

JewelSuite Subsurface Modeling Application



JewelSuite™ software delivers subsurface intelligence and insight through a portfolio of applications focused on geological modeling, geomechanics, reservoir simulation and visualization to optimize field development plans and drive greater production. The JewelSuite Subsurface Modeling application is an innovative, powerful tool to create precise geological models that can seamlessly transfer into any industry standard simulator.

Precise geological models

With its revolutionary gridding technology and advanced structural modeling capability, the JewelSuite Subsurface Modeling application allows faster, better, more robust evaluation of even the most complex geology. Its ability to rapidly build multiple scenarios accelerates analysis of alternative possible outcomes for determining optimal field development plans.

Superior gridding technology

The JewelGrid™ patented gridding technology enables modeling of complex geological structures, such as intricate fault systems, unconformities, and salt intrusions, without compromises. Unlike pillar or stair-step gridding, our gridding technology has no restrictions with respect to geometry and topology handling; all geometries are accurately captured and models can be full-field extending from the deepest point of the field to the surface. What you see is what you model.

Reservoir simulation

Integrate geologic models, without losing any structural detail, seamlessly into your reservoir simulation. This software application includes all workflows required for dynamic modeling and can be used as a powerful pre- and post-processor for your simulator of choice. Updates to the structural and geological models easily transfer into your simulation workflow allowing you to assess the effects on reserves, production rates, and other critical parameters of your field development planning. This seamless integration enables extensive and efficient history matching, sensitivity analysis, and field development planning optimization.

Flexibility, connectivity, and extensibility

You can use the application as a standalone tool or in combination with other JewelSuite applications or third-party software to complement your existing workflow. Data is seamlessly exchanging between applications through shared files, or by dragging and dropping data.

The JewelSuite Subsurface Modeling application is built on the JewelEarth™ development platform that enables you to easily enhance existing functionality with new plug-ins or modules that contain your own algorithms or methodology; build your own workflow standards through set workflow panels; and connect to proprietary databases or other subsurface applications by using the JewelEarth Software Development Kit (SDK).

Intuitive workflows lead users step-by-step through processes.

Workflows	
Geological modeling	
Data import	<ul style="list-style-type: none"> Using Kingdom™, Openworks™, and Petrel™ connectors or our multiple industry standard formats readers to import seismic, surfaces and well data
Data preparation	<ul style="list-style-type: none"> Organize, create, modify and quality control the imported data while protecting original raw data
Stratigraphic modeling	<ul style="list-style-type: none"> Define the vertical hierarchy of the geological layers Create different models with varying resolutions using different interpretations
Fault modeling	<ul style="list-style-type: none"> Define the group of faults to be used in the 3D model and solve possible inconsistencies among them Create alternative models using different resolutions or using different interpretations
Structural modeling	<ul style="list-style-type: none"> Define the structural framework for the 3D model by combining one stratigraphic model with one fault model Create multiple scenarios to analyze alternate possible outcomes
Fluid modeling	<ul style="list-style-type: none"> Define fluid compartments and fluid distributions from the structural model
3D gridding	<ul style="list-style-type: none"> Create the 3D geo-cellular model from the structural model
Property modeling	<ul style="list-style-type: none"> Populate the 3D grid with rock and petrophysical properties using geo-statistical methods
Upscaling	<ul style="list-style-type: none"> Coarsen the 3D grid resolution, if needed, to accelerate flow simulation calculations
Volumetrics	<ul style="list-style-type: none"> Calculate original fluids in place in the 3D grid
Reservoir simulation	
Pre- and post- processing	<ul style="list-style-type: none"> Pre- /post-process flow simulation cases
Hydraulic fractures	<ul style="list-style-type: none"> Create 3D models and flow simulation cases for hydraulic fracturing scenarios
4D geomechanics	
3D meshing	<ul style="list-style-type: none"> Create Finite Element Mesh from the structural model using Abaqus as the meshing engine
Pre- and post- processing	<ul style="list-style-type: none"> Pre- /post-processing to run and analyze dynamic geomechanical simulations

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