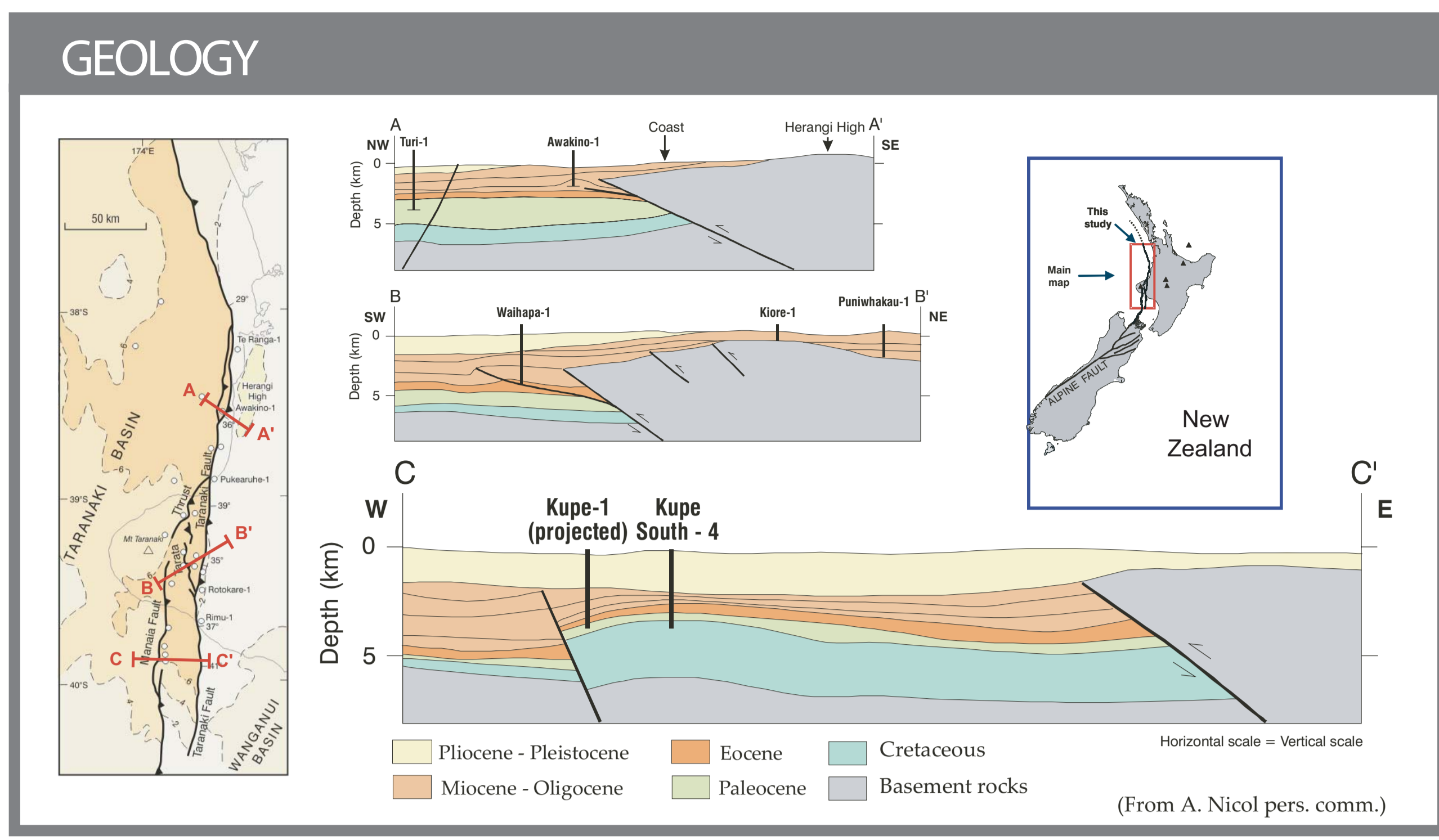


★ BeicipFranlab is acknowledged for providing the CERES 2D software for use in this project, and we thank Frederic Schneider for his contribution to the model development.



### TARANAKI BASIN

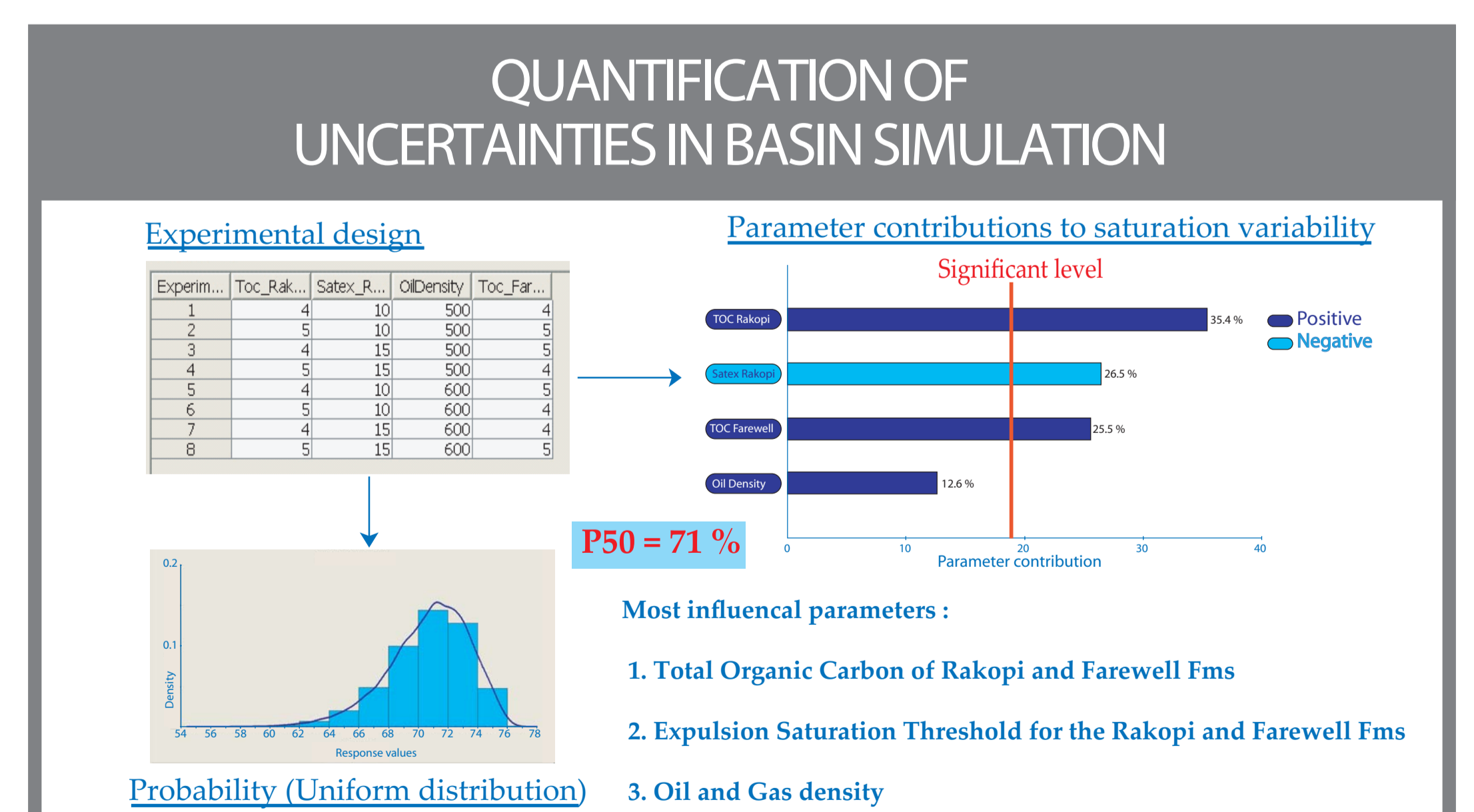
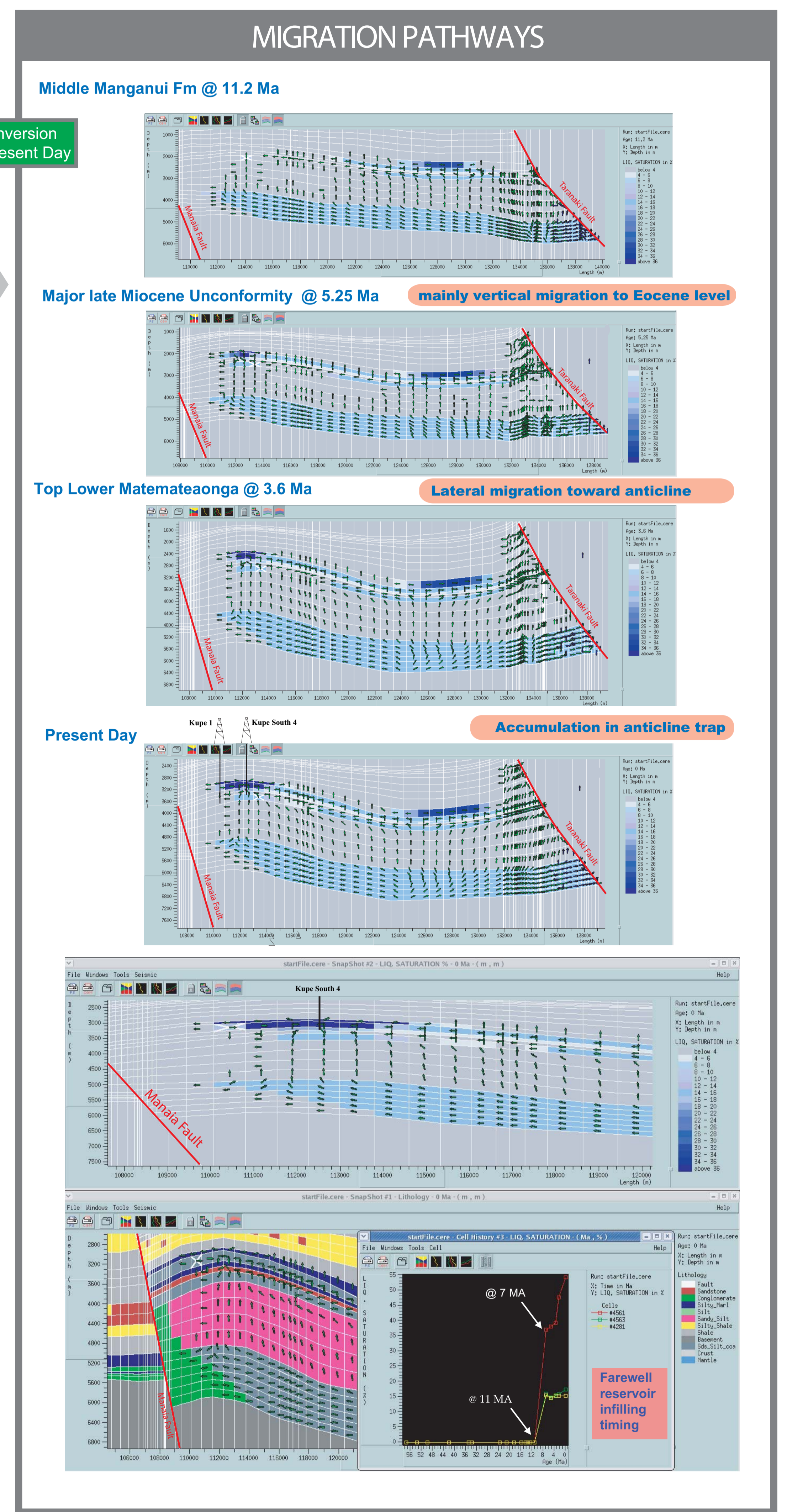
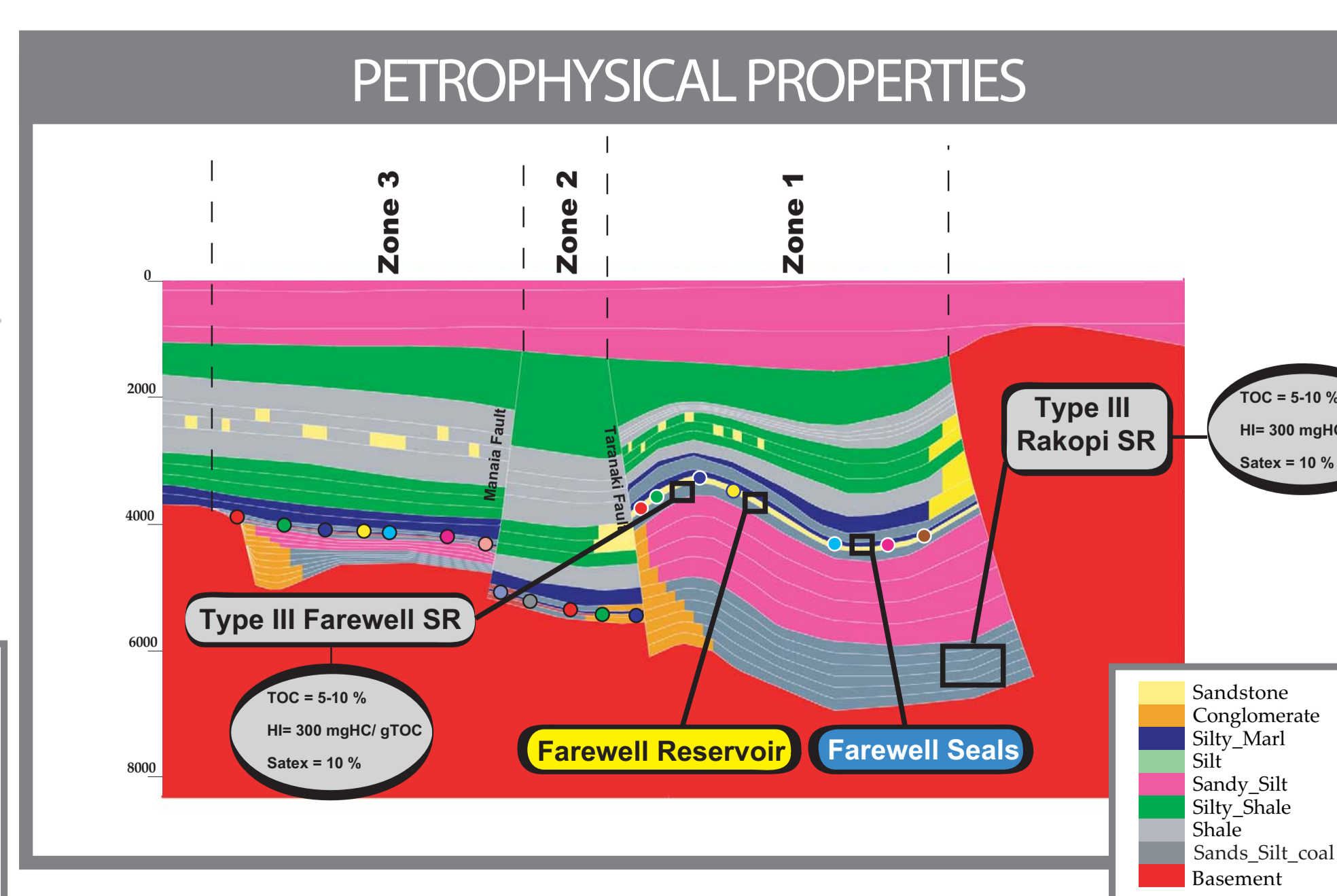
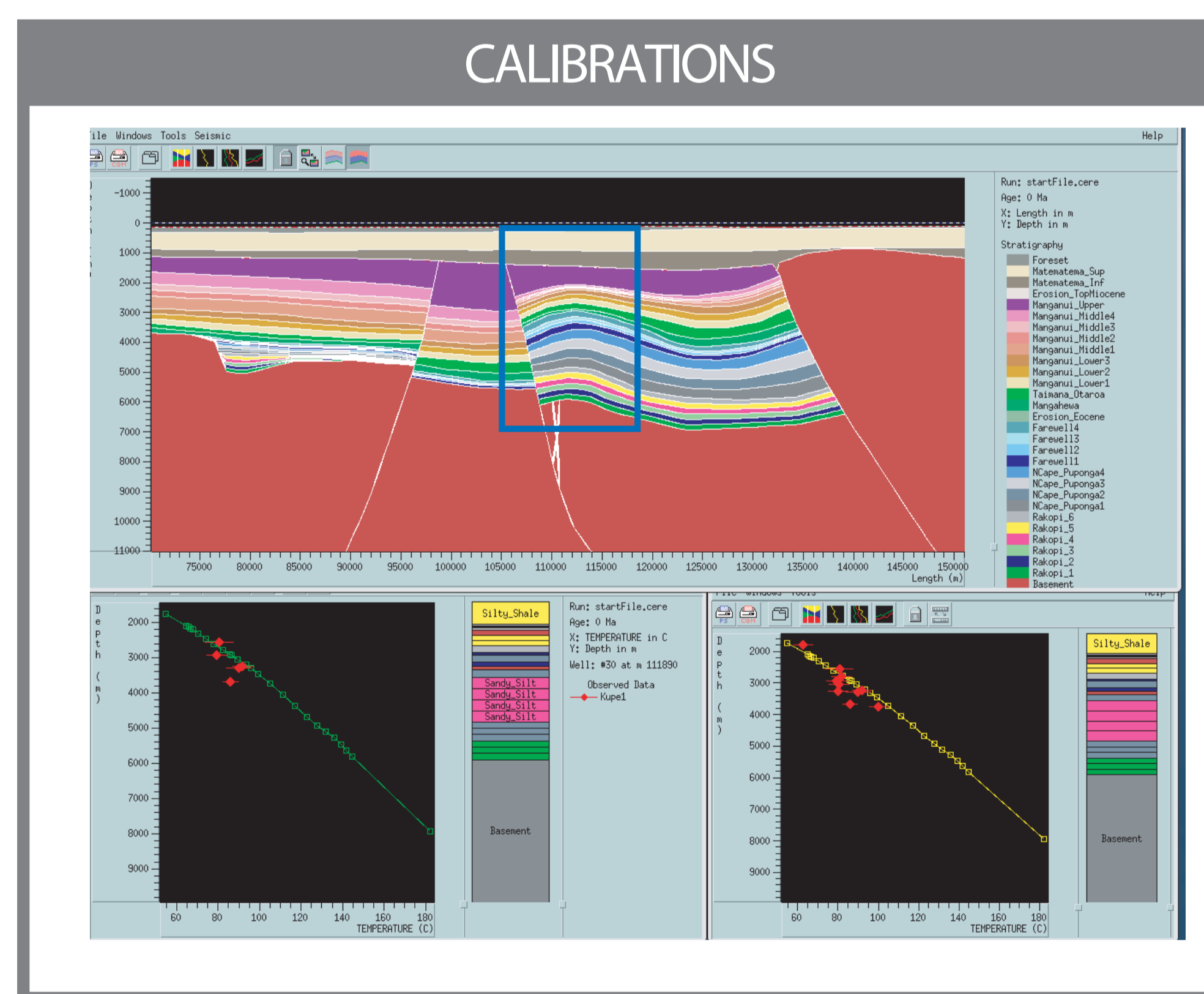
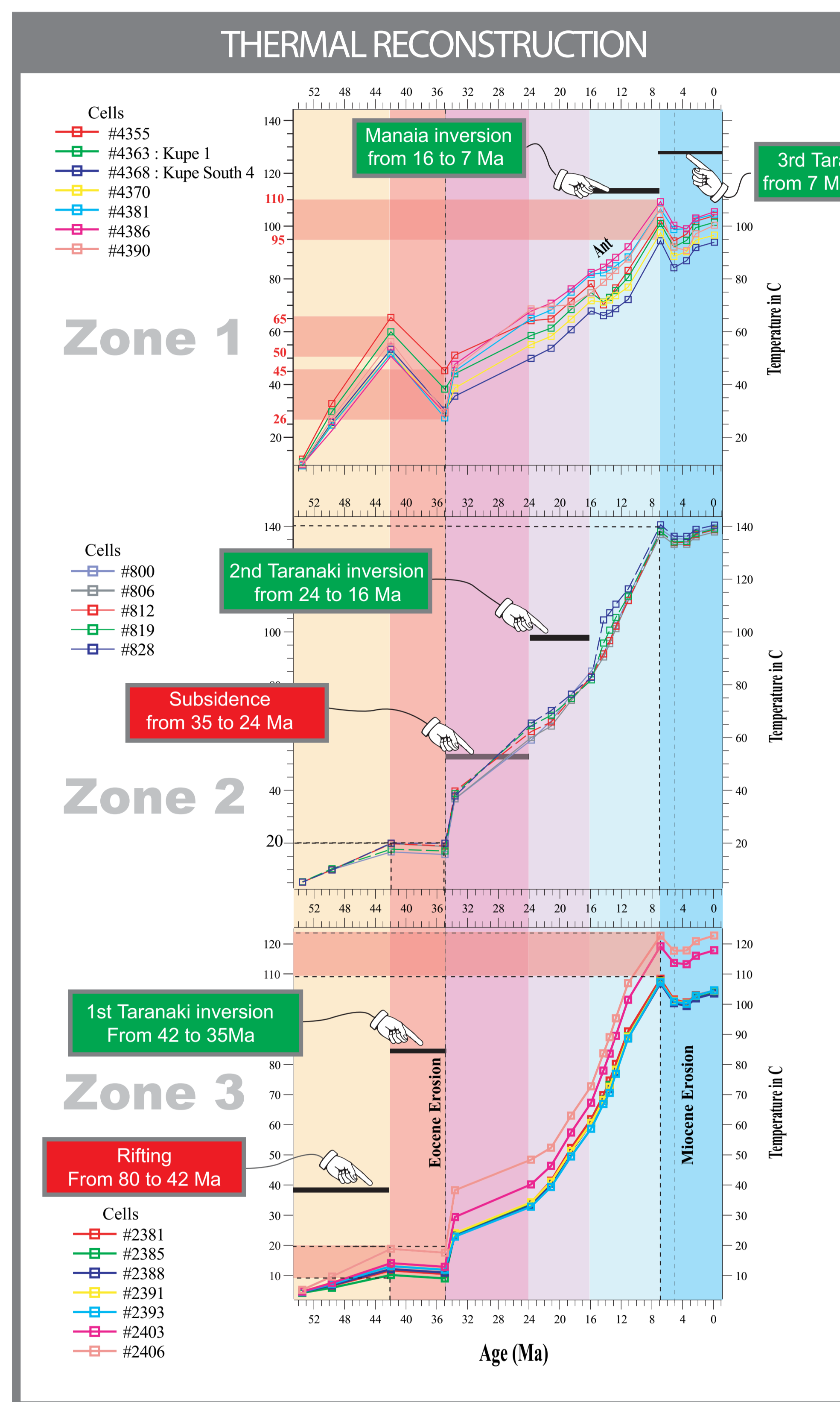
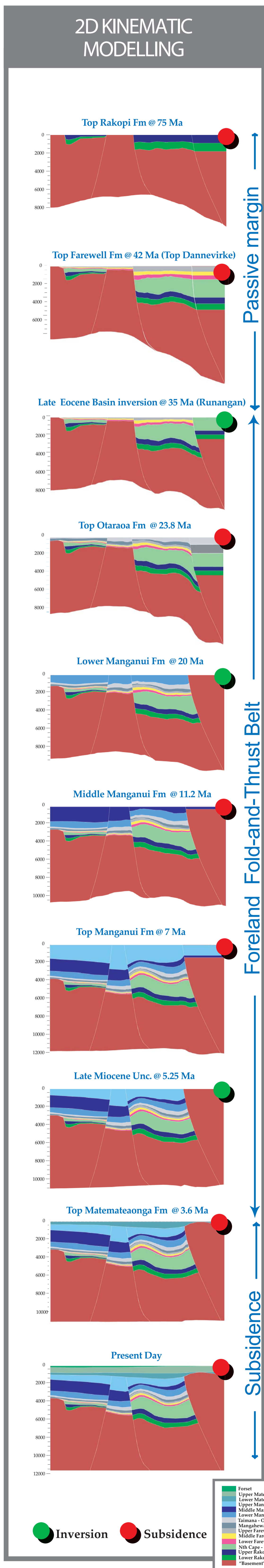
The Taranaki Basin formation began in the Late Cretaceous during the break-up of Gondwana (~80 Ma), and is characterised by rifting and subsidence. Regional plate reconfiguration occurred in the Late Eocene with the initiation of subduction east of Taranaki. This resulted in foreland basin development during the Oligocene and Miocene. Subsidence and intermittent periods of uplift have occurred from Miocene to the present day.

### SOURCE, RESERVOIR AND SEAL

Source rocks, aged Late Cretaceous to Eocene, are mainly coaly facies with interbedded shales (Rakopi, Farewell and Mangahewa formations). They are modelled as having between 5 and 10% TOC with HI up to 350 mg HC/gTOC. Reservoirs are Paleocene shore-face sands (Farewell Formation) capped by Oligocene and Early Miocene siltstone and marl (Taimana and Otaraoa formations).

### PETROLEUM EXPULSION AND MIGRATION

The CERES 2D model of the transect CC' (see location diagram) shows that significant hydrocarbon expulsion from the Late Cretaceous source rock began around 11 Ma. The modelling suggests that Eocene to Early Miocene seals play a major role in lateral fluid migration toward anticlinal traps.



### CONCLUSIONS

- CERES 2D clearly illustrates petroleum expulsion and charge due to tectonically controlled sedimentation and inversion from Late Miocene to present day.
- The petroleum kitchen beneath the Taranaki Fault is observed to contribute to overall charge of the Kupe Field; with migration vertically into the Farewell Formation and then laterally to accumulate in anticline traps.
- Sensitivity testing suggests that source rock TOC and saturation threshold are important parameters for modelling charge.