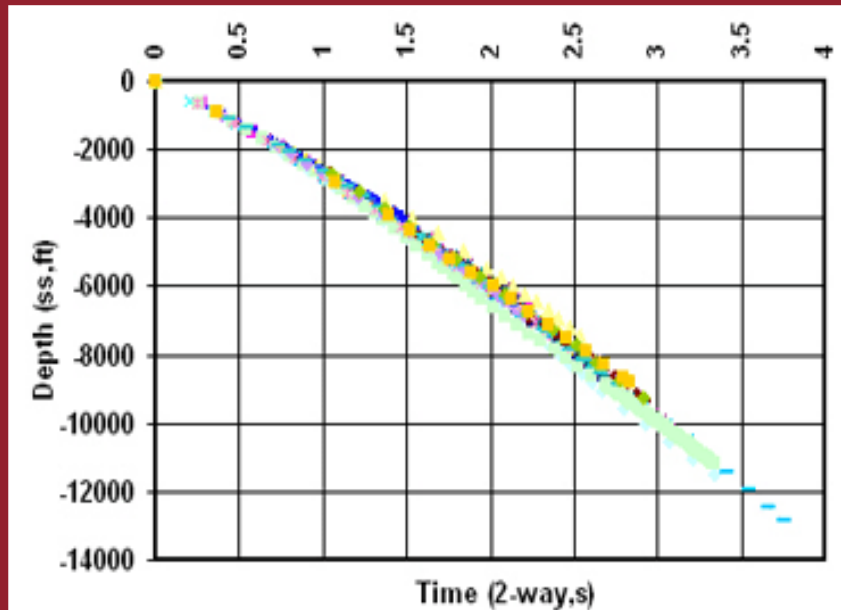
During the last 12 months, we have concentrated on upgrading the geophysical data available through GOM³. Including 230,000+ well log images, accessible by clicking on individual wells, was a big contribution. The capability to add 2-D seismic data

into our 3-D GIS scenes, to be released this fall, will radically leverage the power of GOM³ to exploit the massive libraries of seismic data that companies have collected.

A smaller but important part of our program was adding velocity data and the capability to easily graph it. We currently carry 3,042 velocity surveys, which are updated monthly. Each survey consists of approximately three dozens observations of one-way travel time and the total vertical depth at which the measurement was taken.

Even though velocity data is available on only about 7% of all wells drilled in the Gulf of Mexico, they provide representative coverage of all wells. In any area, the number of surveys available is roughly proportional to the number of wells. The mean distance from any existing well in the Gulf to one with a velocity survey within GOM³ is 7,286 feet, half of the wells are within 5,000 feet of a survey and 78% are less than 10,000 feet away.

Velocity data can be accessed three ways. Under the GOM³ toolbar pick Tables; among those listed is "Velocity Surveys." It contains all points from all surveys in one location that can be easily exported.



Above: Velocity Survey Data

To see or select all the wells in the Gulf with velocity data, load Wells (Map Layers -> Wells); then use the Query Wizard (under the red Tools-Hammer button) on Wells to select all wells where Velocity Survey Flag = 'Y'. You can either highlight the wells with surveys, or

create a "definition query" that will restrict the layer to only those wells with surveys.

No matter how wells with surveys are identified within the map, by clicking on any well with a velocity survey using GOM³'s Hot Link Tool, the data from the survey is immediately accessible in a table.

Most importantly, a typical goal is to analyze all of the surveys in a particular area. To do this, create a layer containing only wells with velocity surveys. Then, select the region of interest with the ArcGIS Select tool. After that spatial selection is made, click ESA's Tools (red hammer) button and pick "Chart Velocity Data." The system takes the surveys within the selected area, writes them out to Excel and for all of them, plots velocity as a function of depth (see picture). This way, two critical relationships can be explored. By inspecting the graph, velocity function outliers can be easily seen (as each well is identified in the chart legend). It is also possible, through Excel's statistical functions, to derive a simple time-depth equation using one or more wells in the area of interest.

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