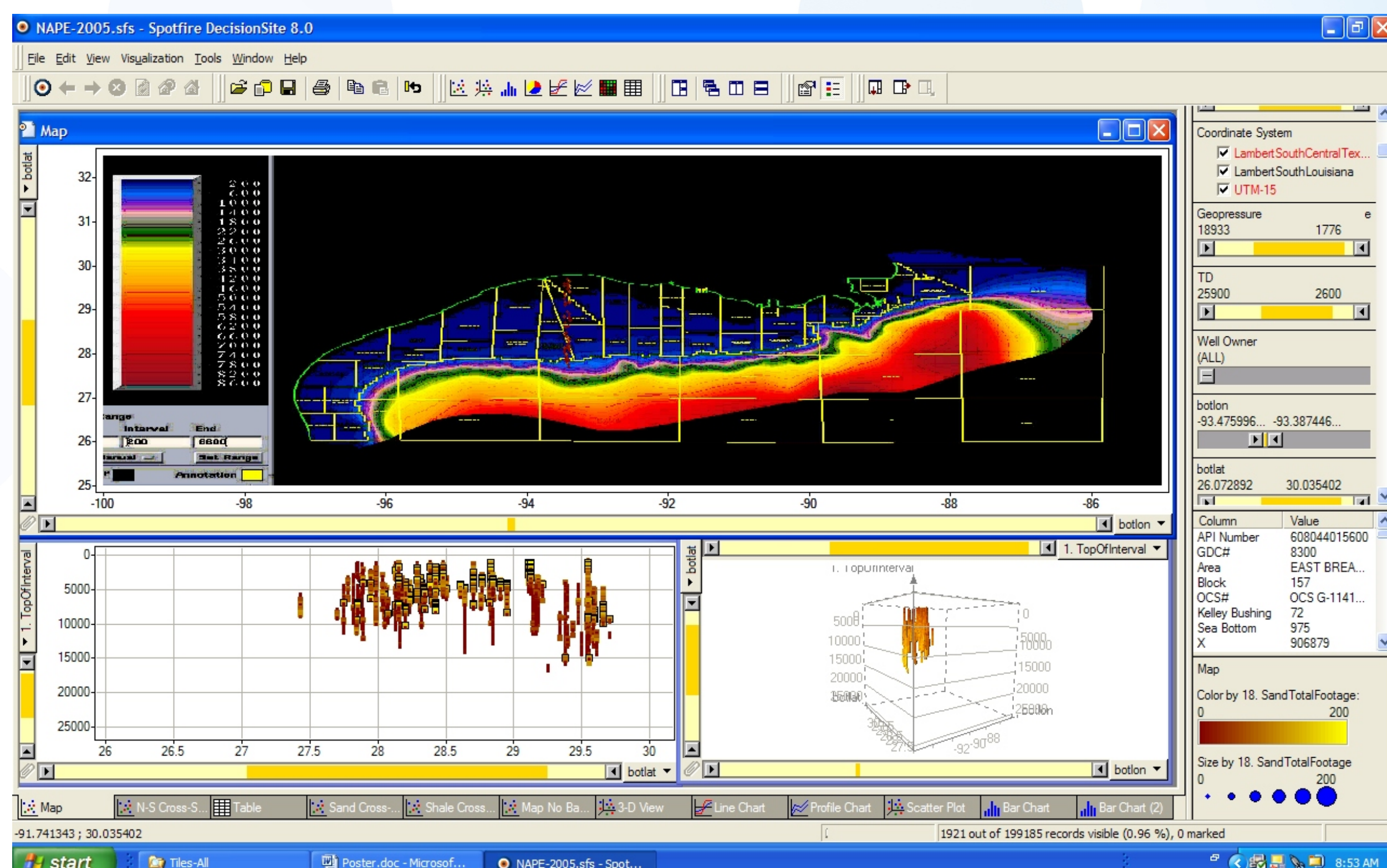


# 2005 Spotfire Energy Forum

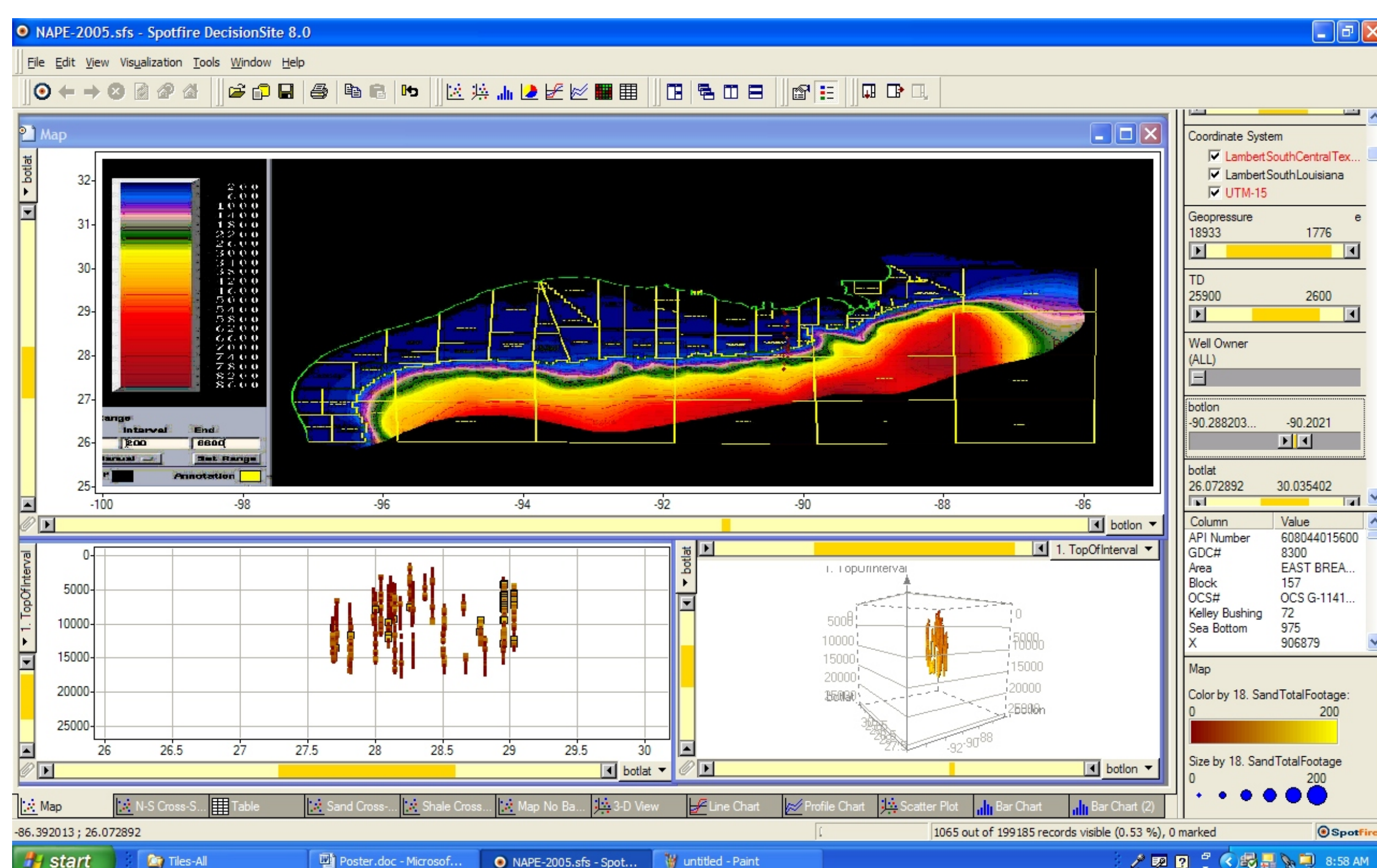
## Raising the Bar in Analytics

# Spotfire On... Rock Property Classification Trends

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1. The map, cross-section, and 3D display show how DecisionSite allows real-time review of GDC's large rock property database. A screen capture of bathymetry for the Gulf of Mexico is placed as a background for the map to provide context. The Bottom Hole Longitude range is set on the query devices, and then moved across to step through cross-sections of the rock property Total Sand Footage, with this image centered on the West Cameron Area.



2. The same map as above shows the change in cross-section location to the South Timbalier Area of the Gulf of Mexico. Note how there are fewer good sands, and they are deeper closer to the coastline (to the left on the cross-section). DecisionSite's interactive updating provides real-time understanding of complex multi-dimensional

## The Result

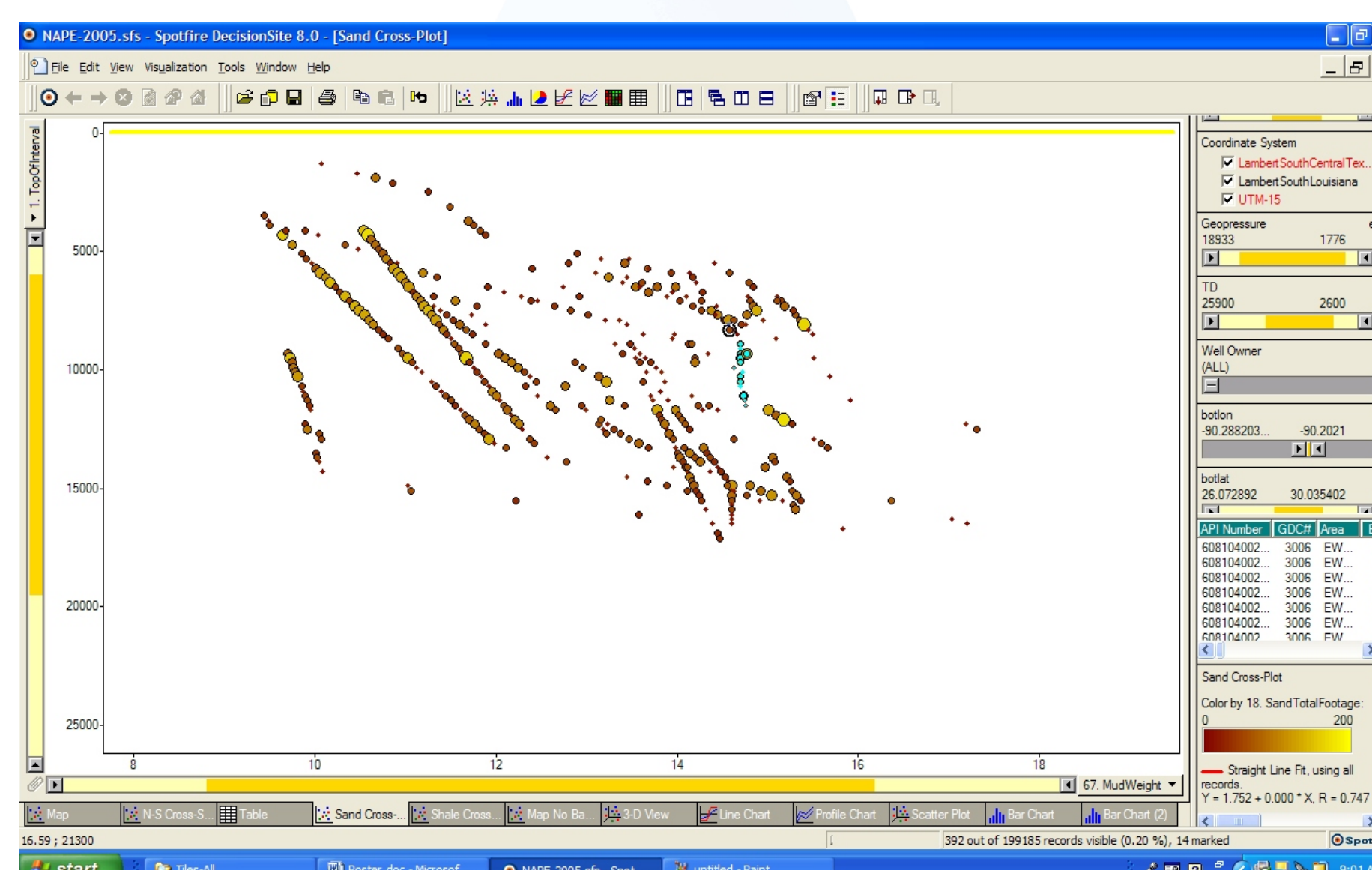
DecisionSite provides a new way to quickly QC raw data, browse the data, and look for trends. You are able to quickly create patterns and classify data into trends, providing you with a new way to identify and qualify new exploration opportunities.

## The Business Issue

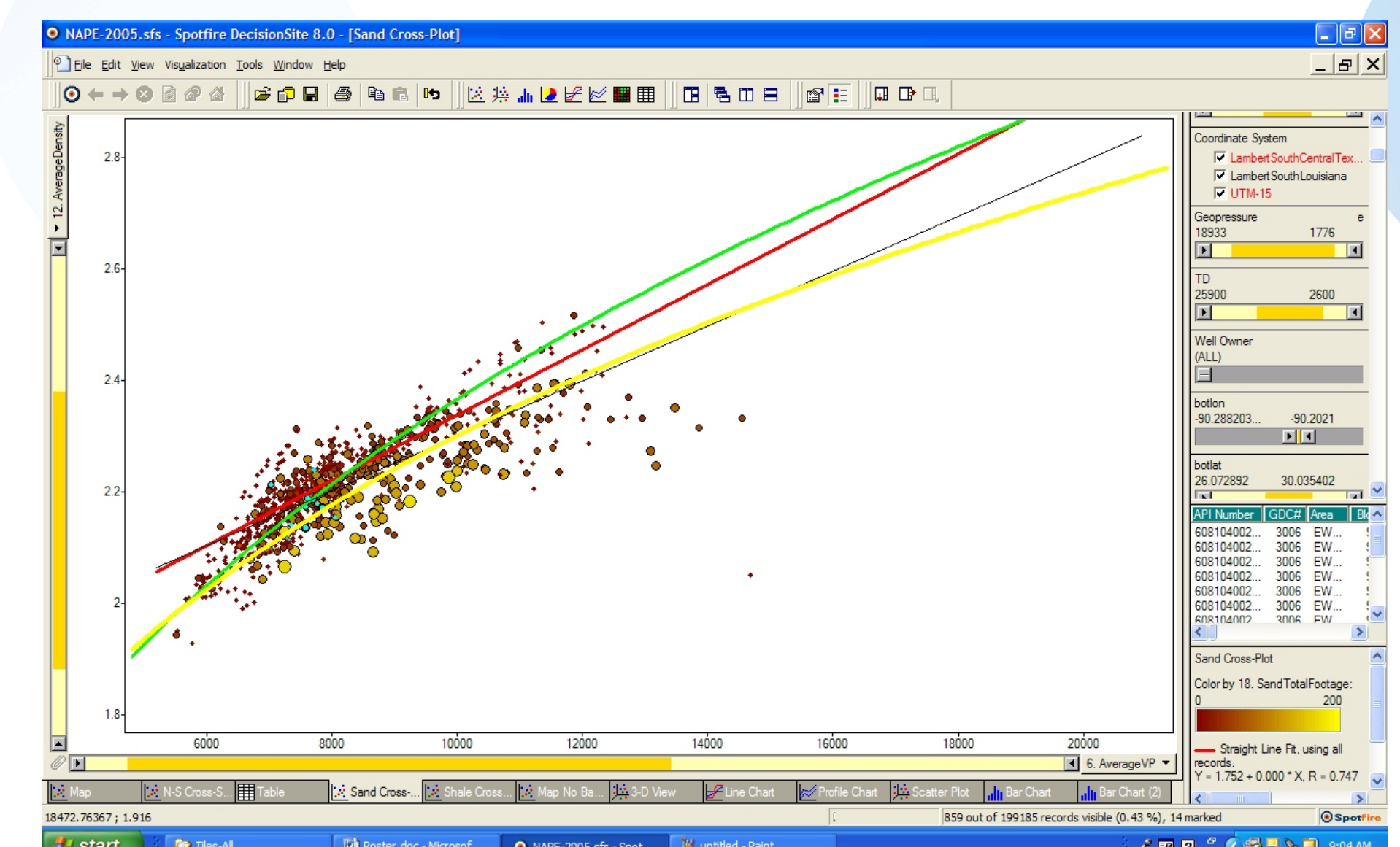
Geophysical Development Corporation has developed an extensive geophysical rock property database for the U.S. Gulf of Mexico over the last 20 years. This database provides a window into the type of seismic response to expect from new gas and oil fields and is being effectively mined by oil and gas companies, including Anadarko Petroleum.

## Spotfire Approach

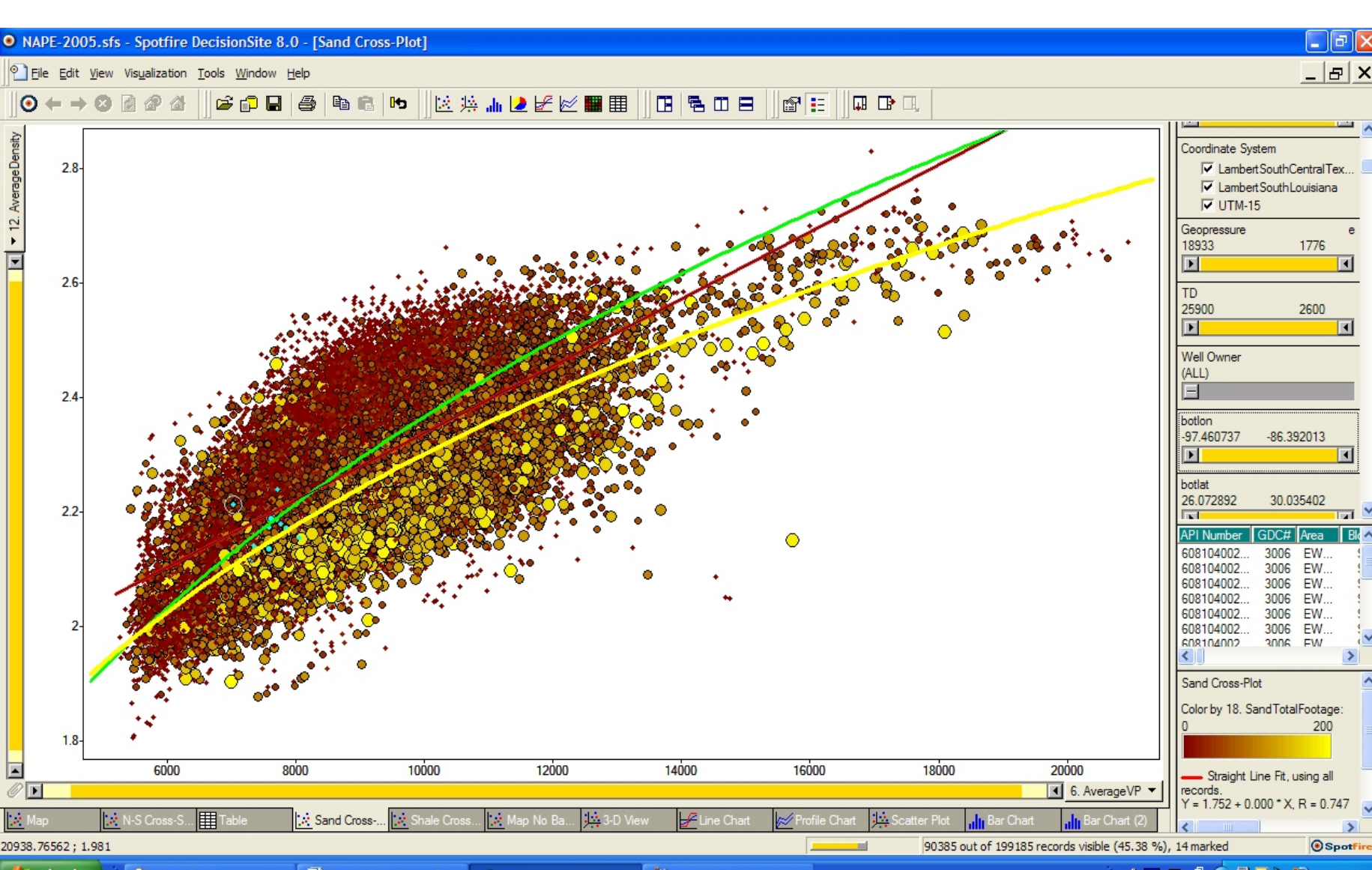
DecisionSite allows real-time database quality control (QC), evaluation, correlation, and pattern finding from all of the derived geophysical rock properties from all 5500+ wells in the Gulf of Mexico database. Data clusters and trend lines are providing insights into where new plays are, what geophysical rock property attributes are key for identifying new fields, and which trends hold the most promise for ongoing exploration, in order to find new gas and oil fields in the Gulf of Mexico.



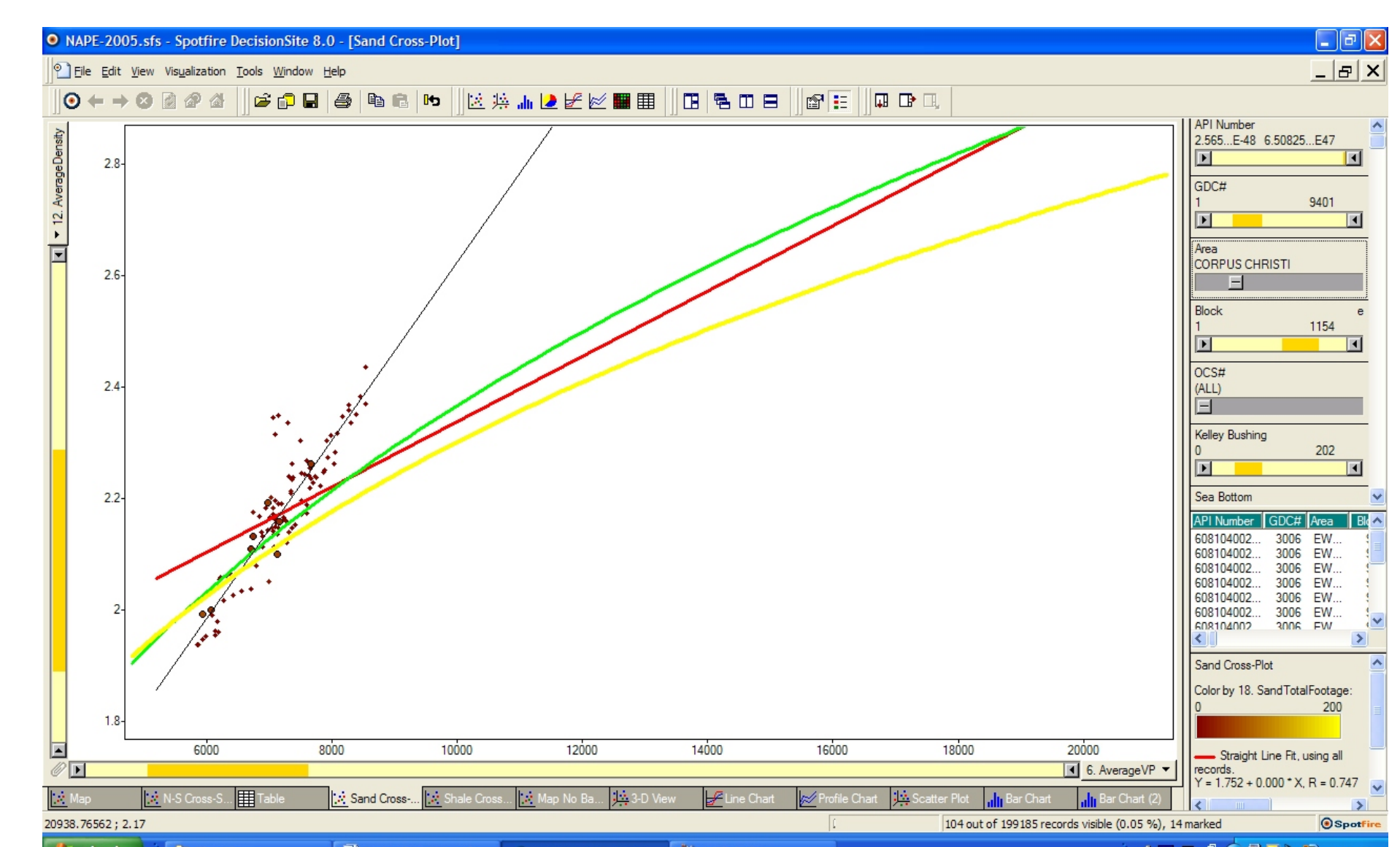
3. The data for the South Timbalier area is then displayed in a cross-section showing depth vs. mud weight. Notice the constant mud weights which have been highlighted with the marker (colored cyan), which provide an example of how easy DecisionSite makes it to quality control large databases. This means mud weight values in the well with GDC number 3006 needs to be checked out.



4. These same South Timbalier Area data are then displayed showing Average Density vs Average Velocity. The green curve is Gardner's equation ( $f(x)=0.23 \times x^{0.25}$ ), the yellow curve is a modification published by BP ( $f(x)=0.152 \times x^{0.298}$ ), the red straight line fit is to all data in the GDC rock property database, and the black straight line fit is to data in the cross-section strip of wells through the South Timbalier Area.



5. The Average Density vs. Average Velocity plot for the entire GDC rock property data set shows relationships between the four curves described above and the QC issue identified from looking at depth vs. mud weight. Note that the red and black straight line fits overlay each other because they are fitting the same data.



6. Moving to the western edge of the Gulf of Mexico while viewing the same plot shows that the shallow wells that have been drilled in the Corpus Christi area contain fewer sands. Neither the Gardner equation, nor the BP equation provide an accurate representation of compaction and velocity relationships. Possibly the rocks have more volcanic content from the Big Bend area, thus the velocities are faster than predicted by the equations.