

# What's New in PetroMod 2015

Petrel platform integration, high-resolution Darcy flow, and more

## KEY FEATURES

- Full integration with Petrel\* E&P software platform
- High-resolution Darcy flow for more precise fluid flow simulations
- Combined Darcy and invasion percolation migration for improved accuracy in complex reservoir structures
- Map-based lithologies accounts for complex facies distributions
- Decoupled source rock definition enables high-resolution charge modeling of unconventional shale plays
- Rock failure functionality delivers accurate charge predictions and pore pressure assessment
- sCore\* lithofacies classification schemes and shale lithologies seamlessly integrate petrophysical data into petroleum systems models
- Mud weight output presents all relevant drilling operation parameters in a mud weight plot

The 2015 version of PetroMod\* petroleum systems modeling software combines geophysical and petrophysical data with geological knowledge to model the evolution of petroleum systems in an intuitive work environment.

The combination of a user-friendly interface and high-speed simulation performance, along with other significant improvements, supports sophisticated analytical workflows of the dynamic temperature, pressure, and migration history of complex geological systems in a fast, process-focused workflow.

PetroMod 2015 introduces improved analytical tools for enhanced simulation results, especially in unconventional play assessments. The simulation interface is integrated with the associated simulation case in the Petrel platform, providing full access to the complete range of modeling capabilities. In addition, all PetroMod software simulation results can be analyzed and included in an integrated geology and geophysics workflow.

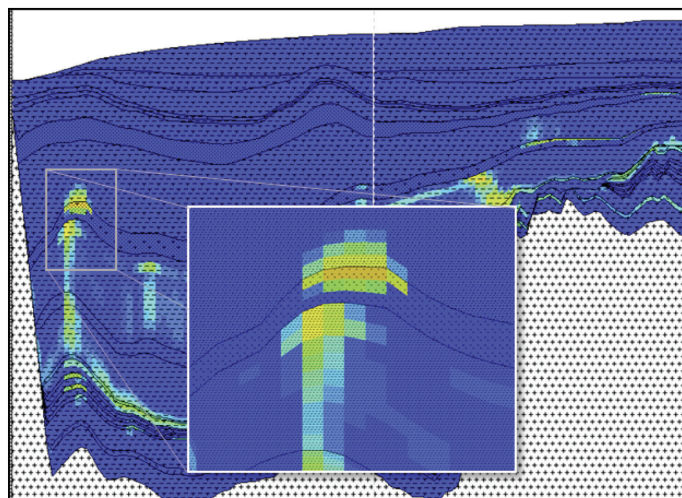
When connected to a PetroMod software project, the Petrel platform can be used as a fully capable 3D viewer for PetroMod software simulation results without requiring installation of PetroMod software on the same computer.

## Full 3D integration with the Petrel platform

With Petrel platform and PetroMod software integration, new 3D petroleum systems simulation cases can be defined using 3D geometry, facies information, and boundary conditions. The simulation case can be submitted to PetroMod software from inside the Petrel platform, and the simulation results are available both in the Petrel platform and in the PetroMod software. A new Geotime player in the Petrel platform enables accurate analysis of the petroleum system through geologic time in the context of the Petrel platform's project data.

## High-resolution Darcy flow

The new Darcy flow enables a more precise fluid flow simulation in low-permeability, high-saturation lithologies. This significantly improves the application of the PetroMod software in unconventional shale plays. Additional improvements include a more precise breakthrough simulation with hydrocarbon buoyancy effects and oil and gas interaction in nonequilibrium reservoirs. The new Darcy flow also improves the simulation of flow in areas characterized by a high-permeability contrast, such as expulsion from a source into a highly permeable carrier bed.

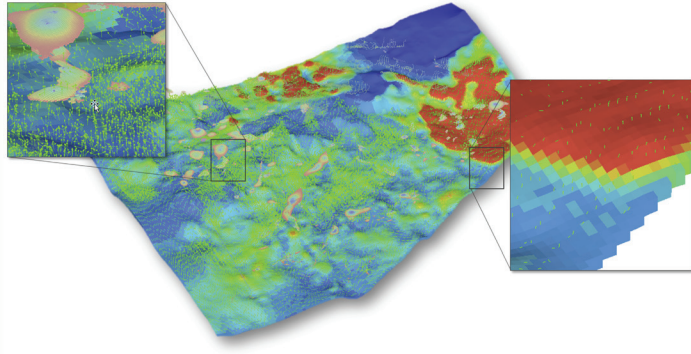


*Especially advantageous in unconventional shale play simulations, the new Darcy flow enables more precise fluid flow simulation of low-permeability, high-saturation lithologies.*

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## Combined Darcy and invasion percolation migration

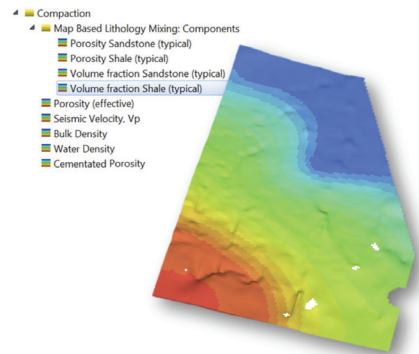
The combination of the high-resolution Darcy flow and invasion percolation migration methods provides accurate simulations of flow in low- and high-permeability lithologies, even in complex reservoir structures and faulted areas.



PetroMod software delivers accurate simulations, even in complex reservoirs.

## Map-based lithologies

PetroMod software now enables defining facies distributions, including continuous variation of mixed lithology ratios. This definition makes it possible to include results from complex facies models directly into petroleum systems modeling. Gradual variations in porosity and permeability provide more accurate simulation of fluid flow patterns in areas of complex facies distribution.



To enable more accurate simulation of fluid flow patterns in areas of complex facies distribution, PetroMod 2015 software highlights gradual variations in porosity and permeability.

## Decoupled source rock definition

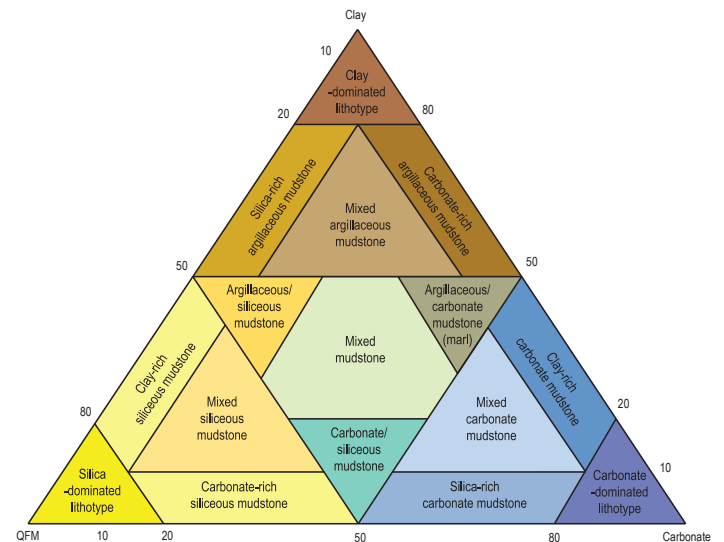
Source rocks can be independently defined from the layer definition, providing more precise distribution of source rocks inside a geologic layer. New capabilities for evaluating different charge scenarios are now available through the definition of effective source rocks with independent total organic carbon (TOC) and hydrogen index (HI) definitions. This new functionality allows high-resolution charge modeling of unconventional shale plays.

## Rock failure functionality

Seal failure is one of the most critical risk factors in exploration. The results of stress and strain simulation can now be incorporated to define the timing and amount of rock fracturing. The user has full control on the effect of seal failure and healing. The new Darcy flow and rock-stress-controlled fracturing method allow for complete and accurate charge prediction and pore pressure assessment.

## sCore scheme and shale lithologies

The characterization of shales using Schlumberger classifications and lithology definitions from the sCore scheme can now be directly mapped to standard lithologies in PetroMod software. This allows smooth integration of petrophysical data into a petroleum systems model.



The sCore scheme for shale characterization can be mapped directly to standard lithologies in PetroMod software.

## Mud weight output

All relevant parameters for drilling operations can now be visualized in a 1D mud-weight plot. Parameters can be extracted from 2D and 3D models to calculate an accurate mud weight prediction along a well trajectory based on a full 3D petroleum systems simulation through geologic time.

[slb.com/PetroMod](http://slb.com/PetroMod)

**Schlumberger**