

Grane Permanent Reservoir Monitoring:

- *What can be seen and how to use it?*

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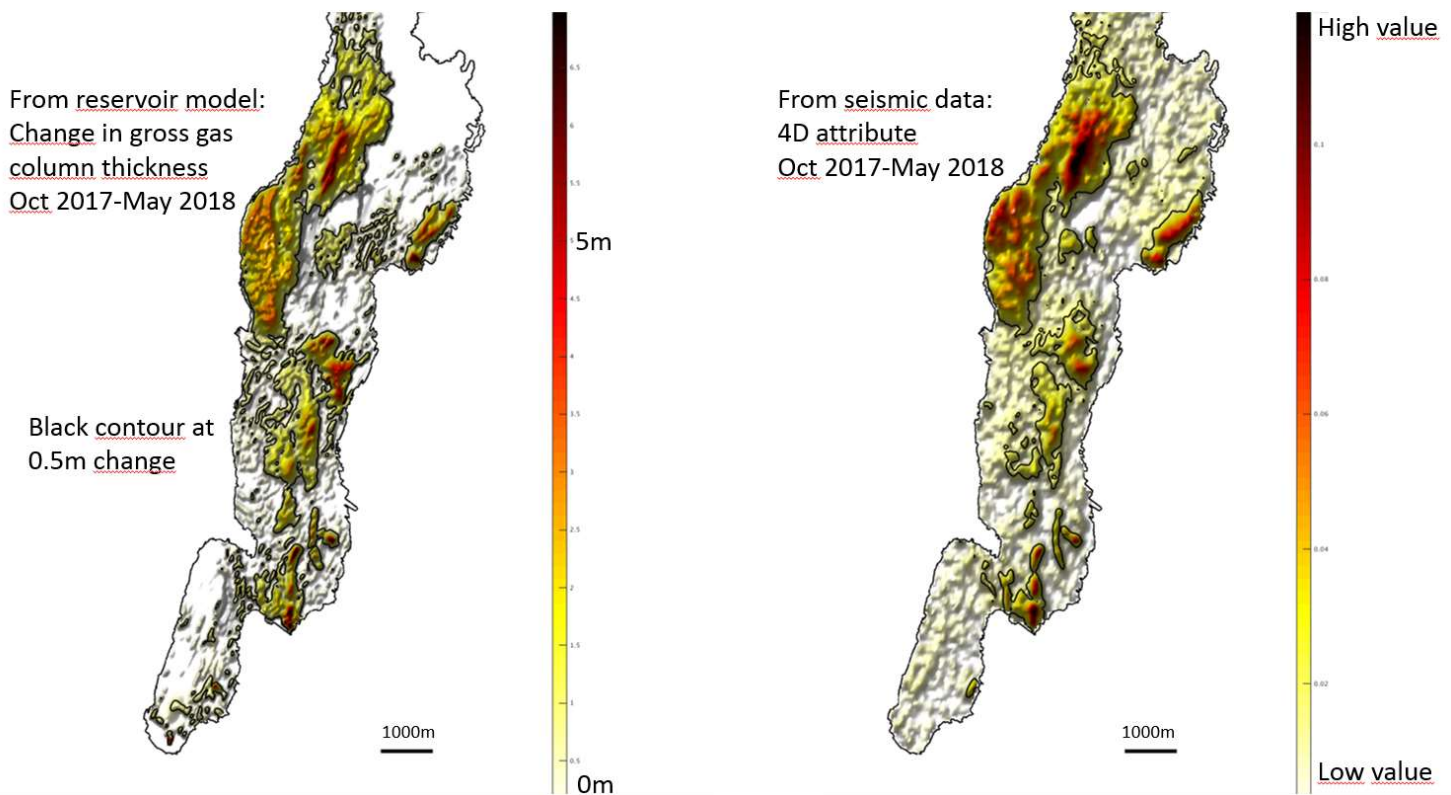
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A Short Introduction

From production start in 2003 until 2013 Grane had a biannual 4D program. Since 2014, nine PRM surveys have been acquired; two surveys per year. The final processed data are available on the work stations typically 8-10 days after last shot. Frequent acquisitions, high quality data and fast deliverance have given Grane a unique position to follow the dynamic behavior of the reservoir which would not be possible with a traditional 4D approach. Both 3D and 4D seismic data quality are essential for Grane to obtain a reservoir model that fits the historical production.

The first step in the analysis is to generate a seismic Production Tracking Plot for all producers for conclusive identification of fluid dynamics along and around the wells. This procedure can guide engineers on adapting branch control and optimized production.

The good compatibility between the reservoir model and the PRM observations (illustrated in the figure below) increase the confidence on simulation model and reservoir predictions. The possible mis-matches however are investigated to be adapted for new release of static and dynamic model. The figure illustrates that 7 months production gives strong 4D response and can be used to understand better detailed dynamic behavior.



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