

3D Facies Proportions in Isatis

3D facies proportions play an important role in facies modelling. They allow taking into account the non-stationarity of the facies within every layer or interval of a reservoir. **Isatis** offers the flexibility to use them as a direct constraint in most of its facies simulation techniques, i.e. **plurigaussian simulations**, **sequential indicator simulations** or **multiple-point statistics** simulations.

Fully capture the facies trends in the reservoir

Facies proportion allows determining locally the **probability of presence** of a given facies. Derived from proportion information at wells, **3D facies proportion matrix** are able to **capture changes in facies distribution** in the whole reservoir unit. Integrating facies proportions in the facies simulation process **improves facies model quality** by taking into account **this non-stationarity of facies distribution** inside the reservoir.

Get a 3D facies proportion model over the whole reservoir

In Isatis, **facies proportions are always 3D** and give the flexibility to define the facies probability in each cell of a geo-cellular model. They are computed automatically from **Vertical Proportion Curves (VPC)** and **2D trend maps**.



Vertical proportion curves map

The **VPC** gives access to the proportions of the different facies in the different layers of the stratigraphic reservoir grid. Isatis makes it possible to group wells per quadrants or per

polygons. The facies proportions are calculated level per level from the selected well(s) and a VPC is created at the gravity center of each polygon. **A final interpolation of the local VPCs** using several possible algorithms **allows creating the 3D facies proportion matrix.**

Improve facies model quality with sensitivity analysis

Facies proportions are key parameters controlling the quality of the facies modelling and the wells connectivity.

Being able to edit them to locally refine the proportion is important, for example to constrain the model to a conceptual geological model. This can easily be achieved by editing, copying or moving the VPCs over areas not covered by wells or changing the values on a cell by cell basis. Isatis also offers the possibility to attach any user defined 3D proportion matrix (e.g. blocking a **seismic facies cube** within a reservoir model).

Last but not least, **Isatis powerful batch and workflow capability provide an ideal tool to run sensitivity analysis of this crucial parameter** allowing the generation of more robust models.

