



Reservoir Pattern Surveillance

An easy-to-use workflow in *studioSL* that is ideal for mature flood management. Quickly go from measured injection-production data to standard reservoir pattern surveillance metrics. Compute well-pairs, pattern efficiencies, recovery factors, and rate targets.

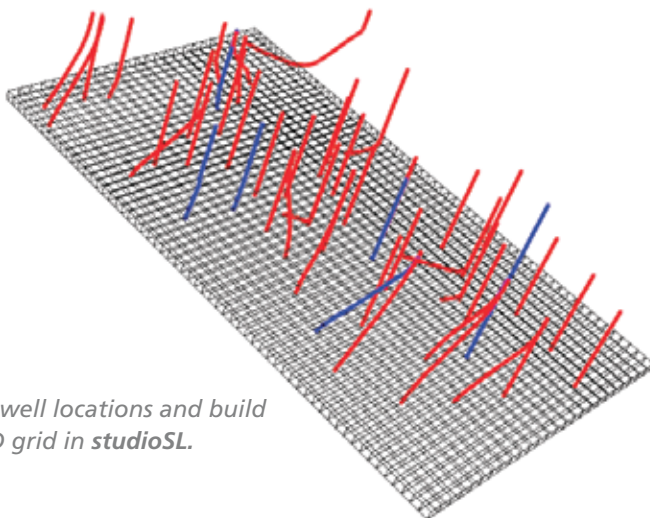
Reservoir surveillance relies on the proper calculation of well rate allocation factors (WAFs). Compute WAFs using *3DSL*, our streamline-based flow simulator, by specifying:

- *Well locations*
- *Historical well rates*
- *Basic geological flow units*

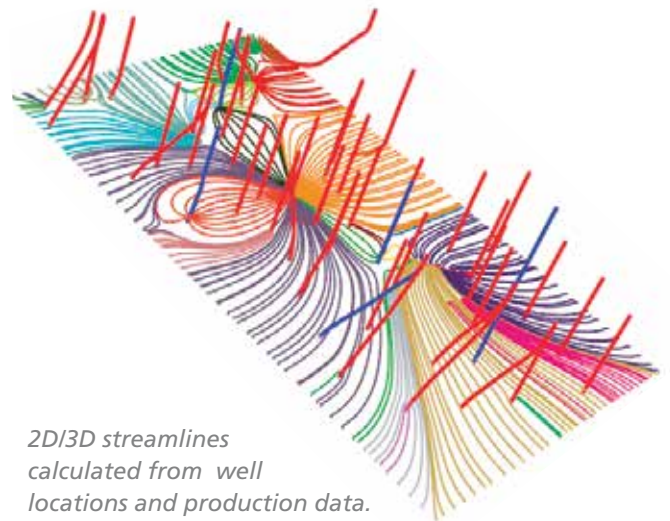
Reservoir pattern surveillance is fundamental to:

- *Identify injector/producer patterns*
- *Quantify pattern performance*
- *Highlight areas of excessive fluid cycling or low recovery*
- *Improve the efficiency of injected fluids*

Quickly build surveillance models by importing production data and well locations from OFM, geoSCOUT, or Accumap. Create 2D/3D grids from ZMAPS, fault traces, and well locations.



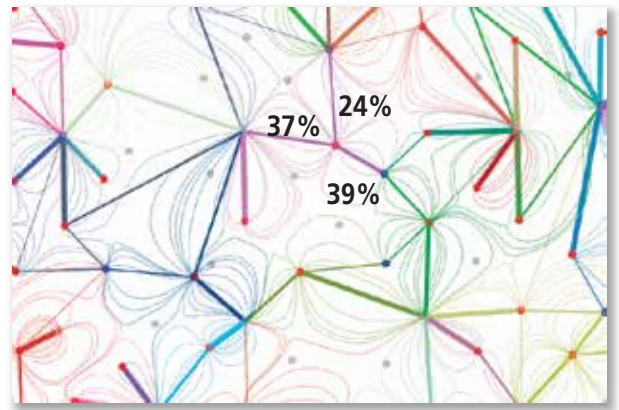
Import well locations and build a 2D/3D grid in *studioSL*.



2D/3D streamlines calculated from well locations and production data.

1 Flow-Based WAFs and Patterns

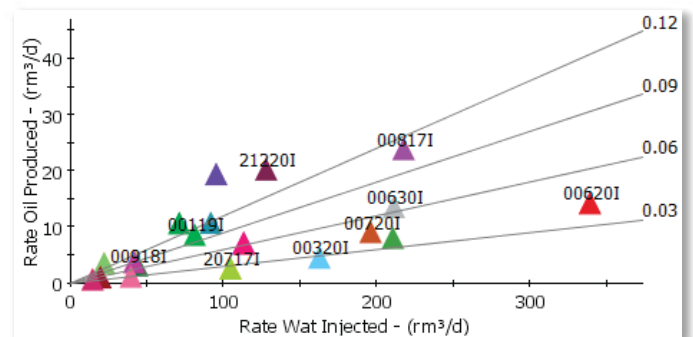
From the streamline paths, extract flow-based WAFs. Allocation factors vary through time and can be used to identify weak and strong well-pairs for every injector pattern at any timestep. Allocation factors are visualized using Streamsim's patented FPmap (US Pat. 6,519,531).



FPMap – well allocation factors from streamlines.

2 Reservoir Pattern Metrics

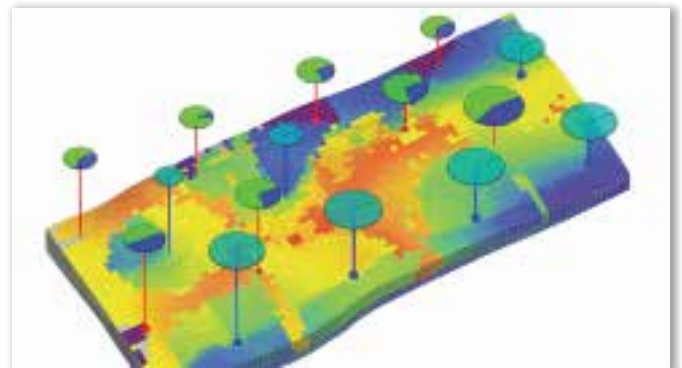
Once well-pairs and allocation factors are computed, studioSL can summarize the offset oil production of each pattern (injector) in the injector efficiency plot.



Injector Efficiencies—offset oil rate associated with each pattern (injector) in current month.

3 Remaining Oil in Place

Integrate injection-production history directly through our dynamic pattern material balance method (US 15/804,891 Patent Pending) to create a Remaining Oil-In-Place (ROIP) map.



ROIP derived from dynamic pattern material balance.

4 Well Rate Targets

As a final step, use studioSL's floodOPT workflow to compute new well rate targets from the flow-based allocation factors. The new rate targets promote fluid sweep and reduce fluid cycling.