



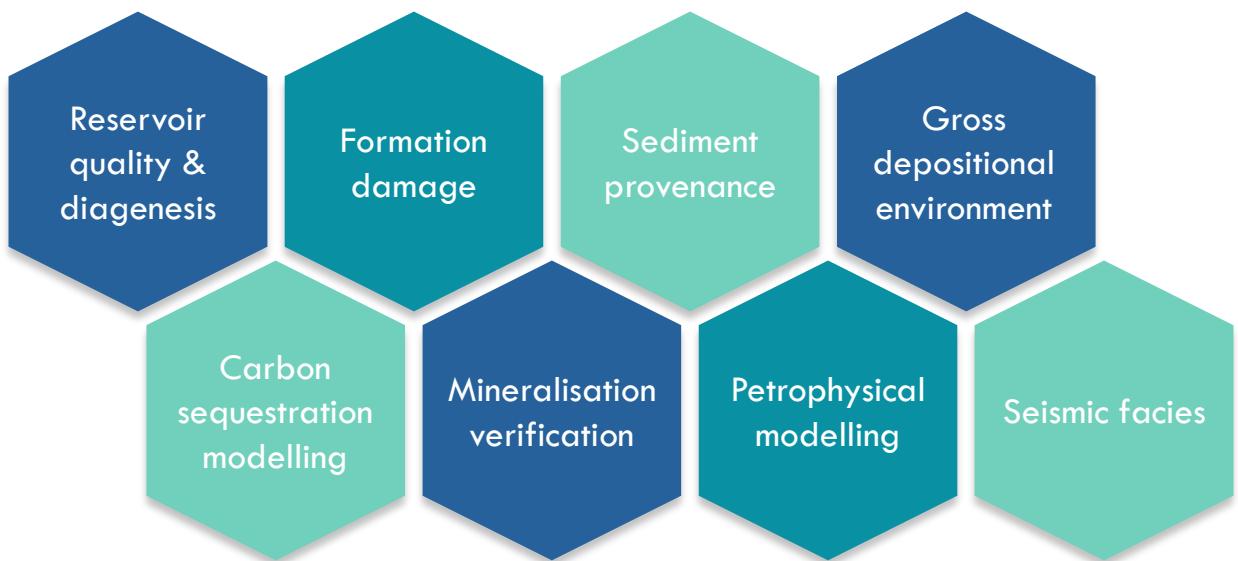
Rocktype

Consulting

Applying our expertise to support client workflows

Client Focused Analysis

Rocktype provides a range of consulting services to support our clients in their technical workflows. These range from advising on how to interpret QEMSCAN-SEM data to address specific questions to integrating different datasets and metadata with QEMSCAN-SEM data. We specialise in applying QEMSCAN results to a range of technical challenges, including;



With a team of data scientists and geological specialists, Rocktype can help digitise, standardise and analyse data to support a wide range of technical work streams. Our experience from projects across the exploration, production and technology industries makes our team well qualified to assist you in a range of consulting projects.

Rocktype

Reservoir Quality, Diagenesis and Formation Damage

We have extensive experience supporting diagenetic models and reservoir quality assessment of clastic, carbonate and shale units. Characterising mineralogy and pore space characteristics of your reservoir rocks is vital in establishing the key controls on reservoir quality. Reproducible quantitative data collection and analysis are required to build predictive capability, essential to successful geological modelling and integration.

We conduct in-depth reservoir quality reviews using QEMSCAN data along with client-supplied data. We can integrate and analyse reservoir data to determine sediment paragenesis and establish the key controls on reservoir quality and reservoir producibility.



QEMSCAN mineral maps are rendered as PNG images for visual analysis. However, beyond the visual, each map is also a rich digital data set suitable for more in-depth analysis.

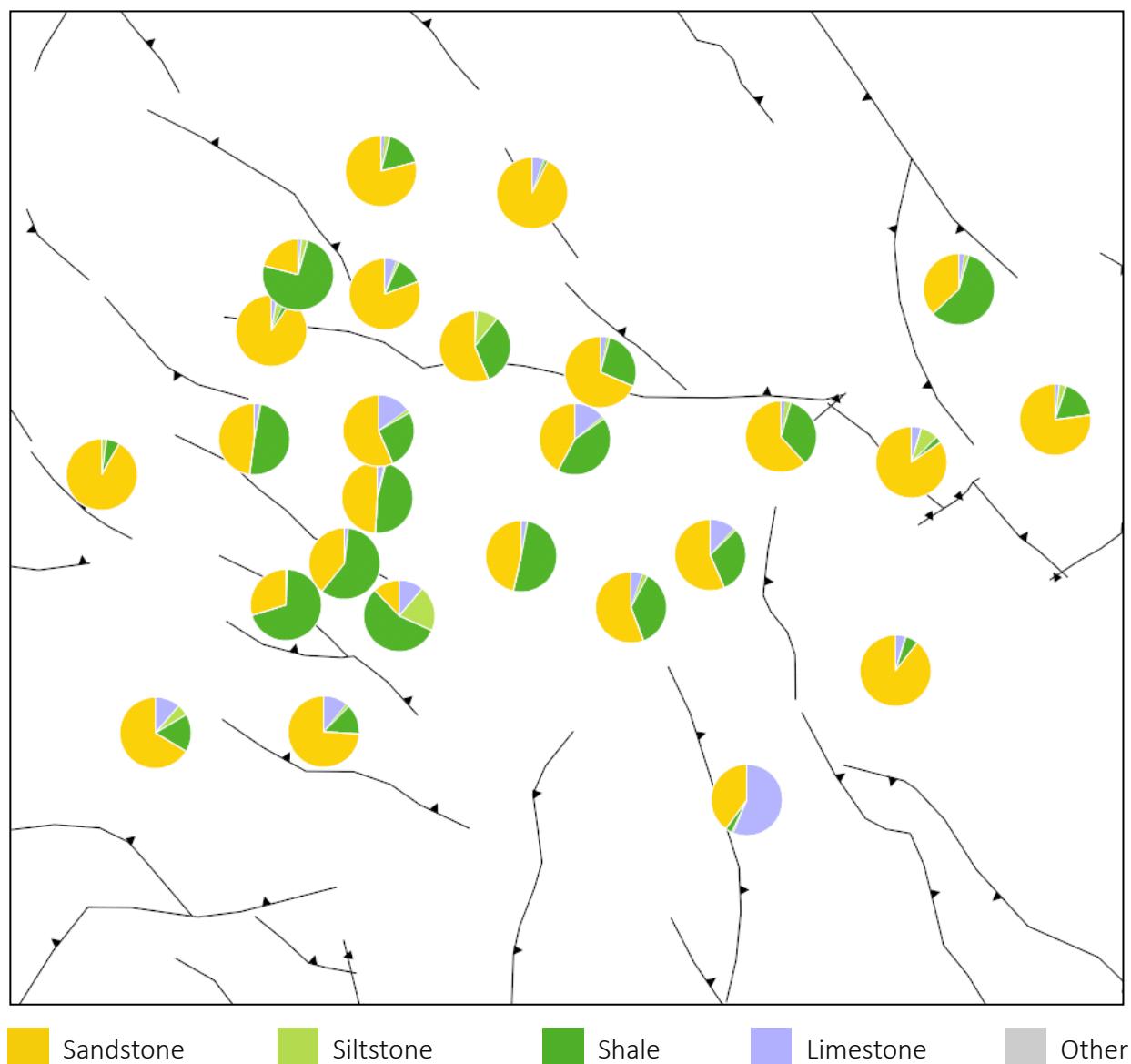
We can extract average mineralogy and porosity from the bulk sample or from distinct lithotypes. By using more advanced spatial analysis routines we also get mineral associations (how minerals associate spatially), pore lining phases plus pore and grain size distributions.

Applying the same standard routines to a larger set of samples provides a powerful tool for data driven reservoir quality modelling and prediction.

Sediment Provenance & Gross Depositional Environment

QEMCAN data, being rich in mineralogical and textural information, is well suited to sediment provenance and gross depositional environment analysis. QEMSCAN images provide the opportunity for visual estimation of sediment textures, important for depositional environment interpretations.

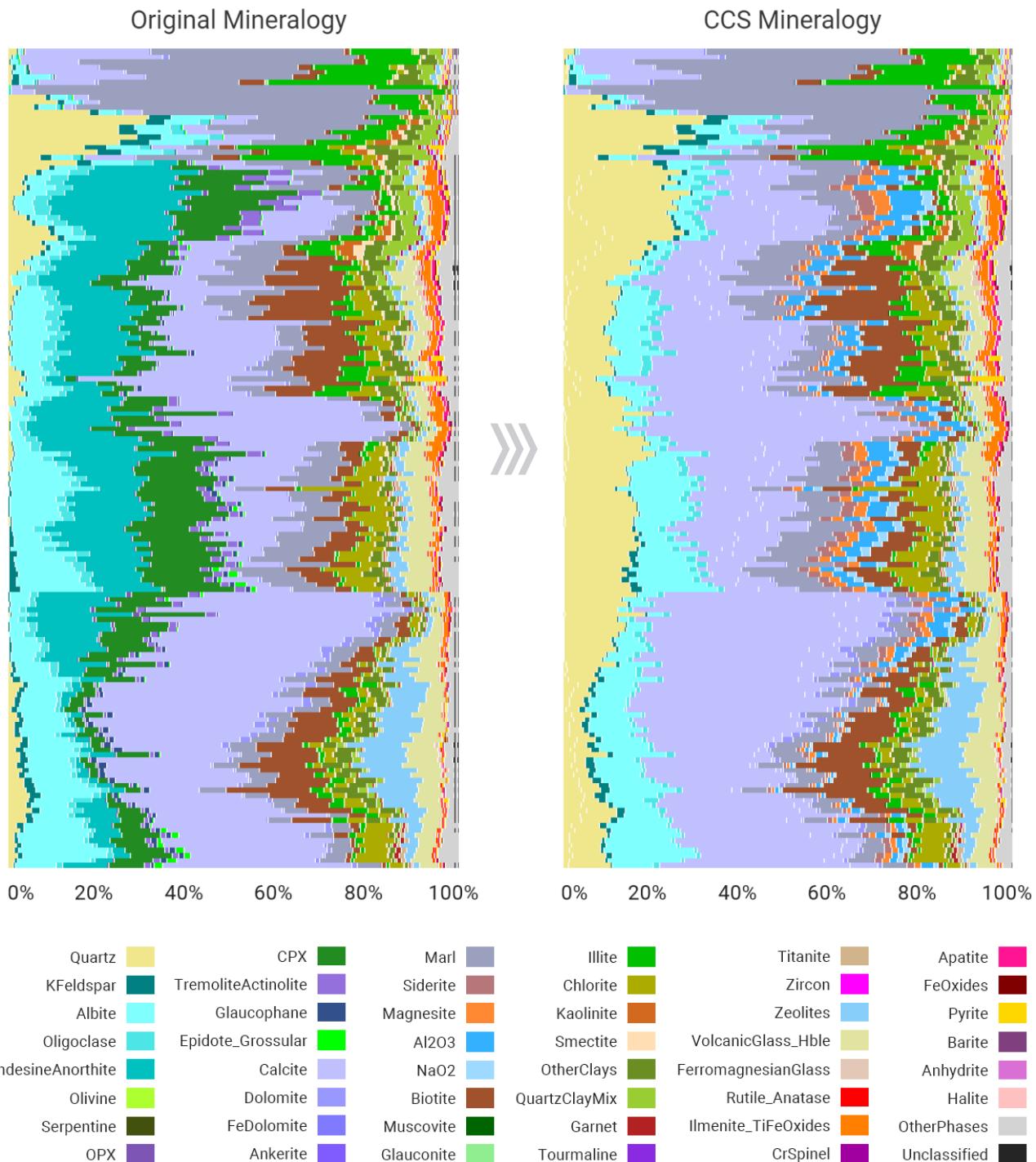
Assessing geographic distribution of QEMSCAN data is also relevant for related workflows such as mining exploration model building.



Map view of well penetrations showing lithotype distribution from cuttings samples within a stratigraphic interval, providing a data-driven basis for sediment provenance models and gross depositional environment maps.

Carbon Sequestration & Mineralisation

Carbon dioxide (CO_2) sequestration in the subsurface is important for achieving atmospheric decarbonisation. CO_2 can be stored in the pore spaces and through mineral trapping in clastic reservoirs.



Left: QEMSCAN data for 300 samples from the Faroe Island Basalt Group for a single well showing the measured mineralogy. **Right:** Modelled post carbon sequestration mineralogy for the same well, assuming that carbon dioxide binding reactions consume all Ca-rich phases, producing principally calcite and silica.

Carbon Sequestration & Mineralisation (continued)

Within the emerging field of carbon mineralisation, such as enhanced weathering and carbon capture and storage (CCS), Rocktype can help assess the suitability of minerals to bind CO₂ and advise on parameter selection to optimise mineralisation workflows.

We can model, measure and visualise the changes to rock properties through mineralisation and verify the amount of CO₂ captured in mineral form. In addition, we work to help establish reporting codes for industry and public reporting of CO₂ captured in mineral form.

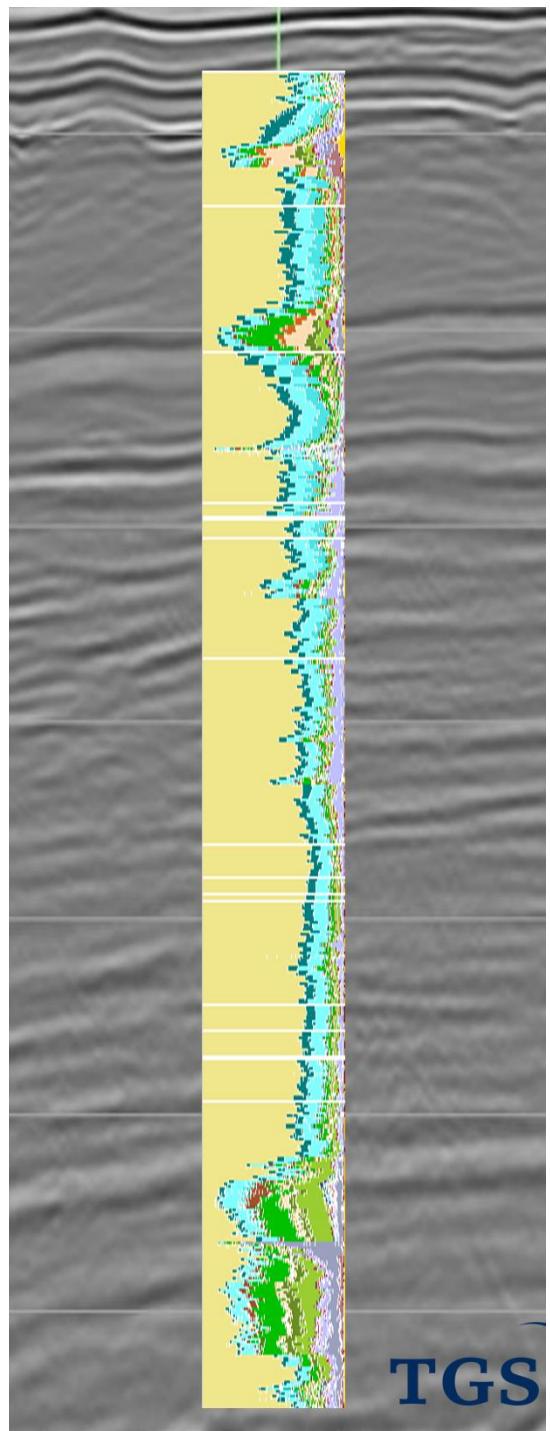
We also carry out lab experiments of carbon dioxide binding reactions with a wet CO₂ rig to help calibrate absorption calculations.

Seismic Facies Interpretation

Large volume QEMSCAN data from cuttings or Coresticks can provide valuable information about the geology behind seismic reflections and the characteristics of seismic facies.

We can ground truth seismic signals and provide the inputs for rock physics models and seismic inversion workflows.

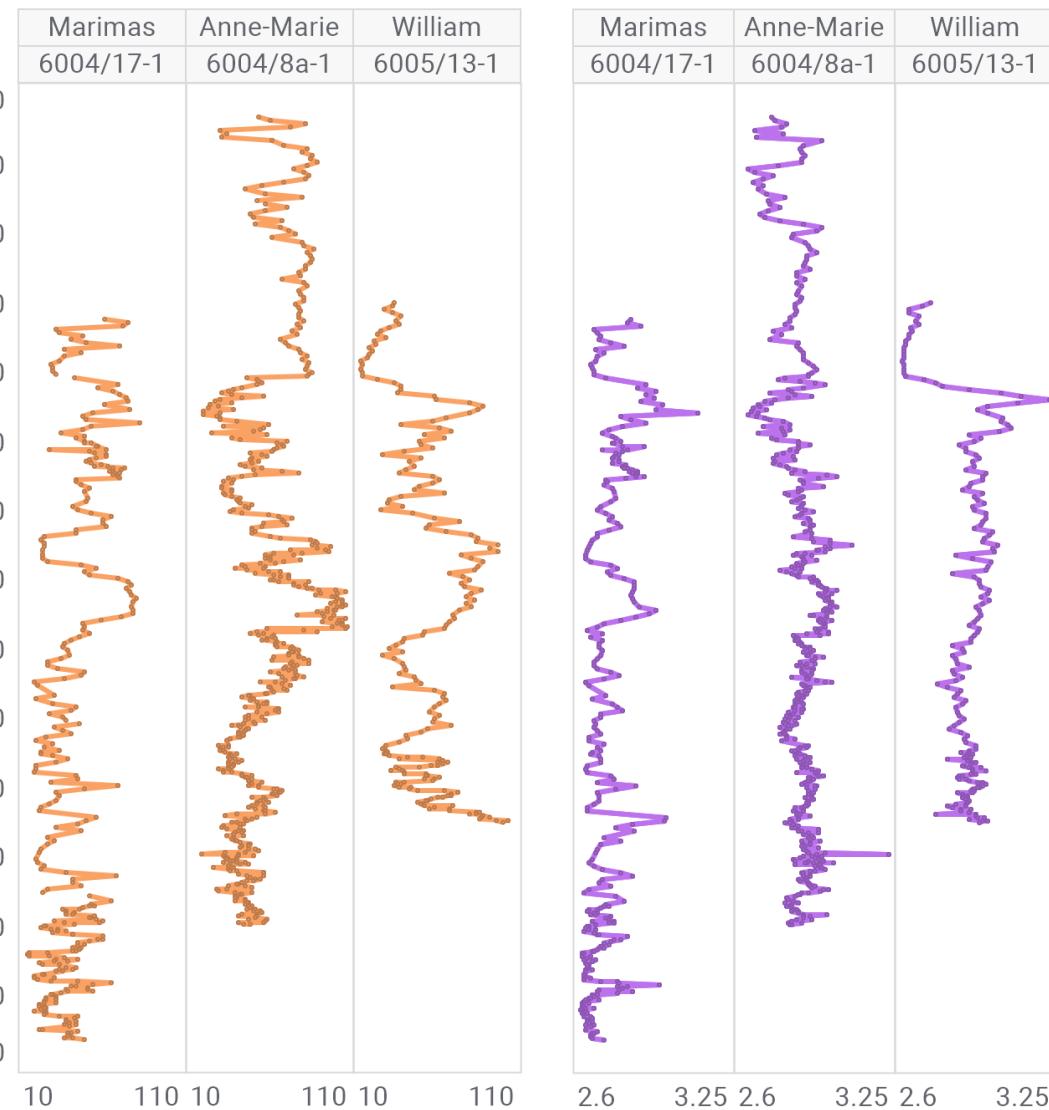
By combining QEMSCAN and geophysical data with machine learning algorithms, it is possible to create digital, big dataset.



Marjun well QEMSCAN data, seismic line IS-FST-01-18 courtesy of Jarðfeingi.

Petrophysical Modelling

In addition to providing mineralogy, porosity, texture and rock type definition, we calculate a range of QEMSCAN derived logs which can support petrophysical modelling. This includes gamma ray, grain density, volume of clay (Vclay) and grain derived neutron signals.



Gamma ray logs (left) and grain density logs (right) calculated directly from QEMSCAN mineralogy data for three Faroe Islands wells.

We provide consulting on the integration of results from QEMSCAN analysis in petrophysical modelling workflows.

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