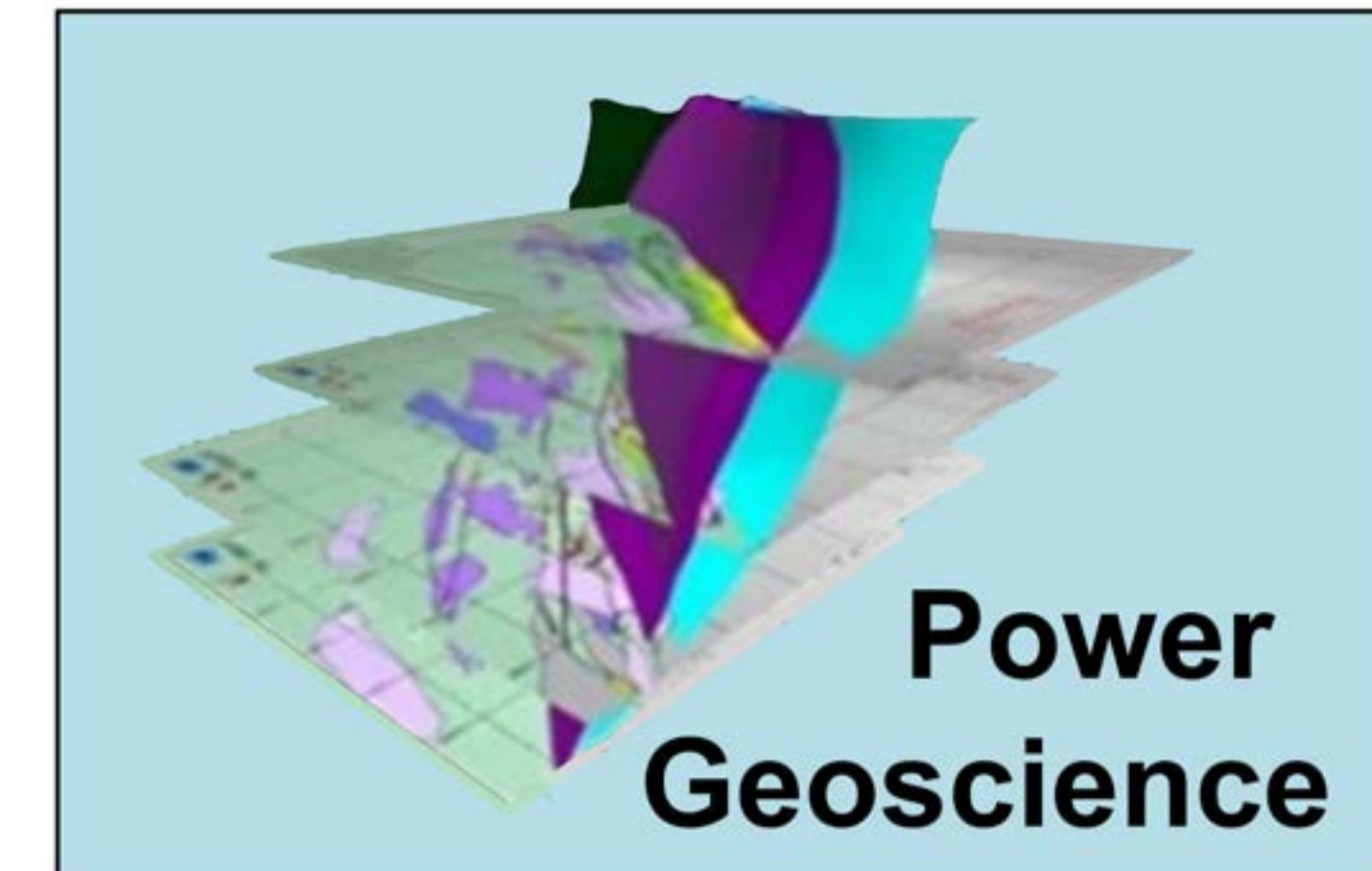


A framework for inclusion of faults in coal seam gas risk assessments

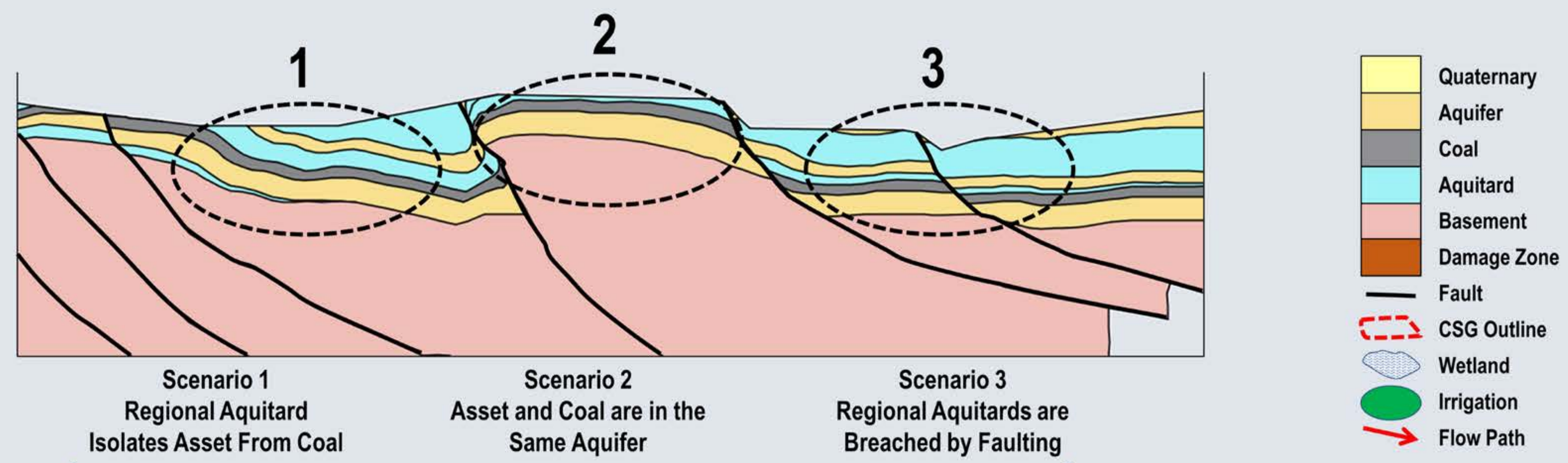


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Power Geoscience

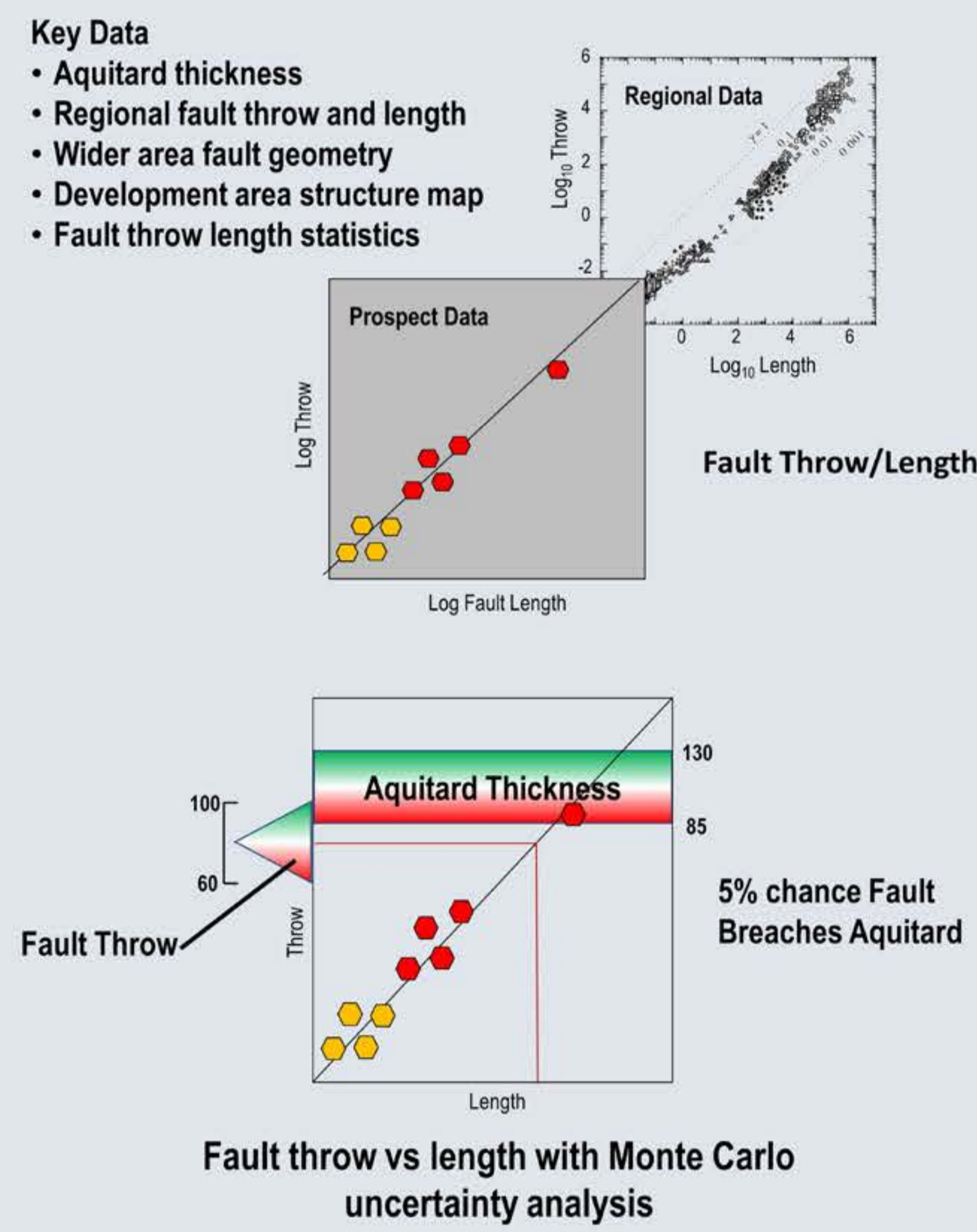


A Framework for Inclusion of Faults in Coal Seam Gas Risk Assessments

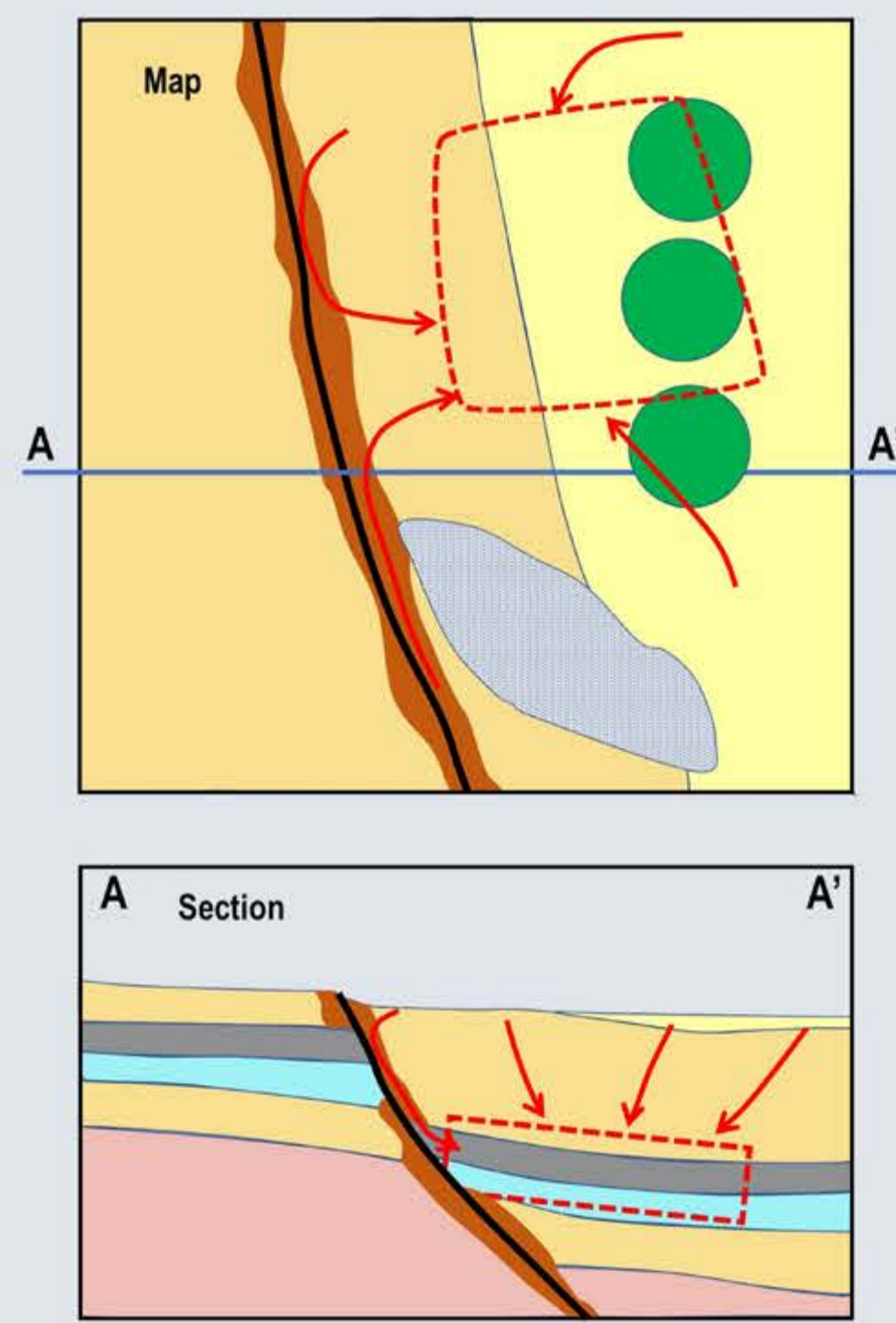
Three End Member Geological Scenarios



1 Show faults are either absent or have displacements much less than the aquitard thickness



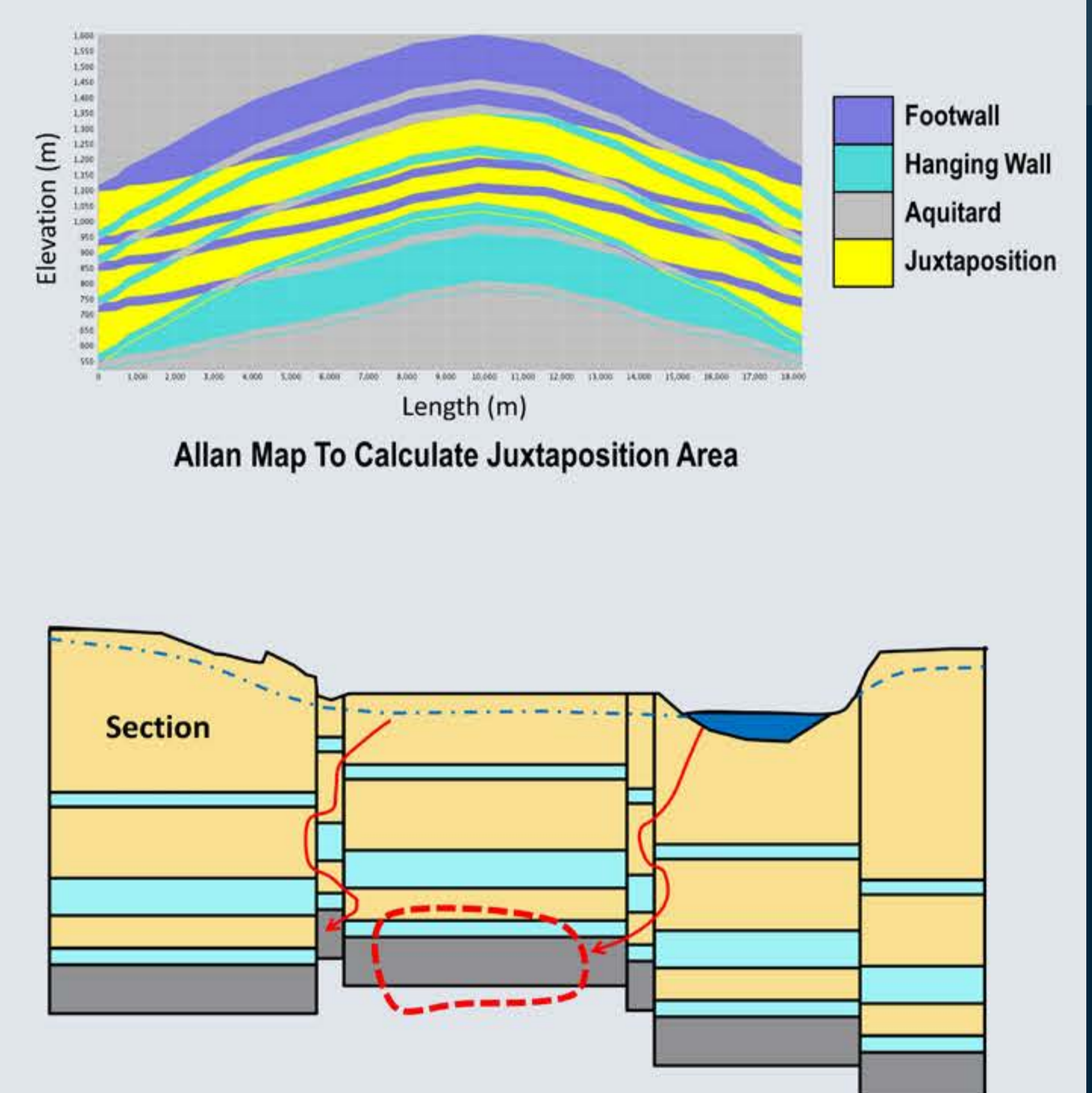
2 Compare fault-parallel flow in damage zones to flow within the aquifer



Two Flow Pathways or mechanisms must be compared:

- Matrix Flow (within aquifer Darcy Flow)
- Damage Zone Flow (DFN/Snows Law)

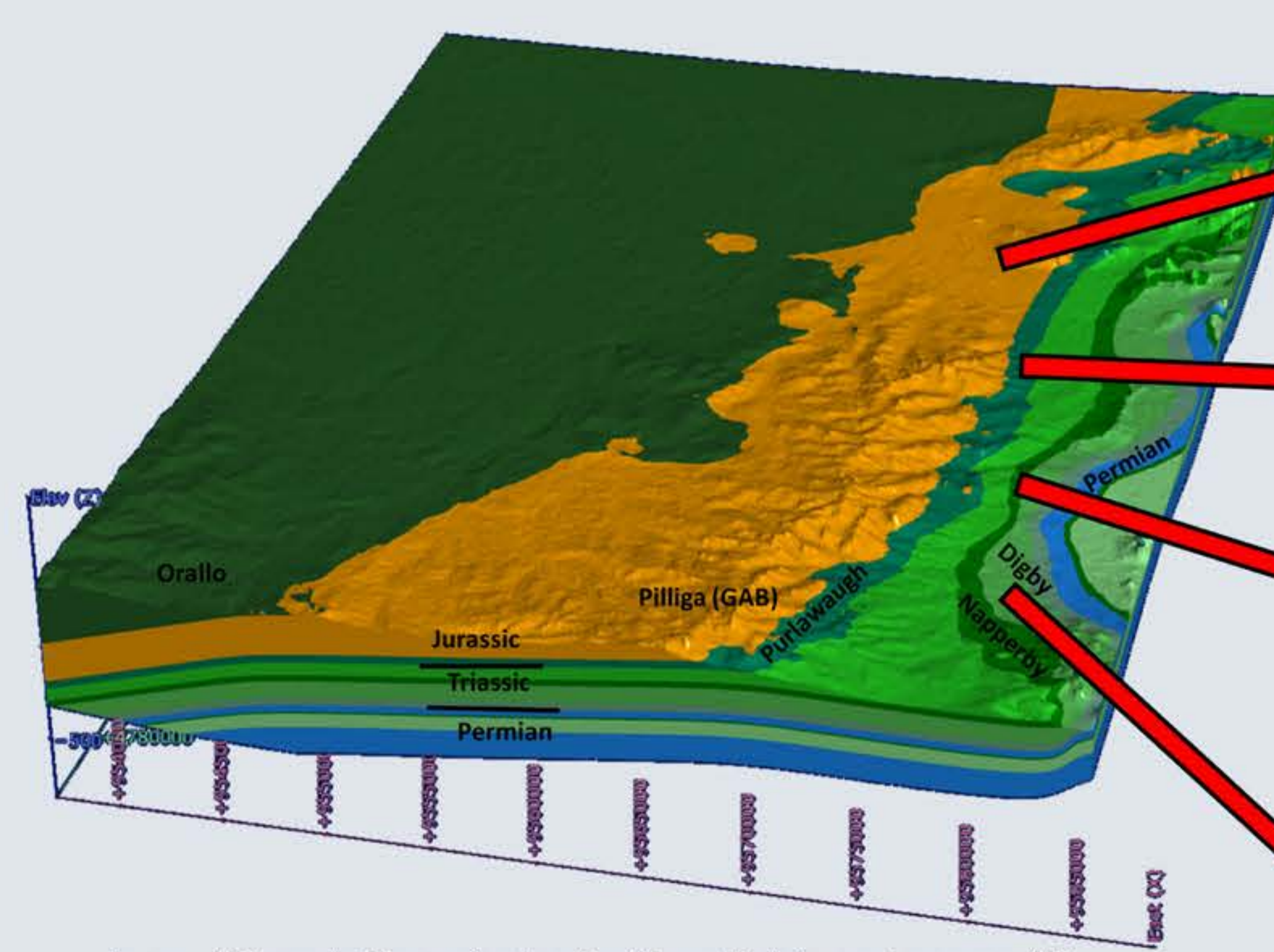
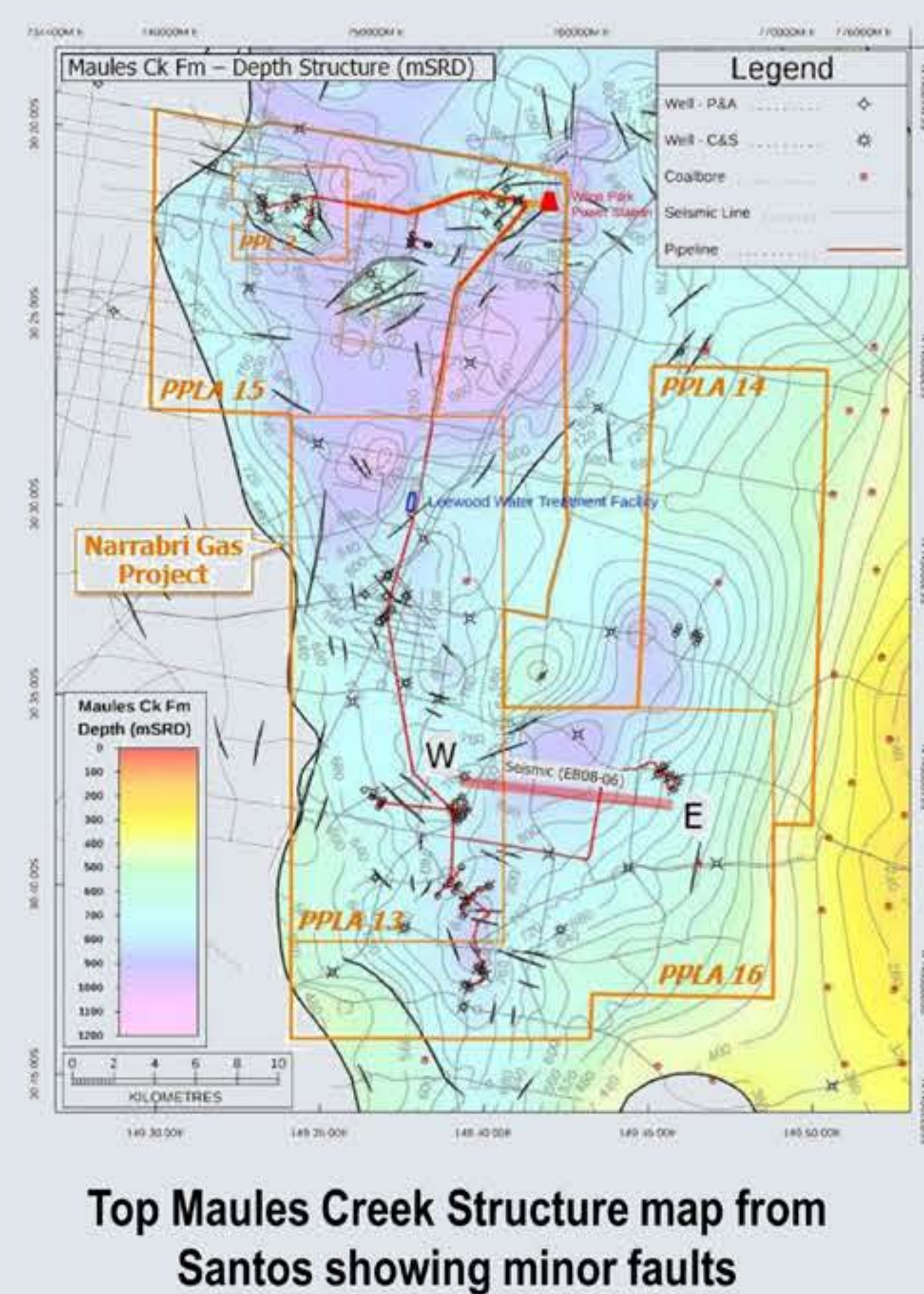
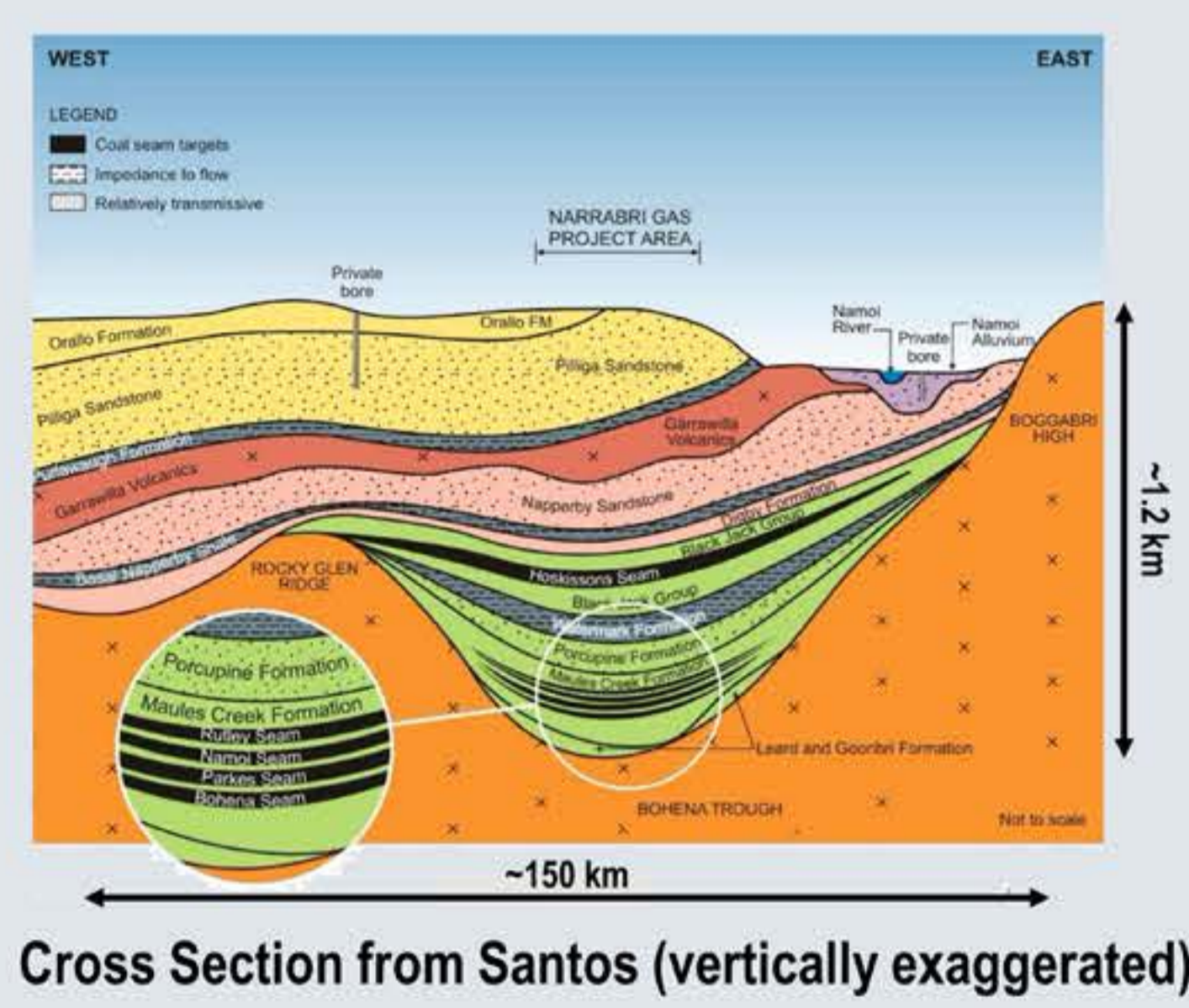
3 Create Allan Maps, consider composite flow paths (matrix, cross fault, and fault-parallel)



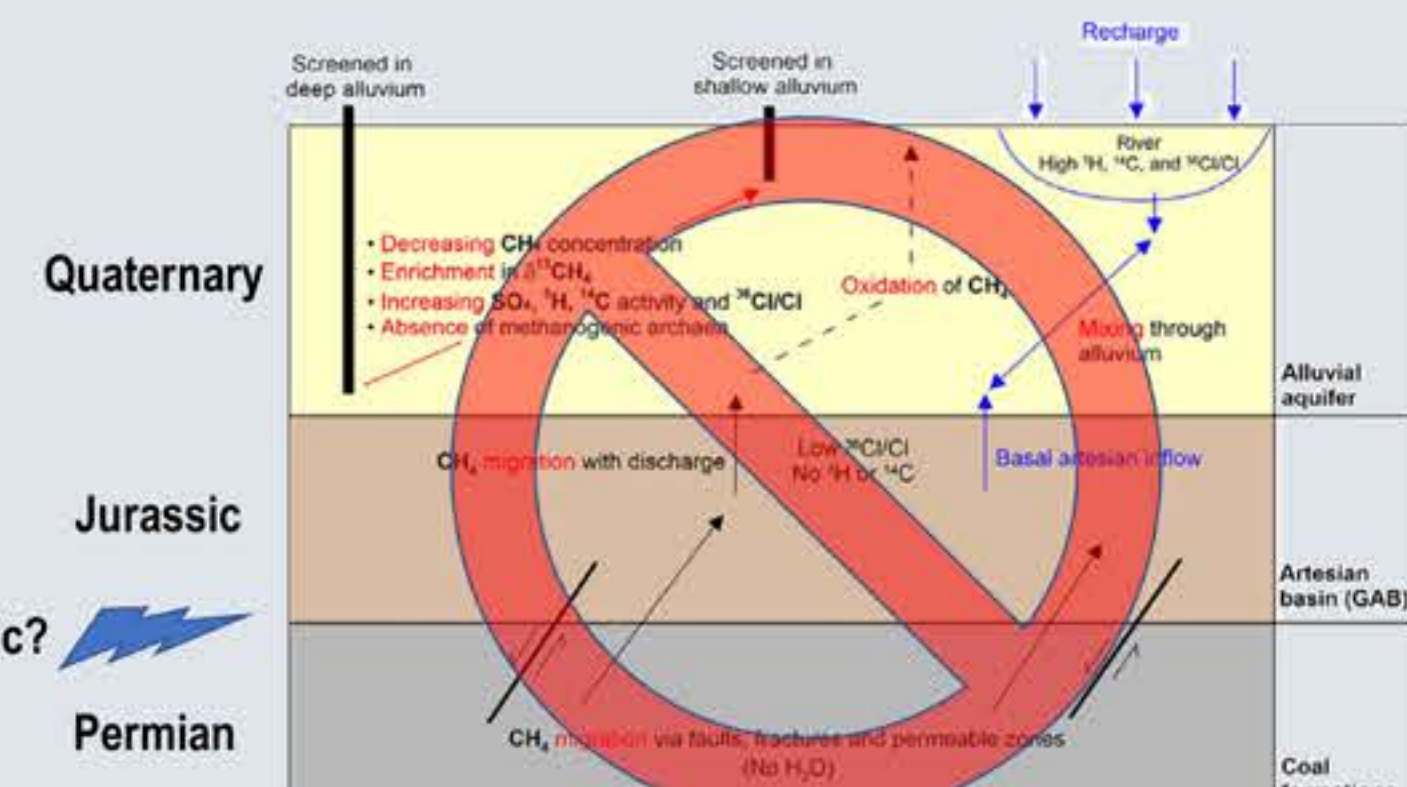
Multi-segment Potential Flow Paths:

- Matrix Flow (aquifer and cross fault flow, Darcy Flow)
- Damage Zone Flow (DFN/Snows Law)

Scenario 1 - Case Study Narrabri (Santos)



In our 3D model (constrained with well data and sparse 2D seismic) we did not need to include any faults at the top Napperby level in the proposed Narrabri project area



Interpretation by Iverach et al (2020) does not consider:

- Aquitard thickness or character
- Vertical extent of faults
- Throw of faults
- Alternative sources for CH₄
- Triassic is missing
- Connection from Coal to GAB

Conclusion

- Consider 3D Geology Carefully
- Use Cross Sections and Allan Maps
- Quantify Fault Throw and Aquitard Thickness
- Calculate Rates with Snow's Law and Darcy's Law

