Schlumberger

GeoSphere 360

Aligned with United Nations Sustainable Development Goals: 12—Responsible consumption and production, 13—Climate action.

3D reservoir mapping-while-drilling service

Better reservoir understanding with volumetric and 3D insights

Emissions Footprint:
Reduces drilling time and emissions associated with meeting production goals, enabling fewer, higher quality wells.

Applications

- Geoimaging of the fullness of the reservoir environment, including stratigraphy and fluid bodies
- Precise landing of wells
- Reservoir illumination
- Water zone detection and avoidance
- Drilling risk mitigation
- Reduction in rig emissions for appraisal and development wells

How it improves wells and reduces carbon footprint

GeoSphere 360* 3D reservoir mapping-while-drilling service goes beyond reservoir mapping in 2D layers. It provides fluid volumes, bodies, and faults—at reservoir scale. This technology delivers new understanding of uncertainty to a true 3D level. GeoSphere 360 service illuminates the reservoir environment to enable booking more reserves and producing more hydrocarbon per well. You can enhance your completion and production facility design by placing fewer, better wells with greater certainty and, in turn, meet your production targets with less CO_2 emissions. The result is improved returns from complex reservoirs with lower impact.

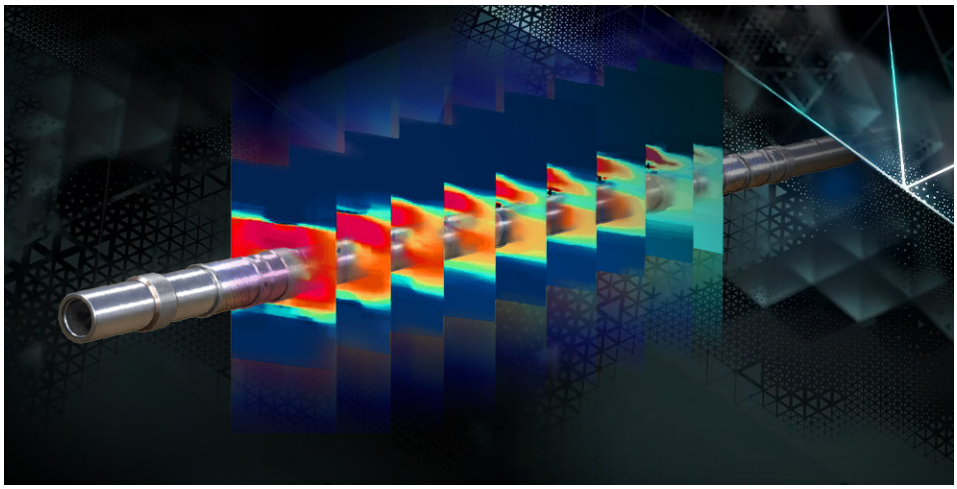
Reservoir-specific GeoSphere 360 service extrapolates shapes that are impossible to see at the wellbore scale for better reservoir understanding in heterogenous or complex reservoirs—and not just 3D structural delineation but also 4D fluid-movement evaluation. By increasing confidence and certainty, operators can drill fewer and more accurate wells using informed, real-time reservoir steering and mapping, which reduces both overall drilling time and carbon footprint.

How it works

GeoSphere 360 service acquires 360° tensor data and sends it uphole in real time via mud pulse telemetry and wired drillpipe. Cloud computing is used to invert the large datasets with a 2D azimuthal pixel-based algorithm. GeoSphere 360 service produces 3D-resistivity volumes that are filtered to understand the geometrical relationship of the resistive geobodies around the wellbore, calibrating the seismic data and feeding into reservoir modeling workflows.

For example, 2D inversions can integrate the 1D GeoSphere 360 service inversion results, illustrating vertical separations between two resistive bodies in a lateral plane. The 2D azimuthal inversion slices can illustrate the lateral variation in the resistive bodies and GeoSphere 360 service 2D transverse inversion enhances integration of the geological dataset from nearby wellbore to reservoir scale, informing highly educated geosteering decisions at realistic drilling ROPs.

Because the full 3D data has significantly more datapoints, the predrill seismic images and geobody extractions are calibrated more accurately than what is possible with conventional technology. Comparing all data sources enables further validation of interpretation. Additionally, subsurface geomodels updated in real time to a high resolution mean higher-confidence strategic geosteering decisions in 3D.



GeoSphere 360 service acquires 360 tensor data and sends it uphole in real time via mud pulse telemetry and wired drillpipe.

slb.com/GeoSphere360