

## Estimate Rock and Fluid Probabilities From Inversions

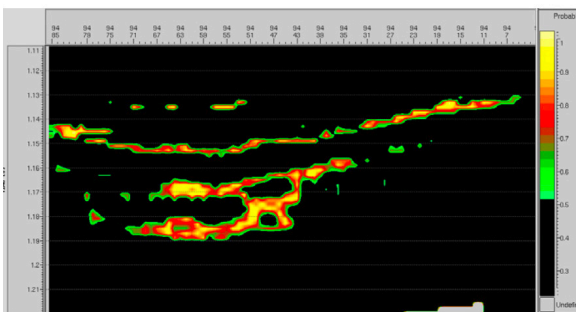
**Facies & Fluids Probabilities (FFP)** is an interactive interpretation tool for determining lithofacies from the outcomes of acoustic and elastic inversions. Facies are usually defined in the petrophysical domain, after which proxies are confirmed in the elastic domain.

Typically, P-impedance and Vp/Vs are used. For unconventional scenarios, the key elastic proxies could be geomechanical.

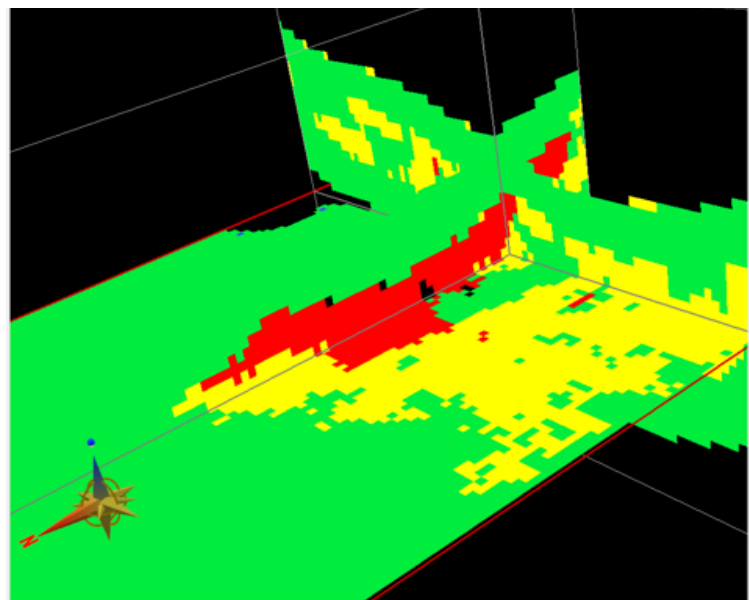
### Bayesian estimation of the probabilities of occurrence of facies

Bayesian inference can be used to infer the probabilities of occurrence of geologic facies from seismic reflection data. The input probability distributions come from observations from well logs, analogs, or models of the distributions of values for reservoir properties of interest. Reservoir properties can be defined by facies, lithologies, fluids, or any combination of these. It is simply required that the disparate facies be somewhat separable with respect to the properties derived from inversions.

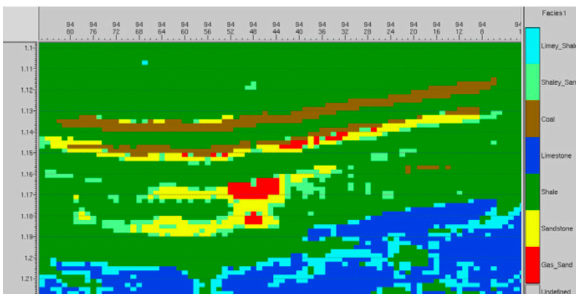
The models are manifest as histograms which are subsequently modeled as Probability Density Functions (PDFs). Using an estimate of the uncertainty in the reservoir parameters from inversion, likelihoods are computed from the PDFs for each facies and at each voxel. From these, Bayesian estimates for the posterior probability of each facies/fluid are determined. In this way, facies-fluid probability volumes for each facies can be formed and a most-probable facies volume constructed.



Probability volumes for each lithotype are created by FFP.



Identify most-likely pay distribution: red: Gas Sand; yellow: Sandstone; green: Shale.



Most-likely lithotype at each sample is calculated from FFP probability volumes.

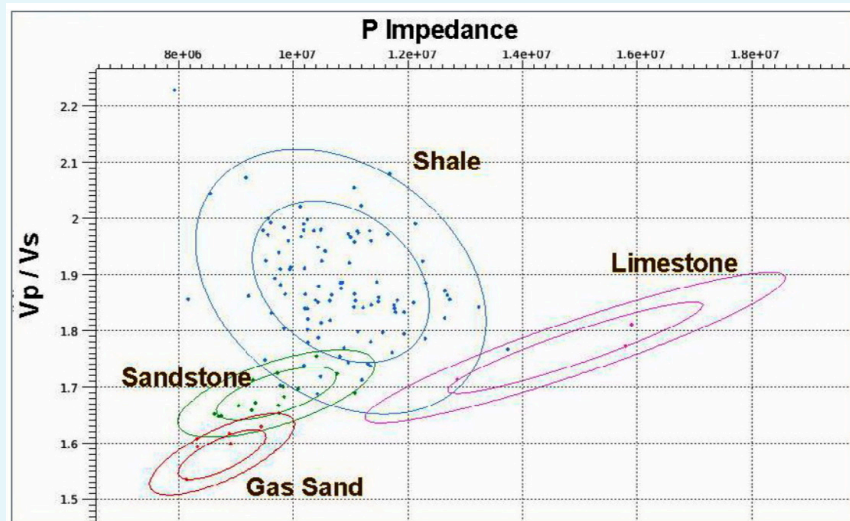
## The Jason advantage

- Optimize reservoir appraisal and assessment with probability- based QI interpretations
- Generate facies maps that are meaningful to geologists
- Discover unknown facies

The PDFs in the **FFP** design are user-editable from a dedicated GUI, making **Facies & Fluids Probabilities (FFP)** a useful interpretation tool. to correctly reconcile the fine-scale well log measurement with the coarser seismic scale.

## Key features

- Bayesian-based facies interpretation
- Templates from logs and analogues
- Inputs are **Jason** inversions
- Full 3D priors with prior uncertainties can be utilized
- Inversion uncertainty estimates and incorporation
- Probability volumes for all Facies
- Most-probable Facies volumes
- Uncertainty estimates and bias corrections
- Petrophysical facies design tool included
- Dedicated Entropy QC tool



*Designing Facies PDFs in P Impedance – Vp/Vs space.*