

OPENSPIRIT

Integrating Subsurface and GIS Workflows

Spatial data is a crucial part of your data portfolio, and managing and integrating this data has become a core element in your company's integration strategy. Whether you are combining the power of spatial analysis with your diverse geotechnical applications, sharing your spatial data with subsurface users, or building corporate information and data management portals, OpenSpirit can integrate your diverse environment and keep your team in sync across the business.



Intelligent GIS: Keeping Your GIS Data Connected to Your G&G Applications and Data Stores

Multi-vendor environments are necessary to fully leverage the diversity of analysis and tools available to manage today's E&P workflows. Increasing reservoir complexity, innovative science, shortage of personnel, increasing data volumes, and decisions needed faster than ever are introducing new technologies, data and workflows into our environments at a rapid pace.

From desktop to server, OpenSpirit integrates with ESRI GIS technology, enabling cross-disciplinary mapping and spatial data management workflows. End users can visualize, quality control (QC), create and deliver "Intelligent Maps," and streamline collaboration and interpretation for their asset teams.

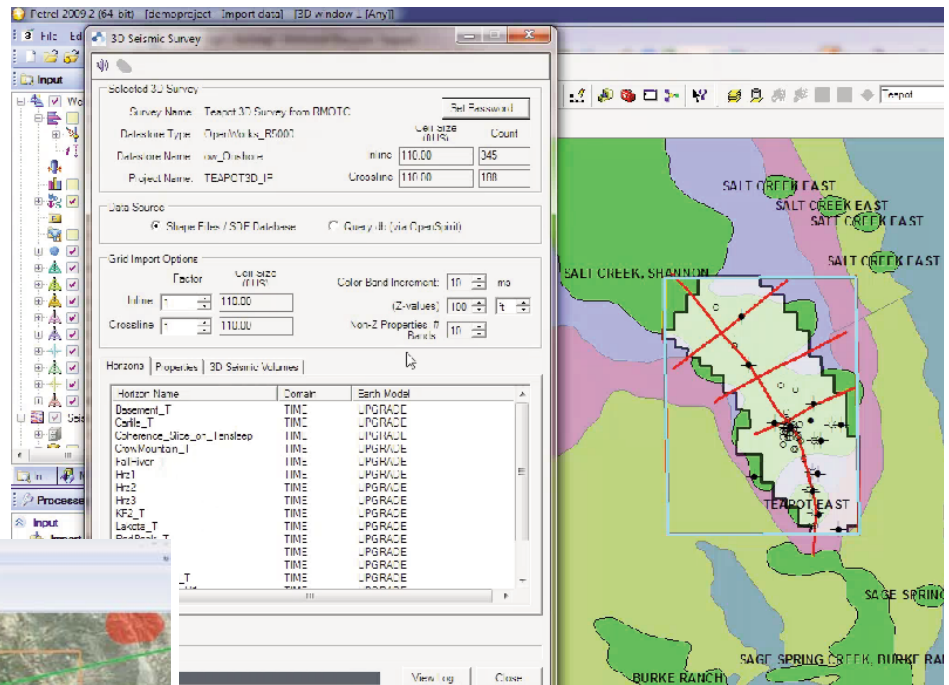
- Choose the best applications aligned with your data management strategies (cross-vendor/cross-platform)
- Seamlessly access data from any OpenSpirit-enabled data store via 40+ partners application adapters
- Combine diverse applications to produce innovative cross-vendor workflows – data management/movement, GIS integration, G&G workflows, and application interoperability
- Leverage your investment across desktop and Web applications

GIS Integration Workflows

GIS users can leverage the **OpenSpirit ArcGIS Extension** as a selection tool in ArcMap to view spatial data accessible via OpenSpirit and simultaneously integrate/interact with multiple OpenSpirit-enabled applications (such as Petrel), knowing that coordinate and units are managed properly. You can directly send any vector or grid data either way as a GIS event, or any well, seismic, or interpretation data as a data selection event.

Or maybe you are getting ready to present your new project to senior management and you want to share your GIS data and G&G data on a global viewer. Use the **OpenSpirit ArcGIS Explorer 900 Add-in** to bring in seismic horizons, wells, and associated spatial data – bringing together the complete picture for easy presentation and understanding.

From your G&G applications, get direct access to your spatial data from the corporate GIS stored in SDE. Leverage the **OpenSpirit SDE Data Connector** to bring this information straight into Irap RMS, Petrel, or other OpenSpirit-enabled application adapters that support OpenSpirit cultural data types.



Use ArcGIS Desktop or ArcGIS Explorer to access, view, query, and select culture and subsurface data via OpenSpirit, and simultaneously integrate and interact with multiple OpenSpirit-enabled applications and data stores.

OpenSpirit GIS Solutions

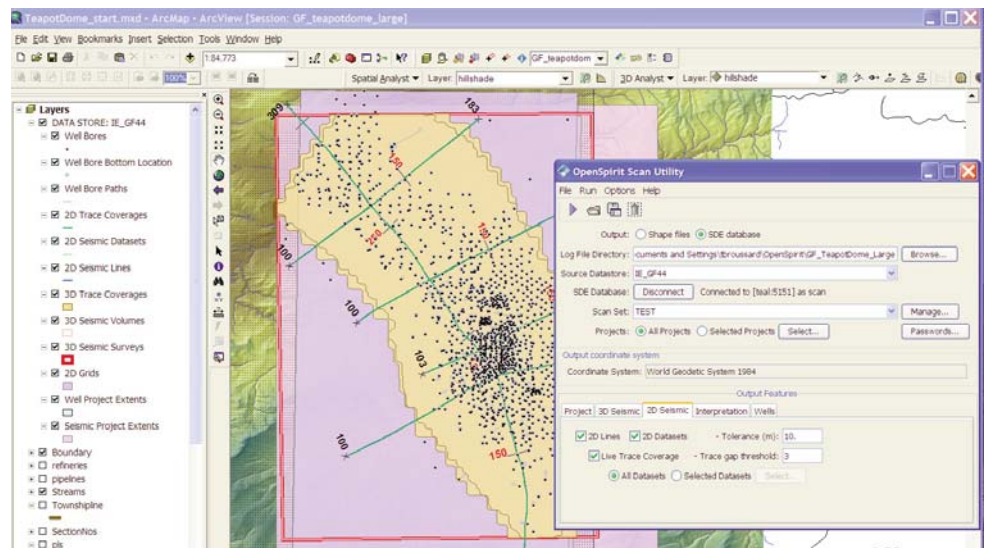
- **ArcGIS Extension** – Use ArcGIS® as a spatial selection tool to view spatial data accessible via OpenSpirit and simultaneously integrate/interact with multiple OpenSpirit-enabled applications. The OpenSpirit ArcGIS Extension enables synchronization between your GIS and OpenSpirit-enabled applications and data stores. Supported data types include:
 - Well surface location
 - Well bore bottom location
 - Well bore path
 - Well pick
 - 3D seismic survey
 - 3D seismic volume
 - 2D seismic line
 - 2D seismic dataset
 - Horizon grid (seismic or non-seismic), pointset or polyline
 - Fault polyline or pointset
 - Horizon-Fault boundary
 - GIS point/polyline/polygon/grid
 - Interactive multi-vendor cursor tracking
- **Scan Utility** – Create shape files or write to SDE by extracting GIS spatial information for well, seismic, and interpretation data from any OpenSpirit-enabled data store. Schedule scan jobs to collect:
 - Well/seismic project outlines
 - Well surface location
 - Well bore bottom location
 - Well bore path
 - 3D seismic survey
 - 3D seismic volume
 - 2D seismic line
 - 2D seismic dataset
 - 2D/3D live trace coverage
 - Horizon grid (seismic or non-seismic)
- **SDE Data Connector** – The OpenSpirit SDE Data Connector enables OpenSpirit-enabled applications like Irap RMS, Petrel, and the OpenSpirit Web Server to read spatial data stored in SDE.
- **ArcGIS Explorer Add-in** – Browse spatial G&G data using this FREE application that uses OpenSpirit data selection and GIS feature events within the ArcGIS Explorer environment.
- **ArcGIS Server** – Transform your data and information portals from read-only to interactive data access and query engines by sending OpenSpirit data selection and GIS feature events from your ArcGIS Server browser to any OpenSpirit-enabled application that supports these events. Samples are available in WebADF, Javascript, and Silverlight.

GIS Data Management Workflows

Data managers are constantly challenged to provide accurate and current data from multiple data sources to a variety of users that are working across a diverse set of applications. The **OpenSpirit Scan Utility** solves this issue for your wells, seismic, and interpretation data stored across any OpenSpirit-enabled data store. Scan all or selected projects and output spatial features as either Shapefiles or as layers in ESRI ArcSDE.

These layers are beneficial in any mapping workflow, but also use the OpenSpirit data key with references back to the original source data, providing a live link to your data from any OpenSpirit-enabled spatial viewer.

Use the OpenSpirit Scan Utility to maintain up-to-date corporate GIS layers, or create summary views of historical projects, or to enable QA/QC workflows, facilitating easy comparisons of data from many different projects in a single GIS view.



The OpenSpirit Scan Utility allows users to scan all or selected projects in an OpenSpirit-enabled data store and output spatial features as either Shape files or as layers in ESRI ArcSDE. These layers include the OpenSpirit data key to maintain an intelligent link between your systems.

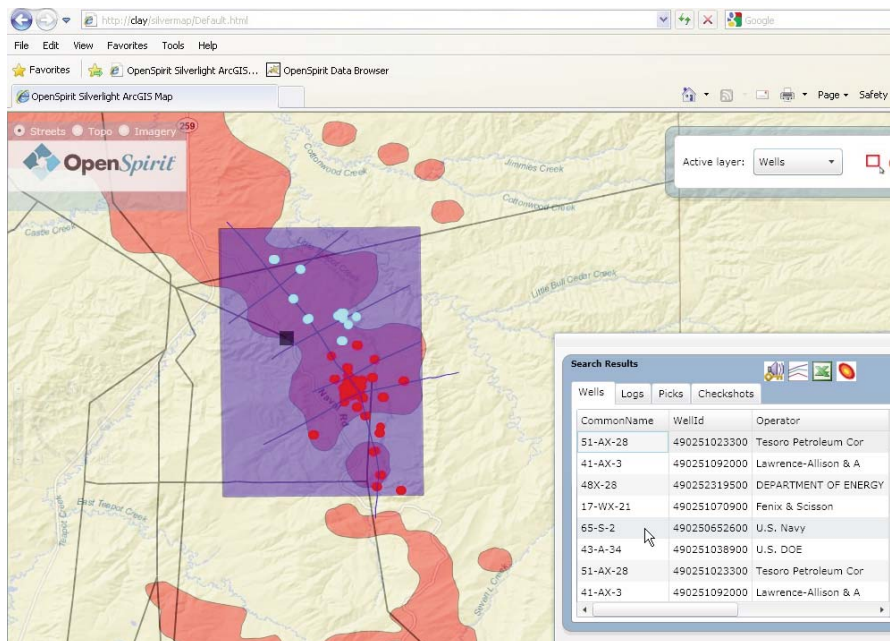
GIS Portal Workflows

Many organizations are leveraging ArcGIS Server capabilities to bring visualization of maps and data to a larger number of users in a lightweight browser-based viewer. Some organizations are taking this even further by integrating the maps into existing data management or dashboard portals, bringing together a complete user experience across an asset team's workflows.

Why stop with just finding and viewing the data? Use the **OpenSpirit ArcGIS Server Integration** sample code inside your ArcGIS Server implementation and allow users to select data from your browser-based map display and broadcast out to any OpenSpirit-enabled desktop application enabled for GIS or data selection events. This capability can be easily integrated into your existing internal ArcGIS Server efforts or worked into any third-party solution you have invested in, adding data access to the solution you already have.

Furthermore, integrating the **OpenSpirit Web Server** product brings in additional capabilities with the option to view well, seismic, and interpretation data in the browser with lightweight Web-based viewers, or generate reports on the fly with detailed information all coming directly from your master data stores via the OpenSpirit services layer. All of these capabilities allow the selection of data and ability to broadcast data to OpenSpirit-enabled desktop applications.

The OpenSpirit Web Server product uses REST-style Web services, allowing easy integration with your existing environment – no need to replace or rebuild your current systems. The OpenSpirit Web Server runs in parallel to your existing tools, allowing access to more data types and including more reporting and viewing capabilities than ever before.



Take your online maps to the next level with OpenSpirit Web Services and ArcGIS Server integration. Access, view, report and interactively select data, allowing integration across multiple OpenSpirit-enabled applications and data stores.

OpenSpirit Data Connectors

OpenSpirit enables your applications to create, read, update and delete data from anywhere within your network using data servers for your specific databases.

- OpenWorks/SeisWorks
 - GeoFrame/IESX/Charisma
 - Finder
 - KINGDOM
 - ArcSDE
 - Petra
 - Managed SEG Y
 - Recall
 - Epos3/Geolog
 - PPDM
- Including:
- geoLOGIC Data Center (gDC)
 - IHS Canadian Data Hub
 - Fugro Trango Well
 - NeuraDB
 - Oilware

Maximize Your GIS Investment

By integrating with ESRI® GIS solutions, OpenSpirit provides powerful tools to help you integrate G&G spatial data with your GIS and maintain integrity among your project data stores and cross-disciplinary applications. Give your geoscientists and engineers the confidence, motivation, and access they need to leverage your GIS framework.

GIS workflows have never been easier!

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